THIS IS SCHEDULE PART 17 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

SCHEDULE PART 17

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

NOVATION OF A TRAM SUPPLY AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together the "**Infraco**" and each separately an "**Infraco Member**"); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated ◆ . 2008 ("**Tram Supply Agreement**") **tie** appointed Tramco to design, manufacture and supply Trams and to supply documentation and associated equipment in connection with the Edinburgh Tram Network. A copy of the Tram Supply Agreement is attached to this Agreement and initialled by the parties for the purpose of identification. This Agreement is supplemental to the Tram Supply Agreement.

B **tie** and Infraco have entered into a contract ("**Infraco Contract**") under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "Client" (as defined in the Tram Supply Agreement) under the Tram Supply Agreement and that Tramco shall owe all of the duties and obligations arising thereunder to Infraco by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

D **tie** wishes to be released from the Tram Supply Agreement and Tramco has agreed to release **tie**.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 In this Agreement the following additional words and expressions shall have the meanings set out opposite to them:

"**Effective Date**" means the last date of execution of this Agreement."

1.3 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.4 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

2. RELEASE BY TRAMCO OF tie

2.1 Tramco releases and discharges **tie** from any and all duties, obligations and liabilities owed to Tramco under the Tram Supply Agreement and accepts the liability of Infraco under the Tram Supply Agreement in lieu of **tie**.

3. RELEASE BY tie OF TRAMCO

3.1 **tie** releases and discharges Tramco from the further performance of Tramco's duties and obligations under the Tram Supply Agreement.

4. ACCEPTANCE OF LIABILITY BY TRAMCO TO THE INFRACO

4.1 Tramco undertakes to Infraco to continue to perform all the duties and to discharge all the obligations of Tramco under the Tram Supply Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie**.

4.2 Tramco warrants to Infraco that, in respect of the duties and obligations which it has already performed under the Tram Supply Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the Tram Supply Agreement and otherwise in compliance with all of the terms and conditions thereof. Tramco warrants to Infraco that it shall be liable for any loss or damage suffered or incurred by Infraco arising out of any negligent act, default or breach by Tramco in the performance of its obligations under the Tram Supply Agreement prior to the Effective Date. Tramco shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 Without prejudice to Clauses 4.2 or 4.4, Tramco shall not contend under this Agreement that its liability to Infraco is affected or diminished by reason of **tie** having suffered no loss and/or any loss claimed to have been suffered by Infraco being different in character from that suffered by **tie**.

4.4 Tramco confirms it was aware at the time of entering into the Tram Supply Agreement that Infraco could suffer losses, damages, costs, expenses, claims, demands and proceedings as a result of Tramco's breach of the Tram Supply Agreement.

4.5 Without prejudice to the generality of this Agreement, Tramco warrants and undertakes to Infraco that its duties and obligations under, the Tram Supply Agreement, whether required to be performed prior to the date hereof, have been and will be performed in accordance with the Tram Supply Agreement.

4.6 Tramco acknowledges that any breach of the warranties in this Agreement may cause Infraco to be in breach of the Infraco Contract and/or cause Infraco to suffer loss and/or damage.

4.7 The liability of Tramco to Infraco pursuant to the Tram Supply Agreement as novated by this Agreement (both in respect of the period prior to the Effective Date and after the Effective Date) shall not be affected by Infraco's assumption of liability to **tie** in respect of the Edinburgh Tram Network pursuant to the Infraco Contract.

4.8 Tramco acknowledges that Infraco has and shall continue to rely upon all Tram Works provided by Tramco under the Tram Supply Agreement as novated by this Agreement.

4.9 For the avoidance of doubt, in accordance with Clause 41.2 of the Tram Supply Agreement save where expressly provided for in the Tram Supply Agreement, nothing in this Agreement shall expose either Party to the application of Indirect Loss.

5. VESTING OF REMEDIES AGAINST TRAMCO

All rights of action and remedies against Tramco under and pursuant to the Tram Supply Agreement vested in **tie** (including their accrued rights of action and remedies) shall automatically and without the need for any further action on the part of Infraco, vest in Infraco with effect from the Effective Date.

6. ACCEPTANCE OF LIABILITY BY INFRACO

With effect from the Effective Date Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the Tram Supply Agreement as novated by this Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the Tram Supply Agreement prior to the Effective Date were the acts and omissions of Infraco.

7. VESTING OF REMEDIES AGAINST tie

As from the Effective Date, all rights of action and remedies under or pursuant to the Tram Supply Agreement vested in Tramco shall lie against Infraco and not **tie** whether or not such rights of action or remedies may have arisen prior to, on or after the Effective Date.

8. ACKNOWLEDGEMENT OF PAYMENT

Tramco acknowledges that all payments properly due to Tramco under the Tram Supply Agreement up to the Effective Date have been paid by **tie** (subject to confirmation of pending payments and the assurance that the Tramco will not suffer payment delays due to the novation process).

9. AMENDMENT OF TRAM SUPPLY AGREEMENT

tie, Tramco and Infraco agree that the terms of the Tram Supply Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF TRAM SUPPLY AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the Tram Supply Agreement and, except as specifically amended by Appendix 1 of this Agreement, all the terms and conditions of the Tram Supply Agreement remain in full force and effect. **tie** hereby confirms that it has not exercised any rights and discretions in regard to the Tram Supply Agreement prior to the point of novation.

11. EQUIVALENT PROJECT RELIEF

tie acknowledges that in relation to any Dispute under the Infraco Contract where the Client's sole involvement in any Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then Infraco shall be entitled to recover its costs incurred in relation to such dispute pursuant to Clause 7A (*Tramco Equivalent Project Relief*) of the Tram Supply Agreement from **tie**. **tie** agrees to pay to the Infraco such reasonable costs unless the dispute proceeds to adjudication where such costs shall be paid as allocated between **tie** and the Tram Supplier by the adjudicator following the Dispute Resolution Procedure.

The Infraco agrees that it shall minimise as far as reasonably practicable its administrative costs in relation to Equivalent Project Relief.

The Tram Supplier agrees not to vexatiously claim under the Tram Supply Agreement or vexatiously use the Disputes Resolution Procedure.

12. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This clause does not affect any right or remedy of any person which exists or is otherwise available.

13. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages together with Appendix 1 which is annexed and subscribed as relative hereto and the copy of the Tram Supply Agreement which is attached and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Director _____

Full Name _____

Director _____

Full Name _____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Authorised Signatory _____

Full Name _____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

APPENDIX 1 TO THE TRAM SUPPLY NOVATION AGREEMENT

SCHEDULE OF AMENDMENTS TO THE TRAM SUPPLY AGREEMENT

Clause 7.15

Insert at end of Clause 7.15 the following:

The Tram Supplier acknowledges that it has a copy of the Infraco Contract and is deemed to be aware of the obligations, risks and liabilities assumed by the Infraco thereunder. Without prejudice to the foregoing, the Tram Supplier shall be deemed to be fully aware of the adverse financial and other consequences for the Client which could arise under the Infraco Contract in consequence, in whole or in part, of a breach on the part of the Tram Supplier of its obligations under this Agreement.

Clause 38.11.2

Delete Clause 38.11.2 and replace with:

38.11.2 all payments under this Agreement to the Client shall be made in pounds sterling by electronic transfer of funds to:

Name and Address of Bank:

Sort Code:

Account Number:

Account Name:

Clause 58.2 - No Fault Termination

Insert the following new Clause 58.2:

58.2 In the event that the Infraco Contract is terminated, this Agreement shall terminate unless the Tram Supplier is notified that **tie** (or another nominated party) requires to step into this Agreement.

Clause 60 - Termination for Corrupt Gifts and Fraud

Delete Clause 60 (Termination for Corrupt Gifts and Fraud), in its entirety substitute therefore:

60.1 The Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) shall not commit any Prohibited Act.

60.2 If the Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) commits any Prohibited Act, then the Client may terminate this Agreement with immediate effect by giving notice to the Tram Supplier.

Clause 68.1.2.1.1

Delete Clause 68.1.2.1.1 and replace with:

68.1.2.1.1 in the case of notices given to the Client: Bilfinger Berger-Siemens Consortium, Lochside House, Lochside Way, Edinburgh Park EH12 9DT, fax number 0131 452 2518, attention: Project Director, or such other address or fax number in the United Kingdom as the Client may notify the Tram Supplier from time to time for that purpose; or

……
Director/Authorised Signatory
tie LIMITED

……..
Director/Authorised Signatory
BILFINGER BERGER UK LIMITED

……..
Director/Authorised Signatory
SIEMENS PLC

……..
Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

NOVATION OF A TRAM SUPPLY AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(**1**) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(**2**) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(**3**) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together the "**Infraco**" and each separately an "**Infraco Member**"); and

(**4**) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated 13 May 2008 ("**Tram Supply Agreement**") **tie** appointed Tramco to design, manufacture and supply Trams and to supply documentation and associated equipment in connection with the Edinburgh Tram Network. A copy of the Tram Supply Agreement is attached to this Agreement and initialled by the parties for the purpose of identification. This Agreement is supplemental to the Tram Supply Agreement.

B **tie** and Infraco have entered into a contract ("**Infraco Contract**") under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "Client" (as defined in the Tram Supply Agreement) under the Tram Supply Agreement and that Tramco shall owe all of the duties and obligations arising thereunder to Infraco by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

D **tie** wishes to be released from the Tram Supply Agreement and Tramco has agreed to release **tie**.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 In this Agreement the following additional words and expressions shall have the meanings set out opposite to them:

"**Effective Date**" means the last date of execution of this Agreement."

1.3 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.4 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

2. RELEASE BY TRAMCO OF tie

2.1 Tramco releases and discharges **tie** from any and all duties, obligations and liabilities owed to Tramco under the Tram Supply Agreement and accepts the liability of Infraco under the Tram Supply Agreement in lieu of **tie**.

3. RELEASE BY tie OF TRAMCO

3.1 **tie** releases and discharges Tramco from the further performance of Tramco's duties and obligations under the Tram Supply Agreement.

4. ACCEPTANCE OF LIABILITY BY TRAMCO TO THE INFRACO

4.1 Tramco undertakes to Infraco to continue to perform all the duties and to discharge all the obligations of Tramco under the Tram Supply Agreement and to be bound by its terms and

conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie**.

4.2 Tramco warrants to Infraco that, in respect of the duties and obligations which it has already performed under the Tram Supply Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the Tram Supply Agreement and otherwise in compliance with all of the terms and conditions thereof. Tramco warrants to Infraco that it shall be liable for any loss or damage suffered or incurred by Infraco arising out of any negligent act, default or breach by Tramco in the performance of its obligations under the Tram Supply Agreement prior to the Effective Date. Tramco shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 Without prejudice to Clauses 4.2 or 4.4, Tramco shall not contend under this Agreement that its liability to Infraco is affected or diminished by reason of **tie** having suffered no loss and/or any loss claimed to have been suffered by Infraco being different in character from that suffered by **tie**.

4.4 Tramco confirms it was aware at the time of entering into the Tram Supply Agreement that Infraco could suffer losses, damages, costs, expenses, claims, demands and proceedings as a result of Tramco's breach of the Tram Supply Agreement.

4.5 Without prejudice to the generality of this Agreement, Tramco warrants and undertakes to Infraco that its duties and obligations under, the Tram Supply Agreement, whether required to be performed prior to the date hereof, have been and will be performed in accordance with the Tram Supply Agreement.

4.6 Tramco acknowledges that any breach of the warranties in this Agreement may cause Infraco to be in breach of the Infraco Contract and/or cause Infraco to suffer loss and/or damage.

4.7 The liability of Tramco to Infraco pursuant to the Tram Supply Agreement as novated by this Agreement (both in respect of the period prior to the Effective Date and after the Effective Date) shall not be affected by Infraco's assumption of liability to **tie** in respect of the Edinburgh Tram Network pursuant to the Infraco Contract.

4.8 Tramco acknowledges that Infraco has and shall continue to rely upon all Tram Works provided by Tramco under the Tram Supply Agreement as novated by this Agreement.

4.9 For the avoidance of doubt, in accordance with Clause 41.2 of the Tram Supply Agreement save where expressly provided for in the Tram Supply Agreement, nothing in this Agreement shall expose either Party to the application of Indirect Loss.

5. VESTING OF REMEDIES AGAINST TRAMCO

All rights of action and remedies against Tramco under and pursuant to the Tram Supply Agreement vested in **tie** (including their accrued rights of action and remedies) shall automatically and without the need for any further action on the part of Infraco, vest in Infraco with effect from the Effective Date.

6. ACCEPTANCE OF LIABILITY BY INFRACO

With effect from the Effective Date Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the Tram Supply Agreement as novated by this Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the Tram Supply Agreement prior to the Effective Date were the acts and omissions of Infraco.

7. VESTING OF REMEDIES AGAINST tie

As from the Effective Date, all rights of action and remedies under or pursuant to the Tram Supply Agreement vested in Tramco shall lie against Infraco and not **tie** whether or not such rights of action or remedies may have arisen prior to, on or after the Effective Date.

8. ACKNOWLEDGEMENT OF PAYMENT

Tramco acknowledges that all payments properly due to Tramco under the Tram Supply Agreement up to the Effective Date have been paid by **tie** (subject to confirmation of pending payments and the assurance that the Tramco will not suffer payment delays due to the novation process).

9. AMENDMENT OF TRAM SUPPLY AGREEMENT

tie, Tramco and Infraco agree that the terms of the Tram Supply Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF TRAM SUPPLY AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the Tram Supply Agreement and, except as specifically amended by Appendix 1 of this Agreement, all the terms and conditions of the Tram Supply Agreement remain in full force and effect. **tie** hereby confirms that it has not exercised any rights and discretions in regard to the Tram Supply Agreement prior to the point of novation.

11. EQUIVALENT PROJECT RELIEF

tie acknowledges that in relation to any Dispute under the Infraco Contract where the Client's sole involvement in any Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then Infraco shall be entitled to recover its costs incurred in relation to such dispute pursuant to Clause 7A (*Tramco Equivalent Project Relief*) of the Tram Supply Agreement from **tie**. **tie** agrees to pay to the Infraco such reasonable costs unless the dispute proceeds to adjudication where such costs shall be paid as allocated between **tie** and the Tram Supplier by the adjudicator following the Dispute Resolution Procedure.

The Infraco agrees that it shall minimise as far as reasonably practicable its administrative costs in relation to Equivalent Project Relief.

The Tram Supplier agrees not to vexatiously claim under the Tram Supply Agreement or vexatiously use the Disputes Resolution Procedure.

12. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This clause does not affect any right or remedy of any person which exists or is otherwise available.

13. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding 5 pages together with Appendix 1 which is annexed and subscribed as relative hereto and the copy of the Tram Supply Agreement which is attached and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**

at Edinburgh

on 14th May 2008 by:

Authorised Signatory [redacted]

Full Name LACHER

Witness Signature [redacted]

Full Name STEVEN BELL

Address [redacted]

LESMAHAGOW

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at Edinburgh

on 14th May 2008 by:

Director [redacted]

Full Name RICHARD JOHN WALKER

Director [redacted]

Full Name GARY STEVE DALTON

EXECUTED for and on behalf of **SIEMENS PLC**

at EDINBURGH

on 14 MAY 2008 by:

Authorised Signatory [redacted]

Full Name C. ROTH

Authorised Signatory [redacted]

Full Name M. FLYNN

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at EDINBURGH

on 13 MAY 2008 by:

[redacted]

Authorised Signatory

Full Name JESUS ESNAOLA

Witness Signature [redacted]

Full Name ALFONSO CAMPOS

Address [redacted]

20200 Beasain

APPENDIX 1 TO THE TRAM SUPPLY NOVATION AGREEMENT

SCHEDULE OF AMENDMENTS TO THE TRAM SUPPLY AGREEMENT

Clause 7.15

Insert at end of Clause 7.15 the following:

The Tram Supplier acknowledges that it has a copy of the Infraco Contract and is deemed to be aware of the obligations, risks and liabilities assumed by the Infraco thereunder. Without prejudice to the foregoing, the Tram Supplier shall be deemed to be fully aware of the adverse financial and other consequences for the Client which could arise under the Infraco Contract in consequence, in whole or in part, of a breach on the part of the Tram Supplier of its obligations under this Agreement.

Clause 38.11.2

Delete Clause 38.11.2 and replace with:

38.11.2 all payments under this Agreement to the Client shall be made in pounds sterling by electronic transfer of funds to:

Name and Address of Bank: BARCLAYS BANK plc, 4th FLOOR APEX PLAZA, FORBURY ROAD, READING RG1 1AX

Sort Code: [redacted]

Account Number: [redacted]

Account Name: SIEMENS plc

Clause 58.2 - No Fault Termination

Insert the following new Clause 58.2:

58.2 In the event that the Infraco Contract is terminated, this Agreement shall terminate unless the Tram Supplier is notified that **tie** (or another nominated party) requires to step into this Agreement.

Clause 60 - Termination for Corrupt Gifts and Fraud

Delete Clause 60 (Termination for Corrupt Gifts and Fraud), in its entirety substitute therefore:

60.1 The Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) shall not commit any Prohibited Act.

60.2 If the Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) commits any Prohibited Act, then the Client may terminate this Agreement with immediate effect by giving notice to the Tram Supplier.

Clause 68.1.2.1.1

Delete Clause 68.1.2.1.1 and replace with:

68.1.2.1.1 in the case of notices given to the Client: Bilfinger Berger-Siemens Consortium, Lochside House, Lochside Way, Edinburgh Park EH12 9DT, fax number 0131 452 2518, attention: Project Director, or such other address or fax number in the United Kingdom as the Client may notify the Tram Supplier from time to time for that purpose; or

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director
BILFINGER BERGER UK LIMITED

[redacted]

...
Authorised Signatory
SIEMENS PLC

[redacted]

...
Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

THIS IS SCHEDULE PART 18 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

SCHEDULE PART 18

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

COLLATERAL WARRANTY IN RESPECT OF A TRAM SUPPLY AGREEMENT IN FAVOUR OF tie FROM TRAMCO

relating to

THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together referred to as the "**Infraco**", which term shall include its successors and permitted assignees); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated ◆ 2008 (the "**Tram Supply Agreement**"), **tie** appointed Tramco to design, manufacture and supply Trams and supply documentation and associated equipment in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "**Client**" (as defined in the Tram Supply Agreement) under the Tram

Supply Agreement by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of the Novation Agreement (as hereinafter defined).

D It is a term of the Tram Supply Agreement that Tramco shall enter into this Agreement with **tie** following the execution of the Novation Agreement.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions shall have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to Clause 13);

"**Deliverables**" means all written or documentary outputs to be prepared and delivered by Tramco in the performance of the Tram Works and Tramco's other obligations under the Tram Supply Agreement;

"**Infraco Contract**" means the contract to be entered into or entered into by **tie** with Infraco as described in Recital B above;

"**Novation Agreement**" means the novation agreement entered into among **tie**, Tramco and Infraco relating to the novation of the Tram Supply Agreement;

"**Party**" means each and any of the parties to this Agreement and **Parties** shall be construed accordingly; and

"**Tram Supply Agreement**" means the agreement dated [◆] and originally entered into by **tie** and Tramco, which has been novated to Infraco and Tramco pursuant to the Novation Agreement.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender includes all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

1.6 In the case of any unintended conflict between the definition or interpretation of words or expressions in this Agreement and in the Tram Supply Agreement, the Tram Supply Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

Tramco warrants and undertakes to **tie** that:

2.1 it has carried out and shall carry out and discharge the Tram Works and all its other duties and obligation under the Tram Supply Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1;

2.2.1 Tramco warrants to **tie** that, in the performance of the Tram Works and all its other duties and obligations under the Tram Supply Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent Tram designer and

manufacturer experienced in carrying out works similar to the Tram Works to be carried out under the Tram Supply Agreement;

2.2.2 it owes a duty of care to **tie** in carrying out its duties and obligations under the Tram Supply Agreement;

2.2.3 all obligations and duties on the part of Tramco set out in the Tram Supply Agreement which are expressed to be made in favour of or given to **tie** shall be directly enforceable by **tie** pursuant to this Agreement following the novation of the Tram Supply Agreement pursuant to the Novation Agreement.

3. COPYRIGHT LICENCE

3.1 Tramco hereby grants to **tie** a royalty-free and exclusive licence to use such Project IPR and Tram Supplier IPR as may be necessary, for operation and maintenance of the trams but, not in any case, for manufacturing purposes, for **tie** to use in relation to any projects associated with the Tram Works and or the operation and/or maintenance of the Edinburgh Tram Network, including the Trams. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written approval of the Tram Supplier. Tramco shall be liable for the Project IPR and the Tram Supplier IPR only to the extent that it is used for the purposes for which it was intended.

3.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable prepared or provided by Tramco in connection with the provision of the Tram Works under the Tram Supply Agreement is vested in any person other than Tramco including, without limitation, any Tram Supplier Party, Tramco shall procure for **tie** the benefit of such a licence as is referred to in clause 3.1 for the purposes referred to therein.

3.3 Tramco shall, if so requested at any time, execute such documents and perform such acts (including the grant to **tie** of a licence to use any Software related with operation and maintenance) as may be required fully and effectively to assure to **tie** or any third party the rights referred to in this clause 3.

3.4 Tramco shall provide to **tie** a copy of any of the Deliverables which are to be provided to Infraco under the Tram Supply Agreement as soon as reasonably practicable after receipt by Tramco of a written request from **tie** to do so, unless already delivered to **tie**.

3.5 Tramco undertakes to **tie** that the use by **tie** of any of the Deliverables for any purpose provided for in this clause 3 shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES AND OCIP INSURANCES

4.1 Tramco undertakes to **tie** that:

4.1.1 it has maintained and shall maintain during the performance of its obligations under the Tram Supply Agreement each of the Required Insurances in accordance with the requirements of Clause 40 (*Required Insurances*) and Schedule 11 (*Required Insurances*) of the Tram Supply Agreement;

4.1.2 cover under the professional indemnity insurance is extended to include Tramco's liabilities under this Agreement;

4.1.3 this Agreement has been disclosed to Tramco's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement;

4.1.4 Tramco shall abide by the terms and conditions of insurance and not do or omit to do anything that might prejudice the cover or its rights to make a claim; and

4.1.5 it has been disclosed to it details of the OCIP Insurances and that it shall abide by the terms and conditions of the insurances contained therein and shall not do or omit to do anything that might prejudice the cover of **tie**'s right to make a claim under the OCIP Insurances.

4.2 As and when required by **tie**, Tramco shall produce for inspection documentary evidence that the Required Insurances are being properly maintained.

4.3 Tramco shall not make any material alteration to the terms of the Required Insurances without **tie**'s prior approval which approval shall not be unreasonably withheld. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if Tramco is unable to obtain professional indemnity insurance, Tramco shall promptly give written notice of this to **tie**.

5. tie STEP-IN

5.1 Tramco shall not exercise nor seek to exercise any right of determination of the Tram Supply Agreement or to rescind the Tram Supply Agreement by reason of a Client Default or to otherwise discontinue the performance of any of Tramco's obligations in relation to the Tram Supply Agreement by reason of breach on the part of Infraco (or otherwise) without giving **tie** not less than 21 days' written notice of its intention to do so and specifying in such notice the grounds for the proposed determination. Tramco for the period of any such notice diligently and properly continue to perform Tramco's obligations under the Tram Supply Agreement.

5.2 Any period stipulated in the Tram Supply Agreement for the exercise by Tramco of a right of determination shall nevertheless be extended as may be necessary to take account of the period of notice required under clause 5.1.

5.3 Compliance by Tramco with the provisions of clause 5.1 shall not be treated as a waiver of any breach on the part of Infraco giving rise to the right of determination nor otherwise prevent Tramco from exercising its rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 5.4

5.4 The right of Tramco to determine the Tram Supply Agreement or to rescind the Tram Supply Agreement or to discontinue the performance of any of its obligations in relation to the Tram Supply Agreement shall cease if within the period of 21 days referred to in clause 5.1, **tie** gives written notice to Tramco:

5.4.1 requiring Tramco to continue with the performance of all its obligations under the Tram Supply Agreement;

5.4.2 acknowledging that **tie** is assuming all the obligations of Infraco (as "Client") under the Tram Supply Agreement; and

5.4.3 undertaking to Tramco to discharge all amounts payable to Tramco under the terms of the Tram Supply Agreement from the date on which such notice under this clause 5.4 is given to Tramco.

5.5 Upon compliance by **tie** with the requirements of clause 5.4, the Tram Supply Agreement shall continue in full force and effect as if the right of determination on the part of Tramco had not arisen and in all respects as if the Tram Supply Agreement had been made between **tie** and Tramco to the exclusion of Infraco.

5.6 Notwithstanding that as between Infraco and Tramco, Tramco's right of determination of its engagement under the Tram Supply Agreement may not have arisen, the provisions of clause 5.5 shall nevertheless apply if **tie** gives written notice to Tramco and Infraco to that effect and **tie** complies with the requirements on its part under clause 5.4.

5.7 Tramco does not need to be concerned or required to enquire whether, and shall be entitled to assume that, as between Infraco and **tie**, the circumstances have occurred permitting **tie** to give notice under clause 5.6.

5.8 Tramco acting in accordance with the provisions of this clause 5 shall not incur any liability to Infraco arising out of the exercise by **tie** of its rights under this clause 5.

5.9 Save as otherwise set out in this Agreement, unless and until **tie** has given notice under this clause 5:

5.9.1 **tie** has no liability whatsoever to Tramco in respect of amounts payable to Tramco under the Tram Supply Agreement; and

5.9.2 **tie** has no authority to issue any direction or instruction to Tramco in relation to the performance of Tramco's obligations under the Tram Supply Agreement.

5.10 Without prejudice to the provisions of clauses 5.1 to 5.9 inclusive, if prior to the service of any notice under clause 5.4 Tramco is determined under the Tram Supply Agreement for any reason whatsoever, Tramco shall, if required in writing so to do by **tie**, no later than 12 weeks after the date of such determination forthwith enter into a new agreement with **tie** on the same terms as the Tram Supply Agreement, but with such revisions as **tie** and Tramco may reasonable require to reflect altered circumstances and the fact that it is **tie** and not Infraco employing Tramco.

6. ASSIGNATION

6.1 Tramco shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of **tie**.

6.2 **tie** shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie**; or

6.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to Tramco) by **tie** or a person falling within clause 6.2.1; or

6.2.3 to City of Edinburgh Council or Transport Edinburgh Limited; or

6.2.4 to any other person with the prior written consent of Tramco (such consent not to be unreasonably withheld or delayed).

6.3 Tramco undertakes to **tie** not to contend in any court proceedings under this Agreement that any person to whom **tie** assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that **tie** is named under this Agreement or any intermediate assignee of **tie** escaped loss resulting from such breach by reason of the disposal of its interest in the same.

7. LIABILITY OF TRAMCO

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by law of contract, delict or otherwise.

7.2 The responsibility of Tramco under this Agreement is not to be reduced or in any way reduced or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

7.3 The rights and remedies conferred upon **tie** by this Agreement are in addition to any other rights and remedies that **tie** may have against Tramco including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of Tramco to **tie** is to be determined in all respects in accordance with the terms of the Tram Supply Agreement and this Agreement and, in the event of any claim by **tie** under or through this Agreement, Tramco shall be entitled to rely upon any defence, right, limitation or

exclusion under the Tram Supply Agreement as though **tie** were named as Client under it, except that:

7.4.1 **tie** shall not be affected by any subsequent variation of the Tram Supply Agreement which would adversely affect the obligations owed by Tramco or the waiver, compromise or withdrawal of any claim made Infraco; and

7.4.2 Tramco shall not be entitled to exercise any right of set-off, retention or withholding against **tie** to which Tramco may be entitled as against Infraco.

7.5 The liability of Tramco under this Agreement shall be no greater in extent than the liability of Tramco under the Tram Supply Agreement.

7.6 In no event shall the Tram Supplier be responsible for indirect or consequential damages.

8. DELIVERY, TITLE TO PARTS AND OTHER PROPERTY

Notwithstanding any provision of the Tram Supply Agreement to the contrary, in respect of Tramco's performance of its obligations under the Tram Supply Agreement:

8.1 Tramco shall sell to **tie** or such other party as shall be notified by **tie** to Tramco in writing, each Tram free from all claims, charges, rights in security, liens, encumbrances, hypothecs and other third party rights of any nature.

8.2 Tramco shall transfer title:

8.2.1 to each Tram, to **tie** or such other party as shall be notified by **tie** to Tramco in writing, on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.2.2 to each item of the Tram Related Equipment to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment to Infraco and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.3 The risk of loss, theft, damage or destruction of:

8.3.1 each Tram shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.3.2 each item of the Tram Related Equipment shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.4 Tramco shall be responsible for each Tram completely manufactured or in the course of manufacture and for all Tram Related Equipment until such time as risk in the Trams and the Tram Related Equipment passes to **tie** (or as **tie** otherwise shall direct) in accordance with this clause 8.

8.5 Tramco undertakes to **tie** that it shall promptly replace any Tram or any part, component or material incorporated in or to be used in connection with such Tram or any Tram Related Equipment, which is lost, damaged or destroyed by whatever cause, prior to such passing of risk.

9. CONSENT OF INFRACO

Infraco consents to the terms of this Agreement.

10. NOTICES

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by registered or recorded delivery post, is deemed to have been received 48 hours after being posted.

11. RIGHTS OF THIRD PARTIES

A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. INVALID TERMS

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. VARIATIONS AND WAIVERS TO BE IN WRITING

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. WAIVER

14.1 Save where expressly stated, no failure or delay by any Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do no operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 64 (*Dispute Resolution Procedure*) of the Tram Supply Agreement and the provisions of the said Clause 64 and Schedules 13 (*Dispute Resolution Procedure*) and 14 (*Panels to the Dispute Resolution Procedure*) are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" shall be deemed to refer to **tie** and Tramco, any reference to "Client" shall be deemed to refer to **tie**, and notices to be given in connection therewith shall be given in accordance with clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

COLLATERAL WARRANTY IN RESPECT OF A TRAM SUPPLY AGREEMENT IN FAVOUR OF tie FROM TRAMCO

relating to

THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together referred to as the "**Infraco**", which term shall include its successors and permitted assignees); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)**, a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated 13 May 2008 (the "**Tram Supply Agreement**"), **tie** appointed Tramco to design, manufacture and supply Trams and supply documentation and associated equipment in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "**Client**" (as defined in the Tram Supply Agreement) under the Tram

Supply Agreement by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of the Novation Agreement (as hereinafter defined).

D It is a term of the Tram Supply Agreement that Tramco shall enter into this Agreement with **tie** following the execution of the Novation Agreement.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions shall have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to Clause 13);

"**Deliverables**" means all written or documentary outputs to be prepared and delivered by Tramco in the performance of the Tram Works and Tramco's other obligations under the Tram Supply Agreement;

"**Infraco Contract**" means the contract to be entered into or entered into by **tie** with Infraco as described in Recital B above;

"**Novation Agreement**" means the novation agreement entered into among **tie**, Tramco and Infraco relating to the novation of the Tram Supply Agreement;

"**Party**" means each and any of the parties to this Agreement and **Parties** shall be construed accordingly; and

"**Tram Supply Agreement**" means the agreement dated 13 May 2008 and originally entered into by **tie** and Tramco, which has been novated to Infraco and Tramco pursuant to the Novation Agreement.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender includes all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

1.6 In the case of any unintended conflict between the definition or interpretation of words or expressions in this Agreement and in the Tram Supply Agreement, the Tram Supply Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

Tramco warrants and undertakes to **tie** that:

2.1 it has carried out and shall carry out and discharge the Tram Works and all its other duties and obligation under the Tram Supply Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1;

2.2.1 Tramco warrants to **tie** that, in the performance of the Tram Works and all its other duties and obligations under the Tram Supply Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent Tram designer and manufacturer experienced in carrying out works similar to the Tram Works to be carried out under the Tram Supply Agreement;

2.2.2 it owes a duty of care to **tie** in carrying out its duties and obligations under the Tram Supply Agreement;

2.2.3 all obligations and duties on the part of Tramco set out in the Tram Supply Agreement which are expressed to be made in favour of or given to **tie** shall be directly enforceable by **tie** pursuant to this Agreement following the novation of the Tram Supply Agreement pursuant to the Novation Agreement.

3. COPYRIGHT LICENCE

3.1 Tramco hereby grants to **tie** a royalty-free and exclusive licence to use such Project IPR and Tram Supplier IPR as may be necessary, for operation and maintenance of the trams but, not in any case, for manufacturing purposes, for **tie** to use in relation to any projects associated with the Tram Works and or the operation and/or maintenance of the Edinburgh Tram Network, including the Trams. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written approval of the Tram Supplier. Tramco shall be liable for the Project IPR and the Tram Supplier IPR only to the extent that it is used for the purposes for which it was intended.

3.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable prepared or provided by Tramco in connection with the provision of the Tram Works under the Tram Supply Agreement is vested in any person other than Tramco including, without limitation, any Tram Supplier Party, Tramco shall procure for **tie** the benefit of such a licence as is referred to in clause 3.1 for the purposes referred to therein.

3.3 Tramco shall, if so requested at any time, execute such documents and perform such acts (including the grant to **tie** of a licence to use any Software related with operation and maintenance) as may be required fully and effectively to assure to **tie** or any third party the rights referred to in this clause 3.

3.4 Tramco shall provide to **tie** a copy of any of the Deliverables which are to be provided to Infraco under the Tram Supply Agreement as soon as reasonably practicable after receipt by Tramco of a written request from **tie** to do so, unless already delivered to **tie**.

3.5 Tramco undertakes to **tie** that the use by **tie** of any of the Deliverables for any purpose provided for in this clause 3 shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES AND OCIP INSURANCES

4.1 Tramco undertakes to **tie** that:

4.1.1 it has maintained and shall maintain during the performance of its obligations under the Tram Supply Agreement each of the Required Insurances in accordance with the requirements of Clause 40 (*Required Insurances*) and Schedule 11 (*Required Insurances*) of the Tram Supply Agreement;

4.1.2 cover under the professional indemnity insurance is extended to include Tramco's liabilities under this Agreement;

4.1.3 this Agreement has been disclosed to Tramco's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement;

4.1.4 Tramco shall abide by the terms and conditions of insurance and not do or omit to do anything that might prejudice the cover or its rights to make a claim; and

4.1.5 it has been disclosed to it details of the OCIP Insurances and that it shall abide by the terms and conditions of the insurances contained therein and shall not do or omit to do anything that might prejudice the cover of **tie**'s right to make a claim under the OCIP Insurances.

4.2 As and when required by **tie**, Tramco shall produce for inspection documentary evidence that the Required Insurances are being properly maintained.

4.3 Tramco shall not make any material alteration to the terms of the Required Insurances without **tie**'s prior approval which approval shall not be unreasonably withheld. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if Tramco is unable to obtain professional indemnity insurance, Tramco shall promptly give written notice of this to **tie**.

5. tie STEP-IN

5.1 Tramco shall not exercise nor seek to exercise any right of determination of the Tram Supply Agreement or to rescind the Tram Supply Agreement by reason of a Client Default or to otherwise discontinue the performance of any of Tramco's obligations in relation to the Tram Supply Agreement by reason of breach on the part of Infraco (or otherwise) without giving **tie** not less than 21 days' written notice of its intention to do so and specifying in such notice the

grounds for the proposed determination. Tramco for the period of any such notice diligently and properly continue to perform Tramco's obligations under the Tram Supply Agreement.

5.2 Any period stipulated in the Tram Supply Agreement for the exercise by Tramco of a right of determination shall nevertheless be extended as may be necessary to take account of the period of notice required under clause 5.1.

5.3 Compliance by Tramco with the provisions of clause 5.1 shall not be treated as a waiver of any breach on the part of Infraco giving rise to the right of determination nor otherwise prevent Tramco from exercising its rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 5.4

5.4 The right of Tramco to determine the Tram Supply Agreement or to rescind the Tram Supply Agreement or to discontinue the performance of any of its obligations in relation to the Tram Supply Agreement shall cease if within the period of 21 days referred to in clause 5.1, **tie** gives written notice to Tramco:

5.4.1 requiring Tramco to continue with the performance of all its obligations under the Tram Supply Agreement;

5.4.2 acknowledging that **tie** is assuming all the obligations of Infraco (as "Client") under the Tram Supply Agreement; and

5.4.3 undertaking to Tramco to discharge all amounts payable to Tramco under the terms of the Tram Supply Agreement from the date on which such notice under this clause 5.4 is given to Tramco.

5.5 Upon compliance by **tie** with the requirements of clause 5.4, the Tram Supply Agreement shall continue in full force and effect as if the right of determination on the part of Tramco had not arisen and in all respects as if the Tram Supply Agreement had been made between **tie** and Tramco to the exclusion of Infraco.

5.6 Notwithstanding that as between Infraco and Tramco, Tramco's right of determination of its engagement under the Tram Supply Agreement may not have arisen, the provisions of clause 5.5 shall nevertheless apply if **tie** gives written notice to Tramco and Infraco to that effect and **tie** complies with the requirements on its part under clause 5.4.

5.7 Tramco does not need to be concerned or required to enquire whether, and shall be entitled to assume that, as between Infraco and **tie**, the circumstances have occurred permitting **tie** to give notice under clause 5.6.

5.8 Tramco acting in accordance with the provisions of this clause 5 shall not incur any liability to Infraco arising out of the exercise by **tie** of its rights under this clause 5.

5.9 Save as otherwise set out in this Agreement, unless and until **tie** has given notice under this clause 5:

5.9.1 **tie** has no liability whatsoever to Tramco in respect of amounts payable to Tramco under the Tram Supply Agreement; and

5.9.2 **tie** has no authority to issue any direction or instruction to Tramco in relation to the performance of Tramco's obligations under the Tram Supply Agreement.

5.10 Without prejudice to the provisions of clauses 5.1 to 5.9 inclusive, if prior to the service of any notice under clause 5.4 Tramco is determined under the Tram Supply Agreement for any reason whatsoever, Tramco shall, if required in writing so to do by **tie**, no later than 12 weeks after the date of such determination forthwith enter into a new agreement with **tie** on the same terms as the Tram Supply Agreement, but with such revisions as **tie** and Tramco may reasonable require to reflect altered circumstances and the fact that it is **tie** and not Infraco employing Tramco.

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6.1 Tramco shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of **tie**.

6.2 **tie** shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie**; or

6.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to Tramco) by **tie** or a person falling within clause 6.2.1; or

6.2.3 to City of Edinburgh Council or Transport Edinburgh Limited; or

6.2.4 to any other person with the prior written consent of Tramco (such consent not to be unreasonably withheld or delayed).

6.3 Tramco undertakes to **tie** not to contend in any court proceedings under this Agreement that any person to whom **tie** assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that **tie** is named under this Agreement or any intermediate assignee of **tie** escaped loss resulting from such breach by reason of the disposal of its interest in the same.

7. LIABILITY OF TRAMCO

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by law of contract, delict or otherwise.

7.2 The responsibility of Tramco under this Agreement is not to be reduced or in any way reduced or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

7.3 The rights and remedies conferred upon **tie** by this Agreement are in addition to any other rights and remedies that **tie** may have against Tramco including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of Tramco to **tie** is to be determined in all respects in accordance with the terms of the Tram Supply Agreement and this Agreement and, in the event of any claim by **tie** under or through this Agreement, Tramco shall be entitled to rely upon any defence, right, limitation or exclusion under the Tram Supply Agreement as though **tie** were named as Client under it, except that:

7.4.1 **tie** shall not be affected by any subsequent variation of the Tram Supply Agreement which would adversely affect the obligations owed by Tramco or the waiver, compromise or withdrawal of any claim made Infraco; and

7.4.2 Tramco shall not be entitled to exercise any right of set-off, retention or withholding against **tie** to which Tramco may be entitled as against Infraco.

7.5 The liability of Tramco under this Agreement shall be no greater in extent than the liability of Tramco under the Tram Supply Agreement.

7.6 In no event shall the Tram Supplier be responsible for indirect or consequential damages.

8. DELIVERY, TITLE TO PARTS AND OTHER PROPERTY

Notwithstanding any provision of the Tram Supply Agreement to the contrary, in respect of Tramco's performance of its obligations under the Tram Supply Agreement:

8.1 Tramco shall sell to **tie** or such other party as shall be notified by **tie** to Tramco in writing, each Tram free from all claims, charges, rights in security, liens, encumbrances, hypothecs and other third party rights of any nature.

8.2 Tramco shall transfer title:

8.2.1 to each Tram, to **tie** or such other party as shall be notified by **tie** to Tramco in writing, on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.2.2 to each item of the Tram Related Equipment to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment to Infraco and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.3 The risk of loss, theft, damage or destruction of:

8.3.1 each Tram shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.3.2 each item of the Tram Related Equipment shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.4 Tramco shall be responsible for each Tram completely manufactured or in the course of manufacture and for all Tram Related Equipment until such time as risk in the Trams and the Tram Related Equipment passes to **tie** (or as **tie** otherwise shall direct) in accordance with this clause 8.

8.5 Tramco undertakes to **tie** that it shall promptly replace any Tram or any part, component or material incorporated in or to be used in connection with such Tram or any Tram Related Equipment, which is lost, damaged or destroyed by whatever cause, prior to such passing of risk.

9. CONSENT OF INFRACO

Infraco consents to the terms of this Agreement.

10. NOTICES

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by registered or recorded delivery post, is deemed to have been received 48 hours after being posted.

11. RIGHTS OF THIRD PARTIES

A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. INVALID TERMS

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. VARIATIONS AND WAIVERS TO BE IN WRITING

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. WAIVER

14.1 Save where expressly stated, no failure or delay by any Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do no operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 64 (*Dispute Resolution Procedure*) of the Tram Supply Agreement and the provisions of the said Clause 64 and Schedules 13 (*Dispute Resolution Procedure*) and 14 (*Panels to the Dispute Resolution Procedure*) are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" shall be deemed to refer to **tie** and Tramco, any reference to "Client" shall be deemed to refer to **tie**, and notices to be given in connection therewith shall be given in accordance with clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding 10 pages are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at EDINBURGH

on 14th MAY 2008 by:

Authorised Signatory [redacted]

Full Name WILLIAM GALLAGHER

Witness Signature [redacted]

Full Name Andrew William Mackenzie

Address [redacted] Queen St
Glasgow

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at EDINBURGH

on 14TH MAY 2008 by:

Director [redacted]

Full Name RICHARD JOHN WALKER

Director [redacted]

Full Name GARY STEVE DALTON

EXECUTED for and on behalf of **SIEMENS PLC**

at EDINBURGH

on 14 MAY 2008 by:

Authorised Signatory [redacted]

Full Name C. ROTH

Authorised Signatory [redacted]

Full Name M. FLYNN

EXECUTED for and on behalf of **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)**

at EDINBURGH

on 13 MAY 2008 by:

Authorised Signatory [redacted]

Full Name JESUS ESNAOLA

Witness Signature [redacted]

Full Name ANTONIO CAMPOS

Address [redacted] J.M. ITURRIOZ

20200, BEASAIN - SPAIN

THIS IS SCHEDULE PART 19 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

SCHEDULE PART 19

TRAM MAINTENANCE AGREEMENT

PLEASE REFER TO EXECUTED COPY OF TRAM MAINTENANCE AGREEMENT

(1) tie LIMITED

- and -

(2) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

TRAM MAINTENANCE AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

CONTENTS

TRAM MAINTENANCE AGREEMENT

BETWEEN:

(1) **tie LIMITED** ("**tie**"), a company registered in Scotland under company number SC230949 whose registered office is at City Chambers, High Street, Edinburgh, EH1 1YJ ("**Client**") which expression shall include its successors, permitted assignees and transferees; and

(2) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) – Spain (the "**Tram Maintainer**") which expression shall include its personal representatives, successors, permitted assignees and transferees,

to be referred to collectively as the "**Parties**" or singularly as the "**Party**" as the context requires.

WHEREAS:

(A) On 30 November 2005, **tie** published in the Official Journal of the European Union notice of its intention to seek offers for the provision and maintenance of tram vehicles in respect of the Edinburgh Tram Network and following a procurement contest conducted in accordance with the Public Supply Contracts Regulations 1995 (SI 1995/201), has appointed the Tram Maintainer for the purpose of maintaining such vehicles on the terms of this Agreement.

(B) By virtue of the Tram Legislation, CEC has been granted the requisite authorities and statutory powers to construct, operate and maintain Line One and Line Two.

(C) On 31 January 2006 **tie** published in the Official Journal of the European Union notice of its intention to seek offers for the provision of infrastructure works (including systems integration services) for Line One and Line Two. Pursuant to a procurement contest to be completed after the Effective Date, **tie** intends to appoint Infraco to provide such services.

(D) If required by **tie**, **tie** and the Tram Maintainer have agreed that this Agreement will be novated by **tie** to Infraco or another party, with the intention that such party shall take over the rights and liabilities of the "Client" under this Agreement and that such party will, thereafter, be responsible to **tie** for the maintenance of the Trams as part of its responsibilities to **tie**. The Tram Maintainer will participate in such novation on the terms set out in this Agreement.

(E) This Agreement sets out the terms on which the Client shall procure from the Tram Maintainer the maintenance of 27 Trams together with an option for the maintenance of any Additional

Trams and the provision of Spare Parts and Special Tools in respect of such Trams and/or Additional Trams.

(F) It is acknowledged that this Agreement forms part of a suite of documents which together aim to achieve a project vision (the "**Project Vision**") for the Edinburgh Tram Network. This Project Vision involves the development of a tramway which will stand favourable comparison with the best in Europe. The quality of the tramway provided will be appropriate to Edinburgh's status and role as a European capital city and its city centre's designation as a World Heritage Site. The tramway will integrate as far as possible with other transport modes to serve the existing fabric of the City of Edinburgh, and promote appropriate development and social inclusion. It is intended that this goal be achieved in a spirit of partnership, utilising modern design and construction methods and standards.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement unless the context otherwise requires (including the recitals above) the following words and expressions shall have the following meanings:

"**Account**" means an account established by the Tram Maintainer for the deposit of cash pursuant to paragraph 4.1 of Schedule 12 (*Return Condition*);

"**Actual Performance Level**" means the Tram Punctuality Performance achieved during any specified period, without taking into account any amendment due to Excusing Cause or other agreed adjustment;

"**Additional Insurance**" has the meaning given to it in Clause 29.16;

"**Additional Operator Trams**" has the meaning given to it in Clause 9.27.1;

"**Additional Services**" means additional services arising from a change agreed between the Parties in accordance with the Change Procedure;

"**Additional Trams**" means Tram unit(s) which may be ordered by the Client in accordance with Clause 18.1;

"**Advance Payment Bond**" means the advance payment bond as defined in the Tram Supply Agreement;

"**Affected Party**" means a Party that is unable to comply with all or a material part of its obligations under this Agreement as a direct result of a Force Majeure Event;

"**Affiliate**" means in relation to any person, any holding company or subsidiary of that person or any subsidiary of such holding company and "**holding company**" and "**subsidiary**" shall have the meanings given to them in sections 1159 and 1160 of the Companies Act 2006;

"**Agreed Labour Hours**" has the meaning given to it in Clause 9.23.4.2 (b);

"**Agreed Repair**" means a repair detailed in the first column of the table in Schedule 11 (*Agreed Repairs*);

"**Agreed Repair Cost**" means the cost of an Agreed Repair as set out in the second column of the table in Schedule 11 (*Agreed Repairs*);

"**Agreement**" means Clauses 1 to 68 (inclusive) together with Schedules 1 to 24 (inclusive) which are annexed and signed as relative hereto, all as may be amended from time to time in accordance with this Agreement;

"**Annual Service Report**" has the meaning given to it in Clause 49.4;

"**Approval Bodies**" means any Relevant Authorities, planning authorities, roads authorities, HMRI, BAA, Network Rail and any other parties who are to issue Consents which may be required for the construction, installation, commissioning, completion, opening, maintenance, use or modification of the Edinburgh Tram Network;

"**Assets**" means all assets and rights to enable CEC, TEL, **tie** or their assignees or agents or another party to own, operate and maintain and extend the Edinburgh Tram Network in accordance with this Agreement, including:

(a) any equipment forming part of the Edinburgh Tram Network;

(b) any books and records (including the operating and maintenance manual, health and safety manuals and other know-how);

(c) any Trams, Spare Parts, Special Tools and other assets (together with any warranties in respect of assets being transferred);

(d) any contractual rights; and

(e) any Intellectual Property Rights;

but excluding any assets and rights in respect of which CEC and/or **tie** (as appropriate) is full, legal and beneficial owner;

"**Availability Criteria**" means that a Tram:

(a) fully complies with the Tram Maintenance Specification, save for Minor Defects; and

(b) is free from Material Defects

and "**non Availability**" shall mean failure to meet the Availability Criteria;

"**Available**" means that a Tram meets the Availability Criteria;

"**Background Information**" means all and any materials, documents, drawings, plans or other information in paper, electronic or any other form, relating in any way to this Agreement or the Tram Legislation (and the parliamentary process) and made available to the Tram Maintainer by **tie**, CEC, any **tie** Party, the Client, any Client Party and/or any of their respective members, officers, agents and/or advisers in connection with this Agreement or during the procurement competition relating to this Agreement or thereafter;

"**Base Case RPIX**" means RPIX as at September 2007;

"**Best Value Improvement Plans**" means the plans referred to in Clause 49.8;

"**Business Day**" means any day other than a Saturday, Sunday or a day which is a public holiday recognised by CEC;

"**Case for Safety**" means all necessary documentation, information and other requirements for the issue of a safety certificate or a safety authorisation (as appropriate) by the Office of the Rail Regulator pursuant to the Railways and Other Guided Transport Systems (Safety) Regulations 2006;

"**CEC**" means the City of Edinburgh Council;

"**Certificate of Service Commencement**" means the certificate issued by **tie** in accordance with Clause 45.3 of the Infraco Agreement;

"**Change in Control**" means any sale or disposal of any legal beneficial or equitable interest in share capital comprising 30% of a corporation or the transfer or acquisition of the ability to direct the management and control of the corporation;

"**Change in Law**" means the coming into effect after the **14th September 2007** of:

(a) Legislation, other than any Legislation which on or before the **14th September 2007** has been published:

(i) in a draft Bill as a part of a Scottish Executive, Scottish Parliament or United Kingdom Government consultation paper;

(ii) in a Bill;

(iii) in draft subordinate Legislation within the meaning of section 21(1) of the Interpretation Act 1978; or

(iv) as a proposal in the Official Journal of the European Union or as a common position adopted by the European Parliament; or

(b) any Guidance (other than Guidance which on the 14th September 2007 has been published (in draft or otherwise) or changes in Guidance; or

(c) any applicable judgement of a relevant court of law which changes binding precedent;

"**Change Procedure**" means the variation procedure set out in Clause 16 (*Changes*);

"**Client Change**" means any addition, modification, reduction or omission in respect of the Services or any other term of this Agreement instructed by the Client in accordance with Clause 16 (*Changes*);

"**Client Change Order**" means the written confirmation issued by the Client to proceed with a Client Change on the basis of an Estimate (as modified, if required);

"**Client Claim**" means a relief or entitlement pursuant to the Infraco Contract (other than in respect of compensation on termination payment) to which the Client is or becomes or may become entitled under the Infraco Contract which is equivalent to and/or consistent with relief or entitlement pursuant to and under the same circumstances as an EPR Claim;

"**Client Default**" has the meaning given to it in Clause 34.1 (*Client Default Termination*);

"**Client Notice of Change**" means a notice served by the Client pursuant to Clause 16.1 setting out the matters specified in Clause 16.2;

"**Client Party**" means any advisers appointed by the Client or any of the Client's employees, agents, contractors and sub-contractors of any tier and its or their directors, officers and employees (excluding the Tram Maintainer or any Tram Maintainer Party);

"**Client's Programme**" means the programme for the Infraco Works which shall be notified to the Tram Maintainer and updated from time to time;

"**Client's Representative**" means the person or persons appointed by the Client from time to time and notified to the Tram Maintainer;

"**Code**" means the Scottish Ministers' Code of Practice on the Discharge of Functions by Public Authorities under the Freedom of Information (Scotland) Act 2002 as the same may be amended, varied or replaced from time to time;

"**Code of Construction Practice**" means the code set out in part 1 of Schedule 18 (*Code of Construction and Code of Maintenance Practice*);

"**Code of Maintenance Practice**" means the code set out in part 2 of Schedule 18 (*Code of Construction and Code of Maintenance Practice*);

"**Commencement Date**" means the date on which the Tram Maintainer has been notified by the Client that all the Conditions Precedent have been either satisfied or waived;

"**Commercially Sensitive Information**" means the subset of Confidential Information listed in Schedule 17 (*Commercially Sensitive Information*) comprised of information:

(a) which is provided by the Tram Maintainer to the Client in confidence for the period set out in that schedule; and/or

(b) that constitutes a trade secret;

"**Conditions Precedent**" means the conditions specified in part 1 of Schedule 1 (*Conditions Precedent*);

"**Confidential Information**" means any information which has been designated as confidential by either Party in writing or that ought to be considered as confidential (however it is conveyed or on whatever media it is stored) including information which relates to the business, affairs, properties, assets, trading practices, goods, services, developments, trade secrets, Intellectual Property Rights, know-how, personnel of either Party, all personal data and sensitive personal data within the meaning of the Data Protection Act 1998, and the Commercially Sensitive Information;

"**Consents**" means without limitation all permissions, consents, approvals, certificates, permits, licences, agreements and authorisations (including those required by Law), needed to

carry out the Services including any consents obtained by or on behalf of the Project Safety and Certification Committee;

"**Construction/Operational Panel**" has the meaning given to it in paragraph 19.1 of Schedule 9 (*Dispute Resolution Procedure*);

"**Control Centre**" means the control centre for the Edinburgh Tram Network to be provided by the Infraco pursuant to the Infraco Contract and operated by the Operator pursuant to the DPOFA;

"**Defective Tram**" means a Tram operating in passenger service with a Minor Defect which arrives at or departs from a Monitoring Point;

"**Deliverables**" means the Tram Maintainer's Materials, the Tram Maintenance Plan, the Tram Maintenance Programme and any other information associated with the Services provided by the Tram Maintainer from time to time;

"**Deliverables Programme**" means the programme prepared by the Tram Maintainer as set out in part 3 of Schedule 2 (*Employer's Requirements*), as may be amended from time to time in accordance with this Agreement;

"**Delivery**" means, in respect of a Tram, when the Tram is delivered to the Depot and/or the Tram Maintainer takes operational control of the Tram and "Deliver" shall be construed accordingly;

"**Depot**" means the depot at Gogar comprising maintenance facilities, stabling facilities, sidings, operations, cleaning facilities, the Control Centre, storage facilities and accommodation for operational and maintenance staff;

"**Depot Equipment**" means the equipment which is identified as being maintained and/or operated by the Tram Maintainer in table 83 of section 29 of the Employer's Requirements;

"**Depot Plan**" means the plan of the Depot annexed to the Depot Sub-Licence;

"**Depot Sub-Licence**" means the sub-licence to the Depot in the form annexed to Schedule 13 (*Depot Sub-Licence*);

"**Discriminatory Change in Law**" means a Change in Law, the terms of which apply expressly to:

(a) the Edinburgh Tram Network; and/or

(b) the Tram Maintainer and not to other persons;

"**Dispute**" means any dispute, difference or unresolved claim between the Parties in connection with or arising from this Agreement;

"**Dispute Resolution Procedure**" means the procedure provided for in Clause 52 (*Dispute Resolution Procedure*) and set out in Schedule 9 (*Dispute Resolution Procedure*);

"**DPOFA**" means the development partnering and operating franchise agreement between **tie** and the Operator dated 14 May 2004 as amended at 20 December 2007;

"**Edinburgh Tram Network**" means the tramway which is to be designed, constructed and maintained in Edinburgh pursuant to the Infraco Contract in Phase 1a (forming part of Line One and Line Two as described in the Tram Legislation (and Phase 1b if built), together with all associated works and facilities including all civil engineering and track works, Trams, infrastructure, plant, machinery and equipment installed or used for such tramway;

"**Effective Date**" means the last date of execution of this Agreement;

"**Emergency Services**" means Lothian and Borders Police, Lothian and Borders Fire Brigade, British Transport Police, Scottish Ambulance Services and HM Coastguard;

"**Employer's Requirements**" means the requirements set out in part 1 of Schedule 2 (*Employer's Requirements*);

"**Environmental Information Regulations**" means the Environmental Information (Scotland) Regulations 2004, Scottish SI 2004/520;

"**EPR Claim**" means a relief or entitlement or payment pursuant to this Agreement to which the Tram Supplier is or becomes or may become entitled pursuant to either a:

(a) Force Majeure Event;

(b) Client Change;

(c) Change in Law; and,

(d) any other rights to claim additional payment or relief;

"**Escrow Agreement**" means the escrow agreement in Schedule 8 of the Tram Supply Agreement;

"**Estimate**" means the estimate to be provided by the Tram Maintainer in accordance with Clause 16.4 and 16.6;

"**Euro Compliant**" has the meaning given to it in Clause 23.8;

"**Excusing Cause**" means any one or more of the following events which interrupts the operation of the Trams:

(i) a road traffic accident; or

(ii) the actions of any of the Emergency Services, CEC or Utilities Companies;

provided that, in each case:

(a) the Tram Maintainer has used all reasonable endeavours to mitigate the effect of such Excusing Cause; and

(b) the Tram Maintainer notifies the Client as soon as it becomes aware of the potential and/or actual impact on its ability to perform the Services;-

(iii) a failure on the part of **tie,** the Client or the Client's Representative in complying with its obligations under this Agreement where the Tram Maintainer can demonstrate to the Client's satisfaction that:

(a) such failure had a material impact on its ability to perform the Services; and

(b) the Tram Maintainer has used all reasonable endeavours to mitigate the effects of such failure; and

(c) the Tram Maintainer notified the Client as soon as it became aware of the potential and/or actual impact on its ability to perform the Services;

(iv) any Permitted Variation agreed to by the Parties which causes the Tram Maintainer to be unable to perform the Services but only to the extent that the Client:

(a) shall have given its prior written consent to the Services being affected in such a manner; and

(b) was informed by the Tram Maintainer of the extent of the impact on such Services as part of the process of agreeing such Client Change;

(v) a Force Majeure Event, provided that the Tram Maintainer has complied with its obligations under Clause 36 (*Termination on Force Majeure*);

(vi) environmental conditions, which result in damage to the Edinburgh Tram Network, that are outside the environmental parameters in the Employers Requirements contained in Schedule 2 of this Agreement; or

(vii) suspension by the Client in terms of Clause 31 (*Suspension of Work*) provided that the Tram Maintainer has complied with its obligations under Clause 31 (*Suspension of Work*);

"**Expiry Date**" has the meaning given to it in Clause 4 (*Term of the Agreement*);

"**Final Persistent Breach Notice**" has the meaning given to it in Clause 33.2;

"**Financial Panel**" has the meaning given to it in paragraph 19.1 of Schedule 9 (*Dispute Resolution Procedure);*

"**First Tram**" a timetabled Tram that is the first to operate in passenger service on any route in each direction on any day;

"**FOISA**" means the Freedom of Information (Scotland) Act 2002 and any subordinate legislation made under this Act from time to time together with any guidance and/or codes of practice issued by the Scottish Information Commissioner in relation to such legislation;

"**Force Majeure Extension**" has the meaning given to it in Clause 36.4;

"**Force Majeure Event**" means the occurrence after the Effective Date of:

(a) war, civil war or armed conflict in the United Kingdom; or

(b) nuclear, chemical or biological contamination unless the source or cause of the contamination is the result of actions of the Tram Maintainer or any Tram Maintainer Party; or

(c) pressure waves caused by devices travelling at supersonic speeds; or

(d) exceptionally adverse weather conditions affecting the shipment or transportation of trams;

"**General Change in Law**" means a Change in Law which is not a Qualifying Change in Law;

"**Good Industry Practice**" means using standards, practices, methods and procedures conforming to the Law and exercising that degree of skill, care, diligence, prudence and foresight that would reasonably be expected from a large, reputable, professionally qualified, competent and skilled organisation experienced in carrying out a similar type of undertaking to those comprised in the design, manufacture, supply and maintenance of Trams and seeking in good faith to comply with its contractual obligations and all duties owed by it;

"**Guidance**" means any applicable guidance, policy, direction or determination issued by any regulatory body with which the Client, **tie**, CEC, the Operator, the Tram Maintainer, the Tram Maintainer Parties and/or its subcontractors are bound to comply (to include, for the avoidance of doubt, the **tie** and CEC policies) and to the extent not published or otherwise publicly available, is made available to the Tram Maintainer;

"**Handback Package**" means the information referred to in Clause 40 (*Transition on Termination or Expiry*) as may be updated from time to time in accordance with Clause 40 (*Transition on Termination or Expiry*);

"**Hazardous Materials**" means any materials, Parts or systems generally known and accepted at the time of their use by the Tram Maintainer in performing the Services to comprise or contain a toxic or other hazard to the safety or health of persons or safety of property;

"**HMRI**" means Her Majesty's Railway Inspectorate;

"**Hot Spare**" means an additional one tram in excess of the Tram Number Requirement made Available by the Tram Maintainer for use by the Operator;

"**HSQE Manager**" shall have the meaning given in Clause 60.5;

"**HSQE System**" shall have the meaning given in Clause 60.1;

"**Indemnified Liabilities**" means actions, claims (including third party claims), demands, proceedings, losses, damages, liabilities, costs and expenses (including legal and other professional charges and expenses);

"**Indemnified Parties**" shall have the meaning given to it in Clause 45.1;

"**Independent Competent Person**" means Interfleet or such other person appointed by the Client to agree and oversee the implementation of all procedures and processes to comply with the provisions of the Railway and Other Guided Transport Systems (Safety) Regulations

2006 and to enable permitting for the testing, commissioning and operation of the Edinburgh Tram Network;

"**Indexed**" means in relation to an amount, that amount to be multiplied by the value of RPIX at the Point of Indexation, divided by the Base Case RPIX;

"**Indirect Losses**" means any damage, cost, third party claim, expense or loss incurred by a Party to this Agreement or Client Party (or an Indemnified Party) as a consequence of a breach of this Agreement or a negligent act or omission which relates to consequential or indirect loss of profits, or loss of revenue, loss of use, loss of production or output, interruption or loss of business or business opportunity or other consequential or indirect loss, loss of contract, loss of goodwill and whether or not the Party committing the breach knew, or ought to have known, that such indirect or consequential loss would be likely to be suffered as a consequence of such breach;

"**Information**" shall have the meaning given to it in section 73 of FOISA;

"**Infraco**" means the contractor to be selected and appointed by **tie** which will be responsible for carrying out and/or managing a comprehensive turnkey contract including the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in relation to the Edinburgh Tram Network or any successor appointed by **tie** and notified to the Tram Maintainer by notice in writing from time to time;

"**Infraco Contract**" means the contract to be entered into by **tie** with the Infraco;

"**Infraco Party**" means each and any of the Infraco's employees, directors, officers, agents, professional advisors, consultants and contractors and its or their sub-contractors (of any tier) and shall include its or their directors, officers and employees as they are involved in relation to the Infraco Works and "**Infraco Parties**" shall be construed accordingly;

"**Infraco Works**" means as the context requires, all or any of the works to be constructed and completed and/or services to be provided and/or the plant, machinery and equipment to be supplied and installed by the Infraco in accordance with the Infraco Contract and which are necessary to deliver a fully functional tram system in Edinburgh, and to subsequently maintain such system all in accordance with the Employer's Requirements;

"**Insolvency Event**" means any of the following events:

(a) the Tram Maintainer is unable to pay its debts as they fall due or is insolvent or admits (in writing) its inability to pay its debts as they fall due;

(b) the Tram Maintainer suspends for a period of two months making payments on all or any class of its debts or a moratorium is declared by the Tram Maintainer in respect of its indebtedness;

(c) the Tram Maintainer ceases business or announces an intention to do so;

(d) the following are entered into:

(i) a voluntary arrangement (other than a solvent one) for a composition of debts of the Tram Maintainer;

(ii) a scheme of arrangement in respect of the Tram Maintainer pursuant to the Insolvency Act 1986 or the Companies Act 1985; or

(iii) a material composition or arrangement (other than a solvent one) with the Tram Maintainer's creditors;

(e) either of the following:

(i) the winding-up of the Tram Maintainer (including passing a shareholders' resolution or the presentation of a petition by the Tram Maintainer for the purpose of winding up the Tram Maintainer); or

(ii) its administration (including where an application is made by the Tram Maintainer for, or petition is presented by the Tram Maintainer for, or any meeting of its directors or members resolves to make an application for, an administration order);

(f) an order for the winding-up or administration of the Tram Maintainer is made;

(g) any liquidator, judicial custodian, receiver, administrative receiver, administrator or the like is appointed in respect of the Tram Maintainer or any material part of the Tram Maintainer's assets;

(h) possession is taken of, or any distress, execution or other process (other than on the dependence or inhibition) is levied or enforced upon, any material part of the property (whether real or personal) of the Tram Maintainer by or on behalf of any creditor or encumbrancer of the Tram Maintainer; or

(i) anything analogous to any of the events mentioned in paragraphs (a) to (h) above occurs in relation to the Tram Maintainer under the law of any relevant jurisdiction jurisdiction including but not limited to Spanish Law 22/2003 of July 9 and Spanish Law 1564/1989 of December 22;

"**Intellectual Property Rights**" or "**IPR**" means any rights in or to any patent, design right, utility model, trade mark, brand name, service mark, trade name, business name, logo, invention (whether registered or unregistered), domain name, semi-conductor right, topography right, software designs and/or other materials, source code, copyright, moral right, know-how or rights in databases and any other rights in respect of any industrial or intellectual property, whether capable of being registered or not, including all rights to apply for any of the foregoing rights or for an extension, revival or renewal of any of the foregoing rights and any similar or analogous rights to any of the above, whether arising or granted under the law of Scotland or of any other jurisdiction;

"**Interim Certificate**" shall have the meaning given to it in Clause 42.2.3;

"**Internal Resolution Procedure**" means the procedure described in paragraphs 10 and 11 of Schedule 9 (*Dispute Resolution Procedure*);

"**Key Personnel**" means those persons listed in Schedule 14 (*Key Personnel*);

"**Last Tram**" means a timetabled tram that is the last to operate in passenger service on all routes in each direction prior to the system shutting down for the night;

"**Late Tram**" means either:

(a) a Tram:

(i) that is in passenger carrying service; and

(ii) is arriving at Edinburgh Airport or departing from any other Monitoring Point; and

(iii) in the case of Edinburgh Airport its arrival, when compared to the Timetable, is more than 2 minutes (i.e. 120 seconds) late; or

(iv) its departure from any other Monitoring Point, when compared to the Timetable, is timed either more than 2 minutes (i.e. 120 seconds) late, or more than 1 minute (i.e. 60 seconds) early; or

(b) where there is no Tram running in service at a Monitoring Point, contrary to the Timetable;

"**Law**" means:

(a) any Legislation;

(b) any Guidance; and

(c) any judgment of a relevant court of law which is a binding precedent,

in each case in force, or applicable, in Scotland;

"**Legislation**" means any Act or instruments of the Scottish Parliament or the United Kingdom Parliament or subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, any exercise of the Royal Prerogative, any enforceable community right within the meaning of section 2 of the European Communities Act 1972 and any bye-laws of any Local (or other statutory) Authority;

"**Legal Opinion**" means a legal opinion from a law firm satisfactory to the Client acting reasonably, in a form acceptable to the Client acting reasonably;

"**Legal Panel**" has the meaning given to it in paragraph 19.1 of Schedule 9 (*Dispute Resolution Procedure*);

"**Line One**" means the tramway works as authorised by the Edinburgh Tram (Line One) Act 2006;

"**Line Two**" means the tramway works as authorised by the Edinburgh Train (Line Two) Act 2006;

"**Local Authority**" means CEC or any local authority established pursuant to the Local Government (Scotland) Act 1973 and 1994 (as these statutes may be amended) or on regional transport partnership or body established pursuant to the Transport (Scotland) Act 2005;

"**Losses**" means all damages, losses, liabilities, costs, expenses (including legal and other professional charges and expenses) and charges whether arising under statute, contract or at common law or in connection with judgments, proceedings, internal costs or demands;

"**Material Defect**" means a defect to a tram that has been advised to the Tram Maintainer and is included in part 2 of Schedule 16 (*Material Defects*), or any other defect which will affect

the safety of operation of such Tram, or its compliance with Disability Discrimination Act 1995;

"**Maximum Performance Payment**" means the base periodic payment for services set out in part 3 of Schedule 3 (*Payment*);

"**Minimum Overall Payment Performance**" means 95% Tram Punctuality Performance;

"**Minimum Performance Payment**" means 70% of the Maximum Performance Payment

"**Minimum Periodic Payment**" means 85% of the Maximum Performance Payment;

"**Minimum Spare Parts Pool**" means the minimum level of each Spare Part or Special Tool to be held in the Spare Parts Pool as specified in the fourth column of the table in part 1 of Schedule 5 (*Spares Pool and Special Tools*);

"**Minor Defect**" means a defect to a Tram that will not affect the safety of operation of such Tram, or its compliance with Disability Discrimination Act 1995, that has been advised to the Tram Maintainer and is included in part 1 of Schedule 16 (*Defects List*);

"**Mobilisation Interim Certificate**" has the meaning given to it in Clause 42.3.3;

"**Mobilisation Milestone**" means a payment milestone for performance of Mobilisation Services set out in part 2 of Schedule 3 (*Payment*);

"**Mobilisation Milestone Date**" means the date for the performance of the relevant Mobilisation Service to meet a Mobilisation Milestone, as set out in part 2 of Schedule 3 (*Payment*);

"**Mobilisation Milestone Payment**" means the payment for achieving a Mobilisation Milestone payable in accordance with Clause 42 (*Payment*);

"**Mobilisation Period**" means the period commencing on the Commencement Date and ending on the Tram Maintenance Commencement Date;

"**Mobilisation Services**" means the services to be performed by the Tram Maintainer pursuant to part 2 of Schedule 3 (*Payment*);

"**Monitoring Point**" means the locations where the arrival or departure of Trams is recorded for the purpose of calculating Tram punctuality for the purpose of Schedule 3 (*Payment*) being:

(a) **Phase 1A:** for the purposes of monitoring arrival and departure: Edinburgh Airport;

(b) **Phase 1A:** for the purposes of measuring departure only:

(i) Edinburgh Park Station;

(ii) Haymarket;

(iii) Foot of the Walk;

(iv) Leith (Newhaven or Ocean Terminal according to the service); and

(v) Picardy Place; and

(c) **Phase 1B:** for the purposes of measuring departure only:

(i) Crewe Toll (northbound only); and

(ii) Granton Square;

"**NCC**" has the meaning given to it in Clause 50.21;

"**New Provider**" has the meaning given to it in Clause 44.1;

"**Notice of Adjudication**" has the meaning given to it in paragraph 10.1 of Schedule 9 (*Dispute Resolution Procedure*);

"**Notification**" has the meaning given to it in paragraph 10.1 of Schedule 9 (*Dispute Resolution Procedure*);

"**Novation Agreement Escrow Letter**" means the escrow letter in the form set out in part 2 of Schedule 1 (*Conditions Precedent*);

"**Object Code**" means any form of computer program which is suitable for direct execution by a machine only and unsuitable to be read and understood by a person;

"**OCIP Insurances**" means the insurances referred to in Clause 29.14 which shall be notified to the Tram Maintainer from time to time;

"**Open Book Basis**" means the availability and disclosure (consistent with the operation of Clause 26 (*Right of Verification and Audit*)) of a reasonable level of data and calculations used by the Tram Maintainer to create and justify costings and financial analysis presented to the Client;

"**Operating Day**" means a 24 hour period running from 3 a.m. on each day when Trams are timetabled to run;

"**Operations Performance Specification**" means the specification set out in section 2 of the Tram Employer's Requirements;

"**Operator**" means Transdev Edinburgh Tram Limited, a company incorporated in Scotland under registered number SC267598 and having its registered office at 1st Floor, City Point, 65 Haymarket Terrace, Edinburgh EH12 5HD, appointed by **tie** as operator under the DPOFA or any successor operator of the Edinburgh Tram Network as may be notified to the Tram Maintainer in writing from time to time;

"**Operator Maintenance**" means the maintenance of the Edinburgh Tram Network to be carried out by the Operator (and its required frequency) as follows:

(a) cleaning of all tramstops, access ways and car parks operated under the auspices of **tie** so as to ensure they are clean and free from all litter, dirt, debris, detritus, industrial and bodily fluids; such cleaning to be carried out not less than daily;

(b) emptying of all litter bins at tramstops or on the Trams daily or as regularly as necessary to prevent them from becoming full;

(c) promptly remove any observed or reported rubbish and debris at the tramstops or on Trams likely to create a risk of fire or other dangers;

(d) regularly remove any observed or reported litter on Trams throughout each day so as to maintain a reasonably clean travelling environment for passengers. This obligation shall also relate to the cleaning up of observed or reported fluids of any type on the Trams; and

(e) cleaning of the parts of the Depot for which the Operator is either the main user or which are shared between the Operator and others and this shall include offices, Control Centre, messing facilities, Operator locker rooms, car parking at the Depot and Depot entrances, so as to ensure such parts are clean and free from all litter, dirt, debris, detritus, industrial and bodily fluids; such cleaning to be carried out not less than daily or as may be otherwise be agreed between **tie** and the Operator;

and shall also include the carrying out of the initial response to a failure of, damage to or other incident occurring on the System which is not specifically identified as the Operator's

responsibility to resolve but actually or, in the Operator's reasonable opinion, potentially interrupts or delays the Transport Services;

"**Operator Maintenance Plan**" means the plan to be prepared by the Operator in relation to the performance of the Operator Maintenance;

"**Operator Procedures**" means all procedures to be carried out by the Operator in respect of the Tram, including daily safety checks, sanding and cleaning of the Trams;

"**Operator Safety Management System**" means the safety management system to be prepared by the Operator to form a whole and safe framework under which the Edinburgh Tram Network is operated;

"**Operator's Case for Safety**" means the case for safety that the Operator is required to maintain in respect of the operation of the Trams;

"**Overall Payment Performance**" has the meaning given to it in paragraph 1.2 of Schedule 3 (*Payment*);

"**Panels**" has the meaning given to it in paragraph 19 of Schedule 9 (*Dispute Resolution Procedure*);

"**Parent Company Guarantee**" means a guarantee to be issued by the Tram Maintainer's Parent Company in the form set out in part 2 of Schedule 1 (*Conditions Precedent*);

"**Part**" means any component or furnishing or equipment, excluding consumables, furnished within or relating to a Tram whether or not the same is installed on such Tram;

"**Passenger Services**" means the public passenger Tram services to be provided by the Operator on the Edinburgh Tram Network;

"**Peak Period**" means, as the context requires, the peak periods identified in tables 3.2 and 3.3 of part 1A of the Employer's Requirements;

"**Performance Bond**" means the performance bond in the form set out in part 1 of Schedule 23 (*Bond and Collateral Warranty*);

"**Performance Rebate**" equals, in relation to a Reporting Period:

(i) the amount by which the Performance Payment for the Services payable by the Client in relation to that Reporting Period is lower than it would otherwise have been as a

result of the occurrence of the conditions stated in Paragraph 5.1.1 and Paragraph 5.1.2 of Schedule 3 (Payment); **less**

(ii) the Relief Threshold;

"**Performance Review Date**" means the date 3, 8, 13, 18, 23 or 28 years (as applicable) after the Service Commencement Date;

"**Performance Review Period**" means the period between Performance Review Dates (and the period between the Service Commencement Date and the first Performance Review Date);

"**Period**" means a period of time during which a certain Tram Number Requirement is specified, as set out in the third column of the table in the definition of Tram Number Requirement;

"**Permitted Variations**" means a Client Change and/or a change proposed by the Tram Maintainer which has been authorised to proceed in accordance with the provisions of this Agreement;

"**Persistent Breach Notice**" shall have the meaning given to it in Clause 33.1;

"**Phase 1a**" means Edinburgh Airport to Newhaven (inclusive) together with the Depot at Gogar and the spur at Roseburn Junction;

"**Phase 1b**" means Roseburn Junction to Granton Square (inclusive);

"**Point of Indexation**" shall be January each year to be applied annually as of 1 April each year;

"**Price**" means the price payable for the Services carried out on the Tram(s) subject to such additions thereto or deductions therefrom as may from time to time be made in accordance with this Agreement;

"**Prohibited Act**" means:

(a) offering, giving or agreeing to give to **tie**, the Scottish Executive, Transport Scotland, the Scottish Ministers, CEC or any **tie** Party or any other public body or any person owned or employed by any of them, any gift or consideration of any kind as an inducement or reward:

(i) for doing or not doing (or for having done or not having done) any act in relation to the obtaining or performance of this Agreement; or

(ii) for showing or not showing favour or disfavour to any person in relation to this Agreement;

(b) paying commission or agreeing to pay commission to any person in connection with the award of this Agreement;

(c) committing any offence:

(i) under the Prevention of Corruption Acts 1889-1916 or in section 68(2) of the Local Government (Scotland) Act 1973;

(ii) under any Law creating offences in respect of fraudulent acts; or

(iii) at common law in respect of fraudulent acts in relation to this Agreement or any other relevant agreement with **tie**, any **tie** Party, the Scottish Executive, Transport Scotland, the Scottish Ministers, CEC or any other public body; and/or

(d) defrauding or attempting to defraud or conspiring to defraud the Scottish Executive, **tie**, any **tie** Party, CEC, Transport Scotland, the Scottish Ministers or any other public body;

Any reference within this Agreement to any "Prohibited Act" shall include acts outwith the United Kingdom and the references within the definition "Prohibited Act" to UK legislation shall be deemed to be amended to refer to legislation in other jurisdictions outside of the United Kingdom;

"**Project**" means the project to procure the construction, operation and maintenance of a two line light rail network in Edinburgh;

"**Project IPR**" means all Intellectual Property Rights created in the performance of the Services which are specific in nature to the performance of the Services including any asset management system and/or works planning or programming system created by the Tram Maintainer in connection with the performance of the Services;

"**Project Safety and Certification Committee**" or "**PSCC**" shall include representatives from **tie,** Transport Edinburgh Limited, CEC in its capacity as roads authority, the Client, the Operator, the Tram Supplier and the Tram Maintainer;

"**Project Vision**" means the project vision referred to in recital F of this Agreement;

"**Qualifying Change in Law**" means:

(a) a Discriminatory Change in Law; and/or

(b) a Specific Change in Law;

"**Quantum**" has the meaning given to it in Schedule 12 (*Return Condition*);

"**Rectification Plan**" has the meaning given to it in paragraph 1.7 of Schedule 3 (*Payment*);

"**Referral**" has the meaning given to it in paragraph 27 of Schedule 9 (*Dispute Resolution Procedure*);

"**Referring Party**" has the meaning given to it in paragraph 16 of Schedule 9 (*Dispute Resolution Procedure*);

"**Related Contracts**" has the meaning given to it in paragraph 55 of Schedule 9 (*Dispute Resolution Procedure*);

"**Related Dispute**" has the meaning given to it in paragraph 55 of Schedule 9 (*Dispute Resolution Procedure*);

"**Relevant Authority**" means any court with the relevant jurisdiction and any local, national or supra-national agency, inspectorate, minister, ministry, official or public or statutory person of the government of the United Kingdom or of the European Union;

"**Relevant Employee**" has the meaning given to it in Clause 44.1;

"**Reliability Bond**" has the meaning given to it in the Tram Supply Agreement;

"**Relief Threshold**" means £1,000 as Indexed;

"**Reporting Period**" means a period of 28 days provided that:

(i) the first such period during the Term shall commence on the Tram Maintenance Commencement Date;

(ii) the first such period in the Term may be varied by up to 7 days by notice from the Client to the Tram Maintainer;

(iii) each such period shall start on the day following the last day of the preceding period; and

(iv) the last such period during the Term shall end on the Expiry Date or termination of this Agreement;

"**Reporting Period End Date**" means the dates set out in Schedule 20 (*Reporting Period End Dates*);

"**Request for Information**" shall have the meaning set out in FOISA and shall include any apparent request for information under FOISA, the Environmental Information Regulations or the Code;

"**Required Insurances**" means the insurances complying with the insurance requirements set out in part 1 of Schedule 4 (*Required Insurances*);

"**Responding Party**" has the meaning given in paragraph 17 of Schedule 9 (*Dispute Resolution Procedure*);

"**Response**" means the response by the Tram Maintainer detailing its proposal to provide maintenance and associated services in respect of the Trams made on 3rd August 2007 which is included in Schedule 21 (*Response*);

"**Return Condition**" means the condition required for the Trams, Spare Parts and Special Tools upon termination or expiry of this Agreement, as set out in part 2 of Schedule 12 (*Return Condition*) and assessed in accordance with part 1 of Schedule 12 (*Return Condition*);

"**Return Condition Bond**" has the meaning given to "Return Condition Bond" in part 1 of Schedule 12 *(Return Condition)* paragraph 4.2;

"**Return Date**" has the meaning given to it in Clause 44.11;

"**Review Procedure**" means the review procedure set out in Schedule 24 (*Review Procedure*);

"**RPIX**" means the general index of retail prices for all items excluding mortgage interest payments (Office of National Statistics: Series Identifier: CHMK) as published or any replacement thereof or, in the event such index ceases to exist, such other similar index as the Parties shall agree from time to time (or, if the Parties cannot so agree, as determined under the Dispute Resolution Procedure on the referral of either Party) provided that, if the basis of computation of such index shall have changed between the two relevant months, any official reconciliation between the two bases of computation published by a United Kingdom

government department shall be binding on the Parties and, in the absence of such official reconciliation, such adjustment shall be made to the figure of such index for the second of those months to make it correspond as nearly as possible to the method of computation for the first of those months and such adjusted figure shall be considered for the purpose of this Agreement to the exclusion of the actual published figure;

"**SDS Provider**" means Parsons Brinckerhoff Limited, a company registered in England and Wales with registered number 02554514 whose registered office is at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle upon Tyne, NE4 7YQ which expression shall include its permitted assignees or such other system design services provider appointed by **tie** or the Client and notified to the Tram Supplier by notice in writing from time to time in relation to the Edinburgh Tram Network;

"**Security Interests**" means any mortgage, pledge, lien, hypothecation, security interest or other charge or encumbrance or any other agreement or arrangement having substantially the same economic effect and includes any security as defined in section 248(b) of the Insolvency Act 1986;

"**Self-Monitoring Plan**" means a detailed plan produced by the Tram Maintainer pursuant to Clause 30 *(Service Performance and Quality Monitoring)* setting out how it proposes to monitor its compliance with the Tram Maintenance Specification and the Employer's Requirements and its obligations under this Agreement in a way which will enable: (i) the Client and **tie** to satisfy themselves as to the level of the Tram Maintainer's compliance with the Tram Maintenance Specification and the Employer's Requirements and its obligations under this Agreement in all respects; and (ii) the Parties to perform their respective responsibilities pursuant to and as described in Clause 49 (*Best Value*);

"**Service Commencement Date**" means the first date of commencement of Passenger Services;

"**Service Quality Report**" means the report to be submitted by the Tram Maintainer to the Client in a form developed and containing the information agreed between the Tram Maintainer and the Client;

"**Service Provision Change**" has the meaning given to it in Clause 44.1;

"**Services**" means all maintenance services and other obligations to be carried out by the Tram Maintainer in accordance with this Agreement (including for the avoidance of doubt, the Mobilisation Services and the maintenance of the Depot Equipment);

"**Services Payment**" means the payment to be made for carrying out the Services (except for the Mobilisation Services) as calculated in accordance with Schedule 3 (*Payment*);

"**Services Period**" means the period commencing on the Tram Maintenance Commencement Date and ending upon termination or expiry of this Agreement;

"**Software**" means the executable object code version of software relating to equipment installed on the Trams, which is supplied in machine readable form and already loaded upon the relevant piece of equipment or computer system to which it relates including for the avoidance of doubt all software embedded in a hardware device which is installed on the Trams;

"**Source Code**" means the source code version of Software, which is supplied in a form capable of being read and interpreted by humans, together with related interpretive information;

"**Spare Parts**" means such components, parts, consumables, equipment and furnishings as may reasonably be required from time to time to maintain, repair or replace any part of any Tram or to keep it compliant with the Tram Requirements Specification and Law for the duration of its operational life;

"**Spare Parts Pool**" the pool of Spare Parts and Special Tools owned by CEC and to be maintained by the Tram Maintainer in accordance with Clause 9.20;

"**Special Tools**" means the special tools required to carry out maintenance of the Trams, listed in part 2 of Schedule 5 (*Spares Pool and Special Tools*) as the same may be varied from time to time by written agreement of the Parties (such agreement not to be unreasonably withheld or delayed);

"**Specific Change in Law**" means any Change in Law which specifically applies to the provision of services the same as or similar to the Services (but not to the provision of other services);

"**Sub-Contractor Direct Agreement**" means an agreement in the form set out in Schedule 6 (*Sub-Contractor Direct Agreement*) to be entered into pursuant to Clause 57.6;

"**System**" the tram system to be constructed in accordance with the Tram Legislation made in respect of the Edinburgh Tram Network together with associated works and facilities and including all civil engineering and track works, tram infrastructure, plant, machinery and equipment installed or used for such tram system;

"**Systems Acceptance Tests**" means the acceptance tests to be carried out on the System as set out in section 23 of the Tram Employer's Requirements;

"**Technical Library**" has the meaning given to it in Clause 50.22.1;

"**Technical Records**" means the technical records in respect of the Trams to be retained and updated in accordance with the Tram Maintenance Specification;

"**Term**" means the period from (and including) the Effective Date until (and including) the earlier of the Expiry Date or the date of termination of this Agreement;

"**Termination Date**" means any date of early termination of this Agreement in accordance with its terms;

"**Termination Notice**" means a notice to terminate this Agreement served by either Party in accordance with the terms of this Agreement;

"**Termination Period**" has the meaning given to it in Clause 44.1;

"**Third Party Software**" means programs, the Intellectual Property Rights in which are:

(a) owned by a third party; and

(b) used by the Tram Maintainer to carry out its obligations under this Agreement;

"**Third Party Software Licence**" means a licence to use the Third Party Software;

"**tie**" means **tie** Limited, a company incorporated under the Companies Act with registered number SC230949 and having its registered office at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ which shall include its successors in title, permitted assignees and transferees;

"**tie Customer Satisfaction Survey**" has the meaning given to it in Clause 49.3;

"**tie Documents**" means all documents, drawings, handbooks or other information in whatever format provided by **tie** or the Client to the Tram Maintainer in connection with the performance of the Tram Maintainer's obligations under this Agreement including the Tram Maintenance Specification;

"**tie and CEC Policies**" means the policies included in Schedule 19 (***tie** and CEC Policies*);

"**tie's Drug and Alcohol Policy**" means the drug and alcohol policy set out in Schedule 19 (*tie and CEC Policies*);

"**tie Party**" means any advisers appointed by **tie** or any of **tie's**, agents, employees, contractors and subcontractors of any tier and its or their directors, officers, employees (but excluding the Infraco, any Infraco Party, the Tram Maintainer and any Tram Maintainer Party), and "**tie Parties**" shall be construed accordingly;

"**tie's Representative**" means the person or persons appointed by **tie** from time to time and notified to the Tram Maintainer;

"**Timetable**" means the timetable which is developed by the Operator under the terms of the DPOFA Agreement and section 2 of the Employers Requirements, as may be notified to the Tram Maintainer by the Client from time to time;

"**Timetabled Hot Spares**" means the number of Hot Spares timetabled to be made Available by the Tram Maintainer for use by the Operator in a Reporting Period;

"**Timetabled Monitored Trams**" means the number of Trams in passenger service timetabled to pass a Monitoring Point in a Reporting Period;

"**Tram**" means any electric tram unit to be designed, manufactured, engineered, fitted out, equipped, installed and delivered in accordance with the Tram Supply Agreement including for the avoidance of doubt, Additional Trams;

"**Tram Documentation**" has the meaning given to it in Clause 9.2.1.3;

"**Tram Employer's Requirements**" means the subset of the Employer's Requirements listed in part 1 of Schedule 2 (*Employer's Requirements*) as relating to the Tram Supplier and Tram Maintainer;

"**Tram Inspector**" means the person specified as such in the Tram Inspector Agreement or such other person as the Client may notify the Tram Maintainer in writing from time to time;

Tram Inspector Agreement" means an agreement between the Tram Inspector, **tie**, and the Infraco for the inspection and certification of Trams dated on or about the date of this Agreement;

"**Tram Interface Specification**" means the interface requirements contained in Schedule 21 *(Response)*;

"**Tram Legislation**" means the Edinburgh Tram (Line One) Act 2006 and the Edinburgh Tram (Line Two) Act 2006 which received Royal Assent on 8 May 2006 and 27 April 2006 respectively and which confer on CEC all requisite authorities and statutory powers to procure construction, operation and maintenance of the Edinburgh Tram Network;

"**Tram Maintainer Accounts**" means in respect of the Tram Maintainer such accounting records as are required to be kept under section 386 of the Companies Act 2006, to be prepared on a consistent basis for each consecutive period not exceeding one month;

"**Tram Maintainer Default**" shall have the meaning given to that term in Clause 32.1;

"**Tram Maintainer Employees**" has the meaning given to it in Clause 44.1;

"**Tram Maintainer IPR**" means:

(a) all Intellectual Property Rights (including Tram Maintainer Software) which the Tram Maintainer can demonstrate by documentary evidence were already existing and owned by or licensed to the Tram Maintainer prior to the Effective Date including any asset management system and/or works programming system operated by the Tram Maintainer which is not comprised within the Project IPR; and

(b) any modifications or developments of any of the Intellectual Property Rights listed in paragraph (a) above which are generic in nature

"**Tram Maintainer Late Last Tram**" means a Last Tram which is also a Tram Maintainer Late Tram;

"**Tram Maintainer Late Tram**" means a Late Tram that is late because of:

(a) any defect on the Tram that does not relate to damage or vandalism by a third party directly or indirectly causing the Tram to be a Late Tram;

(b) any action or omission of the Tram Maintainer; and/or

(c) a Tram not being made Available to the Operator by the Tram Maintainer;

"**Tram Maintainer Party**" means any contractors, agents, subcontractors, professional advisors or consultants engaged by the Tram Maintainer to perform, facilitate or assist with the performance of any of the Services and any of its or their subcontractors of any tier and its or their directors, officers, employees and workmen in relation to the Project and "**Tram Maintainer Parties**" shall be construed accordingly;

"**Tram Maintainer Safety Management System**" has the meaning given in Clause 13.3.1.2;

"**Tram Maintainer's Materials**" means any and all equipment, tooling, works of authorship, products and materials specifically developed, written or prepared by (or on behalf of) the Tram Maintainer for the purpose of the provision of the Services and/or the performance of this Agreement including all drawings, details, plans, operating and maintenance manuals, specifications, schedules, reports, calculations and other materials and data, and all drafts thereof and working papers, used or prepared by (or on behalf of) the Tram Maintainer;

"**Tram Maintainer's Parent Company**" means Construcciones y Auxiliar de Ferrocarriles, S.A;

"**Tram Maintainer's Representative**" means the person appointed by the Tram Maintainer in accordance with Clause 8.1 as may be varied from time to time in accordance with Clause 8.2;

"**Tram Maintainer Software**" means programs, the Intellectual Property Rights in which are:

(a) owned by the Tram Maintainer; and

(b) used by the Tram Maintainer to carry out its obligations under this Agreement;

"**Tram Maintenance Collateral Warranty**" means a collateral warranty between **tie** and the Tram Maintainer in the form set out in part 2 of Schedule 1 (*Conditions Precedent*);

"**Tram Maintenance Commencement Date**" has the meaning given to it in Clause 9.15;

"**Tram Maintenance Novation Agreement**" means a novation agreement between a new party to this Agreement, **tie** and the Tram Maintainer in the form set out in part 2 of Schedule 1 (*Conditions Precedent*);

"**Tram Maintenance Plan**" means the plan prepared by the Tram Maintainer as referred to within the Response as updated from time to time;

"**Tram Maintenance Programme**" means the programme for the maintenance of the Trams as set out in part 2 of Schedule 2 (*Employer's Requirements*) and varied from time to time in accordance with Clause 16 (*Changes*) or adjusted from time to time in accordance with Clause 18.3;

"**Tram Maintenance Specification**" means the specification for the Services as set out in section 40 of the Tram Employer's Requirements;

"**Tram Number Requirement**" means, as the context requires, the number of Trams set out in tables 15 to 18 inclusive in section 2 of the Tram Employer's Requirements;

"**Tram Punctuality Performance**" has the meaning given to it in paragraph 2 of Schedule 3 (*Payment*);

"**Tram Related Equipment**" means the Tram Documentation, Spare Parts and Special Tools;

"**Tram Requirements Specification**" means the specification for the Trams set out in the Tram Employer's Requirements;

"**Tram Supplier**" means the party appointed by the Client to carry out the obligations of the Tram Supply Agreement;

"**Tram Supply Agreement**" means an agreement for the design, manufacture, delivery, testing and commissioning of Trams;

"**Tram Works**" means the Tram Supplier's obligations pursuant to the Tram Supply Agreement including for the avoidance of doubt the Pre Works Development Services and the supply of the Depot Equipment;

"**Transport Edinburgh Limited**" or "**TEL**" means Transport Edinburgh Limited, a company incorporated under the Companies Act with registered number SC269639 and having its registered office at 55 Annandale Street, Edinburgh EH7 4AZ;

"**Transport Scotland**" means an agency within the Scottish Executive Enterprise, Transport and Lifelong Learning Department which was established in January 2006 and having its principal office at Buchanan House, 58 Port Dundas Road, Glasgow H4 0HF;

"**Transport Services**" means the public passenger transport services to be provided by the Operator on the Edinburgh Tram Network (or any part thereof) in accordance with the DPOFA and section 2 of the Tram Employer's Requirements;

"**TUPE Employees**" has the meaning given to it in Clause 44.1;

"**TUPE Information**" shall have the meaning given to that term in Clause 44.1;

"**TUPE Regulations**" has the meaning given to "the TUPE Regulations" in Clause 44.1;

"**Underperformance Warning Notice**" means a notice issued to the Tram Maintainer by the Client in accordance with Clause 30.5 and 30.6; and

"**VAT**" means Value Added Tax.

1.2 In this Agreement, except where the context otherwise requires:

1.2.1 words importing gender include masculine, feminine and neuter;

1.2.2 the singular includes the plural and vice versa;

1.2.3 a reference to any part, Clause, sub-Clause, Schedule or appendix is, except where it is expressly stated to the contrary, a reference to such part, Clause or sub-Clause of or Schedule or appendix to this Agreement;

1.2.4 a reference in any Schedule or appendix to any part, paragraph or sub-paragraph is, except where it is expressly stated to the contrary, a reference to such part, paragraph or sub-paragraph of that Schedule or appendix (as the case may be);

1.2.5 any reference to this Agreement or to any other document shall include any variation, amendment or supplement to this Agreement or such other document expressly permitted under the terms of this Agreement;

1.2.6 any reference to any enactment, draft enactment, order, regulation or other similar instrument (including any EU instrument) (whether specifically named or not) shall be construed as a reference to the enactment, order, regulation or instrument as amended, replaced, consolidated or re-enacted and shall include any orders, regulations, legally binding codes of practice or subordinate legislation (within the meaning of section 21(1) of the Interpretation Act 1978) made thereunder;

1.2.7 references to any items being "in the agreed form" means such items have been initialled by or on behalf of each of the Parties for the purpose of identification;

1.2.8 a reference to a person includes individuals, firms, partnerships, bodies corporate, joint ventures, government departments and any organisation capable of suing or being sued and references to any of the same include the others and their successors and assignees and transferees;

1.2.9 headings and the contents list are for convenience of reference only and do not affect the interpretation of this Agreement;

1.2.10 the ejusdem generis rule does not apply and the meaning of general words is not to be restricted by any particular examples preceding or following those general words;

1.2.11 a reference to a time of day is a reference to the time in Edinburgh;

1.2.12 subject to the restrictions imposed by this Agreement on sub-contracting, an obligation to do something includes an obligation to procure it to be done;

1.2.13 an obligation not to do something includes an obligation not to wilfully allow it to be done; and

1.2.14 the word "including" means "including without limitation".

1.3 This Agreement shall be interpreted and construed as a whole provided that in the event of any inconsistency or conflict between the main body of this Agreement and/or the Schedules and/or the appendices, then:

1.3.1 the main body shall prevail to the extent of any such conflict or inconsistency over the Schedules and appendices; and

1.3.2 the Schedules shall prevail to the extent of any such conflict or inconsistency between the Schedules and appendices.

2. CONDITIONS PRECEDENT

2.1 The Client may by notice in writing to the Tram Maintainer waive satisfaction of any or all of the Conditions Precedent.

2.2 On the date that each of the Conditions Precedent (with the exception of any Conditions Precedent that have been expressly waived by the Client in writing) have in the Client's opinion (acting reasonably) been satisfied, the Client shall notify the Tram Maintainer of the same.

2.3 The Tram Maintainer shall use its reasonable endeavours to satisfy or procure the satisfaction of the Conditions Precedent as soon as reasonably possible after the Effective Date.

3. EFFECTIVE DATE

3.1 Except for the provisions of Clauses 1 (*Definitions and Interpretation*), 2 (*Conditions Precedent*), 4 (*Term of the Agreement*), 25 (*Confidential Information*), 29 (*Insurance*), 45 (*Liability and Indemnities*), 50 (*Copyright and Intellectual property*), 51 (*Data Protection*), 52 (*Dispute Resolution*), 53 (*Derogations*), 54 (*Variations to be in Writing*), 55 (*Waiver and Cumulative Remedies*), 56 (*Notices*), 57 (*Assignation, Changes in Legal Status, Changes in Control and Subcontracting*), 58 (*Conflict of Interest*), 59 (*Security Interests*), 62 (*Consent and Approval*), 63 (*Discrimination*), 64 (*Further Assurance*), 65 (*Applicable Law*), 66 (*No Partnership or Agency*), 67 (*Invalid Terms*) and 68 (*Third Party Rights*) of this Agreement

which shall take effect on the Effective Date, the obligations of the Parties under this Agreement shall be conditional upon the occurrence of the Commencement Date. Upon the occurrence of the Commencement Date, the Client shall notify the Tram Maintainer of the same.

3.2 This Agreement shall terminate automatically on a date 12 months after the Effective Date or, if later, 6 months after the execution of the Infraco Contract (or on such later date as may be agreed in writing between the Parties) if the Commencement Date has not arisen on or before such date and in which event:

3.2.1 all provisions of this Agreement (other than the provisions of Clauses 1 (*Definitions and Interpretation*), 2 (*Conditions Precedent*), 4 (*Term of the Agreement*), 25 (*Confidential Information*), 45 (*Liability and Indemnities*), 50 (*Copyright and Intellectual Property*), 52 (*Dispute Resolution*), 54 (*Variations to be in Writing*), 56 (*Notices*), 61 (*Entire Agreement*), 65 (*Applicable Law*), 66 (*No Partnership or Agency*), 67 (*Invalid Terms*) and 68 (*Third Party Rights*), shall cease to have effect; and

3.2.2 such termination shall be without prejudice to any accrued rights or obligations as at that date.

4. TERM OF THE AGREEMENT

4.1 Subject to Clause 3 (*Effective Date*) this Agreement shall commence on the Effective Date and shall continue unless terminated earlier in accordance with its terms until the expiry of a period of 30 years from the Tram Maintenance Commencement Date ("**Expiry Date**").

5. NOVATION

5.1 Unless waived by the Client in accordance with Clause 2.1, it is a condition precedent to the occurrence of the Tram Maintenance Commencement Date that the Tram Maintainer shall, if required by **tie**, enter into and execute:

5.1.1 a Tram Maintenance Novation Agreement in the form set out in part 2 of Schedule 1 (*Conditions Precedent*);

5.1.2 a Tram Maintenance Collateral Warranty in the form set out in part 2 of Schedule 1 (*Conditions Precedent*); and

5.1.3 a Novation Agreement Escrow Letter in the form set out in part 2 of Schedule 1 (*Conditions Precedent*).

6. PROJECT PARTNERING

6.1 The Parties agree to work in mutual co-operation to fulfil their agreed roles and responsibilities and apply their expertise to carry out and complete the Services in accordance with this Agreement.

6.2 The Client and the Tram Maintainer shall procure that each Client Party and each Tram Maintainer Party (as appropriate) shall work in accordance with the principles set out in Clause 6.1.

6.3 Subject to Clause 6.4, each Party ("**First Party**") undertakes to co-operate with the other ("**Second Party**") in order to facilitate the performance of this Agreement and in particular the First Party shall:

6.3.1 approach all Permitted Variations on a collaborative and Open Book Basis;

6.3.2 use reasonable endeavours to avoid unnecessary complaints, disputes and claims against or with the Second Party;

6.3.3 comply with the provisions of the Dispute Resolution Procedure in relation to any such complaints, disputes and claims with or against the Second Party;

6.3.4 not interfere with the rights of the Second Party in performing its obligations under this Agreement, nor in any other way hinder or prevent the Second Party from performing those obligations or from enjoying the benefits of its rights;

6.3.5 take reasonable steps to mitigate any foreseeable losses and liabilities of the Second Party which are likely to arise out of any failure by the First Party to take any of the steps referred to in Clauses 6.3.2 to 6.3.4 (inclusive); and

6.3.6 take all reasonable steps to manage, minimise and mitigate all costs.

6.4 Nothing in Clause 6.3 shall:

6.4.1 interfere with the right of each of the Parties to arrange its affairs in whatever manner it considers fit (in compliance with Law) in order to exercise its rights and perform its obligations under this Agreement (in compliance with Law); or

6.4.2 relieve either Party from any obligation contained in this Agreement or from any obligation to pay any debt due and payable under this Agreement.

6.5 Senior representatives from the Parties shall meet on a quarterly basis (or as may be otherwise agreed by the Parties) to review:

6.5.1 any matter which has adversely affected or may adversely affect:

6.5.1.1 the completion of the Services;

6.5.1.2 the performance and presentation of the Edinburgh Tram Network;

6.5.1.3 the functioning of the City of Edinburgh (including other modes of transport) and the people of Edinburgh, because of the carrying out of the Services; and/or

6.5.1.4 the Tram Maintainer's ability to perform its obligations in terms of this Agreement; and

6.5.2 any proposal from either Party to:

6.5.2.1 minimise costs; and/or

6.5.2.2 optimise the performance and quality of the Edinburgh Tram Network.

6.6 Either Party may propose measures to address the matters set out in Clause 6.5.1 and a determination of what measures (if any) should be undertaken by the Tram Maintainer and/or the Client to address such matters shall be considered in accordance with and subject to each Party's existing rights, obligations and the existing contractual mechanisms under this Agreement including the rights, obligations and contractual mechanisms set out in Clause 16 (*Changes*), Clause 48 (*Qualifying Changes in Law*) and Schedule 3 (*Payment*).

6.7 Any proposal from either Party in terms of Clause 6.5.2 shall be reviewed in accordance with Clause 16 (*Changes*).

6.8 As required by the Client, the Tram Maintainer shall procure the attendance of any of the Tram Maintainer Parties at the meetings described in Clause 6.5.

7. CLIENT'S REPRESENTATIVE

7.1 The Client's Representative shall:

7.1.1 exercise the functions and powers of the Client in relation to the Project which are identified in this Agreement as functions and powers to be carried out by the Client's Representative;

7.1.2 exercise such other functions and powers of the Client under this Agreement as the Client may notify in writing to the Tram Maintainer from time to time; and

7.1.3 be the primary point of contact for the Tram Maintainer with the Client, and the Tram Maintainer shall observe, and shall procure that any Tram Maintainer Parties observe, all reasonable instructions of the Client and the Client's Representative given in accordance with this Agreement. The Tram Maintainer shall not, and shall procure that any Tram Maintainer Parties shall not, act upon any instruction from any other party unless confirmed by the Client or the Client's Representative in writing. If the Tram Maintainer or any Tram Maintainer Parties shall receive any instructions from any other parties, the Tram Maintainer shall notify the Client or the Client's Representative immediately.

7.2 The Client's Representative shall be entitled at any time, by notice in writing to the Tram Maintainer, to authorise any other persons to exercise the functions and powers of the Client delegated to him, either generally or specifically. Until further notice from the Client, any act of any such person shall, for the purposes of this Agreement, constitute an act of the Client's Representative and all references to "the Client's Representative" in this Agreement (apart from Clauses 7.1 to 7.7) shall be taken as references to such person so far as they concern matters within the scope of such person's authority.

7.3 The Client may by notice in writing to the Tram Maintainer change the identity of the Client's Representative. Such change shall have effect on the date specified in that written notice.

7.4 During any period when a Client's Representative has not been appointed (or when the Client's Representative is unable through illness, incapacity or any other reason whatsoever to carry out or exercise his functions under this Agreement), the Client shall carry out the functions which would otherwise be performed by the Client's Representative.

7.5 No decision, act or omission of the Client or the Client's Representative shall, except as otherwise expressly provided in this Agreement:

7.5.1 in any way relieve or absolve the Tram Maintainer from, modify or act as a waiver or personal bar of any liability, responsibility, obligation or duty under this Agreement;

7.5.2 in the absence of an express written instruction or authorisation issued by the Client under Clause 16 (*Changes*), constitute or authorise a variation; or

7.5.3 be construed as restricting or binding the Client in any way save with regard to the specific project matters to which it relates.

7.6 The Tram Maintainer shall be entitled to treat all instructions and directions of the Client's Representative in respect of any functions and powers of the Client which have been delegated to the Client's Representative in accordance with Clause 7.1 as those of the Client provided always that such instructions or directions of the Client's Representative are in writing, are not in conflict with and are consistent with this Clause 7 (*Client's Representative*) and the other provisions of this Agreement or any other express instructions or directions of the Client, and the Tram Maintainer shall not be required to determine whether an express authority has in fact been given. The Tram Maintainer shall, as soon as reasonably practicable, bring to the attention of the Client any instructions or directions that are given to the Tram Maintainer that are ambiguous or in conflict or inconsistent, and the Client will verify such instructions in writing.

7.7 If for any reason the Client's Representative considers it necessary to give any instructions or directions orally, then, provided that the Client confirms such instruction or direction in writing within five Business Days, such oral instruction or direction shall be deemed to be an express instruction or direction of the Client.

8. TRAM MAINTAINER'S REPRESENTATIVE

8.1 The Tram Maintainer shall appoint a Tram Maintainer's Representative who shall:

8.1.1 act as the principal point of contact for the Client and the Client's Representative in relation to all matters related to this Agreement;

8.1.2 have full authority to act on behalf of the Tram Maintainer for all purposes of this Agreement, and the Client and the Client's Representative shall be entitled to treat all instructions and directions of the Tram Maintainer's Representative as those of the Tram Maintainer;

8.1.3 manage and co-ordinate the provision of the Services by the Tram Maintainer (and any Tram Maintainer's Party) and the integration of provision of the Services with the tasks being performed by the Client's internal team and the other advisers appointed by the Client and/or **tie** (where such tasks have been notified to the Tram Maintainer); and

8.1.4 liaise with the Client's Representative in relation to various matters including the scope of the Services to be carried out from time to time.

8.2 The Tram Maintainer may by written notice to the Client change the identity of the Tram Maintainer's Representative. Where the Tram Maintainer wishes to do so, it shall by written notice to the Client propose a substitute for approval, taking account of the need for liaison and continuity in respect of the provision of the Services and the Tram Maintenance Programme when the change is proposed. Such substitute shall be subject to the prior written approval of the Client (not to be unreasonably withheld or delayed).

8.3 The Tram Maintainer shall also nominate a deputy to the Tram Maintainer's Representative. During any period when the Tram Maintainer's Representative is unable through illness, incapacity, annual leave or any other reason whatsoever to carry out or exercise his functions under this Agreement, such deputy shall carry out the functions which would otherwise be performed by the Tram Maintainer's Representative.

9. TERMS GOVERNING THE SERVICES

9.1 The Services shall be executed by the Tram Maintainer in accordance with this Agreement and in consideration of which the Client shall pay the Price for the Services (in accordance with Clause 42 (*Payment*)). The Tram Maintainer undertakes that it is, and will remain during the term of this Agreement (and that any relevant sub-contractor is, and will remain during the term of this Agreement) appropriately qualified and experienced in and accredited for the purposes of carrying out work of the scope, type and complexity that is required in carrying out the Services, exercising a reasonable level of professional skill, care and diligence. The Tram Maintainer acknowledges that the Client will rely upon the skill, care and diligence of the Tram Maintainer in connection with all matters for which the Tram Maintainer is responsible under this Agreement.

9.2 Services

9.2.1 The Tram Maintainer shall during the Services Period carry out all maintenance, repair, renewals and remedial works to the Trams and any Additional Trams as is necessary to:

9.2.1.1 ensure that the Trams are Available as required to:

(a) meet the Tram Number Requirement;

(b) ensure that the Timetabled Hot Spares are Available; and

(c) ensure any Additional Operator Trams are Available in accordance with Clause 9.27;

9.2.1.2 maintain the Trams and Depot Equipment in accordance with the Tram Maintenance Programme and the Tram Maintenance Plan; and

9.2.1.3 ensure that the requirements of the Tram Maintenance Specification are met at all times including compliance with the following documents, collectively known as the "Tram Documentation", which are individually defined or referenced by the Tram Maintenance Specification:

(a) the Operator Safety Management System;

(b) the Tram environmental management plan;

(c) the Tram staffing plan;

(d) the Tram recruitment and training plan;

(e) the Tram communication plan;

(f) the Tram safety management plan; and

(g) the Tram Maintenance Plan.

9.2.2 The Tram Maintainer shall work with the Operator to ensure the daily handover of the Trams to the Operator for operation which shall include the completion of a handover checklist confirming the Availability of such Trams.

9.2.3 The Tram Maintainer shall work with the Operator to ensure the daily handback of the Trams from the Operator to the Client following operation of the Trams and take into account any comments received from the Operator on the performance or condition of the Trams.

9.2.4 The Tram Maintainer shall provide such support, assistance and co-operation to the Client Parties in relation to the Project as the Client may reasonably request from time to time.

9.2.5 The Tram Maintainer shall, during the Mobilisation Period, carry out the Mobilisation Services on or before the appropriate Mobilisation Milestone Dates.

9.3 The Client shall procure the delivery of the Trams in accordance with the Tram Supply Agreement and the Tram Maintenance Programme to the Tram Maintainer at the Depot.

9.4 Subject to Clause 9.23, the Tram Maintainer shall in carrying out the Services at its own cost, ascertain and comply with all applicable Law relating to the carrying out of the Services and shall ensure that following the completion of the Services, the Trams shall comply with all applicable Law applicable at the time the Services are carried out.

9.5 The Tram Maintainer shall be responsible for performing the Services in accordance with the Tram Maintenance Specification, the Code of Maintenance Practice and the Code of Construction Practice (so far as these are applicable to the Services) and Good Industry Practice applicable at the time the Services are carried out. The Tram Maintainer shall further carry out all Services in a safe manner and so that the Trams are capable of being operated in a safe and efficient manner free from any unreasonable risk to the health and well being of persons using or maintaining them and free from any avoidable risk of pollution, nuisance, interference or hazard.

9.6 The Tram Maintainer warrants and undertakes that the Response, including the Tram Maintenance Plan and the asset management system to be provided by the Tram Maintainer shall comply with and meet the Tram Employer's Requirements.

9.7 The Tram Maintainer shall at all times keep itself fully informed about current professional and technical standards and about all matters relating to, or which might have a bearing on, the carrying out of the Services.

9.8 The Tram Maintainer's duties and obligations under or pursuant to this Agreement will not be released, diminished or in any other way affected by any independent inquiry into any matter which may be made or carried out by the Client or **tie** or by any firm, company or party on the Client or **tie's** behalf nor by any action or omission of any such firm, company or party whether or not such action or omission might give rise to any independent liability of such firm, company or party to the Client or **tie**.

9.9 The Tram Maintainer is deemed to have satisfied itself that it fully understands the scope and extent of the requirements in respect of its obligations pursuant to this Agreement and that it has sufficient information (including the Background Information) or will at the relevant time have sufficient information, to enable it to carry out its obligations pursuant to this Agreement. In connection with such information that it has or will have satisfied itself that it is accurate and complete before placing reliance upon it.

Liaison

9.10 The Tram Maintainer shall (and shall procure that the Tram Maintainer Parties) liaise with the Client, any Client Party, **tie**, any **tie** Party, the Operator and any other parties as may reasonably be required by the Client or **tie** to facilitate the production, by such persons, of any information required from them, in order that the carrying out of the Services and its other obligations under this Agreement can be progressed according to the Tram Maintenance Programme. The Tram Maintainer shall (and shall procure that the Tram Maintainer Parties) liaise with the Client, any Client Party, **tie**, any **tie** Party, the Operator, and any other parties as may be reasonably required by the Client or **tie** as often as is necessary in order to ensure that the Services are carried out properly and in accordance with the terms of this Agreement.

9.11 The Tram Maintainer shall (and shall procure that the Tram Maintainer Parties shall) liaise with the Client, any Client Party, **tie**, any **tie** Party, the Operator and any other parties as may reasonably be required by the Client or **tie** and shall provide such information as may be reasonably requested by such persons in relation to the design, construction, testing, commissioning, integration, operation and maintenance of the Edinburgh Tram Network to the extent that such information is available to the Tram Maintainer, and does not constitute Tram Maintainer IPR.

Prohibited Materials

9.12 The Tram Maintainer undertakes and warrants to the Client that it has not specified for use and shall not specify for use and shall ensure that there shall not be used in relation to the Trams, any materials which at the time of specification or use (as the case may be):

9.12.1 are known to be deleterious in the particular circumstances in which they are specified to be used (either to health and safety or to the durability of the Trams); or

9.12.2 contravene any relevant standard or code of practice issued from time to time by the BSI Group or under a European directive relating to standards; or

9.12.3 do not accord with the guidelines contained in the edition of the publication "Good Practice in Selection of Construction Materials" (Ove Arup & Partners) current at the date of specification or use; or

9.12.4 contravene Good Industry Practice.

9.13 The Tram Maintainer confirms that it has studied in detail the Tram Employer's Requirements and each document comprised therein and the Background Information in relation to this

Agreement, and has satisfied itself that no discrepancies or errors exist within the Tram Employer's Requirements and the Background Information in relation to this Agreement or between the Tram Employer's Requirements and the Response and in relation to the Background Information in relation to this Agreement has satisfied itself as to its veracity, accuracy, reasonableness, scope, materiality, currency where applicable and completeness. The Tram Maintainer acknowledges that it accepts all risks arising from any discrepancies, errors or omissions that subsequently appear within or between such documents and that it shall not be entitled to make any claim against the Client for an extension of time, additional payment, any relief or otherwise in respect of any such errors, discrepancies or omissions. The Tram Maintainer will notify the Client forthwith upon becoming aware of a discrepancy or error within the Tram Employer's Requirements or between the Tram Employer's Requirements and the Response. Where there is such discrepancy or error, the Tram Maintainer shall as soon as reasonably practicable, and in any event within 5 Business Days, provide the Client with proposals for resolving such discrepancy or error which comply with this Agreement. Unless, within 10 Business Days of receipt by the Client of the Tram Maintainer's proposals for resolving such discrepancy or error, the Client notifies the Tram Maintainer requiring it to resolve the discrepancy in a different manner (which manner shall be binding but shall be reasonable in time and cost having regard to the Tram Employer's Requirements), the Tram Maintainer shall resolve the discrepancy in the manner proposed by it.

9.14 The Tram Maintainer shall not deliver to the Client, if **tie** novates this Agreement to Infraco information relating to manufacturing, calculations and detailed design of its trams. The Tram Maintainer shall however put the mentioned information into escrow under the Escrow Agreement in case it ceases its activities in accordance with this Clause or where it is required, release information to the Tram Inspector on a confidential basis.

Commencement of Services

9.15 The Tram Maintainer shall carry out the Services in respect of each Tram and, if applicable, any Additional Trams from the date of commencement of trial operation of the Trams by the Operator at the start of the shadow running milestone as detailed in the Tram Maintenance Programme ("**Tram Maintenance Commencement Date**").

General

9.16 During the Services Period the Tram Maintainer shall be responsible for, without limitation, the provision and employment of all staff (such staff to be suitably experienced, skilled, trained and competent at their level of occupation, managerial, supervisory, skilled or semi-

skilled) necessary to perform the Services in accordance with this Agreement and the total cost of providing the Services (including the total cost of providing Spare Parts and Special Tools for the Trams) is included in each Services Payment

9.17 During the Mobilisation Period the Tram Maintainer shall be responsible for, without limitation, the provision and employment of all staff necessary to perform the Mobilisation Services in accordance with this Agreement and the total cost of providing the Mobilisation Services is included in the Mobilisation Milestones.

Depot and other premises

9.18 Unless otherwise contemplated by the Tram Maintenance Plan, the Tram Maintainer shall carry out all of the Services (except those works carried out pursuant to Clause 9.28) at the Depot unless the consent of the Client is obtained (such consent not to be unreasonably withheld).

9.19 The Services shall comprise only materials and goods which are of satisfactory quality and, unless otherwise agreed in writing, the Tram Maintainer will supply only new materials and goods, except for those items that can be satisfactorily repaired or reused in accordance with Good Industry Practice and, where permitted under the Tram Maintenance Plan.

9.20 **Spare Parts and Special Tools**

9.20.1 The Tram Maintainer shall be responsible for the provision of all Spare Parts and Special Tools necessary or required for the Services. All such Spare Parts shall meet the technical and safety requirements of the Tram Maintenance Specification. Special Tools to be provided pursuant to this Clause 9.20 shall, as a fundamental condition of this Agreement, be provided with a valid certificate of calibration (where appropriate).

9.20.2 The Tram Maintainer shall also ensure that throughout the term of this Agreement all Special Tools which require calibration or testing in order that they shall be fit for their intended purpose shall have a valid test and/or calibration certificate and the Tram Maintainer shall give to the Client within 10 Business Days of any request by the Client a copy of the current test or calibration certificate (where appropriate).

9.20.3 The Tram Maintainer shall acquire adequate stocks of such Spare Parts and Special Tools to ensure that there is always a Minimum Spare Parts Pool at the Depot and, in any case, sufficient Spare Parts and Special Tools to enable the Tram Maintainer to carry out the Services in accordance with this Agreement and manage re-order levels

and lead time such that at no time should such stock of Spare Parts or Spare Tools be less than the Minimum Spare Parts Pool.

9.20.4 For the avoidance of doubt, the cost of the Spare Parts and Special Tools to be provided pursuant to Clause 9.20.1 is included in the Services Payment and the Tram Maintainer shall be entitled to no further payment for any Spare Part or Special Tool.

9.20.5 The Tram Maintainer shall acquire such Spare Parts and Special Tools from the Tram Supplier or otherwise on behalf of CEC in accordance with Clauses 34.3 to 34.4 of the Tram Supply Agreement.

9.20.6 The Tram Maintainer shall transfer title to CEC of each Spare Part or Special Tool upon delivery of such item to the Depot.

9.20.7 Every Reporting Period, the Client and the Tram Maintainer shall review the level of the Minimum Spare Parts Pool in light of the requirements for Spare Parts in delivering the Services pursuant to this Agreement and the Tram Maintainer shall make recommendations to the Client in relation to any adjustments to be made to the Minimum Spare Parts Pool either in relation to the extent of the Minimum Spare Parts Pool or the quantity of any of the Spare Parts required to meet the Minimum Spare Parts Pool. The Client shall review the Tram Maintainer's recommendations and where necessary consult further with the Tram Maintainer as to the adequacy of the Minimum Spare Parts Pool in the light of ongoing maintenance pursuant to the Services and, subject to Clause 9.20.4 and the Tram Maintainer having taken such steps as are possible to rectify the situation, if the Client in its absolute discretion is of the opinion that it would be appropriate to vary the Minimum Spare Parts Pool then such variation shall be a Client Change Order varying the Minimum Spare Parts Pool as it deems appropriate in accordance with Clause 16 (Changes).

Manner of carrying out Services

9.21 The Tram Maintainer shall ensure that the Services are carried out:

9.21.1 in a safe and cost effective manner and so as to comply with all applicable Law, Consents and Good Industry Practice;

9.21.2 so as to ensure compliance with the requirements of the Tram Employer's Requirements and Tram Maintenance Specification including all safety requirements and the Operator Safety Management System and the Tram Maintainer shall ensure that its employees, agents and sub-contractors comply with such requirements, such

that the obligations hereunder are carried out free from the risk of pollution, interference, nuisance or hazard;

9.21.3 so that the Trams are capable of being operated in a safe and efficient manner free from any unreasonable risk to the health and well being of persons using or maintaining them and free from any avoidable risk of pollution, nuisance, interference or hazard;

9.21.4 in accordance with the Code of Maintenance Practice, so far as it is applicable;

9.21.5 in accordance with the Code of Construction Practice, so far as it is applicable;

9.21.6 in such a manner so as not to endanger the health or safety of or unreasonably interfere with the proper performance of the duties of Client employees and third parties or otherwise expose the Client to liability under the Health and Safety at Work etc. Act 1974 or the Transport and Works Act 1992 or any other legislation relating to health and safety;

9.21.7 so as to ensure that no design work, redesign work, maintenance, repair work or modifications to the Trams, Parts, Spare Parts or Special Tools shall prejudice either the Operator's Case for Safety or the warranties provided by the Tram Supplier pursuant to the Tram Supply Agreement and that the Trams remain fit for purpose to comply with the Employer's Requirements, and unless agreed in writing with **tie** and the Client otherwise, for the Trams to remain compatible and inter operable with each other;

9.21.8 in accordance with any Rectification Plan;

9.21.9 in compliance with the Operator Procedures as agreed between the Tram Maintainer and the Operator and as may be varied from time to time;

9.21.10 so as to assist the Client in relation to the provision of information to **tie** in order to establish whether best value has been achieved in respect of the Services;

9.21.11 in accordance with **tie** and CEC Policies;

9.21.12 so as to ensure compliance with the Tram Legislation;

9.21.13 in such manner as not wilfully to detract from the image and reputation of **tie**, Transport Edinburgh Limited, CEC, the Scottish Ministers, Transport Scotland, the Edinburgh Tram Network and the Client;

9.21.14 so as to ensure that sustainability is considered and discussed with the Client in relation to energy consumption and the supply of materials from sustainable sources in respect of the manufacture and operation of the Trams;

9.21.15 in a manner that is not likely to be injurious to persons or property;

9.21.16 using the Key Personnel; and

9.21.17 in compliance with all applicable environmental regulations and requirements.

9.22 If the Tram Maintainer reasonably believes or becomes aware that there is or may be:

9.22.1 a defect in a Part which has been fitted in a Tram whether or not as part of the Services; or

9.22.2 any other defect in relation to the Trams,

which may prejudice the safe or reliable operation of a Tram, the Tram Maintainer shall immediately on becoming aware of such defect notify the Client and the Operator of such defect and provide a proposal as to the most effective course of action by which such defect can be rectified.

9.23 **Tram Maintainer's obligation to repair**

9.23.1 The Tram Maintainer shall during the Services Period effect the repair of all defects in, failures of or damage to the Trams irrespective of cause. The Tram Maintainer shall effect all such repairs in a manner consistent with its obligations under this Agreement and in a manner which causes the minimum disruption to the operation of the Trams on the System and to enable the Trams to be Available at all times.

9.23.2 The Tram Maintainer shall bear all of the costs of complying with Clause 9.23.1 where any damage to a Tram is caused by:

9.23.2.1 a breach of this Agreement by the Tram Maintainer; or

9.23.2.2 any failure by the Tram Maintainer or a Tram Maintainer Party to perform the Services; or

9.23.2.3 the performance of the Services by the Tram Maintainer or a Tram Maintainer Party; or

9.23.2.4 any negligent act or negligent omission by the Tram Maintainer or any Tram

Maintainer Party.

9.23.3 Where any damage to a Tram is not caused by:

9.23.3.1 a breach of this Agreement by the Tram Maintainer; or

9.23.3.2 any failure by the Tram Maintainer or a Tram Maintainer Party to perform the Services; or

9.23.3.3 the performance of the Services by the Tram Maintainer or any Tram Maintainer Party; or

9.23.3.4 any negligent act or negligent omission by the Tram Maintainer or any Tram Maintainer Party,

the Client shall bear the necessary, reasonable and demonstrable costs of the Tram Maintainer repairing such damage and any repairs in respect of such damage and such costs shall be calculated in accordance with Clause 9.23.4.

9.23.4 The necessary cost of the Tram Maintainer repairing damage pursuant to this Clause 9.23 shall be calculated on the following basis:

9.23.4.1 where the repair to be effected is an Agreed Repair the cost shall be the Agreed Repair Cost for such Agreed Repair (such price which shall include, for the avoidance of doubt, the cost of all parts and labour).

9.23.4.2 where the repair to be effected is not an Agreed Repair the cost shall be calculated as follows:

(a) any part which is included in part 1 of Schedule 5 (*Spares Pool and Special Tools*) shall be charged at the cost set out in such Schedule;

(b) the Parties shall agree the total number of hours of labour required ("**Agreed Labour Hours**") to effect such repair and such labour shall be charged at its actual hourly cost (to a maximum rate of £51.77 per hour exclusive of VAT) for the actual time taken to effect such repair, up to a maximum of the Agreed Labour Hours. If necessary and to demonstrate the feasibility of the repair, the Party proposing less man-hours shall demonstrate that the number of man-hours are enough to achieve the repair; and

(c) any other part used or cost incurred shall be charged at its actual cost (as demonstrated to the reasonable satisfaction of the Client by the Tram Maintainer on an Open Book Basis) plus a mark up of 19%.

9.23.5 In determining the cost of repairs pursuant to this Clause 9.23 the Tram Maintainer shall consult with the Operator and the Client in good faith with a view to agreeing:

9.23.5.1 a suitable programme for carrying out the repairs; and

9.23.5.2 the cost calculated pursuant to Clause 9.23.4.

If, following such consultation, agreement is not reached with respect to any of the matters referred to above, the Client shall be entitled to determine such outstanding matters and the Tram Maintainer shall proceed with the repairs notwithstanding the Tram Maintainer's right to refer the matter to the Dispute Resolution Procedure.

9.23.6 In the event that no agreement can be reached as to the costs referred to in this Clause 9.23, the matter shall be resolved as set out in Clause 52 (*Dispute Resolution*).

Standard of repairs

9.24 All repairs to and replacements of the Trams shall be carried out to a standard that restores the defective, failed or damaged Tram to a condition which meets the requirements of the Tram Requirements Specification (subject to normal wear and tear) and enables the Tram Maintainer to comply with its obligations under this Clause 9 (*Terms Governing the Services*).

Temporary repairs

9.25 Where necessary the Tram Maintainer shall be entitled to carry out temporary repairs to failures or damage to the Trams subject where necessary to obtaining the prior approval of HMRI, the Operator, the Client, **tie** and all appropriate regulatory authorities. All temporary repairs shall be fully repaired at the earliest opportunity and in any event forthwith upon receipt of written notice from HMRI, **tie**, the Client or the Operator (as the case may be) stating that it no longer considers such temporary repairs to be safe and/or fit for their purpose.

9.26 **Breakdown/emergency response**

9.26.1 Where the Client and/or the Operator cannot return a Tram to the Depot without assistance, the Tram Maintainer shall provide such assistance, information and advice as the Client shall reasonably require, including such assistance as the Client shall reasonably require in:

9.26.1.1 the Tram Maintainer attending the site of the occurrence to assess the cause of the problem, with a required response time of no more than 15 minutes from the Client's request for attendance to a representative of the Tram Maintainer departing the Depot to attend;

9.26.1.2 rectifying the problem;

9.26.1.3 implementing measures to overcome and/or mitigate the effect on operation of the Trams;

9.26.1.4 implementing temporary repairs; and

9.26.1.5 recovering such Tram for repair.

9.26.2 As soon as practicable following removal or repair of the Tram, the Tram Maintainer shall provide reasonable assistance to the Client in preparing a report (where applicable) summarising the causes of such problem and providing recommendations (where applicable) to avoid the repetition of such occurrence.

9.26.3 Where the most efficient manner of dealing with such failure would be for repairs to be effected at the site of the failure, the Tram Maintainer shall carry out such repairs as can safely be carried out and within the capabilities immediately available to the Tram Maintainer at the site.

9.26.4 To the extent that according to the report produced pursuant to Clause 9.26.2 and accepted by the Client the failure of the Tram requiring action pursuant to this Clause 9.26 was attributable other than to a breach of this Agreement by the Tram Maintainer or a negligent act or omission by the Tram Maintainer or Tram Maintainer Party then the Client shall pay the cost of any repair and recovery in accordance with Clause 9.23 and the Tram Maintainer's reasonable costs of effecting such breakdown recovery. For the avoidance of doubt, the Tram Maintainer shall be solely liable for the cost of any repair and recovery to the extent it arises from the failure of the Tram Maintainer to perform the Services.

9.27 **Additional Operator Tram Availability**

9.27.1 If the Operator requires any additional Trams for its own use ("**Additional Operator Trams**"), including the training of drivers, it shall notify the Tram Maintainer and the Client of its requirements on not more than one (1) weeks' notice. The number of

Additional Operator Trams that the Operator can request for any period shall be limited as follows:

Period	Maximum Additional Operator Trams
Peak Period	0 Trams
All other times	2 Trams

9.27.2 The Tram Maintainer shall ensure that it makes Available to the Operator the Additional Operator Trams notified to it in accordance with Clause 9.27.1. For the avoidance of doubt, an Additional Operator Tram will only be counted as having been made Available if the Tram Maintainer has already made Available Trams to meet both the Tram Number Requirement and the provision of a Hot Spare.

Operational Safety Step-In Event

9.28 In accordance with the provisions of paragraph 6 of parts A and B of Schedule 18 (*Code of Construction Practice and Code of Maintenance Practice*), if the Operator objectively detects the need of any remedial or other work or repair is necessary by reason of any emergency, accident, failure or other event giving rise to an immediate threat to health and safety (including users and/or members of the public) during the carrying out of the Services, the Operator shall so inform the Tram Maintainer and the Client with confirmation in writing. Thereafter, if the Tram Maintainer is unable or unwilling to carry out such work or repair in accordance with the appropriate time period identified in paragraph 6 of Parts A and B of Schedule 18 (*Code of Construction Practice and Code of Maintenance Practice*), the Client may itself carry out or procure the carrying out of the said work or repair. If the work or repair so carried out by the Client is work which the Tram Maintainer was liable to carry out at its own expense under this Agreement, all costs and expenses properly incurred by the Client in relation to such work shall be recovered from the Tram Maintainer by the Client and may be deducted from any monies due or to become due to the Client. If the Tram Maintainer carries out such work or repair, the Tram Maintainer shall be paid in accordance with Clause 42 (*Payment*) the amount of any direct and demonstrable costs as may be reasonable except to the extent that such extra cost results from the Tram Maintainer's default.

9.29 The Tram Maintainer acknowledges that the Client has supplied to it a copy of the Infraco Contract as at the Effective Date.

9.30 The Tram Maintainer undertakes that on the date of use or installation on any Tram, any materials supplied shall be in accordance with Schedule 2 (Employer's Requirements).

9A. EQUIVALENT PROJECT RELIEF

9A.1 Raising EPR Claims

9A.1.1 In the event that the Tram Maintainer reasonably considers it has an entitlement to an EPR Claim, then (except to the extent that the Tram Maintainer's entitlement arises out of a breach of this Agreement by the Client which has not been caused or contributed to by a corresponding breach by **tie**) the Tram Maintainer shall notify the Client's Representative of the details as are reasonably required by the Client to evidence such EPR Claim so as to enable the Client to meet its requirements in relation to the Client Claim.

9A.1.2 Provided that details of the EPR Claim are supplied in accordance with the relevant provisions of this Agreement and so as to enable the Client to meet its requirements in relation to the Client Claim the Client shall, following the appropriate procedure under the Infraco Contract, pursue or defend such EPR Claim with **tie** diligently, expeditiously and treating such claim as if the EPR Claim was its own. The Client shall identify the EPR Claim as separate from any claim the Client has under the Infraco Contract unless it can demonstrate to the reasonable satisfaction of the Tram Maintainer that it is not reasonably practicable to do so.

9A.2 Processing EPR Claims

9A.2.1 In relation to any EPR Claims the Client shall:

9A.2.1.1 keep the Tram Maintainer fully informed as to the progress of such EPR Claims and, if requested by the Tram Maintainer and at the cost of the Tram Maintainer, provide copies of all documentation relating to the same;

9A.2.1.2 act in good faith and shall not bring the good name of the Tram Maintainer into disrepute;

9A.2.1.3 not act (or omit to act) in a manner as would result in a breach of this Agreement;

9A.2.1.4 not act (or omit to act) in a manner which threatens the continuance of the Infraco Contract; and

9A.2.1.5 procure that **tie** shall consult with the Tram Maintainer and that the Tram Maintainer has the right to consult with **tie,** in relation to the EPR Claim.

9A.2.2 The Client shall notify and consult with the Tram Maintainer in relation to: (i) **tie's** and the Client's proposals to resolve the Client Claim to which the EPR Claim relates; and (ii) in the event that it is not reasonably practicable to identify the EPR Claim as separate pursuant to Clause 9A.1.2, the proportion of the Client Claim which is properly and reasonably attributable to the EPR Claim. The Tram Maintainer agrees that the EPR Claim shall not exceed any relief, entitlement and/or additional payment agreed or determine in relation to the Client Claim.

9A.2.3 The Client shall not resolve any Client Claim under the Infraco Contract to which an EPR Claim relates without the prior written consent of the Tram Maintainer, which consent shall not be unreasonably withheld or delayed. If such consent is unreasonably withheld or if the Tram Maintainer has not responded to any request for consent within ten (10) Business Days, the Tram Maintainer shall be deemed to have consented to such resolution, agreement, withdrawal, compromise or settlement as proposed to the Tram Maintainer by the Client.

9A.2.4 Should the Tram Maintainer consent to the resolution of the Client Claim as notified to it by the Client pursuant to Clause 9A.2.2, then the provisions of Clause 9A.4 (*Agreement, Certification and Payment*) shall apply.

9A.3 Dispute Resolution Procedure

9A.3.1 Should the Client or **tie** raise a dispute under the Infraco Contract in relation to an EPR Claim or the Tram Maintainer does not consent to the resolution of the Client Claim or, in the event that it is not reasonably practicable to identify the EPR Claim as separate pursuant to Clause 9A.1.2, the proportion of the Client Claim which is properly and reasonably attributable to the EPR Claim in the manner notified to it by the Client pursuant to Clause 9A.2.2, then:

9A.3.1.1 the Tram Maintainer shall be entitled to invoke the Dispute Resolution Procedure under this Agreement if not already invoked;

9A.3.1.2 the Client shall, at the request of the Tram Maintainer, invoke the Dispute Resolution Procedure under the Infraco Contract; and

9A.3.1.3 the Client shall, at the request of the Tram Maintainer, invoke the Related Disputes mechanism contained at paragraphs 55 to 57 of Schedule 9 (Dispute Resolution Procedure) and procure that **tie** invokes the Related Disputes mechanism contained in Schedule 9 (Dispute Resolution Procedure) of the Infraco Contract.

9A.3.2 The Parties agree that should there be a resolution of the Client Claim or, in the event that it is not reasonably practicable to identify the EPR Claim as separate pursuant to Clause 9A.1.2, the proportion of the Client Claim which is properly and reasonably attributable to the EPR Claim following Clause 9A.3.1:

9A.3.2.1 where such resolution was achieved following the "Internal Resolution Procedure" or "Mediation" (as described in the Dispute Resolution Procedure), then the Tram Maintainer and the Client shall, and the Client shall procure that **tie** shall, be responsible for its own costs in relation to this Clause 9A (*Equivalent Project Relief*);

9A.3.2.2 where such resolution was achieved following the "Adjudication" procedure (as described in paragraphs 15 to 54 inclusive of the Dispute Resolution Procedure), then the Tram Maintainer and the Client shall, and the Client shall procure that **tie** shall, submit to the decision of the adjudicator in respect of allocation of costs; and

9A.3.2.3 where it is agreed, as part of the Internal Resolution Procedure immediately prior to the matter proceeding to "Adjudication" (as described in paragraphs 10 and 11 of the Dispute Resolution Procedure), by **tie**, the Tram Maintainer and the Client that the Client's sole involvement in the Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then the Client shall be entitled to recover all its costs incurred, such Client costs shall be minimised as far as reasonably practicable in relation to this Clause 9A (*Equivalent Project Relief*) and payment of the Client costs shall be the responsibility of **tie** or payment shared as allocated between **tie** and the Tram Maintainer by the adjudicator following the "Adjudication" procedure (as described in paragraph 48.2 in the Dispute Resolution Procedure).

9A.4 Agreement, Certification and Payment

9A.4.1 The Client shall resolve the Client Claim under the Infraco Contract:

9A.4.1.1 where consent has been given or is deemed to have been given pursuant to Clause 9A.2.3, in the manner notified to the Tram Maintainer under Clause 9A.2.2; or

9A.4.1.2 where there has been a resolution following Clause 9A.3.1, as directed by such outcome following Clause 9A.3.1.

9A.4.2 The Client's Representative shall certify such amount or extension of time as is resolved following Clause 9A.4.1 in respect of the EPR Claim to the Tram Maintainer within ten (10) Business Days of such sum or extension of time being resolved.

9A.4.3 Upon certification by the Client's Representative pursuant to Clause 9A.4.2, the Client shall make payment to the Tram Maintainer in accordance with Clause 42 (*Payment*) following the date upon which entitlement to payment in respect of the relevant Client Claim arises under the Infraco Contract, or grant the extension of time to the Tram Maintainer.

9A.4.4 Upon certification in accordance with Clause 9A.4.2, the Tram Maintainer expressly, unconditionally and irrevocably waives and abandons all its rights to recover from the Client relief, entitlement and/or additional payment greater than such certified amount or extension of time in respect of the specific circumstances giving rise thereto.

9A.5 No Equivalent Project Relief on Termination

9A.5.1 For the avoidance of doubt, the provisions of this Clause 9A (*Equivalent Project Relief*) shall not apply to the calculation of compensation on termination payments pursuant to this Agreement.

9B. NOTICES, CONSENTS, APPROVALS, CERTIFICATES AND DETERMINATIONS

9.B.1 In so far as the Client is obliged to act reasonably under this Agreement it will be deemed to have acted reasonably where it is acting on the request, instruction, opinion or other act of **tie** under the Infraco Contract and **tie** has acted reasonably in giving such request, instruction or opinion or performing such other act.

9.B.2 In the event the Tram Maintainer, acting reasonably, does not consider that the Client has acted reasonably pursuant to Clause 9.B.1, the Tram Maintainer shall be entitled to invoke the Dispute Resolution Procedure under Clause 52.

9C. WORK TO BE TO SATISFACTION OF THE CLIENT

9C.1 The Tram Maintainer shall complete the Services in strict accordance with this Agreement to the satisfaction of Client (acting reasonably).

9C.2 The whole of the materials, Tram Related Equipment and labour to be provided by the Tram Maintainer under Clause 9 and the mode, manner and speed of the Services are to be in accordance with this Agreement.

9D. ERRORS AND OMISSIONS IN THE TRAM WORKS

9D.1 If during the carrying out of the Services the Client becomes aware of any error or omission in the carrying out of the Services or of any other breach of this Agreement, the Client shall notify the Tram Maintainer, who shall, at its own expense and in liaison with the Client, rectify any error or omission or breach, or where this is agreed by the Client to be impracticable or undesirable, take such other agreed steps to address the error or omission.

9D.2 Any reasonable and demonstrable direct costs to the Client associated with the Client remedying any such errors or omissions or breaches shall be paid by the Tram Maintainer to the Client.

9D.3 These arrangements shall in no respect diminish the Client's ability to recover damages from the Tram Maintainer for direct losses incurred by the Client consequent upon the error or omission or breach in question.

9D.4 If and to the extent that the Tram Maintainer fails to carry out the necessary rectification and/or other agreed steps in accordance with Clause 9D.1 to the Client's reasonable satisfaction and/or within a reasonable period of time, the Client shall be entitled to carry out such rectification and/or other agreed steps itself, or procure the carrying out by a third party of such rectification and/or other agreed steps in accordance with Good Industry Practice at the Tram Maintainer's expense and shall recover any costs from the Tram Maintainer as a debt.

10. USE OF THE DEPOT

10.1 On completion of the construction of the Depot, the Tram Maintainer shall enter into and execute the Depot Sub-Licence in the form set out in Schedule 13 (*Depot Sub-Licence*).

10.2 Subject to the Tram Maintainer executing the Depot Sub-Licence and complying with and procuring the Tram Maintainer Parties' compliance with the obligations in this Clause 10 (*Use*

of the Depot) and the Depot Sub-Licence, the Tram Maintainer and the Tram Maintainer Parties shall have full right to access and use those parts of the Depot which the Tram Maintainer and the Tram Maintainer Parties properly require to so use for the purpose of carrying out the Services in accordance with this Agreement.

10.3 The Tram Maintainer agrees that:

10.3.1 the right to access and use the Depot granted pursuant to this Clause 10 (*Use of the Depot*) and the Depot Sub-Licence shall terminate on the earlier of the Termination Date or the Expiry Date; and

10.3.2 the Tram Maintainer's and the Tram Maintainer Parties' right to use such parts of the Depot shall not create any relationship of landlord and tenant.

10.4 The Client gives no warranty as to the fitness for purpose of the Depot.

10.5 Subject to the exception set out in Clause 45.2, **tie** and the Client shall not be liable for the death of or injury to persons or for damage to any property or for any losses, claims, demands, actions, proceedings, damages, costs or expenses or other liability incurred by the Tram Maintainer and/or any Tram Maintainer Parties or any person in the use of the Depot.

10.6 Nothing in this Clause 10 (*Use of the Depot*) or the Depot Sub-Licence shall restrict **tie's** and the Client's absolute right of access to any part of the Depot.

11. WARRANTIES

11.1 The Tram Maintainer represents and warrants to the Client that:

11.1.1 none of the Tram Maintainer or any officer, agent, employee of the Tram Maintainer or any Affiliate of the Tram Maintainer has committed a Prohibited Act;

11.1.2 all factual information which has been given by the Tram Maintainer or any of its respective officers, employees, agents or Affiliates in the Response or in any written response to subsequent written requests or enquiries by the Client was when given and remains as at the Effective Date true and accurate in all material respects and all projections, estimates and statements of belief in the Response or such response have been prepared with due care and attention and there is no fact or matter known to the Tram Maintainer and not already disclosed in writing to the Client's Representative which renders any such information untrue, inaccurate or misleading or might if

disclosed, adversely affect the decision of anyone considering whether or not to contract with the Tram Maintainer;

11.1.3 the Tram Maintainer:

11.1.3.1 is duly incorporated under the laws of Spain or the United Kingdom and has the power to own its own assets and carry on its own business; and

11.1.3.2 has full power and authority (and does not require the consent, authority or licence of any third party) to enter into and perform this Agreement which constitutes a valid and binding obligation on the Tram Maintainer in accordance with its terms; and

11.1.3.3 will not, by performing its obligations under this Agreement, be in breach of any undertaking, agreement or legal obligation of any nature in respect of any third party or of any applicable Law so as to have a material adverse effect on its ability to discharge its obligations under this Agreement;

11.1.4 the Tram Maintainer and the Tram Maintainer's parent company is not involved in any dispute with HM Revenue and Customs or any other fiscal or regulatory authority in any jurisdiction concerning any matter which could materially and adversely affect the business of the Tram Maintainer, or its ability to perform the Services in any way;

11.1.5 the Tram Maintainer does not use any processes and is not engaged in any activities which involve the misuse of any confidential or proprietary information belonging to any third party;

11.1.6 the Response or responses to subsequent enquiries by the Client or any Client Parties relating to the manner in which the Tram Maintainer proposes to perform the Services does not involve the use of any designs, materials, know how, trademark, business name or processes which represent or would represent a breach of any Intellectual Property Rights belonging to any third party, or a breach of any duties of confidentiality owed to any third party, or otherwise infringe the legal rights of any third party;

11.1.7 no act has been committed or event or circumstance occurred in respect of the Tram Maintainer which constitutes a Tram Maintainer Default as at the Effective Date and no circumstances are known which make it likely that such a Tram Maintainer Default will occur during the Term;

11.1.8 no litigation, arbitration or proceeding is in progress or, to the best of the knowledge and belief of the Tram Maintainer pending or threatened, against the Tram Maintainer or any of its management or assets which might have an adverse effect on the liability of the Tram Maintainer to perform its obligations under this Agreement;

11.1.9 there has been no material adverse change to the financial condition of the Tram Maintainer or the Tram Maintainer's parent company since the audited accounts for the financial year 2007 including any matter resulting in a downgrade of the Tram Maintainer's or the Tram Maintainer's parent company's credit rating with any commercially acknowledged independent rating agency reporting on the transport sector; and

11.1.10 the performance of the Services does not create any situation in which a conflict of interest arises for the Tram Maintainer.

11.2 Each of the warranties, representations and undertakings given under Clause 11.1 shall be construed as a separate and independent warranty, representation and undertaking and shall not be limited or restricted by reference to or inference from any other terms of this Agreement.

11.3 The Tram Maintainer hereby undertakes with the Client that it will as soon as reasonably practicable (and in any event within 10 Business Days) disclose in writing to the Client any event or circumstance which may arise or become known to it after the date of this Agreement which is materially inconsistent with any of the warranties or representations set out in this Clause 11 (*Warranties*) or which has or is likely to have an adverse effect on the Project.

11.4 The warranties and representations set out in Clause 11.1 shall be deemed to be repeated by the Tram Maintainer as at the Commencement Date and thereafter on each Reporting Period End Date.

11.5 Neither **tie** nor the Client gives any warranty or undertaking or makes any representation as to the completeness, currency, accuracy or fitness for any purpose of any of the Background Information, and subject to Clause 45.2 neither the Client, **tie** nor any Client Party or any of their respective members or advisers nor any of their employees shall be liable to any party to this Agreement in contract, delict (including negligence or breach of statutory duty) or otherwise as a result of:

11.5.1 any inaccuracy, error, defect, omission, unfitness for any purpose or inadequacy of any kind whatsoever in the Background Information; and/or

11.5.2 any failure to make available to the Tram Maintainer or any of the Tram Maintainer Parties any materials, documents, drawings, plans or other information relating to the Project,

provided that nothing in this Clause 11.5 shall exclude any liability in respect of any statements made or information provided fraudulently.

12. LAWFUL AND SAFE OPERATION

12.1 Save where expressly provided otherwise in this Agreement, the Tram Maintainer shall give all notices and pay all fees required (including any licence application and renewal fees required to be given or paid under any applicable Law) in relation to the execution of the Services and performance of its obligations under this Agreement.

12.2 All operations necessary for the execution of the Tram Maintainer's duties and obligations under this Agreement shall be carried out:

12.2.1 without unreasonable noise and disturbance;

12.2.2 without unreasonable interference with the Operator or Infraco at the Depot; and

12.2.3 so as not to interfere unnecessarily or improperly with traffic or the convenience of the public or the access to, use and occupation of, public or private roads or footpaths to or of properties, whether in the possession of the Client or of any other person.

12.3 The Tram Maintainer shall not at any premises from where its employees, agents and/or sub-contractors perform the Services and/or any obligations under this Agreement at any time allow the consumption of, or work under, the influence of alcoholic liquors or drugs or give, sell or barter any alcoholic liquors or drugs or permit or suffer any such gift, sale or barter to be made by any sub-contractor, or any visitor, employee or agent of the Tram Maintainer or any sub-contractor. The Tram Maintainer and its visitors, employees and agents shall observe and comply with, and shall ensure that each sub-contractor and its visitors, employees and agents observe and comply with, all applicable Law as amended from time to time.

12.4 The Tram Maintainer shall (at its own cost and expense):

12.4.1 obtain and maintain in effect all Consents which may be required for the performance of the Services and/or pursuant to this Agreement from time to time; and

12.4.2 implement each Consent within the period of its validity and in accordance with its terms.

12.5 The Tram Maintainer shall provide copies of such Consents to the Client's Representative.

12.6 Acknowledgement by the Client of the copies of Consents provided to them pursuant to Clause 12.5 shall not in any way affect the Tram Maintainer's obligations or relieve the Tram Maintainer from its obligations pursuant to this Clause 12 (*Lawful and Safe Operation*) or otherwise.

12.7 Where **tie's** or the Client's or the Operator's authorisation or completion of documentation in respect of compliance with any Law or the obtaining of any Consent may be required, the Tram Maintainer shall furnish the relevant documentation to **tie** or the Client or the Operator (as the case may be) and, where possible, permit **tie** or the Client or the Operator a period of 10 Business Days to authorise or complete it.

12.8 The Client shall endeavour to assist the Tram Maintainer with applications for Consents which it is required to obtain under this Agreement for the performance of the Services where the Client considers in its sole discretion that such assistance would facilitate the Tram Maintainer in obtaining any Consents. Such assistance shall in no way affect the principle set down in Clause 12.3 that it is the Tram Maintainer's obligation to obtain, maintain and implement the Consents required by this Agreement. Subject to Clause 45.6, the Client shall not incur any liability whatsoever to the Tram Maintainer in connection with its actions pursuant to this Clause 12.8.

12.9 The Tram Maintainer shall provide such information and assistance as the Client may reasonably request to assist the Client in obtaining, maintaining in effect and implementing all other consents which may be required for the purposes of the Project.

13. INTERFACE WITH THE OPERATOR

13.1 Technical Requirements

In accordance with Schedule 24 (*Review Procedure*) the Tram Maintainer shall take account of any comments made by the Client or **tie** in relation to operational issues when refining its Tram Maintenance Plan, Tram Maintenance Programme, standards, procedures and safety documentation in accordance with Schedule 2 (*Employer's Requirements*) and when supporting system integration in accordance with Clause 14 (*Support for System Integration*). The Tram Maintainer shall comment on functional and maintainability issues to the Client as a minimum at each of the Mobilisation Milestones during the Mobilisation Period and every Reporting Period during the Term, seeking to optimise the whole life asset cost of the Tram. These comments shall be delivered to **tie**, the Client and the Operator.

13.2 **Operation and Maintenance Procedures**

13.2.1 The Tram Maintainer acknowledges that the Operator shall be responsible for Operator Maintenance of the Edinburgh Tram Network and in relation to such maintenance, the Tram Maintainer shall at all times liaise with the Operator in its performance of the responsibilities set out in the Operator Maintenance Plan and coordinate such performance with the carrying out of the Services. The Tram Maintainer and the Client agree to work in mutual cooperation to allow the Operator to perform such maintenance in accordance with the terms of the Operator Maintenance Plan with a view to ensuring that the Edinburgh Tram Network as a whole and each part of it are continuously available for the provision of Transport Services. Where, in fulfilling this obligation, the required co-operation detracts from the Tram Maintainer's ability to perform, the Tram Maintainer shall have the right to and the Client shall be obliged to raise the matter with **tie**.

13.2.2 As directed by the Client, the Tram Maintainer shall accept and act upon instructions from the Operator, acting reasonably, in respect of specific contractual rights including safety management, possession co-ordination and maintenance interaction.

13.2.3 The Tram Maintainer shall work together with the Operator with the continual objective that the Services be delivered in accordance with the Tram Employer's Requirements without interruption. The Tram Maintainer shall, without limitation:

13.2.3.1 respond promptly and in compliance with the timing commitments set out in this Agreement to any notification by the Operator that there is a requirement for the Services of which the Operator becomes aware;

13.2.3.2 promptly notify the Operator, **tie** and the Client of any requirement for Operator Maintenance of which the Tram Maintainer becomes aware; and

13.2.3.3 co-operate with the Operator in relation to the planning and execution of Operator Maintenance and the Services.

13.2.4 If, at any time after the Tram Maintenance Commencement Date, it appears likely to the Tram Maintainer that any planned works or activities to be carried out by the Tram Maintainer or the Tram Supplier will necessitate interruption to or restriction of the Transport Services on the Edinburgh Tram Network, the Tram Maintainer (as appropriate) shall:

13.2.4.1 notify the Client, **tie** and the Operator not less than 42 days prior to such

planned works or activities that affect the tram fleet availability, and take all reasonable steps to support the Operator in notifying passengers, as soon as reasonably practicable in advance of the carrying out of such planned works or activities, of the nature of such work and the likely disruption or restriction of the Transport Services; and

13.2.4.2 take all steps, where required by the Client, which are reasonably practicable to minimise the adverse consequences of such works or activities to passengers.

13.2.5 In the event of any unplanned works or activities to be carried out by the Tram Maintainer as a result of a Tram failure, breakdown or an emergency, the Tram Maintainer shall:

13.2.5.1 notify the Client, **tie** and the Operator as soon as possible of the nature of such works or activities and the likely disruption or restriction of the Transport Services;

13.2.5.2 take all reasonable steps to support the Client in notifying passengers as soon as reasonably practicable of the nature of such works and activities and the likely disruption or restriction of the Transport Services; and

13.2.5.3 take all steps which are reasonably practicable to minimise the adverse consequences of such works and activities to passengers. The Tram Maintainer shall take such steps that shall include support to the Operator or the Client as the case may be.

Where the Operator considers that such works and activities will result in likely disruption or restriction of the Transport Services for any period, the Tram Maintainer shall, where required by the Client, take such steps that shall include support to the Operator in providing an alternative means of transportation being in service as soon as reasonably practicable. For the purposes of this Clause 13.2.5, the Parties acknowledge that it will generally be reasonably practicable for the Operator to arrange for an alternative means of transportation to be in service within 90 minutes of becoming aware of the requirement for it.

13.3 **Safety**

13.3.1 The Tram Maintainer shall provide a permanent representative for the Project Safety and Certification Committee (PSCC) who shall be responsible for the Tram

Maintainer's mandatory participation in and technical contribution to the PSCC's output and the discharge of its responsibilities. The Tram Maintainer's obligations shall encompass as a minimum:

13.3.1.1 participation on a compulsory basis in all liaison meetings with HMRI, the Independent Competent Person and emergency services; and

13.3.1.2 the development and implementation of a safety management system (the "**Tram Maintainer Safety Management System**") which shall address such matters, including:

(a) Tram Maintainer staff competency and its continual assessment;

(b) training on all safety related issues;

(c) safety procedures;

(d) record keeping and audit;

(e) certification of materials, Special Tools and equipment;

(f) frequency and mode of internal audit by the Tram Maintainer and audit by the Client of the Tram Maintainer Safety Management System;

(g) incident response, management and review of lessons learned;

(h) continual improvement and best practice;

(i) configuration control of Tram components; and

(j) traceability of mitigation of safety hazards identified and allocated to the Tram Maintainer in the hazard log.

13.3.2 The Client, **tie** and the Operator shall be entitled to review the Tram Maintainer Safety Management System (and its implementation) at any time upon notice which is appropriate in the circumstances and in any case within no more than 3 days. For the avoidance of doubt, **tie**, the Client and the Operator shall be entitled to immediate access upon the occurrence of an incident which potentially involves the safe functioning of the Tram.

13.3.3 Where the Operator identifies defects in the Trams through its carrying out of the Operator Procedures and notifies these defects to the Tram Maintainer and/or where a Tram has been undergoing maintenance by the Tram Maintainer, it shall be the responsibility of the Tram Maintainer to undertake and complete verification, through agreed procedure, of the safety and service readiness of the Trams prior to service start-up every morning no later than one hour (or such other time as agreed between the Parties) prior to Transport Services commencing each day on the applicable Trams and to the status to the Client, **tie** and the Operator in an agreed form.

13.3.4 In the event that the Operator can demonstrate to the Tram Maintainer that the Trams are not ready for service start up, the Tram Maintainer shall notify the Client and **tie,** and the Tram Maintainer shall rectify any deficiency in the Trams in accordance with this Agreement which is preventing the commencement of Transport Services or the shutdown of the network for the night.

13.3.5 The Tram Maintainer shall liaise effectively with the Client, **tie** and the Operator in co-ordination of health and safety issues at the Depot in accordance with the Depot Sub-Licence.

13.4 **Lifecycle Maintenance**

13.4.1 The Tram Maintainer shall give the Operator, **tie** and the Client a minimum of one month's prior notice in outline of any life cycle maintenance forming part of the Services to be carried out on any of the Trams, such initial notice to be followed by at least 14 days' notice in detail.

13.4.2 Not less than 6 months prior to the Service Commencement Date and annually thereafter during the Term, the Tram Maintainer shall provide the Client, **tie** and the Operator with a combined maintenance plan demonstrating how the effects of planned lifecycle maintenance on the provision of the Services in accordance with the Timetable shall be minimised, based upon part 1 of the Employer's Requirements.

Operational Interface and Operator Mobilisation

13.5 Following the Tram Maintenance Commencement Date, the day-to-day operation of the Edinburgh Tram Network shall be the responsibility of the Operator. To enable the efficient operation of the Edinburgh Tram Network, the Tram Maintainer shall provide technical advice free of charge to the Client, the Operator and **tie** regarding the operational deployment and integration of the various components of the Trams and any other information regarding their

design, construction, standards, integration, operation and maintenance which the Client, the Operator and/or **tie** may reasonably request.

System Acceptance

13.6 The Tram Maintainer shall ensure that at all times it works closely and effectively with the Client and the Operator in the performance of both the Operator and the Tram Maintainer's obligations pursuant to the Systems Acceptance Tests and the associated obligations on testing and commissioning set out in part 1 of the Employer's Requirements.

13.7 **Facilities and Access**

13.7.1 The Tram Maintainer shall at all times provide to the Operator, **tie** and the Client such access to the site where the Services are being performed, during the performance of the Services as the Operator may reasonably require and in accordance with Clause 26 (*Right of Verification and Audit*) provided that such access shall not disrupt or interfere with the performance by the Tram Maintainer or any Tram Maintainer Party of the Services and the Client shall, and shall procure that the Operator shall, during any period when it or they have access to such site, comply with all rules and regulations applicable to working at those premises for the safety of persons and convenience of the public.

13.7.2 The Tram Maintainer acknowledges that the Operator, **tie** and the Client will require access to the site where the Services are being performed in order to prepare for the operation of the Edinburgh Tram Network from the Tram Maintenance Commencement Date. The Tram Supplier agrees that it will co-operate with the Operator, **tie** and the Client and plan to avoid any interference with mobilisation by the Operator. The Operator, **tie** and the Client acknowledge they should not interfere with the normal work to be performed by the Tram Maintainer.

13.7.3 The Client agrees that where any damage is caused to the Services by the Operator or by **tie**, the repair of such damage shall not be part of the Tram Maintainer's obligations under this Agreement but where the Client requires the Tram Maintainer to repair such damage, it will issue a Client Notice of Change in respect of such repair works.

13.8 **Partnering**

13.8.1 The Tram Maintainer shall use reasonable endeavours to work collaboratively with the Operator at all times in order to:

13.8.1.1 maximise productivity in relation to the Services and minimise disruption for the public and third parties;

13.8.1.2 ensure the effective discharge of the Tram Maintainer's obligation to support system integration in accordance with Clause 14 (*Support for System Integration*);

13.8.1.3 maintain the highest standards achievable with regard to the provision of the Services;

13.8.1.4 minimise and give best advance notice to one another and to the Client and **tie** of any interruption to the Services caused by any Tram Maintainer Default, maintenance (planned or unplanned) or third party incident;

13.8.1.5 mutually support adherence to the Client's Programme and all related timelines and programmes and to share with the Client, **tie** and the Operator on a systematic basis, deliverables and key information connected with such adherence; and

13.8.1.6 safeguard proper performance of the Services and all obligations under this Agreement.

13.8.2 Where the Tram Maintainer has been notified by the Client of any proposed variation under the DPOFA which may materially affect the Tram Maintainer's performance of its obligations or the exercise of its rights under this Agreement, the Tram Maintainer shall respond with comments within 5 Business Days of being notified by the Client of any proposed variation under the DPOFA. Failure by the Tram Maintainer to respond as stipulated in this Clause shall be a bar to any claim for relief or compensation under this Agreement.

14. SUPPORT FOR SYSTEM INTEGRATION

14.1 The Tram Maintainer shall cooperate with the Client (in any way the Client acting reasonably may request, but for the avoidance of doubt additional services not included in the scope of this Agreement shall be at the cost of the Client) in ensuring that the following key elements of the system integration of the Services with the Edinburgh Tram Network are implemented and maintained throughout the Term, including:

14.1.1 determination and maintenance of the Tram performance requirements such that when the Trams are integrated they shall achieve the "Edinburgh Tram Network System

Availability Targets" set out in the Employer's Requirements (including the Operations Performance Specification);

14.1.2 management of technical interfaces as set out in the Employer's Requirements and as developed by the Client from time to time including issues such as electro-magnetic compatibility, noise, vibration and wheel/rail interface ensuring that each and every material issue arising is satisfactorily closed out and remains closed out;

14.1.3 test management cooperation and analysis in so far as the tests relate to the Trams;

14.1.4 alignment of operations and maintenance procedures to ensure they form a whole and safe system of work in so far as they relate to the maintenance of the Trams;

14.1.5 support system activation and any subsequent extensions or enhancements of Tram service frequencies;

14.1.6 safety assurances and the Case for Safety; and

14.1.7 preparation and updating of a requirements traceability matrix which shall have the ability to trace the requirements of the Services and/or the Tram Maintenance Specification and the Employer's Requirements through the testing procedures and the operation of the Edinburgh Tram Network in so far as it relates to the Trams.

14.2 The Tram Maintainer shall cooperate with the Client in ensuring that the maintenance of the Trams is fully integrated with the Edinburgh Tram Network.

14.3 The Tram Maintainer shall carry out all of the system integration activities described in the Tram Interface Specification.

14.4 The Tram Maintainer shall liaise with and support the Operator and the Client as instructed by the Client in relation to:

14.4.1 system operation and related design issues;

14.4.2 the Systems Acceptance Tests; and

14.4.3 operational defects.

14.5 The Tram Maintainer shall cooperate with the Client in ensuring that all elements of the Trams relative to the Edinburgh Tram Network are compatible with system integration and the Tram Maintainer shall make qualified personnel available to support system integration but for the

avoidance of doubt additional services not included in the scope of this Agreement shall be at the cost of the Client.

14.6 The Tram Maintainer shall be responsible for managing the configuration control of the modification status of the Trams, and, where relevant, the modification status of the Special Tools and Spare Parts. Specifically, but not exclusively, controlling the introduction of software changes and hardware modifications through version control and providing documentation to the Client, **tie** and the Operator detailing the operational implications of the modifications, a minimum of 10 Business Days before their planned introduction.

14.7 The Tram Maintainer shall co-operate and provide all information reasonably requested by the Client relating to the Services so as to enable the Client to discharge its obligations under the Employer's Requirements including the provision of all information referred to in Schedule 21 *(Response)*.

14.8 The Client shall, give adequate consideration to any issues relating to interface with the Tram, the Depot or tram maintenance raised in writing by the Tram Maintainer and shall ensure that **tie** is informed in writing of any such issues raised.

15. DELIVERABLES DEVELOPMENT

15.1 The Tram Maintainer shall develop and update (as appropriate and/or as required by the Client) the Deliverables in accordance with this Agreement, and the Client and **tie** shall be entitled to review the Deliverables (which shall include any amendment to any submitted item) in accordance with Schedule 24 (*Review Procedure*).

15.2 The Tram Maintainer shall submit any changes and any other Deliverables associated with any Permitted Variations to the Client's Representative for review pursuant to Schedule 24 (*Review Procedure*).

15.3 The Tram Maintainer shall allow the Client's Representative and **tie's** Representative, at any reasonable time, a reasonable opportunity to view any Deliverable at any stage of development, and this opportunity shall be made available to the Client's Representative and **tie's** Representative as soon as reasonably practicable following receipt of any written request from the Client's Representative. Where electronic versions of the Deliverables are available, the Tram Maintainer shall upload such Deliverables (including any drawings comprised within the Deliverables) on an extranet or document management system established and maintained by the Client as soon as practicable.

15.4 The Tram Maintainer shall provide the Deliverables in accordance with the Deliverables Programme set out in part 2 of Schedule 2 (*Tram Maintenance Programme*).

15.5 During the preparation and/or update of the Deliverables, the Client and/or the Client's Representative shall be entitled to call for a meeting to discuss the development of any Deliverables and the Tram Maintainer shall give due consideration to any reasonable comments made by the Client or the Client's Representative or **tie** or **tie's** Representative at any such meetings. As soon as reasonably practicable following any such meeting, the Tram Maintainer will prepare and circulate to those attending the meeting, a report listing the Deliverables discussed and any comments made at such meeting.

15.6 If it should be found that the Deliverables do not fulfil the requirements of this Agreement or the needs of any Relevant Authority or Independent Competent Person, the Tram Maintainer shall at its own expense amend the Deliverable. Such amendment shall be made in accordance with Schedule 24 (*Review Procedure*) and such amendment and rectification shall ensure that the Deliverables shall satisfy the requirements of this Agreement and any Relevant Authority or Independent Competent Person.

15.7 The Tram Maintainer shall provide the Client with all Deliverables in accordance with the terms of this Agreement and where no timescale for provision of such Deliverables is specified in the Deliverables Programme such Deliverables shall be provided to the Client as soon as reasonably practicable. The Tram Maintainer shall provide to the Client five copies of the agreed Deliverables in hard copy form and one copy in an agreed soft copy form (as appropriate to the format of the Deliverables). In respect of any further copies of a particular Deliverable, which the Client may require or which **tie** may require, the Tram Maintainer agrees to absorb the reasonable copying charges or other reasonable charges for provision of the same to the Client or **tie** as the Client or **tie** requires and for the purposes of achieving all Consents, providing that the Client or **tie** demonstrates that the additional requirement is reasonable.

15.8 The Tram Maintainer accepts all risks arising from any conflicts, ambiguities, discrepancies, errors or omissions that subsequently appear within or between any of the Tram Maintenance Specification and any of the other Deliverables, and the Tram Maintainer shall not be entitled to make any claim against the Client for an extension of time, payment or otherwise in respect of any such conflicts, ambiguities, discrepancies, errors or omissions.

15.9 The Tram Maintainer shall within 10 Business Days notify the Client upon becoming aware of any conflicts, ambiguities, discrepancies, errors or omissions within or between any of the Tram Maintenance Specification and any of the other Deliverables. Where there are any

conflicts, ambiguities, discrepancies, errors or omissions, the Tram Maintainer shall provide, as soon as is reasonably practicable but in any case within 20 Business Days, its proposals for resolving such conflicts, ambiguities, discrepancies, errors or omissions in compliance with this Agreement. Such proposals could include the suggestion that no action is required. The Tram Maintainer shall proceed with its proposals to resolve any such conflicts, ambiguities, discrepancies, errors or omissions as soon as reasonably practicable. If the proposal from the Tram Maintainer is that no action is required or the Client does not agree with the action proposed by the Tram Maintainer, the Client may notify the Tram Maintainer, within 10 Business Days of the Tram Maintainer's notice, to resolve any conflicts, ambiguities, discrepancies, errors or omissions in a different manner (which notification shall be binding on the Tram Maintainer).

16. CHANGES

Client Changes

16.1 Unless expressly stated in this Agreement or as may otherwise be agreed by the Parties, Client Changes shall be dealt with in accordance with this Clause 16 (*Changes*). If the Client requires a Client Change, it must serve a Client Notice of Change on the Tram Maintainer.

16.2 A Client Notice of Change shall:

16.2.1 set out the proposed Client Change in sufficient detail to enable the Tram Maintainer to calculate and provide an Estimate in accordance with Clause 16.4;

16.2.2 require the Tram Maintainer to provide the Client within 18 days of receipt of the Client Notice of Change with an estimate in accordance with Clauses 16.4 and 16.6 ("**Estimate**"), and specify whether any competitive quotes are required; and

16.2.3 set out how the Client wishes to pay or be reimbursed (as the case may be) for the proposed Client Change. Nevertheless, an agreement must be reached with the Tram Maintainer regarding payment conditions.

16.3 If, on receipt of the Client Notice of Change, the Tram Maintainer considers (acting reasonably) that the Estimate required is too complex to be completed and returned to the Client within 18 Business Days, then the Tram Maintainer shall, within 10 Business Days of receipt of such Client Notice of Change, deliver to the Client a request for a reasonable extended period of time for return of the Estimate, such extended period to be agreed by the Parties, both acting reasonably.

16.4 As soon as reasonably practicable, and in any event within 18 Business Days after having received a Client Notice of Change (or such longer period as may have been agreed by the Parties pursuant to Clause 16.3), the Tram Maintainer shall deliver to the Client the Estimate. The Estimate shall include the opinion of the Tram Maintainer (acting reasonably) on:

16.4.1 whether relief from compliance with any of its obligations under this Agreement is required during or as a result of the implementation of the proposed Client Change;

16.4.2 any impact on the performance of the Services and changes required to be made to the Tram Maintenance Specification;

16.4.3 any impact on the Tram Maintenance Programme;

16.4.4 any amendment required to this Agreement as a result of the implementation of the proposed Client Change;

16.4.5 the proposed method of delivery of the proposed Client Change, including a programme of works;

16.4.6 proposals to mitigate the impact of the proposed Client Change;

16.4.7 any Consents, or changes to existing consents, which are required in connection with, or as a result of, the implementation of the Client Change; and

16.4.8 any increase or decrease in any sums due to be paid to the Tram Maintainer (including the Services Payments) as a result of the implementation of the proposed Client Change.

16.5 The valuation of any Client Changes made in compliance with this Clause 16 (*Changes*) shall be added to or deducted from the sums due to be paid to the Tram Maintainer as the case may be, and shall be ascertained by the Client as follows:

16.5.1 unless there are substantive reasons why, in the Tram Maintainer's reasonable opinion (which shall be set out in reasonable detail by the Tram Maintainer), such rates and prices should not apply, by measurement and valuation at the rates and prices for similar work in Schedule 11 (*Agreed Repairs*) and part 1 of Schedule 5 (*Spares Pool and Special Tools*) insofar as such rates and prices apply;

16.5.2 if the Client accepts that the rates and prices referred to in Clause 16.5.1 should not apply, by measurement and valuation at rates and prices deduced therefrom insofar as it is practical to do so;

16.5.3 if the Client accepts that the rates and prices referred to in Clause 16.5.1 should not apply and it is not practicable to deduce rates and prices therefrom, by measurement and/or valuation at fair rates and prices; or

16.5.4 if the value of the Client Charge cannot properly be ascertained by measurement and/or valuation, by the value of the resources and labour employed thereon, as appropriate in accordance with the pricing set out in Schedule 11 (*Agreed Repairs*) and part 1 of Schedule 5 (*Spares Pool and Special Tools*),

provided that where any Client Change would otherwise fall to be valued under Clauses 16.5.1 and 16.5.2, but the Client's Representative is of the opinion that the instruction therefor was issued at such time or was of such content as to make it unreasonable for the alteration or addition to be so valued, the value of the Client Change shall be ascertained by measurement and/or valuation at fair rates and prices.

16.6 The Tram Maintainer shall include in the Estimate evidence demonstrating that:

16.6.1 the Tram Maintainer has used all reasonable endeavours to minimise (including by the use of competitive quotes where appropriate) any increase in costs and to maximise any reduction of costs;

16.6.2 the Tram Maintainer has, where required by the Client and practicable, sought competitive quotes from persons other than the Tram Maintainer Parties in pursuance of its obligation under Clause 16.6.1;

16.6.3 the Tram Maintainer has investigated how to mitigate the impact of the Client Change; and

16.6.4 the proposed Client Change will, where relevant, be implemented in the most cost-effective manner, including showing, where reasonably practicable, that when any expenditure is incurred, relevant Changes in Law that are foreseeable at the time of consideration of the specific Client Change and which relate to that Client Change, have been taken into account by the Tram Maintainer.

16.7 If the Tram Maintainer does not intend to use its own resources to implement any proposed Client Change, it shall:

16.7.1 demonstrate that it is appropriate to subcontract the implementation of such Client Change; and

16.7.2 comply with Good Industry Practice with the objective of ensuring that it obtains best value for money when procuring any supplier or deliverable required in relation to the proposed Client Change.

16.8 As soon as reasonably practicable after the Client receives the Estimate, the Parties shall discuss and agree the issues set out in the Estimate. From such discussions the Client may modify the Client Notice of Change, and the Client may require the Tram Maintainer to seek and evaluate competitive tenders (to the extent not already sought). In each case the Tram Maintainer shall, as soon as practicable, and in any event not more than 15 Business Days after receipt of such modification, notify the Client of any consequential changes to the Estimate.

16.9 If the Parties cannot agree on the contents of the Estimate, then either Party may refer the Estimate for determination in accordance with the Dispute Resolution Procedure (unless the Client Notice of Change has already been withdrawn) provided that the Tram Maintainer shall not be obliged to implement any proposed Client Change where:

16.9.1 the Client does not have the legal power or capacity to require the implementation of such proposed Client Change; or

16.9.2 implementation of such proposed Client Change would:

16.9.2.1 be contrary to Law;

16.9.2.2 not be technically feasible;

16.9.2.3 substantially and materially increase the probability of a substantial non-compliance with this Agreement by the Tram Maintainer;

16.9.2.4 be outwith the specific competence of the Tram Maintainer either in performing the activity required by the Client Change or in supervising a Tram Maintainer Party to carry out the activity required by the Client Change; and/or

16.9.2.5 make the provision of the Services by the Tram Maintainer financially unfeasible.

16.10 As soon as reasonably practicable after the contents of the Estimate have been agreed, the Client shall:

16.10.1 issue a Client Change Order; or

16.10.2 withdraw the Client Notice of Change in which case the Client shall pay to the Tram Supplier the reasonable costs incurred by the Tram Supplier in complying with this Clause 16 in relation to that Client Notice of Change.

For the avoidance of doubt, the Tram Maintainer shall not commence work until instructed through receipt of a Client Change Order.

16.11 Not used.

16.12 If the Client does not issue a Client Change Order within 28 Business Days of the contents of the Estimate having been agreed or determined pursuant to Clause 16.9, then the Client Notice of Change shall be deemed to have been withdrawn.

16.13 Where an Estimate has been referred to the Dispute Resolution Procedure for determination, but it is deemed by the Client (acting reasonably) that the proposed Client Change is urgent and/or has a potential significant impact on the Tram Maintenance Programme, subject to the Tram Maintainer's right to refuse to carry out a Client Change under Clause 16.9, the Client may instruct the Tram Maintainer to carry out the proposed Client Change prior to the determination or agreement of the estimate by issuing a Client Change Order to that effect.

16.14 Where the Client issues a Client Change Order under Clause 16.13, the Tram Maintainer shall implement the Client Change, and prior to determination of the Estimate shall be entitled to claim the Tram Maintainer's demonstrable costs in implementing the Client Change calculated in accordance with Clause 16.5.

Restrictions on Entitlements to Relief for a Client Change

16.15 The Tram Maintainer shall not be entitled to any extension of time, payment or relief in respect of any Client Change if and to the extent that the Tram Maintainer is in breach of this Agreement.

16.16 If, having received instructions from the Client or the Client's Representative, the Tram Maintainer considers that compliance with those instructions would amount to a Client Change, then the Tram Maintainer shall comply with the instruction and shall within 10 Business Days of any instructions being received, notify the Client of the same, such notification to include an Estimate pursuant to Clauses 16.4 and 16.6. From the date of receipt by the Client of such an Estimate, Clauses 16.4 and 16.6 shall be deemed to apply *mutatis mutandis* to the work carried out by the Tram Maintainer in complying with such instruction. If it is agreed by the Parties or determined pursuant to the Dispute Resolution Procedure that a Client Change would arise if the instructions were complied with (either Party being entitled

to refer the matter to the Dispute Resolution Procedure if the matter has not been agreed within 10 Business Days of the Estimate being received by the Client), then the provisions of this Clause 16 (*Changes*) shall apply to such instructions.

16.17 Any failure by the Tram Maintainer to notify the Client within 10 Business Days of instructions being received that it considers that compliance with such instructions from the Client or the Client's Representative would amount to a Client Change shall constitute an acceptance by the Tram Maintainer that any compliance with the Client's or the Client's Representative's instructions shall be without cost to the Client and without any entitlement to any extension of time or other relief.

16.18 NOT USED

Change Control Register

16.19 The Tram Maintainer shall maintain a change control register which shall detail the status and give summary information on all withdrawn, potential and confirmed variations under this Agreement.

17. TRAM MAINTAINER CHANGES

17.1 Within 10 Business Days of the Tram Maintainer becoming aware of the need or desirability for a variation to the Services (such variations not to include any variation arising from the Review Procedure, including a review of the Minimum Spare Parts Pool in accordance with Clause 9.20, pursuant to which any change shall be made in accordance with the requirements of the Review Procedure), the Tram Maintainer shall notify the Client of the reasons for such variation and make proposals for the proposed variation in writing. The Client shall be free to accept or reject any proposed variation as the Client thinks fit and the Client shall determine whether such proposal is dealt with in accordance with Clause 17.2 or Clause 17.3.

17.2 If the Client wishes to proceed with a variation proposed by the Tram Maintainer, the Client shall serve a Client Notice of Change on the Tram Maintainer and Clauses 16.2 to 16.18 shall be adhered to by the Client and the Tram Maintainer provided that:

17.2.1 the Client may require that there be a reduction to the Price if such change will result in lower costs for the Tram Maintainer; or

17.2.2 in the event that the proposed Tram Maintainer change is of benefit only to the Tram Maintainer any anticipated increase to the costs of the Tram Maintainer resulting from

any change requested by the Tram Maintainer pursuant to Clause 17.1, shall not result in a variation to the Price.

17.3 If the Tram Maintainer considers that a change could effect a saving of £20,000 (as Indexed) or more, the Tram Maintainer shall propose such change in accordance with Clause 16.1 and the Tram Maintainer's proposal shall be accompanied by a value engineering report which shall include:

17.3.1 a whole life cost analysis in respect of each element of (i) the Services affected by the proposed change and/or (ii) any additional works or Services proposed to be carried out in order to effect the proposed change;

17.3.2 option appraisals and reasoned arguments to demonstrate why any particular systems, equipment, materials and the like should be selected in preference to others for incorporation into the Services, taking into account the operational life of the Tram; or

17.3.3 the Tram Maintainer's proposals for the lump sum reduction to the Price in respect of such proposal.

17.4 The Client may accept such proposal at its entire discretion and its decision in this respect shall be final and binding. If the proposed change is accepted, the reduction to the Price that is anticipated as arising as a result of such change shall be shared between the Client and the Tram Maintainer on a 50:50 basis and the Tram Maintainer's share shall be added to the Price after the saving has been made.

18. ADDITIONAL TRAMS

18.1 The Tram Maintainer acknowledges that the Client may, pursuant to the Tram Supply Agreement, by providing the Tram Supplier with a written notice, order additional Trams ("**Additional Trams**") from the Tram Supplier. If so instructed by the Client, the Tram Maintainer shall ensure, subject to Clause 18.4 that the provisions of this Agreement shall apply to such Additional Trams.

18.2 If the Client orders the Additional Trams from the Tram Supplier the provisions set out in Schedule 3 of Part 3 shall apply in relation to the Price payable by the Client for the maintenance of such Additional Trams.

18.3 If the Client orders Additional Trams, the Tram Maintenance Programme shall be adjusted so that the Tram Maintenance Programme shall be that which is applicable to the total number of

Trams delivered to the Client pursuant to the Tram Supply Agreement. Such adjustment shall be in accordance with the provisions of Schedule 3 part 3.

18.4 Any changes to this Agreement arising out of the Client ordering any Additional Trams other than in relation to Price (which shall be determined in accordance with Clause 18.2), shall be agreed between the Client and the Tram Maintainer (both acting reasonably and in good faith) in accordance with the procedures set out in Clause 16 (*Changes*).

19. MEETINGS

19.1 The Tram Maintainer and the Client shall procure that the Tram Maintainer's Representative and the Client's Representative (respectively) attend monthly progress meetings at the Client's premises in Edinburgh (unless agreed otherwise in writing), with **tie**, any **tie** Party and/or any person authorised by the Tram Maintainer's Representative or Client's Representative in writing to review progress of the Services.

19.2 Notwithstanding the provisions of Clause 19.1, the Client's Representative or the Tram Maintainer's Representative may call a meeting at any time to review progress of the Services or any other matter provided that the Representative calling such meeting gives all other Representatives at least 5 Business Days' written notice of such meeting.

19.3 If reasonably requested by the Client, the Tram Maintainer shall attend and shall procure that the Tram Maintainer's Representative, any Key Personnel and/or Tram Maintainer Parties attend any meetings called by **tie**, **tie's** Representative, any **tie** Party, the Client, the Client's Representative or any other party.

19.4 Any relevant Party (including representatives of such Parties) may with the Client's Representative's prior written consent (such consent not to be unreasonably withheld or delayed) participate in a meeting called under this Agreement through the medium of one or more conference telephones or similar form of communication equipment, provided that all persons participating in the meeting are able to hear and speak to each other throughout such meeting.

20. KEY PERSONNEL

20.1 The Tram Maintainer shall ensure that the Key Personnel are appointed on or prior to the Effective Date. The Tram Maintainer shall obtain the prior written consent of the Client's Representative (such consent not to be unreasonably withheld or delayed) before removing or replacing any Key Personnel at any time after the Effective Date.

20.2 The Tram Maintainer acknowledges that the Key Personnel are essential to the proper performance of the Tram Maintainer's obligations under this Agreement. The Tram Maintainer shall ensure that the role of any Key Personnel is not vacant for any period longer than 10 consecutive Business Days and shall replace any Key Personnel who leaves its employment with employees with similar levels of training expertise and experience.

20.3 If reasonably requested by the Client, the Tram Maintainer shall make available to the Client, personnel of appropriate competence, expertise and qualifications (employed either by the Tram Maintainer or any relevant subcontractor) for the purposes of dealing with matters referred to in this Agreement. In particular (but without limitation) such personnel shall:

20.3.1 attend meetings called in accordance with Clause 19.1; and

20.3.2 provide (as reasonably requested by the Client) reports, information, advice and/or assistance in relation to matters referred to in this Agreement including prior to and/or following any such meetings as referred to above.

20.4 The Client's Representative shall, acting reasonably, have the right to require the Tram Maintainer to remove or cause to be removed from the site where the Services are undertaken any person employed thereon who mis-conducts himself in the performance of his duties or fails to conform with any particular provisions with regard to safety which may be set out in this Agreement or persists in any conduct which is prejudicial to safety or health, and such persons shall not be again employed upon the site where the Services are undertaken without the permission of Client's Representative.

20.5 Any costs incurred by the Tram Maintainer in removing, or causing to be removed, a person in accordance with this Clause 20 (*Key Personnel*) shall be borne by the Tram Maintainer.

20.6 Neither Party shall, during the period of this Agreement, contract or retain as an adviser or consultant, any person currently or previously employed or engaged in the previous 3 months by the other Party unless the prior written approval of the other Party has been obtained.

20.7 The Tram Maintainer shall (and shall procure that the Key Personnel, its staff employed in the performance of the Services and the Tram Maintainer Parties) comply with all regulatory requirements appropriate to and required for the performance of the Services, **tie's** Drug and Alcohol Policy and any rules, regulations and instructions from the Client's Representative.

21. RECORDS AND COMPUTER SYSTEMS

21.1 All the Technical Records for any Part installed, replaced, overhauled or inspected by the Tram Maintainer must be:

21.1.1 written up, maintained and kept up to date at all times by the Tram Maintainer in hard copy form (for the avoidance of doubt, after handover of such hard copy records to the Client upon Termination or Expiry of this Agreement the requirement shall be for soft copy form only to be retained by the Tram Maintainer) in accordance with the requirements of the Tram Maintenance Specification;

21.1.2 retained by the Tram Maintainer for the longer of:

21.1.2.1 the duration of this Agreement; and

21.1.2.2 six (6) years from the date on which the Services to which such Technical Records relate are provided; and

21.1.3 provided to the Client in a suitable electronic format within 10 Business Days of a request by the Client for any of such Technical Records,

and the Client will be entitled from time to time to inspect and audit such Technical Records following reasonable notice to the Tram Maintainer.

21.2 Further, for each Tram the following details shall be retained by the Tram Maintainer for not less than 6 years after completion of the Services and such details provided to the Client in accordance with the provisions of this Clause 21.1:

21.2.1 details of all Client Changes; and

21.2.2 all other quality control activity records as agreed with the Client from time to time.

21.3 The Technical Records will be written up and maintained by the Tram Maintainer in respect of all Services in accordance with this Agreement and Good Industry Practice. Such Technical Records will, subject to Clause 21.4, be stored in hardcopy and electronic form.

21.4 Upon any request by the Client for any Technical Record, or upon handover of the Technical Records pursuant to Clause 44.10, the Tram Maintainer shall provide such Technical Records in any suitable non-proprietary format as may be reasonably specified by the Client.

21.5 The Tram Maintainer shall:

21.5.1 use all reasonable endeavours to ensure that the computer systems, equipment and other systems of the Tram Maintainer used by the Tram Maintainer in carrying out the Services, including any computer systems, equipment, other systems and parts supplied by the Tram Maintainer, are at all times free from disabling or destructive programs or devices, including bugs, viruses, logic bombs and/or Trojan horses; and

21.5.2 use all reasonable endeavours to ensure that appropriate security systems are implemented and maintained to protect the integrity and security of such computer systems, equipment and other systems from security and IT risks, including unauthorised access (both by persons external to the Tram Maintainer and the Tram Maintainer's employees, agents and sub-contractors). The Tram Maintainer in cases of software bugs or software viruses, will have a responsibility limited to the substitution of the system, not including the cost of information lost, as long as all reasonable endeavours are used to avoid these situations.

21.6 In the event of a breach of Clause 21.5, the Tram Maintainer shall conduct a full and complete review of the concerned or potentially concerned computer systems, equipment or other systems (including the security arrangements relating to such systems) to identify the source of such disabling or destructive program or device and, at its own costs and with the prior written approval of the Client (such approval not to be unreasonably withheld or delayed), take such action as may reasonably be necessary to immediately remedy as soon as reasonable feasible the breach and additionally use its best endeavours that such breach does not re-occur.

22. SURVEYS OF EDINBURGH TRAM NETWORK AND AUDITS OF MAINTENANCE PROCEDURES

22.1 **tie** or the Client may carry out or procure surveys and audits of the Edinburgh Tram Network in accordance with part 1 of Schedule 12 (*Return Condition*).

23. DELIVERY, TITLE TO PARTS AND OTHER PROPERTY

23.1 The Parties hereby acknowledge that the intention and purpose of installing any of the Parts, of whatever nature, on the Trams is to enable the Trams to be used more conveniently, safely and with greater efficiency.

23.2 Title to all Parts (including Spare Parts and Special Tools) supplied or provided by the Tram Maintainer pursuant to this Agreement, which are not already owned by CEC (pursuant to Clause 9.20 or otherwise), installed on the Trams in the course of or as a result of the Services

shall vest in CEC free and clear of all Security Interests and other third party rights of any nature. The Tram Maintainer will at its own expense take all such steps and execute, and procure the execution of, all such instruments as tie and/or the Client may reasonably require to ensure that title so passes to CEC according to applicable Law.

23.3 Any Part at any time removed from a Tram will remain the property of CEC and the Tram Maintainer undertakes (and shall procure that its sub-contractors so undertake) so far as is practicable to clearly identify such Parts as belonging to CEC and to keep all such Parts stored separately from any third party's property. The Tram Maintainer, with the permission of the Client and CEC, shall be responsible for the disposal and/or recycling of waste materials, Parts and Spare Parts as is necessary during the period of the Services.

23.4 The Tram Maintainer shall not have or acquire title to any Tram, Parts, Special Tools, Spare Parts or Technical Records by reason of the performance of its obligations hereunder. The Tram Maintainer hereby waives and agrees not to exercise any lien the Tram Maintainer may have or acquire over any Tram, Parts, Special Tools, Spare Parts or Technical Records and the Tram Maintainer acknowledges that all Assets have been funded by CEC. The Tram Maintainer will have the right to access the Technical Records, and to store copies of such for the performance of Services under this Agreement, or for the purpose of interpretation of this Agreement.

23.5 The Tram Maintainer shall at its own expense label or otherwise clearly identify at all times as being the property of CEC any Parts and/or raw materials and/or Spare Parts for the Trams in the Tram Maintainer's or its agent's or sub-contractor's possession or control in relation to which advance payment has been made and/or title has vested in CEC pursuant to this Agreement and the Tram Maintainer shall ensure that such items shall at all times in the Tram Maintainer's (its agent's or sub-contractor's) possession or control be kept separate from the Tram Maintainer's or any third party's goods. The location of all Parts shall be tracked by the asset management system at all times.

23.6 On termination of this Agreement for any reason the Tram Maintainer shall promptly deliver to CEC, or as CEC may otherwise direct in writing, any Assets, Spare Parts, Special Tools, Tram Maintainer's Materials, CEC supplied goods or other materials the property in which is vested in CEC by virtue of this Agreement (including pursuant to Clauses 23.2 or 23.5) and if it shall fail to do so, CEC may enter any premises of the Tram Maintainer or of any sub-contractor, remove such Spare Parts, Special Tools, Tram Maintainer's Materials, CEC Supplied Goods and other materials and recover the cost of doing so from the Tram Maintainer.

23.7 The Tram Maintainer shall ensure that:

23.7.1 the Tram Maintainer's systems are or will be Euro Compliant before any introduction of the single European currency in the United Kingdom and that the Tram Maintainer's systems will not be affected by the introduction of the single European currency in the United Kingdom;

23.7.2 the Tram Maintainer's own internal systems and procedures are or will be Euro Compliant before the introduction of the single European currency in the United Kingdom and the Services will not be affected by the introduction of the single European currency in the United Kingdom; and

23.7.3 the Tram Maintainer's systems shall at all times throughout the Term be compliant with all Law applicable in relation to the Euro in the United Kingdom, including the rules on conversion, triangulation and rounding set out in EU Regulation Number 1103/97 and any subsequent or similar regulations or Law.

23.8 For the purposes of Clause 23.7 "**Euro Compliant**" means that (i) the introduction of the Euro within the United Kingdom or any part thereof shall not affect the performance or functionality of any relevant items nor cause such items to malfunction, end abruptly, provide invalid results or adversely affect business; (ii) all currency reliant and currency related functions (including all calculations concerning financial data) of any relevant items to enable the introduction and operation of the Euro; and (iii) in particular (but without limitation) each and every relevant item shall, to the extent it performs or relies upon currency related functions (including all calculations concerning financial data):

23.8.1 be able to perform all such functions in both the national currency of the United Kingdom and in Euros;

23.8.2 during any transition phase applicable to the United Kingdom, be able to deal with the dual denominations of the Euro and national currency of the United Kingdom;

23.8.3 recognise, accept, display and print all the Euro currency symbols and alphanumeric codes which may be adopted by any government and other European Union body in relation to the Euro;

23.8.4 incorporate protocols for dealing with rounding and currency conversion;

23.8.5 recognise data expressed in, and express any output data in, the national currency of the United Kingdom and the Euro; and

23.8.6 permit the input of data in Euros and display an outcome in Euros where such data, supporting the Client's normal business practices, operates in Euros and/or the national currency in the UK.

23.9 The Tram Maintainer shall incorporate provisions equivalent to those provided in Clauses 23.4 to this 23.9 (mutatis mutandis) in every sub-contract.

23.10 Save where provided for in the Maintenance Plan, no Tram or Tram Related Equipment shall be removed from the Depot without the written consent of the Client, which consent shall not unreasonably withheld.

24. ACCELERATION

24.1 If for any reason which does not entitle the Tram Maintainer to an extension of time, the rate of progress of the Services is at any time, in the opinion of the Client's Representative, whose opinion shall be neither unreasonable nor expressed vexatiously and with this Agreement of the Tram Maintainer (agreement not to be unreasonably withheld or delayed), too slow to ensure substantial completion in accordance with the Tram Maintenance Programme, or any previously agreed revised time for completion of the Services agreed under Clause 24.2, the Client's Representative shall notify the Tram Maintainer in writing and the Tram Maintainer shall thereupon take such steps as are necessary and to which the Client's Representative may consent to expedite the progress so as substantially to complete the Services in accordance with the Tram Maintenance Programme, such consent not to be unreasonably delayed or withheld. The Tram Maintainer shall not be entitled to any additional payment for taking such steps. For the avoidance of doubt, any dispute arising out of this sub-clause is capable of referral through the Dispute Resolution Procedure.

24.2 Where the Client desires either:

24.2.1 a date for completion of certain of the Tram Maintainer's obligations under this Agreement earlier than the date set out in the Tram Maintenance Programme current at the date of issue of the preliminary instruction under Clause 24.3; or

24.2.2 to have certain of the Services completed by the relevant date set out in the Tram Maintenance Programme where, following delays or stoppage to programme for whatever reason, the Services would not be so completed in the absence of any acceleration or resequencing arrangements,

the Client's Representative may issue a preliminary instruction under Clause 24.3.

24.3 If the Client's Representative issues a preliminary instruction to the Tram Maintainer to accelerate the carrying out or alter the sequence and timing of any work to be executed under the provisions of this Agreement, the Client's Representative shall in such instruction set out the exact nature of the requirements of the Client with regard to the Tram Maintenance Programme as referred to in Clause 24.3 for which the preliminary instruction has been issued.

24.4 If the Tram Maintainer makes a reasonable objection to such an instruction, the preliminary instruction shall either be withdrawn or so varied as to meet such objection and may then be reissued by the Client's Representative.

24.5 As soon as reasonably practicable after receipt of the preliminary instruction (or after receipt of a preliminary instruction re-issued under Clause 24.4), the Tram Maintainer shall inform the Client's Representative in writing in respect of the proposed instruction:

24.5.1 of the amount of any additional cost to which the Tram Maintainer should be entitled as a result of compliance with the instruction when issued by the Client's Representative subject to Clause 24.3;

24.5.2 that it is not reasonably practicable to state such a sum and that the cost to the Client of compliance by the Tram Maintainer will therefore have to be ascertained in accordance with Clause 16 (*Changes*); or

24.5.3 of the earlier date for completion of the relevant aspect of the Services and the consequential amendment to the Tram Maintenance Programme.

24.6 If on receipt of the information given to the Client's Representative under Clause 24.5 the Client wishes to pay the amount referred to in Clause 24.5.1 and to accept the new planned service completion date stated by the Tram Maintainer pursuant to Clause 24.5.3, the Client shall cause the Client's Representative to issue an instruction:

24.6.1 confirming the details of the acceleration or alteration of sequence or timing required; and

24.6.2 fixing the new date for completion of the relevant aspect of the Services and the amount to which Clause 24.5.1 refers shall be included as if it were a variation.

24.7 Following any instruction under Clause 24.6 the Tram Maintainer shall revise the Tram Maintenance Programme as appropriate.

25. CONFIDENTIAL INFORMATION

25.1 Each Party:

25.1.1 shall treat all Confidential Information belonging to the other Party as confidential and safeguard it accordingly; and

25.1.2 shall not disclose any Confidential Information belonging to the other Party to any other person without the prior written consent of the other Party, or except to such persons and to such extent as may be necessary for the performance of this Agreement or except where disclosure is otherwise expressly permitted by the other provisions of this Agreement.

25.2 Each Party shall take all necessary precautions to ensure that all Confidential Information obtained from the other Party, or **tie,** under or in connection with this Agreement:

25.2.1 is given only to such of the staff, professional advisors and/or the Client Parties, Tram Maintainer Parties or **tie** in connection with this Agreement as is strictly necessary for the performance by the Tram Maintainer of the Services and its other obligations under this Agreement; and

25.2.2 is treated as confidential and not disclosed (without prior approval from the owner of the Confidential Information) or used by such staff or professional advisors and/or the Client Parties, Tram Maintainer Parties or **tie** otherwise than for the purposes of this Agreement.

25.3 Where it is considered necessary in the opinion of the owner of the Confidential Information, the other Party shall ensure that its staff or professional advisors and/or the Tram Maintainer Parties sign a confidentiality undertaking before commencing work in connection with this Agreement.

25.4 Neither Party shall use any Confidential Information it receives from the other Party or **tie** otherwise than for the purposes of this Agreement.

25.5 The provisions of Clauses 25.1 to 25.4 shall not apply to:

25.5.1 any information which is or becomes public knowledge (otherwise than by breach of this Clause 25 (*Confidential Information*));

25.5.2 any information which was in the possession of the receiving Party, without restriction as to its disclosure, before receiving it from the disclosing Party;

25.5.3 any information which is received from a third party who lawfully acquired it and who is under no obligation restricting its use or disclosure;

25.5.4 any information which is independently developed without access to the Confidential Information;

25.5.5 any disclosure pursuant to a statutory, legal, parliamentary or judicial obligation placed upon the Party making the disclosure, including any requirements for disclosure under FOISA, the Code or the Environmental Information Regulations pursuant to Clauses 25.8 to 25.12 (inclusive);

25.5.6 any disclosure by the Client of this Agreement including the Price and commercial terms, any information relating to the design of any aspect of the Edinburgh Tram Network and such other information as may be reasonably required for the purpose of conducting a due diligence exercise with any candidates for other agreements relating to the System and their advisers;

25.5.7 any disclosure by the Client of this Agreement and any related information to **tie**, any Client Party, the Operator or any **tie** Party;

25.5.8 any information which is required to be disclosed to that Party's insurers, financial advisor and/or legal advisers subject to Clauses 25.2 and 25.3;

25.5.9 any registration of information in respect of the Consents and any property registration which may be required as necessary;

25.5.10 any disclosure of information by the Client and/or **tie** to Transport Edinburgh Limited, CEC, Partnerships UK Limited, the Scottish Ministers, Transport Scotland any department, office or agency of the Scottish Executive or the UK government;

25.5.11 any disclosure for the purpose of:

25.5.11.1 the examination and certification of the Client's, **tie**'s or the Tram Maintainer's accounts; or

25.5.11.2 any examination (pursuant to any applicable Law) of the economy, efficiency and effectiveness with which **tie** has used its resources or funding made available to it including any examination pursuant to the Local Government (Scotland) Act 1973 as amended by the Local Government in Scotland Act 2003 of whether **tie** has secured best value in the performance of

its functions; or

25.5.12 any disclosure of Confidential Information obtained from the Tram Maintainer:

25.5.12.1 to any government department or any other local government authority or public authority equivalent in status to **tie.** All government departments or any other local government authority or public authority equivalent in status to **tie** receiving such Confidential Information shall be entitled to further disclose the Confidential Information to other government departments or any other local government authority or public authority equivalent in status to **tie** on the basis that the information is confidential and is not to be disclosed to a third party which is not part of any government department or any other local government authority or public authority equivalent in status to **tie**; or

25.5.12.2 to any person engaged in providing any services to the Client for any purpose relating to or ancillary to this Agreement,

provided that in disclosing information under this Clause 25 (*Confidential Information*) the Client shall be required to disclose only the information which is necessary for the purpose concerned and requires that the information is treated in confidence and that a confidentiality undertaking will be given by the recipient of such information where appropriate.

25.6 Nothing in this Clause 25 (*Confidential Information*) shall prevent any Party from using any techniques, ideas or know-how gained during the performance of this Agreement in the course of its normal business, to the extent that this does not result in a disclosure of Confidential Information or an infringement of Intellectual Property Rights.

25.7 In the event that the Tram Maintainer fails to comply with this Clause 25 (*Confidential Information*), the Client reserves the right to terminate this Agreement by notice in writing in accordance with Clause 32 (*Tram Maintainer Default Termination*).

25.8 The Tram Maintainer acknowledges that **tie** is subject to the requirements of FOISA and the Environmental Information Regulations and shall assist and cooperate with **tie** (at the Tram Maintainer's expense) to enable **tie** to comply with these Information disclosure requirements. **tie** agrees and the Tram Maintainer acknowledges that it shall comply with the terms of the Code in respect of the discharge of its obligations under FOISA.

25.9 The Tram Maintainer shall and shall procure that the Tram Maintainer Parties shall:

25.9.1 transfer any Request for Information to **tie** as soon as practicable after receipt and in any event within five Business Days of receiving a Request for Information;

25.9.2 provide **tie** with a copy of all Information in its possession or power in the form that **tie** requires within five Business Days (or such other period as **tie** may specify) of **tie** requesting that Information; and

25.9.3 provide all necessary assistance as reasonably requested by **tie** to enable **tie** to respond to a Request for Information within the time for compliance set out in section 10 of FOISA or regulation 5 of the Environmental Information Regulations.

25.10 **tie** shall be responsible for determining at its absolute discretion whether the Confidential Information and/or any other Information:

25.10.1 is exempt from disclosure in accordance with the provisions of the Code, FOISA or the Environmental Information Regulations; and

25.10.2 is to be disclosed in response to a Request for Information.

25.11 In no event shall the Tram Maintainer respond directly to a Request for Information unless expressly authorised to do so by **tie**.

25.12 The Tram Maintainer acknowledges that **tie** may be obliged, pursuant to the Code, FOISA or the Environmental Information Regulations to disclose Information:

25.12.1 without consulting with the Tram Maintainer, or

25.12.2 following consultation with the Tram Maintainer and having taken its views into account.

25.13 The Tram Maintainer shall ensure that all information and Deliverables produced in the course of this Agreement or relating to this Agreement are retained for disclosure and shall permit the Client and **tie** to inspect such records as requested from time to time.

25.14 The Tram Maintainer acknowledges that any lists or schedules provided by it outlining Commercially Sensitive Information are of indicative value only and that **tie** and/or the Client may nevertheless be obliged to disclose Commercially Sensitive Information or Confidential Information in accordance with Clause 25.8.

25.15 Any public relations material, press releases, public presentations or conference engagements in relation to this Agreement planned by the Tram Maintainer shall require the Client's and **tie**'s prior written approval.

26. RIGHT OF VERIFICATION AND AUDIT

26.1 The Client's Representative and **tie's** Representative shall nominate a combined audit team, having given reasonable notice, in order to verify that the Services are being carried out in compliance with this Agreement, shall be entitled during the carrying out of the Services, either itself or using such agents or representatives as it may authorise (not being employees or competitors of the Tram Maintainer and having regard to the commercial sensitivities of the Tram Maintainer), to inspect, examine, test or audit work, processes, Technical Records (whether or not in electronic format) and other documentation which the Tram Maintainer is obliged to provide to the Client pursuant to this Agreement, and Parts and Special Tools (which belong to CEC but which may be in the Tram Maintainer's possession or control) or make such other investigation, enquiry or survey in relation thereto at the Depot or any other premises occupied by the Tram Maintainer in connection with the Edinburgh Tram Network, insofar as it is within the control of the Tram Maintainer (the Tram Maintainer having used its reasonable endeavours to obtain such rights of access and audit appropriate to enable the Client to take full advantage of the provisions of this Clause in its dealings with its material suppliers and sub-contractors), the Tram Maintainer's material suppliers or sub-contractors or at any other place where the Services are being carried out. No such inspection shall unreasonably disrupt the commercial operations of the Tram Maintainer or its material suppliers or sub-contractors (as the case may be). Written reports of such visits may be produced and forwarded to the Tram Maintainer. Such reports shall be discussed with the Client, **tie** and the Operator and any actions found as a consequence of such discussions to be required in order for the Tram Maintainer to fulfil its obligations under this Agreement shall be carried out by the Tram Maintainer promptly at its own expense. Any corrective action that is identified as a result of any verification or audit shall be dealt with in accordance with this Clause 26 (*Right of Verification and Audit*).

26.2 The Tram Maintainer shall, and shall procure that its sub-contractors shall, maintain an accurate set of records of personnel and all activities relating to the performance of the Services and all transactions related thereto and a complete up to date and orderly documentary record of all transactions entered into for the purposes of this Agreement including copies of all sub-contracts, manufacturers' specifications and details, purchase orders, documents, data and all such other information as may reasonably be required by the Client, **tie** or the Operator or as may be specified in this Agreement and such information,

records and documents shall be available at all reasonable times for inspection by the Client and the Tram Maintainer shall make available such items of clarification or substantiation as may be required by the Client in relation to the said records, documents and information, provided that the Tram Maintainer shall be entitled to delete from the documents to be disclosed to the Client any commercially sensitive information in relation to the Tram Maintainer's arrangements with its sub-contractors. Without prejudice to the aforesaid provisions of this Clause 26.2, the Tram Maintainer shall provide to the Client a copy in electronic format of any and all of the said records, documents and information free of charge within 10 Business Days of the Client's, **tie's** or the Operator's request for the same. The Tram Maintainer shall ensure that any subcontract includes a clause requiring the sub-contractor to facilitate compliance with the provisions of this Clause 26.2.

26.3 The Tram Maintainer shall supply such financial information relating to the Tram Maintainer and its Affiliates as may from time to time be reasonably requested by the Client within 10 Business Days of such request.

26.4 If the Client is required by a Relevant Authority or there are reasonable grounds upon which the Client believes that either:

(a) the Tram Maintainer is not fulfilling the obligations or is in breach of this Agreement; or

(b) there are grounds to suspect that the Tram Maintainer is not financially sound,

then the Client shall co-ordinate the application of its inspection rights together with **tie** and shall have the right to inspect the Tram Maintainer Accounts and/or conduct a detailed analysis of such Tram Maintainer Accounts provided that the Client shall:

26.4.1 ensure (insofar as reasonably practicable) that the provision of the Services by the Tram Maintainer are not unreasonably disrupted or delayed; and

26.4.2 give at least four (4) Business Days' notice of any inspection it intends to carry out.

26.5 The Tram Maintainer shall promptly provide the Client and the Client Parties with all reasonable co-operation and assistance in relation to any inspection including to:

26.5.1 providing all information reasonably required by the Client and/or the Client Parties for the purposes of its inspection;

26.5.2 granting or procuring the grant of reasonable access to any sites at which the Tram Maintainer information requested is stored and access to any equipment on which such Tram Maintainer information requested is stored;

26.5.3 providing a reasonable number of copies of any documents or records reasonably requested by the Client and/or the Client Parties; and

26.5.4 complying with the Client's reasonable requests for access to personnel engaged in the Tram Maintainer's performance of this Agreement.

26.6 The Tram Maintainer acknowledges and agrees that **tie**, CEC and certain Relevant Authorities from time to time require, whether by virtue of Law, regulation or otherwise, to provide reports, returns and carry out audits and accordingly the Tram Maintainer agrees to provide assistance to the extent required by **tie**, CEC and such Relevant Authorities from time to time. Each of the Parties shall bear their own costs of such information provision and audits.

26.7 The Tram Maintainer shall, and shall procure that its sub-contractors shall, retain such documents and other records relating to this Agreement (except to the extent that the Client confirms that they may be disposed of), for a period of not less than six years after completion of the provision of the relevant Services. The Client shall have the right to audit any and all such documents and records for that period, notwithstanding the termination of expiry of this Agreement, and the provisions of this Clause 26 (*Right of Verification and Audit*) shall survive the termination or expiry of this Agreement.

26.8 If an audit undertaken pursuant to this Clause 26 (*Right of Verification and Audit*) reveals that a Tram Maintainer Default has occurred or that the Tram Maintainer has persistently breached any of the provisions of this Agreement that affects the performance, safety or the reliability of the Trams, the Tram Maintainer shall reimburse to the Client and/or **tie** and/or the Operator the cost of such audit and shall bear all reasonable expenses arising therefrom but in any other case the Client and/or **tie** shall meet its own costs in respect of such audit.

27. HAZARDOUS MATERIALS

27.1 The Tram Maintainer undertakes that it is and will remain during the term of this Agreement, or that any relevant sub-contractor is and will remain during the term of this Agreement, appropriately qualified and experienced in and accredited for the purposes of carrying out work of the scope, type and complexity that is required in carrying out the Services involving the handling of any Hazardous Materials incorporated in any Tram or Part and shall maintain an up to date register recording the location, volume, type, storage condition and handling and disposal procedures for such Hazardous Materials.

27.2 The Tram Maintainer shall not use any Hazardous Materials in performing the Services except where expressly permitted to do so by the Tram Maintenance Specification, applicable Law and Good Industry Practice, or otherwise with the express prior written consent of the Client. If Hazardous Materials are used other than expressly in accordance with the Tram Maintenance Specification, applicable Law and Good Industry Practice, or with the prior written consent of the Client, the Tram Maintainer shall ensure that all such Hazardous Materials used in the provision of the Services are expressly identified in writing to the Client and the Operator by reference to this Clause 27 with reference to the hazards attached to them and the procedures that the Tram Maintainer has for managing such hazards.

27.3 The Tram Maintainer shall ensure that all Services performed under this Agreement with Hazardous Materials, including the removal, handling and disposal of those materials, are carried out in such a manner as to ensure compliance with all applicable Law (including any advisory literature provided by the Health and Safety Commission or Executive). The Tram Maintainer shall inform the Client's Representative if any Hazardous Materials which do not form part of the Services are encountered in the course of the Services and shall submit its proposed method of operation and the precautions to be taken before commencing any work involving such Hazardous Materials. Such submission shall be considered a proposal for Additional Services and shall be dealt with pursuant to the Change Procedure. If the Tram Maintainer proposes to use such Hazardous Materials, it shall comply with applicable Law (including any advisory literature provided by the Health and Safety Commission or Executive) and any additional precautions specified by the Client's Representative as to their use, handling, storage and disposal.

27.4 The Tram Maintainer shall indemnify the Client against any Losses resulting from the Tram Maintainer's failure to comply with the provisions of this Clause 27 (*Hazardous Materials*).

27.5 The Tram Maintainer acknowledges that it is aware that various health hazards may be encountered in performing the Services (which may not be immediately apparent as deliberate

and malicious concealment of such hazards may take place). The Tram Maintainer shall take all reasonably practicable precautions for the protection of its employees and any other person who may be affected by the Services.

28. NOTICE OF ACCIDENTS

28.1 In the event of any notifiable accident or dangerous occurrence during the carrying out of the Services included in this Agreement, the Tram Maintainer shall be responsible for reporting such notifiable accident or dangerous occurrence to the Health and Safety Executive under the Reporting of Injuries and Diseases and Dangerous Occurrences Regulations 1985.

29. INSURANCE

29.1 The Tram Maintainer shall, at its own cost, procure that each of the Required Insurances is taken out and comes into effect on the relevant date specified in each "Period of Insurance" set out in part 1 of Schedule 4 (*Required Insurances*) and shall maintain the Required Insurances in full force and effect until the relevant date specified in each "Period of Insurance" set out in part 1 of Schedule 4 (*Required Insurances*), provided that each such Required Insurance is available in the EU insurance market at commercially reasonable rates and on commercially reasonable terms to contractors of the same status as at the Effective Date and of the same discipline as the Tram Maintainer.

29.2 The Tram Maintainer shall procure that all Required Insurances shall:

29.2.1 be maintained in accordance with part 1 of Schedule 4 (*Required Insurances*); and

29.2.2 be placed at all times with insurers authorised to carry out insurance business in the United Kingdom and confirmed in writing as acceptable by the Client (such written acceptance not to be unreasonably withheld or delayed).

29.3 The Tram Maintainer shall not make any material alteration to the terms of the Required Insurances (including material changes to the level of deductibles) without the Client's prior approval (which approval shall not be unreasonably withheld). If any such material alteration to the Required Insurances is made, the Tram Maintainer shall complete the questionnaire set out in part 3 of Schedule 4 (*Required Insurances*), duly endorsed by its insurance broker. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, the Tram Maintainer shall promptly give notice of this to the Client.

29.4 The Tram Maintainer shall ensure that each of its insurance brokers gives the Client as soon as reasonably practicable after any policy of Required Insurance is taken out, replaced or

renewed, a letter of undertaking in the form set out in part 2 of Schedule 4 (*Required Insurances*).

29.5 The Tram Maintainer shall provide satisfactory evidence to the Client that the Required Insurances have been effected. Thereafter, the Tram Maintainer shall upon request produce to the Client receipts for the payment of current insurance premiums or equivalent documentary evidence to confirm that such Required Insurances are being properly maintained, and on the anniversary of the Effective Date and on each subsequent anniversary thereof until the date of expiry or earlier termination, the Tram Maintainer shall complete an insurance questionnaire set out in part 3 of Schedule 4 (*Required Insurances*) in relation to the Required Insurances to be taken out by the Tram Maintainer and submit such completed questionnaire to the Client as soon as reasonably practicable. If the Tram Maintainer defaults in insuring or continuing to maintain the Required Insurances, the Client may insure against any risk in respect of which such default has occurred and recover any premiums from the Tram Maintainer as a debt immediately due and payable.

29.6 The Tram Maintainer shall:

29.6.1 procure that the Required Insurances which are to be maintained by the Tram Maintainer in accordance with part 1 of Schedule 4 (*Required Insurances*) contain a waiver of subrogation against **tie**, any **tie** Party, the Client, any Client Parties, and the Insured Parties as set out in part 1 of Schedule 4 (*Required Insurances*) save in respect of fraud or deliberate non-disclosure; and

29.6.2 where the Tram Maintainer is obliged to effect any Required Insurances, not bring any claim or action against **tie** or the Client in respect of any Losses suffered by it in circumstances where and to the extent that the Tram Maintainer could recover such Losses under such insurance (whether or not such insurance has in fact been effected or, if effected, has been vitiated as a result of any act or omission of the Tram Maintainer (or any Tram Maintainer Party), including non-disclosure or under-insurance), provided that, to avoid doubt, this Clause 29.6.2 shall not by itself prevent the Tram Maintainer from claiming against the Client (or any Client Party) in respect of a breach of this Agreement by the Client (or any Client Party) for any loss or damage arising from such breach not covered because of the level of deductibles under such insurance permitted by this Agreement or to the extent such loss or damage exceeds the greater of the insurance placed or the minimum limit of indemnity required in respect of such insurance under part 1 of Schedule 4 (*Required Insurances*).

29.7 The Tram Maintainer shall not take any action or fail to take any action or (insofar as it is reasonably within its power) permit or allow others to take or fail to take any action (in either case including failure to disclose any fact) as a result of which any of the Required Insurances may be rendered void, voidable, unenforceable, suspended or impaired in whole or in part or which may otherwise render any sum paid out under any relevant policy repayable in whole or in part.

29.8 The supply to the Client of any insurance policy or insurance certificate or renewal certificate or other evidence of compliance with this Clause 29 (*Insurance)* shall not imply, or be taken as, acceptance by the Client that:

29.8.1 the extent of insurance cover is sufficient and its terms are satisfactory; or

29.8.2 in respect of any interests or parties not insured or any risks not insured against, an acceptance by the Client that the same were uninsurable.

29.9 Neither failure to comply nor full compliance with the provisions of this Clause 29 (*Insurance*) shall relieve the Tram Maintainer of its liabilities and obligations under this Agreement.

29.10 The Tram Maintainer shall apply any proceeds of any policies of insurance maintained in accordance with part 1 of Schedule 4 (*Required Insurances*) in satisfaction of the claim, demand, proceeding or liability in respect of which such proceeds are payable (unless already paid direct to the third party or employee by the insurer).

29.11 The Tram Maintainer undertakes with the Client in relation to the Required Insurances:

29.11.1 to comply with all requirements of the insurers; and

29.11.2 to give notice to the Client immediately upon the happening of any event which will adversely affect any policy of insurance effected in accordance with this Clause 29 (*Insurance*), including the downgrading of the credit rating below A- by Standard & Poors of any party providing any of the Required Insurances.

29.12 The Tram Maintainer shall immediately inform the Client in writing if any of the Required Insurances cease to be maintained and/or cease to be available in the EU insurance market at commercially reasonable rates provided that if the Tram Maintainer is maintaining such insurance at such rates, the Client shall undertake in writing to reimburse the Tram Maintainer in respect of half of the net cost of such insurance to the Tram Maintainer above commercially reasonable rates. If the Client undertakes in writing to reimburse the Tram Maintainer in

respect of half of the net cost of such insurance to the Tram Maintainer above commercially reasonable rates or, if the Client effects such insurance at or above commercially reasonable rates, the Tram Maintainer shall reimburse the Client in respect of what the net cost of such insurance to the Tram Maintainer would have been at commercially reasonable rates and terms, and the cost of maintaining any such insurance at rates above commercially reasonable rates by the Tram Maintainer or by the Client shall be borne in equal proportions by the Tram Maintainer and the Client.

29.13 The Tram Maintainer shall fully co-operate with any measures reasonably required by the Client, including completing any proposals for insurance and associated documents or maintaining such insurance at rates above commercially reasonable rates if the Client undertakes in writing to reimburse the Tram Maintainer in respect of the net cost of such insurance to the Tram Maintainer above commercially reasonable rates or, if the Client effects such insurance at or above commercially reasonable rates, reimbursing the Client in respect of what the net cost of such insurance to the Client would have been at commercially reasonable rates and terms.

29.14 The Tram Maintainer acknowledges that **tie** has taken out insurances (the "**OCIP Insurances**") and agrees that it is on notice of the terms and coverage of the OCIP Insurances and agrees to comply with the requirements of the insurers with whom the OCIP Insurances are placed. The Tram Maintainer agrees that it will intimate to the Client any act, occurrence or failure which may:

29.14.1 lead to any claim being made under the OCIP Insurances; or

29.14.2 render any of the OCIP Insurances void, voidable, unenforceable, suspended or impaired in whole or in part or which may otherwise render any sum paid out under any relevant policy repayable in whole or in part.

29.15 The Tram Maintainer shall not take any action or fail to take any reasonable action or (insofar as it is reasonably within its power) permit or allow others to take or fail to take any action (including in either case failure to disclose any fact) as a result of which any of the OCIP Insurances may be rendered void, voidable, unenforceable, suspended or impaired in whole or in part or which may otherwise render any sum paid out under any relevant policy repayable in whole or in part.

29.16 The Client may ask the Tram Maintainer to take out and maintain any insurance from time to time in the names of the parties reasonably requested by the Client (the "**Additional Insurance**"). If Additional Insurance is required, the terms of this Clause 29 (*Insurance*)

including the provisions which are stated to apply to the "Required Insurances" shall apply with any appropriate adjustment to be agreed between the Parties as a Client Change. The Tram Maintainer shall promptly inform the Client in writing if any of the Additional Insurances cease to be available in the EU insurance market at commercially reasonable terms for tram or rail vehicle maintainers. In this event the Parties shall meet to discuss the means by which any risks previously covered by the Additional Insurances should be managed, mitigated or controlled. Any agreement shall be a Client Change. Any increased or additional premium required by insurers by reason of the Tram Maintainer's own claims record or other acts, omissions, matters or things particular to the Tram Maintainer shall be deemed to be within commercially reasonable rates and terms. The Tram Maintainer shall procure that any Additional Insurance shall:

29.16.1 (if the Client so requires) contain a provision that the Client or any other party reasonably requested by the Client is named as a co-insured party;

29.16.2 provide that any Additional Insurance shall continue in effect and unaltered for the benefit of the insured parties for at least ninety days after written notice by registered mail of any cancellation (including non-renewal), change, modification or lapse for any reason;

29.16.3 contain a provision that requires the insurer to send copies of all notices of cancellation or alteration or suspension or any other notices given under or in relation to the policy to the Client promptly upon receiving any notices of cancellation or alteration or suspension or any other notices;

29.16.4 contain a provision that a notice of a claim given to the insurer by one of the insured parties under the policy shall, in the absence of manifest error, be accepted by the insurer as valid notification of a claim in respect of the interests of all insured parties;

29.16.5 contain a provision to the effect (on the basis of non-vitiation/severability) that all the provisions of any Additional Insurance shall operate as if there were a separate policy in effect (save in respect of the sums insured, limits of liability and excesses/deductibles which shall be at the levels stated) for each named insured and that non-compliance with any policy term, condition or warranty and/or misrepresentation or non disclosure of material information by the Tram Maintainer or any other co-insured will not affect the rights and/or interests of the Client or any other co-insured party under any policies effected as Additional Insurance; and

29.16.6 be primary, and shall not be brought into contribution with any other policy or policies effected by or on behalf of any of the insured parties.

29.17 The Tram Maintainer shall supply the Client with copies of every policy document, insurance certificate and renewal certificate relating to any Additional Insurance (or such other evidence of insurances as may be reasonably required by the Client) and documentary evidence to the effect that the Required Insurances (other than any Additional Insurance) have been taken out and are being maintained as soon as it is available but in any event no later than 10 Business Days (in respect of certificates) and sixty days (in respect of policies) after the inception of the relevant policies, together with evidence of payment of the premiums and any periodic renewal certificates.

29.18 The Tram Maintainer shall inform the Client in writing as soon as reasonably practicable after it receives a claim or becomes aware of the occurrence of any event that may give rise to a claim under any Required Insurance (if related to the Edinburgh Tram Network) or Additional Insurance and will ensure that the Client is kept fully informed of subsequent action and developments concerning the claim; such written information shall not be required in relation to any claim of less than £50,000 (as Indexed). The Tram Maintainer shall take such steps as are necessary or appropriate to ensure that each Tram Maintainer Party, in respect of any event or claim of a like nature arising out of or relating to the operation or responsibility of that Tram Maintainer Party or any event or claim of which they become aware, takes in relation to the Tram Maintainer, like action to that which the Tram Maintainer is required to take under this Clause 29.18 in relation to the Client, and shall inform the Client promptly of information thus received from any Tram Maintainer Party.

29.19 At each anniversary of the Effective Date, the Tram Maintainer shall provide the Client with a summary of all claims made under the Required Insurances, where such claims arise out of this Agreement. Such summary shall include date, circumstances, status and amounts paid and/or outstanding on each claim.

29.20 Without prejudice to any other provision of this Agreement, the Tram Maintainer undertakes to the extent it has the right to do so under the relevant policy that it will not (and that each of the Tram Maintainer Parties to the extent each respectively has the right to do so under the relevant policy will not) settle any OCIP Insurance or Additional Insurance claim above £50,000 (Indexed) without the prior written agreement of the Client (such agreement not to be unreasonably withheld or delayed).

30. SERVICE PERFORMANCE AND QUALITY MONITORING

30.1 The Tram Maintainer shall provide reasonable assistance to enable the Client to create and submit the Service Quality Report to **tie** within 3 Business Days following each Reporting Period End Date.

30.2 The Tram Maintainer shall prepare and submit to the Client an Annual Service Report pursuant to Clause 49 (*Best Value*).

30.3 The Tram Maintainer shall monitor its compliance with this Agreement in respect of the Services, and the Parties shall comply with the following provisions:

30.3.1 no later than 3 months before the Tram Maintenance Commencement Date and on each anniversary thereafter, the Tram Maintainer shall provide to the Client's Representative its proposed Self-Monitoring Plan for the ensuing 12 months; and

30.3.2 the Self-Monitoring Plan shall be designed to underpin the Client's best value obligations and the Tram Maintainer shall have full regard to the requirements of Clause 49 (*Best Value*) when preparing its Self-Monitoring Plan; and

30.3.3 no later than the date falling 20 Business Days after receipt by the Client's Representative of such proposed Self-Monitoring Plan, the Client shall notify the Tram Maintainer in writing as to whether or not it considers the Self-Monitoring Plan to be acceptable for the purposes of this Agreement; and

30.3.4 where the Client considers the relevant Self-Monitoring Plan to be acceptable, then the Self-Monitoring Plan shall be implemented by the Tram Maintainer for the relevant 12 months; or

30.3.5 where the Client does not consider the relevant Self-Monitoring Plan to be acceptable, then the Parties shall use all reasonable endeavours to reach agreement as to the contents of the Self-Monitoring Plan; and

30.3.6 until such time as the Self-Monitoring Plan has been accepted by the Client, the previous year's Self-Monitoring Plan shall remain in effect; or

30.3.7 in default of such agreement, either Party may refer the matter for determination under the Dispute Resolution Procedure, and the Tram Maintainer shall implement the Self-Monitoring Plan as so agreed or determined.

30.4 The Tram Maintainer shall as soon as reasonably practicable provide the Client's Representative with relevant particulars of any aspects of its performance which fail to meet the requirements of this Agreement. The Tram Maintainer shall co-operate with the Client and provide such access as the Client may reasonably require to enable the Client at all reasonable times to observe, inspect and satisfy themselves (including by carrying out sample checks) as to the adequacy of the monitoring procedures implemented by the Tram Maintainer and the Tram Maintainer's compliance with this Agreement.

30.5 Without prejudice to the Client's other rights under this Agreement, if at any time the Tram Maintainer has:

30.5.1 failed to comply with any of its obligations pursuant to Clause 30.3; or

30.5.2 committed any material breach of its obligations under this Agreement,

then the Client may give an Underperformance Warning Notice to the Tram Maintainer setting out in detail the matter or matters giving rise to such notice and containing a reminder to the Tram Maintainer of the implications of such notice.

30.6 Without prejudice to the Client's other rights under this Agreement, if the Tram Maintainer receives three or more Underperformance Warning Notices in any twelve (12) month period, the Client may by notice to the Tram Maintainer increase the level of either the Client's monitoring of the Tram Maintainer (including the employment by the Client of additional performance monitoring officers) or (at the Client's option) of the Tram Maintainer's monitoring of the Tram Maintainer's performance of its obligations under this Agreement, until such time as the Tram Maintainer shall have demonstrated to the reasonable satisfaction of the Client that it will perform (and is capable of performing) its obligations under this Agreement, in which case the following provisions shall apply:

30.6.1 any such notice to the Tram Maintainer shall specify the additional measures to be taken by the Client or by the Tram Maintainer (as the case may be) in monitoring the performance of the Tram Maintainer;

30.6.2 if the Tram Maintainer (acting reasonably) objects to any of the specified measures on the grounds that they are excessive, it shall notify the Client in writing, within 5 Business Days of the receipt of the notice, of the measures objected to (and of any changes necessary in order to prevent prejudice to the Tram Maintainer's performance of its obligations under this Agreement);

30.6.3 the measures to be taken by the Client and the Tram Maintainer (as the case may be) shall be agreed between the Parties or, in the absence of agreement within 10 Business Days of the Client's receipt of the Tram Maintainer's objection, be determined, at the referral of either Party, pursuant to the Dispute Resolution Procedure and on a basis which the relevant adjudicator considers reasonable having regard to the nature and seriousness of the breaches of this Agreement or circumstances leading to the issue of such Underperformance Warning Notices which have occurred, the likelihood of such breaches or circumstances recurring, the risks which would arise if such breaches or circumstances recurred, the level of culpability of the Tram Maintainer in relation to such breaches and circumstances and the actions being taken by the Tram Maintainer to prevent breaches of this Agreement or circumstances entitling the Client to issue further Underperformance Warning Notices recurring; and

30.6.4 the Tram Maintainer shall bear its own costs and indemnify and keep indemnified the Client on demand at all times from and against all reasonable costs and expenses incurred by or on behalf of the Client in relation to such increased level of monitoring (including an appropriate sum in respect of general staff costs and overheads but limited to direct expenses).

31. SUSPENSION OF WORK

31.1 The Tram Maintainer shall on the written order of the Client's Representative, having received the written permission of **tie**, suspend the progress of the Services or any part thereof for such time or times and in such manner as the Client's Representative may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Client's Representative. Except to the extent that such suspension is:

31.1.1 otherwise provided for in this Agreement;

31.1.2 necessary by reason of some default on the part of the Tram Maintainer; or

31.1.3 necessary for the proper completion or for the safety of the Services or any part thereof in as much as such necessity does not arise from any act or default of the Client's Representative or the Client,

then if compliance with the Client's Representative's instructions under this Clause 31 (*Suspension of Work*) involves the Tram Maintainer in delay or extra cost, the Client's Representative shall take such delay into account in determining the Services Payment due to the Tram Maintainer on the basis that such delay would constitute an Excusing Cause.

31.2 If the progress of the Services or any part thereof is suspended on the written order of the Client's Representative and if permission to resume work is not given by the Client's Representative within a period of six months from the date of suspension then the Tram Maintainer may unless such suspension is otherwise provided for in this Agreement or continues to be necessary by reason of some default on the part of the Tram Maintainer serve a written notice on the Client's Representative requiring permission within 20 Business Days from the receipt of such notice to proceed with the Services or that part thereof in regard to which progress is suspended. If within the said 20 Business Days the Client's Representative does not grant such permission, the Tram Maintainer by a further written notice so served may (but is not bound to) elect to treat the suspension where it affects part only of the Services as an omission of such part under Clause 16 (*Changes*) or where it affects the whole Services as an abandonment of this Agreement by the Client.

31.3 Within 45 Business Days of service of notice by the Tram Maintainer in accordance with Clause 31.2 to treat any suspension as an abandonment of this Agreement, this Agreement shall be terminated in whole and the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

32. TRAM MAINTAINER DEFAULT TERMINATION

32.1 Without prejudice to any of the Client's other rights or remedies the Client may having given 7 days' notice (with the written consent of **tie**) in writing to the Tram Maintainer terminate this Agreement on any of the following grounds set out in Clauses 32.1.1 to 32.1.12 (each a "**Tram Maintainer Default**"):

32.1.1 breach of any material provision or requirement of this Agreement where the Client has by written notice requested rectification of such breach and the Tram Maintainer has failed to rectify such breach within 10 Business Days;

32.1.2 failure by the Tram Maintainer to commence any safety critical work comprised in the Services or to proceed expeditiously with the same;

32.1.3 the Tram Maintainer knowingly taking any course of action that causes the Operator's Case for Safety to be breached or materially impaired;

32.1.4 the occurrence of any Insolvency Event in relation to the Tram Maintainer, the Tram Maintainer's parent company or any Affiliate of the Tram Maintainer;

32.1.5 any Change in Control of the Tram Maintainer or any other change in legal status of the Tram Maintainer which is materially prejudicial to carrying out the Services;

32.1.6 any breach of Clause 25 (*Confidential Information*);

32.1.7 the issue of 3 or more Underperformance Warning Notices in any 12 month period;

32.1.8 NOT USED;

32.1.9 the Tram Maintainer conducts itself in a manner which **tie** reasonably considers to be incompatible with the performance of the Services and/or in a manner so as to wilfully detract from the image and reputation of **tie**, CEC, Transport Edinburgh Limited, the Scottish Executive, the Scottish Ministers or any project related to the performance of the Services;

32.1.10 any abandonment of the Services by the Tram Maintainer which has been previously notified by writing by the Client to the Tram Maintainer;

32.1.11 a Tram Punctuality Performance of:

32.1.11.1 90% or less in any Reporting Period; or

32.1.11.2 95% or less in any 3 Reporting Periods out of any 13 consecutive Reporting Periods; and/or

32.1.12 the total liability of the Tram Maintainer under this Agreement would be in excess of the aggregate of four times the value of the Maximum Performance Payment, save for the application of Clause 42.5.

32.2 If the Client terminates this Agreement pursuant to this Clause 32 (*Tram Maintainer Default Termination*), the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

32.3 The Tram Maintainer shall immediately notify the Client of:

32.3.1 any resolution or decision by the Tram Maintainer or the board of directors of the Tram Maintainer or a decision by any director of the Tram Maintainer to seek legal or financial advice pertaining to the solvency of the Tram Maintainer; and/or

32.3.2 any presentation of any petition for the purpose of winding up the Tram Maintainer or any petition for an administration order.

32.4 In the event that the Client has grounds to serve notice pursuant to Clause 32.1, the Client may elect to require the Tram Maintainer to provide a rectification plan within 5 Business Days of the Client serving written notice requiring the Tram Maintainer to provide such plan. The Tram Maintainer shall set out in the rectification plan:

32.4.1 the actions required to be taken by the Tram Maintainer in order to achieve the sustainable rectification (measured against an agreed revised programme and production criteria over a set period) of the Tram Maintainer's poor performance; and

32.4.2 any specific alternative terms or modifications to the terms of this Agreement,

such that the Tram Maintainer shall not be in breach of this Agreement if it performs to this level.

32.5 The Tram Maintainer shall propose the rectification plan at its costs and shall participate in good faith in discussions or negotiations held by the Client regarding the implementation of the rectification plan.

33. PERSISTENT BREACH

33.1 If a breach by the Tram Maintainer of any of its obligations under this Agreement has occurred more than once then the Client may serve a notice ("**Persistent Breach Notice**") on the Tram Maintainer:

33.1.1 specifying that it is a Persistent Breach Notice;

33.1.2 giving reasonable details of the breach; and

33.1.3 stating that such breach is a breach which, if it recurs frequently or continues, may result in a termination of this Agreement.

33.2 If, following service of such a Persistent Breach Notice, the breach specified has continued or occurred once again after the date falling 30 days after the date of service of such Persistent Breach Notice and before the date falling 365 days after the date of service of the Persistent Breach Notice, then the client may serve another notice ("**Final Persistent Breach Notice**") on the Tram Maintainer:

33.2.1 specifying that it is a Final Persistent Breach Notice;

33.2.2 stating that the breach specified has been the subject of a prior Persistent Breach Notice within the period of 365 days prior to the date of service of the Final Persistent Breach Notice; and

33.2.3 stating that if such failure is not remedied within 7 days or is remedied and occurs once or more within the 180 day period after the date of service of the Final Persistent Breach Notice, this Agreement may be terminated with immediate effect (but only if the said Final Persistent Breach Notice given under this Clause 33.2 has been countersigned by **tie**.

33.3 If the Client terminates this Agreement pursuant to this Clause 33 (*Persistent Breach*) the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

34. CLIENT DEFAULT TERMINATION

34.1 The Tram Maintainer may issue a Termination Notice to the Client to terminate this Agreement if:

34.1.1 the Client fails to pay an undisputed sum or sums due to the Tram Maintainer under this Agreement which, either singly or in aggregate, exceeds 3 times the Maximum Performance Payment due and payable and such failure continues for sixty (60) days from receipt by the Client's Representative of a notice of non-payment from the Tram Maintainer; or

34.1.2 the Client is in material breach of this Agreement which substantially frustrates or renders it impossible for the Tram Maintainer to perform its obligations under this Agreement and if such breach is capable of remedy is not remedied by the Client within 30 days of written notice from the Tram Maintainer to the Client's Representative specifying the relevant material breach,

each a ("**Client Default**") and this Agreement shall terminate on the day falling 60 days after the day on which the Client receives the Termination Notice from the Tram Maintainer unless the Client rectifies the Client Default within the said 60 day period.

34.2 The Tram Maintainer shall not exercise, or purport to exercise, any right to terminate this Agreement (or accept any repudiation of this Agreement) except as expressly set out in this Agreement.

34.3 If the Tram Maintainer terminates this Agreement pursuant to this Clause 34 (*Client Default Termination*), the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

34.4 If a Termination Notice is issued by the Tram Maintainer in accordance with Clause 34.1 the Client and the Tram Maintainer acknowledge that **tie** may elect to exercise its rights to step into this Agreement under the terms of the Tram Maintenance Collateral Warranty.

35. PERFORMANCE REVIEW AND NO FAULT TERMINATION

35.1 The Client may terminate this Agreement, having received written authority from **tie** (save where Clause 35.10 applies), at any time after five years following the issue of the Certificate of Service Commencement, by notice in writing, and for whatever reason. This Agreement shall terminate on the date falling six months after the date of service of such written notice.

35.2 In addition to the Client's right to terminate pursuant to Clause 35.1, the Client may, having received written authority from **tie** (save where Clause 35.10 applies), between three and five years after the issue of the Certificate of Service Commencement, terminate this Agreement, by notice in writing, and for whatever reason upon giving written notice to the Client that this

Agreement shall terminate on the date falling six months after the date of service of such written notice.

35.3 Upon termination of the Tram Maintainer's employment pursuant to Clause 35.2, then the provisions of Clause 38.8 shall apply.

35.4 If the Client terminates this Agreement pursuant to this Clause 35 (*Performance Review and No Fault Termination*) then the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

35.5 Following the end of each Performance Review Period, the Client shall review and assess the performance of the Tram Maintainer.

35.6 Pursuant to Clause 35.5, the Client will review the following:

35.6.1 the Tram Maintainer's historic performance under Schedule 3 (*Payment*);

35.6.2 whether the Tram Maintainer has complied with all of its obligations under this Agreement (and, if the Tram Maintainer is in breach of such obligations, whether the Client reasonably considers such breach(es) to have been both minor and infrequent); and

35.6.3 the Tram Maintainer's business plan for the next Performance Review Period to assess whether it is sufficiently robust to satisfy the Client, acting reasonably, that the Tram Maintainer will remain solvent for the next Performance Review Period.

35.7 If any of the criteria set out at Clause 35.6 are not satisfied then the Client may specify particular requirements in respect of those areas where the criteria set out at Clause 35.6 have not been satisfied, to be met by the Tram Maintainer by a specified interim date prior to the next Performance Review Date. If the Client specifies such interim date then the provisions of this Clause 35 will apply at the interim date, mutatis mutandis, as if that date was the original Performance Review Date (and as if the criteria set out at Clause 35.6 were the requirements specified by the Client pursuant to this Clause 35.7).

35.8 Following a Performance Review Date, the Client and the Tram Maintainer shall discuss whether it is appropriate to re-set any criteria within this Agreement from a date twelve months following the Performance Review Date, if and to the extent that the Parties and **tie** consider it reasonable to do so in accordance with but not limited to the following provisions:

35.8.1 in determining what adjustment (if any) it requires to be made, the Parties shall have regard to:

35.8.1.1 the performance of tram maintainers on other tram networks in the UK; and

35.8.1.2 the fact that the Client would not expect to adjust the level of any such criteria unless it was reasonably satisfied that the revised standard would be consistent with sustainable levels of performance by the Tram Maintainer; and

35.8.2 the Client and the Tram Maintainer shall discuss such proposed variation in good faith, with any agreed change made pursuant to Clause 16 (*Changes*), and if the Parties cannot agree such variation, the criteria will remain the same for the following Performance Review Period.

35.9 Within 60 Business Days prior to the date of expiry of the Infraco Contract or in the event that notice has been served to terminate the Infraco Contract, the Client shall offer to **tie** to assign or otherwise transfer this Agreement to any party identified in Clause 35.11.1 and Clause 35.11.2.

35.10 If the offer to assign or otherwise transfer this Agreement pursuant to Clause 35.9 has been refused in writing by **tie** or **tie** has not responded within 30 Business Days of receipt of such offer the Client shall be entitled to terminate this Agreement in accordance with Clause 35.

35.11 If the offer to assign or otherwise transfer this Agreement pursuant to Clause 35.9 has been accepted in writing by **tie** then the Client shall assign, or otherwise transfer the whole or part of this Agreement to:

35.11.1 **tie**, the Operator, the Scottish Ministers, TEL, CEC, Transport Scotland or their successors with no worse financial standing than that of **tie**; or

35.11.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed by a person falling within Clause 35.11.1.

35.12 In the case of such an assignation the Tram Maintainer shall enter into a collateral warranty in favour of the Client in substantially the form set out in Schedule 1 (*Conditions Precedent*).

36. TERMINATION ON FORCE MAJEURE

36.1 Neither Party shall be entitled to bring a claim for a breach of obligations under this Agreement by the other Party or incur any liability to the other Party for any Losses or damages incurred by that other Party to the extent that a Force Majeure Event occurs and such

Party is directly prevented from carrying out such obligations by that Force Majeure Event provided that such prohibition on bringing a claim and exclusion of liability shall not operate if and to the extent that:

36.1.1 the Affected Party could, by the exercise of reasonable foresight and diligence, have prevented or reduced the effect of the Force Majeure Event; and

36.1.2 the Affected Party could, whether before or after the occurrence of the Force Majeure Event, have reduced or eliminated the resulting breach of its obligations under this Agreement by taking reasonable steps.

36.2 On the occurrence of a Force Majeure Event, the Affected Party shall notify the other Party as soon as reasonably practicable, specifying details of the Force Majeure Event and providing evidence of its effect on the obligations of the Affected Party and any action proposed to remove or mitigate its effect.

36.3 The Parties shall enter into *bona fide* discussions with a view to alleviating and removing the effects of such Force Majeure Event as soon as reasonably practicable, and:

36.3.1 if the terms or measures to remove the effect of the Force Majeure Event cannot be agreed on or before the date falling 12 months after the date of the commencement of the Force Majeure Event or by the end of such longer period as the Parties may have agreed; or

36.3.2 such Force Majeure Event is continuing or its consequence remains such that the Affected Party is unable to comply with all or a material part of its obligations under this Agreement for a period of more than 12 months after the date of the commencement of the Force Majeure Event or by the end of such longer period as the Parties may have agreed,

either Party shall have the option to terminate this Agreement by written notice to the other.

36.4 If the Tram Maintainer gives notice to the Client under Clause 36.3 that it wishes to terminate this Agreement, then the Client shall have the option either to accept such notice or to respond in writing on or before the date falling 10 Business Days after the date of its receipt stating that it requires this Agreement to continue ("**Force Majeure Extension**"). If the Client gives the Tram Maintainer such notice, then this Agreement will not terminate until expiry of written notice (of at least 30 days) from the Client to the Tram Maintainer that it wishes this Agreement to terminate.

36.5 The Parties shall at all times following the occurrence of a Force Majeure Event use all reasonable endeavours to prevent and mitigate the effects of any delay in the performance of the Services and the Tram Maintainer shall at all times during which a Force Majeure Event is subsisting take all steps in accordance with Good Industry Practice to overcome or minimise the consequences of the Force Majeure Event.

36.6 The Affected Party shall notify the other party as soon as reasonably practicable after the Force Majeure Event ceases or no longer causes the Affected Party to be unable to comply with its obligations under this Agreement. Following such notification, this Agreement shall continue to be performed on the terms existing immediately prior to the occurrence of the Force Majeure Event.

36.7 If this Agreement is terminated pursuant to this Clause 36 (*Termination on Force Majeure*) then the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

37. TERMINATION FOR CORRUPT GIFTS AND FRAUD

37.1 The Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) shall not commit any Prohibited Act.

37.2 If the Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) commits any Prohibited Act, then the Client shall be entitled to act in accordance with Clauses 37.3 to 37.6.

37.3 If a Prohibited Act is committed by the Tram Maintainer or by an employee of the Tram Maintainer not acting independently of the Tram Maintainer, then the Client may terminate this Agreement by giving notice to the Tram Maintainer.

37.4 If a Prohibited Act is committed by an employee of the Tram Maintainer acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement will terminate, unless within 30 days of receipt of such notice the Tram

Maintainer terminates that employee's employment and (if necessary) procures the performance of the relevant obligations by another person.

37.5 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party and their employees) and not acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement shall terminate.

37.6 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party and their employees) and acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement will terminate (but only if the said notice given under this Clause 37.6 is countersigned by **tie**) unless, within 30 days of receipt of such notice, the Tram Maintainer procures the termination of such party's employment and procures the performance of the relevant part of the Services by another person.

37.7 Any notice of termination under this Clause 37 (*Termination for Corrupt Gifts and Fraud*) shall specify:

37.7.1 the nature of the Prohibited Act;

37.7.2 the identity of the person whom the Client believes has committed the Prohibited Act; and

37.7.3 the date on which this Agreement will terminate, in accordance with the applicable provision of this Clause 37 (*Termination for Corrupt Gifts and Fraud*).

37.8 If this Agreement is terminated pursuant to this Clause 37 (*Termination for Corrupt Gifts and Fraud*) the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

38. PAYMENT ON TERMINATION

38.1 Where the Client terminates this Agreement pursuant to Clauses 32 (*Tram Maintainer Default Termination*), Clause 33 (*Persistent Breach*) or Clause 37 (*Termination for Corrupt Gifts and Fraud*) the Tram Maintainer shall, subject to Clause 45 (*Liability and Indemnities*), be liable to the Client and shall indemnify the Client for all Losses suffered by the Client and claims brought against the Client as a result of such termination and the circumstances or events giving rise to the same.

38.2 No compensation shall be payable by the Client to the Tram Maintainer for termination of this Agreement whether under contract, delict (including negligence), breach of (or compliance with) statutory duty, restitution or otherwise but without prejudice to payments due under Clause 38.3.

38.3 Within 35 Business Days of termination of this Agreement and following receipt of a valid VAT invoice, the Client shall pay to the Tram Maintainer:

38.3.1 any undisputed sums due from the Client to the Tram Maintainer pursuant to Clause 42 (*Payment*);

38.3.2 any entitlement to demobilisation costs pursuant to Clause 38.4; and

38.3.3 where this Agreement is terminated pursuant to Clause 31 (*Suspension of Work*), Clause 34 (*Client Default Termination*) or Clause 35 (*Performance Review and No Fault Termination*), any sums due to the Tram Maintainer in respect of any work in progress, provided that the calculation of such sums have been certified as follows:

38.3.3.1 the Tram Maintainer shall have provided the Client with a reasonable valuation of all work in progress in relation to the Services; and

38.3.3.2 the Client shall, subject to any clarifications as are (acting properly and reasonably) necessary in the Client's opinion, certify by notice in writing to the Tram Maintainer that part of the work in progress which is approved by the Client and give reasons why any part of the work in progress has not been certified and the value of the sums involved no later than 10 Business Days after the date on which such valuation was received.

38.4 The Client shall make payment to the Tram Maintainer of any demobilisation costs which have been demonstrably and reasonably incurred by the Tram Maintainer in respect of:

38.4.1 termination for Client Default pursuant to Clause 34 (*Client Default Termination*); or

38.4.2 termination for no fault termination pursuant to Clause 35 (*Performance Review and No Fault Termination*); or

38.4.3 termination pursuant to Clause 31 (*Suspension of Work*).

38.5 The Tram Maintainer shall use all reasonable endeavours to minimise and mitigate any demobilisation costs payable pursuant to Clause 38.4 and the Client shall not be liable to pay the Tram Maintainer for such demobilisation costs to the extent that:

38.5.1 the Tram Maintainer has failed to minimise or mitigate such demobilisation costs; or

38.5.2 such demobilisation costs have arisen out of the Tram Maintainer's breach of this Agreement or any negligent or wilful act or omission by the Tram Maintainer; or

38.5.3 such demobilisation costs relate to any costs incurred by the Tram Maintainer prior to the Tram Maintenance Commencement Date, other than those incurred solely in respect of the Mobilisation Services, unless such costs were incurred with the prior written agreement of the Client.

38.6 If the Tram Maintainer is obliged by this Agreement to pay to the Client any payment in respect of termination of this Agreement under this Clause 38 (*Payment on Termination*), the Tram Maintainer shall pay the amount due thereunder to the Client within 35 Business Days of the Termination Date.

38.7 When the Client and the Tram Maintainer agree, or it is determined, that the Client shall pay to the Tram Maintainer any payment in respect of termination of this Agreement under this Clause 38 (*Payment on Termination*), it shall pay such amount within 35 days of the Termination Date.

38.8 Where the Client has terminated this contract pursuant to Clause 35.2, the Tram Maintainer shall be entitled to recover, in relation to the period of the contract elapsed, all costs incurred (including any committed costs), net of payments already received; and reasonable, demonstrable costs relating to demobilisation and overheads relating to costs already incurred and an allowance for profit of 5.5% where it can be specifically demonstrated that this has not been included in any payment already received. In addition to these sums the Tram Maintainer shall, for the period that would have represented the contract period elapsed between the date of termination and the date falling five years after the issue of the Certificate of Service Commencement be entitled to payment of one period of Maximum Payment Performance.

39. EFFECT OF TERMINATION OR EXPIRY

39.1 On termination or expiry of this Agreement the Client shall be entitled in its sole and absolute discretion but with prior written notification to the Tram Maintainer to:

39.1.1 be assigned all agreements relating to the Services entered into between the Tram Maintainer and its sub-contractors;

39.1.2 be assigned any assignable warranties which have been given to the Tram Maintainer by any sub-contractor or by any manufacturer of any Part and to give notice to any

such other party of any such assignation (in respect of which the Tram Maintainer undertakes to assist in enforcing any rights thus arising);

39.1.3 continue to use all relevant Intellectual Property Rights in accordance with Clause 50 (*Copyright and Intellectual Property*); and

39.1.4 take possession of or otherwise ensure delivery to the Client (or as the Client may direct) of the Trams, Parts, Spare Parts, Special Tools or the Tram Maintainer's Materials at the Depot or otherwise at any premises used or occupied by the Tram Maintainer (or any other premises upon which such Trams, Parts, Spare Parts, Special Tools or the Tram Maintainer's Materials are situated at such time).

39.2 On termination or expiry of this Agreement in whole, the obligations of the Parties shall cease except for:

39.2.1 any obligations arising as a result of any antecedent breach of this Agreement;

39.2.2 Clauses 1 (*Definitions and Interpretation*), 25 (*Confidential Information*), 39 (*Effect of Termination or Expiry*), 43 (*VAT*), 45 (*Liability and Indemnities*), 50 (*Copyright and Intellectual Property*), 52 (*Dispute Resolution*) and 68 (*Third Party Rights*) and any other provision of this Agreement which is expressed to survive termination or which is required to give effect to such termination or the consequences of termination; and

39.2.3 any other obligations which give effect to such termination or to the consequences of such termination or which otherwise apply (expressly or impliedly) on or after such termination or expiry.

39.3 Upon termination of this Agreement in part, only those obligations directly relating to such part of this Agreement that has been terminated shall cease.

40. TRANSITION ON TERMINATION OR EXPIRY

40.1 Twelve months prior to the Expiry Date and again on the Expiry Date or upon termination (in whole or in part thereof), the Tram Maintainer shall provide to the Client the following information ("**Handback Package**"), which shall promptly be updated with any changes to the same, as and when the same occur:

40.1.1 a list of all contracts, permits, licences, Consents or other documents which are material to the provision of the Services or which have a value in excess of £5,000 (as Indexed) showing (as appropriate) the contract account number, name, address and

telephone number of the parties, contract price, value, term and notice period for termination or expiry date;

40.1.2 a list of all computer systems used for the provision of the Services together with a description of the systems and master passwords where applicable;

40.1.3 the Technical Records and other operational and maintenance data, spare parts usage and other technical records;

40.1.4 a list of assets forming part of the Services with a value of more than £2,500 (as Indexed) or which are otherwise key to the operation of the business;

40.1.5 the names and addresses of all insurers providing the Required Insurances along with the applicable policy numbers and other references;

40.1.6 a letter, in a form reasonably satisfactory to the Client, authorising the Client and its agents to request and to receive from the relevant insurers details of all claims paid or outstanding, relating to this Agreement, under the Required Insurances; and

40.1.7 the TUPE Information in accordance with Clause 44 (*TUPE and Handover*).

40.2 The Client shall not disclose the terms of the Handback Package to any third party, other than:

40.2.1 to the extent in the public domain, or as required by Law, or in the course of conducting, prosecuting or defending any Dispute, or following a Termination Notice; or

40.2.2 subject to the provisions of Clause 50 (*Copyright and Intellectual Property)*, for the purpose of seeking offers from third parties for the provision of any of the Services or like services following the termination or expiry of this Agreement; or

40.2.3 to a successor Tram Maintainer or its sub-contractors for the purpose of ensuring or assisting with continuity of the Services following termination or expiry of this Agreement.

40.3 The Tram Maintainer shall, as far is as commercially reasonable, maintain and manage the business of providing the Services with the intent that the Client or any successor Tram Maintainer would be able to take over that business and secure continuity of the Services on a going concern basis at any time following a Termination Notice until the Termination Date becomes effective.

40.4 Accordingly, following the service of a Termination Notice or in the six month period preceding any anticipated termination or expiry of this Agreement, the Tram Maintainer shall (and shall procure that the Tram Maintainer Parties shall):

40.4.1 take all reasonable steps and co-operate fully with the Client and any successor Tram Maintainer so that continuation of the Services after such termination or expiry is achieved with the minimum disruption and so as to prevent or mitigate any inconvenience or risk to health or safety of any Client Parties and members of the public;

40.4.2 liaise with the Client and any successor Tram Maintainer and provide reasonable assistance and advice concerning the Services and their transfer to the Client or to such successor Tram Maintainer;

40.4.3 allow the Client and any successor Tram Maintainer access (at reasonable times and on reasonable notice) to each part of the Edinburgh Tram Network;

40.4.4 provide to the Client and to any successor Tram Maintainer such information concerning the Edinburgh Tram Network and the Services which is reasonably required for the efficient transfer of responsibility for performance of the Services;

40.4.5 at the request of the Client and/or the successor Tram Maintainer, assign any sub-contracts, guarantees and/or warranties;

40.4.6 allow, or procure that the Tram Maintainer Parties shall allow, the Client and any successor Tram Maintainer such access to any employees engaged by the Tram Maintainer or such Tram Maintainer Party in the provision of the Services as the Client or such successor Tram Maintainer shall reasonably require for the purpose of informing and consulting with such employees over the terms and conditions on which their employment will be transferred (to the extent this is the case) to the Client or any successor Tram Maintainer or sub-contractor engaged by the successor Tram Maintainer; and

40.4.7 on request, make the Handback Package available to the Client or any successor Tram Maintainer.

40.5 The Tram Maintainer shall use best endeavours to facilitate the transfer of responsibility for the Services to a successor Tram Maintainer or to the Client, as the case may be, and the Tram Maintainer shall take no action at any time which is calculated or intended to prejudice or frustrate or make more difficult such transfer. In particular, but without limitation to the

generality of the foregoing, the Tram Maintainer shall, during the final twelve months of the Term (where this expires by effluxion of time) or during the period following service of a Termination Notice, and whilst the same remains outstanding:

40.5.1 without prejudice to Clause 9.20, not allow levels of stocks and Spare Parts, Special Tools and other spares to fall to the level which might reasonably be expected to prejudice the continuing efficient operation and maintenance of the Edinburgh Tram Network in accordance with Good Industry Practice; and

40.5.2 observe and perform the provisions of Clause 44 (*TUPE and Handover*).

40.6 As soon as reasonably practicable after service of a Termination Notice or at least 90 days prior to the Expiry Date, the Tram Maintainer shall, by notice in writing to the Client, provide (or procure that the relevant Tram Maintainer Parties provide) to the Client and any nominated successor Tram Maintainer an inventory of all Spare Parts, Special Tools, other spares, consumables and other items used in the Services which do not form part of the Edinburgh Tram Network and permit the Client or any successor Tram Maintainer to inspect and examine the same. The Tram Maintainer shall (or shall procure that the relevant Tram Maintainer Party which owns the same shall) with effect from the Termination Date or Expiry Date or, if later, within 20 Business Days of being so required to do by notice from the Client, transfer to the Client, or as it may nominate in writing to the Tram Maintainer, all such Spare Parts, Special Tools, other spares, consumables and other items as may be specified by a notice in writing from the Client to the Tram Maintainer (other than those consumed or used in the normal course of the Services prior to such transfer) with a prior agreement on the financial amount to be paid to the Train Maintainer for those items.

40.7 Subject to Clause 40.8, following the transfer of any Spare Parts, Special Tools, other spares, consumables or other items pursuant to Clause 40.6, where there has not been prior agreement on the financial amount to be paid to the Tram Maintainer for those items pursuant to Clause 40.6, the Tram Maintainer and the Client shall seek to agree the price for the spares, consumables and other items transferred under Clause 40.6 but in the event of failure to agree such a price the same shall be determined by reference to the Dispute Resolution Procedure.

40.8 The Client may request to purchase any assets owned by the Tram Maintainer which have been used in the performance of the Services or used in relation to the Edinburgh Tram Network. If the Parties agree a fair market value for any such assets, the Client shall pay the agreed sum to the Tram Maintainer and the Tram Maintainer shall deliver such assets to the Client as soon as reasonably practicable.

40.9 The Tram Maintainer shall, to the extent required by this Agreement, handover the Assets to the Client, such handover to be in a timely and orderly fashion so as to preserve the technical and commercial integrity and goodwill and value of the Edinburgh Tram Network and to enable an efficient handover of the Assets, and the Tram Maintainer shall not be entitled to any payment in respect of the handover or any relinquishment of licence to use the Assets or perform the Services.

41. TRAM MAINTAINER TO INFORM ITSELF FULLY

41.1 The Tram Maintainer shall be deemed to have satisfied itself as to the correctness and sufficiency of the Price, as to the possibility of executing the Services and providing the Services, as to any applicable Law and other safety regulations applicable thereto, as to the condition of and all circumstances affecting the Trams in accordance with Clause 41.2, as to the availability of labour and the general labour position affecting the Services and the availability of raw materials and goods, Spare Parts and Special Tools required to complete the Services in accordance with the terms of this Agreement and to have fixed its rates and prices according to its view of these matters and all other matters necessary for the proper and timely provision of the Services in accordance with the Tram Maintenance Specification and this Agreement.

41.2 In relation to the condition of, and all circumstances affecting, the Trams, the Tram Maintainer shall be deemed to have satisfied itself as to the correctness and sufficiency of the Price in respect of the Services.

41.3 Without prejudice to its obligations under Clause 41.1, the Tram Maintainer shall be responsible for, and shall make no claim against **tie** or the Client in respect of, any misunderstanding affecting the basis of the Services or any incorrect or incomplete information however obtained (provided that nothing in this Clause 41 (*Tram Maintainer To Inform Itself Fully*) will limit **tie**'s or the Client's liability in respect of any fraudulent misrepresentation).

42. PAYMENT

42.1 Services Payment

42.1.1 Subject to the provisions of this Agreement, as consideration for the provision of the Services (except for the Mobilisation Services), the Client shall pay to the Tram Maintainer the Services Payment calculated in accordance with part 1 of Schedule 3 (*Payment*).

42.1.2 Subject to the provisions of this Agreement, as consideration for the provision of the Mobilisation Services, the Client shall pay to the Tram Maintainer the Mobilisation Milestone Payments in accordance with this Clause 42 (*Payment*) and part 2 of Schedule 3 (*Payment*).

42.1.3 Any application for payments of sums due under this Agreement and any payment to be made shall be made in accordance with the procedures set out in this Clause 42 (*Payment*).

42.2 **Application for Services Payments**

42.2.1 The Tram Maintainer shall submit each application for payment in respect of Services Payments, any other fees, costs and/or expenses in respect of Permitted Variations or as otherwise agreed in accordance with this Agreement which are being claimed by the Tram Maintainer for the previous Reporting Period, to the Client's Representative within 15 Business Days following each Reporting Period End Date.

42.2.2 Each application for payment shall set out:

42.2.2.1 the Services Payment claimed;

42.2.2.2 the Overall Payment Performance used to calculate the Services Payment, and the following variables used to calculate such figure:

(a) Tram Punctuality Performance;

(b) Tram Maintainer Late Trams in the Reporting Period;

(c) Defective Trams in the Reporting Period;

(d) Tram Maintainer Late Last Trams in the Reporting Period; and

(e) Timetabled Monitored Trams in the Reporting Period;

42.2.2.3 any repairs made pursuant to Clause 9.23, including a breakdown of the costs by reference to the requirements of Clause 9.23.4, with any supporting evidence;

42.2.2.4 any adjustment pursuant to a Permitted Variation; and

42.2.2.5 any other agreed adjustments pursuant to Clause 42.3,

together with reasonable supporting documentation establishing the basis of such sums being claimed.

42.2.3 The Client shall procure that the Client's Representative shall, subject to any clarifications as are in the Client's opinion (acting properly and reasonably) necessary, certify by notice in writing (an "**Interim Certificate**") to the Tram Maintainer that part of the sum claimed in the application for payment which is approved by the Client and give reasons why any part of the sum claimed has not been certified in the Interim Certificate and the value of the sums involved no later than 10 Business Days after the date on which application for payment was received by the Client.

42.2.4 The Tram Maintainer shall submit a VAT invoice in respect of the amount set out in the Interim Certificate to the Client within 10 Business Days of the date of the Interim Certificate. Payment will become due to the Tram Maintainer on the date of receipt of the said VAT invoice by the Client and subject to Clause 42.2.5 the final date for payment by the Client of such valid VAT invoice shall be twenty (20) Business Days from the date of receipt of the VAT invoice by the Client.

42.2.5 If the Tram Maintainer is late in submitting its application for payment to the Client by more than 10 Business Days after the required timescales set out in Clause 42.2.1, payment in respect of any amount certified in an Interim Certificate shall become due to the Tram Maintainer on the date of receipt of the relevant valid VAT invoice by the Client in respect of the late application for payment, and the final date for payment of such valid VAT invoice shall be made by the Client to the Tram Maintainer within twenty (20) Business Days of the first date of the Reporting Period following receipt of the valid VAT invoice.

42.2.6 If the Tram Maintainer is late in submitting a valid VAT invoice to the Client by more than 10 Business Days after the required timescales set out in Clause 42.2.4, payment in respect of any amount certified in an Interim Certificate shall become due to the Tram Maintainer on the date of receipt of the relevant valid VAT invoice by the Client in respect of the late application for payment, and the final date for payment of such valid VAT invoice shall be made by the Client to the Tram Maintainer within twenty (20) Business Days of the first date of the Reporting Period following receipt of the late valid VAT invoice.

42.3 **Application for Mobilisation Milestone Payments**

42.3.1 The Tram Maintainer shall submit each application for payment of a Mobilisation Milestone Payment in accordance with this Agreement which are being claimed by the Tram Maintainer for the previous Reporting Period, to the Client's Representative within 5 Business Days following each Reporting Period End Date.

42.3.2 Each application for payment shall set out the Mobilisation Milestones completed in that Reporting Period and the Mobilisation Milestone Payments due in respect of the same, with all reasonable supporting evidence of satisfaction of such Mobilisation Milestone.

42.3.3 The Client shall procure that the Client's Representative shall, subject to any clarifications as are in the Client's opinion (acting properly and reasonably) necessary, certify by notice in writing (a "**Mobilisation Interim Certificate**") to the Tram Maintainer that part of the sum claimed in the application for payment which is approved by the Client and give reasons why any part of the sum claimed has not been certified in the Mobilisation Interim Certificate and the value of the sums involved no later than 10 Business Days after the date on which application for payment was received by the Client.

42.3.4 The Tram Maintainer shall submit a VAT invoice to the Client in respect of the amount set out in the Mobilisation Interim Certificate within 10 Business Days of the date of the Mobilisation Interim Certificate. Payment will become due to the Tram Maintainer on the date of receipt of the said VAT invoice by the Client and subject to Clause 42.3.5 the final date for payment by the Client of such valid VAT invoice shall be twenty (20) Business Days from the date of receipt of the VAT invoice by the Client.

42.3.5 If the Tram Maintainer is late in submitting its application for payment to the Client by more than 5 Business Days after the required timescales set out in Clause 42.3.1, payment in respect of any amount certified in a Mobilisation Interim Certificate shall become due to the Tram Maintainer on the date of receipt of the relevant valid VAT invoice by the Client in respect of the late application for payment, and the final date for payment of such valid VAT invoice shall be made by the Client to the Tram Maintainer within twenty (20) Business Days of the first date of the calendar month following receipt of the valid VAT invoice.

42.3.6 If the Tram Maintainer is late in submitting a valid VAT invoice to the Client by more than 5 Business Days after the required timescales set out in Clause 42.3.4, payment in respect of any amount certified in a Mobilisation Interim Certificate shall become due to the Tram Maintainer on the date of receipt of the relevant valid VAT invoice by the Client in respect of the late application for payment, and the final date for payment of such valid VAT invoice shall be made by the Client to the Tram Maintainer within 30 days of the first date of the Reporting Period following receipt of the late valid VAT invoice.

42.4 **Payment of fees**

The Client shall be entitled to withhold an amount from any invoices where such amount is in dispute or where it has been agreed between the Parties that it is entitled to do so.

42.5 **Interest on late payments**

In the event of a failure by either Party to make payment in accordance with this Clause 42 (*Payment*), such Party shall pay to the other Party interest on such payment not paid by the final date for payment at a rate per annum equivalent to 2 per cent above the base rate of The Royal Bank of Scotland plc current on the date upon which such payment first becomes overdue adjusted to reflect any changes to the rate during the period over which the payment remains overdue.

42.6 **Set-off**

42.6.1 The Tram Maintainer shall not be entitled to withhold, retain or set-off any amount owed to it by the Client against any amount due to the Client by it.

42.6.2 Subject to Clause 42.6.3, the Client may deduct any amount payable by the Tram Maintainer to the Client whether by way of damages or in respect of any loss or expense sustained by the Client by reason of the Tram Maintainer's breach of this Agreement from any other payment or payments due to be made to the Client by the Tram Maintainer under this Agreement.

42.6.3 Any notice of intention to withhold payment shall be served by the Client at least 5 days prior to the final date for payment calculated in accordance with Clause 42.2.6 or 42.3.6 (as applicable) and such notice shall state the sums being withheld and the detailed reason or detailed reasons for such withholding. Where an effective notice of intention to withhold payment is given, but on the matter being referred to the Dispute

Resolution Procedure, it is decided that the whole or part of the amount should be paid, the decision shall be construed as requiring payment not later than:

42.6.3.1 10 Business Days from the date of the decision; or

42.6.3.2 the date which, apart from the notice, would have been the final date for payment,

whichever is the later.

42.6.4 The Tram Maintainer shall be entitled to payment of interest as provided in Clause 42.5 in respect of the relevant part of any payments which have been withheld in accordance with Clause 42.6.2 but are subsequently determined as being payable by the Client to the Tram Maintainer either by agreement between the Parties or a decision following a referral to the Dispute Resolution Procedure. The interest shall be calculated for the period between the date when the relevant part of the payment should have been paid but for the notice of intention to withhold payment and the date on which payment is made by the Client in accordance with Clause 42.6.3.

42.7 **General**

42.7.1 Save as otherwise expressly stated in this Agreement:

42.7.1.1 all payments under this Agreement to the Tram Maintainer shall be made in pounds sterling by electronic transfer of funds to:

Name and Address of Bank:	CITIBANK C/ Jose Ortega y Gasset, no. 29 28006 Madrid (Spain)
Swift:	CITIESMX
IBAN:	ES19 1474 0000 1200 0693 0115
Account Number:	1474-0000-12-0006930115
Account Name:	Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

42.7.1.2 all payments under this Agreement to the Client shall be made in pounds sterling by electronic transfer of funds to:

Name and Address of Bank:

Sort Code:

Account Number:

Account Name:

42.7.1.3 all payments payable by (or on behalf of) the Client under this Agreement are inclusive of:

(a) all costs and charges regarding technical advice and assistance to be given relating to the provision of the Services;

(b) all training costs and charges; and

(c) all fees and expenses payable by the Tram Maintainer arising out of or in connection with the performance by the Tram Maintainer of this Agreement, including all fees and expenses:

(i) incurred for or in connection with applications for or the grant of any Consent;

(ii) payable to professional advisers and otherwise in connection with the review, negotiation and entering into and enforcement of this Agreement and any related agreement;

(iii) incurred in relation to licence applications and renewals of any kind; and

(iv) incurred in procuring and maintaining relevant insurance.

42.7.2 If the due date for any payment would otherwise be a day that is not a Business Day, payment shall be made on the next Business Day.

42.7.3 No payment made by a Party to another Party under this Agreement shall prevent the paying Party from recovering any amount overpaid or wrongfully paid by the paying Party under this Agreement (however that payment may have arisen), including those paid by mistake of law or of fact.

42.7.4 The Tram Maintainer and the Client acknowledge that:

42.7.4.1 a maximum of only one application for Service Payment may be made under Clause 42.2 in any Reporting Period;

42.7.4.2 the amount to be specified for payment in any Mobilisation Interim Certificate in respect of a Mobilisation Milestone Payment shall not exceed the amount specified in part 2 of Schedule 3 (*Payment*) in relation to the achievement of the Mobilisation Milestone to which such Mobilisation Interim Certificate relates, except where otherwise agreed; and

42.7.4.3 notwithstanding anything to the contrary contained in this Agreement, the Client shall not be obliged to pay any Mobilisation Milestone Payment earlier than the Mobilisation Milestone Date.

42.7.5 The Tram Maintainer shall not suspend the performance of its obligations under this Agreement if any payment is overdue (but without prejudice to the Tram Maintainer's rights to terminate this Agreement under Clause 34 (*Client Default Termination*).

43. VAT

43.1 The Tram Maintainer shall be deemed to have allowed in its tender for the tax payable by it as a taxable person to the Commissioners of Customs and Excise (or similar authorities in any relevant jurisdiction) being tax chargeable on any taxable supplies to the Client which are to be made under this Agreement.

43.2 All certificates issued by the Client or the Client's Representative under Clauses 42.2.6 and 42.3.6 shall be net of Value Added Tax. In addition to the payments due under such certificates the Client shall separately identify and pay to the Tram Maintainer any Value Added Tax properly chargeable by the Tram Maintainer on the supply to the Client of any goods and/or services by the Tram Maintainer under this Agreement.

43.3 If any dispute, difference or question arises between either the Client or the Tram Maintainer and the Commissioners of Customs and Excise (or similar authorities in any relevant jurisdiction) in relation to any tax chargeable or alleged to be chargeable in connection with this Agreement or the Services, each shall render to the other such support and assistance as may be necessary to resolve the dispute, difference or question.

43.4 Where, under this Agreement, any amount is calculated by reference to any sum which has been or may be incurred by any person, the amount shall include any VAT in respect of that

sum only to the extent that such VAT is not recoverable as input tax by that person (or a member of the same VAT group) whether by set-off or repayment.

43.5 Clause 52 (*Dispute Resolution*) shall not apply to any dispute, difference or question arising under this Clause 43 (*Value Added Tax*).

44. TUPE AND HANDOVER

44.1 In this Clause 44 (*TUPE and Handover*) and Schedule 7 (*TUPE Information*) the following definitions shall apply:

"**Tram Maintainer Employees**" means any employee of the Tram Maintainer or Tram Maintainer Parties or any affiliate of the Tram Maintainer or Tram Maintainer Parties engaged in the performance of the Services;

"**New Provider**" means **tie** and/or any third party who takes over (or who the Tram Maintainer is notified will be taking over) the provision of some or all of the obligations of the Tram Maintainer under this Agreement;

"**Relevant Employee**" means any employee of the Tram Maintainer or a Tram Maintainer Party employed wholly or mainly in or assigned to the provision of the Services under this Agreement as at the date of the Service Provision Change;

"**Service Provision Change**" means any termination, variation, amendment or other alteration of this Agreement which results in all or part of the Services under this Agreement being provided by **tie** or by a third party;

"**Termination Period**" means either (i) the 12 month period ending on the Expiry Date or (ii) the period of any notice determining this Agreement prior to the Expiry Date;

"**TUPE Employees**" means any person whose contract of employment may be transferred to a successor tram maintenance contractor by virtue of the operation of Law (including the TUPE Regulations as amended, replaced or substituted from time to time) or in respect of whom liabilities arising from the contract of employment or employment relationship may be transferred;

"**TUPE Information**" means the information in relation to the TUPE Employees specified in Schedule 7 (*TUPE Information*); and

"**the TUPE Regulations**" means the Transfer of Undertakings (Protection of Employment) Regulations 2006.

44.2 NOT USED

44.3 The Tram Maintainer shall not, without the prior consent of the Client (which shall not be unreasonably withheld or delayed), vary or purport or promise to vary, the terms or conditions (as amended from time to time) of employment of any Tram Maintainer Employee (including any promise to make any additional payment or provide any additional benefit) where such variation or addition takes effect in the Termination Period unless it is in the ordinary course of business.

44.4 NOT USED

44.5 Subject to Clause 44.6, the Tram Maintainer shall at the request of the Client in the Termination Period provide the TUPE Information within 21 days of such request and thereafter until termination or expiry of this Agreement update such information in accordance with the reasonable requests of the Client subject to the Tram Maintainer's common law duties to their employees or under the Data Protection Act 1998. The Client shall treat the TUPE Information as Confidential Information to which Clause 25 (*Confidential Information*) shall apply provided that the Client shall only be permitted to use the TUPE Information for the purposes of conducting a tendering exercise for the appointment of a replacement service provider following a Service Provision Change and shall only be entitled to disclose the TUPE Information to any tenderer pursuant to such exercise and subject to such tenderers accepting a confidentiality obligation in relation to such information equivalent to the obligations set out in Clause 25 (*Confidential Information*), mutatis mutandis.

44.6 The Tram Maintainer shall use its reasonable endeavours to ensure that it will be in a position to provide TUPE Information pursuant to Clause 44.5 in respect of the TUPE Employees who are not also Tram Maintainer Employees but, subject to the Tram Maintainer having used such reasonable endeavours, the Tram Maintainer's obligation to provide TUPE Information pursuant to Clause 44.5 in respect of such TUPE Employees shall be limited to the TUPE Information covering such TUPE Employees actually in the possession of or reasonably obtainable by the Tram Maintainer.

Establishment of hand-over procedure

44.7 Notwithstanding the Tram Maintainer's obligations pursuant to Clause 40 (*Transition on Termination or Expiry*), during the Termination Period the Tram Maintainer and the Client, both acting diligently and in good faith with a view to ensuring that there shall be no material deterioration or break in the provision of maintenance services, shall establish and implement appropriate handover procedures.

Training

44.8 Commencing during the Termination Period, the Tram Maintainer shall conduct an appropriate training programme for various categories of persons nominated by the Client who will be responsible for the provision and/or continuation of the relevant Services following the termination or expiry of this Agreement to ensure the successful continuation of the Services. The content and style of and programme for the training shall be submitted to the Client by the Tram Maintainer for review nine months prior to termination and the Tram Maintainer shall comply with the Client's reasonable requirements in relation thereto. The training shall be supported by appropriate documentation and training manuals and shall include practical fieldwork or "on-the-job" training in addition to classroom lessons.

Continued technical support

44.9 For a period of two years after termination or expiry of the Services, the Tram Maintainer shall provide the Client with such access as the Client may reasonably require to persons having the appropriate knowledge and experience of the history of the Trams and associated technical matters for the following purposes:

44.9.1 general technical advice on subjects for which the Tram Maintainer was responsible pursuant to this Agreement; and

44.9.2 interpretation of maintenance history data, drawing modifications, regulations and the like.

The Client shall reimburse the Tram Maintainer in respect of all reasonable and proper costs and expenses incurred directly by the Tram Maintainer in complying with this Clause 44.9.

Manuals and documents

44.10 Upon termination or expiry of the Services the Tram Maintainer shall procure that the Client is provided with all manuals and documentation used by the Tram Maintainer in connection with the provision of the Services (including an electronic copy of the Technical Records) and shall procure that so far as they relate to safety the Client receives any updates and/or amendments to such manuals and documentation which may be relevant to the continued maintenance of the Trams.

Trams

44.11 Upon termination or expiry of this Agreement, or as a consequence of a survey or audit undertaken by the Client pursuant to Clause 22 (*Surveys of Edinburgh Tram Network and Audits of Maintenance Procedures*), the Tram Maintainer shall ensure that the Trams, Spare Parts and Special Tools are in accordance with the Return Condition on the date of such termination or expiry ("**Return Date**") or rectification due date. Compliance of the Trams, Special Tools and Spare Parts with the Return Condition shall be assessed in accordance with part 1 of Schedule 12 (*Return Condition*).

Deemed TUPE Transfer

44.12 The Client and the Tram Maintainer acknowledge that in the event of a Service Provision Change, the TUPE Regulations may apply to such Service Provision Change. In the event that the TUPE Regulations do not apply to any Service Provision Change, the New Provider shall, with effect from the date of the Service Provision Change, offer employment to each Relevant Employee on like terms to the terms on which they would have become employed by the New Provider had the TUPE Regulations applied or, to the extent that it is not reasonably practicable to do so in respect of any such term, on terms which are not in such respect materially to the detriment of the Relevant Employee.

44.13 The New Provider shall treat the period of continuous service of each Relevant Employee or TUPE Employee with the Tram Maintainer or an Tram Maintainer Party up to the date of the Service Provision Change as continuous with such TUPE Employee's or Relevant Employee's service with the New Provider.

TUPE Transfer Indemnity

44.14 The Client shall, or shall procure that any New Provider shall, indemnify the Tram Maintainer and any Tram Maintainer Party against any losses, costs, claims, demands, actions, fines, penalties, awards, liabilities and expenses (including reasonable legal expenses) incurred by the Tram Maintainer or any Tram Maintainer Party in connection with or as a result of:

44.14.1 any claim or demand by any TUPE Employee (whether in contract, delict, under statute, pursuant to Law or otherwise) arising directly or indirectly from any act, fault or omission of the New Provider in respect of any TUPE Employee on or after the date of termination of this Agreement or the ending of the provision in whole or in part of the obligations of the Tram Maintainer under this Agreement by the Tram Maintainer or any Tram Maintainer Party;

44.14.2 any failure by the New Provider to comply with its obligations under regulation 13 of the TUPE Regulations;

44.14.3 any claim (including any individual entitlement of a TUPE Employee under or consequent on such claim) by any trade union or other body or person representing the TUPE Employees arising from or connected with any failure by the New Provider to comply with any legal obligation to such trade union, body or person;

44.14.4 any change or proposed change in the terms and conditions of employment or working conditions of the TUPE Employees on or after their transfer to the New Provider, or to the terms and conditions of employment or working conditions of any person who would have been a TUPE Employee but for their resignation or decision to treat their employment as terminated under regulation 4(9) of the TUPE Regulations on or before the Service Provision Change as a result of any such changes; and

44.14.5 the change of identity of employer occurring by virtue of the TUPE Regulations and/or this Agreement being significant and detrimental to any of the TUPE Employees, or to any person who would have been a TUPE Employee but for their resignation or decision to treat their employment as terminated under regulation 4(9) of the TUPE Regulations as a result of the change in employer.

45. LIABILITY AND INDEMNITIES

45.1 Subject to the exception set out in Clause 45.3, the Tram Maintainer shall indemnify the Client and its officers, agents and employees ("**Indemnified Parties**") from and against any and all actions, claims (including third party claims), demands, proceedings, liabilities, damages, penalties, fines, forfeitures and the costs and expenses incident thereto (including any legal costs of defence) which any of the Indemnified Parties may hereafter incur, become responsible for or pay out as a result of or in connection with:

45.1.1 any of the Tram Maintainer's or its employees' or any Tram Maintainer Party's negligent or wilful acts or wilful omissions in the performance of the Services;

45.1.2 breach of any term or provision of this Agreement;

45.1.3 breach of any Law; and/or

45.1.4 any non-performance or delay in performance of the Tram Maintainer's obligations under this Agreement.

45.2 The actions, claims, demands, proceedings, suits, losses, penalties, fines, forfeitures and costs and expenses referred to in Clause 45.1 shall include such actions, claims, demands, proceedings, suits, losses, penalties, fines, forfeitures and the costs and expenses, in respect of:

45.2.1 death or injury to any person;

45.2.2 loss of or damage to any property;

45.2.3 loss of or damage to any part of the Edinburgh Tram Network (including any Trams);

45.2.4 causing the Client to be in breach of any Law; or

45.2.5 infringement or alleged infringement of a third party's Intellectual Property Rights.

45.3 The exception referred to in Clause 45.1, which is the responsibility of the Client, is death of, or injury to, persons or loss of or damage to property resulting from any act, neglect or breach of statutory duty by the Client, its agents, servants or other contractors (not being employed by the Tram Maintainer or any Tram Maintainer Party) or for or in respect of any claims, demands, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto.

45.4 Subject to Clause 45.1, the Tram Maintainer shall be liable for and shall indemnify **tie** and the Client against all Losses arising from the damage, deterioration, theft, loss or destruction of any Tram occurring while such Tram is at any premises of the Tram Maintainer or otherwise under the Tram Maintainer's control (including when such Tram is at the Tram Maintainer's sub-contractor's or agent's premises or under such sub-contractor's or agent's control) arising out of any cause whatsoever save to the extent that such damage, deterioration, theft, loss or destruction is caused by the negligence of **tie**, the Client or the Operator.

45.5 Save where expressly provided for, nothing in this Agreement shall expose either Party to the application of Indirect Losses.

45.6 The Tram Maintainer's liability to indemnify the Client under Clause 45.1 shall be reduced in proportion to the extent that the act or neglect of the Client, its agents, servants or other contractors (not being employed by the Tram Maintainer or any sub-contractor) may have contributed to the said death, injury, loss or damage.

45.7 Nothing in this Agreement shall exclude or limit the liability of either Party for:

45.7.1 death or personal injury caused by that Party's negligence or the negligence of anyone for whom that Party is vicariously liable; or

45.7.2 fraud or fraudulent misrepresentation; or

45.7.3 any breach of warranty given as to valid and marketable title, freedom from unduly onerous burdens and conditions or entitlement to possession by action of prescription; or

45.7.4 subject to Clause 45.9, any breach of this Agreement or any delict (including negligence) or other liability arising prior to termination of this Agreement,

provided that nothing in this Clause 45.7 shall confer on either Party rights or remedies they would not otherwise have.

45.8 Subject to Clause 45.3, neither party shall be entitled to claim damages for breach of this Agreement, in delict (including negligence), breach of statutory duty or on any other basis whatsoever to the extent that such damages claimed by that Party are for Indirect Losses suffered by that Party or any of the Indemnified Parties provided that for the avoidance of doubt, nothing in this Clause 45.8 or Clause 45.5 shall affect either Party's liability to the other Party or Indemnified Party, in respect of any claim, action, proceedings or demand against such other Party or Indemnified Party by a third party in connection with Indirect Losses suffered.

45.9 The Tram Maintainer shall not be relieved or excused of any responsibility, liability or obligation under this Agreement by the appointment of any Tram Maintainer Party. The Tram Maintainer shall, as between itself and the Client, be responsible for the selection, pricing, performance, acts, defaults, omissions, breaches, delict and offences of any Tram Maintainer Party. All references in this Agreement to any act, default, omission, breach, delict or offence of the Tram Maintainer shall be construed to include any such act, default, omission, breach or delict of any Tram Maintainer Party.

45.10 In no event, the liability of the Tram Maintainer, under or in connection with this Agreement, shall exceed the sum of 22.5% of the amount of the aggregate Maximum Performance Payment in one year.

45.11 Notwithstanding any other term of this Agreement, the Tram Maintainer's total liability including liquidated damages, and indemnities howsoever arising shall not exceed in aggregate the sum of 18.5% of the aggregate Maximum Performance Payment over the Term, as may be modified from time to time, and as specified in Schedule 3 *(Payment)* provided always that the calculation of the quantum of such limitation shall exclude the proceeds of the Advance Payment Bond, Reliability Bond, Performance Bond, Return Condition Bond

together with all cash securities provided in respect of paragraph 4.1 of part 1 of Schedule 12 (*Return Condition*).

45.12 The Tram Maintainer acknowledges and agrees that the express rights provided in this Agreement in relation to termination and the calculation and payment of amounts due following such termination are exclusive and are in place of (and not cumulative with) any other rights or remedies which might arise as a consequence of such termination. The Tram Maintainer hereby waives all other rights and remedies arising from such termination, whether express or implied, arising by common law (including in delict), by statute or otherwise howsoever provided that nothing in this Clause 45.12 excludes the right of the Tram Maintainer to claim remedies expressly conferred on them by this Agreement.

45.13 Where the act or default of the Tram Maintainer or any of the Tram Maintainer Parties causes the Client to commit an offence, the Tram Maintainer shall immediately take any measure necessary to ensure that that act or default, no longer causes the Client to commit that offence.

45.14 Where the Client reasonably suspects that such an act or default is about to take place and it reasonably believes that this will result in the Client committing an offence, the Client may issue an instruction to the Tram Maintainer to remedy the act or default forthwith and the Tram Maintainer shall comply with the said instruction.

45.15 The Parties acknowledge and agree that the only rights available to them to terminate this Agreement are those expressly set out in this Agreement and that neither Party shall be entitled to exercise a right to terminate or rescind or accept the repudiation of this Agreement under any right whether arising in common law or statute or otherwise howsoever (other than for fraud or a fraudulent misrepresentation).

46. PERFORMANCE BOND AND COLLATERAL WARRANTIES

46.1 If the whole or any part of this Agreement is assigned, novated or otherwise transferred by the Client pursuant to Clause 57.2 after the Tram Maintenance Commencement Date, unless such assignation, novation or otherwise is to a competitor organisation or one that is owned by a competitor to the Tram Maintainer, the Tram Maintainer shall, notwithstanding Schedule 12 (*Return Condition*) provide to the new Client, a performance bond in the form of part 1 of Schedule 23 (*Bond and Collateral Warranty*) which has been issued by a surety approved in advance by **tie**.

46.2 The Performance Bond shall be callable by the beneficiary of such Performance Bond, on demand, and shall be for an initial amount of £1,000,000 sterling.

46.3 In the event the credit rating of either surety referred to in Clause 46.1 is downgraded to A- or a lower rating by Standard & Poors, **tie** shall be entitled to request the Tram Maintainer to procure a substitute performance bond on identical terms from a surety approved in advance by **tie**.

46.4 Within 30 days of any written request from the Client (or such longer period as the Parties, acting reasonably, may agree), the Tram Maintainer shall execute a collateral warranty (in the form set out in part 2 of Schedule 23 (*Bond and Collateral Warranty*)) or where such form is not acceptable, in a different form which is acceptable to both Parties (acting reasonably) in favour of CEC, Transport Scotland, TEL and any other party at the Client's reasonable request, in respect of carrying out the Services.

47. RISK MANAGEMENT

47.1 The Tram Maintainer shall comply with the requirements of Schedule 15 (*Risk Management*).

48. QUALIFYING CHANGES IN LAW

48.1 If a Qualifying Change in Law occurs or is to occur, then either Party may write to the other to express an opinion on its likely effects, giving details of its opinion of:

48.1.1 any necessary change in relation to the Services;

48.1.2 whether any changes are required to the terms of this Agreement to deal with the Qualifying Change in Law; or

48.1.3 whether relief from compliance with any obligations under this Agreement is required as a result of the Qualifying Change in Law,

in each case giving in full detail the procedure for implementing the Qualifying Change in Law. Responsibility for any costs of such implementation (and any resulting variation to payments due under this Agreement or other payment method at the Client's discretion) shall be dealt with in accordance with Clauses 48.2 and 48.3.

48.2 As soon as reasonably practicable after receipt of any notice from either Party under Clause 48.1, the Parties shall discuss and agree the issues referred to in Clause 48.1 and any ways in which the Tram Maintainer can mitigate the effect of the Qualifying Change in Law and the Tram Maintainer shall:

48.2.1 provide evidence to the Client that the Tram Maintainer has used and will continue to use all reasonable endeavours (including where appropriate and practicable the use of

competitive quotes) to minimise any increase in costs and maximise any reduction in costs;

48.2.2 demonstrate how the effects of the Qualifying Change in Law will be, where possible, mitigated; and

48.2.3 demonstrate that the relevant changes will be implemented in the most cost-effective manner.

48.3 As soon as reasonably practicable after the issues referred to in Clause 48.2 have been agreed between the Parties or determined pursuant to the Dispute Resolution Procedure, the Client shall give a Client Notice of Change and the provisions of Clause 16 (*Changes*) shall apply except that the Tram Maintainer shall be obliged to implement the change in all circumstances (except to the extent that such change is not necessary to implement the Qualifying Change in Law). The Client shall issue a Client Change Order once it has been agreed or determined pursuant to the Dispute Resolution Procedure. In assessing the value of the change, the Client shall, for the first five years following the Commencement Date, pay the agreed amount less the agreed threshold of £15,000 for each and every event save that the Tram Maintainer's liability under this Clause 48 shall not exceed £150,000 in the aggregate The Client will, at its sole discretion, determine the scope of each and every event.

48.4 Further to the provisions of Clause 48.3 where a Qualifying Change of Law occurs outwith a period of five years from the Service Commencement Date, the Client shall issue a Client Notice of Change and the provisions of Clause 16 (*Changes*) shall apply.

48.5 Where a General Change in Law raises a technical, design or performance issue that requires a revision of the delivery of the Services in connection with the Trams and Tram Related Equipment and price, the Tram Maintainer shall take all possible measures to ensure that the Edinburgh Tram Network is operating in accordance with the relevant Legislation, but will not be held responsible for the cost and delivery implications of such General Change in Law.

49. BEST VALUE

49.1 The Tram Maintainer shall provide reasonable assistance throughout the Term and to the extent consistent with its obligations under this Agreement, make arrangements to secure continuous improvement in the way in which the Services are conducted having regard to the Project Vision and a combination of economy, efficiency and effectiveness.

49.2 The Tram Maintainer agrees to undertake (or refrain from undertaking) such actions as the Client shall reasonably request, and shall:

49.2.1 prepare, support and assist the Client (in compliance with Clause 26 (*Right of Verification and Audit*)) in preparing best value performance plans and conducting best value reviews in relation to the Services;

49.2.2 complying with reasonable requests for information, data or other assistance made by the Client in pursuance of its best value assessment; and

49.2.3 complying with all requests by the Client, acting reasonably, to procure the attendance of specific officers or employees of the Tram Maintainer or Tram Maintainer Parties at any Client meetings and **tie** meetings at which the Services are to be discussed.

49.3 The Tram Maintainer acknowledges that **tie** may undertake an annual customer satisfaction survey ("**tie Customer Satisfaction Survey**") in order to:

49.3.1 assess satisfaction among the public and passengers with the quality, efficiency and effectiveness of the Services;

49.3.2 complement preparation of the Annual Service Report; and

49.3.3 monitor compliance by the Tram Maintainer with its obligations including its management of the Services.

49.4 Without prejudice to any other provision in this Agreement (and no later than two Reporting Periods prior to the end of any year), the Tram Maintainer shall, at its own cost, provide a written report (the "**Annual Service Report**") which shall review the quality and performance of the Services measured during the relevant period and show the key issues to be addressed going forward, including customer feedback, operational and maintenance issues and improvement proposals. The customer feedback shall include the results of any **tie** Customer Satisfaction Survey carried out pursuant to Clause 49.3. The Tram Maintainer shall upon written request promptly provide supporting information to verify and audit the information and other material contained in the Annual Service Report.

49.5 The Client may make comments on and/or objections to and/or specify omissions in the supporting information or the Annual Service Report and in such case shall provide the Tram Maintainer with written comments and/or objections within 40 Business Days of receipt. In the absence of such Client comments or objections, the supporting information (or the Annual Service Report) shall be deemed to have been accepted by the Client.

49.6 The Tram Maintainer shall, within 25 Business Days of receipt of the Client comments and/or objections under Clause 49.5, make revisions having regard to such comments and/or

objections and resubmit the information and report to the Client. If the information and reports cannot be agreed by the Parties then the matter will be determined in accordance with the Dispute Resolution Procedure.

49.7 If, in the Client's reasonable opinion, the provision and performance of the Services could be more effective, efficient and economic having regard to the Annual Service Report and the **tie** Customer Satisfaction Survey, then the Client may serve a Client Notice of Change pursuant to Clause 16 *(Changes)* stating the desired nature and timing of the changes to the provision or performance of the Services (or the relevant part thereof).

49.8 The Tram Maintainer shall, in conjunction with the Client, develop plans setting out mutually agreed tasks between the Tram Maintainer and the Client to improve the delivery of the Services and demonstrate continuous improvement in the Services ("**Best Value Improvement Plans**"), and the achievement of the Project Vision.

49.9 The preparation of Best Value Improvement Plans will take into account the conclusions from the Annual Service Report and the **tie** Customer Satisfaction Surveys.

50. COPYRIGHT AND INTELLECTUAL PROPERTY

50.1 All Tram Maintainer IPR shall continue to be owned by the Tram Maintainer.

50.2 The Tram Maintainer hereby:

50.2.1 assigns by way of future assignation to the Client with full title guarantee the Project IPR which is created by it and shall procure that Project IPR created by any Tram Maintainer Party is also so assigned, for all of the residue of the term of such rights and all renewals or extensions thereof and together with all accrued causes of action in respect thereof;

50.2.2 grants to the Client a non-exclusive perpetual irrevocable royalty free licence to use such Tram Maintainer IPR as may be necessary for the Client to use in relation to the Tram Maintainer's scope of services and having regard to the operating, maintaining and repairing of the Edinburgh Tram Network, and including any and all Intellectual Property Rights which subsist at any time in:

50.2.2.1 the Tram Documentation;

50.2.2.2 the Trams; and

50.2.2.3 Spare Parts and/or Special Tools.

For clarity, nothing within this sub-clause shall permit the Client to use Tram Maintainer IPR for any commercial or tendering purposes (except by CEC, TEL or **tie** in connection with any extension or expansion of the infrastructure of the Edinburgh Tram Network). Such Tram Maintainer IPR shall not, without the express written consent of the Tram Maintainer, be used, copied or disclosed in whole or in part by the Client other than for the purposes outlined in this Clause 50.2.2; and

50.2.3 grants to the Client, with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) the right to grant non-exclusive non-assignable sub-licences to third parties for such lengths of time as the Client may reasonably require and otherwise on the same terms as the licence granted to the Client pursuant to Clause 50.2.2, to use the Tram Maintainer IPR referred to in that Clause (other than in relation to Third Party Software in so far as is necessary or desirable for such third party to use such Tram Maintainer IPR in relation to any projects associated with the Tram Works including in relation to any extension or expansion of the Edinburgh Tram Network).

50.3 The Tram Maintainer shall promptly deliver to the Client copies of all Tram Maintainer IPR licensed to the Client pursuant to this Clause 50 (*Copyright and Intellectual Property*).

50.4 For the avoidance of doubt, the persons to whom the Client may grant sub-licences pursuant to Clause 50.2.3 shall include:

50.4.1 **tie** and any **tie** Party;

50.4.2 any Client Party;

50.4.3 the Operator and any party other than the Operator providing support to **tie** in relation to the System;

50.4.4 the SDS Provider;

50.4.5 the Tram Maintainer;

50.4.6 CEC and Transport Edinburgh Limited with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed);

50.4.7 any assignee or transferee under this Agreement; and

50.4.8 any party providing maintenance in respect of the Edinburgh Tram Network.

50.5 The Client hereby grants to the Tram Maintainer a non-exclusive revocable royalty free licence for the duration of this Agreement to use such Project IPR as is owned by it as may be necessary for the Tram Maintainer to use solely and exclusively for the purpose of performing the Tram Works.

50.6 The copyright of this Agreement and any data or software supplied to the Tram Maintainer by the Client, shall remain solely with the Client.

50.7 The Tram Maintainer shall at any time and from time to time hereafter at the request of the Client execute all such documents and do all such further acts as may be required in order to vest the rights referred to in Clause 50.2.1 in the Client.

50.8 The Tram Maintainer waives any and all moral rights held or to be held by the Tram Maintainer in the Deliverables and Project IPR and shall use best endeavours to ensure that all of the Tram Maintainer Parties who are authors of the whole or any part of the Project IPR waive and abandon in writing all moral rights.

50.9 The Tram Maintainer agrees that all rights in the Project IPR shall remain the property of the Client and the Tram Maintainer shall retain no rights in the Project IPR beyond the licence granted in Clause 50.5. The Tram Maintainer shall be entitled to use such Project IPR only on the terms set out herein and solely for the purpose of the performance of the Tram Works. In particular, otherwise as permitted in this Agreement herein, the Tram Maintainer shall not disclose, assign, sub-license, lease, rent or otherwise dispose of the Project IPR.

50.10 The Client shall be entitled to use the rights granted to it pursuant to Clause 50.2 (and to sub-license to third parties such rights) to perform its obligations and exercise its rights and allow all Client Parties to perform their obligations and exercise their rights in respect of the Project, such performance of rights and exercise of obligations to include:

50.10.1 carrying out any necessary completion of the design, manufacture, construction and commissioning of any Trams and each part thereof;

50.10.2 carrying out any and all work in relation to the design and construction, testing and operation of the System;

50.10.3 carrying out all and any necessary maintenance, repairs and work including to work to rectify any faults with the Spare Parts and Special Tools or breach of the Warranties (as defined in the Tram Supply Agreement) and to modify them to comply with any Law or other mandatory requirements or otherwise;

50.10.4 making copies of using and reproducing in any format the Tram Documentation and all other documents which the Tram Maintainer is required to deliver in accordance with this Agreement for the purposes of maintenance and repair of the Trams and/or the maintenance of the Spare Parts and Special Tools but only such copies as may be reasonably necessary to achieve such purpose; and

50.10.5 enabling and allowing relevant third parties to perform their obligations in respect of the Project.

50.11 For the purposes of this Clause 50 (*Copyright and Intellectual Property*), "use" shall include the acts of copying, modifying, adapting and translating the material in question and/or incorporating them with other materials and the term "the right to use" shall be construed accordingly.

50.12 The Tram Maintainer:

50.12.1 hereby grants to the Client, free of charge, an irrevocable, perpetual, non-exclusive and transferable (but only to any assignee or transferee of any rights or benefits under this Agreement or upon or at any time following termination or expiry of this Agreement) licence (carrying the right to grant sub-licences) to use the Intellectual Property Rights which are or become at any time during the Term vested in the Tram Maintainer to the same extent as the Tram Maintainer has acquired such rights; and

50.12.2 shall in respect of any of the Intellectual Property Rights which the Tram Maintainer is not entitled to license to the Client pursuant to Clause 50.2, use its best endeavours to procure the grant of a licence from the owners of such Intellectual Property Rights in favour of the Client in substantially the same terms as the licence set forth in Clause 50.2.

50.13 The Client shall not exercise any of the rights licensed to it pursuant to this Clause 50 (*Copyright and Intellectual Property*) to design, construct, manufacture or commission or have designed, constructed, manufactured or commissioned any of the Trams or any part thereof unless and until:

50.13.1 the Client and the Tram Maintainer cannot agree a price and/or delivery time in relation to a Spare Part or Special Tool pursuant to Clause 34.3 of the Tram Supply Agreement (Spares and Special Tools); and/or

50.13.2 there occurs a Tram Maintainer Default.

50.14 The Client shall not be entitled to adapt, reverse engineer, decompile, disassemble and/or modify the Tram Maintainer Software in whole or in part except:

50.14.1 as permitted by Law; and

50.14.2 to the extent that such action is legitimately required for the purposes of integrating the operation of the Tram Maintainer Software with the operation of other software or systems used by the Client or any of the Client Parties on the Edinburgh Tram Network.

50.15 All payments and royalties payable in one sum or by instalments or otherwise in connection with Intellectual Property Rights used by the Tram Maintainer in connection with or to enable the Tram Maintainer to carry out the Project or licensed to the Client shall be deemed to be included in the Services Payment and shall be paid by the Tram Maintainer to those to whom they may be due or payable.

50.16 Where a claim or proceeding is made or brought against the Client or its permitted licensees which arises out of the infringement of any Intellectual Property Rights in any materials provided by the Tram Maintainer or any Tram Maintainer Party to the Client then the Tram Maintainer shall indemnify and keep the Client indemnified on demand at all times from and against all Indemnified Liabilities arising in connection with such claim or proceedings.

50.17 The provisions of this Clause 50 (*Copyright and Intellectual Property*) shall apply during the continuance of this Agreement and after its termination howsoever arising, and immediately following termination howsoever arising, the Tram Maintainer shall provide the Client with:

50.17.1 a copy of the Object Code on media that is reasonably acceptable to the Client; and

50.17.2 a copy of all documentation, manuals and other technical information relating to the Software that is reasonably required by the Client.

50.18 The Tram Maintainer shall not reproduce or publish any document or matter relating to the Tram Works or this Agreement, either alone or in association with any other body or person, without the prior written consent of the Client.

Software

50.19 In designing and creating Tram Maintainer Software forming part of the Deliverables, the Tram Maintainer shall ensure and the Tram Inspector shall audit:

50.19.1 that orderly auditable records of the progress of the development of the Tram Maintainer Software from the functional requirements to the final code are maintained, and that regular verification and testing occurs at each stage of the design process;

50.19.2 that it shall produce, during the development of the Tram Maintainer Software comprehensive and accurate documentation including specifications, cause and effect charts and flowcharts are produced;

50.19.3 that the documentation, access rights, details of configuration software and the like produced in accordance with Clause 50.19.1, is such as to enable an appropriately qualified independent auditor (who is not involved in the original design) to:

(a) relate the Tram Maintainer Software to the performance of the relevant equipment under normal and fault conditions;

(b) to verify its compliance with the functional requirements of that equipment; and

(c) to operate and reconfigure the Tram Maintainer Software without the assistance of the Infraco; and

50.19.4 that the Tram Maintainer Software is designed, developed and documented following an industry-recognised standard, using recognised quality control methods.

50.20 Subject to the terms of any Third Party Software Licence, the Tram Maintainer shall to a reasonable extent, create or provide:

50.20.1 coding and documentation, in machine readable form, of the final structure of the Tram Maintainer Software, and of the intermediate stages leading to it (i.e. source and object codes); and

50.20.2 where the Client so instructs, usable copies of any ancillary computer programs used to generate the code (such as compilers) provided that the Client meets the costs of any additional Third Party Software Licence.

50.21 Where the Tram Maintainer is required to provide Tram Maintainer Software as part of a Deliverable under this Agreement it shall, within thirty (30) days of acceptance of the Tram Maintainer Software by **tie** place, or shall procure the placement of, a copy of the source code of the Tram Maintainer Software in escrow with the NCC Group of Manchester Technology

Centre, Oxford Road, Manchester ("**NCC**") or such other escrow agent as the Parties may agree. The Parties shall enter into NCC's standard escrow agreement in the form included in Schedule 8 of the Tram Supply Agreement (provided that, in the case of Third Party Software, the Tram Maintainer shall procure that the owner of such software enters into such Escrow Agreement) for a single licensee (or if no such agreement exists, the appropriate standard agreement as stipulated by NCC). The cost of such source code deposit (including all renewal costs) shall be payable by the Client.

Technical Library

50.22 The Tram Maintainer shall:

50.22.1 as soon as reasonably practicable, cooperate with the Client in the establishment by the Client of a secure, virtual electronic site for the storage of Deliverables other than the source code (the "**Technical Library**"). Such electronic site shall be capable of being accessed through a standard web browser. At the Client's request, the Tram Maintainer will in addition also cooperate with the Client in delivering and managing documents to establish a physical site with paper copies of the Technical Library; and

50.22.2 as and when Deliverables (other than the source code) are produced or updated from time to time:

50.22.2.1 where such Deliverables are produced or updated by the Tram Maintainer, promptly ensure that a copy of those Deliverables or its updated version is placed in the Technical Library;

50.22.2.2 where such Deliverables are produced or updated by any subcontractor of the Tram Maintainer, as soon as reasonably practical ensure that a copy of those Deliverables or their updated version(s) are placed in the Technical Library;

50.22.2.3 establish an index, in a format approved by the Client, of all Deliverables deposited in the Technical Library from time to time and update that index whenever any such Deliverables are deposited in the Technical Library;

50.22.2.4 deliver one copy of the index and each update established under Clause 50.22.2.3 to the Client; and

50.22.2.5 permit the Client (or its nominee) to have access to the Technical

Library from time to time during normal business hours, and following reasonable notice from the Client (or its nominee) to the Tram Maintainer, for the purpose only of auditing its contents against the current catalogue.

50.23 Within three Business Days of the earlier of the release of the Reliability Bond pursuant to Clause 44.3 of the Tram Supply Agreement or the termination of this Agreement, the Tram Maintainer shall hand over the Technical Library, and the secure access to it, to the Client and the Tram Maintainer's obligations in relation to the further maintenance of the Technical Library shall cease. Should an audit of the contents of the Technical Library against the current catalogue reveal that the index does not contain details of categories or types of Deliverables which should be contained within the Technical Library, the Client may request, and the Tram Maintainer grants, access to the Technical Library from time to time during business hours in order to audit the contents of the Technical Library to determine whether such categories and types of Deliverables are in fact contained within the Technical Library. Any such request shall be made with reasonable notice and shall indicate with reasonable clarity the technical information or the type of Deliverable which is required for review.

51. DATA PROTECTION

51.1 For the purpose of this Clause 51 (*Data Protection*), the term "personal data" shall have the meaning given to it in the Data Protection Act 1998.

51.2 Insofar as is applicable to its obligations pursuant to this Agreement, the Tram Maintainer shall, in relation to any personal data relating to the performance of the Services in respect of which it is either the "data controller" or the "data processor" for the purposes of the Data Protection Act 1998, comply with the obligations of a "data controller" under the provisions of the seventh data protection principle as set out in schedule 1 of that Act. In addition, the Tram Maintainer:

51.2.1 shall have at all material times (and shall use its reasonable endeavours to procure that all the Tram Maintainer Parties have or will have at all material times) the appropriate technical and organisational measures in place against unauthorised or unlawful processing of personal data and against accidental loss or destruction of, or damage to, personal data held or processed by it;

51.2.2 shall (and shall use its reasonable endeavours to procure that the Tram Maintainer Parties shall) take at all material times, all reasonable steps to ensure the integrity of any of its staff with access to personal data processed in connection with the Services;

51.2.3 shall act only on the instructions of the Client or **tie** in relation to the processing of any personal data in respect of which the Client or **tie** is the "data controller" for the purposes of that Act;

51.2.4 shall only obtain, hold, process, use and store such personal data as is necessary to perform its obligations under this Agreement; and

51.2.5 shall allow the Client or **tie** access to any relevant premises on reasonable notice to inspect its procedures referred to in Clause 51.2.1. This right to access shall be duly justified by the Client to the Tram Maintainer.

52. DISPUTE RESOLUTION

52.1 The Parties agree that any Dispute shall be dealt with in accordance with the provisions set out in Schedule 9 (*Dispute Resolution Procedure*).

53. DEROGATIONS

53.1 The Tram Maintainer shall not, without the prior written consent of the Client's Representative, apply for any exemption or derogation from or dispensation under any applicable Law which would otherwise apply to the Services and including any exemption order under section 47(3) of the Disability Discrimination Act 1995 or dispensations under the provisions of section 10 of the Railways and Other Passenger Transport Systems (Approval of Works, Plant and Equipment) Regulations 1994 or any provisions which may replace, modify or supersede such provisions.

54. VARIATIONS TO BE IN WRITING

54.1 No variation or alteration of any of the provisions of this Agreement shall be effective unless it is in writing and signed by both Parties.

55. WAIVER AND CUMULATIVE REMEDIES

55.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement will operate as a waiver of it or of any other right or remedy nor will any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

55.2 The Parties agree that no waiver shall occur or be deemed to have occurred unless or until a clear and unequivocal express waiver of a clearly identified default is contained in a written

notice by the waiving Party to the other Party expressly for the purpose of effecting such waiver.

55.3 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by Law.

55.4 Neither Party shall be entitled to recover compensation or make a claim under this Agreement in respect of any loss that it has incurred to the extent that it has already been compensated in respect of that loss pursuant to this Agreement or otherwise.

56. NOTICES

56.1 Any notice or notification required or authorised to be given under this Agreement by one Party to the other shall be:

56.1.1 in writing;

56.1.2 sent by one of the following methods:

56.1.2.1 pre-paid special or recorded delivery post or facsimile transmission addressed to the Party to which it is given at:

(a) in the case of notices given to the Client: **tie** Limited, Citypoint, 65 Haymarket Terrace, Edinburgh, EH12 5BH, fax number 0131 622 8301, attention: Tram Project Director, or such other address or fax number in the United Kingdom as the Client may notify the Tram Maintainer from time to time for that purpose; or

(b) in the case of notices given to the Tram Maintainer: Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF) address, J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) – Spain fax number, 00 34 943 189211 attention the Edinburgh Tram Project Manager or such other address or fax number in the United Kingdom as the Tram Maintainer may notify the Client from time to time for that purpose; or

56.1.2.2 facsimile transmission addressed to the Client's Representative or the Tram Maintainer's Representative (as appropriate) at a facsimile number notified to the giving Party by the receiving Party for the service of notices under this Agreement from time to time; or

56.1.2.3 personal delivery into the hands of:

(a) in the case of notices given to the Client, the Client's Representative; or

(b) in the case of notices given to the Tram Maintainer, the Tram Maintainer's Representative; and

56.1.3 be deemed duly served:

56.1.3.1 if sent by pre-paid special or recorded delivery post, on proof of delivery; or

56.1.3.2 if sent via facsimile transmission or personal delivery, on the day of issue of the relevant fax confirmation receipt or such personal delivery (as appropriate), unless that day is not a Business Day, or such delivery or transmission is made after 5.00pm on a Business Day, in which case it shall be deemed duly served on the next Business Day thereafter.

57. ASSIGNATION, CHANGES IN LEGAL STATUS, CHANGES IN CONTROL AND SUB-CONTRACTING

57.1 The Tram Maintainer shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of the Client.

57.2 In addition to and without prejudice to the provisions of Clause 5 (*Novation*) and the Tram Maintenance Novation Agreement to be entered into in accordance with Clause 5 (*Novation*), the Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

57.2.1 to the Scottish Ministers, TEL, CEC, Transport Scotland or any local authority; or

57.2.2 to any body with no worse financial standing than that of **tie** who takes over all or substantially all of the functions of **tie**; or

57.2.3 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to the Tram Maintainer acting reasonably) by **tie** or a person falling within Clause 57.2.1; or

57.2.4 to the Operator; or

57.2.5 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) to any person not covered by Clauses 57.2.1, 57.2.2, 57.2.3 or 57.2.4 whose ongoing financial standing is no worse than **tie**.

57.3 If the legal status of the Tram Maintainer shall change in any material way the Client shall be informed by the Tram Maintainer in writing, immediately.

57.4 If there is a Change in Control in the Tram Maintainer, the Client shall be informed immediately by the Tram Maintainer in writing.

57.5 The Tram Maintainer shall not sub-contract the whole of the Services and shall not without the prior written consent of the Client (such consent not to be unreasonably withheld or delayed) sub-contract any part of the Services.

57.6 The Tram Maintainer shall in respect of any part of the Services in respect of which the Tram Maintenance Specification expressly states that a Sub-Contractor Direct Agreement will be required from a supplier in respect of which the Client shall as a condition of giving its consent to the sub-contracting of an element of the Services, require the relevant sub-contractor to enter into a Sub-Contractor Direct Agreement with the Client and **tie**, and in respect of any other sub-contractor if so requested by the Client at any time, the Tram Maintainer shall use all reasonable endeavours to ensure that such sub-contractor enters into a Sub-Contractor Direct Agreement with the Client and **tie**.

57.7 Without limitation it shall be reasonable for the Client to withhold its consent to:

57.7.1 any sub-contract or assignation where the proposed sub-contractor or assignee:

57.7.1.1 is not in the Client's opinion appropriately qualified and experienced in and/or accredited for the purposes of carrying out work of the scope, type and complexity to that required in carrying out that part of the Services to be sub-contracted to it; or

57.7.1.2 has not entered into a Sub-Contractor Direct Agreement with the Client and **tie** pursuant to Clause 57.6; or

57.7.1.3 is not approved by the Operator (acting reasonably) as being appropriate for the purposes of the requirements of the Case for Safety; and

57.7.2 any sub-contract or assignation where the proposed assignee or sub-contractor is not in the Client's absolute opinion of suitable financial standing.

57.8 The appointment or authorisation by the Tram Maintainer of any sub-contractor, agent, officer or employee and/or any consent given by the Client to any sub-contractor, agent, officer or employee shall not relieve the Tram Maintainer of any obligation under this Agreement and the acts of and omissions of any such sub-contractor, agent, officer or employee shall, for the purposes of this Agreement, be deemed to be the acts or omissions of the Tram Maintainer.

57.9 The Tram Maintainer shall provide sufficient superintendence to ensure that the work to be carried out by sub-contractors will comply with the requirements of this Agreement and applicable Law.

57.10 Any application to the Client for consent pursuant to Clauses 57.5 shall be in writing and shall be sent to the address set out in Clause 56 *(Notices)*.

58. CONFLICT OF INTEREST

58.1 The Tram Maintainer shall (and shall procure that the Tram Maintainer Parties shall):

58.1.1 be responsible for ensuring that no conflict of interest arises in respect of its duties under this Agreement;

58.1.2 make all possible enquiries to ensure that there is no conflict of interest prior to its assuming the duties required of it under the terms of this Agreement; and

58.1.3 consult and advise the Client if the Tram Maintainer considers that a conflict of interest arises or if he considers that a conflict of interest may exist or may arise or may be foreseeable and shall furnish the Client with such information as shall enable the Client to determine whether or not a conflict of interest has arisen.

59. SECURITY INTERESTS

59.1 The Tram Maintainer shall not create or agree to create any Security Interest over any Assets or over this Agreement.

59.2 The Tram Maintainer shall not dispose of any right in respect of or interest in any Asset used in the Services or relating to the Edinburgh Tram Network if to do so would have a material adverse effect upon either the Edinburgh Tram Network, the rights in the Assets held by CEC, the position of **tie**, or the position of the Client under this Agreement, whether or not this Agreement has terminated or expired provided always that restrictions in this Clause 59 (*Security Interests*) shall not apply in the case of:

59.2.1 disposals of redundant or obsolete assets not required for the Edinburgh Tram Network provided that the Client has procured **tie's** and CEC's consent to such disposal, and CEC receives any proceeds associated with such disposal; or

59.2.2 disposals of property or assets where such property or assets are replaced by other property or assets comparable or superior as to type and function.

60. HEALTH AND SAFETY

60.1 The Tram Maintainer shall develop and operate:

60.1.1 a health and safety management system, the standard of which shall comply with OHSAS 18001 or HSG65;

60.1.2 a quality management system, the standard of which shall comply with BS EN ISO 9001:2000; and

60.1.3 an environmental management system, the standard of which shall comply with BS EN ISO 14001: 2004,

which shall be known together as the "**HSQE System**".

60.2 The Tram Maintainer shall (and shall procure that the Tram Maintainer Parties) comply with the HSQE System and the Tram Maintainer shall develop appropriate management plans so as to ensure such compliance with the HSQE System.

60.3 If the Services have not been prepared in accordance with the HSQE System or with any other provision of this Agreement, the Client's Representative shall so inform the Tram Maintainer in writing stating the error or omission requiring to be rectified by the Tram Maintainer.

60.4 Compliance with the HSQE System shall not relieve the Tram Maintainer from any of its other duties, obligations or liabilities under this Agreement.

60.5 The Tram Maintainer shall appoint (or shall procure the appointment of) a manager (the "**HSQE Manager**") as soon as reasonably practicable following the Effective Date. The identity of the HSQE Manager (and any replacement) shall be subject to the approval of the Client's Representative (such approval not to be unreasonably withheld or delayed).

60.6 The HSQE Manager shall:

60.6.1 ensure the effective operation of the HSQE System described in this Clause 60 *(Health and Safety)*;

60.6.2 audit the HSQE System at regular intervals and report the findings of such audit to the Client's Representative;

60.6.3 review the HSQE System at intervals agreed with the Client's Representative to ensure its continued suitability and effectiveness; and

60.6.4 liaise with the Client's Representative on all matters relating to the HSQE System.

61. ENTIRE AGREEMENT

61.1 Except where expressly provided otherwise in this Agreement, this Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings concerning the subject matter of this Agreement.

61.2 Each of the Parties confirms to the other that it has neither been induced to enter into this Agreement in reliance on, nor has it made, any representation or warranty except those contained or referred to in this Agreement.

61.3 Any representations or warranties other than those contained or referred to in this Agreement are superseded and extinguished by this Agreement.

61.4 Each Party irrevocably and unconditionally waives all rights and remedies which it might otherwise have had in relation to any representations or warranties other than those contained or referred to in this Agreement save in respect of any fraudulent misrepresentation.

62. CONSENT AND APPROVAL

62.1 The giving of any consent or approval by or on behalf of **tie** or the Client shall not in any way relieve the Tram Maintainer of any of its obligations under this Agreement or of its duty to ensure the correctness, accuracy or suitability of the matter or thing which is the subject of the consent or approval.

62.2 Failure by **tie** or the Client to disapprove or object to any matter or thing shall not prejudice its power subsequently to take action under this Agreement in connection therewith.

63. DISCRIMINATION

63.1 The Tram Maintainer shall not (and the Tram Maintainer shall insert a clause to this effect in each contract with any Tram Maintainer Party) unlawfully discriminate within the meaning and scope of the provisions of the Equal Pay Act 1970, the Sex Discrimination Act 1975, the Employment Rights Act 1996, the Working Time Regulations 1998, the Part-Time Workers (Prevention of Less Favourable Treatment) Regulations 2000, the Fixed Term Employees (Prevention of Less Favourable Treatment) Regulations 2002, the Race Relations Act 1976, the Disability Discrimination Act 1995, the Employment Equality (Sexual Orientation) Regulations 2003, the Employment Equality (Religion or Belief) Regulations 2003 and the Employment Equality (Age) Regulations 2006.

64. FURTHER ASSURANCE

64.1 Each Party shall at the reasonable request and cost of the other (save where it is expressly provided that the cost of such act or execution shall be for that Party's account) do any act or execute any document that may be necessary to give full effect to this Agreement.

65. APPLICABLE LAW

65.1 This Agreement, any document completed or to be completed in accordance with its provisions and any matter arising from this Agreement or any such document shall be governed by and construed in accordance with Scots law.

65.2 Subject to Clause 52 (*Dispute Resolution*), the Parties hereby irrevocably submit to the exclusive jurisdiction of the Court of Session in relation to this Agreement, any such document and any such matter.

66. NO PARTNERSHIP OR AGENCY

66.1 Nothing in this Agreement shall be construed as creating a partnership between, the Client and the Tram Maintainer.

66.2 The Tram Maintainer shall not (and shall procure that the Tram Maintainer Parties shall not) act or purport to act as agent for **tie** and/or the Client in relation to any matter unless specifically authorised in writing under this Agreement by the Client. The Tram Maintainer shall not be entitled to bind **tie** and/or the Client in any way or to create any liability or cause of action against **tie** and/or the Client and shall not hold itself out (and shall procure that no Tram Maintainer Party shall hold itself out) as having any such authority or power.

67. INVALID TERMS

67.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

67.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

67.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

67.2 Without prejudice to any other terms of this Agreement, the Parties shall promptly consult in good faith with a view to agreeing as soon as reasonably practicable one or more provisions in lieu of the invalid provision such as will, so far as is possible under any applicable Law have the same commercial effect as the invalid provision would have had, if it had not been invalid, unlawful or unenforceable.

68. THIRD PARTY RIGHTS

68.1 Subject to any other express provision of this Agreement, a person who is not party to this Agreement shall have no right to enforce any term of this Agreement.

IN WITNESS WHEREOF these presents consisting of this and the 154 preceding pages together with Schedules 1 to 24 (inclusive) which are annexed and signed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**

at EDINBURGH

on 13th MAY 2008 by:

Authorised Signatory [redacted]

Full Name WILLIE GALLAGHER

Witness Signature [redacted]

Full Name ALASTAIR RICHARDS

Address [redacted]

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at EDINBURGH

on 13 MAY 2008 by:

Authorised Signatory [redacted]

Full Name JESUS ESNAOLA

Witness Signature [redacted]

Full Name Antonio Campos

Address [redacted]

This is Schedule 1 referred to in the foregoing Tram Supply Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 1

CONDITIONS PRECEDENT

PART 1: COMMENCEMENT CONDITIONS PRECEDENT

Delivery to the Client, in form and substance satisfactory to the Client (acting reasonably) of the documents listed below. Where listed as a duly certified copy, the document is to be certified by the company secretary of the Tram Supplier as being a true copy, in full force and effect:

1.1 a copy, duly certified, of its certificate of incorporation (or equivalent) and of any certificate of incorporation on change of name (or equivalent) or certificate of re-registration as a public company (or equivalent) related to it;

1.2 a copy, duly certified, of its memorandum and articles of association (or equivalent constitutional documents);

1.3 a copy, duly certified, of minutes of a meeting of its board of directors, or any other owners, representatives, committee or board entitled to bind the Tram Supplier to the terms of the Tram Supply Agreement:

1.3.1 evidencing all necessary approvals on behalf of the Tram Supplier to the execution, delivery and performance by the Tram Supplier of the Tram Supply Agreement and all documents to be executed by the Tram Supplier pursuant to the Tram Supply Agreement;

1.3.2 authorising a specified person to execute the Tram Supply Agreement, all documents to be executed by the Tram Supplier pursuant to the Tram Supply Agreement and to approve any amendments to the draft of the Tram Supply Agreement and to all documents to be executed by the Tram Supply pursuant to the Tram Supply Agreement;

1.3.3 authorising the Tram Supplier's Representative to sign and despatch all notices and other communications required or permitted to be given by the Tram Supplier under the Tram Supply Agreement and all documents to be executed by the Tram Supplier pursuant to the Tram Supply Agreement; and

1.3.4 authorising the Tram Supplier's Representative to sign and despatch all notices and other communications required or permitted to be given by the Tram Supplier under the Tram Supply Agreement and all documents to be executed by the Tram Supplier pursuant to the Tram Supply Agreement;

1.4 evidence that all insurances to be taken out under the Tram Supply Agreement and be in force from the Effective Date have been effected on the Effective Date and that the relevant policies comply with the requirements of the Tram Supply Agreement and provision of copies of the certificates of insurance and policy documents for the insurances specified in the Tram Supply Agreement;

1.5 duly executed Subcontractor Direct Agreements in respect of the Tram Works from key Sub-Contractors, or undertakings that such Subcontractor Direct Agreements will be provided within 2 months of the Effective Date;

1.6 Legal Opinions in respect of the powers and capacity of the Tram Supplier to enter into this Tram Supply Agreement.

PART 2: CONDITIONS PRECEDENT DOCUMENTS

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

NOVATION OF A TRAM SUPPLY AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together the "**Infraco**" and each separately an "**Infraco Member**"); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated ◆ . 2008 ("**Tram Supply Agreement**") **tie** appointed Tramco to design, manufacture and supply Trams and to supply documentation and associated equipment in connection with the Edinburgh Tram Network. A copy of the Tram Supply Agreement is attached to this Agreement and initialled by the parties for the purpose of identification. This Agreement is supplemental to the Tram Supply Agreement.

B **tie** and Infraco have entered into a contract ("**Infraco Contract**") under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "Client" (as defined in the Tram Supply Agreement) under the Tram Supply Agreement and that Tramco shall owe all of the duties and obligations arising thereunder to Infraco by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

D **tie** wishes to be released from the Tram Supply Agreement and Tramco has agreed to release **tie**.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 In this Agreement the following additional words and expressions shall have the meanings set out opposite to them:

"**Effective Date**" means the last date of execution of this Agreement."

1.3 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.4 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

2. RELEASE BY TRAMCO OF tie

2.1 Tramco releases and discharges **tie** from any and all duties, obligations and liabilities owed to Tramco under the Tram Supply Agreement and accepts the liability of Infraco under the Tram Supply Agreement in lieu of **tie**.

3. RELEASE BY tie OF TRAMCO

3.1 **tie** releases and discharges Tramco from the further performance of Tramco's duties and obligations under the Tram Supply Agreement.

4. ACCEPTANCE OF LIABILITY BY TRAMCO TO THE INFRACO

4.1 Tramco undertakes to Infraco to continue to perform all the duties and to discharge all the obligations of Tramco under the Tram Supply Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie**.

4.2 Tramco warrants to Infraco that, in respect of the duties and obligations which it has already performed under the Tram Supply Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the Tram Supply Agreement and otherwise in compliance with all of the terms and conditions thereof. Tramco warrants to Infraco that it shall be liable for any loss or damage suffered or incurred by Infraco arising out of any negligent act, default or breach by Tramco in the performance of its obligations under the Tram Supply Agreement prior to the Effective Date. Tramco shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 Without prejudice to Clauses 4.2 or 4.4, Tramco shall not contend under this Agreement that its liability to Infraco is affected or diminished by reason of **tie** having suffered no loss and/or any loss claimed to have been suffered by Infraco being different in character from that suffered by **tie**.

4.4 Tramco confirms it was aware at the time of entering into the Tram Supply Agreement that Infraco could suffer losses, damages, costs, expenses, claims, demands and proceedings as a result of Tramco's breach of the Tram Supply Agreement.

4.5 Without prejudice to the generality of this Agreement, Tramco warrants and undertakes to Infraco that its duties and obligations under, the Tram Supply Agreement, whether required to be performed prior to the date hereof, have been and will be performed in accordance with the Tram Supply Agreement.

4.6 Tramco acknowledges that any breach of the warranties in this Agreement may cause Infraco to be in breach of the Infraco Contract and/or cause Infraco to suffer loss and/or damage.

4.7 The liability of Tramco to Infraco pursuant to the Tram Supply Agreement as novated by this Agreement (both in respect of the period prior to the Effective Date and after the Effective Date) shall not be affected by Infraco's assumption of liability to **tie** in respect of the Edinburgh Tram Network pursuant to the Infraco Contract.

4.8 Tramco acknowledges that Infraco has and shall continue to rely upon all Tram Works provided by Tramco under the Tram Supply Agreement as novated by this Agreement.

4.9 For the avoidance of doubt, in accordance with Clause 41.2 of the Tram Supply Agreement save where expressly provided for in the Tram Supply Agreement, nothing in this Agreement shall expose either Party to the application of Indirect Loss.

5. VESTING OF REMEDIES AGAINST TRAMCO

All rights of action and remedies against Tramco under and pursuant to the Tram Supply Agreement vested in **tie** (including their accrued rights of action and remedies) shall automatically and without the need for any further action on the part of Infraco, vest in Infraco with effect from the Effective Date.

6. ACCEPTANCE OF LIABILITY BY INFRACO

With effect from the Effective Date Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the Tram Supply Agreement as novated by this Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Supply Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the Tram Supply Agreement prior to the Effective Date were the acts and omissions of Infraco.

7. VESTING OF REMEDIES AGAINST tie

As from the Effective Date, all rights of action and remedies under or pursuant to the Tram Supply Agreement vested in Tramco shall lie against Infraco and not **tie** whether or not such rights of action or remedies may have arisen prior to, on or after the Effective Date.

8. ACKNOWLEDGEMENT OF PAYMENT

Tramco acknowledges that all payments properly due to Tramco under the Tram Supply Agreement up to the Effective Date have been paid by **tie** (subject to confirmation of pending payments and the assurance that the Tramco will not suffer payment delays due to the novation process).

9. AMENDMENT OF TRAM SUPPLY AGREEMENT

tie, Tramco and Infraco agree that the terms of the Tram Supply Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF TRAM SUPPLY AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the Tram Supply Agreement and, except as specifically amended by Appendix 1 of this Agreement, all the terms and conditions of the Tram Supply Agreement remain in full force and effect. **tie** hereby confirms that it has not exercised any rights and discretions in regard to the Tram Supply Agreement prior to the point of novation.

11. EQUIVALENT PROJECT RELIEF

tie acknowledges that in relation to any Dispute under the Infraco Contract where the Client's sole involvement in any Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then Infraco shall be entitled to recover its costs incurred in relation to such dispute pursuant to Clause 7A (*Tramco Equivalent Project Relief*) of the Tram Supply Agreement from **tie**. **tie** agrees to pay to the Infraco such reasonable costs unless the dispute proceeds to adjudication where such costs shall be paid as allocated between **tie** and the Tram Supplier by the adjudicator following the Dispute Resolution Procedure.

The Infraco agrees that it shall minimise as far as reasonably practicable its administrative costs in relation to Equivalent Project Relief.

The Tram Supplier agrees not to vexatiously claim under the Tram Supply Agreement or vexatiously use the Disputes Resolution Procedure.

12. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This clause does not affect any right or remedy of any person which exists or is otherwise available.

13. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding [ ] pages together with Appendix 1 which is annexed and subscribed as relative hereto and the copy of the Tram Supply Agreement which is attached and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Director _____

Full Name _____

Director _____

Full Name _____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Authorised Signatory _____

Full Name _____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

APPENDIX 1 TO THE TRAM SUPPLY NOVATION AGREEMENT

SCHEDULE OF AMENDMENTS TO THE TRAM SUPPLY AGREEMENT

Clause 7.15

Insert at end of Clause 7.15 the following:

The Tram Supplier acknowledges that it has a copy of the Infraco Contract and is deemed to be aware of the obligations, risks and liabilities assumed by the Infraco thereunder. Without prejudice to the foregoing, the Tram Supplier shall be deemed to be fully aware of the adverse financial and other consequences for the Client which could arise under the Infraco Contract in consequence, in whole or in part, of a breach on the part of the Tram Supplier of its obligations under this Agreement.

Clause 38.11.2

Delete Clause 38.11.2 and replace with:

38.11.2 all payments under this Agreement to the Client shall be made in pounds sterling by electronic transfer of funds to:

Name and Address of Bank:

Sort Code:

Account Number:

Account Name:

Clause 58.2 - No Fault Termination

Insert the following new Clause 58.2:

58.2 In the event that the Infraco Contract is terminated, this Agreement shall terminate unless the Tram Supplier is notified that **tie** (or another nominated party) requires to step into this Agreement.

Clause 60 - Termination for Corrupt Gifts and Fraud

Delete Clause 60 (Termination for Corrupt Gifts and Fraud), in its entirety substitute therefore:

60.1 The Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) shall not commit any Prohibited Act.

60.2 If the Tram Supplier or anyone employed by it or acting on its behalf (including any Tram Supplier Party) commits any Prohibited Act, then the Client may terminate this Agreement with immediate effect by giving notice to the Tram Supplier.

Clause 68.1.2.1.1

Delete Clause 68.1.2.1.1 and replace with:

68.1.2.1.1 in the case of notices given to the Client: Bilfinger Berger-Siemens Consortium, Lochside House, Lochside Way, Edinburgh Park EH12 9DT, fax number 0131 452 2518, attention: Project Director, or such other address or fax number in the United Kingdom as the Client may notify the Tram Supplier from time to time for that purpose; or

.....
Director/Authorised Signatory
tie LIMITED

.....
Director/Authorised Signatory
BILFINGER BERGER UK LIMITED

.....
Director/Authorised Signatory
SIEMENS PLC

.....
Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

COLLATERAL WARRANTY IN RESPECT OF A TRAM SUPPLY AGREEMENT IN FAVOUR OF tie FROM TRAMCO

relating to

THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together referred to as the "**Infraco**", which term shall include its successors and permitted assignees); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated ◆ 2008 (the "**Tram Supply Agreement**"), **tie** appointed Tramco to design, manufacture and supply Trams and supply documentation and associated equipment in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "**Client**" (as defined in the Tram Supply Agreement) under the Tram

Supply Agreement by novating the Tram Supply Agreement from **tie** to Infraco upon and subject to the terms of the Novation Agreement (as hereinafter defined).

D It is a term of the Tram Supply Agreement that Tramco shall enter into this Agreement with **tie** following the execution of the Novation Agreement.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions shall have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to Clause 13);

"**Deliverables**" means all written or documentary outputs to be prepared and delivered by Tramco in the performance of the Tram Works and Tramco's other obligations under the Tram Supply Agreement;

"**Infraco Contract**" means the contract to be entered into or entered into by **tie** with Infraco as described in Recital B above;

"**Novation Agreement**" means the novation agreement entered into among **tie**, Tramco and Infraco relating to the novation of the Tram Supply Agreement;

"**Party**" means each and any of the parties to this Agreement and **Parties** shall be construed accordingly; and

"**Tram Supply Agreement**" means the agreement dated [◆] and originally entered into by **tie** and Tramco, which has been novated to Infraco and Tramco pursuant to the Novation Agreement.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender includes all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the Tram Supply Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

1.6 In the case of any unintended conflict between the definition or interpretation of words or expressions in this Agreement and in the Tram Supply Agreement, the Tram Supply Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

Tramco warrants and undertakes to **tie** that:

2.1 it has carried out and shall carry out and discharge the Tram Works and all its other duties and obligation under the Tram Supply Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1;

2.2.1 Tramco warrants to **tie** that, in the performance of the Tram Works and all its other duties and obligations under the Tram Supply Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent Tram designer and manufacturer experienced in carrying out works similar to the Tram Works to be carried out under the Tram Supply Agreement;

2.2.2 it owes a duty of care to **tie** in carrying out its duties and obligations under the Tram Supply Agreement;

2.2.3 all obligations and duties on the part of Tramco set out in the Tram Supply Agreement which are expressed to be made in favour of or given to **tie** shall be directly enforceable by **tie** pursuant to this Agreement following the novation of the Tram Supply Agreement pursuant to the Novation Agreement.

3. COPYRIGHT LICENCE

3.1 Tramco hereby grants to **tie** a royalty-free and exclusive licence to use such Project IPR and Tram Supplier IPR as may be necessary, for operation and maintenance of the trams but, not in any case, for manufacturing purposes, for **tie** to use in relation to any projects associated with the Tram Works and or the operation and/or maintenance of the Edinburgh Tram Network, including the Trams. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written approval of the Tram Supplier. Tramco shall be liable for the Project IPR and the Tram Supplier IPR only to the extent that it is used for the purposes for which it was intended.

3.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable prepared or provided by Tramco in connection with the provision of the Tram Works under the Tram Supply Agreement is vested in any person other than Tramco including, without limitation, any Tram Supplier Party, Tramco shall procure for **tie** the benefit of such a licence as is referred to in clause 3.1 for the purposes referred to therein.

3.3 Tramco shall, if so requested at any time, execute such documents and perform such acts (including the grant to **tie** of a licence to use any Software related with operation and maintenance) as may be required fully and effectively to assure to **tie** or any third party the rights referred to in this clause 3.

3.4 Tramco shall provide to **tie** a copy of any of the Deliverables which are to be provided to Infraco under the Tram Supply Agreement as soon as reasonably practicable after receipt by Tramco of a written request from **tie** to do so, unless already delivered to **tie**.

3.5 Tramco undertakes to **tie** that the use by **tie** of any of the Deliverables for any purpose provided for in this clause 3 shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES AND OCIP INSURANCES

4.1 Tramco undertakes to **tie** that:

4.1.1 it has maintained and shall maintain during the performance of its obligations under the Tram Supply Agreement each of the Required Insurances in accordance with the requirements of Clause 40 (*Required Insurances*) and Schedule 11 (*Required Insurances*) of the Tram Supply Agreement;

4.1.2 cover under the professional indemnity insurance is extended to include Tramco's liabilities under this Agreement;

4.1.3 this Agreement has been disclosed to Tramco's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement;

4.1.4 Tramco shall abide by the terms and conditions of insurance and not do or omit to do anything that might prejudice the cover or its rights to make a claim; and

4.1.5 it has been disclosed to it details of the OCIP Insurances and that it shall abide by the terms and conditions of the insurances contained therein and shall not do or omit to do anything that might prejudice the cover of **tie**'s right to make a claim under the OCIP Insurances.

4.2 As and when required by **tie**, Tramco shall produce for inspection documentary evidence that the Required Insurances are being properly maintained.

4.3 Tramco shall not make any material alteration to the terms of the Required Insurances without **tie**'s prior approval which approval shall not be unreasonably withheld. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if Tramco is unable to obtain professional indemnity insurance, Tramco shall promptly give written notice of this to **tie**.

5. tie STEP-IN

5.1 Tramco shall not exercise nor seek to exercise any right of determination of the Tram Supply Agreement or to rescind the Tram Supply Agreement by reason of a Client Default or to otherwise discontinue the performance of any of Tramco's obligations in relation to the Tram Supply Agreement by reason of breach on the part of Infraco (or otherwise) without giving **tie** not less than 21 days' written notice of its intention to do so and specifying in such notice the

grounds for the proposed determination. Tramco for the period of any such notice diligently and properly continue to perform Tramco's obligations under the Tram Supply Agreement.

5.2 Any period stipulated in the Tram Supply Agreement for the exercise by Tramco of a right of determination shall nevertheless be extended as may be necessary to take account of the period of notice required under clause 5.1.

5.3 Compliance by Tramco with the provisions of clause 5.1 shall not be treated as a waiver of any breach on the part of Infraco giving rise to the right of determination nor otherwise prevent Tramco from exercising its rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 5.4

5.4 The right of Tramco to determine the Tram Supply Agreement or to rescind the Tram Supply Agreement or to discontinue the performance of any of its obligations in relation to the Tram Supply Agreement shall cease if within the period of 21 days referred to in clause 5.1, **tie** gives written notice to Tramco:

5.4.1 requiring Tramco to continue with the performance of all its obligations under the Tram Supply Agreement;

5.4.2 acknowledging that **tie** is assuming all the obligations of Infraco (as "Client") under the Tram Supply Agreement; and

5.4.3 undertaking to Tramco to discharge all amounts payable to Tramco under the terms of the Tram Supply Agreement from the date on which such notice under this clause 5.4 is given to Tramco.

5.5 Upon compliance by **tie** with the requirements of clause 5.4, the Tram Supply Agreement shall continue in full force and effect as if the right of determination on the part of Tramco had not arisen and in all respects as if the Tram Supply Agreement had been made between **tie** and Tramco to the exclusion of Infraco.

5.6 Notwithstanding that as between Infraco and Tramco, Tramco's right of determination of its engagement under the Tram Supply Agreement may not have arisen, the provisions of clause 5.5 shall nevertheless apply if **tie** gives written notice to Tramco and Infraco to that effect and **tie** complies with the requirements on its part under clause 5.4.

5.7 Tramco does not need to be concerned or required to enquire whether, and shall be entitled to assume that, as between Infraco and **tie**, the circumstances have occurred permitting **tie** to give notice under clause 5.6.

5.8 Tramco acting in accordance with the provisions of this clause 5 shall not incur any liability to Infraco arising out of the exercise by **tie** of its rights under this clause 5.

5.9 Save as otherwise set out in this Agreement, unless and until **tie** has given notice under this clause 5:

5.9.1 **tie** has no liability whatsoever to Tramco in respect of amounts payable to Tramco under the Tram Supply Agreement; and

5.9.2 **tie** has no authority to issue any direction or instruction to Tramco in relation to the performance of Tramco's obligations under the Tram Supply Agreement.

5.10 Without prejudice to the provisions of clauses 5.1 to 5.9 inclusive, if prior to the service of any notice under clause 5.4 Tramco is determined under the Tram Supply Agreement for any reason whatsoever, Tramco shall, if required in writing so to do by **tie**, no later than 12 weeks after the date of such determination forthwith enter into a new agreement with **tie** on the same terms as the Tram Supply Agreement, but with such revisions as **tie** and Tramco may reasonable require to reflect altered circumstances and the fact that it is **tie** and not Infraco employing Tramco.

6. ASSIGNATION

6.1 Tramco shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of **tie**.

6.2 **tie** shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie**; or

6.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to Tramco) by **tie** or a person falling within clause 6.2.1; or

6.2.3 to City of Edinburgh Council or Transport Edinburgh Limited; or

6.2.4 to any other person with the prior written consent of Tramco (such consent not to be unreasonably withheld or delayed).

6.3 Tramco undertakes to **tie** not to contend in any court proceedings under this Agreement that any person to whom **tie** assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that **tie** is named under this Agreement or any intermediate assignee of **tie** escaped loss resulting from such breach by reason of the disposal of its interest in the same.

7. LIABILITY OF TRAMCO

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by law of contract, delict or otherwise.

7.2 The responsibility of Tramco under this Agreement is not to be reduced or in any way reduced or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

7.3 The rights and remedies conferred upon **tie** by this Agreement are in addition to any other rights and remedies that **tie** may have against Tramco including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of Tramco to **tie** is to be determined in all respects in accordance with the terms of the Tram Supply Agreement and this Agreement and, in the event of any claim by **tie** under or through this Agreement, Tramco shall be entitled to rely upon any defence, right, limitation or exclusion under the Tram Supply Agreement as though **tie** were named as Client under it, except that:

7.4.1 **tie** shall not be affected by any subsequent variation of the Tram Supply Agreement which would adversely affect the obligations owed by Tramco or the waiver, compromise or withdrawal of any claim made Infraco; and

7.4.2 Tramco shall not be entitled to exercise any right of set-off, retention or withholding against **tie** to which Tramco may be entitled as against Infraco.

7.5 The liability of Tramco under this Agreement shall be no greater in extent than the liability of Tramco under the Tram Supply Agreement.

7.6 In no event shall the Tram Supplier be responsible for indirect or consequential damages.

8. DELIVERY, TITLE TO PARTS AND OTHER PROPERTY

Notwithstanding any provision of the Tram Supply Agreement to the contrary, in respect of Tramco's performance of its obligations under the Tram Supply Agreement:

8.1 Tramco shall sell to **tie** or such other party as shall be notified by **tie** to Tramco in writing, each Tram free from all claims, charges, rights in security, liens, encumbrances, hypothecs and other third party rights of any nature.

8.2 Tramco shall transfer title:

8.2.1 to each Tram, to **tie** or such other party as shall be notified by **tie** to Tramco in writing, on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.2.2 to each item of the Tram Related Equipment to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment to Infraco and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.3 The risk of loss, theft, damage or destruction of:

8.3.1 each Tram shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing on the date of issue of the Certificate of Tram Delivery being issued in respect of that Tram;

8.3.2 each item of the Tram Related Equipment shall pass from Tramco to **tie** or such other party as notified by **tie** to Tramco in writing, on the later of delivery of each item of the Tram Related Equipment and the Certificate of Tram Commissioning being issued in respect of the first Tram.

8.4 Tramco shall be responsible for each Tram completely manufactured or in the course of manufacture and for all Tram Related Equipment until such time as risk in the Trams and the Tram Related Equipment passes to **tie** (or as **tie** otherwise shall direct) in accordance with this clause 8.

8.5 Tramco undertakes to **tie** that it shall promptly replace any Tram or any part, component or material incorporated in or to be used in connection with such Tram or any Tram Related Equipment, which is lost, damaged or destroyed by whatever cause, prior to such passing of risk.

9. CONSENT OF INFRACO

Infraco consents to the terms of this Agreement.

10. NOTICES

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by registered or recorded delivery post, is deemed to have been received 48 hours after being posted.

11. RIGHTS OF THIRD PARTIES

A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. INVALID TERMS

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. VARIATIONS AND WAIVERS TO BE IN WRITING

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. WAIVER

14.1 Save where expressly stated, no failure or delay by any Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do no operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 64 (*Dispute Resolution Procedure*) of the Tram Supply Agreement and the provisions of the said Clause 64 and Schedules 13 (*Dispute Resolution Procedure*) and 14 (*Panels to the Dispute Resolution Procedure*) are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" shall be deemed to refer to **tie** and Tramco, any reference to "Client" shall be deemed to refer to **tie**, and notices to be given in connection therewith shall be given in accordance with clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

NOVATION AGREEMENT ESCROW LETTER

DLA Piper Scotland LLP
Collins House
Rutland Square
EDINBURGH
EH1 2AA

[**Date**] 2008

Dear Sirs,

EDINBURGH TRAM NETWORK - TRAM SUPPLY AND TRAM MAINTENANCE AGREEMENTS

We refer to:

1. a Tram Supply Agreement dated ◆ between (1) **tie** Limited and (2) Construcciones Y Auxiliar De Ferrocarriles S.A. (CAF) for the design, manufacture and supply of Trams and the supply of documentation and associated equipment ("**Tram Supply Agreement**"); and

2. a Tram Maintenance Agreement dated ◆ between (1) **tie** Limited and (2) Construcciones Y Auxiliar De Ferrocarriles S.A. (CAF) for the provision of services for the ongoing maintenance of Trams and for the supply of consumables and spares for Trams ("**Tram Maintenance Agreement**").

We also refer to the documents detailed in Schedule 1 to this letter (items numbered 1 and 2 being referred to as the "**Novation Agreements**" and items 3 and 4 being referred to at the "**Collateral Warranties**") which have been signed by **tie** Limited and Construcciones Y Auxiliar De Ferrocarriles S.A. (CAF) (but which are as at today's date unsigned by Infraco) (as referred to below) (which shall be referred to as the "**Agreement Documents**").

Originals of the Agreement Documents are enclosed with this letter, and are to be held by you as escrow agent upon the following terms and conditions:

3. Whilst the Agreement Documents are held by you in escrow, they shall have no effect as between the parties thereto.

4. Upon **tie** Limited confirming to you in writing in the form set out in Schedule 2 that an agreement to be made between (1) **tie** Limited and (2) a contractor to be appointed by **tie** Limited ("**Infraco**") to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network ("**Infraco Contract**") has been executed by **tie** and Infraco in accordance with the Requirements of Writing (Scotland) Act 1995 and that the

Infraco Contract has become unconditional in all respects save only for the execution by Infraco of the Agreement Documents ("**Infraco Completion**"), you are thereupon authorised and directed forthwith:

to deliver the Agreement Documents to Infraco for execution by Infraco in accordance with the Requirements of Writing (Scotland) Act 1995. Delivery of documents hereunder is to be by hand, by courier or by recorded first-class post.

If you do not receive notice from **tie** Limited as aforesaid that Infraco Completion has occurred before the first anniversary of the date of this escrow letter, or such later date as may be agreed in writing by the parties to this escrow letter, you shall be under no further obligation to the signatories of this letter and none of the Agreement Documents shall have any legal effect.

All of the parties to this escrow letter agree that you shall be fully entitled to act in accordance with the terms set out in this escrow letter upon receipt by you of the notice from **tie** Limited referred to in paragraph 2 above, and that in so doing you shall have no liability to us (or any of us) in any respect whatsoever connected to the performance of your duties under this escrow letter. Furthermore, upon the performance of such duties in accordance with the terms of this escrow letter, you shall be irrevocably released from the obligations arising under this escrow letter.

Please sign the acknowledgement below confirming your agreement to the above terms.

Yours faithfully

They are subscribed for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

.....
Accepted and agreed:
DLA Piper Scotland LLP

SCHEDULE 1 OF THE NOVATION AGREEMENT ESCROW LETTER

AGREEMENT DOCUMENTS

Document No.	Document Description	Parties
	Tram Supply Agreement Novation Agreement	(1) **tie** Limited (2) Construcciones y Auxliliar de Ferrocarriles (CAF) (3) Bilfinger Berger UK Ltd and Siemens plc
	Tram Maintenance Agreement Novation Agreement	(1) **tie** Limited (2) Construcciones y Auxliliar de Ferrocarriles (CAF) (3) Bilfinger Berger UK Ltd and Siemens plc
	Tram Supply Agreement Collateral Warranty	(1) Construcciones y Auxliliar de Ferrocarriles (CAF) (2) **tie** Limited (3) Bilfinger Berger UK Ltd and Siemens plc
	Tram Maintenance Agreement Collateral Warranty	(1) Construcciones y Auxliliar de Ferrocarriles (CAF) (2) **tie** Limited (3) Bilfinger Berger UK Ltd and Siemens plc

They are subscribed for and on behalf of **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)**

at

on 2008 by:

Authorised Signatory _____

Full Name _____

They are subscribed for and on behalf of **TIE LIMITED** at

on 2008 by:

Authorised Signatory _____

Full Name _____

SCHEDULE 2 OF THE NOVATION AGREEMENT ESCROW LETTER

RELEASE LETTER

To: DLA Piper Scotland LLP
Collins House
Rutland Square
Edinburgh EH1 2AA

[Date] 200◆

We, **tie** Limited, refer to the escrow letter dated ◆ from us and Construcciones y Auxliliar de Ferrocarriles (CAF) to you and countersigned by you. Words and phrases defined in the escrow letter shall have the same meanings when used herein.

We hereby confirm to you, by reference to paragraph 2 of the escrow letter that Infraco Completion has taken place, and you are therefore hereby authorised and directed forthwith to deliver the Agreement Documents to Infraco for execution in accordance with the Requirements of Writing (Scotland) Act 1995 (by hand or courier or recorded first-class post) in accordance with paragraph 2 (a) of the escrow letter.

Director/Authorised Signatory,

For and on behalf of **tie** Limited

They are subscribed for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

They are subscribed for and on behalf of **TIE LIMITED** at

on 2008 by:

Authorised Signatory _____

Full Name

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 2 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 2

EMPLOYER'S REQUIREMENTS

This is Schedule 2 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 2

EMPLOYER'S REQUIREMENTS

SCHEDULE PART 2

EMPLOYER'S REQUIREMENTS

Erratum to Version 4

Erratum	Date	Comments
001	24/04/08	Page 48: Section 2.15: The footnote "Damian has already instructed this change." – is to be ignored.
002	24/04/08	Page 90: Section 7: The footnote "The word maximum would allow no channels to be provided and still be compliant! Two channels ok as a minimum." – is to be ignored.
003	24/04/08	Page 147: Section 10.1.5: The reference in the last sentence to Schedule 32 is incorrect. It should read "The Noise and Vibration Policy is included in Schedule Part 29 (***tie*** *and CEC Policies*)".
004	24/04/08	Page 174: Section 12.9 - The reference to Schedule 45 should refer to Schedule Part 40.
005	24/04/08	Page 209: Section 17.1: Last paragraph The reference to Section 32 should read Schedule Part 29. After Project Safety and Quality Interface Document add (40-91-PLA-002).
006	24/04/08	Page 273: Section 23.16.6 - Schedule 7 - Performance Regime is incorrect. This should now refer to Schedule Part 6.
007	24/04/08	Page 609: Section 40.1.2 – Final paragraph Performance payment regime – The reference to Schedule 7. This should now refer to Schedule Part 6.
008	24/04/08	Page 634: Section 40.2.4 Last line Reference to Clause 52 of Infraco should read as Clause 52.20.1.
009	24/04/08	Page 635: Section 40.2.4 Table 93 Fault Category 3 "Edqual Service elements in Schedule 7" should read "Equal Service elements in Schedule Part 6".
010	24/04/08	Page 645: Section 40.2.8 Last set of bullet points at bottom of page Reference to Schedule 7 Performance Measurement System should read as Schedule Part 6.
011	05/05/08	Page 40 Section 2.8 Table 2 reformatted to show entire contents (see attached)
012	05/05/08	Page 41 Section 2.8 Table 3 reformatted to show entire contents (see attached)
013	05/05/08	Page 42 Section 2.8 Table 4 reformatted to show entire contents (see attached)
014	05/05/08	Page 431 Section 29.14 Table 83 see updated version (see attached)
015	05/05/08	Page 610 Section 4.2.2 Table 89 see updated version (see attached)
016	05/05/08	Page 50 Section 2.16(b) 4th bullet - delete "Leith" and replace with "Ocean Terminal or Newhaven according to service"
017	05/05/08	Page 147 Section 10.1.7 - delete "Section 68 of the Edinburgh Tram Line Act 2006" and replace with "Section 63C of the Edinburgh Tram Line Act 2006"
018	05/05/08	Page 169 Section 12.8 Update reference to ISO 10005-1995 to ISO 10005-2005
019	05/05/08	Page 260 Section 23.13.3 - delete "Network" from section heading
020	05/05/08	Page 264 Section 23.14.3 - delete "Network" from section heading
021	05/05/08	Page 266 Section 23.15.3 - delete "Network" from section heading
022	05/05/08	Page 318 Section 24.5 Change reference to Schedule 22 of the Tram Supply Agreement to Schedule 23 of the Tram Supply Agreement
023	05/05/08	Page 318 Section 24.6 3rd paragraph should read "The Trams shall have a key suiting system that provides a logical hierarchy of access to cleaners, inspectors, drivers and maintenance staff. It shall not be part of the general suite but tram specific as detailed in Section 22.2.1 of these Employer's Requirements."

Erratum	Date	Comments
024	05/05/08	Page 622 Section 40.2.2 Table 92 Structures SO3 and SO4 - delete "(if CEC own it)" from the comments column
025	05/05/08	Page 625 Section 40.2.2 Table 92 Structures S20 to S31 - insert "the Operator is responsible for cleaning and graffiti removal" to the comments column
026	05/05/08	Page 627 Section 40.2.2 Table 92 Retaining Walls W03 to W19 - insert "the Operator is responsible for cleaning and graffiti removal" to the comments column
027	05/05/08	Page 632 Section 40.2.4 Final paragraph headed "**Further Maintenance Activities" -** delete bullet "removal of graffiti" and bullet "cleaning"
028	05/05/08	Page 644 Section 40.2.8 Under heading "Reporting Period Review", 4th bullet relating to maintenance report, sub-bullets 1 and 2 - delete "including cleaning"
029	05/05/08	Page 646 Section 40.2.10 3rd paragraph - delete "operational phase" and replace with "Term"
030	05/05/08	Page 652 Section 40.2.19 - delete section and insert "Not used"
031	05/05/08	Page 652 Section 40.2.20 - delete bullets 1 to 4, and 6
032	05/05/08	Page 662 Section 40.3.9 1st paragraph - delete "will be established in detail during the tender process" and replace with "in the Tram Maintenance Agreement"
033	05/05/08	Page 665 Section 40.4.1 9th paragraph 3rd sentence - replace with "The Edinburgh Tram Network design shall be selected such that all equipment/systems used in the design shall continue to be available for the design life specified and that the Infraco shall give tie a minimum of 12 months notice where any supplier intends to cease supply of any component. The Infraco shall recommend a strategy for managing such obsolescence and effect replacement of such components where these fail."
034	05/05/08	Page 672 Section 40.5.2 6th bullet - amend to read "evidence of product whole life cycle experience to date in other service use"
035	05/05/08	Appendix 1 – ET Brand Guidelines as referred to in Section 5 (see attached)

Employer's Requirements

Erratum 011

Table 2 (Page 40 Section 2.8)

Network / Phasing	Service frequency commencing at:	Monday - Friday (trams per hour)					
		first tram 06:00	06:45	07:00	07:20	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6	6[a]	0
1a	Ocean Terminal to Airport	6	6	6	6	6	0
1a	Haymarket to Newhaven	0	0	6	6	0	0
1a	Newhaven to Haymarket	0	0	0	6	0	0
1b	Airport to Ocean Terminal	0	6			6[a]	0
1b	Ocean Terminal to Airport	6	6			6	0
1b	Granton to Newhaven	0	6			6[b]	0
1b	Newhaven to Granton	6	6			6[c]	0

Network / Phasing	Service frequency commencing at:	Saturday (trams per hour)					
		first tram 06:00	06:45	07:30	07:50	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6	6[a]	0
1a	Ocean Terminal to Airport	6	6	6	6	6	0
1a	Haymarket to Newhaven	0	0	6	6	0	0
1a	Newhaven to Haymarket	0	0	0	6	0	0
1b	Airport to Ocean Terminal	0	6			6[a]	0
1b	Ocean Terminal to Airport	6	6			6	0
1b	Granton to Newhaven	0	6			6[b]	0
1b	Newhaven to Granton	6	6			6[c]	0

Network / Phasing	Service frequency commencing at:	Sunday (trams per hour)					
		first tram 07:00	07:45	08:00	08:20	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6	6[a]	0
1a	Ocean Terminal to Airport	6	6	6	6	6	0
1a	Haymarket to Newhaven	0	0	6	6	0	0
1a	Newhaven to Haymarket	0	0	0	6	0	0
1b	Airport to Ocean Terminal	0	6			6[a]	0
1b	Ocean Terminal to Airport	6	6			6	0
1b	Granton to Newhaven	0	6			6[b]	0
1b	Newhaven to Granton	6	6			6[c]	0

Notes:

[a] from approx 23:15 Trams run from the Airport - City Centre only

[b] from approx 23:15 Trams run from Granton - City Centre only

[c] from approx 23:15 Trams run from Newhaven - Haymarket continuing in service on TL2 to Gyle

Employer's Requirements

Erratum 012

Table 3 (Page 41 Section 2.8)

8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario

Networking (Phasing) and Service Frequency commencing at:		06:00	06:45	07:00	07:20	07:45	09:45	15:45	19:00	19:45	23:15
1a	Airport to Ocean Terminal	0	6	8	8	8	6	6	8	6	6a
1a	Ocean Terminal to Airport	6	6	8	8	8	6	6	8	6	6
1a	Haymarket to Newhaven	0	[redacted]	6	8	8	6	6	8	6	6
1a	Newhaven to Haymarket	0		0	6	8	6	6	8d	6	6
1b	Airport to Ocean Terminal	0	6	8	[redacted]	8	6	6	8	6	6a
1b	Ocean Terminal to Airport	6	6	8		8	6	6	8	6	6
1b	Granton to Haymarket	0	6	8		8	6	6	8	6	6 b
1b	Haymarket to Granton	6	6	8		8	6	6	8	6	6c

Networking (Phasing) andService Frequency commencing at:		Saturday (trams per hour) first tram 06:00	06:45	07:30	07:50	08:15	18:30	18:50	19:15	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	8	[redacted]	8	8	6	6a	0
1a	Ocean Terminal to Airport	6	6	6	8		8	8	6	6	0
1a	Haymarket to Newhaven	0	[redacted]	6	8		8	8	6	6	0
1a	Newhaven to Haymarket	0		0	6		8	8d	6	6	0
1b	Airport to Ocean Terminal	0	6	6	[redacted]	8	8	[redacted]	6	6a	0
1b	Ocean Terminal to Airport	6	6	6		8	8		6	6	0
1b	Granton to Haymarket	0	6	6		8	8		6	6b	0
1b	Haymarket to Granton	6	6	6		8	8		6	6c	0

Networking (Phasing) andService Frequency commencing at:		Sunday (trams per hour)									
		first tram 07:00	07:45	07:50	08:00	08:45	18:00	18:20	18:45	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6		6	6		6a	0
1a	Ocean Terminal to Airport	6	6	6	6		6	6		6	0
1a	Haymarket to Newhaven	0		6	6		6	6			0
1a	Newhaven to Haymarket	0		0	6		6	6d			0
1b	Airport to Ocean Terminal	0	6		6	6	6		6	6a	0
1b	Ocean Terminal to Airport	6	6		6	6	6		6	6	0
1b	Granton to Haymarket	0	6		6	6	6		6	6b	0
1b	Haymarket to Granton	6	6		6	6	6		6	6c	0

Notes:
a) from approx 23:15 trams run from Airport - St Andrew Sq only
b) from approx 23:15 trams run from Granton - St Andrew Sq only
c) from approx 23:15 Granton trams run from Newhaven - Haymarket continuing in service on to Gyle
d) from approx 19:20 (18:50 Saturdays and 18:20 Sundays) Haymarket trams running from Newhaven - Haymarket continue in service to Gyle

Note: The numbers in individual cells give the service frequency starting from the time at the top of the relevant column.

Employer's Requirements

Erratum 013

Table 4 (Page 42 Section 2.8)

Phase	Service Frequency	Saturday (trams per hour)					
	commencing at:	First tram 06:00	06:45	07:30	07:50	23:15	Last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6	6a	0
1a	Ocean Terminal to Airport	6	6	6	6	6	0
1a	Haymarket to Newhaven	0	0	6	6	0	0
1a	Newhaven to Haymarket	0	0	0	6	0	0
1b	Airport to Ocean Terminal	0	6	6	6	6a	0
1b	Ocean Terminal to Airport	6	6	6	6	6	0
1b	Granton to Newhaven	0	6	6	6	6b	0
1b	Newhaven to Granton	6	6	6	6	6c	0

Employer's Requirements

Erratum 014

Table 83 (Page 431 Section 29.14)

Table 83 - Depot Plant and Equipment to be Provided (updated 020508)

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
1		Cleaning Equipment										
	1.1	Tram Cleaning Equipment	Equipment for cleaning of tram interiors	110V Industrial vacuum cleaning equipment, ≥ 2kW power Equipment to allow removal Floor polishing equipment	P	Generally used in stabling areas However can be used throughout the Depot	T	O	O	O	O	6
	1.2	Tram pressure washer	Industrial washer for general tram cleaning within the Depot including bogie washing	Self powered Hot water/steam - self heating Pressure variable up to ≥200 bar Flow rate ≥12 l/min Lance and hose ≥10m Detergents compatible with Tram external finishes	M	Throughout Depot	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.3	Infraco pressure washer	Removal Removal of fly posters General cleaning	Features as per Tram pressure washer Mobile towable bowser with capacity for up to one shift of cleaning Infraco to ensure interchangability with tram pressure washer Readily transportable on back of road-rail and other road vehicles	M	Across the ETN	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.4	Tram Washing Plant	Fixed plant for cleaning of Tram exterior	Unidirectional >15 tph continuously Minimised water consumption, maximised water recirculation controllable and monitored from Control Centre via SCADA system Self contained Pre-wet One pair application brushes Automatic end wash Two pair water wash brushes Dryer Operates from -5°C ambient external temperature within shelter Final details TBD with tram supplier ≥70% water recycling	F	Alongside main workshop	I	O	O	O	O	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Backflow prevention devices shall be installed. Treatment of wastewater to meet appropriate standards prior to connecting to site drainage system shall be provided.								
	1.5	Rail Groove Cleaning Equipment	P-way cleaning	Vacuum equipment to remove detritus/debris from grooved track including drain boxes and points Able to clean drains and gullies employing water jets Transportable on road/rail vehicle, lifted with crane or fork lift truck	M	Across the ETN	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Self powered for full shift Easy collection/disposal of detritus/debris								
	1.6	Parts washer	Infrastructure/Tram component cleaning & degreasing in dirty workshop	Able to wash components ≤100kg, ≤750mm diameter	F	Within dirty workshop	I	I/T	I	I	User	1
	1.7	Floor scrubber	Depot floor cleaning	Industrial vacuum/brush scrubber equipment Compatible with floor finishes	M	Within Depot building	T	T	T	T	T	1
2		Mechanical Handling										
	2.1	Shunter	Manouveuring Trams within workshop	Battery powered Road/rail capability Capable of towing/propelling single Trams Speed up to 3 km/h Local and remote control	M	Throughout Depot tracks Road capability to move between tracks on	T	O/T	~~I/~~T	O	User	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Charging facilities Coupler at each end		hardstanding						
	2.2	Tram lifting system and stands	Lifting Trams to allow routine maintenance and removal of bogie(s)	Fixed underfloor system providing flush floor when not in use. Ability to lift fully functional, unladen tram. Synchronised lift from single control panel. Ability to stop and lock lift at any vertical positionInterlocking to protect Tram in event of system/component failure. Manually positioned stands to be provided Interlocking with OLE if required.	F	Main workshop	I	T	T	T	T	1 set

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	2.3	Fixed high level access platforms	To allow access to all equipment mounted on Tram roof	Capable of providing access to all roof mounted equipment on tram Decking to prevent tools or small to components falling through Handrails and toeboards to prevent personnel/material falling Access/egress gates interlocked with OLE End protection	F	Main workshop	I	T	I	T	T	2 sets
	2.4	Overhead crane	Bridge type crane spanning 2 roads within the workshop to allow all material within main workshop to be transported up to and including size/weight of motor bogie	≥6.3 tonne capacity Vertical clearance <960 mm from hook (fully raised) to top of crane Traverses below OLE Interlocked with OLE Remote control using hand held device	F	Main workshop	I	T/I	T	T	User	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Multi-speed faciltiy - lift, traverse and travel Long and cross travel to cover all areas over the two roads								
	2.5	Mobile crane	Facilitate removal of miscellaneous equipment including bogie components within the dirty workshop	≥2t capacity Powered operation	M	Throughout workshops	T	T/I	T	T	User	1
	2.6	Bogie workstands	To allow dismounted bogies to be maintained	Allows bogie to be manoeuvred along the stub track in the dirty workshop Wheel locks Capable of supporting both trailer and motor bogie	M	Dirty workshop	T	T	T	T	T	1
	2.7	Other tram equipment stands	Various stands to allow items of equipment to be stored and readily maintained when dismounted from the Tram	Infraco to propose depending on tram design Expected to include stands for doors,	M	Throughout Depot	T	T	T	T	T	

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				windows, body panels etc…								
	2.8	Accommodation bogies	To allow Trams to be moved within workshop once bogies have been removed or the Tram has been split at any articulation	Allows Tram to be manoeuvred throughout the depot once any combination of bogies has been replaced Allows entire tram to be manoeuvred throughout the depot once any articulation has been split	M	Throughout Depot	T	T	T	T	T	
	2.9	Fork lift truck	Lifting and transporting miscellaneous equipment	Battery powered Charging facilities Road wheels >3 t lifting capacity Drum handling equipment Crane arm Capable of accessing	M	Throughout the Depot but limited to hard standing areas when outside	T & I	T/I	T & ~~/~~I	T & I	User	1 plus 1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				all shelving and racking in stores- Infraco to demonstrate								
	2.10	Pallet truck	Lifting & Transporting equipment particularly in stores	Manually manoeuvred, hydraulic lifting the Infraco to propose requirements. Infraco to provide integrated solution	M	Throughout the Depot but limited to hard standing areas when outside	I	T/I	T/I	T	User	The Infraco to propose
	2.11	Hand trolleys	Transporting tools and spares	Unpowered the Infraco to propose requirements. Infraco to provide integrated solution	M	Throughout the Depot but limited to hard standing areas when outside	I	T/I	T/I	T	User	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	2.12	Infraco lifting slings	General slings for lifting infrastructure heavy components on system and in Depot building	Infraco to propose. Stand for storage	P	Use on system infrastructure	I	I	I	I	I	The Infraco to propose
	2.13	Tram lifting slings	Specific lifting gear to allow all equipment to be removed and replaced.	Raised hook on overhead crane can be no more than 5390 mm ARL the Infraco to propose Stand for storage	M	Use in Depot building only	T	T	T	T	T	Tramco to propose
	2.14	Windscreen/window removal equipment	For use in replacing tram windscreens and side windows	Mobile stand capable to being used to access both windscreen and side windows Electrically powered vacuum beam with suckers adapted to windscreen design Audio/visual alarm in the event of suction loss	M	Use in Depot building only	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	2.15	Re-railing equipment	For use in re-railing trams out on the System	Variety of jacks/beams/slides to be proposed by the Infraco Airbags Slew locking devices Capable of being readily transported on the road/rail vehicle	M	Used any where on system including Tramstops	T	T	T	T	T	1 set
	2.15	Stop boards	To indicate the presence of equipment/personnel/trams on the tracks	The Infraco to propose requirements. Infraco to develop integrated solution	P	Throughout System	I	T/I	I	T/I	User	≥20
3		Workshop & Stores Furniture										
	3.1	Shelving and racking	Storage of spares and other material	Heavy duty The Infraco to propose requirements. The Infraco to develop integrated solution	F	Stores	I	T/I	I	T/I	User	The Infraco to propose
	3.2	Tram staging	for Tram inspections/repairs	The Infraco to propose any	M	Used within Depot	T	T	T	T	T	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				additional staging required		building						
	3.3	General staging	For infrastructure inspections/repairs	The Infraco to propose any additional staging required	M	Across Edinburgh Tram Network	I	I	I	I	I	The Infraco to propose
	3.4	Shelving	Storage of minor items/documents	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose
	3.5	Workbenches	Equipment maintenance	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose
	3.6	Cupboards	Storage of minor items/documents	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose
	3.7	COSHH cupboard	Storage of COSHH items	The Infraco to propose requirements. The	F	Dirty workshop	I	T/I	I	T/I	user	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Infraco to develop integrated solution								
	3.8	Workshop stools	Personnel comfort when working	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	T/I	T/I	User	The Infraco to propose
4		Fixed Plant										
	4.1	Air conditioning maintenance equipment	Specialist tools for filling/emptying refrigerant	The Infraco to propose	F	Anywhere in Depot building	T/I	T/I	T/I	T/I	T/I	The Infraco to propose
	4.2	Tyre replacement equipment	Specialist tools for tyre splitting/removal/balancing /bearing replacement	The Infraco to propose	F	Dirty workshop	T	T	T	T	T	1
	4.3	Underfloor wheel lathe	In-situ reprofiling of Tram tyres	Capable of producing a range of wheel profiles. Tolerances to be agreed between the Infraco Swarf conveyed to skip for removal by means of forklift truck capable of turning all wheels on one Tram within	F	Within Depot building.	I	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				eight hour shift								
	4.4	Sand Plant	Refilling of Tram sanding equipment	Minimum silo capacity 30 tonnes Capable of receiving sand delivery directly from road vehicle Allows Tram driver to fill an empty tram within 5 minutes Rate of fill to be sustainable for 30 minutes. In no circumstances shall the interval between the filling of two Trams exceed 10 minutes The physical condition of the sand shall not deteriorate when stored Sand deliveries to a	F	Dedicated facility	T	O	O	O	~~I~~T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Tram shall stop automatically when the tram sand box is full Sand filling nozzles to be compatible with the sand filling inlets on the trams Signal interlocking to inhibit the movement of a tram if the sand filling nozzles are not returned to their correct storage position.								
	4.5	Machine tools	General machine tools required for maintenance	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Dirty workshop	I	T/I	T/I	T/I	User	The Infraco to propose
	4.6	Paint booth	Respraying of removable Tram panels	For use with water based paints integrated compressor	F	Outside workshop	T	T/I	T/I	T	User	1
	4.7	Pantograph	to calibrates and align	The Infraco to	F	Throughout	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
		maintenance & load test jig	tram pantograph off Tram roof	propose		workshops						
	4.8	Suspension setting equipment	To allow suspension to be set/shimmed without using tram lift	The Infraco to propose	M	Throughout workshops	T	T	T	T	T	1
	4.9	Diesel generator	Back up power source	Capable of connection to the depot LV switchboard and other plant requiring an external energy source. Capable of providing at least three day continuous operation.	M	Across network	*	I, T & O	~~I~~*	I		*To be rented by the Operator if and when required.
5		Hand & Mobile Tools										
	5.1	Infrastructure tools	Hand tools	The Infraco to propose	P	Across ETN	I	I	I	I	I	The Infraco to propose
	5.2	Tram tools	Hand tools	The Infraco to propose	P	Across ETN	T	T	T	T	T	Tramco to propose
6		Welding Shop Equipment										
	6.1	Ferrous welding equipment	General infrastructure repairs	The Infraco to propose requirements. Infraco	F	Dirty workshop	I	T/I	I	T/I	User	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				to develop integrated solution								
	6.2	Aluminium welding equipment	Specialist Tram and Tram shelter repairs	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Dirty workshop	I	T/I	I	T/I	Us er	The Infraco to propose
7		Battery Shop Equipment										
	7.1	Tram battery charger	To recharge Tram Batteries	The Infraco to propose	P	Battery room	T	T	T	T	T	The Infraco to propose
	7.2	Infrastructure battery chargers	To recharge various batteries used in power supply, control and comms equipment	The Infraco to propose and develop solution compatible with tram battery charger	P	Battery room	I	T	T	T	T	The Infraco to propose
8		Instrumentation and Test Equipment										
	8.1	Tram test equipment	To allow testing of measurement and testing of tram equipment	The Infraco to propose. Note any overlap with "Special Tools" to be highlighted. As a minimum, proposal to	M/P	The Infraco to propose	T	T	T	T	T	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				include; headlight tester, tools to allow event recorder to be downloaded and interrogated, tools to allow CCTV systems to be downloaded and interrogated, tools to allow PA and PID announcements to be re-configured.								
	8.2	Infrastructure and Fixed systems test equipment	To allow measurement and testing of infrastructure and fixed systems	The Infraco to propose. Note any overlap with "Special Tools" to be highlighted as a minimum, proposal to include; OLE height and stagger gauge, stray current data loggers, noise measurement equipment, ride measurement equipment, point	M/P	The Infraco to propose	I	I	I	I	I	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				setting detection equipment, ≥3 sets of live line testing equipment								
9		Infrastructure Maintenance Equipment										
	9.1	Portable P&C grinders	To dress points and crossings	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.2	Track welding equipment	to build up profiles/replace sections of track	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.3	Portable tamping equipment	To build up track ballast to realign track	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.3	Portable lighting equipment	To illuminate work/collision sites	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.4	Portable generators	To power site tools/lights	The Infraco to propose	P	On Site	I	I	I	I	I	2
	9.5	Track measuring Equipment	To allow track line and levels to be measured	The Infraco to propose	P	On site	I	I	I	I	I	1 set
10		Road Vehicles										

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	10.1	Road - rail vehicle	To move about the system carrying mobile equipment and personnel	Able to operate on UK roads Able to operate on all parts of the ETN To be equipped with demountable ≥2 man-basket to enable OLE inspection throughout the ETN Capable of towing a tram including ability to apply tram brakes from cab of road-rail vehicle Capable of having snow plough attached in both road and rail mode Crane with capacity ≥6t and a reach (reduced capacity) of at least 4m. Able to transport other equipment items as set out elsewhere in	M	Mobile throughout ETN and road network	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				this list Able to transport ≥3 personnel in cab Payload capability ≥10t This will make it a requirement that the driver has a LGV driving license. Powered winch with ≥8t pulling capacity								
	10.2	Other road vehicles	Miscellaneous vehicles to be proposed by Infraco	The Infraco to propose	M	Throughout road network	I	I	I	I	I	The Infraco to propose
	10.3	Road/rail trailer	Trailer with large man lift for OLE inspection/repairs	Capable of being towed to site by road/rail vehicle or truck	M	Throughout road network	I	I	I	I	I	1

Employer's Requirements

Erratum 015

Table 89 (Page 610 Section 4.2.2)

Table 89 – Infrastructure and Equipment Responsibilities Allocation Matrix

(updated 020508)

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Tram Stop Structure																
Platform surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Platform Inclined Approach		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Canopy		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Inside surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Internal Roof surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External Roof surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Integral Lighting		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Internal seating		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Stop Furnishings																
Stop Name Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Static Information Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Guard Rails/Barriers (as applicable)		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Lighting Columns		N/A	N/A	N/A	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✓
Lighting Lanterns		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Litter Bins		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External seating		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Platform Edge White Line		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Advertising Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Stop Equipment																
CCTV Cameras		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Public Address		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓

Loudspeakers																
Hearing Loops		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Passenger Information Displays		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Passenger Alarm/Help points		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Ticket Vending Machines (maintained & serviced by TEL)		N/A	N/A	N/A	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓
Drainage (Interface defined in Table 93)		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓
Trackside Equipments																
Stop Equipment Cabinets		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Stop Equipment Cabinet Equipment		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Traction Isolator Cabinets		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Traction Isolator Cabinet Equipment		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Point Control Cabinets		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Point Control Cabinet Equipment		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Point Heater Cabinets, Point Heaters & Controls		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Road Junction Cabinets		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗
Road Junction Cabinet Equipment		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗
Point Machines (including Manual Control)		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
OLE Contact Wire & Supports		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
OLE Poles		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
OLE Pole mounted Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
OLE Wall Fixings		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
OLE Wall fixed Equipment		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Tram Signal Heads (Roadside)		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓

Tram Signal Posts (Trackside)		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Signals Posts		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Detector Loops		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Lighting on OLE Masts		N/A	N/A	N/A	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
Trackside cable ducts		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Trackside cables		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Cable drawpits		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Structures (Bridges, Retaining Walls etc)																
Over Bridges See Table 95 for split		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓
Under bridges See Table 95 for split		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓
Retaining walls		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Misc Structures		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Swept Path		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Swept Path Markings		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Track																
Trackwork		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Points & Crossings		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Track Drainage		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Field' Stray Current Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Sub Stations																
Sub Station Buildings		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Sub Station Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Sub Station Compounds		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Sub Station Parking Facilities		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Stray Current Monitoring Points		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Stray Current Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Earthing Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Trams																
Free issue' tram mounted equipments		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Trams		N/A	N/A	N/A	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✓

Tram saloon & Drivers cabs		N/A	N/A	N/A	✗	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✓
Radio																
Portable radios		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Radio Base stations		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Landscaping																
Soft landscaping		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Hard Landscaping		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓

Floor	Room No.	Description	User Competence Assessor	Used by			Cleaned by			Maintained by			Access Controlled by		
				Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**
Stores, Workshops and Maintenance Area															
Ground Floor Level		Stores Office Centrally located	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✔	✘
		Heavy Store (Infraco)		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Heavy store (Tramco)		✘	✔	✘	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Visitors Entrance Hall	n.a	✔	✔	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔
		Workshop Cleaners Room	n.a	✔	✔	✘	✘	✔	✘	✔	✘	✘	✔	✔	✘
		Light Store (Infraco)		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Light Store (Tramco)		✘	✔	✘	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Infrastructure Workshop		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Dirty Workshop / Machine Shop		✘	✔	✘	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Clean Workshop (Infraco)		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Clean workshop (Tramco)		✘	✔	✘	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Lobby	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Male Toilets	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Male Showers	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Female Toilets	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Female Showers	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Staff Corridor	n.a	✔	✔	✔	✘	✘	✔	✔	✘	✘	✘	✘	✘
		Infrastructure Admin	n.a	✔	✘	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Maintenance (Tramco) Admin	n.a	✘	✔	✘	✘	✘	✔	✔	✘	✘	✘	✔	✘
		First Aid	n.a	✔	✔	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔
		Switchroom		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Infrastructure Manager	n.a	✔	✘	✘	✘	✘	✔	✔	✘	✘	✔	✘	✘
		Maintenance (Tramco) Manager	n.a	✘	✔	✘	✘	✘	✔	✔	✘	✘	✘	✔	✘
		Store Room (Cleaners?)	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✘	✘	✘
		Staff Entrance Hall	n.a	✔	✔	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔
		Drying Room	n.a	✔	✔	✘	✘	✘	✔	✔	✘	✘	✔	✔	✘
		Tram Batteries		✘	✔	✘	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Equipment Room		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		UPS Room		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘

Floor	Room No.	Description	User Competence Assessor	Used by			Cleaned by			Maintained by			Access Controlled by		
				Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**	Infraco	Tram Maintainer	**Transdev**
		Compressor Room - Air tools		✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
		Tram Maintenance Area		✘	✔	✔	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Maintenance Area Transit Zone		✔	✔	✔	✘	✔	✘	✔	✘	✘	✘	✔	✘
		Inspection Pits		✘	✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘
First Floor office accommodation			n.a	✘	✘	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔
Furnishings - Used, Cleaned, Maintained and Controlled as appropriate															
Chairs, Desks, Tables, Filing cabinets etc			**As Appropriate**	✘	✘	✔	✘	✘	✔	✔	✔	✔	✔	✔	✔
Kitchen and Catering Equipment				✘	✘	✔	✘	✘	✔	✔	✔	✔	✔	✔	✔
Reception Desk & Furnishings				✘	✘	✔	✘	✘	✔	✔	✔	✔	✔	✔	✔
Control Room Furnishings				✘	✘	✔	✘	✘	✔	✔	✘	✔	✘	✘	✔
Lockers, Coat Rails etc				✘	✘	✔	✘	✘	✔	✔	✔	✔	✔	✔	✔
Training Room furnishings (Projector, Screen etc)				✘	✘	✔	✘	✘	✔	✔	✔	✔	✔	✔	✔
External															
Depot Yard				✘	✘	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔
Depot Stabling Area				✘	✘	✔	✔	✔	✔	✔	✘	✘	✘	✘	✔
Electrical Sub Station				✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
Power Energy Building (Electric, Gas etc)				✔	✘	✘	✔	✘	✘	✔	✘	✘	✔	✘	✘
Depot Car Park				✘	✘	✔	✘	✘	✔	✔	✘	✘	✘	✘	✔

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Miscellaneous																
Communication & Control links		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓

	LEGEND
	Provided by Tram Maintainer
	Provided by the Infraco
✓	Responsible
✗	Not Responsible

Employer's Requirements

Erratum 035

Appendix 1 – ET Brand Guidelines

BRAND GUIDELINES JANUARY 2008

Edinburgh Trams

TIE00899940_0236

Welcome to the Edinburgh Trams brand.

The Edinburgh Trams brand plays a crucial part in our communications with our customers and in creating a strong, memorable and recognisable image for the system. The brand has been specifically developed to sit alongside Lothian Buses as part of a co-ordinated presentation of public transport in Edinburgh.
For the strategy to succeed it is vital that all those involved in the delivery and service of the system adhere to the guidelines contained in this manual.
This will ensure that the Edinburgh Trams brand remains coherent and consistent. It is a well known fact that a well managed and consistently implemented brand helps inspire public confidence and trust.
By working within these guidelines you will help contribute to that process.

Phil Wheeler

Convener, Transport, Infrastructure and Environment
City of Edinburgh Council

Willie Gallaher
Chairman tie

David Mackay
Chairman TEL

Introduction

The elements and architecture of the Edinburgh Trams brand draw heavily from the Lothian Buses identity. This is to reinforce the strategy that has been adopted to create a genuinely integrated public transport system for Edinburgh.

Colours, typography and graphics are consistent between the two modes and are immediately recognisable as 'family members'.

The contents of this manual define how the branding must be implemented if the integrity of the visual relationship between the two modes is to be maintained.

In essence the branding is clean, simple and easy to understand - precisely the values the tram service provides.

Glossary

The key terms used in this document are as follows:

The Mark

A combination of the harlequins, the logotype and the red block.

The Logotype

The text of Edinburgh Trams set in Swiss 721BT. The logotype is used with the harlequins and the block in fixed relationships to form marks.

The Exclusion Zone

The minimum area around marks or logotypes that must be kept free of other graphic elements. This is to ensure that they are reproduced clearly and legibly without interference from other visual devices.

Guide to using the Mark

This page describes how the mark and the red block should be used.

Some simple rules are:

1. Never extend the red block unless the extended width of the red block to the left is more than 2 times the width of the mark and the extensions bleed off the page or media as illustrated by the header above. The extension to the right edge of the media should be half the width of the mark.

2. The red block should never be reduced in height when part of the mark alone but can be extended in height when the width is extended subject to rule 1.

3. The height should only be extended if the block is to bleed off the page or media.

Colour Glossary

To assist those who are involved in reproducing the Edinburgh Trams identity we have described here the primary specifications for print, screen and paint.

Print

PMS
This is short for the Pantone Matching System. This system is used to specify proprietary 'spot' colours. Spot colours are individually mixed for printing.

The letter 'C' after the colour number shows a colour's appearance on coated paper stock. The letter 'U' after the number shows a colour's appearance on uncoated paper stock.

CMYK
These initials represent the colours used in the four colour printing process: Cyan, Magenta, Yellow and Black (Kohl). Different combinations and percentages of these four colours are used to make matches to the 'spot' colours.

Screen

RGB
This is short for Red, Green, Blue the primary colours of light. RGB is used for reproduction on screens and electronic display systems.

Web
To make colours that can be reproduced on internet and intranet sites, Web safe colours should be specified. Web safe colours provide a greater degree of consistency than RGB colours when there is no control over the equipment used to view the site.

Paint

NCS
This is short for Natural Color System. NCS provides a wide range of colour specifications applicable to paints and other materials.

Other systems such as RAL and British Standard BS4800 have a limited number of Edinburgh Trams colour matches. Approval needs to be sought before using these systems.

Typography

We have two fonts: Humanist 521BT for general use and Swiss 721 BT which is only used to create the Logotype.

Only Roman, Bold and Light versions of Humanist 521 should be used with italic versions as appropriate.

Humanist 521 BT

Roman Aa

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890

Bold Aa

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890

Light Aa

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890

Mark usage

The mark shown here is the only acceptable version to be used.

No other colours should be used and the mark should never be stretched or the proportions altered in any way.

Mark usage

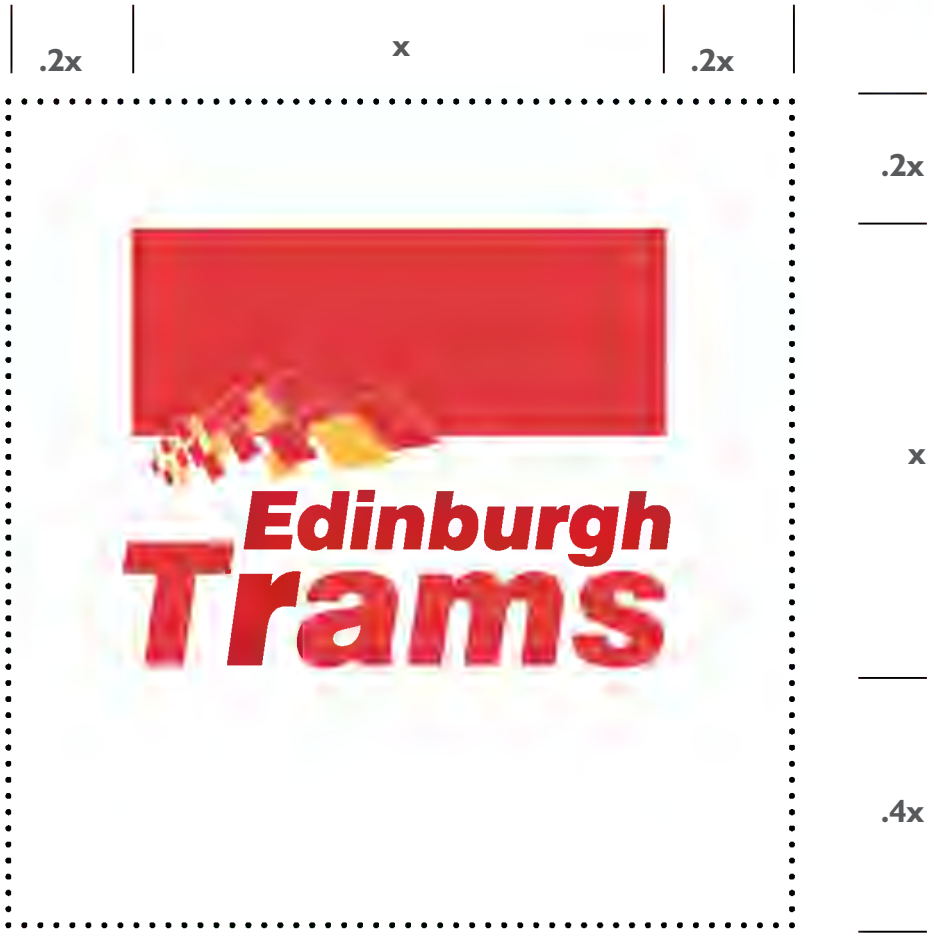
When using a single colour mark the version on the right shows how to reverse out of white while the version on the left demonstrates reversing from black or another colour.

Mark usage

Another option when using a single colour mark, for example when positioned over an image as illustrated here, is to use a transparent mark.

Exclusion Zone

The dotted line indicates the zone into which no other graphic devices should be placed.

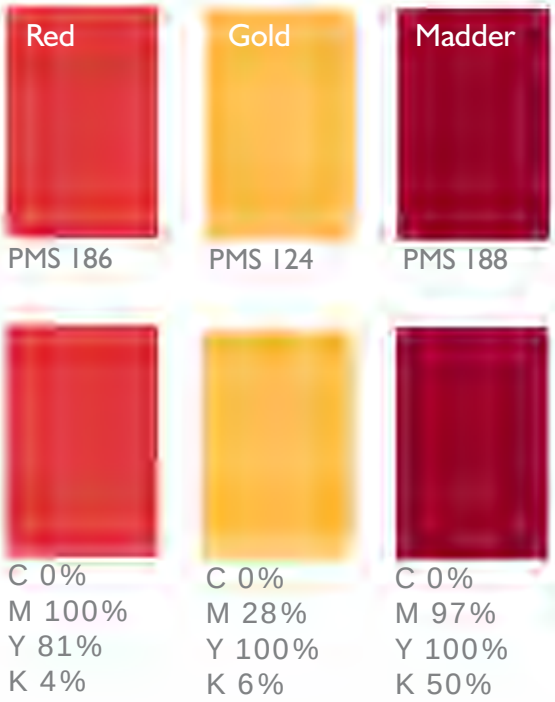


Colours

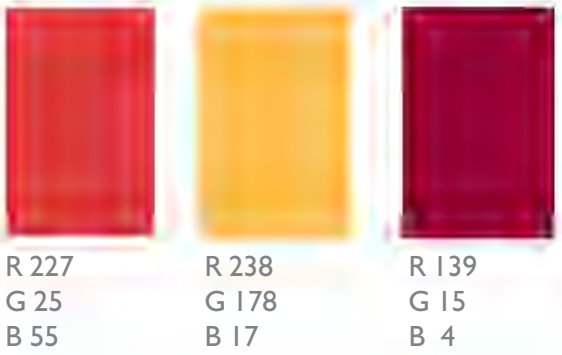
Three core colours make up the brand palette:
Red
Gold
Madder

In certain circumstances gold metallic ink in the form of PMS 873 can be used.

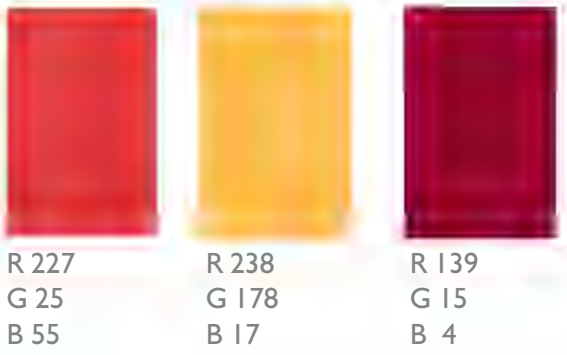
Print



Screen



Web



Stationery

Letterheads should follow the layout and formatting shown here. Guidance on fonts is provided in the typography section.

Edinburgh Trams

Mr G. McCluskey
19 Williams Street
Edinburgh
EH12 9QT

24th November 2007

Our ref: ETL/1234

Dear Mr McCluskey

Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exercitation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputatevelit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi.

Yours sincerely

Andrew McKinnon

Operations Director

Edinburgh Trams Limited
City Point
Haymarket Terrace
Edinburgh
EH1 7YU

T : 0131 226 7896
F : 0131 226 7897
e mail info@tramsforedinburgh.com

Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod

Stationery

Business cards follow the same format as the letterhead.

Marketing

The examples we show here illustrate the basic image and values the Edinburgh Tram brand should convey:

Clean

Simple

Easily understood

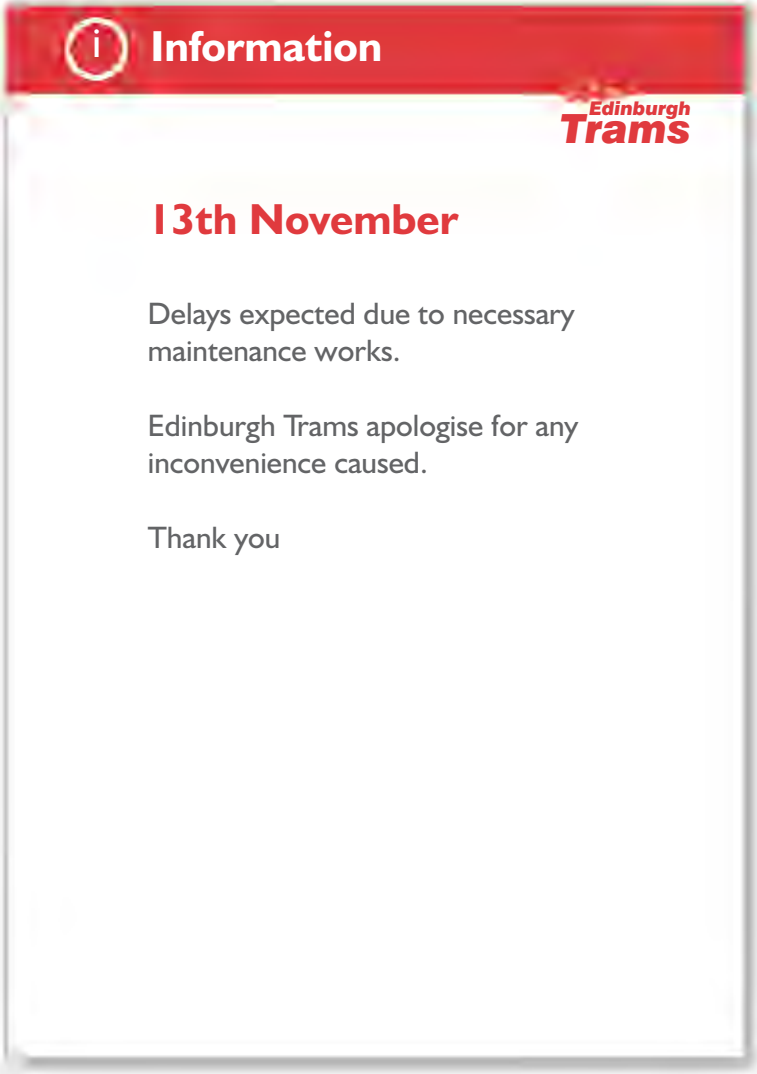
Passenger information

Again information should follow the 3 basic rules:

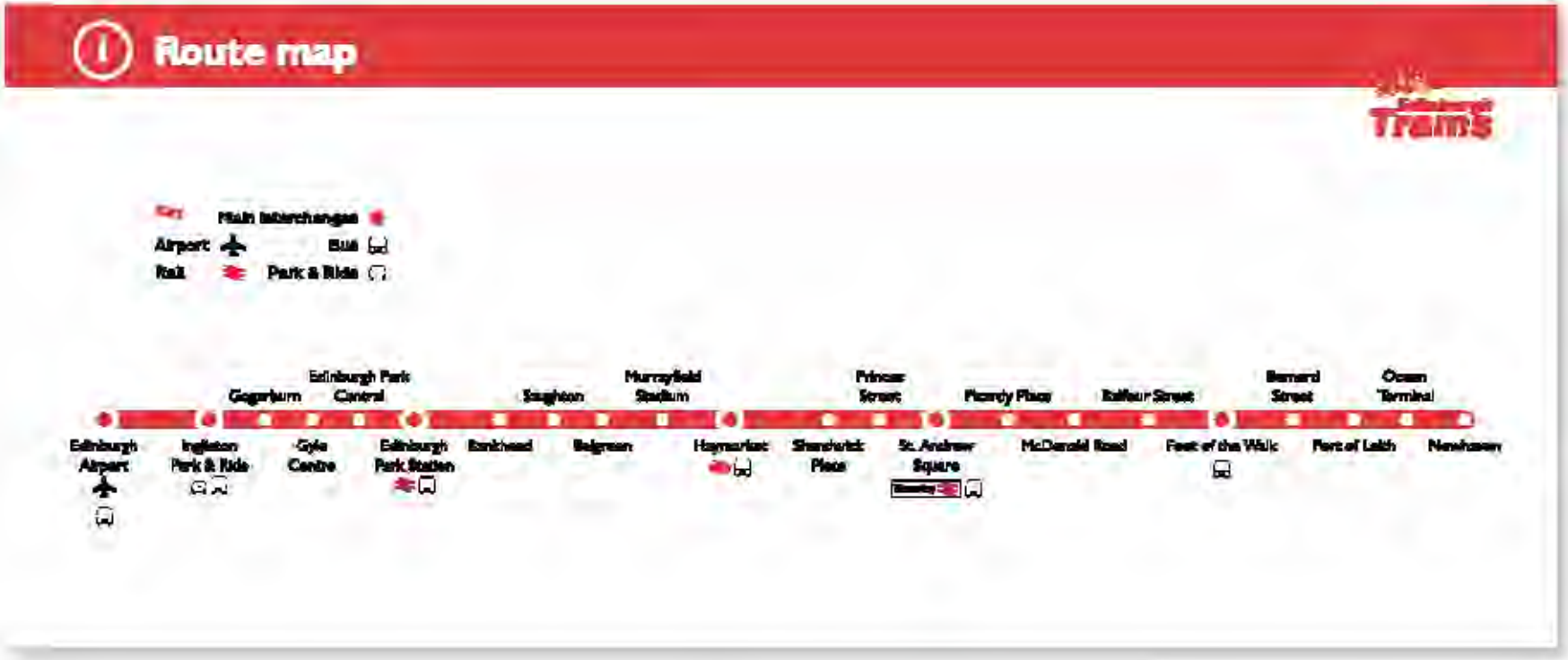
Clean

Simple

Easily understood



Passenger information



Web site

The web site should share the same layout and ‘feel’ as its sister site for Lothian Buses.

Consistency in navigation and layout help to reinforce the integrated transport concept.

Pictograms

Informational pictograms

Statutory pictograms

Directional pictograms

Space Bar Sample of Space Bar position

External design

Reinforcing the strategy of creating a visually integrated public transport system for Edinburgh, the tram livery draws from the Lothian Bus livery. Some modifications have been made in order to satisfy the Rail Vehicle Accessibility Regulations (RVAR) such as the red door colour that provides the required contrast of the doors from the tram body.

Colours follow the Brand palette with the exception of the 'gold' where, on the livery only, a gold vinyl is to be used as on Lothian Buses and not by using the specifications in this document.

Four designated advertising zones have been identified to control the revenue generating advertising presence that the business plan requires. Two trams have been allocated for 'all over' advertising and they will be subject to a strict, separate, design protocol.

Interior

As with the exterior the tram interior will use some of the same colours and finishes to be found on the buses. These will have to be adapted to ensure compliance with RVAR as there are strict technical guidelines on issues such as colour contrast based on Light Reflection Factors which affects all the visible surfaces within the vehicle. Compliance with RVAR is a legal requirement and the end result will be determined in consultation with the DfT Mobility Unit.

The image opposite is an early iteration of the proposed tram interior and will be developed through the process described above.

Tram stops

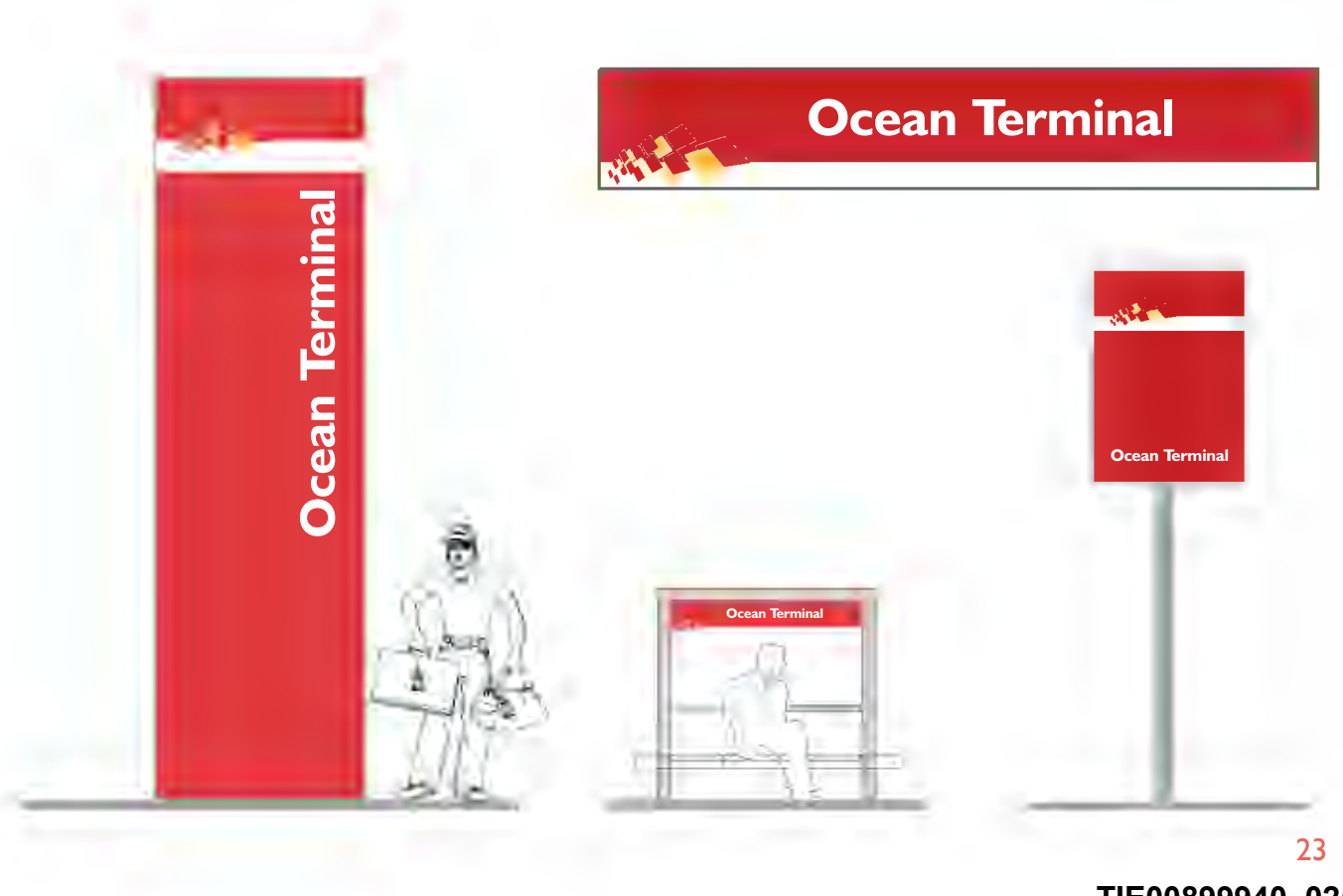
The finishes of the tram stop elements are generally of a neutral colouration.
The introduction of the Edinburgh Trams' key red as a highlight colour should therefore be used sparingly and appropriately as indicated here. The red has been introduced as an integral, functioning part of the shelter structure and serves to carry the high level stop sign. Elsewhere the red is introduced as signage or through information points.

Subtle use of the harlequins can be made on such areas as glazing manifestation as illustrated here. A further example of using the branding in a functional, rather than superficial, way.

Signage

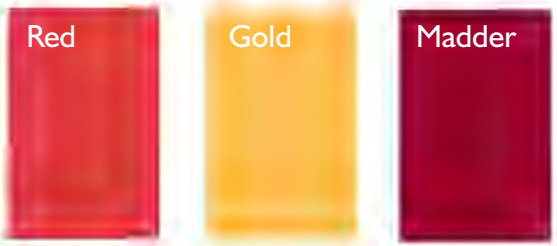
The signage concept has been conceived to create strong, highly visible and legible points of reference and information.

As part of the tramstop elements they follow the principle of introducing the Edinburgh Trams key red in a controlled, functional manner whilst reinforcing the identity and aiding recognition.



Colours

The red, madder and gold are freely available in a variety of finishes such as paint and powder coating by using the RAL specification here.



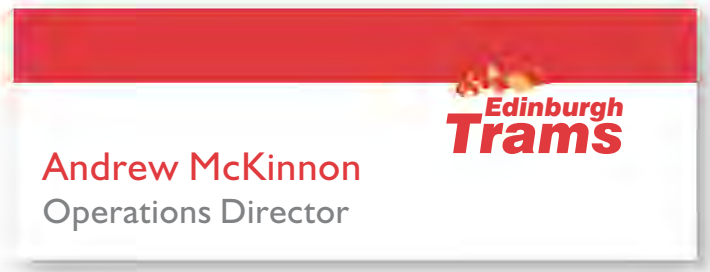
Uniforms

To assist those who are involved in procuring the staff uniforms the following images are intended as a simple guide to make sure the image conveyed through the uniforms is consistent with other areas of the brand's application.

By keeping the uniforms neutral the key red can then be introduced as a detail. As with other elements of the system the red should be used sparingly as shown here.

Name badges

Name badges follow the guidelines established for communications.



Contacts

For assistance with any aspect of the contents of these guidelines please contact either:

Jen Johnston
tie limited
Citypoint
65 Haymarket Terrace
Edinburgh
EH12 5HD

Tel: 0131 622 8330
Fax: 0131 622 8301
e mail: jen.johnston@tramsforedinburgh.com

or

Iain Coupar
Marketing Director
Transport Edinburgh
55 Annandale Street
Edinburgh
EH7 4AZ

Tel: 0131 554 4494
Fax: 0131 554 3942
e mail: icoupar@transportedinburgh.com

This is Schedule 2 referred to in the foregoing Agreement between tie and the Tram Maintainer

SCHEDULE 2

Employer's Requirements

Part 1: Employer's Requirements

See Separate Volume V4.0

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40.5.1	General	681	✓
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40.5.5	Provisional List of Operating Procedures and Standards	687	✓

Document Management Sheet – Employer's Requirements

3.6	Version updated to include: 1) Legal alignment changes agreed on meeting at Tuesday 11.03.08 2) Technical adjustments by RK and AS 3) CEC changes that resulted from their review 4) Revised s26	14/03/08	14/03/08		
3.6a	Version updated to include: 5) Revised s28.13 6) Revised s23 7) Ref check – not complete. 8) Incorporation of DLA (SF) checks. 9) Depot Scope changes.	19/03/08	19/03/08	SH	
3.6b	Updated as per Pinsents comments 03.04.08	03.04.08		MC/SH	
3.6b	For issue	07.04.08	07.04.08	SH	GG/SB
4.0	Final	16.04.08	16.04.08	SH	GG/SB
Version	Summary	Date	Modified	Checked	Approved

Trams for Edinburgh

..connecting our Capital

Edinburgh Tram Network

Employer's Requirements

Edition: v4.0 April 2008

V 4.0

Table of Contents

1 Introduction

1.1 Summary of Overall Scope

The Infraco shall be fully responsible for the works and services described in these Employer's Requirements and in the Agreement:

1.2 Infraco Works

Summary Scope of Infraco Works

Detailed requirements associated with the infrastructure and equipment for the Infraco Works are described within other Sections of these Employer's Requirements and the Agreement.

The scope defined within this section is limited to a summary of the principal elements of the Infraco Works:

- the supply of Trams in accordance with the Tram Supply Agreement;
- the provision of maintenance as defined in the Tram Maintenance Agreement and Section 40 (Maintenance) of these Employers Requirements;
- the provision of Trackwork - A total of approximately 18.8km and 5.5km (for phases 1a and 1b, respectively) of track kilometres, on street and off street trackform;
- the provision of Tramstops - A total of 22 Tramstops and 1 staff only Tramstop for Phase 1a, and 9 Tramstops for Phase 1b, together with associated infrastructure;
- the provision of Tramstop furniture, systems and equipment;
- the provision of interchange facilities as provided in the design information;
- the provision of points and crossings including point machines, their power supplies, point heating and the control thereof, detection and indication;
- the provision of traffic / tram signals;
- the provision of Tram detection system;
- the provision of all 11kv, 400volt and 230 volt power supplies;
- the provision of traction substations and d.c. traction distribution;
- the provision of OLE (Including all trackside isolators);

- the provision of supervisory control, and communication systems and sub-systems including all field, Tram (free issue for installation by Tram Supplier) network and central control and interface equipment;

- Develop and manage an EMC strategy that includes appropriate immunisation of all Third Party neighbouring systems including Network Rail.

- Accept delivery of fixed and portable Ticket Vending Machines from **tie** and then undertake the installation of such machines and the provision of the necessary supporting infrastructure (including power supplies, communication links and foundations). The maintenance of these machines is not within the scope of the Infraco;

- Provision of the Depot containing:

  - A depot building containing a maintenance workshop and associated workshops, offices, stores and equipment;

  - The Control Centre (First Floor) and associated equipment room (Ground Floor);

  - The Edinburgh Tram Network administration offices;

  - A depot yard and stabling area;

  - A traction power substation;

  - A building services transformer and associated works;

  - All necessary services and utility connections;

  - A boiler house;

  - Hard-standing for a diesel alternator; and

  - The Depot access road.

- Provision of Tram associated road works;

- Provision of traffic management;

- Provision of road furnishings;
- Provision of bridges, structures and retaining walls, including the necessary services and facilities e.g. lighting, drainage, fencing and guardrails, earthing and bonding etc.;
- Civil works including earthworks (inclusive of contamination removal, demolition, Site clearance, excavation, bridges and structures, all necessary temporary works and drainage;
- Demolition/modification of certain buildings as identified in the design phase.
- Relocating the War Memorial at Haymarket Junction (the Infraco shall be required to obtain confirmation from **tie** prior to such re-location that **tie** is satisfied that all relevant Consents have been obtained by the Infraco;
- Landscaping including, hard landscaping, soft landscaping, boundary treatments;
- Provision of lighting;
- Provision of signage;
- Provision of fencing;
- The provision of all temporary works and installations (to allow construction of the Edinburgh Tram Network and achievement of delivery of the Edinburgh Tram Network into service) including the provision of connections to appropriate power supplies.
- to carry out and/or manage to completion the design of the Edinburgh Tram Network, including the management coordination, and specification and implementation of the necessary works for the modification of the Urban Traffic Control System;
- to procure and install all materials and equipment, required for the complete operating Edinburgh Tram Network, as summarised and as further detailed within these Employer's Requirements;
- to supply documentation as defined within these Employer's Requirements, including design documentation, as-built documentation, statutory information, as-built information, maintenance documentation and training documentation;
- to energise the Edinburgh Tram Network including liaison with and management of all interested and affected parties;

- to provide access and support for driver training;
- to provide comprehensive management and technical and maintenance services and Deliverables to ensure that all of the above is delivered in full compliance with these Employer's Requirements.

1.3 Phase 1a Scope Statement Regarding Inclusion for the Phase 1b Option

Phase 1a shall meet these Employer's Requirements and provide full functionality as a standalone tram network. The scope for Phase 1a shall include the following elements in order to facilitate the addition of Phase 1b as an option instructed later under this Agreement.

1. The structure, earthworks and necessary works at Roseburn Junction shall include all sub-structure, structures, earthworks, ductwork, drainage and fitting out to bottom of rail fixing, including the provision for the OLE spur connection for Phase 1b from Phase 1a and OLE supports, for the delta connection of Phase 1b with Phase 1a. The structure, earthworks and works shall extend as a minimum such that the subsequent construction of Phase 2b does not interfere with the operation of Phase 2a except to the extent allowed by the possessions detailed below.

2. Plain line shall be installed along the Phase 1a route through the Roseburn Junction, however the Infraco shall ensure that the design and construction shall provide for the turnouts to be installed in a maximum of one 54 hour possession of the Phase 1a inbound and outbound tracks between Murrayfield and the Western end of Haymarket Yards turnback. Traction power supply sectioning shall allow the turnback of service trams throughout the possession. In addition, up to 28 normal night-time possessions shall be available for preparatory works and commissioning works.

3. The central supervisory, control and communications systems provided by the Infraco for Phase 1a shall have sufficient capacity and functionality to accommodate the incorporation of Phase 1b. This shall include all software, firmware, databases with the same control and indication functionality as for Phase 1a. All central control system hardware shall be provided to allow the connection of the Phase 1b infrastructure by means of cable connection alone.

4. The central supervisory, control and communications systems shall be designed and configured such that the commissioning of Phase 1b infrastructure shall be possible without material impact on the passenger services operating on Phase 1a or the operational Control Centre prior to assimilation of Phase 1b with Phase 1a.

5. Documentation, drawings, manuals, spare parts and training shall be provided for Phase 1a on a standalone basis, but shall be in the form that is expandable to accommodate Phase 1b as and when constructed..

2 Operations and Performance

2.1 Scope

The scope of this Section of the Employer's Requirements defines the Operations & Performance requirements applicable to the Edinburgh Tram Network (ETN) which the Infraco must comply with.

2.2 Network Description and Principles

The Edinburgh Tram Network will operate as a 'line-of-sight' tramway, with tramway signalling provided at road junctions and at tramway junctions where appropriate. A fleet of Trams will serve the ETN providing level boarding with low level platforms located along the routes.

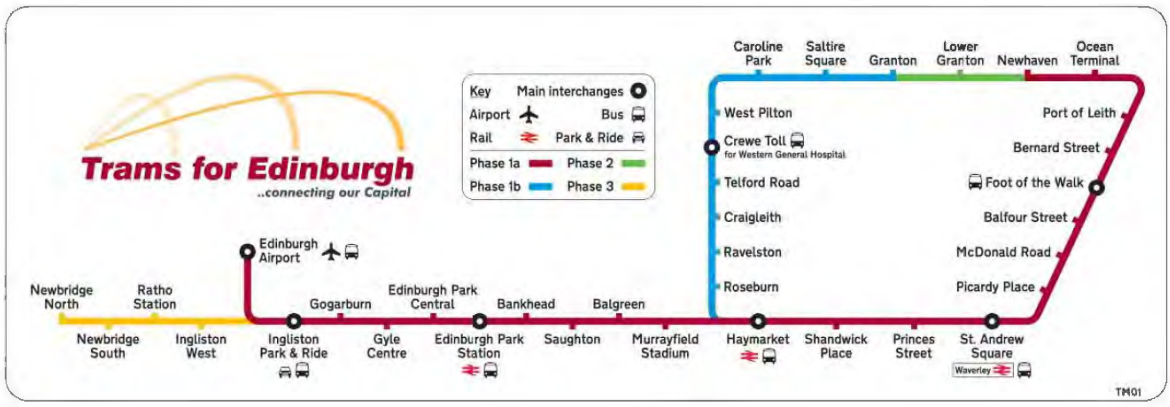


Figure 1

For ease of reference, a diagram of the Edinburgh Tramway Network is shown in Figure 1 above.

The route in the city from Newhaven to Haymarket (approximately half of Phase 1a) and from West Granton Access to Granton Square (approximately a third of Phase 1b) runs mainly on-street with varying degrees of segregation. The Roseburn corridor (approximately two thirds of Phase 1b) is a segregated off-street alignment, shared with a combined footpath and cycleway. Most of the route between Haymarket and the Airport (the remaining half of Phase 1a) is segregated from road traffic.

The whole ETN will consist of double track.

The Depot, located at Gogar, will provide maintenance and stabling facilities for the entire fleet of Trams operating on the ETN. It will also contain the administration and management offices, including an operations and Control Centre, from where the ETN will be managed and maintained.

Transport Services shall be operated in accordance to a timetable, as agreed between the Operator and **tie**, to achieve reliable and consistent operation at the required tram frequencies.

Throughout these Employer's Requirements reference is made to three timetables that shall be progressively introduced in response to patronage demand growth. These are intended to allow for reliability growth and Operator familiarisation with the Edinburgh Tram Network. The following definitions shall apply:

- **Operational Timetable**

  A timetable developed by **tie**, which provides Trams at a frequency of twelve Trams per hour in each direction on the common section between Haymarket and Ocean Terminal. Six Trams per hour in each direction are operated on the sections between Haymarket and the Airport and between Ocean Terminal and Newhaven. For Phase 1b, Trams at a frequency of six trams per hour in each direction on the section between Haymarket and Granton square shall be operated. The Operational Timetable shall be in effect from the Service Commencement Date for a minimum of one year.

- **AM and PM Peak Enhanced Timetable**:

  A timetable developed by **tie**, which provides Trams during the AM and PM peaks at a frequency of sixteen Trams per hour in each direction on the common section between Haymarket and Ocean Terminal. For Phase 1b providing Trams at a frequency of eight trams per hour in each direction on the section between Haymarket and Granton square for the AM and PM peak times only, reverting to the Operational Timetable during the inter peak period. The AM and PM Peak Enhanced Timetable shall be introduced no earlier than one year after the Service Commencement Date and shall be operated for a minimum of six months.

- **Enhanced Timetable:**

  A timetable developed by **tie**, which provides Trams at a frequency of sixteen Trams per hour in each direction on the common section between Haymarket and Ocean Terminal. For Phase 1b providing Trams at a frequency of eight Trams per hour in each direction on the section between Haymarket and Granton square. The Enhanced Timetable shall be introduced no earlier than two years after the Service Commencement Date.

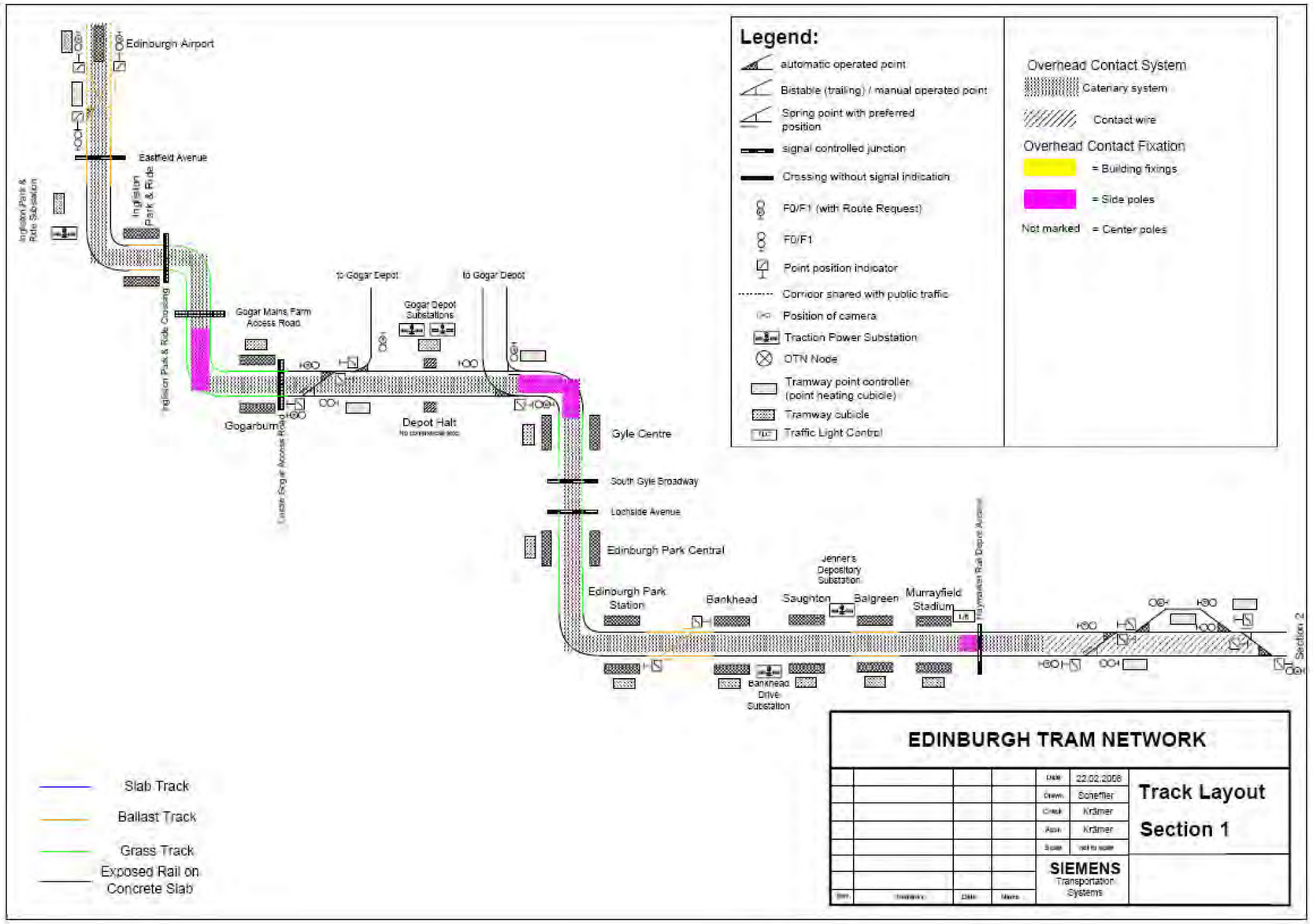


Figure 2 – Edinburgh Tram Phases 1a and 1b Network Diagram

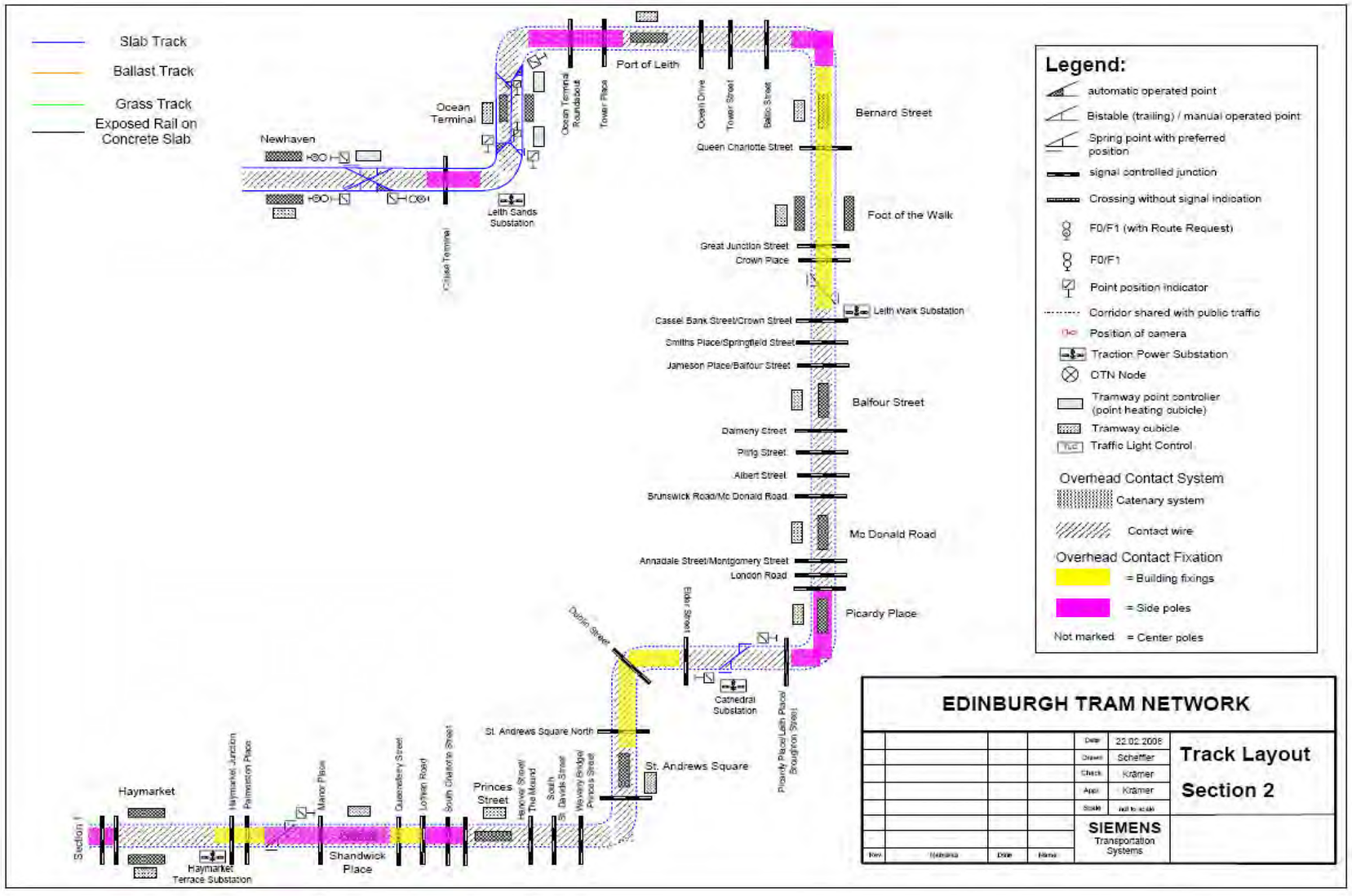


Figure 3 – Edinburgh Tram Phases 1a and 1b Network Diagram

2.3 Specific Operations and Performance Requirements

2.4 Tramstop Location and Types

The Tramstop location and types are detailed in the following table. The acronyms given are provisional.

ID	Tramstop	Platform Style
	PHASE 1a	
AIR	Edinburgh Airport	1 Centre
IPR	Ingliston Park and Ride	2 Side
GBN	Gogarburn	2 Side
DEH	Depot Halt (Staff Only)	2 Side
GYL	Gyle Centre	2 Side
EDP	Edinburgh Park Central	2 Side
EPS	Edinburgh Park Station	2 Side
BNK	Bankhead	2 Side
SGT	Saughton	2 Side
BAL	Balgreen	2 Side
MUS	Murrayfield Stadium	2 Side
HAY	Haymarket	2 Side
SHP	Shandwick Place	1 Centre
PST	Princes Street	1 Centre
SAS	St Andrew Square	1 Centre
PPL	Picardy Place	1 centre
MDR	McDonald Road	1 Centre
BFS	Balfour Street	1 Centre
FOW	Foot of the Walk	2 Side
BER	Bernard Street	1 Centre
POL	Port of Leith	1 Centre
OCT	Ocean Terminal	1 Centre, 1 Side
NEW	Newhaven	2 Side

	PHASE 1b	
GRT	Granton	1 Centre
SSQ	Saltire Square	2 Side
CPK	Caroline Park	2 Side
WPN	West Pilton	2 Side
CTL	Crewe Toll (for Western General)	2 Side
TEL	Telford Road	2 Side
CRA	Craigleith	2 Side
RAV	Ravelston	2 Side
ROS	Roseburn	2 Side

Table 1 – Edinburgh Tram Phases 1a and 1b Network Tramstop Location and Details

2.5 Expansion (including Line 3)

The Infraco shall ensure that the ETN shall be designed to permit expansion to include the following elements:

- Phased implementation of the ETN and associated fleet increases (including the implementation of the Phase 1b Option);
- Addition of Phase 2 of the ETN (as shown in Figure 1), including provision of Lower Granton Road stop, to close the loop along the sea front between Newhaven and Granton Square using the powers in the Edinburgh Tram (Line One) Act 2006;
- Addition of Phase 3 of the ETN (as shown in Figure 1), including associated stops at Ingliston West, Ratho Bridge and Newbridge South, from Ingliston Park and Ride to Newbridge using the powers in the Edinburgh Tram (Line Two) Act 2006;
- Addition of Line Three (From the junction of Princes Street/South St. Andrew Street to Royal Infirmary);

Extensions to the ETN set out above are not currently covered by these Employer's Requirements. However, the ETN must be designed in such a way as not to impede this future expansion.

For the avoidance of doubt, the following are covered by these Employer's Requirements.

- Future frequency increases beyond the enhanced service frequency of 8 & 8 tph;
- Increased operating hours beyond the scheduled last Tram of 23:59 and before the scheduled first Tram at 06:00;
- Associated impacts of increased staff numbers from 361 initially anticipated up to a maximum of 403 e.g. accommodation at the Depot.

2.6 Depot Locations

The Edinburgh Tram Network Depot is located at Gogar and shall be capable of providing capacity for the stabling of 27 trams of 44m in length, clear of fouling points in the stabling area.

The Depot shall be capable of future expansion to provide the capacity required for the identified future service frequencies and/or the requirements for Line Three, such that the Depot can be extended to stable 36 Trams of 44m in length, clear of fouling points in the stabling area.

2.7 Service Patterns, Operating Hours and Frequencies

The ETN shall support a daily service, all year round. The proposed initial service patterns, operating hours and frequencies are as follows:

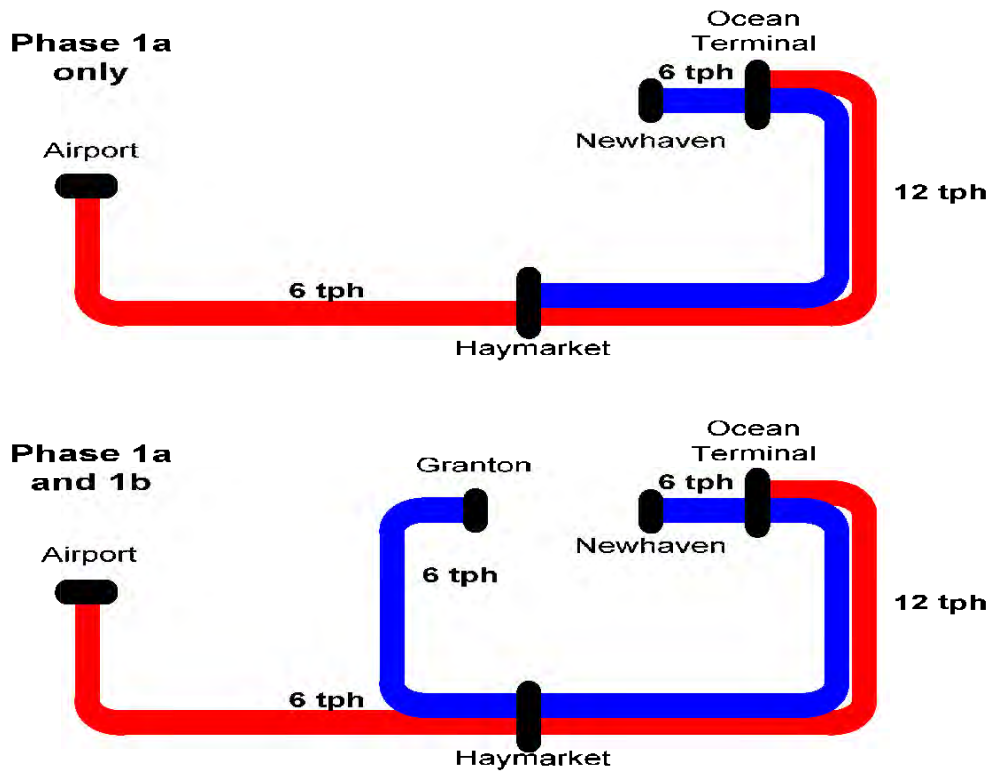


Figure 4 - Service Patterns for the Operational Timetable 6 & 6 Tram per hour scenario

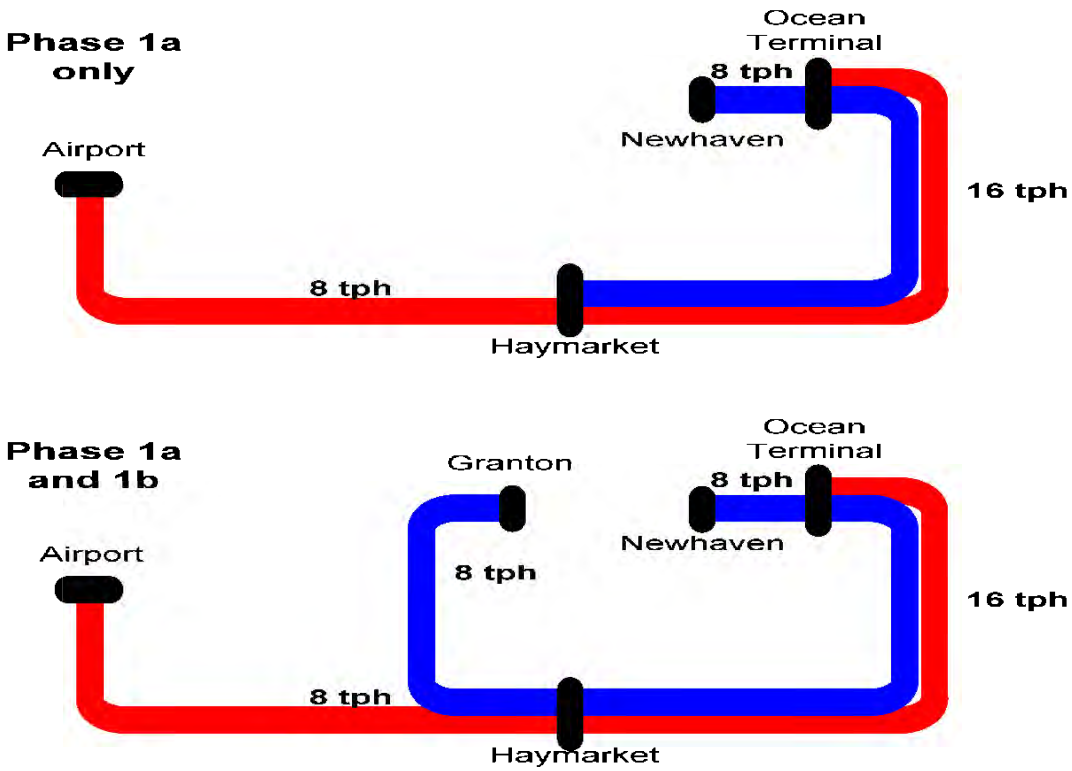


Figure 5 - Peak Service Patterns for the Enhanced AM & PM Peaks Timetable and the Enhanced Timetable 8 & 8 Tram per hour scenario

2.8 Operating Hours and Frequencies

The first and last Tram services and frequencies for 6 & 6 Tram per hour scenario are shown in Figure 4 - service patterns for the Operational Timetable 6 & 6 Tram per hour scenario and for 8 & 8 Tram per hour scenario in Figure 5.

These scenarios are based upon the following assumptions and conditions:

- The two balanced services combine to give a total of 12 or 16 Trams per hour per direction on the common section between Ocean Terminal and Haymarket are required during the daytime to replace withdrawn bus services (and therefore demand and capacity) on Leith Walk;
- For the purposes of ramping up/down service Short workings between Edinburgh Airport (Phase 1a) / Granton Square (Phase 1a & Phase 1b) or Haymarket (Phase 1a only) and St. Andrew Square are based on terminating Trams at St. Andrew Square. The location of the turnback is at York Place;
- Edinburgh Airport service Tram frequency is ramped up/down from Ocean Terminal. Granton Square (Phase 1a & Phase 1b) or Haymarket (Phase 1a only) service Tram frequency is ramped up/down from Newhaven;
- Trams going into service between Gogar Depot and Ocean Terminal/Newhaven will run "in service" from the Gyle (first tram Gyle to Ocean Terminal approx. 05:15 Monday to Saturday inclusive);
- Haymarket (Phase 1a only) or Granton Square (Phase 1a & Phase 1b) service Trams going out of service running between Newhaven and Gogar Depot will run "in service" as far as the Gyle;
- St. Andrew Square curtailed Trams going out of service running between St. Andrew Square and Gogar Depot will run "in service" as far as the Gyle;
- Edinburgh Airport service Trams going out of service will run "in service" from Ocean Terminal to Edinburgh Airport with a short "dead run" from Edinburgh Airport to Gogar Depot;

- The period of time between the last Tram returning to the depot at night and the first Tram leaving the Depot in the morning Monday to Saturday inclusive is anticipated to be 4hrs 30 min, although this may be subject to amendment. Work requiring possessions will have to be agreed with the Operator. Subject to agreed possessions, work may be allowed on the Edinburgh Tram Network infrastructure for 3 hours and 45 minutes, depending on location, each night and allowing time for the implementation and withdrawal of isolations and/or possessions; and

- The provision of Transport Services is based on the requirement to always have a Tram present at the Airport Tramstop.

Table 2 – First and Last Tram Times for the 6 & 6 Tram per Hour Operational Timetable

1b	Airport to Ocean Terminal	0	6			6[a]	0
1b	Ocean Terminal to Airport	6	6			6	0
1b	Granton to Newhaven	0	6			6[b]	0
1b	Newhaven to Granton	6	6			6[c]	0

		Sunday (trams per hour)					
Network / Phasing	**Service frequency commencing at:**	first tram **07:00**	**07:45**	**08:00**	**08:20**	**23:15**	last tram **23:59**
1a	Airport to Ocean Terminal	0	6	6	6	6[a]	0
1a	Ocean Terminal to Airport	6	6	6	6	6	0
1a	Haymarket to Newhaven	0	0	6	6	0	0
1a	Newhaven to Haymarket	0	0	0	6	0	0
1b	Airport to Ocean Terminal	0	6			6[a]	0
1b	Ocean Terminal to Airport	6	6			6	0
1b	Granton to Newhaven	0	6			6[b]	0
1b	Newhaven to Granton	6	6			6[c]	0

Note: The numbers in individual cells give the service frequency starting from the time at the top of the relevant column.

Notes:

[a] from approx 2 23:15 Trams run from the Airport - City Centre only

[b] from approx 2 23:15 Trams run from Granton - City Centre only

[c] from approx 2 23:15 Trams run from Newhaven - Haymarket continuing in service on TL2 to Gyle

First and last Tram services and frequencies for 6 & 6 tram per hour Operational Timetable

Table 3 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario

	Networking (Phasing) andService Frequency commencing at:	06:00	06:45	07:00	07:20	07:45	09:45	15:45	19:00	19:45
1a	Airport to Ocean Terminal	0	6	8	8	8	6	6	8	6
1a	Ocean Terminal to Airport	6	6	8	8	8	6	6	8	6
1a	Haymarket to Newhaven	0		6	8	8	6	6	8	6
1a	Newhaven to Haymarket	0		0	6	8	6	6	8d	6
1b	Airport to Ocean Terminal	0	6	8		8	6	6	8	6
1b	Ocean Terminal to Airport	6	6	8		8	6	6	8	6
1b	Granton to Haymarket	0	6	8		8	6	6	8	6
1b	Haymarket to Granton	6	6	8		8	6	6	8	6

Table 4 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario

Phase	Service Frequency commencing at:	Saturday (trams per hour) First tram 06:00	06:45	07:30	07:50	23:15
1a	Airport to Ocean Terminal	0	6	6	6	6a
1a	Ocean Terminal to Airport	6	6	6	6	6
1a	Haymarket to Newhaven	0	0	6	6	0
1a	Newhaven to Haymarket	0	0	0	6	0
1b	Airport to Ocean Terminal	0	6	6	6	6a
1b	Ocean Terminal to Airport	6	6	6	6	6
1b	Granton to Newhaven	0	6	6	6	6b
1b	Newhaven to Granton	6	6	6	6	6c

Table 5 - First and Last Tram Times for the Enhanced AM & PM Peak Timetable

Networking (Phasing) and Service Frequency commencing at:		Sunday (trams per hour) first tram 07:00	07:45	07:50	08:00	08:45	18:00	18:20	18:45	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6		6	6		6a	0
1a	Ocean Terminal to Airport	6	6	6	6		6	6		6	0
1a	Haymarket to Newhaven	0		6	6		6	6			0
1a	Newhaven to Haymarket	0		0	6		6	6d			0
1b	Airport to Ocean Terminal	0	6		6	6	6		6	6a	0
1b	Ocean Terminal to Airport	6	6		6	6	6		6	6	0
1b	Granton to Haymarket	0	6		6	6	6		6	6b	0
1b	Haymarket to Granton	6	6		6	6	6		6	6c	0

Notes:

a) from approx. 23:15 Trams run from Airport – St Andrew Sq. only.
b) from approx. 23:15 Trams run from Granton – St Andrew Sq. only.
c) from approx. 23:15 Granton Trams run from Newhaven – Haymarket continuing in service on to Gyle.
d) from approx. 19:20 (18:%0 Saturday and 18:20 Sundays) Haymarket Trams running from Newhaven – Haymarket continue in service to Gyle.

The numbers in individual cells give the service frequency starting from the time at the top of the relevant column.

Table 6 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced Timetable

Network (phasing) and service frequency commencing at:		Monday - Friday (trams per hour)									
		06:00	06:45	07:00	07:20	07:45	19:00	19:20	19:45	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	8	8	8		8	8		8[a]	0
1a	Ocean Terminal to Airport	8	8	8	8		8	8		8	0
1a	Haymarket to Newhaven	0		8	8		8	8			0
1a	Newhaven to Haymarket	0		0	8		8	8[d]			0
1b	Airport to Ocean Terminal	0	8	8		8	8		8	8[a]	0
1b	Ocean Terminal to Airport	8	8	8		8	8		8	8	0
1b	Granton to Newhaven	0	4	4		8	8		4	4[b]	0
1b	Newhaven to Granton	4	4	8		8	4		4	4[c]	0

Network (phasing) and service frequency commencing at:		Saturday (trams per hour)									
		first tram 06:00	06:45	07:30	07:50	08:15	18:30	18:50	19:15	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	8	8	8		8	8		8[a]	0
1a	Ocean Terminal to Airport	8	8	8	8		8	8		8	0
1a	Haymarket to Newhaven	0		8	8		8	8			0
1a	Newhaven to Haymarket	0		0	8		8	8[d]			0
1b	Airport to Ocean Terminal	0	8	8		8	8		8	8[a]	0
1b	Ocean Terminal to Airport	8	8	8		8	8		8	8	0
1b	Granton to Newhaven	0	4	4		8	8		4	4[b]	0
1b	Newhaven to Granton	4	4	8		8	4		4	4[c]	0

Network (phasing) and service frequency commencing at:		Sunday (trams per hour)									
		first tram 07:00	07:45	07:50	08:00	08:45	18:00	18:20	18:45	23:15	last tram 23:59
1a	Airport to Ocean Terminal	0	6	6	6		6	6		6[a]	0
1a	Ocean Terminal to Airport	6	6	6	6		6	6		6	0
1a	Haymarket to Newhaven	0		6	6		6	6			0
1a	Newhaven to Haymarket	0		0	6		6	6[d]			0
1b	Airport to Ocean Terminal	0	6		6	6	6		6	6[a]	0
1b	Ocean Terminal to Airport	6	6		6	6	6		6	6	0
1b	Granton to Newhaven	0	6		6	6	6		6	6[b]	0
1b	Newhaven to Granton	6	6		6	6	6		6	6[c]	0

Note: The numbers in individual cells give the service frequency starting from the time at the top of the relevant column.

Notes:

[a] from approx 23:15 trams run from Airport - St Andrew Sq only

[b] from approx 23:15 trams run from Granton - St Andrew Sq only

[c] from approx 23:15 Granton trams run from Newhaven - Haymarket continuing in service on to Gyle

[d] from approx 19:20 (18:50 Saturdays and 18:20 Sundays) Haymarket trams running from Newhaven - Haymarket continue in service to Gyle

2.9 Service Frequencies and Expansion

The design of the ETN shall support the Operational Timetable and Enhanced Timetable service frequencies set out in Table 2 – First and Last Tram Times for the 6 & 6 Tram per Hour Operational Timetable, Table 3 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario and Table 4 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario. In addition to this, the ETN shall operate the same service pattern as set out in Table 4 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario above, but with the Trams per hour increased by 50% throughout without upgrade or loss of performance for up to a maximum of 2 hours between Ocean Terminal and Picardy Place, and indefinitely between Picardy Place and the Airport.

The service patterns for the ETN are defined as the Operational Timetable (as shown in Table 2 – First and Last Tram Times for the 6 & 6 Tram per Hour Operational Timetable), the AM and PM Peak Enhanced Timetable (as shown in Table 3 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario) and the Enhanced Timetable (as shown in Table 4 - First and Last Tram Times for the 8 & 8 Tram per Hour Enhanced AM & PM Peak Scenario).

A simulation indicating the power consumption of the ETN service patterns as defined above and considering the braking energy regeneratated by the Tram shall be performed during design phase.

2.10 Special Working and Degraded Operation

Special working is required at certain times of the year, as detailed in Table 8 - Reconfiguration of Service due to the Closure of Princes Street to allow for the short workings on the network routes, when sections of the ETN shall be closed to allow for example Hogmanay, the Edinburgh Festival and other special events and festivals.

The design of the ETN shall allow services to be turned back at the locations detailed in Table 7 - Turnback Locations. The precise chainages where turnbacks are to be installed is shown on the alignment drawings.

ID	Location
	PHASE 1a
EPS	Edinburgh Park Station
HAY	Haymarket Yards
SHP	Shandwick Place
PPL	Picardy Place
FOW	Foot of the Walk (Leith Walk)

OCT	Ocean Terminal
	PHASE 1b
CTL	Crewe Toll

Table 7 - Turnback Locations

Note that Trams may also be turned back at Gogar Depot, and the facility to allow this shall be provided by the Infraco.

The individual services will be reconfigured to operate using the turn-back facility nearest to the affected area. An example is the requirement to close Princes Street for Hogmanay. In this situation the services shall be reconfigured as detailed in Table 8 - Reconfiguration of Service due to the Closure of Princes Street.

Service alteration for Closure of Princes Street			
Original Route of Service	**Affected Area**	**Trams / Hour**	**Revision**
Between Airport and Ocean Terminal	Princes St. section closed	6 or 8	Services run between Airport and Shandwick Place. No service runs between Shandwick Place and Picardy Place. Services run between Picardy Place and Newhaven
Between Haymarket and Newhaven (Phase 1a only)	Princes St. section closed	6 or 8	No service runs between Haymarket and Picardy Place[a]. Services run between Picardy Place and Newhaven
Between Granton Square and Newhaven (Phase 1b)	Princes St. section closed	6 or 8	Services run between Granton Square and Shandwick Place. No service runs between Shandwick Place and Picardy Place. Services run between Picardy Place and Newhaven

a – Assumption that no services will run the short leg Haymarket to Shandwick Place when Princes Street is closed.

Table 8 - Reconfiguration of Service due to the Closure of Princes Street

2.11 Journey Time and Runtime

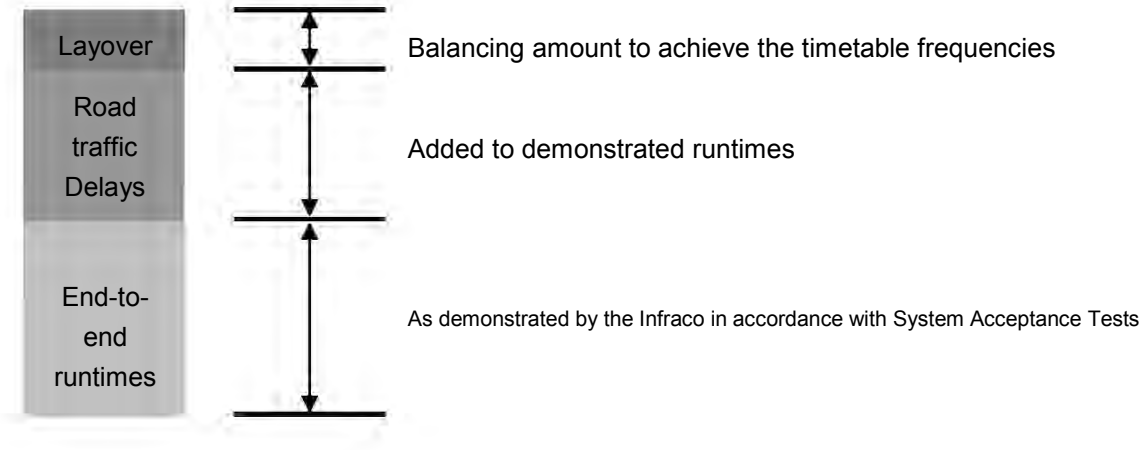


Figure 6 - Maximum Journey Times

The required maximum journey times for the Edinburgh Tram Network, quoted as operational journey time including dwell times of 25 seconds at each Tramstop, as defined during Preliminary design shall be as follows:

Phase 1a		
Airport to Ocean Terminal	in either direction including 25 secs dwells at Tramstops	42mins 18 secs
Phase 1b		
Granton Sq to Newhaven	in either direction including 25 secs dwells at Tramstops	39mins 26 secs

For the avoidance of doubt these are end to end journey times and the Infraco shall demonstrate during System Acceptance Tests defined in Section 23.18 (Testing and Commissioning) of these Employer's Requirements the trip times which can be achieved by the Trams running on the ETN infrastructure as developed and adjusted from the above base line in accordance with Section 2.12. These do not include layover time at the turnback stops as shall be agreed between the Operator and **tie** in order to develop the Operational Timetable.

2.12 Journey Time and Runtime

The Infraco shall continue to develop and refine the runtime model as the design progresses and, at a frequency of no less than every three months or upon **tie**'s request, provide updated reports demonstrating that the maximum run times can be achieved. The Infraco shall also prepare a model of the electricity consumption linked to the run time model and shall use reasonable endeavours to optimise the system design and construction to minimise electricity usage.

Reference should be made to the Runtime Simulation Stage 3 Report (ref: ULE90130-SW-REP-00238-V3) for vehicle performance characteristics and actual driver operations.

The operational and modelling assumptions that shall be used in all modelling of runtime and operational timetables are set out in Table 9 - Operational and Modelling Assumptions.

Item	Value	Notes
Door Performance	12 seconds	Defined as the time for the doors to open and close including DDA requirements and passenger and driver reaction times.
Boarding and Alighting Time	13 seconds	Defined as the time between the doors being fully open and the sounding of the door closing tone.
Dwell Times	25 seconds a constant in modelling and during end to end journey time tests, to be refined for the purposes of the timetables to be Tramstop specific	Average dwell, made up of the door performance time and the boarding and alighting time
Loading	AW2 all seated 4 pass/m2 standing	
Gradient	+/- 8% Max. Note: This value is the maximum allowable gradient for track design.	Gradient data for the complete ETN has been developed in the design phase This identified major gradients at St. Andrew Square and the line alongside Gogar Depot

2.13 Operational Allowances and Rules for Timetabling

An operational allowance will be added to the end to end runtimes demonstrated through testing to meet those quoted in this section to ensure a robust Operational Timetable is constructed.

Requirement	Allowance
Operational Journey time allowance	Newhaven to Haymarket = 1.5 minutes Ocean Terminal to Airport = 1.5 minutes Newhaven to Granton Square = 45 secs (Phase 1b only)
Layover	4 minute minimum or 10% of timetabled runtime, whichever is the greater taken at the terminus for each end to end trip with the exception of the Airport Tramstop where a Tram is required to always be present. Crew change-over locations to be determined as the Operational Timetable is refined.

Table 10 - Operational Runtime Allowances

2.14 Miscellaneous Operational Requirements

2.15 Comfort Break Facilities

Facilities shall be available for driver comfort breaks at the nominated layover locations detailed in Table 11 - Layover Facilities

Location	Comments
Edinburgh Airport	Crew Change Facility[1]
Ocean Terminal	Normal Terminus
Granton Square	Normal Terminus
Haymarket	Crew Change Facility

Table 11 - Layover Facilities

[1] *Damian has already instructed this change.*

At these locations access shall be provided to a suitable toilet with hand washing facilities.

Crew Change Facility

A crew changing facility shall be provided adjacent to the Haymarket Tramstop. This facility shall provide tram crew with access to a toilet with hand washing facilities, a drinking water supply, suitable heating, power, lighting, drainage and connection to the telephone network.

2.16 Performance and Reliability

The design and construction of the ETN shall be demonstrated by RAMS analysis to enable the individual systems availability targets stated in these Employer's Requirements to be met. It shall enable an overall tram punctuality for System technical causes of at least 99% in accordance with the calculation of the Punctuality Service Element contained in Schedule 6 of the Agreement.
As measured on a 28 day basis at the following monitoring points along the route at least 99% of the Trams shall be no earlier than one minute and no greater than two minutes late, caused by technical failure, compared to the scheduled headway.

Monitoring points

a) Phase 1a: for the purposes of monitoring arrival and departure headways between Trams:

- Edinburgh Airport.

b) Phase 1a: for the purposes of measuring departure headways between Trams only:

- Edinburgh Park Station;
- Haymarket;
- Foot of the Walk;
- Leith; and
- Picardy Place.

c) Phase 1b: for the purposes of measuring departure headways between Trams only:

- Crewe Toll (northbound only); and
- Granton Square.

The performance mechanism for Infraco is contained within this Agreement. The design of the ETN shall be such that it allows the ETN to operate safely and effectively in all modes.

Normal Mode being that used to establish the operational timetable. Degraded Mode being restricted operation due to failures or disruption on the tramway or the adjacent highway network.

2.17 Network and Service Pattern

See table 2 – Service Patterns for the Operational Timetable 6 & 6 Tram per hour scenario and table 5 – Peak Service Patterns for the Enhanced AM & PM Peaks Timetable and table 6 – the Enhanced Timetable 8 & 8 Tram per hour scenario] for further information; for daily service patterns; and note that trams are to be co-ordinated between OCT and HAY to give an even headway pattern in both directions.

2.18 Layover s

The Operational Timetable and the Enhanced Timetable developed by the Operator and the Infraco's Proposals shall allow for the following:

- An operational Tram can always be present at the Airport Tramstop;
- Additional layovers to be added to the minimum values to deliver the required headways where appropriate. This additional layover maybe apportioned along the route; and
- The minimum layover requirements are as set out in these Employer's Requirements and these shall be apportioned at the terminus Tramstops only.

Allowance for perturbations that are not road traffic delays:

- These shall be apportioned along the route, as can be seen in Figure 6 - Maximum Journey Times.

2.19 Calculation of Minimum Round Trip Times

In this section, the minimum round trip times for each of the service options are calculated. The calculations add up the elements that are required to establish the round trip times, and the source of each element is stated.

Table 12 - Ocean Terminal – Edinburgh Airport Service (Phase 1a and Phase 1b)

OCT – AIR

00:42:18	OCT - AIR (includes dwell time)[a]
00:04:52	AM junction delay (OCT - HAY)[b]
00:01:30	additional delay between HAY - AIR[c]
00:00:10	10 seconds on each leg for crossover at terminal Tramstop[d]
00:48:50	Total

AIR – OCT

00:41:59	AIR - OCT (includes dwell time)[a]
00:06:01	AM junction delay (HAY - OCT)[b]
00:01:30	additional minutes of junction delay between AIR - HAY[c]
00:00:10	10 seconds on each leg for crossover at terminal Tramstop[d]
00:49:40	Total

Layovers

00:04:55	Minimum layover at OCT end for Airport service[e]
00:10:00	Minimum layover at AIR end for Airport service[f]
00:07:30	Minimum layover at AIR end for Airport service[f]
00:14:55	Total min layover for 6 & 6 tram per hour scenario
00:12:25	Total min layover for 8 & 8 tram per hour scenario
01:53:25	Minimum round trip time for 6 & 6 tram per hour scenario
01:50:55	Minimum round trip time for 8 & 8 tram per hour scenario

Notes:

a Data from 'Edinburgh Tram Network Stage 3 Runtime Simulation Report' (Doc Ref: ULE90130-SW-REP-00238 v2).

b Data from 'Mott Macdonald Report - Traffic Interface Report' (Doc Ref: 0003048//REVC/241103). AM Junction delays between Haymarket and Leith Walk have been used as greater than PM delays.

c of additional junction delay between Haymarket and Edinburgh Airport.

d Estimate of additional time to move through the crossover at the terminus / turnback

e Layover calculated from Table 17 – Number of Trams needed for each service (based on 8 & 8 Trams per hour scenario)

f Based on Headway of 10 or 7.5 minutes, from the requirement for Airport layover in Section 32.

Table 13 - Newhaven – Granton Square Service, (Phase 1b only)

NEW – GRT

00:02:49	NEW – OCT (includes 25s dwell time)[a]
00:36:28	OCT – GRT (includes dwell time)[a]
00:04:52	AM junction delay (NEW - HAY)[b]
00:00:45	additional delay between HAY - GRT[c]
00:00:10	10s on each leg for crossover at terminal Tramstop[d]
00:45:04	Total

GRT – NEW

00:37:00	GRT - OCT (includes dwell time)[a]
00:02:26	OCT - NEW (includes 25s dwell time)[a]
00:06:01	AM junction delay (NEW - HAY)[b]
00:00:45	additional delay between NEW - HAY[c]
00:00:10	10s on each leg for crossover at terminal Tramstop[d]
00:43:56	Total
00:04:15	Minimum layover at NEW end for Granton service[e]
00:04:07	Minimum layover at GRT end for Granton service[e]
00:08:22	Total min layover
01:37:22	Minimum round trip time

Notes:

[a] Data from 'Edinburgh Tram Network Stage 3 Runtime Simulation Report' (Doc Ref: ULE90130-SW-REP-00238v2).

[b] Data from 'Mott Macdonald Report - Traffic Interface Report' (Doc Ref: 0003048//REVC/241103)(AM Junction delays between Haymarket and Leith Walk have been used as greater than PM delays)

[c] Transdev estimate of additional junction delay between Haymarket and Granton Square.

[d] Transdev estimate of additional time to move through the crossover at the terminus / turnback

[e] Layover calculated from Table 17 – Number of Trams needed for each service (based on 8 & 8 Trams per hour scenario).

Table 14 - Newhaven – Haymarket Service (Phase 1a only)

NEW - HAY	
00:02:49	NEW - OCT (includes 25 seconds dwell time)[a]
00:18:58	OCT - HAY (includes dwell time)[a]
00:04:52	AM junction delay (NEW - HAY)[b]
00:01:30	Additional delay between NEW - HAY
00:00:10	10 seconds on each leg for crossover at turnback[c]
00:00:54	Additional movement from HAY to turnback[e]
00:29:13	Total

HAY - NEW	
00:19:11	HAY - OCT (includes dwell time)[a]
00:02:51	OCT - NEW (includes 25 seconds dwell time)[a]
00:06:01	AM junction delay (HAY - NEW)[b]
00:01:30	Additional delay between HAY- NEW
	10 seconds on each leg for crossover at terminal
00:00:10	Tramstop[c]
00:00:54	Additional movement from turnback to HAY[e]
00:29:07	Total
00:04:00	Minimum layover at NEW end for Haymarket service[d]
00:04:00	Minimum layover at HAY end for Haymarket service[d]
00:08:00	Total min layover
01:06:20	Minimum round trip time

Notes:

a Data from 'Edinburgh Tram Network Stage 3 Runtime Simulation Report' (Doc Ref: ULE90130-SW-REP-00238v2).

b Data from 'Mott Macdonald Report - Traffic Interface Report' (Doc Ref: 0003048//REVC/241103). AM Junction delays between Haymarket and Leith Walk have been used as greater than PM delays.

c Transdev estimate of additional time to move through the crossover at the terminus / turnback

d Layover calculated from Table 17 – Number of Trams needed for each service (based on 8 & 8 Trams per hour scenario)

e Transdev estimate of runtime between HAY and Haymarket Turnback (20kph over 300m = 5.6m/s over 300m = 54 seconds)

2.20 Summary to Establish Fleet Size

The minimum round trip times determined in Section 2.19 above are used in Tables 15 to 18 to determine the tram Peak Vehicle Requirement (PVR) and fleet size for Phase 1a & Phase 1b:

	OCT - AIR service	NER - HAY service	NER - GRS service
Service used on Phase	1a and 1b	1a only	1b only
Headway (min:sec)	10:00	10:00	10:00
Trams per hour	6	6	6
Minimum round trip time (hr:min:sec)	01:53:25	01:06:20	01:38:52
Actual round trip time needed to provide required headways and minimum layover (hr:min:sec)	02:00:00	01:10:00	01:40:00
Total additional layover to achieve headways (min:sec)	06:35	03:40	01:08
Peak number of trams	12	7	10

Table 15 - Number of Trams needed for each service (based on 6 & 6 Trams per hour scenario)

Network Option	1a	1a and 1b
PVR	19	22
Standby/maintenance/repair/training	3	3
Total tram fleet required	22	25

Table 16 - Number of Trams needed for each Phase (based on 6 & 6 Trams per hour scenario)

	OCT - AIR service	NEW - HAY service	NEW - GRT service
Service used on Phase	1a and 1b	1a only	1b only
Headway (min:sec)	07:30	07:30	07:30
Trams per hour	8	8	8
Minimum round trip time (hr:min:sec)	01:50:55	01:06:20	01:37:22
Actual round trip time needed to provide required headways & minimum layover (hr:min:sec)	01:52:30	01:07:30	01:37:30
Total additional layover to achieve headways (min:sec)	01:35	01:10	0:08
Peak number of trams	15	9	13

Table 17 - Number of Trams needed for each service (based on 8 & 8 Trams per hour scenario)

Network Option	1a	1a and 1b
PVR	24	28
Standby/maintenance/repair/training	3	3
Total tram fleet required	27	31

Table 18 - Number of Trams needed for each Phase (based on 8 & 8 Trams per hour scenario)

2.21 Tram Fleet Kilometre Usage

The journey times and fleet sizes calculated above can be used to derive an approximate annual fleet and per Tram kilometre run of:

INITIAL OPERATING TIMETABLE

6tph	Daily	Days	Km	6tph	Daily	Days	Km
Weekdays	5531	261	1443591	Weekdays	7103	261	1853883
Saturdays	5363	52	278876	Saturdays	6950	52	361400
Sundays	5318	52	276536	Sundays	6815	52	354380
Total			**1999003**	**Total**			**2569663**
Per Tram 27 trams			**74037**	**Per Tram 27 trams**			**95173**
ENHANCED AM & PM PEAK SERVICE							
8tph	**Daily**	**Days**	**Km**	**8tph**	**Daily**	**Days**	**Km**
Weekdays	6217	261	1622596	Weekdays	7840	261	2046240
Saturdays	5363	52	320150	Saturdays	6950	52	361400
Sundays	5318	52	276536	Sundays	6815	52	354380
Total			**2219282**	**Total**			**2762020**
Per Tram 27 trams			**82196**	**Per Tram 31 trams**			**89097**
FLAT DAYTIME PEAK SERVICE							
8tph	**Daily**	**Days**	**Km**	**8tph**	**Daily**	**Days**	**Km**
Weekdays	7436	261	1940796	Weekdays	9347	261	2439567
Saturdays	7292	52	379184	Saturdays	9224	52	479648
Sundays	5318	52	276536	Sundays	6815	52	354380
Total			**2596516**	**Total**			**3273595**
Per Tram 27 trams			**96167**	**Per Tram 31 trams**			**105600**

Figure 7 – Operational Timetable

The principal assumptions are:

- 'Empty' running to and from the Depot is included;

3 General

3.1 Definitions

In these Employer's Requirements, Schedule 1 (Definitions and Interpretation) and the following definitions shall apply:

Table 19 - Definitions

Term	Definition
Act	An Act of Parliament or the Scottish Parliament following consideration and approval of a Bill
AFC	Automatic Fare Collection (see also TVM)
AIP	Approval in Principle for structures
ALARP	As low as reasonably practicable
Approval	(see Consent); also an approval of detail by an authority where consent is deemed to be granted by with prior conditions.
AutoCAD	Proprietary software used for engineering design
AW0 – AW5	Standard loading conditions for Tram Vehicles defined at Section 22.2.3
BRB	British Railways Board
BS	British Standard
CAA	Civil Aviation Authority
Case for Safety	All necessary documentation, information and other requirements pursuant to the Railways and Other Guided Transport Systems (Safety) Regulations 2006;
CAR	Corrective Action Report
CCTV	Closed Circuit Television
CIBSE	Chartered Institute of Building Services Engineers
CMS	Central Management System
COCP	Code of Construction Practice
COMP	Code of Maintenance Practice
Communications Plan	The Plan to be developed in accordance with the Employer's Requirements
COSHH	Control of Substances Hazardous to Health Regulations 1998
DAT	Delivery Acceptance Test
DCCB	Direct Current Circuit Breaker
DDA	Disability Discrimination Act
Developed	The enlarged Kinematic Envelope that takes into account all of the possible effects of

Term	Definition
Kinematic Envelope (DKE)	curvature, including superelevation of the track together with end and centre throw of the Tram. It is speed dependent and unique to a particular location at a given speed (See also Static Envelope, Dynamic Envelope and Kinematic Envelope) (See also RSPG Part 2 Section G – Guidance on Tramways).
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DSD	Drivers Safety Device
Dynamic Envelope	The Static Envelope enlarged to the maximum possible displacement of the Tram in motion on straight track. It takes into account suspension characteristics and allowances for maintenance and wear of Trams. (End and Centre throw is not included.) (See also Static Envelope, Kinematic Envelope and Developed Kinematic Envelope.) (See also RSPG Part 2 Section G – Guidance on Tramways)
EDMS	Electronic Document Management System
EIA	Environmental Impact Assessment
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMP	Environmental Management Plan
Enhanced Timetable	The Timetable described at Part 1a with 16 trams per hour Hay to Oct
ES	Environmental Statement
FAT	Factory Acceptance Test
GDPO	Town and Country Planning (General Development Procedure)(Scotland) Order 1992
GPR	Ground penetrating radar
Grandfather Rights	A longstanding right where the original reason and date of the granting of the right is unknown
GSN	Goal Structured Notation
HCI	Human Computer Interface
HF	Human Factors
HLM	High Level Model
HMRI	Her Majesty's Railway Inspectorate (or the appropriate approval regime in force)
HS	Historic Scotland
HSCB	High Speed Circuit Breaker
HVAC	Heating, Ventilating and Air Conditioning
ICP	Independent Competent Person
ISO	International Organisation for Standardisation
ITSO	Integrated Transport Smartcard Organisation - a non profit sharing, member owned organisation supported by the Department for Transport

Term	Definition
ItN	Invitation to Negotiate
JRC	Joint Revenue Committee
Kinematic Envelope (DKE)	The Dynamic Envelope enlarged to allow for the permitted tolerances in track gauge, alignment, level and cross-level and the dynamic and static effects of track wear. It is speed dependant. See also Static Envelope, Dynamic Envelope and Developed Kinematic Envelope. (See also RSPG Part 2 Section G – Guidance on Tramways)
LBC	Listed Building Consent
LHMP	Landscape and Habitat Management Plan
Lifecycle Replacement Plan	The Plan to be developed in accordance with the Employer's Requirements
Line 3	A planned extension of the Edinburgh Tram Network to the south east. Line 3 is not currently being progressed although some safeguarding provisions are required.
LRU	Line Replaceable Unit
LRV	Light Rail Vehicle
Maintainer	Infrastructure and Tram Vehicle maintenance
Markov Analysis	Reliability modelling method
MUDFA	Multi-Utilities Diversion Framework Agreement
MX	Proprietary software used for engineering design
NCR	Non Conformance Report
NR	Network Rail
OEM	Original Equipment Manufacturer
OLE	Overhead Line Equipment
Operational Timetable	The Timetable described at Table 2 – First and Last Trams for the 6 & 6 Tram per Hour Operational Timetable Table 2 – First and Last Tram Times for the 6 & 6 Tram per Hour Operational Timetable - Hay to Oct
ORR	Office of Rail Regulation
ORS	Operational Radio System
OTMR	On Tram Monitoring and Recording
PA	Public Address System
Pan	Pantograph
PCC	Point Control Cabinet
PCS	Point Control System
PHC	Point Heating Cabinet
PHP	Passenger Help Point
PEHP	Passenger Emergency Help Point

Term	Definition
PID	Passenger Information Display
Prior Approval	Written approval by any approving body evidencing prior consent.
QA	Quality Assurance
Quality Management Plan	The Plan to be developed in accordance with the Employer's Requirements
RAMS	Reliability, Availability, Maintainability and Safety
RSPG	Railway Safety Principles and Guidance
RSP2	Ralilway Safety Publication 2 – Guidance on Tramways
RTPI	Real Time Passenger Information
RVAR	Rail Vehicle Accessibility Regulations
Safety Management Plan	The Plan to be developed in accordance with the Employer's Requirements
SAT	System Acceptance Test
SCADA	Supervisory, Control and Data Acquisition
SCC	Supervisory Control and Communications
SCT	Site Commissioning Test
SEPA	Scottish Environment Protection Agency
Shadow Running	Validation of the Operational Timetable without carrying passengers
SIT	System Integration Test
SP	Swept Path
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Assessment Guidance
Static Envelope	The maximum cross-section of Trams loaded or unloaded at rest on straight and level track, taking account of tolerances in the manufacture of the trams and the effects on the suspension of tram loading and tram loads arising from the wind and other weather. See also Dynamic Envelope, Kinematic Envelope, and Developed Kinematic Envelope. (See also RSPG Part 2 Section G – Guidance on Tramways)
Sub-System	An individual technical element e.g. communications, Tram etc.
SUC	Statutory Utility Company
SUDS	Sustainable Urban Drainage System ('soakaways')
The System	Collectively the technical sub-systems that together form the Edinburgh Tram Network.
System Interface	The interaction point between the sub-systems
Test Plan	The proposals developed by the Infraco for the structured and programmed testing of the components and the System

Term	Definition
Test T1 – T5	Formal Test requirements defined at Tests and Commissioning
TPDS	Tram Position and Detection System
Tramway Path	The area reserved for a moving tram in its environment. (See also RSP2 – Guidance on Tramways)
Transdev	"Transdev Edinburgh Tram Limited" (TETL) the Edinburgh Tram Network Operator
TRO	Traffic Regulation Order
TRY	Test Reference Year
TTRO	Temporary Traffic Regulation Order
TSS	Traction Sub-Station
TSS	Technical Support Services – advisors to **tie**.
TVM	Ticket Vending Machine (see also AFC)
UTC	Urban Traffic Control
UPS	Uninterruptible Power Supply
WBS	Work Breakdown Structure
WEBS	West of Edinburgh Busway Scheme

3.2 Infraco Services

3.3 General

This section provides a summary of the services that shall be required to be undertaken by the Infraco throughout the duration of the Infraco Works, or during particular stages of the Infraco Works, as appropriate.

3.4 Management and Technical Services

3.5 Summary of Deliverables

This section summarises the Deliverables that shall be provided by the Infraco. The Deliverables shall be provided in accordance with the requirements of the Agreement and shall be reviewed in accordance with the Review Procedure.

The Infraco shall complete the Deliverables set out hereunder, in the timescales agreed, and as identified in the Submittal Programme referred to.

In addition to the required Deliverables, this section also develops, where appropriate, the management and technical systems and services that shall be required to be provided by the Infraco to meet these Employer's Requirements. The Infraco shall develop and submit the following Deliverables for approval by **tie** in accordance with the Review Procedure.

Table 20 - Table showing Summary of Deliverables

Communications, Meetings and Reporting
Communications Plan
Meetings Schedule
Progress Photos
Progress Reports
Site Reports
Topics Register
Programme
Programme to include Design, Construction, Snagging, Commissioning, training, shadow running and opening to passenger service
Time Chainage Diagram
Management Plans
Construction Health and Safety Plan

Construction Plan
Construction Stage Environmental & Sustainability Management Plan(s)
Documentation associated with the completion of all research, surveys and inspections
Environmental Action Plan (EAP)
Infraco KPI Reporting
Infraco Performance Measurement
Network Rail Interface Plan
Overall Approvals Management Plan and Approvals Management Plan
Project Health & Safety File
Project Management Plan
Quality Forms (associated with the Project Safety and Quality Interface document)
Quality Management Plan
Research, Surveys and Inspections
Safety Forms associated with the Project Safety and Quality Interface document.
Safety Management Plan
Schedule of Internal Audits
System Safety Management Plan
Testing and Commissioning Plans
Training Plans

Design Deliverables

Earthing and Bonding Plan
Case for Safety for the Network or Geographical Sections as applicable
Design Stage Configuration Management Plan
Design Stage Verification & Validation Plan
Detailed Cause Consequence Analysis
Functional Hazard Analysis
Hazard Log & Risk Register
Interface Control Documents
Interface Schedules
List of Applicable Standards
Procurement Plan
Requirements Specification / Database
Scheme Plan
Road Network Plan of affected areas
System Architecture Specification
System Design Specification
System Design Test Specification
System Interface Management Plan
System Interface Register

Detailed drawings and other detailed design documentation

Archaeological & Heritage Mitigation Plan
Boundaries Treatment Management Plan
Construction Advice
Construction Site Drainage Plan
Initial and Final Buildability Reports
Landscape and Habitat Management Plan
Method of Working around Protected Species
Other construction advice as noted
Procedures for dealing with Unidentified Apparatus or Recorded Artificial Obstructions
Schedule 3 (Code of Construction Practice) Deliverables
Schedule and Conditional Surveys of Structures / Buildings Documentation (Dilapidation)
Strategy for controlling Invasive and Alien Species
Survey Photographs of Reinstatement Work
Temporary Works, Security and Fencing Arrangements Plan
Waste Management Plan

Cost Management

Actual / Planned / Forecast Spend Tables / Curves
Change Control Schedule and background information
Cost Loaded Programme / Earned Value Analysis based on WBS structure
Cost Report
Schedule of Compensation Events and background information
Value Management Estimates / Analysis

Risk

Commissioning Risk Control Report
Construction Risk Control Report
Infraco Assumptions Register
Infraco Risk Management Plan
Infraco Risk Register
Operational and Maintenance Report
Residual Risk Control Report
Risk Progress Reports

Traffic Management and TTROs

Access Control Permit Procedures
Access Control Permits and Permits to Work
Permits to Work and Utility Permits to Work Procedures
Traffic Management and Work Site Staging Plan
TTRO Obligations and Traffic Management Procedures

Method Statements

Method Statements

Schedule and Conditional Surveys of Structures / Buildings and Documentation (to avoid delay to the Service Commencement Date)

Survey Photographs of Reinstatement Work

Surveys of Structures which may affect Progress

Stakeholder Management Deliverables

Communications Log

Information for the **tie** monthly newsletter

Procurement Schedule

Traffic Routing Map

Weekly Newsletter

Weekly updates of Progress

Other Deliverables as defined below:

Asset Register

Documentation - As-built Design Drawings

Infrastructure Maintenance Plan

Maintenance Plan

O&M manuals

Overall Approvals Management Plan and Approvals Management Plan

Overall Test and Commissioning Plan

Simulation

Spare Parts manuals

Spare Parts, Tools & Test Equipment

Staffing Plan and Recruitment, Retention and Training Plan

System Acceptance

System Integration – including System Integration Plan

3.6 Design

3.6.1 General Obligations

The Infraco shall be responsible for the complete design of the Edinburgh Tram Network including the achievement of full compliance with the Employer's Requirements. The Infraco shall be responsible for achieving the following:

- The Deliverables necessary to enable the Edinburgh Tram Network to be procured, constructed, tested, commissioned and brought into commercial service and consistent with the requirements for training and Case for Safety (taking account of the need to fully co-ordinate these activities, including with other physically-related projects, so as to minimise overall disruption) to meet these Employer's Requirements and the Programme.
- The Infraco shall produce a tram service simulation that will demonstrate that its implementation of the design will achieve the required run times, power consumption and service performance where defined in these Employer's Requirements;
- The Infraco shall ensure that the design covers all aspects of the Edinburgh Tram Network and the associated works as defined in these Employer's Requirements;

- The Infraco shall approach the design and technical services in a structured manner using a recognised 'V' life cycle model with regard to the integration of design engineering, systems engineering and safety engineering activities;

- The Infraco shall be responsible for ensuring that there are no gaps and omissions in the specification and design of the Edinburgh Tram Network;

- The Infraco shall demonstrate that the design has properly considered and adopted the most advantageous whole life cost solutions;

3.6.2 Design Approach

The design approach shall be as set out in the SDS Agreement. The Infraco shall:

- Adopt, develop and adapt the SDS Management Plans covering Configuration Management and Verification and Validation.

- Undertake such supplementary safety analysis that will allow further development of the Case for Safety concurrent with any design undertaken to prove that the Edinburgh Tram Network is acceptably safe;

- Where any new technologies are proposed by the Infraco, submit reports and presentations analysing and assessing the options and justifying the final selections of technologies in terms of time, cost, quality, safety, risk and maintainability, for review by **tie**;
- Prepare and maintain the Risk and Hazard Log;
- Prepare and maintain the System Architecture Specification;
- Prepare and maintain the System Design Specification;
- Prepare and maintain the System Design Test Specification;
- Prepare and maintain the Functional Hazard Analysis;
- Prepare and maintain the Detailed Cause Consequence Analysis;
- Prepare and maintain the Requirements Specification / Database;
- Prepare and maintain the Scheme Plan;
- Prepare and maintain the Procurement Plan;
- Prepare and maintain the Interface Schedules;
- Prepare and maintain the Earthing and Bonding Plan;
- Prepare and maintain the detailed drawings and other detailed design documentation;

3.6.3 Transport Modelling

The Infraco shall procure that the SDS provider performs its obligations in respect of

- transport modelling as such obligations are set out in the SDS Agreement.
- detailed traffic junction design recognition and evaluation and wider area effect assessment;
- temporary traffic diversions and support to **tie** where reasonably required in respect of obtaining the Traffic Regulation Order including impact analysis as defined in section 12.12.

For detailed traffic signal modelling; Infraco shall provide adequate modelling upon which to baseits design.

3.6.4 Environmental

All equipment shall meet its required operational functionality in accordance with these Employer's Requirements. The Edinburgh Tram Network and its components shall take cognisance of, inter alia, the following factors: electrical interference, dust, vibration, supply voltage variations, radio signal variations, solar radiation, temperature, humidity, salt, mist, wind, precipitation, snow etc.

Table 21 shows average temperature and humidity conditions for the region. Based on the given information all equipment shall be suitable for a working life as defined in Design Life of these Employer's Requirements under maximum ambient temperature range from – 9° to + 28 ° C, unless otherwise agreed by **tie**.

Edinburgh (eastern Scotland)

Sunshine (average hours per day)		Temperatures								Precipitation and humidity				Wet days (more than 0.1 mm/0.004 in)	
		Average daily				Highest recorded		Lowest recorded		Relative humidity		Average monthly precipitation			
		minimum		maximum						900	x				
		°C	°F	°C	°F	°C	°F	°C	°F	%		mm	in		
Jan	2	1	34	6	42	14	57	-8	17	84		57	2	17	Jan
Feb	3	1	34	6	43	14	58	-9	15	83		39	2	15	Feb
March	4	2	36	8	46	20	68	-6	21	81		39	2	15	March
April	5	4	39	11	51	22	72	-4	25	75		39	2	14	April
May	6	6	43	14	56	24	76	-1	31	76		54	2	14	May
June	6	9	49	17	62	28	83	3	37	75		47	2	15	June
July	5	11	52	18	65	28	83	6	42	78		83	3	17	July
Aug	4	11	52	18	64	28	82	4	40	80		77	3	16	Aug
Sept	4	9	49	16	60	25	77	1	33	80		57	2	16	Sept
Oct	3	7	44	12	54	20	68	-2	28	82		65	3	17	Oct
Nov	2	4	39	9	48	19	67	-4	24	83		62	2	17	Nov
Dec	1	2	36	7	44	14	58	-7	20	84		57	2	18	Dec

Based on readings for 30 years at 55°55' N, 3°11' W, altitude 134 m/440 ft.

Where equipment is enclosed in equipment housings / enclosures the equipment contained therein shall be capable of operating at an external ambient temperature 15°C higher than the upper limit and at a temperature of 5°C lower than the figures in Table 21 taking into account any heat generated by the equipment.

All equipment housings / enclosures that contain electronic equipment shall be so equipped to minimise the occurrence of condensation within the enclosure.

The following data in Figures 8 & 9 are based on the Edinburgh Test Reference Year (TRY) as given by CIBSE. It is a synthesised weather year based on 20 years of record data. CIBSE recommend that this type of weather data be used for analysing energy use and overall environmental performance.

Temperature

Dry Bulb Temperature	MAX 26.7°C	MIN –10.1°C	MEAN 8.43°C
Wet Bulb Temperature	MAX 18.9°C	MIN –10.7°C	MEAN 6.82°C

Figure 8 - Dry Bulb Temperature Analysis 1: Number of Hours per Year That the Dry Bulb Temperature is Greater Than the Given Value

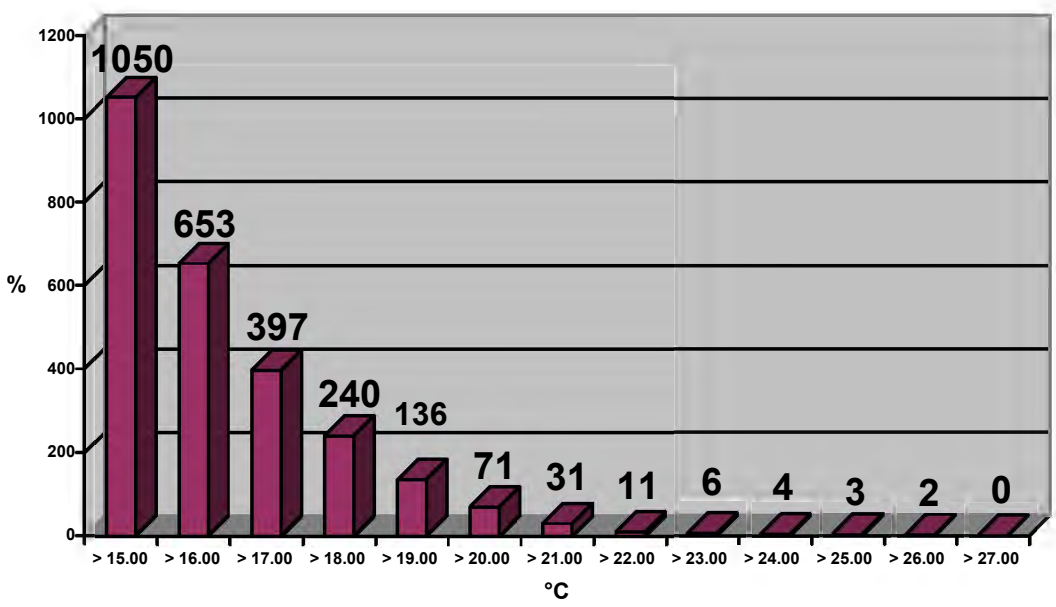
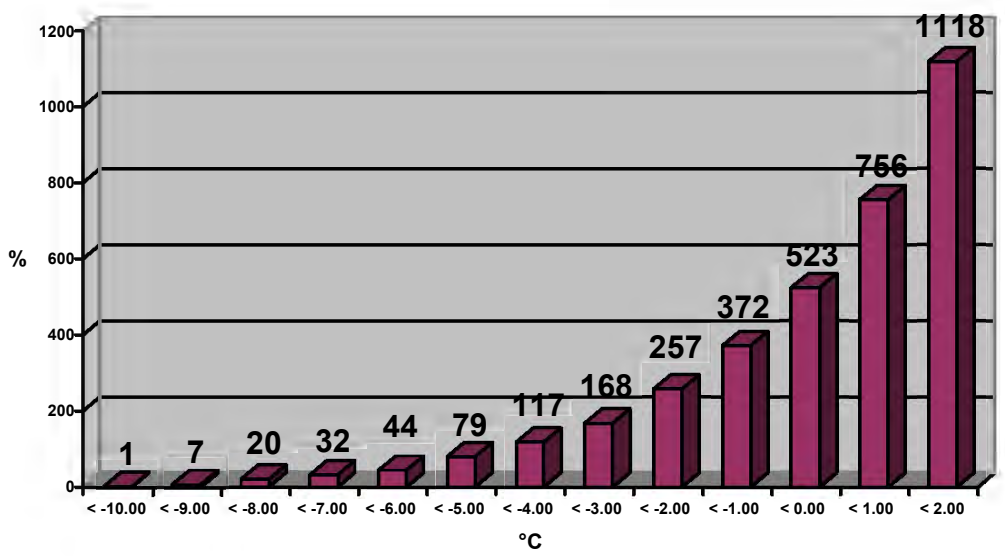


Figure 9 - Dry Bulb Temperature Analysis 2: Number of Hours per Year That the Dry Bulb Temperature is Less Than the Given Value



Wind Speed MAX 19.5m/s MIN 0m/s MEAN 4.6m/s

3.7 Construction-related Deliverables (Schedule 3 Requirements)

The following deliverables, from and with regard to *Schedule 3 (Code of Construction Practice and Code of Maintenance Practice)* are highlighted for submission in accordance with the Review Procedure:

- In accordance with Schedule 3 (Code of Construction Practice and Code of Maintenance Practice), the Infraco shall compile a schedule of all buildings, or other structures, which may be at risk of physical damage as a result of the Infraco Works. Furthermore records of the condition and surveys of any defects shall be prepared by the Infraco;

- Under Schedule 3 (Code of Construction Practice and Code of Maintenance Practice) there is a requirement for the Infraco to undertake works to address defects in existing structures, caused by the Infraco Works. Where such work is completed the Infraco shall be required to take appropriate photographs to fully demonstrate the quality of the reinstatement works;

3.8 Construction Advice and Buildability

The Infraco shall be required to develop a =Buildability Report in accordance with the Review Procedure.

The Infraco shall provide a Buildability Report in accordance with the Review Procedure, which shall address the following.

- The Infraco shall propose construction methods which shall be utilised in respect of the Infraco Works. The Infraco shall also advise **tie** on the time and cost implications of any alternative solutions proposed by the Infraco and which have been accepted by **tie**. The Infraco shall initiate the requirements for Temporary Works, and the programme for approvals for such Temporary Works and their execution.

- Notwithstanding the Infraco's obligations with respect to compliance with the third party agreements, the Infraco shall advise **tie** on the potential impact of the Infraco Works upon neighbouring occupiers and users of nearby roads, railways, buildings and airport facilities and the Infraco shall plan the execution of the Infraco Works in such a way as to minimise disruption and prevent nuisance.

- The Infraco shall advise **tie** on the provision and layout of the main site office and local Work Sector / Work Section facilities and services to be provided or secured by the Infraco. **tie**'s requirements for office accommodation at the main site office are expressed in this section.

The Infraco shall prepare, maintain and comply with plans, schedules and drawings that shall show the Infraco's proposals for temporary works, security and fencing arrangements throughout the duration of the Infraco Works ("Temporary Works, Security and Fencing Arrangements Plan").

3.9 Site Support Facilities for tie

The Infraco shall be responsible for the provision, servicing, maintenance and removal of the specified **tie** office accommodation and transport for the use of **tie** officers and staff

The Infraco shall provide and maintain fully serviced office accommodation and furnishings throughout the duration of the Infraco Works, in accordance with the following requirements:

- Office accommodation to accommodate 10 desks (Infraco supply) each with at least one secure lockable drawer, a swivel cloth upholstered chair. ;
- Three separate offices with a minimum working space of $16m^2$;
- 2 meeting rooms suitable for sitting up to 20 and 8 people respectively;
- Male and female toilets. Minimum area $3m^2$ each;
- Changing/Locker facilities;
- Kitchen facilities;
- Drying facilities;
- Male & Female shower room;
- Parking for up to 15 cars.

The Infraco shall prepare and submit an office layout based on the accommodation description set out below for approval by **tie**.

The Infraco shall integrate this accommodation with the Infraco's own accommodation and, subject to proposals which are acceptable to **tie**, the meeting rooms and welfare facilities may be shared by the Infraco.

3.9.1 Fittings and Furnishings

The Infraco shall also provide the following as minimum requirements:

General Office

- 7 x 4 drawer lockable metal filing cabinets
- 6 wall mounted notice board 1m high 1.5m wide
- 10 waste paper baskets
- 10 telephones connected to 2 lines
- 1 fax machine connected to a separate dedicated line
- 1 high output combined printer and photocopier capable of producing A4 and A3 black and white copies
- 10 connections to internet via broadband, all able to connect at same time
- 1 plan layout table 1 x 2 m
- 1 A0 drawing board and drafting equipment
- 10 desk lamps
- 10 letter tray/ filing baskets
- 2 m of book shelves at 6 of the desks
- 6 large white boards

Meeting Rooms

- Suitably sized tables and the requisite number of chairs for each of the two meeting rooms referred to above.

- 3 flip charts and flip chart paper as required and 1 large wall mounted white board in each meeting room

Changing / drying room

- Lockers c/w locks and keys for 30 people
- 4 chairs
- 30 coat pegs mounted on wall
- 1 boot pull.

General

- A security alarm system
- Access doors, fitted with five lever mortice locks and 6 sets of keys

3.9.2 Services

The Infraco shall provide, install and maintain all the services i.e. Gas, electric, water, drainage, telephone (two lines), broadband etc necessary to ensure effective occupation by **tie** of the accommodation for the duration of the Infraco Works

The Infraco shall provide install and maintain a printer/photocopier capable of producing A4 and A3 size black and white photocopies. The Infraco shall ensure that sufficient stocks of consumables (including paper and toner) are available at all times. Subject to acceptable proposals, the photocopier / fax may be shared by the Infraco and **tie**.

The Infraco shall provide tea, coffee, sugar fresh milk and a supply of drinking water for use by **tie** for the duration of the Infraco Works.

The Infraco shall arrange for the servicing and daily cleaning of the accommodation.

Toilet paper, paper towels, soap, and detergents shall be provided by the Infraco as required.

3.9.3 Equipment

The Infraco shall provide the following equipment for the exclusive use of **tie** throughout the duration of the Infraco Works:

- 10 x 10m long steel tape measures
- 10 x 50m long tape measures
- 10 x high output hand-held torches
- 2 approved electronic utility tracers for tracing/locating cables and pipes
- other consumables as may be required by **tie** (i.e. marker paint etc.).

The Infraco shall provide surveying/setting out equipment to **tie** as reasonably required, in connection with the Infraco Works.

3.9.4 Site Vehicles

The Infraco shall provide, licence, insure (comprehensive for any qualified driver together with any authorised passengers and the carriage of goods or samples), service and maintain four 4 wheeled road vehicles (suitable for the Edinburgh Tram Network) and visitor transport for the exclusive use of **tie**'s representative and staff to enable them to carry out their duties for the duration of the Agreement. The number and type shall be to the specific approval of **tie**.

The vehicles shall be delivered and maintained by the Infraco in good, roadworthy condition.

The Infraco shall provide fuel, oil and maintenance in conformity with the vehicle manufacturers' recommendations and shall clean the vehicles inside and outside as required by **tie**.

A suitable replacement vehicle shall be provided by the Infraco in the event any vehicle being out of service for more than 24 hours.

The Infraco shall ensure that each vehicle shall be fitted with approved warning beacons and any other safety equipment as required for work on roads or within the boundaries of the Edinburgh International Airport.

3.10 Spare Parts, Tools and Test Equipment

The Infraco shall be responsible for the provision, delivery, offloading and placing into stores of the necessary Spares Parts, Tools & Test Equipment.

Detailed requirements and deliverables in respect of the Spares Parts, tools and Test Equipment responsibilities are included in the Agreement.

3.11 Documentation

The Infraco shall be responsible for the provision of all as built / constructed / manufactured drawings, manufacturers information, test certification and other documentation to be provided inaccordance with the Agreement.

Detailed requirements and Deliverables in respect of the documentation responsibilities are included within the Agreement and the Maintenance section of these Employer's Requirements.

3.12 Training

The Infraco shall be responsible for all necessary initial training associated with the operation and maintenance of the Edinburgh Tram Network. Detailed requirements and deliverables in respect of the Training responsibilities are included within Section 40 (*Maintenance*) of these Employer's Requirements.

4 Use of Industry Standard Equipment

The Infraco shall base its system supply on Commercial Off the Shelf (COTS) equipment and software. The use of proprietary equipment and software which is not available on a COTS basis is prohibited unless prior written agreement has been obtained from **tie,** other than that which is specified in the Infraco Proposal.

This is to allow the maintenance, extension and modification of the ETN by third party suppliers and maintainers if necessary.

All electronic interfaces between subsystems shall use open standards and shall utilise non-proprietary protocol.

5 System Identity and Branding

A single system identity shall be applied to the ETN. This shall be developed by **tie** through a specialist contractor appointed by **tie**. The output of this contract with the specialist contractor shall be a documented set of design guidelines which shall be incorporated into these Employer's Requirements as Appendix 1 and which shall be complied with by the Infraco in respect of the Infraco Works. The design guidelines shall include the following elements:

- Logo and other elements of the ETN's graphic identity;
- Signage;
- Application of the systems identity to the following:
  - Ticket machines;
  - Stop furniture;
  - Passenger information;
  - Depot.
- Tram livery;
- Tram interior;
- Uniforms;
- Pictograms;
- Other aspects of the ETN which are visible to the public.

6 Design Life

The equipment and systems to be supplied for the Edinburgh Tram Network shall be designed and built by the Infraco to a standard that shall ensure the System as a whole is capable of continuous operation for a minimum period of 15 years from the Service Commencement Date for each Phase.

Individual items of Infrastructure and equipment shall have a design life as indicated in the table below. Where the design life for an item of equipment is not specified, a minimum of 15 years shall be assumed. All design lives are from the Service Commencement Date for each Phase.

Item of Equipment or System	Design Life
Trams	30 years
Structures	120 years
Track Bed	50 years
Track	25 years
Rails in Straight Lines	20 years
OLE	30 years
Power Cables	30 years
Substations and Substation Equipment	30 years
Tramstop Platforms	50 years
Tramstop Superstructure (including shelters and poles)	25 years
Tram Position and Detection equipment	15 years
Passenger Information Displays	10 years
Telephone Handsets	10 years
Telephone PABX	15 years
Voice recorder	15 years
PA Controller	10 years
Loudspeakers	15 years
Hand Portable Radio Handsets	5 years
Vehicle Mobile Radio Equipment	7 years

Item of Equipment or System	Design Life
Radio Base Station Equipment	15 years
Radio Masts and Antennae	15 years
Passenger Help Points	15 years
CCTV cameras	7 years
CCTV Digital Video Recorders	7 years
SCADA outstations	20 years
Fibre Optic Cabling and Patch Panels	25 years
Fibre Optic Switches, Routers, Hubs	15 years
Other communications equipment	15 years
Cabinets	25 years
UPS systems (excluding batteries)	15 years
Copper Communications Cables	25 years
Batteries (if employed)	4 years
Workstations including Monitors	5 years
Servers	5 years
Standard hand tools	5 years
Portable electrical tools	7 years

Table 22 - Equipment Design Life

7 Extensibility

Table 23 below sets out the assumptions being made in the design of Phase 1a and Phase 1b to allow Phases 2 and 3 to be added with minimum change, and also for future increase in service levels on Phase 1a/1b (over the "8+8" pattern) and for the addition on the proposed Line 3 (assumed routing Bridges-Princes St-Haymarket).

Area	Topic	Phase 1a/1b Design Basis	Provision for Phases 2 and 3	Provision for Phase 1a/1b increased service	Provision for ETL3 (Edinburgh Tram Line 3)	Provisions for other purposes
Track Layout	Roseburn Junction/Delta	Design for full delta	n/a		n/a	n/a
	Balgreen loop and crossover	Design for loop and crossover	n/a		n/a	n/a
	Granton Square	Design for interim terminus	Design for track continuation; build initial as over-run for terminus	n/a	n/a	n/a
	Newhaven	Design for interim terminus	Design for track continuation	n/a	n/a	n/a

Area	Topic	Phase 1a/1b Design Basis	Provision for Phases 2 and 3	Provision for Phase 1a/1b increased service	Provision for ETL3 (Edinburgh Tram Line 3)	Provisions for other purposes
	Ingliston Junction and P&R Tramstop	Make provision for Phase 3 and long-term aspirations	Alignment design not to preclude an allowance terminating Phase 3 service at Ingliston P&R and for East-West continuation from Phase 1	n/a	n/a	n/a
	Track alignment at Princes St/South St Andrew St Junction	Make Provision for Line 3	n/a	n/a	Alignment to allow pointwork and appropriate future traffic management(See CR078)	n/a
Modelling	Network modelling inc. for TSJs	To support 8+8 service	None	None	None	n/a
Traction Power	Traction Power Supply system (Substations/OLE/cabling)	To support 8+8 service +50% addition	Part of basic design	In basic design	Effectively in basic design, as an alternative use of the increased service design provision	n/a

Area	Topic	Phase 1a/1b Design Basis	Provision for Phases 2 and 3	Provision for Phase 1a/1b increased service	Provision for ETL3 (Edinburgh Tram Line 3)	Provisions for other purposes
	Definition of Power characteristics (and other parameters for modelling)	Full traction characteristic of the selected tram	n/a	n/a	n/a	n/a
Depot	Stabling sidings	Design for 35, build for 27	Inc. in 8 extra	Inc. in 8 extra	Not specifically included	n/a
	Workshop	8 Berths theoretical maximum; (practically:4 berths plus 2 service roads)	Initial design would accommodate	Initial design would accommodate	Not specifically included	n/a
	Depot staff accommodation	Numbers to be accommodated nominally match fleet that could be accommodated	Initial design would accommodate	Initial design would accommodate	Not included	n/a
	Depot car parking	See drawings	n/a	n/a	Not included	n/a
	Depot Control Centre	Design for 5 desks; provide 3	Design layout would accommodate	Initial provision would accommodate	Design layout would accommodate	n/a

Area	Topic	Phase 1a/1b Design Basis	Provision for Phases 2 and 3	Provision for Phase 1a/1b increased service	Provision for ETL3 (Edinburgh Tram Line 3)	Provisions for other purposes
	Depot stores	Design basis	Would accommodate	Would accommodate	Not included	n/a
						n/a
SCC	ODN capacity					
	General capacity	There is an initial +50% requirement above the calculated maximum usage	TBA	TBA	TBA	n/a
	Route coding capacity	3-digit route-coding included	Included in base	n/a	Included in base	n/a
	Radio system capacity	A minimum[2] of two channels at each base station	TBA	TBA	TBA	n/a
Roads	Traffic Signalled Junction design and modelling (inc. at temporary termini)	Phase 1a/1b only	Possibly ductwork at temporary termini	n/a	None	n/a

[2] *The word maximum would allow no channels to be provided and still be compliant! Two channels ok as a minimum.*

Area	Topic	Phase 1a/1b Design Basis	Provision for Phases 2 and 3	Provision for Phase 1a/1b increased service	Provision for ETL3 (Edinburgh Tram Line 3)	Provisions for other purposes
	Traffic Management layout at Princes St/South St Andrew St	Phase 1a only	n/a	n/a	None	n/a
	Traffic signalling ductwork	Design basis	n/a	n/a	n/a	Allowance in design at locations where additional signals might be provided
Tramway Ducting	Ductwork and access chambers	A minimum of 20% addition of the number of ducts	Initial design would accommodate	Initial design would accommodate	Initial design would accommodate	n/a
Utilities	Cross-track ducts	Where agreed with the SUCs, provision of secondary spare duct	n/a	n/a	n/a	Provision in design basis

Table 23 - Extensibility Assumptions

8 Standards

8.1 Principles

Where there is no relevant standard specified in the Agreement, the Infraco Works shall comply as a minimum with relevant current British or European Standards, DfT and/or Scottish Government Publications, Standards and Technical Memoranda or IEC/ISO Standards in accordance with the order of precedence set out in section 8.2.

The Infraco Works shall comply with the ORR Safety Publication 2 and with the requirements of HMRI. Where standards do not exist, the Infraco Works shall comply with Good Industry Practice and all relevant codes of practice and guidance notes. Materials or equipment provided shall be in accordance with regulations and standards appropriate to the United Kingdom or the country of manufacture, but only where in the opinion of **tie**, compliance with the regulations and standards appropriate to the country of manufacture ensures an equivalent or higher quality than the regulations and standards appropriate to the United Kingdom. In such situations, the onus will be on the Infraco to prove that they are of an equivalent or higher quality.

Where standards are specified in these Employer's Requirements, these shall include any successor or replacement standards, announced or in force before7 August 2007 and in relation to Tram Supply Obligations and Tram Maintenance Obligations only, 14 September 2007, which provide an equivalent or improved quality and standard.

The Infraco shall comply with standards reasonably required by the relevant Roads Authority, including any local standards and amendments to the Design Manual for Roads and Bridges.

The Infraco shall be responsible for identifying all proposed departures from standards: in these instances, the Infraco shall seek the formal approval of **tie**, and provide all details justifying the departure from standards.

The Infraco shall be responsible for making any necessary applications to the relevant Roads Authority for departure from standards and for complying with the resulting consequences, including those arising from the failure of an application for such departure.

The Infraco shall ensure that all materials, construction and workmanship comprised in the Infraco Works meet the requirements of the British or European standards relevant to the materials used. Materials used should have a British Board of Agrément Certificate wherever reasonably possible which identifies a lifespan for that material.

8.2 Hierarchy of Precedence.

The order of precedence shall be as follows:

1) Legislation;

2) Guidance;

3) Where not included in Guidance;

(i.) British Standards;

(ii.) Scottish Government standards and guidance;

(iii.) Local Authority standards (CEC);

(iv.) Statutory Utility standards;

(v.) International Industry standards.

8.3 The Infraco's Responsibilities

The Infraco in its system integrator role and as the system designer shall be responsible for:

- As appropriate, the development of, and compliance to, robust management processes in respect of compliance with Law and any other relevant standards or regulations included in the Agreement and section 8.2.
- The identification and selection of appropriate standards for all aspects of the Infraco Works
- The identification and definition of any application limits of such standards for all aspects and at all stages of the Infraco Works (such as design, construction, testing and commissioning, operation, and maintenance) in particular at the network, System and subsystem level.
- The identification and successful resolution of any conflicts within and between the obligations contained within this section 8 and Law.

8.3.1 Applicable Standards

Applicable standards are listed in the following table.

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 8500 – 1: 2002	Concrete – Complementary British Standard to BS EN 206-1. Method for specifying and guidance for specifier	x	x	x			x		x	x	
BS 8500 – 2: 2002	Concrete – Complementary British Standard to BS EN 206-1. Specification for constituents material and concrete	x	x	x			x		x	x	
BRE Special Digest Nr 1	Concrete in aggressive ground.	x	x	x			x		x	x	
BS 4449: 1997	Specification for carbon steel bars for reinforcement of concrete	x	x	x			x		x	x	
BS 6744: 2001	Stainless steel bars for the reinforcement and use in concrete – Requirements and test methods	x	x	x			x		x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 10210 S355 J2H	Steelwork: Hollow sections	x					x				
BS EN 10025 S355J2G3	Steelwork: All other sections	x					x			x	
BS 5400 -	Steel, Concrete and Composite Bridges	x									
BS 5400 - Part 1: 1988	General Statement (see BD 15/92)	x									
BS 5400 Part 2: 1978	Specification for Loads (See BD 37/01)	x									
BS 5400 Part 3: 2000	Code of Practice for Design of Steel Bridges	x									
BS 5400 Part 4: 1990	Code of Practice for Design of Concrete Bridges (see IA.5 and BD 24/92)	x									
BS 5400 Part 5: 1979	Code of Practice for Design of Composite Bridges (see BD 16/82)	x									
BS 5400 Part 9: 1983	Bridge Bearings (see BD 20/92)	x									
BS 5400 Part 10: 1980	Code of Practice for Fatigue (see BD 9/81)	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 5930: 1999	Code of Practice for Site Investigations	x	x	x					x	x	
BS 8666: 2000	Scheduling, Dimensioning, Bending and Cutting of Steel Reinforcement for Concrete	x	x	x			x		x	x	
BS EN 206-1: 2000	Concrete - Specification, performance, production and conformity (AMD 13189)	x	x	x			x		x	x	
BS 8500-1: 2002	Concrete – Complimentary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier.	x	x	x			x		x	x	
BA 47/99 (Aug '99)	Waterproofing and Surfacing of Concrete Bridge Decks	x									
BA 41/98 (Feb '98)	The Design and Appearance of Bridges	x									
BA 42/96 (Nov '96)	The Design of Integral Bridges	x									
BA 55/00 (May '00)	The Assessment of Bridge Substructures & Foundations, Retaining Walls & Buried Structures	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BA 57/95 (Aug '95)	Design For Durability	x									
BD 2/79 (Jun '88)	Technical Approval of Highway Structures on Motorways and other Trunk Roads, Part IV: Procedures for Lighting Columns	x		x							
BD 2/89 (Oct '89)	Technical approval of DTp highway structures on motorways and other trunk roads Part 1, General Procedures	x									
BD 7/81 (Aug '81)	Weathering steel for highway structures	x									
BD 9/81 (Dec '81)	Implementation of BS 5400 Pt 10, CP for fatigue	x									
BD 12/95 (Feb '96)	Design of Corrugated Steel Buried Structures with spans not exceeding 8m (including circular Arches)	x									
BD 13/90 (Feb '91)	Design of Steel Bridges Use of BS 5400: Part 3: 1982	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BD 15/92 (Dec '92)	General Principles for the Design and Construction of Bridges Use of BS 5400: Part 1: 1988	x									
BD 16/82 (Dec '82)	Design of composite bridges - Use of BS 5400 Pt 5: 1979 including Amendment No. 1 (Dec '87)	x									
BD 20/92 (Oct '92)	Bridge Bearings Use of BS 5400: Part 9: 1983	x									
BD 21/97 (Aug '97)	The Assessment of Highway Bridges and Structures Amendment No. 1 (Aug '97)	x									
BD 24/92 (Nov '92)	Design of Concrete Highway Bridges and Structures Use of BS 5400: Part 4: 1990 Including Interim Advice Note IA.5 July 1996	x									
BD 28/87 (Jul '87)	Early thermal cracking of concrete including Amendment No. 1 (Aug '89)	x									
BD 30/87 (Jul '87)	Backfilled retaining walls and bridge abutments	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BD 31/87 (Jan '88)	Buried concrete box type structures	x									
BD 33/94 (Nov '94)	Expansion Joints for Use in Highway Bridge Decks	x									
BD 37/01 (Aug '01)	Loads for Highway Bridges	x									
BD 42/00 (May '00)	Design of Embedded Retaining Walls and Bridge Abutments	x									
BD 43/90 (Apr '90)	Criteria and Material for the Impregnation of Concrete Highway Structures	x									
BD 44/95 (Jan '95)	The Assessment of Concrete Highway Bridges and Structures Including Interim Advice Note IA.4 July 1996.	x									
BD 47/99 (Aug '99)	Waterproofing and Surfacing of Concrete Bridge Decks	x									
BD 48/93 (Jun '93)	The Assessment and Strengthening of Highway Bridge Supports	x									
BD 49/93 (Jan '93)	Design Rules for Aerodynamic Effects on Bridges	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BD 52/93 (Apr '93)	The Design of Highway Bridge Parapets	x									
BD 56/96 (Nov '96)	The Assessment of Steel Highway Bridges and Structures	x									
BD 57/95 (Aug '95)	Design for Durability	x									
BD 58/94 (Nov '94)	The Design of Concrete Highway Bridges and Structures with External and Unbonded Prestressing	x									
BD 60/94 (Apr '94)	The Design of Highway Bridges for Vehicle Collision Loads (this does not apply to existing structures).	x									
BD 70/97 (Feb '97)	Strengthened/Reinforced Soils and Other Fills for Retaining Walls and Bridge Abutments (use of BS 8006:1995)	x									
BD 74/00 (May '00)	Foundations	x					x			x	
TD 9/93 (Jun '93)	Highway Link Design	x									

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
TD 27/96 (Aug '96)	Cross sections and headrooms	x									
ASO10	Railway sleepers – Jarrah, Karri and Wandoo.		x								
ASO11	Railway crossing timbers – Jarrah.		x								
BS EN 13674-1:2003	Specification for railway rails (partially replaces BS11)		x								
BS47	Fishplates for railway rails.		x								
BS EN 13043:2002	Aggregates for bituminous mixtures and surface treatments for roads.		x	x						x	
BS64	Specification for normal and high strength steel bolts and nuts for railways rail fishplates.		x								
BS729	Specification for hot dip galvanised coatings on iron and steel articles.		x								
BS EN 1097-3:1998	Testing aggregates. (partially replaces BS812)		x								

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS970	Specification for wrought steels for mechanical and allied engineering purposes.		x								
BS1377	Methods of tests for soils for civil engineering purposes.	x	x	x			x			x	
BS3100 (withdrawn)	Specification for steel coatings for general engineering purposes.		x				x			x	
BS4921	Specification for sheradised coatings on iron and steel.		x				x			x	
BS EN 10270-1:2001	Specification for patented cold drawn steel wire for mechanical springs.		x								
BS6906	Methods of tests for geotextiles.		x								
BS EN 1562	Founding. Malleable cast irons.		x								
BS EN 1563	Founding. Spheroidal graphite cast iron.		x								
BS EN 13481-2	Performance requirements for fastening systems for concrete sleepers.		x								
BS EN 13481-3	Performance requirements for fastening systems for wooden sleepers.		x								

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 10002 – 1	Tensile testing of metallic materials (method of test at ambient temperature).		x								
BS EN 10025	Hot rolled products of structural steels. General technical delivery conditions		x							x	
ENAAA-2	Railway applications – Track – Fastening Systems Part 2: Performance requirements for fastening system for concrete sleepers.		x								
ISO/R887	Plain washers for metric bolts, screws and nuts.		x								
RT/E/S/40045	Network Rail Standard Electric Points Heating.		x								
UIC605OR	Protection from corrosion – measures to be taken on direct current catenaries to reduce the risks on adjacent piping and cable systems.		x								
UIC860	Technical specification for the supply of rails.		x								

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
UIC861-2	Standard sections for points rails adapted to the UIC54 and 60kg/m rail sections.		x								
UIC861-3	Standard 60kg/m rail profiles – types UIC60 and 60E.		x								
UIC863	Technical specification for the supply of non-treated track support (wooden sleepers for standard and broad-gauge track and crossing timbers).		x								
UIC863-1	Use of non-European timbers for the manufacture of sleepers.		x								
UIC864-1	Technical specification for the supply of sleeper screws.		x								
UIC864-2	Technical specification for the supply of steel track bolts.		x								
UIC864-3	Technical specification for the supply of spring steel washers for use in permanent way.		x								

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
UIC864-4	Technical specification for the supply of fishplates or sections for fish-plates made of rolled steel.		x								
UIC864-5	Technical specification for the supply of rail seat pads.		x								
UIC864-6	Technical specification for the supply of baseplates and for sections for baseplates made of rolled steel.		x								
UIC864-7	Rolled profiles for baseplates for UIC rails.		x								
UIC864-8	Rolled profiles for fishplates for 54kg/m and 60kg/m rails.		x								
UIC866	Technical specification for the supply of cast manganese steel crossings for switch and crossing work.		x								
BS 1363-2:1995	13A plugs, sockets-outlets and adaptors. Part 2, Spec. for 13A switched and unswitched socket-outlets				x			x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 1363-4:1995	13A plugs, socket-outlets and adaptors. Part 4, Spec. for 13A fused connection units switched and unswitched				x			x	x	x	
BS 3573:1990	Polyolefin copper-conducted telecommunications cables							x	x	x	
BS 4533-102.1:1990	Luminaires. Particular requirements. Part 102.1 Fixed general purpose luminaires				x				x	x	
BS 4579-1:1970 (withdrawn, replaced by BS EN 61238-1)	Performance of mechanical and compression joints in electric cable and wire connectors. Part 1 Compression joints in copper conductors				x	x	x	x	x	x	
BS 4579-2:1973	Performance of mechanical and compression joints in electric cable and wire connectors. Part 2 Compression joints in nickel, iron and plated copper conductors				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 4662:1970 (withdrawn. replaced by BS 4662:2006)	Specification for boxes for the enclosure of electrical accessories				x	x	x	x	x	x	
BS 4737-4.1:1987	Intruder alarm systems in buildings. Part 4.1 Codes of practice. Code of practice for planning and installation				x				x	x	
BS 5225-1:1975	Photometric data for luminaires. Part 1 Photometric measurements				x				x	x	
BS 5225-3:1982	Photometric data for luminaires. Part 3 Method of photometric measurement of battery-operated emergency lighting luminaires				x				x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 5266-1:1999	Emergency lighting. Part 1 Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment				x				x	x	
BS 5266-3:1981	Emergency lighting. Part 3 Specification for small power relays (electromagnetic) for emergency lighting applications up to and including 32A				x				x	x	
BS 5467:1997 (equivalen european harmonisation document to be provided)	Specification for 600/1000V and 1900/3300V armoured electric cables having thermosetting insulation				x		x		x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 546:1950	2-pole and earthing-pin plugs, socket-outlets and socket-outlet adaptors. See also Supplement No 1:1960 Specification for plugs made of resilient material				x				x	x	
BS 5486-11:1989 (withdrawn, replaced by BS EN 60439)	Low-voltage switchgear and control gear assemblies. Part 11 Specification for particular requirements of fuseboards				(withdrawn, replaced by BS EN 60439)x			x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 5486-12:1989 (withdrawn, replaced by BS EN 60439)	Low-voltage switchgear and control gear assemblies. Part 12 Specification for particular requirements of type-tested miniature circuit-breaker boards				x			x	x	x	
BS 5499-1:2002	Graphical symbols and signs. Part 1 Safety signs, including fire safety signs. Specification for geometric shapes, colours and layout				x				x	x	
BS 5499-3:1990	Fire safety signs, notices and graphic symbols. Part 3 Specification for internally-illuminated fire safety signs				x			x	x	x	
BS 5499-5:2002	Graphical symbols and signs. Safety signs, including fire safety signs. Part 5 Signs with specific safety meanings				x			x	x	x	
BS 5649-2:1978	Lighting columns. Part 2 Dimensions and tolerances			x					x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 5649-5:1982	Lighting columns. Part 5 Specification for base compartments and cableways			x					x	x	
BS 5649-7:1985	Lighting columns. Part 7 Method for verification of structural design by calculation			x					x	x	
BS 5733:1995	Specification for general requirements for electrical accessories				x	x	x	x	x	x	
BS 5839-1:2002	Fire detection and alarm systems for buildings. Part 1 Code of practice for system design, installation, commissioning and maintenance				x				x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6004:2000 (equivalen european harmonisation document to be provided)	Electric cables. PVC insulated, non-armoured cables for voltages up to and including 450/750V, for electric power, lighting and internal wiring				x	(please provide equivalen european harmonisation document)x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6121-2:1989 (withdrawn, replaced by BS EN 50262)	Mechanical cable glands. Part 2 Specification for polymeric glands				(withdrawn, replaced by BS EN 50262)x	x	x(withdrawn; refer to "Power")	x	x	x	
BS 6133:1995	Code of practice for safe operation of lead-acid stationary batteries								x	x	
BS 6290-2:1999	Lead-acid stationary cells and batteries. Part 2 Specification for the high-performance Plant positive type								x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6290-4:1997	Lead-acid stationary cells and batteries. Part 4 Specification for classifying valve regulated types								x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6346:1997 (equivalent european harmonisation document to be provided)	600/1000V and 1900/3300V armoured electric cables having PVC insulation				x(please provide equivalent european harmonisation doc	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6651:1999 (withdrawn, replaced by BS EN 62305)	Code of Practice for protection of structures against lightning	x			(withdrawn, replaced by BS EN 62305)x	x	x(withdrawn; refer to "Power")	x	x	x	
BS 6701:1994	Code of Practice for installation of apparatus intended for connection to certain telecommunication systems				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6724:1997 (equivalent european harmonisation document to be provided)	600/1000V and 1900/3300V armoured electric cables having thermosetting insulation and low emission of smoke and corrosive gases when affected by fire				x	x	x	x	x	x	
BS 7001:1988	Interchangeability and safety of a standardized luminaire supporting coupler								x	x	
BS 7211:1998 (equivalent european harmonisation document to be provided)	Thermosetting insulated cables (non-armoured) for electric power and lighting with low emission of smoke and corrosive gases when affected by fire				x	x	x	(refer to "Power")x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 7430:1998	Code of practice for earthing	x			x	x	x		x	x	
BS 7654:1997	Single phase street lighting fuses (cut-outs) for low-voltage public electricity distribution systems. 25A rating for highway power supplies and street furniture			x					x	x	
BS 7671:2001	Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition			x	x	x	x	x	x	x	
BS 7919:2001 (equivalent european harmonisation document to be provided)	Electric cables. Flexible cables rated up to 450/750V, for use with appliances and equipment intended for industrial and similar environments			x	x	x	x	x(refer to "Power")	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 12613:2001	Plastic warning devices for underground cables and pipelines with visual characteristics			x	x	x	x	x	x	x	
BS EN 40-1:1991	Lighting columns. Part 1 Definitions and terms			x					x	x	
BS EN 40-3-1:2000	Lighting columns. Part 3-1 Design and verification. Specification for characteristic loads			x					x	x	
BS EN 40-3-2:2000	Lighting columns. Part 3-2 Design and verification. Verification by testing			x					x	x	
BS EN 40-5:2002	Lighting columns. Part 5 Requirements for steel lighting columns			x					x	x	
BS EN 40-6:2002	Lighting columns. Part 6 Requirements for aluminium lighting columns			x					x	x	
BS EN 50085-1:1999	Cable trunking and cable ducting systems for electrical installations. Part 1 General requirements			x	x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 50085-2-3:2001	Part 2-3 Particular requirements for slotted cable trunking systems intended for installation in cabinets				x	x	x	x	x	x	
BS EN 50086-2-1:1996	Conduit systems for cable management. Part 2-1, Particular requirements. Rigid conduit systems				x	x	x	x	x	x	
BS EN 50171:2001	Central power supply systems				x	x	x	x	x	x	
BS EN 50173-1:2002	Information technology. Generic cabling systems. General requirements and office areas				x	x	x	x	x	x	
BS EN 50174-1:2001	Information technology. Cabling installation. Part 1 Specification and quality assurance				x	x	x	x	x	x	
BS EN 50174-2:2001	Information technology. Cabling installation. Part 2 Installation planning and practices inside buildings				x	x	x	x	x	x	
BS EN 50262:1999	Metric cable glands for electrical installations				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 50310:2000	Application of equipotential bonding and earthing in buildings with information technology equipment				x	x	x	x	x	x	
BS EN 54-10:2002	Fire detection and fire alarm systems. Part 10 Flame detectors. Point detectors				X				x	x	
BS EN 54-11:2001	Fire detection and fire alarm systems. Part 11 Manual call points				X				x	x	
BS EN 54-1:1996	Fire detection and fire alarm systems. Part 1 Introduction				X				x	x	
BS EN 54-2:1998	Fire detection and fire alarm systems. Part 2 Control and indicating equipment				X				x	x	
BS EN 54-3:2001	Fire detection and fire alarm systems. Part 3 Fire alarm devices. Sounders				X				x	x	
BS EN 54-4:1998	Fire detection and fire alarm systems. Part 4 Power supply equipment				X				x	x	
BS EN 54-5:2001	Fire detection and fire alarm systems. Part 5 Heat detectors. Point detectors				X	x		x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 54-7:2001	Fire detection and fire alarm systems. Part 7 Smoke detectors. Point detectors using scattered light, transmitted light or ionization				X				x	x	
BS EN 55015:2001	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment							x	x	x	
BS EN 60051-1:1999	Direct acting indicating analogue electrical measuring instruments and their accessories. Part 1 Definitions and general requirements common to all parts				x				x	x	
BS EN 60081:1998	Double-capped fluorescent lamps. Performance specifications				x				x	x	
BS EN 60188:2001	High-pressure mercury vapour lamps. Performance specifications								x	x	
BS EN 60269-1:1999	Low-voltage fuses. Part 1 General requirements				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60400:2000	Lamp holders for tubular fluorescent lamps and starter holders				x				x	x	
BS EN 60432-2:2000	Safety specification for incandescent lamps. Part 2 Tungsten halogen lamps for domestic and similar general lighting purposes				x				x	x	
BS EN 60439-1:1999	Specification for low-voltage switchgear and control gear assemblies. Part 1 Type-tested and partially type-tested assemblies				x	x		x	x	x	
BS EN 60439-2:2000	Specification for low-voltage switchgear and control gear assemblies. Part 2 Particular requirements for busbar trunking systems (busways)				x	x		x	x	x	
BS EN 60439-3:1991	Part 3 Particular requirements for low-voltage switchgear and control gear assemblies for installation in places where unskilled persons have access to their use.				x	x		x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60439-4:1991	Part 4 Particular requirements for assemblies for construction sites (ACS)				x	x	x	x	x	x	
BS EN 60439-5:1996	Part 5 Particular requirements for assemblies intended to be installed outdoors in public places. Cable distribution cabinets (CDCs) for power distribution in networks				x	x	x	x	x	x	
BS EN 60454-1:1995	Pressure-sensitive adhesive tapes for electrical purposes. Part 1 General requirements				x	x	x	x	x	x	
BS EN 60529:1992	Degrees of protection provided by enclosures (IP code)				x	x	x	x	x	x	
BS EN 60598-1:2000	Luminaires. Part 1 General requirements and tests								x	x	
BS EN 60598-2-18:1994	Luminaires. Part 2-18. Particular requirements. Luminaires for swimming pools and similar applications								x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60598-2-22:1999	Luminaires. Part 2-22. Particular requirements. Luminaires for emergency lighting								x	x	
BS EN 60598-2-23:1997	Luminaires. Part 2-23. Particular requirements. Extra low voltage lighting systems for filament lamps								x	x	
BS EN 60598-2-2:1997	Luminaires. Part 2-2. Particular requirements. Recessed luminaires								x	x	
BS EN 60598-2-3:2003	Luminaires. Part 2-3. Particular requirements. Luminaires for road and street lighting			x					x	x	
BS EN 60598-2-5:1998	Luminaires. Part 2-5. Particular requirements. Floodlights								x	x	
BS EN 60896-2:1996	Stationary lead-acid batteries. General requirements and methods of test. Part 2 Valve regulated types								x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60898-1:2003	Circuit-breakers for overcurrent protection for household and similar installations. Part 1 Circuit-breakers for a.c. operation				x	x		x	x	x	
BS EN 60898-2:2001	Part 2 Circuit-breakers for a.c. and d.c. operation				x	x	x	x	x	x	x
BS EN 60921:1991	Ballasts for tubular fluorescent lamps. Performance requirements				x	x	x	x	x	x	
BS EN 60923:1996	Auxiliaries for lamps. Ballasts for discharge lamps (excluding tubular fluorescent lamps). Performance requirements				x	x	x	x	x	x	
BS EN 60925:1991	Performance requirements for d.c. supplied electronic ballasts for tubular fluorescent lamps				x	x	x	x	x	x	
BS EN 60927:1997	Auxiliaries for lamps. Starting devices (other than glow starters). Performance requirements				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60929:1992	a.c. supplied electronic ballasts for tubular fluorescent lamps. Performance requirements				x	x	x	x	x	x	
BS EN 60947-2:2003	Low-voltage switchgear and control gear. Part 2, Circuit-breakers				x	x	x	x	x	x	
BS EN 60947-3:1999	Part 3, Switches, disconnectors, switch-disconnect TBA ors and fuse-combination units				x	x	x	x	x	x	
BS EN 60947-4-1:2001	Part 4-1, Contactors and motor-starters. Electromechanical contactors and motor-starters				x	x	x	x	x	x	
BS EN 61008-1:1995	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs). Part 1 General rules				x	x	x	x	x	x	
BS EN 61008-2-1:1995	Part 2-1 Applicability of the general rules to RCCBs functionally independent of line voltage				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 61009-1:1995	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs). Part 1 General rules				x	x	x	x	x	x	
BS EN 61009-2-1:1995	Part 2-1 Applicability of the general rules to RCBOs functionally independent of line voltage				x	x	x	x	x	x	
BS EN 61048:1993	Capacitors for use in tubular fluorescent and other discharge lamp circuits. General and safety requirements				x	x	x	x	x	x	
BS EN 61049:1993	Capacitors for use in tubular fluorescent and other discharge lamp circuits. Performance requirements				x	x	x	x	x	x	
BS EN 61347-2-1:2001	Lamp control gear. Part 2-1 Particular requirements for starting devices (other than glow starters)				x	x	x	x	x	x	
BS EN 61347-2-3:2001	Lamp control gear. Part 2-3 Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 61347-2-7:2001	Lamp control gear. Part 2-7 Particular requirements for d.c. supplied electronic ballasts for emergency lighting				x	x	x	x	x	x	
BS EN 61347-2-8:2001	Lamp control gear. Part 2-8 Particular requirements for ballasts for fluorescent lamps				x	x	x	x	x	x	
BS EN 61347-2-9:2001	Lamp control gear. Part 2-9 Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps)				x	x	x	x	x	x	
BS EN 61537:2002	Cable tray systems and cable ladder systems for cable management				x	x	x	x	x	x	
BS EN 61558-1:1998	Safety of power transformers, power supply units and similar devices. Part 1 General requirements and tests				x	x	x	x	x	x	
BS EN 61558-2-9:2003	Part 2-9 Particular requirements for transformers for Class III handlamps for tungsten filament lamps				x	x	x	x	x	x	
BS EN 62035:2000	Discharge lamps (excluding fluorescent lamps). Safety specifications				x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 62040-1-1:2003	Uninterruptible power systems (UPS). Part 1-1 General and safety requirements for UPS used in operator access areas				x	x	x	x	x	x	
BS EN 62040-1-2:2003	Uninterruptible power systems (UPS). Part 1-2 General and safety requirements for UPS used in restricted access locations				x	x	x	x	x	x	
BS IEC 1008-2-2:1990	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCCBs). Part 2-2 Applicability of the general rules to RCCBs functionally dependent on line voltage				x	x	x	x	x	x	
BS 5489-1:2003	Code of Practice for the Design of Road Lighting				x	x	x	x	x	x	
GM/TT0146	Lighting of Railway Premises (Railway Group Standards)								x	x	
GI/RT7010	Lighting of Railway Premises (Railway Group Standards)								x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
GI/GN7607	Guidance for Low Voltage Electrical Installations (Railway group guidance notes)				x	x	x	x	x	x	
GI/RT7007	Low Voltage Electrical Installations (Railway Group Standards)				x	x	x	x	x	x	
GPGLRP3	Good Practice – Lighting for Railway Premises				x			x	x	x	
										x	
EN50121 Pts 1-5	Railway applications electromagnetic compatibility				x	x	x	x	x	x	
2004/40/EC	European directive				x			x		x	
EN50128: 2001	Railway Applications – Communications, signalling and processing systems – software for railway control and protection systems.				(not applicable)x			x		x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
ENV50129: 1998	Safety related electronic systems for signalling.				(not applicaqble)x			x		x	
IEC61508: 1998	Functional safety of electrical/electronic/programmable electronic safety related systems.							x		x	
	Methods for assessing the safety integrity of safety related software of uncertain pedigree (SOUP), Health and Safety Executive				(not applicable)x			x		x	
	Edinburgh Tram Earthing Systems Policy	x	x		x	x	x	x	x	x	

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
EN50128: 2001	Railway Applications – Communications, signalling and processing systems – software for railway control and protection systems.				(not applicable)x	x	x	x	x	x	
IEC61508: 1998	Functional safety of electrical/electronic/programmable electronic safety related systems.				(not applicable)x			x			
MPT 1331	Code of Practice for Radio Site Engineering							x			
MPT 1362	Code of Practice for installation of mobile radio equipment in land based vehicles							x			
MPT 1327	A Signalling Standard For Trunked Private Land Mobile Radio Systems (June 1997)							x			

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
G1/RT7015	Railway Group Standard (Feb 2003)					x					
BS EN50126	Railway applications- The specification and demonstration of Dependency, Reliability, Availability, Maintainability and Safety,		x		x	x	x	x	x	x	x
BS EN50149	Railway applications – Fixed installation-Copper and Copper alloy grooved contact wire,						x				
BS EN50119	Railway applications - Fixed installation-electric traction-Overhead Lines.						x				
BS EN50206-2 –	Pantographs for Light Rail vehicles						x				
BS EN50125-1	Railway applications - Fixed installations, Environmental conditions						x				
BS EN50317,	Railway applications - Fixed installations, Requirements for and validation of measurements of dynamic interaction between pantograph and contact line						x				

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN50151	Railway applications - Fixed installations, Special requirements for composite insulators						x				
BS EN50345	Railway applications - Fixed installations, Insulating synthetic rope assemblies for support of overhead contact lines						x				
BS EN50318	Railway applications - Fixed installations, validation of the simulation of dynamic interaction between pantograph and contact line						x				
BS EN 50122-1	Railway Applications – Fixed Installations Part 1: Protective provisions relating to electrical safety and earthing				x		x				
BS EN 50122-2	Railway Applications – Fixed Installations Part 2: Protective provisions against the effects of stray currents caused by d.c. traction systems				x						

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS EN 60146	Semiconductor convertors – General requirements and line commutated convertors				x						
BS EN 50123	Railway Installations – Fixed installations – d.c. switchgear				x						
IEC 850 (IEC 60850)	Supply voltages for traction systems										
BS 2618	British Standard Specification for Electrical Traction Equipment				(not applicable)x						
BS 6290	Batteries				x						
BS 7354	Battery Duty Calculations.				x						
CP 1013	Earthing.				x						
BRB Spec. DC 112	DC Power Cables.				x		x				

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6360 (IEC 60228)	Cable Conductors.				x		x				
BS 6899 Type GP2	DC Power Cable Insulation.				x		x				
IEC 228 (BS 6360)	Conductors for Multicores.				x		x				
DMRB	The United Kingdom Design Manual for Roads and Bridges (as amended by any City of Edinburgh Council -specific requirements)	x		x							
TSM	Traffic Signs Manual			x							
MCDHW	The Manual of Contract Documents for Highway Works;			x							
SHW	Specification for Highway Works;			x							
HCD	Highway Construction Details.			x							
CEC	'Edinburgh Standards for Streets'.			x							
NRSWA	New Roads and Street Works Act 1991			x							

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
CEC	Measures Necessary Where Apparatus is Affected by Major Works (Diversionary Works)			x							
CEC	Specification for the Reinstatement of Openings in Roads			x							
	Code of Practice for the Co-ordination of Street Work and Works for Road Purposes and Related Matters			x							
	Utility specific specifications (to be advised by each utility)			x							
RSPG Part 1, 1966	Railway Safety Principles and Guidance, Safety Principles	x	x	x	x	x	x	x	x	x	x
RSPG Part 2, Section G	2005, Railway Safety Principles and Guidance, Tramways	x	x	x	x	x	x	x	x	x	x
RVAR	Railway Vehicle Accessibility Regulations								x		x
GM/RC1500	1994-12, 2001-10 Code of Practice for EMC between the railway and its neighbourhood				x	x	x	x	x	x	x

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
EN55013	Sound and television broadcast receivers and associated equipment. Radio disturbance characteristics. Limits and methods of measurements.							x		x	x
GE/RT8015, 2002	Electromagnetic compatibility between railway infrastructure and trains.										x
ECE 43	1990-08, Uniform Provisions Concerning the Approval of Safety Glazing and Glazing Materials (Rev1 08.1990).								x	X	x
prEN13129-3	2003-10, Railway Applications – Air conditioning for urban and suburban rolling stock – Part 1: Comfort parameters										x
BS EN 779	2002-12-05, Particulate air filters for general ventilation - Determination of the filtration performance									x	x
BS 857	1967-06-30, Specification for safety glass for land transport										x

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
BS 6853 1999-01-15	Code of Practice for fire precautions in the design and construction of passenger carrying trains or European equivalent Standard										x
BS EN 50121-3-1 2000-12-15	Railway Applications - Electromagnetic compatibility - Rolling stock - Train and complete vehicle										x
BS EN 50125-1	Railway Applications – Environmental conditions for equipment										x
BS EN 50155-3-1 2000-12-15	Railway Applications – Electronic Equipment used on Rolling Stock										x
BS EN 50215 1999-09-15	Railway Applications - Testing of rolling stock after completion of construction and before entry into service										x
BS EN 60077-1 2002	Railway Applications – Electric Equipment for Rolling Stock										x

Specification No.	Specification Title	Structures	Track	Roads	Power Distr.	Fare Collection	OLE	SC & C	Tramstops	Depot	Trams
prEN ISO 3095 1975-09	Acoustics; Measurement of noise emitted by rail bound vehicles										x
prEN ISO 3381 1976-02	Acoustics; Measurement of noise inside rail bound vehicles										x
EN 12663-2000	Railway applications, Structural requirements of railway vehicle bodies										x
EN 13749-2005	Methods of specifying structural requirements of bogie frames										x
VDV 164 1995-04	System for fault detection, fault registration and fault message (FERM) on guided public transport vehicles										x
IEC 60494-2, 2002-08	Railway applications - Rolling stock; Pantographs; Characteristics and tests - Part 2: Pantographs for metros and light rail vehicles						x				x

Table 24 - Applicable Standards

9 Geotechnical

Where the Infraco Works may affect geotechnical and geo-environmental features, including but not limited to, aquifers, ground water and surface watercourses, the Infraco shall comply with the requirements of relevant third parties, the Scottish Environment Protection Agency (SEPA) or other statutory consultees and environmental legislation.

The Infraco shall agree the criteria and methods for the identification, classification, treatment and disposal of material with SEPA, the relevant local environmental health authority or other relevant authority as appropriate. The Infraco shall obtain all necessary consents for the removal, disposal or re-use of materials. Materials not suitable for re-use shall be transported off Site to a licensed facility in accordance with the requirements of the applicable relevant authority and environmental legislation.

The Infraco shall not carry out works or activities which would result in any Site or any land licensed to the Infraco under the Agreement or any adjacent or adjoining property being classified as contaminated land under the Environmental Protection Act 1990, the Contaminated Land (Scotland) Regulations 2000, the Contaminated Land (Scotland) Regulations 2005 and the guidance contained in the Scottish Executive Statutory Guidance for the the Contaminated Land Regime, Edition 2 dated May 2006 and/or any similar environmental legislation, or that would preclude such a classification being removed.

The Infraco shall assess the risk of the ingress of landfill gases, coalfield gases and other hazardous ground gases and implement appropriate measures to mitigate such risks.

The Infraco Works shall be designed and constructed to accommodate reasonably foreseeable changes in the existing and potential future nature and level of ground water, where reasonably practicable.

10 Environment

10.1 Environmental Considerations

10.1.1 General

Environmental Statements have been prepared for Line One and Line Two in accordance with the standing orders of the Scottish Parliament, which require that projects approved by private Act of Parliament must be subject to Environmental Impact Assessment (EIA). EIA in Scotland is governed by the Environmental Impact Assessment (Scotland) Regulations 1999 (S.I. 1999 No. 1). The Environmental Impact Assessments (EIAs) have been undertaken to identify the construction and operational effects of building and operating a tram network in Edinburgh. Each assessment has been documented in a comprehensive Environmental Statement which describes:

- The design of the project and the way it will be constructed and operated;
- Its impacts on the physical, natural and human environment; and
- The measures that will be undertaken to minimise these impacts.

The Environmental Statements report the assessment of the following environmental topics which should be considered by the Infraco:

- The proposed scheme – including an explanation of the need for the scheme, alternatives considered, route alignment and infrastructure description, construction and operational activities;
- Approach to the EIA – summarising the legal requirements, scope and methods used in undertaking this EIA;
- Policy context – provides a review of compliance of Line One and Line Two to relevant national, regional and local policies;
- Traffic and transport;
- Land use - including potential impacts to the agricultural use of land along the route;
- Geology, soils and contamination – including references to hydrogeology and waste management;

- Landscape and visual amenity;
- Ecology and nature conservation;
- Surface water – including water quality and hydrology;
- Heritage - including archaeology;
- Socio-economic effects;
- Noise and vibration;
- Air quality - including local air quality (PM10, NO2), global air quality (CO2) and dust; and
- Cumulative impacts.

The Infraco shall ensure that the environmental impact caused by the Infraco Works shall be no worse than that contained in the Environmental Statements.

10.1.2 Freedom of Access to Environmental Information

The attention of the Infraco is drawn to the requirements of the Environmental Information (Scotland) Regulations 2004 (SSI 2004/520). This Statute permits public access to environmental information held by a Scottish public authority.

10.1.3 Relevant Legislation, Regulations and Guidance

The following are a series of project specific documentation governing various aspects of the environmental considerations of the Edinburgh Tram Network design, construction and operation.

10.1.4 Code of Construction Practice

A code of construction practice was prepared in consultation with the City of Edinburgh Council (CEC), Scottish Natural Heritage (SNH), the Scottish Environmental Protection Agency (SEPA) and Historic Scotland, in order to define **tie's** minimum standards of construction practice. Compliance with this code is a legal requirement of the Edinburgh Tram (Line One) and (Line Two) Acts (2006) under Section 66 and this code has been developed by **tie** and this developed version is included in Schedule 3 (Code of Construction Practice and Code of Maintenance Practice).

The Code of Construction Practice sets out policies, legislation and guidance relating to the impact of the proposed construction works on the environment and the amenity and safety of residents, businesses, the general public and the physical surroundings adjacent to the ETN. The Code of Construction Practice also provides a list of environmental protection measures to be implemented during the construction of the ETN.

10.1.5 tie's Noise and Vibration Policy

tie's Noise and Vibration Policy (NVP/001 V1.01) sets out the mitigation approach for noise and vibration impacts during the operation of the Tram in Edinburgh. Mitigation requirements relating to noise and vibration impacts during the construction of the ETN route are outlined in the Code of Construction Practice. Compliance with the Noise and Vibration Policy is a legal requirement under Section 66 of the Edinburgh Tram (Line One) and (Line Two) Acts (2006). Other legal requirements relating to noise insulation are set out in Sections 63, 64 and 65 of the respective Acts. The Noise and Vibration Policy is included in Schedule 32 (**tie** and CEC Policies).

10.1.6 The Tram Design Manual and Urban Design Briefs

A Design Manual and urban design briefs have been prepared for the ETN. Both sets are regarded as supplemental guides to deemed consent for Line One and Line Two under the section 11 (Class 29) of the General Permitted Development (Scotland) Order 1992.

Although permitted development status exists for the ETN it is nonetheless necessary to gain prior approval from the City of Edinburgh Council before the Infraco Works can commence. The Design Manual and urban design briefs are both designed as guides in informing both the design process and the prior approval process. It is therefore important that the Infraco gives appropriate consideration to the contents of the Design Manual and the briefs as major component in the integration of a tram design into the urban fabric of the City.

10.1.7 Landscape and Habitat Management Plan

The Landscape and Habitat Management Plan (LHMP) details the proposals for retention, protection and enhancement of existing planting and habitats, within the Roseburn Corridor. It also sets out details of replacement planting and habitat which are lost as a consequence of the development. The plan will be updated by the Infraco as new information on habitat, landscape proposals and Tram design becomes available. The plan will also include proposals for noise mitigation for properties adjacent to the ETN. Revisions to the LHMP will require to be approved by the City of Edinburgh Council Planning Authority. The procedure for updating the LHMP is set out within Section 68 of the Edinburgh Tram (Line One) Act (2006).

10.1.8 Badger Mitigation Plan

The Badger Mitigation Plan sets out the scope and form of the proposed mitigation measures for avoiding/ reducing adverse impacts on badgers within the Roseburn Corridor. The Plan will be updated by the Infraco as new information on badger social groups and the ETN design becomes available. Revisions to this Plan will be agreed with SNH, CEC and the Edinburgh and Lothians Badger Group (ELBG) and approved by the CEC Planning Authority.

In preparing the detailed environmental design and implementation (including maintenance and monitoring periods) proposals for landscape and ecology the Infraco will ensure that all commitments given in the Environmental Statement and arising from the Scottish parliamentary process relating to the Tram Legislation (including the detailed agreements following discussions with stakeholders) are met.

10.1.9 Protected Species Plan

The Protected Species Plan identifies the constraints governing how all protected species (predominantly located in the Gogarburn area) are to be dealt with.

10.1.10 Archaeological Requirements

All Infraco Works are to be carried out in compliance with the approved AHMP relevant to that location.

10.1.11 Landscape Design

The landscape design shall include, for construction, aftercare and maintenance / monitoring, ongoing for the whole Term. The detailed landscape design shall be in accordance with the environmental objectives, principles and requirements given in the Environmental Statements, to ensure that the Edinburgh Tram Network as constructed and operated is in compliance with the Environmental Statements, and any subsequent side agreements entered into between the CEC, **tie** and various third parties.

10.2 Ecological Design

The ecological design shall include, for construction, aftercare maintenance and monitoring:, the ecological mitigation proposals will cover the wholeTerm.

The ecological design shall be in accordance with the environmental objectives, principles and requirements given in the Environmental Statements, to ensure that the Edinburgh Tram Network as constructed and operated is in compliance with the Environmental Statements prepared for Parliament, and any subsequent side agreements entered into between the CEC, **tie** and various third parties (e.g. Scottish Natural Heritage, New Ingliston Limited, Edinburgh and Lothian Badger Group).

The updated and ongoing ecological surveys and mitigation works to be carried out by Infraco shall take into account seasonal constraints and variations and will accommodate ongoing relevant surveys begun by other parties (e.g. biological water quality monitoring). The Infraco shall ensure that the construction, maintenance and monitoring of the Infraco Works complies with all existing UK and EU Environmental legislation concerned with the protection of species and habitats including but not limited to:

- Wildlife and Countryside Act 1981 (as amended in particular by Variation of Schedules 1988, 1992 & 1998);
- The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended);
- Protection of Badgers Act 1992; and
- Countryside and Rights of Way Act 2000 in so far as it extends to Scotland.

The Infraco shall not commence works within any part of the Site until the necessary update surveys of ecological interest in respect of that part of the Site have been undertaken and a survey report has been submitted to **tie**. Any relevant findings of such surveys shall be included into the Infraco's Landscape and Habitat Management Plan and the Construction Environmental Management Plan (CEMP).

The Infraco shall ensure that:

- Details of all species protected by Law and any structure or place used for shelter or protection by any such species protected by Law within the Site are kept confidential and not disclosed to any person except insofar as is essential for carrying out the Infraco Works; and

- All necessary current licenses, and named license holders, are available before the commencement of any Infraco Works, which may affect species protected by Law and or any structure or place used for shelter or protection by any such species protected by Law.

In the event that the Infraco identifies or becomes aware of any species protected by Law, or any structure or place used for shelter or protection by any species also protected by Law, which could be directly or indirectly affected by the Infraco Works and for which appropriate protection measures have not previously been agreed, the Infraco shall notify **tie** immediately and shall:

- Cease all Infraco Works that may adversely affect such species, structure or place;

- Provide Scottish Natural Heritage and **tie** with any further information of which the Infraco is aware relating to such species, structure or place as may be requested;

- Consult upon and agree mitigation and/or monitoring measures with Scottish Natural Heritage and **tie** in relation to such species, structure or place; and

- Obtain any necessary licenses to carry out the agreed measures.

The Infraco shall ensure that all construction work is carried out with due regard to the seasonal interests of any flora, fauna or habitat and in particular, all species listed for any degree of protection under Law. The Infraco shall make due allowance for the seasonal constraints in preparing the Programme.

10.3 Construction of Ecological Measures

10.3.1 General

Special ecological measures shall include but not be limited to the requirements for carrying out the Infraco Works:

- fencing;
- safe passage for wildlife;
- the location of nesting or roosting boxes;
- the location of habitat creation measures to be inspected;
- the known location of protected species, and
- the list of licenses obtained or required for working with or within the vicinity of Protected Species; and
- maintaining access to foraging and water.

10.3.2 Site Supervision of Landscape and Ecological Works

The Infraco shall ensure that the environmental Site works shall be inspected and monitored by Infraco's environmental clerk of works who will be supported by Infraco's landscape architect and ecologist, as necessary.

10.3.3 Landscape Works

Planting, seeding and aftercare works shall be carried out by the Infraco.

The Infraco will be responsible for locating all services routes prior to any landscape work being carried out.

10.3.4 Completion of the Planting Works and Completion of the Landscape and Ecological Aftercare Works

On practical completion of the landscape and ecological implementation works and on completion of the three years landscape and ecological aftercare works. The Infraco shall submit the required certificates and arrange a formal inspection of the Infraco Works with **tie**.

A separate inspection shall be arranged with relevant landowners for any areas of off-site planting.

10.3.5 Construction Environmental Management Plan (CEMP)

The Infraco shall prepare a Construction Environmental Management Plan (CEMP) including specific management / action plans or Method Statements, as necessary, to convey the required level of information for the following:

- Drainage features, including oil interceptors and pollution control valves, treatment of run-off, (including run-off volumes) and the location and appearance of any balancing ponds and/or swales, access or proposed access to the same;
- Carriageway surfacing;
- Working times;
- Noise reduction and abatement;
- Pollution control and contingency plan (see below);
- Discharge, land drainage and abstraction licenses to comply with EA requirements;
- Protection of retained vegetation;
- Maintenance e.g. de-icing;
- Sourcing of construction materials;

- Waste disposal, including disposal of construction waste, arisings, spoil, miscellaneous solids and liquids;
- Topsoil and subsoil handling (strip, storage, amelioration and re-use);
- Management and disposal of any excess soil or spoil arising from the works; and
- Site compounds.

The specific requirements of the pollution control and contingency plan are as follows:

- Compliance with the SEPA pollution prevention guidance;
- Identification and categorisation of surface waters vulnerable to Site works and an assessment of the earthworks that are likely to give rise to silty run off, the routes this is likely to take and the methods to prevent damage from silt;
- Precautions for handling of fuel, oil and other liquids during the works, in particular, near rivers, streams and watercourses;
- Requirements for pollution control equipment;
- How mud and dust will be controlled;
- How water supply boreholes and wells will be protected;
- The measures to be taken to protect watercourses and associated wildlife from, for example, chemical spillages or the introduction of sediment-laden run off; and
- Discharge criteria for suspended solids in run off from the Site during construction and proposals for monitoring and control.

11 Surveys

Surveys and investigations shall be undertaken by the Infraco as required to facilitate the design, construction and maintenance of the Edinburgh Tram Network.

Before commencing any Infraco Works (including investigations) where either the Infraco or **tie** considers there to be potential for a future claim from adjacent property owners or occupiers, the Infraco shall carry out a detailed condition inspection of the relevant properties and infrastructure which may be affected by the Infraco Works. If any such inspection is carried out, this shall be done in conjunction with the owners or occupiers concerned. A condition survey report shall then be prepared and agreed with the owner or occupier.

Condition survey reports prepared under the preceding paragraph shall include photographic evidence of the existing condition of the relevant property or infrastructure including evidence of critical dimensions such as existing crack widths.

The Infraco shall undertake sufficient surveys to prepare a topographical survey model. Relevant sections of the topographical survey model shall be updated by the Infraco at least every six months throughout the period of the Infraco Works, where work has been undertaken in relation to the sections concerned.

The topographical survey model shall include all Works as constructed and the Infraco shall include in each updated topographical survey model all then existing fixtures including:

- principal cabling;
- street furniture;
- structures and buildings;
- trackwork;
- drainage;
- power supply systems including OLE structures;
- ducting and draw pits.

These surveys shall include aspects concerned with:

- dimensions
- condition; and
- inspection for assessment.

The Infraco shall update the photographic records (excluding aerial photographs) and other such data contained in the topographical survey model at intervals of not less than six months.

The Infraco shall provide access to and copies of, when requested, all reports of investigations carried out as part of the Infraco Works.

12 Project Management Processes

12.1 Communication – General

The Infraco shall develop and maintain a "Communications Plan" and this shall be submitted to **tie** in accordance with the Review Procedure.

The Communications Plan shall illustrate how all the communication processes, activities and issues are to be managed, progressed and satisfactorily resolved. The Communications Plan shall detail how the Infraco will communicate with Sub-Contractors, the Operator, **tie**, the MUDFA Contractor, key stakeholders and third parties. The Communications Plan shall also include the intended processes for dealing with enquiries, particularly complaints, from all sources. The Infraco shall refer to the Stakeholder Services in this Section of the Employer's Requirements, in order to ensure that the Communications Plan includes all necessary requirements.

The Infraco shall implement all the requirements of the Communications Plan.

The Infraco shall liaise with the relevant parties to ensure that the Infraco is copied into all relevant communications that are generated by others, in order to ensure that any relevant construction related issues, such as Temporary Works and practical constraints, are identified and addressed.

12.1.1 Meetings

The Infraco shall work with **tie** to develop the meetings schedules and requirements for progress reporting throughout the duration of the Infraco Works. The following table provides an outline of the minimum requirements:

Meetings	Frequency	Chaired by / Minutes taken
Safety Meeting	Weekly	Infraco
Management Review Meetings	Two monthly	**tie**/Infraco alternately
Project Progress Meetings	Four weekly (Fortnightly prior to Site start)	**tie**

Meetings	Frequency	Chaired by / Minutes taken
Design and Planning Meetings	Fortnightly	Infraco
Stakeholder & Third Party Meetings	As required	**tie**
Site Meetings	Weekly	Infraco
Cost Review Meetings	Four weekly	**tie**
Risk Review Meetings	Four weekly	**tie**

Table 25 - Table showing meeting schedules

The primary purpose of these meetings shall be to enable the Infraco to advise on:

- Any safety issues;
- The current state of the programmed Infraco Works;
- Progress made in the various activities;
- Communication issues;
- Third party issues; and
- Commercial issues (Including change control).

The Infraco shall develop and maintain a comprehensive meetings schedule indicating those meetings which the Infraco shall chair and those meetings which the Infraco shall attend.

Prior to commencement on Site, progress meetings shall be held every two weeks. The purpose of these meetings shall be to review progress made by both Parties, and identify and agree actions required.

The Infraco shall provide an agenda, for all meetings to which they are designated as chair. The Infraco shall also provide appropriate documentation in advance of each of the meetings, as defined in the following sections, or otherwise as agreed with **tie**.

12.1.2 Progress Reporting

Progress reports shall be submitted by the Infraco to **tie** no later than three Business Days before each progress meeting.

The Infraco's progress reports shall contain comprehensive information and shall be structured in a manner which is commensurate with **tie**'s own reporting structure. The various sections of the progress reports shall require to be agreed with **tie**, but should include the following:

1. Executive Summary;
2. Health & Safety Report;
3. Quality & Environment;
4. Financial Summary Report; and
5. Project Performance / Programme.

Information provided within the progress reports shall include, but not be limited to, the following:

- Health & safety report including a summary of H&S records
- Summary financial information summarised from the separate cost report including summary and headline data on planned spend/actual spend, forecast spend and summary of costs for Compensation Events and future forecast.
- Planned versus actual resource summary;
- Physical progress against Milestones anticipated/required completion dates;

- Four weekly forecast of all activities;
- Eight weekly critical impact notice (including all information on any internal or external factor which may affect programme delivery);
- Labour histograms detailing planned, actual and forecast across all disciplines;
- The activities commenced or completed since the previous report and upon what dates;
- The expected remaining duration of all activities commenced but not completed;
- Any other additional activities with expected durations, methods, and resource requirements and sequence assumptions;
- Schedule and programme for the delivery of method statements, permits and isolations for the next four weeks;
- Any changes to expected durations, method, resource requirements and sequence assumptions;
- Forecast completion dates for all Infraco Works in each geographical section and intermediate geographical section including any slippage or advance upon the Planned Service Commencement Date and/or the Planned Sectional Completion Dates (as appropriate);
- Programme comparison between actual vs. planned;
- Schedule of information received;
- Schedule of outstanding information;
- Progress photographs;
- Top 10 opportunities; and
- Top 10 risks.

12.1.3 Progress Photos

The Infraco shall on a monthly basis throughout the period until the Service Commencement Date procure that photographs covering all of the Infraco Works are taken by a professional photographer whose appointment the Project shall be approved by **tie**, such approval not to be unreasonably withheld or delayed.

tie shall determine the scope of the photographs referred above.

The Infraco shall ensure that:

- A minimum of 50 digital colour photographs shall be taken on a monthly basis;
- All photos shall be provided in electronic format in a form to be agreed with **tie**;
- One set of 10 inch x 8 inch size prints shall be prepared from the colour photographs referred to above;
- All prints referred to above shall be presented in albums with individual clear plastic wallets and marked on the reverse side with the date that the photograph was taken, the name and address of the photographer, identification reference number and a brief description of Work being undertaken and the direction from which the photograph was taken;
- All prints and negatives shall be delivered to **tie** within two weeks of being taken; and
- Except where **tie** have provided their prior written consent, the photographs shall not be used for any purpose other than as set out in the Agreement.

The Infraco shall procure that all Intellectual Property in respect of the photographs vests in **tie**.

12.1.4 Site Meeting Report

A report shall be submitted by the Infraco to **tie** no later than one Business Day before each site meeting. The report shall include reference to any significant issues (associated with safety, programme, design, cost, planning and consultee aspects), which have arisen since the previous monthly progress report.

The site meeting report shall also identify actual manpower resources (labour returns), plant and equipment that have occurred on site, for the previous week.

12.1.5 Topic Register

It is **tie**'s intention to continue to develop and maintain a "Topics Register" for the Infraco Works. The Topics Register is used to record all issues as they arise that require to be specifically addressed. The record is then amended as appropriate to track the manner in which issues have been progressed or resolved to the satisfaction of **tie**. The Infraco is required to add to, or respond to issues as appropriate and attend regular review meetings at which the Topics Register shall be updated and actions assigned by **tie**.

The Infraco shall participate in the management of the Topics Register.

12.1.6 Work Breakdown Structure

An agreed Work Breakdown Structure is included in the Introduction of these Employer's Requirements. The Infraco shall adopt this WBS to ensure a recognised, structured analysis, by all parties, when interrogating the programme and cost analysis. The WBS may be further developed by the Infraco with the written consent of **tie**.

Accordingly there shall be a requirement for the Infraco to adopt all aspects of the WBS in the development of programme and cost documentation.

12.2 Programme Management

The Infraco shall undertake programme management including the implementation, regular updating and management of a fully detailed comprehensive Programme illustrating how the Infraco proposes to execute the whole of the Infraco Works in compliance with the Project Programme.

This Infraco Programme shall be prepared using Primavera software in a version compatible with that of **tie**.

This Programme shall be in Primavera P3e (Version 6 or otherwise as agreed with **tie**) format and accompanied by a time chainage programme illustrating the same information. The Programme shall be cost and resource loaded and coded to reflect the Infraco's WBS activities as detailed in section 39 of these Employer's Requirements.

The Infraco shall be responsible for liaising directly with **tie**, CEC (and other appropriate third parties) to maximise delivery of the ETN but minimise disruption to public transport and other services, and ensuring that any necessary diversion routes are agreed in recognised time periods prior to the commencement of Infraco works. The Infraco shall also take note of the constraints as identified in 39 of these Employer's Requirements.

The Programme shall be submitted to **tie** in accordance with the Review Procedure within a period which shall ensure that the Infraco Works can be progressed and monitored by the Infraco and **tie** against the details contained therein. The Programme shall clearly identify the following:

- the commencement, construction and completion constraints for all elements of the Infraco Works, separated into sectors by WBS code;
- all Milestones;
- the constraints, procedures, documentation and approvals specified in the Agreement;
- the Infraco manufacture and construction execution strategy, Infraco Works and site testing and commissioning, all constraints, procedures, documentation and approvals periods;
- seasonal constraints and constraints applied by CEC and other third party and statutory bodies as defined in the Agreement;
- the required design approvals and notices;
- all works to be undertaken by any Sub-Contractor;
- sufficient detail to illustrate the integration of the Deliverables with the proposed dates of possessions and the commencement and completion of construction for all elements of the Infraco Works, by WBS code;
- all other projects affecting the Infraco Works and how they are integrated into the Infraco Works. For example, any street works to be carried out by CEC, and works by or on behalf of all third parties (including landowners and developers);

- any witnessing, inspections, testing etc of the Infraco Works which requires to be carried out by third parties;
- long lead time materials and works;
- the identification and duration of all advance works, other than those already underway;
- the requirements and approval periods for traffic management, TROs, TTROs, and including any third party's requirements for notices and road closures;
- the commencement, completion dates and relationships of intermediate geographical section of the Infraco Works within each geographical section of the Infraco Works;
- the links and relationships between all activities and the justification of the underpinning logic;
- all design, manufacture and construction periods;
- the identification and timing of inputs and approvals required from **tie**, third parties, and any Approval Bodies are clearly identified; and
- the interface and relationship with the MUDFA Works;

The Programme shall meet the following minimum requirements:

- shall be in Primavera P3e (Version 6) for detailed implementation;
- shall follow and fully reflect the **tie**'s Work Breakdown Structure ("WBS") included within these Employer's Requirements.
- shall be cost and resource loaded down to coded activities;
- all resource reporting and progress reporting shall be coded to suit the activities contained within the WBS;
- records of time spent against activities shall be completed weekly against planned works as generated by Primavera;

- Any deviations shall be reported in the progress report and include notification of remedial actions for authorisation by **tie**;

- weekly records shall be collated and delivered to **tie** by 09:00hrs on the Tuesday following the week to which the records relate;

- the Programme shall also take into account programming input and attendance at meetings, both as required by **tie**; and

- the Programme shall also contain cost/spend tables and cumulative curves to match the achievement of major milestones and activities within the WBS.

The Infraco shall take into account the availability of alternative materials or components when developing the Programme. The Infraco shall identify those materials and components which require advance ordering and processing. Any advanced orders which are approved shall be identified and defined in the Programme.

The Infraco shall update the Programme every four weeks in line with **tie** reporting periods to take full account of the Infraco progress in completing the Infraco Works.

A hard and soft copy updated Programme and an Infraco Progress Report shall be submitted by the Infraco to **tie** no later than three Business Days before each four weekly progress meeting.

12.3 Time Chainage

The Infraco shall also produce, manage, develop and work in accordance with its Time Chainage Diagram.

The Time Chainage Diagram shall be submitted to **tie** in accordance with the Review Procedure to ensure that the Infraco Works can be progressed and monitored by the Infraco against the details contained therein but in any case, the Time Chainage Diagram shall be submitted not later than six weeks after the Commencement Date. The Time Chainage Diagram shall be updated regularly and be available for inspection or distribution on a monthly basis, during the course of the Infraco Works.

The Time Chainage Diagram shall fully reflect, accommodate and comply with the information detailed on the Programme.

12.4 Planning and Other Consents

The responsibility for the Consents is as set out in Clause 19 of the Agreement.

12.5 Project Management Plan

12.5.1 General

The Infraco shall submit and maintain a plan describing the approach to project management for the delivery of the complete scope of the Infraco Works. This project management plan shall include sections to clearly and separately describe the approach to the specific topics set out below.

12.5.2 Resource and Competence

A description of the procedures employed to ensure that the required resource and competence level throughout the duration of the Infraco Works shall be achieved.

12.5.3 Documentation

Identify key policies and procedures to deliver such works, infrastructure and equipment to programme, specification, budget and otherwise safely and efficiently and in a manner which is fully integrated with the activities of other relevant contractors.

The approach to the development of a suite of project specific documentation, indicating how they shall effectively be integrated with, and reflect, the Infraco's corporate procedures and policies (including any Joint venture or consortia procedures).

Templates that shall be used for the procurement and delivery of the service deliverables, which shall be required to be prepared by the Infraco.

Outline proposals covering the suite of required documentation including training, maintenance and operations manuals, as-built drawings, design Information, testing procedures and proposals, and certification and records (e.g. testing).

12.5.4 Regulations

Management arrangements and procedures for ensuring/monitoring compliance with all applicable Regulations (e.g. HMRI), Law, and the requirements of the Agreement and its Schedules.

12.5.5 Procedures

Details of internal procedures for decision making and review in your management team with particular emphasis on safety, programme, budget, quality, the management and control of non-compliance and the implementation of continuous improvement.

12.5.6 Proposals on reporting and controlling design information requirements

Procedures which shall be followed in obtaining outstanding consents and approvals for the works.

Definition of the process for managing the approvals interface with **tie**, HMRI, Planning Authority, Roads Authority, Network Rail, the Operator and third parties with whom agreements have been entered into.

12.5.7 Interface Plans

Given that successful co-operation between the Operator, Infraco, and **tie** is essential to the delivery of a successful project, a description of the key areas of this interface and details which demonstrate how this is successfully achieved.

Details of supply chain process/procedures, in particular provide details of the criteria for selection of sub-contractors/suppliers for this project.

Details of how the Tram Provider shall be managed.

Details regarding the commissioning and handover of the Edinburgh Tram Network or Geographical Sections thereof to the Operator shall be provided.

12.5.8 Design

Clear definition of the areas where the Infraco shall undertake design work and an explanation of where the Infraco believes this deviates from the previous design work done.

12.6 Construction Management Plan

The Infraco shall submit and maintain a Construction Plan relating to the Programme. This Construction Plan shall include sections to clearly and separately describe the approach to the specific topics set out below.

12.6.1 Mobilisation

Detailed mobilisation plan, to incorporate comprehensive details of all aspects of mobilisation including, but not limited to, number of work sites, the facilities on each, a general arrangement drawing of main sites, lay down areas, materials storage, welfare and car parking. This should detail timescales and immediate resource availability and should also provide details of the permissions required and assumptions made.

12.6.2 Plant

A description of the plant that will be used for the construction of the project and of how long the plant will be used. This should include description in relation to plant used for specialist purposes such as rail laying or wire stringing (these should be separately identified).

12.6.3 Sub-Contractors

Details of the sub-contractor management and control process during the construction phase, including how the performance of sub-contractors will be measured and reviewed and how sub-contractor compliance with standards will be assured.

12.6.4 Method Statements

A description of the process by which method statements shall be developed and approved, and a schedule summarising those method statements that are anticipated. An initial schedule shall be submitted in accordance with the Review Procedure and this shall be updated from time to time with agreement from **tie**.

12.6.5 Avoidance of Disruption

Description of the management process for ensuring that traffic disruption is kept to a minimum, particularly in relation to Traffic Management and TTRO requirements. Details of procedures of how unforeseen works (that are out with the area covered by the Temporary Traffic Restriction Order, but are necessary to complete the Infraco Works within the TTRO area) shall be dealt with.

Proposals for maintaining reasonable access to premises at all times and what measures The Infraco might employ when access is denied taking into account the requirements of the Disability Discrimination Act 1995.

Details of how it is proposed to liaise with all potentially affected third parties, and an assessment of the likely identities of such parties.

12.7 Network Rail Interface Plan

The Infraco shall submit and maintain a plan describing the approach to managing the ongoing interface requirements with Network Rail. The plan should identify the critical activities and the key risks associated with this interface and proposals to mitigate these risks. Notwithstanding the Infraco's responsibility of complying with the Agreement (including compliance with the Third Party Agreement and the Asset Protection Agreement) the Plan should address the following issues.

- A description of procedures for gaining access to Network Rail's infrastructure both in terms of the approval process and the physical access proposals;
- Confirmation, in terms of safety and in terms of undertaking the Infraco Works, the personnel utilised shall be appropriately qualified, skilled, experienced and adequate in quantity;
- The proposed Possession Strategy for works on or adjacent to Network Rail infrastructure, to include identification of Possessions & Isolations on Programme taking cognisance of lead time;
- Summary of the required method statements for principal construction activities associated with Works adjacent to Network Rail infrastructure;
- The proposals which allow access for Network Rail to maintain their infrastructure;
- Details as to how the Railway Group & Network Rail Line standards shall be complied with;
- Specific details of how Network Rail's infrastructure and rail vehicles shall be protected from injury/damage arising from the works activities;
- Details of how staff and any third parties shall be protected from injury from Network Rail's infrastructure or vehicles using it;
- The strategy for Red & Green Zone working;

- Proposals for competencies, making specific reference to management of the certification of personnel and operatives in accordance with the National Competency Control Agency "Sentinel" systems and procedures;

- A specific accident/incident procedure with regard to Network Rail infrastructure which details action to be taken, including the communications regime;

- Proposals for security and prevention of trespass onto site, especially onto adjacent Network Rail property;

- Proposals with regard to work in and around First Scotrail's Haymarket Depot and its associated stabling & sidings. There shall be a requirement to highlight proposals for ensuring access to Haymarket Depot is maintained for staff; road and rail vehicles, especially if rail vehicles require access/egress to the depot by road. There shall be a requirement to identify how First ScotRail operations shall not be restricted.

12.8 Quality Management

The Infraco shall undertake the Works fully in compliance with quality management processes and procedures referenced in ISO 9001 and ISO 9004.

The Infraco shall develop and maintain a Quality Plan to meet the requirements of ISO 10005 - 1995, and which fully defines all quality aspects of the Works. The Quality Plan shall be submitted in accordance with the Review Procedure. The Quality Plan shall demonstrate an integrated quality management system relating to the design, construction, testing and commissioning of the system and shall show how Infraco and its Sub-Contractors shall comply with the requirements of the Quality Plan.

The Infraco shall have all associated documentation readily available for internal review and review by **tie**. Regular internal audits shall be undertaken by the Infraco to ensure full compliance with ISO 9001 and ISO 9004 in accordance with Clause 5.1 of the Code of Construction Practice. The Infraco shall prepare and submit in accordance with the Review Procedure a "Schedule of Internal Audits" for agreement with **tie**. This shall define the planned nature and timing of the internal audits. Furthermore **tie** reserve the right to undertake external audits in accordance with paragraph 5.2 of the Code of Construction Practice and Code of Maintenance Practice.

The Infraco shall ensure that their management system for the Infraco Works is developed to ensure that it aligns with the requirements of the Tram Project Quality policy Statement (DEL.HSQE.103).

Quality control including materials and works on Site shall also be undertaken in accordance with the requirements of paragraph 3.2 of the Code of Construction Practice. The Infraco shall be required to comply with these Employer's Requirements including the completion of forms and other systems in order to assist **tie** in complying with **tie**'s own safety and quality management systems.

12.8.1 Document Standards and Control

All Deliverables that are shared with, or issued to, **tie** shall be posted and reside within **tie**'s document management system. The official version of any project document shall be the version that exists within **tie**'s document management system. Access shall be granted to **tie**'s document management system on a named basis, and access levels shall be determined by **tie**. The Infraco also agrees to abide by **tie**'s document management procedure as notified to Infraco from time-to-time.

Documents from external parties should be uploaded to the project extranet for processing by document control. The extranet will also be the official conduit for issuing project information. In exceptional circumstances where documents must be exchanged by email, only the Document Control team will receive and issue this information. They will then handle all appropriate processing and distribution.

Deliverables shall conform to the following standards:

Acceptable File Types

- MS Office Suite 2003;
- MS Project 2003;
- MS Visio 2003;
- Portable Document Format (PDF) – Fully-searchable (OCR) Acrobat Reader v7 compatible;
- Compressed Files/Folders – WinZip v10 compatible;
- Graphics – GIF, TIFF, JPG, JPEG, or BMP;
- Audio – Audio files should be saved in MP3 format;
- Video – WMV or MPEG format with WMV preferred;

- Drawings – DWG (inclusive of used templates) and DCF.

Acceptable File Sizes

In general, all files should be optimised to keep their size to a minimum. For email correspondence the maximum allowable attachment size is 10MB. Individual files in excess of 50MB are only acceptable with prior agreement from **tie**.

Project Applications

- Collaboration – SharePoint 2007 (hosted by **tie**);
- Project Planning – Primavera v6;
- Risk Management – Active Risk Manager (hosted by **tie**);
- Deliverables. In addition to Deliverables conforming to the above, they should specifically be supplied in complete, self-contained and fully editable formats.

Typical examples include;

- Drawing Deliverables should be supplied as complete DWG files (inclusive of used templates) as well as the DCF print snapshot;
- Documents should be in Word 2003 (or previous) format;
- Spreadsheets should be in Excel 2003 (or previous) format and include the associated macros, equations, and functions.

Illegal Characters

As a matter of best practice the following characters should not be used in filenames to minimise the risk of error in software applications:

&	**¦**	**$**
~	**¬**	**£**
*****	**^**	**?**
%	**; (semi-colon)**	**!**
#	**, (comma)**	**@**
****	**‘ (apostrophe)**	**=**
/	**` (single quote)**	
<	**“**	
>	**. (dot)**	
{	**: (colon)**	
}		

12.9 Infraco Performance Measurement

As part of the overall project reporting regime, a four weekly report incorporating performance against Key Performance Indicators (KPI) shall be required from the Infraco. These shall be project, as opposed to company, specific.

A fundamental consideration is that the KPIs agreed must be measurable and without dispute, thus they shall be fact based. The outputs shall be compared on a four weekly basis against both four weekly and rolling targets. A colour coded "traffic light" visual warning shall be used.

The KPIs agreed are split into a number of different areas. The following provides the breakdown of components within each of the areas. Deductions against the failure to achieve the agreed KPIs are set out in Schedule 45.

Table 26 – Table showing indication of Safety KPIs

Safety
Accident Frequency Rate (AFR)
Equivalent Fatality Rate (EFR)
Lost Time Accidents (LTA)
RIDDOR
Road Traffic Injuries
Road Traffic Damage (caused by Infraco actions)
Accident Investigations (late receipt)
HSE inspections, observations, improvement notices and prohibitions
Working at height
PPE – not using/not using correctly
Review of Accident Book entries
Possible 3rd Party specific (e.g. Network Rail)
NCRs
CARs (non-completion/late response or action)
Procedure compliance
Test failures (to include concrete and welding)
Safety Tours
Safety Inspections
Security
Achievement of programme
Snagging correction

Method Statements/Risk Assessments – failure to operate in compliance therewith
Late Possessions / Overruns
Reporting
Spills
Working hours contraventions
Complaints
Pollution – water courses; noise; light; dust; others
Trespass
COSHH contraventions
Signage and warning signage
Specific parameters may need to be devised relating to programme, performance, reporting and other specific issues that are important to **tie**.

The Infraco shall submit samples, manufacturers' literature, documentation and other such materials to demonstrate compliance with the Employer's Requirements, from time to time, for review by **tie**, in advance of the associated materials or equipment being procured. The Infraco shall prepare a Schedule of Procurement Proposals to identify all such proposed submissions and their timing for approval by **tie**.

12.10 Cost Management and Reporting

The Infraco shall carry out a pro-active role in cost management and reporting. A cost report shall be submitted by the Infraco to **tie** no later than 3 Business Days before each cost review meetings / or at a 4 weekly period, to be agreed with **tie**. In addition cost summary information shall be provided for inclusion in the Progress Reports.

The Infraco cost reports shall contain comprehensive information and shall be structured in a manner that is commensurate with **tie**'s own reporting structure. The cost reports shall be required to provide information, including the following:

- Executive summary and narrative on significant changes from the previous report;
- Actual / Planned / Forecast Spend Tables / Curves to match the achievement of major deliverables and activities within the Work Breakdown Structure;
- Change Control Schedule and background information;
- Schedule of Compensation Events and background information;
- Value management estimates / analysis;
- Schedule of status of completion of Construction Milestones and Critical Milestones;
- Copy of the progress statements included in Monthly Progress Monitor.

The Infraco shall also be required to provide value engineering estimates and reports. These reports shall be provided by Infraco from time to time, as proposed by the Infraco or as required by **tie**, for the purpose of achieving better value.

12.11 Risk Management

12.11.1 Project Objectives

tie is dedicated to ensuring that a consistent approach to risk management is adopted across the ETN, which shall enable an informed view of risk to be taken.

ETN project risk management's mission is "to successfully manage all risks to and opportunities for the project thus ensuring that a supported and fully functioning operational service is delivered within budget and on time.

The key drivers within this mission are to:

- Promote and support proactive management of risk and opportunity;
- Integrate risk awareness / management, and not risk aversion, into the project culture;
- Manage risk in accordance with best practice;
- Reduce risk exposure to acceptable levels;
- Capitalise on opportunities;
- Ensure that all identified risks are owned and managed by the party best able to manage them;
- Provide assurance and enhanced information to managers and stakeholders.

tie maintains a project risk management plan and risk register covering the strategic, project management and commercial aspects of the ETN and shall continue to do so throughout the Term and operation. **tie** seeks to have all service providers, including the Infraco, contributing towards this risk register.

12.11.2 Risk Deliverables

The Infraco shall provide various Deliverables, as described in this section, to assist **tie** in meeting **tie**'s risk management obligations associated with strategic, project management and commercial aspects of the ETN. The required procedures for managing hazards and risks associated with obligations associated with safety are not covered in this section.

The Infraco shall be responsible for the production, management, development, regular maintenance and necessary updating and distribution of the documentation included within the table below. The documentation shall be held by the Infraco in electronic format with hard and soft copies being made available as required.

Risk Documentation shall be submitted to **tie**, in paper copy and electronically, for their approval in accordance with the Review Procedure and the required dates and frequencies are included in the table below.

Required Action from the Infraco	Timing/Frequency applicable to the Infraco
The Infraco shall provide assurance that they shall manage design and construction risk to the satisfaction of **tie** and in order to fulfil the objectives described in12.11.1. As part of this obligation the Infraco shall be responsible for the production, development and maintenance of a Infraco Risk Management Plan ("IRMP") for the management of all risk aspects of the Edinburgh Tram Network throughout the Term. The IRMP shall focus on the risk factors related to the Infraco managed activities related to the Infraco Works for the delivery of the Edinburgh Tram Network including the risk deliverables noted below. The IRMP shall identify individuals and their responsibility in relation to risk.	Agree format and delivery date for the IRMP with **tie**'s designated risk manager within one month of the Commencement Date. The Infraco shall update and maintain the IRMP throughout the Term. The Infraco shall issue an update to the IRMP at least bi-annually throughout the Term.

Required Action from the Infraco	Timing/Frequency applicable to the Infraco
The Infraco shall be responsible for the development and maintenance of an Infraco Risk Register ("IRR"), to best present all capex, opex, lifecycle, programme and quality risks to the Edinburgh Tram Network. The IRR shall also detail the proposed and completed mitigation of such risks. The platform used shall include the ability to generate reports, highlight risks to **tie**, key programme and cost impacts. The Infraco shall be responsible for the identification of commercial risks associated with all interfaces related to the works and shall facilitate and coordinate the inputs from stakeholders and other parties requested by **tie** from time to time. The IRR shall include analysis of each risk in terms of 'likelihood' and 'impact' providing detail on the inherent risk significance and current residual risk significance. Each risk shall have a designated responsible owner and the Infraco shall provide dashboard type graphical summaries of the risk profile and management actions being taken to mitigate. The risks to be addressed should include technical, operational, infrastructure, interface, economic, legal and regulatory, organisational and environmental risks. The Infraco should review the IRR on a four weekly basis to ensure that it is current. The Infraco shall meet with **tie** on a four weekly basis in line with the tram period calendar to discuss the control of key risks by the Infraco.	Agree format assessment criteria, platform and delivery date with **tie**'s designated risk manager within one month of the Commencement Date. The Infraco shall update and maintain the IRR as required on a four weekly basis and shall distribute the IRR to **tie** on a four weekly basis throughout the Term. Assessment criteria must be compatible with **tie**'s own risk register and assessment criteria.

Required Action from the Infraco	Timing/Frequency applicable to the Infraco
It is recognised that the identification, monitoring and progress of risk shall be discussed at regular workshops. The Infraco shall provide to **tie** a schedule of and undertake workshops, regarding risk matters to assist **tie** in ensuring the effective management of risk in relation to the Edinburgh Tram Network, **tie**, the Operator and/or relevant suppliers should receive timely notification of these in order to be able to attend. It is noted that **tie** may routinely request to attend workshops in order to be able to evaluate Infraco's approach to and performance in relation to risk. Infraco shall also attend meetings and workshops with **tie**'s project and risk management team and other ETN suppliers, the Operator and service providers as instructed by **tie** to take part in update of existing project risk and identification of new risks. The representatives attending such workshops shall be qualified and shall have sufficient knowledge of the ETN project to be able to contribute pertinent information within these workshops.	Provide and agree workshop schedule for the coming 6 months within the risk progress report to **tie**'s designated risk manager within 2 months of the Commencement Date.

Required Action from the Infraco	Timing/Frequency applicable to the Infraco
The Infraco shall be responsible for the preparation and maintenance of a Commissioning Risk Control Report which shall detail the plans for mitigating risks associated with the commissioning of the Edinburgh Tram Network. This should cover commissioning, operational and design risks, but not limited to the trams, the tracks, the power supply and the tram depot. The Commissioning Risk Control Report shall concentrate primarily on the (commercial risk) associated with the commissioning process, but shall also refer to ongoing issues which also affect the construction and/or operation or part operation of the Edinburgh Tram Network .	Agree format of the Commissioning Risk Control Report to **tie**'s designated risk manager (as notified to the Infraco from time to time) within 6 month of the Commencement Date. Final report to be delivered at least 3-months prior to start of the Testing and Commissioning. The Infraco shall update the Commissioning Risk Control Report as required until the Service Commencement Date..
The Infraco shall be responsible for the preparation and maintenance of a Residual Risk Control Report ("RRCR") that will detail the plans for mitigating the risks arising from the construction and commissioning of the Edinburgh Tram Network, which are still of ongoing importance. The RRCR should clearly detail the areas of importance that could affect the ETN after the Service Commencement Date until the end of the Term. These areas could be associated with design, operational and defects factors. Risks to be noted in the RRCR may include, but shall not be limited to commercial risk associated with, snagging, claims, specification defects and other commercial concerns.	Agree format of RRCR with **tie**'s designated risk manager (as notified to the Infraco from time to time) within 12 months of the Commencement Date. Final report to be delivered at least three months prior to the Service Commencement Date. The Infraco shall update the RRCR as required throughout the Term.

Required Action from the Infraco	Timing/Frequency applicable to the Infraco
The Infraco shall prepare and maintain an Operational and Maintenance Risk Register ("OMRR") that will detail the identified risks associated with provision of the Maintenance Services in relation to the Edinburgh Tram Network and management actions being taken to mitigate. The Infraco shall liaise with its Sub-Contractors and the Operator and any other relevant party as required in relation to the creation, development and updating of the OMR	Agree format and assessment criteria of the OMRR with **tie**'s designated risk manager (as notified to the Infraco from time to time) within 12 months of the Commencement Date. First formal report to be delivered at least three months prior to the Service Commencement Date. The Infraco shall update the OMRR in line with the four weekly tram period calendar

Table 27 - Table showing required actions from the Infraco

12.12 Traffic Management / Temporary Traffic Regulation Orders (TTROs)

The Infraco shall be responsible for the preparation of a Traffic Management Plan (TMP) and Work Site Staging Plan (WSSP). The TMP and WSSP shall comply with instructions issued by **tie** and shall be drafted in consultation with **tie** and CEC. The Infraco shall be responsible for the preparation of a Traffic Management Plan (TMP) and Work Site Staging Plan (WSSP). The plans shall apply to all work required in connection with the Infraco and including wider area traffic management measures associated with the construction of the main works. The TMP and WSSP shall comply with instructions issued by **tie** and shall be drafted in consultation with **tie** and CEC.

The TMP and WSSP shall identify and account for interfaces with parallel works, including the MUDFA Works.

The TMP and WSSP shall also include all necessary survey work, temporary traffic diversion modelling, assessment and design which will take account of the works, network constraints and the traffic control requirements.

The design shall identify the required alterations to road layouts, regulatory changes to be enacted through TTRO, altered/additional traffic signal equipment, new traffic signal installations and advance/local road signage.

The design shall also determine the locations of temporary bus stops and taxi ranks, alterations to parking and access/servicing arrangements for residents and businesses in works areas.

The TMP and WSSP shall be submitted within four weeks of the Commencement Date by the Infraco to **tie** and CEC for approval in accordance with the Review Procedure and as detailed in the current CEC-**tie** Interface Protocol relating to TTROs (Protocol Ref: TECH – 01).

The TMP and WSSP submission packages shall be as described in the Protocol and the plans shall include temporary works method statements, and shall identify general traffic, bus and pedestrian diversionary routes, access routes for emergency vehicles, and alternative arrangements for bus stops, parking and loading. The plans shall also include assumptions registers, issues logs and any other means to ensure prompt resolution of issues which could affect the progress and economic execution of the Infraco Works.

Leaflets and other approved publicity material as reasonably required shall be prepared for the information of the public/stakeholders/media showing temporary traffic management arrangements and traffic diversions and how these will operate.

Prior to implementation the TMP and WSSP shall be presented for review and approval to the **tie**/CEC/ Police/TEL Traffic Management Review Panel (TMRP) in-line with the agreed protocols and timescales which include procedures to give stakeholders advanced notification of the proposed arrangements to be implemented during the works.

The TMP and WSSP shall also include all necessary drawings, diagrams and supporting information to show the mobilisation, erection and dismantling of Temporary Works, traffic and pedestrian management during any pre-diversion works and the Infraco Works, access to properties, details of fencing and security measures.

The Infraco shall update the TMP and WSSP every two weeks throughout the duration of the Infraco Works for review at fortnightly design meetings and every four weeks at stakeholder and third part meetings.

The Infraco shall be responsible for the preparation of draft TTROs which shall be submitted to **tie** for onward submission to CEC, in its capacity as Roads Authority, for approval, again as described in the current CEC-**tie** Interface Protocol relating to TTROs (Protocol Ref: TECH – 01). The submission packages shall be as described in the Protocol.

TTRO submissions will adhere to the programme detailed in the Protocol.

The Infraco shall also attend meetings in relation to the TTROs, as required by **tie**, including representations to the **tie** / CEC Roads Working Group Committee, which convenes quarterly.

The Infraco shall develop a set of requirements in relation to TTROs and traffic management, which shall be based on information supplied to the Infraco by **tie** and/or **tie** ("TTRO Obligations and Traffic Management Plan") and shall take account of the interface on traffic management that will be required in relation to the MUDFA Works.

The Infraco shall prepare and develop project-specific procedures for complying with the TTRO Obligations and Traffic Management Plan, and these procedures shall be submitted for approval by **tie** and CEC in sufficient time to avoid disruption to the Programme.

By appropriate induction, the Infraco shall ensure all site-based personnel, management staff, operatives and visitors are fully aware of and understand the procedures contained within these Employer's Requirements.

The designated project or site manager appointed by the Infraco shall be accountable for the implementation and compliance with these requirements and procedures.

The Infraco shall ensure that the overriding considerations expressed in these procedures and requirements shall be the safety of road users, minimising disruption caused by the Infraco Works, pedestrian management and ensuring that traffic and pedestrian disruption is kept to a minimum.

This shall include taking such measures as CEC, in its capacity as roads authority, may reasonably require.

The Infraco shall ensure that reasonable access to all business, residential premises and properties (having regard to Infraco's obligation to comply with the Programme) along the route of the Edinburgh Tram Network is maintained at all times. Infraco shall not be obliged by virtue of this provision to provide access which is more extensive than the access agreed in any Third Party Agreement.

12.13 Stakeholder Management

12.13.1 General

A Stakeholder and Communications Management Plan has been developed by **tie**. The Infraco shall comply with the requirements of this document.

The Infraco shall be, jointly with **tie**, accountable for minimising any possible adverse impact of the implementation of the Edinburgh Tram Network on stakeholders (both statutory and non statutory), local businesses and the general public.

12.13.2 Design

The Infraco shall incorporate the following requirements into the design in addition to any other requirements as defined:

- Securing, implementing and incorporating into the design all necessary Network Rail, BAA and other third party agreements;
- Assisting by providing all technical details relevant to the compulsory purchase order process and land acquisition process (including wayleaves and servitudes); including integration with **tie**'s stakeholder and GIS systems.
- Liaising with CEC, Scottish Executive, Historic Scotland, World Heritage Trust, Scottish Natural Heritage and others as required by **tie** in relation to the performance of the Infraco Works.

12.13.3 Liaison and Public Information

The Infraco shall appoint a liaison officer to manage all public relations, information and press related matters relating to the Infraco Works, who shall along with the necessary technical, commercial and other Infraco resource, liaise with **tie**, and if so requested by **tie**, with CEC, other statutory bodies, members of the public, local businesses, the press and the media as may be

necessary on all matters relating to the Infraco Works. Except where expressly stated in the Agreement, the Infraco shall not make any publicity or media statements or make any other formal disclosure of information regarding the Infraco Works without the prior approval of **tie**.

The liaison obligation referred to in the above paragraph shall include, but shall not be limited to the following matters:

- From time to time as directed by **tie**, Infraco shall be required to participate in business, stakeholder and community liaison groups, public meetings and consultation meetings as the progress of the Infraco Works dictate.

- From time to time as directed by **tie**, Infraco shall be required to provide proactive input, information and comment into information initiatives organised by or on behalf of **tie** and attending as requested by **tie** at any relevant consultation meetings

- As directed by **tie Infraco** will assist with the development and maintenance of, and adherence to, a communications protocol for dealing with all stakeholders, businesses and members of the public affected by the Infraco Works. In particular this will require strict adherence to timescales determined by **tie**.

- Assisting with the development and maintenance of procedures developed by **tie** in relation to stakeholder management by way of the provision of information relating to the Infraco Works

- Provision of weekly updates to **tie** on the progress of the Infraco Works and all planned Infraco Works in a form reasonably requested by **tie**.

- Depending upon the type of communication, Infraco shall give **tie** a minimum of two weeks notice in advance of all plans for any formal communication with stakeholders, businesses and members of the public (e.g. for major customer works governed by the Customer Interaction Cycle far more weeks would be required). The form and content of such formal communication shall be subject to **tie**'s prior approval

- Provision to **tie** of all information reasonably requested by **tie** in respect of the Infraco Works planned in a form prescribed by **tie** and timescales and frequency agreed with **tie**.

- **tie** and Infraco will be jointly involved in the appointment of appropriately qualified "Tram Helpers". They will be directly managed by **tie,** but integrated into Infraco work areas and teams through joint induction and briefing; appropriate cross training; "Tram Helper" visibility in Infraco work areas; "Tram Helper" involvement in the direct management of stakeholder issues on site;

direct engagement by "Tram Helpers" or appropriate Infraco management and staff to assist in the resolution of on site issues; provision of appropriate Infraco uniform and equipment, etc. "Tram helpers" are to be recruited and in place four weeks prior to commencement of notification.

- Provision and use of approved branding materials, PPE kit and signage at all operational Work Sections. No such materials, kit or signage shall be erected at any Work Section without the prior approval of **tie**.

- The provision and distribution of traffic routing maps which conform to the terms of the TTROs for all areas affected by the Infraco Works in advance of the Infraco Works starting in any particular location as may be requested by **tie**. In the event that **tie** requires that such material is for public issue, public issue shall not occur before the form and content has been approved by **tie**. Infraco shall ensure that all public statements (including by way of media referred to in the sections below (customer care centre, website, weekly newsletter, monthly newsletter, call centre and communication log) in relation to the Infraco Works are consistent with (**tie**'s) Communications Strategy and integrated with **tie**'s systems and procedures.

12.13.4 Information Centre

The Infraco shall provide all information and documentation regarding the Infraco Works as may be reasonably required by **tie** in respect of the mobile and fixed information centres being operated jointly by **tie** and Infraco in relation to the Edinburgh Tram Network. The frequency of update and version control of information shall be subject to a process agreed with **tie**.

12.13.5 Website

The Infraco shall provide all information regarding the Infraco Works, reasonably requested by **tie**, in order to populate the website, which shall be maintained and operated by **tie** throughout the progress of the Infraco Works, in respect of the Edinburgh Tram Network. The frequency of update and version control of information shall be subject to a process agreed with **tie**.

12.13.6 Weekly Newsletter

The Infraco shall produce and publish weekly newsletters every Wednesday, detailing the Infraco Works to be undertaken in the forthcoming week and outlining, with appropriate maps, drawings and diagrams, the impact on the general public, businesses and in particular any alterations to road traffic circulation patterns required by the coming week's Infraco Works.

Each newsletter, the contents and format of which shall have the prior approval of **tie**, will also be issued, if requested by **tie**, by fax and email to: local and national newspapers and other news media, CEC, Lothian and Borders Police, the emergency services, to any party or parties requested by **tie** and to any other persons or organisations that have requested receipt of the newsletters.

The newsletters shall also be distributed door to door by the Infraco in affected locations and the Infraco shall advise **tie** when such distribution is occurring.

The Infraco shall monitor and record the distribution of newsletters, recording who is carrying out such distribution, the intended recipients etc, so as to enable **tie** to carry out its own audit and monitoring of such distribution. Infraco to ensure, by regular surveys that circulation data is accurate and up to date.

Sufficient free distribution take-away hard copies of these newsletters shall be delivered to and placed in the information centre by the Infraco before 08:00 every Thursday morning.

The Infraco is required to submit a draft of each issue of the newsletters to **tie** no later than midday on the Monday immediately preceding the proposed issue of the newsletters on the Wednesday. **tie** shall respond before 17.00 hours the same day.

12.13.7 tie Monthly Newsletter

The Infraco shall provide all information and assistance reasonably requested by **tie** in relation to the publication by **tie**, of a monthly newsletter in relation to the progress of and future plans for the Edinburgh Tram Network.

12.13.8 Customer Contact Centre

The telephone number, fax number and e-mail address of the call centre to be operated jointly by **tie** and Infraco in relation to the Edinburgh Tram Network (the "hotline") shall be publicised through the press and the weekly newsletter and clearly displayed on all appropriate PPE kit, site signage, hoardings and at other suitable locations within and throughout the vicinity of the Infraco Works. All letters, e-mails, customer queries shall be answered by Infraco within timescales, to be agreed in advance with **tie**.

12.13.9 Communication Log

All contacts, communications, complaints, comments and queries howsoever received by the Infraco shall be registered in a suitable electronic log (the "communication log").

The Communications Log shall be developed and maintained by Infraco in a manner that allows it to be fully integrated with **tie**'s Stakeholder Database and GIS systems. The communication log shall set out each contact under the type (e.g. General, Traffic, Safety, Vibration, Noise, Dirt, Disruption, Injury, Parking, Access, RTA, publicity, suggestions etc).

The method of approach shall also be logged (e.g. phone, direct, letter, email, etc.) as well as the time and date.

The log shall be so constructed such that statistical analysis of the different communications can be presented as part of the data to be provided to **tie**. It shall be a requirement that the Infraco shall deliver an "above average" customer satisfaction level, with criteria, frequency and method of assessment to be agreed by **tie**. In order to demonstrate this, there shall be a requirement for the Infraco (and as required **tie**) to undertake internal (and external) audits of the overall engagements with the stakeholders. All this information shall be summarised by the Infraco in its monthly progress report.

Infraco shall take such steps as are required to address any such contact, communication, complaint, comment or query in accordance with the response requirements set out in Table 28 - Notification Hierarchy and in line with the agreed enquiry management process.

To the extent that a stricter response requirement is otherwise required under the Agreement, the stricter response requirement shall apply.

To the extent that Table 26 provides for the recovery of any amount by **tie** from the Infraco, such amount may be deducted from any monies due to or to become due to the Infraco or, alternatively, may be recovered from the Infraco as a debt.

A record of all remedial actions taken shall be maintained.

In the event of the Infraco receiving a complaint, a follow up letter or electronic communication shall be passed to the complainant by the Infraco within 24 hours of their receipt of the complaint, outlining the complaint and details and timing of the remedial action being undertaken by the Infraco.

An up to date copy of the communications log shall be compiled daily by the Infraco, together with a report on the progress of any actions.

The communications log shall be inspected and signed daily by a nominated senior representative of the Infraco and shall be counter signed by the Infraco's Representative at least once per week.

The Infraco's Representative shall write a report to **tie** and/or the Nominated City Officer of CEC (as notified by **tie** from time to time) at a frequency determined by **tie** (at least once per month) containing a list of any breaches of the requirements as defined within this section and also Schedule 3 (Code of Construction Practice and Code of Maintenance Contract) occurring within the previous month, setting out:

- the nature of the breach;
- the duration of the breach;
- the action taken by the Infraco to mitigate the breach; and
- the steps taken to minimise the likelihood of a subsequent occurrence of the breach.

Subject to the Infraco obtaining **tie**'s prior approval, a copy of each week's communication log shall be placed every Friday in the information centres, where it will remain until completion of the Infraco Works.

Any person, including representatives of **tie** and CEC's nominated representatives may freely inspect all deposited copies of the communications log during the normal opening hours of the information centres.

The version of communications log on public display should not breach any data protection legislation or other Law.

Copies of the communication log shall be forwarded to **tie**'s Representative and/or and CEC's Nominated City Officer once per week.

The master communication log shall be available for **tie**'s Representative and CEC's Nominated City Officer to inspect at any other time during normal working hours.

Level of Urgency	Category of Notification	Required Response Time
1	**High urgency** Involves an immediate threat to persons or property or the circumstances otherwise require immediate rectification.	Immediate action required. If response not completed by the Infraco within 4 hours, **tie** may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Infraco.
2	**Medium urgency** No immediate threat to persons or property, but circumstances require rectification within 24 hours.	Remedial action requires to be completed within 24 hours. If the Infraco does not complete the required response within 24 hours, **tie** may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Infraco.
3	**Issue requires rectification** but no immediate threat to persons or property and the circumstances do not otherwise require immediate rectification.	Timescales for rectification to be agreed between the Infraco and **tie**. In the event that the Infraco does not comply with the agreed timescales, **tie** may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Infraco.

Table 28 - Notification Hierarchy

13 Permits / Approvals

The Infraco shall obtain all necessary permits and approvals prior to undertaking investigations or works on Site, in accordance with paragraph 3 of the Code of Construction Practice.

13.1 Method Statements

The Infraco shall prepare method statements in respect of all investigation and work activities, as detailed in this Section and paragraph 3.2 of the Code of Construction Practice and submit these in accordance with paragraph 3.3 of the Code of Construction Practice.

The Infraco shall produce a method statement entitled "Procedures for dealing with Unidentified Apparatus or Unrecorded Artificial Obstructions", which shall be submitted by Infraco in accordance with paragraph 3.3 of the Code of Construction Practice. This method statement shall contain procedures which shall confirm the processes for dealing with unforeseeable events or circumstances, the discovery of unidentified apparatus (including live services) or unrecorded artificial obstructions. The final version of the method statement and procedures shall be agreed with the relevant key third parties, Approval Bodies, the Utilities and the emergency services The method statement shall be updated and a final version produced which shall be finalised by the Infraco in accordance with paragraph 3.3 of the Code of Construction Practice.

13.2 Existing Structures Which May Affect Progress and relationship with Third Parties

The Infraco shall undertake works to address the condition of existing structures where such condition may affect the progress of the Infraco Works. Where such work is completed the Infraco shall take appropriate photographs to fully demonstrate the quality of the reinstatement works.

The Infraco shall undertake survey inspections associated with buildings and structures which may be at risk of physical damage as a result of the Infraco Works.

For such structures and buildings the Infraco shall compile an appropriate schedule of such buildings / structures, and produce surveys / records similar to those described under paragraph 18.2.1 of Schedule 3 (Code of Construction and Code of Maintenance Practice).

Early warning must be given to **tie** where any third party is, or is likely to start, acting unreasonably. In these situations, **tie** will seek to resolve any issues with the third party to assist Infraco.

13.3 Network Rail

The Infraco shall ensure that the requirements of the Network Rail GRIP process are implemented on the works for which they are responsible whilst working in accordance with all relevant Network Rail Group Standards.

The contract requirements for Network Rail with regard to health and safety are included within the Network Rail document NR/SP/OHS/008. The project specific requirements are identified within the Safety Clause Menu against the requirements of Network Rail document NR/SP/OHS/008 and indicated with 'ticks' in the contractor column sections 51 to 59 inclusive of the safety clause menu and any other requirements that the Infraco is proposing by virtue of his method of undertaking the Infraco Works. The safety clause menu shall be signed off by the Infraco to confirm its proposals.

The Infraco Works shall be undertaken as Third Party Works as identified within the Network Rail document (RT/LS/P/043).

14 Human Factors

The Infraco shall provide systems and working practices that are:

- As easy to use as possible;
- Unlikely to cause annoyance or stress to users of the Edinburgh Tram Network, whether members of the public, operators, or maintainers; and
- Likely to promote safety to all.

The Infraco shall systematically and comprehensively:

- identify all the human factors issues associated with the engineering of the Edinburgh Tram Network, using task analysis;
- determine which of these human factors issues pose the most significant risk to the efficiency, productivity, safety and health of the Edinburgh Tram Network; and
- describe the organisational arrangements and processes the Infraco intends to put in place to manage these significant human factors issues as part of the engineering of the Edinburgh Tram Network

The Infraco shall produce and maintain in accordance with the submittals schedule a human factors management plan, covering the requirements summarised above, and where appropriate, shall undertake human factors studies to recommend solutions.

Areas of particular concern are:

- The human computer interfaces in the Control Centre;
- The layout of the driver's cabs;
- The facilities to enable maintenance of equipment:
  - In the workshop and Depot;
  - At trackside;

- In substations;
- At the Tramstops; and
- In the Control Centre.

The Infraco shall adopt all applicable best practice and guidelines for human factors. In designing the environment in the Control Centre, the Infraco shall comply with BS EN 50126 and ISO 11064 "Ergonomic Design of Control Centres.

15 Reliability, Availability and Maintainability

15.1 Reliability and Availability

The Edinburgh Tram Network is made up of many different subsystems, most of which may affect the reliability of operation of the ETN as a whole. In respect of achieving and maintaining reliability, the Infraco shall design, construct and maintain the Edinburgh Tram Network in accordance with Good Industry Practice, subject to the reasonable constraints of cost. Where necessary, the ETN should be made resilient to single point equipment and cable failure by employing suitable levels of equipment/cable redundancy and duplication.

On equipment or cable failure, subsystems shall be designed in a fail-safe manner, with graceful degradation. Limited back-up facilities shall be provided to maintain services under specified partial failure conditions.

Defined below are the requirements for availability of individual subsystems (each of which is given a definition), and also the availability of individual components of the subsystems.

In addition to the above, the overall availability of the Edinburgh Tram Network and its subsystems must support the tram punctuality requirement that is set out in these Employer's Requirements. Consequently it may be necessary to increase the minimum requirements that are set out below, especially as the consequences of the actions that third parties may take, including delays caused by other road users, need to be included in the punctuality analysis for the Edinburgh Tram Network.

For all components and subsystems, assume a Mean Time to Repair (MTTR) of 4 hours.

Any downtime required for planned maintenance can be discounted from the determination of availability, provided that such maintenance can be reasonably undertaken at a time when the maintenance has no impact on the operation of the ETN. This will often be during overnight shut downs.

15.2 Traction Power System

Component or Subsystem	Minimum Availability
AC circuit breaker, where its availability is defined as the probability that it either fails to conduct electricity when commended to be closed.	99.99%
Transformer / rectifier where its availability is defined as the probability that it either fails to provide the nominal 750VDC when energised.	99.99%
DC circuit breakers and busbars, where its availability is defined as the probability that traction power is not available from the DCCB when commanded to be closed, provided that 750 VDC is available at from the rectifier	99.99%
Transformer / rectifier where its availability is defined as the probability that it fails to provide the nominal 750VDC when energised by the HV input.	99.99%
Substation battery and charger, where its availability is defined as the probability that control voltage is not available from the battery at any time during its normal operation, regardless of the state of the incoming LV supply	99.99%
Substation, where its availability is defined as the probability that 750VDC voltage is not available for the OLE when the substation is commanded to provide 750VDC	99.75%

Table 29 - Substation Equipment

Component or Subsystem	Minimum Availability
OLE System, where its availability is defined as the probability that in any linear km of the OLE system, trams are not able to operate at the normal operational speed due to defects in the OLE. This is based on an 8 hour incident once every 3 years, 20hr/day operation and (20 route-km plus depot, about 50 track-km)	99.99925% for each km

Table 30 – Overhead Line Equipment

15.3 Supervisory and Communications Systems.

Component or Subsystem	Minimum Availability
ODN node	99.99%
Fibre Optic Cabling	99.99%
Patch Panels and Connectors	99.99%
ODN network, where its availability is defined as the probability that any message from a given input to a node reaches its intended destination node correctly and could be transmitted onwards by that node.	99.99%

Table 31 - Operational Data Network

Component or Subsystem	Minimum Availability
Transponder (if used)	99.9%
Loop Detector	99.9%
TPDS Trackside Controller	99.9%
TPDS subsystem, where its availability is defined as the probability that any given tram has its position detected and passed to the signal controller and to Control Centre operators correctly, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional	99.75%

Table 32 - Tram Position and Detection System

Component or Subsystem	Minimum Availability
Passenger Information Display	99.9%
Local Controller (if required)	99.9%
PID subsystem, where its availability is defined as the probability that the appropriate message is displayed correctly at a given PID, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional	99.75%

Table 33 – Passenger Information Display

Component or Subsystem	Minimum Availability
Telephone Handset	99.9%
PABX	99.99%
Telephone network, where its availability is defined as the probability that any 30 second conversation between a given telephone and another given telephone is heard clearly and completely by the caller and the intended recipient, assuming that the ODN is fully functional.	99.75%

Table 34 – Telephone Network

Component or Subsystem	Minimum Availability
PA speaker	99.9%
PA controller	99.9%
Microphone and speaker	99.9%
PA subsystem, where its availability is defined as the probability that an operator can make an intended announcement clearly at a given platform, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional.	99.75%

Table 35 - Public Address System

Component or Subsystem	Minimum Availability
Base Station	99.95%
Mobile Handset (Tram, Vehicle, or Hand Held)	99.7%
Central Switch	99.99%
Operational Radio subsystem, where its availability is defined as the probability that a 10 second call (voice) or short data message can be received clearly by the intended recipient, assuming that the ODN is fully functional and that the hardware component of the Control Centre workstations is fully functional	99.75%

Table 36 - Operational Radio System

Component or Subsystem	Minimum Availability
Help / Emergency Help Point	99.9%
Help Point subsystem, where its availability is defined as the probability that a member of the public can contact the Control Centre operator and can carry out a Help Point conversation lasting 20 seconds, clearly and without interruption, assuming that the ODN is fully functional and that the PABX is fully functional	99.75%

Table 37 - Passenger Help / Passenger Emergency Help System

Component or Subsystem	Minimum Availability
CCTV camera	99.95%
Digital Video Recorder	99.95%
CCTV Matrix	99.95%
CCTV subsystem, where its availability is defined as the probability that an image is displayed correctly and in the specified sequence at the Control Centre, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional	99.9%
Recording and replay subsystem, where its availability is defined as the probability that an image is displayed from any given time in the past (within the recorded period) can be retrieved and displayed correctly, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional	99.9%

Table 38 - CCTV System

Component or Subsystem	Minimum Availability
SCADA RTU (including I/O cards and interface cards)	99.95%
SCADA subsystem, where its availability is defined as the probability is the lesser of (a) that an indicator is read correctly at the RTU, transmitted to the SCADA Master Station in the Control Centre, and displayed correctly on any SCADA display that is in use within four seconds: and (b) that a control is effectively transmitted to an outstation within two seconds, assuming that the ODN is fully functional and that the hardware component of the Control Centre servers and workstations is fully functional	99.75%

Table 39 - SCADA System

Component or Subsystem	Minimum Availability
Servers (if necessary, by use of hardware and software redundancy)	99.99%
Workstations	99.9%
Printers	99.5%
CCTV Matrix Controller	99.9%
LAN Switches, Routers and Hubs	99.99%

Table 40 - Central Control Equipment

15.4 Maintainability

The ETN and its components shall be designed with maintainability in mind. To this end, the following shall be observed:

- Important equipment shall be in a redundant configuration, so that a component may be replaced while standby equipment takes over its duty;
- Equipment shall be replaceable, if possible, as field replaceable units, so that defective components can be replaced without the need to power down the overall piece of equipment; and
- Equipment, particularly at trackside and on Tramstops, shall be positioned so that where possible it is accessible for maintenance or replacement without the necessity to halt tramway traffic or to close the Tramstop and without the need to use access equipment such as steps.

15.5 Supportability

The equipment selected for use on the Edinburgh Tram Network shall be selected so that:

- It has a long design life, as specified in section 6 of these Employer's Requirements.
- It shall be based on standard Commercial Off-the Shelf (COTS) equipment as far as appropriate, so that replacement parts may be easily obtained and integrated into the ETN without the necessity of resorting to the original subsystem or equipment suppliers.

16 Electromagnetic Compatibility

16.1 EMC Directive

On 20th July 2007 a new EMC Directive came into force in the European Union. Statutory Instrument 2006 No.3418 implements the new EMC Directive 2004/108/EC in UK law. The rules for the new EMC Directive have changed significantly from the old Directive (89/336/EEC). After 19th July 2009 declarations made will require appropriate "Technical Documentation". This means that the Declaration of Conformity made using the old conformance mechanisms will have to be updated to use "Technical Documentation". The Infraco must be aware of the relevance of the 19th July 2009 date and insist that suppliers provide documentation accordingly.

16.2 Essential Protection Requirements

The purpose of the EMC Directive is to ensure that electrical/electronic equipment does not cause or be susceptible to electromagnetic disturbance. The protection requirements required of all electrical/electronic equipment/systems/installations are as follows:

- the electromagnetic disturbance generated shall not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended; and

- they shall have a level of immunity to the electromagnetic disturbance to be expected in their intended use which allows them to operate without unacceptable degradation of that intended use.

The Infraco must produce an Edinburgh Tram Network specific EMC strategy document in accordance with the Submittal Programme that clearly defines its strategy for achieving compliance with these essential protection requirements and shall submit it to **tie** for its approval.

17 Health, Safety, Quality and Environment

17.1 Quality Management

The Infraco shall undertake the Infraco Works fully in compliance with quality management processes and procedures referenced in ISO 9001 and ISO 9004.

The Infraco shall develop a Quality Plan to meet the requirements of ISO 10005 - 1995, and which fully defines all quality aspects of the Infraco Works. The Quality Plan shall be submitted in accordance with the Review Procedure. The Quality Plan shall demonstrate an integrated quality management system relating to the design, construction, testing, commissioning and maintenance of the Edinburgh Tram Network and shall show how Infraco and its Sub-Contractors shall comply with the requirements of the Quality Plan.

The Infraco shall have all associated documentation readily available for internal review and review by **tie**. Regular internal audits shall be undertaken by the Infraco to ensure full compliance with ISO 9001 and ISO 9004 in accordance with paragraph 5.1 of the Code of Construction Practice. The Infraco shall prepare and submit in accordance with the Review Procedure a "Schedule of Internal Audits" for agreement with **tie**. This shall define the planned nature and timing of the internal audits. Furthermore **tie** reserves the right to undertake external audits in accordance with paragraph 5.2 of the Code of Construction Practice.

The Infraco shall ensure that its management system for the Infraco Works is developed to ensure that it aligns with the requirements of the Tram Project Quality Policy Statement (DEL.HSQE.103).

Quality control including materials and works on Site shall also be undertaken by the Infraco in accordance with the requirements of paragraph 3.2 of the Code of Construction Practice and the Project Safety and Quality Interface Document. The Infraco shall be required to comply with the requirements of this document including the completion of forms and other systems in order to assist **tie** in complying with **tie's** own safety and quality management systems.

17.2 Health & Safety

17.2.1 Safety Management Plan

The Infraco shall submit a safety management plan that is over-arching with regard to safety and defines the management procedures that shall be put in place to ensure health and safety for the design, construction, testing, commissioning and maintenance of the Edinburgh Tram Network. This document shall be stand alone and separate from other safety deliverables such as health and safety plan, system safety management plan, case for safety development etc. The Safety Management Plan shall address all issues relating to the safety of the Infraco Works, staff and third parties, however specific details relating to the items below are required and shall be submitted by the Infraco in accordance with the Submittal Programme:

- The plan shall detail the approach and all management procedures relating to health and safety for the Edinburgh Tram Network;
- The plan shall show how the Infraco will ensure that its Sub-Contractors apply all relevant health and safety policies and procedures to all Sub-Contractors;
- Details of all interfaces associated with safety and the procedures of how these shall be managed. Interfaces shall include Roads Authorities, Health and Safety Executive; any other relevant statutory authorities, HMRI; Competent Person (ROGS); Network Rail; Police; Fire and Rescue Services; Ambulance Service; and all applicable Law;
- Proposed Safety Initiatives;
- How the Infraco proposes that a safety culture shall be cascaded and enforced throughout the team including with Sub-Contractors;
- Infraco proposals for how safety shall be incentivised throughout the team, including with Sub-Contractors;
- The emergency procedures which the Infraco propose to implement;
- Details of how the Infraco shall implement accident and incident reporting and promotion of an open culture;
- The Infraco's safety inspection & safety tour regime;

- An outline of the Infraco's procedures relating to safety for compliance with **tie**'s Drugs & Alcohol Policy and procedures and details of the Infraco's own similar policy and procedures;
- Details of any particular safety issues the Infraco considers would be significant and initial mitigation measures the Infraco considers necessary;
- Commissioning of the Edinburgh Tram Network;
- Driver Training on the Edinburgh Tram Network;
- Maintenance of the Edinburgh Tram Network.

17.2.2 Occupational Health & Safety Management System

The Infraco shall adopt an occupational health & safety management system consisting of the implementation and use of those processes and procedures referenced in BS 8800, OHSAS 18001-2007 and/or HSG 65 (Successful H&S Management).

17.2.3 Project Health & Safety Plan and Health & Safety File

The Infraco shall develop a construction phase plan and supply all necessary information for the Project Health & Safety File in accordance with the Construction (Design and Management) Regulations 2007 and L144 Managing Health and Safety in Construction and as described in the pre-construction information. The construction phase plan shall require to be submitted in accordance with the Review Procedure.

17.2.4 Interface with tie's Safety Systems

The Infraco shall ensure that the management system for the Infraco Works is developed to ensure that it aligns with the requirements of the Tram Project Safety Policy Statement (DEL.HSQE.105). Section 32 of the Agreement contains the Project Safety (and Quality) Interface Document. The Infraco shall be required to comply with the requirements of this document including the completion of forms and other systems in order to assist **tie** in complying with **tie**'s own safety and quality management systems.

17.2.5 System Safety Management Plan (SSMP)

The Infraco shall be responsible for the development of the SSMP.

The SSMP shall define the engineering process that shall ensure, and provide a record of, assurance that the tramway has achieved an acceptable level of performance. This is achieved through a staged "case for safety" submission (refer below) process to signify that safety has been engineered into the design of the Edinburgh Tram Network. The SSMP shall define the process, activities and requirements for the preparation for a "case for safety" at the relevant design stage. The SSMP shall also define the system safety management organisation and the strategy to achieve the individual hazard system safety targets. The SSMP is concerned with only with those hazards that could give rise to an increased level of risk to passengers, staff and the general public from the operating system. (All health and safety hazards related to the risk to workers, staff and the general public from the construction activities should be covered under the safety management plan.)

17.2.6 The Railways and Other Guided Transport Systems (Safety) Regulations 2006

The Edinburgh Tram Network shall be delivered in accordance with The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS).

The Infraco shall design and execute the Infraco Works using safety management and procedures to demonstrate that the Edinburgh Tram Network is safe to introduce into service as defined by the Safety Management System under ROGS. This shall also include the development of the Case for Safety to the satisfaction of the Competent Person and the Project Safety Certification Committee. These aspects form an integral part of the design of the Edinburgh Tram Network and are detailed in this section of these Employer's Requirements.

The Infraco shall undertake all Infraco Works in accordance with the written safety verification scheme requirements prepared by **tie**. Safety verification will be undertaken by **tie**. The Competent Person shall assure the process and its outputs. The Infraco shall allow **tie** and the Competent Person access to undertake safety verification activities, such as system safety audits. The Infraco shall develop a safety management system for when the Edinburgh Tram Network is operational which complies with the requirements of ROGS and other relevant legislation to the satisfaction of the Competent Person and **tie/TEL**.

Whilst there is no requirement in ROGS for projects such as the ETN to be notified to or given prior consent or approval by HMRI, HMRI have been involved in the development of the Edinburgh Tram

Network scheme to date and it is **tie**'s intention to continue this involvement. The Infraco shall assist **tie** in any liaison with the HMRI when requested to do so.

17.2.7 Health and Safety Management

The health and safety responsibilities and CDM/ROGs application are defined in the matrix below for each phase of the project.

Table 41 – Matrix showing Contractual Responsibilities – Health & Safety Management

		Infraco					Revenue services	
RESPONSIBILITIES	**MUDFA**	**Pre Novation Design**	**Post Novation Design**	**Construction / Installation**	**Commissioning / Test running ***	**Shadow running**	**Operation**	**Maintenance.**
tie Ltd.	CDM Client.	CDM Client. **ROGS duty holder.**	CDM Client. **ROGS duty holder.**	CDM Client. **ROGS duty holder.**	CDM Client. **ROGS duty holder. ****	- **ROGS duty holder. ****	-	-
Transdev.		Adviser to **tie**.	Adviser to **tie**.	Adviser to **tie**.	Driver training. Inputting into hazard log.	Operator of tram system. Inputting into hazard log.	Operator of tram system.	-
SDS	Designer.	Designer. Managing hazard log.	Designer. Inputting into hazard log.	-	-	-	-	-
MUDFA contractor.	Principal contractor	-	-	-	-	-	-	-
Infraco.	-	-	Design manager. Managing hazard log.	Principal contractor. Managing hazard log.	Principal contractor. Managing hazard log.	-	-	Contractor/Principal contractor. Maintainer–infrastructure.
Tramco.	-	-	Designer. Inputting into hazard log.	Contractor. Inputting into hazard log.	Contractor. Inputting into hazard log.	-	-	Maintainer–vehicles.
TEL.	-	-	-	-	-	-	**ROGS duty holder.**	CDM Client.
CEC.	-	-	-	-	-	-	-	-Maintainer - roads
REGULATIONS								
CDM Regs	Yes – Construction Phase Plan, Residual Risk Register. Health & safety file initiated.	Yes – Pre-construction information, Residual Risk Register. Health & safety file progressed.	Yes – Pre-construction information, Residual Risk Register. Health & safety file progressed.	Yes – Construction Phase Plan. Health & safety file progressed.	Yes – Construction Phase Plan. Health & safety file completed & handed over to TEL.	No – no longer construction work.	No.	Yes – where maintenance works are "construction works". (Notifiable works last more than 30 days or 500 man days).
ROGS Regs	No.	Yes – Safety Verification Scheme. Appointment of Independent Competent	Yes – Safety Verification Scheme. NoNOs from ICP.	Yes – Safety Verification Scheme. NoNOs from ICP.	Yes – Safety Verification Scheme + Safety Management System. NoNOs from ICP.	Yes – Safety Verification Scheme + Safety Management System. Final NoNO from ICP.	Yes – Safety Management System.	Yes – Safety Management System.

		Person (ICP).						
SAFETY MANAGEMENT SYSTEMS								
Safety Management Systems	AMIS SMS – construction. SDS SMS – design.	**tie** SMS – safety verification. SDS SMS - design.	**tie** SMS – safety verification. Infraco SMS – design management. SDS SMS – design. Tramco SMS – design.	**tie** SMS – safety verification. Infraco SMS – construction/installation Tramco SMS – manufacture/installation.	**tie** SMS – safety verification. Infraco SMS – installation/operation. Tramco SMS – installation. Transdev SMS – operation.	**tie** SMS – safety verification. Infraco SMS - operation. Transdev SMS – operation.	TEL SMS. Transdev SMS - operation.	TEL SMS. Infraco SMS – maintenance. Tramco SMS – maintenance.

* The project moves into this stage in phases once key milestones have been achieved e.g. the energisation of the OLE within the depot.

** This is flexible. TEL may assume the role of **ROGS duty holder** during this phase.

KEY

Responsibilities under the CDM Regulations

Responsibilities under the ROGS Regulations

17.3 Environmental Management

17.3.1 Environmental Management System

The Infraco shall adopt an environmental management system consisting of the implementation and use of those processes and procedures referenced in ISO 14001.

Documentation developed to meet the requirements of the environmental management system shall be submitted in accordance with the Review Procedure.

The Infraco shall ensure that the management system for the Infraco Works is developed to ensure that it aligns with the requirements of the Tram Project Environmental & Sustainability Policy Statement (DEL.HSQE.101).

17.3.2 Environmental and Sustainability Action Plan

The Infraco shall submit and maintain an Environmental & Sustainability Action Plan (EAP). This shall be based on SDS Environmental Mangement Plan and shall cover environmental issues for the duration of the Infraco Works, including design and construction stages. It shall describe the management process, procedures and interface requirements associated with meeting the Infraco's environmental responsibilities.

It shall then develop in detail the potential impacts on environmental resource, mitigation measures and responsibilities associated with all stages of the Infraco Works.

The EAP shall be prepared using the following sources of information.

- the Environmental Statements;
- The Design Manual;
- The Noise and Vibration Policy as contained within the Code of Maintenance Practice;
- The Code of Construction Practice;
- The Landscape and Habitat Management Plan for the Roseburn Corridor;
- The Badger Mitigation Plan for the Roseburn Corridor;
- Agreements made with statutory bodies; and

- Parliamentary agreements.

The EAP shall be amended by the Infraco to reflect any changes to the tramway design or engineering solutions and the results of surveys..

17.3.3 Construction Environmental Management Plan (CEMP)

The Infraco shall prepare a construction environmental management plan (CEMP) including method statements, as necessary, to convey the required level of information during the construction stage of the Infraco Works.

Site specific EMPs shall be prepared for each geographical section and intermediate geographical section as appropriate. These plans shall be produced by the Infraco prior to any works commencing on Site and must be reviewed by **tie** before work starts. The site specific EMPs must separately address the following sites and/or issues:

- Site accommodation, compound and offices and storage areas;
- Site clearance;
- Geographical sections and intermediate geographical sections of the Tram route;
- The Depot;
- Structures, such as sub-stations not already included in the above; and
- Road, cycleway and footway works, including drainage, signage and lighting.
- A series of site specific and topic related EMPs shall also be produced by the Infraco that shall address all the environmental issues, landscape, ecology etc. These shall cover the general control and protection measures for each topic as it relates to each of the site specific sections in the plan area. The Infraco shall have responsibility for the production, content and implementation of the Site Specific EMPs.
- The Infraco shall submit to **tie** the site specific EMPs 8 weeks prior to the commencement of the relevant section of the Infraco Works.

- **tie** shall comment on the plan(s) submitted, in accordance with the Review Procedure and agree the final plans prior to the commencement of any work on the relevant section or activity.

17.3.4 Requirement of Site Specific EMPs

The Infraco shall develop the site specific EMPs to include the following details:

- **A description of the works to be undertaken**
- List of all separate work activities that fall within the scope of the works.
- **A detailed programme of the construction activities**
- Proposed dates and sequence of the works (showing how environmental impacts are affected by potential changes to the Programme);
- Details of proposed normal working hours and intended start up and close down times; and
- Outline of any works which may require construction activities outside of normal working hours.
- **Location of the works, including a site plan, showing construction site boundaries**
- This shall show the position of plant and position of any sensitive receptors e.g. watercourses, local residents, etc.
- **Personnel access routes/points**
- Location plan of each access route/point;
- List of activities for which each access point is to be used
- **Vehicular access routes/points**
- Location plan of each access route/point;
- List of activities for which each access point is to be used
- **Equipment and plant to be used (including type, make and expected number)**
- **Method of delivery/removal of materials and plant**

- **Details of proposed site accommodation**
- **Details of how public right of way and access to property will be retained and managed**
- A list of Consents/permissions obtained or to be obtained for the works
- **External Consultation**
- A list of those notified of the works and the date notified
- A list of proposed notifications and dates
- **Significant environmental impacts relating to each activity.**
- (This should draw upon the definitions of significant impacts used in the Environmental Statement).
- **Significant environmental risks relating to each activity.**
- **Receptors which are likely to be affected by the works.**
- **On-site mitigating measures for each impact and risk.**

These will be transferred onto site management statements which will briefly state the key risks and mitigating measures which have been agreed. The site management statement will be attached to the construction method statement for the works to ensure that it is brought to the attention of all site staff. The Site Management Statement will be briefed out to all site based staff as a toolbox talk.

- **Monitoring proposals that shall include:**
- The receptors for which monitoring will be undertaken;
- Frequency of monitoring;
- Factors against which the monitoring results will be analysed;
- Threshold levels;

- Timescales within which results will be analysed;
- List of organisations/individuals to whom results will be distributed; and
- Actions to be taken in the event that thresholds are breached.

17.3.5 Permits to Work

Prior to being granted access to commence construction works, the Infraco shall complete and submit to **tie** for its autorisation, the required Permits to Work.

Further details of the Permits to Work process are included within the Code of Construction Practice, the Project Safety & Quality Interface Document and Section 39 of the Employer's Requirements.

18 Cabling and Ducting

This Section sets out the requirements with the Infraco must comply with in relation to cabling and ducting.

18.1 Cabling

All cables must be mechanically protected such that they cannot be accessed by the public without using tools to remove separate mechanical protection.

Cables and associated supports must be rated such that neither the cables nor the supports degrade due to thermal or mechanical stress during their design life.

Cables must operate satisfactorily under all foreseeable fault, and loading conditions.

Cables must operate satisfactorily under all foreseeable environmental conditions. This must include the effects of sunlight, dampness, temperature, and exposure to water. Cables must be selected to recognise risk that they may be submerged in water.

Cables must be designed to last for the durations that are set out in Table 22 - Equipment Design Life.

Cable terminations must not impose any stress on the cables, and sufficient spare length must be provided in all cables to permit foreseeable maintenance and repair work.

Cables must be identified in accordance with requirements agreed with **tie**.

Where joints in cables are required, and cannot be reasonably avoided, they must be located in draw pits and identified on the as-built drawings. Joints in draw pits must be both suitably supported and accessible. This may require draw pits that are larger than normal size to be used to contain cable joints.

All cables in all draw pits will be identified with a suitable label.

18.2 Ducts

Spare ducts shall be provided on all duct routes as follows:

Number of ducts in cable route	Minimum number of spare (unused) ducts	Minimum size of spare duct
2	0	N/A
3 or more	20% of the number of ducts	Maximum size of used ducts

Table 42 – Ducts

All ducts, and all individual ducts in banks of ducts, must contain draw ropes of sufficient mechanical integrity to enable additional new or replacement cables to be pulled through the duct.

All ducts, including ducts that are installed but not used for cables, must be free from debris and free from obstructions.

All installed ducts, including ducts that are installed but not used for cables, must not be crushed. All internal dimensions of the duct as built must never less than 90% of duct's nominal dimensions.

Ducts must be provided with drainage that is integrated with the specification of the cables used such that there is no foreseeable risk of degradation from any water that may be in the ducting system.

Ducts must be of sufficient mechanical integrity to protect both themselves and the cables contained in the ducts from all foreseeable damage, degradation and vandalism.

The bending radii of ducts must be integrated with the requirements of the cables to be installed such that the cables can be installed, replaced and terminated without damage.

Ducts must be provided in sufficient number and size to ensure that there is no degradation in the cables due to thermal effects or chafing of cables. It shall be possible to remove and replace any individual cable in the ducting system without the need to remove or significantly disturb any other cables from the system.

Cable ducts shall be installed with appropriate warning arrangement to anyone who may be undertaking excavation work that may damage the ducts. This may be achieved by the installation of plastic warning tape in the ground above the ducts.

Where cables are installed in segregated parts of the tramway, they shall not be installed in cable troughs unless specifically agreed by **tie**. Any proposals for the use of cable troughs must include:

- Locked lids or equivalent to minimise the risk of vandalism and/or theft;
- Where cable troughs form part of the walkway along the tram route, a proven design of locked lids that will eliminate any rocking of the lids must be used; and
- Troughs must be secured against any lateral movement.

For the avoidance of doubt, where cable troughs form part of a structure, the above requirements still apply.

Where ducts are used on the off street tramway, these are preferred to be placed under the walkway with draw pit covers forming part of the walkway.

Any slipping and/or tripping hazards associated with draw pits that are located in a walkway must be eliminated.

Some cables terminate in equipment on ballasted track. These include:

- traction return bonding connected to the rails;
- connections to loops; and
- possibly some connections to some Point Position Indicators.

These cables are to be installed such that the risk of damage to the cables due the activities of track maintenance equipment, vandalism and people walking on the track is minimised.

18.3 Duct Chambers and Draw pits

Duct chambers must be structurally sound and built to the requirements of the cabling network as specified in this section 18.

The design of the location of draw pits must such that they can be safely accessed without stopping the operation of the tramway or requiring a road closure, unless specifically agreed by **tie**.

The integration of draw pit covers into the surfacing in the surrounding area shall be included in the design. This will include the orientation and the surfacing of the cover.

Draw pit covers will be of a family, such that the number of different keys needed to lift draw pit covers is minimised.

The Infraco shall provide sufficient draw pit keys and access equipment to adequately operate and maintain the system.

18.4 Cable separation

Sufficient separation between cables must be provided in order to:

- ensure that any risk of damage to the insulation of the cables that could cause potential risks of energising other circuits is minimised. All cables carrying +750V dc must not be in physical contact with any other cables unless the cables are permanently bonded together,
- ensure that electromagnetic compatibility between cables is provided, and
- permit access to cables and any essential cable joints for maintenance purposes

18.5 Other requirements

Where cables are installed inside conducting items that are not earthed, such as OLE poles, the insulation and the mechanical protection of the cables must be sufficient to mitigate any associated hazards.

As built drawings will accurately identify:

- the cables that are contained in each duct, to aid cable location and fault finding; and
- the location of all draw pits and all duct runs.

19 Cabinets

This Section 19 sets out the requirements which the Infraco must comply with in relation to cabinets and the environmental conditions as defined in Section 3.6.4.

Cabinets, cubicles and equipment housings will be required in the following instances as a minimum:

- To house communications equipments at the Tramstops;
- To house SCADA equipment within substations;
- To house radio equipment at base stations; and
- To house points control, points indicator control, points heaters and Tram control equipment at rail junctions.

All cabinets that are located externally shall meet the following requirements:

- They shall provide an ingress protection rating of 55 (BS EN 60529 Specification for Degrees of Protection Provided by Enclosures) as a minimum;
- They shall be coated with materials that inhibit graffiti and assist with its removal;
- Equipment housing, enclosures, cable routes etc. shall allow for an increase of temperature caused by the equipment, whereby the housing itself shall not cause any harm to the functionality of the equipment or the temperature reached at the surface of the enclosure
- All cabinets shall provide an entry for cabling, with no cables visible or accessible without opening the cabinet;
- All cabinets are provided with a robust lock, satisfying the **tie** lock suiting requirements set out in these Employer's Requirements;
- The cabinet doors shall be equipped with a multi point locking mechanism that complies with the Edinburgh Tram Network security locking policy;
- In the event of the equipment cabinets being opened, an alarm shall be transmitted to the Supervisory Control and Data Acquisition system so that staff in the Control Centre can be alerted;

- The equipment contained within the cabinets shall be of a modular construction that shall allow rapid replacement should that become necessary;

- When the cabinet doors are open, they do not obstruct tramway operation, road vehicles, passengers or other members of the public; and

- Work can be carried out safely on the contents without affecting tramway operations or requiring temporary traffic management.

In addition, those cabinets located at Tramstops shall be designed to integrate visually with the Tramstop furniture. The external colour and appearance of the cabinets, shall match and complement the architectural finishes and materials of the structures of the Tramstop where the cabinet is to be mounted.

20 NOT USED

21 Utilities / MUDFA

Where Infraco is instructed by a **tie** Change to carry out utilities diversions, relocation or protective works to deliver the Edinburgh Tram Network the following shall apply.

The philosophy adopted for the MUDFA Works is to clear the ground of utilities such that the track can be installed in ground that has no live utilities within it. The MUDFA Works considers utilities that lie below the area of land that is described by the tram's DKE. It is assumed that the width of ground needed for the construction of the track slab is no more than the width of the tram's DKE.

Where utilities lie below 1200mm from the surface, they are left in-situ.

Where utilities occupy ground that is within 600mm of the existing road surface, they are removed and replaced.

Where utilities lie between these two limits, they are considered on a case by case basis. Generally, utilities that cross the tramway are protected (sleeved for example) and left in position. Where utilities run along the tramway, they are diverted and placed outside the tram's DKE.

Special arrangements are made for major utilities such as the HV cables and the service tunnel along Leith Walk.

Schedule 46 details specific locations and utility types which shall be either left in situ or be diverted by Infraco as a **tie** Change. Where utilities' scope decisions and responsibilities fall outside this schedule Infraco and tie shall jointly agree the most appropriate party (either MUDFA or Infraco) to undertake the diversion works.

The generic allocation of responsibility for relocating utilities is set out in Section 21 of these Employers Requirements. Infraco will only be responsible for relocating such utilities after receiving a **tie** Notice of Change instructing such relocation.

Tie will obtain designs for all utility diversion works and issue them to Infraco.

Infraco shall deliver the utilities diversion works instructed in accordance with designs provided.

Infraco shall ensure that the Programme as amended in accordance with Clause 80 contains adequate allowance for these utility diversion works.

Infraco responsibilities in respect of utilities diversions instructed as a **tie Change** shall also include:

1. Where diversion works are to be delivered by Statutory Utilities (SUs) supporting tie in the development and agreement of utilities diversions works package agreements with the SUCs. Such support mean supporting tie and providing all necessary information to enable tie to negotiate contracts for diversion works with SUCs, assembling and checking work package agreements, defining detailed scope, providing constructability advice and agreeing programme of works with SUC's and co coordinating such so that impact on programme for delivery of the Infraco Works is minimised, agreeing construction and delivery methodologies with SUCs, finalising the scope of Utilities diversion works and the boundary of responsibility between work to be delivered by Infraco and that of SUCs.
2. Providing all enabling, traffic management requirements, ancillary building, civil engineering, electrical and mechanical works in connection and all attendances required to enable SUCs to carry out and complete their works.
3. Coordinate the works of SUCs with each other and with that of the Infraco.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
Water	Connections	Connections to new mains will be required before old main can be decommissioned. This is part of the advance diversion scope of MUDFA.	If any connections are missed by MUDFA and subsequently identified by Infraco, they must be carried out at the time of Infraco. However, this risk is small as missed connections would usually lead to immediate customer complaints when the old service was decommissioned.	Note that this is not intended to be the primary mitigation of this risk: site investigation and planning should ensure that connections are identified and dealt with by MUDFA.
	Diversion (other than 800mm at Depot)	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out by (or at the same time as) Infraco. Extensive site investigation has been carried out to reduce this risk, but it cannot practically be eliminated.	
	Diversion of 800mm at Gogar Depot.	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out by (or at the same time as) Infraco.	There is little, if any, risk of encountering any other water service in the Gogar Depot area that has not been dealt with by MUDFA.
	External Protection	Part of the advance diversion scope of MUDFA.		Long longitudinal protection would not be acceptable for water mains

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	Insurance Pipes	Part of the advance diversion scope of MUDFA.		

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
Waste water	Diversions and manhole construction	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, or where the designs of works have been unable to be sufficiently progressed prior to MUDFA vacating the Work Sections, the diversions must be carried out by (or at the same time as) Infraco. Extensive site investigation has been / will be carried out to reduce this risk, but it cannot practically be eliminated.	Sewer design and agreement with SUC (Scottish Water) regarding treatment required to existing sewers is not currently complete and the programmed completion of the telecoms cabling works is such that existing services cannot be abandoned to allow the manhole and sewer construction works to be undertaken for significant periods of time after all the ducts and other utility diversions are complete. This may result in sewer diversion works to be undertaken after all other MUDFA programmed works in Work Sections are complete. Works may be undertaken by either MUDFA or Infraco.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	Internal Refurbishment	Part of the advance diversion scope of MUDFA.		
	External protection	Where crossing or short longitudinal - part of the advance diversion scope of MUDFA.	Where long longitudinal: would be relatively easy to incorporate into Infraco - for a section, excavation would be deeper with (e.g.) concrete placed - this would avoid double excavation by MUDFA and Infraco.	
	Connections to new sewers	Connections to new mains will be required before old main can be decommissioned. This is part of the advance diversion scope of MUDFA.	If any connections are missed by MUDFA and subsequently identified by Infraco, they must be carried out at the time of Infraco. However, this risk is small as missed connections would usually lead to immediate customer complaints or evidence of flooding when the old service was decommissioned.	This is not intended to be the primary mitigation of this risk: site investigation and planning should ensure that connections are identified and dealt with by MUDFA.
	Existing connections	An existing connection to an existing (and left in place) sewer may have to be repositioned. This would be part of the advance diversion scope of MUDFA.	A connection may not be identified at the time of MUDFA, and uncovered by Infraco. The connection must be repositioned at the time of Infraco.	

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	Manhole access level change (eg raise height of access cover)	St Andrews Square and North & South St Davids Street will be undertaken by MUDFA as part of the road realignment and construction works required to accommodate the proposed Traffic Regulation Order (TRO).	Manhole access level changes must be adjusted at the time of Infraco. Manhole lids to be flush with the finished road surface.	It will also mean that new manholes installed by MUDFA may have to be modified by Infraco.
	New Gully connections	St Andrews Square and North & South St Davids Street will be undertaken by MUDFA as part of the road realignment and construction works required to accommodate the proposed Traffic Regulation Order (TRO).	Infraco shall install road gulleys. These will have to be installed at the same time as the road construction is carried out.	If a new road gully is required at a place where the road level is not to be changed, MUDFA could install it. However this situation is unlikely, and for consistency and avoidance of confusion Infraco should probably do all of this.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
Telecoms	Protect	Where crossing or short longitudinal - part of the advance diversion scope of MUDFA. Where long longitudinal: would be part of the advance diversion scope of MUDFA allowing Infraco a "clear run". However would necessitate double - excavation of a long length of the tram foundation area.		Where long longitudinal: would be relatively easy to incorporate into Infraco - for a section, excavation would be deeper with (e.g.) concrete placed - this would avoid double excavation by MUDFA and Infraco*.
	Slew/Lower	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out as Infraco Works. Extensive site investigation has been carried out to reduce this risk, but it cannot practically be eliminated.	

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	Divert (inc manhole construction)	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out as Infraco Works. Extensive site investigation has been carried out to reduce this risk, but it cannot practically be eliminated.	
	Insurance Ducts	Part of the advance diversion scope of MUDFA.		
	Manhole access level change (eg raise height of access cover)	St Andrews Square and North & South St Davids Street will be undertaken by MUDFA as part of the road realignment and construction works required to accommodate the proposed Traffic Regulation Order (TRO).	Manhole access level changes must be adjusted at the time of Infraco. Manhole lids to be flush with the finished road surface.	This will also mean that new manholes installed by MUDFA may have to be modified by Infraco.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
Gas	Divert	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out as Infraco Works. Extensive site investigation has been carried out to reduce this risk, but it cannot practically be eliminated.	
	Protect	Part of the advance diversion scope of MUDFA.		Long longitudinal protection would not be acceptable for gas mains
	Insurance Pipes	Part of the advance diversion scope of MUDFA.		
	Connections	Connections to new mains will be required before old main can be decommissioned. This is part of the primary scope of MUDFA.	If any connections are missed by MUDFA and subsequently identified by Infraco, they must be carried out as part of Infraco Works. However, this risk is small as missed connections would usually lead to immediate customer complaints when the old service was decommissioned.	This is not intended to be the primary mitigation of this risk: site investigation and planning should ensure that connections are identified and dealt with by MUDFA.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
Electricity	Divert	Part of the advance diversion scope of MUDFA.	If any apparatus is discovered by Infraco that was not identified at the time of the utility advance diversion works, the diversion must be carried out as part of Infraco Works. Extensive site investigation has been / will be carried out to reduce this risk, but it cannot practically be eliminated.	
	Protect	Where crossing or short longitudinal - part of the advance diversion scope of MUDFA.	Where long longitudinal: would be relatively easy to incorporate into Infraco - for a section, excavation would be deeper with (e.g.) concrete placed - this would avoid double excavation by MUDFA and Infraco.	Where long longitudinal: would be part of the advance diversion scope of MUDFA allowing Infraco a "clear run". However would necessitate double - excavation of a long length of the tram foundation area.
	Insurance ducts	Part of the advance diversion scope of MUDFA.		

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	Domestic + Business connections	Connections to new cables will be required before old cable can be decommissioned. This is part of the primary scope of MUDFA.	If any connections are missed by MUDFA and subsequently identified by Infraco, they must be carried out as part of Infraco Works. However, this risk is small as missed connections would usually lead to immediate customer complaints when the old service was decommissioned.	This is not intended to be the primary mitigation of this risk: site investigation and planning should ensure that connections are identified and dealt with by MUDFA.
Street Furniture (eg street lighting, traffic lights, lighted bollards, bus stops, etc)	Existing power & telecoms Divert	St Andrews Square and North & South St Davids Street will be undertaken by MUDFA as part of the road realignment and construction works required to accommodate the proposed Traffic Regulation Order (TRO).	All existing power and telecoms diversions required must be carried out by (or at the same time as) Infraco. Depth of cover and the final road infrastructure alignment and construction to be finalised by and carried out by Infraco.	Extensive site investigation has been / will be carried out to reduce this risk, but it cannot practically be eliminated.
	Protect	St Andrews Square and North & South St Davids Street will be undertaken by MUDFA as part of the road realignment and construction works required to accommodate the proposed Traffic Regulation Order (TRO).	All existing power and telecoms diversions required must be carried out by (or at the same time as) Infraco. Depth of cover and the final road infrastructure alignment and construction to be finalised by and carried out by Infraco.	.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	New connections	For future street furniture, appropriate ducting would be installed by MUDFA where (1) design details are available sufficiently in advance, (2) the road/tram alignment is formally finalised and (3) the future ground levels are such that new ducts can be buried beneath the existing ground level, without either excessively deep excavation or inadequate (or no) cover.	Where design is not available in time for MUDFA, or where future road levels do not facilitate advance installation, duct installation work must be carried out as part of Infraco Works.	
Other	SP transmission cables	If the design agreed with Scottish Power requires external protection beyond that provided by the track slab in that area, and if the design is available in good time, then MUDFA could undertake these works if required.	Infrastructure design will have to take account of the specific requirements to avoid diverting these cables. This will include special track slab construction (for Leith Walk) and careful bridge abutment/pier design (for 3 other areas). Should this design be impossible, the diversion work would be carried out by Scottish Power directly.	This would not be possible before 2008 (at the time of writing; lead time requires a notification before October in one year for work in the summer of the following year). Consultation between utilities and infrastructure design teams should facilitate this design.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	BT cables at A8 by Gogar		Infrastructure designs shall take account of the specific requirements to avoid diverting these cables.	This may include a deeper excavation for the tunnel under the A8 than had previously been envisaged, plus provision of temporary support for the cables during the construction of the tunnel. Should this design be impossible, the diversion work would be carried out under MUDFA terms and conditions. Consultation between utilities and infrastructure design teams should facilitate this design. Trial holes have been undertaken on behalf of BT to confirm the depth of the existing cables – the initial, informal, impression from BT is the cables are higher than anticipated which indicates the cables may not require diversion but incorporation into the infrastructure design.

Service	Description	MUDFA SCOPE	INFRACO SCOPE	NOTES
	BT cables at Roseburn street		Infrastructure design will have to take account of the specific requirements to accommodate these cables. Infraco shall consider the design solution for cabling installation as part of the Infraco Works.	This will include careful bridge abutment/pier design. The cabling element of this work is to be carried out by BT following diversion works, and may impact on the Infraco programme. Consultation between utilities and infrastructure design teams should facilitate this design. Note: a design solution for the cables as part of the Infraco works has been agreed with BT.
	Utility work dependent on prior structures work, eg cables in bridge decks		Will require structures work to be completed before utility work can be started. Infraco shall complete any and all utility diversions, utility protections works etc. including design (by SDS) following (or at the same time as) the Structures are completed.	

Table 42a – Table showing the responsibility for diversion/protection work on the utilities for the Edinburgh Tram project

22 Locks and Key Suiting

22.1 General

The Edinburgh Tram Network will have many locks installed to provide a suitable level of secure access to equipment and rooms. The locks and keys used shall be integrated into appropriate key suiting families. The philosophy is to strike an appropriate balance between the following two extremes:

- A single fully integrated key suiting arrangement for the whole of the Edinburgh Tram Network;
- No suiting, with every lock needing a different key;

The Infraco shall propose key suiting arrangements that are subject to approval by **tie**. In developing the proposals, Infraco shall consider:

- The need for staff to be able to undertake their duties without having to carry large numbers of keys with then to access the places that their duties require;
- Future expansion of the Edinburgh Tram Network;
- Changes to the key suiting that are likely to be needed as the system matures, and any key suiting must bear be sufficiently flexible to enable such changes to be made; and
- The ongoing costs of providing keys to staff during the life of the Edinburgh Tram Network;

22.2 Key Suiting System

A key suiting system that is based by the Infraco on the following is likely to be acceptable to **tie**.

A stand alone suite of keys, hierarchically structured to provide access to equipment such as:

The suiting documentation will list all locks to be installed on the Edinburgh Tram Network, including any locks that are not proposed to be included in the suites. There should be 4 completely separate suiting systems, as set out below:

22.2.1 Tram

- The Infraco shall procure all keys that are required for operating each tram. It is anticipated that each tram driver will need to carry no more than two keys for each Tram in order to undertake their duties. One key would permit access onto the tram, into the cab, and enable the Tram to be driven. The second key would open any panels that the driver may need to access and may also provide for such tasks as locking doors out of use;

- A different key would permit staff such as cleaners to access the inside of the Tram and the Tram cabs, but would not enable the Tram to be driven;

- Tram Maintenance staff may also need additional keys to access sensitive or potentially dangerous equipment.

22.2.2 Substations and Power

A stand alone suite of keys, hierarchically structured to provide access to equipment such as:

- Isolator cabinets, to check the position of isolators and to fit isolation padlocks;

- Substation LV areas;

- Substation HV areas in substations;

- Isolators, to permit hand operation;

- Equipment within the substations may also have a multitude of locks that may be suited, depending on the Infraco maintenance philosophy.

Separate individual locks with a single key will be used for securing isolations. There will be no suiting whatsoever for these.

22.2.3 Depot and buildings

A stand alone suite of keys, hierarchically structured to provide access at doors in the Depot building and other buildings in the Depot area such as the Depot plant building. A low level key in this structure could be used for any trackside gates that are required along the alignment.

22.2.4 Signalling and Communication Equipment

A stand alone suite of keys, hierarchically structured, to provide access to all trackside cabinets, including:

- Points control;
- Points heating;
- Signalling and;
- Tramstop.

Isolator cabinets are substations are excluded from this suite because they are included in the substations and power suite of keys.

23 Testing and Commissioning

23.1 Systems Acceptance

23.1.1 Scope

This section of the Employer's Requirements is to define the systems acceptance requirements applicable to the Edinburgh Tram Network (ETN) which the Infraco must comply with.

23.1.2 General Description and Principles

The process for acceptance of the Edinburgh Tram Network set out in this document is designed to ensure that the ETN is delivered in an acceptably safe, compliant, and efficient manner. The objectives of the process are to ensure that system performance, integrity, reliability, availability, and safety are rigorously tested and that throughout all stages of the delivery process the many sub-systems and the overall System are validated and verified against **tie**'s requirements and applicable standards. The detailed sequence and scope of infrastructure testing and commissioning prior to System Acceptance Testing shall be programmed out and proposed by the Infraco.

The acceptance process is heavily dependent on the delivery of the planned service timetables, the Operational Timetable (see 2.8 of these Employer's Requirements) and the Enhanced Timetable (see 2.8 of these Employer's Requirements). Details regarding the tram service frequency, number of trams and the phased opening of the Edinburgh Tram Network are contained in 2.8 of these Employer's Requirements.

Pre-system acceptance testing includes both Factory Acceptance Tests (FATs), Site Acceptance Tests (SATs), Sub-system Integration Tests (SITs) and System Commissioning Tests (SCTs).

Once a Section of the ETN is physically completed and the System Integration Tests are satisfactorily completed then the formal acceptance process requires the Infraco to carry out and pass a series of System Acceptance Tests (SATS) in order to achieve Sectional Completion. These tests are:

Table 43 - Description of the Acceptance Tests

Test	Test Name	Test Description	Programme
T1	Post Commissioning Test	The test shall demonstrate and prove that each Section of the ETN in sequence is able to perform in an acceptably safe manner and deliver the required run times. Please refer to relevant section below. This is the gateway test to driver training.	Post Commissioning Test will immediately follow the successful commissioning of the nominated section and is a requirement for progressing into the Driver Training.
T2	Performance Test 1	After Section D has passed Test T1 then this test shall demonstrate and prove that Phase 1a of the ETN is able to perform satisfactorily to move into the three-month Shadow Running period. Please refer to relevant section below. This is the gateway test to shadow running.	Performance Test 1 will immediately preceed the Shadow Running period and is a requirement for progressing to this phase of the programme.
T3	Pre-operations Test	The test shall cover a seven day period during the latter part of the Shadow Running phase of the programme. The Test is the operation of the initial entry into service timetable and includes infrastructure, trams, and operations systems – Please refer to relevant section below.	Pre-operations Test shall immediately precede the Service Commencement Date.
T4	Network Performance Test	The Test shall be carried out over a 28 day period in Passenger Service to establish that the ETN can reliably operate the Operational Timetable – please refer to Please refer to relevant section below.	To be completed within twelve months of the Service Commencement Date.
T5	Network Reliability Test	Reliability Testing of certain sub-systems in Passenger Service – please	To be completed within twelve months of the Service

		refer to Please refer to relevant section below.	Commencement Date.

The Post Commissioning Test (T1), Performance Test 1 (T2) and Pre-operations Test (T3) have to be passed before the Edinburgh Tram Network (or Sections thereof) can open for passenger carrying service and are therefore to be scheduled during the test running and driver training and shadow running phases.

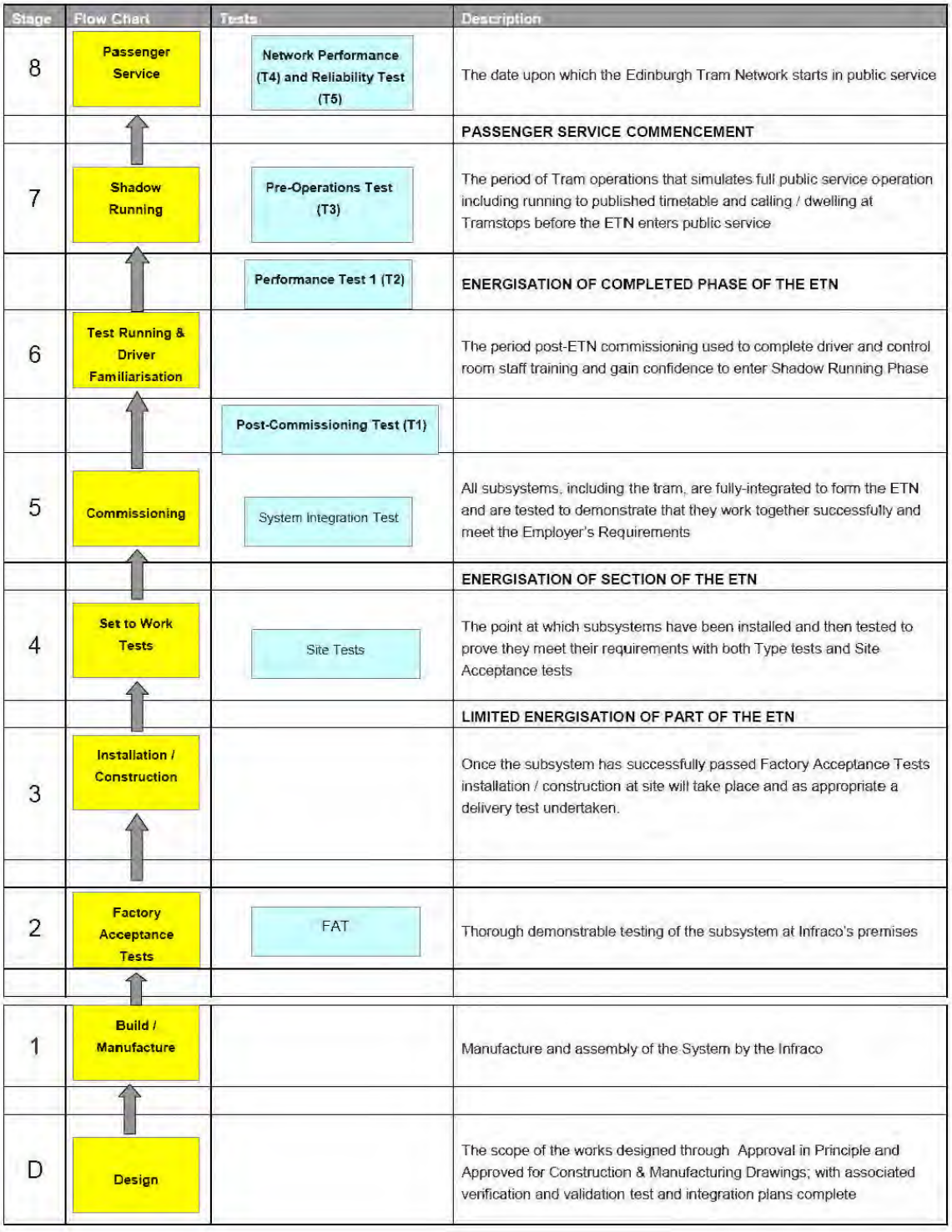
The Post Commissioning Tests (T1) can be undertaken in isolation for each Section.

Performance Test 1 (T2) and the Pre-operations Test (T3) can only be undertaken for that/those section(s) that are to be opened for passenger carrying service immediately thereafter.

The Network Performance (T4) and Network Reliability Test (T5) shall not be carried out until Passenger carrying Service has commenced on the whole Edinburgh Tram Network.

The figure on the next page shows the structure of the tests.

Figure 10 - Edinburgh Tram Network: Extract from System Life Cycle Model



23.2 Test Planning

The efficient programming of the tests is vital to the success of the system acceptance test process. Infraco shall, therefore, consider and incorporate, in a coordinated manner at each stage of the implementation of this process, the relevant documentation, the required tram availability and commissioning site availability and staff (from all concerned parties), into the overall Infraco test plan.

The Infraco shall prepare and present the Infraco test plan for review no later than six months after the Effective Date. The Infraco test plan shall describe how the Factory Acceptance Testing, Site Testing and Commissioning, Test Running and Driver Training and Shadow Running, as well as the Network Performance and Network Reliability tests are to be undertaken. The definition of these tests is shown in Figure 10. The programming of the tests shall be in accordance with the Programme as described in Section 39 of these Employer's Requirements. Infraco shall ensure that the PSCC and the Independent Competent Person (or the appropriate approval regime in force) are satisfied that the testing process is robust, comprehensive and satisfies all of the safety issues legislated and mandated for the system.

As the project evolves the Infraco Test Plan/Risk Register/Hazard Log shall be maintained by the Infraco. Infraco shall demonstrate that the issues raised in this log have been mitigated or that the tests have demonstrated the risk has been resolved. It is therefore important that the testing procedures and results are correlated with the Project Risk Register and Hazard Log.

23.3 Pre-Systems Acceptance Testing (before starting the systems acceptance process)

The following should be noted with regards to any tests to be undertaken:

- The individual test documentation / specifications shall be submitted to **tie** for acceptance in accordance with Schedule 14 (Review Procedure) and **tie**'s approval obtained before the test can take place;

- A notice period of at least seven working days shall be given to **tie** prior to any test in order that **tie**, and/or its representative(s), can arrange, at their option, to witness the test. The Operator's staff shall also be invited to witness all testing activities;

- Factory Acceptance Tests (FAT) and Site Acceptance Tests (SAT) test results shall be submitted to **tie** for review;

- **tie** reserves the right to be present during any of the tests to be undertaken; and
- Any such review will be undertaken in accordance with Schedule 14 (Review Procedure).

The following tests shall be carried out in advance of the systems acceptance testing sequence.

23.4 Factory Acceptance Tests (FAT)

23.4.1 Overview

Factory Acceptance Tests consist of a series of progressive activities all of which are undertaken at the sub-system manufacturer's premises.

Initial testing at the component manufacturer's premises of components to be used as part of a sub-system shall be undertaken to verify that the components behave as predicted in the design and satisfies the Employer's Requirements for that component.

Initial testing undertaken at the manufacturer's premises shall be undertaken to verify that the sub-system **or** component behaves as predicted in the design and meets the requirements of the design specification and provides correct functionality.

Once sub-systems or components have been successfully tested they shall be incrementally integrated and tested to verify that the sub-systems behave as predicted in the design and meet the requirements of the design specification and provide correct functionality.

Part of the FATs are first article inspections or type tests. These shall be undertaken on the first production item. This inspection shall verify that the Quality and functionality of the product is acceptable and that the manufacturers' quality control processes and procedures have been implemented.

The test specification(s) shall be produced by Infraco and shall be subject to acceptance in accordance with the Review Procedure. **tie** agreement to all proposed component, sub-system and Factory Acceptance Test specifications is required at least ten business days prior to the date of the component, sub-system and FAT tests identified above and any additional tests required by Infraco.

23.4.2 Pass Criteria

FAT testing shall demonstrate that the individual sub-systems or components and equipment fully meet the requirements and are suitable for the subsequent release from the factory environment, delivery to site and installation.

FATs demonstrate the integration of the modules and sub-systems under factory conditions and their reliable operation under cyclical testing.

As far as applicable the FAT will demonstrate that the sub-system or components has been successfully exercised through simulation, including a demonstration on how the alarm handling manages the worst case alarm flood. This test will be subject to **tie** approval.

23.5 Site Tests

23.5.1 Overview

The objective of site tests is to demonstrate that:

(a) Construction/installation activities have been completed correctly by demonstrating that the design specification and functionality of these Employer's Requirements have been achieved;

(b) The sub-systems, in isolation and before passengers are carried, function and behave at site as designed and tested in the FAT;

(c) The infrastructure sub-systems and the tram will then be integrated with each other insofar as is possible to prove that they collectively function and behave at Site as designed and tested in the FAT; and

(d) The ETN functions and behaves at Site as designed and tested in the FAT. This is defined as system commissioning tests and involves the integration of the infrastructure sub-systems and the tram.

The Independent Competent Person as defined under the ROGS Regulations, other regulatory bodies and the PSCC shall need to be satisfied that the ETN is safe to operate before commencement of system commissioning activities. In order to verify this it shall be necessary for the Infraco to address the issues raised by the Independent Competent Person, PSCC, HMRI (or the appropriate approval regime in force) and Approval Bodies. This may necessitate defining specific tests or incorporating additional Network Performance Test details into the suite of verification commissioning tests. Often the areas of interest to these bodies do not become clear until the majority of issues on the risk register and hazard log have been closed out. Typically these may include items such as:

- pedestrian collision, and the risk of a person being "run over " by a tram;
- gauging and possible entrapment of people in pedestrian areas;
- failed tram recovery;
- control room operational procedures; and
- Recovery from derailments, including rerailing a tram.

It is assumed that **tie** shall procure all electrical power and that a supply is available for the complete on site test procedures until commencement of passenger service.

23.6 Sub-system Integration Tests (SIT)

23.6.1 Overview

Sub-system Integration Tests cover items 23.5.1 of these Employer's Requirements. They shall be undertaken on Sections.

The Infraco shall produce the suite of SIT testing specifications for acceptance by **tie** no later than three months prior to the commencement of the tests through the Review Procedure.

23.6.2 Pass Criteria

The tests are passed when:

- Each sub-system, module or component of the system functions in isolation as designed and does not deviate from FAT results.

- All sub-systems for the given section of tramway are demonstrated to collectively perform in accordance with the operations and performance, and all of these Employer's Requirements.

23.7 System Commissioning and Integration Tests (SCT)

23.7.1 Overview

System Commissioning and Integration Tests shall be undertaken on Sections.

Such activities include the running of tram(s) over section(s) of the Edinburgh Tram Network for which Sub-system Integration Tests have been successfully completed. This will verify that the ETN behaves as predicted and as demonstrated as far as was practical in previous tests.

Infraco shall liaise with both **tie** and the Operator to ensure that sufficient competent operational personnel are available to conduct the required activities, including tram drivers and control room staff.

23.7.2 Pass Criteria

The tests are passed when:

- Each sub-system, module or component of the system functions collectively as designed and do not deviate from FAT results.

All sub-systems for the given section of tramway are demonstrated to collectively perform in accordance with the operations and performance, and all of the Employer's Requirements for a representative number of consecutive passes of a tram in each direction over the given section of the network.

- The integration testing shall include demonstrating that the control room systems and control centre equipment connected to a representative sample of the substation SCADA and other

equipment required for Tramstops can be effectively exercised under a robust simulation of trams progressing around the ETN.

23.8 System Acceptance Activities and System Acceptance Tests

The Infraco shall produce the suite of System Commissioning Test specifications for review by **tie** no later than three months before commencement of the tests. These will be reviewed in accordance with the Review Procedure

23.9 Operations and Maintenance Staff Training

The object of this series of activities is to complete driver, control room and maintenance staff training and provide said staff with greater system familiarisation, demonstrating competence to enter Shadow Running phase upon the passing both of the Post Commissioning and Performance Test 1 (T1 and T2). It therefore forms an integral part of the driver-route familiarisation and training programme.

Staff Training shall achieve the following objectives:

- Enables control room staff to gain experience running a tramway without passenger pressures;
- Allow operational staff to fulfil their duties; and
- Enables the drivers to gain route knowledge and familiarity with the trams and procedures without passenger pressures.

The activities undertaken during this phase are designed to demonstrate confidence in the system performance and system safety by means of passing the post commissioning test and performance test T1, and to gain approval of the Independent Competent Person, PSCC and HMRI. (or the appropriate approval regime in force) to progress to Shadow Running.

Infraco shall liaise with the Operator to undertake careful integration of the operational training programme and testing needs in order to avoid conflicts between operational requirements and the technical validation/verification. These comprise items 4, 5 and 6 of the system commissioning model in Figure 10 – Edinburgh Tram Network –Extract From System Lifecycle Model.

23.10 Shadow Running

The Shadow Running phase will last three months and shall:

- Build and validate the operating pattern up to the Service Commencement Date;
- Carry out any further emergency exercises;
- Demonstrate that the ETN can be safely operated in a routine manner and can recover from emergency situations and emerging perturbations;
- Resolve any issues in respect of operating practices;
- Demonstrate that reliability growth is being monitored and corrective action taken as necessary;
- Allow mileage accumulation to be carried out on the trams;
- Permit infrastructure and tram maintenance staff to familiarise themselves with the procedures, practices and operations regimes and to demonstrate competence development;
- Ensure experience is gained in the gathering and evaluation of the performance monitoring regime data in accordance with Schedule 7 of this Agreement; and
- Allow minor adjustments and tuning of systems.

This comprises item 7 of the system commissioning Model in Figure 10 – Edinburgh Tram Network – Extract From System Lifecycle Model.

The evaluation of Shadow Running is the pre-operations test (T3), the passing of which is the gateway to moving into operation, provided all necessary HMRI (or the appropriate approval regime in force) consents are obtained.

23.11 Final System Acceptance Tests in the Operations and Maintenance Phase

Within twelve months of opening the ETN to passenger service Infraco shall undertake and pass the Network Performance (T4) and Network Reliability Test (T5) (as described in Sections 23.16 and 23.17).

23.12 Emergency Exercises

The Infraco and the Operator shall prepare a plan for review by tie and the Competent Person and following approval of the plan, the Operator shall perform with support from the Infraco a series of exercises with the emergency services and other stakeholders such as Network Rail and BAA. The planning for these exercises will require close liaison by the Infraco and the Operator with the various emergency services. They will be planned to take place in the commissioning period, test running or in the shadow running phase. The nature of the exercises will require detailed planning with Fire, Police, and Ambulance services but are likely to include, as a minimum:

- A simulated road traffic accident at a major road junction;
- A major tram collision/derailment including emergency isolations; and
- A rescue of persons trapped underneath a tram.

23.13 Post Commissioning Test Specification – T1

This sub-section sets out the Performance Test assumptions applicable to all Performance Tests. Should the Infraco be able to prove to the reasonable satisfaction of **tie**'s Representative that any of the Performance Test pass criteria have been exceeded by reason of a Performance exclusion then the test results will be amended to discount the effects of such Performance Test exclusions.

The following exclusions shall apply:

- Operator staff in the Control Room causing or significantly contributing to delays in the operation of the System;
- Failure to provide the correct number of trained Tram Drivers as defined in the DPOFA save where the failure is as a result of the Infraco's own failure in respect of its own obligations in the Agreement;
- Failure of the Tram Drivers to consistently drive the Trams to good industry practice;
- Failure to procure all electrical power that is required for the operation of the System. Periods when the electrical supply is not available will be discounted from the Test and the test period shall be extended by an equivalent period;

- A failure by the Operator to comply with the relevant parts of the Operations and Maintenance Manuals; and

- Damage caused by the Operator.

However, in no event shall any allowances or relief or Network Performance Test exclusion be granted to the Infraco where any delays or failure to pass the Network Performance Test has been caused or contributed by:

(a) Any default, breach or omission by the Infraco or its subcontractors;

(b) Infraco Defects or Snagging;

(c) Equipment undergoing modification or rectification by the Infraco and;

(d) TRAMCO's failure pursuant to the Tram Maintenance Contract.

The burden of proof shall be on the Infraco to show that such failures of the Operator were caused by reasons for which the Infraco was not responsible and for which the Operator should be properly accountable for by reason of the Operator's default, omission, negligence or breach of statutory duty. The Infraco shall develop and agree audit procedures with **tie**, and the Operator in respect of the Network Performance Test exclusions set out in this paragraph.

Dwell times at Tramstops shall be regulated; as set out in the Employer's Requirements.

23.13.1 Overview of Post Commissioning Test

This section describes the requirements for the Post Commissioning Tests, their execution, monitoring and completion. Post Commissioning Tests form part of the requirements for the final system acceptance.

23.13.2 Test Objectives

This Post Commissioning Test seeks to achieve the following objectives:

Prove that the system is capable of controlling an 'off-street' section of Edinburgh Tram Network in an acceptably safe manner; and

Prove that the system is capable of controlling an 'on-street' section of Edinburgh Tram Network in an acceptably safe manner.

23.13.3 Network Performance Test Description

The Post Commissioning Test is a multi part test, with each part of the test required to be passed in sequence before the entirety of the Post Commissioning Test can be passed. It cannot be conducted until Phase 1a of the Edinburgh Tram Network has been successfully commissioned.

23.13.4 Features

The Infraco shall demonstrate that Gogar Depot and Phase 1a of the Edinburgh Tram Network can be monitored and controlled in accordance with the Case for Safety.

Tests shall provide for:

- Demonstration of the run times as defined below.
- Forty end-to-end tram movements on the nominated section of which twenty are in each direction; and
- Trams will dwell at each Tramstop, and will exercise opening and closing of the doors at each Tramstop, the minimum period of doors being fully opened at each Tramstop will be 13 seconds.

The undertaking of the test shall essentially be an operational function led by Infraco but in conjunction with the Operator. Infraco shall manage the preparation for the tests with technical and maintenance support and monitoring by Infraco (along with representatives from **tie)**.

For the demonstration of run time, the following conditions shall apply:

- Targets of the run time demonstrations shall be developed in accordance with Section 2.12 of the Employers Requirements and agreed between the parties from the agreed maximum journey times and associated assumptions detailed in Section 2.11 of the Employers Requirements during the design phase, as further details of tram performance and traffic lights are available;
- For avoiding of influences due to public traffic, run time demonstrations shall take place during night times only;
- tie will be responsible for the communication with local authorities like CEC, UTC or police;
- run time demonstration to be performed in both directions and shall include the following two demonstrations:
  - run allowing tram priority at each traffic junction along the route
  - run following the regulations and phasing of traffic lights under regular conditions
- Sufficient runs shall be carried out in both directions to provide a level of confidence that the target runtimes have been achieved as agreed in accordance with Section 2.12 of the Employers Requirements.
- Infraco shall undertake and pass the Post Commissioning Test (T1) before proceeding to the Performance Test 1 (T2).

tie shall be given thirty working days advance notice of the finalisation of the Post Commissioning Test plan and seven working days written notice of the Test commencement date.

23.13.5 Pass Criteria

Subject to the exclusions defined in23.13 above, the following shall define the pass criteria for the T1 test.

- All test results from previous tram and system and sub-system tests are to be available and signed off as accepted by **tie**, including all the closed out Snagging Rectification Certificates.

- The test shall have been successfully completed when:

  - At least 95% of the end-to-end tram movements are within the agreed target runtime; and

  - Acceptance of the Case for Safety and test results by the Independent Competent Person and where appropriate Her Majesty's Railway Inspectorate (or the appropriate approval regime in force) and approval or "No Objection to Proceed" respectively for full driver training has been obtained.

23.13.6 Monitoring and Reporting of Test Performance

Appropriate levels of observation by Infraco shall be conducted to satisfy **tie** that the auto-generation of reports from the systems is accurate.

23.14 Performance Test 1 Specification – T2

23.14.1 Overview

This section describes the requirements of Performance Test 1 and the proposals for its execution monitoring and completion. Performance Test 1 forms part of the requirements for the final System Acceptance.

23.14.2 Test Objectives

Performance Test 1 seeks to achieve the following objectives:

- Demonstrate that the Edinburgh Tram Network (or sections thereof) can be operated in an acceptably safe manner;

- Demonstrate that the completed Operator training programme has achieved an adequate competency to proceed in Shadow Running; and

- Demonstrate the mobilisation and competency of the maintenance teams provided by the Infraco.

23.14.3 Network Performance Test Description

Performance Test 1 builds upon Post Commissioning Test and cannot be undertaken until Post Commissioning Test has been passed.

23.14.4 Features

The Infraco shall demonstrate that the Edinburgh Tram Network can start Shadow Running and can be monitored and controlled in accordance with the Case for Safety.

Performance Test 1 shall provide for:

- Operation from 07:00 to 20:00 hrs on three consecutive days (none of which are Saturday, Sunday or Bank Holidays);
- The System will run to the Operational Timetable with headways extended by no more than 50%. For the avoidance of doubt, the trips scheduled for this test are the same as in the Operational Timetable as set out in Sections 2.11 and 2.12 of these Employer's Requirements; and
- Trams shall dwell at each Tramstop and shall exercise opening and closing of the doors at each Tramstop. The minimum period of doors being fully opened shall be 13 seconds at each Tramstop.
- The undertaking of the test shall be an operational function led by Infraco but in conjunction with the Operator. Infraco shall manage the preparation for the Tests with technical and maintenance support and monitoring by Infraco (along with representatives from **tie**).
- Infraco shall undertake and pass Test T2 before proceeding to the Shadow Running phase.
- **tie** shall be given twenty working days advance notice of the Performance Test 1 plan and seven working days written notice of the Test commencement date.

23.14.5 Pass Criteria

The following define the pass criteria for the T2 test.

All test results from previous tram and system and sub-system tests are to be available and signed off as accepted by **tie**. Any Defect Correction lists shall be available and agreed as being programmed to be remedied.

The test shall have been successfully completed when:

- At least 95% of the end-to-end tram movements meet the requirements of the Performance Regime in terms of Punctuality Service Element as defined in 2.16.

- Acceptance of the Case for Safety and test results by the PSCC , the Independent Competent Person and where appropriate Her Majesty's Railway Inspectorate (or relevant approval body) and their approval or 'Letter of No Objection to proceed" into Shadow Running.

23.14.6 Monitoring and Reporting of Test Performance

The primary data used to evaluate the test shall be automatically generated from the Supervisory Control & Communications performance monitoring sub system and validated independently.

23.15 Pre-Operations Test Specification – T3

23.15.1 Overview

This section describes the requirements of the Pre-Operations Test and the proposals for its execution monitoring and completion. The Pre-operations Test shall be conducted during the Shadow Running phase of the project and forms part of the requirements for the final System Acceptance.

23.15.2 Test Objectives

The Pre-operations Test seeks to prove that the Edinburgh Tram Network, or section thereof, in the event of sectional opening operates to a sustained level of performance determined by the Opening Timetable and the performance regime such that:

- The Operator can safely commence passenger carrying revenue earning service;
- The Infrastructure and Tram Maintainers can commence the Planned Maintenance proposed for passenger carrying revenue earning service; and
- The Edinburgh Tram Network passes the ride quality criteria in Tables 62 & 63 of the Employers Requirements.

23.15.3 Network Performance Test Description

Pre-operations Test is a four-part test upon successful completion of all parts of which the Edinburgh Tram Network or section(s) thereof can be opened to public service. The Pre-Operations test cannot be undertaken ahead of the successful completion and passing of the respective Performance Test 1.

23.15.4 Features

The Infraco shall demonstrate that the entire Edinburgh Tram Network or section(s) thereof can be operated to the defined levels of performance, reliability and availability and in accordance with the operational Case for Safety.

The Part 1 test shall comprise:

- Five consecutive days (none of which are Saturday, Sunday or Bank Holidays) of testing in accordance with the Operational Timetable. This test is to be undertaken no sooner than two weeks after commencement of the Shadow Running phase;

The Part 2 test shall comprise:

- Five consecutive days (none of which are Saturday, Sunday or Bank Holidays) of testing in accordance with the Enhanced Timetable, which cannot commence until two weeks from successful completion of the Part 1 test, and must be completed at least two weeks prior to the end of the Shadow Running phase, unless agreed otherwise by **tie**.

For both the Part 1 and Part 2 tests, trams shall dwell at each non-terminus Tramstop for a nominal 25 seconds and the doors shall normally remain closed.

The Part 3 test (which can be undertaken at any time during shadow running) shall comprise:

- One of the fleet of trams shall be selected by **tie** to be instrumented and monitored. The selected tram shall provide results for 100 journeys of the selected tram consecutively over all sections of the ETN;

- Measurement of lateral, longitudinal and vertical accelerations to be taken on the floor of the trailing cab of the tram.

- All tram journeys during the test period that provide data for this test shall be completed within a tolerance of plus or minus 10% of the journey times that are setout in the Operational Timetable;

- Analysis to be performed as follows:

    - For each journey between Tramstops a root mean square average of the combined lateral, longitudinal and vertical accelerations (RSS addition) is to be determined in accordance with ISO 2631.

The Part 4 test shall comprise:

- One tram from the fleet will be loaded to AW0
- Measurement of lateral, longitudinal and vertical accelerations to be taken on the floor of the trailing cab of the tram
- Entire Edinburgh Tram Network to be covered within 10% of the journey times that are setout in the Operational Timetable
- Load the tram to AW2 and repeat steps above; and
- Analysis to be performed as follows:
    - Select the greater of the results (AW0 or AW2) for each of the journeys to be used as a benchmark for each individual tram for any particular journey.

The undertaking of the test shall essentially be an operational function led by Infraco but in conjunction with the Operator. Infraco shall manage the preparation for the Tests with technical and maintenance support and monitoring by Infraco (along with representatives from **tie**).

Infraco shall undertake and pass Pre-operations Test before proceeding to the Service Commencement Date.

tie must be given thirty working days advance notice of the Performance Test 1 plan and seven working days written notice of the Test commencement date.

23.15.5 Pass Criteria

The following define the pass criteria for the T3 test.

All test results from previous tram and system and sub-system tests shall be available and signed off as accepted by **tie** including the clearance of all Defect Correction lists unless dispensation has been proposed by Infraco and agreed by tie acting reasonably.

23.15.6 Part 1 and 2 Pass Criteria

Each Pre-operations Test can only be successfully completed:

- As soon as 99% Punctuality Service Element as defined in chapter 2.16 has been achieved in accordance with the Infraco and Tram Maintainer performance regimes.

For the avoidance of doubt any delays caused by road traffic shall not be included in the delay measurement.

23.15.7 Part 3 and 4 Pass Criteria

Part 3 test can be deemed to be passed when none of the 100 journeys have an rms of the combined lateral, longitudinal and vertical accelerations exceeding 30mg.

Part 4 test can be deemed to have been passed when the instrumented tram from the fleet has attained a Ride Index equal to or less than as shown in the tables below in accordance with ISO 2631:

Speed	Wz Vertical	Wz Lateral
40 km/h	2,32	1,58
70 km/h	2,96	2,36

Table 44 - Ride Index in the Drivers Cab

Speed	Wz Vertical	Wz Lateral
40 km/h	2,24	1,64
70 km/h	2,82	2,28

Table 45 - Ride Index in the Passenger Compartment

23.15.8 Consents

This is in addition to passing the above tests.

All consents to achieve full passenger service must have been obtained and evidenced as part of Test T3.

23.15.9 Monitoring and Reporting of Test Performance

The primary data used to evaluate Parts 1 and 2 of this test shall be automatically generated from the Supervisory Control & Communications performance monitoring sub system and validated independently.

During the Pre-operations Test monitoring period Infraco will undertake audits, to the satisfaction of **tie**, of the collection and communication of fault and tram punctuality data against each of the performance indicators.

23.16 Network Performance Test Specification – T4

23.16.1 Overview

This section describes the requirements of Network Performance Test (T4) and the proposals for its execution monitoring and completion. Network Performance Test forms part of the requirements for the final System Acceptance.

The Test shall cover a 28 day consecutive period, which shall be undertaken after the Edinburgh Tram Network has entered Public Service until the Test is satisfactorily passed or, unless otherwise agreed by **tie**.

The Test is the operation of the complete ETN to the Operational Timetable each day for the duration of the test. The timetable used for the test shall be agreed with **tie**.

The undertaking of the test will be an operational function carried out by the Operator. Infraco shall manage the preparation for the Tests with technical and maintenance support and monitoring by Infraco (along with representatives from **tie**).

Infraco shall undertake and pass the Network Performance Test within twelve months after the Service Commencement Date of the whole Edinburgh Tram Network.

tie shall be given thirty working days advance notice of the Network Performance Test plan and seven working days written notice of the Pre-operations Test commencement date.

23.16.2 Pass Criteria

The test will measure the Punctuality Service Element over twenty-eight days.

The test shall be passed once the criteria stated in the Employer's Requirements Operational and Performance Section (Section 2) have been demonstrated to be met.

The Infraco may discount any one day from the calculation but shall not be a day on which a Special Demonstration shall be planned.

For the avoidance of doubt the exclusions in Section 23.13 shall apply.

23.16.3 Special Demonstrations

During the Network Performance Test a number of demonstrations will be performed, these are described in the following two sub-sections.

23.16.4 Substation and UPS Demonstrations

Infraco shall demonstrate that the system can operate with two of the traction supplies from a substation taken out of use, one at a time, for a period of two hours during the peak service. The substations concerned and the times for their disconnection will be selected by **tie**.

The disconnection of the substations and placing them into bypass will be undertaken in accordance with the Operator's normal procedures for such switching.

Operation of the Uninterruptible Power Supplies (UPS) at two tram stops for four hours shall also be demonstrated. During this period the electrical supply to the chosen tram stop UPS's shall be disconnected. The tram stop UPS's concerned and the time for their disconnection shall be chosen by **tie**.

The Infraco shall prepare a plan detailing the programme for the above events and include this in the test arrangements that will be submitted to **tie** in accordance with the review procedure.

23.16.5 Tram Change Over

The Infraco shall demonstrate, during peak hours, a Tram changeover by which a Tram in service shall be substituted with the "hot spare".

tie will give Infraco thirty minutes notice of this test.

23.16.6 Monitoring and Reporting of Test Performance

The Punctuality Service Element shall be obtained. The results for the previous day shall be ratified in accordance with the Performance Regime in Schedule 7 of this Agreement and the Operator Performance Regime under the DPOFA Agreement.

A meeting will take place daily where the performance up to that date is reviewed and any investigations concluded and data accepted. The meeting will be recorded and minutes distributed to each party by the meeting secretary within three working days.

During the Network Performance Test monitoring period **tie** may undertake audits of the collection and communication of fault data against each of the performance indicators.

23.16.7 Network Performance Test Timetable

The Enhanced Timetable delivering the ultimate capacity of the ETN as contracted shall be prepared by the Operator as that which shall be the ultimate timetable to be used in Passenger Service, proposed by the Infraco, and agreed by **tie**.

23.17 Network Reliability Test Specification – T5

23.17.1 Overview

This sub-section describes the requirements of Network Reliability Test and the proposals for execution, monitoring and achievement of System Acceptance.

Network Reliability Test is a set of sub-system reliability tests each measured over a twenty-eight day period. Each specified sub-system has its own specified target detailed within 23.17.2. The tests may start on the same date as T4 (on or after Service Commencement Date) and as each subsystem is individually demonstrated to meet its contractual target that subsystem reliability test is then considered completed. Network Reliability Test is only passed when all the sub-systems meet their targets.

The undertaking of the test will essentially be a maintenance function carried out by the Infraco. However, it requires Infraco management of the preparation for the Tests with technical support and monitoring by Infraco, (along with representatives from **tie** during the Test).

Infraco shall undertake and pass Network Reliability Test within twelve months after the Service Commencement Date of the whole Edinburgh Tram Network to pass Network Reliability Test.

If any part of the works or part of the ETN fails to pass Network Reliability Test then rectification, repair, modification or reinstatement of that part shall be undertaken. The defect correction period on that part of the system or any sub-system which fails the test shall be extended a further twelve months beyond the time of rectification, repair or modification. Infraco will propose and undertake the necessary remedial action and retest to achieve acceptance.

tie must be given 20 working days advance notice of the Network Reliability Test plan and fourteen working days written notice of the test commencement date.

23.17.2 Sub-Systems Subject to Network Reliability Test and Reliability targets

Table 46 - Network Reliability Test

TEST	TARGET VALUE
Tram Reliability	Please refer to Tram Supply Agreement.
Passenger Information Display System	As set out in the Employer's Requirements 99.75% availability over six consecutive Periods.
Passenger Help/Emergency Help Point System	As set out in the Employer's Requirements 99.75% availability over six consecutive Periods.
On Street Track & Formation	Achieves 99.995% availability over six consecutive Periods.
Off Street Track & Formation	Achieves 99.995% availability over six consecutive Periods.
Point Machines	Achieves 99.995% availability over two consecutive Periods.
Traction Switchgear	Achieves 99.99% availability over two consecutive Periods.
OLE Equipment	Achieves 99.999% availability over two consecutive Periods.
Earthing & Bonding	No reported stray current instances, or rail to earth voltages that exceed 60 volts as defined in the EN50122/1, for four consecutive Periods
Operational Radio	Achieves 99.75% availability over two consecutive Periods.
Operational Data Network	Achieves 99.99% availability over two consecutive Periods.
UTC Interface	Achieves 99.75% availability over four consecutive Periods.
Wheel/Rail Interface	No proven instances of Noise and Vibration exceedence have occurred in a six month periods
CCTV System	Achieves 99.9% availability over two consecutive Periods.
Tram Position Detection System	Achieves 99.9% availability over two consecutive Periods.
Traction SCADA System	Achieves 99.75% availability over two consecutive Periods.
Tramstop Lighting	Achieves 98.5% availability over two consecutive Periods.

23.17.3 NOT USED

23.17.4 Assumptions and Exclusions

General Exclusions and Assumptions

Should the Infraco be able to prove to the satisfaction of **tie** that any of the reliability tests would have been exceeded by means of one or more of the following exclusions then, in consultation with **tie**, the test results shall be amended to discount the effects of such proven Network Reliability Test exclusions.

The Network Reliability Test exclusions and Network Reliability Test assumptions set out in this section relate only to the Network Reliability Test and shall not be used or relied upon in any circumstances in any connection with any other test.

When the tests have commenced, neither **tie,** the Operator or Third Parties shall be entitled to interfere, interrupt or influence the tram operation or service or the tests in such a way that it disadvantages Infraco, or has an impact on the testing process, the results, or causes the non acceptance of the tests.

Operator Influences

Defects caused by the Operator's failure to:

Provide properly trained staff as defined in the DPOFA, exercising a reasonable duty of care to good industry practice.

Exclusions

The Infraco must demonstrate by reasoned argument that failures or loss of availability resulting from Operator actions were caused by reasons for which the Infraco was not responsible (eg Operating Manuals and supplier training). The Infraco shall develop and agree audit procedures with **tie** and the Operator in respect of the Network Reliability Test exclusions set out in this paragraph.

However, in no event shall any allowances or relief or Reliability Network Reliability Test exclusion be granted to the Infraco where any delays or failure to pass Network Reliability Test has been caused or contributed to by:

- Any default, breach or omission of the Infraco;
- Infraco defects; and
- Equipment undergoing repair, modification or rectification by the Infraco.

Realistic long term response times to repair defects shall be provided by Infraco during the period of the test.

It is assumed that **tie** shall procure all electrical power and that a supply is available for the tests.

Any failures resulting from inappropriate actions or omissions by the Operator or his contracted staff shall be discounted. as set out in the DPOFA .

For the avoidance of doubt, the impact of third party vandalism shall be excluded.

23.17.5 Monitoring & Reporting of Test Performance

The scoring of faults should be achieved by first reviewing the fault logs and performance reports using them as a filter to establish which faults need to go forward into the review. The review meeting will then be used to discuss and allocate the responsibility of faults under the performance regime.

The review meeting will take place daily where the performance of each system will be reviewed for the previous day. Representatives of Infraco, Tramco, **tie** and the Operator will attend this meeting. Each sub-system will be reviewed and agreement reached on all failures. The meeting will be recorded and the resulting daily report distributed to each party within 3 Business Days.

23.17.6 Audit Procedures

During the Network Reliability Test monitoring period, **tie** may undertake audits of the collection and communication of fault data against each of the sub-system tests and also audit the response times to rectification of notified faults.

23.17.7 Services in Connection with the Operator

The Operator shall be appointed separately by **tie** to provide various services in conjunction with the construction, commissioning and operation of the Edinburgh Tram Network. The Operator's Scope of Supply shall include the following:

Provision of representatives during the Construction, Commissioning and Operation stages to provide the Operator's Services, including liaison with the Infraco.

Observing and reporting on the acceptability of the proposed design and the quality of infrastructure, trams and equipment;

Supporting obtaining the necessary consents for commissioning and Public Operation;

Assisting Infraco in development of a Testing & Commissioning Plan (in conjunction with Infraco)

Appointment and training of staff in support of any commissioning process.

Notwithstanding the Operator's responsibilities described above, the Infraco responsibilities (associated with the interface with the Operator) shall include, but not be limited to, the following:

- providing support to obtain operational approvals and consents in respect of the Edinburgh Tram Network;
- providing technical support on systems integration
- providing technical support on the development of operational plans and management systems; and
- provide technical support with regard to operational interfaces with CEC traffic management systems. This shall include phasing sequence drawings of key junctions
- Preparing and submitting plans for driver training and the training of other operational staff. Undertaking training of the Operator's trainers (8-10 trainers) and control room staff (18-21 staff)
- Prepare and submit plans for maintenance and operations manuals
- Provide support required for System Acceptance, including the development of a Testing and Commissioning Plan;
- Work to mitigate any delays to the system construction and commissioning howsoever caused.

Comm. Model Ref	Infraco	Operator
	The following table represents a guide of the key responsibilities associated with the Infraco and the Operator during the various phases of the Life Cycle Model. Further details are provided within these Employer's Requirements and the DPOFA. The Infraco Contract (refer to the Code of Construction Practice) allows for the potential for Sectional Completion. Accordingly, where Sectional Completion was to apply, then it would follow that the (System Commissioning Model) stages for each Sectional Completion would apply at different times in the programme (e.g. possible to have "Shadow Running" ongoing for Section A, whilst "Commissioning" for Section B on-going). The listed responsibilities would equally apply to each Sectional stage. Items are listed under the most appropriate stage, but this does not exclude the associated activity from being required during other stages	
	GENERAL OBLIGATIONS	
	The general provision of all the technical and management services as defined within these Employer's Requirements. This shall include design, programming, installation, testing, system acceptance, training and maintenance. The Infraco shall be required to work closely with the Operator to successfully deliver the project.	Liaising and working closely (and timely) in partnership with the Infraco to meet the requirements of the Project associated with design, installation, system acceptance, delivery into service and maintenance, taking account of the Infraco's Scope of Supply. The Operator shall also be responsible for Operator Maintenance.

	Management and implementation of a liaison process, with the assistance of the Operator, to ensure that all parties are fully informed and resources arranged adequately.	Provision of staff resources during the Commissioning, Construction and Operation stages to provide the Operator's Services, including liaison with the Infraco. Provide and keep updated the training and recruitment plan describing the roles of each member of the Operations staff with specific instructions for the proper performance of their duties and training requirements.
		Ensuring that all relevant operational and maintenance subcontracts are in place and that appropriate subcontractor staff training programmes are implemented.
	Responsibility for adherence to the programme	Monitoring Progress
	Responsibility for complying with the functional and non-functional requirements as defined within these Employers Requirements.	Observing and commenting on the acceptability of the design and installation.
	Production of risk deliverables and register in accordance with these Employer's Requirements.	Provision of risk advice (from the Operator's viewpoint) to Infraco and commenting / liaising on risk documentation produced by Infraco.
	Under the CDM Regulations, the Infraco shall be responsible as Principal Contractor and shall comply with all associated CDM Responsibilities relating to the design and construction activities until Services Commencement Date (and beyond, where appropriate). Beyond the Services Commencement Date, the Infraco may be required to undertake certain elements of work (including maintenance) which fall within the remit of CDM Regulations. In such a scenario the Infraco would be responsible as Principal Contractor for the duration of such works.	As with any party working on a "CDM site", the Operator shall be responsible for complying with CDM Regulations and the Principal Contractors Safe Systems of working (e.g. permit to work system). Notwithstanding the Infraco's over-arching responsibility as Principal Contractor up to Services Commencement Date, once the network is energised (and trams begin to operate) the Operator shall have a key role in managing the "operational end" of systems (e.g. the Operator would be responsible for developing and managing a permit to isolate systems within the context of the over-arching Infraco's systems).

	There shall be a requirement for the Infraco to comply where appropriate with the Operators Systems and procedures associated with the Operator's responsibility to manage operational safety.	The Operator shall be responsible for Operational Safety. This shall include developing Operational Plans, timetables and Management Systems and Operating Procedures for the Operational Phase. Operational safety responsibilities shall, by definition, occur once any part of the system is energised (anticipated to be between Stages 4 and 5, "Set to Work Tests" and "Commissioning", respectively.
DD	**DETAILED DESIGN STAGE**	
	Completing the full design and meeting all the deliverables as defined within the SDS Providers Agreement with **tie**, which is being novated and which is included in Volume 7 of the Infraco ITN.	Observing and reporting on the acceptability of proposed designs against the Design Manual and the Employers Requirements and the ability of the proposals to meet operational objectives
	Obtaining all approvals and consents in respect of the Edinburgh Tram Network;	Supporting the obtaining of necessary consents for Commissioning and Public Operation (and any consents which are relevant to the Operator).
	Managing and undertaking all interfaces with CEC traffic management systems.	Assisting Infraco with the interfaces with CEC, which are relevant to the Operator.
	Developing and updating a Testing and Commissioning Plan (TCP) for each element of the System including programmes and procedures with controls and acceptance criteria.	Providing input to a Testing and Commissioning Plan (TCP) for each element of the System including programmes and procedures with controls and acceptance criteria.

	Assisting the Operator with the development of a process for the handover for Operational purposes of the infrastructure and equipment from Infraco.	Developing a process for the handover for Operational purposes of the infrastructure and equipment from Infraco.
	Scheduling, and coordinating with the Operator, driver training, and the training of other operational and maintenance staff. The scope of the training shall cover all aspects of maintenance (as defined within these Employer's Requirements) and all operations. The Infraco shall be responsible for developing coordinated Training Plans in accordance with section 40 (Maintenance) of these Employer's Requirements.	Assisting the Infraco in the development of coordinated Training Plans and the specification of training documentation requirements from Infraco and Sub-suppliers.
	Complying with, and undertaking internal audits, associated with the Code of Construction Practice	Reviewing Infraco's compliance with the Code of Construction Practice, associated with any operator related issues.
1	**BUILD / MANUFACTURE**	
	Managing and implementing the manufacture and assembly of the System in accordance with the general provision of all the technical and management services as defined within these Employer's Requirements	Observing and reporting on the quality and functionality of Infrastructure and Equipment provision / manufacture and its compliance with Specifications where it affects the operational objectives.
	Liaising with the Operator to address any associated issues, and where necessary rectifying any works.	
2	**FACTORY ACCEPTANCE TESTS**	
	Managing and implementing the Testing process in accordance with the TCP. FAT tests (initial tests and integrated testing) shall be undertaken to verify that the components / system behave as planned in the design, meet the requirements of the design specification and provides correct functionality.	Assisting and providing advice to Infraco to manage the Testing process in accordance with the TCP.
		Observation if necessary and appropriate of any factory acceptance tests on equipment to be provided.

3	INSTALLATION / CONSTRUCTION	
	Managing and implementing the installation and construction at the Site in accordance with the general provision of all the technical and management services as defined within these Employer's Requirements.	Observing and reporting on the quality and functionality of Infrastructure and Equipment provision and installation, and its compliance with Specifications where it affects the operational objectives
	Liaising with the Operator to address any associated issues, and where necessary rectifying any works.	
4	SET TO WORK TESTS	
	Managing and implementing the Testing process in accordance with the TCP. These site tests (System Integration Tests) in accordance with section 6 of Part 1c – Tram Testing and Commissioning of the Employer's Requirements shall be undertaken to demonstrate that the construction / installation has been undertaken satisfactorily and that the systems behave as intended in the design.	Assisting and providing advice to Infraco to manage the Testing process in accordance with the TCP
		In accordance with the TCP; witnessing and reporting on the implementation tests
		Attending Tests
		Managing the Operational Safety of the Testing and Commissioning process in support of Infraco once the system is energised and trams begin to operate. Develop a system of management of safety during testing and commissioning (including the training of staff and contingency provisions)
	Obtaining Consents and Approvals required to allow the system to be energised and trams to operate to the extent not the responsibility of **tie** under Clause 19.	Supporting the obtaining of Consents and Approvals for the system to be energised and trams to operate.
	Reviewing and commenting on the proposed Commissioning Phase Operating Procedures.	Developing Commissioning Phase Operating Procedures.

5	COMMISSIONING	
	Managing and implementing the Testing and Commissioning process in accordance with the TCP. This includes the site commissioning testing as defined within this Section at 23.20.1.	Assisting and providing advice to Infraco to manage the Testing and Commissioning process in accordance with the TCP
		In accordance with the TCP; witnessing and reporting on the implementation tests
		Attending Tests
		Managing the Operational Safety of the Testing and Commissioning process in support of Infraco once the system is energised. Develop a system of management of safety during testing and commissioning (including the training of staff and contingency provisions)
	Providing technical support on the development of operational plans, timetables and management systems and Operating Procedures; and	Developing Operational Plans, timetables and Management Systems and Operating Procedures for Operational Phase
	preparing and submitting plans, manuals & procedures for maintenance and operations in accordance with these Employer's Requirements, in time for System Energisation.	Reviewing and commenting on the acceptability of plans, manuals & procedures for maintenance and operations.
6	TEST RUNNING AND DRIVER FAMILIARISATION	
	Scheduling, and coordinating with the Operator, driver training and the training of other operational staff as part of the Commissioning activities prior to the start of Shadow Running. Implementing training plans including the undertaking of training of the Operator's trainers (8-10 trainers) and control room staff (18-21 staff).	Appointing and training of Operator staff and Operational rules and procedures training for Infraco. The Operator shall be responsible for training the drivers (utilising the training plans / information developed by Infraco and the Operator Trainers, who shall have been assessed as competent by Infraco on the operation of their systems and equipment).
	Demonstrating that the completed Operator training programme has produced a level of adequate	Assisting Infraco to demonstrate that the completed Operator training programme has

	competency to proceed to shadow running.	produced a level of adequate competency to proceed to shadow running.
T1	The implementation of the T1 Post Commissioning Test: follows successful commissioning of the nominated section, test to demonstrate and prove the system is able to perform in a safe manner and delivers the required end to end run times (these may be up to 5% greater than target runtimes).	Assisting and providing advice to Infraco to manage the Testing and Commissioning process in accordance with the TCP
T2	The implementation of the T2 Performance Test: precedes Shadow Running: test to demonstrate and prove the system is able to perform satisfactorily to move into the 3 month Shadow Running Period (The T2 Performance Test is performed over 3 days and 95% of runtimes must be within target runtime; whilst service headways may be increased by up to 50% of those of the operating timetable).	
		In accordance with the TCP; witnessing and reporting on the tests
		Attending Tests
		Managing the Operational Safety of the Testing and Commissioning process. Develop a system of management of safety during testing and commissioning (including the training of staff and contingency provisions)
	Infraco to review to prepare Go Live timetable to be tested during shadow running.	Operator to prepare the Opertional Timetable to be tested during shadow running.
	Obtaining Consents and Approvals required to allow the system to start shadow running to the extent not the responsibility of **tie** under Clause 19.	Supporting the obtaining of Consents and Approvals for the system to commence shadow running.

7	**SHADOW RUNNING**	
	Implementing the Shadow Running Phase to cover the requirements. Please refer to relevant section below.	
T3	Implementing the T3 Pre-Operations Test: precedes Service Commencement, the test is undertaken during the Shadow Running Period, the test is the operation of the initial entry into service timetable and includes infrastructure, trams and operations systems (T3 is over 2 x 5 days and 99% performance must be achieved).	In accordance with the TCP; witnessing and reporting on the tests
		Attending Tests
		Managing the Operational Safety of the Testing and Commissioning process
		Developing a system of management of safety during shadow running and public operation (including the training of staff and contingency provisions)
	Obtaining the necessary Consents and Approvals for Public Operation to the extent not the responsibility of **tie** under Clause 19.	Supporting the obtaining necessary consents for Public Operation
8	**SERVICE COMMENCEMENT DATE**	
	Infraco shall support the preparation for the T4 Network Performance Test with technical and maintenance support and monitoring. (T4 is over a 28 consecutive day period on a rolling basis in passenger service with the ultimate timetable in operation. 1 day in the period may be discounted. The test is to show that reliable operation is achieved.)	The Operator shall manage the preparation for the T4 Network Performance Test with technical and maintenance support and monitoring by the Infraco. The implementation of the T4 Network Performance Test.

	Demonstrations during the Network Performance Test e.g. sub-stations / UPS – demonstration of operation where a sub-station can be taken out of service for 2 hours during peak service.	
	Review, comment and provide support in preparation of the Test and Ultimate Timetables.	Preparation of an agreed Network Performance Test Operational Timetable and Enhanced Timetable as that which shall be the ultimate timetable to be used in Passenger Service.
	Infraco management for the preparation of the T5 Network Reliability Test with technical support and monitoring by Infraco.	The implementation of the T5 Network Reliability Test: the reliability testing of certain sub-systems in Passenger Service (within 12 months of opening).
	In accordance with the TCP; witness and report on the tests	Managing the Operational Safety of the Testing and Commissioning process. Develop a system of management of safety during testing and commissioning (including the training of staff and contingency provisions)

Table 47 - Table showing a guide of the key responsibilities associated with the Infraco and the Operator during the various phases of the Life Cycle Model

23.18 Tram Testing and Commissioning

23.18.1 Document Scope

The scope of this section of the document is to define the Tram Testing & Commissioning requirements that are applicable to all elements of the Edinburgh Tram Network (ETN).

23.18.2 General Requirements

This document defines the process for the testing and commissioning of the ETN that shall be carried out by the Tram Supplier together with the requirements of the Tram Tests that must be carried out to meet the Employer's Requirements and all relevant regulatory bodies as to the quality, performance and compliance of the Trams. It also identifies the tests to be carried out to meet the requirements for System Acceptance testing (involving Trams) of the completed Edinburgh Tram Network.

For certain of the type tests it may be acceptable to reference relevant tests previously undertaken on similar systems. The Tram Supplier will justify to the Tram Inspector all instances where this approach is applicable. This approach will only be possible in areas where there has not been anything other than very minor design changes. Where this approach is proposed, the final test reports and supporting data must be provided to allow the information to be assessed and accepted or rejected. It will be the Tram Supplier's responsibility to obtain any necessary permissions for the use of the test results and data concerned.

23.18.3 Test Plan

The Tram Supplier shall create and adhere to a Test Plan, which will comply with the requirements of EN50215 and encompass a logical build up of testing that leads to acceptance of the vehicles. The Test Plan shall include sufficient testing to demonstrate that all the Employer's Requirements have been met and to ensure that all relevant consents for passenger operation can be achieved from all relevant bodies. It must also be created in such a way as to maximise off-site testing.

The Tram Supplier shall carry out the Tram tests in accordance with this document, the Test Plan and the Tram commissioning and delivery programme. The Tram Supplier shall submit the Test Plan for agreement by the Infraco. Detailed Test Specifications for all tests shall also be submitted for agreement as part of the design scrutiny process and not less than eight weeks prior to the commencement of the tests.

The Test Plan shall be provided in Microsoft Project, together with any commentary, specifications and all results following completion of the Tram tests, in Microsoft Word/Excel format. The relevant supplied drawings shall be provided in electronic format and as hard copy. Test reports for each Tram Test shall be submitted, within two weeks following the completion of the Tram Test.

23.18.4 Tram Test Categories

The Tram Tests shall be divided into five discrete stages:

- Factory Acceptance Tests ("FAT")
- Delivery Acceptance Tests ("DAT")
- Site Commissioning Tests ("SCT")
- System Integration Tests ("SIT")
- System Acceptance Tests ("SAT")

With the exception of the Factory Acceptance Tests, which shall be carried out at the Tram Supplier's Factory, all other tests are to be carried out after the Trams are delivered to the Depot. All the tests are to be carried out by the Tram Supplier, except for the System Integration and System Acceptance Tests, which will be managed by Infraco.

Each category of Tram test can comprise two sub-categories:

- Type tests shall be performed to demonstrate that the vehicle design complies with the relevant section of these Employer's Requirements and all relevant Legislation and regulations;
- Routine tests shall be carried out on each vehicle prior to delivery/handover. The routine tests shall include the agreed measurements and checks to confirm the compliance of each Tram.

The Tram Supplier shall provide all necessary support to the Infraco during the testing and commissioning activities in Edinburgh, from the delivery of the first Tram and until the completion of the System Acceptance Tests. This will include input to the development of the necessary specifications and procedures. The support for the Tram tests to be undertaken in Edinburgh shall include, but be not be limited to, a testing manager and technicians (who will be based in Edinburgh throughout the delivery and testing of the trams), full logistics support for the despatch of urgent and routine spares during the testing process, documentation authors and administrative support for the production and control of test specifications, reports, and supporting documentation.

23.18.5 Test Certificates

Upon the successful completion of each of the Tram tests the Tram Inspector will issue the following test certification:

- Factory Acceptance Type Test Certificate;
- Factory Acceptance Routine Test Certificate;
- Certificate of Tram Delivery; and
- Site Commissioning Type Test Certificate.

Upon successful completion of all the tests for any individual Tram the Tram Inspector will issue the following test certification:

- Certificate of Tram Commissioning.

23.19 Factory Acceptance Tests (FAT)

Factory Acceptance Tests– This group of tests shall be undertaken at the Tram Supplier's Factory and upon successful completion the Tram Supplier will be issued with a Factory Acceptance Type Test Certificate and/or Factory Acceptance Routine Test Certificate by the Tram Inspector. The Factory Acceptance Tests shall be conducted in accordance with the Tram Manufacturing, Delivery Programme and the Test Plan. The FAT will be broken down into Factory Acceptance Type Tests and a series of Factory Acceptance Routine Tests and will comprise both static inspections and dynamic tests. The Factory Acceptance Type Tests shall be undertaken on a single Tram. This shall be the first Tram unless agreed otherwise in writing by the Tram Inspector.

Static inspections and tests shall be conducted at the Tram Supplier's Factory or at the sub-suppliers' premises during normal working hours during which the Tram Inspector will be entitled to inspect, examine and witness testing of all major systems, sections, apparatus, equipment, components, internal seating, fixtures and fittings and devices, including all structural, electrical, hydraulic and other major components and assemblies (except where the items concerned have been previously tested to the Tram Inspector's satisfaction and the appropriate test certificate issued).

Dynamic tests shall be conducted on the test track at the Tram Supplier's Factory or an alternative location subject to the Tram Inspectors agreement.

The Tram Inspector shall be given adequate prior notice of all tests. **tie** may, at its sole discretion, waive its right to attend or witness any test.

Whether or not the Tram Inspector is in attendance the Tram Supplier shall keep, and make available to the Tram Inspector on request, true and accurate records of the tests, the performance of the Tram during such tests, and any faults which developed or became apparent during the course of such tests.

The Tram Inspector may require evidence that the Tram has operated an agreed number of kilometres/hours in order to fulfil the requirements of the Test and Commissioning Plan under the agreed test track conditions without major faults or breakdown and has met the performance standards set out in this section throughout such period before issuing the Factory Acceptance Routine Test Certificate and/or Factory Acceptance Type Test Certificate. The distance travelled during the dynamic test on the test track will be limited and the main objective will be to check functions and performances not endurance, hence the distance travelled will relate to an agreed schedule to prove these functions.

The Factory Acceptance Routine Tests and the Factory Acceptance Type Tests referred to in the following tables shall include such examinations and tests as the Tram Inspector may reasonably require to satisfy himself that the Trams qualify or do not qualify for a Factory Acceptance Routine Test Certificate and/or and a Factory Acceptance Type Test Certificate. This will include but not be limited to; the checking of individual manufacturing and inspection records, module and sub-assembly tests including as-built dimensional checks where appropriate, for major items such as but not limited to bogie frames, wheel sets, traction and brake equipment.

The Tram Supplier shall make available to the Tram Inspector throughout the Factory Acceptance Routine Tests and/or Factory Acceptance Type Tests qualified staff and, where appropriate, its major sub-contractors to conduct, supervise and record the results of all such inspections, tests and examinations as are referred to in this document and to respond to all enquiries about the condition or performance of the Trams or its major sub-systems.

Table 48 - Factory Acceptance Tests: Static Type Tests

TEST	LOCATION	EN 50215 Reference	COMMENTS
Overall dimensional checks	Static test, at the Tram Supplier's Factory	8.1	To include external static envelope, internal dimensions, door widths and openings.
General examination and security check.	Static test, at the Tram Supplier's Factory		To establish accuracy and security of fixing of fixtures and fittings,
Coefficient of flexibility	Static test, at the Tram Supplier's Factory	8.2	Static test with a maximum cant of 100mm simulated. Horizontal and vertical flexibility.
Lifting ability	Static test, at the Tram Supplier's Factory	8.3	Body Lifting and major component removal. Bogie handling.
Tram weight	Static test, at the Tram Supplier's Factory	8.4	Tram and axle weights, including individual wheel and axle loading. Load testing of the complete vehicle and the checking of critical dimensions and clearances under a range of loading conditions. Suspension deflections and door entrance height measurement.
Sealing	Static test, at the Tram Supplier's Factory	8.5	Resistance of body structure to water ingress, humidity and snow.
Electrical insulation	Static test, at the Tram Supplier's Factory	8.6	High voltage insulation tests. Withstand and impedance of all cabling.
Bonding & return circuits	Static test, at the Tram Supplier's Factory	8.7	Continuity and integrity of all safety earth bonds and return current circuits.
Hydraulic system	Static test, at the Tram Supplier's Factory	8.9	Pumps and pipe-work. Pressure tests and leakage.
Braking System	Static test, at the Tram Supplier's Factory	8.10	Friction brake system

TEST	LOCATION	EN 50215 Reference	COMMENTS
Parking brake	Static test, at the Tram Supplier's Factory	8.11	Clamping force measurement
Auxiliary Power Supply	Static test, at the Tram Supplier's Factory	8.12	Power supplies and associated equipment.
Battery charging system	Static test, at the Tram Supplier's Factory	8.13.1	Batteries, battery chargers and associated equipment. Battery capacity for emergency working.
Auxiliary and control system	Static test, at the Tram Supplier's Factory	8.14	Vehicle control and management system. Software validation. Drivers' controls and instruments.
Doors	Static test, at the Tram Supplier's Factory	8.14.3	Passenger Doors, driver's doors. Emergency access and egress. Operation and timing.
Heating, ventilation & air-conditioning	Static test, at the Tram Supplier's Factory	8.14.4	System operation and effectiveness at the ambient conditions of the test location Thermostats, air flows. Hot/cold areas.
Lighting	Static test, at the Tram Supplier's Factory	8.14.5	Interior and exterior lighting.
Monitoring equipment	Static test, at the Tram Supplier's Factory	8.14.7	CCTV System, cameras and displays.
Event recorder	Static test, at the Tram Supplier's Factory	8.14.7	OTMR, (as far as practicable at the test location).
Communications and passenger information systems	Static test, at the Tram Supplier's Factory	8.14.7	Radios, PA, emergency communications (as far as practicable at the test location). Warning tones. Passenger information system. Passenger Emergency Help Points.
Configuration control	Static test, at the Tram Supplier's Factory	8.14.8	Determination of defined software and firmware status for all sub-systems. Modification status for all major and critical components and others as appropriate.

TEST	LOCATION	EN 50215 Reference	COMMENTS
Traction system	Static test, at the Tram Supplier's Factory	8.16	Motors, gearboxes, control equipment, power supplies and current collection.
Tram control system	Static test, at the Tram Supplier's Factory	8.16	Tram central control system and interfaces, fault monitoring and diagnostics.
Operability and maintainability	Static test, at the Tram Supplier's Factory	8.17	Verification of conformity with the proposed and agreed design. Operator and maintainer access to all appropriate areas.
Safety systems	Static test, at the Tram Supplier's Factory	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop. Emergency pushbutton, Track brakes. Horns/warning devices.
Windscreen washers, wipers and demisters	Static test, at the Tram Supplier's Factory	9.18	System operation and effectiveness, demisters.
Pantograph	Static test, at the Tram Supplier's Factory	9.12	Operation. Contact forces.
Sanding system	Static test, at the Tram Supplier's Factory		System operation. Sand delivery rate. Coherence between VTCU output and the correct sanding unit.
Flange lubrication system.	Static test, at the Tram Supplier's Factory	9.11	Set-up of equipment.
Visual examination of all client defined features	Static test, at the Tram Supplier's Factory	HMRI, RVAR	Interior layout, seating, livery and signage.
Emergency coupler	Static test, at the Tram Supplier's Factory		Check of mountings / space envelope. manual operation.

Table 49 - Factory Acceptance Tests: Dynamic Type Tests

TEST	LOCATION	EN50215 Reference	COMMENTS
Traction system performance	Dynamic test, at the Tram Supplier's Factory test track	9.1	Dynamic performance, acceleration and braking rates. Jerk rates. Current collection. Degraded modes. Speed attainment. Power consumption. Wheelslip correction and sanding. Simulated locked axle detection
Braking system	Dynamic test, at the Tram Supplier's Factory test track	9.3	Friction brake system, service and emergency deceleration rates and stopping distances. Dynamic brake operation and blending with friction brake, jerk rates. Wheelslide correction and sanding. Track brake operation.
Thermal capacity	Dynamic test, at the Tram Supplier's Factory test track	9.4	Temperature rise monitoring of traction, braking & auxiliary equipment during repeated duty cycles. Including degraded modes and emergency duty.
Motion resistance	Dynamic test, at the Tram Supplier's Factory test track	9.5	Demonstration/derivation of Tram resistance to motion.
Coupling test	Dynamic test, at the Tram Supplier's Factory test track	9.8	Coupled Tram operation with emergency couplers, as far as practical and subject to availability of two Trams.
Ride quality	Dynamic test, at the Tram Supplier's Factory test track	9.9	Assessment of Tram ride quality, (providing that the test is meaningful at this location).
Flange lubrication system.	Dynamic test, at the Tram Supplier's Factory test track	9.11	System operation.
Pantograph	Dynamic test, at the Tram Supplier's Factory test track	9.12	Operation, Functional check.

TEST	LOCATION	EN50215 Reference	COMMENTS
Electromagnetic compatibility	Dynamic test, at the Tram Supplier's Factory test track	9.14	Electromagnetic radiation and susceptibility of vehicle systems. See also EN 50121, within the constraints of the test track.
Voltage interruption and jump	Dynamic test, at the Tram Supplier's Factory test track	9.15	Reaction of traction/dynamic brake/auxiliary power systems to supply voltage interruptions jumps. Operation over the full-specified voltage range covered by the type test certificate of the traction and auxiliary equipment (as far as practicable at the test location).
Windscreen washers, wipers and demisters	Dynamic test, at the Tram Supplier's Factory test track	9.18	System operation and effectiveness, including demisters.
Tram control system	Dynamic test, at the Tram Supplier's Factory test track	9.19	Interfaces between traction, braking, auxiliary, control and safety systems. Tram management systems, displays and diagnostics.
Monitoring equipment	Dynamic test, at the Tram Supplier's Factory test track	9.19	CCTV System, cameras and displays.
Event recorder	Dynamic test, at the Tram Supplier's Factory test track	9.19	OTMR, (as far as practicable at the test location).
Communications & passenger information systems	Dynamic test, at the Tram Supplier's Factory test track	9.19	Radios, PA, emergency communications. Warning tones. Passenger information system as far as practicable at the test location.
Safety systems	Dynamic test, at the Tram Supplier's Factory test track	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop and speed inhibit. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer calibration.

TEST	LOCATION	EN50215 Reference	COMMENTS
Operability & maintainability	Dynamic test, at the Tram Supplier's Factory test track	8.17	Demonstration of degraded modes
Parking brake	Dynamic test, at the Tram Supplier's Factory test track	8.11	System operation and pull away test
Noise and vibration	Dynamic test, at the Tram Supplier's Factory test track	9.16	Noise and vibration measurements, as far as practicable at the test location.

Table 50 - Factory Acceptance Tests: Static Routine Tests

TEST	LOCATION	EN 50215 Reference	COMMENTS
Overall dimensional checks	Static test, at the Tram Supplier's Factory	8.1.2	Reduced overall dimension check.
General examination and security check.	Static test, at the Tram Supplier's Factory		To establish accuracy and security of fixing of fixtures and fittings.
Tram weight	Static test, at the Tram Supplier's Factory	8.4.3	Tram, and axle, weights.
Sealing	Static test, at the Tram Supplier's Factory	8.5.2	Resistance of body structure to water ingress
Electrical insulation	Static test, at the Tram Supplier's Factory	8.6	High voltage insulation tests. Withstand and impedance of all cabling.
Bonding and return circuits	Static test, at the Tram Supplier's Factory	8.7	Continuity & integrity of all safety earth bonds and return current circuits.
Hydraulic system	Static test, at the	8.9	Pumps and pipe-work. Pressure tests. Leakage.

TEST	LOCATION	EN 50215 Reference	COMMENTS
	Tram Supplier's Factory		
Braking System	Static test, at the Tram Supplier's Factory	8.10.2	Friction brake system functional test including parking brake
Auxiliary power supply	Static test, at the Tram Supplier's Factory	8.12.2	Power supplies and associated equipment.
Battery charging system	Static test, at the Tram Supplier's Factory	8.13.2	Batteries, battery chargers and associated equipment.
Auxiliary and control system	Static test at the Tram Supplier's Factory	8.14.1	Tram control and management system. Drivers' controls and instruments.
Doors	Static test, at the Tram Supplier's Factory	8.14.3	Passenger doors, driver's doors. Emergency access and egress. Operation & timing
Heating, ventilation and air-conditioning	Static test, at the Tram Supplier's Factory	8.14.4	System operation and effectiveness. Thermostats, air flows. Hot/cold areas. Duct sealing. Functional check
Lighting	Static test, at the Tram Supplier's Factory	8.14.5	Interior and exterior lighting. Functional check.
Monitoring equipment	Static test,at the Tram Supplier's Factory	8.14.7	CCTV System, cameras and displays.
Event recorder	Static test, at the Tram Supplier's Factory	8.14.7	OTMR, (as far as practicable at the test location).
Communications and passenger information systems	Static test, at the Tram Supplier's Factory	8.14.7	Radio, PA, emergency communications (as far as practicable). Warning tones. Passenger information system.
Configuration control	Static test, at the Tram Supplier's Factory	8.14.8	Verification of defined software and firmware status for all sub-systems. Modification status for all major and critical components and others as appropriate.

TEST	LOCATION	EN 50215 Reference	COMMENTS
Traction system	Static test, at the Tram Supplier's Factory	8.16	Motors, gearboxes, control equipment, power supplies and current collection.
Tram control system	Static test, at the Tram Supplier's Factory	8.16	Tram central control system and interfaces, fault monitoring and diagnostics.
Operability and maintainability	Static test, at the Tram Supplier's Factory	8.17	Fault handling, diagnostics and indications. Safety isolations.
Safety systems	Static test, at the Tram Supplier's Factory	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop. Emergency pushbutton, Track brakes. Horns/warning devices.
Windscreen washers, wipers and demisters	Static test, at the Tram Supplier's Factory	9.18	Functional check including demisters.
Pantograph	Static test, at the Tram Supplier's Factory	9.12	Operation. Contact forces
Sanding system	Static test, at the Tram Supplier's Factory		System operation. Sand delivery rate.
Flange lubrication system.	Static test, at the Tram Supplier's Factory	9.11	Set-up of equipment.
Visual examination of all client defined features	Static test, at the Tram Supplier's Factory		Interior layout, seating, livery and signage.

Table 51 - Factory Acceptance Tests: Dynamic Routine Tests

TEST	LOCATION	EN 50215 Reference	Comments
Traction system performance	Dynamic test, at the Tram Supplier's Factory test track	9.1.2	Dynamic performance, acceleration and braking rates. Current collection. Speed attainment. Wheelslip correction and sanding.
Braking system	Dynamic test, at the Tram Supplier's Factory test track	9.3.2	Friction brake system, service and emergency deceleration rates and stopping distances. Dynamic brake operation and blending with friction brake, Wheelslide correction and sanding. Track brake operation.
Flange lubrication system.	Dynamic test, at the Tram Supplier's Factory test track	9.11	System operation, as far as practicable.
Tram control system	Dynamic test, at the Tram Supplier's Factory test track	9.19	Interfaces between traction, braking, auxiliary, control and safety systems. Tram management systems, displays and diagnostics.
Monitoring equipment	Dynamic test, at the Tram Supplier's Factory test track	9.19	CCTV System, cameras and displays.
Event recorder	Dynamic test, at the Tram Supplier's Factory test track	9.19	OTMR, (as far as practicable at the test location).
Communications and passenger information systems	Dynamic test, at the Tram Supplier's Factory test track	9.19	PA, emergency communications. Warning tones. Passenger information system (as far as practicable at the test location).
Safety systems	Dynamic test, at the Tram Supplier's Factory test track	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop and speed inhibit. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer calibration.

23.20 Delivery Acceptance Tests (DAT)

These tests shall be carried out by the Tram Supplier upon the delivery of each Tram. They shall establish that the Tram has not been damaged or affected in any way by the delivery process and that it remains in the condition in which it was inspected prior to despatch from the Tram Supplier's factory. On satisfactory completion of the DAT the Tram Inspector will issue a Certificate of Tram Delivery.

TEST	LOCATION	EN 50215 Reference	Comments
Overall dimensional checks	Static test, at the Depot		Reduced to any parts or components which will been adjusted/removed during the transport.
General examination and security check.	Static test, at the Depot		To establish accuracy and security of fixing of all fixtures and fittings, transit damage. Visual inspection
Hydraulic system	Static test, at the Depot	8.9	Pumps and pipe-work. Visual inspection and checks for leakage.
Tram weight	Static test, at the Depot		Measurement of as-delivered tare weight, plus sand and fluids.

Table 52 – Table showing Delivery Acceptance Tests

23.20.1 Site Commissioning Tests

The Site Commissioning Type Tests shall be undertaken on the Tram(s) as appropriate, when they are delivered to the Depot and following the completion of the DAT. Upon successful completion the Tram Supplier will be issued with a Site Commissioning Type Test Certificate by the Tram Inspector. The tests shall comprises Static and Dynamic tests and will include, but not be limited to, the tests referred to in the tables on the following page.

For the avoidance of doubt the Tram Inspector shall not issue a Type Test Certificate even if by a lack or fault of the system infrastructure a test is failing or cannot be executed.

Table 53 – Site Commissioning Tests: Static Type Tests

TEST	LOCATION	EN 50215 Reference	Comments
Monitoring equipment	Static test, at the Depot	8.14.7	CCTV System, cameras and displays.
Tram location and detection system	Static test, at the Depot	8.14.7	Tram location and detection system.
Event recorder	Static test, at the Depot	8.14.7	OTMR
Communications and passenger information systems	Static test, at the Depot	8.14.7	Radios, PA, emergency communications. Warning tones. Passenger information system.
Noise.	Static test, at the Depot	8.18	Noise (outstanding from factory), internal & external. At same time as dynamic and performed on specified track section.
Safety systems	Static test, at the Depot	8.19	Brake control systems, emergency brake, passenger emergency. Driver's Deadman system, door safety loop. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer
Pantograph	Static test, at the Depot	9.12	Operation. Contact forces.
Electromagnetic compatibility	Static test, at the Depot	9.14	Electromagnetic radiation and susceptibility of Tram systems. Completion of the Tram FAT type test.

Table 54 – Site Commissioning Tests: Dynamic Type Tests

TEST	LOCATION	EN 50215 Reference	Comments
Traction system performance	Dynamic test, at designated test site	9.1.1	Dynamic performance, acceleration & braking rates. Jerk rates. Acceleration and control on gradients. Roll-back protection. Current collection. Speed attainment. Power consumption. Wheelslip correction and sanding. Emergency duty.
Braking system	Dynamic test, at designated test site	9.3.1	Friction brake system, service and emergency deceleration rates and stopping distances. Dynamic brake operation and blending with friction brake, jerk rates. Wheelslide correction and sanding. Track brake operation.
Thermal capacity	Dynamic test, at designated test site	9.4	Temperature rise monitoring of traction, braking and auxiliary equipment during repeated duty cycles. Including degraded modes and emergency duty.
Tram/track interaction	Dynamic test, at designated test site	9.8	Wheel rail interaction. Load testing of the complete vehicle and the checking of critical dimensions and clearances under a range of loading conditions. Suspension deflections and inter-vehicle clearances. Safety against derailment. Coupled Tram operation
Ride quality	Dynamic test, at designated test site	9.9	Assessment of Tram ride quality.
Kinematic gauging	Dynamic test, at designated test site	9.10	Dynamic performance, kinematics and gauging. Load testing of the complete vehicle and the checking of critical dimensions, swept path and clearances under load conditions. Suspension deflections. Pantograph sway,

TEST	LOCATION	EN 50215 Reference	Comments
Flange lubrication system.	Dynamic test, at designated test site	9.11	System operation.
Pantograph	Dynamic test, at designated test site	9.12	Included in Kinematic gauging
Electromagnetic compatibility	Dynamic test, at designated test site	9.14	Electromagnetic radiation and susceptibility of Tram systems.
Noise and vibration	Dynamic test, at designated test site	9.16	Noise and vibration tests performed on the specified section of track.
Safety Systems	Dynamic test, at designated test site	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop and speed inhibit. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer. Event Recorder (OTMR).
Tram location and detection system	Dynamic test, at designated test site	8.14.7	Tram location and detection system.
Operability and maintainability	Dynamic test, at designated test site	8.17	Coupling test and recovery.
Parking brake	Dynamic test, at steepest gradient	8.11	System operation, effectiveness on steepest available gradient.

The Site Commissioning Routine Tests shall be performed on each Tram and comprise static and dynamic tests. This shall comprise of a full functional test, both statically and dynamically, of the Tram, including inspection, examination or testing of all major systems, sections, apparatus, equipment, components, internal seating, fixtures and fittings and devices (including testing the same whilst in operation); with the further inclusion of electrical, hydraulic and other major components and assemblies, as far as practical, at the test location.

The Site Commissioning Routine Test will be designed to establish that each individual tram functions in accordance with the design. It is not intended that the routine test should be a full re-working of the either the type test or the factory tests merely confirmation through carefully targeted testing that the build was correct., It will confirm that it is in a suitable condition to operate safely on the system. Upon successful completion of the Routine Tests the Tram Supplier will be issued with a Certificate of Tram Commissioning by the Tram Inspector.

Whether or not the Tram Inspector is in attendance at a Site Commissioning Test, the Tram Supplier shall keep and make available to the Tram Inspector on request true and accurate records of the Site Commissioning Test conducted, the performance of the Tram during such tests and any faults which developed or became apparent during the course of such tests.

23.20.2 Re-Testing

The Tram Supplier shall, if requested by the Tram Inspector, undertake such further examinations and tests as the Tram Inspector may reasonably require to satisfy himself that a Tram and/or the Trams qualify for a Certificate of Tram Commissioning

23.20.3 Testing Support

The Operator shall make the following available where required by the Testing and Commissioning Plan, (and agreed by Infraco):

- Depot and workshop facilities at the Depot;
- Reasonable assistance from its drivers, maintenance and other staff; and
- Track, power supplies and other facilities, as agreed, to meet the needs of the Tram Testing and Commissioning Plan.

All parties involved and their respective representatives and staff shall:

- Observe such reasonable requirements as may be notified in writing by the Operator or to preserve health and safety, protect the Trams against damage and avoid unnecessary disruption to the Operator's operations.
- Use all reasonable endeavours to avoid risks to health and safety, damage to the Trams or unnecessary disruption to the Operator's operations.
- The Tram Supplier shall make available throughout the Tram Commissioning Tests qualified staff from the Tram Supplier's organisation and, where appropriate, its major sub-contractors to:
  - Conduct, supervise and record the results of all such inspections, tests and examinations as are referred to in this document; and
- Respond to all reasonable enquiries about the condition or performance of the Trams or the major systems, sections, apparatus, equipment, components, internal seating, fixtures and fittings and devices, including all structural, electrical, hydraulic and other major components and assemblies and to rectify any failures of the same.

Table 55 – Site Commissioning Tests: Static Routine Tests

TEST	LOCATION	EN 50215 Reference	Comments
Braking system	Static test, at the Depot	8.10.2	Friction brake system, including parking brake
Monitoring equipment	Static test, at the Depot	8.14.7	CCTV System, cameras and displays.
Event recorder	Static test, at the Depot	8.14.7	OTMR,
Tram location and detection system	Static test, at the Depot	8.14.7	Tram Location and Detection equipment.
Communications and passenger information	Static test, at the Depot	8.14.7	Radios, PA, emergency communications. Warning tones. Passenger information system.

TEST	LOCATION	EN 50215 Reference	Comments
systems			
Configuration control	Static test, at the Depot	8.14.8	Verification of defined software and firmware status for all sub-systems. Modification status for all major and critical components and others as appropriate.
Traction system	Static test, at the Depot	8.16	Motors, gearboxes, control equipment, power supplies and current collection.
Safety systems	Static test, at the Depot	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman system, door safety loop. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer.
Windscreen washers, wipers and demisters	Static test, at the Depot	9.18	System function
Pantograph	Static test at the Depot		Contact forces and operation.
Sanding system	Static test, at the Depot		System function.
Doors	Static test at the Depot		Cycle times.
Heating, ventilation and air-conditioning	Static test, at the Depot	8.14.4	Functional check

Table 56 – Site Commissioning Tests: Dynamic Routine Tests

TEST	LOCATION	EN 50215 Reference	Comments
Traction system performance	Dynamic test, at designated test site	9.1.2	Dynamic performance, acceleration & braking rates. Speed attainment. Operation through supply interruptions and at varying line voltages.
Braking system	Dynamic test, at designated test site	9.3.2	Friction brake system, service and emergency deceleration rates and stopping distances. Dynamic brake operation and blending with friction brake, sanding. Track brake operation.
Ride quality	Dynamic test, at designated test site	9.9.2	Subjective ride test to discern any obvious ride irregularity.
Flange lubrication system.	Dynamic test, at designated test site	9.11	System function.
Noise and vibration	Dynamic test, at designated test site	9.16.2	Subjective noise and vibration assessment to discern any obvious irregularity.
Tram control system	Dynamic test, at designated test site	9.19	Interfaces between traction, braking, auxiliary, control and safety systems. Tram management systems, displays and diagnostics.
Monitoring equipment	Dynamic test, at designated test site	9.19	CCTV System, cameras and displays.
Event recorder	Dynamic test, at designated test site	9.19	OTMR
Tram location and	Dynamic	9.19	Tram location equipment

TEST	LOCATION	EN 50215 Reference	Comments
detection system	test, at designated test site		
Communications and passenger information systems	Dynamic test, at designated test site	9.19	Radios, PA, emergency communications. Warning tones. Passenger information system (as appropriate).
Safety systems	Dynamic test, at designated test site	8.19	Brake control systems, emergency brake, passenger emergency. Driver's deadman's system, door safety loop and speed inhibit. Emergency pushbutton, Track brakes. Horns/warning devices. Speedometer calibration.
Parking brake	Dynamic test, at designated test site	8.11	System function Part of braking test

23.21 System Integration Tests (SIT)

The System Integration Tests consist of tests carried out to prove that the ETN as a whole can function as intended. All infrastructure, operation and control systems shall be exercised during these tests. The Tram Supplier will provide reasonable input to the development of the SAT specifications as well as participation in, and support to, the tests whenever reasonable technical support is needed in reference to the Trams.

The System Integration Tests will include, but will not be limited to, the following:

- Comprehensive gauging and dimensional checks under a range of loading conditions;
- Run time tests;
- Interface checks to all items of workshop plant and equipment including the wheel lathe, Tram washing machine, sanding plant, cranes and hoists;
- Access and handling checks for all major items of equipment, sub-assemblies and major capital spares items;
- Validation of the radio communication system; and
- Validation of the tram position detector system.

The System Integration Tests will involve carrying out gauging runs over all parts of the ETN in order to establish that the Trams (when operating individually or in conjunction with other Trams) accord with the Tram Section and the agreed detailed interface arrangements in terms of the alignment geometry, clearances, loads, pantograph dynamics, wheel rail interface, traction power system, communications and route setting equipment, compliance with operational procedures and Tram performance values. In particular it shall be demonstrated that there is sufficient clearance between passing Trams on the Network and between Trams and other Network equipment and installations to ensure that the Trams can be operated safely and without damage to themselves and to the other parts of the System.

There shall be static and dynamic tests to verify that the pantograph conforms to the requirements of the Employer's Requirements.

There shall be a series of tests to demonstrate the ability of one Tram to recover another failed Tram, including on the most severe gradient on the ETN and potentially in a degraded mode.

The testing of the systems, including but not limited to; power supplies, overhead line, Depot equipment, and EMC tests will require the use of a number of Trams running at the same time.

Table 57 – System Integration Tests: Static Type Tests

TEST	LOCATION	EN 50215 Reference	Comments
Lifting ability	Static test, at the Depot	8.3	Body Lifting and major component removal. Bogie handling.
Battery charging system	Static test, at the Depot	8.13	Battery access for maintenance and topping up. Operation and suitability of external battery chargers.
Monitoring equipment	Static test, at the Depot	8.14.7	CCTV System, Interface with the Depot systems.
Event recorder	Static test, at the Depot	8.14.7	OTMR, Interface with the Depot systems.
Tram location and detection system	Static test, at the Depot	8.14.7	Tram location equipment.
Communications and passenger information systems	Static test, at the Depot	8.14.7	Radios, PA, emergency communications. Warning tones. Passenger information system. Interface with the Depot systems.
Traction system	Static test, at the Depot	8.16	Power supply interaction.
Operability and maintainability	Static test, at the Depot	8.17	Review and demonstration of accessibility and removal of components. Fault handling, diagnostics and indications. Safety issues.
Noise and vibration.	Static test, at the Depot	8.18	Noise and vibration levels, internal and external.
Pantograph	Static test, at	9.12	Operation. Contact forces.

TEST	LOCATION	EN 50215 Reference	Comments
	the Depot		
Sanding system	Static test, at the Depot		Refilling system. Verification that the fill level can be observed from inside the tram.
Flange lubrication system.	Static test, at the Depot	9.11	Refilling.
Visual examination of all client defined features	Static test, at the Depot	HMRI, RVAR	Interior layout, seating, livery and signage
Electromagnetic compatibility	Static test, at the Depot	9.14	Electromagnetic radiation and susceptibility of vehicle systems.

Table 58 – System Integration Tests: Dynamic Tests

TEST	LOCATION	EN 50215 Reference	Comments
Tram/track interaction	Dynamic test, at designated test site	9.8	Wheel rail interaction. Load testing of the complete vehicle and the checking of critical dimensions and clearances under a range of loading conditions. Suspension deflections and inter-vehicle clearances.
Kinematic gauging	Dynamic test, at designated test site	9.10	Dynamic performance, kinematics and gauging. Load testing of the complete vehicle and the checking of critical dimensions, swept path and clearances under a range of loading conditions. Suspension deflections. RVAR and HMRI requirements.
Platform gauging	Dynamic test, at designated test site	9.10	Platform stepping distance and heights, tare and loaded conditions. RVAR requirements.
Flange lubrication system.	Dynamic test, at designated test site	9.11	Effectiveness.
Pantograph	Dynamic test, at designated test site	9.12	Operation, contact forces, sway. OLE deflection.
Electromagnetic compatibility	Dynamic test, at designated test site	9.14	Electromagnetic radiation and susceptibility of vehicle systems.
Voltage interruption and jump	Dynamic test, at designated test site	9.15	Reaction of traction/dynamic brake/auxiliary power systems to supply voltage interruptions, jumps and short circuits. Operation over full-specified voltage range.
Noise and vibration.	Dynamic test, at designated test site	9.16	Noise and vibration levels.
Monitoring equipment	Dynamic test, at designated	9.19	CCTV System, cameras and displays.

TEST	LOCATION	EN 50215 Reference	Comments
	test site		
Tram location and detection system	Dynamic test, at designated test site	9.19	Tram location equipment, throughout the available route. Road junction and point motor control.
Communications and passenger information systems	Dynamic test, at designated test site	9.19	Radios, PA, emergency communications. Reception and effective communication with the Depot throughout the available route. Warning tones. Passenger information system
Operability and maintainability	Dynamic test, at designated test site	8.17	Review of all systems as required. Demonstration of degraded modes and recovery practices. Coupling test
Traction supply	Dynamic test, at designated test site		Sub-station load tests, sub-station outages. Regeneration. Overload protection, touch voltage and stray current tests.
Section run times	Dynamic test, throughout the System		Proving of the System infrastructure in stages as it becomes available to operate.

23.21.1 System Acceptance Testing

Tram testing will be undertaken in support of the system acceptance testing set out in these Employer's Requirements.

24 Trams

24.1 Scope

This section defines the requirements for Trams that are applicable to the Edinburgh Tram Network and with which the Infraco must comply.

24.2 General Technical Specification

The Trams shall be of a high quality in design and construction and comply with the following general design criteria:

- High safety standards including, but not limited to:
  - Compliance with Railway Safety Publication 2 - Guidance on Tramways, issued by the Office of the Rail Regulator;
  - Compliance with Rail Vehicle Accessibility Regulations, 1998;
- High reliability, minimum maintenance requirement and ease of repair;
- Proven design and technology;
- Low floor access;
- Easy to clean;
- Modern and attractive appearance;
- Low weight;
- Low environmental impact;
- Meets access requirements for the disabled;
- Minimum use of energy;
- The Trams will be required to have a minimum operating capability of at least 100,000 km per year; and

The Trams shall be designed to have a minimum service life in accordance with Section 6 of these Employer's Requirements.

The Trams shall be articulated in order to negotiate the track alignment. They will be fully bi-directional and capable of being driven from either end and shall have passenger doors on both sides. They will be capable of being operated by one person.

Normal service Trams shall comprise one vehicle, but shall be capable of running coupled together for the purpose of one Tram recovering another failed Tram from any point on the system.

The Tram should be designed and constructed in accordance with a Quality Plan (as prescribed under ISO9001), which should also include a delivery plan and a Test Plan.

A full-scale Tram mock-up shall be provided to demonstrate areas critical to operation and access as part of the formal design process and for use in public consultation. The mock-up shall include the entire cab and a representative portion of one saloon, including a vestibule with at least one operational pair of bi-parting doors and space reserved for wheelchair use. The mock-up shall show the exterior form and livery. The mock-up shall be weatherproof and shall be delivered to a location in Edinburgh designated by **tie.**

24.3 Wheel / Rail Interface

The Trams shall have a wheel profile and suspension characteristic that is compatible with the rail profiles used throughout the System in terms of risk of derailment, noise, wear and vibration. The wheel profile shall allow for flange running at crossings. The Tram will be designed to operate in conjunction with a track gauge of 1,435mm and a flange back-to-back dimension consistent with the rail types to be used on the Edinburgh Tram Network.

24.4 Tramway Path

Trams shall be compatible with the System track alignment and the geometric constraints as outlined in Section 26 of these Employer's Requirements, which gives the alignment criteria and the assumed Tram characteristics. From this the developed kinematic envelope ("DKE") calculations and any other information, to show compatibility with the alignment, shall be provided by the Infraco. The Trams shall negotiate the minimum radius horizontal and vertical curves, and maintain acceptable wheel flange wear.

Minimum clearances to existing structures, Tramstops, overhead line equipment structures and all other road furniture shall be maintained in accordance with the agreed DKE and it shall always be possible for one Tram to pass another, at any point on the system. The Infraco shall ensure that the Tram Supplier shall provide supporting information to enable a reduced DKE to be developed for use in locations where restricted speeds are or may require to be applied.

24.5 Supervisory, Control & Communications Systems

The Trams shall be fitted with equipment to automatically indicate their position to, and communicate with, a central control centre.

Additionally, a bus tracker box will be fitted.

A voice radio system will be permanently available between the driver and the central control centre. This equipment will be supplied by Infraco and will be free-issue to the Tram Supplier, to be installed and tested as part of the Tram manufacturing process.

The supply and integration of the free-issue equipment will be controlled through a system interface register, to be developed from Schedule 22 of the TSA and managed by Infraco.

All on-board systems with real-time clocks shall be updated and synchronised from a common source, throughout the working life of the Tram.

24.6 Depot Facilities

The Trams shall be maintained at the Depot and a system interface register shall be used to ensure that the Trams and the equipment provided for their routine maintenance and operation are compatible.

The Trams shall be compatible with a mechanised sand filling system at the Depot (see Section 29 of these Employer's Requirements), enabling the sand system on the Trams to be replenished within five minutes and by one driver alone. The Infraco shall ensure that the Tram Supplier shall provide a specification for the sand, and contact details for a UK-based commercial supplier of this sand.

The Trams shall have a key suiting system that provides a logical hierarchy of access to cleaners, inspectors, drivers and maintenance staff. It shall not be part of the same suite as detailed in Section 22 of these Employer's Requirements.

The Trams shall be supplied with a nominal 24VDC shore supply, socket compatible with battery charging equipment in the depot.

24.7 Electro-Magnetic Compatibility

The Trams and their sub-systems shall not generate excessive, nor be susceptible to, electro-magnetic interference and shall comply with EN 55013, EN 50121 and EN 50122 as appropriate.the requirements of the specification as detailed in section 16 of these Employer's Requirements.

24.8 Climate and Environment

The Trams shall operate normally in all climatic and environmental conditions found in the Edinburgh area on the proposed route, including operation in a marine environment having a saline atmosphere and being subject to fine wind-blown sand. This shall also include conditions where ice forms on the overhead line and wind speeds of up to 120km/h.

The Trams shall function, without deterioration in performance and for their whole design working life, within the weather conditions anticipated within the Edinburgh area as described elsewhere in Section 3.6.4 of these Employer's Requirements - taking into account the previously quoted wind speed. All equipment housings/enclosures that contain electronic equipment shall be so equipped to avoid the occurrence of condensation. The Trams shall be capable of being started up normally under the range of weather conditions as outlined above after no less than 72 hours of being left in the open in a shutdown condition.

24.9 Interface Management

The Infraco shall procure that the Tram Supplier participates in the interface engineering process. The Tram interfaces are identified in the TSA. The management of the interfaces will be carried out by Infraco using the system interface register.

24.10 Systems Assurance

The Infraco shall ensure that the Tram Supplier shall implement a System Assurance engineering process in accordance with the requirements of the Edinburgh Tram Network. This process shall cover all aspects of design, manufacture, integration, testing and commissioning of the Tram, and all interfaces with the system, to demonstrate compliance with the reliability, availability, maintainability and safety requirements of **tie**.

The Infraco shall ensure that the Tram Supplier shall follow the approach of BS EN 50126:1999 "Railway Applications – The specification and demonstration of RAMS".

The Infraco shall ensure that the Tram Supplier shall implement a reliability, availability and maintainability management process and will detail it in a Reliability, Availability and Maintainability Plan (RAMP).

The Infraco shall ensure that the Tram Supplier shall implement a System Safety Management Plan (SSMP), which shall define the process, activities and requirements for the preparation of a 'Case for Safety' during the design and handover stages of the project. The plan shall also define the system safety management organisation and the strategy to achieve the individual hazard system safety targets.

All foreseeable system safety hazards are to be identified, evaluated and recorded in a Hazard Log that will be managed and maintained throughout the project lifecycle. The Infraco shall ensure that the Tram Supplier shall implement a hazard management process to identify hazards through hazard analysis and the means to mitigate these hazards.

24.11 Noise and Vibration

Trams shall at all times meet the requirements of the **tie** Noise and Vibration Policy (NVP/001/V1.01). Trams shall operate as quietly as is reasonably possible. The proposed design shall incorporate wheel damping, side skirts with sound-deadening linings and resilient mounting of electrical equipment likely to generate noise. The Infraco shall ensure that the Tram Supplier shall provide the anticipated noise levels of the proposed Tram. Noise tests shall be carried out in Edinburgh to determine the frequency peaks generated, in particular by the wheels. The results of these tests shall be used to determine the type and extent of any tuned vibration dampers that should be fitted to the wheels.

24.12 Specific Technical Requirements

The Tram body shall be a nominal width of 2.65m externally. Note that external door sills may be required in order to comply with Rail Vehicle Accessibility Regulations.

The total Tram length shall be a nominal value of up to 44m.

The following loading conditions shall apply in this document:

- AW0 = Tram tare weight (empty car)
- AW1 = AW0 + full load of seated passengers
- AW2 = AW1 + weight of standing passengers at 4 persons/m^2

- AW3 = AW1 + weight of standing passengers at 5 persons/m_2
- AW4 = AW1 + weight of standing passengers at 6 persons/m_2
- AW5 = AW1 + weight of standing passengers at 8 persons/m^2

Where the mean passenger weight is taken to be 70.5kg.

The passenger capacity of the tram shall be at least 230 persons, of which a minimum of 80 shall be seated, on fixed seats. There shall in addition be provision for wheelchairs in accordance with Rail Vehicle Accessibility Regulations. There shall also be provision for luggage racks.

At least 66% of the floor area available for standing must be low-floor, with a height above rail level of between 300mm and 400mm. High floor areas shall be minimised. All doorways shall allow level boarding access at a height between 300-350mm above the top of the rail. The slope of the floor at the entrance shall be in accordance with disabled access regulations. Suitable means of adjustment shall be provided to compensate for wheel wear in order to remain within these limits.

The Tram shall have a maximum operating speed of up to 70km/h. However, a speed of 80km/h must be achievable, though not sustainable for a prolonged period.

The Tram structure will incorporate a strong and stiff underframe capable of supporting a buffing load in compliance with EN 12663 category V without permanent deformation. The structure shall not deform, crack, fracture, corrode or suffer loosening of rivets or bonding during the normal service life of the vehicle. It shall be, and remain, watertight against rain, passing through standing water and passing through the washing plant throughout its working life.

The tram structure shall be designed and tested to accommodate a passenger loading of AW5 as defined earlier in this clause.

All cavities in the floor structure, body sides and ceiling will be well drained and constructed in such a way that water does not collect and corrosion does not occur. Insulation material will fill all void spaces to minimise noise, vibration and heat loss.

The articulated joints will provide a wide gangway and resistance to vehicle climbing in the event of a collision. The articulation will require minimum maintenance and be capable of being dismantled to separate the Tram bodies with a minimum of equipment.

Where different metals are in contact, due regard shall be given to preventing the effects of dissimilar metal corrosion. All metal surfaces shall be treated to resist corrosion. All body panels will be interchangeable between vehicles and all exterior panels will be lined with water resistant, sound absorbing and heat insulating materials to minimise the possibility of resonance.

Easily replaceable energy absorption devices shall be provided at both ends of the Tram such that frontal and rearward collisions, at speeds up to 5 km/hr shall be fully absorbed without causing permanent deformation of the body structure. The front skirts and lower body side panels shall be mechanically fastened so as to allow easy replacement and shall be interchangeable between Trams. Each panel must be able to be replaced by one person in ten minutes.

The Trams shall be designed to be resistant to fire in accordance with the standard BS6853 Category 2, or the equivalent European Standard.

The maximum axle load at AW4 loading, and including all consumables, shall be 11.5 tonnes.

The windscreen shall be compliant to the equivalent International Regulation ECE 43 (Uniform Provisions Concerning the Approval of Safety Glazing and Glazing Materials (Rev1 08.1990). The windscreen and cab side windows shall consist of laminated glass panes made of safety glass. There should be no diffraction effects or colour distortions in the cab windows. Any glass screens dividing the driver's cab from the saloon shall be treated to minimise reflections. All internal glazing shall be made from safety glass.

The side windows (including the door windows) will be made from heat reflecting safety glass. The glazed area shall be maximised within the limits set by structural integrity, solar gain and passenger modesty. Passengers must have a clear view to the exterior whether seated or standing. Tinted windows shall be used to minimise dazzling.

The windows shall allow permeability for radio waves with frequencies for Global System for Mobile telecommunications, and other public-domain transmissions.

All windows, (including the driver's windscreen) shall be easily replaceable using standard methods and tooling available in the Depot. All glass surfaces must be replaceable within two hours and should be secured so as to be watertight and draught-proof. Bonded glass is not preferred, unless it can be demonstrated that the bonded glazed units can be easily interchanged in less than two hours. Bonding to a mechanically-fixed window frame, or securing using a rubber section, is preferred.

If the windows used are bonded, they should have a black, printed ceramic silk screen print to cover the bonding zone and protect the bonding material from ultra violet transmission, on which the ultra violet -Transmission should be less than 0,1% at 400-600 nm.

Opening hopper windows will be fitted throughout the passenger compartment. All interior glass surfaces in the Tram passenger compartments shall be fitted with Ultra Violet light reducing and shatter resisting film on the inside surface, which shall be easily replaceable as a maintenance task when required yet give good visibility when in place. This film shall also provide effective protection against damage to the glass by 'etching'-type graffiti.

24.13 Driver's Cab

The driver's cab shall be arranged so that at least 95% of adult persons can comfortably access the cab desk and all the controls located within the cab, whilst retaining the appropriate field of view out of the cab. The design of the cab shall be undertaken to good human factors practice.

The driver's cabs shall be air-conditioned and the temperature shall be thermostatically controllable by the driver. Air conditioning in both cabs shall be switched on or off from either cab. Temperature selection shall be only available from the cab in use.

An effective windscreen demisting system shall be fitted, suitable for the climatic conditions encountered in Edinburgh. The demisting system shall be able to clear the windows of condensation within ninety seconds of a cab being made operational.

The cab may extend to the full width of the Tram, and be separated from the passenger area by a glazed partition providing good passenger visibility through the cab windscreen. A mirror providing the driver with a view into the saloon (when sat at the controls) shall be provided.

An internal cab to saloon door is required, which must be lockable from the saloon side and cab side but capable of being opened at any time from inside the cab. The door must latch automatically when closed.

An inward opening, hinged and lockable external cab door may be provided. It shall be capable of being locked and unlocked from both inside and outside the cab.

The cab lighting level shall be 250-300 LUX at 1.0m above floor level. The driver shall have the control of switching this lighting on or off.

A generally translucent mesh fabric sunblind shall be provided, with an opaque strip extending 150mm up from the bottom edge. The blind must be able to be deployed by the driver whilst in the driving position. It need only be retractable at stops.

Cab windscreens and cab windows shall maximise the degree of all round vision available to the driver. A clear unobstructed view of the road/track ahead shall be provided with clear and unrestricted sight lines, particularly low down in front of the cab.

The partition between the Cab and Saloon and other glazing surfaces shall minimise the incidence of reflections at all times and in all expected environmental conditions. Blinds or curtains shall be provided to screen the saloon lighting from the cab at night.

The following features that relate to instruction of Tram drivers shall be provided:

- A Tram driver can be under instruction when a Tram is in passenger service, consequently it must be possible for an instructor and a driver to be inside the cab with the cab/saloon door closed, and the instructor must be comfortably and safely located in the cab.

- The instructor must be able to apply the Tram security brakes quickly.

- The instructor must be seated and secure in the cab to the extent that he can apply the brakes even when the Tram is performing unpredictably.

- The instructor's seat may be a portable item,supplied with the Tram.

The driver's seat, unless purpose-designed for a Tram, shall be a seat specifically designed for bus applications rather than for other vehicles such as heavy rail or heavy goods vehicles, as it must be capable of being adjusted frequently without any damage. The seat must be of ergonomic design, easy to clean and easily removable from the cab. The seat cushions shall be easily removable for cleaning.

The driver's seat must be easily adjustable so that 95% of adult persons may be seated comfortably with effective reach to the drivers' controls, and maintain unrestricted lines of sight through the windscreen.

Both cabs on each Tram shall provide stowage for:

- A points handle, typically a steel bar about 1m long (supplied by others). This must be placed so the driver can easily take it with him when leaving the cab, and so it must be stowed and un-

stowed without risk of damage to the cab finishes or equipment. When not in use it must be secured so as to prevent becoming a hazard in the event of an emergency stop or a collision.

- A first-aid box (supplied by others)
- A fire extinguisher to be supplied with the Tram.
- A place to hang a driver's coat, where it will not interrupt the view in any direction.
- A place to hold two A5 ring binders of timetables, information and procedures.
- A place to clip an A5 sheet of paper, which can be conveniently referred to by the driver (whilst at a Tram stop), and which does not obscure any controls or gauges.
- A hand lamp (supplied by others)

Provision shall be made within each cab to allow two operational personnel to separately and securely store personal effects

There shall be provision in each cab for a secure cash box (supplied by others). The dimensions of this are to be provided by **tie**.

There shall be charging points in each cab for a portable radio and a hand-held ticket machine.

The tram shall be fitted with holders in each cab for a destination board, for the purpose of indicating additional destinations of public interest. This board is to be placed in position by the driver so as to be seen from in front of the tram. The dimensions of the board are to be provided by **tie**.

24.14 Tram Controls

The layout of controls, switches and instrumentation shall be agreed with **tie** on the mock-up, by use of design submittals and the use of the mock-up. The desk panels shall be made of material that is wear resistant and free from reflections.

It shall be possible to drive the Tram from each cab. Insertion of the driver's key and the operation of one switch in either cab shall switch on all of the equipment needed to enable the Tram to be driven from that cab. Essential sub-systems shall not be separately switched.

The Tram acceleration and braking shall be controlled from a combined controller handle, incorporating a dead man safety device. This shall normally be locked out of use until released by the driver's key, which shall remain captive in the controller until the controller is placed in the off

position. It shall not be possible to operate the Tram with more than one controller in use at any one time.

The controller shall include a slow speed mode, for driving through the Tram washing plant.

The following controls shall be conveniently placed for the driver's free hand when the Tram is in motion:

First priority

- Audible warnings (bell, horn);
- Track brake (in addition to the emergency brake on the driver's controller);
- Indicators;
- Pantograph emergency drop.

Second priority

- Manual sand (in addition to the automatic sanding system);
- Windscreen washer and wiper controls;
- Headlamp dip/main beam;
- Panic Alarm;
- Tram punctuality display against timetable or headway.

The following controls shall be conveniently placed for use when the Tram is at a Tram stop:

- Door controls;
- Rear-view normal mode push-button;
- Tram Ready To Start (junction calling when at a Tramstop close to the junction);
- Hazard and marker lights;

- Air-conditioning and temperature controls;
- Saloon heating control;
- Fault reset push-button;
- Public Address controls;
- Radio controls;
- Cab light switch;
- Saloon lighting;
- Pantograph control;
- Windscreen demister.

At least one cab shall display an odometer calibrated in km. Both cabs shall display a speedometer calibrated in km/h and mph.

Windscreen wiper control shall be by means of a multi-position switch having intermittent, continuous slow and continuous fast positions. Wipers shall be self-parking to a position close to and parallel with the edge of the windscreen.

There shall also be a separate push button, which operates wipers and windscreen washers for as long as it is held down, and provides one additional sweep of the wipers after it is released.

Each cab shall be equipped with an indicator to inform the driver whether the Tram is running early or late, and by how much.

24.15 Rear View Equipment

Rear-views shall be provided by close circuit television equipment which shall function as follows:

The 'normal' view, displayed whenever the Tram is in motion, shall have two screens in the cab integrated into the desk: one on the left side of the desk and one its right. The images in them shall be the same as would be seen in mirrors.

The 'Tram stop' view shall be displayed in the time between the doors being enabled at a stop and all doors being proved closed. In this view, the monitor on the platform side (the side on which the doors are enabled) shall show the same as in normal view. The other monitor shall display the image from the rear camera on the platform side, to enable the driver to view passengers disembarking and embarking and to ensure that doors are clear before they are closed.

Note that the images of views back from the cab will be laterally inverted and those forward from the rear of the Tram will not.

A separate push button conveniently located on the cab desk shall provide the driver with a changeover facility from 'Tram stop' to 'normal mode' for as long as it is held down, to allow a driver to check that nothing is overtaking the Tram at an on-street stop whilst the doors are closing.

Closed circuit television images must remain clear enough to see a cyclist overtaking the Tram before the Tram sets off from an in-street Tram stop, even whilst it is raining, dark, under street lighting and there are car headlamps shining towards the cameras. The tram supplier will be required to demonstrate that the CCTV coverage allows drivers to effectively see all passengers boarding and alighting, as well as being sufficient for the needs of driving the tram on street.

The images from the cameras shall be displayed in the cab to the driver on colour flat-screens with manually adjustable brightness. Images on these screens shall be viewable by the driver under all ambient lighting and weather conditions and at as wide an angle as possible. Care shall be taken to ensure that 'flaring' of the image from brightly lit, wet, road surfaces is avoided. Special consideration shall be given to the use of this equipment in wet weather and poor lighting conditions, when it may be necessary to remove rain droplets or prevent them from forming on the camera lens.

Rain affects closed circuit television both by creating additional reflections from wet road surfaces and by settling on the camera housings themselves. The system must cope adequately with both.

24.16 Interior

Care and attention shall be given to provide a safe passenger environment. Passenger movement within the Tram shall be made as safe as practicable, and able-bodied passengers shall be able to move along the entire length of the passenger saloon of the Tram.

The free and safe movement and loading of passengers shall be facilitated by the incorporation of handrails, grab-poles and an interior free of tripping hazards and sharp corners throughout the Tram. The gangway width between seats shall be not less than 650mm. Hand-holds will be provided to maximise the use of standing space, particularly in vestibules and articulations.

Steps may be included to permit the movement of passenger's to or from areas where there is a difference in the height of the floor of the Tram. Steps shall not exceed 200mm in height and the quantity should be as few as possible. There shall be a minimum of 16 seats accessible to passengers without using steps.

All seats shall be at least 450mm wide, ergonomically designed, resistant to damage and soiling and have easily replaceable covers. The seats shall as far as possible not be placed on pedestals, i.e. shall not require a step up for passengers when taking a seat. Wherever practicable seats should be cantilevered from the vehicle side so as to leave a clear floor area to facilitate cleaning. Seat rows shall be pitched no closer than 752mm.

The non-slip, easy clean floor covering shall also continue up the vehicle sides and seat pedestals so that there are no corners that can act as dirt traps. The floor covering shall be hardwearing with minimal openings and continuous welded or seamless glued joints. The edges of the floor covering shall be sealed to prevent water penetration to the structure of the Tram.

The floor covering shall be highly resistant to staining from any source.

The actual floor area available for standing passengers shall be clearly identified. From this the total standing capacity shall be calculated, respecting Rail Vehicle Accessibility Regulations and the limitations of standing room in areas such as articulations. Seating shall generally be arranged transversely with minimum longitudinal seating.

The tram shall be fitted with luggage racks, distributed evenly about the vehicle and situated as close as practicable to the vestibules. The luggage racks shall occupy a floor space of up to $10m^2$ and extend the full height of the interior and have two intermediate shelves. At floor level a horizontal bar shall extend across the opening into the saloon to prevent objects rolling out of the luggage space. Luggage shall be effectively prevented from excessive movement out of the racks, either under high rates of braking or lateral acceleration. The luggage racks should be easily replaced by seating (or standing areas if appropriate) should **tie** require to do so.

The tram is to be provided with information screens so as to be visible from within most parts of the saloon. The screen should be able to display video information for events and places of public interest, and should also be able to display selected views from the closed-circuit television system. All passenger areas of Trams shall be provided with windows in all sidewalls to maximise visibility for passengers. This requirement shall also apply to draught screens and separation walls to the driver's cabs.

The Tram shall provide data on the number of passengers boarding and disembarking at each Tramstop. This data shall be easily downloaded each day when the tram returns to the Depot. Software to allow analysis of the data shall be provided.

The passenger counting facility shall be incorporated on 6 of the trams in the fleet only. It shall be possible, with minimum disruption to wiring looms, body panels and major equipment, to retro-fit passenger counting equipment should this be required after the vehicles have been delivered.

Passenger stop request buttons shall be provided in the saloon area in accordance with Rail Vehicle Accessibility Regulations.

Interior saloon lighting shall provide glare free, uniformly distributed illumination in passenger areas, to a level of between 280-350 lux. The lighting diffusers shall be easily cleanable.

Emergency internal lights must function after disconnection from the overhead power supply (at all operating temperatures) in accordance with the battery back-up and load-shedding requirements below. Emergency internal lighting shall provide a minimum illumination of 30 lux at floor level and shall be evenly distributed in each passenger area of the Tram. The operation shall be independent from the overhead line power supply. Uniformity of illumination shall not be less than a factor of 0.4 Headroom throughout the seating areas shall be at least 2.1m to ceiling.

There shall be litter bins provided at each vestibule on both sides of the tram, each being able to be filled with typical soft drink cans. The litter bins shall be easily emptied.

All passenger areas of Trams shall be provided with a heating and ventilation system that maintains a constant acceptable ambient temperature during transit between Tram stops and during boarding and alighting at Tram stops when operating in all prevailing climatic and environmental conditions on the proposed route.

The arrangement of heating devices shall prevent excessive draughts caused by high airflow rates, due to the even warm air distribution inside the Tram. With the appropriate arrangement of the

vents, the air inside the Tram shall be heated and distributed over a large area through natural convection. Pockets of hot and cold air shall be avoided.

The interior of each Tram shall be fitted with reserved spaces for on-board advertising and passenger information notices. These spaces shall allow cardboard panels, 210mm deep, to fit snugly into retaining grooves. A clear smooth surface at least 160mm deep shall be available between the grooves to allow for the fixing of vinyls. There shall be a route map above the inside of every passenger doorway. The Infraco shall ensure that the Tram Supplier shall produce and fix all notices required by law or the Safety Management System, and fix free-issue logos, route maps and other notices, using appropriate materials and attachment methods, against a schedule which shall be agreed by **tie** on the mock-up.

Trams shall be fitted with racks close to the vestibule areas for holding information leaflets and newspapers. The arrangement and design of these racks is to be agreed by **tie** on the mock-up.

Two night partitions shall be provided which are fully retractable and can be securely stowed when not in use. These partitions shall be located adjacent to the articulations on either side of the wheelchair area towards the centre of the tram.

This night partition should be included in the mock-up.

The function of these partitions shall be to enable the rearmost portion of the tram to be securely locked out of use by the on-board inspector in order to enable him to more closely supervise the passengers in the forward portion of the tram whilst retaining the wheelchair facilities, as required by RVAR.

The partitions themselves shall be simple to operate by one person in the range of 5th percentile female to 95th percentile male. It shall be possible to lock the partitions in either the stowed or fully deployed position using a key which is carried by the on-board inspector as part of his normal duties. It shall be possible to deploy and stow the partition within 2 minutes. When deployed or stowed the partition shall be robust enough to withstand a person falling against it without sustaining damage.

A key operated control, located such that it may be conveniently operated by the on-board inspector with the partition deployed, from either side of the partition, shall cause the lights in the rearmost (isolated) portion of the tram to be reduced to emergency lighting levels, and disable the external door pushbuttons in order to prevent passengers accessing this portion of the tram. Under all circumstances the crew entry functionality at the single end doors shall remain operable and it shall be possible to operate the emergency door release throughout the tram. Additionally the Passenger

Emergency Communication Units shall remain active in all parts of the tram. The activation of the key operated control shall be indicated in the active driving cab but shall not cause a fault alarm.

In order to assist with the design the following information gives the anticipated normal method of operation.

At a terminus where the partition is to be put in place:

- The passenger doors will be opened in the normal way to allow passengers to exit and enter the tram (at this point they may board at any point in the tram);
- The driver will close and remove the enable command from all doors before closing down the cab and walk to the other cab;
- The on-board inspector will move any passengers in the area to be closed off to the portion of the tram forward of the partition;
- The inspector will then secure the partition in place and operate the key switch to deactivate the rearmost door controls and dim the lights;
- The driver will activate the forward cab and enable the doors for passenger boarding in the normal manner prior to departing.

Consideration should be given to providing an indication on the side passenger information displays to indicate to intending passengers that boarding is at the forward end of the tram only.

Tram loading will be uneven when the partition is deployed. The implications on load compensation in traction and braking control of the tram shall be considered and should continue to function appropriately when this condition is in force.

Interior ceiling and coving panels should be securely retained, so that they do not fall onto the maintainer when the catch is released. All interior panels should be small enough to be handled and lifted by one person unaided.

The interior livery shall be developed as part of the system identity and branding package and is to incorporate the features set out in the Design Guidelines. Typically this shall include the following factors:

- Paint finishes should use the same colours as for the exterior;
- GRP interior panels / door interiors / lower finisher trim for bonded glazing shall be Blue RAL 5005;
- Roof / coves / sides laminates shall be the same colour as Perstorp PP5650U Cezanne;
- Seats and wheelchair backrests shall be covered in Holdsworth Edinburgh Tartan – W218ET (including priority moquette);
- Driver's seat covering shall be Black hide material;
- Floor colours shall be as per Taraflex Luna NT Lewis (Taraflex Red BEF 53/01) and Taraflex Polaris NT Arran (Taraflex Blue BEF 33/01);
- Floor covering weld cord – Yellow;
- Seat backs shall be in Lothian Blue; and
- Hand rails and stanchions shall be in Red RAL 3020.

Passenger seats shall be of a similar style to the Grammar Pratico 2845 Low backrest, as currently deployed on Lothian Buses.

24.17 Bogies

The vehicle will have a minimum of 66% adhesive weight on motored axles.

The bogies shall be of proven design and have been used successfully in another Tram project.
The bogies will incorporate suspension systems to give a high-quality ride characteristic. The suspension system will be self-adjusting or adjustable for wheel wear so that ride heights can be closely maintained.

The ground clearance (from top of rail) fully laden with worn wheels shall not be less than 50mm to any part of the bogie structure except a track guard.

Each axle on the motor bogies will have a spring-applied friction brake. It shall be possible to release the spring-applied brake manually in the event of failure of the actuation system. Under normal operation the parking brake will release and apply automatically when the driver's controller is activated.

Each bogie shall have two electro-magnetic track-brakes, one suspended over each rail between the wheels.

The wheels shall incorporate resilience and damping in order to minimise noise and vibration. Tuned vibration absorbers will be fitted after carrying out tests to determine their most effective parameters.
Effective under-run protection arrangements shall be provided. The end bogies will carry adjustable track guards on their outer ends, to conform to Railway Safety Publication 2 – Guidance on Tramways, issued by the Office of the Rail Regulator requirements for under-run protection. The motor bogies will be interchangeable with each other.

Removal of components such as brake actuators, suspension units, etc. will be facilitated to allow on-site repair and replacement of major items such as motors or wheels to take place with the minimum of Tram down-time.

The ride comfort levels measured according to the ISO 2631 Standard on a ballasted straight and level track in good condition shall be no worse than:

Speed	Wz vertical	Wz lateral
40 km/h	2,32	1,58
70 km/h	2,96	2,36

Table 59 - Ride Comfort in the Driver's Cab

Speed	Wz vertical	Wz lateral
40 km/h	2,24	1,64
70 km/h	2,82	2,28

Table 60 - Ride Comfort in Passenger Compartment

At least two wheelsets of the Tram shall be equipped with flange lubrication equipment on all wheels. Both sides of the flange shall be lubricated. It shall be capable of being programmed to operate on the basis of either location, or of a time interval, or a combination of these.

24.18 Re-Railing

The Trams shall be capable of being returned to the running track in case of derailment with the minimum amount of equipment and in the shortest possible time. The Infraco ensure that the Tram Supplier shall indicate the best methods for re-railing and the equipment required, for all track forms used on the system.

If the Tram design includes suspended body sections, then articulation locks shall be procured by the Infraco from the Tram Supplier.

24.19 Propulsion Equipment

The Tram shall not export additional risk onto Network Rail infrastructure. In particular, the harmonic generation from the propulsion and control equipment shall not interfere with train-borne or trackside systems or other third party systems and infrastructure.

The traction equipment shall detect and automatically manage wheel slip and wheel slide, so as to maintain performance and stopping distances in all track conditions and without damage to the wheel treads. When slip or slide is detected sand will automatically be applied to the rails in front of the leading axle. Sanding must not take place due to spurious wheelslip/slide detected at flange running crossings, pointwork or sharply curved or transitional track. The traction equipment shall tolerate variations in wheel diameter.

The Trams will have the following performance when motoring, on straight and level track and with a nominal line voltage of 750V dc:

Speed (km/h)	Load	Performance	Notes
0 -> 30	Up to AW4	1.2 m/s^2	Instantaneous
0 -> 70	Up to AW4	0.8 m/s^2	Average

Table 61 - Tram Performance Levels

The effect of variation of the line voltage (within the prescribed system limits) on the Tram performance, shall be provided by the Tram Supplier on behalf of the Infraco. The maximum line current, and the conditions when it shall be demanded by the Tram, shall also be provided by the Tram Supplier on behalf of the Infraco.

The Trams shall provide safe operation on all gradients under degraded performance modes as imposed by the traction equipment. In particular, the Trams shall be able to complete any journey on the System with one complete traction drive unit isolated.

The traction and braking control system shall be optimised to provide smooth and low jerk values in starting from rest, acceleration, braking and stopping, on level track and on all gradients that are encountered, under all loading and environmental conditions, while protecting against unintended downhill movement.

The Tram may be fitted with a short-time rated emergency mode, with a higher tractive effort, to assist in recovering other Trams.

24.20 Braking Equipment

The Tram Braking Equipment shall be designed to comply with BS EN 13452 Part 1 except where stated below.

The service brake application shall be capable of retardation at an acceptable rate (as defined in Tables 3 and 4 of BS EN 13452 Part 1) at all specified laden conditions and the jerk rate shall be limited so as to not cause discomfort to standing passengers. The service brake shall normally consist of a regenerative electro-dynamic brake, (that as far as is practicable shall return the braking energy to the overhead line) and a friction brake. The electro-dynamic brake shall normally take precedence over the friction brake.

The regenerated voltage shall not exceed 900V. Should the overhead line become unreceptive, the braking energy shall be dissipated in naturally cooled resistors. Transition between regenerative and rheostatic modes shall be automatic, instantaneous and free from jerk. Braking distances and deceleration rates shall be unaffected by transitions during braking.

The brake resistors shall be protected from overheating. Malfunction of the dynamic brake system must be detected and recorded by the fault monitoring system.

Electro-dynamic and friction brakes shall be blended. In normal operation the friction brake will take over from the electric brake at a low speed. In addition, sand will be applied automatically during braking when triggered by the wheel slip/slide control system. Should the electro-dynamic brake be unavailable on any particular traction drive then the friction brake will be automatically applied to compensate, without jerk or loss of performance.

For emergency braking applications the jerk rate shall be limited without compromising emergency braking performance. The friction braking system should be capable of repeated full service or emergency brake applications.

The Tram parking brake shall be of sufficient performance for a Tram (whether laden or unladen) to hold without movement and for an indefinite period another unladen Tram without brakes on the steepest gradient on the Edinburgh Tram Network under all adhesion conditions.

The braking function and performance of the Tram shall be in accordance with Tables 3 and 4 of BS EN 13452 Part 1. The definitions of the braking modes given in these tables are as defined at Section 3.2 of the Standard.

When the Emergency brake is applied, the track brakes should be released immediately before the Tram comes to rest in order to minimise jerk to passengers.

All braking and jerk rates shall comply with the requirements defined in Standard EN 13452.

24.21 Run Time

The Trams will be capable of being operated continuously for twenty hours in each day.

A runtime simulation will be carried out by the Infraco to demonstrate the required end-to-end journey times. The Trams shall have sufficient performance and ratings to meet the requirements for these run times and end to end journey times. The inputs to the simulation shall be based on theoretical Tram performance validated by type test measurements with similar Trams in service elsewhere. The infrastructure and operational assumptions for the runtime shall include, but not be limited to:

- Alignment information, including speed restrictions due to geometry and sighting restrictions;
- Location of Tram stops and assumed dwell times;

- Speed restrictions due to the presence of pointwork;
- Service brake rates including agreed allowances for driver variation and technique, and varying adhesion conditions;
- Jerk rate and acceleration compliant with the requirements;
- Assumed delays due to operation in mixed traffic, which may be in the form of assumed speeds or time delays;
- Assumed delays due to the operation of the traffic-signal-controlled junctions, which may be in the form of assumed speeds or time delays;
- Tram loading;
- Wheel wear; and
- Traction system supply voltage.

24.22 High-Voltage Equipment

All Tram-borne high voltage equipment shall be adequately rated for operation at the line voltage. All high voltage equipment other than the pantograph will be securely enclosed in rigid, metal and earthed equipment cases.

The high-voltage sub-systems will be protected by high-speed circuit-breakers or fuses, which shall be enclosed so that their operation does not cause alarm or danger to persons standing near to the Tram. The length of electrically unprotected cabling between the pantograph and the protection devices shall be minimised.

Wherever feasible, there will be duplication of primary assemblies in order to minimise the potential for single-point failures. There will be a minimum of two self-contained traction groups, so that failure of a traction drive on one bogie does not immobilise the Tram.

24.23 Auxiliary Power Supply Systems

The auxiliary supply converter(s) shall start when fed from the overhead line, irrespective of the state of charge of the batteries.

The converter outputs for auxiliary supplies and battery charging derived from the overhead supply shall be isolated from the overhead supply to prevent any possibility of excessive voltages appearing on the low-voltage circuits.

The saloon heating units (if mounted in the saloon area) shall be provided with appropriate protection and insulation for the heating elements and their terminal connections.

The charging system for the batteries will be appropriate to the type and size of battery provided.

A suitable socket for connecting a 24V battery charging supply shall be provided.

The batteries shall be of a low maintenance type suitable for traction applications and enclosed in electrolyte-proof containers to contain environmental pollution in case of damage. There shall be absolutely no possibility of spillage from the batteries entering the passenger saloon or the cab. The battery enclosure shall be vented to prevent the build-up of gases.

In the event of loss of the 750V overhead supply, the batteries will allow all essential systems to operate for a minimum of thirty minutes. Certain critical functions will continue to operate for up to one hour from battery supply:

After ten minutes:

- The saloon lighting system shall revert to emergency lighting only.

For up to thirty minutes, the following systems shall remain in operation:

- Brake system;
- Public Address system ;
- Emergency lighting; and
- Door system.

For up to one hour the following systems shall remain operational:

- Pantograph;
- Minimum exterior lighting; and
- Radio communication system.

24.24 Faults and Diagnostic System

The Trams will have a condition and fault monitoring system integral with the vehicle control system, to give indication to the driver of the status of equipment and to allow control of degraded modes. Failures or events requiring maintenance intervention shall be recorded by an on-board system that shall retain all pertinent details after the Tram has been shut down, for downloading and analysis by maintenance staff. This system will have sufficient capacity to store such information at least for the interval between scheduled maintenance examinations, on a first-in, first-out basis. There shall be a visible indication that at least one day's worth of recording remains available.

The downloading of data shall be accomplished using a commonly available lap-top computer or related portable device. Any software or special equipment or licences required to download or analyse the data from the Trams shall be provided by the Tram Supplier.

The display for the driver shall also provide unambiguous information of the status of the Tram, and the severity of any faults present. In particular, the system shall continuously indicate one of the following fault states according to the condition of the Tram:

- Tram OK;
- Minor fault, report to control and continue;
- Major fault, report to control and continue in degraded mode;
- Major fault, Tram must be immediately taken out of service; and
- Major fault, Tram inoperative.

The Tram shall perform a self-check automatically whenever it is started up from a shut-down condition.

24.25 Sanding System

The Tram shall be equipped with a system, which deposits sand immediately ahead of the driven wheels in the direction of travel to rectify any poor adhesion conditions at the wheel/rail interface. The system shall be activated both automatically whenever wheelslip or wheelslide is detected, and manually when under control of the driver. Sand will also be automatically applied whenever the emergency or security brakes are used.

Sand shall be deposited on at least two locations on each rail per direction of travel. The rate of sand deposition shall be no more than that required to correct the poor adhesion. The automatic sanding system shall be inhibited when the Tram is stationary, unless activated manually. The sanding unit response time shall be effectively instantaneous.

The Tram-mounted sand boxes shall have sufficient capacity for a full day's service under all conditions of weather and loading.

The sand filler covers shall have seals to keep the sand content dry under all weather conditions, and when the vehicle is being washed.

A means of ascertaining the sand level in the sandboxes shall be provided, visible from within the Tram.

The Tram sandboxes shall be filled from outside of the Tram using a sand dispensing plant at the Depot. The sandbox arrangement will be compatible with the sand dispensing plant such that it is possible for the driver of the Tram to completely fill all the sandboxes in five minutes. In the event of failure of the plant, it shall also be possible to fill the sandboxes manually, and if any special equipment is required for this, the Infraco shall ensure that the Tram Supplier shall provide it.

24.26 Passenger Doors

The Tram will be equipped with at least four pairs of bi-parting sliding-plug doors, plus two single doors, on each side of the vehicle for the passenger saloon and one internal cab door per cab with a clear opening of not less than 610mm. The doors shall be equipped so that rainwater does not drip onto passengers when the doors are opened.

The passenger saloon doors shall be fitted on both sides of the vehicle in the low-floor area. The doors will be of the following characteristics:

- The double door clearance width shall not be less than: 1300 mm
- The double door clearance height shall not be less than: 2025 mm
- The closing force shall be: <200N
- The opening force shall be: <250N

The doors will be opened and closed by the driver or simply released by the driver so that the passengers will be able to open the doors themselves using door push buttons. The push buttons will be illuminated when they are activated. The doors shall stay open for a fixed time before closing automatically. A warning tone shall be sounded when the doors are released and a different tone shall sound to give warning of door closure.

Devices will be incorporated into the individual door control mechanisms, or in the leading edge of the door, to detect and protect against door obstruction. Slow or defective door mechanisms will be indicated to the driver by the vehicle fault management system. The driver shall be able to isolate any door by using the driver's key to operate an isolation switch local to each door. Such a door shall be secured from all forms of operation other than emergency release.

It shall be possible to open each door manually in case of emergency (including any door that has been isolated). An internal emergency handle will be provided at each door entrance. Operation of the handle shall cause an immediate application of the emergency brake and unlock the door such that it can then be moved open by hand after the vehicle is stationary. The emergency handle will only be able to be reset using the driver's key.

The door edges shall be fitted with weather-proof seals that are soft enough to allow a person's fingers to be withdrawn after the doors have closed. The seals shall be effective against all likely weather conditions and in the Tram washing plant and shall not offer a hand-hold to allow persons to ride on the outside of the Tram.

The Tram shall accept a door enable command from the driver when the Tram speed is below 10km/h, but the doors shall not become enabled until the Tram is at a standstill. If, having been enabled, the Tram speed then rises above 10km/h, the enable command shall automatically be cancelled.

The time from the Tram coming to rest to doors being fully open in response to a prompt passenger demand, plus the time from the driver pressing the door close button to the Tram moving off, shall be less than 12 seconds. This time shall include all necessary delays for RVAR-required tones. The doors themselves shall move from closed to fully open or vice versa in 3.5 seconds or less.

The door guidance mechanism shall not be a swing plug mechanism nor a folding door.

The following controls shall be fitted in each cab for driver control of the doors:

- Separate door-enable controls for the left and right sides. It must be possible to enable both sides simultaneously. The 'enable' buttons of the Tram should each be located on the appropriate side of the cab desk.

- One door 'open' button, which will open any doors previously enabled, but not opened by passengers, provided the Tram is at a stand still.

- One door 'close' button, which will close all doors that are open. This will be the normal mode of door closing at Tram stops other than termini.

- To prevent the doors being enabled on the wrong side, the door enable shall be interlocked and programmed with the correct side for the platform at each Tram stop along the route. This feature shall be capable of being over-ridden by the driver (for example, if the Tram uses an unusual platform at a terminus), but such over-ride shall require the driver to press at least one additional button, which shall not be located adjacent to the other door controls in the cab. It shall be possible to open all the doors when the Tram is in the Depot.

The door enabled indicator lights at the doors shall illuminate and the door enabled tone start, simultaneously with the door actually becoming available.

A door shall re-close automatically, with warning tone, if no obstacle is detected for twenty seconds (configurable). This will be the normal mode of door closing at termini.

When all doors are closed and traction is available, an audible signal, distinct from all other tones and quieter and less offensive than any alarm tone, shall sound in the cab in use. This is preferred to a lamp or other visual signal as the driver already has to view the platform and check ahead before moving off.

Unless a separate external cab door is provided, the door nearest each cab on each side (four doors in total) of the Tram shall be provided with local internal and external 'door open' and 'door close' switches operated by the driver's key. These shall be spring-loaded centre-off, turned one way to open and the other to close. Any door opened using a local switch shall be capable of being closed either using the appropriate local switch or the 'door close' button in any active cab. The purpose of these switches is to allow local control of the door by a driver who needs to leave and re-enter a passenger-carrying Tram, for example to operate points, at a place which is not a Tramstop. In addition, unless a separate cab door is provided, a separate control shall be provided in the cab to allow the Tram driver to open and close the nearside front passenger door separately from the cab. This is to allow the driver to open and close this door separately at the crew change halt at the Depot. An exterior emergency door release shall be incorporated to comply with the requirments of Railway Safety Publication 2,

The door-enabled tone required by Rail Vehicle Accessibility Regulations 1998 (as amended) shall be audible from both inside the Tram and on the platform. This may require an additional external sounder if, in order to be heard outside, the internal one is uncomfortably loud for passengers on the Tram.

24.27 Communication and Monitoring Systems (CCTV)

Spatial provision shall be made in the most appropriate part of the Tram for the operational radio system, driver control units and tram position and detection system equipment, including the associated cabling, support equipment, microphones, speakers, antennae and power supplies. The cabling shall be installed and tested by the Tram Supplier.

These sub-systems will be supplied by the Infraco as free-issue items to the Tram Supplier, and shall be installed and functionally tested during the Tram manufacturing process. The Infraco and Tram Supplier shall work with the suppliers of these sub-systems to define and agree the interface requirements.

The Tram shall be fitted with cab-to-cab intercom facilities. The intercom facility will also provide communication between all four cabs when two Trams are coupled during the recovery of a defective Tram. This facility shall be fully duplex and hands-free.

The Tram shall be fitted with internal cameras that record digital images covering:

- The whole of the saloon, (including the passenger help points) with sufficient clarity to enable individuals to be identified for evidential purposes; and

- The views ahead/back from the cabs.

The resolution of recorded images and recording speed of images shall be of a quality from which it would be capable of being reliably used as part of an accident investigation, and in respect of the saloon images shall be of a quality to enable a conviction in the event of illegal activity. Appropriate labelling in accordance with regulations governing the use of such equipment shall be put in place.
The cameras shall be of a hemispherical type without any detectable direction of the camera view. Additional information, i.e. time, date, camera number and the Tram number will be added to every image recorded.

The recorded Closed Circuit Television images will be capable of being retained on the Tram for not less than 72 hours at which point the system will restart recording and erase the retained image. Minimum frame rate shall be 16fps, per camera. Consideration should be given to providing a push-button in the cab to enable the driver to add an index-point to the recorded images.

Closed Circuit Television images shall be taken from the Tram for subsequent retention and analysis. This shall be done using a removable data storage medium rather than by data transfer. It shall be readily apparent to the Tram driver and to maintenance staff when the storage medium is not present on the Tram. The data storage medium shall be retained by a secure locking device, that is not released by a Tram system key. All data storage devices shall be interchangeable between trams.

All software required for off-Tram viewing, editing and analysis, shall be procured by the Infraco from the Tram Supplier. This shall include any non-standard supporting hardware and any associated licences.

24.28 Event Recorder

The Tram shall include a data recorder capable of providing time, speed and distance information at 1.0m resolution or better for the last day's operations, and at 10.0m resolution or better for the last seven days' operations. Additionally, the start and end of the following events shall be recorded:

- Horn;
- Bell;
- Traction;
- Brake;
- Hazard brake;
- Safety brake;
- Track brake;
- Driver's Safety Device;
- Door enable left present;
- Door enable right present;
- Manual sand command present;
- Tram Ready to Start;

- Hazard lights;
- Left indicator;
- Right Indicator; and
- Passenger Help Point.

Software enabling event recorder download data to be interrogated and displayed in both graphical and tabular format shall be provided. The software shall also enable all of the data to be exported into Microsoft Excel for further analysis.

The data shall be recorded onto a secure, removable data storage medium. The data recorded shall include the Tram number and date. The data shall be retained and be retrievable at least until 48 hours after the Tram has been shut down. The data storage medium shall be retained by a secure locking device,that is not released by a Tram system key. All data storage devices shall be interchangeable between trams.

The Infraco shall ensure that the Tram Supplier shall indicate how the distance base of the recorder shall be recalibrated in normal usage.

24.29 Public Address System

Automatic, audible announcements for destination and stops shall be made by means of a digital voice announcement system. The Tram Supplier shall supply a copy of any necessary equipment and software needed to upload new and amended announcements or to alter the times and places at which announcements are made. The system should allow for a sound quality of RASTI 0.7, or better.

Additionally, the Tram shall be fitted with both internal and external public address systems, selectable individually by the driver, to allow the driver to make direct announcements.

The following are additional to the requirements of the Rail Vehicle Accessibility Regulations 1998 (as amended):

- Rail Vehicle Accessibility Regulations permit audible announcements between stops to be omitted where the run time between stops is less than two minutes. This option is to be used wherever possible.

- Where stops are omitted the system shall automatically allow for this without intervention of the driver.

- At a stop, in addition to the Rail Vehicle Accessibility Regulations requirement of announcing the next stop and destination, the equipment must also be capable of announcing the current stop. The form of the announcement to be provided initially shall be:

  "This is <name of current stop>. This Tram is for <name of destination>. The next stop is <name of next stop>."

It shall be initiated by the door enable, and there shall be a short delay so that the door-enable tone is finished before the announcement starts.

24.30 Passenger Information System

The Tram shall be fitted with six external destination displays, one at each end above the cab and two on each side, one near each end. The side displays should not be obscured by open doors. These displays shall be capable of displaying as a minimum a service number and the ultimate destination of the Tram. The displays should be legible from an oblique viewing angle.

In addition to the text indicating the destination of a tram on both the side and cab exterior displays an area immediately preceding the text shall be reserved for a single symbol. This symbol shall be displayed in an array of LEDs of the same size and resolution as that of a text character. The symbol shall be in a single colour which is the same as that of the text display. It shall be possible to display a variety of characters including simple geometric shapes and representative symbols (e.g. an aeroplane to indicate AIRPORT as the destination). It shall be possible to select an appropriate symbol during the programming of the system which will then appear on the display when the driver selects his route.

The purpose of this feature is to assist passengers with reading difficulties to ensure that they board a tram on the correct route for their requirements.

Internal saloon displays shall be used to show information concerning the next stop and additionally a "Tram Stopping" sign. They shall also display the local time, and should also be able to display public service information. The number and location of these displays shall be such that the information shall be easily visible to passengers within any part of the Tram.

The internal visual displays shall display, successively:

- Screen 1: Tram to
- Screen 2: <Destination>
- Screen 3: Next Stop
- Screen 4: <Next Stop>

Stepping to the next stop name shall take place on arrival at a stop once the doors are enabled. Where stops are omitted, the displays shall take account of this automatically without the intervention of the driver.

The size of the Passenger Information Display font shall conform to the requirements of the Rail Vehicle Access Regulations 1998 (as amende). The brightness of the displays shall compensate for ambient light quality.

After leaving the stop before a terminus, the external destination indicators shall change to show the destination of the next trip, so that the Tram arrives at the terminus with the correct next destination already displayed.

24.31 Passenger and Inspector Alarm System

Passenger alarm devices shall be located in the saloon area, at every door area and at the disabled passengers area. These devices shall allow communication with the driver and the location of the active device shall be indicated on the driver's display. The communication system shall be fully duplex.

Request 'Stop' buttons shall be provided and shall be compliant with Rail Vehicle Accessibility Regulations 1998 (as amended) and shall:

- Become operable when doors are proved closed at a Tramstop;
- When the first one is pressed, sound a single audible warning in the cab, illuminate a warning light in the cab and illuminate the Tram stopping indicators (required by the Rail Vehicle Accessibility Regulations) 1998 (as amended) in the saloon;
- No further audible warning in the cab from subsequent button pushes; and

- Be positioned such that they can be easily activated by any passenger intending to disembark, but should not be positioned such that they can be inadvertently activated by standing passengers.

Request stop from the wheelchair spaces shall:

- Illuminate a different warning light in the cab.
- Create a door open request for the nearest door, so it opens as soon as enabled.
- Override the automatic close on that door for the next opening.

All request stop indications shall be cancelled by the next door enable command.

Devices shall be provided that enable the on-board inspector, working within the saloon or on an adjacent platform, to alert the tram driver to an incident.

The handheld, pocket sized device to be carried by the on-board inspector shall have 2 modes of operation. Mode 1 will provide an alarm to the driver to indicate that the inspector is experiencing difficulties or feels under threat. Mode 2 will alert the driver to an immediate emergency e.g. the inspector is under physical attack.

When the inspector initiates a Mode 1 alarm the handheld device will operate silently. If a Mode 2 alarm is initiated a loud 'panic alarm' sound will be emitted from the handheld device in order to deter the attacker.

The inspector's device shall be stored in a charger/holder in the Depot Duty Room for Drivers and Inspectors and picked up by the inspector as he begins his duty on the tram. The Inspector's device shall be equipped with a mounting device and sized such that it can be conveniently and comfortably be carried on the ticket issuing machine shoulder strap. Each cab of the tram shall be equipped with a receiver capable of responding to all alarm Modes transmitted within range.
It shall be possible to replace either the handset or the receiver with a spare in the event of failure or loss.

The handheld device and related system shall operate satisfactorily in the electromagnetic environment which will be encountered on the Edinburgh Tram Network.

24.32 Hauling or Propelling a Defective Tram

An emergency coupler will be provided at each end of each Tram. It will be used only for hauling or propelling a defective Tram. The couplers will normally be concealed behind a removable cover. Coupling must be possible at all locations on the Edinburgh Tram Network.

An empty Tram shall be capable of both hauling and propelling (but not both simultaneously) another empty Tram, which is incapable of movement under its own power, between any two points.

As well as mechanical coupling, the following control facilities shall be provided on a coupled pair of Trams:

- Track brake control of both Trams from the cab in use, assuming that each Tram's batteries have sufficient charge;
- Through intercom between all cabs; and
- Through control and power to hazard lights, brake lights and marker lights.
- The intercom, marker lights, brake lights and hazard lights shall be operational on both Trams even if the Tram being assisted has no battery power available.
- The Tram will have a true reverse direction capability from a leading cab, to allow the uncoupling of one Tram from another. This will be enabled with the use of a sealed switch.

24.33 Exterior Details and Livery

The exterior livery shall be as set out in Section 5 of these Employer's Requirements.

The paint shall typically be water based and should allow for the application and removal of advertising vinyl coverings without damage.

The Infraco shall ensure that the repair methods for the Tram shall be defined by the Tram Supplier and shall not import undue risk with regard to the processes and materials used.

The external lighting shall comply with Her Majesty's Railway Inspectorate Railway Safety Publication, Part 2, The Road Vehicles Lighting Regulations, 1989 and the amendment 1994.

The external lighting shall consist of Light Emitting Diode (LED) arrays wherever practicable, and shall be composed of:

Facing forward

- Two white dip-able symmetric headlights;
- Two white front position lights (integrated in the headlight cluster)(side lights);
- One fixed white centre headlight located centrally above the windscreen;
- Two amber direction indicators; and
- Two end outline marker light (white, at high level).

Facing rearward

- Two red rear position lights (tail lights);
- Two red brake lights;
- Two high intensity rear fog lights (red);
- Two amber direction indicators; and
- Two end outline marker lights (red) (at high level).

Side Markers. Four, or more, amber LED combination lights down both sides working as:

- Side marker lights;
- Direction indicators; and
- Side reflectors.

The Tram exterior shall be designed so as to prevent surfing by any individual.

The Tram exterior finish shall allow for easy repair to accidental damage and severe attacks of graffiti. The finish shall allow for the easy application and removal, if required in the future, of special finishes for advertising, such as self-adhesive vinyl.

24.34 Roof-Mounted Equipment

Much of the electrical traction and auxiliary equipment will be housed in equipment cases located on the roof of the Tram. The equipment cases will be robust, weatherproof and suitable for storage and operation in an exposed position. All enclosures will minimise the risk of condensation, and provide adequate and effective ventilation for cooling where required. The normal working of the roof-mounted equipment shall not be adversely affected by dust, wind, rain, snow or ice.

Access to the equipment within the equipment cases will be quick and straight-forward for suitably qualified and trained staff, working from high-level platforms. Standing areas shall have non-slip surfaces. Due regard will be given to the safety requirements considering the location at height and the working voltage. Specific measures will be required to mitigate the risk from charged capacitors and batteries, and equipment likely to be at high temperature. All metal enclosures shall be suitably earthed to the vehicle structure.

All the roof-mounted assemblies shall be easily removable with the minimum amount of disruption to the Tram, to allow repair by replacement. The use of plugs and sockets to allow quick connection and disconnection of assemblies is preferred. Cabling and piping shall be protected from accidental damage.

As far as is practicable, the equipment will be equally divided between the two end sections of the Tram to equalise weight distribution.

The location of the pantograph will be determined by the layout of the Tram and shall be mounted above a bogie and as near to the centre of the Tram as possible.

24.35 Pantograph

Infraco shall ensure that the pantograph for the tram fleet shall be supplied by Tramco.

The governing specifications for the pantograph shall be BS EN 50206-2, BS EN 50119 and Railway Safety Publication 2 - Guidance on Tramways, issued by the Office of the Rail Regulator.

The wire height requirements shall be confirmed, including the operational wire heights within the depot buildings, over-bridges and high load route areas.

A single roof mounted pantograph shall be provided compatible with the Edinburgh Tram Network OLE.

Failure of any porcelain insulators on the lightning protection or other equipment shall not allow flexible cables to fall onto the vehicle roof.

The pantograph mechanism shall raise and lower using an electric drive system. In the event of failure or emergency situation, it shall be possible to lower the pantograph using a hand-crank operated from inside the Tram.

In developing the OLE design, the following pantograph / OLE characteristics have been assumed.

- Maximum wire height 6.8 m
- Minimum wire height 4.3 m
- Profile to be developed
- Overall Collector Head width 1850mm assumed
- Carbon length 1000mm minimum
- Collector Head Depth 250mm
- Along track length to be developed
- Head mass (to be as low as reasonably achievable)
  - (a) Carbon 13.0 kg assumed
  - (b) Metallised Carbon 15.0 kg assumed
- Articulation (frame) dynamic mass 12.0 / 16.0 kg
- Head suspension 12000 N / m
- Frame damping raising 60 / 100 N sec / m
- Frame damping lowering 60 / 100 N sec / m
- Head suspension damping 8 / 12 N sec / m
- Quasi-static contact force 90 N / 180 N
- Friction frame hinge 8 N / 10 N

25 Tramstops

This Section of the Employer's Requirements defines the Tramstop requirements applicable to the Edinburgh Tram Network which the Infraco must comply with.

25.1 General

The Edinburgh Tram Network shall have Tramstops provided at the locations shown in Figure 1 – Edinburgh Tram Phases 1a and 1b Network Diagram of these Employer's Requirements.

All elements of the Edinburgh Tram Network infrastructure shall be designed, manufactured and installed to provide a layout and a suite of furnishings reflecting a fully integrated system and shall be of an economical design and construction that shall reflect economy of use, maintenance, overhaul and renewal.

Provision shall be made, in the form of space, agreed fixing details, local cable routes for data, power and lighting (where appropriate) for a local termination point (Tramstop equipment cabinet), to be provided at all Tramstops.

The Tramstop design aesthetic shall extend to the design of the associated street furniture cabinets, trackside isolator cabinets, point control, point heater cubicles, road junction control cabinets, detector loop cabinets, etc. which shall be visually compatible with the Tramstop furniture. Particular note shall be paid to the requirements laid down in the Tram Design Manual to ensure compliance.

The emphasis on this co-ordination shall ensure an integrated design approach within the urban environment.

25.2 Tramstop Definition

Tramstops shall provide passengers waiting for, entering or leaving the tram system with safe, comfortable, environmentally friendly, informative, high quality access and egress facilities.

Tramstops shall be of the following three types:

- Island platform stops;
- Side platform stops; and
- Combined side and island platform stops.

Platforms shall be long enough to cater for nominal tram vehicles with the extreme distance between the outer edges of the end passenger doors of the vehicle of up to 38.13 m.

Side platform stops shall provide passengers with an effective circulation area and shall be a minimum of 3.0 metres wide. Island platform stops shall be a minimum of 4.0 metres wide unless otherwise agreed with **tie**. A stopping tolerance of plus/minus 2.0m shall be allowed for in the platform length.

All platforms shall contain a minimum clear unobstructed envelope.

The platform height shall match the requirements of the tram to ensure level access in accordance with RVAR (Rail Vehicle Accessibility Regulations).

The layout of architectural elements on the platform shall be arranged to provide the user with ease of access and passage on / off the trams.

Access routes serving the platform shall be appropriate for the level of pedestrian activity and be, where practical, a direct route from key passenger generators.

Key views and vistas of the City of Edinburgh shall not be unnecessarily interrupted.

Platforms shall provide passengers with a clear view of approaching trams.

Tramstops shall maintain consistency of alignment with the track.

A Tramstop shall be defined as:

- That area bounded by the rear of any platform structure and the track crossing points at either end; (or for central stops the external track edge between the track crossing points at either end);
- Including any underground service ductwork and cabinet specifically associated with the stop, outside this zone in the immediate vicinity;
- Including all dedicated access routes to the nearest public road or key passenger generator; and
- Including all structures, systems (including cabinet), finishes etc required to deliver the functionality of the Tramstop.

25.3 Tramstop Requirements

25.3.1 General

Tramstop architecture shall reflect a coordinated design consistent with the overall design aspirations as outlined in the Tram Design Manual and in the CEC Code of Practice for Access and Mobility and shall be subject to the approval of **tie**.

All components used in the construction of the Tramstop shall comply fully with relevant British and European Standards.

Tramstops shall be compliant with amongst others:

- The requirements of the Tram Design Manual;
- Railway Safety Publication 2 – Guidance on Tramways, issued by the Office of the Rail Regulator;
- Disability Discrimination Act requirements;
- The outcome of consultation with the Mobility and Access Committee for Scotland (MACS);
- The Department for Transport Inclusive Mobility Guide to Best Practice on Access on Pedestrian and Transport Infrastructure; and
- The Building Regulations (Part M).

Reference should also be made to:

- Mobility-impaired access and egress to and from each platform, the minimum width of ramps provided on the Edinburgh Tram Network System shall be 2.0m between handrails;
- Ramps, if required, shall have a maximum gradient of 1 in 20;
- No ramp shall be longer than 10m without the incorporation of a landing;
- Landings shall be no shorter than the width of the ramp; and

- Mobility impaired tram access/egress points shall be clearly defined within the platform finish if required by the tram design and consistent with tram stopping tolerances.

Tramstops shall be of a design that ensures the mobility impaired are able to use them and all parts thereof without hindrance or confusion. All walking routes approaching or within the Tramstop area shall be clear of any form of obstruction.

Provision shall be made for those who require to use canes e.g. inclusion of tapping rails. Guardrails shall be provided with handrails.

Where appropriate, Tramstops shall be provided with handrails, balustrades, and general platform furniture, other than seating, of a design that inhibits their use as seating or as a climbing medium.

Tactile surfacing shall be provided as appropriate e.g. at platform edges, stairs or ramps (if applicable), and at dropped kerbs.

25.3.2 Platform Surface

The general platform surface shall be in accordance with the Tram Design Manual and will vary dependant upon location, but in all instances provision shall be made for tactile strips (400mm wide) to assist the visually impaired along the platform edge. The platform edge shall have a suitable 65mm wide delineation of the white or alternative inset line to the leading edge of the line-side coping, or other equivalent visual feature.

Disabled boarding points shall be indicated, if required, by use of tactile material indicating the position of the relevant tram doors.

Platform surfaces shall have a nominal cross fall away from the platform edge of 1:40 to a slot drainage system. Platform drainage will be dependant upon local topographical criteria.

The platform top surfaces shall be slip resistant and durable. Transition zones shall be provided, free of trip hazards, which can be clearly differentiated by those who are visually impaired.

25.3.3 Tramstop Furniture and Equipment

All Tramstop furniture and equipment on the platforms shall be constructed of materials and finishes that are resistant to scratching and ensure the easy removal of graffiti.

Emphasis shall be given to the reduction of 'clutter' and where possible elements shall be combined to provide a dual functionality.

The Tramstop furniture and equipment shall be designed to allow easy replacement of damaged components without affecting equipment, lighting and seating.

Tramstop furniture and equipment shall be designed to support the passenger service without maintenance intervention that results in any form of disruption to the service during service hours.
The equipment provided at each location shall be appropriate to that location to limit any unnecessary clutter at Tramstops.

Tramstop furniture and equipment shall be of a modular design based around simple geometric shapes and of modular construction to enable their rapid replacement.

Components and materials shall be of a quality suitable for use in a densely populated and marine environment.

The design of the Tramstop furniture and equipment shall ensure that minor inspection, repairs and maintenance, including lamp replacement, can be carried out during the operational day with the minimum of disruption to passengers, and without disruption to passenger services.

25.4 Description of Tramstop and Street Furniture

25.4.1 General

Each Tramstop shall include the following components:

- Passenger Shelter / Canopied Waiting Area;
- Passenger Help Point;
- Passenger Emergency Call Point;
- Closed Circuit Television Cameras;
- Real Time Passenger Information Display Bus Tracker Reporting (where identified);
- Braille assistance;

- Public Address;
- Information Panel;
- System Logo and Stop Name;
- A perch rail/seat; and
- Advertising panel (6 sheet) - if permitted by Planning Authority;
- Ticket Vending Machines;
- Lighting;
- Litter bins.

Equipment placed on platforms shall not prohibit passengers from having a clear view of an arriving tram.

25.4.2 Shelters and Canopied Waiting Areas

Each platform shall contain facilities to provide passengers with weather protection (e.g., wind, snow and rain) in the form of a canopy or shelter designed and constructed to provide maximum visual transparency with minimum visual impact, consistent with offering the required protection.

Tramstop shelters shall be of a modular design based around simple geometric shapes, providing the necessary requirements for passenger use and comfort. A clear uninhibited view of arriving trams shall be available to passengers from within the shelter area.

Tramstop shelters shall permit future easy alteration to the capacity in terms of volume of passengers and equipment to meet emerging needs.

Lighting within the shelter shall provide a minimum of 50 Lux evenly distributed (controlled by sensor).

All shelters shall be provided with adequate drainage facilities to ensure all rainwater is carried away into the Tramstop drainage system.

Side infill panels together with back panels shall be of toughened transparent glass to provide a light visual appearance and with the Roof panel of complementary quality to provide passengers with protection from the weather. The design shall be such that it provides a safe environment for passengers in the event that glass panels are missing from the shelter as a result of breakage. The design of the shelter shall also take account of access requirements for maintenance and repair purposes.

Side panels shall provide sufficient depth to give weather protection but not obstruct the safe use of the Passenger Emergency Call and Help Points and shall meet the requirements of the visually impaired.

Shelter roofs shall be profiled to prevent build up of litter / debris on the top surface. The shelter structure, roof and wall panels shall, as far as is possible, be made from proprietary components in order to facilitate ease of replacement and repair.

25.4.3 Tramstop Lighting Columns

Platforms shall be provided with a minimum illumination level of 30 Lux.

Lighting shall be low energy, avoid glare to tram drivers and road users, have good colour rendition and be provided throughout the whole of the area occupied by the Tramstop.

The Tramstop lighting shall differ from the adjacent urban and or city lighting and shall emphasise the presence of the Tramstop to enable passengers to identify the Tramstop from a distance. Consideration should be given to the requirement to make use of local ambient lighting (which may need to be enhanced) to avoid additional clutter at the Tramstop.

Access routes to the stops shall, wherever practical, use existing street lighting as the sole or primary means of illumination. Where this is not possible then lighting of a similar level to the local road lighting shall be provided.

All platform shelter / canopy lighting shall enhance security in the waiting area.

Tramstop lighting shall not conflict with the requirements for Closed Circuit Television coverage and shall permit the attachment of other stop furniture or equipments as required.

Hinged columns, hinging parallel to the track, shall be provided for ease of maintenance.

Tramstop emergency lighting facilities shall be provided in all shelters where the adjacent road lighting would be inadequate in the event of a Tramstop power supply failure.

25.4.4 Tramstop Name Signs

Each Tramstop shall include an illuminated pole mounted Logo, or more than one if there are more than one access points from a public road, or a sign incorporating the Edinburgh Tram Network corporate identity visible from a distance of 50m.

Each Tramstop shall be provided with Tramstop name signage as part of the general furniture arrangement on each platform.

Tramstop name signs shall be legible to tram-borne passengers as early as possible on their approach to the platform.

An appropriate number of stand-alone Tramstop name signs shall be provided along the length of each platform. The construction and materials shall form part of the "family" of components forming the Tramstop furniture.

The Tramstop name sign support structures shall be incorporated within the line of any guardrails, should these be provided, and into the advertising / information display.

The Tramstop name signs and Logo shall be illuminated and shall be displayed on the tram arrival side of the shelter as well as along the platform.

25.4.5 Advertising / Information Signs and Displays

A Real Time Passenger Information Display (double sided) shall be provided at each platform.

This shall take the form of a dynamic multi line visual display which is legible in all weather conditions to passengers having normal vision and standing at a distance of 10.0m away.

The Real Time Passenger Information Display shall comply with the requirements described in the Employer's Requirements.

Passenger information regarding the tram service and safety notices shall be provided at all Tramstops in both writing and Braille.

All passenger-operated equipment shall be provided with clear unambiguous operating instructions in both writing and Braille.

A suitably enclosed weatherproof map (part of the Tramstop furniture) of the local area, bearing the words 'You are Here', shall be located in each platform shelter.

A suitably enclosed weatherproof information display or displays (indicating the locations of adjacent bus stops and bus related information, hospitals, local amenities and places of interest) shall also be located at each platform access/egress position.

At appropriate key interchange locations (refer to 35.4.1 - Overview to the Passenger Information Display System), provision shall be made within the Tramstop layout to provide a bus tracker information panel, which shall be provided and installed by others.

25.4.6 Litter Bins

Litter bins, where provided, shall be stainless steel (Minimum Grade 304 to BS 5135) to facilitate easy cleaning and shall have a lockable removable bin liner.

The location of bins shall not obstruct the main passenger circulation routes and shall ensure convenience of use.

A minimum of two litter bins per platform shall be provided each positioned mid-point between the shelter and the end of the platforms.

Lockable access covers shall be provided and the bins shall be designed to limit entry and retention of liquids.

The bin size shall be determined on the basis of a single collection per day.

25.4.7 Public Address

Speakers shall be provided at each lighting pole location and within the shelter to enable passengers to receive messages without volume settings being high and causing nuisance outside the area of the platform.

Induction loops shall be provided within the central area around the shelter position.

Further details of the public address system are contained in Section 35.13.2 – Workstation Capabilities.

25.4.8 Tramstop CCTV

Closed Circuit Television (pan, tilt and zoom) digital colour cameras shall be provided on each platform to enable colour pictures to be displayed at the Control Centre and other Closed Circuit Television monitoring authorities.

The canopies / shelters, stop lighting and publicity / information displays shall not inhibit the Closed Circuit Television coverage of the Tramstop or platform.

The total number of cameras on each Tramstop shall be dictated by the physical restraints associated with each individual Tramstop, however, a minimum of one per platform shall be provided.

25.4.9 Passenger Help Points and Passenger Emergency Help Points

Tramstops will be provided with one combined Passenger Help Point and one Passenger Emergency Help Point on each platform, providing two-way (duplex) audio communication between a person located on the platform and the operator located at the Control Centre.

The Passenger Help Points / Passenger Emergency Help Points detailed arrangements shall be in accordance with Section 35.13.2 – Workstation Capabilities.

25.4.10 Guardrails, Handrails and Cycle Racks

Platform guardrails shall be provided to the rear of any platform where there is a potentially dangerous interface with passing road vehicles, Network Rail or a significant change in level.

Splashguards shall be provided in vulnerable locations.

Where provided, guardrails shall be set at 1150mm above platform level and comply with the requirements for the mobility impaired.

Cycle parking frames will be provided at each Tramstop, where this is appropriate. These will be positioned within view of the Closed Circuit Television surveillance system.

25.4.11 Seating

Bench seats (with integral arm rests and perforated seating structure) shall be positioned on each platform and within each shelter a perch rail / seat shall be provided, designed to prevent the retention of liquids. In all instances the under seat space shall be open to meet security requirements.

25.4.12 Ticket Vending Machines (TVMs)

Ticket vending machines shall be located within or adjacent to the shelters. The TVMs shall be positioned in an appropriately shaded location to assist users in reading the machine's visual display. Ticket vending machines will be supplied to the Infraco, as free issue, by TEL.

Infraco shall make provision for the power and communication cable routes, cables and draw wires from the Tramstop equipment cabinet to the proposed ticket vending machine locations.

Sufficient spare ways within the power and equipment cabinet to accommodate ticket vending machines and a local ticket vending machine network connection will be provided. Further details regarding ticket vending machines can be obtained in 36.5 of these Employer's Requirements.

25.5 Electrical (LV) and Communication Facilities

All Tramstop electrical (LV) and communication equipment shall be accommodated within a Tramstop equipment cabinet. LV supplies shall be provided to the equipment cabinet from which local electrical supplies to Tramstop equipment will be fed.

A 230V, 13A or equivalent socket shall be provided within the Tramstop equipment cabinet.

A 110V supply shall be provided at a suitable location on each platform for cleaning purposes.

All power requirements for the Tramstop infrastructure and adjacent infrastructure equipment will be sourced from the local Distribution Network Organisation supply. All power supplies shall be adequately rated to support the requirements of the Tramstop equipment.

25.6 Layover Facilities

Layover facilities shall be provided in accordance with Section 2.15.

26 Track

This Section of the Employer's Requirements defines the Track requirements applicable to the Edinburgh Tram Network which the Infraco must comply with.

26.1 Track Layout

The Infraco shall ensure that the track layout shall be in accordance with ETN Diagram at Figures 2 & 3 – Edinburgh Tram Phases 1a and 1b Network Diagram

26.2 Components

Trackwork components to be provided shall include, but are not limited to, the following:

- Rails (relate to Wheel / Rail interface: N.B. inc. hardness related to welding repair);
- Sleepers and points and crossing bearers;
- Turnouts;
- Points and points motors;
- Points baseplates and slippers;
- Points rollers;
- Crossings;
- Check rails and check rail fastening systems;
- Guard rails and guard rail fastening systems;
- Transition rails;
- Rail joints (fishplated and welded);
- Insulated rail joints;
- Isolatable rail joints and provisions for access to associated rail/cable connections;

- Rail movement joints;
- Rail fastening systems;
- Rail pads;
- Baseplates;
- Resilient baseplate systems;
- Rail embedment for street running track;
- Paved trackbed and concrete trackbed systems;
- Grooved rail drainage systems (including boxes);
- Buffer stops and vehicle arrestor systems;
- Ballast;
- Granular filtering;
- Granular blanketing;
- Geotextile membranes;
- Plastics membranes;
- Geosynthetic reinforcement;
- Provision and installation of signs and markers; and
- Grasstrack.

26.3 General Requirements

Tracks shall be designed and constructed for left-hand running under line of sight operation.

The maximum design speed shall be 80 km/h.

Where the Edinburgh Tram Network runs within an urban environment on non-segregated sections of tramway, the speed limit shall be the same as that for motor vehicle traffic.

The trackforms shall be applied as indicated at the documents System wide trackform Surface Finishes Version 3 ULE90130-SW-DRG-00069.PDF, ULE90130-SW-DRG-00070.PDF and ULE90130-SW-DRG-00071.PDF

The track shall facilitate ease of construction and minimise disruption to other road users and the public during the construction phase on all roads and across all junctions between Haymarket and Ocean Terminal via Princes Street.

The track shall minimise the potential for stray current and be in accordance with the requirements and codes of practice for stray current and the **tie** Earthing and Bonding Policy document. As the valid standard the EN 50122 shall be in force.

Ensure simplicity of overall maintenance and ease of rail replacement and relaying, minimising the disruption to other road users.

The track shall comply with the operational noise and vibration requirements as stated in the **tie** Noise and Vibration Policy. Detailed technical solutions will be determined during the Detailed Design Phase for areas identified as sensitive to Noise and Vibration. The assessment of these solutions shall be in line with the characteristics of the vehicles, the existing sub-structure and the structures adjacent to the track-bed.

The track shall integrate fully with roads, such that differences in roads surfaces, specifically finished levels and skid resistance, are minimised as far as is reasonably practicable.

The track shall integrate fully with surrounding area functionality and appearance, to ensure that hazards to pedestrians, the mobility impaired and cycle users are minimised as far as is reasonably practicable, and such that track surface finishes are in accordance with all design requirements, guidance and aspirations.

Adequate track formation shall be provided to facilitate the secure foundation for track installation.

The in-street track formation shall be of shallow design such that it permits minimum amount of public utility diversions and aids the high speed construction of the tramway.

The surface at pedestrian crossing points shall be level with the top of the running rails and surfaced in non-slip materials. These materials shall be chosen to be reasonably consistent with the character of the locality whilst providing clear indication to all users (including the visually impaired) of the correct point to cross the track and the extent of the Edinburgh Tram Network environment.

Track shall be a standard tramway track with steel rails set to Standard Gauge (1.435m) and shall be compatible with the Edinburgh Tram Network trams.

On ballasted sections of the route, road/rail equipment will be used for maintenance tasks such as tamping. These machines shall be equipped with suitably profiled wheels.

26.4 DKE, Structure Gauge and Clearances

The DKE adopted shall be the "Assumed Tram for Design", as presently defined in the SDS design documents.

Structure gauge and clearance drawings shall include the standards for staff maintenance walkways and tram evacuation walkways.

Adequate walkways are required throughout the route off-street. Appropriate signing shall be included to indicate the walkway.

26.5 Trackforms

Various trackforms, as presently shown in the SDS design documents, are required to suit the different domains in which the track lies along the route and in the Depot and sidings. The different trackforms provided shall comprise, but not necessarily be limited to:

- Flush-finished track in road areas and at Tramstops, including mixed operation with traffic of various kinds, or not; and with a variety of surface finishes;
- Track with grass flush finish;
- Track with plain concrete flush finish (e.g. in the depot and for certain structures, e.g. the A8 Underpass);
- Direct fixation track on structures;
- Ballasted track; and

- Special trackforms in the depot or at Tramstops.

The trackforms shall be designed and installed to take full account of the requirements for future maintenance of components, e.g. life-extension of rails by welding in situ, and the adjustment of the levels of rails and the adjacent surfaces, and of sectional renewal.

26.6 Specific Technical Requirements

Retention of alignment on small radius curves in the case of ballasted track where rails are continuously welded shall be considered. A minimum radius shall be established for the application of ballasted track, with an appropriate alternative trackform applied elsewhere.

For in-street track construction, and in the absence of sleepers or similar, a means of retaining the lateral and rotational position, such as tie-bars of the rail together with the track gauge shall be provided.

A standard trackform shall be provided which shall comprise a slab that shall be suitable for any of the road, pavior / block / sett and grass surface finishes. In effect the surface finishes shall be interchangeable without having necessarily to redesign or reconstruct the whole slab.

A special track form shall be used at sensitive locations to mitigate against ground borne noise and vibration. These locations will be identified by the Infraco in agreement with **tie**.

At the end of all terminating tracks, provision shall be made for a device for arresting Trams. These devices may include sliding friction or fixed type buffer stops, sand drags, architectural features such as planters, wheels stops or other means. The choice of such device(s) shall be made through risk analysis of the location, taking into account the risk to passengers, pedestrians and staff and to the vehicles and surrounding environment.

Rail shall be continuously welded wherever possible. The use of fish-plated joints shall be avoided although fishplated track may be proposed in the Depot to avoid the requirement for rail movement joints at turnouts.

26.7 The Wheel / Rail Interface

A report has been produced by SDS (ref: ULE 90130-SW-REP-00130 v3) which shall form the basis of development of this critical interface. The key factors will be recorded here.

26.8 Drainage

Drainage from trackwork shall be interfaced with the road and civils drainage systems. Adequate drainage within the trackwork system shall be provided such that the integrity of the installations is secure.

The Edinburgh Tram Network shall have a drainage system that, as a minimum, achieves accepted EU or BS standards and Good Industry Practice.

The drainage of all new bridge structures shall be positive and, unless otherwise required by the relevant local authority, all surface water shall be piped to the local storm water sewer systems by a defined drainage path.

Particular attention shall be paid to ensure that surface water drainage systems in the vicinity of traction substations and cable ducts are routed to avoid any risk of flooding of electrical equipment areas, point machine chambers, and the ducts themselves.

For on-street track, the track drainage system shall incorporate an insulated break from the storm water system.

Drainage proposals including any new flows into existing drains and the method of connection shall be approved by Scottish Water, SEPA and the City of Edinburgh Council Roads Department as appropriate.

26.9 Technical Requirements for Points and Crossings

All turnouts, crossings and interruptions to the continuity of the rail head shall be equipped with flange running sections or other design which minimises joint noise.

The design shall minimise flange squeal through tight radii and through junctions.

Points shall be provided with two movable blades so mounted to allow the use of magnetic track brakes and their safe passage through the point and crossing.

All points shall be freely trailable without damage to the blades or mechanism.

Points and crossings shall be designed so that they are capable of through stressing as required.

All points on the main line, likely at some time or another to be taken in the facing direction (including trailing, emergency crossovers), shall be equipped with detection and indication. Indication of trailing points likely to be taken at high speed shall be considered.

All points, when operated by hand lever, shall be capable of being thrown fully, by one throw of the lever, by a male or female person of slight build, without undue effort or strain. To this end, the maximum required effort to change the points shall not normally exceed 230Nm.

Some form of indication shall be incorporated into the mechanism to indicate that the point has thrown fully. Lever mechanisms requiring repeated operation to throw the points are not acceptable.

Efforts should be made to reduce friction and the effort to throw the points. Flange relief of the point tongues is one such feature.

Point tongue profiles and movement on all points shall conform to the same dimensions and tolerances.

Design tolerances shall be maintained in service with a relatively low level of attention.

Designs with potential for high wear rates or other high maintenance features are not acceptable.

Designs with the potential for lengthy infrastructure replacement periods are not acceptable, particularly in on-street areas.

Adequate, functional drainage must be provided to ensure that rail grooves and point machine pits are kept clear of rainwater, sand and rubbish from the street etc.

Pointwork in the depot site area shall be installed in a flush-finished trackform for 9 turnouts and 1 crossing at the beginning of the depot area. This flush-finished trackform will be designed for re-railing purposes only.

26.10 Technical Requirements for Point Operation

26.10.1 Point Machines and Mechanisms in General

All point machines, whether powered or not, shall be from the same family of machines and provided by the same supplier.

Point machines shall allow the points to be 'freely' trailable without damage to the blades or mechanism.

In street running track, point machines shall be installed between the rails of the track.

On ballasted track, in order to facilitate maintenance, they shall be installed to the side of the track, on the outside of a typical two track layout.

Point machines shall be capable of manual operation in a single throw by tram drivers using a removable point bar to be carried in the Tram drivers cab. Only one form of point bar shall be utilised on the system.

It shall be possible for the points to be changed by a male or female person of slight build, without undue effort or strain when the points are not affected by snow or ice. To this end, the maximum required effort to change the points shall not normally exceed 230Nm.

When operated by hand using the standard points operating bar, it shall not be possible to inadvertently partially throw the points, which shall always throw sufficiently to make the respective detection circuits at each lie of the points with a single movement of the lever.

A total number of 70 point operating bars shall be supplied.

All combinations of points and point machines shall be validated to demonstrate that:

- The machines shall exert sufficient force under all foreseeable circumstances to move the points blade into the required position;
- The points shall close and lock reliably under all foreseeable operating conditions;
- Detection settings shall have adequate maintenance tolerances to ensure that points detection setting testing shall be required no more than monthly on all points;
- The wheel/rail interface at the toes of the points shall be such that there is no derailment risk under all combinations of wheel wear, rail wear, and detection settings;
- Any tram driver shall be able to operate all points safely and without risk of injury; and

The enclosing case of the Point Machine shall be to Class IP 67 and be drained.

Point Machines shall not be overstressed in performing its duty. Efforts should be made to minimise friction and the effort to throw the points. Flange relief of the point tongues is one such feature and there are others such as PTFE slides and supporting rollers.

The flangeway in advance of the point tips shall not be less than 41mm. It shall be consistent with the wheel/rail interface report.

The amount by which nominally 'closed' point tongues may be open at their tips whilst still providing detection, shall be agreed as a part of the wheel/rail interface criteria.

Each Point Machine shall be clearly identified and robustly labelled.

Point Machines of all types and their drive and detector rods shall be insulated from the running rails and from the surrounding earth. Separate earthing connections for the drive motor (where fitted) and the machine case shall be provided.

Point Machines of all types shall normally not require maintenance more frequently than at three-monthly intervals although inspection may be carried out more frequently.

All Point Mechanisms shall incorporate at least one volt-free change-over contact in both the 'Normal' and 'Reverse' positions, in addition to those required for detection purposes.

In the case of Point Machines incorporating an over-centre device, it shall not be possible for the machine to be set in the 'null' position during powered or sprung operation, as applicable.

26.10.2 Specific Requirements for Motorised Point Machines

The Point Machines will operate from a 230Vac supply.

The Point Machine shall be capable of operating the two point tongues for the full throw required to provide the standard 'blades open' gap, to clear the backs of the flanges of the wheels. However, the throw shall not be so great as to flex the tongues further than necessary, thereby introducing unnecessary stress in the track components and load on the operating machine mechanism. This dimension 50mm,+5/-0mm will be finalised after the wheelset profile has been determined and the Wheel-Rail Interface Report has been finalised in the Detailed Design Phase.

26.10.3 Specific Requirements for Sprung Point Mechanisms

The Spring Point Mechanism shall be capable of being biased to effect a route to either lie of the points. The mechanism shall normally set the points in their 'Normal' position but by adjustment, they shall be capable of being set in the 'Reverse' position.

In both cases, it shall be possible to change the lie of the points using the standard points operating bar with an effort not exceeding 230Nm.

Only the incursion of a foreign body in the space between the point tongue and the stock rail shall prevent a satisfactory change in the lie of the points.

The lie of the points shall be continuously maintained in the 'Normal' (or if adjusted, 'Reverse') position by adequate spring pressure.

After having been forced across by the passage of a tram, the mechanism shall positively return the points to the 'Normal' position and provide the standard 'blades open' gap, to clear the backs of the flanges of the wheels.

If possible, by the rearrangement of components, the Spring Point Mechanism shall be convertible into a Bistable Point Mechanism for the avoidance of spares duplication.

26.10.4 Specific Requirements for Bistable (flip-flop) Point Mechanisms

The Bistable Point Mechanism shall be capable of being biased to effect a trailing route through either lie of the points, by use of a standard points operating bar. The mechanism shall normally retain the points in the position last trailed. However, by operation using the approved points operating bar, they shall be capable of being set in the alternative position.

Only the incursion of a foreign body in the space between the point tongue and the stock rail shall prevent a satisfactory change in the lie of the points.

The lie of the points will be continuously maintained in the position last trailed by adequate spring pressure.

After having been forced across by the passage of a tram, the mechanism shall positively leave both blades of the points held firmly across with the 'closed' point against the stock rail and provide the required 'blades open' gap, to clear the backs of the flanges of the wheels on the other side.

The amount by which nominally 'closed' point tongues may be open at their tips shall be within the same tolerances specified for points operated by powered Point Machines.

If possible, by the rearrangement of components, the Bistable Point Mechanism shall be convertible into a Spring Point Mechanism for the avoidance of spares duplication.

26.10.5 Specific Requirements for Hand-Operated Point Mechanisms (Point Levers)

Points operated by Hand-Operated Point Mechanisms shall normally be traversed in the facing direction subject to a 10 km/h track speed limit.

One throw of the lever shall fully throw the points to either 'Normal or 'Reverse' positions. Levers which require one or more attempts to complete the operation are not acceptable.

It shall not be possible to inadvertently partially throw the points, which shall always throw sufficiently to allow the respective 'points thrown' indication at each lie of the points to be given with a single movement of the lever.

Only the incursion of a foreign body in the space between the point tongue and the stock rail shall prevent a satisfactory change in the lie of the points.

After having been thrown, the mechanism shall positively leave both blades of the points held firmly across with the 'closed' point against the stock rail and provide the required 'blades open' gap to clear the backs of the flanges of the wheels on the other side.

The amount, by which nominally 'closed' point tongues may be open at their tips, shall be within the same tolerances specified for points operated by powered Point Machines.

26.11 Technical Requirements for Point Control and Indication

26.11.1 Detection

Where detection and indication is required, the mechanism shall be fitted with detection equipment capable of differentiating between a 'safe' and 'unsafe' gap. When closed, the detectors must be capable of detecting a minimum gap of 1.5mm although the 'unsafe' gap detection including a safety margin will be slightly greater than this at 2.5mm, +0/-0.5mm between the closed point tongue and the corresponding stock rail at each lie of the points. To be confirmed with wheel/rail interface criteria.

Each point tongue shall be independently detected through a separate mechanical connection to the point tongues, independent of the drive rod connection and as close as practicable to the tip of the tongue. Totally enclosed proximity switches are preferred for this duty.

26.11.2 Control

The Point Controller shall receive information from the Tram Position and Detection System (TPDS) and set the Points and Point Indicators and shall be driven by the output from the point detection.

The Point Controller shall acknowledge the requests from TPDS and make all the necessary safety checks before commanding the point machine to move the points.

When the Point Controller causes the Point Machines to change the points, it shall monitor the detection contacts in the associated Point Machine(s) to determine whether the points have fully thrown.

Once the points have been satisfactorily operated (i.e. been fully thrown), the Point Indicator shall show a sloping row of lights (or LED clusters), corresponding to the lie of the point to approaching trams. If the points have not fully thrown, a horizontal row of lights (or LED clusters) shall be displayed.

If an appropriate command has been set by personnel in the Control Centre, the Point Controller shall block any associated points requested by the tram on-board computer from its route code.

The Point Controller shall report to the adjacent Tram Position and Detection System and or SCADA when any of the following conditions apply:

- Failure of the Point Machine supply;
- Failure of the Point Indicator supply;
- Receipt of an indication of faulty point detection; and
- Failure of the Point Heaters supply.

When the relevant track circuits or mass detectors detect the presence of a tram in a prescribed area, the Point Controller will lock the points against any further signals to change them until the tram has left the prescribed area.

The Point Controller shall also afford the facility to set and control the associated points locally.

26.11.3 Indication

The lie of the points shall be indicated to trams approaching the toe of the points in a facing direction. Indication of trailing points likely to be taken at high speed shall also be considered. The specific requirements at each location are defined on the track layout diagram.

The basic technology and design of the point indicator shall be same as the tram signals. The colour shall not be white, red or green.

Point indicators shall exhibit the following standard aspects to drivers:

- Points set to left hand route: diagonal row of lights sloping upwards towards the left;
- Points set to right hand route: diagonal row of lights sloping upwards towards the right; and
- Points not detected: horizontal bar

The indicator shall be placed for visibility to the tram driver in the same basis as tram signals.

The means of illumination shall be by LEDs.

A minimum of five clusters in each row shall be provided.

All Point Indicators shall be located in agreement with the Operator and shall be co-located where relevant with tramway signals.

Each Point Indicator shall be clearly identified and robustly labelled.

The aspect shall be clearly visible in all weather conditions.

The Point Indicators shall normally not require maintenance more frequently than at three-monthly intervals although inspection may be carried out more frequently.

26.11.4 Control Cabinet

Controls to set and control the associated points locally shall be provided in a cabinet. These shall be operable while the relevant points are in direct view of the person operating them.

The Point Controller cabinet shall contain the power supply for the operation of the associated points and to all associated Point Indicators.

The Point Controller cabinet shall contain and control with an input from the SCADA system, the power supply to the point heaters mounted on the associated points.

The Point Controller shall not require maintenance more frequently than at six-monthly intervals although inspection may be carried out more frequently.

26.12 Indication of Hand Operated Point Mechanisms (Point Levers)

The lie of the points shall be indicated to trams approaching the toe of the points in a facing direction.

Upon the operating lever being thrown, a simple mechanical device will detect that the closing point tongue has closed to within the permitted tolerances specified above.

Detection of the fully thrown condition shall cause a mechanical indicator to display a corresponding indication to the tram driver. The indicator shall present an indication equivalent to that shown on lit indicators and be visible from the normal tram driver's operating position in the cab, when the tram is 5 metres to the rear of the point tips, in daylight and illuminated by the tram's headlights after dark. Failure to close the tongue to within this tolerance shall not allow the indicator to show a 'points thrown' indication. Both point tongues shall be detected, either individually or as a coupled pair.

26.13 Technical Requirements for Points Heating

Points heating systems will allow the efficient operation of points in low temperatures and shall be such that the components will not intrude into the surrounding infrastructure.

Points heating shall be electrically powered and shall be controlled automatically by sensing when the predefined temperatures for activation and deactivation have been reached.

Point Heating devices shall provide health status information via the SCADA to the Control Centre.

Point Heaters shall be capable of being manually activated and/or deactivated locally and from the Control Centre.

The locations at which point heating shall be provided will be agreed and shown on the track layout diagram.

Where more than one heater is controlled from a Point Controller, it shall energise each of them in sequence in order to limit the inrush current demanded.

The Point Controller shall monitor the local ambient temperature and humidity and control the supply to the point heaters accordingly.

The settings at which the point heaters are energised shall be adjustable within the limits of 0°C to + 5°C.

26.14 Tolerances

The following definition of construction and maintenance tolerances shall be developed and agreed between Infraco and **tie**.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Speed	Shared running	Maximum	kph		**50**	**50**	**50**
Speed	Segregated running	Maximum	kph		**80**	**80**	**80**
Speed	Depot	Maximum	kph		**15**	**15**	**20**

Table 62 - Speed assumptions and normal limitations

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Geometric element	Minimum length		m		**15**	**12**	**6**

Table 63 - Geometric Elements - Element lengths are tied to the tram length, specifically distance between bogies

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Horizontal radius - Minimum	Running lines	Slab track	m		50	30	25
Horizontal radius - Minimum	Depot lines		m		50	40	20
Horizontal radius curves	Distance between opposite flexure	Radii dependant - no transition curves	m	Considered minima dependant upon tram data	15	10	6

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Horizontal radius curves	Distance between opposite flexure	With transitions on adjacent opposite flexure curves	m	Exceptional to be considered individually (also refer wheelbase)	10	8	6
Horizontal radius curves	Distance between curves of opposite flexure	Turnouts - theoretical tangent points at switch toe to next tangent pt (of opposite flexure)	m	Considered minimums dependant upon tram data (wheelbase)	10	8	6
Horizontal radius curves	Distance between curves of opposite flexure	Turnouts - theoretical tan.pt. at switch toe to tan.pt. (of similar flexure)	m	Considered minimums dependant upon tram data (bogie axle ctrs)	5	3	2
Horizontal radius curves	Tramstops		m	Absolute minimums	Infinity	2000	1000

Table 64 - Horizontal Curves: Minimum requirements for horizontal curves including distances between similar and opposite flexure. Similar requirements also for horizontal curvature up to turnouts and through Tramstops.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Cant	Platforms		mm		0	0	0
Cant	Tangent track	Facilitate drainage	mm		0	15	15
Cant	Fixed Obtuse crossings		mm		0	15	30
Cant	Curves		mm	Subject to Tram	75	75	100
Cant	Plain line track – depot		mm		0	0	15

Table 65 – Cant: Maximum cant values

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Negative cant	Plain line		mm		0	15	15
Negative cant	Turnouts	Turnouts - when turnout is facing downhill on a grade	mm		0	0	15
Negative cant	Turnouts	Turnouts and acute diamond crossings	mm		0	0	15
Negative cant	Turnouts	Obtuse crossings in diamonds	mm		0	0	0

Table 66 - Negative Cant: Maximum allowable values which are particularly important with regard to turnouts and obtuse crossings.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Cant excess			mm	Subject to Tram	0	25	50

Table 67 - Cant Excess - Normally applied where slow speed running may be encountered, but does have some bearing in this concept.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Cant deficiency	Plain line		mm	Maximum	40	60	75
Cant deficiency	Plain line - Depot		mm		40	75	100
Cant deficiency	Through route of turnout	On tangent or curved track	mm		0	40	60
Cant deficiency	Turnout route		mm		40	60	75
Cant deficiency	Based on theoretical radius at switch toe	Cant deficiency based on theoretical radius formed by shortest wheel-base placed centrally at switch toe	mm		40	40	50
Cant deficiency - jerk	At switch toes Consider shortest wheelbase	Maximum permitted jerk rate at switch toes using theoretical radius formed by shortest wheel-base	m/s3	jerk = 0.2 m/s3	0.3	0.4	0.5
Cant deficiency - jerk	Plain line Consider shortest wheelbase	Maximum permitted jerk rate as a result of the geometry change and shortest wheel-base	m/s3		0.25	0.35	0.45

Table 68 - Cant Deficiency: Deficiency at the switch toe will require careful consideration, effectively setting speed restrictions. Particular impact on the criteria will be to assess jerk with reference to the shortest wheelbase.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Transition curves	Virtual Transition	Length basis	m	Subject to Tram	No use	1.8	1.8
Transition curves	Clothoid	Minimum length	m	Subject to Tram	15	10	6

Table 69 - Transition Curves - Dimensional requirements with some relationship to the tram dimensions

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Cant gradient	Cant gradient - Maximum permitted	RoCC may be overwritten by other minimums		Consider RoCC	RoCC	600	300
Cant gradient	Cant gradient - Minimum permitted				1500	2000	3000
Cant gradient	Switch toes				0	0	0
Cant gradient	Crossings and diamonds				0	0	0

Table 70 - Cant Gradient: Permitted maximums which, in effect, define twist parameters (dealt with later). Note: All the following apply only in the cases of applied cant on track on zero grade. For track on a grade or a vertical curve, where a twist in the track will arise from a horizontal curve, the maximum gradient that arises from applied cant must be less than the following limits (i.e. one in (value greater than following limits)) because an element of effective cant gradient will result from the combinations of horizontal curve and grade / vertical curve. In the latter cases the gradients that arise from applied cant are governed by the overall twist limits which are specified in table 78 below.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Rates of change – cant		Rate of change of cant	mm/s	Subject to Tram	35	55	68
Rates of change - cant def		Rate of change of cant deficiency - plain line	mm/s	Subject to Tram	35	55	68
Rates of change - cant def		Rate of change of cant deficiency - S&C	mm/s	Subject to Tram	35	55	80

Table 71 - Rates of change of cant (RoCC) & Rates of change of cant deficiency (RoCCD) - Rate of change in lateral acceleration.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Vertical alignment	Sag	Vertical curve radius - minimum	m	Subject to Tram	1000	625	500
Vertical alignment	Hog	Vertical curve radius - minimum	m	Subject to Tram	1000	625	500
Vertical alignment	Vertical acceleration		% of g		2	2	4
Vertical alignment	Turnouts and diamonds	Vertical curve radius. Proximity of vertical curve tangent point to switch toe and crossing of turnouts and diamonds.	m		15	10	6
Vertical alignment	Advance sws - xng & sws	Vertical curve radius	m		0	0	0
Vertical alignment		Minimum curve element length	m		20	15	10

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Vertical alignment	Instantaeneous change in grade		%		None	0.1	0.2
Vertical alignment	Grade distance between adjacent curves (similar flexure)	Preferred situation	m		None	None	None
Vertical alignment	Grade distance between vertical curves of opposite flexure	With combined average radius ***less than*** 3125m	m		15	10	6
Vertical alignment	Grade distance between vertical curves of opposite flexure	With combined average radius ***greater than*** 3125m.	m		15	10	0

Table 72 - Vertical Alignment - Some elements require consideration from the tram supplier, others refer again to element lengths

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Vertical geometry	Tramstops	Radius through tramstops (without exceeding gradient criteria)	m		Infinity	2000	1000

Table 73 - Vertical Geometry: Tramstop requirements

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Gradients			%		5.0	6.7	8.0
Gradients	Tramstops		%		1.0	2.0	2.5

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Gradients	Stabling	Maximum – includes locations where tram driver is routinely required to leave driving position	%		0.0	0.1	0.2
Gradients	Turnouts and junctions	Dependant upon twist and negative cant	%		0.2	3.0	6.5

Table 74 – Gradients: Maximum gradients in various locations

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Twist (as part of the design)	Short wave (over bogies)		$^0/_{00}$	Subject to Tram	1.5	2.0	3.3
Twist (as part of the design)	Long wave over length of vehicle	Project Tram geometric capability 10m @ 3mm $^0/_{00}$ + 10mm -- i.e. 30+10 = 40 (or 4 $^0/_{00}$)	$^0/_{00}$	Subject to Tram	1.5	2.0	3.3

Table 75 - Twist

The above represents the limits on the overall twist in the track that is a summation of: any gradient arising from applied cant; effective combinations of horizontal curves and grades / vertical curves; and other twisting effects (e.g. resulting from induced crossfalls for road drainage).

Twist is introduced into the track whenever cant is applied and when track with zero cross-level has a combination of horizontal curvature and vertical curvature or gradient.

Such geometry creates a twist, which has to be negotiated by the tram vehicle. Clearly the tram has to be capable of handling such geometric situations. Certain manufacturers may define these criteria in their own way, an interpretation of which is indicated below.

Twist in the long wave is measured over the wheelbase (bogie centres); short wave being measured over the axle centres of the bogie. Short wave twist also leads to wheel un-loading, not, as yet, defined here.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Vert / Horiz alignment	Horizontal radius - 25	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	1600	1200	1000
Vert / Horiz alignment	Horizontal radius - 30	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	1333	1000	833
Vert / Horiz alignment	Horizontal radius - 40	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	1000	750	625
Vert / Horiz alignment	Horizontal radius - 50	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	800	600	500
Vert / Horiz alignment	Horizontal radius - 60	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	667	500	n/a
Vert / Horiz alignment	Horizontal radius - 80	Vertical curve radius - minimum (product rule)	m	40k,30k,25k	500	n/a	n/a

Table 76 - Vertical/horizontal alignment combinations

Taking the comments above regarding twist, it can be seen the certain combinations of vertical and horizontal alignment can cause undesirable geometric situations. The tables below define, using a simple product rule, the limitations.

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Track spacing	Plus allowance for DKE	Double track main line - track centres - side poles	mm	- 3100			
Track spacing	Plus allowance for DKE	Double track main line - track centres - centre poles	mm	- 3600			
Track spacing	Plus allowance for DKE	Depot tracks and sidings - track centres		TBA Subject to Tram			
Track spacing	Plus allowance for DKE	Depot tracks and sidings - track centres - working space		TBA Subject to Tram			

Table 77 - Track Spacing. Note: straight track on radii larger than 350 metres on fixed non-ballasted trackform

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Gauge	Track gauge				1435	1435	1435
Gauge	Track gauge widening				0	0	0
Gauge	Track gauge-flange-running			TBA Subject to Tram			
Gauge	Check flangeway			TBA Subject to Tram			

Table 78 – Gauge: Standard data that requires further review/approval

Element	Qualifier	Comment	Unit	Comment	Desirable Value	Limiting Value	Exceptional Limiting Value
Rail inclination		Inclination - Vertical street grooved rail		TBA			
Rail inclination		Inclination - Non grooved rail		TBA Subject to Tram			

Table 79 - Rail Inclination

27 Roads and Utilities

This Section of the Employer's Requirements defines the roads and utilities requirements applicable to the Edinburgh Tram Network with which the Infraco must comply.

27.1 General

The roads works and utilities shall consist of all the necessary road works and associated accommodation works required to fully integrate the Edinburgh Tram Network into the urban road environment, including those relevant areas that are not trafficked.

The road works, utilities and associated accommodation works shall be provided in accordance with the Design Manual for Roads and Bridges (DMRB), except as amended by the requirements of, or otherwise agreed with, the relevant authority including where such requirements are more onerous.

The roads and utility works shall include but not be limited to the following:

- Road and junctions (including all necessary off-alignment works);
- Site clearance;
- Safety barriers and fencing;
- Drainage works including track drainage;
- Earthworks;
- Surfacing;
- Road lighting;
- Traffic signage and road markings;
- Traffic signals and tram signals;
- Landscaping;
- Temporary and permanent traffic measures;
- All associated cable ducting required for the works;

- Depot access and utilities, including within the Depot;

- Utility diversion works where not carried out by MUDFA; and
- Removal of all redundant services and apparatus affecting the works.

The works shall take account of MUDFA.

27.2 System-Wide Requirements

The tram network shall be segregated from the road wherever feasible using a variety of means as appropriate to the features and constraints of the individual locations. These include the use of road markings and varying surface types for visual or textural delineation. The design of the segregation details shall optimise their effectiveness without significantly compromising safety and operational factors, including the operation of junctions and emergency and maintenance access.

27.3 General Requirements

All works shall be carried out in accordance with the provisions of the Tram Legislation. All works on adopted roads shall be to a standard to allow subsequent re- adoption by the Roads Authority.

Wide-area modelling of traffic impacts consequent to the design shall be provided as a pre-requisite to approval, and prior agreement with the City of Edinburgh Council on the Traffic Regulation Orders and Temporary Traffic Regulation Orders necessary to implement the design and complete the works.

In addition to roads that have been adopted by the Roads Authority, the route for the tramway also uses roads that are currently in private ownership. In all cases the owners of private roads shall be consulted and their input and approval sought during the design process. Road works within these areas shall be to the same standard as that used for the roads adopted by City of Edinburgh Council (similarly, new and extended roads shall follow the same process). Where third parties are affected by a new or extended road their inputs and approvals where necessary shall be sought during the consultation process.

27.4 Stray Current

Refer to Stray Current of these Employer's Requirements at section 32.

27.5 Roads

27.5.1 General

The general requirements for the design of the roadworks shall meet the relevant Standards set out in Section 3.6 of these Employer's Requirements with emphasis on the following:

- Design Manual for Roads and Bridges (DfT);
- City Development Transport – Development Quality Handbook – Movement and Development (CEC);
- Edinburgh Standards for Streets (CEC); and
- Tram Design Manual (CEC).

27.5.2 Roads Design

The roads and track alignment shall be integrated in a manner that best uses the available space and optimises the alignment of both systems. Horizontal clearances between kerb lines of roads and tram network structures shall be not less than those set out in the relevant Department for Transport technical memoranda and the Department for Transport publication "Roads and Traffic in Urban Areas" and shall meet the guidance in ORR RSP2.

The requirements for geographical sections of the design and construction shall be discussed and agreed with **tie** and the City of Edinburgh Council to determine the extent of the proposed re-modelling, roadworks and (temporary and/or permanent) traffic management.

All surfacing materials shall comply with the DMRB requirements and consider City of Edinburgh Council's preferences. The integration of the Edinburgh Tram Network alignment, road design and road markings shall minimise the risk of road vehicles skidding on the rails. The finished works shall meet the serviceability requirements, balanced with commercial, social and environmental considerations. In particular, the following factors shall be taken into account:

- Make the best use of existing infrastructure;
- The requirements of the promoter (**tie** and CEC);

- Minimise the disruption to traffic;
- Minimise the public perception of waste and unnecessary disruption;
- Minimise the construction cost;
- Maximise the maintainability;
- Minimise the construction time;
- Minimise the excavation, material usage and hence vehicle movements; and
- Meet the needs of properties fronting onto the route of the tramway.

The Roads Design shall include but not be limited to:

- Identification of constraints and provision of typical sections;
- Tram / road interface review in the light of outputs from the design process;
- Provision of integrated tram/road design model;
- Assessment of the impact of the track alignment on the road design and layout;
- Assessment of the impact of the OLE design on the road design and layout;
- Layout drawings including extent of the works;
- Drawings detailing discrete locations where the vertical track alignment deviates from existing ground levels, this will include cross-sections and contoured plans as required;
- Standard details;
- Drawings to show changes to existing car parking provisions along the route, for example at Rosebery House, Haymarket including new access;
- Access and general arrangement layout to the Depot at Gogar;

- Consultation with City of Edinburgh Council, Scottish Environment Protection Agency and Scottish Water during the initial drainage design process identifying potential outfall locations and surface water treatment requirements for both roads and tram;
- Location of existing surface water drainage networks and outline routing of surface water from track and road drainage over the entire route;
- Standard details of drainage connections, sand traps, manholes, etc.;
- Pedestrian guardrails and boundary fencing;
- Interpretation of outputs from the traffic modelling process;
- Identification of junctions where existing traffic signals may need modification. Identification of locations where new traffic signals may require to be installed;
- Preparation of information to support the Traffic Regulation Orders and Temporary Traffic Regulation Orders. This will be based on the roads design, or the latest road design available. Prior to submission for the Statutory Process the TROs will be reviewed against the latest design;
- Safety audits for all stages;
- Compliance with the approvals process;
- Layout drawings for tram / road interface at 1:500 scale;
- Final junction register;
- Integration of traffic and tram signalling systems determined by the traffic model and tram run-time simulation;
- Three-dimensional MX model for all roads design;
- Details including any special measures at specific locations;
- Detailed General Arrangement of new access to car park at Haymarket including any modifications to car park layout;

- General Arrangement and vertical alignment for new access road to the Depot at Gogar;
- 1:200 scale drawings for each junction;
- Detailed design of surface water drainage networks modelled using appropriate software;
- Detailed design of site clearance layout, boundary fencing, safety barrier and pedestrian guardrail, pavement, earthworks, signs and markings, kerbing, footways, traffic signal layouts and road lighting;
- Determination of the extent of modifications to existing traffic signals and new installation requirements. Preparation of a traffic signal equipment performance specification; and
- Links with the CEC UTC;
- Compliance with all side agreements entered into by CEC (whether final or in draft) with respect to the Parliamentary Tram Acts.

27.5.3 Road User Safety Audit

Road User Safety Audits shall be carried out as required by The City of Edinburgh Council and sufficient to demonstrate the integrity of the design process to HMRI (or the appropriate regime in force).

27.5.4 Cycleways

Where it is required that cycleways are provided as part of the Infraco Works these shall be designed and constructed in accordance with the relevant guidelines including:

- Design Manual for Roads and Bridges;
- City of Edinburgh Council "Roads Development Guidelines";
- Scottish Executive's "Cycle by Design"; and
- SUSTRANS "Cycle Friendly Infrastructure Guidelines for Planning and Design".

27.6 Drainage Including Track Drainage

All roads drainage shall be designed and constructed in accordance with The Design Manual for Roads and Bridges, Volume 4 and comply with The City of Edinburgh Council's requirements and the Scottish Environment Protection Agency standards. Where appropriate during the design process Scottish Water shall be consulted. The design parameters defined by these design codes and agreed by **tie** / CEC / SEPA / Scottish Water as being appropriate for the area and system shall be accommodated within the finished works.

At locations where the tramway drainage is connected to any other drainage system measures shall be taken to ensure that any by-products of the tram system are accounted for (e.g. provision of sand interceptors). Where necessary early involvement of the Scottish Environmental Protection Agency (SEPA) shall be sought to define and agree surface water outfall locations.

Provisions shall be included for the proper and effective drainage of grooved rails and point machine pits in road running track detailed in the relevant section of these Employer's Requirements.

Provision shall be made in trackwork for the interception of entrained debris in the system that drains surface water from grooved rails, to enable the easy collection and removal of detritus by means of planned maintenance.

Outlets from the grooved rail and point machine pit drains shall be connected directly to the roads drainage system. For on-street track, the track drainage system shall incorporate an insulated break from the storm water system.

Provision shall be made in trackwork for the effective drainage of the track structure on grass track, ballasted and other off-road running sections (except on bridges, viaducts and the like). Outlets from these drainage systems shall be connected to collector drains running alongside the track. Chambers for access to clean and maintain the collector drain pipes and for the interception and removal of entrained debris and detritus shall be incorporated in the collector system. Collector drain systems shall be connected to other systems or outfalls as appropriate for the local regime and existing drainage systems, and in accordance with the requirements of the relevant water utility, the Scottish Environmental Protection Agency, the roads authorities and all other authorities as appropriate.

The drainage of all new bridge structures shall be positive and, unless otherwise required by the relevant local authority, all surface water shall be piped to the local storm water sewer systems by a defined drainage path.

Particular attention shall be paid to ensure that surface water drainage systems in the vicinity of traction substations and cable ducts are routed to avoid any risk of flooding of electrical equipment areas, point machine chambers, and the ducts themselves.

27.7 Road Signs, Traffic Signals and Urban Traffic Control

Road signs shall comply with the Traffic Signs Regulations and General Directions 2002 and the Traffic Signs Manual. The works shall be consistent with the requirements stated in the Edinburgh Standards for Streets (CEC). The signage provided for the tramway and the mandatory road signs shall be considered holistically and measures shall be taken to avoid clutter that could lead to a confusing environment for road users.

The traffic and tram signalling systems shall support the run-time of the tramway whilst minimising the impact on other road users. It shall be fully integrated with the City of Edinburgh Council's urban traffic control system. A protocol will require to be developed with the City of Edinburgh Council regarding the installation and integration of the traffic and tram signals. The signalling system shall incorporate recent/current technological developments, as appropriate, to optimise the combined efficiency of the tram and traffic signals.

The traffic management system shall accommodate the direct and consequential impacts of the Tram system and will be subject to approval by **tie** and CEC Wide-area modelling of traffic impacts consequent to the design shall be provided as a pre-requisite to approval, and prior agreement with the City of Edinburgh Council to implement the design and complete the works.

27.8 Road Lighting and Road Furniture

The road lighting shall conform to the Council strategy on lighting applying current street lighting standards and the Tram Design Manual. The lighting columns and Overhead Line Equipment (OLE) poles shall be rationalised to minimise road clutter and ensure safety of all users. Similarly, the quantity and disposition of road furniture shall also be rationalised for visual and safety reasons. OLE is subject to prior approval of the CEC planning authority and is to be obtained through the design process.

Lighting and road furniture will require to conform with safety guidelines and pass all relevant stages of road safety audit which are to be undertaken within the road design for tram implementation.

27.9 Utilities

The Edinburgh Tram Network shall be designed and constructed such that there is a minimal requirement to divert existing public utilities.

The final alignment shall take cognisance of the need to avoid the diversion of utilities' system-critical apparatus such as high-voltage oil-filled cables, fibre-optic communication cables, and high-pressure gas mains, wherever possible. Any protection required to such utilities shall be instructed as a **tie** Change and follow the principles of Section 21.

Utility diversions that are not covered under the advance Multi Utilities Diversion Framework Agreement (MUDFA) including unknown apparatus that is found during the Infraco Works shall be instructed as a **tie** Change and follow the principles of Section 21.

27.10 OLE Poles

Location of Overhead Line Equipment poles will be designed so as to minimise the risk of traffic impact. Collision barriers shall be provided where there is a reasonably foreseeable risk of a collision between a road vehicle and an OLE pole. However, collision barriers are not the preferred solution and all reasonable mitigation efforts shall be made, and careful consideration given, in the location of poles to avoid the necessity for collision barriers. Should this not be achievable, the collision barriers shall be functional, practical and maintenance free with anti-climbing measures to prevent the public from climbing and standing on top of barriers. Details of such barriers shall be approved by the City of Edinburgh Council in their capacity as Roads Authority as well as for visual impact through the prior approvals process.

28 Structures

28.1 General

The Edinburgh Tram Network requires the construction, or modification to, a number of structures throughout its length. The work involved in the Edinburgh Tram Network will impact on bridges and retaining structures. This Section 28 sets out the requirements which the Infraco must comply with in relation to structures.

28.2 Structures List

The following is a list of the principal structures along the Edinburgh Tram Network.

Table 80 - Structures Schedule

Structure Ref.	Section	Structure Name	Description
S19	2A	Haymarket Station Viaduct	New underbridge
S18	1D	Leith Walk Railway Bridge	Existing underbridge over single railway line
S1	3A	Roseburn Terrace Bridge	Existing single span plate girder underbridge.
S2	3A	Coltbridge Viaduct	Existing three span masonry arch underbridge
S3	3A	St George's School Access Bridge	Existing single span masonry arch overbridge.
S4	3A	St George's School Footbridge	Single span steel truss footbridge
S5	3A	Ravelston Dykes Bridge	Existing single span masonry arch overbridge.
S6	3A	Craigleith Drive Bridge	Existing single span masonry arch underbridge.
S7	3A	Holiday Inn Access Bridge	Existing three span composite overbridge
S8	3A	Queensferry Road Bridge	Existing single span masonry arch overbridge.

Structure Ref.	Section	Structure Name	Description
S9	3A	Groathill Road South Bridge	Existing single span masonry arch underbridge.
S10	3A	Telford Road Bridge	Existing single span overbridge.
S12	3B	Crewe Road Gardens Bridge	Existing single span RC structure
S20	2A	Russell Road Bridge	New underbridge at Russell Road delta
W3	5A	Russell Road Retaining Wall One	New retaining wall required due to level difference.
W4	5A	Russell Road Retaining Wall Two	New retaining wall required due to level difference.
W18	5A	Murrayfield Tramstop Retaining Wall	
S21A	5A	Roseburn Street Bridge	New underbridge
S21B	5A	Murrayfield Stadium Retaining Wall	New retaining wall required due to level difference.
S21C	5A	Murrayfield Stadium Underpass	New underbridge
S21D	5A	Murrayfield Training Pitches Retaining Wall	New retaining wall required due to level difference.
S21E	5A	Water of Leith Bridge	New underbridge
S23	5B	Carrick Knowe Underbridge	New underbridge (Intersection Bridge)
S24	5B	Existing Saughton Road Bridge	Existing WEBS structure
S25	5B	Existing Broomhouse Road Bridge	Existing WEBS structure

Structure Ref.	Section	Structure Name	Description
S26	5B	South Gyle Access Road Bridge	New underbridge
W11	5B	Bankhead Drive Retaining Wall	New retaining wall required due to level difference.
S27	5C	Edinburgh Park Station Bridge	New underbridge (Intersection Bridge)
S28	5C	A8 Underpass	New underpass
W16	5C	A8 Retaining Wall	Now replaced by a slope.
W19	5C	Gyle Stop Retaining Wall	New retaining wall required due to level difference.
S32	6	Depot Access Bridge	New structure required to provide vehicular access from Gogar Burn roundabout to the new depot.
S29	7A	Gogar Burn Bridge	New underbridge
S33	7A	EARL Underbridge	No longer required.
W14	7A	Gogar Burn Retaining Wall One	New retaining wall required due to level difference.
W15	7A	Gogar Burn Retaining Wall Two	New retaining wall required due to level difference.
W100	3A	Roseburn Corridor Retaining Walls	
S17	1D	Tower Place Bridge	Existing underbridge at Leith Docks

Structure Ref.	Section	Structure Name	Description
S16	1D	Victoria Dock Entrance Bridge	Existing underbridge at Leith Docks
W1	1D	Lindsay Road Retaining Wall	Existing modular retaining wall adjacent to Lindsay Road.
S30	7A	Gogar Culvert One	New culvert
S31	7A	Gogar Culvert Two	New culvert
S34	7A	Gogar Culvert Three	New culvert
W8	5A	Baird Drive Retaining Wall	New retaining wall required due to level difference.
S22	5A	Balgreen Road Bridge	New underbridge
W9	5A	Balgreen Road Retaining Wall One	New retaining wall required due to level difference.

28.3 Proposed Structural Form

The approval for all structures and civil engineering works shall be in accordance with the Consents Programme and Schedule 14 (Design Management Plan). The proposals at all structures listed above shall be subject to review/acceptance by **tie** prior to application for consent being made to the City of Edinburgh Council, or Approval to Network Rail as appropriate.

28.4 Listed Structures

Due cognisance shall be taken by the Infraco of the historical status of any of the structures affected by the Infraco Works. Work on such structures will be subject to the relevant approval process, as described in the Consents Programme and Schedule 14 (Design Management Plan).

28.5 Vibration and Noise

Structures and civil engineering works shall be designed in accordance with **tie**'s Noise and Vibration Policy at 10.1.5.

28.6 Bearings and Movement Joints

The design shall minimise the need for bearings and movement joints within all the structures. Integral structures shall be adopted where feasible.

Where bearings are required, either elastomeric or pot type bearings shall be used to accommodate the longitudinal and transverse translations and rotations while minimising lateral loads on sub-structures.

All bearings shall be replaceable under full live loading.

The use of movement joints shall be minimised, but where proposed they shall be easily maintainable and replaceable.

28.7 Design Life

The design life of all structures is set out in Section 6 (Design Life) of these Employer's Requirements.

28.8 Design Standards

All structures shall be designed in accordance with the appropriate design standards – See Section 8 (Standards) of these Employer's Requirements. Adopted design standards should be listed by the Infraco in the Approval in Principle Form 'A', or equivalent, submitted to **tie** for individual structures.

28.9 Structure Loading

Structures supporting the ETN shall be designed to carry 0.5RL loading as defined in the Design Manual for Roads and Bridges (DMRB and BS5400 Part 2). The maximum allowable tram axle load is determined in 24.12 of these Employer's Requirements.

During the design of structures due cognisance shall be given to the loadings imposed by construction and maintenance vehicles. Any constraints upon the operation of construction and maintenance vehicles shall be identified and advised to **tie**.

28.10 Rail Break

All elements shall be designed and provided to cater for tensile breakage of one rail at any location at ultimate limit state only. The other unbroken rails and the supporting structure shall resist the unbalanced force from a broken rail. The force resisted by any element shall be the lesser of:

- The force resulting from the rail and concrete deck temperatures and shrinkage, or
- The sum of the clip resistances between the movement joints bounding the break.

The effect of rail break shall be considered in conjunction with rail tensile temperature effects and the tram dynamic weight, centrifugal, nosing and braking and/or traction effects. The partial load factor shall be taken as 1.0.

28.11 Clearances

As a minimum, clearances shall be to RSPG 2 Tramways requirements.

Structural designs shall take due cognisance of the potential developed kinematic envelope of Trams that may be operated on the ETN.

28.12 Finishes

Finishes to all concrete components of the Infraco Works shall comply with the following:

▪ All buried and permanently submerged surfaces	F1, U1
▪ Pier tops, bearing shelves and hidden surfaces	F2, U2
▪ Parapet Coping, Exposed surfaces	F3, U3
▪ Main bridge deck	U4
▪ Special finishes – where deemed appropriate these are to be agreed with **tie** and all relevant authorities (e.g. CEC structures department) taking cognisance of all cost and construction impacts.	Note

Table 81 - Finishes

28.13 Protection

Structural steelwork shall be protected by a paint system in accordance with the appropriate standard. Steel surface preparation and the application of high performance paint coatings shall provide a design life to the first maintenance intervention in excess of twenty years. This requirement takes precedent over other standards.

The top surface of the any bridge deck shall be protected with a proprietary sprayed waterproofing system in accordance with BD 47/99.

All buried concrete surfaces shall receive two coats of bitumen; and Pavix (or equivalent) is to be applied to all concrete surfaces exposed to salt spray. A risk based assessment is to be undertaken for approval by **tie** to identify the extent of anti-graffiti treatment to be applied to exposed concrete surfaces.

28.14 Infrastructure Maintainability

The infrastructure shall be designed to minimise maintenance requirements. In particular the design should allow access which will not adversely impact systems operation of the Edinburgh Tram Network for the completion of routine work.

Structures will be subject to regular general inspections and a principal inspection at a frequency of every six years. The principal inspection shall entail amongst others a close visual inspection of all

elements of a structure. Details of the inspection and maintenance regimes are to be developed by Infraco and approved by **tie**. Maintenance Requirements are detailed further in Table 92 – Structures at Section 40 of these Employer's Requirements.

28.15 Provision for Inspection and Maintenance

Access to the underside of decks for inspection and maintenance shall be via vehicular-mounted inspection platforms operating from ground level, where access is feasible within contracted design parameters. For maintenance of metal parapets, for example, access shall be from the walkways. For bridges across Network Rail infrastructure it will be necessary to undertake such inspections in accordance with Network Rail requirements.

28.16 Bearings

Mechanical bearings shall be replaceable by jacking up the structure's deck a nominal amount, which minimises disruption and physical works. Where this is required, track will be designed such that only the bridge track is displaced. The bearings shall not require replacement for at least 50 years. Where bearings are provided, suitable inspection and maintenance galleries shall be provided.

Unauthorised access to these galleries shall be prevented through the incorporation of suitable measures.

No specific provisions shall be made for inspection and maintenance of the bearings on piers. Access to these bearings will be via a hydraulic access platform.

28.17 Expansion Joints

Bridge expansion joints shall be of the sealed type and provision shall be made to carry any water seeping through the joint into the deck drainage system. Expansion joints shall be easily maintained and replaced.

28.18 Earthing and Bonding

Structures shall be designed to comply with the Earthing and Bonding Policy at Earthing and Bonding of these Employer's Requirements.

28.19 Protection against Stray Current

Where trackform is an integral part of the structures, it shall be designed to comply with Stray Current Section 32 of these Employer's Requirements.

28.20 Third Party Relationships

28.20.1 Road Closure and Traffic Management

All Infraco Works affecting road traffic will be subject to the granting of permissions from relevant parties and may involve road closures or traffic management measures approved by CEC or the owner of the affected road. All such approvals are to be in place in advance of of any traffic impacts and comply with the requirements of Project Management Processes

In particular, the following works are expected to have a significant effect on traffic movements and may require particular consideration:

- Groathill Road Bridge and Craigleith Drive Bridge may require road closures for the duration of the Infraco Works;
- Construction of the abutments and new deck for Roseburn Terrace Bridge will require temporary closure of the A8 and partial workings within the carriageway;
- The construction of a structure, passing under the A8 to the east of Gogar roundabout, shall require significant traffic management to minimise disruption to traffic during construction. Additionally consideration will be required for the traffic impacts to the construction of the Depot Access Bridge and A8 retaining wall structures;
- Ocean Drive Bridge widening may require road closure for the duration of the Infraco Works;
- Roseburn Corridor Structures will be impacted an may require temporary traffic constraints (Ravelston Dykes Bridge, Holiday Inn Access Bridge, Queensferry Road Bridge, Telford Road Bridge, Crew Road Gardens Bridge;
- Tram bridges to be constructed over live roads may require some traffic constraints including Haymarket Station viaduct, Russell Road Bridge, Roseburn Street Viaduct, Balgreen Road Bridge, South Gyle Access Bridge.

28.20.2 Other Interested Parties

All relevant third parties shall be consulted by Infraco as required during the course of. In particular, this will include in relation to structures:

- Network Rail – noting particularly the Carricknowe and Edinburgh Park Bridges;
- Forth Ports;
- Edinburgh Airport Limited;
- Edinburgh Park Management Limited / New Edinburgh Limited; and
- Scottish Rugby Union.

28.20.3 Landscaping and Boundary Treatment

The Design Manual sets out the parameters of the design elements of the environmental mitigation measures to be implemented. The design guidance and requirements contained within the Design Manual shall be considered by the Infraco taking into account the CEC's own Development Quality Guidelines. (They include: Quality of Landscaping in New Developments, Biodiversity, Tree protection and Urban Forestry.)

A Landscape and Habitat Management Plan (LHMP) shall also be identified and prepared for the approval of **tie** and subsequent presentation to the CEC. It should be noted that there is a requirement for the LHMP applicable to the Roseburn Corridor to be specifically approved by the CEC Planning Committee.

A Boundaries Treatment Management Plan shall be created and updated by the Infraco to reflect emerging issues regarding boundary interface design matters between the track and adjoining ownerships. In general, all landscaping and boundary measures shall be in keeping with the surrounding environment and shall be consistent with the local character of the relevant area.

Where it is determined that fencing is required either to physically segregate the tram track or to separate the tram from other parties (for example Network Rail) the fencing shall be of a type and standard that provides the necessary separation and satisfy the requirements of the other party. In the case of Network Rail it must conform to their Group and Company Standards. The design will take into account concerns with respect to an individual having safety space in a fenced route.

Boundary treatments shall take cognisance of the need for appropriate noise mitigation measures, as well as other appropriate ecological works (e.g. badger mitigation) ensuring all Infraco Works have achieved all relevant approvals. In particular it is required that such boundary treatment and noise mitigation measures meet with the requirement to provide an end result which is no worse than the environmental impact assessment and presented in the Environmental Statement which was presented as part of the parliamentary submission.

29 Depot

29.1 Scope

This Section of the Employer's Requirements defines the Depot requirements applicable to the Edinburgh Tram Network (ETN) which the Infraco must comply with.

29.2 Depot, Buildings and Associated External Works

The Depot shall be of an economical design which reflects economy of use and maintenance in providing all the functionality required by **tie**.

The Depot shall provide the facilities to operate, service, repair and maintain a reliable passenger service.

29.3 The Site

The Depot site in Gogar is located in the vicinity of Edinburgh International Airport and has constraints imposed upon its design by the Civil Aviation Authority due to the proximity of the emergency runway at the airport. Factors to be accommodated in the design and construction of the Depot include height restrictions that shall necessitate detailed discussions with the aviation authorities.

29.4 Staff Halt

At a location to be agreed by **tie**, shelters shall be provided for the sole use of tram crew and other staff working on the Edinburgh Tram Network so as they can board the Trams. The staff halt shall comprise of shelters not less than 2.5m x 2m which shall provide weather protection. The staff halt will be linked to the Depot by a designated walking route leading to a controlled gate in the Depot boundary fence. The shelters shall be monitored by CCTV cameras, if they are not visible from the Depot Control Centre. The shelters will be provided with telephones providing a dedicated link to the Depot Control Centre.

The staff halt shall not introduce any speed restriction to the passage of Trams.

29.5 Drainage

The general site area shall be lowered to ensure that all structures are below the flight path. As a result of this excavation, both foul and surface water drainage may need to be pumped from the permanent works to off-site outfalls.

29.6 Access

Road access from the A8 Gogar roundabout link road shall provide both entry and exit for normal Depot operations traffic and also for delivery and egress of Trams with the minimum of impact on other facilities. Height restrictions on vehicle loads shall be verified in relation to the Airport operations. The link road giving access to the Depot may be extended by others and will cross the Tram route to the Airport, and the Depot entry track.

29.7 Utilities

Existing utilities and sewers crossing the Depot Site site shall be protected or re-located as appropriate and shall be instructed as a **tie** Change and follow the principles of Section 21.

29.8 Depot Site Layout

The configuration of the Depot and the use of the equipment contained therein shall minimise disturbance to neighbours.

Allowance shall be made in the site layout adjacent to the Depot building to accommodate temporary office facilities that may be needed during the construction, testing and commissioning phases of the Infraco Works. This shall include the provision of temporary electricity and water services.

The Depot site shall accommodate a zone within which the required accommodation can be located.

The Depot shall be secure and be provided with security systems as appropriate.

- The Depot shall have a suitably robust security fence 2.4m high shall enclose the Depot site with controlled entry points for Trams, vehicles and pedestrians. The security entry points shall be unmanned with security control systems providing the means of operation. These shall be centred on the Depot reception during normal office hours with transfer to the Control Centre at other times.

- The Depot shall incorporate two separate access points to the running lines.

- The entire Depot external operating area within the perimeter fence shall be provided with a comprehensive CCTV surveillance system, the images from which shall be displayed in real-time in the Control Centre. The cameras shall form part of the network CCTV system (refer to Section 35 (Supervisory Control and Communications Systems) of these Employer's Requirements. In particular a CCTV system shall be provided to view the Depot vehicular and

pedestrian entrances. It shall be integrated with the entry systems and shall be centred on the Depot reception during normal office hours with transfer to the Control Centre at other times.

The current reference design sets the Depot site below existing ground level and retaining structures shall be constructed as necessary along the A8 site boundary. These structures shall also form the ramp for the through track of the tram system to the Airport.

- The stabling area and its configuration shall be established by the combination of track requirements and the Depot building footprint. The Depot layout shall accommodate a minimum of 36 berths. The stabling facility shall be built to accommodate an initial 27 x 44m Trams. Adequate provision shall be made to allow cleaning personnel to move around berthed Trams.

- Set between the stabling roads shall be access paths alternately at least 1.0m and 2.0m wide with service points to provide facilities for Tram cleaning and minor maintenance on the 2.0m width paths.

- The desirable longitudinal gradient of all tracks within the Depot shall be zero. The absolute maximum longitudinal gradient shall be 0.4%. Cross-level gradient (cant) of all tracks shall be zero (see Section 26 (Track) of these Employer's Requirements).

- At the ends of any tracks that terminate, a Tram-arresting device shall be provided.

- A track shall be provided to enable Trams to be loaded and off loaded onto/from road transportation.

- A servicing track shall be provided complete with a tram wash plant and hand windscreen cleaning points. Road access shall be provided for detergent deliveries to the wash plant.

- The wash plant shall be located inside a shelter (the shelter need not extend the full length of the Tram being washed) – see Table 83 - Depot Plant and Equipment to be Provided of these Employer's Requirements, where the operating temperature range is set out. The facility will be provided with suitable devices to remove excess moisture from the washed vehicles. High quality results, at least as good as those achieved by Lothian Buses on their fleet, shall be delivered by this facility.

- Sand filling points within an enclosed structure shall be installed on the servicing track. The bulk sand silo (capacity at least 30t) and associated feeder equipment shall be located close by, along with the provision of road access for sand deliveries.

- A suitably drained bogie wash point shall be provided in the apron at the front of a Tram entry point to the workshop which allows demounted bogies to be easily manoeuvred in and out of the workshop. Plant used for this operation shall be transportable and housed within the main workshop. Power and water shall be provided to allow the tram pressure washer to be utilised at this location. Treatment of wastewater, to meet appropriate standards prior to connecting to the site drainage system, shall be provided.

- Car parking shall be provided for one third of the personnel employed on the Depot site. Within this provision, visitor car parking shall be provided close to the Depot entrance for no less than six vehicles.

- Servicing areas for external stores and containment of waste shall be provided.

- A sub-station for both traction power (main line and depot feeds) and domestic Depot supplies shall be provided.

- Due to the proximity of the Airport runway, planting and landscaping within the Depot site shall be restricted and consistent with CAA guidance to prevent bird strikes. Native species of plants shall be used where possible and shall be compatible with Tram operations.

- The Depot site shall be appropriately lit.

29.9 Depot Building

The following identify the principal features of the Depot building:

- The main Tram workshop, other workshops, stores, management, administration, operations and maintenance offices, staff welfare facilities (support accommodation) and the Control Centre for the complete Edinburgh Tram Network, shall be contained within a steel framed building clad in an insulated panel cladding system. The roof of the building shall be insulated to a suitable standard with the minimum number of penetrations.

- The building workshop shall accommodate a minimum of two tram maintenance roads, a wheel lathe road and a further tram service road.

- The support accommodation shall be arranged on two floors set to one side of the main tram maintenance workshop. The Control Centre shall be located at first floor level with the equipment room set below. A view of the depot external stabling area and tram entry/exit point shall be provided to Control Centre staff from within the Control Centre.

- The Depot shall be provided with the appropriate electricity supplies including 400V for individual items of workshop equipment both inside and outside the building, 230V for internal domestic use and 110V for small tools.

- Natural light in offices shall be maximised and all rooms shall be placed within the building in locations appropriate to their function. This shall be supplemented by artificial lighting consistent with the tasks undertaken and the hours of operation of the facility.

- Additional service space shall be provided for the accommodation of domestic services as well as for the accommodation and systems directly linked to the Tram operations.

- Full heating and ventilation will be provided throughout the building with air conditioning to the cControl Centre, equipment room, training and meeting rooms.

- Fire alarms and fire extinguishing systems shall be provided throughout the Depot building. Fire suppression shall be provided in the technical equipment room(s).

- Suitable office furniture shall be provided for all areas within the Depot building.

The following schedule of accommodation shall form the basis of the design for the office and welfare facilities attached to the Depot.

29.10 Schedule of Staff Numbers

The Depot shall accommodate the number of staff identified in the "Establishment with Expansion" column set out below.

Note: The locker rooms should have sufficient capacity for approximately 5% spare capacity on these numbers to cope with staff turnover and associated training overlap.			**Max Number on duty in the Depot at one time**	
Anticipated Job Title	**Establishment for Phase 1a/1b**	**Establishment with Expansion**	**Phase 1a/1b**	**With Expansion ratioed up**
OPERATIONS				
CORPORATE MANAGEMENT				
General Manager	1	1	1	1
Operations Manager	1	1	1	1
Commercial Manager	1	1	1	1
OPERATIONS				
Duty Managers	11	12	4	4
Operations Supervisor	9	9	2	2
Operations Assistant	1	1	1	1
Drivers	112	126	11	12

Anticipated Job Title	Establishment for Phase 1a/1b	Establishment with Expansion	Phase 1a/1b	With Expansion ratioed up
OPERATIONS				
Engineering Manager	1	1	1	1
Vehicle Engineer	1	1	1	1
Infrastructure Engineer	3	3	3	3
Safety and Standards Manager	1	1	1	1
Performance Regime Manager	1	1	1	1
Clerk	1	1	1	1
FINANCE				
Finance Manager	1	1	1	1
Accounts Assistant	2	2	2	2
Administration				
Secretaries	1	1	1	1
Admin. Staff	2	2	2	2

Anticipated Job Title	Establishment for Phase 1a/1b	Establishment with Expansion	Phase 1a/1b	With Expansion ratioed up
REVENUE PROTECTION STAFF				
Inspectors	112	126	11	11
Cashiers	1	1	1	1
Revenue Protection Manager	1	1	1	1
INFRASTRUCTURE / VEHICLE CLEANING				
Cleaning Manager	1	1	1	1
Cleaners	20	23	10	11
SUB TOTAL	**285**	**318**	**59**	**67**
TRAM MAINTENANCE				
Office Staff	3	3	3	3
Storeman	1	1	1	1
Technicians	30	34	15	16

Anticipated Job Title	Establishment for Phase 1a/1b	Establishment with Expansion	Phase 1a/1b	With Expansion ratioed up
SUB TOTAL	**34**	**38**	**19**	**21**
INFRASTRUCTURE MAINTENANCE				
Office Staff	4	4	4	4
Storeman	1	1	1	1
Technicians	37	42	18	20
SUB TOTAL	**42**	**47**	**23**	**25**
SUMMARY				
Operations	285	318	59	67
Tram Maintenance	34	38	19	21
Infrastructure Maintenance	42	47	23	25

Table 82 – Schedule of Staff Numbers

29.11 Accommodation (First floor)

The first floor is to be occupied by the Operator. The accommodation set out below is required as a minimum and must be related in all respects to the numbers of staff to be employed and based at the Depot as set out in Table 82 – Schedule of Staff Numbers, where not otherwise specified. Appropriate account is also to be taken by the Infraco of the maximum numbers of staff indicated as being on the premises at any one time in sizing toilets, messing facilities etc.

- A Control Centre to include the equipment as defined in paragraph 35.13 and allow a good ergonomic layout for the functions carried out therein.

- A room adjacent to the Control Centre, with sufficient space for the incorporation of the necessary furniture and technical equipment used to store and manage the handheld radios and ticketing equipment and their batteries, together with one desk space.

- A cash office adjacent to the Control Centre, with adequate space for two staff members and the associated equipment for cash counting and sorting, as well as a safe of an appropriate size.

- A viewing area shall be provided for visitors to view the Control Centre without disrupting the activity within.

- Windows shall be provided to provide a view into the tram workshop from the first floor. Suggested locations are adjacent to the Control Centre (if not inside, then integrated with the viewing area referred to above), adjacent to the engineering office, and in the viewing area.

- Adequate toilets and showers (Male, Female, Disabled).

- Access from the ground floor with at least two staircases and one lift (for disabled access and, unless other arrangements are available, for the lifting of equipment and furniture required on the first floor).

- One set of stairs is to give direct access between an external door (itself adjacent to the visitor's parking spaces) and the first floor. A reception area is to be provided at the first floor landing including an allowance for a reception desk and a minimum of four waiting chairs. A second set of stairs is to be adjacent to the Control Centre and provide a direct link, to a route from the staff parking/external access gate and the locker rooms, and to the walking routes onwards into the stabling sidings and to the access gate in the Depot fence to the staff halt on the main line.

- Office for the General Manager, sized for one person with meeting table for six people.
- Office for the Operations Manager, sized for two people. To be situated close to the Control Centre.
- Office for the Safety and Performance Managers, sized for two people.
- Engineering office, sized for three people, with meeting area for four people.
- Office for the Duty Manager and Supervisors, sized for three people.
- Office for the Finance and Commercial Managers, sized for two people.
- General office, sized for eight people.
- Messing facility, including limited self-service kitchen facility.
- Cleaning office and store.
- Interview room, close to the office of the Operations Manager.
- Meeting room for 10 people, close to the Reception.
- Two training rooms, one sized for 30 people and one for 15 people. The larger should be able to be subdivided, broadly in half. Note that this may be required to be on a permanent basis once the complete system is open for service.
- Space to locate the PABX and a computer server for the Operator.
- Locker Rooms, male and female in suitable proportion for the total relevant staff numbers and with an allowance for flexibility in recruitment. The design shall allow for flexibility in the division to allow for long-term changes in the proportions. The locker rooms should be placed conveniently for the Control Centre and messing facility. The space allowance for lockers should be based on two-thirds height/interleaved lockers.
- A store for uniforms and other small operational equipment.
- A records store.

- A location for photocopying.

29.12 Workshop General Requirements

- In the main workshop, all roads shall have traction power. The wheel lathe shall be placed in a central position to enable the workshop doors to be closed whilst the lathe is in operation;
- Gantry structures, for access to the Tram roof area from both sides, shall be provided for a minimum of two berths;
- Under-track pits shall be provided on no fewer than four tram maintenance berths incorporating access and egress stairs. Pits shall have adequate lighting, drainage and power tool sockets;
- 'Built-in' jacking points (i.e. lifting under the Tram bogies) shall be provided to one of the roads, which shall be provided with traction power, the pits containing this equipment shall be adequately drained;
- Battery charging equipment shall be provided for Tram batteries, fork lift trucks and all other battery powered equipment with associated ventilation equipment, in a dedicated area off the main workshop;
- Hydraulic and electronic workshop facilities, including bespoke test benches, shall be provided appropriate to the Trams. Fixed equipment, for the servicing and testing of hydraulic and electronic equipment shall be provided. The areas shall be capable of being separated from the main workshop area by closure of an industrial door; and
- Both heavy and light stores areas shall be provided complete with the necessary racking systems to suit the storage requirements of the spare parts required for all systems, equipment and Trams being supplied. Forklift truck access to these areas shall be provided. Stores are to be segregated between those required for the Tram Maintainer and those for Infraco.

29.13 Accommodation on Ground Floor

29.13.1 General Facilities

The ground floor is to be principally occupied by the Infraco. The accommodation requirements set out below is required as a minimum.

The design of the accommodation must be related in all respects to the numbers of relevant staff to be employed and based at the Depot as set out in Table 82 – Schedule of Staff Numbers, where not

otherwise specified. Appropriate account is also to be taken by the Infraco of the maximum numbers of staff indicated as being on the premises at any one time in sizing toilets, messing facilities etc.

The different spaces should be arranged grouped logically together and with respect to accesses etc. The workshop areas must also accommodate all relevant equipment listed in the Plant and Equipment Schedule – see Table 83 - Depot Plant and Equipment to be Provided.

- The equipment room shall be underneath the Control Centre. Necessary domestic plant rooms.
- A store for tram and infrastructure cleaning equipment.
- First aid room (suitable for all staff at the depot, accessible from the first floor and to an external vehicle access).

29.13.2 Facilities

- Staff access shall be arranged preferably, adjacent to the locker rooms and convenient for external access and with appropriate security.
- Adequate toilets and showers shall be provided (Male, Female, Disabled) serving both contractors.
- A messing facility, including limited self-service kitchen facility.
- Locker rooms, male and female in suitable proportion for the total relevant staff numbers and with an allowance for flexibility in recruitment. The design shall allow for flexibility in the division to allow for long-term changes in the proportions. The space allowance for lockers should be based on a full-height lockers for each relevant person. There should be dry locker rooms, sufficient for all Infraco staff, based on full-height lockers, and a drying room to include additional full-height lockers for all of the Infrastructure and Tram Maintenance staff.
- machine tool area, open to the tram workshop. This might be linked to the dirty workshop.

29.13.3 Tram Maintainer Specific Facilities

- A small store for workshop cleaning equipment.
- A location for a computer server for the Tram Maintainer.
- Tram Maintenance Managers Office, sized for one person with meeting area for four persons.

- Tram Maintenance General Office, sized for five persons.
- Tram Stores including office, small items store and large items store with access for fork-lift truck. The size of these shall be agreed with the relevant contractor.
- Battery store and charging area
- Clean workshop(s) for electronics and hydraulics
- Dirty workshop for bogie, with cross access track from the main vehicle workshop underneath the travelling crane; area could be linked with machine tool area

29.13.4 Infrastructure Maintainer Specific Facilities

- A location for a computer server for the Infrastructure Maintainer.
- Infrastructure Maintenance Manager's office, sized for one person with meeting area for four persons.
- Infrastructure Maintenance general office, sized for five persons.
- Infrastructure stores including small office, small items store and large items store with access for fork-lift truck. The size of these shall be agreed with the relevant contractor.
- Clean workshop for electronics
- Dirty workshop which could be the machine tool area.

29.14 Provisional Schedule of the Plant and Equipment

The plant and equipment to be provided and installed shall include, but not be limited to, the following:

Table 83 - Depot Plant and Equipment to be Provided

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
1		Cleaning Equipment										
	1.1	Tram Cleaning Equipment	Equipment for cleaning of tram interiors	110V Industrial vacuum cleaning equipment, ≥ 2kW power Equipment to allow removal Floor polishing equipment	P	Generally used in stabling areas However can be used throughout the Depot	T	O	O	O	O	6

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.2	Tram pressure washer	Industrial washer for general tram cleaning within the Depot including bogie washing	Self powered Hot water/steam - self heating Pressure variable up to ≥200 bar Flow rate ≥12 l/min Lance and hose ≥10m Detergents compatible with Tram external finishes	M	Throughout Depot	T	T	T	T	T	1
	1.3	Infraco pressure washer	Removal Removal of fly posters General cleaning	Features as per Tram pressure washer Mobile towable bowser with capacity for up to one shift of cleaning Infraco to ensure	M	Across the ETN	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				interchangability with tram pressure washer Readily transportable on back of road-rail and other road vehicles								

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.4	Tram Washing Plant	Fixed plant for cleaning of Tram exterior	Unidirectional >15 tph continuously Minimised water consumption, maximised water recirculation controllable and monitored from Control Centre via SCADA system Self contained Pre-wet One pair application brushes Automatic end wash Two pair water wash brushes	F	Alongside main workshop	I	O	O	O	O	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Dryer Operates from -5°C ambient external temperature within shelter Final details TBD with tram supplier ≥70% water recycling Backflow prevention devices shall be installed. Treatment of wastewater to meet appropriate standards prior to connecting to site drainage system shall be provided.								

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.5	Rail Groove Cleaning Equipment	P-way cleaning	Vacuum equipment to remove detritus/debris from grooved track including drain boxes and points Able to clean drains and gullies employing water jets Transportable on road/rail vehicle, lifted with crane or fork lift truck Self powered for full shift Easy collection/disposal of detritus/debris	M	Across the ETN	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	1.6	Parts washer	Infrastructure/Tram component cleaning & degreasing in dirty workshop	Able to wash components ≤100kg, ≤750mm diameter	F	Within dirty workshop	I	I/T	I	I	User	1
	1.7	Floor scrubber	Depot floor cleaning	Industrial vacuum/brush scrubber equipment Compatible with floor finishes	M	Within Depot building	T	T	T	T	T	1
2		Mechanical Handling										
	2.1	Shunter	Manouveuring Trams within workshop	Battery powered Road/rail capability Capable of towing/propelling single Trams Speed up to 3 km/h	M	Throughout Depot tracks Road capability to move	T	O/T	I/T	O	User	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Local and remote control Charging facilities Coupler at each end		between tracks on hardstanding						
	2.2	Tram lifting system and stands	Lifting Trams to allow routine maintenance and removal of bogie(s)	Fixed underfloor system providing flush floor when not in use. Ability to lift fully functional, unladen tram. Synchronised lift from single control panel. Ability to stop and lock lift at any vertical positionInterlocking to	F	Main workshop	I	T	T	T	T	1 set

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				protect Tram in event of system/component failure. Manually positioned stands to be provided Interlocking with OLE if required.								
	2.3	Fixed high level access platforms	To allow access to all equipment mounted on Tram roof	Capable of providing access to all roof mounted equipment on tram Decking to prevent tools or small to components falling through Handrails and toeboards to prevent	F	Main workshop	I	T	I	T	T	2 sets

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				personnel/material falling Access/egress gates interlocked with OLE End protection								
	2.4	Overhead crane	Bridge type crane spanning 2 roads within the workshop to allow all material within main workshop to be transported up to and including size/weight of motor bogie	≥6.3 tonne capacity Vertical clearance <960 mm from hook (fully raised) to top of crane Traverses below OLE Interlocked with OLE Remote control using hand held device Multi-speed faciltiy - lift, traverse and travel	F	Main workshop	I	T/I	T	T	User	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				Long and cross travel to cover all areas over the two roads								
	2.5	Mobile crane	Facilitate removal of miscellaneous equipment including bogie components within the dirty workshop	≥2t capacity Powered operation	M	Throughout workshops	T	T/I	T	T	User	1
	2.6	Bogie workstands	To allow dismounted bogies to be maintained	Allows bogie to be manoeuvred along the stub track in the dirty workshop Wheel locks Capable of supporting	M	Dirty workshop	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				both trailer and motor bogie								
	2.7	Other tram equipment stands	Various stands to allow items of equipment to be stored and readily maintained when dismounted from the Tram	Infraco to propose depending on tram design Expected to include stands for doors, windows, body panels etc…	M	Throughout Depot	T	T	T	T	T	
	2.8	Accommodation bogies	To allow Trams to be moved within workshop once bogies have been removed or the Tram has been split at any articulation	Allows Tram to be manoeuvred throughout the depot once any combination of bogies has been replaced Allows entire tram to	M	Throughout Depot	T	T	T	T	T	

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				be manoeuvred throughout the depot once any articulation has been split								
	2.9	Fork lift truck	Lifting and transporting miscellaneous equipment	Battery powered Charging facilities Road wheels >3 t lifting capacity Drum handling equipment Crane arm Capable of accessing all shelving and racking in stores- Infraco to demonstrate	M	Throughout the Depot but limited to hard standing areas when outside	T & I	T/I	T/I	T	User	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	2.10	Pallet truck	Lifting & Transporting equipment particularly in stores	Manually manoeuvred, hydraulic lifting the Infraco to propose requirements. Infraco to provide integrated solution	M	Throughout the Depot but limited to hard standing areas when outside	I	T/I	T/I	T	User	The Infraco to propose
	2.11	Hand trolleys	Transporting tools and spares	Unpowered the Infraco to propose requirements. Infraco to provide integrated solution	M	Throughout the Depot but limited to hard standing areas when outside	I	T/I	T/I	T	User	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	2.12	Infraco lifting slings	General slings for lifting infrastructure heavy components on system and in Depot building	Infraco to propose. Stand for storage	P	Use on system infrastructur e	I	I	I	I	I	The Infraco to propose
	2.13	Tram lifting slings	Specific lifting gear to allow all equipment to be removed and replaced.	Raised hook on overhead crane can be no more than 5390 mm ARL the Infraco to propose Stand for storage	M	Use in Depot building only	T	T	T	T	T	Tramco to propose
	2.14	Windscreen/window removal equipment	For use in replacing tram windscreens and side windows	Mobile stand capable to being used to access both windscreen and side windows Electrically powered vacuum beam with	M	Use in Depot building only	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				suckers adapted to windscreen design Audio/visual alarm in the event of suction loss								
	2.15	Re-railing equipment	For use in rerailing trams out on the System	Variety of jacks/beams/slides to be proposed by the Infraco Airbags Slew locking devices Capable of being readily transported on the road/rail vehicle	M	Used any where on system including Tramstops	T	T	T	T	T	1 set
	2.15	Stop boards	To indicate the presence of equipment/personnel/tram	The Infraco to propose requirements. Infraco	P	Throughout System	I	T/I	I	T/I	User	≥20

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
			s on the tracks	to develop integrated solution								
3		Workshop & Stores Furniture										
	3.1	Shelving and racking	Storage of spares and other material	Heavy duty The Infraco to propose requirements. The Infraco to develop integrated solution	F	Stores	I	T/I	I	T/I	Us er	The Infraco to propose
	3.2	Tram staging	for Tram inspections/repairs	The Infraco to propose any additional staging required	M	Used within Depot building	T	T	T	T	T	The Infraco to propose
	3.3	General staging	For infrastructure inspections/repairs	The Infraco to propose any additional staging	M	Across Edinburgh Tram	I	I	I	I	I	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				required		Network						
	3.4	Shelving	Storage of minor items/documents	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose
	3.5	Workbenches	Equipment maintenance	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose
	3.6	Cupboards	Storage of minor items/documents	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	User	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	3.7	COSHH cupboard	Storage of COSHH items	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Dirty workshop	I	T/I	I	T/I	use r	The Infraco to propose
	3.8	Workshop stools	Personnel comfort when working	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Throughout workshops	I	T/I	I	T/I	Us er	The Infraco to propose
4		Fixed Plant										
	4.1	Air conditioning maintenance equipment	Specialist tools for filling/emptying refrigerant	The Infraco to propose	F	Anywhere in Depot building	T/I	T/I	T/I	T/I	T/I	The Infraco to propose
	4.2	Tyre replacement equipment	Specialist tools for tyre splitting/removal/balancing /bearing replacement	The Infraco to propose	F	Dirty workshop	T	T	T	T	T	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	4.3	Underfloor wheel lathe	In-situ reprofiling of Tram tyres	Capable of producing a range of wheel profiles. Tolerances to be agreed between the Infraco Swarf conveyed to skip for removal by means of forklift truck capable of turning all wheels on one Tram within eight hour shift	F	Within Depot building.	I	T	T	T	T	1
	4.4	Sand Plant	Refilling of Tram sanding equipment	Minimum silo capacity 30 tonnes Capable of receiving sand delivery directly from road vehicle Allows Tram driver to	F	Dedicated facility	T	O	O	O	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				fill an empty tram within 5 minutes Rate of fill to be sustainable for 30 minutes. In no circumstances shall the interval between the filling of two Trams exceed 10 minutes The physical condition of the sand shall not deteriorate when stored Sand deliveries to a Tram shall stop automatically when								

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				the tram sand box is full Sand filling nozzles to be compatible with the sand filling inlets on the trams Signal interlocking to inhibit the movement of a tram if the sand filling nozzles are not returned to their correct storage position.								
	4.5	Machine tools	General machine tools required for maintenance	The Infraco to propose requirements. The Infraco to develop	F	Dirty workshop	I	T/I	T/I	T/I	User	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				integrated solution								
	4.6	Paint booth	Respraying of removable Tram panels	For use with water based paints integrated compressor	F	Outside workshop	T	T/I	T/I	T	Us er	1
	4.7	Pantograph maintenance & load test jig	to calibrates and align tram pantograph off Tram roof	The Infraco to propose	F	Throughout workshops	T	T	T	T	T	1
	4.8	Suspension setting equipment	To allow suspension to be set/shimmed without using tram lift	The Infraco to propose	M	Throughout workshops	T	T	T	T	T	1
	4.9	Diesel generator	Back up power source	Capable of connection to the depot LV switchboard and other plant requiring an external	M	Across network	*	I	I	I		*To be rented by the Operator if and when required.

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				energy source. Capable of providing at least three day continuous operation.								
5		Hand & Mobile Tools										
	5.1	Infrastructure tools	Hand tools	The Infraco to propose	P	Across ETN	I	I	I	I	I	The Infraco to propose
	5.2	Tram tools	Hand tools	The Infraco to propose	P	Across ETN	T	T	T	T	T	Tramco to propose
6		Welding Shop Equipment										
	6.1	Ferrous welding equipment	General infrastructure repairs	The Infraco to propose requirements. Infraco to develop integrated solution	F	Dirty workshop	I	T/I	I	T/I	Us er	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	6.2	Aluminium welding equipment	Specialist Tram and Tram shelter repairs	The Infraco to propose requirements. The Infraco to develop integrated solution	F	Dirty workshop	I	T/I	I	T/I	User	The Infraco to propose
7		Battery Shop Equipment										
	7.1	Tram battery charger	To recharge Tram Batteries	The Infraco to propose	P	Battery room	T	T	T	T	T	The Infraco to propose
	7.2	Infrastructure battery chargers	To recharge various batteries used in power supply, control and comms equipment	The Infraco to propose and develop solution compatible with tram battery charger	P	Battery room	I	T	T	T	T	The Infraco to propose
8		Instrumentation and Test Equipment										

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	8.1	Tram test equipment	To allow testing of measurement and testing of tram equipment	The Infraco to propose. Note any overlap with "Special Tools" to be highlighted. As a minimum, proposal to include; headlight tester, tools to allow event recorder to be downloaded and interrogated, tools to allow CCTV systems to be downloaded and interrogated, tools to allow PA and PID announcements to be re-configured.	M/P	The Infraco to propose	T	T	T	T	T	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
	8.2	Infrastructure and Fixed systems test equipment	To allow measurement and testing of infrastructure and fixed systems	The Infraco to propose. Note any overlap with "Special Tools" to be highlighted as a minimum, proposal to include; OLE height and stagger gauge, stray current data loggers, noise measurement equipment, ride measurement equipment, point setting detection equipment, ≥3 sets of live line testing	M/P	The Infraco to propose	I	I	I	I	I	The Infraco to propose

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				equipment								
9		Infrastructure Maintenance Equipment										
	9.1	Portable P&C grinders	To dress points and crossings	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.2	Track welding equipment	to build up profiles/replace sections of track	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.3	Portable tamping equipment	To build up track ballast to realign track	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.3	Portable lighting equipment	To illuminate work/collision sites	The Infraco to propose	M	On Site	I	I	I	I	I	1 set
	9.4	Portable generators	To power site tools/lights	The Infraco to	P	On Site	I	I	I	I	I	2

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				propose								
	9.5	Track measuring Equipment	To allow track line and levels to be measured	The Infraco to propose	P	On site	I	I	I	I	I	1 set
10		Road Vehicles										
	10.1	Road - rail vehicle	To move about the system carrying mobile equipment and personnel	Able to operate on UK roads Able to operate on all parts of the ETN To be equipped with demountable ≥2 man-basket to enable OLE inspection throughout the ETN Capable of towing a tram including ability to apply tram brakes from cab of road-rail	M	Mobile throughout ETN and road network	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				vehicle Capable of having snow plough attached in both road and rail mode Crane with capacity ≥6t and a reach (reduced capacity) of at least 4m. Able to transport other equipment items as set out elsewhere in this list Able to transport ≥3 personnel in cab Payload capability ≥10t							

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				This will make it a requirement that the driver has a LGV driving license. Powered winch with ≥8t pulling capacity								
	10.2	Other road vehicles	Miscellaneous vehicles to be proposed by Infraco	The Infraco to propose	M	Throughout road network	I	I	I	I	I	The Infraco to propose
	10.3	Road/rail trailer	Trailer with large man lift for OLE inspection/repairs	Capable of being towed to site by	M	Throughout road	I	I	I	I	I	1

	No	Description	Function	Features	Fixed/Mobile/ Portable	Location used	Supplier	User	Maintainer	Access Control	Cleaned	Quantity
				road/rail vehicle or truck		network						

29.15 Overhead Line Equipment

The Depot tracks shall be equipped with overhead line equipment. This will be in compliance with the Employer's Requirements for Overhead Line Equipment in Section 31.

Electrical and safety interlocking with the craneage and other plant and equipment shall be provided.

29.16 Depot Substation Buildings and Associated External Works

The requirements for the Depot substation building and associated external works are as follows:

- The Depot sub-station requirements and facilities shall accommodate the needs of the traction power loads within the Depot and to service the adjacent sections of main line, the Depot domestic supplies and the requirements of the Distribution Network Operator.
- A separate 11kV/400V LV transformer and distribution switchgear shall be accommodated fed from the main 11kV supply located in the Depot substation.
- The depot LV switchboard shall be capable of being energised from an external / mobile generator via socket and plug with an interlocked isolator. This shall provide 400 V ac supplies to essential services within the Depot complex.
- Provision shall be made for the switchboard generator apron and clear access to the connection point.

29.17 Depot Systems

29.17.1 Electrical Supplies

The power supply to the traction sub-station is described in Section 30 (Traction Power) of these Employer's Requirements.

Scope

The requirements on the Infraco shall include but not be limited to:

- Main (11kV) power transformer and LV switchboard;
- Sub-mains distribution and main equipment;
- Small power distribution;
- Power supply to mechanical plant and controls;
- Back-up supplies (fixed standby generator);
- Uninterruptible power supplies;
- Data distribution and information technology systems supplies (including operations IT systems);
- Fire protection system supplies;
- Power supplies to CCTV, security and access control systems supplies;
- Power supplies to lighting – internal and external, emergency lighting supplies;
- Cable containment;
- Lightning protection and Depot equipment earthing; and
- Commissioning of systems and training.

Auxiliary Power Supplies

Auxiliary supplies shall be provided with a suitably sized uninterruptible power supply. The uninterruptible power supply room shall be provided with cooling in order to maintain battery life (along with ventilation to offset hydrogen build-up if required).

110 Volt Power Supplies

Appropriate networks of 110 V shall be provided:

- 110 V power shall be distributed within the stabling area;
- 230 V/110 V transformers shall provide 110 V supplies throughout the workshops, the main LV switchroom, the plantroom, the wash plant and the sand filling plant.

Control Centre

Electrical supplies shall be configured such that in the event of a single failure there shall be no loss of data and no requirement for excessive actions on the part of the Control Centre staff.

A dual supply changeover arrangement, with high integrity circuit breakers is preferred to a single large uninterrupted power supply. The power changeover function shall not in itself cause the failure of any system so powered, the loss of information or an interruption to the availability to any sub-system for more than 20 seconds.

- Two, suitably sized uninterrupted power supplies shall be connected in parallel and supplied from the Depot substation to provide supplies to critical loads, i.e. Control Centre and equipment room supplies;
- The equipment room electrical systems to provide heating, ventilation, air conditioning, lighting, power and other building services to provide effective habitation for the centralised terminals of all sub systems deployed upon the Edinburgh Tram Network and the human/computer interfaces thereof shall be provided; and
- Lighting to equipment room shall be provided in accordance to CIBSE Codes. Emergency lighting within equipment room shall be at least 50% of normal to allow operations to be carried out even during mains failure.

An appropriate means of facilitating uninterrupted data and voice communication between the equipment room and Control Centre shall be provided for those sub-systems that are present at the operator workplaces, mimic diagrams, display banks and any emergency override facilities. Dedicated containment (and riser, depending on the room's orientation) for cabling between the two rooms shall be provided.

29.17.2 Specific Sub-System Technical Requirements

Access Control

A complete access control system shall be provided to relevant standards with a clearly defined access control strategy.

Controlled entry for pedestrians, Trams and road vehicles shall be provided with appropriate access control for each. Access control shall be switchable between a reception area (for daytime use) and the Control Centre. The Depot road entrance shall have two separate vehicle gates for entry and exit, and additionally a pedestrian gate on the footway. The vehicle gate shall be capable of being opened, and the pedestrian gate released, from either the Control Centre or the Depot reception, or by a member of staff presenting a security card to a reader at the gate.

The vehicle gate shall re-close once a vehicle has passed through. The pedestrian gate shall close automatically and re-lock when it closes. The vehicle exit gate shall open automatically when a vehicle approaches it from within the Depot.

Tram entry / exit locations shall be provided with manual gates, which shall normally be left open. At these gateways, there shall be a microwave or equivalent detector, which shall sound a single brief distinct audible warning in the Control Centre whenever the beam is interrupted by a person or larger object.

Intercoms shall be provided from each of the two entry gates (pedestrian and vehicle) to reception and Control Centre. There shall be two intercom positions on the same pole, one at convenient height for car drivers and one for heavy goods vehicle drivers, who shall be able to use them whilst in the driving seats of their vehicles. here shall be one security card reader at the lower position and one with the intercom at the pedestrian gate. Any equipment in centre of the road shall be removable if required to allow tram movement by road if designed to be through the same access. An intercom system shall operate in line with the access control system.

IT Systems

IT Systems including network cabling containment throughout the Depot building for the independent supply of IT systems shall be provided in accordance with Good Industry Practice.

- Data cabling shall be provided to appropriate standards;
- All equipment finishes shall be appropriate to area and type of use within the Depot building and shall be in materials with a long life in an environment that is in continuous use;
- All accessories used shall be from approved suppliers/manufacturers. Lifespan of finishes / accessories shall be verified with relevant supplier. Correctly (IP) rated items shall be installed as appropriate to the environment; and
- All materials used shall comply with their appropriate standards. Where necessary, finishes / accessories to carry the appropriate 'test pass' mark.

Data collection facilities shall be provided for the management of information provided by all relevant equipment including the underfloor wheel lathe, SCADA, wash plant etc.

Adequate data points shall be provided to enable data collection facilities to be connected.

Lighting

Natural light in offices shall be maximised and all rooms shall be placed within the building in locations appropriate to their function.

Office lighting shall be to CIBSE document 'Lighting Guide 7: Office Lighting'. The document encourages the maximum use of daylight in offices. Use of lighting controls (i.e. daylight sensing, presence detection) shall also be provided, hence saving energy by utilising daylight wherever and whenever possible.

Lighting in main workshop and other areas shall be placed such that light is given where required for work to take place, including when Trams are present. Each lighting element shall also be safely accessible for maintenance during the continuous operating hours with the OLE over one Tram berth isolated.

- Lighting shall be provided so as to provide the required lighting levels (to CIBSE Guides) even when Trams are occupying the workshop. Task lighting shall be provided by luminaires placed close to the task, also supported by portable lamps connected to local supplies;

- Appropriate switching and control strategies shall be implemented; and

- Verification of lighting levels shall be supported by lighting calculations and also by taking post-installation light meter readings.

29.17.3 Workshop Doors

Workshop Tram access doors shall be bi-parting, bi-folding with clear panels for through visibility. The doors shall be power-operated with push-button controls both inside and outside. The open and close button shall be press and hold whilst the door moves, rather than press and walk away to ensure door does not open or close onto an obstruction or person.

- A top-hung door with a bottom track shall be provided and allowed for when sizing the electric motor;

- The actuating mechanism shall be such that it can be maintained without the need to isolate the overhead line equipment;

- In the event of power or door operating equipment failure, it shall be possible for one person to operate the doors manually from ground level;

- The doors shall be provided with a suitably located insulated aperture to accommodate the live overhead line;

- Overdoor heaters, if proposed, shall operate only when doors open via interlinks and integral thermostats.

Door leaves shall be bonded to earth so that should they inadvertently come into contact with the overhead line equipment, the fault resistance shall be sufficiently low to ensure immediate circuit breaker trip without damage to doors or equipment.

29.17.4 Hazardous Material Storage

Facilities for the storage of hazardous materials and road access for their delivery and off loading shall be provided.

29.18 Equipment Room

29.18.1 Fire Alarms / Fire Extinguishing System

The equipment room shall have a means of locally activating the fire alarm via a wall-mounted panel.

The equipment room shall be fitted with smoke and temperature alarms.

The equipment room shall also be fitted with an automatic and manually operated extinguishing system, which shall not damage the equipment when activated. The extinguishing system chosen shall be designed subject to a risk assessment based on criticality etc.

In the event of the loss of the primary power supply, the alarm system shall function for a minimum of six hours. This system shall be integrated with the durations and functionality of all other UPS systems.

29.18.2 Heating and Ventilation

The equipment room shall be environmentally controlled to minimise the effects of room heating due to equipment dissipation.

The heat exchanger vents shall not be positioned over the work area of the maintainers nor directly above equipment cubicles, and shall be placed in position to minimise localised chilling effects.

The room shall be positively ventilated to prevent dust ingress.

All equipment fitted with fans shall ensure that fan failure shall not compromise system functionality.

29.18.3 Lighting

Lighting within the equipment room shall be either incandescent or fluorescent type fittings.

In the event of power failure, emergency lighting shall be fitted which shall operate for four hours and maintain the level of illumination in the room.

The lighting shall be positioned to illuminate the front and rear of the equipment cubicles, but not directly above equipment cubicles.

29.18.4 Cable / Conduit Entry

Cable routing shall be primarily through floor-recessed conduit.

The main cable entry / exit shall be via an aperture located in the floor, which provides entry or access for cables external to the Depot.

Cable access shall be through the equipment room ceiling.

Particular care shall be taken to ensure that electro-magnetic compatibility is not degraded when cables are closely located.

Cables shall be continuously screened through the wall / floor / ceiling apertures.

Appropriate strain relief or clamping shall be provided.

All cables and conduits shall be clearly marked with cable identifiers or suitable permanent marking which shall last for the expected lifespan of the cable or conduit.

29.18.5 Architectural Requirements

Equipment shall be laid out in the equipment room to afford easy accessibility.

Cubicle doors, when opened shall not impinge on access.

Appropriate 'safe' walkways shall be clearly identified on the floor of the room.

Equipment shall be placed such that cabling runs are minimised.

Antenna, low signal or high frequency cable runs shall be minimised and the equipment positioning optimised to ensure a majority of these runs are compliant.

The equipment room floor shall be sealed to minimise dust ingress into the equipment and the surface shall ensure that no static build-up occurs.

29.18.6 Security Requirements

In the event of security and access control system failure, this shall be logged accordingly and displayed to the Control Centre staff.

29.18.7 Equipment Room Furniture

The equipment room shall be furnished with modern ergonomic furniture to assist the maintainers and reduce fatigue.

There shall be two maintainer's desk positions in the room.

The design of the equipment room furniture shall include provision for the effective management of cabling, and equipment and maintenance power supply distribution.

Each desk position shall have personal storage of a minimum of three lockable drawers.

Positioning of storage shall not inhibit the work-envelope of the maintainer.

Additional tool storage locations shall be located in appropriate areas of the equipment room

29.19 Mechanical and Public Health

29.19.1 General

The mechanical and public health services works to be provided shall include the main Depot, and comprise heating, fresh air ventilation, toilet accommodation extract ventilation, specialist extract ventilation, comfort cooling systems, control systems, incoming natural gas supplies and distribution, fire alarm systems, fire suppression system, incoming mains water supplies, domestic hot water generation, domestic hot and mains water distribution, rainwater collection, waste and soil pipework systems, and underground surface water and foul drainage immediately local to the main Depot (connecting into main services systems).

29.19.2 Water

Cold water shall be provided to each stabling road.

Mains water shall be supplied to areas such as the vehicle workshop (and other special purpose workshops), plant room and wash plant. Backflow prevention devices shall be employed.

Domestic hot water shall be centrally generated and stored. The calorifiers and circulation plant shall be housed in the appropriate plant room.

29.19.3 Air Conditioning

Air conditioning shall be provided in the Control Centre, and all administration areas.

A 'free-cooling' system shall be provided for the equipment room.

Duplicate cooling systems, each capable of 100% duty, shall be installed to serve the Control Centre and equipment room.

29.19.4 Ventilation

Dedicated extractor systems shall be provided to suit specific items of equipment (i.e., lathes, paint spraying booths. vehicle battery charging and uninterrupted power supply system).

29.19.5 Drainage Pad

A drainage pad shall be provided adjacent to the pressure washer with a water and power supply for a pressure washer.

Treatment of wastewater to meet appropriate standards prior to connecting to site drainage system shall be provided.

29.19.6 Mechanical Systems

The systems shall be configured such that in the event of a single failure there shall be no loss of data and no requirement for excessive actions on the part of the Control Centre staff.

All centralised mechanical services plant shall be located in the plant room with sufficient space allocation for maintenance and / or plant removal. The only exception to this may be the heat rejection plant necessary for the air conditioning/comfort cooling installations, which are likely to located externally. Should equipment be required to be located externally the impact on the overall visual appearance of the Depot shall be considered.

30 Traction Power

The scope of this Section of the Employer's Requirements is to define the traction power (substations) requirements applicable to the Edinburgh Tram Network which the Infraco must comply with.

30.1 General Requirements

The provision of traction power shall be derived from a number of suitably located traction substations distributed around the Edinburgh Tram Network.

Each Edinburgh tram traction power substation shall include:

- The traction substation enclosure;
- The associated Scottish Power HV (11 kV) three-phase power supplies with associated HV switchboard, metering and local emergency tripping facility;
- 230V LV services with associated metering and distribution equipment for substation services i.e. lighting, small power etc;
- Traction substation transformer-rectifier/s and equipment;
- Traction dc switchboards;
- Feeder and bypass isolators;
- Substation earthing;
- Negative busbars;
- Batteries / charger;
- SCADA interface marshalling panels or agreed equivalent;
- Associated internal power and control cabling; and
- Miscellaneous items to complete.

Substations shall be containerised at all locations where this is practicable.

Provision shall also be made for a 11 kV supply to the Depot services transformer.

30.2 Traction Substations

30.2.1 General

A sufficient number of traction substations (including a separate substation for the Depot) shall be provided, as described later in this Section 30.

The equipment to be provided for each of the eight traction substations for Phase 1a shall comprise:

- Appropriate HV supply arrangements from a Scottish Power circuit breaker (as part of their HV switchboard to be located in a separate section of the substation building);
- A single indoor transformer-rectifier unit;
- A 750 V dc switchboard with direct acting overload protection, impedance protection, earth fault protection and transfer tripping;
- A negative busbar cubicle;
- A tripping and closing battery and charger; and
- All associated internal power and control cabling, and earthing.

The layout and disposition of all equipment contained within all substations shall be identical where this is practical.

Separate personnel access shall be provided to the compartment housing LV control, protection and instrumentation equipment and associated multicore cabling terminations. This compartment shall be fully segregated from the HV / traction voltage compartments by means of a cage or similar. An access door shall be provided between the two compartments, with a locking system that is to be agreed with **tie**.

Two track feeder isolators with earthing function and a motorised bypass isolator shall be provided.

At all substations, control and indication information shall be provided to SCADA by suitable remote communication interface.

30.2.2 Russell Road Track Paralleling Hut (applicable to Phase 1b only)

Consideration shall be given to the provision of a Russell Road track paralleling hut, which shall be provided with similar equipment as all other substations, however an HV supply from Scottish Power will not be provided and the substation shall be used as a track paralleling hut in the first instance.

The design shall consider the future detailed provision for the installation of such an HV Supply, in configuration of the substation which shall be identical, as far as practicable, to all other substations to be provided within the Edinburgh Tram Network.

Cable ducts into the building shall be provided to enable the future installation of a HV Supply with the minimum of disturbance to the ongoing operation of the location.

30.2.3 Gogar Depot Substation

The equipment at the Depot traction and services substation shall comprise three HV supply cables from three Scottish Power circuit breakers, or ring main units feeding two indoor transformer-rectifier units for depot stabling traction and main line traction, and the other to the services transformer in the Depot building.

One four-panel 750V dc switchboard with direct acting overcurrent protection, relay overcurrent protection, thermal image, earth fault protection on three (two for the yard and one for the workshop) track feeder circuit breakers and direct acting reverse current protection on the rectifier circuit breaker. (Alternatively, a fused rectifier may be used, whereby no direct acting reverse current protection on the rectifier circuit breaker is needed at all. An isolator may be offered in place of a rectifier circuit breaker. If the fused rectifier option is chosen, then this will be fed from one rectifier transformer; a three panel 750V dc switchboard feeds the main line in the usual way as described above.

The whole of the Depot yard shall be earthed on the negative side including the workshop traction supplies.

The enclosure of the yard and workshop circuit breaker shall be solidly earthed, and also connected to the rectifier negative pole.

Two negative busbar cubicles (one for the yard rectifier and the other for the main line rectifier), a tripping and closing battery and charger, all associated internal power and control cabling, and earthing shall be provided.

In an annex segregated from the main enclosure for fire detection, two motorised track feeder isolators with motorised earthing function and a motorised load break bypass isolator with over-current detection and tripping relay shall be provided.

30.3 System Protection Settings

As well as complying with the **tie** requirements for as built documentation, all calculations used to determine protection settings shall be provided by the Infraco in a format allowing complete checking of methodology results without any additional sources of information.

30.4 Power System Design Principles

The 11 kV feeds to each traction substation shall be derived from and form part of the local Distribution Network Providers (Scottish Power) Network ring with a dedicated ring main unit or switchboard feeding the Edinburgh Tram Network the traction substation.

HV switchgear shall be provided to meet the requirements of the DNO (Scottish Power).

The 750 V dc traction power system shall provide a very high degree of reliability. Thus, small single-rectifier, substations shall be provided at close spacing, arranged to feed the 'in' and 'out' lines in permanent cross-connection between substations.

The OLE feeding shall be arranged so that the use of locally operated manual feeder isolators can facilitate the remote isolation and earthing of the overhead line; alternative solutions may also be offered.

Each traction substation shall also be configured so it can be isolated from the main line and bypassed without an impact on the Tram service.

The auxiliary switches of the bypass isolator shall, on the bypass isolator closing, re-configure the hard wire inter-tripping pilots to bypass the isolated substation. In the event of a fault, the over-current relay of the bypass isolator shall trip the feeding circuit breakers at both ends of the extended section, and give SCADA indication of the direction in which the fault current flow was detected. Other procedures for indication of fault location may also be offered.

Equipment located within the substations and the remote motorised isolators, including the earthing function, shall be controlled and monitored over the SCADA system.

11 kV supplies at the Depot and control centre will be taken from two 11 kV Scottish Power feeders, via a Scottish Power switchboard affording three 11 kV feeds to the Edinburgh Tram Network.

One feed shall supply the traction transformer-rectifier for the Depot yard, workshop and stabling area roads that have the track solidly earthed.

The second feed shall supply the traction transformer-rectifier for a normal main line feeding configuration.

The third feed shall supply the transformer, adequately-sized for the Depot and control centre LV ac services.

Maximum use of the standard traction transformer rectifier unit shall be achieved for the System by providing a high degree of reliability. This will be afforded by deriving traction supplies from two separate Scottish Power feeders at each substation.

In the particular case of the Depot, in the event of loss of the 400 V ac supply, essential equipment (principally the Control Centre) shall continue to function on UPS supplies and from a separate generator (see Section 29 (Depot) of these Employer's Requirements).

The 11 kV incoming supply to all traction substations shall be able to be individually tripped by the system controller located in the Control Centre via SCADA, and by staff locally by means of a dedicated 11kV trip push button to be located in each substation lobby.

The OLE shall also be able to be tripped in either direction by the system controller from the Control Centre via SCADA.

The OLE shall be able to be tripped in both directions simultaneously via a hard wire emergency mass trip button to be located in the Control Centre that shall trip all substations in the designed groups.

The OLE shall be able to be tripped locally in both directions simultaneously by means of an emergency push button located in each substation lobby.

The substations are named, referenced and located as shown below:

Table 84 - Substation Abbreviations

Substations	Nomenclature
Phase 1a	
Leith Sands Substation	LSE

Leith Walk Substation	LWE
Cathedral Substation	CAE
Haymarket Terrace Substation	HTE
Jenner's Depository Substation	JDE
Bankhead Drive Substation	BDE
Gogar Depot Substation	GDE
Ingliston Park and Ride Substation	IPE
Phase 1b	
Craigleith Substation	CGE
Granton Mains East Substation	GME
Granton Road Substation	GRE

The 750 V dc feeder circuit breakers at each substation shall be arranged to feed the OLE locally through manual feeder isolator / earth switches located in their own compartment of the traction substation. Motorised load break bypass isolators shall be provided in these compartments or at suitable location to link adjacent OLE sections in an emergency.

Intermediate sub-sectioning points shall be provided, comprising section isolators in trackside pillars (depot: pole mounted will be acceptable) to give operational flexibility during emergencies. With the exception of 'tail end' feeds, most sections of OLE shall be double end fed, and provided as second level protection with transfer tripping through private pilot cables.

30.5 Scottish Power Interface (DNO)

All Scottish Power 11 kV supplies connections, together with all associated protection, emergency tripping and tariff metering equipment shall be procured by the Infraco.

The provision of a separate Scottish Power LV supply connection for lighting and auxiliary services within the traction substation buildings, excluding the depot traction substation shall be procured by the Infraco.

The ratings and protection of the Scottish Power supplies shall be suitably co-ordinated with the characteristics of the power conversion equipment.

SCADA indications shall be made available and SCADA cable tails shall be provided for Scottish Power to wire into their equipment. A maximum number of up to 5 in-/output connections are to be considered as sufficient.

30.6 Multicore and Control Cabling

All necessary multicore and control cables within the substation, and LV ac supplies to the substation equipment, shall be provided.

Each substation LV ac supply shall be drawn from a suitably rated LV ac consumer unit.

The provision and installation of all the necessary intertripping pilot cables to and from the dc switchgear located within each substation shall be included.

Cables for all LV ac and LV dc protection, control, alarm and indications shall have copper conductor with XLPE or PVC insulation and an overall PVC oversheath and galvanized steel wire armour where cables are to be installed without armoured conduit or trunking or other adequate mechanical protection.

The conductors shall be plain annealed copper wire complying with BS EN 60447 – 2007 as applicable or equivalent and all cores shall be clearly identified by printed numbers at regular intervals.

The minimum conductor size shall be not less than seven strands of 0.67 mm diameter wire, or in the case of single wire conductors the minimum cross-sectional area shall be not normally be less than 2.5 mm^2. In special cases for light current installations single strand, annealed copper conductors with a cross-section of 1.5 mm^2 may be used but only with the specific written approval of **tie**.

All cable sheaths shall be free from defects and impervious to water.

Multicore and control cables shall be terminated in accordance with the manufacturer's recommendations and the cable cores shall be left long enough to be terminated without the addition of separate tails.

All detail diagrams shall be cross-referenced and shall show multicore cable schedule reference numbers to facilitate cable identification.

30.7 Transformer Rectifiers

30.7.1 General Arrangement

Each unit shall consist of a dry type, Class F AN cooled transformer to BS EN 60726. Each unit shall be suitable for environmental conditions E1 and ambient temperatures C1. The rectifier shall

comprise silicon diodes mounted on heat sinks, the whole to BS EN 60146, and cooled by natural circulation of air, enclosed in a cubicle with a rigidly constructed fabricated steel framework. The steel framework shall be completely clad in sheet steel to the extent as shall be consistent, by the provision of screened openings, with the requirements of natural cooling and ability to assess readily by direct vision from outside the cubicle any unhealthy condition of the major internally mounted components. Drip-proof top covers shall be fitted. The outer surfaces of the cubicles shall be Grey Shade 631 Semi Gloss to BS 381C 1996 or similar, e.g. RAL 7047. Adequate ventilation provision shall be made in the substation buildings without jeopardising the security of the building to ensure the equipment is able to perform correctly.

Alternatively, a separate close-coupled transformer cubicle may be offered. Substation floor area shall be considered at a premium, so an important consideration is compactness of layout without jeopardising operating and maintenance requirements.

All equipment shall comply with the requirements of BS EN 60076 and BS EN 60146, and the degree of enclosure shall be IP31 of BS EN 60529.

30.7.2 Rating

The rating of the transformer-rectifiers shall be declared as the 100 per cent continuous rated output at 750 V dc on all transformer tappings. Each combined unit shall have an overload rating according to the rating class of BS EN 60146 stated in the Schedules. The impulse voltage withstand rating shall be 75 kV for the nominal system voltage of 11 kV.

30.7.3 Voltage Regulation

The overall voltage regulation of each combined transformer - rectifier shall be 5 per cent with a tolerance of ±5 per cent of the regulation from 5 to 100 per cent rated load.

30.7.4 Voltage Ratio & Connections

The HV primary winding shall be delta connected, and two secondary windings, one star and one delta, arranged for series bridge rectifier operation in accordance with circuit diagram 12 of BS EN 60146 to produce 750 V dc at 100 per cent rated load and nominal tapping.

30.7.5 Voltage & Phase Tapping

Tappings shall be provided on the HV windings in order to make an off-circuit HV voltage selection, by means of bolted links.

30.7.6 Transformer Cores

The cores shall be built up of cold rolled grain oriented silicon steel sheets in accordance with the guaranteed maximum total loss stated in BS EN 10107. When a transformer is connected on the nominal tapping, and operating at rated voltage and frequency, the flux density at any point in the magnetic circuit shall not exceed 1.6 Tesla.

The magnetic circuit shall be insulated from all structural parts and be capable of withstanding a test voltage to the frame of 2 kV rms for one minute. A link shall be provided for earthing the magnetic circuit to the enclosure.

30.7.7 Performance Under External Short Circuit

The performance of the rectifier transformer under external short circuit conditions shall be in accordance with BS EN 60076 (BS 171 is withdrawn). In applying the values stated therein it is to be assumed that the voltage at the terminals of one side of the transformer is maintained at the full rated value for the duration of the short circuit when there is a short circuit between the phases or to earth on the other side of the transformer, or between poles on the rectifier output.

30.7.8 Losses

The no-load and load losses shall be as low as is consistent with reliability and economical use of materials.

30.7.9 HV Cable Terminations

A cable termination chamber for top or bottom entry shall be provided suitable for dry type terminations and the HV cable.

30.7.10 Diodes

The type of diode used shall have been proved in service and have an assessed reliability generally in accordance with valid and current European Standards ((actual BS 9300 seems not to standardise diodes for traction rectifiers)). A fuse-less design of diode bridge shall be provided. Alternatively fused diode bridges with monitored fuses in combination with fuse-less, but short circuit proof resistor/capacitor circuits may also be offered (refer to section30.7.11).

Each diode shall be capable of withstanding voltages having a peak value not less than 2.5 times the peak working reverse voltage rating.

Particular attention shall be paid to the method used for mounting the diodes, and it shall be possible to replace easily any individual diode without disturbing other components.

30.7.11 Surge Protection

Each rectifier shall be fitted with surge protection to ensure that the reverse voltage is shared equally across series connected diodes and bridges and that the voltage across individual diodes is limited to the peak transient reverse voltage rating of the diode.

In order to attenuate surge voltages caused by lightning strikes, pantograph arcing or similar effects, a surge protection circuit comprising two separately fused resistor/capacitor networks shall be provided. The design of the surge circuit shall be such that resonant effects with significant

harmonics present in the open circuit voltage are minimised. . Alternatively, a non-fused short-circuit proof resistor/capacitor circuit may also be offered.

Adequate protection against lightning and over-voltages, however caused shall be afforded to the substation equipment. The characteristics of all surge diverters to be used on the Edinburgh Tram Network shall be correctly co-ordinated with those of the rectifier surge circuits, so as to limit over-voltages to acceptable levels and minimise resonance effects.

30.7.12 Temperature Rise

The rectifier transformer temperature rise shall be limited to 800 K at rated output. The maximum operating temperature of any rectifier component, including busbars and connections, shall not exceed the limits permitted by BS EN 60146.

30.7.13 Protective Services

The following devices shall be provided:

- Diode heat sink and transformer winding over-temperature alarm and trip, with alarm contacts for SCADA indication and local alarm lamp indication (amber) or, alternatively, indicated on substation control & protection display;
- Surge circuit fuse failure alarm, operating for the failure of either or both circuits, with alarm contacts for SCADA indication and local alarm lamp indication (amber) or alternatively indicated on the substation control & protection display; if a non fused solution is provided (refer to Section 30.7.11 Surge Protection then no indication is required.
- A supply supervision device shall be provided to monitor the presence of the main supply to the transformer-rectifier and to give a supply failure alarm through the SCADA system; and
- An extreme inverse over-current/earth fault relay protection on the 11 kV incoming circuit for tripping the Scottish Power rectifier feeder circuit breaker, with alarm contacts for SCADA indication.

30.7.14 Instrumentation

Each rectifier shall be fitted with a shunt or dc current transducer with connection to an ammeter mounted on the front of the cubicle. Each rectifier shall be fitted with a fused voltage divider connected to a rectifier output voltmeter mounted alongside the ammeter.

The overall accuracy of the shunt / dc current transducer and ammeter, and of the voltage divider and voltmeter, shall be to Class Index 1.3.

Alternatively, this instrumentation may be located in the rectifier feeder cubicle of the DC switchgear or the values may be shown on substation control & protection displays.

All 750 V dc connections, relays and instruments and any stray current monitoring instruments shall be capable of withstanding the test voltage stipulated in BS EN 50124-1 2001.

30.7.15 Negative Isolation

The negative connection from each rectifier shall include a disconnection facility by means of an isolator, either as part of the rectifier or part of the negative busbar cubicle.

30.8 A.C. HV Switchgear

Provision is to be made for a 'Scottish Power' emergency trip facility (located in each substation lobby) to allow mobile tramway staff, who may not be authorised for access to the traction substations, to trip the Scottish Power in-feed to a substation in the event of a failure of the SCADA system.

30.9 D.C. Traction Supply Switchgear

30.9.1 General

The switchgear shall be of the high-speed air break type in accordance with BS EN 50123-2, suitable for use on a 750 V dc traction overhead line system, with floating track negative return circuit.

Circuit breakers shall be of the carriage-mounted 'withdrawable' type, within cubicles.

The switchboard shall comply with BS EN 50123 Part 6 and be capable of sustaining without damage, the electrical and mechanical stresses produced by fault conditions up to the prospective system short circuit rating.

The entire switchboard enclosure shall be insulated from earth and there shall be no inadvertent earthing of the switchboard other than via the main earth bar passing through the low impedance earth fault sensor.

Each cubicle shall be of rigid folded sheet steel construction suitable for all normal and fault conditions, and withstand repeatedly without distortion or failure, shocks caused by closing and opening impacts. Enclosures shall have a degree of protection to IP 31.

Removal of covers on any cubicle to permit access to components shall not cause exposure of live conductors in the adjacent cubicles.

The design of the cubicles shall ensure complete dispersion of ionised effluent from the circuit breaker to atmosphere without hazard to personnel or the possibility of establishing a conducting path to the switchboard frame.

The switchgear assembly shall be designed in compliance with, and have certified test reports to demonstrate compliance with clause 6.6.3 of BS EN 50123-6 1998. Front access doors to compartments with exposed metalwork connected to the primary circuit shall be insulated against arcing to the door (3 mm polycarbonate screen or equivalent) and have a fault rated flexible earth strap at the top of the door between door and cubicle frame. Hinges and door latches shall be substantial and keep engaging on door closure.

Outgoing cable boxes shall be suitably sized to accommodate the DC cables. Feeder cable boxes shall be furnished with a surge arrester coordinated with the OLE and rectifier surge protection ratings.

Other DC switchgear, proved and tested in similar applications providing same or similar functionality in compliance with relevant, current and valid European Standards may also be provided.

30.9.2 Busbars

The busbars shall be rigidly supported and fully insulated throughout their length, including tee-off connections and joints between adjacent chambers.

The busbars shall be completely enclosed in an earthed metal chamber, access to which shall be by means of bolted panels. Removal of these panels shall not give access to outgoing circuits. No small wiring or other equipment shall be mounted in busbar chambers.

Other solutions providing same or similar functionality and electrical safety may also be provided.

30.9.3 System Voltage and Fault Level

The normal system traction working voltage shall be taken as 750 V DC, with a tolerance in accordance with BS EN 50163.

The switchgear shall be capable of withstanding the electrical and mechanical stresses when clearing short circuit currents up to the maximum prospective level of the system, assuming that normal voltage will be maintained at the primary terminals of the rectifier transformer.

The switchgear shall be capable of interrupting the following currents:

- Terminal short circuits;
- Overhead line faults adjacent to a substation;
- Overhead line faults remote from substations, and including faults at the most distant point fed under the most onerous outage conditions tolerable;
- All values of traction load currents likely to be encountered in service, passing through the switchgear in either the forward or reverse direction; and
- Load currents of tramcar auxiliaries, under both starting and running conditions, passing through the switchgear in either the forward or reverse directions.

All electrical clearances in air and insulator creepage distances shall be adequate to withstand all specified steady state voltages and all transient voltages likely to arise in service.

30.9.4 Temperature Rise

Each current carrying component of the equipment supplied shall be capable of continuous operation at the specified ratings without exceeding the maximum temperature rises stated in the appropriate European Standard.

30.9.5 Circuit Breaker Isolation

Each complete circuit breaker together with its auxiliary switches and operating mechanism shall be arranged on a 'withdrawable' carriage to permit full accessibility for maintenance purposes and as a means of isolating the circuit.

Indication of circuit breaker `open/closed' status, and circuit breaker position, shall be visible through a window in the cubicle access door or by other suitable means (e.g. after opening the cubicle access door and, in addition, on substation protection and control display)..

The circuit breaker carriage shall remain within the confines of the cubicle when in the service or isolated positions.

A positive stop shall be provided to indicate when the circuit breaker has been fully moved into the service position.

Mechanical interlocks shall be provided so that it is neither possible to withdraw the circuit breaker without having first tripped the operating mechanism, nor to replace the circuit breaker if in the closed position. Means shall also be provided to enable the circuit breaker to be operated electrically or by hand when in the isolated position. A padlocking facility shall be provided on the isolating handle aperture. The main isolating contacts of the fixed portion shall be equipped with shutters arranged automatically to cover all live parts on both busbar and outgoing circuits. Provision shall be made for padlocking each individual shutter in the closed position.

Secondary isolating contacts shall be provided as necessary and arranged so that when in the isolated position all auxiliary supplies to the circuit breaker carriage are still connected.

Facilities shall also be provided so that the circuit breaker and its associated electrical auxiliary circuits can be operated electrically when the carriage is completely withdrawn from the cubicle enclosure.

The circuit breaker carriage shall be equipped with suitable wheels for movement on normal floor surfaces and also to act as guides in conjunction with suitable alignment rails, pins and sockets to ensure correct and accurate engagement of the plug and socket contacts.

Steel ramps and tracks of suitable section and robust construction shall be provided for the movement of the carriage into and out of the stationary portion of the cubicle. The arrangement shall positively and accurately align the main and secondary plugs of the carriage with the respective stationary portion plugging contacts and during all movements under service conditions maintain such alignment and earthing contact. The ramps shall be designed to permit easy movement of the carriage between cubicle and floor without shock or damage to the equipment or floor.

Plugging or scraping contacts with copper current paths shall be provided to ensure a satisfactory and positive connection of the metalwork of the circuit breaker carriage to the switchboard earth bar established in the isolated position before any 750 V connections are made.

30.9.6 Circuit Breakers

All circuit breakers shall have a continuous current rating in accordance with BS EN 50123 and BS EN 60439 where applicable, shall be identical in arrangement and fully interchangeable with each other, where appropriate. Rectifier and feeder circuit breakers shall not be interchangeable, in -case Rectifier circuit breakers are provided (in case of Fused Rectifier diodes, Rectifier disconnectors are sufficient and to be provided).

The closing circuit shall contain an anti-pumping feature which shall prevent automatic re-closure should the closing signal be retained indefinitely either by operator action or resulting from a failure on the supervisory control system. The circuit breaker shall not respond to a close signal when open and a trip signal is present.

Closing and tripping circuits shall be capable of satisfactory operation within the limits of 70 per cent (tripping of feeder circuit breaker trip coils) 80 per cent (closing) and 120 per cent, of the rated dc auxiliary supply voltage.

The 'trip' coils of the dc rectifier circuit breakers shall, if needed (see above), take the form of 'under voltage release' coils after Network Rail practice, so that loss of auxiliary voltage will cause the rectifier circuit breaker to drop out, leaving the feeder breakers closed up as a track paralleling hut (TPH).

The circuit breaker shall be capable of being closed and tripped manually in the service position while still retaining its full fault making and breaking capacity. Under such manual operation it shall be possible to disconnect the auxiliary dc supply without interfering with the operation of the breaker.

Provision shall also be made for the slow manual closing of circuit breakers when withdrawn for maintenance purposes and one device for this purpose shall be provided per switchboard. The slow closing device shall be such that the moving portion of the circuit breaker can be halted at any point in the travel, to enable checks to be made at all points of the closing stroke.

Mechanical indicators shall be provided to show whether the circuit breaker is open or closed. An operations counter shall be fitted.

Shunt tripping coils shall be wired in series with circuit breaker auxiliary contacts arranged so that the supply to these coils is automatically cut off on completion of a successful operation.

All contacts shall be easily and quickly replaceable.

The arc chutes shall be so arranged that any emission of flame, hot gases or metal particles during operation of the circuit breaker will be contained within the cubicle and not cause damage. Arc-chutes shall be designed for convenient handling and removal during inspection and maintenance.

The design of the arc control chutes shall be such that erosion caused by the arc and emission of ionised effluent during operation of the circuit breaker is minimal. The materials used in them shall be non-hygroscopic.

Each circuit breaker carriage shall be fitted with a label holder and an easily removable blank white sandwich plastic label.

The front and rear of each cubicle shall display a prominent label showing the circuit identification by name and approved reference number.

30.9.7 Interlocks

A system of mechanical or electronic interlocks (substation control and protection) shall be provided which automatically imposes a fixed sequence of events designed to prevent mal-operation of the circuit breaker unit as a whole.

30.9.8 Protection Devices

Each feeder circuit breaker shall be fitted with a uni-directional series instantaneous overload device, with a calibration range chosen to be a standard for the system. It shall also be fitted with a multi-functional device to afford instantaneous, programmable and thermal image protection. Rate of rise protection is disallowed (may be a standard part of the multi function relay, provided it can be disabled) but impedance protection will be considered.

Each feeder circuit breaker shall be fitted with a line proving device to prove the circuit onto which the circuit breaker has been instructed to close is not faulted. The maximum current that may flow due to the 'line proving', in the event of a short circuit shall not exceed 40 amps. The relay that measures the residual resistance in the circuit and blocks the circuit breaker against closing shall have a setting range of 2 to 50 ohms as a minimum. In addition to blocking the circuit breaker from closing a SCADA indication shall also be given that the closing has been blocked.

A combined intertripping and earth fault protection scheme shall be provided. Each switchboard shall be equipped with a low impedance earth fault detector, arranged to initiate a local mass trip of all dc circuit breakers and to intertrip corresponding feeder breakers at adjacent substations for all causes of feeder CB tripping. 'Intertrip receive' protection relays or related control equipment shall be fitted with a manual reset flag or similar (e.g. display), showing when the protection is operated. Intertrip by-pass facilities shall be provided, by means of auxiliary switches in the substation bypass isolators reconfiguring automatically when the isolator is closed. Inter-trip, in/out of service, switches shall be provided in order to inhibit the intertripping when OLE is sub-sectioned. Provision shall be made for SCADA 'opening' of the feeder circuit breakers without causing a mass trip or intertrip.

Contacts shall be provided to give individual trip alarms from main and back-up protections through the SCADA system.

The SCADA system will include a remote trip facility. In order to maximise reliability, the incoming SCADA control signal for this facility shall be arranged not only to trip the appropriate local feeder circuit breaker but also to trip the corresponding feeder circuit breaker at the remote end of the OLE section via the intertripping pilot wire system.

Each circuit breaker shall be fitted with a push button and lamp (white) to provide a local trip 'circuit healthy' indication on demand with the breaker closed. The current path for this feature shall include the actual circuit breaker trip or actuation coil.

Additionally, a voltage operated relay fitted with a self reset flag indicator shall be provided to supervise the tripping supplies to the switchboard. Contacts shall be provided to give an alarm through the SCADA system.

Each outgoing d.c. feeder cable box shall be equipped with a surge diverter.

30.9.9 Control and Instrumentation

All equipment shall comply with relevant and valid European Standards.

Auxiliary control supply shall be from a floating LV d.c. supply. Individual panels shall have both polarities of the supply fused, or protected by magnetic circuit breakers.

Current measuring devices shall be fed from either shunts or transducers. All 750 V connections and associated relays and instruments shall be capable of withstanding the test voltages according to relevant and valid European Standards.

Main items to be included on each panel shall include:

- Circuit breaker control switch (open/close);
- Circuit breaker control selector switch (local/supervisory); and
- Indication lamps (open/closed - green/red).

All control and control selector switches shall be suitable for locking by means of a padlock. Indication lamps shall be of the LED type to ensure long life.

Each feeder circuit breaker panel shall be provided with an ammeter, of overall accuracy including the shunt to Class Index 1.5.

Each rectifier panel shall be provided with a voltmeter fed from the rectifier side of the circuit breaker, or the rectifier voltage transducer.

Alternatively, listed control and indication elements may also be provided by means of the substation protection and control units (e.g. display). In this case, therefore, padlocking is not applicable.

30.9.10 Overhead Line Emergency Trip

A facility to ensure the fail-safe hard wire emergency mass trip of traction substation dc circuit breakers by the system controllers shall be provided within the Control Centre.

Separate emergency trip push buttons shall be provided for the following two groups:

- Haymarket to Newhaven
- The rest of the Edinburgh Tram Network including the Depot,

This facility shall take the form of a suitably located and identified wall mounted box containing all equipment and push buttons necessary to provide this function.

The equipment to be provided in each traction substation and TP hut for this feature shall comprise a hold-in relay energised from the tripping batteries of the traction substation and a remote normally-closed contact in the Control Centre or other substation. The system shall be provided with trimming resistances to keep the relay current within limits for varying distances to the remote contact. The system is envisaged to be stable at up to 15 km with 1.5 sq mm pilot cores. The mass

trip relay shall have sufficient circuits to trip all feeder circuit breakers and dc rectifier circuit breakers. It is not envisaged to use the rectifier circuit breaker trip and an open link shall be provided in this circuit. Two further normally-open and normally-closed contacts shall be provided for use in cascading the trip to other traction substations in a similar manner.

Provision shall be made for an overhead line emergency trip facility (located in each substation lobby) to allow mobile tramway staff, who may not be authorised for access to the traction substations, to trip the overhead lines in both directions from a substation in the event of a failure of the SCADA system. The logic of this trip facility will be integrated in the central station controller of each substation.

30.9.11 Circuit and Busbar Earthing

Means shall be provided at each panel for applying a safety earthing device to busbar or circuit connections in order to comply with safety legislation. A dedicated earthing truck or other suitable earthing equipment, as needed for the installed equipment, shall be provided at each substation for such purposes.

30.9.12 Isolator Motorised Operation

Where motorised isolators are provided, operation of the feeder isolator and earth switch functions shall be from the substation tripping battery.

Operational commands shall be via SCADA signals hard wired from the SCADA outstation within the substation to relays in the isolator panel.

Both OLE feeder terminals shall have 'live line' detection arranged to inhibit opening of the feeder isolator and this detection shall be brought back to the Control Centre via SCADA.

It shall not be possible to earth a feeder unless the bypass and feeder isolator are both open.

It shall not be possible to close a feeder isolator unless both the earth has been removed and the adjacent bypass isolator is open.

It shall not be possible to close the bypass isolator unless both adjacent feeder isolators are open. SCADA position indication shall be provided for all switching elements in all positions.

In the event of loss of rectified Scottish Power LV supply the operation shall auto change over to a battery supply.

For isolators located in the Depot, this section is not applicable, because of manual operation.

30.9.13 Bypass Isolator Over-current Feature

The bypass isolator when closed shall reconfigure the 'pilot wire' inter-tripping between adjacent substations to bypass the substation in which the bypass isolator is accommodated.

In case protection of contact line cannot be provided by adjacent substations when bypass-isolator is closed, the bypass isolator shall have a 'line current' trip feature where the current passing through the bypass isolator is measured and operates one of two relays depending on the direction of current flow through the isolator to trip both remote substations in the event of detecting a current in excess of setting.

The setting range to be approved by **tie**.

The relays shall be powered from a dedicated battery with a minimum of four hours standby time.

This battery shall be supplied from the substation tripping battery supply. There shall be SCADA indication of loss of battery voltage.

30.10 Batteries and Chargers

30.10.1 Scope and System Voltage

One 100 per cent duty battery, 100 per cent duty charger and dc distribution board unit shall be provided for each traction substation, for the purposes of providing tripping, closing and control supplies for the 750 V dc and ac switchgear. The battery charger will be supplied from the Scottish Power LV ac supplies in the substation. Neither polarity shall be deliberately earthed and the supply shall function unaffected with either pole inadvertently earthed.

It is to be noted that such supplies for the Scottish Power 11 kV switchgear will be derived from a battery and charger to be supplied and installed by Scottish Power themselves (Electricity Supply Regulations requirement).

The nominal battery voltage, suitable for the switchgear, shall be in accordance with BS 2618. The charger supply shall be 230 V, single phase, 50 Hz, and the complete equipment shall be a manufacturer's standard product.

30.10.2 Batteries

The batteries shall be of the high performance type, and shall be designed for a life expectancy of at least ten years under the conditions of service likely to be encountered. Battery cases shall be of high impact polystyrene translucent plastic. The batteries shall be such that maintenance shall be required at not less than twelve month intervals.

30.10.3 Battery Duties

The rating of each battery shall be sufficient to meet the requirements of the most arduous duty cycle at any one of the substations including:

- The continuous standing load; and
- On the assumption the battery is charged to 80 per cent of its rated capacity and the charger supply is then lost, the battery shall then be able to supply the standing load for twenty-four hours and then have sufficient capacity to carry out the closure and tripping of a 750 V circuit breaker twelve times in quick succession.

30.10.4 Battery Accommodation

Each battery together with its associated charger and dc distribution load shall be accommodated in a single, self-contained, ventilated, sheet steel cubicle of rigid construction.

The cells shall be so mounted that ready access is provided to the tops of all cells for maintenance purposes. The battery enclosure internal metalwork shall be treated with electrolyte-resisting paint.

30.10.5 Battery Chargers

Each battery charger shall be of the automatic constant voltage type and shall be suitable for supplying the constant load and at the same time maintaining the battery in a fully charged condition while floating across the load and charger.

Arrangements shall be made such that, in the event of the battery becoming discharged, the rate at which recharging commences is as high as possible consistent with maintaining the automatic charging constant voltage feature and with the connections remaining undisturbed, as for normal service.

Each charger shall also incorporate a boost charge feature, which shall, after having been started, provide an automatically controlled high charge rate sufficient to restore a fully discharged battery to the fully charged state within twelve hours without excessive gassing or any form of damage to the

battery. The boost charge shall be initiated manually but reset to float automatically, and shall not cause damage to any connected equipment. Each charger shall be capable of automatically and continuously supply the constant load with the battery disconnected. Under such conditions, the charger shall still maintain the nominal system voltage without any damage to itself, and the ripple of dc output shall not exceed ±15 per cent.

30.10.6 Alarm Devices

The following shall be provided:

- Undervoltage detection equipment to give local indication (amber lamp) and supervisory alarm when the system voltage falls to below 80 per cent nominal. A time delay shall be incorporated to prevent initiation during temporary voltage dips;
- Charge fail detection equipment to give local indication (amber lamp) and supervisory alarm if the voltage from the charger falls below the nominal floating charge voltage. Blocking diodes shall be provided to prevent the battery voltage being supplied to the equipment, so that only the charger voltage is effective in causing the alarm. The device shall not operate on switching surges or transient loss of ac supply; and
- Earth fault detection equipment to give local indication (amber lamp) and supervisory alarm of the occurrence of an earth fault, and to give local discrimination between positive and negative faults.

The above alarms shall be given separate SCADA alarm channels.

30.10.7 Instrumentation

The following shall be provided:

- Charger output/output voltmeter;
- Output dc load ammeter; and
- Centre zero battery ammeter.

30.10.8 Battery Distribution Board

The following shall be provided:

- Provision for isolating the battery (withdrawing the main fuses);

- Main and subsidiary fuses in both polarities; and

- Subsidiary fuses to dc switchboards (three in Depot traction substation, one in each of the other substations), ac switchgear transformer rectifier units, feeder and bypass isolators, two spare circuits.

30.11 Earthing, Bonding, Surge Protection & Ancillary Equipment

30.11.1 Earthing Systems

Each substation shall be equipped by Scottish Power with an earth system for their equipment which may be available for connection to the Edinburgh Tram Network substation earthing system and equipment, but only by agreement between the parties.

A earthing installation at each traction substation shall also be provided capable of specified performance alone, without recourse to connection to the Scottish Power earth system. Where Scottish Power allows interconnection, the Edinburgh Tram Network earth system shall connect to the Scottish Power earth terminal via a disconnectable link.

The Edinburgh Tram Network earthing systems shall be constructed employing copper conductors, including all necessary junctions, connectors and supports. The installation shall comply with relevant, current and valid European Standards.

The earth systems shall comprise a continuous main earth bar installation, located where possible in the cable trench, and around the inside walls of the substation, with branch connections to equipment and metalwork.

Each earthing conductor shall either be solid copper with a minimum cross-sectional area of 80 mm2 or stranded PVC sheathed copper with a minimum cross-sectional area of 70 mm^2.

All joints and bonds shall be made by proven methods to the current carrying ability of the earth conductor and full details shall be submitted for **tie**'s approval.

Attention is drawn to manufacturers' instructions on the earthing of traction dc switchgear via to low impedance earth fault protection equipment.

An Edinburgh Tram Network local earth rod system, of resistance to earth less than 2 ohm, shall be provided at each traction substation and connected to the substation earth system through a

disconnection link by means of stranded PVC sheathed copper cable with a minimum cross-sectional area of 70 mm^2 per cable. The earth rod system shall be in a minimum of two near equal sections (~4 Ohm) each connected back to the substation earth system as described. The resistance between any point of the earth system and a group of earth rods shall not exceed 0.1 ohm. This assumes earth interconnection with the Scottish Power system.

30.11.2 Traction Negative Busbar System

A negative busbar, insulated from earth and mounted within a sheet steel enclosure, shall be provided at each traction substation. The enclosure shall also incorporate an off-load isolator for the connection cables to the rectifier negative terminal. The negative busbar shall provide the connection point for the outgoing negative feeder cables to the tram track. The enclosure shall be able to accommodate four 1000 square millimetre section aluminium cables to the running rails. The enclosure shall be arranged to facilitate visual inspection of the connections inside. The enclosure shall be provided with robust insulated terminals adjacent to the negative busbar for terminating the stray current monitoring cables. Alternative stray current monitoring system can also be provided whereas no stray current monitoring cables may be necessary.

In order to minimise the flow of stray return currents in the earth and buried services, the negative pole of the traction supply, comprising rectifiers, negative busbars, feeder cables and tram track, shall not be deliberately earthed at any point.

The traction negative busbar of each traction substation shall be connected to the substation earth bar either via a minimum of one BB HVL and two Alstom 'Interval of discharge' (Soule 2 RAY's) in parallel, or via an equivalent circuit (e.g. Siemens Sitras® SCD), to control the touch voltage of the traction negative circuit and provide a fault return path. These shall be accommodated within the sheet steel negative busbar enclosure or in a separate cubicle.

The metalwork of the negative busbar enclosure shall be connected to the substation earth system.

30.11.3 Surge Diverters

Adequate protection against lightning and atmospheric overvoltages shall be afforded to the substation equipment. The characteristics of all surge diverters shall be correctly co-ordinate with those of the rectifier surge circuits, so as to limit overvoltages to acceptable levels and minimise resonance effects.

The equipment connected to the OLE shall be protected against surges by surge diverters.

Each feeder isolator shall be equipped with a non-linear resistor gapless surge diverter connected positive pole to earth at the cable terminations in the substation. The surge diverters shall be of the zinc oxide type, enclosed in the dc feeder circuit breaker cable box.

The surge diverters shall be so designed and constructed to combine a high discharge capacity and low residual voltage with mechanical robustness.

30.11.4 Substation Ancillary Equipment

The following ancillary equipment shall be provided in each substation:

- 2 No. suitable sized and rated fire extinguishers of approved type and size;
- 1 No. fully-stocked first aid cabinet of approved type;
- 2 No. `Electric Shock' wall-mounted framed safety instruction cards;
- 1 No. substation operation diagram printed on a plastic medium and framed;
- 6 No. double-sided rigid plastic notices 100 mm x 600 mm with cord loop attachment, "Danger-Live";
- 12 No. double-sided rigid plastic notices 100 mm x 60 mm with cord loop attachment, "Caution - do not interfere with this apparatus"; and
- 4 No. key safes, approximately 150 mm x 250 mm of approved type.

Sufficient padlocks for all switchgear shall be provided. The structured key security system shall be agreed with **tie**.

All substation door access keys shall be in accordance with the structured key security system set out in Section 22 of these Employer's Requirements.

30.12 Cables & Accessories

30.12.1 General

All cables shall comply with the current applicable specifications of the relevant European Standard and the supplementary requirements of these Employer's Requirements.

30.12.2 Types of Cables

Categories of cables shall be allocated series of reference numbers as follows:

- HV supply cables (1000 series)
- 750 V dc traction cables (positive) (2000 series)
- 750 V dc traction cables ((negative) (3000 series)
- Stray current monitoring cables (4000 series)
- LV supply cables (5000 series)
- Pilot cables (dc transfer trip) (6000 series)
- Telecoms multipair cables (7000 series)
- Fibre optic cables (8000 series)

30.12.3 11kV A.C. Cable

AC cables shall be provided for the interconnection of the Scottish Power HV switchgear, the a.c. circuit breaker, and the transformer rectifier units.

The cables shall be in compliance with Scottish Power standard and may be three phase or single phase with sheaths connected also in accordance with Scottish Power standards.

30.12.4 Traction Supply Cables

Single core 750 V DC copper cables shall be used for the connection of rectifier (positive) to dc switchgear, and rectifier (negative) to negative busbars.

Cables from rectifiers to DC switchgear positive and negative busbars shall be dimensioned taking into account the rating of the transformer/ rectifier unit, including their overload class.

Negative cables may have a reduced insulation level commensurate with the reduced voltage withstand required.

The cables shall be manufactured in accordance with appropriate European Standards.

Conductors shall be stranded tinned copper wires to BS EN 60228.

The insulation shall be butyl rubber (BR) or ethylene propylene rubber (EPR) to BS 6899 type GP2.

Alternatively XLPE may be considered by **tie** with adequate reference application and justification.

Cables shall be anchored at terminations by mechanical plastic glands, where gland plates must be traversed, and if necessary supported by non-hygroscopic resin-bonded laminated wood, hardwood or similar non-metallic approved clamps.

Conductor terminations shall be by means of indented or annular-compressed tinned copper lugs, with heat-shrinkable tube oversheath.

Cable conductors shall be jointed with indented or annular compressed ferrules with an approved compression tool, the joint made up by an approved jointing kit and sheathed by an approved heat-shrinkable tube.

Compression tools shall be certified as calibrated, and shall only be used when within the calibration period.

Cables to be utilised within the permanent works shall be drummed up and provided to site to ensure maximum cable lengths are installed throughout to minimise the necessity for through joints.

30.12.5 Low Voltage Supply and Multicore Control Cables

The cable construction shall comply with European standards.

Cables shall have copper conductor with XLPE insulation, PVC oversheath and, where not installed with mechanical protection, galvanized steel wire armour.

The conductors shall be plain annealed copper wire complying with BS EN 60447 circular or shaped conductors. All cores shall be identified by phase colours, or in case of control cables, by printed numbers.

All sheaths shall be free from defects and impervious to water.

LV supply cables shall be terminated in accordance with the manufacturer's recommendations and the cable cores shall be left long enough to be terminated without the addition of separate tails.

Cables to be utilised within the permanent works shall be drummed up and provided to site to ensure maximum cable lengths are installed throughout to minimise the necessity for through joints.

31 Overhead Line Equipment

31.1 Scope

This Section of the Employer's Requirements defines the overhead line equipment (OLE) requirements that are applicable to the Edinburgh Tram Network which the Infraco must comply with.

31.2 General Requirements

The information provided in this section supplements any information provided in the Tram Design Manual and other documentation provided by **tie**.

Unless otherwise stipulated, all requirements pertaining to overhead line equipment shall be compliant with BS EN 50119.

31.3 Equipment Overview

Appearance of the overhead line equipment is of paramount importance throughout the Edinburgh Tram Network. The appearance must be appropriate to the location, and visual intrusion shall be minimised.

The type of equipment provided (including, for example, auto-tensioned, fixed termination, catenary support; central mast with balanced bracket arms, side masts with cantilever arms, span wire construction etc.) over each section of the Edinburgh Tram Network shall be appropriate to the area and to the tramway operating speed requirement in that location. The use of building fixings shall be maximised.

31.4 Electrical Power Characteristics

The overhead line equipment shall be energised at a nominal 750V in accordance with BS EN 50163: 2005: Railway Applications - Supply Voltages of Traction Systems.

The overhead line equipment system shall comply with the following electrical and operational parameters:

- System voltage;
- Conductor of suitable cross sectional area;

- Traction buried reinforcing DC cables;
- The required operational speeds; and
- All in-service loading conditions.

31.5 Environmental Considerations

The overhead line equipment system shall fully comply with the environmental criteria as set out in these Employer's Requirements.

31.5.1 Ice Loading

The conventional ice loading of 10mm radial shall be used when assessing the ice-loading on overhead conductors.

31.5.2 Pollution

The creepage path and creepage distance of insulators shall accommodate the implications of atmospheric pollution in accordance with EN 50119:2001, pollution level "medium", and for areas close to the sea, "heavy"..

31.6 Material for Equipment

Standard materials shall be used with the exception of the route sections from Newhaven Road to Ocean Drive and Caroline Park to Granton Square Tramstops, where stainless steel or aluminium material (for tubes and fittings) shall be provided.

If 'parafil' or an equivalent material is to be considered, rigorous quality control fully documented and certified measures for the application, installation and long-term maintenance of the material shall be implemented. These measures are subject to specific approval by **tie**.

31.7 Pole and Cantilever Tube Deflection Criteria

The deflection of poles, cantilever tubes and other structural elements under normal and transient loading conditions shall be such as to not detract from the minimum safety functionality or appearance of the overhead line equipment system.

31.8 Mechanical and Electrical Clearances

Mechanical and electrical clearances shall, as a minimum, be in accordance with BS EN 50119 and the guidelines specified in ORR's publication "Guidance on Tramways", Railway Safety Publication 2 (**"RSP 2"**). In addition, a 'safe working zone', shall be incorporated.

31.9 Contact Wire Gradient and Geometry

Contact wire gradients adopted shall take account of the planned tram operating speed in the area and shall follow BS EN 50119 requirements. The contact wire gradient shall be such that at all times and under all environmental and operating conditions, contact with the pantograph is maintained.

The overhead line equipment horizontal geometry shall be arranged so that the contact wire is always in contact with the working width of the pantograph under all environmental and operational conditions.

31.9.1 Contact Wire Height

The governing requirement for the establishment of rules for contact wire heights shall be as clause 5.2.8 of BS EN 50119. For safety considerations, in areas where tram path is shared with the public traffic the contact wire height and the profiling of the wire shall take into account:

- ORR's RSP2 requirement for minimum wire heights where a support has failed;
- Minimise the risk of contact with wire from people and/or objects on open top double decker buses, over-height road vehicles, window cleaners carrying ladders and any third party work;
- Activities associated with the Edinburgh festival, Christmas fun-fair on Princes Street, and similar public events; and
- Provide the necessary clearance for designated high-load routes.

31.10 Structural Integrity

All proposed structures within the overhead line equipment system shall be designed to comply fully with the design parameters and codes of practice specified for the project.

31.11 Electromagnetic Compatibility

The overhead line equipment shall comply with Electromagnetic Compatibility Section of these Employer's Requirements.

31.12 Dynamic Performance

The dynamic performance of the overhead line equipment/pantograph interface shall be in accordance with the requirements of Clause 5.2.1 of BS EN 50119.

The performance of the overhead line equipment/pantograph interface shall be validated by a full dynamic simulation study undertaken during the design phase. The governing specification for all design activities is BS EN 50119.

The study method shall be validated in accordance with the requirements of BS EN 50317 and BS EN 50318.

31.13 Design Life

The design life of the overhead line equipment is set out in Design Life of these Employer's Requirements.

31.14 Auto-Tensioned Equipment Types

31.14.1 Form of Equipment

Low visual impact equipment is required throughout the Edinburgh Tram Network. Thus, anywhere along the route of the Edinburgh Tram Network, where line speed and/or pantograph interaction with the overhead line equipment demands, auto tensioned trolley wire equipment will generally be the appropriate solution.

31.14.2 Conductors and Tensioning Devices

The overhead line equipment shall utilise a single contact wire system, with additional parallel (buried) feeders or catenary system outside the city centre where the messenger wire replaces the parallel feeders..

The contact wire size shall be confirmed by electrical modelling studies and by pantograph/ overhead line equipment dynamic modelling.

Should mechanically tensioned balance weight system be proposed, the tensioning device shall comprise a counterweights and pulleys system of discrete and compact design. For example, the counterweight stack must be incorporated inside the pole structure. The system shall utilise a fail-safe mechanism with vandal proof features.

31.14.3 Tension Lengths

The maximum tension length between anchor locations shall be chosen so as to minimise the number of anchor points but without undue drag, localised hard spots and overloading of the equipment.

31.14.4 Span Length

The pole positioning, and hence span length along the track, shall be chosen:

- To maximise the structure spacing to achieve economy;
- To maintain the technical parameters referred to elsewhere in this document, e.g. geometry, clearance, dynamic performance, etc;
- For visual and aesthetic appearance issues, in accordance with the Tram Design Manual, and
- The achievement of all relevant consents and approvals.

31.14.5 Parallel Feeders

Aerial parallel feeders shall not be permitted. All parallel feeders shall be buried, located in suitable ducts running along the tracks and with cross feeding to the overhead line equipment conductors at suitable intervals. Outside Edinburgh city centre other options, like catenary system may also be offered by the Infraco for approval by **tie**.

31.15 Fixed Termination Equipment Types

31.15.1 Form of Equipment

Fixed termination trolley wire equipment shall be considered as an appropriate and cost effective solution for highly sensitive areas and/or where lower operational running speeds are required.

31.15.2 Reduced Conductor Tension System

At junctions and sharp corners, where the operational speeds are limited by the track geometry, a variant of the fixed termination unsupported wire shall be considered which utilises a reduced conductor tension system.

31.16 Depot Equipment Type

In the Depot area, a fixed termination single contact wire system (supported or unsupported) shall be provided which shall accommodate the wire height constraints.

31.16.1 Equipment Support and Registration

Cantilevers

For both auto-tensioned and fixed termination systems the cantilevers shall consist of a horizontal registration tube insulated and hinged at the face of the pole, and supported by a tie wire.

As an option, fully insulated tubes and steady arms (glass fibre plastic or equivalent) may be proposed and offered for review by **tie**.

Cross Span Wire Supports

In Edinburgh city centre areas, as an alternative to cantilever on pole equipment option, the simple cross span wire support assembly may be considered. These can be constructed between poles or attached to suitable buildings, along the route of the Edinburgh Tram Network. The choice of material and the method of construction of cross span wires shall be subjected to the approval of the planning authority.

All fittings, clamps and accessories shall be standard proprietary items, capable of being sourced freely from the market.

For minimising the visual impact of the equipment the use of non-corroding material (particularly stainless steel) shall be considered by the Infraco.

Jumpers and Feeders

All feeders and jumpers shall be electrically and mechanically compatible with the environmental and operational conditions. The visual impact due to connecting buried feeder cables to overhead conductors shall be considered when selecting appropriate feeder pole locations.

Insulation

All overhead line equipment support and registration assemblies shall be double insulated or equivalent. Failure of any single insulator shall not create an unsafe condition.

Section Insulators

Apart from the entrance to the Depot maintenance workshop, all section insulators shall be of the 'make before break' type.

31.17 Overhead Line Equipment Poles and Equipment Enhancement

Where poles are provided, the shape and colour shall be considered as part of the visual approach. The objective shall be to minimise their overall visual impact. It should be noted that the Tram Design Manual identifies a preference for circular poles.

Consideration shall be given to individual replacement of building fixings by poles in the future, should building alterations require their removal on a temporary or permanent basis.

The appearance around the base of support poles is of importance in certain areas. Consideration shall be given to minimise the impact to and ease of replacement of poles if damaged, e.g., by errant road vehicles.

The paint finish, if painting is required, shall be fully applied at the manufacturers works. However, following installation on site, the paint finish may have to be re-applied in some areas. The paint system to be used shall be offered for approval by **tie**.

Special attention shall be given to avoid damage to painted surfaces during delivery and installation. Specific approval shall be sought to make good any damage to paint work, following installation on site and **tie** reserves the right to reject equipment on the grounds of damaged paintwork alone.

31.17.1 Combined OLE / Lighting Poles

An integrated design of overhead line equipment poles and street lighting is required. This shall seek to optimise the spacing of support poles and minimise visual intrusion of the OLE and road lighting as a whole. An appropriate electrical feeding and earthing scheme shall be provided. This shall minimise the additional components required to be attached to support poles and shall take account of the maintenance approach to be adopted for the road lighting. The general requirements

for bonding and earthing of the system are contained in Earthing and Bonding of these Employer's Requirements.

Poles carrying overhead wiring along Princes Street shall not interrupt axial views down the streets connecting to Princes Street, shall be located between tram lines and shall be placed at regular intervals.

It should be noted that the Tram Design Manual prohibits fixings for wiring to buildings or structures on the north side of Princes Street.

31.17.2 Anchor Bolts, Foundations and Ties

Tie-back anchors shall be permitted in the off-street sections of the Edinburgh Tram Network with adequate anti-climbing protection, the design of which shall be subject to specific approval by **tie**.

Any anchor bolt connections and fasteners shall be fully secured and vandal proofed.

31.17.3 Foundations

For the ease of construction and where applicable the preferred type of foundations shall be of side bearing concrete, cast in-situ. These shall be either mechanically or hand dug, depending on the access and limited space availability for plant and equipment. This type of foundation shall be provided in Edinburgh city centre and populated areas, particularly where underground utilities are closely spaced or not easily detectable.

In certain areas within the Edinburgh Tram Network where the track alignment and construction of the track slab permits, the overhead line equipment foundations may be incorporated within the track slab design.

31.17.4 Fixing to Masonry and Concrete Structures

There are a significant number of buildings, particularly within the World Heritage Site categorised for their architectural or heritage values.

Fixings to buildings listed in schedule 10 of each of the Edinburgh Tram (Line One) Act 2006 and Edinburgh Tram (Line Two) Act 2006 require full listed building consent.

31.18 Safe Working On The System

The configuration of the overhead line equipment shall take into account the project requirements for a safe working zone of 2.0m (measured horizontally from the near rail and also vertically above

the ground). All electrical and mechanical clearances shall comply BS EN 50119 and with the recommendations and guidance provided by HMRI RSP2.

31.19 Switching and Sectioning Requirements

31.19.1 Sectioning

The overhead line shall be divided by means of OLE section insulators into separate electrical sections and subsections, the lengths of which are determined by the locations of the traction substations and operational requirements.

31.19.2 Isolation Facilities

At substation feeder points, off-load, positive polarity, SCADA controlled, motor operated isolator/earth switches (termed 'feeder isolators') shall be provided to isolate and earth each overhead line section from its respective feeder cable. Additionally, positive polarity, SCADA controlled, motor operated load brake isolators (termed 'bypass isolators') shall be provided to interconnect adjacent overhead line sections when the intervening substation is out of service. These shall be connected across the line side of the two feeder isolators, and will normally be open. At key overhead line sectioning points, positive polarity manually operated isolator/earth switches (termed "section isolators") shall be provided to isolate sub-sections from other sub divisions of the section and (in some cases) earth the isolated section.

At the section insulator and the insulated rail joint between Depot and main line, a mechanically coupled double pole section isolator is to be provided to bypass the section insulator and insulated rail joint. The isolator is intended to be used solely to power the Depot and stabling and fans from the main line in the event of failure of the depot traction power supply. It is not intended to be used to power the main line from the depot stabling traction power supply.

31.20 Isolator Enclosures

Feeder isolators and bypass isolators shall be provided.

Section isolators shall be provided. For on-street sections these 'section isolators' shall be totally enclosed in trackside cubicles, referred to as 'section pillars'.

Section pillars shall be of stainless steel construction to IP 65, free-standing with a base set on a concrete foundation. The pillars shall be factory-built assemblies, of rationalised widths to suit the range of isolator numbers required per unit.

The enclosure shall be bonded to the tram track via an insulated 'earth' cable from an internal stainless steel stud, and the arrangements of which shall comply with Earthing and Bonding of these Employer's Requirements.

The isolator/earth switch 'earth' bar shall be bonded to the section pillar and connected to the tram track via suitable cable(s) additional to the above.

The dimensions of the pillars shall be the minimum compatible with standard creepage and clearance distances because physical clearances on the tramway are restricted.

An A4 size document holder shall be provided on the inside of the enclosure door.

The doors shall be outward opening through 180 degrees, hinged internally and fitted with stays. The doors shall be fitted with heavy-duty stainless steel locks operated by dedicated keys, which shall be provided in accordance with the operation and maintenance requirements for the **tie** structured key security system described in Section 22 of these Employer's Requirements.

It shall be possible to view the status of the isolator and any locking without opening the doors.

31.20.1 Paint Finish

The paint finish, if painting is required, shall be fully applied at the manufacturers works. However, following installation on site, the paint finish may have to be re-applied in some areas. The paint system to be used shall be offered for approval by **tie**.

Special attention shall be given to avoid damage to painted surfaces during delivery and installation. Specific approval shall be sought from **tie** to make good any damage to paint work, following installation on site and **tie** reserves the right to reject equipment on the grounds of damaged paintwork alone.

31.20.2 Labelling

Front panel legends, fitted centrally to the door consisting of approved 'Danger 750 V' - labels (black letters on a yellow background), and 'pillar description - reference number labels' with black letters on a polished stainless background, shall be provided on each pillar door.

31.20.3 Isolators

Isolators within an enclosure shall be arranged in groups where possible. The physical position of each isolator within each group shall correspond with the actual direction of the overhead line connected to it, and a standard layout shall be adopted throughout the system.

The isolator blades shall be of copper, and the isolator assembly and its insulation shall be suitable for the required current carrying capacity within the environment of the enclosure.

Feeder and section isolators and operating mechanisms shall be suitable for off-load breaking and fault making in respect of both 'closing' and 'earthing' operations. The operating mechanism for manual operation shall have a firm distinct stop in the operation at each stage of operation. It shall not be possible to move from closed to earth positions, or the reverse, without the operator coming to a definite halt at the 'open' position before moving to the earth position by a separate operator movement.

Bypass isolators and their operating mechanisms shall be suitable for on-load breaking and fault making in respect of 'closing' operations.

The construction of the isolator shall be such that live parts are fully shrouded from the operator, by 8 mm of polycarbonate or equivalent arc resistant material, whilst allowing the position of the isolator contacts to be clearly visible with the enclosure door open.

The isolator mechanism shall be such that it can be locked by means of a padlock in the closed, open or earthed position.

Each isolator mechanism shall be clearly labelled with its unique identifier reference code in accordance with the electrical nomenclature scheme.

31.21 Power Feeder, Reinforcing and Bonding Cables

31.21.1 Feeder Cables

Single core 750 V dc cables shall be used for:

- The connection of substations (positive) to the OLE;
- OLE parallel reinforcing cables;
- Negative cables from substation negative busbars to the track; and
- Negative track parallel cables and rail and track cross bonding cables.

OLE parallel reinforcing cables shall be sized in accordance with the design of the overall traction system.

Feeder cables shall be sized to match the rating of the OLE / reinforcing cable combination of each section.

Feeder cables from the traction substation feeder isolators to the OLE parallel reinforcing cable junctions shall be buried cable ducts running track side. A maximum of two cables may be carried per 150 mm diameter duct.

Cables for different circuits shall not share a common duct. The choice of cable material shall also minimise the number of bi-metallic cable joints.

Positive and negative cables shall not share a common duct.

Reinforcing cables shall be installed in buried ducts along the track. They shall run from OLE feeder point to feeder point with connections to the OLE via single core suitably rated copper cables to 'inbound' and 'outbound' lines. These feeds shall be at traction substations and maximum intervals of 450 m. Cables shall be drummed and supplied at maximum lengths to avoid and/or minimize cable through joints. Where joints cannot be avoided they shall be located in suitable cable drawpits or in neat, small dimension pillars of minimum intrusion on the streetscape. Joints between drum lengths of reinforcing cable, where no OLE connection is involved, may be in pillars or drawpits at the discretion and agreement as to specific installation method statements by **tie**. The insulation system employed at connection points shall meet the requirements of EN 50124-1 2001 to level 0.9 kV and OV4.

At nominal mid points between the OLE feeds and a maximum 250m from an OLE feed point there shall be suitably rated copper cross connections between the 'inbound' and 'outbound' OLE contact wires via the shortest practicable visually acceptable cable route. There shall be no joints in these cables.

Positive reinforcing and feeder cables shall be terminated in compression cable lugs of proprietary appropriate size and material for the cable used. Proprietary crimping tools designated for the cable lug to be crimped shall be used. Such crimping tools shall be under quality assurance control and within their calibration period. The appropriate flat stainless washer shall be used between cable lug and fixing bolt head. At all bi-metallic connections a suitable bi-metal connector piece shall be employed such that dissimilar metals are not connected other than by molecular fusion.

Feeder cables to the OLE shall be copper cored flexible, where required, installed in the OLE support poles in a neat and unobtrusive manner. As installed the cables shall meet the requirements for double insulation such that two distinct insulation layers can be identified to the

satisfaction of HMRI (or the appropriate regime in force). There shall be no joints between connection to the contact wire and the connection to the reinforcing cable(s).

The bi-polar section isolator at the eastern Depot entrance shall have one side of the positive pole cabled to the main line OLE parallel reinforcing cable by duplicate suitably rated cables. The other side of the positive pole shall be cabled to the Depot east isolator panel by duplicate suitably rated cables. The negative pole shall have suitable cables to each side of the isolator, one to each rail either side of the insulated rail joints.

Negative cables may have a reduced insulation level commensurate with the reduced voltage withstand required.

31.21.2 Track to Traction Substation (TSS) Negative Return Cables

Each of the four running rails in the vicinity of the TSS shall have a cable brought back to the negative busbar of the TSS.

A nominal one metre from the position on the running rails of the connections mentioned in the above, the cess running rail of each track shall be connected to the six-foot rail of the other track by a single cable. These are also classed as 'return' cables.

31.21.3 Rail to Rail and Track to Track Traction Cross Bonds

The rails of each track shall be connected together with a single suitably rated cable at suitable intervals.

At every second connection in the above, the six-foot rails of each track shall be connected together with a single suitably rated cable.

31.21.4 Running Rail Continuity Cables

Where 'along track continuity bonding' is required for negative return traction current return, 'along track' bonding cables shall be installed. Places requiring such bonding are:- Insulated rail joints to be normally bonded out, fishplated rail joints, rail sliding expansion joints (breathers), points and crossings, or other designated places.

'Along track bonding' shall comprise duplicate copper or steel cables as a minimum for each running rail to be so bonded.

31.21.5 General Requirements for Cables

All cables shall be terminated in compression cable lugs of proprietary appropriate size and material for the cable used. Proprietary crimping tools designated for the cable lug to be crimped shall be used. Such crimping tools shall be under quality assurance control and within their calibration period. The appropriate flat stainless washer shall be used between cable lug and fixing bolt head. All return cables shall be connected to the running rails via proprietary connector plates to connect with the running rails using duplicate 'Cembre' or equivalent connectors, by milled holes in the rail web with connector thimbles expanded into the holes on a spacing not less than that allowed by the track designer. Bolt and connection sizes shall be coordinated with the rating of the cable size to be connected. Simpler single 'Cembre' type connections (or similar approved) may be used for cross bonding cables and duplicated continuity cables mentioned in the above.

The cables shall be manufactured to European standards, appropriate to their application.

Cables shall be anchored at terminations by mechanical plastic glands, where gland plates must be traversed, and if necessary supported by non-hygroscopic resin-bonded laminated wood, hardwood or similar non-metallic approved clamps. Conductor terminations shall be by means of indented or annular-compressed lugs to suit the cable, with heat-shrinkable tube over-sheath.

Cable conductors shall be jointed with indented or annular compressed ferrules with an approved compression tool, the joint made up by an approved jointing kit and sheathed by an approved heat-shrinkable tube. Compression tools shall be certified as calibrated, and within the calibration period.

31.21.6 Cable Ducts

Power cables shall be laid in suitably sized UPVC/polyethylene cable ducts. Parallel reinforcing cables for the OLE will require a minimum of 200 mm diameter ducts.

Draw pits shall be sized to suit the particular cables installed within the cable run and shall facilitate the installation of the cables without damage to the cable. Particular attention shall be made to ensure the cable loop can be installed without damage to the cable when installing at mid point.

Suitable draw wires shall be installed in each of the ducts when they are laid, and the draw wires shall remain in the ducts after the installation of the cables to aid any future modification or repair work.

31.21.7 Installation of Cables

The arrangement of cables and all methods of laying and installation, including any special methods that may be necessary, shall be submitted by the Infraco for approval by **tie**.

Unless it has been agreed that the construction of cables is such as to permit laying at sub-zero temperatures, cable laying shall take place only when the ambient temperature is above 0°C and has been at this temperature for at least 24 hours, and approved special precautions have been taken to maintain the cable above this temperature to avoid risk of damage during handling. The recommendations of the cable manufacturer must also be taken into account.

All cables shall be installed with a bending radius not less than that recommended by the cable manufacturer.

Cable installation shall take account of the physical properties of the cables and the manufacturer's recommendations shall be clearly detailed on all cable pulling schedules.

All joints and terminations shall be made by proven methods to the current carrying ability of the cable and full details shall be provided to **tie**.

31.21.8 Surge Diverters

Surge diverters shall be positioned at the junction of each feed point and the OLE at traction substations on the OLE side of the isolator, and at over-bridges.

Surge diverters shall be of the gapless, metal oxide type with a rated discharge current of at least 10kA. The earthing terminal of the arrester will be connected to buried rods to provide an earthing resistance of less than 5 ohms. Surge arrestors' design, material and performance shall conform to the requirements of power supply specified standards for the Edinburgh Tram Network.

31.21.9 Bonding

The earthing and bonding requirements shall comply with **tie**'s Earthing and Bonding Policy (see Section 34 of these Employer's Requirements).

32 Stray Current

The ETN shall be designed in accordance with BS EN 50122-2.

In order to keep the stray currents caused by the traction return current as low as possible, permanent conductive connections between the return circuit and earth, including drainage diodes, are disallowed. The rail insulation against earth shall be at least five times better than recommended in BS EN 50122-2 before commencement of the Testing and Commissioning Phase.

Voltage limiting devices between return circuit and earth shall be dimensioned such, that they do not short-circuit the return circuit and earth during normal operation of the ETN, but ensure that accessible voltages do not exceed 60 V limit stated in RSP2 clause 183.

Where track substructures are steel-reinforced in longitudinal direction, a sufficient amount of reinforcement bars, i.e. at least four per track, shall be longitudinally interconnected by welding. At both sides of expansion gaps in the substructure, these bars shall have welded cross-connections and shall be interconnected in longitudinal direction by means of a conductor with suitable mechanical flexibility. This interconnected system shall not be connected to the return circuit at any point.

The Infraco must produce an Edinburgh Tram Network specific Stray Current Mitigation Strategy document that clearly defines its strategy for achieving as low as reasonably practicable protection requirements for the stray current effects and must submit such strategy to **tie** for their approval. Additionally, as part of that Stray Current Mitigation Strategy, the Infraco must produce a "Code of Practice for Stray Current Corrosion Control" and submit it to **tie** for their approval.

33 Low Voltage Architecture

The LV supplies shall be arranged by the Infraco with the DNO, and this shall also include all necessary metering equipment or agreements for provision of unmetered supplies. The LV supplies shall include all those required for illuminated road signs, other road furniture, street lighting, traffic signal controllers, points actuation, tram signals, communications equipment, and Tramstop equipment.

The LV supplies shall provide the necessary security of supply to achieve the overall ETN reliability requirements, for individual elements and as a whole.

The LV supplies shall allow cabinet sizes in areas of visual concern to be minimised.

Provision shall be made by the Infraco for the attachment of local generators at critical points in the ETNin the case of local supply outages (e.g. at Tramstops).

The system architecture provided by the Infraco shall take account of the known statistical history of local power outages such that the overall ETN system and subsystems availability is achieved.

In establishing the capacity and duration of any UPSs provided, the time that the Infraco maintenance staff may need to mobilise and install a temporary generator shall be considered by the Infraco and advised to **tie**. This time shall be demonstrated by the Infraco to **tie** during the commissioning period. **tie** shall give at least two weeks notice that the test may be required. **tie** may then require the test to be undertaken by the Infraco immediately with no further prior notice at a time and location to be determined by **tie**. This time shall be appropriately included in the overall availability analysis for the ETN.

LV power design by the Infraco shall take account of local system requirements e.g. for additional lighting and for specific loads, such as the passenger lift at Murrayfield Tramstop and drainage pumps where installed.

The LV architecture shall reflect the fact that isolated supplies will be required trackside and remote from Tramstops or substations at such as pointwork and signals at tramway junctions, and isolated TPDS cabinets.

Particular attention must be given by the Infraco to suitable redundancy for critical equipment such as drainage pumps and the communications systems.

LV supplies to substations shall be provided as part of the Infraco's arrangements with the DNO unless these supplies are provided from elsewhere.

Where UPSs are to be provided by the Infraco, careful consideration of appropriate loads to be supplied should be given by the Infraco. Automatic load-shedding schemes shall be considered where appropriate to support the required overall System availability.

Proposals for remote metering of substations shall be provided by the Infraco for the approval of **tie**.

34 Earthing and Bonding

The requirements for earthing and bonding are set out in the latest version of the document "System Earthing Policy", reference ULE90130-SW-REP-00071 and the Infraco shall comply with such requirements in respect of carrying out the Infraco Works.

35 Supervisory Control and Communications Systems

35.1 Scope

The scope of this section of the document is to define the Supervisory Control & Communications requirements that are applicable to the Edinburgh Tram Network (ETN).

It is split into three parts:

- Specific technical requirements of the various telecommunication subsystems;
- Components of those subsystems located at the Control Centre;
- Common considerations applying to these subsystems.

35.2 Specific Technical Requirements

This describes the various subsystems of the Supervisory Control and Communications System:

- The Tram Position and Detection Subsystem;
- The Passenger Information Display System;
- The Telephone Network;
- Operational Radio System;
- Passenger Help / Passenger Emergency Help Points;
- Closed Circuit Television (CCTV) System;
- Supervisory Control and Data Acquisition;
- Operational Data Network.

1.3 sets out considerations that apply to all Communications Subsystems that are included in 1.2.

The detailed interfaces between Infraco and Tramco shall be developed. Consequently the statements made in the ERs concerning the scope split between Infraco and Tramco may be subject to change.

35.3 Tram Position and Detection System

35.3.1 Overview

The Tram Position and Detection System shall provide the information needed to monitor the efficient and effective movement and to implement the overall regulation of trams running on the Edinburgh Tram Network. The Tram Position and Detection System shall include both tram borne and trackside equipment.

Each tram driver shall be responsible for safe tram operation using 'Line Of Sight' principles, with the Tram Position and Detection System identifying and setting the correct route ahead of the tram and providing tram signals.

The Tram Position and Detection System shall provide monitoring facilities to the Control Centre staff.

The Tram Position and Detection System shall collect the following data from each tram as is passes over the loops for transmission to the Control Centre in real time:

- Tram number;
- Tram run number;
- Tram destination;
- Driver staff identity number;
- Driver duty number; and
- Whether the Tram is in service or out of service.

The Tram Position and Detection System shall provide a number of functions which shall include:

- Tram identification;
- Tram position on network (outside of depot);

- Tram progress monitoring;
- Route setting;
- Processing of manual 'Tram ready to start' and automatic advance signal demand requests from trams;
- Provide demands to the Points Controllers to permit trams to safely traverse points junctions;
- Provide demands to the local Traffic Signal Controller(s) to permit trams to safely traverse tram/road crossings; and
- Tram signals to provide controlled entry to and exit from the depot berthing and maintenance facilities;
- Store data concerning the times each tram arrives at and departs from all of the Tramstops. This will be passed to the Central Data Recorder to allow the daily performance of the system to be calculated by the Performance Monitoring System.

The Tram Position and Detection System shall convert relevant Tram Position and Detection System data into a format to update the Real Time Passenger Information Display system.

On the approach of a tram to each Tramstop and at the termini, the Tram Position and Detection System shall provide updates to the Passenger Information Display system such that the Tramstop Passenger Information Displays are updated and display information as stated in 35.4.1.

On each day, the TPDS shall enter the details of journeys for the particular tram for each entire operating day into the tram on-board computer at the commencement of service. The tram driver shall input his own driver code and the tram diagram number for the day. Alternatively, the TPDS may transmit this data to the tram. Any change to this data e.g. as the result of an incident affecting the service shall be initiated by the driver.

The Tram Position and Detection System will include the ability to:

- Display to the Driver how early or late he/she is at each stop;
- Allow the Driver to issue 'Tram Ready-to-Start' commands at selected Tramstops;
- Allow the Driver, when his/her tram is on the approach to a diverging junction, to manually demand that the points move left or right by operating controls in the cab.

35.3.2 Technical Requirements

Key locations where Tram Position, Route Setting and Detection Equipment shall be provided shall include:

- At the approach to, and exit from, tramway/ road junctions;
- Entry to, and exit from, the Depot;
- At the approach to, and at, all Tramstops;
- At the approach to, and exit from, points and crossings.

Trackside Equipment at each of these locations shall be connected to the Edinburgh Tram Operational Data Network.

In the event that this Operational Data Network fails, the Trackside Tram Position and Detection System Equipment at each of these locations shall continue to operate autonomously until network connections are restored, at which point normal operations shall resume without Control Centre staff intervention.

The TPDS shall pass the times at which each tram arrives and leaves each Tramstop to the Performance Monitoring System (PMS), so that the PMS can calculate the operational performance of the Tram System according to specified algorithms.

Tramway signal heads shall be positioned at all signal controlled Track and Road Junctions and Pedestrian Crossings to allow optimum sighting for the tram driver. Local environmental conditions and the requirements of all interested parties, including that of HMRI (or the appropriate regime in place), shall be taken into consideration when choosing the positions of these signals.

Tramway signal heads shall display different proceed aspects for different routes if they are signalled separately. In such cases the Tram Position and Detection System shall pass the appropriate direction request to the road traffic signal controller as well as the point controller.
Tramway signal heads shall indicate the acceptance of the signal demand by the system to the tram drivers.

The lie of all facing points shall be detected and displayed by point indicators. These are in the scope of the Points Control System, and are described in the section of this document dealing with the Track. However, although Signals and Points Indicators shall be clearly distinguishable, they should also be in similar style, and it will require some co-ordination with the Points Controller supplier to ensure compatibility.

Tramway signal heads shall utilise Light Emitting Diodes (LED's) and not incandescent lamps.

At all signal controlled tram and road junctions there shall be an interface installed between the Edinburgh Tram Network Tram Position and Detection System and the local traffic Signal Controllers. All tram signals at signalled controlled tram and road junctions shall be driven directly by the Traffic Signal Controller, through demands from the Tram Position, Route Setting and Detection System. The Tram Position and Detection System/Urban Traffic Control System interface shall implement an agreed Tram Priority at each signal controlled junction.

Each Tram Position and Detection System/Urban Traffic Control System interface shall incorporate the facility for the initiation of a "tram proceed" signal in the event of either tram detection failure or local Urban Traffic Control System interface failure. This facility shall be available at all times for use by the Control Centre Staff. Trackside facilities for tram drivers to make manual requests of the UTC are not required. A foreseeable single point failure shall not cause a tram to be presented with a tram stop signal on the street that causes the tram to stop for more than 5 minutes. A FMEA analysis shall be produces within 8 months of contract close that satisfactorily demonstrates that the proposed solution meets this requirement.

The failure of the Tram Position and Detection System equipment at any signal-controlled road crossing shall initiate the immediate operation of the junction into a predetermined (adjustable) priority cycle sequence. All such failures shall be monitored, reported and logged to the Tram Control Centre via SCADA and passed to the PMS System.

The implementation of the detection system at Tramstops and other trackside locations will be permitted to use the Tram Position and Detection System hardware in lieu of a Supervisory Control and Data Acquisition Remote Termination Unit for the passage of alarms and indications, should this prove a more efficient use of hardware resources.

35.3.3 Tram-Borne Equipment

The Tram Position and Detection System shall include equipment to be installed on the trams. This equipment shall include:

- A Driver's Panel and keypad, to be installed in each cab;
- Communications equipment, to provide transmission of messages between the tram and the trackside equipment;
- Vehicle fault / maintenance indications / alarms transmission interface.

This equipment shall utilise the on-tram power supply.

All operations data messages etc. to or from the tram-borne Tram Position and Detection System shall be monitored and recorded in the equipment room for future reference or fault investigation.

35.4 Passenger Information Display System (PIDS)

35.4.1 Overview

Each Tramstop platform shall be equipped with a real time passenger information display system that shall be connected to the Control Centre by the Operational Data Network.

PIDs shall allow a limited selection of messages and free-form text to be displayed, at selected individual, selected groups or at all Tramstops on command from the Control Centre.

Each platform shall be equipped with at least one double-sided display; the display shall be in the form of a dynamic three line display.

Each display shall conform to the requirements of "DfT Inclusive Mobility - Guide to best practice in access to transport infrastructure". They shall each have the following characteristics:

- It shall be double sided;
- It shall be based on LED technology;
- Each side shall have three dynamic information lines, the third of which shall also provide a time display;

- Each line shall have at least 32 characters;
- Each character shall be at least 50 mm high;
- Characters shall be bright yellow on a black background;
- The PID shall adjust to ambient light levels making it legible in all weather and lighting conditions.

Each Passenger Information Display shall be sited so that it is visible to anyone standing within the Tramstop shelter, and from as much of the platform area as possible.

Passenger Information Displays shall also be provided at the following locations:

- Ingliston Park and Ride facility;
- Edinburgh Airport passenger terminal;
- Ocean Terminal Shopping Centre; and
- Haymarket Railway Station.

Alternative types of display may be used at these locations subject to agreement with **tie**.

At termini, the Passenger Information Displays shall display a departure time, which shall be the later of the scheduled departure time and the arrival time plus one minute. At other Tramstops, the Passenger Information Displays shall show variable messages including the destination and time to arrival (in minutes) of the next three tram service arrivals, or arrivals within the next 30 minutes, which ever is the less at the particular platform.

Tramstop Passenger Information Displays shall be able to display Lothian Buses 'BUSTRACKER' information as an overall capability. Real-Time data shall be provided over an internet connection by the client in an agreed format.

The following Tramstops shall have Passenger Information Displays that display the arrivals of both buses and trams at the Tramstop:

- Ocean Terminal
- Foot of the Walk
- Picardy Place
- Saint Andrew Square
- Princes Street
- Haymarket
- Edinburgh Park Station
- Airport
- Crewe Toll
- Granton

Passenger Information Displays on Tramstops, including those with bus/tram interchange facilities, shall be capable of prefacing the destination of the tram service being displayed by a two or three digit 'trip number' and of any required bus service by a three digit route number.

Each Passenger Information Display shall incorporate a digital time display (synchronised to the Edinburgh Tram Network time server derived from the Rugby Radio Clock or its successor or similar) as part of the display.

The colour and contrast of the lettering that is displayed by the Passenger Information Display shall fully take into account the requirements of the visually impaired. In particular DfT guidelines e.g. 'Inclusive Mobility - relating to provision for the visually impaired' and the requirements of Mobility and Access Committee for Scotland (MACS) shall be considered.

The Passenger Information Display System shall incorporate the necessary degree of redundancy and duplication to enable the systems availability targets to be achieved without losing the ability to handle faults and accept necessary upgrades.

The equipment shall be consistent with the design of the structural elements of the Tramstop.

The Passenger Information Displays shall have 3 line LEDs and configured as lines, scrolling functionality should be possible.

35.5 Telephone Network

35.5.1 Overview

The Edinburgh Tram Network shall be provided with a Telephone Network that shall provide two-way voice communications between all staff at fixed locations throughout the Edinburgh Tram Network. The main Operator interface with the Telephone Network shall be provided by an integrated workstation at each Control Centre staff position.

The Operator's interface shall be designed to carry out control functions in an ergonomically efficient manner.

The Telephone Network shall comprise of the following sub-systems:

- A central Private Automatic Branch Exchange (PABX):
- Public Switched Telephone Network;
- Depot extensions (via the Depot structured cabling scheme);
- Passenger Help / Emergency Help Points (via the Operational Data Network);
- Public Address System (via the Operational Data Network);
- Substation extensions (via the Operational Data Network); and
- A Voice Recorder;
- Control Centre Human Computer Interface (HCI) for the telephony services; and
- Call logging and maintenance facilities.

To facilitate management and maintenance of the PABX, it shall be provided with a maintainer's workstation, located in close proximity to the equipment.

The PABX shall provide:

- Digital call recording;
- Digital call logging;
- Maintenance and subscriber management; and
- All recording of the Telephone Network is to be digital to the current best medium.

All recording as described above should be carried out to the data recorders.

The Telephone Network shall include all PABX equipment, all necessary interfaces, configuration of the system elements, the connecting cables and management and diagnostic facilities.

The Telephone Network shall provide voice communications to external agencies including the emergency services and the urban traffic controllers.

The Telephone Network shall provide maintenance and administrative staff within the depot and substations telephone communications facilities appropriate to their needs.

35.5.2 Technical Requirements

The Telephone Network shall provide voice communication with all internal Edinburgh Tram Network organisation members and external parties but not with trams.

The Telephone Network and all associated components shall be of sufficient capacity to meet the current and future needs of the Edinburgh Tram Network.

All elements of the Telephone Network shall be designed to operate in an integrated manner.

The Telephone Network shall use the Operational Data Network for call routing to remote locations, e.g. Tramstops and traction power substations.

Suitable operator equipment shall be provided for the depot receptionist.

Suitable telephone handset equipment shall be provided for depot operational, administrative and maintenance staff.

Suitable telephone handset equipment shall be provided for traction power substations.

Access to the Public Switched Telephone Network shall be configurable at all telephones, including those within the depot and substations, in order to change call barring and security measures.

PABX equipment shall be located in the Equipment Room. A multi-pair tie cable shall be provided to interconnect the PABX with the depot structured cabling patch panel.

The Telephone Network shall be equipped with a Maintainers' Workstation, also situated in the Equipment Room, for network management and diagnostics.

The Maintainers' Workstation shall allow the:

- Display of system status and alarms;
- Download of call and system logs to removable media;
- Configuration of the Telephone Network;
- Management of subscribers;
- Provision for updating system software; and
- Reporting of real time status and alarms to external equipment.

35.6 Public Address System

35.6.1 Overview

Loudspeakers and Audio Loops located at each Tramstop platform shall form part of the Edinburgh Tram Network Public Address System. The Operational Data Network, details of which are contained in Section 35.6.1 shall connect the associated amplifiers/controllers to the Control Centre.

35.6.2 Technical Requirements

Each Tramstop shall constitute a zone.

An appropriate number of low output speakers shall be provided at each platform to prevent the possibility of announcement intrusion into adjoining properties, yet clearly audible without distortion on all areas of the platform. The speakers and their mountings shall be visually unobtrusive.

The Control Centre shall have the ability to make direct announcements to any Tramstop or groups of Tramstops, or turn off individual Tramstops or groups of Tramstops.

There shall be automatic switching between the volume setting for day / night time for each day of the week at the appropriate time of day.

Each Tramstop platform shall also be equipped with an audio loop to provide Public Address facilities for those who use hearing aids. The messages conveyed by these audio loops shall be identical to those issued by the standard Public Address equipment.

Park and Ride facilities shall be considered as a single Tramstop for Public Address purposes.

A 'library' of pre-recorded Public Address announcements shall be available to the Control Centre. Facilities shall be provided in the Control Centre for suitably trained operational staff to record additional announcements.

The approach and passing of 'Out of Service' trams shall be capable of initiating an automatic announcement at the stop advising passengers of the approach of the 'Out of Service' tram as it passes through the network.

35.7 Operational Radio System (ORS)

35.7.1 Overview

The ORS shall meet the mobile communications requirements for operation and maintenance requirements of the trams, and the tram network, and have sufficient capacity to meet the known future needs as defined in these Employer's Requirements.

An ORS shall be provided to enable safe and effective two-way communication enabling voice and data exchanges between the Control Centre staff and:

- Drivers on board an individual Tram, groups of Trams and/or all trams;
- Drivers of road and other support vehicles for the Edinburgh Tram Network; and
- Individually, or in groups, other mobile Edinburgh Tram Network operations and/or maintenance staff using hand portable equipment along the Edinburgh Tram Network and in the Depot.

Reliable voice communications shall be available throughout the length of the route, and to all areas used by operations or maintenance staff in the course of their duty so that messages of normal, priority or emergency status can be conveyed with high reliability.

The main operator interface with the ORS shall be provided by workstations installed in the Control Centre (for Control Centre staff), and tram mounted mobiles (for tram crews), road vehicle mounted mobiles and hand portable equipment for other mobile staff. Infraco shall supply 130 sets of radios with two spare batteries each and carrying cases. These sets will be supported by suitable re-charge racking and storage facilities.

The ORS shall comprise:

- A trunking controller;
- Sufficient base-stations to provide acceptable and reliable coverage to the satisfaction of **tie**;
- Integrated Control Centre operators' equipment;
- Mobile equipments for tram, road vehicle or hand-portable operation; and
- All communications links and configuration of the system.

35.7.2 General Requirements

The ORS shall use trunking technology capable of group and broadcast calls with normal or emergency priority.

Base-station equipment in close proximity to the Edinburgh Tram Network shall connect to the trunking controller via the Operational Data Network.

The radio system or two-way communication shall not be affected by the failure of the Control Centre systems or supplies.

The ORS shall operate within allocated frequencies administered by OfCom. Operating licences and consents for the ORS shall be obtained from OfCom and any other relevant authorities, e.g. Civil Aviation Authority (CAA). The Operator shall be required to hold all such licences and permits obtained.

Communication shall be reliable, continuous and free from interference as set out in the RAMsS section of this document.

The Operational Radio System shall have all voice communications digitally recorded by the central voice recorder. Recording of the Operational Radio System voice communications shall be integrated with recording of the Telephone Network.

All recording of the Operational Radio System is to be digital to the current best medium.

35.7.3 Short Codes

The Operational Radio System shall be able to send 'short codes' to Trams. It shall be possible to send such short codes to individual trams, groups of trams or to all trams and shall be configurable by the Operator's administrator.

The short codes shall be:

Table 85 - Radio Short Codes

Status Message	Status Meaning	Control to Tram	Tram to Control
CHANGE	Change Active Unit		✓
ACK MESS	Status message acknowledge		✓
ACK CALL	Group Voice Call Acknowledge		✓
###-DEP	Departure from departure points, where ### is the three letter code for each departure Tramstop.		✓
DELAY	Delay to Report		✓
FAULT	Defect to Report		✓
NEWCREW	Crew Change Complete		✓
HELP	Police Required		✓ (see notes below)
EXIT	Depot Exit Request		✓
ENTRY	Depot Entry Request		✓
RELIEF	Crew Relief Request		✓
XO-DONE	Crossover / Turnback complete		✓
STABLED	Tram Stabled		✓
CREWGONE	Driver Leaving Tram – will report back		✓

ALL-STOP	Stop Immediately	✓	
STOPNEXT	Wait Next Stop	✓	
FIREMEN	Beware Fire Engines	✓	
FIREGONE	Fire Engines Clear	✓	

Notes

The 'HELP' code shall also be able to be sent from the hand portable and from the road vehicle radios; and

The emergency call functionality shall also require the use of short codes.

There shall be at least 30 codes.

The Operational Radio System including all mobiles radios and hand-portables shall be capable of being reconfigured by the Operator to operate with amended or additional status messages.

35.7.4 Physical Considerations

The Radio System Trunking Controller shall be installed in the Equipment Room. It shall communicate with either the maintainer's workstation or as a separate dedicated workstation, located in close proximity to the equipment.

All base station antennae shall be fitted with adequate surge protection measures.

Provision shall be made for charging racks sufficient for the for hand-portable radio equipment. Charging racks are to be located in the Control Centre.

All masts required to support base station equipment shall be capable of withstanding all foreseeable wind loading. They shall be fitted with anti-climb protection.

35.7.5 Radio Maintainers' Workstation

The Operational Radio System shall be equipped with a Radio Maintainers' Workstation for network management and diagnostics.

The Maintainers' Workstation shall allow the:

- Display of system status and alarms;
- Download of system logs to removable media;
- Configuration of the Operational Radio System;
- Subscriber management;
- Provision for updating system software;
- Reporting of real time status and alarms to external equipment; and

The Operational Radio System maintainers' workstation shall be situated in the Equipment Room.

Fault and downtime information shall be transmitted to the PMS system.

35.7.6 Road Vehicle Mobile Radio Equipment

The Operator and Maintainers will operate road vehicles requiring Operational Radio System mobile radio equipment. As a minimum all road vehicles shall be equipped with:

- Mobile transceiver;
- Cable harness, feeder and antenna;
- Display, keypad, speaker & microphone; and
- Necessary power supplies.

All road vehicle mobile equipment shall be equipped with a keypad and alphanumeric display unit and be capable of displaying and storing short data messages.

Road vehicle mobiles shall translate status codes into meaningful textural messages.

All vehicle mobiles shall be equipped with an emergency call facility.

35.7.7 Hand-Held Mobile Radio Equipment

Certain Operational and Maintenance staff will be mobile and require hand portable mobile radio equipment. As a minimum the equipment shall include one hundred and thirty sets of:

- Hand-held radios with battery;
- Carrying cases for the hand-held radios;
- Two spare batteries for each radio;
- All necessary operational accessories, such as lapel microphones; and
- Sufficient charging racks suitable for 230VAC 50Hz operation to ensure availability of fully charged radios.

As a minimum the handportable radio shall use batteries with a life of 10 hours when used with a 90%rx / 10%tx duty Cycle.

Battery chargers shall fully charge a battery in less than 4 hours.

All hand portable radios shall be weatherproof and suitable for continuous use on or about the person in the outdoor environment.

All hand portable mobile equipment shall be equipped with a keypad and alphanumeric display unit and be capable of displaying and storing short data messages.

Hand portable mobiles shall translate status codes into meaningful textural messages.

All hand portable mobiles shall be equipped with an emergency call facility. The hand portables shall operate effectively and clearly within the trams and along the route of the Edinburgh Tram Network.

35.7.8 Tram borne Radio Equipment

Radio equipment shall be fitted to each driver's cab to enable two-way voice communications between drivers and controllers at the depot.

The Operational Radio Network equipment fitted to the tram shall include, as a minimum:

- Mobile transceiver;
- Keypad and display compatible with MAP27 interface protocol;
- Radio antenna, to be mounted on the tram roof.

The above equipment shall be free issued to the Tram Supplier for installation.
This radio equipment will utilise equipment supplied by the Tram Supplier, including:

- Gooseneck microphone;
- Emergency call button or kick switch and interface to the ORS;
- All necessary interconnections between Operational Radio Equipment in both cabs provided; and
- All necessary interconnections to other on-tram systems including power supply.

All voice communications involving the tram driver shall be via a hands-free method incorporating the touch-screen console and the gooseneck microphone so as to minimise distraction of the driver from his/her driving responsibilities. The integration of these functions shall be undertaken by Infraco.

When the tram is required to change direction of travel; e.g. after arrival at a terminus, the tram driver shall not be required to make any input to the Operational Radio System as he/she takes up occupation of the 'now leading' cab and the 'Change' status message shall be automatically generated.

Tram radios shall translate status codes into meaningful textual messages and display these to the driver.

All radio calls received during on-board Public Address announcements shall be clearly indicated to the driver at the time of receipt.

All tram-borne radios shall be equipped with an emergency call facility.

35.7.9 Tram-Borne Interfaces

The interfaces for tram-borne Operational Radio Network equipment with other tram-borne systems shall include:

- Passenger Emergency Help Points;
- Public Address System; where the tram driver instigates an on-board Public Address, this shall take precedence over any incoming radio calls received during the duration of public address. The tram driver shall be alerted to the presence of an incoming radio call;
- Radio voice communications and an attack alarm shall be provided between the tram drivers and the inspectors on board each tram.

35.8 Passenger Help / Passenger Emergency Help Points

35.8.1 Overview

Each Tramstop platform shall be equipped with at least one Passenger Help / Passenger Emergency Help Point that shall be connected to the Control Centre by the Operational Data Network.

Each Passenger Help / Passenger Emergency Help Point shall be sited so that it is visible by the platform Closed Circuit Television camera.

Provision shall be provided for the connection of future additional Passenger Help/Passenger Emergency Help Points, as a minimum, at Ingliston Park and Ride facility.

All Passenger Help / Passenger Emergency Help Points System Equipment shall comply with the latest disability advice from the Department for Transport.

35.8.2 Technical Requirements

Each Passenger Help / Passenger Emergency Help Point shall be provided with a two-way speech connection between the user on the Tramstop platform and the Control Centre Staff.

Each Passenger Help / Passenger Emergency Help Point shall be clearly visible and signed, and mounted in a manner that restricts its vulnerability to vandalism.

Each Passenger Help / Passenger Emergency Help Point shall be capable of being activated in two modes, normal and emergency, and there shall be a clearly marked and separate activation button for each function. Initiation of a call at the Passenger Help / Passenger Emergency Help Point shall be by pushing the appropriate call button.

Initiation of a call shall initiate the immediate recording of the subsequent voice communication that shall be time and date related.

Initiation of a call at the Passenger Emergency Help Point shall also cause the relevant Closed Circuit Television camera to focus on the Passenger Help / Passenger Emergency Help Point, overriding any sequential scanning for that camera. The recording rate of the CCTV camera will be increased during the PEHP conversation to the rate specified at section 35.14.13 of these Employer's Requirements.

35.9 Closed Circuit Television

35.9.1 Overview

The Edinburgh Tram Network shall be provided with a digital colour Closed Circuit Television (CCTV) System.

The tram CCTV system shall interface to the City of Edinburgh Council citywide CCTV system as 35.9.2.

Each Tramstop platform shall be equipped with at least one Closed Circuit Television camera. Additional Closed Circuit Television cameras shall be provided if adequate coverage of the access and egress routes at Tramstops and park and ride facilities cannot be achieved using the platform Closed Circuit Television cameras. Additional Closed Circuit Television cameras shall be provided to give full coverage of Park and Ride facilities.

Images from the CCTV cameras shall be transmitted to a Digital Video Recorder where they shall be recorded and time-stamped.

The Closed Circuit Television System shall comply with the requirements outlined in the Home Office guidelines for digital CCTV and the related UK Police Guidance notes and shall provide clear images of 'evidential quality' under all weather and lighting conditions to be made available at the Control Centre for operational purposes and for the recording for evidential purposes.

The Edinburgh Tram Network Depot complex will be equipped with a digital CCTV System as part of the Depot Security System. This CCTV System shall be interfaced to the Passenger CCTV System detailed in this Section. The requirements for the Depot CCTV System are described in 29.8 - Depot Site Layout.

(Please note: As of 11/12/2007, the calculation of the number of CCTV cameras and the bandwidth required on the ODN – See 35.11 for a definition – is based on two cameras per Tramstop, plus ten cameras at the depot and none at Sub-stations. This gives a requirement for 54 new cameras. The ODN also needs to allow for 7 existing, plus two new, cameras at the Ingliston Park & Ride.

35.9.2 Technical Requirements

Cameras shall be of the dome type, vandal resistant and mounted on Tramstop infrastructure or special CCTV poles. The mounting arrangements for each camera shall ensure stability and limit any vibration to acceptable limits so as not to interfere with image quality.

CCTV cameras located at the Park and Ride facilities shall be positioned to cover all of the car park paths, locations identified for Ticket Vending Machines, shelters, buildings, any other structures and both pedestrian and vehicle access points.

The CCTV System at Park and Ride facilities shall provide a clear image of vehicles including the ability for operators to read their registration plates.

The CCTV viewing system shall normally cycle through a pre-defined list of camera images and carry this out over a pre-programmed time period.

All CCTV cameras shall be provided with pan, tilt and zoom facilities both automatically within preset limits and under manual control, and be programmed to zoom in on the Passenger Help / Passenger Emergency Help Point when they are used and to a Ticket Vending Machine location when a TVM alarm is initiated. The Control Centre Staff shall be able to override automatic operation and control the cameras.

The CCTV cameras shall incorporate configurable 'no-dwell' zones to ensure the privacy of adjacent buildings and shall be suitably adjusted at the time of camera installation.

The CCTV System shall be provided with appropriate electrical / electronic interfaces to facilitate the presentation of images to an Edinburgh Tram Network display located within the Lothian & Borders Police Centre, the Lothian Buses Control Centre (Annandale Street) and one located at the Edinburgh in View CCTV Centre. This interface will also enable the transmission of images from the CEC's CCTV system to the ETN such that an appropriate subset of the CEC's CCTV images can be viewed in the Control Centre.

These interfaces shall be physically located in the Equipment Room. They shall include the provision and installation of the necessary connections and extensions to the Tram communication system to provide the necessary interfaces to third parties, and shall remain under the control of the Edinburgh Tram Network.

The selection of individual images by any of the above mentioned third parties for their further interrogation on their local monitors shall only be provided following telephone authority being obtained by them from the Control Centre Operator and shall not inhibit the continued use or availability of images to the Control Centre Operator.

Facilities shall be provided to enable any images generated by cameras that are part of the other interconnected CCTV systems to be selected by the Control Centre Operator and displayed within the Control Centre. Facilities shall be provided to "screen print" images for expediency.

35.10 Supervisory Control and Data Acquisition

35.10.1 Overview

A Supervisory Control and Data Acquisition (SCADA) System shall be provided to monitor and control remote equipment.

The SCADA System shall comprise of a central host, which is used to scan the outlying equipment that is connected to Remote Terminal Units (RTUs) or "Intelligent Relays" shall regularly scan the attached equipment for status or to set/reset the associated controls and, in turn, will be scanned periodically by the central system. Alternatively, electronic subsystems like e.g. traction substation control & protection systems can be directly connected to overall SCADA by means of e.g. a databus or network connection.

The primary interface to the SCADA System shall be a diagram displayed to the Control Centre operators. The SCADA System shall transmit system data received, in real-time, from the RTUs to the mimic display.

The SCADA System will comprise four main functional elements as follows:

- Traction Power SCADA;
- Tramstop SCADA;
- Trackside SCADA; and
- Ticket Vending Machine alarm indications shall be transmitted via the SCADA system. Further details are contained in Employer's Requirements Integrated Fare Collection Section.

The current status of the Traction Power System as presented by the SCADA System shall be available as a display to the Control Centre Staff at all times.

35.10.2 General Requirements

The SCADA itself shall not be a safety critical system, however, it shall provide the facility for the Control Centre staff to make requests of remote equipment to execute actions on behalf of the Control Centre staff, and provide indications for sub-systems.

These sub-systems are:

- Safety related - the traction power control system and remote terminal at each substation;
- Security related - the Passenger Help / Passenger Emergency Help Points at each Tramstop together with the associated Closed Circuit Television camera; and
- Security related - The transmission of Intruder Alarms.

The SCADA system shall pass data relating to equipment failure to the Performance Monitoring System (PMS), to allow the PMS to calculate operational performance relating to equipment availability.

The implementation of the SCADA System at Tramstops and other trackside locations may use the Tram Position and Detection System hardware in lieu of a SCADA RTU for the passage of alarms and indications, should this prove to be more efficient option.

Each SCADA System RTU shall contain a minimum of 30% spare capacity for the future in addition to those specified in the sections below, for the addition of further controls and indications across the Edinburgh Tram Network.

At Tramstops the SCADA Remote Termination Units shall be housed in the Tramstop equipment cabinet with the other Tramstop Supervision, Control and Communication Equipment.

Within Substations the SCADA Control and Monitoring Modules shall be wall or cabinet mounted. SCADA Remote Termination Units shall also be installed within the Points Controller cabinet at all electrically heated points. Further details are contained in 26.11.2 of these Employer's Requirements.

It shall be assumed that the signals to be monitored and controlled by the SCADA system will be concentrated into an interface rack. Connection shall be made from the SCADA Modules to the interface rack.

Individual Tramstop systems control and communications equipments shall be designed to integrate with the Tramstop furniture wherever possible.

35.10.3 Traction Power SCADA

The Edinburgh Tram Network Traction Power Supply System has substations placed along the Edinburgh Tram Network as detailed in Employer's Requirements Traction Power (Substations) Section.

Each Traction Power Control Unit should provide as a minimum:

- 128 Digital Inputs;
- 16 Digital Outputs;
- 16 Analogue Inputs.

It shall be possible to put each substation into a bypass mode remotely by using SCADA, in order to guard against equipment and power failures or to allow maintenance.

The SCADA System shall contain a series of 'macros' that shall enable the Control Centre staff to isolate and earth all electrical sections between adjacent sub-stations or between a sub-station and the end of the Edinburgh Tram Network route by making no more than two mouse clicks, or equivalent, from the SCADA Human Computer Interface power diagram. This operation will initiate a sequence of switching operations, the progress and completion of which shall be indicated to the Control Centre staff via the SCADA Human Computer Interface power diagram. Should any operation in this sequence 'time out', or fail, a visual and audible alarm shall be generated to the Control Centre staff and the sequence be suspended by the system.

Facilities shall be provided to enable the switching sequences to be created, edited and deleted by a person with the appropriate rights of SCADA access to the system shall be provided.

The following SCADA System controls and indications provided for each substation shall include, but not be limited to:

- Fire Alarms;
- Equipment Over Temperature Alarms;
- Intruder Alarms;

- Low Voltage Power Supply Fault indication;
- DC power fault indication (e.g. output circuit failure, etc.);
- Over Voltage Trip Alarms;
- Under Voltage Trip Alarms (if Under Voltage Trips are generated);
- Line Live;
- Line Earthed;
- Stray current monitoring, if provided;
- Power data, volts and amps in real time;
- 'UPS status for communications equipment;
- Battery and Battery Charger Status;
- DNO indications;
- Status of all isolators; and
- Status of all circuit breakers and control of them.

The Edinburgh Tram Overhead Line Equipment shall be arranged such that it is possible to isolate all or parts of the overhead traction supply. Feeder and Bypass Isolators are located at the line side in electrical cabinets or within the nearest substation. Further details are available in Employer's Requirements Overhead Line and Pantograph Section.

The SCADA System controls and indications to and from these Isolators shall include:

- Control command for opening and closing of individual Bypass Feeders at each substation;
- Indication of all individual Feeder Isolator position (open / closed / earthed / indeterminate); and
- Indication and Control of all individual Bypass Isolators.

Where a Control Command is instigated by an Operator, the display shall ask him / her to confirm the action before proceeding. In any case, each Control Command shall be handled at the protocol level by a Request – Check – Confirm sequence to ensure that the possibility of the wrong control being performed is minimised. SW and HW interlocking may be realised in the traction power station by means of the substation control and protection system in each substation, which may also be required for local operation.

Information presented to the Operator shall be accurate under all feasible circumstances and shall include the status of all sub-section isolators. Manual input of the status of sub-section isolators may be proposed by Infraco with the appropriate risk analysis.

35.10.4 Tramstop SCADA

Tramstop Equipment shall be monitored by the Control Centre Operating staff via the SCADA System.

Such equipments shall include, but not be limited to:

- Operation of Passenger Help / Passenger Emergency Help Point and status;
- 'No-Break' Power Supply failure alarms;
- Communications Systems Status & Alarms;
- CCTV fault status;
- Public Address System volume level control, fault status and controls;
- Passenger Information Display fault status;
- Passenger Help/Passenger Emergency Help Point activation;
- Passenger Help/Passenger Emergency Help Point fault status;
- Tramstop equipment intruder alarms (including Fare Collection System Alarms – see below);
- Tramstop electrical supply status (including Tramstop lighting supplies).

Each Tramstop RTU should provide as a minimum:

- 64 Digital Inputs;
- 16 Digital Outputs;
- 4 Analogue Inputs.

35.10.5 Trackside SCADA

The SCADA System shall monitor trackside equipment as follows:

- Point Controls and Indications;
- Failure of Points to move within a given time of the request;
- Point Heater Controls and Indications (The Operator shall be able to command the heating of points in the event of the thermostatic control failing);
- Tram Wash equipment; and
- Sand replenishment equipment - inclusive of sand levels etc;
- Status of lift(s);
- Pumps.

It is possible that the Trackside SCADA system will share an RTU with the Tramstop SCADA system, and the trackside SCADA requirements will vary at different points along the alignment. The I/O counts are included within the Tramstop I/O count. However, note that an extra RTU will be necessary in the Depot for the specialised equipment there, for which the allowance below should be made:

- 64 Digital Inputs;
- 4 Analogue Inputs.

35.10.6 Fare Collection SCADA

Ticket Vending Machine Alarms shall be brought to the attention of the Control Centre Operating staff via the SCADA System.

The TVMs provided by **tie** shall contain normally closed relay contacts (contacts open on occurrence of fault) for the following alarms to the SCADA system, and shall include:

- TVM Vandal Alarm;
- TVM coin jam;
- TVM printer malfunction;
- TVM card unit malfunction;
- TVM tickets low;
- TVM Cash Vault(s) ¾ full;
- TVM doors open.

TVMs shall be procured by TEL and issued to Infraco for installation.

The I/O for the TVMs is already included in the count in the Tramstop SCADA.

35.11 Operational Data Network

35.11.1 Overview

An Operational Data Network (ODN) shall be provided to ensure two-way voice and data transmission to fixed locations along the entire Edinburgh Tram Network, with high reliability, availability and low latency.

The ODN shall provide the communications 'backbone' between Tramstops, substations, other remote equipment and the Depot, and shall convey data for a variety of applications including:

- Tram Positioning, Routing and Detection System;
- Passenger Information Displays;
- Telephone Network;
- Public Address;
- Operational Radio Network (optional);
- Passenger Help / Passenger Emergency Help Points;
- Closed Circuit Television;
- Point Control and Indication;
- Point Heating Control and Indication;
- Supervisory Control And Data Acquisition; and
- Ticket Vending Machines (separation of data shall be provided, one secure encoded stream for revenue, ticketing and fare collection data and the other for Ticket Vending Machine alarms, administration and management).

The ODN shall use a fibre optic transmission system. A multi-core fibre shall connect all ODN nodes.

The ODN shall include all master and outstation node equipment, interface cards, configuration of the system elements, the connecting cables and management and diagnostic facilities. Fibre optic repeaters between nodes shall not be employed.

The ODN Control Centre Node shall be equipped with sufficient communications capacity to allow the interconnection of all traction power substation nodes, Tramstop nodes point control nodes and Depot equipment.

Where appropriate, Depot subsystems shall be connected to the ODN via the secure Local Area Network.

The ODN shall support the emergency relocation of Control Centre staff to alternative location(s) served by the ODN following a Control Centre evacuation, where they will be able to continue operation of the Edinburgh Tram Network albeit in a degraded mode.

The ODN shall not be a safety critical system. However it shall convey safety or security related messages to and from the following sub-systems:

- Safety related - Traction Power Supervisory Control And Data Acquisition; and
- Security related - Passenger Help / Passenger Emergency Help Points and the associated Closed Circuit Television images;
- Security related - The transmission of Intruder Alarms.

The ODN shall provide a bandwidth sufficient for the satisfactory transfer of all data, telephone and other signals required for controlling, monitoring and communicating with equipment distributed throughout the Edinburgh Tram Network.

In addition, the associated ODN communications paths and power supplies shall themselves incorporate similar levels of redundancy / diversity.

The ODN shall be configured such that in the event of single failure there shall be no loss of data and no requirement for any immediate actions on the part of the Control Centre staff. It shall be configured so as to provide automatic re-routing in the event of failures such that any loss of facility is confined to that given locality and does not affect the operation of the transmission system and facilities at any other location.

The ODN shall incorporate the necessary degree of redundancy and duplication to enable the commitment to be achieved without losing the ability to handle faults and accept necessary upgrades.

Where there are connections or any exchange of data between subsystems, each system shall be such that any failure in another system shall not cause a failure of the system, (except in the functionality between the two systems concerned).

There shall be commonality of design between all types of ODN nodes.

The transmission latency of the ODN shall be such that it does not contribute any appreciable delay to any voice or data applications.

The ODN shall provide an expansion capability of 200% to allow for system growth or to enable further interfaces to be added or an increase in the bandwidth requirements of existing applications or known future enhancements of the Edinburgh Tram Network.

35.11.2 Location of Nodes

Remote ODN Nodes shall be located so that together they serve all locations along the alignment which require communications with the Control Centre, including Tramstops, substations, and points control and points heating cabinets. ODN nodes shall be provided at all Tramstops. Nodes shall also be provided at other locations if it not within the immediate vicinity of a Tramstop node.

Tramstop Nodes

Each Tramstop Node shall be equipped with communications interfaces to allow the interconnection of the following two-way voice or data services throughout the Edinburgh Tram Network:

- Digital Closed Circuit Television cameras and associated controls;
- Passenger Help / Passenger Emergency Help Points;
- Public Address;
- Ticket Vending Machines;
- Passenger Information Displays;
- Supervisory Control And Data Acquisition Remote Telemetry Units;
- Tram Position and Detection System Equipment; and
- Edinburgh Tram Network timeserver.

Where appropriate, a Tramstop Node shall be equipped with additional communications interfaces to allow the interconnection of the following two-way voice or data services throughout the Edinburgh Tram Network:

- Radio base station equipment or
- Other Control Centres e.g. Police. Fire, Ambulance and other Emergency Services, Traffic Control Centre.

Traction Power Substation Node

If required separately, a Substation Node shall be equipped with communications interfaces to allow the interconnection of the following two-way voice and data services throughout the Edinburgh Tram Network:

- Supervisory Control And Data Acquisition Remote Telemetry Units;
- Private Automatic Branch Exchanges extensions; and
- Edinburgh Tram Network timeserver.

Where appropriate, an ODN Substation Node shall be equipped with additional communications interfaces to allow the interconnection of the following two-way voice or data services throughout the Edinburgh Tram Network

- Digital Closed Circuit TV cameras and associated controls;
- Tram Position and Detection System equipment;
- Radio base station equipment or
- Other Control Centres e.g. Police.

Points Control Node

If required separately, a Points Cabinet Node shall be equipped with communications interfaces to allow the interconnection of the following two-way voice or data services throughout the Edinburgh Tram Network:

- Supervisory Control And Data Acquisition Remote Telemetry Units; and

- Tram Position and Detection System equipment.

Where appropriate, a Points Cabinet Node shall be equipped with additional communications interfaces to allow the interconnection of the following two-way voice or data services throughout the Edinburgh Tram Network:

- Radio base station equipment or
- Other Control Centres e.g. Police.

35.11.3 General Requirements

For all ODN nodes, the multi-core fibre shall be terminated at a fibre patch panel situated adjacent to the node.

Tramstop node equipment shall be mounted in the Tramstop Equipment Cabinet. Traction Power Substation node equipment shall be either rack or wall mounted dependent upon its location. Control Centre Node equipment shall be fitted within an equipment rack located in the Equipment Room.

The ODN shall be equipped with a Maintainers' Workstation (which may be shared with other subsystems) running a Network Management System for network management and diagnostics.

The Maintainers' Workstation shall allow the:

- Display of system status and alarms;
- Download of system logs to removable media;
- Configuration of the Operational Data Network;
- Provision for updating system software; and
- Reporting of real time status and alarms to external equipment.

The ODN maintainers' workstation shall be situated in the Equipment Room at the Control Centre.

35.12 Considerations applying to all Communications Subsystems

This sub-section details those considerations which apply to all the subsystems these are:

- Electrical Connections;
- Cabinets;
- Alarming of Faults.

35.12.1 Electrical Connections

All powered equipment described above, with the exception of the Passenger Information Display System and Ticket Vending Machine, shall be provided with a 'No-Break' power supply, via a UPS system, located in the nearest Tramstop Cabinet or Substation, as appropriate. LV Supplies will be in accordance with 33 these Employer's Requirements.

All electrical connections shall be made in such a way that the public shall not have access to any cabling. All cabling and wiring must comply with the Cabling and Ducting section of these Employer's Requirements.

The cable routes shall avoid close contact with, or interference from, high voltage electrical supplies and for this reason a 3.0 metre separation shall be achieved in any plane between any communication cable routes and high voltage electrical supplies.

Wherever practicable, communication between two or more items of trackside equipment and from trackside equipment to the Control Centre shall be by such means that permits minimal trackside cabling and an acceptable level of system integrity.

All powered equipment described in this section shall be provided with a connection to an earth. The earthing and bonding requirements are described in **tie**'s Earthing and Bonding Policy Document.

35.12.2 Cabinets

All Tramstop control equipment, forming part of the subsystems, as described above, shall be mounted in cabinets located on or adjacent to the Tramstop platforms. Within substations, cabinets may be wall or floor-mounted as appropriate. The requirements on cabinets in general are detailed in 19 of these Employer's Requirements.

35.12.3 Alarming of Faults

It is essential that malfunctioning of equipment is brought to the attention of the operators, in a unified manner, as quickly as possible. This shall be achieved through the medium of the SCADA System.

Where possible, this may be achieved through network monitoring of the subsystems, and a connection between the network monitoring system and the SCADA system. Where this is not possible, it shall be achieved through a contact connected into an RTU connected in turn to the appropriate SCADA system.

35.13 Control Centre

This describes the components of the various subsystems described above are located in the Control centre. It divides those systems into:

- Those components within the Control Centre;
- Those components within the Equipment Room.

35.13.1 Control Centre - Overview

The Control Centre shall be the focal point for the control and operation of the Edinburgh Tram Network. Its purpose shall be to provide a working place for the operational employees to manage and coordinate day-to-day activities associated with system operations. The Control Centre shall be located on the first floor of the Depot building.

The Control Centre comprises of a number of workstations, at which Control Centre staff sit and use equipment to remotely control or retrieve data from the system. The operator interface shall be designed to carry out control functions in an ergonomically efficient manner.

These workstations are:

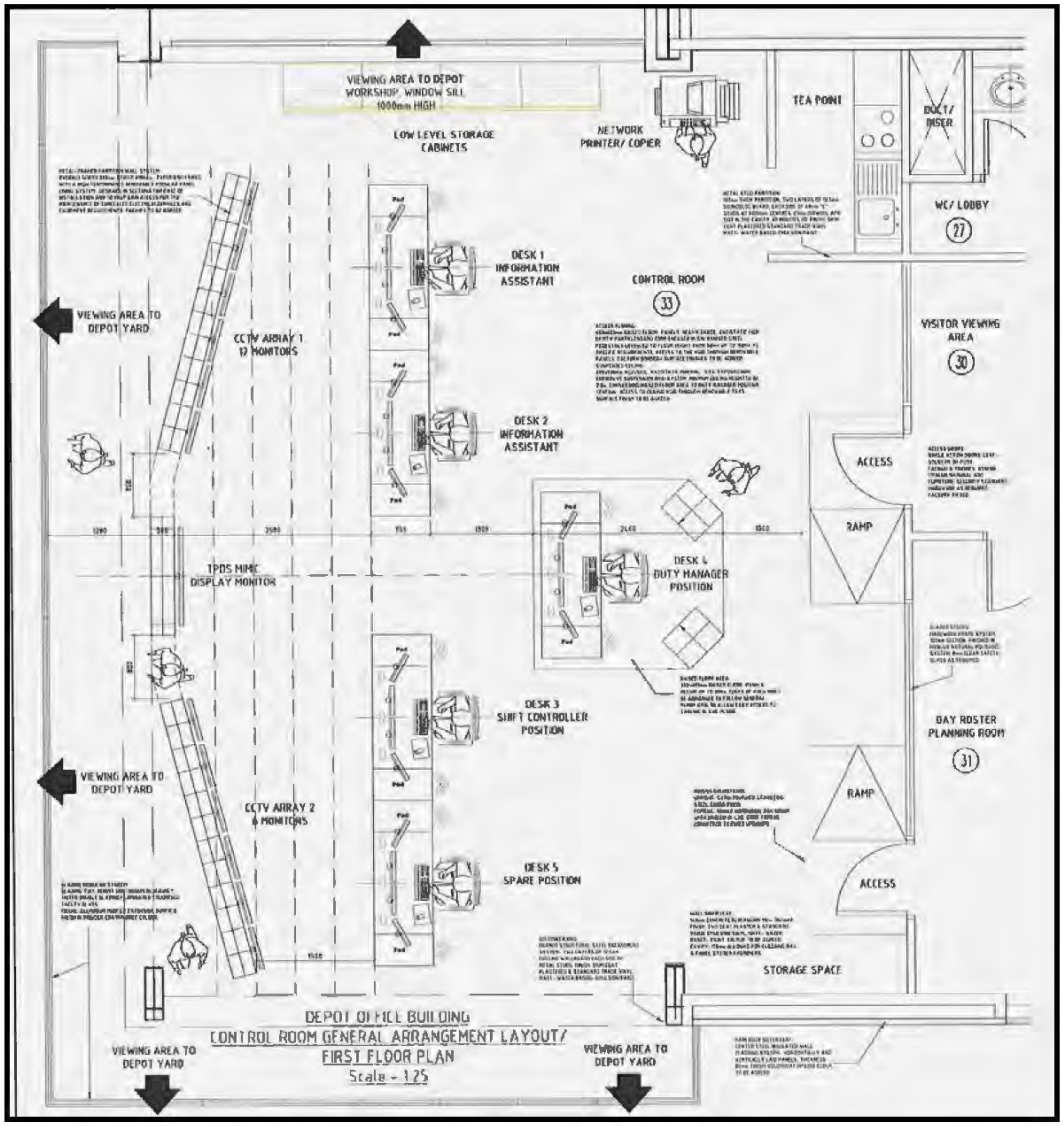
- The Duty Manager;
- The Shift Controller;
- The Information and Security Supervisor;

- There are also two workstations that have been identified for future expansion of the system.

A Monitor Matrix shall be provided, to be positioned either on the front wall or in close vicinity to the Control Centre desks. The matrix shall be of sufficient size to be viewed by all Control Centre staff.

A typical Control Centre Layout is shown in the diagram below. This shows the Control Centre with the addition of the two workstations that have been identified for future expansion.

Figure 11 - Typical Control Centre Layout



35.13.2 Workstation Capabilities

Each Control Centre Workstation shall have the capability to provide indication and control of all subsystems and services: however, it will normally be restricted by logon status to the duties normally associated with the position. The various control and monitoring capabilities are described by subsystem:

- Tram Position and Detection Subsystem;
- SCADA System;
- Operational Radio System;
- Passenger Information Displays;
- Public Address;
- Closed Circuit Television;
- Passenger Help / Passenger Emergency Help Point System;
- Telephone System.

There shall be at least three screens attached to each workstation. The three screens shall be able to form a continuous display. The status of the dynamic data shall be regularly updated, at a frequency of not less than once every five seconds.

Through the top-level diagram it shall be possible to access additional nested menus or screens to gain additional information from the subsystems and facilities.

The presentation of the menus and 'human computer interface', to the Control Centre operators, shall be subject to the approval of **tie**.

Each workstation shall be equipped with at least one keyboard, and some or all of a mouse, joystick, or touch screen capability to navigate around the screens. The keyboard (s) shall be retractable when not in use.

Differential alarm tones shall be provided for each of:

- Operational Radio Network normal calls;
- Operational Radio Network emergency calls;
- Passenger Help Point activation;
- Passenger Emergency Help Point activation;
- Internal and external telephones; and
- Emergency Telephone lines

Tram Position and Detection Subsystem

The Workstation shall present a diagrammatic representation of the entire Edinburgh Tram Network both as an overview display and a series of overlapping sectional displays

Each display shall provide the following as a minimum:

- Last known position of each tram;
- Run / Route number of each tram;
- Number of each tram;
- Punctuality of each tram;
- Driver staff identity for each tram;
- Tram in service / out of service;
- Tram destination; and
- Status of each tramway signal;
- Lie of points;
- Input a tram signal demand via the UTC system;

The Control Centre Workstation(s) controls are only intended for use when the system is disrupted, in emergencies, engineering works, equipment failure conditions, or at the run out and run in of trams to/form the depot. Under normal operating conditions the Tram Position and Detection System will automatically control signals, points and routing of the trams and without the intervention of Control Centre staff. They shall be designed in such a way as to not compromise the safe running of the tram system at any time.

SCADA System

The Workstation shall present a diagrammatic representation of the entire Edinburgh Tram Network both as an overview display and a series of overlapping sectional displays, upon which shall be displayed the control, monitoring and alarm functions associated with the following:

- Electrical Power Substation Equipment for each Electrical Supply Point, the actual position and status of circuit breakers and motorised section isolators;
- Tramstop Equipment;
- Trackside Equipment; and
- Vending Machine Alarms. Details available in Employer's Requirements, Integrated Fare Collection.

The controls and indications shall be displayed in real time and synchronised with the Edinburgh Tram Network Time system.

SCADA Alarms

All alarm events shall generate an alarm message, which shall be electronically logged and displayed to the targeted Control Centre operator.

Each alarm message shall identify the system that has generated it.

Each alarm message shall be assigned a priority level.

High priority alarms shall generate an audible tone.

Alarms shall be presented in a hierarchical manner, with sufficient gradation to ease handover between Control Centre staff.

The Control Centre staff shall have the facility to accept alarms individually or as a 'page' of alarms.

The alarm list shall have the facility to display alarms in chronological order, with the latest alarm first.

Each alarm entry shall include the date and time of occurrence, location and plant identity.

The silencing of alarms shall not inhibit the annunciation of further alarms nor constitute an acknowledgement of the alarm.

Alarm Sequence

Onset of Alarm

This shall be indicated by a flashing alarm message and sounding an audible alarm at the Workstation. There is also a simultaneous logging in the fault log and printing of the alarm on a printer situated in the equipment room.

Acknowledgement of the Alarm by the Control Centre Staff

The alarm message shall be steady, the audible alarms shall revert to a low level, and the acknowledgement shall be logged in the fault log and printed on a printer situated in the equipment room.

Acknowledgement of Reset of the Alarm by the Control Centre Staff

The reset alarm message shall be steady, the low level audible alarms shall cease, and the acknowledgement shall be logged in the fault log and printed on the Supervisory Control and Data Acquisition System printer situated in the Equipment Room.

Operational Radio System

The Workstation shall permit (preferably via a touch screen interface):

- Initiation / receipt of radio calls to any/all tram(s) and other vehicles fitted with the Operational Radio System;
- Initiation / receipt of radio calls to any/all portable radio handsets;

- Provides audible and visual alarms for emergency radio calls received. Such alarms shall be displayed so as to clearly differentiate between normal events and emergency events; and

- Use of 'short radio codes'.

Primary means of initiating radio calls to individual trams from the Control Centre staff shall be achieved by mouse click(s) on the relevant tram represented on the Tram Position Detection System display.

The attention of Control Centre staff to a tram making a radio call to the Control Centre shall be achieved by appropriate graphics symbols on both the Tram Position Detection System and Operational Radio System Human Computer Interfaces accompanied by an audible signal.

All Operational Radio System communications shall be via the Control Centre: direct calling between outstation radios is not required and shall not be available.

When an outstation user wishes to call the Control Centre, they shall insert a call request message. The Control Centre staff will then call them back.

When Control Centre staff call an outstation, the outstation radio shall 'ring' and the outstation operator shall answer the call and speak first.

All radio calls shall also be capable of being made and received via the Control Centre Workstations.
When an emergency call is received at the Control Centre, a distinct audible and visual alarm shall appear on the Workstation. It shall not be possible for a Control Centre member of staff to cancel an emergency call without answering it.

Nomenclature for tram radio call signs shall be the same as the tram number.

When Control Centre staff send a single voice message to all trams and request the tram drivers to acknowledge receipt, the radio system shall present a list of all trams and their status to the Control Centre staff via the Operational Radio System Human Computer Interface.

The status shall be coloured to identify:

- Trams that have acknowledged the message, in green;

- Trams that do not have active radios, in amber;

- Trams that have not acknowledged the message in red.

This will enable the Control Centre staff to identify any trams that have not acknowledged the call. A similar arrangement shall apply to status codes sent to trams.

The Operational Radio System shall support the emergency relocation of Control Centre staff to alternative location(s) served by the Operational Data Network following a Control Centre evacuation, where they will be able to continue operation of the Edinburgh Tram Network albeit in a degraded mode.

The system shall digitally record all outgoing and incoming radio messages.

Passenger Information Displays

The Passenger Information Display System shall be accessible to the Control Centre staff via the Control Centre Workstations.

Normally, the Platform Information Display System shall be automatically updated from the Tram Position Detection System. However, the Control Centre staff shall have the ability to display a selection of pre-recorded messages and free form text on individual Platform Information Displays or groups of displays.

Details and times of the application of pre-recorded messages and free form text shall be logged by the Central Data Recording System.

Public Address

The Control Centre staff shall have the ability to initiate and transmit direct announcements to individual Public Address System Platforms, zones or groups of zones via the Control Centre telecommunications console.

The Control Centre staff shall be able to alter the volume setting of individual Public Address System zones or groups of zones.

Details of all Control Centre staff interventions and direct announcements shall be logged by the Central Data Recording System.

Closed Circuit Television

Colour pictures shall be transmitted to the Control Centre from the Tramstops, substations, park & ride facility and surrounding areas.

The system shall normally display a continuous cycle of Closed Circuit Television. The system shall interrupt this cycle to automatically display the image of the location where a Passenger Help Point / Passenger Emergency Help Point is activated: this shall cause the relevant camera image to be transferred to the Control Centre Staff's local Closed Circuit Television display. This should be able to be overridden by the Control Centre staff. After termination of a Passenger Help / Passenger Emergency Help Point call, the associated Close Circuit Television Camera shall revert to the normal scanning sequence.

The Operator shall be able to select those images that are required to be displayed in predetermined viewing patterns on the Monitor Matrix at the front on the Control Centre near that of the support workplace. Priority of selection shall be adjustable, to be governed by the current Edinburgh Tram Network operating procedures. This shall be adjustable and the system shall allow new viewing patterns to be created, amended and deleted as required by the Control Centre staff to suit individual operational circumstances.

Operation of a Ticket Vending Machine alarm shall similarly cause the local Closed Circuit Television image to be automatically displayed on a pre-selected monitor in the Control Centre.

The selection of the camera for control shall cause the image to be transferred to the Control Centre Staff's local Closed Circuit Television display.

The Control Centre Staff shall have a joystick that shall allow control of the pan, tilt, zoom and focus camera attributes.

The Closed Circuit Television Graphical User Interface shall allow the Control Centre operator to switch any camera image to be recorded at high rate to the central data recorder, to be viewed on any monitor or his own workstation.

The control of the video switching shall be completely transparent to the user.

Location, time and date stamped recording facilities shall be activated if the emergency button is activated on a Passenger Help / Passenger Emergency Help Point, the image from the relevant camera shall be automatically routed to a designated screen in the Control Centre.

Video and textual information shall be displayed on the local display when swapped from the monitor matrix display and shall maintain camera identity, status and location.

All characters overlaid on a Closed Circuit Television image shall provide clearly legible letters and characters on a dark background. Character generation shall be separate from the video image such that the location of a camera failure can be clearly identified.

The Control Centre shall provide facilities to capture a video image displayed on the Control Centre operator's display and print the image via a high quality video printer.

Passenger Help / Passenger Emergency Help Point System

The Passenger Help / Passenger Emergency Help Points System shall be accessible to the Control Centre staff via the Control Centre Workstations for alarm presentation, and via the Control Centre telecommunications console for communication with the person initiating the alarm or help request. Activation of a Passenger Help / Passenger Emergency Help Point shall give an immediate flashing indication and associated audible alarm on all Control Centre staff workstations and the Control Centre Overview Display. If this is an Emergency Help point activation, the image of the associated CCTV camera shall be automatically called to the Monitor Matrix.

The alarm message shall be steady and the audible alarm shall be silenced upon acknowledgement by the Control Centre staff.

Upon termination by the Control Centre staff of a Passenger Help / Passenger Emergency Help Point call, the reset alarm message shall be steady.

Telephone System

There shall be a touch screen interface to the Telephone, (and Public Address and Passenger Help Point / Passenger Emergency Help Point sub-systems if not provided for otherwise) that provides for:

- Initiation / receipt of telephone calls to any / all users on the exchange provided;
- Priority and high integrity initiation / receipt of telephone calls to / from emergency services;
- Audible and visual alarms for Passenger Help Point / Passenger Emergency Help Point calls received; and
- Making of public address announcements at individual, grouped or all Tramstops and / or park & ride sites.

All Control Centre staff positions shall be identical, with functionality determined by user 'log-in'.
All voice communications to and from the Control Centre shall be recorded and be capable of being played back.

Recorded voice communications shall be stored as detailed in 35.14.14.

Emergency telephone lines shall be provided to allow contact with and from the organisations detailed in 35.13.4, regardless of any failure of the main Private Automatic Branch Exchange.

Such facilities need not necessitate individual handsets but may consider a single handset (on the relevant operator workplaces) with priority displays and call buttons.

The Workstation shall incorporate:

- Information displays: (Supervision of extensions and exchange lines);
- Call processing and routing: Traffic and console status; and
- Ability to provide user input via keyboard entry.

The Workstation shall provide:

- Interactive voice greetings and messaging;
- Advanced call monitoring;
- Line engaged signal;
- Waiting time or queuing status;
- Called / calling parties identity;
- Pre-programmed numbers;
- Hands-free / wireless operation;
- Time display, synchronised by the Time Server;
- Conference calling;
- Audio control;
- Programmable functions;
- A local loudspeaker;

- An adjustable ring tone;
- Public Address System Interface; and
- Number ID

35.13.3 Control Centre Philosophy

The Control Centre shall provide Control Centre staff, and especially the shift controller and duty manager, with clear visibility of the entrance and exit tracks and associated infrastructure of the Depot complex with the main tramway and at least one end of Depot shed tracks and stabling apron tracks.

All Workstations shall be of similar design to maintain the aesthetics of the Control Centre.

Each Control Centre Staff position shall be able to control the local lighting, so that screen light reflections shall be reduced.

The Control Centre shall provide positions for the following operations personnel:

Operations Duty Manager

The Duty Manager will be responsible for overall control of the Edinburgh Tram Network and the safety of its operation.

The Operations Duty Manager is required to 'book' Tramcrew on / off duty and needs to see crew before they take their turn of duty in order to be convinced that they are in an appropriate condition to commence duty. The Control Centre shall provide for this without the need for Tramcrew to enter the Control Centre.

The Duty Manager's workstation will be identical to all other workstations.

Operations Shift Controller

The shift controller is responsible for the minute by minute operation of the Edinburgh Tram Network ensuring service perturbation risks are minimised and Tramcrew are aware of the current state of the Edinburgh Tram Network.

Operations Information & Security Supervisor

The information & security supervisor provides support to the duty manager and shift controller by monitoring the positions of trams, monitoring and editing of Passenger Information Displays, monitoring of Closed Circuit Television and Passenger Help / Passenger Emergency Help Points. This post will also take the primary role in ensuring passenger information and security.

Duty Manager

The duty manager's work place shall be located such that he can clearly see and interact with all the operations of the Control Centre.

The duty manager's workplace shall provide facilities to monitor and control the following subsystems:

- Tram Position and Detection;
- Supervisory Control and Data Acquisition;
- Operational Radio System;
- Closed Circuit Television;
- Telephones.

Shift Controller

The operator workplace provided for the shift controller shall be a complete replica of that provided for the duty manager.

In addition, the shift controller shall be given clear visibility of the mimic display and the bank of CCTV displays located at the front of the Control Centre.

Information & Security Supervisor

The information and security supervisor workplace shall be identical to the other workstations.

Monitor Matrix

A monitor matrix shall be mounted either on the front wall or in close vicinity to the Control Centre desks. The matrix shall be of sufficient size to be viewed by all Control Centre staff.

It shall display CCTV images. Textual information shall be displayed on the displays to provide camera identity, status and location. Characters shall provide clearly legible letters and characters on a dark background. Character generation shall be separate from the video image such that the location of a camera failure can be clearly identified, and shall not be generated by the camera itself.

The Monitor Matrix shall cycle through a user-definable set of images over a period of time.

Positioning of the images or sequencing in the matrix shall reflect the geographical layout of the Edinburgh Tram Network. The sequencing and display time of these images shall be user configurable.

The Information and Security Operator shall be able to select those images that are required to be displayed in specified viewing patterns on Monitor Matrix. Priority of selection shall be adjustable, to be governed by the current Edinburgh Tram Network operating procedures. This shall be adjustable and the system shall allow new viewing patters to be created, amended and deleted as required by the Control Centre staff to suit individual operational circumstances.

When activated by the Passenger Help / Passenger Emergency Help Points System interface, the Monitor Matrix shall display the associated CCTV image for that Passenger Help/Passenger Emergency Help Point.

35.13.4 Emergency Telephone Lines

The Control Centre shall have dedicated 'direct' lines between itself and the following locations as a minimum:

- Fire Brigade Control Centre;
- Lothian & Borders Police Control Centre;
- Lothian Buses Control Centre (Annandale Street);
- Edinburgh in View CCTV Centre;

- Ambulance Control Centre;
- Airport Control Centre;
- Network Rail Edinburgh Waverley Power Signal Box;
- Network Rail Electrical Control Centre at Cathcart; and
- City of Edinburgh Urban Traffic Control.

The primary telephone interface providing these facilities shall be through the single integrated audio telecommunications device at each desk, with a secondary hand-held unit for back up. Multi facilities will not be acceptable.

Any incoming calls from emergency services shall be brought to the attention of the Control Centre staff, via messages on the display, audible alarms and / or indicators on the handsets.

All voice communications and messages critical to safe operation shall be recorded on the central data recording system.

All Control Centre communications between control-room staff shall also be recorded and stored for at least thirty-one days.

35.13.5 Local Area Network

All of the Workstations situated within the Control Centre shall be connected to a dual redundant Local Area Network, which shall in turn be connected to the Servers and Systems in the Equipment Room and thence to the Operational Data Network.

The Local Area Network cabling standard shall be category 5/5e or higher.

Each Control Centre staff position shall have two Local Area Network connections per Local Area Network and these shall be accessible through the floor mounted recessed sockets.

The Local Area Network shall accommodate the connection of further terminals for the requirements of future expansion of the Edinburgh Tram Network.

35.13.6 Control Centre Time Display

The Control Centre shall have one or more wall-mounted digital display clocks, mounted so that all Control Centre operators have full view of the displayed time.

These clocks shall show the day, date, hours, minutes and seconds.

The clocks shall be synchronised with the Rugby time signal or its successor or similar.

35.13.7 Safety Requirements

The Control Centre will not house safety critical systems, however, it will provide controls and indications for sub-systems that can be considered to be safety or security related.

These sub-systems are:

- Safety related - the Traction Power Control System and Supervisory Control and Data Acquisition at each substation;
- Security related - the Passenger Help / Passenger Emergency Help Point communications to each Tramstop; together with the associated Closed Circuit Television equipment; and
- Safety related - the Tram Position, Route Setting and Detection System.

35.13.8 Electrical Requirements

The equipment located in the Control Centre shall run from 230/240VAC 50Hz electrical supplies.

Appropriate switched mains sockets shall be located on the walls and in the floor area close to each Control Desk locations for miscellaneous mains powered equipment.

There shall be no 110VAC or 415VAC 50 Hz available in this room. Power tools which require 110VAC 50Hz shall utilise a step-down / isolation transformer to achieve this.

Each mains socket shall be rated for a current of 13A.

The Control Centre equipment shall be supported by the provision of Uninterruptible Power Supply / diverse electrical supplies, further details are available in the Employer's Requirements Depot Section. An Uninterruptible Power Supply mains distribution panel shall be available in the Control Centre to provide a fault tolerant supply for all the equipment in the room. The connection of the

equipment to the Uninterruptible Power Supply distribution panel shall be through a system which has the same standard three-pin plug and sockets as normal 240v supplies, but is differentiated from the normal supply by means of appropriate labels and/of colour.

The design shall include full details of the future capacity that shall be provided for Edinburgh Tram Network expansion, and the method proposed for the work necessary to incorporate, install and commission future extensions.

All Control Centre cables and equipment shall be identified by permanent labelling in an approved format as detailed in the overall system-wide requirements.

The system wiring shall be sized to permit a minimum of 35% increase in power consumption for any additional equipment added as part of future Edinburgh Tram Network enhancements.

The main cable entry shall be via an aperture located in the floor, which provides entry or access for cables into the equipment room.

Particular care shall be taken to ensure that Electro-Magnetic Compatibility is not degraded when cables are closely located.

Cables shall be continuously screened through the aperture in the floor.

Appropriate strain relief or clamping shall be provided.

All cables and conduits shall be clearly marked with cable identifiers or suitable permanent marking which shall last for the expected system lifespan.

Local cabling between the Control Centre and the Equipment Room ducts shall be such that new cabling shall be capable of being installed without disruption to the operations including impact on the connections to the workstations.

35.13.9 Logging

In addition to voice image and message recording, there are two additional log facilities:

- Fault log; and
- Day log.

Fault Log

An electronic fault log shall be created which shall log status messages from Supervisory Control and Data Acquisition and communications systems.

The fault log records all system faults for further investigation.

Data storage shall be provided which shall record data on a 'first in-first out' basis.

Data shall be backed up on a removable storage medium and the system shall automatically do this or notify the Control Centre operator that backup is required before overwriting.

Data shall be backed up on a removable storage medium and the system shall automatically do this or notify the Control Centre operator that backup is required before overwriting.

Fault reports shall be automatically generated.

Day Log

An electronic log of day-to-day operations shall be implemented, from which a hard copy can be generated.

35.13.10 Central Data Recording

The Control Centre shall have a means of digitally recording/replaying the following information:

- All Operational Radio System voice communications;
- All Telephone Network calls to or from the Control Centre;
- All calls via the emergency telephone lines;
- Public Address announcements;
- Closed Circuit Television images, (at variable speed controlled by the viewer);
- Textual changes to Passenger Information Display; and
- The data shall be stored on non-volatile memory storage for the purposes of review or incident investigation.

The Control Centre staff shall be able to replay the data recorder from each desk position.

Information shall be recorded in a tamper-proof manner to evidential standards and be retained for a minimum period of one month.

35.13.11 Printers

The Control Centre shall house local printers for the printing of logs of maintenance or diagnostic data or colour prints of Closed Circuit Television frames.

35.13.12 Control Centre Furniture

The Control Centre shall be furnished with modern ergonomic furniture to assist the Control Centre staff and reduce fatigue.

Each desk position shall have personal storage of a minimum of three lockable drawers. Positioning of storage shall not inhibit the work-envelopes of the Control Centre Staff.

Additional storage equipment shall be located to the sides of the Control Centre.

The design of the Control Centre furniture shall include provision for the effective management of cabling, and equipment and maintenance power supply distribution.

Each of the Control Centre staff shall have the following functionality:

- Computer / workstation with dual flat screen displays, plus retractable keyboard;
- Integrated audio communications device comprising of handset and headset for (Public Address, Operational Radio, Telephones and Passenger Help / Passenger Emergency Help Points). The Telephone System (PABX) and the Operational Radio System shall be provided separately;
- Emergency telephones;
- Local light dimming control;
- Joystick control, (movement zoom and focus of Closed Circuit Television Cameras;
- Pointing device such as a mouse or tracker ball and keyboard; and
- Passenger Help / Passenger Emergency Help Point identification display.

The integrity of Controls and Indications shall be commensurate with the extent to which safety depends upon their correct operation, in both normal and degraded modes.

35.13.13 Spare Capacity / System Expansion

Following installation of the initial Edinburgh Tram Network Control Centre System:

- All conduits, troughing, trunking, and apertures shall be only 50% full of cables;
- All multi-pin connectors shall have a minimum of 10% capacity available for expansion; and
- All multi-way termination blocks shall provide a minimum of 20% capacity for expansion.

35.14 Equipment Room

35.14.1 Overview

The Equipment Room shall be situated either directly adjacent to, or directly below the Control Centre. The primary purpose of the Equipment Room is to provide a location to house the bulk of equipment, which supports the operational monitoring, management and operation of the Edinburgh Tram Network.

The equipment shall primarily be contained in freestanding cabinets located in the Equipment Room. Cabling from the equipment exits from the cabinets and shall be routed to sub-systems located outside the Depot or routed through an aperture into the Control Centre.

Within the Equipment Room will be maintainer desks, which shall be used for maintaining equipment associated with the running of the system.

It is proposed that the Equipment Room shall house the servers which host the following systems (subject to the required performance, reliability, safety and maintainability characteristics):

- Tram Position and Detection subsystem;
- Passenger Information Display subsystem;
- Telephone Network Private Automatic Branch Exchange;
- Public Address subsystem;
- Operation Radio Network Trunking Controller and base station (if required);

- Passenger Help / Passenger Emergency Help Point subsystem;
- Closed Circuit Television subsystem;
- Matrix controller;
- Supervisory Control and Data Acquisition subsystem;
- Operational Data Network Control Central Node;
- Performance Monitoring System;
- Central Data Recording and Storage;
- Radio Clock;
- Security and Access Controller;
- Fire alarm system;
- Voice recording and playback;
- Printers (if required).

35.14.2 Maintainer's Positions

Where appropriate, a Maintainer's Workstation shall be provided for a subsystem, along with any printer. The maintainer's position shall be supplied with any additional diagnostic equipment that cannot be integrated into the maintainer's workstation as part of the suite of software. Any additional special adapters or cables and connectors shall also be provided.

35.14.3 Security and Access Control

The security and access control system shall be housed in the Equipment Room.

The security and access control system shall also monitor the entry and exit to the Equipment Room.

Abnormal or illegal entry messages shall be sent to the Control Centre. These actions shall also be logged in the central data recorder.

35.14.4 Layout

The layout of the Equipment Room shall not be detrimental to maintenance and movement of equipment.

The positioning of cabinets and equipment shall take into consideration the cable and conduit entries and exits into the room.

The maintainer's workstations shall be situated with a full view of the equipment.

35.14.5 Equipment Housings and Mounting

Where possible, the equipment shall be placed in sealed, lockable cabinets, which provide a minimum of IP34 sealing.

Where indicators or diagnostic light emitting diodes/displays are used on equipment the cabinets shall have a glass door to assist in easy viewing from the maintainer's workstation.

Wherever possible, equipment shall be rack mounted or modular to aid replacement and maintenance.

To assist with installation all cabinets and equipment shall be fitted with suitable craneage or lifting points.

35.14.6 Diagnostic, Maintenance or Offline Mode Indications

If the equipment in the Equipment Room is placed into a diagnostic, maintenance or offline mode, this shall be communicated to the Control Centre staff and shall not compromise system safety or the performance of other systems.

35.14.7 Equipment Power Supplies

All powered equipment shall be connected to an Uninterruptible Power Supply in an adjacent room. This shall deliver 230V a.c. 50 Hz or 400 V a.c. 50 Hz.

Switched mains sockets shall be located on the walls and in the floor area close to the equipment locations. Further details are available in the Employer's Requirements - Depot. There shall be provision for 110V a.c. 50Hz in this room to enable the connection of power tools and the sockets shall be clearly marked accordingly.

Each 230V ac 50Hz mains socket shall be rated for a current of 13A.

A Supply distribution panel shall be mounted to the wall to enable disconnection of supplies in the event of an emergency.

The system wiring shall be sized to permit a minimum of 25% increase in power consumption to accommodate additional equipment required for Edinburgh Tram Network expansion.

The power loading and performance characteristics of equipment shall be stated at the extremes of temperature, normal running and transient conditions.

35.14.8 Storage

The Equipment Room shall provide storage for both personal and vocational items. This shall be in the form of lockable cupboards and units.

All main data storage shall be carried out on servers or equipment located in the equipment room where access is restricted. All system or program data must be shown to be retrievable in the instance of a system re-build.

Adequate shelving and filing cabinets etc shall be provided to locate equipment, handbooks, files and storage of electronic data.

Printers and miscellaneous equipment shall be sited in the locale of the maintainers in order to afford easy access.

35.14.9 Spare Capacity / System Expansion

All conduits, troughing, trunking, or apertures shall be only 50% full of cables. All multi-way termination blocks shall provide a minimum of 20% capacity for expansion. All multi-pin connectors shall have a minimum of 10% capacity available for expansion.

Each cabinet shall only be populated up to 75% to provide additional space for system enhancements.

Cabinets containing equipment which may be affected by the future Edinburgh Tram Network enhancements shall have enough spare capacity to accommodate those changes or demonstrate that the expansion or upgrade can be achieved with the minimum amount of changes or use of personnel.

All patch panels and terminals shall have the capacity for equipment used by the future Edinburgh Tram Network enhancements.

35.14.10 Master Clock and System Clocks

Within the Equipment Room, a Master Clock System shall be installed.

The Master Clock shall source a time signal from the standard Rugby clock signal (or its successor) or similar and broadcast the time signal to all systems that require accurate time synchronisation.

The Master Clock shall broadcast the time signal over the Local Area Network or directly via wired connections to the appropriate equipment.

In the event of Rugby time signal failure the system shall continue to generate time signals based on an accurate battery-backed clock. In the event of Master Clock failure, each of the systems that require the Rugby time signal shall continue operating using their own local clock signal. The failure of the Master Clock shall be logged accordingly and displayed to the Control Centre staff.

The time shall be sent to each of the systems to allow logging to resolution of 10ms or better.

A digital display clock shall be situated in a position, which can be easily seen by the maintainers at their workstation position. The clock shall source its time from the master clock. It shall show the day, date, hours, minutes and seconds.

35.14.11 Performance Monitoring System

The Performance Monitoring System shall be connected to the equipment room Local Area Network and be accessible by all designated users with appropriate user group login and password protection.

It shall receive data from the Tram Position and Detection Subsystems and the SCADA systems, which will allow it automatically to calculate those measures of performance of the Tram Network that can be calculated automatically. The relevant Performance Measures are all of those measures that form Performance Measurement System, as set out in Schedule 6 to the Infraco Agreement. This system shall produce appropriate daily and other periodical reports in both paper and software format. The reports shall to provide a suitable audit trail for the calculation of the PMS. The detailed specification for this system shall be subject to further development with **tie** and subject to **tie**'s approval.

The Performance Monitoring System shall also be accessible remotely through a Local Area Network firewall, via the Internet.

35.14.12 Monitor Matrix Display Driver

The Monitor Matrix Controller shall receive data from the Closed Circuit Television System cameras and display the images onto the Matrix of displays in the Control Centre.

It shall be connected to the dual redundant Local Area Network and / or Closed Circuit Television System.

It shall have the capability of being expanded to accommodate the expansion of the Edinburgh Tram Network closed circuit television system.

35.14.13 Central Data Recording

The Central Data Recorder shall be housed in a cabinet separate to all other equipment. The cabinet shall be sealed and locked and have suitable tamperproof fittings. The door shall be fitted with an alarm to indicate when it has been opened, which shall be logged, printed, and displayed to the Control Centre staff.

The data shall be stored in secure manner such that no tampering can be achieved. The maintainers shall have easy access to the system in order to backup/archive data. The system shall have the capability of supporting connections to a Local Area Network based digital recording system held in the Equipment Room.

The system shall provide playback facilities within both the Control Centre and one of the administration offices.

All recorded Control Centre communications shall be time stamped to the nearest second, updated from the Edinburgh Tram Network Time Server in the Equipment Room. Recordings shall be archived to transportable media.

The archiving process shall not interrupt the recording process. The viewing of recorded Closed Circuit Television images shall not interrupt the recording of further Closed Circuit Television images.

The quality of data stored shall be suitable for legal interpretation and proceedings.

The data shall be stored on a system, which shall have the capacity to store at least thirty-one days worth of system communications, Closed Circuit Television images and text information.

Each camera shall be recorded at a minimum rate of 16 frames per second (fps): however, the images shall be recorded at a higher frame rate of 25 fps when:

- An Emergency Help point has been activated;
- A TVM alarm is detected;
- A designated zone has been entered;
- The Control Centre staff manually command the Closed Circuit Television image to be recorded.

The data shall be recorded in a circular buffer where the oldest data is overwritten by the latest data ('first in-first out') and is subject to the storage capacity of 31 days referred to above.

The data shall be stored in secure manner such that no tampering can occur.

The images shall be overlaid by security coding of time/date and location.

Freeze frame facilities shall be provided.

In the above cases, the system will interrogate the Operator at the end of every three minutes to determine whether or not the high recording rate should be continued.

The central data recorder shall provide conversion facilities to adjust the optimisation of the images but not the pictorial content.

The storage device shall provide an audible warning that the storage capacity is within 5% of capacity and that the Control Centre staff are required to archive data to a non-volatile medium.

The status of the data recorder shall be conveyed to Control Centre staff.

Each DVR shall be connected to the Operational Data Network, to allow images to be transferred between locations to allow remote viewing.

35.14.14 Voice Recording

The Equipment Room shall house a Local Area Network based digital recording system that shall record all voice communications both into and out of the Control Centre.

The Central Voice Recorder shall be housed in a cabinet separate to all other equipment.

The cabinet shall be sealed and locked and have suitable tamperproof fittings.

The door shall be fitted with an alarm to indicate when it has been opened, which shall be logged, printed, and displayed to the Control Centre staff.

The voice recordings shall be stored in a secure manner such that no tampering can be achieved. The maintainers shall have easy access to the system in order to backup / archive data.

The system shall provide playback facilities within both the Control Centre and in one of the administration offices.

All recorded Control Centre communications shall be time stamped to the nearest second, updated from the Time Server in the Equipment Room.

Recordings shall be archived to removable media.

The archiving process shall not interrupt the recording process.

The quality of data stored shall be suitable for legal interpretation and proceedings.

The voice recordings shall be stored on a system, which shall have the capacity to store at least thirty-one days worth of voice communications.

The data shall be recorded in a circular buffer where the oldest data is overwritten by the latest data ('first in-first out').

The data shall be stored in secure manner such that no tampering can be achieved.

The storage device shall provide an audible warning that the storage capacity is within 5% of capacity and that the Control Centre staff are required to archive data to a non-volatile medium.

The status of the voice recorder shall be conveyed to Control Centre staff.

35.14.15 Equipment Room Maintainer Desks

Two workstations shall be provided for the maintainers, which comprise a local display, 'man-machine interface' and keyboard to enable the interrogation of the server or other related equipment for diagnostic or maintenance purposes.

The Workstations in the Equipment Room shall be of similar design to their equivalents in the Control Centre but their users shall require a greater level of more detailed access. Such access shall be governed by password and user group membership.

The Equipment Room workstations shall comprise:

- Display, mouse and keyboard for interaction with the Tram Position and Detection System and Passenger Information Display sub-system, the Operational Radio System and the UTC sub-system, the latter via the Tram Position, Route Setting and Detection System;
- Touch screen interface to the Telephone Network, Public Address system, and Passenger Help/Passenger Emergency Help Point systems;
- Touch screen interface to the Operational Radio System;
- Displays and console for the selection and monitoring of Closed Circuit Television images from remotely located cameras;
- Display, mouse and keyboard for interaction with the Supervisory Control and Data Acquisition System; and
- Human computer interfaces for the purpose of archiving and retrieving logged data.

Each maintainer's position shall have two-off Local Area Network connections per Local Area Network and these shall be accessible through recessed sockets.

Each maintainer's position shall have a Telephone Network handset.

35.14.16 Equipment Room Local Area Network Requirements

Each of the maintainer's workstation computers situated within the Equipment Room shall be connected to a Local Area Network.

The Local Area Network cabling standard shall be category 5/5e or higher.

Each Equipment Room maintainer's positions shall have two Local Area Network connections that shall be accessible through recessed sockets.

The Equipment Room Local Area Network shall accommodate the connection of further terminals for the requirements of future Edinburgh tram Network expansion.

35.14.17 Other Systems

A repeat of the 'System Overview' display that is located in the Control Centre staff shall be made available on the Operator's Local area network, updated at least every 5 seconds. This is to enable **tie** to use this image for purposes such as for onward transmission to the TEL /Lothian Bus information centres and in the depot mess room to assist staff with timing crew changes.

36 Integrated Fare Collection

36.1 Scope

The scope of this Section of these Employer's Requirements is to define the integrated fare collection requirements that are applicable to the Edinburgh Tram Network.

36.2 Procurement

Ticket Vending Machines (TVMs) and Ticket Validators for installation at Tramstops will be 'free issued' by **tie** to the Infraco at the Depot. The Infraco shall be required to provide the necessary foundations, ducting, power supply and communications linkage to the TVM and Ticket Validator locations at the Tramstops. The Infraco shall be responsible for the installation of agreed quantities of TVMs and Ticket Validators at the agreed locations.

36.3 General Technical Specification

The hand held TVM docking stations shall be 'free issued' by **tie** to the Infraco at the Depot and the Infraco shall provide appropriate power and comms interface connections, together with appropriate racking to store and charge.

36.4 Integrated Fare Collection

tie/TEL shall be responsible for the Edinburgh Tram integrated fare collection system which shall provide passengers with tickets and ticket validation on and/or off Trams for multi modal seamless bus and Tram journeys within the confines of the Lothian Bus operational area for ticket sales and throughout the SESTRAN area for validation.

Static Ticket Vending Machines will be provided at Tramstops, and hand held ticket vending machines that can also validate tickets will be carried by an Inspector on board each Tram. The fare collection system shall consist of a number of items of equipment each providing elements of the overall System functionality.

These shall include:

- Ticket Vending Machines providing ticket purchasing facilities – these are to be provided separately to the Infraco by **tie** and 'free issued' for installation by the Infraco;
- Tramstop ticket Validators – these are to be provided separately to the Infraco by **tie** and 'free issued' for installation by the Infraco;

- Docking stations for hand-held ticket issuing and smart-card validation machines and associated support apparatus (including docking stations) – these are to be provided separately to the Infraco by **tie** and 'free issued' to the Infraco. The Infraco shall provide power and communications interface connections to the Depot local area network, together with appropriate racking to store and charge the hand held ticket machines.

The elements of the IFC system shall use the system wide communications backbone that shall be provided by Infraco to provide the wide area connections for data transfer and equipment control.

The Infraco shall provide connections for the Ticket Vending Machines and Ticket Validators to be connected locally to the communications network at Tramstops.

The Infraco shall provide a connection for the ticketing central management system to be connected to the communications network and local area operational network at the depot / operational control centre.

The Infraco shall provide for the ticketing central management system to be connected to the outside world by means of a secure IP address.

36.5 Ticket Vending Machines and Validators

36.5.1 General

There shall be a minimum of two TVMs per Tramstop. Exact numbers of TVMs and Ticket Validators are to be agreed for each Tramstop.

The Infraco shall include in the design of the Tramstops suitable foundations for the TVMs and the Ticket Validators and provide 230 volt ac power and communications links to the units as appropriate.

36.5.2 Docking Stations for Hand-Held Ticket Machines

Docking stations and chargers shall be 'free issued' by **tie** to the Infraco. The Infraco shall provide power and communications interface connections to the depot local area network, together with appropriate racking to store and charge the hand held ticket machines. These will be connected to the Central Management System.

Table 86 - Hand Held Ticket Machine Quantities

Equipment	Quantity	Comments
Docking Stations	*35*	As determined in the design and implementation phases

36.5.3 Equipment Interfaces

The following equipment interfaces are required to be provided by the Infraco:

Table 87 - System Interfaces

Interface	Interface with Discipline	Interface Definition	Interface Management
Central Management System	System wide	Integrated Fare Collection	Individual sub systems
Ticket Vending Machine	Tramstop / Buildings	Integration Fare Collection	Buildings
Ticket Vending Machine	Supervisory, Control and Communications System	Integrated Fare Collection	Supervisory, Control and Communications System
Smart Card Validators	Tramstop / Buildings	Integration Fare Collection	Buildings
Smart Card Validators	Supervisory, Control and Communications System	Integrated Fare Collection	Supervisory, Control and Communications System
Hand Held Ticket Machines	Central Internal Financial Control system and SC&C	Integrated Fare Collection	Integrated Fare Collection

The interfaces identified above will be further developed by the Infraco to include details of programme requirements for interface resolution. The detailed interfaces and management thereof will be carried out according to the system integration process for the Edinburgh Tram Network.

37 System Integration

37.1 Introduction

A tramway has many constituent parts and therefore integration is a crucial factor when designing, implementing and operating a successful tramway.

tie shall be provided by the Infraco with a totally integrated Edinburgh Tram Network with all systems, subsystems and interfaces working efficiently and harmoniously together as one and able to be operated and maintained in full compliance with the requirements of the Edinburgh Tram Network and appropriate Consents. To achieve this, the Infraco shall be responsible for successfully undertaking comprehensive co-ordination and system integration roles within the Infraco Works. The system integration responsibility shall exist throughout all phases of the Infraco Works.

This Section of the Employer's Requirements outlines these responsibilities and provides details of the extent of co-ordination and system integration.

37.2 Definitions

System Integration shall include the collation, identification, recording and management of all elements of the Infraco Works, including but not limited to, the project management, design, procurement, manufacturing, factory testing, delivery, offloading, erection, construction, equipping, testing, commissioning, system acceptance testing, shadow running, operation and maintenance of the ETN.

Such integration shall include both the 'hard' integration elements in terms of system and sub-system functionality etc and 'soft' integration elements associated with approvals and Consents, people interfaces, plans, processes and procedures, and land/property agreements.

Also included shall be the production and delivery of all associated documentation (training and maintenance manuals and "As Built" documentation), all spare parts and special tools etc to allow the safe and efficient fulfilment of all operation and maintenance obligations, including dependability criteria, for the projected life time of the Edinburgh Tram Network.

System interfaces shall mean where two or more main elements or subsystems meet or interact or are intended to meet or interact in a manner which is necessary for the expedient and necessary progress of the Infraco Works and the safe and efficient operation and maintenance of the Edinburgh Tram Network.

37.3 Principle

System Integration is a fundamental project requirement and shall include the efficient and effective leadership of the system engineering and associated processes, coordination of the processes for the design, implementation and bringing the Edinburgh Tram Network into public service, complete technical direction and configuration management of the existing system design and system and subsystem interfaces to facilitate the Infraco Works.

37.4 Inter-contract Integration, Integration of third party and free issue equipment

The Infraco shall be responsible for managing all activities required to ensure that the Edinburgh Tram Network is successfully integrated with the equipment and subsystems being provided by the Infraco Parties and others. This over-arching integration role shall include as a minimum the following activities:

- undertaking a design co-ordination system and subsystem development function between contracts;
- lead in the system integration of the ticketing machines, ticket validators and bus passenger information displays;
- lead in the system integration of the subsystems and equipment being provided under the ETN project together with, systems and equipment, such as the "free issue components" or as indicated by **tie**;
- provision of an integrated testing and commissioning plan; and
- implementation of an integrated testing and commissioning programme.

37.5 Formal Roles to be undertaken by the Infraco

37.5.1 System Design Authority

The Infraco shall be responsible for the management of the design and interface processes in respect of systems and equipment being provided under or supplied pursuant to this Agreement. The system design authority role shall be deemed to include leadership of the System engineering process, co-ordination of the design process, configuration management of the System design, System and subsystem interfaces and all associated documentation including general technical direction.

37.5.2 System Integrator

The Infraco shall perform the system integrator role with the aim of meeting the objectives of system integration as set out in this Section. This responsibility shall exist in all phases of the contract from initial requirements analysis, final sign-off of the ETN for operational use and during maintenance.

The Infraco shall be responsible for the practicalities of how the role of system integrator shall be executed, however as a minimum the role is deemed to include the management of the following activities:

- Systems assurance;
- Electromagnetic compatibility including stray current;
- Electromagnetic interference and any associated immunisation of Network Rail signalling systems or assets;
- Environmental issues – noise and vibration;
- System acceptance inclusive of testing and commissioning and training;
- Inter-contract integration;
- Third party issues and consents;
- System safety; and
- Verification and validation.

The Infraco shall:

- Produce a comprehensive system integration management plan, to be implemented and regularly updated by the Infraco throughout the duration of the Infraco Works. Such a plan shall form a fundamental part of the Infraco's overall operational & maintenance plan and design & implementation plan.
- Establish and document appropriate arrangements for the identification, management and monitoring of system integration at the scheme, system, and sub-system levels;

- Provide demonstrable assurance throughout the technical development, procurement and implementation of the ETN that the system and sub-systems form an integrated whole (both in terms of physical, functional and organisational fit, and the operation performance and dependability)

- Identify and integrate the System and all systems as defined in these Employer's Requirements. and equipment being provided under for the ETN project together with, subsystems and equipment provided by others as detailed in 37.4.

- Maintain the integrity of the scheme configuration; and

- Provide and demonstrate compliance and traceability between the scheme requirements and the design and implemented solution and evidence to support the phased and final cases for safety.

All Deliverables shall be:

- submitted in soft copy as required by **tie**;

- Produced in accordance with the ISO 9000 series and in a format approved by **tie**;

- Clearly written, without jargon, with terminology defined; figures, data, calculations and information used shall be clearly traceable and justified; all assumptions shall be stated and justified; and

- Be updated as necessary throughout the Term or as requested by **tie**.

38 Location Specific Requirements

The requirements set out in this section of the Employer's Requirements are mostly applied either system wide or common to particular elements throughout the ETN. The principal exceptions are in relation to the Depot, the Specific Agreements made during the Parliamentary process and the Third Party Agreements as detailed in Schedule 13 (Third Party Agreements). Specific requirements have been identified through the design process. These have been developed by the SDS Provider through the design process over the past years, in particular the following processes:

- The SDS design process, preliminary and detailed (still ongoing) including (in no specific order and not limited to;
- Initial briefing from **tie** and their designers from the Parliamentary stage on issues within the STAG drawings and that had arisen subsequently, either during or in parallel with the Parliamentary process;
- Consultation with CEC as Promoter/Undertaker, as Planning Authority and with their Transport function, including as Roads Authority;
- Consultation with Stakeholders, including major bodies such as BAA, RBS, New Edinburgh Limited, Network Rail and First Scotrail, Historic Scotland, the World Heritage Trust, Forth Ports, and the emergency services. Note that some of these have Agreements as referred to above, but that further consultation and the passage of time has identified additional, changed and/or more detailed requirements to those set out in the Agreements;
- Consultation with other affected landowners, who may not have specific design requirements built into Agreements, as referred to above;
- Consultation with the Operator and with TEL (including Lothian Buses);
- Consultation with HMRI;
- Consultation with other affected bodies such as SEPA, Scottish Power, and the other Utilities;
- Specific consultation with frontagers;
- Specific consultation with general interest groups, relating to e.g. environmental matters, disability issues and cycling;
- Consultations with those submitting planning applications along the tram route;

- Public consultation.

39 Project Programme

39.1 Introduction

This Section of the Employer's Requirements provides an account of the programme restrictions that will impact on the Programme. The Section also contains details of the format in which programmes should be submitted and how costs should be broken down in the Work Breakdown Sheet.

39.2 Key Dates

- Key dates in respect of the Edinburgh Tram Network and the provision of the works, services and supplies by the Infraco are set out below. The tram depot at Gogar shall be complete and commissioned ready to accept first tram delivery by the end of November 2009.

Delivery into service for Phase 1a and Phase 1b shall bein accordance with the Programme.

In addition to the Programme dates included above, there are further Programme restrictions within which Infraco must work. These are constraint dates which shall not necessarily affect the whole Works but may do so. Infraco shall take due cognisance of these and the Programme dates outlined above. The constraint dates are as listed below:

- Table of overall Programme Constraints;

Constraint	Dates
Embargos	August Embargo – from the first Sunday in August until the first Sunday in September Christmas Embargo – from the Thursday preceding the first Sunday in December until the first working day of the New Year annually
MUDFA	Latest revision of programme as agreed with **tie** through formal progress meetings.
Design	Latest revision of programme as agreed with **tie** through formal progress meetings.
Others	All other Constraints as shown in Schedule 13 – Third Party Agreements, Code of Construction Practice and Network Rail Possessions

Table 88 – Table of overall Programme Constraints

- Further working time restrictions are imposed on the Infraco by the Construction Code of Practice;

- Network Rail potential possession dates..

39.3 Basis for Programme

- Infraco shall base its programme on the project management requirements at 12 of these Employer's Requirements;

- The Work Breakdown Structure (WBS) for building and coding the programme that is to be used to develop the Infraco programme is that used in **tie**'s master programme;

- The P3e Activity Code Dictionary (Mandatory Codes as below); and

39.4 Third Party Agreements

Infraco shall include these constraints and obligations resulting from Schedule 13 – Third Party Agreements. Infraco shall demonstrate to **tie** that these constraints and obligations have been considered and resolved in the programme.

tie acknowledge their supporting role in the delivery of the obligations contained within these Third Party Agreements.

39.5 P3e Activity Code Dictionary (Mandatory Codes)

The following codes shall be used by the Infraco in the preparation and development of their programme. These codes can only be modified with the express permission of **tie**.

Activity Code		Description
Geographical Sections		
01	Section 01	Newhaven Road to Haymarket
02	Section 02	Haymarket Corridor
03	Section 03	Haymarket to Granton Square
04	Section 04	Granton Square to Newhaven Road – (Future Development)
05	Section 05	Roseburn Junction to Gogar
06	Section 06	Gogar Depot
07	Section 07	Gogar to Edinburgh Airport
08	Section 08	Ingliston Park & Ride to Newbridge – (Future Development)
Intermediate Geographical Sections		
01A		Newhaven Road (inclusive) to Foot of the Walk (exclusive)
01B		Foot of the Walk (inclusive) to McDonald Road (exclusive)
01C		McDonald Road (inclusive) to Princes Street West (exclusive)
01D		Princes Street West (inclusive) to Haymarket (exclusive)
02A		Haymarket (inclusive) - Roseburn Junction (inclusive)
03A		Roseburn Junction (exclusive) to Crewe Toll (inclusive)
03B		Crewe Toll (exclusive) to Caroline Park (inclusive)
03C		Caroline Park (exclusive) to Granton (inclusive)
04A		Granton (exclusive) to Lower Granton Road (inclusive) - Future Development
04B		Lower Granton Road (exclusive) to Newhaven Road (exclusive) - Future Development
05A		Roseburn Junction (exclusive) to Balgreen Road (inclusive)
05B		Balgreen Road (exclusive) to Edinburgh Park (inclusive)
05C		Edinburgh Park (exclusive) to Gogarburn (inclusive)
06A		Gogar Depot
07A		Gogarburn (exclusive) to Edinburgh Airport (inclusive)
08A		Ingliston Park & Ride to Newbridge North - Future Development

Sub-Section (Tram Stop)

00	Intermediate Section Wide
01	Depot
02	Depot Stop (exclusive) - Gogarburn (inclusive)
03	Gyle (exclusive) - Depot Stop (inclusive)
04	Gogarburn (exclusive) to Ingliston Park & Ride (inclusive)
05	Ingliston Park & Ride (exclusive) to Edinburgh Airport (inclusive)
06	Edinburgh Park Central (exclusive) - Gyle (inclusive)
07	Edinburgh Park Station (exclusive) - Edinburgh Park Central (inclusive)
08	Bankhead (exclusive) - Edinburgh Park Station (inclusive)
09	Saughton Road North (exclusive) - Bankhead (inclusive)
10	Balgreen Road (exclusive) - Saughton Road North (inclusive)
11	Murrayfield Stadium (exclusive) - Balgreen Road (inclusive)
12	Roseburn Junction (exclusive) to Murrayfield Stadium (inclusive)
13	Haymarket (inclusive) - Roseburn Junction (inclusive)
14	Shandwick Place (inclusive) - Haymarket (exclusive)
15	Princes Street West (inclusive) - Shandwick Place (exclusive)
16	St. Andrew's Square (exclusive) - Princes Street West (exclusive)
17	Picardy Place (inclusive) - St. Andrew's Square (exclusive)
18	McDonald Road (inclusive) - Picardy Place (exclusive)
19	Balfour Street (inclusive) - McDonald Road (exclusive)
20	Foot of the Walk (inclusive) - Balfour Street (exclusive)
21	Bernard Street (inclusive) - Foot of the Walk (exclusive)
22	Port of Leith (inclusive) - Bernard Street (exclusive)
23	Ocean Terminal (inclusive) – Port of Leith (exclusive)
24	Newhaven Road (inclusive) - Ocean Terminal (exclusive)
25	Roseburn Junction (exclusive) to Roseburn (inclusive)
26	Roseburn (exclusive) - Ravelston Dykes (inclusive)
27	Ravelston Dykes (exclusive) - Craigleith (inclusive)
28	Craigleith (exclusive) - Telford Road (inclusive)
29	Telford Road (exclusive) - Crewe Toll (inclusive)
30	Crewe Toll (exclusive) - West Pilton (inclusive)
31	West Pilton (exclusive) - Caroline Park (inclusive)
32	Caroline Park (exclusive) - Saltire Square (inclusive)
33	Saltire Square (exclusive) - Granton Square (inclusive)
34	St. Andrew's Square

Discipline Codes

ACCB	Accommodation and Boundary Works
APPR	Approvals
APPP	Prior Approvals – Detail Design
APPT	Technical Approvals – Detail Design
ARCH	Architecture
AUXI	Auxilliary Power
BLDS	Buildings
BRDG	Bridges
CECS	CEC Services
CHAR	Charette Changes
COMM	Commissioning
DASB	Design – As Builts
DEMO	Demolition
DEPO	Depot
DRAN	Drainage
EART	Earthworks / Embankments
ELEC	Electricity
ENVI	Environmental
GASS	Gas
GEOT	Geotechnical
HIGH	Highways
HMRI	Railway Inspectorate
JNCS	Junctions
LAND	Landscaping
LIGH	Lighting
MANA	Management
MECH	Mechanical
MILE	Milestones
MISC	Miscellaneous
MODL	Modelling
MULT	Multi-Discipline
NETR	Network Rail
OHLE	OHLE
OTHW	Other Works
PLAT	Platforms
POWR	Power (Traction)
ROAD	Roads / Paths / External Works

SEWR	Sewerage
SIGN	Signalling
STAK	Stakeholder
STRL	Street Lighting
STRU	Structures / Retaining Structures
SUBM	Submissions
SUBS	Sub-Stations
SURV	Surveys
SYSC	Systems Communications
SYSE	Systems Engineering
TELC	Telecoms (Including Data)
TRAM	Tram Vehicles
TRCK	Track
TRMS	Tram Stops
TROS	Traffic Order
TTRO	Temporary Traffic Order
TUNN	Underpasses / Tunnels
UTIL	Utilities
WATR	Water Supply

Phase Codes

D	DEVELOPMENT (Management)
L	LAND & PROPERTY (Management)
J	JRC (Management)
S	SDS DESIGN
ID	INFRACO DESIGN
M	MUDFA (Utilities - Construction)
A	ADVANCED WORKS (Construction)
I	INFRACO (Construction)
T	TRAMCO (Construction)
W	SYSTEM WIDE As Built Design
P	PROJECT WIDE

Scope Type Codes

O	Original Scope
A	Approved Change to Original Scope
U	Unapproved Change to Original Scope

Line Codes

00	Common
1a	Phase 1a - Airport to Newhaven Road
1b	Phase 1b - Roseburn Junction to Granton Square
02	Phase 02 - Granton Square to Newhaven Road
03	Phase 03 - Ingliston Park & Ride to Newbridge North - Future Development

40 Maintenance

40.1 Scope

The scope of this section is to define the maintenance requirements with which the Infraco must comply.

It is anticipated that the Edinburgh Tram Network will have been delivered, tested and commissioned and taken into operation in accordance with the other parts of these Employers Requirements.

The maintenance scope is to maintain the delivered Edinburgh Tram Network functionality for the Term according to this Section of the Employer's Requirements and the Agreement.

40.1.1 General

The Infraco maintenance responsibilities during the Term are detailed here and apply to both the Edinburgh Tram Network infrastructure and Trams. This section also details the Infraco's obligation to develop a maintenance strategy and plan for the Edinburgh Tram Network as a whole, for delivering a maintenance service. The strategy and plan shall include planned inspections and interventions, lifecycle replacement and response to unplanned equipment failures and damage for whatever reason. For the avoidance of doubt, in accordance with the Infraco Agreement, repair of damage due to accidents, vandalism, graffiti, theft, derailments, external influences, force majeure, and repair of damages due to improper handling or operation of the system, where this is not the responsibility of Infraco, entitles Infraco to payment for additional labour and material required in accordance with the Schedule of Agreed Prices.

In response to these requirements the Infraco shall develop a maintenance strategy to support and enable the Edinburgh Tram Network to maintain the performance standards, and a Maintenance Plan for all Infrastructure and Tram systems and elements under their responsibility, that make up the Edinburgh Tram Network. The Maintenance Plan shall be submitted to **tie** and reviewed and agreed in accordance with the Review Procedure.

The Infraco's performance in delivering effective maintenance will be measured, monitored and managed through a combination of the key performance indicators and availability criteria, and assessed by **tie** through a series of qualitative tests in accordance with the Agreement.

40.1.2 Overall Objectives

The main objective of the Edinburgh Tram Network is to provide a safe, reliable, punctual, clean, easily accessible, comfortable and environmentally friendly transport service.

The Maintenance Plan shall form part of the Infraco integrated management system. This shall also include the following objectives, procedures and processes:

- The Parties shall co-operate to achieve the aims under the Agreement;
- The Infraco shall demonstrate how it will meet the Employer's specific requirements under the Infraco Agreement, particularly the requirements for the availability of the ETN and defined sub-systems;
- The Infraco shall manage all their Infraco Parties to ensure they fulfil the requirements of their contracts;
- The Infraco shall ensure that the activities of all Infraco Parties do not compromise the operations, safety and life expectancy of the ETN;
- The Infraco shall set up and adhere to schedules and programmes for all planned work, including adherence to the relevant Operations & Maintenance Specifications and Manuals provided by Infraco;
- The Infraco shall in discharging its obligations minimise any downtime on the system for the Operator;
- The Infraco shall co-operate with **tie** and interfacing parties including the Operator, CEC, Network Rail shall co-operate and, in particular, shall support any obligations they respectively have under their safety management system;
- The Infraco shall be aware of, and be compliant with Law and standards governing operation and maintenance of tram network infrastructure, systems, equipment, and any changes thereto; and
- The Infraco shall establish and maintain lines of communication with all interfacing and affected parties by means of scheduled meetings, consultation, notices, and when required by tie publicity, in regard to maintenance works.

Each year the Infraco shall plan and undertake programmes to review and improve the levels of system availability, safety, performance, and delivery of the infrastructure and trams. The Infraco shall develop a performance improvement plan which shall be developed in conjunction with the Operator and shall be included in future issues of the infrastructure maintenance plan. Infraco shall update the Maintenance Plan in the light of operational experience and resubmit for approval in accordance with the Review Procedure in Schedule 14 of the Agreement.

The Infraco performance payment regime set out in Schedule 7 of the Agreement shall provide a financial incentive for Infraco to provide reliable systems and assets for operation and to undertake effective maintenance of the Edinburgh Tram Network.

40.2 Infrastructure Maintenance Requirements

40.2.1 Purpose

This Infrastructure Maintenance Requirements section identifies the output specification that the Infraco shall meet. This includes delivering planned preventative (cyclical), life cycle and corrective maintenance to the infrastructure of the Edinburgh Tram Network and all relevant plant and equipment for which Infraco is responsible. The Infrastructure Maintenance Plan, which shall be developed by Infraco in response to these Requirements, shall specify objective plans and specifications for maintenance from the pre-operational period and over the Term and shall contain a strategy complying with 40.2.4 of this Section. These Employer's Requirements may be reviewed as necessary during the operational period by agreement with **tie**. The Infrastructure Maintenance Requirements shall be read in conjunction with the other sections of these Employer's Requirements and with such 'as-built' technical documentation, design standards and Operation & Maintenance standards and manuals as are developed by the Infraco.

The Infrastructure Maintenance Plan shall be a fully controlled issue document. Updates shall be shown as a draft version until these are agreed by **tie**. It shall take into account all statutory, regulatory and contractual requirements in force at the time of issue.

40.2.2 Scope

The Infrastructure Maintenance Plan shall cover all maintenance activities, including but not exclusively, the response to unplanned equipment failures and damage for whatever reason, to the infrastructure, plant and equipment that make up the Edinburgh Tram Network. The following responsibilities matrix identifies the general scope for which the Infraco is responsible. The Infraco responsibility for Depot Plant and Equipment maintenance is identified in Table 83 - Depot Plant and Equipment to be Provided.

The Infraco detailed responsibilities in respect of road related obligations are contained in table 90 – Roads, structures in table 92 – Structures (as carried out by the Infraco or others) and landscaping (trees and vegetation).

Table 89 – Infrastructure and Equipment Responsibilities Allocation Matrix

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Tram Stop Structure																
Platform surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Platform Inclined Approach		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Canopy		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Inside surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Internal Roof surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External Roof surfaces		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Integral Lighting		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Internal seating		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Tram Stop Furnishings																
Stop Name Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Static Information Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Guard Rails/Barriers (as applicable)		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Lighting Columns		N/A	N/A	N/A	✗	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✓
Lighting Lanterns		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Litter Bins		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
External seating		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Platform Edge White Line		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Advertising Signage		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Stop Equipment																
CCTV Cameras		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Public Address Loudspeakers		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Hearing Loops		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Passenger Information Displays		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Passenger Alarm/Help points		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Ticket Vending Machines (maintained & serviced by TEL)		N/A	N/A	N/A	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✓
Drainage (Interface defined in Table 93)		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Trackside Equipments																
Stop Equipment Cabinets		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Stop Equipment Cabinet Equipment		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Traction Isolator Cabinets		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Traction Isolator Cabinet Equipment		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Point Control Cabinets		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Point Control Cabinet Equipment		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Point Heater Cabinets, Point Heaters & Controls		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Road Junction Cabinets		N/A	N/A	N/A	✘	✘	✔	✘	✘	✘	✘	✘	✘	✘	✔	✘
Road Junction Cabinet Equipment		N/A	N/A	N/A	✘	✘	✔	✘	✘	✘	✘	✘	✘	✘	✔	✘
Point Machines (including Manual Control)		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
OLE Contact Wire & Supports		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
OLE Poles		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
OLE Pole mounted Equipments		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
OLE Wall Fixings		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
OLE Wall fixed Equipment		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Tram Signal Heads (Roadside)		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓
Tram Signal Posts (Trackside)		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Signals Posts		N/A	N/A	N/A	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓
Tram Detector Loops		N/A	N/A	N/A	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Lighting on OLE Masts		N/A	N/A	N/A	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗	✓
Trackside cable ducts		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Trackside cables		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Cable drawpits		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Structures (Bridges, Retaining Walls etc)																
Over Bridges See Table 95 for split		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓
Under bridges See Table 95 for split		N/A	N/A	N/A	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✓
Retaining walls		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Misc Structures		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Swept Path		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Swept Path Markings		N/A	N/A	N/A	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✓
Track																
Trackwork		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Points & Crossings		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Track Drainage		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓
Field' Stray Current Equipments		N/A	N/A	N/A	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✓

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Sub Stations																
Sub Station Buildings		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Sub Station Equipments		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Sub Station Compounds		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Sub Station Parking Facilities		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Stray Current Monitoring Points		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Stray Current Equipments		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Earthing Equipments		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Trams																
Free issue' tram mounted equipments		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Trams		N/A	N/A	N/A	✘	✘	✘	✔	✘	✔	✘	✘	✘	✘	✘	✔
Tram saloon & Drivers cabs		N/A	N/A	N/A	✘	✘	✘	✔	✘	✔	✘	✘	✘	✘	✘	✔
Radio																
Portable radios		N/A	N/A	N/A	✘	✘	✘	✔	✔	✘	✘	✘	✘	✘	✘	✔
Radio Base stations		N/A	N/A	N/A	✔	✘	✘	✘	✔	✘	✘	✘	✘	✘	✘	✔
Landscaping																
Soft landscaping		N/A	N/A	N/A	✘	✘	✘	✔	✔	✘	✘	✘	✘	✘	✘	✔
Hard Landscaping		N/A	N/A	N/A	✘	✘	✘	✔	✔	✘	✘	✘	✘	✘	✘	✔

Floor	Room No.	Description	User Competence Assessor	Used by			Cleaned by			Maintained by			Access Controlled by		
				Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	Transdev
Stores, Workshops and Maintenance Area															
Ground Floor Level		Stores Office Centrally located	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗
		Heavy Store (Infraco)		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Heavy store (Tramco)		✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Visitors Entrance Hall	n.a	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓
		Workshop Cleaners Room	n.a	✓	✓	✗	✗	✓	✗	✓	✗	✗	✓	✓	✗
		Light Store (Infraco)		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Light Store (Tramco)		✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Infrastructure Workshop		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Dirty Workshop / Machine Shop		✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Clean Workshop (Infraco)		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Clean workshop (Tramco)		✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Lobby	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Male Toilets	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Male Showers	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Female Toilets	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Female Showers	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Staff Corridor	n.a	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✗
		Infrastructure Admin	n.a	✓	✗	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Maintenance (Tramco) Admin	n.a	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗
		First Aid	n.a	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓
		Switchroom		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Infrastructure Manager	n.a	✓	✗	✗	✗	✗	✓	✓	✗	✗	✓	✗	✗
		Maintenance (Tramco) Manager	n.a	✗	✓	✗	✗	✗	✓	✓	✗	✗	✗	✓	✗
		Store Room (Cleaners?)	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗
		Staff Entrance Hall	n.a	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓
		Drying Room	n.a	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗
		Tram Batteries		✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Equipment Room		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		UPS Room		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Compressor Room - Air tools		✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
		Tram Maintenance Area		✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Maintenance Area Transit Zone		✓	✓	✓	✗	✓	✗	✓	✗	✗	✗	✓	✗
		Inspection Pits		✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗
First Floor office accommodation			n.a	✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓
Furnishings - Used, Cleaned, Maintained and Controlled as appropriate															
Chairs, Desks, Tables, Filing cabinets etc			As Appropriate	✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
Kitchen and Catering Equipment				✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
Reception Desk & Furnishings				✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
Control Room Furnishings				✗	✗	✓	✗	✗	✓	✓	✗	✓	✗	✗	✓
Lockers, Coat Rails etc				✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
Training Room furnishings (Projector, Screen etc)				✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
External															
Depot Yard				✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓
Depot Stabling Area				✗	✗	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓
Electrical Sub Station				✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Power Energy Building (Electric, Gas etc)				✓	✗	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗
Depot Car Park				✗	✗	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓

Description	User Competence Assessor	Used by			Cleaned by				Maintained by				Access Controlled by			
		Infraco	Tram Maintainer	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev	Infraco	Tram Maintainer	CEC	Transdev
Miscellaneous																
Communication & Control links		N/A	N/A	N/A	✗	✗	✗	✗	✔	✗	✗	✗	✗	✗	✗	✔

LEGEND	
	Provided by Tram Maintainer
	Provided by the Infraco
✔	Responsible
✗	Not Responsible

Table 90 – Roads

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
Defects reporting CLARENCE, walking surveys, etc	Rail and rail containment	Infraco			Sharing of information between CEC & Infraco call centres. All part of the routine 28 day inspection, work arising dealt with below
	Tram Stops	Infraco			
	Overhead Line Equipment	Infraco			
	Tram duct access chambers	Infraco			
	Tram vehicle detection loops	Infraco	-	-	
	Non-tram vehicle detection loops	CEC	1 working hour		
	Temporary tram signs	CEC	28 days	-	
	Coloured/textured surfacing for tram	CEC	28 days	-	
	All other road related defects	CEC	28 days	-	
Defect repairs	Rail and rail containment	Infraco			
	Tram Stops	Infraco			
	Overhead Line Equipment	Infraco			
	Tram duct access chambers	Infraco			
	Tram vehicle detection loops	Infraco			
	Temporary tram signs	Infraco			
	Coloured/textured surfacing for tram	CEC		3 months	Resurfacing only to be undertaken when it is agreed that it is required.
	All other road related defects	CEC	-	Emergency* (7 days) Non Emergency (3 months)	* Likely to result in injury (CEC liability, conscious decision by CEC on timescale)
Signals	Tram detection loops and cable to the UTC controller	Infraco		1hr	
	Traffic and tram signal equipment	CEC		4hrs	24 hr response already contracted by CEC.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	Traffic detection	CEC		4hrs	
	CEC Traffic Control Centre	CEC		5mins	Telephone contact with CEC Control Centre except when this is unmanned when Tram control will be able to make a junction call themselves.
Lighting	On OLE poles	Infraco		* 2hr	Response required when 6 or more adjacent lights fail.
	Platforms	Infraco		* 1hr	Response required when 2 or more adjacent lights fail.
	Street Lighting	CEC		* 2hr	Response required when 6 or more adjacent lights fail.
	All other illuminated road signs and bollards	CEC		28 days	
Winter Maintenance	Roads	CEC		* 2hrs	
	Cycleways/footways	CEC		* 2hrs	
	Platforms on-street	CEC		* 2hrs	
	Platforms off-street	Infraco		* 2hrs	
Removal of obstructions	On road/footway including non-segregated tramway path, platforms and platform ramps	CEC		* 1hr	May involve Lothian and Borders Police
	On tramway (segregated sections)	CEC		*1hr	
	On platform (segregated sections)	CEC		*1hr	
CCTV	For roads	CEC		28 days	
	For tram	Infraco		2 days	

Table 91 – Roseburn Corridor

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
Defects reporting CLARENCE, walking surveys, etc	Cycleway/footway	CEC	28 days		
	Retaining walls	CEC	28 days		
	Lighting	CEC	28 days		
	Embankment/cutting and its vegetation	CEC	28 days		
	Kick-rail	Infraco			Demarcation between areas
	Fencing – between cycleway/footway and	Infraco			
	tramway - all other fencing	CEC			
	Noise Barriers	Infraco			If required and do not form a part of the perimeter fencing.
	Grass track	Infraco			
	Drainage	Infraco			
	Tram Stops	Infraco			
	Overhead Line Equipment	Infraco			
	Tram duct access chambers	Infraco			
	Tram vehicle detection loops	Infraco			
	Temporary tram signs	Infraco			
	Coloured/textured surfacing for tram	Infraco			
Defect repairs	Cycleway/footway	CEC		Emergency* (7 days) Non Emergency (3 months)	
	Retaining walls	CEC			
	Lighting	CEC			

	Embankment/cutting and its vegetation	CEC			
	Kick-rail	Infraco			
	Fencing	Infraco			
	Noise Barriers	Infraco			
	Grass track	Infraco			
	Drainage	Infraco			
	Tram Stops	Infraco			
	Overhead Line Equipment	Infraco			
	Tram duct access chambers	Infraco			
	Tram vehicle detection loops	Infraco			
	Temporary tram signs	Infraco			
	Coloured/textured surfacing for tram	Infraco			
Winter Maintenance	Cycleways/footways	CEC		* 2hrs	
	Platforms	Infraco		* 2hrs	
Removal of obstructions	On cycleway/footway	CEC		* 1hr	May involve Lothian and Borders Police
	On tramway and platform	Infraco		* 1hr	
CCTV	At Tramstops	Infraco		2 days	

Table 92 – Structures

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
Structures	S01 Roseburn Terrace Bridge Existing structure to carry trams and cycles	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance (see Definitions below). Existing deck to be removed by the Infraco and fascia to be incorporated within new structure. The existing abutments will be retained to support the embankments but will not support the new bridge deck. Inspection report available. No major defects noted that would present a future maintenance liability.
	S02 Coltbridge Viaduct Existing structure to carry trams and cycleway	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) and assessed. The existing structure will carry the proposed tramway with a new steel walkway attached to the western elevation. Any defects noted during the inspection will be rectified by the Infraco during the construction of the walkway and new deck slab.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S03 St George School Access Bridge Existing road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance (if CEC own it). Infraco will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides vehicular access over the proposed tramway.
	S04 St George School footbridge Existing footbridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance (if CEC own it). CEC to be responsible for polycarbonate sheets. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides pedestrian access over the proposed tramway.
	S05 Ravelston Dykes Bridge Existing bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. TEL will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides vehicular access over the proposed tramway.
	S06 Craigleith Drive Bridge Existing bridge to carry trams and cycles	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. The structure have been inspected (report is available) and assessed. The structure has capacity to carry the proposed tramway. No major defects were noted.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S07 Holiday Inn Access Bridge Existing road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides vehicular access over the proposed tramway.
	S08 Queensferry Road Bridge Existing road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides vehicular access over the proposed tramway.
	S09 Groathill road South Bridge Existing bridge to carry trams	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. The structure have been inspected (report is available) and assessed. The structure has capacity to carry the proposed tramway. No major defects were noted.
	S10 Telford Road Bridge Existing road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. Existing structure has been inspected (inspection report available) but no assessment has been undertaken as the structure provides vehicular access over the proposed tramway.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S11 Drylaw Drive Bridge Existing bridge to be demolished				Structure to be demolished by the Infraco.
	S12 Crewe Road Gardens Bridge Existing road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. Structure to be extended by the Infraco over the proposed tramway. No inspection or assessment has been undertaken. A full set of construction drawings for the structure were provided.
	S16 Victoria dock Entrance Bridge Existing bridge carrying to carry trams and general traffic	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. An inspection of the structure was undertaken (inspection report is available), however, no assessment has been undertaken to date.
	S17 Tower Place Bridge Existing bridge carrying to carry trams and general traffic	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance. An inspection of the structure was undertaken (inspection report is available), however, no assessment has been undertaken to date.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S18 Leith Walkway Railway Bridge Existing	Network Rail			The structure has been inspected and assessed (reports are available). The structure has capacity to carry the proposed tramway. The major defected noted during the inspection, leaking water main, has now been rectified. However, the next routine inspection should confirm that no adverse affects have occurred to the substructures.
	S19 Haymarket Station Viaduct New	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.
	S20 Russell Road Bridge New	Infraco			Infraco to be responsible for all maintenance.
	S21A Roseburn Street Bridge New	Infraco			Infraco to be responsible for all maintenance.
	S21B Murrayfield Stadium Retaining Wall New	Infraco			Infraco to be responsible for all maintenance.
	S21C Murrayfield Stadium Underpass New	Infraco			Infraco to be responsible for all maintenance.
	S21D Murrayfield Training Pitches R/W New	Infraco			Infraco to be responsible for all maintenance.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S21E Water of Leith Bridge New	Infraco			Infraco to be responsible for all maintenance.
	S22 Balgreen Road Bridge New	Infraco			Infraco to be responsible for all maintenance.
	S23 Carrick Knowe U/B New bridge carrying trams and cycles	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.
	S24 Saughton Road Bridge Existing WEBS bridge	Infraco			Infraco to be responsible for all maintenance. This structure was constructed as part of the WEBS project. Full construction drawings were supplied to ensure that the structure is integrated into the tram system without any modification. An assessment report confirming this is available.
	S25 Broomhouse Road Bridge Existing WEBS bridge	Infraco			Infraco to be responsible for all maintenance. This structure was constructed as part of the WEBS project. Full construction drawings were supplied to ensure that the structure is integrated into the tram system without any modification. An assessment report confirming this is available.
	S26 South Gyle Access Bridge New tram only bridge	Infraco			Infraco to be responsible for all maintenance.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	S27 Edinburgh Park Station Bridge New tram only bridge	Infraco			Infraco to be responsible for all maintenance.
	S28 A8 Underpass New	Infraco			Infraco to be responsible for all maintenance.
	S29 Gogar Burn Bridge New	Infraco			Infraco to be responsible for all maintenance.
	S30-31-34 Gogar Culverts New	Infraco			Infraco to be responsible for all maintenance.
	S32 Depot Access Bridge New road bridge over tram	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.
	S33 No longer required				
	W01 Lindsay Road Retaining Wall New	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.
	W02 Ferry Road Retaining Wall New	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.
	W03-04 Russell Road Retaining walls 1&2 New	Infraco			Infraco to be responsible for all maintenance.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	W08 Baird Drive Retaining wall New	Infraco			Infraco to be responsible for all maintenance.
	W09 Balgreen Road Retaining wall 1 New	Infraco			Infraco to be responsible for all maintenance.
	W11 Bankhead Drive Retaining. Wall New	Infraco			Infraco to be responsible for all maintenance.
	W14 & W15 Gogar Burn Retaining Walls New	Infraco			Infraco to be responsible for all maintenance.
	W16 A8 Retaining Wall New	Infraco			Infraco to be responsible for all maintenance.
	W17 Depot Internal Retaining Walls New	Infraco			Infraco to be responsible for all maintenance.
	W18 Murrayfield Tramstop Retaining Wall New	Infraco			Infraco to be responsible for all maintenance.
	W19 Gyle Stop Retaining Wall New	Infraco			Infraco to be responsible for all maintenance.

Task or Activity	Sub-heading	Maintenance Works to be undertaken by:	Frequency	Minimum Response Time	Comments
	W100 Roseburn Corridor Retaining. Structures New	CEC			CEC to be responsible for the ongoing structural maintenance. Infraco will be responsible for day-to-day maintenance.

Clarification of terms used in Tables 89 to 92 inclusive of the Employers Requirements.

Tram Stop:
Shall comprise: shelters, lighting, passenger information, platform and ramps including the paving, kerbing/cope and soft landscaping, drainage, cleansing and waste removal, seats, cycle racks (where these are directly associated with the tramstop, ticket machines and waste bins).

Rail and Rail Containment

Shall comprise: the rail and rail drainage (up to the point where this ties in to existing road drainage), and the structural elements that contain its permanent placement, and any associated road repairs where these are a consequence of the tramway maintenance. In the case of Roseburn Corridor it shall also include the grass track, up to and including the kick-rail and fencing separating the tramway from the cycleway/footpath.

Overhead Line Equipment

Shall comprise: the pole, the overhead power line and any necessary equipment to allow the permanent placement of the overhead power line.

Tram duct access chambers

Shall comprise: chamber/manholes and permanent covers to access points to the tram related duct access points along the route.

Temporary tram signs

Shall comprise: traffic signs, including temporary speed restriction signs, which are erected from time to time for limited periods over and above permanent tram signs.

Coloured/textured surfacing for tram

Shall comprise: specialist coloured and textured surfacing, including skid-resistant and edge demarcation surfacing, which is laid specifically for hazards directly associated with the tram track over and above that required for general traffic.

Grass Track

Shall comprise: the rail and rail drainage and the structural elements that contain its permanent placement, and any associated repairs, all within the boundaries defined by kick-rails and/or fence/retaining walls.

Structures

"Day-to-day" maintenance of structures will comprise cosmetic treatments including cleaning, the removal of graffiti and localised repairs of paintwork where this is required as a result of graffiti removal.

"Structural maintenance" of any structures will comprise renewal of waterproofing and associated road surfacings; repairs to brickwork, masonry, concrete or steel; repairs to facings and cladding; repair and/or replacement of bearings; repairing 3rd party damage; and any other maintenance activity not mentioned in the "day-to-day" activities above. Where this will require the removal of the rails or its containment is required prior to the structural maintenance then this will be undertaken in all instances by Infraco and reinstated upon completion of the works.

Where activities are the obligation of the Infraco or the Infraco's Sub-contractors, or the Infraco is supporting other parties' roads, structures and Roseburn Corridor obligations, Infraco shall ensure that such obligations are fulfilled, to ensure the safety of the Edinburgh Tram Network is not degraded and that the ability of Infraco, Tram Maintainer, **tie** and the Operator to achieve their objectives is not frustrated.

40.2.3 Maintenance Approach

The approach to maintenance of the Edinburgh Tram Network (**"ETN"**) shall be as follows:

- All day to day maintenance and inspection activities and planned life cycle renewals and refurbishments shall be planned, organised, undertaken and safely handed back to the Operator in an operational condition as required by the Infrastructure Maintenance Plan and the specifications (against which the ETN is built) and procedures;

- All activities carried out under the scope of the Infrastructure Maintenance Plan shall be the responsibility of the Infraco manager responsible for the maintenance obligations;

- All day to day maintenance, inspection activities and life-cycle replacement works shall be carried out in accordance with agreed procedures and method statements, in the knowledge of, and in liaison with, the Operator;

- Infraco will maintain system interfaces (e.g. Wheel / Rail or Pantograph / OLE), to the best effect for the ETN as a whole.

- Maintenance and life-cycle replacement works shall be classified as planned or unplanned activities arising from condition assessment which has been determined by planned inspection and testing;

- Unplanned maintenance activities shall include rapid response to unplanned equipment failure and damage from whatever cause, and shall be monitored in accordance with the fault rectification times. The approach to each of these categories will be different but there shall be two managers (the Tram Maintainer and the Infraco, with one to be designated as the lead manager) liaising with the Operator's engineering manager, who are responsible for undertaking works in their area of responsibility. These managers shall be able to call upon the services of contractors to carry out all or part of these works.

40.2.4 Maintenance Strategy

Preventative Maintenance

The Infraco shall schedule interventions such that all components that make up the infrastructure shall be subject to checks, repairs and conditioning treatments in order to maximise the asset and component lives, and in advance of critical tolerances being reached which would have affected operation, or have reduced their performance in the service for which they were designed.

Two types of preventative maintenance shall be undertaken:

- Systematic preventative maintenance that follows a predetermined schedule based upon time, usage and data gained through operational and maintenance experience such as:

  - Condition inspection and safety checks; for example, grooves for excessive wear, damage, or debris;

  - Cleaning of equipment and drains;

  - Functional tests to reveal faults; and

  - Adjustments to enable optimum operation.

- Conditional preventive maintenance including carrying out planned inspections to establish if the performance or operation of infrastructure sub systems are within pre-determined measurable parameters such as:

  - Vibration and noise levels ;

- Temperature thresholds in substation transformers etc.;
- Wear limits on rail, and wire height and stagger, etc.;
- Including non-destructive testing as appropriate; and
- Points operation times and geometric limits.

The Infraco shall take the necessary corrective maintenance action arising as a consequence of the conditions where these are out of tolerance.

Reactive and Fault Correction Maintenance

The Infraco shall repair or change damaged or faulty equipment, following the observation of any failures and/or the occurence of incidents. This involves two kinds of intervention:

- Breakdown in service requiring specific intervention shall be limited to re-establishing safe, robust and sound operating conditions. This shall require a specific intervention, to be carried out by Infraco staff within the limits of the equipment and operating rules and procedures agreed with the Operator and **tie**.
- Repairs: this covers interventions that shall be undertaken following incidents or failures that occur in operation, potentially involving a longer stoppage of equipment including overhauls of parts of a sub-system or section of the line. This is an intervention of lasting character, carried out by maintenance staff or contractors. After repair, if equipment has been replaced, then it shall conform to its original specifications or such alternative standards as agreed with **tie**; or in the event that the equipment is reconditioned then it shall conform with allowable tolerances.

Response times for reactive and fault correcting maintenance will be based on the potential impact of the incident or failure. A response to an incident is to be initiated within the time limits specified in Clause 52 of the Agreement. Fault Correction times are detailed in the table on the following page.

Table 93 - Fault Correction Requirements

Fault category	Correction Time Limit Between 06:01-22:00	Correction Time Limit Between 22:01-06:00	Description
1	1 hour to attend and make safe and functional. 2 hours to Breakdown Intervention	2 hours to attend and make safe and functional. Rectified by 07:30	Critical issue such as Health & Safety risk, or failure halting the operation of the tram network in whole or part thereof, failure of major system
2	2 hours	3 hours	Failure impacting the punctuality of the tram network, or having potential to impact.
3	8 hours	9 hours	Failure or incident not having immediate impact on network operation, but impacting the quality of the Transport Services as monitored by the Edqual Service elements in Schedule 7 of this Agreement
4	1 week	1 week	Failure or incident not impacting network operation, nor quality of the Transport Services as monitored by the Edqual Service elements in Schedule 7 of this Agreement
Tramstop lighting Fault	2 days	2 days	
Tramstop telephone Fault	3 days	3 days	
Fault causing the lift at Murrayfield Tramstop or depot to be out of operation	6 hours	6 hours	

Fault category	Correction Time Limit Between 06:01-22:00	Correction Time Limit Between 22:01-06:00	Description
Tramstop electronic passenger information display Fault	2 days	2 days	
Tramstop PA system Fault	24 hours	24 hours	
Tramstop CCTV Fault	2 days	2 days	
Defect, fault or other disrepair that restricts access to all or part of a Tramstop or otherwise interferes with its use	1 day	1 day	
Defect, fault or disrepair causing a trip hazard at an Tramstop (including unintended changes of floor levels or protrusions from the floor of more than 25mm)	24 hours	24 hours	
Defect degrading system access to	6 days	6 days	

Fault category	Correction Time Limit Between 06:01-22:00	Correction Time Limit Between 22:01-06:00	Description
below DDA requirements			
Broken glass at a Tramstop or the depot	2 hours	2 hours to attend, make safe and functional. Rectified by 07:30	
Overflowing / damaged gutter at a Tramstop or the depot	24 hours	24 hours	
Structural defect, fault or other disrepair at a Tramstop or the depot	28 days	28 days	
Any other defect, fault or other disrepair at a Tramstop or the depot (including in relation to shelters, seats, canopies, signage, cycle parking, litter bins and poster cases) but excluding blocked	5 days	5 days	

Fault category	Correction Time Limit Between 06:01-22:00	Correction Time Limit Between 22:01-06:00	Description
drains, overgrown vegetation and fencing faults.			
Blocked drain other than on a street running section of the Edinburgh Tram Network System	24 hours	24 hours	
Blocked drain on a street running section of the Edinburgh Tram Network System	2 hours	By 07:30 if notified between 22:01 and 05:30	
Overgrown vegetation	3 days	3 days	
Defect, fault or disrepair fencing such that access to the track or buildings and equipment is not prevented	6 hours	6 hours	
Defect, fault or disrepair in respect of a Monitoring Point or any other	24 hours	24 hours	

Fault category	Correction Time Limit Between 06:01-22:00	Correction Time Limit Between 22:01-06:00	Description
electronic monitoring equipment			
Structural defect, fault or disrepair other than at a Tramstop or the depot	28 days	28 days	
Any other defect, fault or disrepair other than at a Tramstop or the depot	2 days	2 days	

Note:

The foregoing table concentrates on elements not covered by the punctuality and qualitative criteria of the Performance Monitoring Regime set out in Schedule 6 to the Agreement.

The Infraco shall develop an electronic system for the management of reactive and faulting maintenance. The system shall be based upon the electronic Event Logger which will be situated in the Control Centre and shall enable the accurate analysis, reporting and logging of faults and other reactive maintenance requirements (including cleaning) including the time and date when they were reported and the time and date when they were cleared. Infraco shall manage all faults through to a satisfactory resolution and will provide a full record and audit trail including details of how the resolution was achieved and the time taken to achieve it. The full details of the system to be agreed with **tie** and shall form part of the asset management system as referred to in these Employer's Requirements.

Life Cycle Maintenance

The Infraco shall refurbish and replace elements of infrastructure before its performance deteriorates below the design, stated tolerances or equipment has become obsolete and/or is incurring disproportionately high maintenance costs as assessed by the Infraco and proposed to **tie**.

The initial lifecycle replacement plan will be based upon the manufacturer's stated design life, Infraco's previous experience, and assumptions on the impact of designed use.

Subsequent annual updates will take into account condition and reliability data gathered during the inspection, maintenance and operational use.

Further Maintenance Activities

In respect of the ETN, the Infraco shall in addition to preventive, life cycle and reactive maintenance undertake the:

- Removal of graffiti;
- Repair vandalism and accident damage; and
- Cleaning.

Repair of vandalism and accident damage and removal of graffiti will be undertaken by the Infraco and, where this is not caused by the Infraco or any of the Infraco Parties, the Infraco shall be entitled to payment for additional labour and material required in accordance with the Schedule of Agreed Prices.

40.2.5 Organisation, Training and Competency

Staffing Plan, Recruitment and Training Plan

The description of the Infraco organisation for all aspects of maintenance and all management and administrative support shall be set out in Infraco human resources plans (staffing plan and recruitment and training plan). These documents shall contain all details of:

- Organisational structure;
- Job descriptions and required competencies;
- Standard training courses;
- Compliance with all appropriate Law and regulations;
- and the procedures required to:
  - Recruit staff to fulfil the various employee roles and maintain the required establishment;
  - List the scope of items to be sub-contracted by the Infraco;
  - Monitor the performance and competency of maintenance staff whether direct labour or contractors; and
  - Secure and review the required competencies and associated training courses.

The maintenance documents submitted in draft form with the Infraco Proposals shall subsequently be developed and agreed with **tie** and Operator as part of the Infraco Works. This will include the identification of key staff. These documents shall be reviewed and updated when necessary, and at least annually.

It is to be expected that there will be an element of staff turn-over during the contract period. The Infraco shall include in the plan their process of ensuring quality is maintained and knowledge is managed and maintained. The proposed replacement of any key staff member of Infraco shall be notified to **tie** and to the Operator.

40.2.6 Quality, Health, Safety and Environmental

Health and Safety

For all matters relating to Health and Safety, Infraco shall produce and maintain a Safety Management Plan, which shall comply with the requirements of ISO18001 and be certified by an ISO approved body. The Safety Management Plan shall be reviewed and updated when necessary, and at least annually.

Environmental and Sustainability Management

For all matters relating to environmental and sustainability management Infraco shall produce an Environmental Management Plan. This shall set out the various environmental legal and regulatory requirements that Infraco shall comply with and the Infraco standards, processes and procedures that will enable compliance with such environmental, legal and regulatory requirements, to also meet its obligations under the various agreements to which it is a party, the **tie** Environmental and Sustainability policy and shall in all respects comply to the requirements of ISO 14001 and be certified by an ISO approved body.

The Environmental Management Plan shall be submitted to **tie** prior to completion of Section A on Site, and shall be reviewed and updated when necessary, and at least annually.

Quality

The Infraco HSQE Manager shall be responsible for providing a Quality Management Plan within the Quality Management System which shall comply with the requirements of ISO 9001 and be certified by an ISO approved body. The Quality Management Plan shall be available at least three months in advance of any maintenance activities commencing. The Infraco HSQE Manager shall be responsible for auditing and inspecting the requirements of all Infraco plans, processes and procedures.

The Quality Management Plan shall be submitted to **tie**, and shall be reviewed and updated when necessary, and at least annually.

Safety

The Infraco shall develop, to the satisfaction of **tie**, the Independent Competent Person as defined under the ROGs regulations, HMRI and other Approval Bodies, a generic safety management system for the commissioning and operation of the ETN that complies with the ROGs regulations.

The generic safety management system shall be capable of development to a full and final version prior to commencement of commissioning of the ETN.

The preliminary work on the safety management system will include the production of a safety justification framework document that will indicate the likely format and some of the detail of the eventual Case for Safety that the Operator, Infraco and Tram Maintainer will be required to present to, and gain approval from, the Competent Person as defined under the ROGs Regulations.

The framework document will be drafted in conjunction with the Operator and **tie** and in consultation with the Competent Person, as defined under the ROGs Regulations and other relevant Approval Bodies describing how system safety is achieved through system design supported by system maintenance and system operation. It shall embrace the following subject areas:

- Description of system design, maintenance and operation: Introductory section giving general description of the ETN, identification of safety responsibilities and reporting mechanisms;

- Arrangements during construction and initial access to the lines: organisation and management of working staff, safety, emergency arrangements, identification of staff, insurance, safety audit, arrangements for keeping and distributing records;

- Arrangements for testing and staff training: organisation and management of staff, safety arrangements including staff working on the tramway, emergency arrangements, identification of staff, insurance, fault analysis, safety audit, arrangements for keeping and distributing records;

- Infrastructure management: track, speed limits, public crossings (surface and bridges), fencing, Tramstop infrastructure, monitoring and reporting systems;

- Tram operation arrangements: operating arrangements including fitness and training of staff, certification of staff, tram preparation, defect repair and breakdown procedures and communications;

- Tramstop arrangements: access for contractors, control of access and vandalism and security;

- Tram maintenance arrangements: engineering and operational acceptance of tram vehicles, competence of staff engaged on maintenance, quality assurance, technical audit, monitoring, reporting of defects, procedure for imposing operating restrictions, acceptance of trams for the transport services;

- Infrastructure maintenance: inspection procedures, accreditation, control and monitoring, reporting procedures, emergency arrangements, communications, signage and warnings in the operating environment;

- Interfaces with other organisations: liaison with emergency services, HMRI and Roads authorities;

- Risk assessment: assessment of the risks associated with all aspects of the project operations including groups of people most at risk, severity of failure event and likelihood of event occurring;

- Health and safety policy: policy statement, monitoring arrangements, alcohol and drug policy including testing and disciplinary action; and

- Code of practice for working on or near the line;

- Control of safety critical work.

40.2.7 Liaison with tie and Other Parties on Maintenance Related Issues

Infraco Communications Plan

The Infraco shall create a Communications Plan (which shall be agreed with **tie** as part of the finalisation of the Infrastructure Maintenance Agreement) for all matters related to communications between the Infraco, the Operator, Tram Maintainer, **tie**, TEL, CEC and if required by **tie** other third parties.

A Communications Plan shall be submitted to **tie** prior to commencement on Site, and shall be reviewed and updated when necessary and at least annually.

The Infraco shall establish effective lines of communication with the Operator and **tie**, through the control centre and planning staff in order to plan maintenance activities around tram service requirements. The Infraco shall pay particular attention to communication in respect of the planning and undertaking of works having a direct impact on the operation of the ETN, the return to full service following completion of the maintenance and unplanned maintenance activities or repairs covering day to day operations and tie/third party long-term contractual matters.

The Infraco shall provide details of how effective lines of communication with the Operator and **tie** will be set up and maintained throughout the Term. This will include details of how key staff and expertise will be provided "on call" at all times to the Operator in the event of unforeseen breakdowns etc. Infraco shall after liasing with the Operator propose a process for system / equipment handover after the completion of maintenance activity to be agreed with **tie** and a programme of daily meetings to discuss punctuality performance (and associated deductions) and infrastructure availability.

The Communications Plan shall be aligned with that of the Operator and Tram Maintainer to ensure communication in critical areas, such as health and safety management, access arrangements for maintenance and response, and permits to work, are coordinated.

40.2.8 Reporting

Annual Review

Infraco shall prepare an annual review report, "The Annual Review Report". The content of the Annual Review Report shall be agreed with **tie** and address the following, as a minimum:

- Health and safety, environmental and quality annual performance reports and proposals for improvement;
- Annual report on planned, reactive and lifecycle maintenance activities carried out against programme, together with impact of shortfalls and proposals for recovery;
- Overall system performance, trends in condition or failures and recommendations based on learning though the process of delivering maintenance; and
- Summary and classification of complaints and significant events, together with actions taken / recommended.
- Recommendations based on learning though the process of delivering maintenance.

Infraco shall be responsible for arranging each year's Annual Review Meeting, to take place, as nearly as possible, twelve months after the previous year's Annual Review Meeting.

Infraco shall issue the meeting agenda and all required management reports and papers, as agreed with **tie**, no later than five working days in advance of each meeting.

Reporting period review

The reporting period review report shall include comprehensive details to cover as a minimum the following information for the relevant Reporting Period:

- Output from performance measurement system with associated performance deduction calculations as Schedule 7;
- Details of all events after associated with failures to provide Available Infrastructure and Available Trams;
- Health and safety, environmental and quality reports;

- Maintenance report showing progress against Annual Maintenance Plan and detailing the programme for the upcoming eight weeks, including;
    - A statement on planned maintenance, including cleaning, performance during the Reporting Period and any backlog;
    - Report on reactive and fault correcting maintenance, including cleaning, required during the Reporting Period, impact on Tram service, and any wider implications to the service and the Maintenance;
    - Any planned future works to be carried out within the eight week period, howsoever arising, which have the potential to disrupt the operation of the Edinburgh Tram Network service; and
    - Infrastructure condition, failures in the Period and mitigation undertaken in Period and with recommendations and actions to be taken, complaints and any significant events.

Infraco shall schedule the Four weekly Review Meetings no less than one month in advance of each meeting.

Infraco shall issue the meeting agenda and all required management reports and papers, as agreed with **tie**, later than five working days in advance of each meeting.

Records

Infraco shall maintain all records necessary for the effective delivery of the maintenance services. All records shall to be up to date within ten Business Days of the end of the relevant Reporting Period relating to the specific record. Records are to be the property of **tie**, access to the records will be afforded to **tie** within five days of a request being made. Records will be kept for the longer of the Term or 6 years from the day the maintenance service was performed.

The record details, including format, storage medium, recovery procedure, administration and access, are to be proposed within the draft Communication Plan, and discussed and agreed with **tie** in conjunction with the final Communications Plan.

The agreed method of communicating a request will be included within the Communications Plan.

40.2.9 Infrastructure Maintenance Plan - Overview

Infraco shall develop and deliver a Maintenance Plan that ensures that all the Infrastructure assets and equipment safely continue to meet their designed operational performance or specification, meet the availability targets identified within the Contract, and support the achievement of the performance regime.

40.2.10 Development of the Plan

An Infrastructure Maintenance Plan shall be developed by Infraco and submitted to **tie** prior to commencement of maintenance activities. This shall detail how maintenance will be delivered in response to the infrastructure maintenance requirements; where it is not possible to include elements of detail at the time, a development plan will be included, identifying exactly what information is outstanding, and when it will be provided.

The completed Infrastructure Maintenance Plan will be submitted by the date identified in the development plan and agreed with **tie**.

During the operational phase Infraco shall submit to **tie** an annual infrastructure maintenance plan for review and approval three months before the anniversary of the Service Commencement Date of the Edinburgh Tram Network or part thereof. The new plan will detail the planned and life cycle maintenance for the following year in order to provisionally approve planned works. The process of approval is to be agreed with **tie** during the tender stage.

Life Cycle Requirements

A Lifecycle Replacement Plan shall be included within the Infrastructure Maintenance Plan. This will detail all planned lifecycle replacement works over the Term.

The annual updates to the Infrastructure Maintenance Plan will include an updated Lifecycle Maintenance Plan detailing life cycle replacement works until the end of the maintenance period.

The planned maintenance strategy (including cyclical and life-cycle maintenance) should be such that the performance of the Edinburgh Tram Network should never fall below that of the designed operational performance or specification, within the Term.

Reactive Maintenance Requirements

The Infraco Maintenance Plan shall detail Infraco's assumptions on the volume and type of reactive maintenance likely to be experienced in the relevant period, and should detail how their resource planning has been prepared to respond to it.

Frequencies

The Infraco Maintenance Plan shall indicate the frequency and sequence to which maintenance will be undertaken; based upon statutory obligations, manufacturer's and best practice recommendations, Contractor's experience and operational performance and availability requirements.

Maintenance Codes

A standard Work Breakdown Structure, consistent with that defined for the construction phase, shall be established to identify maintenance tasks to various infrastructure sub-systems.

40.2.11 Tools

The Infraco shall maintain and replace as appropriate, a full set of tools sufficient for the maintenance of the ETN in good condition and calibrated where necessary.

40.2.12 Availability and Warranty

The availability requirement for the Edinburgh Tram Network is contained within the performance regime.

Lack of availability of key systems or the late running of trams due to failures which are the Infraco responsibility will give rise to the imposition of performance deductions from the fee payable under Schedule 6. Details of the performance regime are set out in the Schedule 6.

During any warranty period or extended warranty period associated with any part and during the Term (as set out in the Agreement), a robust process shall be in place to manage the return and replacement of parts thus contributing to optimal operational service, whilst optimising the management of warranty claims under the Agreement.

40.2.13 Asset Management System

An integrated asset maintenance management and recording system shall be provided and utilised by Infraco in order for data obtained from the tram and infrastructure sub-systems or other sources to be collated and analysed. This will enable the Infraco to assess safety and performance issues and to facilitate modifications and changes, where necessary, to the maintenance plan and working practices including the asset management system itself.

A computerised asset management system shall be established, in a form to be agreed with **tie**, to facilitate maintenance of the assets and allow data obtained from the infrastructure sub-systems, trams or other sources to be collated and analysed. This will include development of an asset register.. This will enable technical staff to assess safety and performance issues and to facilitate modifications and changes, where necessary, to the maintenance plan and working practices.

In addition to recording all the assets as they arrive on site, the asset management system shall record against each discrete item provided with a serial number:

- Its date of registration;
- Its location(s), including transfers from one site or equipment to another;
- Its maintenance history, with references etc.;
- Its fault history;
- Its maintenance prognosis (when maintenance is next due etc.); and
- Overdue inspection / maintenance.

The functional details of the asset management system will be integrated with the hard copies of the suite of operation and maintenance manuals and comply with the requirements specification for an asset management system.

40.2.14 Work Instructions

Infraco shall verify that they and all sub-contractors have carried out the necessary planning to undertake all proposed maintenance activities in accordance with the Infrastructure Maintenance Plan and all necessary risk assessments, method statements and work instructions.

For each maintenance activity type, detailed work instructions will be broken down against equipment type and artisan skill set to facilitate planning of the work. Each work instruction will provide a step by step breakdown of the work involved including information about how any equipment to be worked on should be accessed and / or made safe.

40.2.15 Minimum Spare Parts Holdings

In order to cover all planned infrastructure maintenance and arising corrective maintenance, sufficient spares shall be held by the Infrastructure Maintainer throughout the duration of the Infrastructure Maintenance Agreement to ensure that delays in completing planned or corrective maintenance are not experienced due to parts unavailability.

Infraco will provide details of its planned spares holding within the Infrastructure Maintenance Plan.

The Infrastructure Maintainer shall be required to maintain, at all times, a minimum holding of certain spare parts. The schedule of minimum spare parts holding will be developed by **tie** and Infraco as part of the finalisation of the Infrastructure Maintenance Agreement. The level of minimum spare parts holding will also be reviewed every year to ensure that it is appropriate on the basis of operational experience and Infraco's ongoing requirements.

For the avoidance of doubt, the initial stock / holding of spares shall be provided as part of the initial capital expenditure by Infraco. The Infraco maintainer shall be responsible for the replacement of any spare part used and the stock / holding shall be maintained at the same level, subject to adjustments approved by **tie**, based upon experience, once the ETN is operational. Where repair is to be undertaken in-situ, information shall be provided of any special facilities or equipment required. Where equipment is to be returned to the original equipment manufacturer (or any other organisation) for repair, it shall be demonstrated that the holding is sufficient to allow for predicted turnaround times.

Wherever reasonably practicable and where cost efficient the Infrastructure Maintainer shall source as many consumable spare parts and as much repair work from approved local suppliers in the interests of cost efficiency and minimisation of lead times.

40.2.16 Maintenance Records

All maintenance work performed shall be logged for record, monitoring and audit purposes. This shall be recorded in a log book and in the asset management system.

40.2.17 Indicative Scope

Infraco shall develop their Infrastructure Maintenance Plan to include all fixed Infrastructure and mobile equipment under their responsibility; this includes, but is not limited to those identified in table below.

The maintenance of Infrastructure shall generally be based on the recommendations of the manufacturer or designer, and as set out in the operating and maintenance manual. Specific additional requirements are listed in the second column.

Table 94 - Infrastructure Maintenance Plan Scope

System, Element or Service	tie Specific Requirements
Overhead Line Electrification	
Control and Communications Systems	The common failure reporting of the SCADA system, the log files of computers and the recording devices shall be used for the detection of failures in addition to fault reports provided by the Operator. As the Closed Circuit Television (CCTV) and the Public Address System (PA) at the Tramstops and in the depot area are crucial for the security of the site, their proper functioning shall be monitored. CCTV cameras need to be cleaned regularly and recording media made available. Quick repair of any faulty or damaged CCTV equipment shall be conducted to maintain Tramstop security. It is equally essential that the information given over the PA system be clear and audible, taking into account ambient noise level at Tramstops.
Power Supplies and Sub-Stations	
Tramstops	Regular maintenance is essential to ensure that features, which were designed to prevent crime and improve the environment, do not deteriorate and present opportunities for crime and raise fears for personal security. It is also crucial to ensure that Help Points are clearly signed and well lit so that their location is clear to passengers on the Tramstop. Therefore, the quick repair of faulty or damaged equipment is essential.
Pest Control	Special planned maintenance shall be considered for vermin

System, Element or Service	tie Specific Requirements
	control, pigeon shoots and the removal/ cleaning of birds' droppings and nests. These activities shall be scheduled as required and every six months intervals maximum throughout the ETN.
Depot Building and Yard	Special planned maintenance shall be considered for vermin control, Pigeon shoots and the removal/cleaning of birds' droppings and nests. These activities shall be scheduled as necessary and every six months intervals maximum. Infraco will ensure that safe, secure, access and use of the facilities is not impeded by adverse weather conditions such as snow and ice.
Lighting for Depot Building, Depot Yard, Tramstops, P&R Site, Control Centre and Offices	
Track Work and Roads	
Landscaping	A landscape and vegetation plan shall be developed and adhered to by Infraco to summarise the responsibilities and frequency and scope of the management of trees on, or closely adjacent to, the System (see Third Party Agreements (Schedule 13) and the Code of Maintenance Practice).
Structures	Regular drain clearing
Internal Workshop Equipment	This equipment should be supplied to Infraco with the corresponding operating instructions, which also contain instructions for proper maintenance.
External Workshop Equipment	
Infraco Road Vehicles	Maintenance of vehicles shall be in line with best practice and legislative requirements

40.2.18 Cleaning Maintenance Plan

Within the Infrastructure Maintenance Plan Infraco shall include a cleaning plan which shall detail the cleaning schedule for all infrastructures and equipment for which Infraco have responsibility. In addition to scheduled cleaning, if required by **tie,** Infraco shall provide a reactive cleaning service to respond to specific incidents causing litter or hazards. Where this requires additional material or labour, the scope and costs shall be agreed in advance in writing in accordance with the Agreement.

40.2.19 Track and Infrastructure Cleaning

The Infraco shall ensure that all locations for which Infraco has responsibility are kept free of rubbish and litter. The locations shall be cleaned in accordance with the location categories defined in any Regulations made under the Environmental Protection Act 1990. These categories are:

- Category 1 Walkways linking to public rights of way or road;
- Category 9 Railway embankments in urban areas.

The complete ETN shall be litter picked once every six months on average with the area within the Tramstop being litter picked every month.

Infraco cleaning of Tramstops shall be limited to the following:

- CCTV cameras;
- Passenger Information Displays; and
- Public Address speakers.

40.2.20 Depot Building and Yard, Offices and Car Park

Infraco shall ensure that all locations for which Infraco has responsibility are kept free of rubbish and litter. The areas within the Depot shall be cleaned in accordance with the frequencies stipulated in the Infrastructure Maintenance Plan, but no less than the following:

- Toilets – once a day;
- Canteen areas – once a day;
- Offices – once a day;
- Corridors and communal areas – once a day;
- Workshop area – once a day; and
- Car Park and Depot Yard – once a week.

40.2.21 Cleaning Records

All cleaning work performed shall be logged for record, monitoring and audit purposes. This shall be recorded in a log book and in the CMS.

40.3 Tram Maintenance Strategy

40.3.1 Purpose

The purpose of this tram maintenance section is to describe how Infraco shall procure that Tram Maintainer shall meet its obligations under the Tram Maintenance Agreement and its obligations under the Operators safety justification document in respect of maintenance and all references to Tram Maintainer responsibilities in this section shall be read as Infraco responsibilities and the Infraco shall have overall responsibility for the compliance. This includes the fleet of trams supplied under the Tram Supply Agreement and any relevant plant and equipment for which the Tram Maintainer is responsible. The final version of the Tram Maintenance Plan, to be developed by Tram Maintainer in response to these Employer's Requirements, will set out the specific objectives for the pre-operational period and the first twelve years of operation, following which this document may be reviewed. This Tram Maintenance section should be read in conjunction with the Tram Maintenance Agreement, and with such 'as-built' technical documentation and operation and maintenance manuals as shall be provided by the Tram Supplier.

The Tram Maintenance Plan shall be a fully controlled document. The Infraco shall procure that Tram Maintainer will take into account all mandatory requirements in force at the time of issue. It shall be updated annually allowing a three month review period to take cognisance of operational experience.

40.3.2 Scope

This Tram Maintenance section covers the maintenance activities for the following:

- Tram servicing & maintenance (planned activities);
- Tram repairs (unplanned activities); and
- Cleaning of the trams (primarily the responsibility of the Operator).

Where certain activities are the obligation of parties other than Tram Maintainer, the Tram Maintenance section will describe how the Tram Maintainer shall ensure that such maintenance obligations are fulfilled, so as to ensure the safety of the ETN, is not degraded and that the ability of the Operator to achieve its objectives is not frustrated.

Table 89 – Infrastructure and Equipment Responsibilities Allocation Matrix and Table 83 - Depot Plant and Equipment to be Provided identifies the scope for which the Tram Maintainer is responsible.

Overall Objectives

The overriding objective is to operate a safe, reliable, punctual, clean, easily accessible, comfortable, and environmentally friendly transport service which meets **tie**'s expectations.

The Tram Maintenance Plan will be developed to deliver this objective by:

- Co-operation with Infraco to achieve the aims of the Tram Maintenance Agreement;
- Meeting the specific requirements under the Tram Maintenance Agreement, particularly the defined performance standards in respect of tram availability and reliability;
- Diligent management of subcontractors to ensure they fulfil the requirements of their subcontracts;
- Adherence to the relevant Operations and Maintenance Manuals;
- Setting up and adherence to schedules and programmes for all planned work;
- Co-operation with interfacing parties and in particular the support of any obligations they have under a 'Safety Case', 'Safety Management System' or Legislation;
- Awareness of, and compliance with, legislation, statutes, regulations, and standards governing the operation of the Tramway and any changes thereto. (This will include reviews to identify any necessary changes to any established operating procedures for Phases 1a and 1b); and
- Establishing and maintaining lines of communication with all interfacing and affected parties by means of scheduled meetings, public meetings and consultation. Each year the Tram Maintainer shall undertake programmes to improve the safety, performance, and delivery of the Tram service. These programmes shall be developed in the form of a performance improvement plan which shall be included in future issues of the Operations and/or Tram Maintenance Plan.

Maintenance Approach

The approach to maintenance of the Trams shall be as follows:

- All day to day maintenance and inspection activities and any "special works" are to be planned, organised, carried out and safely handed back to an operational status under the requirements of this Tram Maintenance section and Infraco and/or Operator procedures and regulations;

- All activities carried out under the control of the Tram maintenance plan are the responsibility of a named Tram Maintainer manager (or his named deputy) responsible for the maintenance obligation;

- Maintenance activities are classified as planned, or unplanned arising from condition determined from planned inspection and testing;

- The approach to each of these classifications will be different but essentially there will be two managers (Tram Maintainer and Infraco) liaising with the Operator's Engineering Manager, for carrying out the works in their area of responsibility with Infraco having overall responsibility. Subject to prior approval, these managers may call upon the services of approved sub-contractors to carry out some of these works; and

- Tram maintenance staff will have been trained to drive the Trams within the Depot and will do so when Operator drivers are unavailable to do so.

- The Tram Maintainer shall minimise the operational downtime of the tram vehicles or any other equipment under its control for maintenance.

Table 95 - Maintenance Plan

Maintenance Activity	Planned Frequency	Responsible Manager	Contracted out to External Supplier – Tenderer to complete
Inspection of Trams	Yes See Appendix 1	Tram Maintainer Manager	
Servicing of Trams	Yes See Appendix 1	Tram Maintainer Manager	
Maintenance & overhaul of Trams	Yes See Appendix 1	Tram Maintainer Manager	
Cleaning of trams Sanding, consumable replenishment	Yes See Appendix 1	Operator	N/A
Repairs as required to trams to deliver the timetable (including	Unplanned	Tram Maintainer Manager	

accident damage and vandalism repairs)			

40.3.3 Organisation, Training, and Competency

Staffing Plan, Recruitment & Training Plan

The description of the Tram Maintainer organisation for all aspects of the operation, maintenance, and all management and administrative support of Phases 1a and 1b shall be set out in the Tram Maintainer human resources plans, staffing plan and recruitment and training plan. These documents will contain details of:

- Job descriptions and required competencies; and
- Standard training courses;
- and the procedures required to:
  - effectively recruit staff to fulfil the various employee roles;
  - monitor their performance; and
  - secure and review the required competencies and associated training courses.

These documents shall be agreed with **tie** as part of the finalisation of the Tram Maintenance Agreement.

40.3.4 Quality, Health, Safety, & Environment

Health and Safety

For all matters relating to health and safety the Tram Maintainer shall produce a Safety Management Plan which shall be agreed with **tie** as part of the finalisation of the Tram Maintenance Agreement. This Plan shall set out all relevant or appropriate regulatory requirements that the Tram Maintainer has to comply with, and the Tram Maintainer standards and procedures that it will have to develop to comply with legislation. The Plan will also meet the obligations under the Tram Maintenance Agreement. The Safety Management Plan must not prejudice the Operator safety case. The Tram Maintainer shall operate complaint to ISO 18001.

Environment

For all matters relating to environmental management, the Tram Maintainer shall produce an Environmental Management Plan which shall be agreed with **tie** as part of the finalisation of the Tram Maintenance Agreement. This Plan shall set out all relevant and appropriate regulatory requirements that the Tram Maintainer shall comply with, and the Tram Maintainer Standards and Procedures that it will have to develop to comply with legislation. The Plan will also meet the obligations under the various Agreements. The Tram Maintainer shall operate in compliance within EN14001.

Quality

The Tram Maintainer shall be responsible for quality in so far as implementing the requirements of the above two plans in respect of auditing and inspecting the requirement of all Tram Maintainer plans and procedures. The Tram Maintainer shall operate to and achieve accreditation to ISO 9002.

40.3.5 Liaison with Promoter & Other Parties on Maintenance Related Issues

Communications Plan

The Tram Maintainer shall create a Communications Plan (which shall be agreed with **tie** as part of the finalisation of the Tram Maintenance Agreement) for all matters related to communications within Infraco, the Operator, and all relevant third parties and stakeholders.

It is critical that the Tram Maintainer establishes effective lines of communication with the Operator, through their Control Centre, in order to plan the maintenance activities around service requirements. This specifically relates to the withdrawal of Trams for planned preventative maintenance and returning of Trams for service following completion of these activities and unplanned maintenance activities or repairs.

The Tram maintainer will provide details of how effective lines of communication with the Tram Operator will be set up and maintained throughout the period of the Tram Maintenance Agreement. This will include details of how key staff and expertise will be provided 'on-call' at all times to the Operator in the event of unforeseen tram breakdowns etc. It will also include a system for Tram handover after the completion of Tram Maintenance activity and a programme of daily meetings to discuss punctuality performance (and associated deductions), tram defect status and future Tram utilisation.

40.3.6 Tram Servicing and Maintenance Plan

Fleet Overview

The Tram fleet for Phases 1a and 1b will consist initially of 27 Trams, each capable of carrying about 250 passengers.

The Trams will be maintained at a new purpose-built depot.

40.3.7 Maintenance Plan Overview

All planned and preventative inspection and maintenance shall be carried out using a programme that shall be agreed annually between **tie** and Infraco. A balanced programme is required for this type of rolling stock, enabling the most efficient use of Tram downtime.

Maintenance schedules and examination job titles in this document have been drawn from general experience of similar vehicle types, and do not relate to any particular vehicle. It should be noted that all exams, sequences and frequencies mentioned are indicative at this stage, and will be reviewed once further fleet and maintenance contractor details are known.

Unplanned repair activities are not included in this Tram Maintenance section but shall be provided by the Tram Maintainer in terms specified in the Tram Maintenance Agreement.

40.3.8 Maintenance Strategy

Tram Planned Preventative Maintenance

There are two types of preventative maintenance which are to be carried out:

- Systematic preventative maintenance which follows a predetermined schedule such as:
  - Condition inspection and safety checks;
  - Cleaning of equipment;
  - Functional tests to reveal faults; and
  - Adjustments to enable optimum operation.

- Conditional preventative maintenance consists of carrying out regular inspections to determine that the performance, or operation of, Tram sub-systems remain within pre-determined measurable parameters, such as:
  - Vibration and noise levels;
  - Temperature threshold; motors and cooling circuits, etc.;
  - Wear threshold; wheel diameter, suspension heights/clearances, and pantograph height, etc.; and
  - Door operation times.

Tram Corrective Maintenance

This type of maintenance entails repairing or changing faulty equipment, through observation of failures. It involves three kinds of intervention:

- Breakdown in service requiring specific intervention. Immediate repairs are to be carried out rapidly to clear the line as quickly as possible. This activity is limited to re-establishing sound operating conditions and assisting the Operator to re-establish operational headways. Unless a repair can be rapidly undertaken to ensure safe, normal operation of the affected Tram for the remainder of the day, the affected Tram should be withdrawn from service and returned to the Depot where a more permanent repair, under controlled conditions, may be carried out.

- Repairs. This covers interventions carried out following incidents or failures that occur in operation, or identified from routine maintenance activity, generally involving a longer stoppage of equipment including overhauls of an entire Tram or major Tram component or operating system. This is an intervention of lasting character, carried out by maintenance staff (or approved sub-contractors). After repair, the Tram must conform to its original specifications.

- Whilst not strictly a breakdown, the Tram Maintainer shall also be required to assist with the recovery of any Tram derailment occurring on the line and carry out the appropriate re-railing technique, irrespective of the cause of the derailment. The Tram Maintainer will advise the Operator of the safe condition, or otherwise, when re-railing of the Tram has been completed.

Further Maintenance Operations

Preventive maintenance and corrective maintenance must be complemented by:

- Operations that contribute to the good image of public transport (appearance and comfort) such as removal of graffiti and re-applying freshening up paintwork, that cannot be achieved by the Operator through routine cleaning methods; and

- Checks on wheel condition (profile and flats).

The final version of the Tram Maintenance Plan shall include the proposed programme for all Tram preventative maintenance and further maintenance operations.

The periodicity/interval and duration or all planned preventative maintenance activities shall be specified in the final version of the Tram maintenance plan. It is anticipated that most intervals will be fixed-time intervals based upon calculated scheduled service distances, to be specified by the Tram Supplier. If any activities are specifically based upon a kilometreage based interval, which cannot readily be related to elapsed time, this should be made clear in the proposal.

The various examination types, based on their interval shall be categorised by code letter and the activities to be undertaken shall be fully detailed. The information should be summarised in the form of a matrix or star/dot chart where the breakdown of exam type is shown labelled on one axis and equipment or sub-system to be worked on is labelled on the other axis.

The Tram Maintainer will also create a list of standard repair times for items that are susceptible to damage or failure in service, such as replacement of glazing, lower front skirts, pantograph etc. Where possible, standard durations for repair and fixed prices for these repairs shall be established.

Maintenance Codes

A standard set of maintenance codes should be established to identify maintenance tasks to various Tram sub-systems:

The following standard set of codes is proposed (and are used in the Star Charts) and should be developed further as the details of the Tram design and recommended maintenance approach are understood:

Table 96 - Star Charts

Code	Area
A	Sanding System
B	Brakes
C	Bodywork
E	Battery and Control Systems
F	Radio and communications systems
G	Pantograph
H	Heating and Ventilation
I	Interior Trim and Fittings
M	Electrical Machines
O	Doors
P	Electrical Traction Power Equipment
T	Mechanical Transmission
U	Underframe and Bogies
Z	Emergency Equipment

Maintenance star charts setting out the indicative periodicities for maintenance activities shall be developed as part of the Maintenance Plan.

These star charts are to be developed in line with the finalisation of the Tram Maintenance Agreement and Tram Supplier's recommendations.

40.3.9 Availability and Warranty

The availability requirement for phases 1a and 1b of the ETN will be established in detail during the tendering process. Where possible, at peak periods and for special events, all trams should be made available.

Any lack of availability will give rise to the imposition of availability deductions from the fee payable under the Tram Maintenance Agreement. Details of the availability performance regime are set out in the Tram Maintenance Agreement. This also sets out the requirement for a 'hot spare' Tram and for Trams to be available for training purposes outside of peak hours.

During the Warranty and Extended Warranty period (as set out in the Tram Supply Agreement) a robust process must be in place to manage the return and replacement of parts thus ensuring optimal operational service, whilst optimising the management of warranty claims under the Tram Supply Agreement.

40.3.10 Technical Management

An integrated, computer-based maintenance management and recording system (CMS) should be utilised in order for data obtained from the maintenance of the Trams or other sources to be collated and analysed. This will enable the technical team to assess safety and performance issues and to facilitate modifications and changes, where necessary, to the Tram Maintenance Plan and working practices.

The CMS shall also provide a real-time configuration management control system of the Trams by recording serial numbers of all components on the Trams. This record shall also be updated whenever components are exchanged or replaced during maintenance or repair of the Trams.

The CMS will need to be capable of interfacing with Infraco and/or **tie**'s systems to facilitate remote access to maintenance management data.

40.3.11 Work Instructions

In order for Infraco to be able to verify that the Tram Maintainer has carried out the necessary planning to undertake all proposed preventative maintenance activities in accordance with the Tram Maintenance Plan, details of the work activities shall be submitted for information only.

For each exam type detailed work instructions will be broken down against equipment type and artisan skill-set to facilitate planning of the work. Each work instruction will provide a step-by-step breakdown of the work involved including information about how any equipment to be worked on should be accessed and/or removed from the Tram.

Each work instruction should, as a minimum, include details of:

- Health and safety precautions;
- Key skills and competencies required to undertake the work;
- Consumable components to be replaced;
- Special tooling (if any);

- Particular Depot facilities required; and
- Agreed time to complete the task.

40.3.12 Minimum Spare Parts Holdings

In order to cover all planned Tram Preventative Maintenance and arising Corrective Maintenance, sufficient spares shall be held by the Tram maintainer throughout the duration of the Tram Maintenance Agreement to ensure that a Tram is seldom unavailable for service due to parts unavailability.

Spares fall into the following categories:

- Consumables (brake pads, filters, bulbs etc.);
- Line Replaceable Units (repair on site);
- Line Replaceable Units (return to OEM for repair); and
- All other equipment.

The Tram Maintainer shall provide details of its planned spares holding and into which of each of the above categories each item falls.

In order to facilitate a seamless transition of Tram Maintenance services from one Tram Maintainer to another on the expiry or earlier termination of the Tram Maintenance Agreement, the Tram Maintainer shall be required to maintain, at all times, a minimum holding of certain spare parts. The schedule of minimum spare parts holding will be developed by **tie** and the Tram Maintainer as part of the finalisation of the Tram Maintenance Agreement. The level of minimum spare parts holding will also be reviewed after three years to ensure that it is appropriate on the basis of operational experience and Infraco's ongoing requirements.
Failure to maintain the minimum spare parts holding will give rise to an availability deduction being made in respect of the maintenance fee.

Where repair is to be undertaken on site, information shall be provided of any special facilities or equipment required. Where equipment is to be returned to the original equipment manufacturer (or any other organisation) for repair, it shall be demonstrated that the holding is sufficient to allow for predicted turnaround times. Estimated lead times for all other spares shall also be provided.

Where line replaceable units (LRUs) are exchanged as part of normal Tram preventative maintenance (to be brought up to optimum condition off the vehicle), the appropriate work

instruction should be explicit regarding this fact and should also state the approved time for exchange of such components. The spares holding of LRUs should be sufficient to cater for this method of working.

Wherever possible the Tram maintainer shall source as many consumable spare parts and as much repair work from approved local suppliers in the interests of cost efficiency and minimisation of lead times.

40.3.13 Cleaning Maintenance Plan

Tram Cleaning

Internal and external cleaning of Trams is the responsibility of the Operator. This will also include the removal of graffiti, except where this cannot be removed by normal cleaning methods or requires replacement of the panel(s) concerned. In such cases the panels will be replaced or made good by the Tram Maintainer. This shall also include the replacement of window glazing due to damage by etching.

The Tram Maintainer must ensure that adequate quantities of interior and exterior body panels, glazing and window sealing materials are kept in stock to meet this obligation.

40.4 Maintainability, Maintenance and Spares

40.4.1 General

An asset register shall be produced by the Infraco and the Tram Maintainer and populated by them with equipment data, serial numbers etc. The asset register shall be available prior to the commencement of delivery of equipment and materials. All spares, tools and test equipment which are delivered as part of the Works, shall be entered in the asset register.

Performance, reliability, fault / failure data shall be available that enables analysis of the Edinburgh Tram Network for product improvement.

Data shall be presented to maintenance staff such that potential causes of faults / failures are clearly identified.

Hardware components shall be easily accessible and not require specialist equipment for their removal or replacement.

Connectors shall be used which permit fast and easy disconnection and replacement of faulty / failed components and prevent dirt and moisture ingress and are suitably supported and specified for the operating environment in which they are used.

Maintenance regimes, component replacement programmes and spares holding levels shall be determined through fault tree, cause-consequence and Markov analysis, as appropriate, and ratified through the verification and validation process.

Spares that have potential long lead times, or minimum order quantities, shall be identified and adequate quantities held on site in order to achieve the performance requirements of the system including repair times.

The Edinburgh Tram Network shall be designed to facilitate inspection, repair, maintenance and fault finding without interruption to the ETN operations and performance.

Spares provided shall be sufficient to ensure the continuous operation of the system from the date of the Edinburgh Tram Network handover to **tie**. These spares shall include provision for damage and vandalism. The Edinburgh Tram Network design shall be underwritten such that all equipment / system suppliers shall warrant that all equipment in the design shall be available for the design lives specified and that they shall give **tie** a minimum of twelve months notice where after that period they intend to cease supply of that component.

Equipment housings / enclosures and their contents, e.g. racks etc. shall not exceed 2.0m in height unless specifically agreed by with **tie**.

The lowest mounting point, plug-in group or terminal block shall not be less than 0.4m above floor level unless specifically agreed by with **tie**.

Cables shall be clearly identified at each end of the cable connections by clearly visible and indelible labels. Related drawings shall describe the labelling conventions.

The maximum use shall be made of readily available and fully proven 'industry standard' materials and components. These shall remain readily available for the projected life of the Edinburgh Tram Network and which shall be supported in the market place on an ongoing basis.

Provision for handling the possible obsolescence of any of the components during the projected life of the ETN without degrading the ongoing performance of the Edinburgh Tram Network shall be individually addressed prior to supply/construction.

The detailed arrangements for the delivery, storage, management, and control of spare parts shall be agreed between the Infraco, the Tram Maintainer and the Operator as part of the arrangements for the ongoing operation and maintenance of the ETN.

In addition, Infraco shall procure that an adequate supply of consumables and spares shall be available to support the testing, commissioning and shadow running.

The Infraco / Tram Maintainer shall establish and maintain a log of all such consumables and spares used during this process and an updated copy shall be presented with each monthly progress report.
Where cables are to be provided, they shall contain sufficient slack to permit reasonable disturbance during maintenance.

40.4.2 Structures and Civil Engineering

As the bulk of these features will be static, the quantity of spares shall include those items that may suffer attrition as a result of accidents and vandalism such as signage, bollards, etc., and any special features bespoke to the ETN.

If not readily available, small quantities of special surfaces, e.g. tactile paving, etc., shall be stocked but it is anticipated that common wearing surfaces will be repaired using materials commonly available to the trade.

40.4.3 Track

In respect of track and ancillaries, the levels and numbers of spare holdings of major replacement elements, such as rails, sleepers, switch half-sets and full-sets, and crossings – 'standard' supply and more importantly of bespoke design – are considered to be of critical importance. At least one point machine, point indicator and hand operated mechanism shall be provided. Additionally, quantities of small parts and day-to-day maintenance items, together with special equipment such as buffer stops, are to be provided, based on instructions contained in the maintenance manual and on forecast component lives. In proposing the numbers of all spares holdings, the objective will be to ensure, as far as will be reasonably practicable, uninterrupted operation of the tram services.

40.4.4 Training

An indicative training plan for all parties involved in the maintenance and operation of the Edinburgh Tram Network System shall be produced and submitted to **tie** within six months of the Commencement Date. This shall be updated as required thereafter and as a minimum, be submitted to **tie** every eight months.

40.4.5 Infrastructure and Trams

Training and Competency

Staff training and competency assessments shall be carried out in accordance with best practice. The requirements of the ROGs regulations for safety critical work shall be observed.

Training Plan

An indicative training plan for all staff of the Edinburgh Tram Network System shall be produced within six months of the Commencement Date.

Both operating and maintenance training courses shall be provided for all of the items of supply associated with the Edinburgh Tram Network, including the operation and maintenance of all specialist plant and tools provided or required. All training materials and classes shall be in the English language.

The training may take place either at an individual contractor's premises or, locally on the tramway system or at other facilities to be agreed with the Operator/Maintainer and made available by the training supplier. All these arrangements shall be with the prior agreement of the Operator/Maintainer. "Maintainer" in this Section regarding Training in maintenance and operation means both Infraco and Tram Maintainer.

A training plan shall be provided for each group of trainees (i.e. Operator and Maintainer) covering all the items of supply. The plan will set out in a logical manner the order, duration, location and the content of the training to be given, the type (i.e. classroom, practical hands on) and the scope (i.e. operation, routine maintenance, first line repair, second line repair etc).

The Training Plan shall take due account of the Operator's proposed operational plan and the maintainer's proposed maintenance plan and any manufacturer's or otherwise recommended maintenance intervals for the scope of equipment supplied as well as all manufacturer's maintenance intervals for the equipment provided.

The Training Plans will clearly set out the course objectives. These will ensure that:

- All appropriate grades of operational and maintenance staff are able to perform, in a proper, effective and safe manner all necessary scheduled and reasonably foreseeable unscheduled tasks in order to functionally operate, maintain, fault find and safely restore in the shortest time in the event of any failure, the full functionality of the systems and equipment forming the Edinburgh Tram Network.

- All appropriate operational and maintenance staff are able to comprehend environmental and operational conditions, safety concepts and the health and safety requirements when carrying out their duties.

- All appropriate operational and maintenance staff are able to correctly interpret and make proper correct safe and effective use of all operational electronic data, displays and printed/written documentation presented to them in the course of their duties.

- The competence of all of the trainees shall be certified in a format that is compliant with all of the obligations placed on the employers of the trainees.

- The Training Plans shall clearly set out the level of testing of trainees, and how the certification of trainees will be achieved and documented. It shall also set out the method of participant feedback to be used following the completion of the training. Where appropriate, the testing and certification process will be split where appropriate to ensure competency on particular items of equipment, systems and methods.

- The training plans shall be agreed with **tie** and the operator prior to the commencement of the training.

Training Material

Infraco will provide, inter alia, the following training materials appropriate to the individual training session.

- Twelve sets of all training material and two sets of the Training plans and trainer's course material and notes, together with copy discs, drawings and artwork shall be provided to enable the Operator/ Maintainer to provide future training courses for himself when necessary.

- All training material, including master discs, drawings and artwork, will be updated within four months of the completion of the training on the basis of the formal feedback from attendees and the Operator/ Maintainer of 'lessons learnt' and from its practical application on the tramway on a routine basis and shall reflect all changes made to the system such that the system and training are fully aligned.

- In the event of any of the systems or equipment supplied and installed having to be modified or amended or the maintenance requirements for the same being revised within the Warranty period, the training material shall be revised and updated to reflect the changes to equipment, components or procedures that have become necessary.

Training Costs

All relevant costs, including travel and accommodation, associated with the effective training of the Operator/Maintainer's staff, on site or remote, shall be at the expense of the training provider, including materials, classrooms and instructors, but excluding the time cost for the trainees.

40.4.6 Maintenance Training

All relevant costs associated with the effective training of the Operator/Maintainer's staff, on site or remote, shall be at the expense of the training provider, including materials, classrooms and instructors, but excluding the time cost for the trainees.

Training courses and materials shall be provided in line with the Training Plans. These shall cover all operations necessary for the maintenance, repair and renewal of all the infrastructure and equipment forming the ETN systems throughout its life including items such as fault diagnosis, replacement and repair of equipment, software maintenance, system structure, integration and interfaces and hardware and software set-up.

The training shall include training on all the specialist tools and test equipment and software required to maintain and operate the system.

The training shall be structured as set out in the training plan to cover the basic theory, system operation overview, routine maintenance, first line fault rectification, second line fault rectification, renewals and software maintenance.

The training documentation shall include reference to manufacturer's documentation and also include all documentation, drawings, and technical data required to provide a single reference for the items covered by the training. The documentation will include fault identification and rectification process flow charts to assist maintenance personnel in identifying and rectifying faults. The initially recommended periodicity of inspections, tests and routine maintenance or rectification processes shall include 'pass' or 'fail' criteria. In the case of a 'failed' test, the appropriate course of action, with remedies for such inspections, tests and maintenance shall be detailed. Course documents, course content and notes shall be submitted for approval by **tie**.

Risk assessments shall be carried out on all of the proposed maintenance methods and where found to be appropriate safe systems of work shall be included within the training material and training. COSHH assessments will be carried out on all substances to be used in the training and proposed for the maintenance of the equipments. All such documentation shall be submitted to **tie** for approval.

Personal Protective Equipment for course attendees shall be provided, as appropriate, by Infraco.

Testing and certification of the attendees shall be carried out. Upon completion of the training on each section of the equipments and systems, all attendees shall be required to pass a written and practical test for evaluation and certification purposes by the trainer to confirm that personnel are competent to carry out all necessary tasks. The certification process and documentation shall be submitted to **tie**. The individual results and certification shall be fully documented and presented to **tie** and the Operator / Maintainer for their records.

40.4.7 Operational Training

Sufficient Operational Training Courses shall be provided in line with the Training Plan for all the various grades of the Operator/Maintainer's staff, to ensure that safe and proper operation of the system can be achieved throughout its life, commencing with the formal take-over of the ETN.

The training shall be structured as set out in the training plan to cover the operation of the ETN under all operating conditions, including normal running and working in the many degraded modes, and in the recovery from degraded modes.

The training shall include operator familiarisation and functional training in conjunction with the Factory and Site Acceptance Tests of the integrated system and Control Centre systems.

The training shall provide comprehensive hands-on training on the equipment and systems for all operational equipment including trams.

This shall include the simulation of a service and all associated equipments and failures.

The training shall include full details of the functionality of the tramway and control systems.

The training documentation shall include reference to manufacturers' documentation and also include all documentation, drawings, and technical data required to provide a single reference for the items covered by the training. The documentation shall include fault identification process flow charts to assist the Operator / Maintainer in identifying faults and to assist in the deployment of the correct maintenance personnel.

40.5 Information Procedures, Records and Manuals

40.5.1 General

All designers, suppliers, installers and maintainers of the Edinburgh Tram Network shall provide comprehensive documentation in support of their works. Such documentation shall be prepared in

accordance with the contractual requirements, Employer's Requirements and any other relevant documentation.

This information will be included in the form of the Project Health and Safety File. The file will be divided into Sections and Volumes in a manner to be agreed with **tie**. Each Section will be numbered in sequence and may comprise more than one volume. The volumes shall be identified by an integrated sequential numbering system.

40.5.2 Information

Information to be provided shall include, but shall not necessarily be limited to:

- Product literature;
- Design parameters, specifications, data and drawings;
- Product specifications;
- Illustrated parts lists;
- Product usage and examples of use service;
- Whole life cycle evidence and documentation;
- Maintenance and fault finding;
- Spares management, product storage and handling; and
- Health and Safety considerations and documentation.

40.5.3 Operation and Maintenance Manuals Information

Infraco shall produce for the Edinburgh Tram Network operating instructions for the system as a whole and for all individual sub-systems consolidated into an overall suite of bespoke Operations and Maintenance Manuals. This data shall be produced in hard copy form and shall also be available as an on-line database to operations and maintenance personnel.

The Edinburgh Tram Network shall have maintenance instructions for the system as a whole and for all individual sub-systems consolidated into an overall suite of Operations and Maintenance Manuals.

This data shall be produced in hard copy form and available as an on-line database available to maintenance personnel. The technical documents and manuals shall be compiled electronically in a universal format such as XTML.

Maintenance instructions shall be available in hard copy form and for download to remote/portable diagnostics terminals.

The Operations Manuals and Maintenance Manuals shall be comprehensively indexed and cross-referenced. They shall meet all requirements of an ISO 9000 Quality Plan, ISO 14000 Environmental Plan and ISO 18000 Health and Safety Plan. They shall take into account the relevant legal requirements and customary practices existing in Scotland. They shall be of a quality at least as good as that outlined in the SDS Maintenance Documentation Specification (reference number ULE90130-SW-SPN-00064).

They shall be prepared in accordance with a uniform approach, combining together the contributions from different contributors. They shall be consistent in terms of the page layout, indexing, language, tense, person and methodology of maintenance of each item of equipment on the system in a clear and concise manner.

The Maintenance Manuals shall include initial planned maintenance schedules and all inspection and maintenance frequencies. These frequencies shall include, but not necessarily be limited to, post commissioning, daily, weekly, specific and periodic inspection and procedural activities. All such activities shall be fully co-ordinated and integrated to minimise the frequency of visits and thus the possible disruption of the tram service.

The contributors shall update the manuals' information at periods considered appropriate to their equipment and/or installation supply throughout during the contracted period of maintenance and/or warranty agreement. Notwithstanding such interim updates, a full review and update will be undertaken at the end of such maintenance and/or warranty agreement. Such updating material shall be carried out and provided by the appropriate maintainer.

The master copy of the Manuals shall be held electronically and be accessible via the Internet using an appropriate access permission regime. The access arrangements shall record who accesses individual sections and when.

The information to be included in the manuals from the relevant subcontractors through the Infraco and Tram Maintainer shall include, but not be limited to the following:

- System Overview (including explanation of manuals content)

Landscaping Manuals, comprising:

- Area Descriptions;
- Inspection and Maintenance Manual; and
- Planting Stock Lists.

Structures Manuals, comprising:

- Structures descriptions, etc.;
- Inspection and maintenance manual; and
- Illustrated parts list.

Power supply Mmanuals, comprising:

- Equipment Description and Operation Manual (how the equipment works);
- Maintenance Manual (including inspection and day-to-day maintenance procedures);
- Overhaul Manual; and
- Illustrated Parts List.

Overhead Line, Manuals, comprising:

- Equipment Description and Operation Manual (how the equipment works);
- Inspection and Maintenance Manual (including erection procedures, etc.);
- Overhaul Manual; and
- Illustrated Parts List.

Permanent Way Manuals, comprising:

- Equipment Description and Operation Manual (how the equipment works);

- Inspection and Maintenance Manual;
- Overhaul Manual; and
- Illustrated Parts List.

Tramstops Manuals, comprising:

- Tramstop descriptions, Lighting, Seating, Signs, etc.;
- Inspection and Maintenance Manual; and
- Illustrated Parts List;
- Supervisory Control and Communications Systems Manuals, comprising:
- Equipment Description and Operation Manual;
- Inspection and Maintenance Manual; and
- Illustrated Parts List.

Tram Manuals, comprising:

- Information to be included in a Drivers Handbook;
- Equipment Description and Operation Manual;
- Maintenance Manual (including inspection and day-to-day maintenance procedures);
- Overhaul Manual (larger overhauls are unlikely to be carried out by **tie** and this will be required by their eventual overhaul contractor); and
- Illustrated Parts List.
- A full suite of vehicle design drawings.

Gogar Maintenance Depot Manuals, comprising:

- Description of Depot and its Equipment (including road and on-track maintenance vehicles);
- Maintenance Manual (covering all equipment including integrated equipment maintenance schedule) under the following headings:
  - Fixed equipment;
  - Mobile equipment;
  - Portable equipment; and
  - Hand tools.
- Illustrated Parts Lists for each of the above.

Central Control Centre Manuals, comprising:

- Operational Procedures (these may be included in System Operation manuals);
- Equipment Description and Operation Manual; and
- Illustrated Parts List.

Signalling, including:

- Equipment Description and Operation;
- Inspection and Maintenance Manual; and
- Illustrated Parts List.

40.5.4 Asset Register

The Operations and Maintenance Manual shall be linked to an Asset Register within the computerised Asset Management System that shall be provided by the Infraco . This shall be populated with actual equipment data, serial numbers etc. This asset register shall be capable of being linked to a graphical information system (GIS) and include as-built, maintenance and other drawings and records.

Performance, reliability, fault/failure data shall be included, presented and made available to enable analysis for product improvement.

40.5.5 Provisional List of Operating Procedures and Standards

A – Operating Procedures (To be developed in conjunction with the Operator)

1. Permit to work;
2. Power switching and isolation;
3. Switching and Safety Interlocking with Inspection Platforms in Depot;
4. Track Safety;
5. Issue and use of Personal Protection Equipment;
6. First Aid;
7. Communication with OCC (Trackside);
8. Communication with OCC (Tram);
9. Depot & Yard Tram Movements & Parking;
10. Use of Wheel Lathe;
11. Lifting & Safe Handling;
12. Recording of Maintenance & Repair in Infraco Records System;
13. Risk Assessments (Safety, and Environment);
14. COSHH Risk Assessments;
15. Preparation and Approval of Method statements;
16. Materials Procurement & Control;
17. Waste Disposal;
18. Evacuation of Depot;

19. Detailed maintenance procedures (as supplied by the Tram Maintainer & Infraco);

20. Monitoring the medical condition of employees;

B – Infraco Standards (to be developed by Infraco prior to Section A completion)

1. Tram (pantograph parameters, door parameters, wheel profile, suspension/coupler heights & clearances, brake parameters and wear limits);

2. Tram Driver routine preparation;

3. Tram Cleaning;

4. Tram related Noise and Vibration (To be developed in conjunction with the Tram Maintainer);

5. Tram clearances with Tramstops (To be developed in conjunction with the Tram Maintainer).

Part 2: Tram Maintenance Programme

These are comments from tie on the Maintenance Plan (TMA Schedule 2 Part 2) submitted on 9th November 2007:-

Introduction

It is not tie's intention to instruct CAF over the content of their Maintenance Plan, but once the contract is operating, CAF will need to seek approval from tie for their intended Plan for each coming year. The comments below are therefore purely suggestions and are based on common UK tram maintenance practice.

Maintenance Plan Comments

1. The proposed content for the daily tram Preparation inspection should be incorporated into the overall Maintenance Plan document
2. Within the tram preparation inspection – please explain what is the "Cab Terminal & Lamp Box"?
3. Tram Preparation inspection – suggest adding a passenger door function check (usually one door is checked at random each night)
4. Tram Preparation inspection – suggest the addition of an exterior condition check including a c check that all opening panels are securely closed
5. There is no Auto-Coupler fitted to the Edinburgh tram (therefore the first section of the Plan needs revision).
6. We suggest that the base IS exam periodicity is too short. 2 months between IS inspections would be normal once the trams have got over any bedding-in period
7. When the trams are new (perhaps first 3 months of operation, we suggest there is a more frequent visual inspection – perhaps every 5 to 7 days) to make sure all the new equipment is functioning properly frequency
8. Section 2.9.1 – tyre gauging not listed – suggest a 2-monthly periodicity
9. If the flange lubrication system is curve-sensing a check on its function is needed, perhaps every 3 months
10. UK practice is to ultrasonically test axles – suggest at 2/3 yearly periodicity. This is usually a bought-in service.
11. Suggest that a test of the emergency lighting operation is missing (linked to item 9.2 battery capacity test). Suggest emergency light left on to prove 1 hour capacity – test should be done every year
12. Suggest that a dynamic brake test is missing. The trams should have their actual braking performance tested on the move every year. (They should also each be tested from new though this may form part of the commissioning tests).

Maintenance Management System

There is certain functionality within the Maintenance Management System that we will require, namely:-

- automatic reminder to rolling stock team leader of any outstanding defects on a particular tram
- easy ability to show up repeating faults
- controls discouraging the use of non-accredited staff from carrying out safety critical work
- serial number tracking of key components including the setting up of parent-and-child component hierarchies (e.g. a wheel is part of a wheel-set assembly and that wheel-

set is part of a bogie – so that if the bogie is exchanged, all of the “child” components are changed with it).

- a defect audit trail which directly links an in-service failure with work done in the workshop and any material used, so that conclusive evidence exists to explain the cause(s) of the original fault.

TRAM MAINTENANCE SERVICES

INDEX

1. MAINTENANCE DOCUMENTATION

1.1. MAINTENANCE PLAN DEFINITION

The Maintenance Plan drawn up for the Edinburgh LRV Units is based both upon CAF's large experience as builder and maintainer of rolling stock and upon the latest technology applied in the design and production of the stock. This calls for stock maintenance and service requirements lower than those proposed for earlier generation vehicles for similar accomplished reliability rates. In addition, the mean life between failures of the equipment incorporated into the vehicles is improved.

The most important criteria observed for the choice of equipment making up these Units, in addition to those related to operation and functionality, have been as follows:

- Simplification of the maintenance tasks.
- Accessibility.
- Interchange ability.
- Reduced and less frequent tasks.
- Safety.
- Minimum environmental damage.

Therefore, as opposed to units belonging to earlier generations, the intervals between preventive maintenance events are lengthened in as much as possible and the amount of tasks is also reduced, all this being possible based on the experience gathered to date. Also, the overhaul and significant repair events shall not only be spaced out in time but thanks to the durability and low maintenance requirements of the equipment the work loads are reduced for the same availabilities. Also the LRU philosophy is adopted, this means that equipment modularisation is used as much as is possible to make their maintenance events independent from the rest of the unit and to make interchange ability simpler and more operative.

Therefore, the Maintenance Plan designed for the units is highly based on three types of operations:

- Regular checks, based on visual examinations, inspections, measurements, technical cleaning, checks and top-up of several levels of fluids, analysis of *software* installed on the train and the execution, if necessary, of operation tests on the equipment.
- Other checks more relevant than the above, are those where preventive maintenance criteria are applied to the most critical modules of the train. Each of these shall have the periodicity suggested by the manufacturer and

the experience gathered. In general terms, this shall imply checking, verification, replacement of worn items, torquing, more comprehensive checks, bench tests and small dismantling and assembly work. These operations are comprised within the maintenance work described in the preceding item together with the modification and predictive maintenance events from the software installed. As the work involved in this type of maintenance depends directly on the operation of the train, the periodicity of the operations is a function of the mileage travelled and operating conditions.

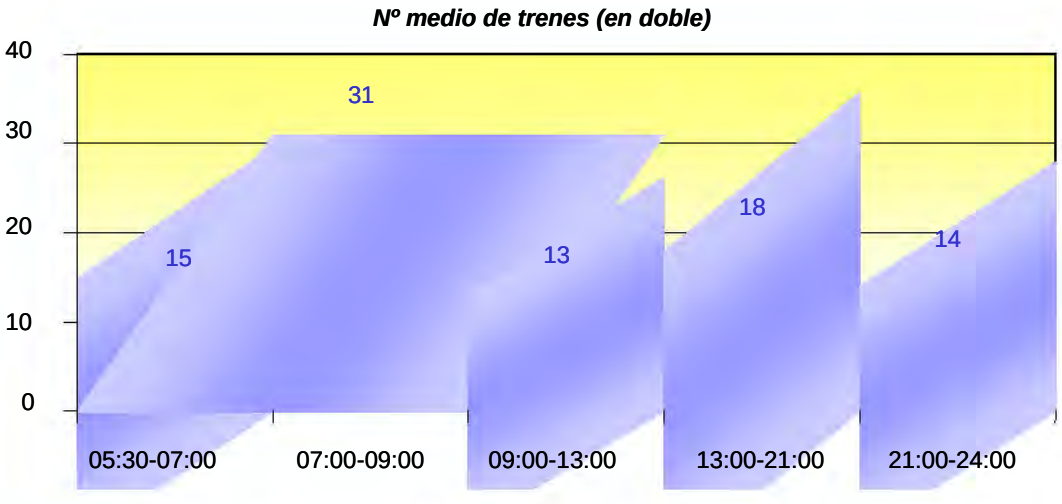
- Finally, the maintenance cycle is completed with the revision, dismantling, reconditioning and general assembly, which is determined by the wear and tear resulting of the prolonged use of the equipment. This type of operations include not only short cycle inspections such as those mentioned above but also repairs which entail the replacement of important units. These operations, by means of the technique of depot parts or modules turnover, optimise the down time periods of the trains and allow the trains to resume revenue service almost under the same initial conditions.

The several types of maintenance used by CAF shall be explained below. Maintenance Plan operations are classified according to the several maintenance types.

An example of Maintenance Planning – Local Train Network – RENFE (Madrid)

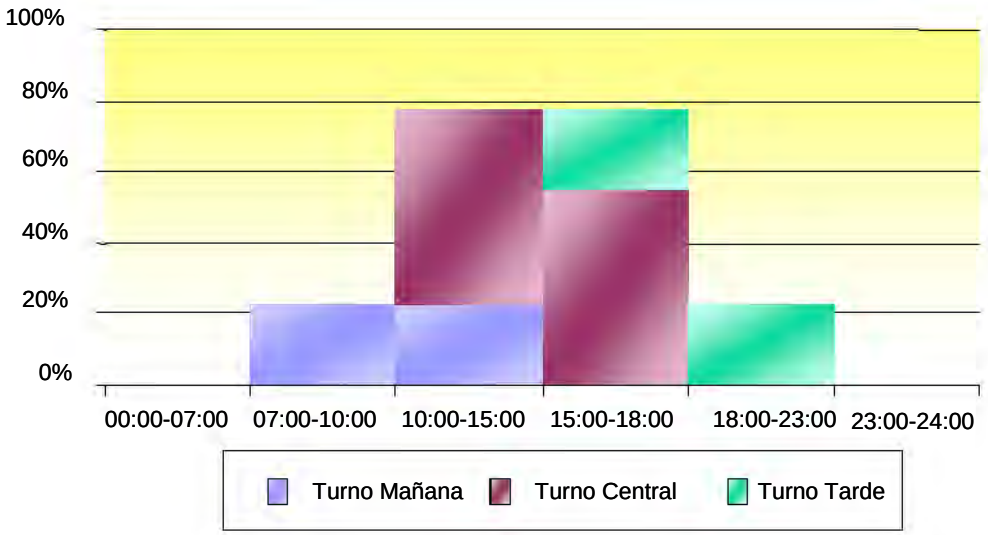
This planning model ensures that no maintenance operations are performed on Units during peak hours. The model has already being adopted by CAF for its maintenance operations and it forms an important part of CAF's operational strategy, generating some high availability rates.

An example of this method is shown below, indicating the real situation achieved by CAF for the maintenance of a fleet of trains pertaining to the local train network service. The operating diagram for the service in question is shown below (indicating the number of 6-car trains for each time slot)



Average Nº of trains (double)

CAF has adapted its working hours in order to perform maintenance tasks during off-peak hours. In this way, the whole of the Customer's fleet is available for service during peak hours (100% availability). The medium and long cycle inspections are the only exceptions to this and these operations need to be co-ordinated with the customer beforehand as the out-of-service time is greater than the off-peak time interval. The following chart shows the direct personnel assigned to maintenance operations:

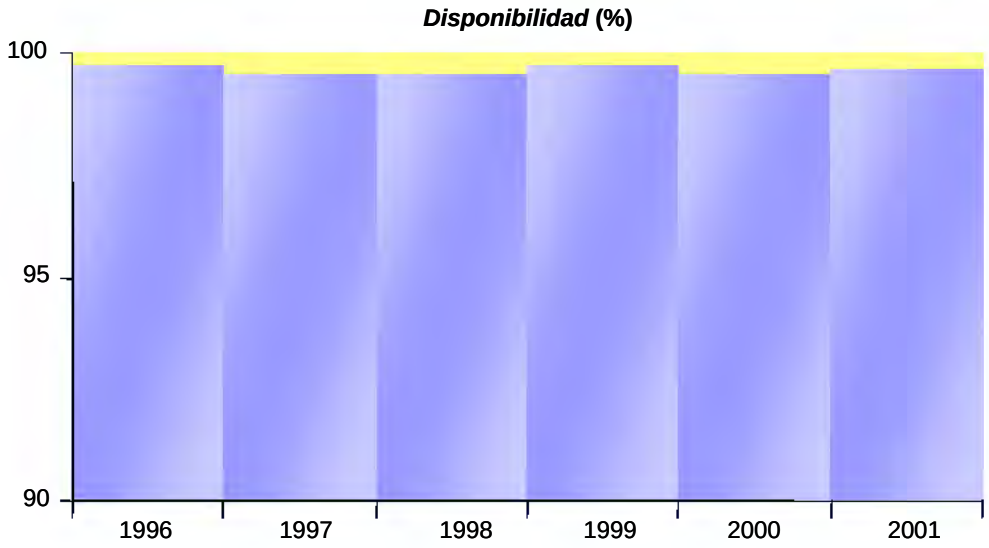


Morning shift *Central shift* *Afternoon shift*

There is also a small night guard duty shift (not shown on the graph).

Over the last few years, the availability figures achieved during peak morning hours, taking into account the fact that overhauls (major repairs performed at 1.200.000 kilometres and carried out by the Customer himself at his own workshops) are not included in this calculation, are as follows:

Availability %



1.2. PREVENTIVE MAINTENANCE

This type of maintenance aims at reducing the probability of failure in a system or equipment.

These maintenance operations shall be aimed at the reduction of the probability of failures in the vehicles. The following items shall be included:

1.2.1. Ordinary Maintenance (IS Visit)

This type of maintenance that was called "visit" by some railway operators, and it basically comprises one regular inspection in order to very that all items are in good condition. This is an ocular inspection in which, among others, the following checks are made:

- Check for broken, loose or deformed items.
- Check for faulty lighting
- General visual inspection of the vehicle.

Although this maintenance method main seem to be an easy procedure, it is paramount for safety, corporate image and comfort purposes.

In addition, this set of operations includes the functional checking of several equipment such as:

- Check of windscreen wipers and washer.
- Topping up of sanders if necessary. Verification of hoses and nozzle position.

- Check of flange lubrication operation.
- Check of brake functionality.
- Exterior washing.

The optimum cycle of this type of maintenance differs from train to train, but they can be within one week and one month.

1.2.2. Systematic Preventive Maintenance (Revisions PV-P4)

It consists on the visits made according to an established mileage based schedule. The schedule includes all standard control, cleaning, adjusting and replacement maintenance events. Performing these operations does not depend on the component condition, but on mileage or time interval identified for the event in question.

1.2.3. Preventive Maintenance on Condition (Revisions PV-P4)

This is the maintenance according to the condition or status of items. It consists on performing the appropriate maintenance events based on the equipment condition once the pre-established revision schedules have been exceeded. The purpose of the method is to change an item before it fails, but not before it is actually necessary. It is not based upon “predictions” or suppositions based upon historical data. What it does is to analyse how each item performs at each moment, i.e. it is individualized for each item.

Under the name “Maintenance Based on Condition” there are different methods of applying the final philosophy of the method. The following provides a brief description of each method:

- Predictive maintenance:

  Via the monitoring of different parameters the performance of the parts is controlled. This allows the fault to be detected before it occurs allowing the full service life of the parts to be reached. This is very useful when the life of the parts cannot be effectively determined and/or when the costs of the fault and/or the recovery of the part are very high. This method tends to minimise the downtime necessary for maintenance. Typical examples of the application of this method are the analysis of vibrations in axle end bearings, analysis of oils in engines and/or gear-units, the thermal control of bearings, etc.

1.2.4. Predictive Preventive Maintenance (Revisions PV-P4)

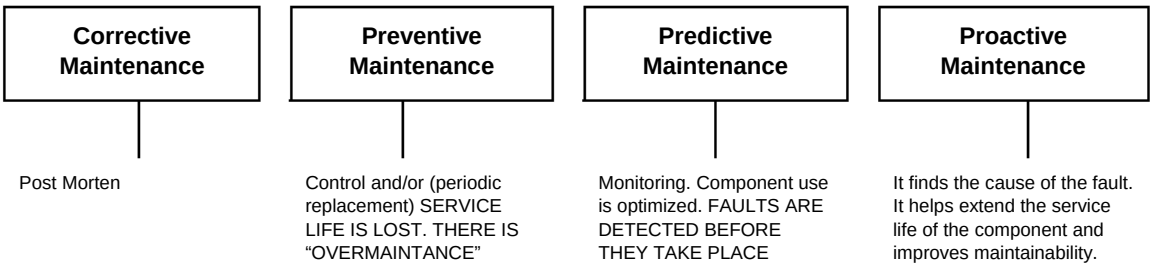
It consists on performing the appropriate maintenance events based on the equipment condition following the analysis of the evolution of significant parameters such as:

- Sampling analyses
- Individual measurements
- Visual controls (colour, thickness, etc.)

One of the preventive maintenance techniques which is currently used is the following:

- Proactive Maintenance:

  This is the next step to preventative maintenance. Analysis of the parameters must go beyond the early detection of faults: It searches for the cause of these faults and tries to correct them as well as finding ways of extending the service life of the parts and optimising their maintainability. This is an excellent tool which contributes to appropriate redesign and, the most important maintenance, pre-maintenance or design maintenance.



1.3. CORRECTIVE MAINTENANCE

This is based on component replacement following failure. 100% of the component service life is used but the failure occurs at any given moment and no prediction exists as to the failure moment. This is totally ruled out for safety items and other items where failure consequences are much higher in cost than the value of the component as such, as is the case of lubricants, where a failure can give rise to seizures due to lack of lubrication, damaged slip rings in motors due to lack of brush replacement, etc. Another very important factor is the loss of productivity or loss of revenue service until the component is repaired / replaced.

Current railway operation focuses on passenger safety and lack of train availability, or what is even worse, train service disruption, as the top priority factors to be considered. Another essential factor to be considered is assurance of maximum riding comfort.

Corrective maintenance comprises the following:

1.3.1. Palliative Corrective Maintenance or Failure Repairs

This is a provisional maintenance event performed by the driving operator or by the person responsible for maintenance using the onboard resources and according to the railway operation rules. This maintenance mode allows for failure tracing on the line, with the sole purpose of preventing track obstruction for all other vehicles.

Following the service action, the vehicle can resume the journey in a degraded mode commensurate with the failure and with or without passengers.

1.3.2. Curative or Repair Maintenance

This is a conclusive service action which is performed by a person in charge of maintenance for the failed equipment or device. Following the repair, the vehicle must recover all its original characteristics.

1.4. SMALL VANDALISM

Injuries caused by vandalism in vehicle interiorism, windows and cleaning of interior paintings will have an exemption of 1.345 ₤ per unit per year, when this exemption is exceeded, Infraco/tie will carry with this costs.

In this cases, the maintainer will support the reparations with the resources needed.

1.5. ACCIDENT AND GREAT VANDALISM

They will be excluded, break of windscreens of the cabin, external paintings and circulation accidents.

In case Infraco/tie requires it, the maintainer will present an offer for the realization of the excluded works, indicated in the previous paragraph.

2. FREQUENCY OF PREVENTIVE MAINTENANCE EVENTS

The time interval between two consecutive preventive maintenance events is variable and depend on the nature of the equipment to be maintained, and the number and the scope of the events are different in each revision.

The operations to be performed for preventive maintenance can be allocated to several days with different activities, and each one can be completed independently from the others. Thus, the customer has the equipment for operation during peak hours, and maintenance events take place only in off-peak hours, at night, on bank holidays etc. Operations that require more than one working day are divided such that one day bogies are checked, the following day the brakes etc. The unit is available at service peak hours and is checked at off-peak hours.

The Official Maintenance Plan shall include each maintenance specification from the manufacturers of the equipment or items incorporated in the vehicle. Based on said specifications, the scopes of the maintenance events and the appropriate applicable cycles shall be identified.

As a prelyminar edition, the following maintenance cycle is proposed:

REVISIONS							
REVISION	**IS**	**PV**	**P0**	**P1**	**P2**	**P3**	**P4**
Minimum	13 days	8.000 km	15.000 km	70.000 km	305.000 km	610.000 km	1.220.000 km
Medium	18 days	10.000 km	20.000 km	80.000 km	320.000 km	640.000 km	1.280.000 km
Maximum	23 days	12.000 km	25.000 km	90.000 km	335.000 km	670.000 km	1.340.000 km

Table 1: "Revision frequency"

The schedule assumes the yearly mileage of approximately 100.000 km/year/unit. If the yearly mileage differ greatly from the above figure, it shall be necessary to revise the frequencies of preventive events.

The complete maintenance plan proposed is presented in Appendix 1 – Maintenance Plan.

3. MAINTENANCE PLAN IMPROVEMENT

After a previous test period, CAF is used to change the Initial Maintenance Plan in most of maintenance activities managed. The earlier months of work are used to study the possible failures and the necessities of the previous Plan, and then it's improved progressively by means of a logic evolution, for the aim of minimising the total maintenance cost and optimising the trains availability.

This improved Plan has to be agreed with the Customer and the main suppliers (engine, HVAC, etc.), and the necessary information and criteria will be given to the Customer, for being able to judge CAF proposal for optimising the Maintenance Plan.

Following paragraphs are to explain briefly the way CAF is used to manage maintenance works, and the way the Maintenance Plan is improved.

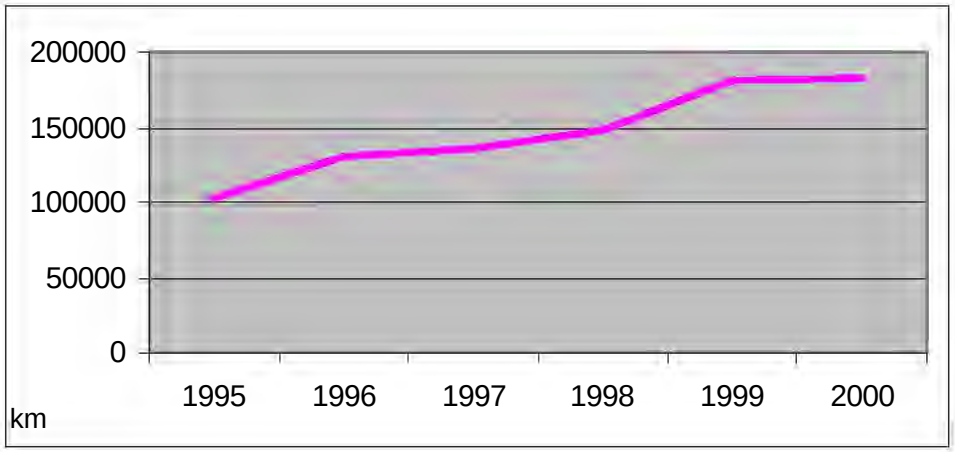
The improved maintenance plan will be based on CAF's vast experience as constructor and maintainer of rolling stock and on the modern technology set up for designing and building rolling stock.

Thus, in comparison to old maintenance philosophies, preventive maintenance work is spaced out as much as possible while being improved in quality. Moreover the old operations of protracted downtime disappear. The so-called overhauls and major repairs are replaced by lighter work, which is not only more spaced-out in time but less workload demanding.

The philosophy of LRUs (Line Replaceable Units) is also adopted as much as possible, i.e., the use of modules for as much assets as possible to make its training and repairing operations independent of the rest of the unit.

Some real examples of maintenance improvement got by CAF are available for Customer. Here it's shown an example of maintenance cycle extension, from the Móstoles Maintenance Workshop, in Spain, where RENFE (Spanish Railways) Commuter EMUs are being maintained by CAF, getting very profitable results. At the beginning of the undertaking of this maintenance, executed operations number was twice the nowadays number, so half of costs are being saved.

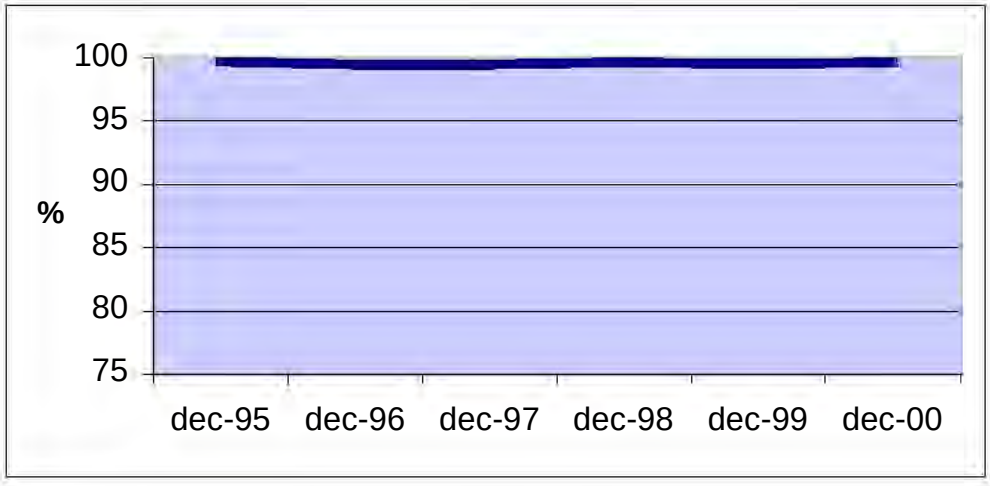
Reliability
(Mean Kilometres Between Failures, MKBF)



MKBF (year 2000) = 182 226 km.
Reliability improvement (years 1995 to 2000) = 78%
(*) Incidence: 5 or more minutes delay

Kilometres Between Incidences (5 minutes), years 1995 to 2000					
1995	1996	1997	1998	1999	2000
102 613	130 513	135 450	147 809	181 999	182 226

Peak Hour Availability



Availability (Dec. 2000, peak hour) = 99.66 %
Contract Requirements= 96.00 %

Peak hour Avilability (overhauls not included)					
1995	1996	1997	1998	1999	2000
99.75%	99.49%	99.50%	99.70%	99.53%	99.66%

4. COMPUTERIZATION OF MAINTENANCE

This involves the application of a tried and tested data processing system adopted by CAF (Computer Aided Maintenance) which allows the complete automated management of the Maintenance activity. On the one hand, it will ensure the mechanisation of the repetitive tasks and, on the other, easy handling of large amounts of data and their reduction to a suitable size that makes it possible for them to considered, discussed and analysed. In particular, it will fulfil four basic objectives:

- Saving of resources.
- Facilitating the work.
- Handling of large amounts of information.
- Adequate processing of this information.

In fact, the application of the Computer Aided Maintenance system will ensure:

- Improvement in the availability of the trains, by means of:
  - Rapid processing of the work orders.
  - Simulation-based planning aid.
  - Detection of recurring breakdowns.
  - Improvements in the co-operation of the disposition of stocks and personnel.
- Reduction of maintenance costs, by means of:
  - Reduction in the consumption of spare parts.
  - Identification of obsolescence of materials.
  - Optimisation of the replenishment and rationalisation of stores.
  - Optimisation of the capacities of the service, increase in efficiency.
  - Reduction of indirect workforce.
  - Analysis of profitability.
- Control of the results:
  - Analysis of the effectiveness of maintenance policies.

  - Structured technical and financial record.
  - Reliability.
- Improvement of the service:
  - Flexible adaptation to the production demands.
  - Coordination of efforts.
  - Reduction of administrative tasks.
- Systematisation of the work:
  - Simplification of the handling of information.
  - Simplification of the analysis.
  - Reliable and accessible information.

4.1. TECHNICAL MONITORING OF VEHICLES

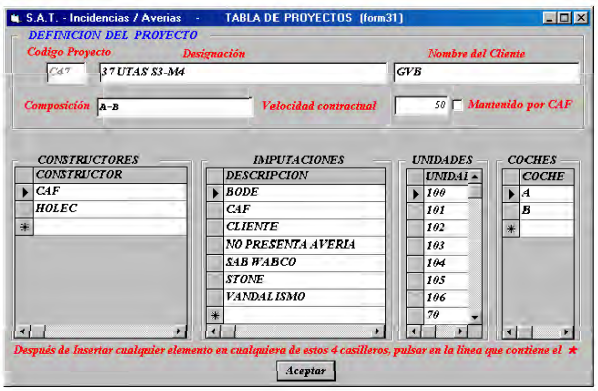
A computer system is available for the technical analysis of the functioning of the vehicles. Among other modules, it contains:

- Information about the current condition of the vehicles.
- Historical record of activities and costs.
- Modifications implemented.
- Consumption.
- Evolution of breakdowns.
- Evolution of quality parameters.

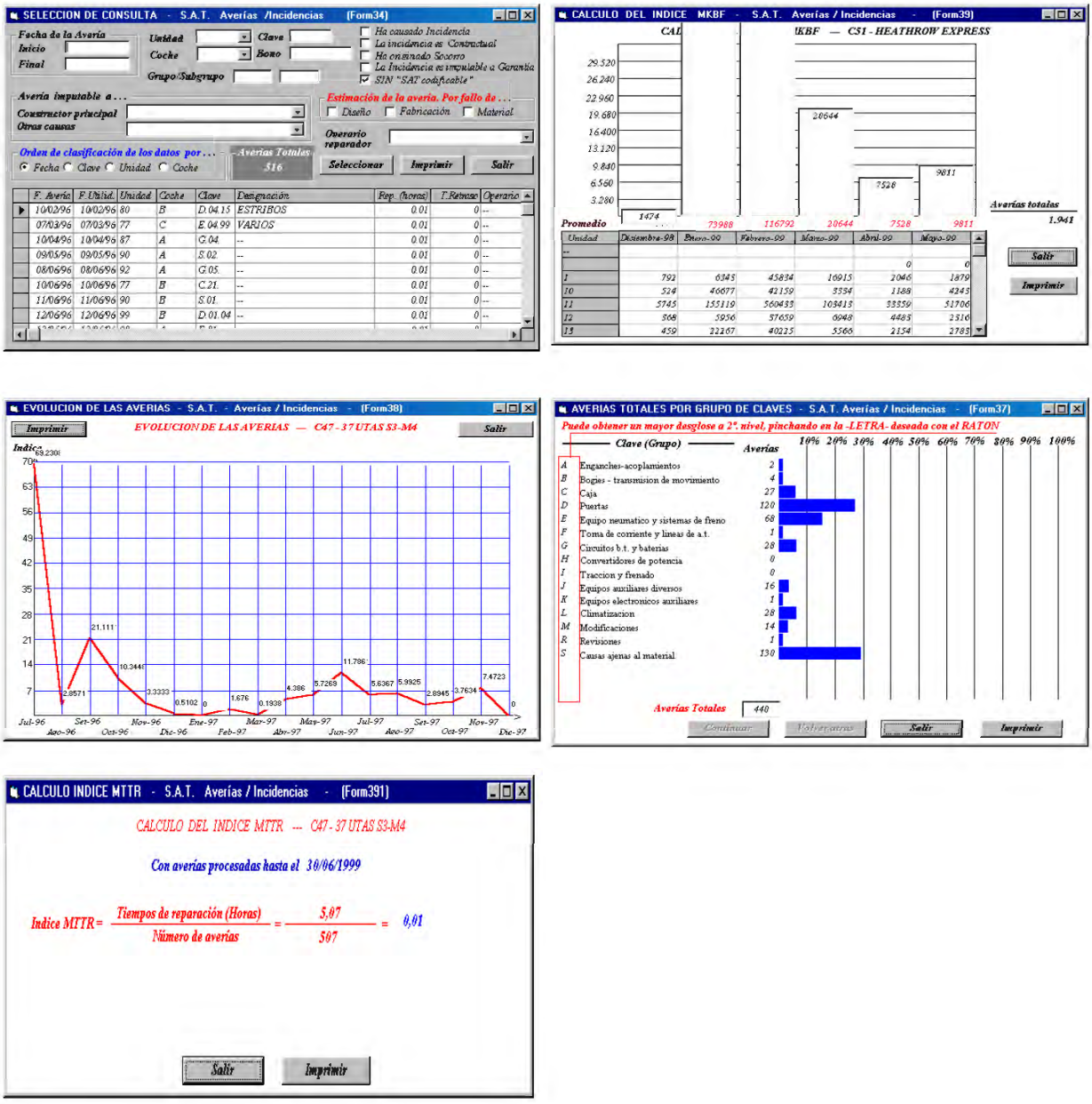
With the aim of achieving, by means of analysis:

- Reduction of breakdowns.
- Reduction of costs.
- Better planning of the workloads.
- Definition of preventative tasks.

The management of the information obtained through this system greatly facilitates the detection of areas in need of improvement, the balancing of tasks and the definition of the maintenance policy. Some examples of applications are shown below:



Project definition screen ***Breakdown recording screen***



Consultation Selection Screens, MKBF (Mean Kilometres Between Failures), breakdown trends, ABC of breakdowns by functional groups and general calculation of MTTR (Mean Time To Recovery)

The software chosen by CAF for all its projects is the Prisma II ® system, a Windows-based system with a tried and tested track record of 10 years on various types of railway maintenance. This not only generates the information on site, including, personnel and material management and administration but also analyses breakdowns and provides maintenance parameters; it also draws up documents that are periodically handed over to the customer.

The operator will also have access to computer files and databases, including those files involving on-line safety criteria such as wheel profile measurements, etc.

The Prisma II system is custom made for maintenance targets, centring on the reliability of the equipment, reduction of maintenance costs and ongoing improvement, all combined with a minimisation of indirect resources.

The functional aspects of the Prisma II system are those corresponding to each module making it up, which manage preventive, corrective and predictive maintenance. In particular these modules are:

Personnel module:

This includes all the necessary functions for controlling, identifying, deploying and evaluating both in-house and subcontracted human resources involved in maintenance work.

Workers are grouped by trade, category and team in the interest of improved monitoring. Types of working hours are defined, work is valued, organisation charts are obtained and availability determined for executing and timetabling of the work.

Material resources module:

This describes and groups the various non-human resources necessary for executing the maintenance tasks.

Contract module:

This serves for managing maintenance work contracted out, cross referenced with the equipment pool, while also controlling prices and tying in with orders and invoices, etc.

Assets module:

This describes and identifies with precision the fleet to be maintained, giving a description of its technology. It is tied in with the other modules, such as historical record, planning, structures, document management, production and timetabling.

Structures module:

Exploded and imploded drawings of structures with zoom, integrated with document management systems and connected to other modules.

Document management module:

This organises the whole list of plans and graphic diagrams for carrying out advanced maintenance.

Work order module:

This module serves for the creation of any necessary work orders, either manually or automatically. A study can be made of the whole historical record and plans referring to the element concerned. It is closely linked to the modules managing

notices, fault diagnoses, stores, preventive maintenance, predictive maintenance and historical records.

Preventive maintenance module:

This module allows the user to see the current state of maintenance of all vehicles whether there are any outstanding defects and what is being planned to bring the unit to its correct maintenance state.

Advanced planning module:

This combines advanced planning aid programmes for the user with a simple procedure by means of graphics, on-line simulation of necessary resources, isolation of charges and setting of priorities in terms of maintenance functions to allow planning of resources to take place.

Store and spares module:

This has all the services necessary for managing a medium-sized store, with control of location and inventories, historical records by material, incoming and outgoing movements, stock taking, purchasing needs.

Purchasing module:

Custom made for maintenance tasks, with facilities for managing suppliers and their historical record, suggestions of orders and suppliers (in connection with work orders and stores), it carries out open orders, manages associated documents, monitors orders, suppliers and invoices, etc.

Historical record module:

The historical record is automatically generated and facilitates all types of enquiries and reports on the analysis of costs and their distribution, graphs showing trends in working times, downtimes, etc., by multiple criteria, analysis of maintenance response, historical records unit by unit, analysis of efficiency and performance of human resources, analysis of defects, etc.

Predictive maintenance module:

With manual data input or specific connection, it defines control and alarm points, monitors the trend of variables and analyses trends affecting the historical record, interacting with the modules of preventive maintenance and breakdown diagnosis, automatically adjusting scales and procedures to dates or proposing actions of another type.

Breakdown diagnosis module:

This module is directed towards analysis of breakdowns and their root cause and analysis of epidemic failures to allow the maintenance procedure to be rapidly

changed to either in the short term compensate for the failures and in the long term to see if changed procedures can be made to eliminate the problem.

Ongoing improvement module:

This is geared towards the setting up of continual improvement systems by means of suggestions, and guarantees a simplified and detailed control of the trend of such systems, participation of personnel, etc., interrelated to work orders and maintenance tasks.

The computerised management of the maintenance tasks, as mentioned above, will allow the following:

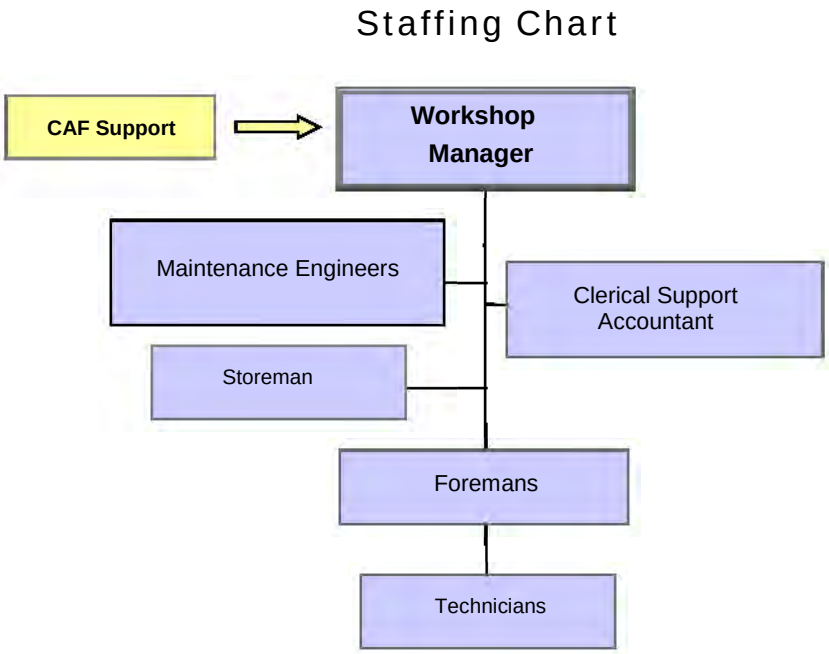
- Improvement of availability, by means of:
  - Planning aid by simulation.
  - Detection of repetitive breakdowns.
  - Improved co-ordination in the disposition of stocks and personnel.
- Reduction of maintenance costs by means of:
  - Reduced consumption of spare parts.
  - Identification of material obsolescence.
  - Optimisation of replenishment and rationalisation of stores.
  - Optimisation of service capacities, increase in efficiency.
  - Reduction of indirect labour.
  - Analysis of profitability.
- Records:
  - Analysis of the efficiency of maintenance policies.
  - Structured technical and economic historical record.
  - Reliability.
- Service improvement:
  - Flexible adaptation to production needs.
  - Coordination of efforts.
- Reduction of administrative tasks:

- Planning of work.
- Simplification of information handling.
- Simplification of analysis.
- Reliable, accessible information.

5. MAINTENANCE SUPPORT REQUIREMENTS

5.1. PERSONNEL

The following personnel structure has been envisaged, considering a single maintenance centre for maintenance operations:



This Chart includes the whole staff necessary to arrange the entire maintenance program.

5.2. PERSONNEL FUNCTIONS AND QUALIFICATION REQUIREMENTS

A short description of the maintenance personnel is made in this Section.

5.2.1. Workshop Manager.

Functions:

- Deciding and control the targets, let them to be reached.
- Assuring the rolling stock availability.
- Calculating the Workshop general budget.

- Letting the service requirements to be reached.
- Managing the materials, economic and human resources in the workshop.
- Managing the investments for maintenance.
- Deciding training programs, and rewards and punishments for workers.
- Assuring the implantation of Quality and Environment Programs.
- Supervising the management of spares.

Professional skills:

- Engineer or economist.
- Rolling stock maintenance knowledge, and relationship skills.
- Rolling stock maintenance experience.

5.2.2. Maintenance Engineer

Functions:

- Guarantying equipment availability
- Establishing Maintenance and Cleaning Plans, reviewing them and suggesting improvements.
- Suggesting solutions for technical or human necessities.
- Programming the maintenance operations schedule.
- Implanting the computer systems for maintenance, and supervising their utilization.
- Asking for updating of trains technical documentation.
- Asking for updating of workshop technical documentation.
- Facing the structural staff of maintenance.
- Supervising spares managing.
- Supervising fault analysis.
- Supervising components and dismounted equipment reparation.
- Writing and updating reliability, availability, maintainability and safety reports, and other reports asked for the Operator.

- Supervising of units faults, inspections and operations.
- Supervising and helping to implant the Quality Assurance Plan procedures.
- Supervising and helping to implant the Environmental Protection Plan procedures.
- Deciding and supervising receiving, storing and packaging criteria.
- Suggesting personnel changes, awards, punishments and training.
- Supervising cleaning works.

Professional skills:

- Electrical, electronic and/or mechanical engineer.
- Technical knowledge on railways, maintenance and computers.
- Experience in rolling stock maintenance.

5.2.3. Clerical Support Staff.

Functions:

- Personnel managing.
- Logistics responsible.
- Facing suppliers.
- Controlling of investments.
- Responsible of factoring and financial or administrative matters.
- Supervising the computer system.

Professional skills:

- Clerks.
- Experience with maintenance work control.

5.2.4. Chiefs - Foreman

Functions

- Supervision, management and control of the work performed by the different technical teams carrying out the Preventive Maintenance operations, making particularly sure that the Inspection Programmes envisaged are in fact carried

out, planning and resolving with sufficient time any reduction in the resources assigned to these tasks.

- Mediation between the technicians and the Head of the Maintenance Service.
- Ensure compliance with the Health and Safety Regulations and Occupational Risk Prevention Regulations.

Professional profile

- Vocational Training FP-II or higher
- Technical knowledge of railways.
-

5.2.5. Technicians.

Functions:

- Carrying out the scheduled inspections and operations.
- Keeping the safety rules.
- Informing the results of the inspections and operations.
- Collaborating with quality requirements.
- Suggesting training necessities.
- Polyvalence with pneumatic and mechanical knowledge.

Professional skills:

- Skilled technician.
- Railway technician knowledge.

APPENDIX 1 – PROPOSED MAINTENANCE PLAN

PRELIMINARY DAILY TRAM PREPARATION	
PARTS TO BE VISITED	**OPERATIONS TO BE PERFORMED**
Cab terminal	
	Check lamp box and terminal incidents
Cab controls	
	Check the correct operation of the cab controls, buttons.
Cab	
	Check the correct operation of the windscreen wipers.
	Check cab lighting, themal magnetic switch panel and console.
	Create communication with the public via the PIS.
	Check the correct condition and adjustment of the driver seat.
	Check the correct operation of the Dead Man Device, handle movement.
Automatic start up	
	Execute automatic start up (autotest) for doors, brake, video surveillance, traction.
Saloon	
	Check the saloon lighting turns on.
	Check the correct condition of the saloon seats, panels and hatchdoors..
Pneumatic Compressor	
	Check the water tightness of the pneumatic system, ensuring that the compressor turns off in less than Xmin.
Exterior lighting	
	Turn on the saloon, exterior, position, cross, long beam, intermittent, brake, beacon, gauge lights.
Cab air conditioning	
	Activate the cab HVAC and check its operation.
Traction	
	Connect a circuit breaker and apply traction for a few metres to check that the unit brake is released and that the traction equipment is OK.

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
1	**COUPLER**							
1,1	**Automatic Coupler**							
	Verify that the automatic coupler height is correct relative to rail top.				x	x	x	x
	Verify the maximum shifting of the automatic coupler.				x	x	x	x
	Verify correct coupling/ uncoupling						x	x
	Lubricate automatic coupler.						x	x
	Paint automatic coupler.						x	x
	Complete disassembly of the coupler - Change internal dampers - Change silentblocks							x
	Complete assembly with operation test							x
1.1.1	Coupler head							
	Verify visually the correct condition of the coupler head and the main axis as well as its fixings.				x	x	x	x
	Verify the position and correct condition of the uncoupling handle				x	x	x	x
1.1.2	Intermediate eyelet tube							
	Check condition of the intermediate tube, the cylindrical shat and the complete eyelet.				x	x	x	x
	Verify that both caps and the set washer are in place.				x	x	x	x
	Verify the correct tightening of the intermediate tube and coupler head fixing screw.				x	x	x	x
1.1.3	Stowable support trestle assembly.							
	Verify the joint between the intermediate tube and the traction bar.				x	x	x	x
	Verify the correct condition of the drive arm, the support trestle and the stowing handle, as well as their fixing hardware.				x	x	x	x
	Verify correct condition and fixing of top and bottom half-flanges.				x	x	x	x
	Verify that the coupler stows correctly as well as stowing angles by using he stowing handle.				x	x	x	x
1.1.4	Latching device							
	Verify that all items are in optimum condition.				x	x	x	x
	Verify that all items are correctly tightened and that threats are sealed with LOCTITE.				x	x	x	x
	Verify the correct operation of the latch device pulling the roped handle.				x	x	x	x
	Verify correct condition and fixing of the P.A.t. cables.				x	x	x	x
1,2	**Mechanical coupling between vehicles**							
	Complete disassembly of the coupling - Change internal dampers - Change silentblocks							x
	Complete assembly with operation test							x
1.2.1	Top joint							
	Verify the correct tightening of the fixing screw on the motor and trailer vehicle.			x	x	x	x	x
	Verify correct condition of lubricators and that they are in position			x	x	x	x	x
	Verify that the top joint is correctly lubricated.			x	x	x	x	x
	Inspect for the correct condition of the safety ring. Otherwise, replace it.			x	x	x	x	x
	Lubricate top joint.						x	x
1.2.2	Turning crown							
	Verify the correct tightening of the fixing screw on the trailer vehicle.			x	x	x	x	x
	Verify the correct tightening of the fixing screw of the joint pieces on the exterior crown.			x	x	x	x	x
	Inspect for the correct condition of gaskets. Otherwise, replace or lubricate.			x	x	x	x	x
	Lubricate the turning crown.						x	x
	Verify that the balls are in optimum condition. Otherwise, completely top up the balls filling.						x	x
	Clean the ball rolling tracks, the greasing holes and the gasket surfaces.						x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Replace the gaskets.						x	x
2	**BOGIE**							
2,1	**Motor bogie frame**							
	Visually check for cracks, fine cracks or deformation on structural items and welding beads. If necessary check by dye-penetrants.			x	x	x	x	x
	Verify by ultrasounds or magnetic particle inspection the condition of welding beads and spots CLASS B.						x	x
	Repair cracks of structural items and welding beads.						x	x
	Clean the motor bogie frame with pressurized steam and dry out with compressed air.					x	x	x
	Perform dimensional verification. Correct out of range dimensions by cool straightening or machining						x	x
	Paint the motor bogie frame.						x	x
2,2	**Carrying bogie frame**							
	Visually check for cracks, fine cracks or deformation on structural items and welding beads. If necessary check by dye-penetrants.			x	x	x	x	x
	Clean the carrying bogie frame with pressurized steam and dry out with compressed air.					x	x	x
	Repair cracks of structural items and welding beads.						x	x
	Verify by ultrasounds or electromagnetic particle inspection the condition of welding beads and spots CLASS B.						x	x
	Perform dimensional verification. Correct out of range dimensions by cool straightening or machining						x	x
	Paint the carrying bogie frame.						x	x
2,3	**Motor bogie**							
	Check the presence and correct condition of all fixing items for the headstocks.			x	x	x	x	x
	Visually check welds for cracks or deformation on headstock supports.				x	x	x	x
	Verify the fixing hardware tightening torque of headstock framing on brackets.				x	x	x	x
	Paint the headstock surface.						x	x
	Load the motor bogie on a press and verify heights.						x	x
	Verify the fixing hardware tightening torque of both headstock brackets on the motor bogie frame.				x	x	x	x
2.3.1	Bogie bolster							
	Verify by ultrasounds or magnetic particle inspection the condition of bogie bolster welding beads.						x	x
	Perform the dimensional verification of the bogie bolster.						x	x
	Paint the bogie bolster.						x	x
2.3.2	Guard-iron							
	Check for failures, cracks and deformation. Repair as necessary.			x	x	x	x	x
	Verify the tightening torque of the fixings of the motor bogie support on the axle-box. Tighten as necessary.				x	x	x	x
	Verify the tightening torque of each guard-iron mounts on the motor bogie supports. Tighten as necessary.				x	x	x	x
	Adjust the guard-iron and sand ejector pipes height.				x	x	x	x
	Paint the guard-irons.						x	x
2.3.3	Bogie electric installation							
	Verify that supports, clamps, fittings, hoses and fixing hardware are in place and in good condition.			x	x	x	x	x
2.3.4	Brake system hydraulic installation							
	Visually verify that flanges, clamps, joints, fittings, elbows, pipes, pressure taps and fixing hardware are in place and in good condition.			x	x	x	x	x
	Verify that joint fittings are secured correctly.			x	x	x	x	x
	Verify the brake system hydraulic circuit by applying 100 bar for 15 min. The head loss must be over or equal to 0.1 kg/cm2.			x	x	x	x	x
2.3.5	Installation of the flange lubrication system							
	Visually verify that all supports, clamps, joints, fittings, elbows, pipes and fixing hardware are in place and in good condition.			x	x	x	x	x
	Verify that joint fittings are secured correctly.			x	x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
2,4	**Carrying bogie**							
	Load the carrying bogie on a press and verify heights.						x	x
2.4.1	Electric Installation							
	Verify that supports, clamps, fittings, hoses and fixing hardware are in place and in good condition.			x	x	x	x	x
2.4.2	Brake system hydraulic installation							
	Visually verify that flanges, clamps, joints, fittings, elbows, pipes, pressure taps and fixing hardware are in place and in good condition.			x	x	x	x	x
	Verify that joint fittings are secured correctly.			x	x	x	x	x
	Verify the brake system hydraulic circuit by applying 100 bar for 15 min. The head loss must be over or equal to 0.1 kg/cm2.			x	x	x	x	x
2,5	**Sanders and sand ejectors**							
	Check the sand level within the reservoirs. Top up as necessary.	x	x	x	x	x	x	x
	Visually check for indents or cracks or on sanders and sand ejectors.			x	x	x	x	x
	Verify that threats and automatic fittings do not leak. Replace as necessary.			x	x	x	x	x
	Clean all sand ejector parts.					x	x	x
	Verify that sealing, sliding and guiding surfaces show no wear. Otherwise, make good by grinding.					x	x	x
	Verify diameter sizes of all piping outlets.					x	x	x
	Verify diameter size of the calibrated flow diameter.					x	x	x
	Verify correct air spray through nozzles.					x	x	x
	Paint sanders and sand ejectors.					x	x	x
	Change hoses							x
2,6	**Axle-boxes**							
	Verify visually the correct condition of axle-box caps, fixing and check for grease leaks.			x	x	x	x	x
	Verify the distance between the slide protection sensor head and the phonic wheel (on axle-boxes fitted with sensor).				x	x	x	x
	Check cap fixing hardware tightening torque, brake disks, adaptors, resilient wheels, fixing bowls and cables.				x	x	x	x
	Clean axle-boxes.				x	x	x	x
	Check bearing temperature. Apply grease.					x	x	x
	Change bearings							x
	Verify that labyrinths are not damaged and check for grease built-up.				x	x	x	x
	Check the condition of the contact disk (on axle-boxes with earthing device). Clean contact surface.						x	x
	Change contact disk							x
	Check, and replace as necessary, the earthing brushes (on axle-boxes with earthing device).					x	x	x
	Change earthing brushes							x
	Clean particles and waste oil.					x	x	x
	Check for wear or deformation on the contact surfaces.					x	x	x
	Verify colour.					x	x	x
	Check wear height.					x	x	x
	Paint axle-boxes.						x	x
2,7	**Primary suspension**							
	Visually verify the correct condition of primary springs. Replace as necessary.			x	x	x	x	x
	Verify the fixing hardware tightening torque of primary springs on the bogie frame, for motor cars A and B.				x	x	x	x
	Verify the tightening torque of fixing hardware of primary springs on their support plate and of support plates on the bogie frame, for trailer cars C.				x	x	x	x
	Verification of heights and adjustment.						x	x
	Static horizontal loading test.						x	x
	Vertical loading test.						x	x
2,8	**Secondary suspension**							

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Degrease and clean by pressurized steam the secondary suspension assembly. Dry out with compressed air.			x	x	x	x	x
	Measure the vertical distance from the rail to the highest point of the bogie bolster for the motor bogie, and to the underframe for the carrying bogie. Adjust as necessary.				x	x	x	x
2.8.1	Stop nut assembly							
	Verify the correct condition of the stop nut assembly items, particularly check for failures and deformation.			x	x	x	x	x
	Measure the vertical stroke under tare of the top face of the stop nut and the bogie frame support. Adjust as necessary.				x	x	x	x
	Verify the tightening torque and tighten as necessary.					x	x	x
2.8.2	Lateral stops							
	Verify the correct condition of the fixing hardware and the resilient body of the lateral stops on the motor and carrying bogie. Check for spalling and wear.			x	x	x	x	x
	Measure the lateral stroke of the lateral stops relative to the bogie bolster support for the motor bogie or to the underframe for the carrying bogie. Adjust as necessary.				x	x	x	x
	Verify the tightening torque of auto-locking nuts and tighten as necessary.						x	x
	Verify the resiliency characteristics of the lateral stops.						x	x
	Change lateral stops							x
2.8.3	Springs							
	Verify the correct condition of all items, and specifically check for cracks or deformation.			x	x	x	x	x
	Verify the correct condition of elastic pads and specifically check for spalling and wear.			x	x	x	x	x
	Verify the correct condition of the vertical stop and fastening on the top support..			x	x	x	x	x
	Measure the vertical distance between the vertical stops and lower supports. Adjust as necessary.				x	x	x	x
	Paint the springs.						x	x
2.8.4	Transversal and vertical dampers							
	Verify the correct condition fixing hardware and resilient items.			x	x	x	x	x
	Check for damper deformation.			x	x	x	x	x
	Check for oil leaks.			x	x	x	x	x
	Verify the tightening torque of auto-locking nuts and tighten as necessary.				x	x	x	x
	Change dampers							x
2.8.5	Drag links							
	Verify the correct condition of all fixing hardware and specially the elastic joints.			x	x	x	x	x
	Verify the fixing hardware tightening torque on the motor bogie, on the carrying bogie and on the underframe.						x	x
	Paint drag links and protect against corrosion the surfaces of holes.						x	x
	Change elastic joints							x
2,9	**Bogie rolling bridge-sets**							
	Verify the dimensions of the rolling bridge-set.					x	x	x
	Clean and degrease the rolling bridge-set of the trailing bogie with pressurized steam.					x	x	x
	Verify by magnetoscopy or ultrasounds the welds of the axle-box frames. Perform their dimensional verification.						x	x
	Paint the carrying bogie rolling bridge-set.						x	x
2.9.1	Wheel							
	Clean with steam and note surface flaws. If necessary, turn or change the wheels.			x	x	x	x	x
	Verify the clearance between the internal faces of the wheels. Disassemble and press fit them as necessary.					x	x	x
	Perform the geometric verification of wheels. If necessary, relathe them.					x	x	x
2,10	**Cow-catcher**							

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Check for indents, deformation etc. on the cow-catcher. Check paint condition.			x	x	x	x	x
	Verify correct tightening of the cow-catcher fastening on the carbody.			x	x	x	x	x
	Verify the correct condition of welds on the cow-catcher assembly.				x	x	x	x
	Verify and adjust the height of the cow-catcher at 115 mm over the rail.			x	x	x	x	x
2,11	**Flange lubrication**							
	Verify the operation of the lubrication system.		x	x	x	x	x	x
	Check for leaks on the compressed air circuit and on the lubricant circuit.		x	x	x	x	x	x
	Verification and adjustment of the position of the spray delivery piping.				x	x	x	x
	Verify the tightening torque of all fixing items.				x	x	x	x
	Verify the grease reservoir level and top up.		x	x	x	x	x	x
	Clean the conical tangent nozzles.				x	x	x	x
	Check grease level within the reservoirs. Top up as necessary and verify the correct lubrication operation.	x	x	x	x	x	x	x
	Change hoses and ejectors							x
2,12	**Motor bogie brake calliper**							
	Check for wear on the brake linings of the motor bogie brake callipers and verify the groove depth.		x	x	x	x	x	x
	Replace motor bogie brake calliper linings.		x	x	x	x	x	x
	Verify the mechanical system for release of the motor bogie brake calliper.		x	x	x	x	x	x
	Verify brake system cab indicators.		x	x	x	x	x	x
	Verify correct condition and tightening of the motor bogie brake calliper fixing items.			x	x	x	x	x
	Verify the loosening aid system.				x	x	x	x
	Drain the service brake enclosure and the brake/loosening aid enclosure of the motor bogie brake calliper.				x	x	x	x
	Replace motor bogie brake calliper oil.					x	x	x
	Verify the pressure in the motor bogie brake calliper.				x	x	x	x
	Dismount the motor bogie brake calliper, inspect its components and replace those needing replacement.						x	x
	Change joints and wear and tear parts							x
2,13	**Carrying bogie brake calliper**							
	Check for wear on the brake linings of the carrying bogie brake callipers and verify the groove depth.		x	x	x	x	x	x
	Replace carrying bogie brake calliper linings.		x	x	x	x	x	x
	Verify the mechanical system for release of the carrying bogie brake calliper.		x	x	x	x	x	x
	Verify brake system cab indicators.		x	x	x	x	x	x
	Verify correct condition and tightening of the carrying bogie brake calliper fixing items.			x	x	x	x	x
	Verify the loosening aid system.				x	x	x	x
	Drain the service brake enclosure and the brake/loosening aid enclosure of the carrying bogie brake calliper.				x	x	x	x
	Replace carrying bogie brake calliper oil.					x	x	x
	Verify the pressure in the carrying bogie brake calliper.				x	x	x	x
	Dismount the carrying bogie brake calliper, inspect its components and replace those needing replacement.						x	x
	Change joints and wear and tear parts							x
2,14	**Brake disk**							
	Verify that brake linings are positioned correctly, that they are not worn down to the limit and that they do not score the friction surface of the brake disks.			x	x	x	x	x
	Verify correct condition and tightening of the motor car friction disk fixing items.			x	x	x	x	x
	Inspect the correct condition and tightening of the protection plug on the brake disk hub oil injection hole for motor cars.			x	x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verify correct condition and tightening of the trailer car friction disk fixing items.			x	x	x	x	x
	Verify wear limits of brake disks for motor and trailer cars.			x	x	x	x	x
	Change friction disk							x
2,15	**Gear unit**							
	Verify that the gear-unit casing is in optimum condition.			x	x	x	x	x
	Check for leaks on the input and output sides of the gear unit.			x	x	x	x	x
	Check oil level on the oil filler cap.			x	x	x	x	x
	Oil change.					x	x	x
	Verify optimum condition and specially check for cracks on of V-seal rings, O rings, mating faces and rubber-metal items.				x	x	x	x
	Inspect and evaluate the quantity of abrasion particles on the magnet of the drain plug and filler cap. Clean as necessary.					x	x	x
	Clean the gear unit box.				x	x	x	x
	Inspect the ageing protection metal-rubber layer.				x	x	x	x
	Check for clogging of the inspection hole and clean if necessary. Verify correct condition of filtres and replace as necessary.				x	x	x	x
	Verify the fixings of the gear-unit on the motor bogie frame.					x	x	x
	Verify the correct position of screws on the casing, bearings and cap.						x	x
	Replace the resilient mounts of the gear unit on the motor bogie frame.						x	x
	Verify that the contact face of gear teeth is clean and crack free.						x	x
	Change gear box bearings							x
2,16	**Gear-unit - wheel-set coupling**							
	Verify correct condition and tightening of the joint screws on the gear-unit side with the gear-unit hollow shaft.				x	x	x	x
	Check for wear and damage of ball bearings.				x	x	x	x
	Check for wear and damage of coupling parts.				x	x	x	x
	Replace ball bearings.							x
	Clean the coupling.						x	x
3	**DOORS**							
3,1	**Cab door**							
	Verify the correct condition of the glazing of the cab door.	x	x	x	x	x	x	x
	Verify correct condition and operation of the lock.	x	x	x	x	x	x	x
3,2	**Passenger access doors**							
	Inspect for the correct condition of the following stops, and replace those defective:			x	x	x	x	x
	- Interlocking stop.			x	x	x	x	x
	- Telescope stop.			x	x	x	x	x
	- Door opening stop.			x	x	x	x	x
	- Synchronization bar stop.			x	x	x	x	x
	- Stroke limit stop.			x	x	x	x	x
	Check door reopening when obstacles are detected.	x	x	x	x	x	x	x
	Check door emergency opening operation.	x	x	x	x	x	x	x
	Check the equipment fixed on the tramway carbody:				x	x	x	x
	- Tightening torques of the interior and exterior emergency handles.				x	x	x	x
	- Fixing of electric cables.				x	x	x	x
	- Cable tension.				x	x	x	x
	- Locking verification.				x	x	x	x
	Check door automatic mode operation.	x	x	x	x	x	x	x
	Check door manual mode operation.			x	x	x	x	x
	Clean and replace the following items as necessary:							
	- Interlocking spring.						x	x
	- Top and lower arm of the synchronization bars.						x	x
	- Top and lower pulleys of the the synchronization bars.						x	x
	- Door opening, interlocking, telescope and stroke limit stops.						x	x
	Replace the following items as necessary:							
	- Door control operator electronic plate.						x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	- Interior emergency actuation handles.						x	x
	- Berne square key for unlocking the exterior emergency handle.						x	x
	- Electric cabling.						x	x
	- Unlocking mechanical cabling.						x	x
	Verify the closing of the traction loop.	x	x	x	x	x	x	x
	Verify the RS485 line cabling.				x	x	x	x
3.2.1	Door operator assembly							
	Verify the tightening torque of fixing items on bearing housings.				x	x	x	x
	Inspect for the correct condition stops, bearing housings and studs.				x	x	x	x
	Verify that linkage movements take place without abnormal impacts or noises.				x	x	x	x
	Check the condition and tension of the belt.			x	x	x	x	x
	Lubricate the bearing housings.				x	x	x	x
	Lubricate the telescope.				x	x	x	x
	Clean the guiding rail.						x	x
	Clean the telescope thoroughly.						x	x
	Replace the synchronization rod, interlocking rod, return rod joint, return pulley, belt, tension pulleys, telescope support, motor support bearings, gear motor, bearing housing and interlocking control contact.						x	x
3.2.2	Complete door leaves							
	Check that there area no cuts on the seals. Otherwise, replace them.			x	x	x	x	x
	Verify good contact of peripheral joints and central joints.			x	x	x	x	x
	Verify that the electric cabling does not interfere with mechanical movements.			x	x	x	x	x
	Slowly operate the door operator and verify that the guide items move by rolling and not by sliding.			x	x	x	x	x
	Verify correct lubrication of bearing housings and guides. Otherwise, lubricate them.				x	x	x	x
	Replacement of gaskets.						x	x
	Change bearings							x
4	**CAB**							
4,1	**Master controller**							
	Verify the interlocking of the traction/braking handle.	x	x	x	x	x	x	x
	Visually verify the correct condition of the toothed belt, toothed wheels and ball bearings.			x	x	x	x	x
	Visually inspect electric wiring and specially the safety terminals and the coil cable.			x	x	x	x	x
	Lubricate the master controller.			x	x	x	x	x
4,2	**Cab lining**							
	Visually verify the correct condition of traps and ceiling panels. Repair as necessary.		x	x	x	x	x	x
	Visually verify the correct condition of side panels. Repair as necessary.		x	x	x	x	x	x
	Verify the correct opening of trap doors and the condition of hinges and supports.					x	x	x
	General revision. Repair all panels, gaps, hinges and supports as necessary.						x	x
4,3	**Driver desk**							
	Visually verify the correct condition of all control items.	x	x	x	x	x	x	x
	Verify the correct operation of the control items.	x	x	x	x	x	x	x
	Externally clean the control console panels and the glazing of the circuit breaker cabinet.			x	x	x	x	x
4,4	**Windshield wipers**							
	Verify the level of liquid of the wipers of the fluid tank. Top up if necessary.		x	x	x	x	x	x
	Review the condition of the blade and verify its cleaning performance. Replace as necessary.		x	x	x	x	x	x
	Verify cleanliness of the fluid tank. Clean as necessary.				x	x	x	x
	Revise the electric connections of the motor and the pump.				x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verify the correct operation of the windshield wiper.	x	x	x	x	x	x	x
	Verify the correct condition and tightening of the fixing items of all pieces.				x	x	x	x
	Verify the tightness of the whole circuit.				x	x	x	x
	Lubricate the hinges and mobile parts.				x	x	x	x
4,5	**Driver seat**							
	Verify the correct operation of all movements.		x	x	x	x	x	x
	Verify that padded areas are not sagged. Otherwise, replace defective items.		x	x	x	x	x	x
	Verify the tightening torque of all fixing items.			x	x	x	x	x
	Fit in the control disk.				x	x	x	x
	Replace upholstery.						x	x
5	**CARBODY**							
5,1	**Interior lighting**							
5.1.1	Saloon lighting							
	Verify the operation of the saloon lamps. Replace as necessary.	x	x	x	x	x	x	x
	General revision of press buttons, lamps and cabling. Verify fixings. Replace damaged items.				x	x	x	x
5.1.2	Cab lighting							
	Verify the operation of the cab lamps. Replace as necessary.	x	x	x	x	x	x	x
	General revision of press buttons, lamps and cabling. Verify fixings. Replace damaged items.				x	x	x	x
5.1.3	Control console and cabinet lighting							
	Verify the operation of the saloon lamps. Replace as necessary.	x	x	x	x	x	x	x
	General revision of press buttons, lamps and cabling. Verify fixings. Replace damaged items.				x	x	x	x
5.1.4	Emergency lighting							
	Verify the operation of the saloon lamps. Replace as necessary.	x	x	x	x	x	x	x
	General revision of press buttons, lamps and cabling. Verify fixings. Replace damaged items.				x	x	x	x
5,2	**Glazing**							
	Visually verify the correct condition of all glazing. Replace defective glazing.	x	x	x	x	x	x	x
	Inspect the condition of the demister bands of the cab lower front glaze panel as well as electric wiring.				x	x	x	x
5,3	**Interior accessories**							
5.3.1	Fire extinguishers							
	Visually inspect fire extinguisher condition.	x	x	x	x	x	x	x
	Verify the identification label and the seal. NOTE: Replace the fire extinguishers according to the legislation in effect.	x	x	x	x	x	x	x
5.3.2	Sun visor							
	Verify correct condition and operation.	x	x	x	x	x	x	x
	Disassemble, clean, replace and verify.						x	x
5.3.3	Poignées							
	Verify the fixings and replace damaged items.			x	x	x	x	x
	Clean and local repairs.					x	x	x
	Disassembly and general repair with surface treatment on condition.						x	x
5.3.4	Half-partitions							
	Verify correct condition and cleanliness. Replace as necessary.	x	x	x	x	x	x	x
5,4	**Floor lining**							
	Visual inspection. Perform local repairs as necessary.			x	x	x	x	x
	Replace flooring lining as necessary.						x	x
5,5	**Exterior paint and inscriptions**							
	Verify the condition of exterior inscriptions.	x	x	x	x	x	x	x
	Verify the correct condition of the carbody exterior paint coat, specially check for graffitis and forbidden inscriptions. Otherwise wash the tramway, remove the graffitis and inscriptions and/or paint.						x	x
5,6	**Saloon lining**							

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Visually verify the correct condition of door traps and side panels. Repair as necessary.		x	x	x	x	x	x
	Visually verify the correct condition of ceiling panels. Repair as necessary.		x	x	x	x	x	x
	Visually verify the correct condition of side panels and trims. Repair as necessary.		x	x	x	x	x	x
	Visually verify the correct condition of the interior indicator lining. Repair as necessary.		x	x	x	x	x	x
	Verify the correct opening of trap doors and the condition of hinges and supports.					x	x	x
	General revision. Repair all panels, gaps, hinges and supports as necessary.						x	x
5,7	**Exterior signalling**							
5.7.1	Crossing and running lights							
	Visual inspection and operation verification.	x	x	x	x	x	x	x
	Verify drain space and water-tightness of headlights.				x	x	x	x
5.7.2	Marker lights							
	Verify the drain space and the water tightness of the marker lights for motor and trailer cars.				x	x	x	x
	Clean the exterior and interior of the light screens.				x	x	x	x
	Visual inspection and operation verification.	x	x	x	x	x	x	x
5.7.3	Flasher lights							
	Visual inspection and operation verification.	x	x	x	x	x	x	x
	Verify drain space and water-tightness of lateral and front flasher lights.				x	x	x	x
5.7.4	Gauge lights							
	Visual inspection and operation verification.	x	x	x	x	x	x	x
	Verify the drain space and the water tightness of the front gauge lights for motor and lateral gauge lights for motor and trailer cars.				x	x	x	x
	Visual inspection and operation verification.	x	x	x	x	x	x	x
	Verify drain space and water-tightness of brake lights.				x	x	x	x
5,8	**Fixed and tip-up seats**							
	Verify the condition of the shrouds, linings and trims. Repair breakage or cracks on the shrouds. Replace the defective item as necessary.	x	x	x	x	x	x	x
	Verify that the screws and and nuts are optimally tightened. Tighten as necessary.			x	x	x	x	x
	General revision of all seats, replace and/or repair defective items.						x	x
5,9	**Roof**							
	Clean water drain holes of the T.U. roof.	x	x	x	x	x	x	x
5,10	**Emergency materials**							
	Revision of the seal presence. Otherwise, verify any missing items.	x	x	x	x	x	x	x
5,11	**Bodyends**							
5.11.1	Motor car front bodyend							
	Visually verify correct condition of the front bodyend.	x	x	x	x	x	x	x
5.11.2	Motor car rear bodyend							
	Visually verify the correct condition of cabinets and panels.		x	x	x	x	x	x
	Verify the correct opening of trap doors and the condition of hinges and supports.			x	x	x	x	x
5.11.3	Trailer car bodyends							
	Visually verify the correct condition of panels.		x	x	x	x	x	x
5,12	**Cabling and Trap Doors**							
	Check the condition of cables, fittings and fixing hardware.		x	x	x	x	x	x
	Verify the condition of traps, fixing hardware, locks, supports, tie rods and hinges. Replace supports, tie rods and hinges as necessary.			x	x	x	x	x
	Verify the correct condition of the items that make up the lever assembly of the front trap door of A and B motor bogies.				x	x	x	x
	Paint the cables and trap doors on condition.						x	x
6	**HVAC EQUIPMENT**							
6,1	**CAB HVAC equipment**							

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Check for cracks and water drops on the tray of the evaporation zone. Clean the tray drain hole.			x	x	x	x	x
	Verify the fittings and condition of outlet pipes.			x	x	x	x	x
	Clean the electric connections of the HVAC unit components.			x	x	x	x	x
	Verify the tightening torque of fixing items of the HVAC unit on the ceiling.				x	x	x	x
	Verify the tightening torque of fixing items of interior components of the HVAC unit.				x	x	x	x
	Verify that all the HVAC equipment components are correctly connected.				x	x	x	x
	Verify the condition of HVAC unit structure, paint, gaps and specially mounts. Clean, paint and repair damages.				x	x	x	x
	Verify the operation of the HVAC equipment of the two cabs and the foot warmers.	x	x	x	x	x	x	x
6.1.1	Cooling circuit							
	Verify, while in operation, the flow of coolant on the sight-glass. Clean o replace the sight glass. Perform the partial charge of coolant as necessary.			x	x	x	x	x
	Verify the water-tightness of the cooling circuit after draining the coolant. Perform the total charge of coolant.					x	x	x
	Inspect fittings and welds of the piping and valve system. Partially top up as necessary.				x	x	x	x
	Check condition of tubes of the piping system.				x	x	x	x
6.1.2	Electronics							
	Use a PC to verify the operation of control electronics.			x	x	x	x	x
6.1.3	Condensation and evaporation coils							
	Clean the condensation coil with compressed air.				x	x	x	x
	Clean the evaporation coil with compressed air.					x	x	x
	Clean the condensation coil with pressurized water.				x	x	x	x
	Thoroughly clean the evaporation coil with pressurized water.					x	x	x
	Verify the tightness of the evaporation coil.				x	x	x	x
6.1.4	Discharge and condensation fans							
	Check the operation of the discharge and condensation fans. Verify that the connectors of the discharge and condensation fans on the electric panel operate correctly.			x	x	x	x	x
	Check the correct rotation direction of the discharge and condensation fans.			x	x	x	x	x
	Visually inspect electric wiring of discharge and condensation fans.			x	x	x	x	x
	Check the current rate drawn in the discharge and condensation fans.					x	x	x
	Check the bearings and drive blades of discharge and condensation fan motors. Replace if damaged.				x	x	x	x
6.1.5	Thermostatic check valves							
	Verify tightness of the thermostatic check valve.			x	x	x	x	x
	Verify tightness of the by-pass control valve.			x	x	x	x	x
6.1.6	Pressure switches							
	Verify operation and calibration of pressure switches.					x	x	x
6.1.7	Heating elements							
	Verify operation of heating elements.			x	x	x	x	x
	Verify wiring of heating elements.				x	x	x	x
6.1.8	Temperature probes							
	Verify the values picked up by temperature probes.			x	x	x	x	x
	Verify the electric wiring of temperature probes.				x	x	x	x
6.1.9	Electric boards							
	Visually verify the switches, contactors, relays, PCBs and other electric accessories on electric boards. Verify that switches and relays can be correctly connected and reset.			x	x	x	x	x
	Check the electric wiring of electric board items.			x	x	x	x	x
	Clean the electric wiring of electric boards.			x	x	x	x	x
	Verify electric connectors.				x	x	x	x
6.1.10	Temperature selector switch							

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verify operation of the temperature selector switch.			x	x	x	x	x
6.1.11	Trap doors and filters							
	Clean with compressed air the filtering cap of exterior and return air filters.			x	x	x	x	x
	Replace exterior and return air filters as necessary.		x	x	x	x	x	x
	Replace the dryer filter as necessary.				x	x	x	x
6.1.12	Discharge air conduits.							
	Clean air discharge conduits with compressed air.					x	x	x
6,2	**Cab HVAC unit compressors**							
	Verify oil level. Top up if necessary.				x	x	x	x
	Verify maximum and minimum operating pressures.				x	x	x	x
	Measure current drawn in by the compressor.				x	x	x	x
	Verify the correct condition of silent blocks and fixing hardware of these items.				x	x	x	x
	Clean electric terminals with compressed air.				x	x	x	x
	General revision of the compressor, disassembly, replace and/or inspection of all parts of the compressor and assembly.						x	x
6,3	**Saloon Ventilation Equipment**							
	Verify operation	x	x	x	x	x	x	x
	Tighten fan and motor fixing screws				x	x	x	x
	Verify and tighten connections on terminal bars. Test drawn in current.				x	x	x	x
	Verify bearing noise, replace as necessary.				x	x	x	x
	General revision, replacement of bearings, cleaning, verification and adjustments						x	x
7	**GANGWAYS**							
7,1	**Gangway corridor**							
	Check for wear gaps between the bolt-on frame items.		x	x	x	x	x	x
7.1.1	Bolt-on frames							
	Verify the water-tightness between bolt-on frames and bodyends.			x	x	x	x	x
7.1.2	Corrugated bellow							
	Verify that the steel cable is correctly tensioned pulling on the joint fabric.		x	x	x	x	x	x
	Inspect the correct position of the joint fabric of the corrugated bellow around the bolt-on frame or the rubber sections.		x	x	x	x	x	x
	Verify that the fabric does not have holes or cracks and that it is correctly positioned on the aluminium sections. Otherwise, repair the fabric.		x	x	x	x	x	x
	Check for failures of aluminium sections. Repair any damaged section.			x	x	x	x	x
	Clean the bottom of the bellow.				x	x	x	x
	Verify that water drain holes are not clogged.				x	x	x	x
7.1.3	Rubber sections							
	Verify that rubber sections do not have wear or failures. Otherwise, replace them.		x	x	x	x	x	x
7.1.4	Tensioning bands							
	Verify that tensioning bands do not have wear or failures. Otherwise, replace them.		x	x	x	x	x	x
	Verify that protections are fastened onto tensioning bands.		x	x	x	x	x	x
7.1.5	Fixing bolts and safety pins							
	Verify that fixing bolts and safety pins are not worn down. Otherwise, replace them.			x	x	x	x	x
	Verify that fixing bolts and safety pins are covered with protections.		x	x	x	x	x	x
7.1.6	Ceiling lining, false ceiling and lining skirts.							
	Verify that fixing strips on ceiling lining and on flooring skirts are correctly screwed-on.				x	x	x	x
8	**HIGH VOLTAGE ELECTRIC SYSTEM**							
8,1	**Pantograph**							
	Clean the pantograph.					x	x	x
	Apply a new paint base coat and a finish coat on the pantograph.						x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verify condition and tightening of the fixing items of all pantograph items.						x	x
	Visually verify the correct condition of the pantograph and pantograph components.	x	x	x	x	x	x	x
8.1.1	Frame							
	Visually check for cracks and deformation on the frame.				x	x	x	x
8.1.2	Pick-up shoes							
	Check for wear on carbon shoes. File down marks equal or above 5 mm.			x	x	x	x	x
8.1.3	Flexible couplings							
	Visually inspect flexible couplings.			x	x	x	x	x
	Check lubrication of flexible couplings. Lubricate as necessary.			x	x	x	x	x
	Verify the tightening torque of flexible couplings. Tighten as necessary.				x	x	x	x
	Replace flexible couplings as necessary.					x	x	x
8.1.4	Support springs							
	Verify contact pressure of support springs. Verify condition and tightening torque of springs. If necessary, adjust the contact pressure.			x	x	x	x	x
8.1.5	Top and lower arm							
	Visually check the condition of top and lower arms. Replace as necessary.				x	x	x	x
8.1.6	Top and lower tie bars							
	Visually check the condition of top and lower tie bars.				x	x	x	x
	Adjust top and lower tie bars.						x	x
8.1.7	Drive device							
	Inspect electric cables, connections, switches, supports, handles and emergency mechanism of the drive device.				x	x	x	x
	Check operation of the drive device and the emergency system.				x	x	x	x
8.1.8	Damper							
	Replace the stop of the swing lever.				x	x	x	x
	Check for damper deformation or cracks on the vibration damper. Replace damper pars or install a new damper as necessary.				x	x	x	x
	Replace the damper.						x	x
8.1.9	Coupler							
	Visually inspect coupler parts condition. Replace coupler pars or install a new coupler as necessary.				x	x	x	x
	Verify operation of the coupler.				x	x	x	x
8.1.10	Isolators							
	Replace the threaded element of the coupler.						x	x
	Check for cracks on the isolators. Replace as necessary.				x	x	x	x
8.1.11	Joints							
	Clean the isolators.				x	x	x	x
	Lubricate all pantograph joints.				x	x	x	x
	Change joints							x
8.1.12	Pan head and plate springs.							
	Inspect bearings and joints.						x	x
	Verify that plate springs bend without effort.				x	x	x	x
	Check for damages and corrosion on plate springs, springs support and mastic. Replace as necessary.				x	x	x	x
	Otherwise straps.				x	x	x	x
	Change bearings and joints							x
8.1.13	Bolt-on frames							
	Replace the lead horns.						x	x
8,2	**Circuit breaker**							
	Measure wear due to arcing. If necessary, replace the mobile contact, the top connection and connections on the left and right.				x	x	x	x
	Measure the distance between deflectors of the arc chute. Replace deflectors as necessary.				x	x	x	x
	Verify play between fork and pulley. If incorrect, replace the damper and add/remove shim washers.					x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Check the connections of the arc chute and the tightening torque of the fixing items.				x	x	x	x
	Clean the arc chute.				x	x	x	x
	Replace main contacts.						x	x
	Replace arc chute components.						x	x
	Replace the guiding assembly, the damper assembly, the damping block and the fork.						x	x
	Replace the I-max trip unit.				x	x	x	x
	Replace auxiliary switches.						x	x
	General inspection of the circuit breaker and the arc chute.						x	x
	Verify that the elastic rings are in correct position when the circuit breaker is brought to close position.				x	x	x	x
	Verify the condition of the washer (5, Figure C-3).				x	x	x	x
	Replace PUR washer and MVQ ring of the closing device.				x	x	x	x
	Replace the items of the closing device.						x	x
8,3	**Lighting Arrestor**							
	Verify correct condition of the lighting arrestor. Check for electric arcing signs.				x	x	x	x
	Verify the correct fixing of the lighting arrestor on the roof.				x	x	x	x
	Inspect the cable connecting the lighting arrestor to the pantograph and its fixing.				x	x	x	x
	Change cable connecting							x
	Clean the casing and the support flange of the lighting arrestor				x	x	x	x
8,4	**Brake Resistors**							
	Visually check the exterior of the brake resistors and their connection cables.				x	x	x	x
	Verify the correct fixing of brake resistors on the roof of the tramway.				x	x	x	x
	Clean brake resistors exterior with compressed air.				x	x	x	x
	Verify the ohmic value of brake resistors.				x	x	x	x
8,5	**Traction Inverter**							
	Verify the exterior condition of the box, specially the plate support bolts and exterior edges.				x	x	x	x
	Clean box ventilation grills.				x	x	x	x
	Verify the correct condition of cover hinges.				x	x	x	x
	Verify the correct tightening of control connectors and power conductor cable glands.				x	x	x	x
	Verify the correct fixing of the box on the tramway.				x	x	x	x
	Verify the correct condition of the earthing cable and fixing hardware.				x	x	x	x
	Inspect the interior:							
	Verify the box inlet and outlet conduit connections.					x	x	x
	Inspect the exterior aspect of the filter inductance.					x	x	x
	Inspect the exterior aspect of the filter capacitors.					x	x	x
	Verify the value of the precharge resistor and the discharge resistor.					x	x	x
	Verify that the control PCB is correctly installed in the rack.					x	x	x
	Verify the correct condition of the cabling.					x	x	x
	Verify the tightening torque of fixing items of interior equipment in the inverter box.					x	x	x
	Replace damaged or defective inverter box interior equipment.					x	x	x
	Replace fans:					x	x	x
	Main fans.					x	x	x
	Control PCB fan.					x	x	x
	Air recirculation fans.					x	x	x
	Replacement of rubber gaskets:					x	x	x
	For main fans.					x	x	x
	For the inverter top covers.					x	x	x
	For the lining of profiles subject to contact hazard.					x	x	x
	For all cable holding bars.					x	x	x
	Rehabilitate the inverter box by repairing and painting.						x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Rehabilitate the inverter box.						x	x
9	**LOW VOLTAGE ELECTRIC SYSTEM**							
9,1	**Static converter**							
	Visually check the condition of the static converter components.					x	x	x
	Inspect the fixings of all the static converter components.					x	x	x
9.1.1	Static converter box							
	Inspect the paint and the plate condition.				x	x	x	x
	Clean the top back cover located on the forced ventilation area.				x	x	x	x
	Replace the rubber gaskets on the converter cover.						x	x
	Clean the static converter box with sand blasting, prime it and paint it.						x	x
9.1.2	Branching							
	Check for warming, burns or failures on the connection tubing and PG fittings.					x	x	x
	Check the correct branching of the control and signalling connector.				x	x	x	x
	Inspect the HV input and 380 Vac output electric connections and interconnection connectors					x	x	x
	Inspect the fixings of the electric connections of all components of the static converter.					x	x	x
9.1.3	Fans and ventilation heat sink							
	Clean the ventilation heat sink with compressed air or with soapy water if necessary.					x	x	x
	Check for friction or abnormal noise by manually turning the fans					x	x	x
	Replace the fan of the ventilation heat sink.						x	x
	Replace the fans of the fan plate.						x	x
	Verify the operation of the fans by connecting them to a power source. No friction or abnormal noise should occur.						x	x
9.1.4	Resistors							
	Check for leaks and failures on the HV filter resistors.					x	x	x
	Check for oil leaks on the AC filter capacitors.					x	x	x
	Measure the capacity of the electrolytic capacitors.					x	x	x
9.1.5	Electronics							
	Verify the correct position of the PCBs on the control rack.					x	x	x
	Verify the condition of the inverter IGBT transistors.					x	x	x
	Test the electronic PCBs.						x	x
9.1.6	Coils							
	Verify the condition of the DC output filter coils and the HV input coil.					x	x	x
9.1.7	Transformers							
	Verify the condition of the output transformers and the voltage reference transformer.					x	x	x
9,2	**Battery**							
	Verify the polarity and the tightening of the connections between SRX-155 FR items.					x	x	x
	Verify the polarity and the tightening of the connections between exterior terminals.					x	x	x
	Verify electrolyte level. Check the battery charge voltage.				x	x	x	x
	Apply a new coat of Vaseline on the battery terminals.					x	x	x
	Verify the general condition of battery voltage.					x	x	x
	Clean the battery exterior with plain water.					x	x	x
	Verify the voltage and current of the charge system.					x	x	x
	Top up the battery with distilled or deionised water.				x	x	x	x
	Verify electric continuity.					x	x	x
	Perform a charge and discharge cycle. Check the battery capacity.					x	x	x
	Paint the battery box.						x	x
	Change battery							x
10	**TRACTION MOTOR**							
10,1	**Traction motor**							
	Verify the general condition of the motor, the fixings of the fan guard, and chic for indents and failures.				x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verify paint condition and repair damaged areas.				x	x	x	x
	Verify the tightening torques of component fixing screws.				x	x	x	x
	Verify the correct condition of the cabling and connections.				x	x	x	x
	Clean the traction motor exterior and the cooling tubes of the stator which can be accessed by removing the air inlet grill.				x	x	x	x
	Verify the stator insulation. If necessary, repair it with silicone resin.				x	x	x	x
	Lubricate the bearing on the non drive end.				x	x	x	x
	Verify the condition of the traction motor fixings onto the bogie frame and onto the gear unit.					x	x	x
	Inspect the rotor: seat of the motor side of the gear-unit-motor coupling, condition of the weld of the short-circuit bars-rings, seat of fans, tightening of balancing blocks.						x	x
	Verify the continuity of the resistors thermometers and the correct condition of the speed sensor.						x	x
	Replace the bearing.						x	x
	Clean the stator, the rotor and the cooling tubes of both. Dry out with air.						x	x
	Perform tests for dielectric strength, winding resistance, insulation resistance and ohmic resistance for the temperature probe.						x	x
10,2	**Traction Electronics**							
	Verification of the start of the treatment module and the study of abnormal situations.			x	x	x	x	x
11	**HYDRAULIC SET**							
11,1	**Motor Bogie Hydraulic Set**							
	Verify oil level on the motor bogie hydraulic set.		x	x	x	x	x	x
	Top up the motor bogie hydraulic set with oil.		x	x	x	x	x	x
	Verify the tightness of hydraulic connections.		x	x	x	x	x	x
	Verify the pressure built-up time of the motor bogie hydraulic set.		x	x	x	x	x	x
	Verify the time interval between two recouplings.		x	x	x	x	x	x
	Verify the correct condition and tightening of the fixing items of the motor bogie hydraulic set.			x	x	x	x	x
	Verification of the emergency brake application.				x	x	x	x
	Verification of the service brake application.				x	x	x	x
	Verification of the urgency brake application.				x	x	x	x
	Verification of the parking brake application.				x	x	x	x
	Verify the motor bogie hydraulic set pressurization when the motor is stopped and when the motor restarts.				x	x	x	x
	Verify the accumulation pressure on accumulators.				x	x	x	x
	Purge the motor bogie hydraulic set.					x	x	x
	Purge the hydraulic circuit.					x	x	x
	Change the motor bogie hydraulic set oil.					x	x	x
	Disassembly and cleaning of the motor bogie hydraulic set motor.				x	x	x	x
	Check the fouling of the motor bogie hydraulic set oil.				x	x	x	x
	Replace the air filter of the suction valve on the motor bogie hydraulic set.					x	x	x
	Replace the original filter.					x	x	x
	Replace the safety filter.					x	x	x
	Dismount the motor bogie hydraulic set, inspect its components and replace those needing replacement.						x	x
11,2	**Carrying Bogie Hydraulic Set**							
	Verify the oil level on the carrying bogie hydraulic set.		x	x	x	x	x	x
	Top up the oil of the carrying bogie hydraulic set with oil.		x	x	x	x	x	x
	Verify the tightness of hydraulic connections.		x	x	x	x	x	x
	Verify the pressure built-up time of the carrying bogie hydraulic set.		x	x	x	x	x	x
	Verify the time interval between two recouplings.		x	x	x	x	x	x
	Verify the correct condition and tightening of the fixing items of the carrying bogie hydraulic set.			x	x	x	x	x
	Verification of the emergency brake application.				x	x	x	x
	Verification of the service brake application.				x	x	x	x
	Verification of the urgency brake application.				x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Verification of the parking brake application.				x	x	x	x
	Verify the carrying bogie hydraulic set pressurization when the motor is stopped and when the motor restarts.				x	x	x	x
	Verify the accumulation pressure on accumulators.				x	x	x	x
	Purge the carrying bogie hydraulic set.					x	x	x
	Purge the hydraulic circuit.					x	x	x
	Replace the carrying bogie hydraulic set oil.					x	x	x
	Disassembly and cleaning of the carrying bogie hydraulic set motor.				x	x	x	x
	Check the fouling of the carrying bogie hydraulic set oil.				x	x	x	x
	Replace the air filter of the suction valve on the carrying bogie hydraulic set.					x	x	x
	Replace the original filter.					x	x	x
	Replace the safety filter.					x	x	x
	Dismount the carrying bogie hydraulic set, inspect its components and replace those needing replacement.						x	x
12	**PNEUMATIC SYSTEM**							
12,1	**Pneumatic System Separator Filter**							
	Purge the pneumatic system separator filter.	x	x	x	x	x	x	x
	Change filter							x
12,2	**Reservoir of accumulators**							
	Verify the accumulation pressure. ATTENTION: Perform this verification on the first operation week. If no nitrogen leak is detected repeat 4 month later.				x	x	x	x
	Verify the correct condition and tightening of the fixing items of accumulator reservoirs.			x	x	x	x	x
	Verify the nitrogen pressure on the accumulator reservoir.				x	x	x	x
	Inflate the accumulator reservoir.				x	x	x	x
	Replace the accumulator reservoir.							x
	Verify the correct condition of the accumulator reservoir joint fittings.				x	x	x	x
12,3	**Auxiliary Compressor**							
	Verify the correct condition of the auxiliary compressor, specially the noise level and lack of dirt.			x	x	x	x	x
	Verify the correct fixing of the auxiliary compressor silent blocks on the base and check fro cracks and deformation. Replace as necessary.				x	x	x	x
	Replace the suction filter of the auxiliary compressor.				x	x	x	x
	Replace the electric motor brushes.				x	x	x	x
	General revision.						x	x
12,4	**KM Type Pressure Switch**							
	Verify the opening and closing pressure of the pressure switch on the auxiliary compressor stop and restart cycles.				x	x	x	x
	Verify the tightness of the KM type pressure switch.				x	x	x	x
	KM type pressure switch replacement.						x	x
12,5	**Sanding control panel**							
	Verify tightness of the sanding control panel.		x	x	x	x	x	x
	Verify the operation of the sanding control panel. Replace the panel defective items as necessary.			x	x	x	x	x
	Clean the sanding control panel conduits.					x	x	x
	Thoroughly check the various items of the panel and specially their operation.					x	x	x
12,6	**Sanding Pressure Regulator**							
	Verify the tightness of pressure regulator. Replace as necessary.		x	x	x	x	x	x
	Verify the pressure regulator operation. Adjust or replace as necessary.			x	x	x	x	x
	Verify wear limits of valves, guide, piston and spring. Replace defective items.					x	x	x
13	**VIDEOMONITORING SYSTEM**							
	Clean the exterior and interior camera lenses.				x	x	x	x
	Clean the viewfinder of exterior and interior camera.			x	x	x	x	x
	Clean the screens indicator monitors.	x	x	x	x	x	x	x

Ref Operation	MAINTENANCE TASKS	Intervals						
		IS (15 days)	PV (10,000)	P0 (20,000)	P1 (80,000)	P2 (320,000)	P3 (640,000)	P4 (1,280,000)
	Focusing of exterior and interior camera lenses.			x	x	x	x	x
	Revision of exterior and interior camera fixings.			x	x	x	x	x
	Verification of the videomonitoring central unit control operation				x	x	x	x
	Opening and display of files.				x	x	x	x
	Verify the operation of acknowledged alarms and of the general system.	x	x	x	x	x	x	x
14	**EVENT RECORDING EQUIPMENT**							
	, Verify the insertion of connectors and connections.					x	x	x
	Change of batteries on the control unit board of the recording central unit.					x	x	x
	Data download.			x	x	x	x	x
15	**PASSENGER INFORMATION SYSTEM**							
	Verify the insertion of connectors and connections.					x	x	x
	Replace the information central unit control board battery.					x	x	x
	Verification of the bell operation.	x	x	x	x	x	x	x
	Verification of the operation of interior and exterior indicators and public address system.	x	x	x	x	x	x	x
16	**ON BOARD COMPUTER SYSTEM (OCBS)**							
	Verify the insertion of connectors and connections.					x	x	x
	Change of control board batteries on the the monitoring/control central units.					x	x	x

Part 3: Deliverables Programme

Milestone nunber	REF.	DELIVERABLE	DATE	REMARKS
M1 of TMA		Demonstration to tie of completion of review of Tram Supplier Tram design and Infraco Depot design to	**18/07/2008**	
		1- Maintainability in accordance with Tram Maintenance Specification and Depot plans	**18/07/2008**	
		2- Identification of all required spares and stock levels	**18/07/2008**	
		3- Identification of all special tools and test equipment	**18/07/2008**	
		4- Identification of all training needs	**18/07/2008**	
M2 of TMA		1- Finalisation of any changes agreed by tie to the Tram Maintenance Specification and maintenance plans in response to final Tram and Depot design	**28/11/2008**	
		2- Acceptance by tie of Tram Maintainer's safety management system	**28/11/2008**	
		3- Approval by the tie of Tram Maintainer's maintenance procedures and management procedures	**28/11/2008**	
M3 of TMA		Finalisation of maintenance team training and recruitment plan including competence assessment	**See below**	
M4 of TMA		Completion of mobilisation of maintenance team management and administrative staff to Depot	**See below**	
M5 of TMA		Delivery to the Depot of all Tram Maintainer procured spares, special tools, equipment, and all computer	**See below**	
M6 of TMA		Complete mobilisation of maintenance team technicians to Depot	**17/07/2010**	
M7 of TMA		1- Completion of maintenance team training in accordance with training and recruitment plan and all required competencies certified		
		2- Demonstration of no non-conformance to a Client audit to demonstrate readiness for the delivery of the Tram Maintenance Services		
	1	Recruit Fleet/Contract local manager	**24/07/2008**	
	2	Occupy depot offices	**11/12/2009**	
	3	Supply office equipment (desks/pcs/etc.)	**18/12/2009**	
	4	Supply road vehicle(s)	**18/12/2008**	
	5	Provide Maintenaance Manuals (TSA)	**28/08/2009**	
	6	Take over management of workshop area	**11/12/2009**	
	7	Provide tram Illustrated Parts List (TSA)	**29/01/2010**	
	8	First access to depot stores	**11/12/2009**	
	9	Equip stores with warranty spares	**18/12/2009**	
	10	Equip stores with normal tools	**18/12/2009**	
	11	Equip stores with consumable parts	**18/12/2009**	
	12	Recruit Technicians (first batch)	**02/10/2009**	
	13	Train Technicians (first batch)	**18/12/2010**	
	14	Equip stores with capital spares	**29/01/2010**	
	15	Accredit Technicians (first batch)	**29/01/2010**	
	16	MMS system configured, populated and running	**29/01/2010**	
	17	First tram passes commissioning tests	**29/01/2010**	
	18	Equip stores with Special Tools (TSA)	**30/07/2010**	
	19	Provide 5x trams for testing/training purposes	**29/01/2010**	
	20	Provide first monthly TramCo performance report to InfraCo	**26/03/2010**	
	21	Provide 10x trams for Phase 1a operation	**10/09/2010**	
	22	Last tram passess commissioning tests	**24/09/2010**	
	23	Provide 25x trams for full service operation	**23/12/2010**	
	24	Accreditation to EN 14001 (Environmental stds.)	**Depot commissioning + 1 year**	
	25	Accreditation to ISO9002 (Quality Stds.)	**Depot commissioning + 1 year**	

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

SCHEDULE 3

PAYMENT

PART 1: PERFORMANCE PAYMENT

1. SERVICES PAYMENT

1.1 Subject to the provisions of paragraph 3 of this Schedule 3 (*Payment*), the Services Payment due from the Client to the Tram Maintainer for each Reporting Period shall be established as follows:

$$SP = ((MaxPP - MinPP) \times OPP) + MinPP$$

In any event SP shall not be less that the Minimum Periodic Payment

where:

SP is the Services Payment;

MaxPP is the Maximum Performance Payment for the Reporting Period as calculated in accordance with paragraph 1.3;

MinPP is the Minimum Performance Payment for the Reporting Period;

OPP is the Overall Payment Performance as calculated in accordance with paragraph 1.2;

1.2 The Overall Payment Performance shall be calculated on the following basis:

$$OPP = \frac{TPP - MinOPP}{100\% - MinOPP}$$

save where OPP is a negative figure, in which case OPP shall be 0 (zero)

and where:

TPP is the Tram Punctuality Performance calculated in accordance with paragraph 2; and

MinOPP is the Minimum Overall Payment Performance.

1.3 The Maximum Performance Payment shall be adjusted in accordance with this paragraph 1.3 during the last Reporting Period and agreed before the thirteenth Reporting Period End Date of each year:

Maximum Performance Payment is based upon the planned total Tram kilometrage per year as set out in part 3 of this Schedule 3 (*Payment*) for the first three years and, thereafter, as advised by the Client ("**Planned Kilometrage**"). The Tram Maintainer will measure the total kilometrage travelled by the Tram fleet in each Reporting Period ("**Actual Kilometrage**").

1.4 Not Used

1.5 The Tram Maintainer shall evaluate the Tram Punctuality Performance in accordance with this Schedule 3 (*Payment*).

1.6 The Tram Maintainer's Representative shall meet with representatives of the Operator, the Client and **tie** every Operating Day at 09:00 (or such other time as all parties shall reasonably agree) to determine the responsibility for any Late Trams or other non Availability or poor performance of Trams. Where the parties cannot, acting reasonably, determine responsibility for any Late Tram or other non Availability or poor performance then **tie** shall, in its absolute discretion, determine responsibility, subject only to referral of such resolution to the Dispute Resolution Procedure.

1.7 If the Tram Punctuality Performance is less than 95% then the Tram Maintainer shall, within 10 Business Days prepare a rectification plan ("**Rectification Plan**") (to be agreed with the Client, acting reasonably) setting out a comprehensive analysis of the reasons why the Tram Punctuality Performance is less than 95% and setting out a detailed plan to improve performance to achieve a Tram Punctuality Performance of at least 98%.

1.8 The Tram Maintainer shall report the results of the evaluation for each Reporting Period to the Client on or before the 10th Business Day of the Reporting Period following the Reporting Period in which the evaluation was performed.

2. TRAM PUNCTUALITY PERFORMANCE

2.1 Tram Punctuality Performance shall be calculated on the following basis:

$$TPP = 1 - \left(\frac{LT + UHS + \left(\frac{DT}{4} \right) + (5 \times LLT)}{TMT + TMS} \right)$$

where:

TPP is the Tram Punctuality Performance;

LT is the total number of Tram Maintainer Late Trams in the Reporting Period;

UHS is the total number of Timetabled Hot Spares which were not made Available in accordance with Clause 9.2.1.1 in the Reporting Period;

DT is the total number of Defective Trams in the Reporting Period;

LLT is the total number of Late Last Trams in the Reporting Period;

TMT is the total number of Timetabled Monitored Trams in the Reporting Period; and

TMS is the total number of Timetabled Hot Spares in the Reporting Period.

2.2 Excusing Causes

In determining the number of Late Trams and Late Last Trams in any Reporting Period for the purposes of paragraph 2.1 above, the Tram Maintainer shall not include any Late Tram or Late Last Tram arising from an Excusing Cause that existed at the time the Tram arrived at (or departed) the relevant Monitoring Point. A report shall be submitted in accordance with paragraph 5.

3. SERVICES PAYMENT PENDING TRAM RELIABILITY

3.1 Until the earlier of:

3.1.1 the date when the final Tram is delivered and Reliability established (within the meaning given in clause 44 of the Tram Supply Agreement); and

3.1.2 the expiry of 13 full Reporting Periods from the commencement of Passenger Services,

the Services Payment due from the Client to the Tram Maintainer shall be established as follows:

SP = MaxPP x 0.9

where SP and MaxPP have the meaning given to those expressions in paragraph 1.1 of this Schedule 3 (*Payment*).

3.2 That element of the Maximum Performance Payment for each Reporting Period which is not payable pursuant to paragraph 3.1 above ("**Service Payment Retention**") shall be applied as follows:

3.2.1 The Service Payment Retention shall be paid to the Tram Maintainer in accordance with the provisions of Clause 42.2 (*Application for Services Payments*), which shall be construed mutatis mutandis, as if references therein to the date of the Interim Certificate was a reference to the date when the final Tram is declared Reliable provided that all Trams shall have been delivered Reliable not later than the expiry of 13 full Reporting Periods form the commencement of Passenger Services; or

3.2.2 If all Trams have not been declared Reliable by the expiry of 13 full Reporting Periods from the commencement of Passenger Services, the Service Payment Retention shall be retained by the Client and the Tram Maintainer shall have no further entitlement to it.

3.3 Upon the earlier of:

3.3.1 the payment of the Service Payment Retention to the Tram Maintainer pursuant to paragraph 3.2.1; or

3.3.2 the expiry of 13 full Reporting Periods from the commencement of Passenger Services,

the Services Payment provisions set out in paragraph 1.1 of this Schedule 3 (*Payment*) shall apply with full force and effect, and the provisions of this paragraph 3 shall cease to have effect (save in respect of the payment obligation or retention right set out in paragraph 3.2 above).

4. REVIEW OF PERFORMANCE BENCHMARKS

4.1 On or prior to the expiry of 13 full Reporting Periods after the commencement of Passenger Services and thereafter on or prior to each subsequent Performance Review Date, the Client shall review and determine the Minimum Overall Payment Performance benchmark and the Tram Punctuality Performance benchmark

("**Performance Benchmarks**") to apply for each Reporting Period from each such date to the next Performance Review Date.

4.2 In determining what Performance Benchmarks are to apply up to the next Performance Review Date under paragraph 4.1 above, the Client will have regard to the following:

4.2.1 the level of performance achieved by the Tram Maintainer in the preceding periods in relation to the then current level of Performance Benchmarks and the extent to which that level of performance is or is likely to be sustainable or to be improved upon by an efficient maintenance of the Trams using all reasonable endeavours to optimise the availability of those Trams;

4.2.2 the improvement in performance which the Tram Maintainer might reasonably be expected to achieve up to the next Performance Review Date; and

4.2.3 the effect (or likely effect) of any investments or improvements made, or due to be made which can reasonably be expected to affect the performance of the Tram Maintainer under this Agreement.

4.3 If the Tram Maintainer disagrees that any or all of the Performance Benchmarks determined by the Client under paragraphs 4.1 and 4.2 above are reasonable for the Client to determine then either of the parties may refer that issue for determination in accordance with the Dispute Resolution Procedure but until such revisions are agreed or otherwise determined in accordance with such Dispute Resolution Procedure, the Performance Benchmarks are assessed by the Client under paragraphs 4.1 and 4.2 above shall apply.

5. EXCUSING CAUSES AND PERFORMANCE REBATES

5.1 To the extent that:

5.1.1 a single Minor Defect or Major Defect on a Tram in passenger service has led to Tram Maintainer Late Trams continuing to be allocated in excess of one hour after the removal of the defective Tram back to the Depot where the Tram Maintainer has made a Hot Spare available to the Operator; or

5.1.2 one or more Excusing Causes have resulted in Tram Maintainer Late Trams being allocated which are due to an adverse impact on the performance of the Services by the Tram Maintainer under this Agreement of an Excusing

Cause or on the monitoring of such performance under part 1 of this Schedule 3 (*Payment*);

results in the Services Payment payable by the Client under part 1 of this Schedule 3 (*Payment*) in relation to a Reporting Period being less than it would otherwise have been by an amount equal to or greater than the Relief Threshold then, in order to claim a Performance Rebate from the Client in consequence thereof, then the Tram Maintainer shall:

(a) within 10 Business Days after the end of the relevant Reporting Period submit to the Client written notice:

(i) describing the effect that each such single defect or single defect or Excusing Cause has had on the performance of the Services or on the monitoring of such performance during that Reporting Period including full details of the nature of the single defect or Excusing Cause, the date of occurrence and its duration (or likely duration in the case of a single defect or Excusing Cause that is affecting Services at the date of the notice);

(ii) describing the effect of each such single defect or Excusing Cause or external factor on the allocation of Tram Maintainer Late Trams and Tram Maintainer Late Last Trams;

(iii) stating the Services Payment that would have been due from the Client in respect of that Reporting Period had the Excusing Cause(s) or external factor not occurred; and

(iv) stating the proposed Performance Rebate due from the Client assuming that the Actual Performance Level for Tram Punctuality Performance during any period affected by an Excusing Cause or external factor would have been no higher than the Actual Performance Level applying to those parts of the Reporting Period not affected by an Excusing Cause or external factor (or where the proposed Performance Rebate applies to a full Reporting Period, the previous Reporting Period not affected by an Excusing Cause or external factor);

(b) demonstrate to the reasonable satisfaction of the Client that:

(i) the Tram Maintainer could not have avoided the occurrence of the Excusing Cause(s) or the external factor or the consequences thereof by steps which it might reasonably be expected to have taken, without incurring material additional expenditure;

(ii) the Excusing Cause(s) or external factor caused the claimed effect on the allocation of Tram Maintainer Late Trams and Tram Maintainer Late Last Trams; and

(iii) the reduction in the Services Payment caused by the Excusing Cause(s) or external factor could not reasonably be expected to have been avoided or reduced by the Tram Maintainer taking all those steps which a reasonably experienced, efficient and competent maintenance contractor engaged in the same type of undertaking (comparable in size, scope and complexity to its activities in relation to this Agreement) would properly be expected to take if seeking in good faith and in accordance with Good Industry Practice to mitigate or recover the effect of the Excusing Cause(s), in particular by implementing any relevant contingency plans that the Tram Maintainer is required to put in place under this Agreement.

5.2 In the event that the Tram Maintainer has submitted a notice under paragraph 5.1(a) and complied with its obligations under paragraph 5.1(b) then:

(a) the Tram Maintainer and the Client shall endeavour to agree as soon as practicable the amount of the Performance Rebate (if any);

(b) the Tram Maintainer shall provide, as soon as reasonably practicable after any request by the Client, such further information and explanations as the Client may reasonably request;

(c) to the extent that the Client agrees to pay the proposed Performance Rebate, the Client shall pay to the Tram Maintainer the Performance Rebate or such part as it agrees to be payable, within 14 days of the later of the receipt by the Client of the notice to the Client under paragraph 5.1(a) and the receipt of all information and explanations requested under paragraph 5.1(b) that are reasonably required by the Client to verify its liability to make such payment;

(d) if the Client wishes to dispute all or part of the proposed Performance Rebate, it shall, within 28 days of receipt of the notice under paragraph 5.1(a) of part 1 of this Schedule 3 (*Payment*) (or if later within 28 days after receipt of any further information reasonably requested under paragraph 5.2 (b) of part 1 of this Schedule 3 (*Payment*)), submit written notice to the Tram Maintainer setting out the reasons why it disagrees with the notice submitted under paragraph 5.1 (a) of part 1 of this Schedule 3 (*Payment*) or considers that the Tram Maintainer has not complied with its obligations under paragraph 5.1(b) of part 1 of this Schedule 3 (*Payment*);

(e) to the extent that the Tram Maintainer and the Client are unable to agree the amount of the Performance Rebate (if any) within 28 days of days of receipt of the notice referred to in paragraph 5.2 (d) of part 1 of this Schedule 3 (*Payment*), then the determination of the applicable Performance Rebate may at the instance of either Party be referred for determination in accordance with the Dispute Resolution Procedure; and

(f) the Client shall pay any unpaid amount of the Performance Rebate subsequently agreed or determined to be payable within 14 days of the quantum of the Performance Rebate being agreed or within 14 days of receipt by **tie** of the determination thereof, together with interest in accordance with the rate set out in Clause 42.5 of this Agreement from the due date for payment of the Services Payment for the Reporting Period in relation to which the Performance Rebate is payable up to the date of payment.

5.3 The Client shall be entitled to deduct from any Performance Rebates payable by it under this paragraph 5 of part 1 of this Schedule 3 (*Payment*) any variable cost savings realised by the Tram Maintainer as a result of non-performance of the Services, particularly in the case of Excusing Causes having an extended duration.

PART 2: MOBILISATION MILESTONES

PAYMENT MILESTONES SCHEDULE CAPITAL

PAYMENT MILESTONES SCHEDULE CAPITAL MAINTENANCE

PAYMENT MILESTONES SCHEDULE- Mobilisation TMA								Payment Period				
No.	Milestone Description	Revised forecast date based on signature on 26th March 2008	Milestone Payment Proposed	£ of Total Milestone Payments	revised previous plus 30 days	revised forecast reporting period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.8 VAT Certificate to client	Clause 38 payment of Interim Certificate	Amount to be paid
	Mobilisation TMA		£2,275,806.32					within 3 business days	10 Business days from application date	7 days from issue of Interim certificate	20 business days from issue of VAT certificate	
	Contract Award	26/03/2008		£0.00	12/05/2008	Q2/2008-2009	24/05/2008	26/05/2008	11/06/2008	16/06/2008	16/07/2008	£0.00
M1	Demonstration to the of completion of review of Tram Supplier Tram design and Infraco Depot design to ensure	28/09/2008	13.95%	£317,474.58	06/11/2008	Q3/2008-2009	09/11/2008	12/11/2008	26/11/2008	03/12/2008	31/12/2008	£317,474.58
M2	Finalisation of any changes agree by be to the Tram Maintenance Specification and maintenance Specification and maintenance plans in response	28/01/2009	18.60%	£423,299.97	05/03/2009	Q3/2008-2009	31/03/2009	04/04/2009	18/04/2009	28/04/2009	28/05/2009	£423,299.97
M3	Finalisation of maintenance team training and recruitment plan including competence assessment	28/09/2009	18.60%	£423,299.97	06/11/2009	Q3/2009-2010	14/11/2009	18/11/2009	02/12/2009	09/12/2009	08/01/2010	£423,299.97
M4	Completion of mobilisation of maintenance team management and administrative staff to depot	28/12/2009	18.60%	£423,299.97	05/02/2010	Q3/2009-2010	05/02/2010	10/02/2010	24/02/2010	03/03/2010	31/03/2010	£423,299.97
M5	Delivery to the depot of all Tram maintainer procured spares, special tools,equipment and all computer	28/02/2010	13.95%	£317,474.58	05/04/2010	Q1/2010-2011	01/05/2010	05/05/2010	19/05/2010	26/05/2010	23/06/2010	£317,474.58
M6	Complete mobilisation of maintenance team techn can to Depot	28/09/2010	9.30%	£211,649.98	06/11/2010	Q3/2010-2011	13/11/2010	17/11/2010	01/12/2010	08/12/2010	05/01/2011	£211,649.98
M7	Completion of maintenance team training in accordance with training and recruitment plan and all required competences certified	05/12/2010	4.65%	£105,824.99	13/01/2011	Q1/2010-2011	05/02/2011	09/02/2011	23/02/2011	02/03/2011	32/03/2011	£105,824.99
M7	Demonstration of non conformance to advent audit to demonstrate readiness for the delivery of the tram maintenance services	30/11/2010	2.33%	£53,481.45	06/01/2011	Q3/2010-2011	03/01/2011	10/01/2011	26/01/2011	02/02/2011	02/03/2011	£53,481.45
CROSS CHECKS			100.00%	£2,275,806.32								£2,275,806.32

PART 3: MAXIMUM PERFORMANCE PAYMENT

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	**Milestone Description**	**Comments**	**Previous Forecast Date**	Revised forecast date based on signature on 12th May 2008	**Previous forecast reporting period**	revised forecast reporting period period	**Period End Date**	**Application for payment**	**Clause 38.6 Issue of Interim Certificate**	**Clause 38.6 VAT Certificate to client**	**Clause 38 payment of Interim Certificate**
	Maintence payment will start on commencement of shadow running and will apply to all 27 Trams.							within 15 business days	10 Business days from application date	10 Busines days from issue of interim certificate	20 days from issued of interim certificate
1	Commencement of Shadow Running	Employers Requirements Clause 23.10 Shadow Running. The evaluation of the shadow running is the pre operations test. Tram Inspector will confirm passing of test so payment can be made	30/09/2010	18/04/2011	07/2010-2011	01 - 11/12					
2	Maintenance payment number 01 year 1	Payment number 1 is due at the start of shadow running	30/09/2010	18/04/2011	07/2010-2011	01 - 11/12	30/04/2011	20/05/2011	03/06/2011	17/06/2011	23/06/2011
3	Maintenance payment number 02 year 1	Payment number 2 is due at end of first period after maintenance payment 1 was applied for		16/05/2011		02 - 11/12	28/05/2011	17/06/2011	01/07/2011	15/07/2011	21/07/2011

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of Interim Certificate
4	Maintenance payment number 03 year **1**	Payment number 3 is due at end of first period after maintenance payment 2 was applied for		13/06/2011		03 - 11/12	25/06/2011	15/07/2011	29/07/2011	12/08/2011	18/08/2011
5	Maintenance payment number 04 year 1	Payment number 4 is due at end of first period after maintenance payment 3 was applied for		11/07/2011		04 - 11/12	23/07/2011	12/08/2011	26/08/2011	09/09/2011	15/09/2011
6	Maintenance payment number 05 year 1	Payment number 5 is due at end of first period after maintenance payment 4 was applied for		08/08/2011		05 - 11/12	20/08/2011	09/09/2011	23/09/2011	07/10/2011	13/10/2011
7	Maintenance payment number 06 year 1	Payment number 6 is due at end of first period after maintenance payment 5 was applied for		05/09/2011		06 - 11/12	17/09/2011	07/10/2011	21/10/2011	04/11/2011	10/11/2011
8	Maintenance payment number 07 year 1	Payment number 7 is due at end of first period after maintenance payment 6 was applied for		03/10/2011		07 - 11/12	15/10/2011	04/11/2011	18/11/2011	02/12/2011	08/12/2011
9	Maintenance payment number 08 year 1	Payment number 8 is due at end of first period after maintenance payment **7** was applied for		31/10/2011		08 - 11/12	12/11/2011	02/12/2011	16/12/2011	30/12/2011	05/01/2012

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of Interim Certificate
10	Maintenance payment number 09 year 1	Payment number 9 is due at end of first period after maintenance payment 8 was applied for		28/11/2011		09 - 11/12	10/12/2011	30/12/2011	13/01/2012	27/01/2012	02/02/2012
11	Maintenance payment number 10 year 1	Payment number 10 is due at end of first period after maintenance payment 9 was applied for		26/12/2011		10 - 11/12	07/01/2012	27/01/2012	10/02/2012	24/02/2012	01/03/2012
12	Maintenance payment number 11 year 1	Payment number 11 is due at end of first period after maintenance payment 10 was applied for		23/01/2012		11 - 11/12	04/02/2012	24/02/2012	09/03/2012	23/03/2012	29/03/2012
13	Maintenance payment number 12 year 1	Payment number 12 is due at end of first period after maintenance payment 11 was applied for		20/02/2012		12 - 11/12	03/03/2012	23/03/2012	06/04/2012	20/04/2012	26/04/2012
14	Maintenance payment number 13 year 1	Payment number 13 is due at end of first period after maintenance payment 12 was applied for		19/03/2012		13 - 11/12	31/03/2012	20/04/2012	04/05/2012	18/05/2012	24/05/2012
15	Maintenance payment number 01 year 2	Payment number 1 year 2 is due at the end of the first period after maintenance payment 13 was applied for		16/04/2012		01 - 12/13	28/04/2012	18/05/2012	01/06/2012	15/06/2012	21/06/2012
16	Maintenance payment number 02 year 2	Payment number 2 year 2 is due at end of first period after maintenance payment 1 was applied for		14/05/2012		02 - 12/13	26/05/2012	15/06/2012	29/06/2012	13/07/2012	19/07/2012

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of Interim Certificate
17	Maintenance payment number 03 year 2	Payment number 3 year 2 is due at end of first period after maintenance payment 2 was applied for		11/06/2012		03 - 12/13	23/06/2012	13/07/2012	27/07/2012	10/08/2012	16/08/2012
18	Maintenance payment number 04 year 2	Payment number 4 year 2 is due at end of first period after maintenance payment 3 was applied for		09/07/2012		04 - 12/13	21/07/2012	10/08/2012	24/08/2012	07/09/2012	13/09/2012
19	Maintenance payment number 05 year 2	Payment number 5 year 2 is due at end of first period after maintenance payment 4 was applied for		06/08/2012		05 - 12/13	18/08/2012	07/09/2012	21/09/2012	05/10/2012	11/10/2012
20	Maintenance payment number 06 year 2	Payment number 6 year 2 is due at end of first period after maintenance payment 5 was applied for		03/09/2012		06 - 12/13	15/09/2012	05/10/2012	19/10/2012	02/11/2012	08/11/2012
21	Maintenance payment number 07 year 2	Payment number 7 year 2 is due at end of first period after maintenance payment 6 was applied for		01/10/2012		07 - 12/13	13/10/2012	02/11/2012	16/11/2012	30/11/2012	06/12/2012
22	Maintenance payment number 08 year 2	Payment number 8 year 2 is due at end of first period after maintenance payment 7 was applied for		29/10/2012		08 - 12/13	10/11/2012	30/11/2012	14/12/2012	28/12/2012	03/01/2013
23	Maintenance payment number 09 year 2	Payment number 9 year 2 is due at end of first period after maintenance payment 8 was applied for		26/11/2012		09 - 12/13	08/12/2012	28/12/2012	11/01/2013	25/01/2013	31/01/2013

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of Interim Certificate
24	Maintenance payment number 10 year 2	Payment number 10 year 2 is due at end of first period after maintenance payment 9 was applied for		24/12/2012		10 - 12/13	05/01/2013	25/01/2013	08/02/2013	22/02/2013	28/02/2013
25	Maintenance payment number 11 year 2	Payment number 11 year 2 is due at end of first period after maintenance payment 10 was applied for		21/01/2013		11 - 12/13	02/02/2013	22/02/2013	08/03/2013	22/03/2013	28/03/2013
26	Maintenance payment number 12 year 2	Payment number 12 year 2 is due at end of first period after maintenance payment 11 was applied for		18/02/2013		12 - 12/13	02/03/2013	22/03/2013	05/04/2013	19/04/2013	25/04/2013
27	Maintenance payment number 13 year 2	Payment number 13 year 2 is due at end of first period after maintenance payment 12 was applied for		18/03/2013		13 - 12/13	31/03/2013	20/04/2013	04/05/2013	18/05/2013	24/05/2013
28	Maintenance payment number 01 year 3	Payment number 1 year 3 is due at the end of the first period after maintenance payment 13 was applied for		15/04/2013		01 - 13/14	27/04/2013	17/05/2013	31/05/2013	14/06/2013	20/06/2013
29	Maintenance payment number 02 year 3	Payment number 2 year 3 is due at end of first period after maintenance payment 1 was applied for		13/05/2013		02 - 13/14	25/05/2013	14/06/2013	28/06/2013	12/07/2013	18/07/2013
30	Maintenance payment number 03 year 3	Payment number 3 year 3 is due at end of first period after maintenance payment 2 was applied for		10/06/2013		03 - 13/14	22/06/2013	12/07/2013	26/07/2013	09/08/2013	15/08/2013
31	Maintenance payment number 04 year 3	Payment number 4 year 3 is due at end of first period after maintenance payment 3 was applied for		08/07/2013		04 - 13/14	20/07/2013	09/08/2013	23/08/2013	06/09/2013	12/09/2013

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of Interim Certificate
32	Maintenance payment number 05 year 3	Payment number 5 year 3 is due at end of first period after maintenance payment 4 was applied for		05/08/2013		05 - 13/14	17/08/2013	06/09/2013	20/09/2013	04/10/2013	10/10/2013
33	Maintenance payment number 06 year 3	Payment number 6 year 3 is due at end of first period after maintenance payment 5 was applied for		02/09/2013		06 - 13/14	14/09/2013	04/10/2013	18/10/2013	01/11/2013	07/11/2013
34	Maintenance payment number 07 year 3	Payment number 7 year 3 is due at end of first period after maintenance payment 6 was applied for		30/09/2013		07 - 13/14	12/10/2013	01/11/2013	15/11/2013	29/11/2013	05/12/2013
35	Maintenance payment number 08 year 3	Payment number 8 year 3 is due at end of first period after maintenance payment 7 was applied for		28/10/2013		08 - 13/14	09/11/2013	29/11/2013	13/12/2013	27/12/2013	02/01/2014
36	Maintenance payment number 09 year 3	Payment number 9 year 3 is due at end of first period after maintenance payment 8 was applied for		25/11/2013		09 - 13/14	07/12/2013	27/12/2013	10/01/2014	24/01/2014	30/01/2014
37	Maintenance payment number 10 year 3	Payment number 10 year 3 is due at end of first period after maintenance payment 9 was applied for		23/12/2013		10 - 13/14	04/01/2014	24/01/2014	07/02/2014	21/02/2014	27/02/2014
38	Maintenance payment number 11 year 3	Payment number 11 year 3 is due at end of first period after maintenance payment 10 was applied for		20/01/2014		11 - 13/14	01/02/2014	21/02/2014	07/03/2014	21/03/2014	27/03/2014
39	Maintenance payment number 12 year 3	Payment number 12 year 3 is due at end of first period after maintenance payment 11 was applied for		17/02/2014		12 - 13/14	01/03/2014	21/03/2014	04/04/2014	18/04/2014	24/04/2014

PAYMENT MILESTONES MAINTENANCE SCHEDULE- 1 TO 27 Trams		CAF					Payment Period				
No.	Milestone Description	Comments	Previous Forecast Date	Revised forecast date based on signature on 12th May 2008	Previous forecast reporting period	revised forecast reporting period period	Period End Date	Application for payment	Clause 38.6 Issue of Interim Certificate	Clause 38.6 VAT Certificate to client	Clause 38 payment of interim Certificate
40	Maintenance payment number 13 year 3	Payment number 13 year 3 is due at end of first period after maintenance payment 12 was applied for		17/03/2014		13 - 13/14	31/03/2014	20/04/2014	04/05/2014	18/05/2014	24/05/2014

TRAM KM FORECAST

Year	2008	2009	2010	Year 1 2011	Year 2 2012	Year 3 2013
Mileage (km)	Nil	Nil	Nil	57037	70000	85000
Trams				27	27	27
Total				1540000	1890000	2295000

EDINBURGH TENDER

Tender Data	1.08	€/ km & Trams	100.000	km

KM Proposed			
1st year:	km & Trams (27 units)	57.037	km/Tram
2nd year:	km & Trams (27 units)	70.000	km/Tram
3rd year:	km & Trams (27 units)	85.000	km/Tram

	Year 2007	year 2008	Year 2009	Year 2010	year 2011	Year 2012	Year 2013
		CPI forcast estimate	CPI forcast estimate	CPI forcast estimate	CPI forcast estimate	CPI forcast estimate	CPI forcast estimate
KM	**Price € / km**	**3%**	**3%**	**3%**	**3%**	**3%**	**3%**
55001 - 60000	**1,3756**	1,4168	1,4593	1,5031	1,5482	1,5947	1,6425
60001 - 65000	**1,3187**	1,3583	1,3990	1,4410	1,4842	1,5288	1,5746
65001 - 70000	**1,2700**	1,3081	1,3473	1,3878	1,4294	1,4723	1,5164
70001 - 75000	**1,2278**	1,2646	1,3026	1,3416	1,3819	1,4233	1,4660
75001 - 80000	**1,1908**	1,2266	1,2634	1,3013	1,3403	1,3805	1,4219
80001 - 85000	**1,1582**	1,1930	1,2288	1,2656	1,3036	1,3427	1,3830

85001 - 90000	**1,1293**	1,1631	1,1980	1,2340	1,2710	1,3091	1,3484
90001 - 95000	**1,1033**	1,1364	1,1705	1,2056	1,2418	1,2791	1,3174
95001 - 100000	**1,08**	1,1124	1,1458	1,1801	1,2155	1,2520	1,2896

NOTE 1: If each tram or any tram does not exceed 55.000 km per year or is above 100.000 km per year, the parties shall meet and reach an agreement with respect to payment for that tram or trams.
NOTE 2: Unless the parties agree otherwise, the parties shall agree at the beginning of the year the payment forecast and the payments for periods 1 to 12 shall be made based on that forecast with a balancing payment to adjust for the actual at the end of period 13.
NOTE 3: For years 1 to 3 then the proportion of the €/km figure that is based upon costs incurred in £ sterling is 40%. Therefore 40% is not subject to currency fluctuation and shall be converted into £/km using the rate of 0.693 € per £1 sterling. The other 60% of the €/km figure shall be converted into £/km based on the prevailing exchange rate on the date of payment application unless the Parties agree to hedge the maintenance payments.
NOTE 4: For years 4 to 30 then the proportion of the €/km figure that is based upon costs incurred in £ sterling is 60%. Therefore 60% is not subject to currency fluctuation and shall be converted into £/km using the rate of 0.693 € per £1 sterling. The other 40% of the €/km figure shall be converted into £/km based at the prevailing exchange rate on the date of payment application unless the Parties agree to hedge the maintenance payments.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

SCHEDULE 4

REQUIRED INSURANCES

Part 1

Required Insurances

1. PROPERTY DAMAGE AND BUSINESS INTERRUPTION INSURANCE

Insured Parties:	The Tram Maintainer Any Tram Maintainer Party each for its respective rights and interests
Coverage:	All risks of physical loss, destruction or damage to the Insured Property from any causes not otherwise excluded. <u>Insured Property</u> All real and personal property used by the Insured Parties in connection with the activities forming the subject of this Agreement including but not limited to – Buildings Contents including improvements and alterations Machinery, plant, tools and equipment Stock including raw materials, work in progress and finished goods <u>Business Interruption</u> Loss of gross profit or revenue and increased costs of working following loss or destruction of or damage to property used by the Insured Parties in connection with the activities forming the subject of this Agreement
Limit of Indemnity:	The full replacement value of the Insured Property at the time of reinstatement The amount of gross profit or revenue for the maximum indemnity period First loss basis will be considered
Period of Insurance:	From the earlier or the Effective Date or the commencement of the activities forming the subject of this Agreement until completion of the works specified in the Agreement including the period of any defect period or extended warranty period or the expiry of the

	maximum indemnity period if later.
Territorial Limits:	Anywhere within Europe including whilst in transit by road or rail.
Exclusions:	loss of any of the Insured Property by theft or disappearance when the loss is revealed only in the course of an inventory undertaking the cost of making good wear and tear, gradual deterioration, etc. but not resulting damage war, invasion, acts of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection or military or usurped power nuclear risks sonic bangs
Extensions:[1]	The insurance must include the following minimum extensions: professional fees including surveyors', consulting engineers' and legal fees removal of debris temporary repairs automatic reinstatement of sum insured local authority Clause including European Union, railway inspectorate or Health and Safety Executive full value terrorism cover off-site storage property at maintainer's premises waiver of subrogation between insured parties non-invalidation utilities/suppliers/customers/property stored extensions denial of access extension subsidence, ground heave and landslip
Maximum Permitted Deductible:	GBP 40,000 each and every occurrence or all occurrences attributable to one source or original cause

[1] To be agreed no later than 12 months before the commencement of maintenance services

2. PUBLIC AND PRODUCTS LIABILITY INSURANCE

To be retained to cover liability risks not insured by the OCIP at the Tram Maintainer's own premises

Insured Parties:	**tie** Any **tie** Party The Tram Maintainer Any Tram Maintainer Party Any party forming the Client (should the Client not be **tie** or the Infraco) Any Client Party The Infraco each for its respective rights and interests.
Coverage:	To indemnify the insured parties against legal liability for damages or compensation arising out of bodily injury including death, illness, disease and psychiatric damage and direct loss of or damage to physical property including obstruction, interference, loss of amenities, nuisance, trespass, stoppage of traffic, infringement of light, easement or quasi easement, or any like cause happening during the Period of Insurance and arising out of or in connection with the activities of the parties in respect of the services forming the subject of the Agreement.
Limit of Indemnity:	£80,000,000 any one occurrence/unlimited in the aggregate (other than in respect of sudden and accidental pollution which shall be in the aggregate)
Period of Insurance:	From the earlier or the Effective Date or the commencement of the activities forming the subject of this Agreement until completion of the activities specified in the Agreement including the period of any defect period or extended warranty period.
Territorial Limits and Jurisdiction:	Worldwide
Exclusions:	fines, penalties, punitive or exemplary damages. war, invasion, acts of foreign enemies, hostilities (whether declared or not), civil war, rebellion, revolution, insurrection of military or usurped power. nuclear risks seepage, pollution or contamination unless caused by a sudden, unintended and unexpected happening. professional indemnity, but not excluding property damage or bodily

	injury. Professional indemnity exclusion is not to apply to activities in connection with the sale or supply of goods or products or the maintenance of Trams Exclusion of property in the Insured Party's care, custody or control is not to apply to Trams in their custody for the purposes of maintenance or overhaul or other activities forming the subject of this Agreement
Extensions:	cross liabilities Clause claimants' and defence costs and expenses in addition to limits of indemnity waiver of subrogation between insured parties Health and Safety at Work Act Clause the Insured includes the respective officers, directors, agents, servants and employees of an insured party contractual liability Clause non invalidation-non-vitiation Clause cover is to be primary with no contribution with any other policies effected by or on behalf of the insured parties Defective Premises Act liability Data Protection Act liability
Maximum Permitted Deductible:	GBP 25,000 each and every occurrence or all occurrences attributable to one source or original cause in respect of property damage (personal injury claims will be paid in full)

3. EMPLOYERS' LIABILITY INSURANCE

Insured Party:	The Tram Maintainer and any Tram Maintainer Party
Coverage:	To indemnify the Insured Party against legal liability for damages or compensation arising out of bodily injury including death, illness, disease and psychiatric damage sustained by any employee arising out of and in the course of the employee's employment caused during the Period of Insurance.
Limit of Liability:	Minimum limit of indemnity of GBP 10,000,000 any one occurrence or series of occurrences arising from one original cause or event, unlimited during the Period of Insurance.
Period of Insurance:	From the Effective Date for twelve months and thereafter each further twelve month period until the earlier of the end of the activities forming the subject of this Agreement or the date of termination of this Agreement.

Minimum Extensions:	The insurance must include the following minimum extensions: Contractual liability Claimant's and defence costs and expenses Indemnity to principals Cross liabilities Inclusion of directors, officers, partners and employees as Insured Parties Health and Safety legislation prosecution costs including costs of an appeal Unsatisfied court judgements Compensation for court attendance Definition of employee to include as a minimum persons under a contract of service or apprenticeship, labour only subcontractors, self-employed persons, labour masters or persons supplied by them, operators and drivers of hired in plant
Maximum Permitted Deductible:	NIL

4. COMPREHENSIVE MOTOR INSURANCE

Insured Party:	The Tram Maintainer **tie** or the Client (id not **tie**)
Coverage:	Comprehensive in respect of loss or damage to Own Vehicles. Legal Liability for death, injury, illness or disease or loss of or damage to Third Party Property.
Limit of Liability:	Own Damage - Market Value/Cost of Repairs Third Party: Bodily Injury - Unlimited. Property Damage by Cars £20,000,000 any one occurrence Property Damage by Commercial Vehicles £5,000,000 any one occurrence unlimited during the Period of Insurance
Period of Insurance:	From the Effective Date for twelve months and thereafter each further twelve month period until the date of expiry or earlier termination of the Agreement.
Minimum Extensions:	The insurance must include the following minimum extensions: Contingent motor liability Passenger indemnity and negligence of passengers Occasional business use by employees Unauthorised movement Indemnity to principals

Unauthorised use by employees

Maximum Permitted Deductible:	GBP 25,000 in respect of own damage GBP NIL in respect of third party liability

5. DIRECTORS' & OFFICERS' LIABILITY

Insured Party:	The Tram Maintainer (Insured Organisation) The Directors and Officers of the Tram Maintainer (insured Persons)
Coverage:	A – Directors' & Officers' Liability To pay on behalf of each Insured Person the direct loss to the extent they are not indemnified by the Insured Organisation B – Corporate Reimbursement To pay on behalf of the Insured Organisation the direct loss to the extent the Insured Organisation has indemnified the Insured Person
Limit of Liability:	GBP 10,000,000 any one occurrence and in the aggregate during any twelve month Period of Insurance
Period of Insurance:	From the Effective Date for twelve months and thereafter each further twelve month period until the expiry or earlier termination of the Agreement.
Minimum Extensions:	The insurance must include the following minimum extensions: Defence costs in respect of pollution and contamination Outside directorships Provision for run-off cover and extended claim reporting period on expiry Bilateral discovery period
Exclusions:	No insured versus insured exclusion in respect of claims outside the United States of America Bodily injury and property damage – "for" language to be used
Maximum Permitted Deductible:	A - GBP NIL in respect of Directors' & Officers' liability B - GBP 25,000 in respect of Corporate Reimbursement

Part 2

Broker's Letter of Undertaking

To: [THE EMPLOYER]

Dear Sirs

We confirm in our capacity as insurance brokers that the Required Insurances specified in Clause 29 (*Insurance*) and Schedule 4 *(Required Insurances)* of the Tram Maintenance Agreement dated ◆ between ◆ (the "**Tram Maintainer**") and Client as defined therein (the "**Agreement**") are, as at the date hereof, in effect in respect of the risks set out in the attached cover notes.

We have arranged the Required Insurances on the basis of the information and instructions given by the Tram Maintainer. We have not made any particular or special enquiries regarding the Required Insurances beyond those that we would normally make in the ordinary course of arranging the insurances on behalf of our insurance broking clients.

The confirmations set out in this letter are given by reference to our state of knowledge at the date hereof.

Pursuant to instructions received from the Tram Maintainer, we hereby undertake in respect of the interests of the Tram Maintainer and the Client in the Required Insurances referred to in the attached cover notes:

1. to use reasonable endeavours to have endorsed on each and every policy evidencing the Required Insurances when the same is issued, endorsements substantially in the form set out in Schedule 4 (*Required Insurances*) of the Agreement;

2. to advise the Client:

   2.1 promptly after receiving notice of any insurer's cancellation or suspension of any of the Required Insurances or receiving notice of the intended cancellation or suspension of any of the Required Insurances;

   2.2 promptly upon our receipt from the Tram Maintainer of any notice of any changes proposed to be made to the Required Insurances which, if effected, would result in a material reduction in limits or coverage (including in respect of extensions of cover) or in an increase in deductibles, exclusions or exceptions;

   2.3 of any default in the payment of any premium for any of the Required Insurances;

   2.4 at least twenty days prior to the expiry of any of the Required Insurances if we have not received written renewal instructions from the Tram Maintainer or if we receive written instructions to renew, to advise the Client of the details thereof; and

   2.5 on receipt of notice of any act or omission of the Tram Maintainer or any Sub-Contractor which will invalidate or render unenforceable in whole or in part, any of the Required Insurances;

3. no later than 10 days (in respect of certificates) and as soon as reasonably practicable in respect of policies and other documents, to supply you and/or your insurance advisors (or your or their authorised representative) copies of all placing slips, certificates, cover notes, renewal receipts and confirmations of renewal and payment of premiums and all policy documents (or

confirmation of the terms of such policy documents where such policy documents cannot be made available) in respect of the Required Insurances, or upon request, to make available to you the originals of any or all such documents held by us;

4. to disclose to the insurers any fact, change of circumstance or occurrence is material to the risks insured against under the Required Insurances;

5. to treat as confidential all information in relation to the Required Insurances supplied to us by the Tram Maintainer or any Sub-Contractor or the Client and not to disclose, without the written consent of the Client, such information to any third party other than the insurers under the Required Insurances, unless required to do so by law or any regulatory authority; and

6. to notify the Client as soon as reasonably practicable prior to our ceasing to act as brokers to the Tram Maintainer, unless impracticable because of circumstances beyond our control, in which case we shall notify the Client as soon as reasonably practicable upon becoming aware that we shall cease, or have ceased, so to act.

Where insurers wish any of the Required Insurances to be cancelled for reasons of non-payment of premium, we will request those insurers to give you a reasonable opportunity of paying such amounts outstanding before issuing notice of cancellation on behalf of such insurers.

The above undertakings are given subject to our continuing appointment for the time being as insurance brokers to the Tram Maintainer in relation to the Required Insurances concerned and the monitoring and handling of claims in relation to the Tram Maintainer, and our obligations set out in this letter shall automatically cease upon termination of our appointment.

For the avoidance of doubt all undertakings and other confirmations given in this letter relate solely to the Required Insurances. They do not apply to any other insurances and nothing in this letter should be taken as providing any undertakings or confirmations in relation to any other such insurance that ought to have been placed or may at some future date be placed by other brokers.

This letter is given by us on the instructions of the Tram Maintainer and with the Tram Maintainer's full knowledge and consent as to its terms as evidenced by the Tram Maintainer's signature below.

This letter shall be governed by and shall be construed in accordance with Scots Law and any dispute as to its terms shall be submitted to the exclusive jurisdiction of the courts of Scotland.

Yours faithfully

.....
For and on behalf of (Insurance Broker)

.....
For and on behalf of (The Tram Maintainer)

Part 3

Insurance Questionnaire

ALL CLASSES OF REQUIRED INSURANCES	
Do your current insurance policies comply with the full scope of cover required for each class of Required Insurance as detailed in the Schedules? **If NO, please identify the class of Required Insurance and provide full details**	NO Under the Liability - The limit is less than the limit required - Clauses not known like: - Health and safety at work at clause - Non vitiation non invalidation clause - Defective premises act liability - Policy is not primary - Data protection act liability
Where your current insurance policies do not comply with the full scope of the Required Insurances	
(a) can your policies be amended or extended and if so please provide cost implications, or	**Limit could be increase but we shoul need to quote to know the cost implication.** **Data protection could not be included.This is not possible under the Spanish liability wordings**
(b) please provide reasons why the full scope of insurance as detailed in the Schedules will not be carried	As explained before

1.0	PROPERTY DAMAGE AND BUSINESS INTERRUPTION – PREMISES RISKS	
1.1	**Name and Address of Insurers**	**ZURICH**
1.2	**Policy Number(s)**	**91831347910**
1.3	**Renewal Date**	**JANUARY 1st**
1.4	**Limit of Indemnity**	£ 103.217.472
1.5	**Does the policy include the full range of extensions specified in the schedule of required insurances? If not, please advise which are not covered.**	YES
1.6	**What excesses apply?**	£ 10.119,39 - PROPERTY DAMAGE

	48h. BUSINESS INTERRPTION
2.0 PUBLIC AND PRODUCTS LIABILITY	
2.1 Name and Address of Insurers	**ZURICH**
2.2 Policy Number(s)	**458323**
2.3 Renewal Date	**JANUARY 1st**
2.4 Limit of Indemnity in respect of (please state whether any one occurrence or in the aggregate)	
a. Public Liability	£ 80.954.880 PER CLAIM
b. Products Liability	£ 80.954.880 PER CLAIM AND AGGREGATE
c. Subsidence, collapse, vibration or removal or weakening of support	CLAUSE NOT KNOWN
d. Fire and explosion	£ 80.954.880 PER CLAIM
e. Pollution	£ 80.954.880 PER CLAIM
f. Any other "inner" limit	£ 8.095.488 PER CLAIM – TENANT´S LIABILITY
2.5 Is the policy subject to a heat warranty or condition of any sort and/or any height or depth restrictions? If so attach copies.	NO
2.6 Is Contractual Liability included?	YES
2.7 Does the policy include liability in respect of damage to premises temporarily occupied for the performance of works therein or thereon?	YES
2.8 Does the policy include a cross liability provision and a General Indemnity to Principals/Main Contractors Clause?	YES
2.9 What limitations apply in respect of cover for loss or damage due to defective design, workmanship or materials?	NONE
2.10 What excesses are applicable?	£ 10.119,36
2.11 Is the policy extended to include financial loss?	YES (If yes state limit £ 1.349.248)
2.12 Does the policy include liabil ty for the acts of subcontractors?	YES

2.13	Does the policy respond to judgements made outside UK?	YES
2.14	Is the cover subject to any material exclusions or limitations? (If YES please supply copies thereof?	NO
2.15	Have you ever undertaken or are you currently undertaking work on behalf of Network Rail or British Airports Authority? (If YES please state which or both?	
2.16	Does your policy extend to include the minimum insurance requirements of either Network Rail or British Airports Authority? (If YES please state which or both)	
2.17	Does the policy include the Trams whilst in your care, custody and control for maintenance activities?	YES
3.0	EMPLOYERS' LIABILITY – NOT APPLICABLE IN SPAIN (SOCIAL SECURITY).When CAF has to hire employees locally,then an Employers´Liability policy will be issue locally according with your legislation.	
3.1	Name and Address of Insurers	
3.2	Policy Number(s)	
3.3	Renewal Date	
3.4	Limit of Indemnity	£
3.5	Is the policy subject to a heat warranty or condition of any sort and/or any height or depth restrictions? If so attach copies.	
3.6	Is Contractual Liability included?	
3.7	What is the definition of "employee"?	
3.8	Does the policy include a cross liability provision and a General Indemnity to Principals/Main Contractors Clause?	
3.9	Does the policy respond to judgements made outside UK?	
4.0	COMPREHENSIVE MOTOR INSURANCE – NOT APPLICABLE	
4.1	Name and Address of Insurers	

4.2	Policy Number(s)	
4.3	Renewal Date	
4.4	Limits of Indemnity in respect of (Please state whether any one occurrence or in the aggregate)	
	a. Third Party Property Damage	£
	b. Third Party Bodily Injury (if any)	£
4.5	Is the policy subject to a Deductible or excess? If so please provide details.	
4.6	Are there any restrictions on usage or types of drivers? If so please provide details.	
5.0	DIRECTORS' and OFFICERS' LIABILITY INSURANCE	
5.1	Name and Address of Insurers	CHUBB
5.2	Policy Number(s)	82001331
5.3	Renewal Date	APRIL 10TH
5.4	Limits of Indemnity (Please state whether any one occurrence or in the aggregate)	£ 10.792.000 PER CLAIM
5.5	Is the policy subject to a Deductible or excess? If so please provide details.	53.960 £ IN U.S.A.
5.6	Is cover subject to any material exclusions or limitations? If YES so please provide details.	
5.7	Please confirm what the provisions of your policy are in respect of – Extended reporting period Bodily injury and property damage exclusion Insured versus insured claims	

6.0	SELF –INSURANCE ARRANGEMENTS	
6.1	Please advise if any of the abcve classes of business are completely self-insured and provide details of the arrangements (self-insurance funds, captive insurers etc)	
6.2	Please advise if significant elements or levels of the covers required are self-insured and provide details of the arrangements	

DECLARATION:

We confirm that the foregoing details are accurate and that the above policies are subject to no special terms, conditions and exceptions other than those referred to above. We also confirm that all premiums due to date have been paid.

Signed.....

Position INSURANCE BROKER - CAF

Name IVAN MATARUSA

Date 2006/9/26

For and on behalf of

AON GUL 7 CARVAJAL

.....

.....

This form should be completed by your Insurers or your Registered Insurance Brokers ONLY.

The above information is agreed on behalf of the Candidate by the Candidate's Authorised Representative:

Name.....

Signed.....

For and on behalf of.....

Date 27/ Sept. /2006

PROPOSED OPERATIONAL PHASE COVER SPECIFICATION PREPARED 10TH JANUARY 2008

This is a proposed cover specification only. Cover has not been effected and the details in this proposed cover specification are subject to change based on insurers' willingness to provide the full scope of cover proposed.

INSURED:

i. **tie** Limited

ii. The INFRACO Maintainer and TRAMCO Maintainer

iii. The Co-contractors and/or Sub-Contractors of any tier including the maintenance contractors

iv. Transdev Edinburgh Tram Limited as operator

v. Local authorities and utility providers as required

vi. Transport Edinburgh Limited (TEL)

vii. Any other party having an insurable interest (and not mentioned above) to the extent that the Insured (i) is required by contract or agreement to provide insurance to such parties

viii. The Scottish Ministers/Scottish Executive, Transport Scotland and City of Edinburgh Council

ix. Network Rail

x. Alfred McAlpine Infrastructure Services Ltd

each for their respective rights and interests.

Business Interruption cover –
Insured (i), (iv) and (vi) only

PERIOD:

From the commencement of passenger operations and annually renewable thereafter.

INTEREST:

The operation and maintenance of the Edinburgh Tram Network including all ancillary and associated works and activities related therewith of whatsoever nature.

Section 1 – Material Damage & Business Interruption

All risks of loss or destruction of or damage to the Insured Property by any cause not excluded including resulting Business Interruption

Section 2 – Third Party Liability

To indemnify the Insured against all sums (including claimants' costs and expenses) arising out of:

(a) death or bodily injury to or illness or disease or psychiatric damage suffered by any person;
(b) loss or damage to property;
(c) obstruction, interference, loss of amenities, negligence, nuisance, trespass, stoppage of traffic, infringement of any easement or right of air, light, water or way or any like cause

happening or consequent upon a cause occurring during the Period of Insurance and arising out of or in connection with the Project

SUMS INSURED/LIMITS OF INDEMNITY:

Section 1 – Material Damage/Business Interruption

Material Damage

Reinstatement value of the Property Insured

Business Interruption

The intention is to arrange Business Interruption cover to pay for the shortfall in revenue due to Insured Damage which all the Insured Parties would expect to obtain from the Edinburgh Tram Network Project. This cover would be expected to indemnify the Insured Parties irrespective of any contractual set-offs or restrictions as between the Insured Parties.

Cover would include increased costs of working plus additional increased costs of working if available from the insurance market

Maximum indemnity period - 12 months

Section 2 – Third Party Liability

£100,000,000 any one occurrence
£100,000,000 any one occurrence and in the aggregate in respect of products liability
£100,000,000 any one occurrence and in the aggregate in respect of pollution or contamination
Unlimited liability for bodily injury as required under the Road Traffic Acts

EXCESS:

Section 1 Material Damage & Business Interruption

Material Damage

£50,000 each and every occurrence and/or series of occurrences increasing to
£250,000 each and every occurrence in respect of overhead power cables and associated supporting structures
£500,000 each and every occurrence in respect of tram breakdown and track subsidence cover

Business Interruption

14 days or £50,000 each and every occurrence whichever is the greater

Section 2 Third Party Liability

£10,000 each and every occurrence and/or series of occurrences in respect of

property damage

TERRITORIAL LIMITS: Anywhere in the United Kingdom (including inland transits and off-site storage) but worldwide in respect of Section 2

CONDITIONS:

Section 1 Material Damage/Business Interruption

- professional fees including surveyors', consulting engineers' and legal fees
- removal of debris
- temporary repairs and expediting expenses
- automatic reinstatement of sum insured

- local authority clause including European Union, railway inspectorate or Health and Safety Executive
- off-site storage
- property at supplier's premises
- waiver of subrogation between insured parties
- non-invalidation and non-vitiation
- severability of interest
- tram breakdown and track subsidence – limit £2M in the aggregate during the Period of Insurance
- track subsidence
- driver/operator error
- 72 hour clause
- reinstatement basis of settlement
- suppliers extension
- utilities extension
- denial of access
- notifiable diseases, food and drink poisoning, defective sanitation
- property hired in
- temporary loan
- capital additions

- trace and access
- metered water and fire extinguishing media
- replacement locks
- machinery breakdown
- damage to landscaped area by emergency services
- clearance of drains
- temporary removal
- plans and documents
- minimisation of loss
- escalation
- buildings for demolition
- computer data
- reinstatement basis of settlement
- Damage to utility suppliers' property
- alternative accommodation

Section 2 Third Party Liability

- Consumer Protection Act or Health and Safety at Work Act Prosecution Defence Costs

- Food Safety Act
- Defective Premises Act
- Data Protection Act
- Motor Contingent Liability
- Movement of Obstructing Vehicles
- Compensation for Court Attendance
- Employees' and Visitors' Effects
- Indemnity to Principal

- Professional Visits Worldwide
- Leased and Rented Premises
- Servicing of Vehicles
- Libel and Slander

- waiver of subrogation between insured parties
- contractual liability clause

- non invalidation-non-vitiation clause
- severability of interests clause
- munitions of war

PRINCIPAL EXCLUSIONS:

Section 1 – Material Damage & Business Interruption

- Fines or penalties
- Motor vehicles (other than trams), water craft
- Wear and tear and corrosion but not resulting damage
- Inventory losses
- Deductible
- Change in water table, temperature
- Collapse or cracking of buildings
- Date recognition
- Fraud or theft by employees
- Normal bedding down of structures
- Machinery and computer breakdown
- Track subsidence, heave, sinkage or misalignment unless caused by fire, lightning, earthquake, storm, tempest, explosion and water damage
- Damage to excavations
- War, invasion, acts of foreign enemies, hostilities (whether declared or not), civil war, rebellion, revolution, insurrection of military or usurped power.
- Nuclear risks
- Seepage, pollution or contamination unless caused by defined perils.
- Sonic boom

Section 2 – Third Party Liability

- Employers' Liability
- Liability arising out of the use of, ownership or possession of any motor vehicle other than trams or plant as a tool of trade
- Liability arising out of the use of, ownership or possession of any aircraft or waterborne craft
- Asbestos exclusion
- Liquidated damages

- Fines, penalties, punitive or exemplary damages
- War, invasion, acts of foreign enemies, hostilities (whether declared or not), civil war, rebellion, revolution, insurrection of military or usurped power.
- Nuclear risks
- Seepage, pollution or contamination unless caused by sudden, unintended and unexpected happening.
- Professional indemnity
- The cost of making good loss of or damage to property belonging to the Insured or in the Insured's care, custody or control
- Medical malpractice

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 5 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 5

SPARES POOL AND SPECIAL TOOLS

Part 1: Spares Pool

1. COMPLETED SPARE PARTS PROFORMAS

The aim of this document is to present the list of spare parts needed for the maintenance of the 27+4 Trams. Following considerations have been made:

- Spare parts are understood, as big spares for overhaul and accident / vandalism operations.
- Supplier and lead times for the spare parts are NOT DEFINED YET. In further stage, CAF will present this information.
- Exchange time, weight and Volume of the spare parts will BE DEFINED IN FURTHER STAGE.

Item	Description	Assumed no. (per Tram)	Minimun Spares Holding	Price (per unit)	Total price (Minimum Spares Holding x Price per Unit)	Total price (Minimum Spares Holding x Price per Unit)
1	Motor bogie (complete)	3	4	182.118 €	728.473 €	£539.216
2	Trailer bogie (complete)	1	2	135.760 €	271.521 €	£200.980
3	Traction set including :	3	1	466.192 €	466.192 €	£345.075
	IGBT Traction inverter					
	Traction control unit ECON					
	Traction motors					
	Braking resistor					
	High speed circuit breaker					
	Mater controllers			Included above		
4	Gearbox	12	6	24.548 €	147.290 €	£109.024
5	Brake actuator (for motor bogie)	12	6	6.167 €	37.004 €	£27.391
6	Brake actuator (for trailer bogie)	4	2	6.374 €	12.747 €	£9.436
7	Wheel sets (complete, for one motor bogie)	6	6	24.548 €	147.290 €	£109.024
8	Wheel sets (complete, for one trailer bogie)	2	2	32.055 €	64.110 €	£47.454
9	Wheel rims (1 set)	1 set	2	7.912 €	15.824 €	£11.713
10	Emergency coupler	2	2	9.009 €	18.017 €	£13.336
11	Pantograph	1	2	13.232 €	26.465 €	£19.589
12	Battery charger	1	1	19.799 €	19.799 €	£14.656
13	Battery	1	1	6.990 €	6.990 €	£5.174
14	High Voltage control box	3			Included in traction	Included in traction
15	Cab air conditioning unit	2	3	18.110 €	54.329 €	£40.214
16	Saloon heating and ventilation unit	3	2	27.330 €	54.661 €	£40.460
17	Tram control computer	1	1	62.076 €	62.076 €	£45.949
18	Brake pump / Central hidraúlica	4	4	12.278 €	49.114 €	£36.354

Item	Description	Assumed no. (per Tram)	Minimun Spares Holding	Price (per unit)	Total price (Minimum Spares Holding x Price per Unit)	Total price (Minimum Spares Holding x Price per Unit)
19	Brake discs	16	16	2.059 €	32.947 €	£24.387
20	EVENT RECORDER	2	2	19.179 €	38.358 €	£28.392
21	Cab desk panel (without equipment) set	2	2	11.773 €	23.547 €	£17.429
22	Drivers seat	2	2	1.632 €	3.264 €	£2.416
23	Windscreen	2	8	4.186 €	33.489 €	£24.789
24	Door mechanism and leaf (double door)	10	5	10.175 €	50.873 €	£37.656
25	Door mechanism and leaf (single door)	4	2	8.593 €	17.186 €	£12.721
26	Saloon side window 1 set per tram	1 set	2	14.872 €	29.743 €	£22.016
27	Body front skirt (2 sets)	2 sets	6	3.257 €	19.541 €	£14.464
28	Body side skirts (2 sets)	2 sets	6	18.030 €	108.182 €	£80.076
29	Passenger seat unit (1 set per tram)	1 set	0	62.165 €	15.541 €	£11.504
30	Passenger seat squab (1 set per tram)	1 set	1	28.648 €	28.648 €	£21.205
31	Handrails (1 set)	1 set	1	13.752 €	6.876 €	£5.090
32	Cameras (1 set)	1 set	1	39.808 €	39.808 €	£29.466
33	Passenger Display unit (interior) (1 set)	1 set	2	25.700 €	51.400 €	£38.046
34	Passenger Display unit (exterior) (1 set)	1 set	2	6.853 €	13.706 €	£10.145
35	Complete Articulation assembly	5	3	22.349 €	67.048 €	£49.629
36	Sanding units (1 set)	1 set	1	10.361 €	10.361 €	£7.669
37	Suspension items (1 set)	1 set	1	27.013 €	27.013 €	£19.995
38	Energy absorption device (2 sets)	2 sets	2	18.394 €	36.788 €	£27.230
39	Flange Lubrication System	1 set	1	1.214 €	1.214 €	£898
40	Cab Front Shell Moulding	2	2	14.468 €	28.935 €	£21.418
41	Under-run Guard	2	2	6.785 €	13.570 €	£10.045
42	Exterior Ligthing Units		2	6.185 €	12.369 €	£9.156

Item	Description	Assumed no. (per Tram)	Minimun Spares Holding	Price (per unit)	Total price (Minimum Spares Holding x Price per Unit)	Total price (Minimum Spares Holding x Price per Unit)
43	Axle End Earthing Brush Units complete		4	3.394 €	13.576 €	£10.049
44	Speed Probes		1	1.885 €	1.885 €	£1.395
45	Roof Equipment Set of cases complete with fittings		0	To be defined	To be defined	To be defined
46	Cab Sun Blind	2	2	128 €	257 €	£190
47	Swan-neck cab microphone		4	342 €	1.368 €	£1.013
48	Electro-magnetic track brake unit complete		4	9.423 €	37.691 €	£27.899
49	Cab door complete with fittings		2	613 €	1.227 €	£908
50	Interior ligthingd cover(s)		1	7.387 €	7.387 €	£5.468
51	Pantograph head assembly		6	1.713 €	10.277 €	£7.607
52	Windscreen wiper arms complete		6	429 €	2.571 €	£1.903
53	Cab rear view camera		2	2.833 €	5.665 €	£4.193
	TOTAL				2.974.212 €	£2.201.512

NOTE: Currency hedged as per 29 April 2008 (0,7402 euro/GBP)

Part 2: Special Tools

Item No.	Description	Assumed No.
1	HVAC Diagnostic Software	1
2	Traction Equipment Diagnostic Software	1
3	Brake Equipment Diagnostic Software	1
4	Door Equipment Diagnostic Software	1

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 6 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 6

SUB-CONTRACTOR DIRECT AGREEMENT

(1) [SUB-CONTRACTOR]

- and -

(2) [tie LIMITED] or [*OTHER THIRD PARTY BENEFICIARY*]

- and -

(3) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

DIRECT AGREEMENT IN FAVOUR OF [tie LIMITED] or [OTHER THIRD PARTY BENEFICIARY] FROM [SUB-CONTRACTOR] relating to THE TRAM MAINTENANCE AGREEMENT

AGREEMENT

BETWEEN

(1) **[*SUB-CONTRACTOR*]** [(company number [◆]) whose registered office is at [◆]] *OR* [carrying on business together in partnership under the name of [◆] at [◆]] ("**Sub-Contractor**")];

(2) **[[tie LIMITED** (Company Number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ] OR **[[Other third party beneficiary]** [(company number [◆]) whose registered office is at [◆]] ***OR*** [carrying on business together in partnership under the name of [◆] at [◆]]] [("**Beneficiary**") which expression shall include its successors and permitted assignees.; and

(3) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) – Spain (**"Tram Maintainer"**).

BACKGROUND

A By an agreement in writing dated ◆ 2008 (the "**Tram Maintenance Agreement**"), **tie** appointed the Tram Maintainer to maintain the Trams and supply documentation and associated equipment in connection with the Edinburgh Tram Network.

B It is a term of the Tram Agreement that the Tram Maintainer shall procure that the Sub-Contractor enter into this Agreement with the Beneficiary.

C The Sub-Contractor has been appointed by the Tram Maintainer as [◆] in terms of the Sub-Contract (as hereinafter defined).

D It is a term of the Sub-Contract or has otherwise been agreed that the Sub-Contractor enters into this Agreement with the Beneficiary in relation to the Sub-Contract Works.

IT IS AGREED as follows:

1. **DEFINITIONS AND INTERPRETATION**

In this Agreement:

1.1 the following words and expressions have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to clause 13);

"**Edinburgh Tram Network**" means the tramway which is to be designed, constructed and maintained in Edinburgh in Phase 1a (forming part of Line One and Line Two as described in the tram Legislation) and Phase 1b, or either of them (as may be amended from time to time together with any modification, line extension, spur, interconnection and any additional line which may be instructed), to be constructed in accordance with the Tram Legislation together with all associated works and facilities including all civil engineering and track works, Trams, infrastructure, plant, machinery and equipment installed or used for such tramway;

"**Good Industry Practice**" means using standards, practices, methods and procedures conforming to Law and exercising that degree of skill, care, diligence, prudence and foresight that would reasonably be expected from a large, reputable, professionally qualified, competent and skilled organisation experienced in carrying out activities of a similar nature, scope and complexity to those comprised in the Sub-Contract Works, and seeking in good faith to comply with its contractual obligations and all duties owed by it;

"**Insurance Period**" means the period of 12 years from the date of issue of the last certificate of substantial completion in respect of the Sub-Contract Works, as established pursuant to and for the purposes of the Sub-Contract (or, if sooner, 12 years after termination of the employment of the Sub-Contractor under the Sub-Contract);

"**Intellectual Property Rights**" means any rights in or to any patent, design right, utility model, trade mark, brand name, service mark, trade name, business name, logo, invention (whether registered or unregistered), domain name, semi-conductor right, topography right, software designs and/or other materials, source code, copyright, moral right, know-how, or rights in databases and any other rights in respect of any industrial or intellectual property, whether capable of being registered or not, including all rights to apply for any of the foregoing rights or for an extension, revival or renewal of any of the foregoing rights and any similar or analogous rights to any of the above, whether arising or granted under the law of Scotland or of any other jurisdiction;

"**Law**" means:

(a) any Act or instruments of the Scottish Parliament or the United Kingdom Parliament or subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, any exercise of the Royal Prerogative, and any enforceable community right within the meaning of section 2 of the European Communities Act 1972;

(b) any applicable guidance, direction or determination issued by any regulatory body with which **tie**, CEC, the Tram Maintainer and/or the Sub-Contractor is bound to comply; and

(c) any applicable judgment of a relevant court of law which is a binding precedent,

in force, or applicable in Scotland;

"**Line One**" means the tramway works as authorised by the Edinburgh Tram (Line One) Act 2006;

"**Line Two**" means the tramway works as authorised by the Edinburgh Tram (Line Two) Act 2006;

"**Party**" means each and any of the parties to this Agreement and Parties shall be construed accordingly;

"**Sub-Contract**" means the sub-contract dated [□] made between the Tram Maintainer and the Sub-Contractor;

"**Sub-Contract Works**" means the works and services to be undertaken by the Sub-Contractor under the Sub-Contract;

"**Sub-Contractor Deliverables**" means all documents, information, reports, diagrams, records, method statements, risk assessments, manuals, schedules, databases, photographs, formulae, plans, designs, specifications, drawings, details, calculations, models and simulations, the outputs and reports based on any models, programmes and all other material created and/or provided by the Sub-Contractor (or any other third party) in the performance of the Sub-Contract Works and the Sub-Contractor's obligations under the Sub-Contract;

"**TEL**" means Transport Edinburgh Limited a company incorporated under the Companies Act with registered number SC269639 and having its registered office at

55 Annandale Street, Edinburgh, Midlothian, EH7 4AZ which shall include its successors in title and permitted assignees;

"**Trams**" means the tram vehicles to be provided for operation on the Edinburgh Tram Network;

"**Tram Legislation**" means the Edinburgh Tram (Line One) Bill and the Edinburgh Tram (Line Two) Bill, and after such Bills are enacted means the Edinburgh Tram (Line One) Act, the Edinburgh Tram (Line Two) Act and such other legislation relative to the Edinburgh Tram Network as may be enacted from time to time; and

1.2 unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender include all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a clause is a reference to a clause in this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

2. STANDARD OF CARE

2.1 The Sub-Contractor warrants and undertakes to the Beneficiary that it has carried out and shall carry out the Sub-Contract Works and its other duties and obligations under the Sub-Contract subject to and in accordance with the terms thereof.

2.2 In addition to and without derogation from clause 2.1, the Sub-Contactor warrants to the Beneficiary that:

2.2.1 in the performance of the Sub-Contract Works and its other obligations under the Sub-Contract it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent contractor experienced in carrying out works and services similar to the Sub-Contract Works in connection with projects of a similar type, nature and complexity;

2.2.2 any design produced by the Sub-Contractor will satisfy in every respect any relevant performance specification or any requirement included or referred to in the Sub-Contract and will be suitable in every respect for the purposes included in or reasonably to be inferred from the Sub-Contract; and

2.2.3 any design produced by the Sub-Contractor will fully comply with Law.

2.3 The Sub-Contractor shall owe a duty of care to the Beneficiary in carrying out its duties and obligations under the Sub-Contract.

3. MATERIALS

3.1 The Sub-Contractor warrants to the Beneficiary that it has not and shall not use any materials which at the time of use:

3.1.1 are known to be deleterious in the particular circumstances in which they are used (either to health and safety or to the durability of any works on which the Sub-Contractor is employed by the Tram Maintainer); or

3.1.2 contravene any relevant standard or code of practice issued from time to time by the BSI Group or under a European directive relating to standards; or

3.1.3 do not accord with the guidelines contained in the edition of the publication "Good Practice in Selection of Construction Materials" (Ove Arup & Partners) current at the date of specification of use; or

3.1.4 contravene Good Industry Practice.

4. COPYRIGHT LICENCE

4.1 The Sub-Contractor hereby grants to the Beneficiary an royalty-free and exclusive licence to use such Intellectual Property Rights for operation and maintenance of the trams but in any case for manufacturing purposes in the Sub-Contractor Deliverables as may be necessary for the Beneficiary to use in relation to the [[Edinburgh Tram Network] ***OR*** [*Where beneficiary is not* ***tie*** *an appropriate use should be included*]]. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written agreement of the Sub-Contractor.

4.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Sub-Contractor Deliverable prepared or provided by the Sub-Contractor in connection with the Edinburgh Tram Network is vested in any person other than the Sub-Contractor, the Sub-Contractor shall procure for the Beneficiary the benefit of such a licence as is referred to in clause 4.1 for the purposes referred to therein.

4.3 The Sub-Contractor shall, if so requested at any time, execute such documents and perform such acts as may be required fully and effectively to assure to the Beneficiary or any third party the rights referred to in this clause 4.

4.4 The Sub-Contractor shall provide to the Beneficiary a copy of any of the Sub-Contractor Deliverables as soon as reasonably practicable after receipt by the Sub-Contractor of a written request from the Beneficiary to do so.

4.5 The Sub-Contractor undertakes to the Beneficiary that the use by the Beneficiary of any of the Sub-Contractor Deliverables for any purpose provided for in this clause 4 shall not infringe the rights of any third party in relation to the Sub-Contractor Deliverables.

5. REQUIRED INSURANCES

5.1 The Sub-Contractor undertakes that:

5.1.1 it has maintained and shall maintain during the performance of its obligations under the Sub-Contract and the Insurance Period each of the insurances as follows:

5.1.1.1 professional indemnity insurance with an insurer authorised to carry out insurance business in the United Kingdom for an amount not less than £[□] on an each and every claim basis and £[□] on an aggregate basis in respect of pollution and contamination claims and date recognition claims, in respect of the legal liability of the Sub-Contractor as a result of any negligent act, error or omission in the performance of the professional activities and duties in connection with the Sub-Contract Works and in the performance of its obligations under the Sub-Contract; and

5.1.1.2 [◆] [*Detail any further insurances held by the Sub-Contractor*]

5.1.2 cover under the professional indemnity insurance is extended to include the Sub-Contractor's liabilities under this Agreement;

5.1.3 this Agreement has been disclosed to the Sub-Contractor's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement; and

5.1.4 the Sub-Contractor shall abide by the terms and conditions of insurance and shall not do or omit to do anything that might prejudice the cover or its right to make a claim.

5.2 As and when reasonably required by the Beneficiary, the Sub-Contractor shall produce for inspection documentary evidence that such insurance is being properly maintained.

5.3 If the insurer makes or attempts to make any material alteration or purports to withdraw the Sub-Contractor's professional indemnity cover, or if the Sub-Contractor is unable to obtain professional indemnity insurance, the Sub-Contractor shall promptly give notice of this to the Beneficiary.

6. STEP-IN

6.1 The Sub-Contractor shall not exercise nor seek to exercise any right of determination of its employment under the Sub-Contract or to rescind the Sub-Contract or to discontinue the performance of any of the Sub-Contractor's obligations in relation to the Sub-Contract by reason of breach on the part of the Tram Maintainer (or otherwise) without giving to the Beneficiary not less than twenty one days' written

notice of its intention to do so and specifying in such notice the grounds for the proposed determination. The Sub-Contractor will for the period of any such notice diligently and properly continue to perform the Sub-Contractor's obligations under the Sub-Contract.

6.2 Any period stipulated in the Sub-Contract for the exercise by the Sub-Contractor of a right of determination will nevertheless be extended as may be necessary to take account of the period of notice required under clause 6.4.

6.3 Compliance by the Sub-Contractor with the provisions of clause 6.1 will not be treated as a waiver of any breach on the part of the Tram Maintainer giving rise to the right of determination nor otherwise prevent the Sub-Contractor from exercising its rights after the expiration of the notice unless the right of determination has ceased under the provisions of clause 6.4.

6.4 The right of the Sub-Contractor to determine its employment under the Sub-Contract or to rescind the Sub-Contract or to discontinue the performance of any of its obligations in relation to the Sub-Contract shall cease if within the period of twenty one days referred to in clause 6.1 the Beneficiary gives written notice to the Sub-Contractor:

6.4.1 requiring the Sub-Contractor to continue with the performance of all its obligations under the Sub-Contract;

6.4.2 acknowledging that the Beneficiary is assuming all the obligations of the Tram Maintainer under the Sub-Contract; and

6.4.3 undertaking to the Sub-Contractor to discharge all amounts payable to the Sub-Contractor under the terms of the Sub-Contract.

6.5 Upon compliance by the Beneficiary with the requirements of clause 6.4 the Sub-Contract will continue in full force and effect as if the right of determination on the part of the Sub-Contractor had not arisen and in all respects as if the Sub-Contract had been made between the Beneficiary and the Sub-Contractor to the exclusion of the Tram Maintainer.

6.6 Notwithstanding that as between the Tram Maintainer and the Sub-Contractor the Sub-Contractor's right of determination of its engagement under the Sub-Contract may not have arisen the provisions of clause 6.5 shall nevertheless apply if the Beneficiary

gives written notice to the Sub-Contractor and the Tram Maintainer to that effect and the Beneficiary complies with the requirements on its part under clause 6.4.

6.7 The Sub-Contractor does not need to be concerned or required to enquire whether, and will be bound to assume that, as between the Tram Maintainer and the Beneficiary, the circumstances have occurred permitting the Beneficiary to give notice under clause 6.6.

6.8 By acting in accordance with the provisions of this clause 6, the Sub-Contractor will not incur any liability to the Tram Maintainer.

6.9 Unless and until the Beneficiary has given notice under this clause 6:

6.9.1 the Beneficiary has no liability whatsoever to the Sub-Contractor in respect of amounts payable to the Sub-Contractor under the Sub-Contract; and

6.9.2 the Beneficiary has no authority to issue any direction or instruction to the Sub-Contractor in relation to the performance of the Sub-Contractor's duties under the Sub-Contract.

6.10 Without prejudice to the provisions of clauses 6.1 to 6.9 inclusive, if prior to the service of any notice under clause 6.4 the employment of the Sub-Contractor under the Sub-Contract is determined for any reason whatsoever the Sub-Contractor shall, if requested in writing so to do by the Beneficiary no later than 12 weeks after the date of such determination, forthwith enter into a new agreement with the Beneficiary in relation to the carrying out of the Sub-Contract Works on the same terms as the Sub-Contract, but with such revisions as the Beneficiary and the Sub-Contractor may reasonably require to reflect altered circumstances and the fact that it is the Beneficiary and not the Tram Maintainer employing the Sub-Contractor.

7. ASSIGNATION

7.1 The Sub-Contractor shall not assign, novate or otherwise transfer the whole or any part of the Agreement without the prior written agreement of the Beneficiary.

7.2 The Beneficiary shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

[[*Include where the Beneficiary is* ***tie***]

[7.2.1 to the Scottish Ministers, TEL, the City of Edinburgh Council or any local authority; or

7.2.2 other body with no worse financial standing than that of the Beneficiary who takes over all or substantially all the functions of the Beneficiary; or

7.2.3 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form acceptable to the Sub-Contractor acting reasonably) by the Beneficiary or a person falling within clause 7.2.1; or

7.2.4 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) to any person not covered by clauses 7.2.1 or 7.2.2.]

Or

[[*Include where the Beneficiary is an other third party*]

7.2.1 without the consent of the Sub-Contractor to any person provided that no more than two such assignations will be permitted. Any assignations by the Beneficiary to a subsidiary or associated company of the Beneficiary or a member of the same group of companies will not count as an assignation;

7.2.2 with the prior written consent of the Sub-Contractor (such consent not to be unreasonably withheld or delayed).]

7.3 The Sub-Contractor undertakes to the Beneficiary not to contend in any court proceedings under this Agreement that any person to whom the Beneficiary assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that the Beneficiary is named under this Agreement or any intermediate assignee of the Beneficiary escaped loss resulting from such breach by reason of the disposal of its interest in the same.

8. LIABILITY OF THE SUB-CONTRACTOR

8.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by the law of contract, delict or otherwise.

8.2 The responsibility of the Sub-Contractor under this Agreement is not to be reduced or in any way released or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by the Beneficiary against a third party.

8.3 The rights and benefits conferred upon the Beneficiary by this Agreement are in addition to any other rights and remedies that the Beneficiary may have against the Sub-Contractor including (without prejudice to the generality of the foregoing) any remedies in delict.

8.4 Subject to the other provisions of this Agreement, the liability of the Sub-Contractor to the Beneficiary is to be determined in all respects in accordance with the terms of the Sub-Contract and, in the event of any claim by the Beneficiary under this Agreement, the Sub-Contractor shall be entitled to rely upon any defence, right, limitation or exclusion under the Sub-Contract as though the Beneficiary were named as the Tram Maintainer under it, except that:

8.4.1 the Beneficiary shall not be affected by any subsequent variation of the Sub-Contract which would adversely affect the obligations owed by the Sub-Contractor or the waiver, compromise or withdrawal of any claim made by the Tram Maintainer; and

8.4.2 the Sub-Contractor shall not be entitled to exercise any right of set-off, retention or withholding against the beneficiary to which the Sub-Contractor may be entitled against the Tram Maintainer.

8.4.3 In no event, the Sub-Contractor shall be responsible for indirect or consequential damages

9. CONSENT OF TRAM MAINTAINER

9.1 The Tram Maintainer consents to the terms of this Agreement.

10. **NOTICES**

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by special or recorded delivery, is deemed to have been received on proof of delivery.

11. **RIGHTS OF THIRD PARTIES**

11.1 A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. **INVALID TERMS**

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. **VARIATIONS AND WAIVERS TO BE IN WRITING**

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. **WAIVER**

14.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

[*[Include where the Beneficiary is **tie**]*

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 52 (*Dispute Resolution*) of the Tram Maintenance Agreement and the provisions of the said Clause 52 (*Dispute Resolution*) and Schedule 9 (*Dispute Resolution Procedure*) and Schedule 10 (*Panels*) of the Tram Maintenance Agreement are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" in the Tram Maintenance Agreement shall be deemed to refer to the Beneficiary and the Sub-Contractor and the reference in the Tram Maintenance Agreement to "Clause 56 (*Notices*)" shall mean clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages are executed as follows:

EXECUTED for and on behalf of **[SUB-CONTRACTOR]** at

on 200[◆] by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **[[tie LIMITED]**
***OR* [*other third party beneficiary*]** at

on 200[◆] by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 200[◆] by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

SCHEDULE 7

TUPE INFORMATION

1. The number of staff who are TUPE Employees.

2. In relation to each employee who falls within the scope of paragraph 1 above:

   2.1 the employee's age and gender (so that pension entitlements can be calculated and provided for) and whether such employee is within or outside any group pension scheme; and

   2.2 the employee's salary, length of service, contractual period of notice, any pay settlement covering future dates which has already been agreed by the Tram Maintainer and any redundancy entitlement.

3. Information relating to or connected with the other terms and conditions of the contracts of employment with employees falling within the scope of paragraph 1 above including details of:

   3.1 terms incorporated from any collective agreement;

   3.2 so far as the Tram Maintainer should reasonably be aware any outstanding liability for past breaches of such contracts;

   3.3 so far as the Tram Maintainer should reasonably be aware any outstanding statutory liability (for example, any claim under non-discrimination legislation); and

   3.4 so far as the Tram Maintainer should reasonably be aware any other outstanding liability required to be met by any successor tram maintenance contractor if its tender is accepted.

4. Such other information as the Client may reasonably require in relation to TUPE Employees.

[redacted]

Director/Authorised Signatory
tie LIMITED

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 8 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 8

NOT USED

This is Schedule 9 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 9

DISPUTE RESOLUTION PROCEDURE

1. The Parties agree that this Schedule 9 (*Dispute Resolution Procedure*) shall have effect for the resolution of any Dispute.

2. Any Dispute shall, in the first instance, be referred to the Internal Resolution Procedure in accordance with paragraph 10.

3. Neither Party shall commence any court proceedings until the procedures in paragraphs 10 to 57.3 have been completed, under exception that the provisions of this Schedule 9 (*Dispute Resolution Procedure*) shall not apply so as to prevent either Party seeking an interim order, or interim relief, in the Scottish courts.

4. In the event that any court proceedings whatsoever are initiated by either Party against the other, the Parties agree that the Court of Session, Scotland, shall have exclusive jurisdiction.

5. Neither Party shall be entitled to suspend the performance of its undisputed obligations under this Agreement merely by reason of the reference of any Dispute to the Dispute Resolution Procedure contained in this Schedule 9 (*Dispute Resolution Procedure*).

6. Subject to the Tram Supplier's and the Client's discretionary rights set out in paragraphs 55 to paragraph 57.2 to require that a Dispute and a Related Dispute (as defined in paragraph 55) be dealt with together at an appropriate stage of the Dispute Resolution Procedure, the provisions of this Schedule 9 (*Dispute Resolution Procedure*) are mandatory and binding upon the Parties. For the avoidance of doubt, nothing in this Schedule Part 9 shall be intended to disapply section 80(2) and 79(2) of the Edinburgh Tram (Line One) Act 2006 and the Edinburgh Tram (Line Two) Act 2006 (together the "**Tram Acts**") respectively.

7. Except in relation to the matters provided for in paragraphs 14 to 54 and subject to the provisions of paragraph 9, in the event that either Party following the timeous referral of any Dispute then pursues such Dispute under the Dispute Resolution Procedure, and in the event that such Party fails to observe any time limit or timescale provided for in this Schedule 9 (*Dispute Resolution Procedure*) in relation to the pursuit or progression of such Dispute, such Party shall, upon such failure occurring and upon the expiry of 90 days following written notification from the other Party requiring the first Party to pursue the Dispute Resolution Procedure, be deemed to have irrevocably waived any right to pursue or progress such Dispute any further. In that event, such Party shall be deemed to have elected not to have referred

such Dispute or to have withdrawn such Dispute from the Dispute Resolution Procedure and shall be deemed to have irrevocably waived any right to refer any Dispute arising from the same or substantially the same Dispute or similar circumstances to the Dispute Resolution Procedure and shall be liable for payment of the whole fees incurred by any mediator or adjudicator who has acted in respect of such Dispute. This paragraph 8 is without prejudice to the rights of either Party to raise in defence to any Dispute any defence (including, without prejudice to the foregoing generality, any defence of retention, compensation or set-off) which would otherwise be available to it.

8. Notwithstanding the provisions of paragraph 8, in the event that a Party who pursues any Dispute under the Dispute Resolution Procedure fails to observe any time limit or timescale provided for in this Schedule 9 (*Dispute Resolution Procedure*) in relation to the pursuit or progression of the Dispute or fails to take action following a notification from the other Party pursuant to paragraph 7 above, the other Party may elect to waive such failure, in which event the time limit or timescale to which such failure relates shall be extended at the discretion of such other Party and the Dispute shall progress in accordance with the Dispute Resolution Procedure, subject that all other time limits and timescales provided for in this Schedule 9 (*Dispute Resolution Procedure*) which are affected by such extension shall be deemed to have been extended to give effect to such extension of the time limit or timescale to which such failure relates.

Internal Resolution Procedure

9. The following procedure is the Internal Resolution Procedure referred to in paragraph 2:

9.1 In the event of any Dispute arising, the Tram Maintainer's Representative and the Client's Representative shall seek to resolve the Dispute at a meeting to be convened within three Business Days of written notification by either Party to the other that it wishes to initiate the Internal Resolution Procedure in respect of that Dispute ("Notification"). Such Notification shall be given in accordance with the provisions of Clause 56 (*Notices*) of this Agreement.

9.2 If following the meeting referred to in paragraph 9.1, the Dispute is not resolved or in the event that a meeting has not been convened 3 Business Days pursuant to paragraph 9.1, each Party shall, before the expiry of the period of seven Business Days from Notification, serve, in accordance with the provisions of Clause 56 (*Notices*) of this Agreement, a written position paper ("**Position Paper**") upon the other Party. Each Party's Position Paper shall state in reasonable detail that Party's

position and required objectives in relation to the Dispute; any required redress, and, where possible, any comments on the other Party's position.

9.3 Upon such service of a Position Paper by the Party initiating or pursuing the Dispute, the Chief Executive (or equivalent) of the Tram Maintainer and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) shall seek to resolve the Dispute by meeting in good faith to discuss and negotiate upon the Dispute without recourse to legal or other proceedings.

9.4 In the event that resolution of the Dispute is achieved by the Chief Executive (or equivalent) of the Tram Maintainer and the Chief Executive (or equivalent) of the Client, the resolution shall be reduced to writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties.

9.5 Unless concluded by a written legally binding agreement, all discussions and negotiations connected with the Dispute shall be conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

10. In the event that any Dispute is not resolved by the Internal Resolution Procedure within a period of twenty Business Days from Notification (or longer if so agreed by the Parties) then the following provisions of this paragraph 11 shall apply;

10.1 The Chief Executive (or equivalent) of the Tram Maintainer and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) shall, within a further period of five Business Days, seek to agree that the Dispute shall be resolved by any one of the following procedures:

10.1.1 mediation in accordance with paragraphs 11 to 13; or

10.1.2 adjudication in accordance with paragraphs 14 to 54; or

10.1.3 litigation before the Court of Session, Scotland, in which event the Summons or Petition in any such litigation shall be signed and served within ten Business Days of the date of expiry of the period of sixty Business Days following the conclusion of the internal resolution procedure under paragraphs 9 and 10.

In the event that the Chief Executive (or equivalent) of the Tram Maintainer and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event

of their unavailability) are unable to agree that the Dispute be resolved by the procedures described in paragraphs 10.1.1, 10.1.2 or 10.1.3, the Party initiating or pursuing the Dispute shall refer the Dispute to mediation (and thereafter adjudication, if necessary) in accordance with paragraphs 11 to 13 or in the case of a Related Dispute conjoined by either Party pursuant to paragraph 55 or where a Related Dispute has already been referred to the decision of an adjudicator to adjudication in accordance with Paragraphs 14 to 54 (without the need to first refer the Dispute to adjudication).

Mediation

11. The Parties shall attempt in good faith to resolve the Dispute by a procedure of mediation in accordance with the Centre for Effective Dispute Resolution mediation rules or Model Mediation Procedure in force at the commencement of the mediation, (or in the event that the Centre for Effective Dispute Resolution has ceased to exist as at the time of the commencement of the mediation, mediation rules or a model mediation procedure offered by any other body offering commercial mediation services which shall be selected by agreement between the Parties (failing such agreement by the Party referring the Dispute to mediation. In the event that any provision of such mediation rules or model mediation procedure conflicts with any provision of this Schedule 9 (*Dispute Resolution Procedure*), the provisions of this Schedule 9 (*Dispute Resolution Procedure*) shall take precedence. In the event that any timescales contained in such mediation rules or model mediation procedure conflicts with the timescales referred to in this Schedule 9 (*Dispute Resolution Procedure*), the timescales contained in such mediation rules or model mediation procedure shall be amended accordingly such that the timescales referred to in this Schedule 9 (*Dispute Resolution Procedure*) shall be adhered to.

12. In the event that resolution of the Dispute is achieved in consequence of such mediation procedure, such agreed resolution shall be recorded in writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties. Unless concluded by a written legally binding agreement, all discussions and negotiations (including written submissions made and documents produced in relation thereto) connected with the mediation procedure referred to in paragraph 11 shall be conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

13. If any Dispute to which this Schedule 9 (*Dispute Resolution Procedure*) relates is not resolved by the mediation procedure referred to in paragraphs 11 and 12 within a period of 30 Business

Days from the referral of the Dispute to mediation (or longer if so agreed by the Parties), the mediation procedure shall be terminated and, unless the Party initiating or pursuing the Dispute withdraws the Dispute, the Dispute shall within a further sixty days of the termination of the mediation procedure, be referred to adjudication in accordance with paragraphs 14 to 52.

Adjudication

14. In the event that either Party refers a Dispute to adjudication in terms of paragraph 10.1.2 or 13, or exercises a statutory right available to it under the Housing Grants Construction and Regeneration Act 1996 to raise adjudication proceedings in relation to "construction operations" (within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996) which are not Authorised Works as defined in the Tram Acts, such adjudication shall be conducted in accordance with paragraphs 14 to 52, wherein any reference to "days" is a reference to calendar days.

15. Where a Related Dispute (as defined in paragraph 55) relates or is claimed by the other party to a Related Contract to relate to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 and where such other party to a Related Contract claims to exercise a statutory right available to it under the Housing Grant, Construction and Regeneration Act 1996, then reference of the Dispute arising under this Agreement to mediation shall not be a precondition to the commencement of adjudication proceedings. In the foregoing circumstances, the Tram Supplier or the Client shall be entitled to refer a Dispute at any time to adjudication in terms of paragraphs 14 to 54 hereof.

Notice of intention to seek adjudication

16. Either Party may give written notice (the "**Notice of Adjudication**") of its intention to refer the Dispute to adjudication and the Party giving such notice shall be the "**Referring Party**".

17. The Notice of Adjudication shall be given to the other Party and the Party receiving the Notice of Adjudication shall be the "**Responding Party**".

18. The Notice of Adjudication shall set out briefly:

    18.1 the nature and a brief description of the Dispute and of the parties involved;

    18.2 details of where and when the Dispute has arisen;

18.3 the nature of the redress which is sought; and

18.4 the names and addresses of the Parties (including the addresses which the Parties have specified for the giving of notices).

19. The adjudicator selected to consider the Dispute shall be selected from one of the panels ("**Panels**") appointed by the Parties in accordance with the following:

19.1 there shall be three Panels, one in respect of legal matters, ("**Legal Panel**"), one in respect of construction/operational matters and construction/operational interface matters ("**Construction/Operational Panel**") and one in respect of financial matters ("**Financial Panel**").

19.2 each Panel shall be comprised of at least four members, who are listed in Schedule 10 (*Panels for the Dispute Resolution Procedure*) to the Agreement.

19.3 if any member of a Panel resigns or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties as a member of the Panel, a replacement shall be appointed by the Parties as soon as practicable. Any such replacement shall be wholly independent of **tie**, any **tie** Party, TEL, Transport Scotland, the Client, any Client Party, the Tram Maintainer, any Tram Maintainer Party, CEC or any Relevant Authority, any Approvals Body, the Tram Supplier, any Tram Supplier Party, the Infraco, any Infraco Party, the Operator or any equipment supplier or any party associated with the Edinburgh Tram Network, and any successor to or subsidiary or parent of any of the aforementioned parties. If the Parties are unable to agree on the identity of such replacement(s), the President or Vice President for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland shall appoint such replacement(s) within thirty days of any application for such appointment by either Party.

20. The Referring Party shall at the same time as giving the Notice of Adjudication to the Responding Party, send to each of the members of the relevant Panel a copy of the Notice of Adjudication and a request that each member of the relevant Panel advises both Parties within three days of the date of the Notice of Adjudication as to whether or not he is able and willing to act. The Referring Party shall (acting reasonably) be entitled to select which of the Panels is the relevant Panel in light of the subject matter of the Dispute. The Parties shall attempt to agree within two further days as to which one of the members of the relevant Panel who responded indicating that they are able and willing to act shall be requested to act as

adjudicator. In the event that such agreement is reached, the Referring Party shall, within a further period of one day, request the member of the relevant Panel upon whom agreement has been reached to act as adjudicator. In the event that such agreement is not reached, the Responding Party shall, within a further period of two days, select one of the members of the relevant Panel who responded indicating that they are able and willing to act and the Referring Party shall request that member to act as adjudicator.

21. If no member of the relevant Panel indicates that he is able and willing to act within three days of receiving a request to act as adjudicator, the Referring Party shall request the President or the Vice President for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland to select a person to act as adjudicator.

22. Any person appointed, requested or selected to act as adjudicator in accordance with paragraphs 19, 20, 21, 24 and 25 shall be a natural person acting in his personal capacity. A person appointed, requested or selected to act as an adjudicator shall be wholly independent of **tie**, any **tie** Party, TEL, Transport Scotland, the Client, any Client Party, the Tram Maintainer, any Tram Maintainer Party, CEC or any Relevant Authority, any Approvals Body, the SDS Provider, the Tram Supplier, any Tram Supplier Party, the Infraco, any Infraco Party, the Operator or any equipment supplier or any party associated with the Edinburgh Tram Network, and the Tram Maintainer Parties and any successor to or subsidiary or parent of any of the aforementioned parties.

23. The requests referred to in paragraphs 20 and 21 shall be accompanied by a copy of the Notice of Adjudication.

24. The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland must communicate the selection of an adjudicator to the Referring Party within three days of receiving a request to do so.

25. If the Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland fails to comply with paragraph 24, the Referring Party may:

    25.1 agree with the other Party to the Dispute to request a specified person to act as adjudicator; or

    25.2 request any other adjudicator nominating body to select a person to act as adjudicator. An "adjudicator nominating body" shall mean a body (not being a natural person and

not being a Party to the Dispute) which holds itself out publicly as a body which will select an adjudicator when requested to do by a Referring Party.

26. The person requested to act as adjudicator in accordance with the provisions of paragraph 20 or 21 shall indicate whether or not he is willing to act within two days of receiving the request.

27. Where an adjudicator has been selected and appointed in accordance with paragraph 20 or 21 within seven days of the date of the Notice of Adjudication, then the Referring Party shall refer the Dispute in writing (the "**Referral**") to the adjudicator within that seven day period. Where an adjudicator has not been selected within and appointed within seven days of the Notice of Adjudication, then the Referral shall be made immediately upon such selection and appointment. Any failure on the part of the Referring Party to make the Referral within seven days of the date of the Notice of Adjudication shall not invalidate the decision of the adjudicator.

28. The Referral shall be accompanied by copies of, or relevant extracts from the Agreement and such other documents as the Referring Party intends to rely upon.

29. The Referring Party shall, at the same time as he sends to the adjudicator the documents referred to in paragraphs 27 and 28, send copies of those documents to the Responding Party.

30. The adjudicator may, with the consent of the parties to those Disputes, adjudicate at the same time on more than one Dispute under the Agreement.

31. The Parties may agree to extend the period within which the adjudicator may reach a decision in relation to all or any of these Disputes.

32. An adjudicator may resign at any time on giving notice in writing to the Parties.

33. An adjudicator must resign where the Dispute is the same or substantially the same as one which has previously been referred to adjudication, and a decision has been taken in that adjudication.

34. Where an adjudicator ceases to act under paragraph 32 or 33, or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties:

34.1 the Referring Party may serve a fresh notice in accordance with paragraphs 16 to 18 and shall in accordance with paragraphs 19 to 29 request an adjudicator to act; and

34.2 if requested by the new adjudicator, the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

35. The Parties to a Dispute may at any time agree to revoke the appointment of the adjudicator and in such circumstances the fees and expenses of that adjudicator shall, subject to paragraph 36, be determined and payable in accordance with paragraphs 52 and 53.

36. Where the revocation of the appointment of the adjudicator is due to the default or misconduct of the adjudicator, the Parties shall not be liable to pay the adjudicator's fees and expenses.

Powers of the Adjudicator

37. The adjudicator shall:

37.1 act impartially in carrying out his duties and shall do so in accordance with any relevant terms of the Agreement and shall reach his decision in accordance with Scots law; and

37.2 avoid incurring unnecessary expense.

38. The adjudicator may take the initiative in ascertaining the facts and the law necessary to determine the Dispute, and shall decide on the procedure to be followed in the adjudication. In particular, he may:

38.1 request either Party to supply him with such documents as he may reasonably require including, if he so directs, any written statement from either Party supporting or supplementing the Referral and any other documents given under paragraphs 28 and 29;

38.2 conduct the adjudication in the English language and decide whether a translation of any document is to be provided and, if so, by whom, by when, and at whose cost;

38.3 meet and question either Party and their representatives;

38.4 subject to obtaining any necessary consent from a third party or the Parties, make such site visits and inspections as he considers appropriate, whether accompanied by the Parties or not;

38.5 subject to obtaining any necessary consent from a third party or the Parties, procure the carrying out of any tests or experiments, and make directions as to the conditions for and responsibility for the cost of the same;

38.6 obtain and consider such representations and submissions as he requires, and, provided he has notified the Parties of his intention, appoint experts, assessors or legal advisers;

38.7 give directions as to the timetable for the adjudication, any deadlines, or limits as to the length of written documents or oral representations to be complied with; and

38.8 issue other directions relating to the conduct of the adjudication.

39. The Parties shall comply with any request or direction of the adjudicator in relation to the adjudication.

40. If, without showing sufficient cause, a Party fails to comply with any request, direction or timetable of the adjudicator made in accordance with his powers, fails to produce any document or written statement requested by the adjudicator, or in any other way fails to comply with a requirement under these provisions relating to the adjudication, the adjudicator may:

40.1 continue the adjudication in the absence of that Party or of the document or written statement requested;

40.2 draw such inferences from that failure to comply as may, in the adjudicator's opinion, be justified in the circumstances;

40.3 make a decision on the basis of the information before him, attaching such weight as he thinks fit to any evidence submitted to him outside any period he may have requested or directed;

40.4 disqualify any part or parts of that Party's submissions affected by the failure to comply; and

40.5 grant the other Party proper opportunity to consider and respond to any evidence or representation made late.

41. Subject to any agreement between the Parties to the contrary, either Party may be assisted by, or represented by, such advisers or representatives (whether legally qualified or not) as he considers appropriate.

42. The adjudicator shall consider any relevant information submitted to him by either Party and shall make available to them any information to be taken into account in reaching his decision.

43. The adjudicator and the Parties shall not disclose to any other person any information or document provided in connection with the adjudication which the Party supplying it has indicated is to be treated as confidential, except to the extent that disclosure is required by law or is necessary for the purposes of, or in connection with, the adjudication, or the information is already in the public domain.

Adjudicator's Decision

44. Unless otherwise agreed in accordance with paragraph 56.1 or 57.1 the adjudicator shall reach his decision not later than:

44.1 twenty eight days after the date of the Referral as defined in paragraph 27;

44.2 forty two days after the date of the Referral if the Referring Party so consents; or

44.3 such period exceeding twenty eight days after the Referral as the Parties may, after the giving of that notice, agree.

45. Where the adjudicator fails, for any reason, to reach his decision in accordance with paragraph 44;

45.1 either of the Parties to the Dispute may serve a fresh notice in accordance with paragraphs 16 to 18 and shall request an adjudicator to act in accordance with paragraphs 19 to 29; and

45.2 if requested by the new adjudicator the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

46. As soon as possible after he has reached a decision, the adjudicator shall deliver a copy of that decision to each of the Parties.

47. The adjudicator shall decide the matters in Dispute and may make a decision on different aspects of the Dispute at different times.

48. The adjudicator may take into account any other matters which the Parties agree should be within the scope of the adjudication or which are matters under the Agreement which he considers are necessarily connected with the Dispute and, in particular, he may:

48.1 open up, review and revise any decision taken or any notice certifying payment given by any person referred to in the Agreement, unless the Agreement states that the decision or notice certifying payment is final and conclusive; and/or

48.2 decide that any of the Parties to the Dispute is liable to make a payment under the Agreement (whether in sterling or some other currency) and, subject to the terms of the Agreement, when that payment is due and the final date for payment.

49. The adjudicator shall provide written reasons for his decision.

Effect of the Decision

50. In his decision, the adjudicator may, if he thinks fit, order either or both of the Parties to comply (forthwith) with his decision or any part of it. In the absence of any directions by the adjudicator relating to the time for performance of his decision, the Parties shall be required to comply with any decision of the adjudicator immediately on delivery of the decision to the Parties in accordance with paragraph 46.

51. The decision of the adjudicator shall be binding on the Parties, and they shall comply with it, until the Dispute is finally determined by legal proceedings or by agreement between the Parties.

52. The adjudicator shall be entitled to the payment of such reasonable amount as he may determine by way of fees and expenses incurred by him and the Parties shall be jointly and severally liable to pay that amount to the adjudicator.

53. Without prejudice to the right of the adjudicator to effect recovery from either Party in accordance with paragraph 52, the adjudicator may by direction determine the apportionment between the parties of liability for his fees and expenses, or otherwise the Parties shall each be liable to pay one-half share of the adjudicator's fees and expenses.

54. The adjudicator shall not be liable for anything done or omitted in the discharge or purported discharge of his functions as adjudicator unless the act or omission is in bad faith, and any employee or agent of the adjudicator shall be similarly protected from liability.

Related Disputes

55. Notwithstanding the terms of paragraphs 2, 3 and 6 to 9 above, in the event that a dispute or potential dispute under, or in connection with any contract associated with the Edinburgh Tram Network (referred to in this Schedule 9 (*Dispute Resolution Procedure)* as "**Related Contracts**")), has arisen or arises out of substantially the same issues of fact and/or law (as the case may be) as a Dispute under the Agreement (a "**Related Dispute**"), then providing that the Related Contract contains dispute resolution provisions in terms substantially the same as set out in this Schedule 9 (*Dispute Resolution Procedure*) (save for necessary changes), either

Party may require and direct that the Dispute and the Related Dispute be dealt with together at an appropriate stage of the Dispute Resolution Procedure.

56. In the event that a Related Dispute has already been referred to the decision of an adjudicator in accordance with the provisions of the Related Contract, and the Client is of the opinion that a Dispute is to be (but has not yet been) referred to adjudication under this Schedule 9 (*Dispute Resolution Procedure*), the Client or the Tram Supplier may refer the Dispute, or may by notice in writing to the Tram Maintainer require that the Dispute be referred (as the case may be) to the adjudicator appointed under the Related Contract to decide upon the Related Dispute, with the intention that such adjudicator shall, insofar as is relevant, practicable and appropriate, come to the same conclusion as to the facts and apply the same reasoning and analysis in reaching a decision on the Dispute as the adjudicator's conclusions, reasoning and analysis applied by him as the adjudicator in the Related Dispute and:

56.1 the adjudicator shall, if practicable, hear the Dispute at the same time as the Related Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator);

56.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator), the adjudicator shall have power (if so requested by the Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator; and

56.3 the Client shall procure that, as soon as practicable, the other party or parties to the Related Dispute shall give the Tram Maintainer copies of the Related Contract, the Referral Notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

57. In the event that a Dispute has already been referred to the decision of an adjudicator, and the Client is of the opinion that a Related Dispute is to be (but has not yet been) referred to adjudication, the Client may refer the Related Dispute to the adjudicator appointed under this Schedule 9 (*Dispute Resolution Procedure*) to decide upon the Dispute, and:

57.1 the adjudicator shall, if practicable, hear the Related Dispute at the same time as the Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator).

57.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator), the adjudicator shall have power (if so requested by the Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator;

57.3 as soon as practicable, the Client shall give to the Tram Maintainer copies of the Related Contract, the Referral Notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

57. In the event that a Dispute has already been referred to the decision of an adjudicator, and the Client is of the opinion that a Related Dispute is to be (but has not yet been) referred to adjudication, the Client may refer the Related Dispute to the adjudicator appointed under this Schedule 9 (*Dispute Resolution Procedure*) to decide upon the Dispute, and:

57.1 the adjudicator shall, if practicable, hear the Related Dispute at the same time as the Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator).

57.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator), the adjudicator shall have power (if so requested by the Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator;

57.3 as soon as practicable, the Client shall give to the Tram Maintainer copies of the Related Contract, the Referral Notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

[redacted]

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 10 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 10

PANELS FOR DISPUTE RESOLUTION PROCEDURE

CONSTRUCTION/OPERATIONAL

Alan Wilson
[redacted]
Chesterfield
DERBYSHIRE
[redacted]

Tony Canham
[redacted]
NORWICH
[redacted]

Peter Chapman
[redacted]
OXSHOTT
SURREY
[redacted]

Guy Cottam
[redacted]
BATH
[redacted]

FINANCIAL

Nigel Lowe
Nigel Lowe Consulting Limited
[redacted]
LONDON
[redacted]

Bryan Porter
[redacted]
GLASGOW
[redacted]

John Hunter
Hunter Consulting
[redacted]
STIRLING
[redacted]

Eric Mouzer
[redacted]
BIRMINGHAM
[redacted]

LEGAL

Lord Dervaird (Prof. John Murray QC)
[redacted]
EDINBURGH
[redacted]

Gordon Coutts, QC
[redacted]
EDINBURGH
[redacted]

[redacted], QC
[redacted]
EDINBURGH
[redacted]

Nick Ellis
Advocates Library
Parliament House
EDINBURGH
[redacted]

[redacted]

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tie LIMITED

[redacted]

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 11 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 11

AGREED REPAIRS

Schedule 11 - Tram Agreed Repairs-V5.xls

	STERLING GBP £ (Fixed exchange rate)				
REF.	REPAIR/DEFECT	MAN-HRS	MATERIALS	TOTAL	
			Pounds		
1	Replace bodyside window (glazing) - 1x unit (Opening Window, two glaces)	£104	£378	£482	
1A	Replace bodyside window (glazing) - 1x unit (Fixed Window)	£104	£202	£306	
2	Replace bodyside window (glazing) - subsequent unit (OW)	£78	£378	£456	
2A	Replace bodyside window (glazing) - subsequent unit (FW)	£78	£202	£280	
3	Replace bodyside window unit complete (incl. Frame, Opening Window)	£156	£676	£832	
4	Replace windscreen (glazing)	£260	£3.797	£4.057	
5	Replace cab side window (glazing)	£78	£467	£545	
6	Replace door leaf window (glazing)	£52	£435	£487	
7	Replace interior glass draught screen	£78	£140	£218	
8	Replace front GRP panel	£52	£4.351	£4.403	
9	Exchange pantograph complete	£208	£0	£208	
10	Replace pantograph carbon	£52	£567	£619	
11	Replace wheel - 1x	£416	£1.880	£2.296	
12	Replace 2nd or subsequent wheel	£156	£1.880	£2.036	
13	Replace tyre 1x	£312	£932	£1.244	
14	Replace tyre 2nd or subsequent	£52	£932	£984	
15	Exchange traction motor/gearbox unit	£156	£0	£156	
16	Replace friction brake disk	£104	£1.868	£1.972	
17	Exchange driver seat	£52	£1.479	£1.531	
18	Replace cab microphone	£52	£310	£362	
19	Exchange power bogie	£234	£0	£234	
20	Exchange trailer bogie	£208	£0	£208	
21	Exchange cab door	£156	£181	£337	
22	Exchange passenger door leaf	£52	£3.049	£3.101	
23	Exchange under-guard	£78	£0	£78	
24	Tyre turn 1x bogie	£156	£0	£156	
25	Tyre turn 2nd or subsequent bogies	£104	£0	£104	
26	Exchange Albert (emergency) coupler	£52	£8.171	£8.223	
27	Replace saloon seat cushion (base)	£26	£125	£151	
28	Replace saloon seat cushion (back)	£26	£125	£151	
29	Exchange cab radio module	£52	£0	£52	
30	Exchange TPDS transponder	£26	£0	£26	
31	Replace door-open pushbutton	£52	£467	£519	
32	Replace passenger Call-for-Help unit	£52	£932	£984	
33	Carry out OTMR download	£26	£0	£26	
34	Carry out static brake test	£26	£0	£26	
35	Carry out dynamic brake test	- - -	- - -	- - -	
36	Carry out post-third party repairs pre-service inspection	£52	£0	£52	
	NOTE: The prices above are based on year 2007and will be Indexed annually. It is also assumed each item is bought on one to one basis. A price revision could be made on the contract effective commencement date to take into account if it is possible to buy in batches and, also, to find local suppliers in order to reduce some of the costs.				

[redacted]

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tie LIMITED

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 12 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 12

RETURN CONDITION

Part 1 - Procedure

1. Final Inspection

During the period of six months prior to the scheduled Expiry Date the Client and/or any person designated by the Client will be entitled to inspect the Trams and the Spare Parts Pool on one or more occasions (as notified by the Client to the Tram Maintainer), and including, for the avoidance of doubt, its Technical Records in order to verify that their condition meets the Return Condition provided that such inspections shall not unreasonably disrupt the Services. Each such inspection will be long enough to permit the Client and/or any person designated by the Client to inspect the relevant Trams (including, for the avoidance of doubt, all relevant Technical Records) and/or the Spare Parts Pool. For the avoidance of doubt, the Client shall be entitled to inspect the Trams and the Spare Parts Pool both during the said period of six months and on the required Return Date.

2. Non-Compliance

If at the time of any inspection referred to in paragraph 1 or upon the required Return Date the condition of such Trams does not meet the requirements referred to in the Return Condition in any material respect or the Spare Parts Pool does not meet the requirements of the Return Condition, the Client will provide to the Tram Maintainer details of such non-compliance and the Tram Maintainer will, unless otherwise expressly agreed in writing, indemnify the Client on terms satisfactory to the Client in its reasonable discretion against the reasonable cost of putting such Trams into the Return Condition.

3. Intermediate Inspections

3.1 Without prejudice to the Client's rights under paragraph 1, at any time during the Term, the Client and/or any person designated by the Client will be entitled, upon giving the Tram Maintainer reasonable notice of its intention to do so, to inspect (or re-inspect) the Trams including, for the avoidance of doubt, its Technical Records in order to verify that their condition as at the date of such inspection complies with the Return Condition provided that such inspections shall not unreasonably disrupt the Services and the Tram Maintainer shall use all reasonable endeavours to facilitate the Client's exercise of its rights under this paragraph 3.

3.2 The Tram Maintainer will pay to the Client on demand all reasonable out of pocket expenses incurred by the Client in connection with any inspection carried out pursuant to paragraph 3.1 if (i) the Tram Maintainer has provided security pursuant to paragraph 4 which is still in existence; or (ii) such inspection identifies instances where any Tram, Technical Record, Spare Part or Special Tool does not comply with the Return Condition where the total cost of the remedial work as may be necessary to put all Trams, Technical Records, Spare Parts and/or Special Tools back in the Return Condition shall, in the Client's absolute discretion (acting reasonably), exceed £50,000 in aggregate value.

3.3 The Tram Maintainer may in its absolute discretion request the Client carry out a re-inspection pursuant to paragraph 3.1 whereupon the Client will endeavour to carry out such re-inspection at the earliest practicable opportunity. The Tram Maintainer will pay to the Client on demand all reasonable out of pocket expenses incurred by the Client in connection with any re-inspection carried out pursuant to paragraph 3.1 where in the Client's reasonable opinion such inspection is desirable as a prudent measure because a previous inspection has shown that the relevant Trams were not in accordance with the requirements stipulated in paragraph 3.1 or where such re-inspection is requested by the Tram Maintainer for the purpose of the Client verifying that any remedial action that had been identified by the Client on a previous inspection has been completed to the Client's satisfaction.

3.4 The Client shall have no duty or liability to carry out such inspections as are referred to in paragraph 3.1 and the provisions of paragraphs 1, 2 and 4 shall continue to apply to the Trams and the Spare Parts Pool whether or not the Client shall exercise its rights under this paragraph 3. Furthermore, the Client shall have no liability arising out of any such inspection other than for material damage or personal injury caused by its employees or designated persons during the course of conducting such inspection and the discharge of their duties.

3.5 In relation to re-inspection (other than those carried out at the Tram Maintainer's invitation) the Client will act reasonably having regard to all relevant circumstances when determining the period of time after the previous inspection when any re-inspection shall be carried out.

4. Provision of Security in respect of Return Condition

If at the time of any inspection pursuant to paragraph 3.1 the condition of the Trams, Spare Parts Pool or the Technical Records does not comply with the Return Condition, the Client

will provide to the Tram Maintainer details of such non-compliance and/or non-performance together with details of the Client's reasonable estimate of the quantum of such non-compliance or non-performance in terms of the cost of rectifying or repairing or otherwise making good those items which are not in compliance or accordance with the requirements of the Return Condition (**"Quantum"**). If the Quantum (as determined by the Client in its absolute discretion, acting reasonably) from time to time exceeds £50,000 in aggregate amount the Tram Maintainer will within ten (10) Business Days of the Client providing details of the Quantum to the Tram Maintainer provide security in a sum not less than the aggregate Quantum from time to time, such security to be in the form of (at the Tram Maintainer's discretion):

4.1 a deposit of cash Sterling into the Account; or

4.2 a bond in substantially the form of the Performance Bond (**"Return Condition Bond"**).

but in the absence of the Client and the Tram Maintainer being able to agree any of the details referred to in sub-paragraph 4.2 within such period of ten (10) Business Days, the security shall take the form of a cash deposit in accordance with sub-paragraph 4.1.

5. Non-Compliance revealed by a Final Inspection

If, at the time of any final inspection pursuant to paragraph 1 or on the required Return Date for the Trams, the condition of the Trams does not comply with the requirements of this Agreement, and where the Quantum of such non-compliance and/or non-performance is greater than £50,000 in aggregate amount then, without prejudice to the provisions of paragraph 2, the Tram Maintainer will within five (5) Business Days of the Client providing such details to the Tram Maintainer pursuant to paragraph 2 provide the Client with security as provided for in paragraph 4 as if the provisions of that paragraph were repeated in full in this paragraph, mutatis mutandis.

6. Realisation of Security

6.1 On the Return Date for any Tram or the Spare Parts Pool the Client shall be entitled to withdraw any and all funds standing to the credit of the Account and/or draw down all or any part of the amount of the Return Condition Bond in the following circumstances:

6.1.1 to the extent necessary to remedy any non-compliance by the Tram Maintainer with its obligations under this Agreement to comply with the Return Condition; and/or

6.1.2 if and to the extent that the Tram Maintainer fails to indemnify the Client in full in the circumstances specified in, and in accordance with, paragraph 2.

6.2 If the Tram Maintainer has provided security under paragraph 4 but the amount of such security exceeds the aggregate Quantum from time to time, the Tram Maintainer shall be entitled to reduce the level of such security by an amount equal to such excess.

6.3 If the Tram Maintainer is entitled to reduce the level of security from time to time pursuant to paragraph 6.2 the Client will co-operate with the Tram Maintainer and (at the Tram Maintainer's expense) do such acts or things as may be reasonably necessary to facilitate any permitted reduction in the level of security provided by the Tram Maintainer for the time being including giving any necessary instruction to make payment out of the Account.

6.4 On the Return Date of the last Tram to be redelivered under this Agreement or on any date thereafter in circumstances where the Client is not entitled to withdraw funds from the account or draw down on the Return Condition Bond pursuant to paragraph 6.1 the Parties agree that sums standing to the credit of the Account shall be returned to the Tram Maintainer and/or the Tram Maintainer may cancel any extant Return Condition Bond.

7. Audit Sampling

For the purpose of determining the level of any non-compliance and/or non-performance with the requirements of this Agreement, the Tram Maintainer acknowledges that the Client shall be entitled to inspect a sample of Trams to be determined by the Client in its absolute discretion and that, so long as any such sample is reasonably representative having regard to the nature or circumstances of any particular instance of non-compliance or non-performance, the Client shall be entitled to rely on such samples (acting reasonably) for the purpose of evaluating the likely extent of any non-compliance or non-performance across all Trams (or part thereof) and for determining the Quantum.

Part 2 - Condition

Unless otherwise agreed with the Client and save as modified by the Client in accordance with Clause 16 (*Changes*), each Tram, Spare Part and Special Tool must be returned in a condition consistent with:

1. its position within the Tram Maintenance Programme and the requirements of the Tram Maintenance Specification as appropriate; and

2. the Tram Requirements Specification as appropriate,

and, subject to normal wear and tear, the Tram will be returned in fully operational condition and with all its Parts fitted and operational, with the cabs of each Tram containing driver's log books and/or fault record books as appropriate and the Spare Parts Pool will contain all the Spare Parts required for the Minimum Spare Parts Pool.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 13 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 13

DEPOT SUB-LICENCE

1. In accordance with Clause 10 (*Use of the Depot*) of this Agreement the Client grants to the Tram Maintainer a sub-licence to occupy and use the Depot on a non-exclusive basis on the terms set out below:

   1.1 subject to the Tram Maintainer complying with the undertakings set out in paragraph 2 below, the Tram Maintainer shall have the right during the Term to enter into, remain in and occupy those parts of the Depot within the area shaded yellow on the Depot Plan for the purposes of carrying out and performing the Services and other obligations assumed by the Tram Maintainer in accordance with this Agreement including those offices and facilities shaded yellow on the Depot Plan in connection with the performance of such Services and other obligations.

   1.2 The Client and the Tram Maintainer agree that:

      1.2.1 the right to occupy granted pursuant to paragraph 1.1 above shall terminate on the earlier of the Termination Date or the Expiry Date;

      1.2.2 the Tram Maintainer's occupation of the Depot will be as a sub-licensee only and shall confer on the Tram Maintainer no greater interest than that of sub-licensee and in particular the sub-licence granted by paragraph 1.1 above shall not create a relationship of landlord and tenant;

      1.2.3 the benefit of the sub-licence granted by paragraph 1.1 above is personal to the Tram Maintainer, its contractors and sub-contractors and its and/or their work persons, servants and agents and is not assignable and the rights given in paragraph 1.1 above may only be exercised by the Tram Maintainer, its contractors and sub-contractors of any tier and its and/or their work persons, servants and agents.

2. The Tram Supplier agrees and undertakes to the Client that it shall (and shall procure that its sub-contractors shall):

   2.1 carry out the Services with the minimum disruption to neighbouring properties to the Depot;

2.2 use the Depot only for, and to the extent necessary for, the purposes of carrying out and performing the Services and other obligations assumed by the Tram Maintainer under and in accordance with this Agreement;

2.3 keep the Depot as clean and tidy as practicable and not make any physical alterations thereto;

2.4 provide cleaning, maintenance and access control services as required under Appendix 2 of this Schedule 13 (*Depot Sub-Licence*);

2.5 not to display any signs or notices at the Depot without the prior written consent of the Client, (such consent to be at the Client's absolute discretion);

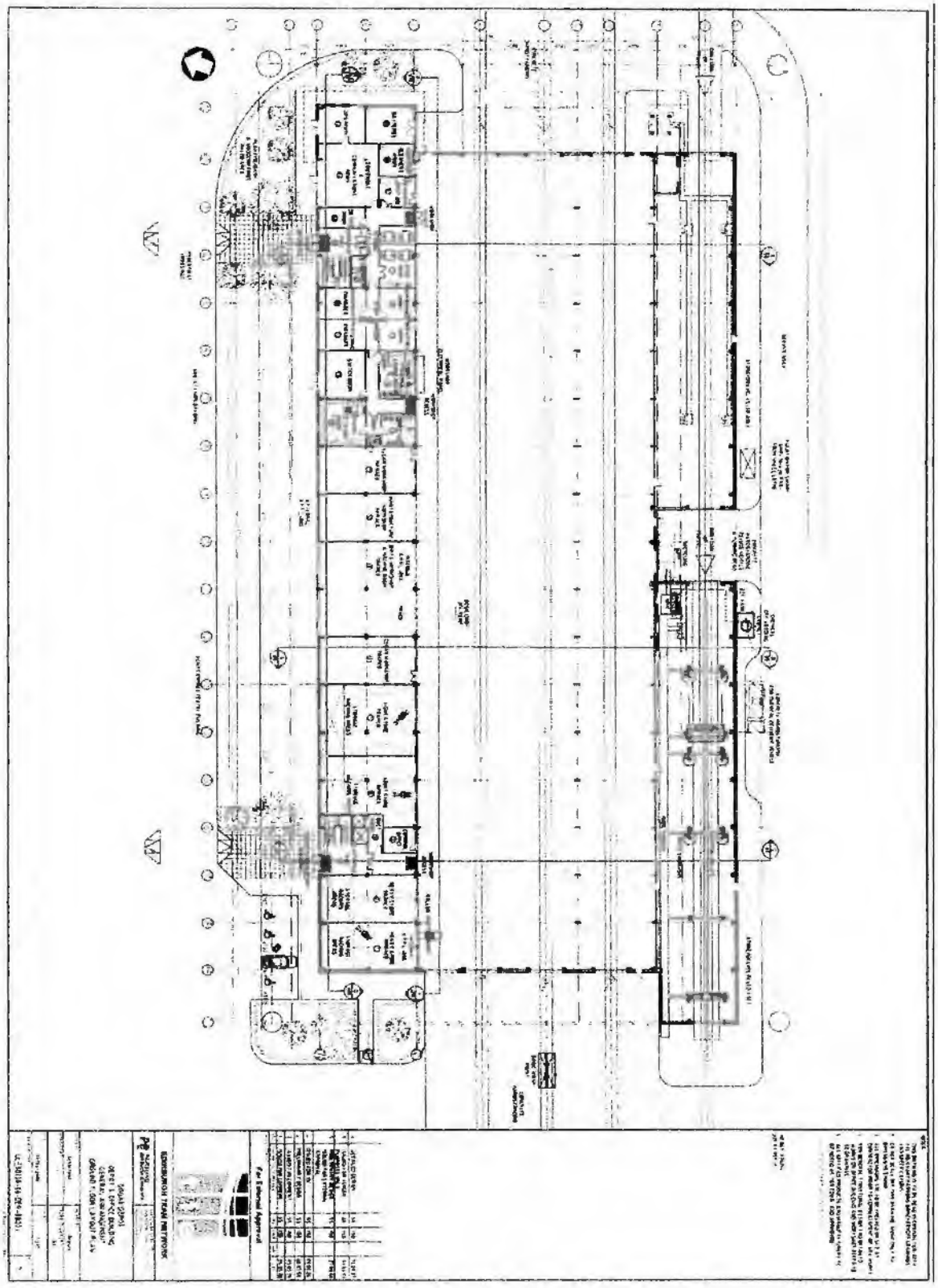
2.6 Upon termination of the licence make good any damage which the Tram Maintainer has caused to the Depot and remove all equipment and apparatus which it has brought into the Depot; and

2.7 not cause unreasonable interference to the other users of the Depot.

3. The Tram Maintainer acknowledges that the Operator shall have the responsibility for the co-ordination of health and safety issues at the Depot and Tram Maintainer hereby agrees to comply with any instructions of the Operator in relation to health and safety issues at the Depot.

APPENDIX 1

Depot Plan



APPENDIX 2

DEPOT RESPONSIBILITIES ALLOCATION MATRIX

See Schedule 2 Employer's Requirements Section 40 Table 83 and Table 89

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tie LIMITED

[redacted]

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 14 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 14

KEY PERSONNEL

Name	Iñigo Urretabizkaia		
Current Employer	CAF		
Professional Qualifications	BACHELOR SCIENCE IN INDUSTRIAL ENGINEERING		
Availability	YES		
Relevant Experience to the [Tram Supply Agreement]/[Tram Maintenance Agreement]			
Project	**Role and Responsibility (including identity of employer)**	**From**	**To**
LRV PITTSBURGH BRUSSELS METRO	QUALITY PROJECT MANAGER	2002	2006
INTERNATIONAL PROJECTS CAF	MAINTENANCE AND WARRANTY SERVICE DEPUTY MANAGER, CAF	2006	2007
INTERNATIONAL PROJECTS CAF	MAINTENANCE AND WARRANTY SERVICE MANAGER, CAF	2007	-

Name	David Anthony Lowe
Current Employer	Construcciones y Auxiliar de Ferrocarriles
Professional Qualifications	BSc Mechanical Engineering
Availability	

Relevant Experience to the [Tram Supply Agreement]/[Tram Maintenance Agreement]

Project	Role and Responsibility (including identity of employer)	From	To
Existing LUL rolling stock	London Underground Ltd Mechanical engineer in the technical office. Review and improve design of existing rolling stock to improve reliability and support maintenance activities	1989	1994
Hong Kong Metro	CAF Systems engineer in support of Safety, Reliability and Maintenance studies for new rolling stock. Modifications manager for fleet as continuation	1994	1999
WMATA	CAF Systems design and integration engineer for propulsion, brakes and ATO systems. Onsite testing, Modifcation and engineering support manager during the warranty period.	1999	2003
Sacramento LRV	CAF Systems design and integration engineer for brakes system and EMC studies and testing.	2001	2003
Pittsburg LRV	CAF Systems design and integration engineer for propulsion and brakes systems.	2002	2003
Irish Rail DMUs	CAF Modifcation and engineering support manager during the warranty period.	2003	2004
NIR DMUs	CAF Warranty manager	2004	2005
Irish Rail Intercities	CAF Warranty manager	2005	2007

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CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 15 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 15

RISK MANAGEMENT

Required Action from the Tram Maintainer	Timing/Frequency applicable to the Tram Maintainer
The Tram Maintainer shall support the Client in the development of the **Project Risk Management Plan** ("**PRMP**"). The PRMP will detail the management of commercial, environmental, safety and security risk aspects of the Edinburgh Tram Network. The PRMP shall be focused on the risk factors related to the implementation of the Edinburgh Tram Network and shall outline the management arrangements to facilitate the inclusion of input from third parties. The risk management process will be applied and co-ordinated throughout the Term. The PRMP shall indicate the critical success factors, key areas of focus and individuals involved.	Input from the Tram Maintainer as required by the Client to facilitate the delivery of the PRMP within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the PRMP to be issued.
The Tram Maintainer shall support the Client with contribution to the **Project Assumptions Register** ("**PAR**") which shall record and report all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability assumptions and consequent risks in relation to the Edinburgh Tram Network throughout the Term. The PAR shall be one central register with input from a number of parties, which the Client will co-ordinate. The Tram Maintainer shall document all relevant assumptions made in relation to the performance of the Services.	Input from the Tram Maintainer as required by the Client to facilitate the delivery of the PAR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the PAR to be issued.
The Tram Maintainer shall support the Client with contribution to the **Project Risk Register** ("**PRR**") to be developed by the Client. The PRR should summarise all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability risks to the Edinburgh Tram Network. The PRR will also detail the proposed and completed mitigation of such risks. The PRR shall include analysis of each risk in terms of 'likelihood' and 'impact' prior to and following mitigation to allow effectiveness of mitigation to be assessed, responsible owner of each risk and graphical summaries of risk profile.	Input from the Tram Maintainer as required by the Client to facilitate the delivery of the PRR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the PRR to be issued.

Required Action from the Tram Maintainer	Timing/Frequency applicable to the Tram Maintainer
The risks to be addressed should include strategic, commercial, economic, legal and regulatory, organisational, environmental, technical, operational and infrastructure risks. The Client will continue to use "Active Risk Manager", and the Client shall bear all the costs for license agreements and access costs for its use by the Client and any other party with the consent of the Client.	(continued)
The Tram Maintainer shall prepare and submit a **Progress Report** on risk to the Client on the status of risk management and mitigation in relation to the Services giving a summary of new risks identified, new assumptions, key matters to be resolved and achievements, including risks that have been closed out. The Progress Report must demonstrate how identified risks are being actively managed by the Tram Maintainer. The Progress Report should indicate "**Red-Amber-Green**" (**RAG**) status on key components including specification compliance, incomplete design and programme for outstanding work.	Delivery by the Tram Maintainer to the Client within 1 month of the Effective Date. The Tram Maintainer shall provide an updated Progress Report on a monthly basis throughout the Term.
The Tram Maintainer shall support the Client in the preparation and maintenance of a **Cost and Programme Contingency Report** ("**CPCR**") for the construction phase of the Edinburgh Tram Network. The CPCR shall indicate the recommended capital cost and programme contingency allowances to be considered. The CPCR to be provided by the Client will also include a detailed quantitative risk analysis using the Monte Carlo simulation (*@RISK*4.5 and *Pertmaster Project Risk* or equivalents) for both cost and programme components. The CPCR shall also summarise the recommended mitigation for the construction phase and also include the commissioning and defects phases of the project.	Input from the Tram Maintainer to facilitate delivery of the CPCR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the CPCR to be issued.

Required Action from the Tram Maintainer	Timing/Frequency applicable to the Tram Maintainer
The Tram Maintainer shall engage in liaison with the Client and any other party requested by the Client regarding risk matters to ensure effective management of risk. Liaison to include participation in risk management meetings and workshops and assistance with development of the risk identification procedures relevant to the implementation of the Edinburgh Tram Network.	The Tram Maintainer shall be available for monthly meetings with the Client and any other party requested by the Client. The Tram Maintainer shall also engage in ongoing liaison (including participation in risk workshops) with such parties as required by the Client throughout the Term.
The Tram Maintainer shall support the Client in the preparation of a **Construction Risk Control Report** ("**CRCR**") which shall indicate the risks identified by the Client during the construction phase of the Edinburgh Tram Network, including, but not limited to, construction sequence, construction methodologies, access, quality, approvals, security, safety and compliance. The Tram Maintainer shall assist in demonstrating how risks are to be managed and co-ordinated with other relevant parties, including the use of 'informed' registers, co-ordinating plans and summarising plans.	Input from the Tram Maintainer to facilitate delivery of the CRCR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the CRCR to be issued.
The Tram Maintainer shall support the Client in the preparation of a **Commissioning Risk Control Report** which shall detail the plans for mitigating the risks associated with the commissioning of the Edinburgh Tram Network. The Commissioning Risk Control Report shall identify the areas where the largest commissioning risks may appear. This should cover operational and design risks that could be associated with the whole project including, but not limited to, the trams, the tracks, the power supply and the tram depot. The Commissioning Risk Control Report shall concentrate on the commissioning process, but shall also refer to ongoing issues which also affect the construction and/or operation of the Edinburgh Tram Network.	Input from the Tram Maintainer to facilitate delivery of the Commissioning Risk Control Report within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the Commissioning Risk Control Report to be issued
The Tram Maintainer shall support the Client in the preparation a **Residual Risk Control Report** ("**RRCR**") that will detail the plans for mitigating the risks arising from the construction and commissioning of the Edinburgh Tram Network which are still of ongoing importance. The RRCR should clearly detail the areas of importance that could affect the project	Input from the Tram Maintainer to facilitate delivery of the RRCR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the RRCR to be issued

Required Action from the Tram Maintainer	Timing/Frequency applicable to the Tram Maintainer
that will require to be addressed at the start of the project. These areas could be associated with design, operational and defects factors. Risks to be noted in the RRCR may include, but shall not be limited to, snagging, claims, specification defects and commercial concerns.	
The Tram Maintainer shall support the Client in the preparation and maintenance of an **Operational and Maintenance Report** ("**OMR**") that will detail the identified risks associated with the provision of maintenance services in relation to the Edinburgh Tram Network.	Input from the Tram Maintainer to facilitate delivery of the OMR within the timescales agreed pursuant to the Infraco Contract. Input will be required from the Tram Maintainer on an ongoing basis during the Term to allow periodic updates of the OMR to be issued.

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Director/Authorised Signatory
tie LIMITED

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Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 16 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 16

DEFECTS LIST

This is Schedule 16 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

PART 1 - MINOR DEFECTS

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
CATEGORY C	**Minor Defect**				
	Fault needs to be advised to driver/operator but does not affect the operation of the tram in traffic. No immediate technical support required.				
C.1.	Loss of Cyclops light		TramCo	Believed to be not essential under the RTA	C
C.2.	Unusual wheel squeal		Indeterminate until investigated	Could be tram or track specific	C
C.3.	One doorway isolated	Dependent upon Operator discretion	TramCo	Check RVAR implications of particular door out of use.	N
C.4.	Loss of one marker light		TramCo	What degree of redundancy exists on tram (e.g. LEDs)?	N
C.5.	Screen wash level low	Could be filled up in service?	TramCo	Cab indication?	N
C.6.	Non-obscene or non-racist graffiti	Depends upon size/severity - could be Cat B	Opco		N
C.7.	Damaged or missing seat(s)	Replacement cushions can be fitted in service normally.	Opco		C
C.8.	Defective night screen partition		TramCo	Needs more thought as to implications.	C
C.9.	Loss of any CCTV image		TramCo		C
C.10.	Loss of TFT info screen		TramCo		C

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
C.11.	Conductor-driver communtication lost		TramCo		N
C.12.	Emergency coupler damaged		Opco		N
C.13.	Minor windscreen damage	No driver vision impairment or risk of lose glass	Opco		C
C.14.	Loose handrail		TramCo		C
C.15.	Any equipment isolated from cab		Opco	Could be Cat A or B dependant upon equipment but fault annuciator will advise accordingly.	C
C.16.	Use of reverse		Opco	Usually frowned upon without good cause.	Y
C.17.	Loose floor covering	If severe would be Cat B	Opco	Tripping hazard	N
C.18.	Loss of wipers when not raining and non-leading cab.		TramCo		N
C.19.	Loss of sun-blind	Cat A if under severely low sun conditions	TramCo/unless abused by Operator		N
C.20.	Partial loss of auxilliary power	Assuming no operational consequence for remainder of service	TramCo	Split unit with load shedding allows one half of aux. converter to operate tram safely, but should not stay out in service in this condition.	N
C.21.	Loss of screen washer		TramCo	Will tram have low-level warning?	N
C.22.	Loss of internal destination indicator	Conductors or driver to compensate by additional use of p.a.	TramCo		C
C.23.	Loss of p.a.	Cat B if combined with internal destination indicator fault as well	TramCo		N
C.24.	Loss of any PEC	Onboard staff to be	TramCo	Passenger Emergency Call	N

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
		visible and available		Point	
CATEGORY D	**Other Defect**				
	Fault is treated according to operational discretion and the list is adjusted for these in the light of experience gained.				
	Any fault not listed above				Y

PART 2 - MATERIAL DEFECTS

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
CATEGORY A	Material Defect				
	Tram must be returned to depot immediately by de-tramming passengers at next stop (or sooner if necessary). Tram may need to return at reduced speed or by being assisted by another tram. Technical support immediate. Vehicle not allowed back off depot until fault cleared other than for test run purposes.				N = Not; Y = Yes; C = if Operator agrees concession.
A.1.	Derailment, collision or impact with person or large obstacle.		OpCo	Driver will need to make quick initial assessment if he/she is able to. Technical assistance likely to be needed.	N
A.2.	Severely damaged windscreen (damage area larger than 40 mm within Zone A which is an area 290 mm wide centred on the steering wheel !. For steering wheel read centreline of driver's seat?	Where driver vision impaired or risk of glass fall out. If at rear end, could be treated as Cat. B	OpCo	Driver will need to make quick initial assessment if he/she is able to.	N
A.3.	Broken axle	Tram not to be moved at all until inspected by Technician.	TramCo	Will need to be skated home. Difficult to see how a driver could diagnose this failure.	N
A.4.	Police investigation.	If absolutely necessary.	OpCo		N
A.5.	Loss of 750 volt feed.		Indeterminate until investigated	Driver will need to make quick initial assessment if he/she is able to. Could be infrastructure or tram problem.	N

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
A.6.	Visible Pantograph damage		Indeterminate until investigated	750 volt may or may not be lost. Driver will need to make quick initial assessment and may need technical support before tram can move at all. Formal investigation required.	N
A.7.	Door opens in traffic (i.e. door irregularity leading to a potential unsafe situation)		TramCo	Formal investigation required.	N
A.8.	Door will not close and lock (whether isolated or not) or opens on the move.	If can be successfully isolated & locked, then Cat C.	Indeterminate until investigated	Formal investigation required.	N
A.9.	Passenger injured when caught in door.		Indeterminate until investigated	Formal investigation required.	N
A.10.	Not used				
A.11.	Not used				
A.12.	Broken internal glazing or glass lighting	If in small area conductor may be able to mitigate to a Cat B	OpCo		C
A.13.	Broken external bodyside window	If glass held in place, then Cat B	OpCo	Driver will need to make quick initial assessment.	N
A.14.	Loss of all exterior lighting during darkness or low light.		TramCo	Operator may need to use Bardic lamps as markers, or arrange for escort vehicle.	N
A.15.	Not used				
A.16.	Notably reduced or disconcerting brake performance.		TramCo	Hold vehicle at a terminus or siding until technical help arrives	N
A.17.	Not used				
A.18.	Primary cab control defective.		TramCo	E.g. traction controller, plus list of items to be worked up.	N

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
A.19.	Loss of wipers at leading end during rain	If no rain, then Cat B	TramCo/external causes	Wipers required even if no rain in case of dust or substances thrown at or sprayed at windscreen.	N
A.20.	Unable to release brakes.		TramCo		N
A.21.	Fire, smoke or severe smell from tram equipment	Where confirmed by member of on-board staff	TramCo	Move after de-tramming to location where technical help can be administered. Will need a formal post-incident investigation.	N
A.22.	Driver seat badly defective		OpCo		N
A.23.	Significantly impaired vision through leading cab windows.		TramCo or external causes		N
A.24.	Horn & bell both defective	If only horn defective then Cat B, or if only bell defective then Cat C.	TramCo		N
A.25.	Excessive wheel slip or slide	Could proceed at caution and be Cat B depending on tram's route.	TramCo	Implies a WSP or sanders fault	N
A.26.	Spillage of hazardous or bio-hazard material.	Could be treated as Cat B if tramcrew can limit exposure.	OpCo		N
A.27.	Tram unable to activate road junction controller (TPDS)	Could be Cat B depending on tram working	Infraco.	This is rarely if ever a tram defect.	N
A.28.	Loss of sunblind during bright low-sun conditions		TramCo/unless abused by Operator		N
A.29.	Loss of both headlamps		TramCo		N

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
A.30.	Loss of all auxilliary power.	Cat B if no operational consequences for at least 1.5 hrs.	TramCo	Aux. converter has redundancy built in that should prevent this from happening. Batteries will become depleted over time. Traction inverter cooling will be lost.	N
A.31.	Loss of use of rear-view camera or mirror.	Conductor may be able to mitigate risk.	Indeterminate until investigated		N
A.32.	Suspicious package on board		OpCo	Will need a specific procedure	N
A.33.	Loss of all rear reflectors at the rear end.	If one reflector only then Cat C	TramCo	Minimum of one rear reflector required by law. One reflector meets the law.	N
A.34.	Loss of both rear red brake lights at rear end.	If one light only, then cat. B	TramCo	Minimum of one brake light required by law. Good redundancy could mitigate effects of a failure.	N
A.35.	Loss of trafficators either side or end.	Operational discretion to be exercised depending upon which light.	TramCo		N
A.36.	Not used				
A.37.	Parking brake failure		TramCo	Formal investigation required.	N
A.38.	Failure of roll-back detection/braking		TramCo		N
A.39.	Injury to passenger where tram implicated		Indeterminate until investigated	Formal investigation required.	N

Ref.	Fault	Qualification	Likely Responsibility	Remarks	Acceptable as off-depot state
CATEGORY B	**Material Defect**				
	Tram shall be returned to depot at the next sensible opportunity (Control Room initiative) by de-tramming passengers at the next terminus or suitable location. Tram may need to return at reduced speed. Technical support immediate. Vehicle not allowed back off depot until fault cleared other than for test run purposes.				
B.1.	Not used				
B.2.	Loss of one braking module		TramCo	High redundancy within hydraulic brake system (5x modules ?).	N
B.3.	Loss of one traction package		TramCo	Electric braking likely to be affected	N
B.4.	Loss of electric brake			Tram will still brake successfully but handling will be affected. Is not unsafe but will put an unusual strain on the friction brake system.	N
B.5.	Rough Riding	Speed may be limited dependant upon severity.	Indeterminate until investigated.	Could have many causes but driver unlikely to be able to diagnose in service.	N
B.6.	Wheel flat or flats	Speed may be limited dependant upon severity.	Indeterminate until investigated.	Likely to be tram but could be driver mishandling.	C
B.7.	Severely unusual noise	Speed may be limited dependant upon severity.	Indeterminate until investigated.	Driver may or may not be able to diagnose. Technical support likely to be needed.	N

B.8.	Minor windscreen damage (driver view not impaired and no risk from glass pieces). Outside of criteria in fault A.2. above.	If damage less than 10mm or outside of wipers' swept path, then Cat. C.	OpCo		C
B.9.	Loss of radio (either end)	If a system wide failure, then Control will need to use initiative.	Infraco		N
B.10.	Loss of one headlamp during darkness, fog or low light		TramCo	What will policy be - usually UK trams run with headlights on day and night, but RTA does not require working headlights on road vehicles during daylight?	N
B.11.	Loss of one marker light, either side or end; yellow, red or white.		TramCo	Level of redundancy on tram?	N
B.12.	Loss of both rear fog lights during fog, mist or driving rain.		TramCo	One rear fog light meets the law.	N
B.13.	Loss of wipers when not raining.		TramCo/unless external causes	Wipers required even if no rain in case of dust or substances thrown at or sprayed at windscreen.	N
B.14.	Not used				
B.15.	Not used				
B.16.	Loss of saloon heating in very cold weather.	Inspector could make a judgement on the day. Tram will be at its coldest off depot.	TramCo	Minimum temp. to be agreed below which the tram should not operate.	C
B.17.	Loss of cab climate control in either very cold or very hot weather.			Minimum & maximum temps.to be agreed beyond which the tram should not operate.	C
B.18.	Under-guard (or other part of vehicle) dragging on ground		OpCo	Could be as a result of an impact or snow build up.	N

B.19.	Loss of OTMR		TramCo	Must show indication to driver "by law"	N
B.20.	More than one adjacent door locked out of use.		TramCo	Check RVAR restrictions on door availability	N
B.21.	Not used				
B.22.	Blatently obscene or racist graffiti	Conductor or mobile cleaner may be able to deal with it.	OpCo		N
B.23.	Loss of two or more internal CCTV images		TramCo		C
B.24.	Cash vault full		OpCo	Tram could be met and the cash box exchanged?	N
B.25.	Not used				
B.26.	Insecure internal or external panel		OpCo		N
B.27.	Loss of external destination indicator	Cat C if temporary blinds are deployed.	TramCo		C
B.28.	Not used				
B.29.	Not used				
B.30.	Loss of on-board emergency equipment.		OpCo	Could be replenished whilst in traffic. Cupboard should be sealed and checked on Prep. Exam.	N
B.31.	Mis-aligned headlamp where dazzling of other drivers likely		Indeterminate until investigated.		N
B.32.	Not used				
B.33	Severe arcing from pantograph or wheels other then in freezing weather	Technical support required.	Indeterminate until investigated.	Ice on OHLE or rails can cause this but could also be indicative of fault with pantograph or tyre earth bonds.	N

B.34	Unable to close & lock cab door		TramCo		N
B.35	Unable to open cab door		TramCo		N
B.36	Loss of all interior lighting in one section of tram during darkness.		TramCo		N
B.37	Notably reduced or disconcerting traction performance.		TramCo	Hold vehicle at a terminus or siding until technical help arrives	N
B.38	Loss of all marker lights at one corner of tram (red or white) or all along one side (yellow)	Internal partition to not be used and saloon lights to be all on.	TramCo	Good redundancy could mitigate effects of a failure.	N

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 17 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 17

COMMERCIALLY SENSITIVE INFORMATION

CAF considers as Commercially Sensitive Information any information delivered at any moment, to **tie** or the Client any of the parties working, collaborating with **tie** or the Client, related with:

- Prices, including, but not limited to, overall amounts, partial amounts, options prices and payments milestones;
- Detailed technical drawings; and/or
- Detailed technical calculations.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

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Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 18 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 18

CODE OF CONSTRUCTION PRACTICE AND CODE OF MAINTENANCE PRACTICE

Part 1 - CODE OF CONSTRUCTION PRACTICE

1. MANAGEMENT SYSTEMS

1.1 The Tram Maintainer shall implement and comply with the following management systems:

1.1.1 a "quality management system" in accordance with ISO 9001;

1.1.2 a "safety management system" in accordance with OHSAS 18001 or HSG65; and

1.1.3 an "environmental management system" in accordance with ISO 14001.

2. INSTRUCTION AND TRAINING

2.1 The Tram Maintainer shall ensure that its employees, Sub-Contractors, agents and others on Site (as defined in the Infraco Contract) undertake a number of inductions. These shall comprise:

2.1.1 project-specific induction for the Services (provided by the Tram Maintainer); and

2.1.2 worksite and task-specific-induction including a method statement briefing and toolbox talk, (provided by the Tram Maintainer).

2.2 Any persons who have not received the induction, for example visitors, shall be escorted on Site (as defined in the Infraco Contract) by a competent inducted person.

2.3 The Tram Maintainer shall maintain induction and training records in order that the Client can inspect them. These records shall identify the scope of the induction and training and the persons who received them.

3. SAFE SYSTEMS

3.1 **Risk Assessments**

3.1.1 The Tram Maintainer shall prepare risk assessments for all work activities being undertaken.

3.1.2 Each risk assessment shall include as a minimum the following details:

3.1.2.1 Document control

3.1.2.1.1 document title and number;

3.1.2.1.2 revision status;

3.1.2.1.3 authorisation for use; and

3.1.2.1.4 reference to supplementary documentation.

3.1.2.2 identification of any hazards;

3.1.2.3 identification of those who might be harmed, and how; and

3.1.2.4 an evaluation of the risks and, in relation to each risk, the control measures required to reduce the risk to an appropriate level.

3.2 Method Statements

3.2.1 The Tram Maintainer shall prepare method statements for all work activities which fall within the definition of "construction work" under the Construction (Design & Management) Regulations 2007. Each method statement shall relate to the relevant work location.

3.2.2 Categorisation of Method Statements

Method statements shall be categorised as detailed below:

CATEGORY	RISK	APPROVAL PROCESS
A1	**Low risk.** Minimum implications on Human life or the Project	**Prepared** by Contractor / Sub Contractor **Approved** by Contractor / Sub Contractor
A2	**Medium risk.** Possibly implications on Human life or the Project	**Prepared** by Contractor / Sub Contractor **Approved** by Contractor / Sub Contractor **For Information** the Client Ltd Project Manager
A3	**High risk.** Major implications on Human life or the Project.	**Prepared & Approved** by Contractor/ Sub Contractor **Accepted** by the Client Ltd HSQE Advisor **Accepted** by the Client Ltd Project Manager

3.2.3 Each method statement shall include as a minimum the following details:

3.2.3.1 Document control

3.2.3.1.1 document title and number;

3.2.3.1.2 revision status;

3.2.3.1.3 contractor prepared and approved; and

3.2.3.1.4 the Client acceptance for use (as defined below).

3.2.3.2 Scope of work

3.2.3.3 Hazards identified

3.2.3.4 Public interface arrangements

3.2.3.5 Protection of existing infrastructure

3.2.3.6 Environmental protection arrangements

3.2.3.7 Plant, equipment and materials

3.2.3.8 Emergency procedures

3.2.4 The documentation referred to in paragraph 3.2.3 above shall be developed so that it is specific to the Services. The Tram Maintainer shall ensure that revisions and updates can be identified.

3.2.5 The Tram Maintainer shall issue a copy of its procedure for the production of method statements and risk assessments to the Client for approval in accordance with the Review Procedure.

3.3 Submission of Risk Assessments & Method Statements

3.3.1 A 4-week "look ahead" schedule identifying the required scope of the Services shall be issued to the Client by the Tram Maintainer. This schedule shall identify the relevant risk assessments and method statements which are required in respect of each such scope. The Client shall identify which risk assessments and method statements require to be provided by the Tram Maintainer to the Client based upon the categorisation of method statements in accordance with paragraph 3.3.2 above.

3.3.2 The Tram Maintainer shall issue risk assessments and method statements to the Client a minimum of 20 Business Days prior to the commencement of the Services which are the subject of the method statements and risk assessments.

3.3.3 The Tram Maintainer shall not undertake any Services for which a risk assessment or method statement has been requested without the agreement of the Client.

3.3.4 The Client shall supply a letter of acceptance with all requested and returned Method Statements and Risk Assessments, which are found to be acceptable for site use. No requested Method Statement work activities shall commence on site without this letter of acceptance.

3.3.5 Irrespective of whether or not the Client has reviewed a risk assessment and method statement produced by the Tram Maintainer, the Tram Maintainer shall issue one copy of the risk assessment and method statement to the Client for information purposes before any work shall commence.

3.4 Permit to Commence Works

3.4.1 The Tram Maintainer shall comply with the Client's system for controlling access to undertake work activities, which shall require the Tram Maintainer to obtain an approved permit to commence works from the Client (**"Permit to Commence Works"**) for each Work Site and agreed scope of construction works.

3.4.2 In so far as not otherwise submitted pursuant to this Agreement, the Tram Maintainer shall submit a form for each required Permit to Commence Works (**"Permit to Commence Works Form"**) which is required, to the Client a minimum of 5 Business Days in advance of the access being required.

3.4.3 The Tram Maintainer shall advise the Client of the persons within its organisation who are competent to authorise the Permit to Commence Works Forms.

3.4.4 Each Permit to Commence Work Form shall identify the necessary licences, third party approvals and notifications that have been obtained / granted to enable the works to be undertaken, together with the specific control measures that require to be implemented under the Tram Maintainer's safety management system.

3.4.5 The Tram Maintainer's personnel who will implement the Permit to Commence Works procedure shall be required to undergo training by the Client.

3.5 **Permits to Work**

3.5.1 The Tram Maintainer shall implement a "permit to work" system for the following activities as a minimum:

3.5.1.1 hot works;

3.5.1.2 entry into confined spaces;

3.5.1.3 work affecting services;

3.5.1.4 access to live facilities; and.

3.5.1.5 works on private land controlled by third parties.

The Tram Maintainer shall implement a procedure for managing third party permits to work

3.5.2 The Tram Maintainer shall issue a copy of its permit to work procedures to the Client for approval in accordance with the Review Procedure.

3.5.3 The Tram Maintainer shall advise the Client of the competent persons within its organisation who shall be competent to authorise permits to work.

3.6 Personal Protective Equipment

3.6.1 The Tram Maintainer shall provide all necessary personal protective equipment ("**PPE**") for its employees and provide them with all necessary information, instruction and training on its use.

3.6.2 The Tram Maintainer shall ensure that all persons on any Work Site (including any Tram Maintainer Parties and visitors) wear the necessary PPE.

3.6.3 The Client's specific requirements for PPE with regard to particular tasks are as follows:

3.6.3.1 head protection conforming to BS 5240 or BS EN 397;

3.6.3.2 protective footwear complying with BS EN 345 (safety boots which provide ankle support and contain steel midsoles shall be required for works which are carried out on railway land);

3.6.3.3 yellow high visibility clothing to comply with BS EN 471:1994, Table 1, Class 2 or 3, which shall be worn at all times; the clothing shall comply with the requirements of Clause 4.2.3(b) in all cases; jackets with sleeves in accordance with Clause 4.2.4 and to Class 3 shall be worn on dual carriageway roads with a speed limit of 50 mph or above, unless operatives stay within the working space at all times; and

3.6.3.4 orange high visibility clothing complying with GO/RT 3279 shall be worn where any works are carried out on railway land.

3.7 Work Site Completion Certificates

3.7.1 The Tram Maintainer shall comply with the Client's system for certifying the completion of the relevant work activities within each Work Site, which shall require the Tram Maintainer to complete a completion certificate ("**Work Site Completion Certificate**") for each Work Site in relation to which the relevant Services have been completed.

3.7.2 The Work Site Completion Certificate shall be completed by the Tram Maintainer to identify and cross reference the quality control records, testing and commissioning records and any other relevant records identified within Schedule 2 (*Employer's Requirements*) and this Schedule 18 (*Code of Construction Practice*), together with details of any outstanding works which are required and the timescales for undertaking them.

4. REPORTING

4.1 The Tram Maintainer shall report the following information to the Client within the same working day or 24 hours of the event occurring:

4.1.1 details of any accident or incident;

4.1.2 details of any environmental event; and

4.1.3 details of any visit by either the Health & Safety Executive or SEPA, together with details of any report issued or enforcement action that resulted.

4.2 The Tram Maintainer shall include the following information within its four weekly progress report which is to be provided to the Client as part of the Services:

4.2.1 an update on any events referred to in paragraphs 4.1.1 to 4.1.3;

4.2.2 details of any near misses;

4.2.3 details of any accident investigation reports raised by the Tram Maintainer including details of corrective and preventative actions which have been taken;

4.2.4 the accident incident rate (**"AIR"**) and accident frequency rate (**"AFR"**) for the Services (including details of total hours worked and number of persons employed);

4.2.5 a summary of the monitoring and internal auditing activities undertaken by the Tram Maintainer in the period, including details of any corrective or preventative actions raised or closed out; and

4.2.6 details of the programme of monitoring and auditing planned for the subsequent four-weekly period.

5. AUDITING AND MONITORING

5.1 The Tram Maintainer shall be responsible for carrying out, auditing and monitoring of its site establishment and work activities.

5.2 The Client shall undertake regular auditing and monitoring of the Tram Maintainer's activities and site establishment and documentation records, and the Tram Maintainer shall action any findings which are raised by the Client.

6. NON-CONFORMANCE, COMPLAINTS AND DISCIPLINARY MATTERS

6.1 The Client shall implement a process for recording and processing breaches by the Tram Supplier of the requirements of this Schedule 18 (*Code of Construction Practice*) and complaints.

6.2 The Tram Maintainer shall take such steps as are required by the Client to remedy any such infringement or address any such complaint and the following priority levels for action shall apply:

Level of Urgency	Category of Notification	Required Response Time
1	High urgency. Involves an immediate threat to persons or property or the circumstances otherwise require immediate rectification.	Immediate action required. If response not completed by the Tram Maintainer within 4 hours, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer.
2	Medium urgency. No immediate threat to persons or property, but circumstances require rectification within 24 hours.	Remedial action requires to be completed within 24 hours. If the Tram Maintainer does not complete the required response within 24 hours, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer.
3	Issue requires rectification, but no immediate threat to persons or property and the circumstances do not otherwise require immediate rectification.	Timescales for rectification to be agreed between the Tram Maintainer and the Client. In the event that the Tram Maintainer does not comply with the agreed timescales, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer.

If the Tram Maintainer fails to take any remedial action required by the Client pursuant to the table above, the Client shall be entitled to employ and pay other persons to carry out the same and all costs incurred by the Client shall be recoverable

from the Tram Maintainer by the Client and may be deducted by the Client from any monies due or to become due to the Tram Maintainer or, alternatively, recoverable from the Tram Maintainer as a debt.

6.3 The Client shall implement a process for initiating disciplinary actions which could arise from complaints received in respect of Tram Maintainer staff or breach by any member of the Tram Maintainer's staff in respect of the requirements of Schedule 2 (*Employer's Requirements*) or this Schedule 3 (*Code of Construction Practice*). These comprise:

6.3.1 Black Card: issued for gross misconduct, or the aggregation of two Red Cards or three Yellow Cards - results in employment on the Edinburgh Tram project being terminated for the individuals involved.

6.3.2 Red Card: issued for serious misconduct, or the aggregation of two Yellow Cards.

6.3.3 Yellow Card: issued for misconduct.

7. IDENTIFICATION

7.1 The Tram Maintainer shall ensure that all site construction staff are easily identifiable to the public by use of photo identity cards.

7.2 The Tram Maintainer shall ensure that all site construction staff identify their employer by means of their company logo on their high visibility waistcoat / jacket and safety helmet.

8. HOURS OF WORKING

8.1 Normal maximum hours of permissible working for the Services shall be:

Monday – Friday **0700 – 1900 hours**

Saturday **0800 - 1300 hours**

8.2 These hours of work shall not apply to equipment which is required to operate continuously (e.g. for safety or environmental reasons) or to work undertaken within fully enclosed areas such as buildings.

8.3 **Work Outside Normal Hours**

8.3.1 In certain circumstances work outwith these hours may be undertaken with the prior approval of the Client and CEC. These circumstances may include:-

8.3.1.1 Sunday and evening/night working on public roads and in the vicinity of the railway network, where such working is required to minimise disruption to other traffic; or

8.3.1.2 where, through consultation with local residents and businesses adjacent to the proposed Services to be undertaken outwith the normal hours of working, it is deemed by the Tram Maintainer acting reasonably and having due and proper regard to the said consultation to be less disruptive to those businesses and residents by having the Tram Maintainer working extended hours outwith the normal hours of working, or

8.3.1.3 where Services are taking place in areas where there are no residents adjacent to the proposed Services.

8.3.2 Application for prior approval must be made by the Tram Maintainer at least two weeks in advance.

8.4 Where Sunday or evening and night working has the potential to disturb nearby land users and occupiers, the Tram Maintainer shall notify such users and occupiers seven days in advance with a description of the work to be carried out, measures which will be taken to control noise or other disturbance, and proposed hours of working.

8.5 No works shall be undertaken between Haymarket at Magdala Crescent to Leith Walk Junction of London Road from and including the following dates:

Festival 03rd August 2008 until 07th September 2008;

Festival 02nd August 2009 until 06th September 2009;

Festival 01st August 2010 until 05th September 2010;

Christmas 07th December 2008 until 02nd January 2009;

Christmas 06th December 2009 until 04th January 2010; and

Christmas 05th December 2010 until 04th January 2011.

9. SITE ARRANGEMENTS

9.1 Site Housekeeping

9.1.1 A 'good housekeeping' policy shall be applied by the Tram Maintainer at all times; this shall include, but not necessarily be limited to, the following requirements:

9.1.1.1 all working areas, including offices, shall be kept in a clean and tidy condition;

9.1.1.2 all working areas shall be a no-smoking area; specific areas within the Site shall be designated as smoking areas and shall be equipped with containers for smoking waste; these shall not be located at the boundary of the Site and adjacent to neighbouring land;

9.1.1.3 open fires shall be prohibited at all times;

9.1.1.4 all necessary measures shall be taken to minimise the risk of fire and the Tram Maintainer shall comply with the requirements of the local fire authority;

9.1.1.5 radios (other than two-way radios used for the purposes of communication related to the Services) and other forms of audio equipment shall not be operated on the Site;

9.1.1.6 any waste susceptible to spreading by wind or liable to cause litter shall be stored in enclosed containers;

9.1.1.7 rubbish shall be removed at frequent intervals and the Site kept clean and tidy;

9.1.1.8 hoardings shall be frequently inspected, repaired and re-painted as necessary;

9.1.1.9 eating and drinking shall only permitted within the Tram Maintainer's designated welfare area;

9.1.1.10 adequate toilet facilities shall be provided for all Site staff;

9.1.1.11 food waste shall be removed frequently;

9.1.1.12 the Tram Maintainer's personnel (including any Sub-Contractors) shall be required to conform to a reasonable dress code;

9.1.1.13 any behaviour that is lewd or likely to cause offence shall not be permitted; and

9.1.1.14 wheel washing areas shall be brushed clean frequently.

9.1.2 The Tram Maintainer shall inspect all working areas at least weekly and shall provide a four weekly written report on compliance with paragraph 9.1.1 above. the Client, the Client's Representative or any other party authority by either of them may carry out inspections of the Site at any time without prior notice of time and place of the inspections. Access to all areas of the Services shall be given to visiting inspectors and the Tram Maintainer shall give inspectors all reasonable assistance during their Site inspection.

9.1.3 The Tram Maintainer shall register the project with the Considerate Constructors Scheme.

9.2 **Welfare**

9.2.1 The Tram Maintainer shall be responsible for ensuring that adequate welfare facilities are provided; adequate facilities shall comprise:

9.2.1.1 sufficient toilet facilities for all staff at readily accessible locations, including adequate supplies of toilet paper;

9.2.1.2 facilities for changing, storing and drying clothes, for heating water and for washing and drinking (the latter must have seating for each person and wipe-clean mess table tops);

9.2.1.3 washing facilities near every toilet facility and changing room; the washing facilities shall include a supply of hot and cold or warm water, soap or cleaning agent and towels or hot air drier;

9.2.1.4 clean, wholesome drinking water, clearly marked as such;

9.2.1.5 a means of heating food; and

9.2.1.6 rest facilities.

9.2.2 The Tram Maintainer shall keep all welfare facilities clean and shall not use them for the storage of materials, plant and other working equipment.

9.2.3 The Tram Maintainer shall provide suitable and sufficient fire fighting equipment for all on-site accommodation.

9.2.4 Where there is the possibility of female employees or visitors being present on the Site, the Tram Maintainer shall provide separate toilet, washing and changing facilities.

9.3 Fencing and Hoardings

9.3.1 The Tram Maintainer shall ensure that all working areas are sufficiently and adequately fenced to prevent the public and animals from straying on to the working area; hoardings shall be provided to suit the individual location by carrying out an appropriate risk assessment, but may be:

9.3.1.1 adjacent to a pedestrian route;

9.3.1.2 a modular wire mesh fence, a minimum of 1.8 metres in height, where appropriate for minimum security needs; or

9.3.1.3 a 2.4 m minimum height, plywood faced, timber framed boundary hoarding, of a surface density of not less than 7kg/m² or other hoarding providing equivalent security and noise attenuation, in the vicinity of noise sensitive neighbours;

9.3.1.4 in locations identified by the Client a proprietary steel panelled hoarding system a minimum of 2.4m in height;

9.3.1.5 a 2.4m minimum height, plywood faced, timber framed boundary hoarding, of a surface density of not less than 7kg/m² together with a covered walkway over a pedestrian route;

9.3.1.6 adjacent to a live road carriageway;

9.3.1.7 as for a pedestrian route, but in conjunction with a vehicle restraint system which complies with containment level T1 and T2 of BS EN 1317 - 2:1998, where determined by the risk assessment;

9.3.1.8 in areas not adjacent to a live carriageway or pedestrian route;

9.3.1.9 as for a pedestrian route;

9.3.1.10a post and wire fence 1.2m in height erected on the line of the Permanent Land;

9.3.1.11other designs, where a particular level of risk mitigation appearance or acoustic rating is considered to be required and is agreed with the Client and CEC; and

9.3.1.12where the Services to be undertaken are of a minor nature, and subject to the approval of the Client, barriers comprising post and planks or similar proprietary systems can be used.

All fencing and hoardings shall comply with Chapter 8 of the Traffic Sign Manual.

All access and egress to worksites shall be via designated positions within the fencing and hoardings, which shall remain closed and secured when not in use.

9.3.2 All fencing and hoardings that create poorly lit pedestrian routes shall have appropriate lighting fitted by the Tram Maintainer, and these shall be illuminated at all times when the adjacent street lighting is lit.

9.3.3 The Tram Maintainer shall ensure that the location and design of Site boundaries, hoarding and temporary structures on the public road shall permit adequate visibility at junctions and proper forward visibility along the roads in accordance with the National Roads Directorate advice notes and the requirements of CEC.

9.3.4 The Tram Maintainer shall ensure that where hoardings are provided, they are painted on the side facing away from the working area in a colour and style to be approved by the Client and CEC, and that the public side of the hoarding carries signs which identify the project and give appropriate contact information for the Tram Maintainer.

The Tram Maintainer shall ensure that where fencing is provided the fence panels are covered by material that complies with the requirements of Loss Prevention Standard LPS 1215 *Flammability Requirements and Tests for LPCB Approval of Scaffolding Materials.* The material shall be printed in a

colour and style to be approved by the Client and CEC, and carries signs which identify the project.

9.3.5 All hoardings shall be maintained by the Tram Maintainer in a neat and tidy condition at all times, 24 hours, 7 days a week.

9.3.6 The Tram Maintainer shall be expressly prohibited from displaying or allowing to be displayed any advertisement or notice including illicit bill or fly posting on the hoardings. The Tram Maintainer shall ensure that all graffiti, fly posting or defacement to the hoardings is removed and made good or obscured within 24 hours.

9.3.7 An information board shall be provided by the Tram Maintainer at each working area detailing information on the work programme and estimated duration of the Tram Maintainer at that working area, together with the location of the information centre, the web address and a 24-hour telephone number for use by members of the public who wish to lodge complaints or comments or additional information.

9.3.8 All fencing and hoarding shall be removed as soon as reasonably practicable after the completion of any part of the Tram Maintainer.

9.4 **Lighting and Visual Intrusion**

9.4.1 The Tram Maintainer shall site construction buildings, equipment and lighting so as to minimise visual intrusion and light spillage at nearby residential properties, in so far as is consistent with the safe and efficient operation of each Work Site. Lighting shall be removed as soon as is consistent with the safe and efficient operation of each Work Site.

9.4.2 Site lighting shall be positioned and directed by the Tram Maintainer so as to minimise nuisance to residents and to minimise distractions or confusion to passing drivers on adjoining public roads. This provision shall apply particularly to working areas where work after dark will be carried out and the Tram Maintainer shall provide appropriate lighting for these sites.

9.4.3 So far as is practicable, all power to temporary traffic signals, lighting and the like shall be taken by the Tram Maintainer from mains supplies rather than from portable generators. Where portable generators are used, industry best

practice shall be followed to minimise noise and pollution from such generators.

9.4.4 The Tram Maintainer shall comply with the Institute of Lighting Engineers' document *Guidance Notes on Reduction of Light Pollution 2000* in so far as is reasonably practicable and applicable to the Tram Maintainer.

9.5 **Access and Loading**

9.5.1 The Tram Maintainer shall ensure that lorries shall enter and exit the Site in a forward direction at designated locations, except where space restriction does not permit this. If the reversing of vehicles into public spaces is required, then a responsible person observing the rear of the vehicle shall properly control the movement. The sounding of audible reversing alarms shall not be permitted outside normal working hours, except where this has been approved by the Client and CEC in connection with Tram Maintainer Works permitted under paragraph 8.3 above). Entry and exit conditions shall be subject to prior approval by the Client, CEC and the Lothian and Borders Police before implementation.

9.5.2 Access to and egress from the Site shall be carried out by initiating a left turn wherever reasonably practicable.

9.5.3 All loading and unloading of vehicles shall take place off the public road as far as is reasonably practicable.

9.6 **Security**

9.6.1 Adequate security shall be exercised by the Tram Maintainer to protect the public and prevent unauthorised entry to or exit from the Site. Site gates, where used, shall be closed and locked when there is no Site activity and Site security measures shall be implemented.

9.6.2 Site security cameras, where used, shall be placed in locations which will not unduly infringe upon the privacy of local residents.

9.7 **Living Accommodation**

9.7.1 No living accommodation shall be provided by the Tram Maintainer within any construction working area. Mess rooms, locker rooms, toilets and showers shall be permitted at Work Sites.

9.8 **Clearance of Site on Completion**

9.8.1 The Tram Maintainer shall clear and clean all utilities apparatus (where relevant to the Tram Maintainer Works), working areas and accesses as work proceeds and when no longer required for the carrying out of the Services.

9.8.2 All surplus soil and materials, rubbish, Temporary Works (including temporary roads and hardstandings), Tram Supplier's Equipment, sheds, offices and temporary fencing shall be removed, post holes filled and the surface of the ground restored as near as practicable to its original condition, or to such condition as has previously been agreed with the Client and CEC in accordance with this Agreement and/or the Specification (as appropriate).

9.9 **Pest Control**

9.9.1 The Tram Maintainer shall ensure that the risk of infestation by pests or vermin is minimised by adequate arrangements for the disposal of food waste or other material attractive to pests. If infestation occurs, the Tram Maintainer shall take such action to deal with it as required by the Client and CEC.

10. REQUIREMENTS RELATING TO WORKS AFFECTING EDINBURGH AIRPORT

10.1 The Tram Maintainer shall comply with the requirements of Edinburgh Airport Limited in relation to aerodrome safeguarding, including those requirements included within the Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2003 (SEDD Circular 2/2003).

10.2 The Tram Maintainer shall have regard to, and comply (where relevant) with all BAA and CAA guidelines, including, (but not necessarily limited to):

10.2.1 CAP 168 Licensing of Aerodromes.

10.2.2 CAP 680 Aerodrome Bird Control.

10.2.3 CAA Safeguarding of Aerodromes Advice Note 1 (Safeguarding – An Overview).

10.2.4 CAA Safeguarding of Aerodromes Advice Note 2 (Lighting near Aerodromes).

10.2.5 CAA Safeguarding of Aerodromes Advice Note 4 (Cranes and Other Construction Issues).

10.2.6 BAA Standard Conditions for Aerodrome Safeguarding.

10.3 The Tram Maintainer shall prepare for approval by the Client and Edinburgh Airport Limited a "Construction Management Strategy" as defined within CAA Safeguarding of Aerodromes Advice Note 4 (Cranes and Other Construction Issues). The Construction Management Strategy shall address as a minimum the following issues:

10.3.1 use of cranes or other tall construction equipment;

10.3.2 control of activities likely to produce dust or smoke clouds

10.3.3 the design of temporary lighting to avoid distracting pilots (see Advice Note 2);

10.3.4 storage of materials, particularly compliance with height limits;

10.3.5 control and disposal of waste, to prevent attraction of birds; and

10.3.6 site restoration, to prevent attraction of birds.

11. REQUIREMENTS RELATING TO WORKS AFFECTING THE RAILWAY

11.1 The Tram Maintainer shall comply with the requirements of Network Rail in relation to railway safeguarding.

11.2 The Tram Maintainer shall comply with all Network Rail standards and guidelines, including but not limited to "*Contract Requirements (NR/SP/OHS/008)*" including the Safety Clause Menu and "*Health and Safety Management of Third Party Works (RT/LS/P/043)*".

12. HEALTH & SAFETY REQUIREMENTS

12.1 **Safety Signage**

The Tram Maintainer shall be responsible for the provision of all safety signage required for the work activities being undertaken. Safety signage shall comply with the Health and Safety (Safety Signs and Signals) Regulations 1996.

12.2 **Hazardous Substances**

12.2.1 The Tram Maintainer shall maintain a register of safety data sheets for all materials and substances used.

12.2.2 The Tram Maintainer shall be responsible for undertaking "COSHH" assessments for materials and substances used or with which contact will be made on the Site.

12.2.3 The Tram Maintainer shall liaise with the Client regarding proposals for storage of hazardous substances in open air, in buildings, within the workplace and the decanting, disposal of empty containers, tanks and cylinders.

12.3 **Electricity**

12.3.1 The Tram Maintainer shall use electrical tools and equipment which operate at a voltage no greater than 110V. Where there is a requirement to operate tools and equipment using a voltage greater than 110V, the approval of the Client shall be obtained in writing.

12.3.2 Electrical tools shall be double insulated and used in conjunction with a RCD.

12.3.3 Tools shall be connected to a 240V supply via a portable 110V centre tapped transformer.

12.3.4 The lead between the 240V supply and the transformer shall be as short as is reasonably possible.

12.3.5 All temporary electrical systems shall possess a current inspection certificate.

12.3.6 All tools shall have passed an electrical safety test and shall be identified with a label which states the unique identification, the test date, the next test date and the organisation which carried out the electrical safety test.

12.4 **Provision and Use of Work Equipment**

12.4.1 The Tram Maintainer shall be responsible for ensuring the inspection of all work equipment. Records of inspections shall be retained at the Site.

12.4.2 Work equipment shall only be used by authorised personnel, who have received appropriate training and certification.

12.5 **Lifting Operations and Lifting Equipment**

12.5.1 The Tram Maintainer shall be responsible for ensuring that all lifting equipment is accompanied by current test and examination certificates.

12.5.2 Safe working loads shall be shown on all lifting equipment.

12.5.3 Lifting equipment and lifting operations shall only be used by authorised personnel, who have received appropriate training and certification.

12.6 **Height Gauges for Low Structures**

A height gauge in the form of a rigid "goal post" type structure shall be erected at:

12.6.1 all egress points from the worksites. The height that the cross bar is set to shall be dependent upon the minimum height of any obstruction that a vehicle will encounter on public or third party land; and

12.6.2 all access points to the worksites or in the proximity of an on site obstruction. The height to which the crossbar requires to be set shall be subject to review during the course of the Services to ensure that it takes cognisance of the ongoing Services.

The height gauge shall comprise a form that shall alert the driver of contact with the crossbar and shall be located in a position that shall enable the driver to take avoiding action prior to contacting any obstruction.

12.7 **Overhead Power Lines**

Where plant and equipment is working in the vicinity of an overhead power line, the distance between the plant and equipment and the overhead line should be at least:

12.7.1 15m (plus the length of the jib) if the lines are suspended from steel towers; or

12.7.2 9m (plus the length of the jib) if the lines are supported on wooden poles.

In cases where approach is likely, stout, distinctive barriers should be erected at ground level to prevent access. Where work is to take place close to overhead lines, detailed precautions should be discussed with the owner of the overhead lines. However, the responsibility for ensuring that precautions are adequate remains with the Tram Maintainer, not with the owner of the power lines.

In addition to the specific precautions required when working in the vicinity of overhead power lines, the following shall be undertaken:

12.7.3 barriers shall be erected at least 6m away, to prevent inadvertent approach by other site vehicles; and

12.7.4 crossing points shall be clearly marked beneath the lines by means of a rigid "goal post" structure at a height specified by the electrical supplier.

Storage of materials shall be prohibited in the area between the overhead lines and the ground-level barriers.

13. FIRE PREVENTION

13.1 The requirements of the document "*Fire Prevention on Construction Sites: The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation* (published by the Construction Confederation and the Fire Protection Association) shall apply to the Services.

13.2 All temporary protective coverings shall comply with the requirements of the Loss Prevention Standard LPS 1207 'Fire Requirements for Protective Covering Materials'.

13.3 All scaffold cladding materials shall comply with the requirements of the Loss Prevention Standard LPS 1215 'Flammability Requirements for Scaffold Cladding Materials'.

13.4 The Tram Maintainer shall, as appropriate to the work activities, appoint "a fire marshall" who shall be responsible for day to day fire safety.

13.5 A permit to work shall be implemented for all "hot works".

13.6 The use of halogen lighting shall be prohibited.

14. FIRST AID

14.1 the Tram Maintainer shall be responsible for providing first aid provision for its personnel (including any Sub-Contractors) in accordance with the Health and Safety (First Aid) Regulations ("Regulations") 1981. This shall include the provision of:

14.1.1 a first aid box, the size of which shall be commensurate with the number of workers on Site; and

14.1.2 the required number of first aiders or appointed persons required by the Regulations.

15. INSPECTIONS

15.1 The Tram Maintainer shall be responsible for undertaking the statutory inspections required in terms of the Construction (Health, Safety and Welfare) Regulations 1996 that relate to the Services being carried out. The records of the inspections shall be retained on the Site.

16. ROADS AND FOOTPATHS, CYCLEWAYS AND BRIDLEWAYS

16.1 General

16.1.1 The Tram Maintainer shall submit to the Client a statement setting out the proposed measures (including specified traffic routes) to be taken with respect to traffic and road safety for the duration of the Services, to enable the development including all relevant information in relation to the Tram Maintainer obtaining Temporary Traffic Regulation Orders (**"TTROs"**) and the equivalent of such orders as are applicable to third parties (for example Edinburgh Airport Limited), for approval before the Services commence. The Tram Maintainer shall circulate the approved statement to all bodies identified by the Client and CEC and any other bodies reasonably requested by the Client.

16.1.2 The measures to be taken with respect to traffic and road safety shall include, but not necessarily be limited to:

16.1.2.1 use of TTROs; the Tram Maintainer shall consult with the Client, CEC and other third parties on the arrangements for agreeing and implementing TTROs to facilitate road closures and the like; the use of TTROs shall take into account the requirement for, and availability of, suitable alternative routes;

16.1.2.2use of temporary signing and lining where required by the Client and CEC to identify places where construction is taking place;

16.1.2.3use of temporary signing to restrict vehicle types and sizes and define routes for construction traffic;

16.1.2.4use of appropriate temporary signing and lighting wherever the Services are in progress to ensure the safety of all road users; and

16.1.2.5preparation and implementation of a programme agreed by Tram Maintainer with the Client and CEC for road closures and temporary traffic signal arrangements.

16.2 **Temporary Road Closures And Diversions**

16.2.1 The Tram Maintainer shall finalise the arrangements for required closures and diversions of specified highways, footpaths and cycle ways with the Client and CEC, BAA or any private landowner, to suit its Programme.

16.2.2 Before breaking up, closing or otherwise interfering with any street or footpath to which the public has access, the Tram Maintainer shall make such arrangements with the Client and CEC as may be reasonably necessary to cause as little interference with the traffic in that street or footpath during the Services as shall be reasonably practicable.

16.2.3 Temporary road closures which result in the diversion of bus routes shall be agreed by the Tram Maintainer with the relevant bus operators who will in turn notify the Traffic Commissioner.

16.2.4 Pedestrian access to properties shall be maintained at all times where practicable, unless otherwise agreed with the Client and CEC and the owners and tenants of affected properties. Access to and from public facilities shall be maintained at all times unless otherwise agreed with the relevant administrating bodies.

16.2.5 Wherever the Services interfere with the existing public or private roads or other ways over which there is a public or private right of way for any traffic, the Tram Maintainer shall construct diversion ways as necessary. The standard of construction and lighting shall be suitable in all respects for the class or classes of traffic using the existing ways and the widths of the

diversions shall not be less than that of the existing way unless otherwise agreed with the Client and CEC or the owner of the private road.

16.2.6 Diversion routes shall be constructed in advance of any interference with the existing ways, shall be kept as short as reasonably practicable and shall be maintained by the Tram Maintainer to provide adequately for the traffic flows. All diversion routes shall be removed and the road returned to the Client and CEC as soon as is reasonably practical after completion of the Services. Liaison shall be undertaken with the Client and CEC regarding any special events such as the Edinburgh Festival, Christmas, New Year, sporting events and filming which might interact with the diversions.

16.2.7 Adequate horizontal clearance of 0.6 metres minimum shall be provided from the kerb line, to avoid fouling by vehicles. The minimum headroom beneath any projection over the road shall be 5.3 metres.

16.3 **Parking Provision for Construction Traffic**

16.3.1 Areas and locations of parking provision for site and construction traffic shall be agreed by the Tram Maintainer with the Client and CEC prior to the commencement of Services.

16.3.2 No daytime or overnight parking of site or construction vehicles outside any construction compounds or work sites shall be allowed except where the delivery or removal of materials is taking place at that location and with prior agreement with the Client and CEC, as required under paragraph 8.3 above.

16.4 **Pedestrian Routes, Cycle Routes and Bridleways**

16.4.1 The Tram Maintainer shall ensure that all existing pedestrian routes, cycle routes and bridleways are maintained throughout the Services unless otherwise agreed with the Client and CEC. Any temporary replacement footway or cycleway shall meet the following requirements:

16.4.1.1 all temporary and diverted footways, which replace footways which are currently accessible to wheelchairs and pushchairs, shall continue to be usable by such users where reasonably practicable and take into account DDA access requirements;

16.4.1.2tactile paving shall be used where present on existing pedestrian facilities unless otherwise agreed with the Client and CEC;

16.4.1.3any temporary footways and cycle ways shall have uniform surfaces; there shall be no steps and any longitudinal gradients shall be suitable for the prevailing conditions, preferably 1 in 20 and no greater than 1 in 12; cross-falls shall be suitable for disposal of surface water run off, but ideally shall not exceed 1 in 30;

16.4.1.4ramps shall be provided at all junctions of footways and cycle ways with carriageways; gradients shall be appropriate to the circumstances, not exceed 1 in 12, and the base of the ramps shall be flush with the carriageway; all temporary footways and cycle way ramps shall be surfaced in non-slip material and kept free from mud and debris; the Tram Maintainer shall ensure that there is no ponding at any junction;

16.4.1.5existing footway and cycle way widths shall be maintained where practicable; footway and cycle way widths shall not be reduced without the prior agreement and approval of CEC;

16.4.1.6clear signing and protection measures shall be provided at all times for each pedestrian and cycle route or bridleway affected by the Services, in accordance with Chapter 8 of the Traffic Signs Regulations and General Directions 1981 and relevant safety legislation; the Tram Maintainer shall liaise and agree the signing requirements of all pedestrian and cycle routes affected by the Services with the Client and CEC, and shall provide any additional signage and/or protection measures required and agreed with the Client and CEC; and

16.4.1.7headroom clearance over footways and cycle ways shall be appropriate for the circumstances and a minimum of 2.3 metres; a horizontal clearance of 0.6 metres shall be provided from the kerb line, where practicable, for any hoarding to avoid fouling by vehicles; the minimum headroom beneath any projection over the highway shall be 5.3 metres, but will be higher for abnormal load routes; where a path is a designated bridleway, headway clearance shall be appropriate for the circumstances and a minimum of 3.6

metres; all pedestrian routes diverted onto the carriageway shall be clearly defined by continuous barriers, constructed to the reasonable requirements of the Client and CEC.

16.5 **Maintenance and Repair of the Road**

16.5.1 The Tram Maintainer shall carry out a pre-construction inspection and take photographs of the public roads, footpaths and cycle ways in the vicinity of the Site in conjunction with the Client and CEC. The Tram Maintainer shall produce a report of the results of the joint inspection. The report shall establish the general road conditions within and in the vicinity of the Site, the residual life of the road and the level of reinstatement likely to be required in order to comply with the requirements of this Agreement, including the Specification. The report shall be agreed and signed by both the Tram Maintainer, the Client and CEC as appropriate.

16.5.2 The Tram Maintainer shall take every reasonable precaution to prevent its operations from unnecessarily damaging the roads and footpaths within the Site and in the vicinity of the Tram Maintainer Works.

16.5.3 The Tram Maintainer shall carry out all maintenance works as are necessary to maintain the roads and footpaths affected by the Services in a safe and serviceable condition to the reasonable satisfaction of CEC and the Client.

16.5.4 Reinstatements of the road shall be carried out in accordance with the RAUC(S) "*Specification for the Reinstatement for Openings of Roads*", October 2003.

16.6 **Existing Street Furniture**

16.6.1 No street furniture or other features within the vicinity of the Site and the Services, but outwith the area covered by the Tram Legislation shall be unnecessarily disturbed or altered by the Services, except as expressly required by the Client in accordance with this Agreement. Any damage to street furniture consequent upon construction activities connected with the Services shall be reported to the Client and the appropriate owner or authority (unless the appropriate owner cannot be identified) immediately on discovery of the damage. Any damage shall be replaced or made good as soon as practicably possible and to the reasonable satisfaction of the owner of the street furniture or other feature.

16.6.2 Any street furniture or other obstructions outside the area to be occupied by the Tram Maintainer but which are required to be moved in order to gain

access to the Site shall, subject to the prior consent of the owner thereof, be removed and reinstated or replaced as appropriate, on completion of the Services. Any costs associated therewith shall be borne by the Tram Maintainer, including the costs of reinstatement or replacement.

16.7 **Vehicle Movements and Access to the Site**

16.7.1 The Tram Maintainer and its Sub-Contractors and suppliers moving loads, construction plant, materials and spoil (including vehicles used for carrying such when empty) shall limit the use of the public roads for such purposes as far as reasonably practicable.

16.7.2 All access routes shall be agreed with the Client and CEC prior to the commencement of the relevant part of the Services.

16.7.3 Vehicles arriving or leaving the Site shall do so during the normal working hours as specified in paragraph 8.1 above, unless otherwise agreed with the Client and CEC. Access (which is deemed to include both the route and entrance to any Work Site) by lorries shall be as agreed with the Client, CEC and the Lothian and Borders Police. Access to and egress from the Site shall be carried out by initiating a left turn wherever reasonably practicable.

16.7.4 All vehicles operating on the Site shall be fitted with roof mounted yellow flashing beacons and reversing alarms.

16.7.5 The Tram Maintainer shall take all reasonable measures to ensure that delivery vehicles do not remain stationary on the road unnecessarily prior to entering the Site. In exceptional circumstances, for example where the Site is very constrained, it may be necessary to have the potential for a limited number of vehicles to stand on the road. The location of such standing areas their size and the duration of any standing periods shall be subject to prior agreement with the Client, CEC and the Lothian and Borders Police.

16.7.6 The Tram Maintainer shall ascertain and comply with any restrictions in respect of abnormal load routes as they may affect access to the Site.

16.8 **Mud on Roads**

16.8.1 The Tram Maintainer shall take strict measures to minimise the spillage of mud and loose materials on roads arising from the Services and ensure that

the roads are safe at all times. These shall include, but not necessarily be limited to:

16.8.1.1 the provision of easily cleaned hard standings for vehicles entering, parking and leaving the Site or construction compound;

16.8.1.2 the provision of wheel washing facilities at construction compounds and construction sites, including, where practicable, mechanical wheel spinners, adequate provision for drainage via settlement tanks and regular maintenance of settlement tanks;

16.8.1.3 where mechanical wheel wash facilities are not practicable at construction sites, the use of manual techniques to ensure that the wheels of vehicles are clean prior to them leaving the construction site;

16.8.1.4 the use of mechanical road sweepers and surface flushing apparatus to clean the hard standing and to remove any mud or debris deposited by site vehicles on roads, footpaths, and in gullies or drains in the vicinity of the Site; the road sweepers or other equipment shall be readily available whenever the need for cleaning arises;

16.8.1.5 the loading and sheeting of vehicles are in such a manner as to prevent material falling off during their journey;

16.8.1.6 compliance with the requirements regarding the control of dust outlined in paragraph 19 below; and

16.8.1.7 compliance with the requirements regarding the control of waste water, mud, debris from wheel washing outlined in paragraph 21 below.

16.9 **Provision, Erection and Maintenance of Traffic Safety and Control (Traffic Safety Measures)**

16.9.1 The Tram Maintainer shall provide, erect and maintain such traffic signs, road markings, lamps, barriers and traffic control signals and such other measures as may be necessitated by the construction of the Services in accordance with the requirements of the Agreement and to the approval of the Client and CEC. The Tram Maintainer shall not commence any work which affects the

public road until all traffic safety measures necessitated by the work are fully operational.

16.9.2 The Tram Maintainer shall keep clean and legible at all times all traffic signs, road markings, lamps, barriers and traffic control signals and shall position, replace, reposition, cover or remove them as required by the progress of the Services and to the reasonable requirements of the Client and CEC.

16.9.3 The Tram Maintainer shall ensure that all barriers, footpath space and temporary footpaths (including the requirement for kerb ramps where use has to be made of the carriageway) shall comply with the requirements of the document *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure* issued by the Mobility and Inclusion Unit of the Department for Transport.

16.9.4 So far as practicable, all power to temporary traffic signals and lighting shall be taken by the Tram Maintainer from mains supplies rather than from portable generators. Where portable generators are used all reasonable measures will be taken to minimise noise and pollution from such generators.

16.10 **Implementation of the Closure of Roads and Access to Frontages**

16.10.1 The Tram Maintainer shall not close any roads or private accesses until immediately before the area is required for construction in accordance with this Agreement and the Programme. The construction of the Services shall follow in the area of a temporary closure expeditiously and shall be carried out efficiently and in a continuous manner to ensure that all temporary closures are re-opened as quickly as possible.

16.10.2 The Tram Maintainer shall, in carrying out the Services, take all reasonable precautions to prevent or reduce any disturbance or inconvenience to the owners, tenants or occupiers of adjacent properties, and to the public generally. The owners, tenants or occupiers of affected properties shall be informed of the Services to be undertaken, their planned duration, road and access closures and alternative access routes (where required) in writing and by locally posted public notices at least one calendar month prior to work starting.

16.10.3 The Tram Maintainer shall render all necessary assistance to occupiers of premises affected by the Services so as to enable them to accept and send out deliveries to and from their premises during their normal working hours.

16.11 Access for Emergency Vehicles

16.11.1 The routes proposed by the Tram Maintainer for emergency service vehicles and personnel to gain access to the Site, the construction corridor and neighbouring sites along the route shall be agreed by the Tram Maintainer with the emergency services and the Client and CEC prior to the start of construction.

17. NOISE

17.1 Noise Control

17.1.1 The Tram Maintainer shall take all practicable measures to minimise nuisance from noise. The noise limits specified in this paragraph 17.1 or which may be otherwise agreed with CEC shall not be regarded as a licence to make noise up to the stated limit.

17.1.2 Subject to the specific requirements of CEC and other affected third parties the following minimum requirements shall be met:

17.1.2.1during normal working hours, as defined in paragraph 8.1 above the maximum noise levels measured 1 metre from any occupied dwelling or other building used for residential purposes, generated by construction plant and equipment shall not exceed the following limit:

Monday to Friday (inc.) 0700-1900 hours $L_{Aeq\ 12\ hour}$ 75 dB

Saturday 0800 - 1300 hours $L_{Aeq\ 5\ hour}$ 75 dB

17.1.2.2outside normal working hours, the following limits shall apply:

Period	Hours	Limit
Monday to Friday (inc.)	1900-2200	$L_{Aeq\ 3\ hours}$ 65 dB
Saturday	1300-2200	$L_{Aeq\ 9\ hour}$ 65 dB

Sunday & Bank Holidays	0800-2000	$L_{Aeq\ 12\ hours}$ 65 dB

17.1.2.3 the default noise limit for any night time (2200 hours (or 2000 hours on Sundays and Bank Holidays) to 0700 (or 0800 on Saturdays, Sundays and Bank Holidays)) construction work shall be $L_{Aeq\ 1\ hour}$ 55dB at residential buildings; higher noise levels may be permitted where ambient noise levels are higher.

17.1.2.4 the maximum noise levels measured 1 metre from any school, college or other teaching facility resulting from construction work shall not exceed the following limits:

At any time when occupied $L_{Aeq\ 1\ hour}$ 65 dB

17.1.2.5 the maximum noise level measured 1 metre from any office building or other building used for office purposes during normal working hours shall be as defined in paragraph 17.1.2.1 above.

17.1.3 In order to ensure that the best practicable means are used to meet the levels set out above, a programme of on-site monitoring by a suitably qualified practitioner shall be agreed between the Tram Maintainer, the Client and CEC. This monitoring programme shall include the location and frequency of readings, and shall define to whom the results shall be made available. Monitoring shall be undertaken by the Tram Maintainer at locations identified in the Environmental Statements as those where mitigation measures may be necessary to avoid significant noise disturbance.

17.1.4 In exceptionally difficult circumstances, essential work causing noise above these limits may be permitted with the prior approval of the Client and CEC. Where not otherwise required in accordance with this Agreement, application for prior approval must be made at least two weeks in advance of the relevant Services commencing, and shall be fully justified and kept to the minimum necessary. Conditions may be attached to any permission for such Services.

17.1.5 In the event that measurements indicate noise has exceeded the limits in paragraph 17.1.2 above of this clause, the Tram Maintainer shall stop the operation in a safe manner and take all practicable measures to prevent

recurrence. If this does not enable the limits to be met, exceptional permission must be applied for under the terms of paragraph 17.1.4 above.

17.1.6 Without prejudice to the other requirements of this paragraph 17, the Tram Maintainer shall comply with the recommendations set out in BS 5228, '*Noise Control on Construction and Open Sites*'; insofar as these are reasonably practicable and applicable to the Services, and in particular with the following requirements:

17.1.6.1 all vehicles and mechanical plant used for the purpose of the work shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order;

17.1.6.2 all compressors and generators shall be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers;

17.1.6.3 all machines in intermittent use shall be shut down in the intervening periods between work or throttled down to a minimum; noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure (see BS5228 Part 1:1997, Figures B.1, B.2 and B.3 (or later issue));

17.1.6.4 stationary equipment with significant noise output shall be sited away from sensitive site boundaries as far as is practicable;

17.1.6.5 temporary noise barriers shall be used to reduce noise levels where appropriate and practicable; barriers shall be located as close to the plant as possible, and shall have a mass per unit area of at least $7kg/m^2$;

17.1.6.6 no deliveries shall arrive at the Site before 0700 hours;

17.1.6.7 the engines of all parked vehicles or vehicles waiting to enter any work area shall be switched off within two minutes of arrival; and

17.1.6.8 work compounds shall be laid out so that accesses and loading areas are located as far away from sensitive neighbours as practicably

possible and so that temporary structures screen noisy areas where practicable.

17.1.7 Without prejudice to the requirements of this paragraph 17 set out above, the Tram Maintainer shall comply with the City of Edinburgh Department of Environmental and Consumer Service's document *Construction Site Noise: A Guide for Contractors*, August 2000 (or current issue, if subsequent amendments have been issued), and shall liaise with that department in accordance with the requirements therein.

17.2 **Communications Regarding Noise**

17.2.1 The Tram Maintainer shall give 7 days notice to local residents who may be adversely affected by noise from the proposed programme of Services, providing a description of the work to be carried out, measures that will be taken to control noise or other disturbance, and the proposed hours of working.

17.2.2 The Tram Maintainer shall provide the Client and any other party requested by the Client with a list of contacts who will be responsible for investigating and resolving noise issues in respect of the carrying out of the Services.

18. VIBRATION

18.1 **Vibration Control**

18.1.1 Subject to the specific requirements of the Client and CEC, the following minimum requirements shall be met:

18.1.1.1 to protect residents and users of buildings from nuisance and harm the Tram Maintainer shall, as far as practicable, not exceed the Vibration Dose Values specified in BS6472:1992 as resulting in a 'low probability of adverse comment'; and

18.1.1.2 to protect buildings and other structures from physical damage, peak particle velocity levels shall not exceed 5mm/sec except for particularly sensitive buildings or structures where the level shall not exceed 3mm/sec.

18.1.2 If vibration levels are predicted to exceed the criteria specified in paragraph 18.1.1 above, then the Tram Maintainer shall procure that a suitably qualified practitioner undertakes monitoring during the activity and the Tram Maintainer shall adopt alternative methods of working to reduce vibration levels to those prescribed in above. The monitoring programme shall be agreed between the Tram Maintainer, the Client and CEC. This programme shall include the location and frequency of readings and will identify to whom the results should be made available.

18.1.3 In order to ensure that these levels are not exceeded, a programme of on-site monitoring by a suitably qualified practitioner shall be agreed between the Tram Maintainer, the Client and CEC. This programme shall include the location and frequency of readings, and to whom the results should be made available and, as a minimum, shall cover all locations identified as 'significantly affected' in the Environmental Statement.

18.2 **Inspection of Buildings and Other Structures**

18.2.1 The Tram Maintainer shall be responsible for the compilation of a schedule of all buildings or other structures, including scheduled monuments and listed buildings that are located within the Site, or which are located directly adjacent to such Work Sites, which may be at risk of physical damage or damage caused by vibration generated during the Services. The said schedule is to be subject to agreement with CEC, CEC having the power to add, or subtract, buildings from the schedule as they deem fit. The agreed schedule is to be published in accordance with the requirements of Schedule 2 (*Employer's Requirements*). A notice of inclusion within the schedule is to be delivered to each scheduled building, attachment of a notice to the building shall be sufficient evidence that notice has been served. Subject to the granting to the Tram Maintainer of free and unhindered access to the building or structure, a record of the condition and survey of any defects in the building or structure shall be prepared prior to the commencement of any Services. Certified copies of the building record and condition survey shall be made available free of charge by the Tram Maintainer to the owners of the examined buildings or structures, on their presentation of proof of title to the building. The best practicable means shall be undertaken by the Tram Maintainer to avoid damage, or to minimise damage where it is unavoidable. The condition of the buildings and other structures listed in the schedule shall

be monitored at reasonable intervals during the Services and for a period of one year after the completion of the said Services. The results of the aforesaid monitoring shall be made available free of charge by the Tram Maintainer to the owners of the examined buildings, on their presentation of proof of title to the building.

18.2.2 The results of this record of the conditions and survey of any defects shall be provided to the Client and CEC, the property owner and occupier and, in the case of scheduled or listed features, to CEC and Historic Scotland by the Tram Maintainer.

18.2.3 Where an element of the Services have been completed and at any time up to two years after their completion, the owners of properties identified under paragraph 18.2.1 above may, upon providing reasonable evidence of damage, request that a second defects survey is undertaken. Any damage which is identified as being caused by the Services shall be repaired by the Tram Maintainer within a reasonable time of identification at the expense of the Tram Maintainer to the reasonable satisfaction of the property owner and so that the property is returned no worse than the standard of repair and stability existing before the Services commenced.

19. DUST AND AIR POLLUTION

19.1 Dust and Other Air Pollution

19.1.1 The Tram Maintainer shall take all necessary measures to avoid creating a dust nuisance during the Services.

19.1.2 Particular consideration shall be given by the Tram Maintainer to Services affecting the operations of Edinburgh Airport Limited. Details of the specific mitigation measures shall be included within the Construction Management Strategy identified under paragraph 10.3 above.

19.1.3 Measures to prevent dust shall include the following:

19.1.3.1 the provision of easily cleaned hardstandings for vehicles;

19.1.3.2 the enclosure of material stockpiles at all times and damping down of dusty materials, using water sprays during dry weather;

19.1.3.3the hard surfacing of heavily used areas which will be kept clean by regular brushing and water spraying;

19.1.3.4control of dust released from cutting or grinding of materials on the Site; any mobile crushing plant which is used during the Services shall be appropriately licensed and sited so as to minimise dust annoyance to any persons who may be liable to be affected by emissions; the Tram Maintainer shall notify SEPA in advance of any mobile crushing plant being brought onto the Site;

19.1.3.5the complete sheeting of all vehicles carrying spoil and other dusty materials;

19.1.3.6watering of unpaved surfaces and roads; and

19.1.3.7a limit on vehicle speeds on unpaved surfaces of 20 kph.

19.1.4 Where dust generating Services (such as excavation and demolition) are undertaken close to buildings so that there is a potential for soiling of windows and ledges with dust, the Tram Maintainer shall clean such windows and ledges as frequently as is necessary (and as a minimum, at least once per week) during periods of dust generating work and on completion of the Services at that Work Site. The Tram Maintainer shall take precautions to prevent damage occurring as a consequence of cleaning works.

19.1.5 The Tram Maintainer shall take precautions to prevent the emission of smoke or fumes from construction vehicles, site plant and stored materials including volatile substances. Vehicles and plant shall be well maintained and measures shall be taken by the Tram Maintainer to ensure that engines and motors are not left running for long periods when not directly in use.

19.1.6 The engines of all parked vehicles or vehicles waiting to enter any work area shall be switched off within two minutes of arrival.

19.1.7 Work compounds shall be laid out by the Tram Maintainer so that accesses and loading areas are located as far away from sensitive neighbours as is practicably possible, and so that temporary structures screen noisy areas where practicable.

19.1.8 There shall be no burning of waste on the Site.

20. DISPOSAL OF WASTE AND CONTAMINATED MATERIALS

20.1 Waste

20.1.1 A waste management plan (**"WMP"**) shall be developed in accordance with *"Site Waste Management Plans: Guidance for Contractors and Clients"* (DTI 2004). The Tram Maintainer shall be responsible for the preparation of the WMP to address all of the approvals and consents which require to be obtained and thereafter, the Tram Maintainer shall be responsible for the development of the WMP to document the control measures and mitigation measures that shall be implemented. The plan shall in particular identify:

20.1.1.1 responsibilities for waste management;

20.1.1.2 the types and quantities of waste materials likely to be generated;

20.1.1.3 measures to be taken to minimise generation of waste;

20.1.1.4 proposals for recycling and/or re-use;

20.1.1.5 measures to be adopted for management of waste on the Site including enclosure, segregation, secure storage, sorting for recovery, and other on-site handling;

20.1.1.6 proposed treatment and disposal routes; and

20.1.1.7 licensing arrangements.

20.1.2 The Tram Maintainer shall implement and comply with the WMP.

20.1.3 The Tram Maintainer shall undertake monthly audits to demonstrate compliance with Statutory Requirements and the WMP. The Tram Maintainer shall set out its audit programme in the WMP and shall provide copies of the audit report to the Client.

20.1.4 Spoil or other waste materials arising from the Services shall be used, wherever reasonably practicable, in the Services.

20.1.5 The disposal of waste, including any surplus spoil, shall be managed by the Tram Maintainer, so far as is reasonably practicable, to maximise the environmental and development benefits from the use of surplus material to

minimise the removal of surplus spoil from the Site and to reduce any adverse environmental effects of disposal.

20.2 **Contaminated Land and Materials**

20.2.1 The Tram Maintainer shall identify all areas within the Site where contaminated land, including land contaminated by invasive alien species listed in Part 2 of Schedule 9, of the Wildlife and Countryside Act 1981 (as amended), may be encountered. In each of these areas, the Tram Maintainer shall:

20.2.1.1 carry out appropriate additional site investigations as instructed by the Client to the satisfaction of the Client and CEC to determine the extent and type of contaminants present on the Site;

20.2.1.2 identify potential sources, pathways and receptors and assess the risk of harm to receptors;

20.2.1.3 liaise with the Client, CEC and SEPA to address their reasonable requirements and to agree control or protection measures necessary for dealing with identified risks;

20.2.1.4 obtain any necessary licences for the storage, treatment and disposal of contaminated material (including dewatering discharge); and

20.2.1.5 ensure that removal and disposal of contaminated materials complies with a strict consignment note system and that delivery is to appropriately licensed disposal facilities.

20.2.2 The Tram Maintainer shall develop management procedures to be followed in the event that contaminated or hazardous materials are discovered on the Site during construction.

20.2.3 If the Tram Maintainer identifies contamination on the Site which has not been previously identified , no further development shall take place (except to the extent that would not disturb that contamination) until a site investigation has been carried out in accordance with paragraph 20.2.1 above.

20.2.4 The Tram Maintainer shall comply with the guidance in the Health & Safety Executive document "*Protection of Workers and the General Public during*

the Development of Contaminated Land" (1991) and to the DEFRA document "*Helping to Prevent the Spread of Invasive Non-native Species, Horticultural Code of Practice*" (March 2005), in so far as this is reasonably practicable and applicable to the Services. Invasive alien species listed on Schedule 9, Part II of the Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland Act) 2004, will be treated in accordance with the Environmental Protection Act 1990. Japanese knotweed and giant hogweed and soils containing particles of these plants are regarded as controlled waste.

20.2.5 Appropriate precautions shall be taken if materials containing asbestos are encountered. The Tram Maintainer shall observe the exposure limits and measurement methods for asbestos, set out in the Health & Safety Executive Guidance Note EH 10 (2001), and shall also comply with Health & Safety Executive "*Guideline Note MS13 - Asbestos*" (2005), the Health & Safety Commission document "*Approved Code of Practice and Guidance Note Work with Asbestos Insulation, Asbestos Coating and Asbestos Insulating Board*" (2002), in so far as these are applicable to the Services.

21. PROTECTION OF THE WATER ENVIRONMENT

21.1 Waste Water and Run-off

21.1.1 A construction site drainage plan (**"CSDP"**) shall be prepared, in consultation with SEPA. The Tram Maintainer shall be responsible for the preparation of the CSDP to address all of the approvals and consents which require to be obtained. Thereafter, the Tram Maintainer shall be responsible for the development of the CSDP to document the control measures and mitigation measures that shall be implemented. The CSDP shall include measures to ensure that surface water runoff is contained and managed appropriately and that appropriate measures are taken to prevent inundation of the Site. "Sustainable Urban Drainage System" (**"SUDS"**) measures shall be included within the Services where reasonably practicable and applicable, in accordance with Law and the guidance in:

21.1.1.1 "*Interim Code of Practice for SUDS*" (CIRIA 2004);

21.1.1.2 "*Sustainable Urban Drainage System – Design Manual for Scotland and Northern Ireland*" (CIRIA C521); and

21.1.1.3"*Sustainable Urban Drainage Systems – Best Practice Manual*" (CIRIA C523).

21.1.2 The Tram Maintainer shall implement and comply with the CSDP.

21.1.3 The Tram Maintainer shall ensure that there shall be no washout from temporary construction laydown and storage areas into watercourses.

21.1.4 No water shall be discharged into watercourses, but shall be stored in settlement lagoons or tanks, or filtered prior to discharge, or discharged onto a grassy area to soak away.

21.1.5 Waste water and site discharges to surface water or sewer shall only be permitted where the effluent quality and discharge location is acceptable to SEPA or Scottish Water (as appropriate). Water Environment (Controlled Activities) (Scotland) Regulations 2005 ("**CAR**") discharge authorisation shall be obtained by the Tram Maintainer if required prior to discharge.

21.1.6 The Tram Maintainer shall ensure that all treatment facilities are regularly inspected and maintained and that a full record is kept of inspection, maintenance and other measures to maintain equipment performance.

21.1.7 Approval from SEPA shall be obtained by the Tram Maintainer prior to any excavation below the water table, including any site de-watering and discharge. Contact should be made with SEPA at least one month prior to the relevant operation to establish the level of CAR authorisation required. Cut-off ditches may be used to prevent water from entering excavations.

21.1.8 The Tram Maintainer shall comply with BS 6031: 1981 "*Code of Practice for Earthworks*", regarding the general control of site drainage is so far as this is applicable to the Services.

21.1.9 The Tram Maintainer shall ensure that areas of exposed ground and stockpiles are minimised to reduce silty runoff. Geotextiles or other equivalent measures shall be used by the Tram Maintainer where necessary to prevent silty run-off from soil mounds close to watercourses.

21.1.10 The Tram Maintainer shall ensure that any water that has come into contact with contaminated materials is disposed of in accordance with the requirements of SEPA or Scottish Water (as appropriate).

21.1.11 The Tram Maintainer shall take suitable precautions to prevent the entry of pollutants into any bodies of water, and report any incidents to SEPA and Scottish Water.

21.1.12 Procedures for responding to potentially polluting incidents or inundation of the site by floodwaters shall be implemented in accordance with SEPA guidance (with reference to paragraph 21.6 below).

21.1.13 Cementicious mixtures are highly alkaline and corrosive and shall be prevented from entering watercourses and drains. The Tram Maintainer shall make suitable provision for washing out ready mix concrete lorries, skips, concrete pumps and the like.

21.2 **Storage of Polluting Materials**

21.2.1 The Tram Maintainer shall make provision to ensure that oil drums and containers or other potential contaminants stored on the Site are properly isolated and bunded and that no oil or other contaminants are allowed to reach watercourses or groundwater, including aquifers. Oil storage containers (both fixed and mobile) with a 200 litre capacity or greater shall be stored in compliance with the Water Environment (Oil Storage) (Scotland) Regulations 2006, where applicable. Drip trays and other secondary containment measures shall be used by the Tram Maintainer where necessary to prevent spills during refuelling and operation of small static and mobile equipment. Storage locations for such materials shall be positioned away from watercourses. All surface water or other contaminated water which accumulates in bunds shall be removed by the Tram Maintainer by manually controlled positive lift pumps, and not by means of a gravity drain.

21.2.2 Refuelling shall be carried out by the Tram Maintainer in a designated area which is away from watercourses and drains.

21.2.3 Spill response kits containing equipment appropriate to the quantity and types of materials present on site shall be available for use by the Tram Maintainer in the event of a fuel spillage. Personnel shall be trained in their use.

21.3 **Protection of Aquifers**

21.3.1 The Tram Maintainer shall have due regard for protection of underlying aquifers and adhere to the SEPA "*Groundwater Protection Policy for*

Scotland". In all instances, measures to ensure appropriate protection of aquifers shall be undertaken, subject to prior approval of SEPA. Prior approval shall be sought by the Tram Maintainer in writing, prior to commencement of the relevant Services.

21.4 **Control and Management of Foul Drainage**

21.4.1 Where permanent facilities are not accessible foul water and sewage effluents produced by the construction workforce shall be contained by temporary foul drainage facilities. A licensed contractor engaged by the Tram Maintainer shall dispose of all foul water collected off-site.

21.5 **Services in the Vicinity of Water**

21.5.1 The Tram Maintainer shall take suitable precautions to prevent the entry of pollutants, including sediments and dusts, into any bodies of water, and report any incidents to SEPA.

21.5.2 Crossings of watercourses shall be constructed by the Tram Maintainer so as not to impede the flow, obstruct the movement of floodwater or exacerbate erosion of the channel and banks and shall require CAR authorisation from SEPA.

21.5.3 In watercourses which support migratory fish, Services shall be avoided during upstream and downstream fish migration, spawning, incubation and hatching periods.

21.5.4 Where bankside habitat is temporarily affected, it shall be reinstated by the Tram Maintainer to its original form on completion of the Services at that Work Site.

21.5.5 Areas of bankside adjacent to working areas shall be fenced off during construction to prevent damage to the banksides.

21.5.6 Stripping of surface vegetation near water by the Tram Maintainer shall be kept to a minimum. Exposed surfaces shall be seeded or reinstated by the Tram Maintainer with vegetation, as soon as is practical after construction in that working area is complete.

21.5.7 Where culverting is required as Temporary Works, such culverting shall be subject to CAR authorisation from SEPA. Culverting that is so authorised shall be designed by the Tram Maintainer and constructed to permit the passage of fish and other aquatic fauna under normal flow conditions.

21.6 Guidance

21.6.1 The Tram Maintainer shall comply with all relevant SEPA "pollution prevention" guidelines, including, but not necessarily limited to:

21.6.1.1	PPG1	General guide to the prevention of water pollution.
21.6.1.2	PPG2	Above ground oil storage tanks.
21.6.1.3	PPG3	The use and design of oil separators.
21.6.1.4	PPG4	Disposal of sewage where no mains drainage is available.
21.6.1.5	PPG5	Works in, near or liable to affect watercourses.
21.6.1.6	PPG6	Working at construction and demolition sites.
21.6.1.7	PPG7	Refuelling facilities
21.6.1.8	PPG8	Storage and disposal of used oils.
21.6.1.9	PPG13	High pressure water and steam cleaners.
21.6.1.10	PPG18	Control of spillages and fire fighting runoff.
21.6.1.11	PPG19	Garages and vehicle service centres.
21.6.1.12	PPG21	Pollution incident response planning.
21.6.1.13	PPG22	Dealing with spillages on roads.
21.6.1.14	PPG23	Maintenance of structures over water.
21.6.1.15	PPG26	Pollution prevention storage and handling of drums and intermediate bulk containers.

21.7 Water Environment (Controlled Activity) (Scotland) Regulations 2005

Without prejudice to the foregoing terms of this paragraph 21, the Tram Maintainer shall comply with the terms of CAR where relevant to the Services.

22. ECOLOGY

22.1 Encroachment into Wildlife Areas

22.1.1 The Tram Maintainer shall take all reasonably practicable measures to minimise harm to and disturbance of wildlife caused by noise and vibration, dust and other air pollution, including:

22.1.1.1 minimising habitat loss by keeping the working corridor and extent of working areas to the minimum necessary for the Services; removal of habitats and new planting shall be undertaken in consultation with Scottish Natural Heritage (**"SNH"**), the Client and CEC;

22.1.1.2 fencing off adjacent habitat to prevent unnecessary incursion or damage; staff shall be made aware of the need to avoid damage to adjacent retained areas;

22.1.1.3 the reinstatement or replacement of areas of habitat disturbed during construction in areas not required for the Services on completion of the Services in accordance with the Landscape and Habitat Management Plan (**"LHMP"**). The Tram Maintainer shall be responsible for the preparation of the LHMP to address all of the approvals and consents which require to be obtained and thereafter, the Tram Maintainer shall be responsible for the development of the LHMP to document the control measures and mitigation measures that shall be implemented ; and

22.1.1.4 compliance with the guidelines set out in British Standard (BSI *Code of Practice for Earthworks* (BS6031) in relation to soil stripping, storage and placing.

22.1.2 Approval shall be obtained by the Tram Maintainer from the Client, SNH, SEPA, Scottish Executive Environment Group Wildlife Habitats Division (**"SEEG WHD"**) and CEC, for detailed method statements for any Services proposed in designated sites, including Special Protection Areas (SPA)/Ramsar sites, Sites of Special Scientific Interest (SSSI), Sites of Interest for Nature Conservation (SINC) and Wildlife Sites.

22.1.3 Applications for approval shall be made by the Tram Maintainer at least one calendar month prior to relevant Services commencing.

22.2 **Protected Species**

22.2.1 In advance of any Services, the Tram Maintainer shall employ suitably qualified professionals to check all working areas and any land within 30 metres of the boundary of the working area (unless there is a boundary with a private third party within the 30 metres, in which case no checks shall be taken within the private land), or 100m from any piling operations or use of explosives for the presence of species protected by statute. Where protected species are identified, appropriate mitigation measures shall be agreed in advance with the relevant authorities and any appropriate licences obtained in accordance with any requirements for licensing. The Tram Maintainer shall implement any mitigation measures agreed in accordance with this paragraph 22.2.1.

22.2.2 Where any habitat has to be cleared in the breeding bird season, typically March to June or July for most species, the habitat must be checked prior to removal for the presence of nesting wild birds, their nests and eggs and young. If found, no habitat shall be removed until nesting is complete, or unless other suitable mitigation is agreed in advance between the Tram Maintainer and SNH.

22.2.3 The Tram Maintainer shall be responsible for obtaining a licence from SNH for any work that may cause disturbance to a badger or involves the damage or destruction of a sett. Licence applications shall be made for any Services within 10m, heavy machinery operating within 30m, and for piling or use of explosives within 100m, and no Services shall proceed until the required licences are obtained. Alternative setts shall be provided in the event of and in advance of any loss.

22.2.4 The Tram Maintainer shall be responsible for obtaining a licence from SEEG WHD for any work which may cause disturbance to otters or involve damage or destruction to an otter holt or lying up site or if any Services are proposed within 30m of an otter holt or lying up site. Alternative holts or lying up sites shall be provided in the event of and in advance of any loss.

22.2.5 The Tram Maintainer shall be responsible for ensuring that all bridges and other built structures and mature and dead trees within the working area shall be checked by a licensed bat handler for their use by roosting or hibernating bats prior to felling or other potentially damaging operations. If found, mitigation measures shall be agreed between the Tram Maintainer and SNH and SEEGWHD and implemented, including review of the design to seek ways of avoiding loss of the roost. If avoidance is not possible, a licence shall be applied for by the Tram Maintainer from SEEG WHD for disturbance to a European Protected Species and / or destruction or damage to a breeding site or resting place. Alternative roost sites shall be provided in advance of any loss. Any loss of feeding habitat shall be compensated for by new habitat creation as detailed in the LHMP. All mitigation measures for protected species shall be installed by the Tram Maintainer as early as possible during the construction process so that use can be established at an early stage.

22.2.6 Where appropriate use of mitigation measures by target species will be positively encouraged using a variety of techniques e.g. feeding.

22.2.7 Permanent mitigation structures for protected species including mammal fencing and tunnels and artificial badger setts shall be checked during construction and approved on completion by a suitably qualified ecologist and reported to SNH. Should these structures not be to the required standard specified, remedial measures shall be taken by the Tram Maintainer .

22.2.8 Mitigation shall aim to compensate for loss of foraging specifically for badgers through creation of appropriate grassland and scrub habitat wherever possible within the Limits of Deviation in the Tram Legislation in line with the Civil Aviation Authority Advice Note 3 – "*Potential Bird Hazards from Amenity Landscaping and Building Design*".

22.2.9 The Tram Maintainer's personnel and personnel engaged by any Sub-Contractors shall be briefed by a suitably qualified professional on measures for protected species as part of site induction.

22.3 **Protection of Mature Trees**

22.3.1 For the purposes of this paragraph, "trees" are defined as trees with a diameter of over 10cm girth at a height of 1.5 m above ground level.

22.3.2 Loss of trees shall be avoided as far as reasonably practicable. The Tram Maintainer shall comply with the guidelines set out in British Standard (BS) 5837:1991 "Trees in Relation to Construction" insofar as these are reasonably practicable and applicable to the Services.

22.3.3 All tree surgery operations shall comply with the British Standard (BS) 3998 "*Recommendations for Tree Work*" and a method statement addressing safety of workers and the public shall be prepared and implemented.

22.3.4 Felling shall be carried out in accordance with the Forestry Commission document "*Forest and Water Guidelines 2004*", which relates to the influence that woodland and trees can have on the freshwater environment, insofar as this is reasonably practicable and to the extent that they are applicable to the Services.

22.3.5 Prior to felling, the Tram Maintainer shall procure that trees suitable as bat roosts are checked by a licensed bat handler for roosting and hibernating bats, and should any be identified, mitigation measures shall be agreed by the Tram Maintainer with SNH and SEEG WHD and the Tram Maintainer shall obtain any relevant licences.

22.3.6 Woody material generated shall be retained on the Site as far as is reasonably possible and used as part of habitat creation measures.

22.3.7 Adverse effects on all trees within or in the vicinity of the Site shall be minimised by the adoption of suitable mitigation measures. These may include, but shall not be limited to, the following:

22.3.7.1 selective removal of lower branches in an approved manner, to reduce mechanical damage by construction plant;

22.3.7.2 control of construction activities to minimise compaction of the ground beneath the entire canopy of the tree; no heavy materials or plant shall be stored, and construction traffic movements shall be controlled, by fencing or other means, so as to minimise vehicle movement within the canopy;

22.3.7.3 the use of matting around the root zone to minimise soil compaction; and

22.3.7.4the use of chestnut paling around the trunk to prevent damage.

22.4 Tree Replacement

Where trees are removed, damaged or die as a consequence of the Services, they shall be replaced by the Tram Maintainer by at least 2 trees for every one removed, which replacement trees shall be of similar or approved size and in a location as close as possible to the original position. All tree planting shall be agreed with the Client and CEC, and shall be in accordance with the LHMP. The supply, storage, handling, planting and maintenance of new planting shall be undertaken in accordance with the appropriate British Standards, including, but not necessarily limited to;

22.4.1 (BS5837) "Trees in Relation to Construction";

22.4.2 (BS3998) "Recommendations for Tree Works"; and

22.4.3 (BS4428) "Code of Practice for General Landscape Operations (excluding hard surfaces)".

22.5 Control of Invasive and Alien Species

22.5.1 If any invasive alien species listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended), are identified along the route, including Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum mantegazzianum*) or Himalayan Balsam (*Impatiens glandulifera*), a strategy shall be developed and implemented by the Tram Maintainer prior to the commencement of the Services to manage their presence. The strategy will ensure appropriate treatment of invasive alien species in advance of construction in accordance with approved methodology and will prevent the spread of the species within and outside the development area. The soil containing these species or plants thereof shall be dealt with as contaminated material and disposed of in accordance with paragraph 20.2 above;

22.5.2 The Tram Maintainer shall comply with the strategy for the control of invasive and alien species.

23. ARCHAEOLOGY AND CULTURAL HERITAGE

23.1 Archaeological and Heritage Mitigation Plan

23.1.1 In advance of the commencement of the Services, an "Archaeological and Heritage Mitigation Plan" (**"AHMP"**) shall be prepared. The Tram Maintainer shall be responsible for the preparation of the AHMP to address all of the approvals and consents which require to be obtained and thereafter, the Tram Maintainer shall be responsible for the development of the AHMP to document the control measures and mitigation measures that shall be implemented. The AHMP will identify the level of mitigation proposed at each site of archaeological or historic significance (as defined by statute and/or Historic Scotland), taking into account the measures outlined in the Environmental Statements. These may include:

23.1.1.1prior archaeological evaluation by trial excavations;

23.1.1.2a detailed photographic record prior to construction;

23.1.1.3a watching brief during construction;

23.1.1.4a detailed standing building survey and salvage;

23.1.1.5archaeological excavation;

23.1.1.6preservation in situ;

23.1.1.7further documentary research and archiving; or

23.1.1.8other such measures as may be approved.

23.1.2 The Tram Maintainer shall implement and comply with the AHMP.

23.1.3 No development within or immediately adjacent to an area which is, in the opinion of the Client and CEC, of known or suspected archaeological importance, shall commence until a scheme to deal with any archaeological remains on the Site has been submitted to and approved by the Client and CEC and implemented. The Tram Maintainer shall apply for prior approval at least two calendar months in advance of the relevant Services commencing.

23.1.4 No development within or adjacent to an area which is designated as a Scheduled Ancient Monument shall commence without the Tram Maintainer confirming whether Scheduled Monument Consent is required from Historic Scotland, and where necessary obtaining such consent. The AHMP shall identify the Scheduled Ancient Monuments and Listed Buildings which shall

be affected, and shall outline the Services that can take place in proximity to them and will detail the necessary mitigation.

23.1.5 All records obtained through the mitigation shall be lodged with the National Monuments Record of Scotland (**"NMRS"**).

23.1.6 The AHMP shall outline the appropriate procedures that shall be followed should any significant archaeological remains be found during the pre-construction excavations.

23.1.7 Any archaeological works carried out on the Site by the Tram Maintainer shall be undertaken by a suitably qualified investigating body acceptable to the Client and CEC. The results shall be provided to the property owner and occupier and, in the case of scheduled or listed features, to the Client, CEC and Historic Scotland.

23.1.8 The Tram Maintainer shall take all reasonable precautions to prevent employees, any Sub-Contractors, their employees, or any other persons from removing or damaging any fossils, coins, articles of value or antiquity, structures or other remains or any other thing of archaeological or historical interest during investigations and during all the Services. The AHMP shall outline the legal obligations placed on those who discover portable antiquities or disturb human remains.

23.1.9 The Tram Maintainer shall appoint a suitably qualified professional person to record the condition of all scheduled and listed buildings and structures or parts thereof, within or adjacent to the construction working areas which are identified as at risk from physical damage or vibration. This will have been carried out in accordance with the Institute of Field Archaeologists Standards and Guidance. The results shall be provided to the property owner and occupier and in the case of scheduled or listed features, to CEC and Historic Scotland.

23.1.10 At least one month prior to commencement of the relevant excavation works, a copy of each survey undertaken under paragraph 23.1.9 above shall be provided by the Tram Maintainer to the Client, the property owner and occupier and, in the case of scheduled or listed features, to the Client, CEC and Historic Scotland.

23.1.11 After the Services have been completed and at any time up to two years after the opening of the tram, the above parties may, upon providing the Client or the Tram Maintainer with reasonable evidence of damage, request that a second defects survey is undertaken. Any damage which is identified as being caused by the Services shall be repaired within a reasonable time of identification at the expense of the Tram Maintainer to the reasonable satisfaction of the property owner and such that the property is returned to the standard of repair and stability existing before the Services commenced.

23.2 **Guidance**

23.2.1 All archaeological investigations, watching briefs or other activities shall be carried out in accordance with the following guidance from the Institute of Field Archaeologists, particularly – but not necessarily limited to standards and guidance for:

23.2.2 field evaluation;

23.2.3 excavation;

23.2.4 archaeological watching brief;

23.2.5 archaeological investigation and recording of standing buildings or structures;

23.2.6 collection, documentation conservation and research of archaeological materials;

23.2.7 the IFA policy statement on Environmental Protection;

23.2.8 the IFA Code of Conduct; and

23.2.9 the British Archaeologists and Developers Liaison Group Code of Practice.

Part 2

PART B - CODE OF MAINTENANCE PRACTICE

1. MANAGEMENT SYSTEMS

1.1 The Tram Maintainer shall implement and comply with the following management systems:

1.1.1 a "quality management system" in accordance with ISO 9001;

1.1.2 a "safety management system" in accordance with ISO 18001 or HSG65; and

1.1.3 an "environmental management system" in accordance with ISO 14001.

2. INSTRUCTION AND TRAINING

2.1 The Tram Maintainer shall ensure that its employees, Sub-Contractors, agents and others on the Edinburgh Tram Network for whom the Tram Maintainer has responsibility undertake a number of inductions. These shall comprise:

2.1.1 specific induction for the Maintenance Services (provided by the Tram Maintainer);

2.1.2 worksite and task-specific-induction including a method statement briefing and toolbox talk, (provided by the Tram Maintainer).

2.2 Any persons who have not received the induction, for example visitors, shall be escorted on Edinburgh Tram Network non-public areas at all times by a competent inducted person and receive a site briefing.

2.3 The Tram Maintainer shall maintain induction and training records in order that the Operator and the Client can inspect them. These records shall identify the scope of the induction and training and the persons who received them.

3. SAFE SYSTEMS

3.1 Risk Assessments

3.1.1 The Tram Maintainer shall prepare risk assessments for all work activities being undertaken.

3.1.2 Each risk assessment shall include as a minimum the following details:

3.1.2.1 Document control

(a) document title and number;

(b) revision status;

(c) authorisation for use; and

(d) reference to supplementary documentation.

3.1.2.2 identification of any hazards (as a minimum they should address the following – access to the work site, security of the work site, interface with the public, potential for vandalism, interface with the tram system and interface with traffic);

3.1.2.3 identification of those who might be harmed, and how; and

3.1.2.4 an evaluation of the risks and, in relation to each risk, the control measures required to reduce the risk to an appropriate level.

3.2 Method Statements

3.2.1 Where the risk assessments identify that additional control measures are required, the Tram Maintainer shall prepare method statements.

3.2.2 Each method statement shall include as a minimum the following details:

3.2.3 Document control

(a) document title and number;

(b) revision status;

(c) authorisation for use; and

(d) reference to supplementary documentation.

3.2.3.1 General information

(a) description and scope of work;

(b) location and boundaries (including sketch or site plan if appropriate); and

(c) access routes for personnel and materials and equipment.

3.2.3.2 Resources

(a) number of personnel (including function and role);

(b) contacts; and

(c) lines of communication.

3.2.3.3 Details of work activities

(a) detailed work sequence;

(b) plant, equipment and tools to be used;

(c) personal protective equipment required;

(d) delivery requirements;

(e) wastes produced, and means of disposal; and

(f) inspection and testing requirements, including details of:

(i) acceptance criteria;

(ii) quality control checklists and record forms to be used;

(iii) frequencies of inspections and testing; and

(iv) documentation which is required prior to the issue of a handover checklist in accordance with Clause 60.2 of the Agreement.

3.2.3.4 Specific control measures

(a) permits and authorisations required; and

(b) temporary amended systems.

3.2.3.5 Emergency procedures

(a) Evacuation and rescue.

(b) Interface with the Operator / Control Centre and Emergency Services.

3.2.3.6 Supplementary documentation

(a) risk assessments; and

(b) COSHH assessments.

3.2.4 The documentation referred to in paragraph 3.2.2 above shall be developed so that it is specific to the Maintenance Services. The Tram Maintainer shall ensure that revisions and updates can be identified .

3.2.5 The Tram Maintainer shall issue a copy of its procedure for the production of method statements and risk assessments to the Client for approval.

3.3 Access Permit

3.3.1 The Tram Maintainer shall comply with the Operator's system for controlling access to undertake work activities as notified to the Tram Maintainer by the Client, which shall require the Tram Maintainer to obtain an approved access permit (**"Access Permit"**) from the Client for works that will require a disruptive possession.

3.3.2 In so far as not otherwise submitted pursuant to this Agreement, the Tram Maintainer shall submit a form for each required Access Permit (**"Access Permit Form"**) which is required, to the Client at least 10 Business Days in advance of access being required. In the event of emergency works or essential unplanned Maintenance Services a reduced period of notice can be applied in accordance with Clause 20.13 of the Agreement.

3.3.3 The Tram Maintainer shall advise the Client of the persons within its organisation who are competent to authorise the Access Permit Forms.

3.3.4 Each Access Permit Form shall identify the risk assessments, method statements and permits to work which have been raised under the Tram Maintainer 's safety management system.

3.3.5 Each Access Permit Form shall identify any requirements for system interruption or isolation.

3.3.6 The Tram Maintainer shall agree with the Client the "start work date and time" and "stop work date and time" for each work activity or group of work activities to be included in each Access Permit.

3.3.7 The Tram Maintainer shall identify within each Access Permit Form any special control measures which require to be implemented including:

3.3.7.1 requirement for a temporary speed restriction;

3.3.7.2 requirement for disablement of traffic signals;

3.3.7.3 traffic management requirements under Chapter 8 of the traffic signs manual for segregating the work sites from the operational Edinburgh Tram Network or road traffic; and

3.3.7.4 requirement to undertake works outwith the conditions included within the noise and vibration policy referred to in the Tram Legislation.

3.3.8 On completion of the work activity or group of work activities, or the "stop work time" (which ever is sooner) the Tram Maintainer shall return the relevant Access Permit to the Client for cancellation.

3.3.9 The Tram Maintainer's authorised persons shall be required to undergo training by the Client (with the input of the Operator) in the operation of the Access Permit system.

3.4 Permits to Work

3.4.1 The Tram Maintainer shall implement a "permit to work" system for the following activities as a minimum:

3.4.1.1 breaking the ground;

3.4.1.2 hot works;

3.4.1.3 entry into confined spaces;

3.4.1.4 work affecting services;

3.4.1.5 access to live facilities; and

3.4.1.6 works on private land controlled by third parties.

3.4.2 The Tram Maintainer shall implement a procedure for managing third party permits to work.

3.4.3 The Tram Maintainer shall issue a copy of its permit to work procedures to the Client for approval.

3.4.4 The Tram Maintainer shall advise the Operator and the Client of the competent persons within its organisation who shall be competent to authorise permits to work.

3.5 Personal Protective Equipment

3.5.1 The Tram Maintainer shall provide all necessary personal protective equipment (**"PPE"**) for its employees and provide them with all necessary information, instruction and training on its use.

3.5.2 The Tram Maintainer shall ensure that all persons on any Work Site (including any representatives of the Operator, the Client and visitors) wear the necessary PPE.

3.5.3 the Client's specific requirements for PPE with regard to particular tasks are as follows:

3.5.3.1 yellow high visibility clothing to comply with BS EN 471:1994, which shall be worn at all times when working on the Edinburgh Tram Network or roads.

3.5.3.2 orange high visibility clothing complying with GO/RT 3279 shall be worn where any works are carried out on railway land.

4. REPORTING

4.1 The Tram Maintainer shall report the following information to the Operator and the Client within 24 hours of the event occurring:

4.1.1 details of any accident or incident which requires notification to the Health & Safety Executive (the Tram Maintainer shall copy Form 2508 to the Operator and to the Client);

4.1.2 details of any environmental event which requires notification to the Scottish Environmental Protection Agency (**"SEPA"**); and

4.1.3 details of any visit by either the Health & Safety Executive or SEPA, together with details of any report issued or enforcement action that resulted.

4.2 The Tram Maintainer shall report the following information to the Client and, if requested by the Client, to any other relevant third party on a four weekly reporting cycle:

4.2.1 details of any near misses;

4.2.2 details of any accident investigation reports raised by the Client including details of corrective and preventative actions which have been taken;

4.2.3 the accident frequency rate (**"AFR"**) for the Maintenance Services (including details of total hours worked and number of persons employed);

4.2.4 a summary of the monitoring and internal auditing activities undertaken by the Tram Maintainer in the period, including details of any corrective or preventative actions raised or closed out; and

4.2.5 details of the programme of monitoring and auditing planned for the subsequent four-weekly period.

5. AUDITING AND MONITORING

5.1 The Tram Maintainer shall be responsible for carrying out and recording, auditing and monitoring of its maintenance work activities.

5.2 The Client any other party reasonably requested by the Client may undertake regular auditing and monitoring of the Tram Maintainer's maintenance work activities, and the Tram Maintainer shall action any findings which are raised the Client or the relevant other party.

6. NON-CONFORMANCE, COMPLAINTS AND DISCIPLINARY MATTERS

6.1 The Client shall implement a process for recording and processing breaches by the Tram Maintainer of the requirements of this Part B of Schedule 3 (*Code of Construction Practice and Code of Maintenance Practice*) and complaints.

6.2 The Tram Maintainer shall take such steps as are required by the Client to remedy any such infringement or address any such complaint and the following priority levels for action shall apply:

Level of Urgency	Category of Notification	Required Response Time
1	High urgency. Involves an immediate threat to persons or property or the circumstances otherwise require immediate rectification.	Immediate action required. If response not completed by the Tram Maintainer within 4 hours, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer.
2	Medium urgency. No immediate threat to persons or property, but circumstances require rectification within 24 hours.	Remedial action requires to be completed within 24 hours. If the Tram Maintainer does not complete the required response within 24 hours, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer.
3	Issue requires rectification, but no immediate threat to persons or property and the circumstances do not otherwise require immediate rectification.	Timescales for rectification to be agreed between the Client and the Tram Maintainer . In the event that the Tram Maintainer does not comply with the agreed timescales, the Client may procure that the relevant work is carried out and the costs of so doing shall be recovered from the Tram Maintainer .

If the Tram Maintainer fails to take any remedial action required by the Client pursuant to the table above, the Client shall be entitled to employ and pay other persons to carry out the same and all costs incurred by the Client shall be recoverable from the Tram Maintainer by the Client and may be deducted by the Client from any monies due or to become due to the Tram Maintainer or, alternatively, recoverable from the Tram Maintainer as a debt.

7. IDENTIFICATION

7.1 The Tram Maintainer shall ensure that all staff undertaking Maintenance Services are easily identifiable to the public by use of photo identity cards.

7.2 The Tram Maintainer shall ensure that all personnel undertaking maintenance activities identify their employer by means of their company logo on their safety helmet.

8. SITE ARRANGEMENTS

8.1 Site Housekeeping

8.1.1 A 'good housekeeping' policy shall be applied by the Tram Maintainer at all times; this shall include, but not necessarily be limited to, the following requirements:

8.1.1.1 all working areas, including offices, shall be kept in a clean and tidy condition;

8.1.1.2 all working areas shall be a no-smoking area; specific areas within the Site shall be designated as smoking areas and shall be equipped with containers for smoking waste; these shall not be located at the boundary of the Site and adjacent to neighbouring land;

8.1.1.3 open fires shall be prohibited at all times;

8.1.1.4 all necessary measures shall be taken to minimise the risk of fire and the Tram Maintainer shall comply with the requirements of the local fire authority;

8.1.1.5 radios (other than two-way radios used for the purposes of communication related to the Maintenance Services) and other forms of audio equipment shall not be operated on the Site;

8.1.1.6 any waste susceptible to spreading by wind or liable to cause litter shall be stored in enclosed containers;

8.1.1.7 rubbish shall be removed at frequent intervals and the Site kept clean and tidy;

8.1.1.8 eating and drinking shall only be permitted within the Tram Maintainer's designated welfare area;

8.1.1.9 adequate toilet facilities shall be provided for all maintenance staff;

8.1.1.10 food waste shall be removed frequently;

8.1.1.11 the Tram Maintainer's personnel (including any Sub-Contractors) shall be required to conform to a reasonable dress code;

8.1.1.12 any behaviour that is lewd or likely to cause offence shall not be permitted; and

8.1.2 The Tram Maintainer shall inspect all working areas at least weekly and shall provide a four weekly written report on compliance with paragraph 8.1.1 above. The Tram Maintainer or any other party authorised by it may carry out inspections of the Site at any time without prior notice of time and place of the inspections. Access to all areas of the Maintenance Services shall be given to visiting inspectors and the Tram Maintainer shall give inspectors all reasonable assistance during their Site inspection.

8.2 Temporary Fencing

8.2.1 The Tram Maintainer shall ensure that all working areas are sufficiently and adequately protected to prevent the public and animals from straying on to the working area; temporary fencing shall be provided to suit the individual location by carrying out an appropriate risk assessment.

8.2.2 All temporary fencing shall comply with Chapter 8 of the [Traffic Sign Manual].

All access and egress to worksites shall be via designated positions within the temporary fencing, which shall remain closed and secured when not in use.

8.2.3 All temporary fencing that creates poorly lit pedestrian routes shall have appropriate lighting fitted by the Tram Maintainer, and these shall be illuminated at all times when the adjacent street lighting is lit.

8.2.4 The Tram Maintainer shall ensure that the location and design of temporary fencing and temporary structures on the public road shall permit adequate visibility at junctions and proper forward visibility along the roads in accordance with the National Roads Directorate advice notes and the requirements of CEC.

8.2.5 All temporary fencing shall be maintained by the Tram Maintainer in a neat and tidy condition at all times, 24 hours, 7 days a week.

8.2.6 The Tram Maintainer shall be expressly prohibited from displaying or allowing to be displayed any advertisement or notice including illicit bill or fly posting on the temporary fencing. The Tram Maintainer shall ensure that all graffiti, fly posting or defacement to the temporary fencing is removed and made good or obscured within 24 hours.

8.2.7 All temporary fencing shall be removed as soon as reasonably practicable after the completion of any part of the Maintenance Services.

8.3 Lighting and Visual Intrusion

8.3.1 Site lighting shall be positioned and directed by the Tram Maintainer so as to minimise nuisance to residents and to minimise distractions or confusion to passing drivers on adjoining public roads. This provision shall apply particularly to working areas where work after dark will be carried out and the Tram Maintainer shall provide appropriate lighting for these sites. Lighting shall be removed as soon as is consistent with the safe and efficient operation of each Work Site.

8.3.2 So far as is practicable, all power to temporary traffic signals, lighting and the like shall be taken from mains supplies rather than portable generators. Where portable generators are used to provide power to temporary traffic signals, lighting and the like the Tram Maintainer shall ensure industry best practice be followed to minimise noise and pollution from such generators.

8.3.3 The Tram Maintainer shall comply with the Institute of Lighting Engineers' document *Guidance Notes on Reduction of Light Pollution 2000* in so far as is reasonably practicable and applicable to the Tram Maintainer.

8.4 Access and Loading

8.4.1 The Tram Maintainer shall ensure that lorries shall enter and exit the Site in a forward direction at designated locations, except where space restriction does not permit this. If the reversing of vehicles into public spaces is required, then a responsible person observing the rear of the vehicle shall properly control the movement. The sounding of audible reversing alarms shall not be permitted outside normal working hours, except where this has been approved by the Client and CEC in connection with the Maintenance Services. Entry

and exit conditions shall be subject to prior approval by the Client, CEC and the Lothian and Borders Police before implementation.

8.4.2 Access to and egress from the Site shall be carried out by initiating a left turn wherever reasonably practicable.

8.4.3 All loading and unloading of vehicles shall take place off the public road as far as is reasonably practicable.

8.5 **Living Accommodation**

8.5.1 No living accommodation shall be provided by the Tram Maintainer within any maintenance working area. Mess rooms, locker rooms, toilets and showers shall be permitted at designated positions agreed with the Client.

8.6 Clearance of Maintenance Work Site on Completion

8.6.1 The Tram Maintainer shall clear and clean all working areas and accesses as work proceeds and when no longer required for the carrying out of the Maintenance Services.

8.6.2 All surplus materials, rubbish, Temporary Works, Tram Maintainer's Equipment, and temporary fencing shall be removed, and the surface of the ground restored as near as practicable to its original condition, or to such condition as has previously been agreed with the Client in accordance with this Agreement and/or the Employer's Requirements (as appropriate).

8.7 Pest Control

8.7.1 The Tram Maintainer shall ensure that the risk of infestation by pests or vermin is minimised by adequate arrangements for the disposal of food waste or other material attractive to pests. If infestation occurs, the Tram Maintainer shall take such action to deal with it as required by the Client.

9. REQUIREMENTS RELATING TO WORKS AFFECTING EDINBURGH AIRPORT

9.1 The Tram Maintainer shall have regard to, and comply (where relevant) with all BAA and CAA guidelines when working on or adjacent to [Edinburgh Airport].

9.2 For Maintenance Services to be carried at Edinburgh airport, the Tram Maintainer shall prepare for approval by the Client and any other party reasonably requested by

the Client a "Construction Management Strategy" as defined within CAA Safeguarding of Aerodromes Advice Note 4 (Cranes and Other Construction Issues). The Construction Management Strategy shall address as a minimum the following issues:

9.2.1 use of cranes or other tall construction equipment;

9.2.2 control of activities likely to produce dust or smoke clouds

9.2.3 the design of temporary lighting to avoid distracting pilots (see CAA Safeguarding of Aerodromes Advice Note 2 Lighting near Aerodromes);

9.2.4 storage of materials, particularly compliance with height limits;

9.2.5 control and disposal of waste, to prevent attraction of birds; and

9.2.6 site restoration, to prevent attraction of birds.

10. REQUIREMENTS RELATING TO WORKS AFFECTING THE RAILWAY

10.1 The Tram Maintainer shall comply with the requirements of Network Rail in relation to railway safeguarding and at all times keep the Client informed of any and all dealings with Network Rail.

11. REQUIREMENTS RELATING TO WORKS AFFECTING OTHER THIRD PARTIES

11.1 The Tram Maintainer shall comply with the requirements of other affected third parties in relation to procedural requirements e.g. notifications, implementation of Permit to Work systems as defined within Third Party Agreements or as may be reasonably required by the Client.

12. ROADS AND FOOTPATHS, CYCLEWAYS AND BRIDLEWAYS

12.1 General

12.1.1 The measures to be taken with respect to traffic and road safety shall include, but not necessarily be limited to:

12.1.1.1 use of TTROs; the Tram Maintainer shall consult with the Client and other third parties notified by the Client on the arrangements for agreeing and implementing TTROs to facilitate road closures and the

like; the use of TTROs shall take into account the requirement for, and availability of, suitable alternative routes;

12.1.1.2 use of appropriate temporary signing and lighting wherever the Maintenance Services are in progress to ensure the safety of all road users;

12.1.1.3 use of temporary signing to restrict vehicle types and sizes and define routes for construction traffic;

12.1.1.4 use of appropriate temporary signing and lighting wherever the Maintenance Services are in progress to ensure the safety of all road users; and

12.1.1.5 preparation and implementation of a programme agreed by the Tram Maintainer with the Client and CEC for road closures and temporary traffic signal arrangements.

12.2 Temporary Road Closures And Diversions

12.2.1 The Tram Maintainer shall finalise the arrangements for required closures and diversions of specified roads, footpaths and cycle ways with the Client, the Operator, CEC, BAA, any private landowner or relevant bus operator.

12.2.2 Before closing or otherwise interfering with any street or footpath to which the public has access, the Tram Maintainer shall make such arrangements with the Client, and if requested by the Client, with the Operator and CEC as may be reasonably necessary to cause as little interference with the traffic in that street or footpath during the Maintenance Services as shall be reasonably practicable.

12.2.3 Pedestrian access to properties shall be maintained at all times where practicable, unless otherwise agreed with the Client, and if requested by the Client, with the Operator and CEC and the owners and tenants of affected properties. Access to and from public facilities shall be maintained at all times unless otherwise agreed with the relevant administrating bodies.

12.2.4 Wherever the Maintenance Services interfere with the existing public or private roads or other ways over which there is a public or private right of way for any traffic, the Tram Maintainer shall construct diversion ways as

necessary. The standard of construction and lighting shall be suitable in all respects for the class or classes of traffic using the existing ways and the widths of the diversions shall not be less than that of the existing way unless otherwise agreed with the Tram Maintainer, and, if requested by the Client, with the Operator and CEC or the owner of the private road.

12.2.5 Diversion routes shall be constructed in advance of any interference with the existing ways, shall be kept as short as reasonably practicable and shall be maintained by the Tram Maintainer to provide adequately for the traffic flows. All diversion routes shall be removed and the road returned to the Client and CEC as soon as is reasonably practical after completion of the Maintenance Services. Liaison shall be undertaken with the Client and CEC regarding any special events such as the Edinburgh Festival, Christmas, New Year, sporting events and filming which might interact with the diversions.

12.2.6 Adequate horizontal clearance of 0.6 metres minimum shall be provided from the kerb line, to avoid fouling by vehicles. The minimum headroom beneath any projection over the road shall be 5.3 metres.

12.3 Parking Provision for Construction Traffic

12.3.1 Areas and locations of parking provision for site and construction traffic shall be agreed by the Tram Maintainer with the Client and CEC prior to the commencement of the Maintenance Services.

12.4 Maintenance and Repair of the Road

12.4.1 The Tram Maintainer shall take every reasonable precaution to prevent its operations from unnecessarily damaging the roads and footpaths within the Site and in the vicinity of the Maintenance Services.

12.4.2 The Tram Maintainer shall carry out all Maintenance Services as are necessary to maintain the roads and footpaths affected by the Maintenance Services in a safe and serviceable condition to the reasonable satisfaction of the Client, the Operator and CEC.

12.4.3 Reinstatements of the road shall be carried out in accordance with the RAUC(S) "*Specification for the Reinstatement for Openings of Roads*", October 2003.

12.5 Existing Street Furniture

12.5.1 No street furniture or other features within the vicinity of the Site and the Maintenance Services, but outwith the area covered by the Tram Legislation shall be unnecessarily disturbed or altered by the Maintenance Services. Any damage to street furniture consequent upon construction activities connected with the Maintenance Services shall be reported to the Client and the appropriate owner or authority (unless the appropriate owner cannot be identified) immediately on discovery of the damage. Any damage shall be replaced or made good as soon as practicably possible and to the reasonable satisfaction of the owner of the street furniture or other feature.

12.5.2 Any street furniture or other obstructions outside the area to be occupied by the Tram Maintainer but which are required to be moved in order to gain access to the Maintenance Services shall, subject to the prior consent of the owner thereof, be removed and reinstated or replaced as appropriate, on completion of the Maintenance Services. Any costs associated therewith shall be borne by the Tram Maintainer, including the costs of reinstatement or replacement.

12.6 Vehicle Movements and Access to the Site

12.6.1 The Tram Maintainer and its Sub-Contractors and suppliers moving loads, construction plant, materials and spoil (including vehicles used for carrying such when empty) shall limit the use of the public roads for such purposes as far as reasonably practicable.

12.6.2 All access routes shall be agreed with the Client and CEC prior to the commencement of the relevant part of the Tram Maintainer Works.

12.6.3 Access (which is deemed to include both the route and entrance to any Work Site) by lorries shall be as agreed with the Client, CEC and the Lothian and Borders Police. Access to and egress from the Site shall be carried out by initiating a left turn wherever reasonably practicable.

12.6.4 All vehicles operating on the Site shall be fitted with roof mounted yellow flashing beacons and reversing alarms.

12.6.5 The Tram Maintainer shall take all reasonable measures to ensure that delivery vehicles do not remain stationary on the road unnecessarily prior to

entering the Site. In exceptional circumstances, for example where the Site is very constrained, it may be necessary to have the potential for a limited number of vehicles to stand on the road. The location of such standing areas their size and the duration of any standing periods shall be subject to prior agreement with the Client, CEC and the Lothian and Borders Police.

12.6.6 The Tram Maintainer shall ascertain and comply with any restrictions in respect of abnormal load routes as they may affect access to the Site.

12.7 Provision, Erection and Maintenance of Traffic Safety and Control (Traffic Safety Measures)

12.7.1 The Tram Maintainer shall provide, erect and maintain such traffic signs, road markings, lamps, barriers and traffic control signals and such other measures as may be necessitated by Maintenance Services in accordance with the requirements of the Agreement and to the approval of the Client, the Operator and CEC. The Tram Maintainer shall not commence any work which affects the public road until all traffic safety measures necessitated by the work are fully operational.

12.7.2 The Tram Maintainer shall keep clean and legible at all times all traffic signs, road markings, lamps, barriers and traffic control signals and shall position, replace, reposition, cover or remove them as required by the progress of the Maintenance Services and to the reasonable requirements of the Client, the Operator and CEC.

12.7.3 The Tram Maintainer shall ensure that all barriers, footpath space and temporary footpaths (including the requirement for kerb ramps where use has to be made of the carriageway) shall comply with the requirements of the document *Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure* issued by the Mobility and Inclusion Unit of the Department for Transport.

12.7.4 Where portable generators are used to provide power to temporary traffic signals, lighting and the like the Tram Maintainer shall ensure industry best practice be followed to minimise noise and pollution from such generators.

12.8 Implementation of the Closure of Roads and Access to Frontages

12.8.1 The Tram Maintainer shall not close any roads or private accesses until immediately before the area is required for undertaking the Maintenance Services in accordance with this Agreement and the Maintenance Programme. The Maintenance Services shall follow in the area of a temporary closure expeditiously and shall be carried out efficiently and in a continuous manner to ensure that all temporary closures are re-opened as quickly as possible.

12.8.2 The Tram Maintainer shall, in carrying out the Maintenance Services, take all reasonable precautions to prevent or reduce any disturbance or inconvenience to the owners, tenants or occupiers of adjacent properties, and to the public generally. The owners, tenants or occupiers of affected properties shall be informed of the Maintenance Services to be undertaken, their planned duration, road and access closures and alternative access routes (where required) in writing and by locally posted public notices at least one calendar month prior to work starting.

12.8.3 The Tram Maintainer shall render all necessary assistance to occupiers of premises affected by the Maintenance Services so as to enable them to accept and send out deliveries to and from their premises during their normal working hours.

12.9 Access for Emergency Vehicles

12.9.1 During Maintenance Services involving any likely disruption to roads and access routes the Tram Maintainer shall propose suitable access routes for emergency service vehicles and personnel to gain access to the Edinburgh Tram Network. These shall be agreed by the Tram Maintainer with the Client, Emergency Services, the Operator and CEC prior to the start of the Maintenance Services.

13. NOISE

13.1 Noise Control

13.1.1 The Tram Maintainer shall take all practicable measures to minimise nuisance from noise.

13.2 Communications Regarding Noise

13.2.1 The Tram Maintainer shall give seven days notice to local residents who may be adversely affected by noise from the proposed programme of Maintenance Services, providing a description of the work to be carried out, measures that will be taken to control noise or other disturbance, and the proposed hours of working.

14. VIBRATION

14.1 Vibration Control

14.1.1 The Tram Maintainer shall take all practicable measures to minimise damage caused due to vibration.

15. DUST AND AIR POLLUTION

15.1 Dust and Other Air Pollution

15.1.1 The Tram Maintainer shall take all necessary measures to avoid creating a dust nuisance during the Maintenance Services.

15.1.2 Particular consideration shall be given by the Tram Maintainer to works affecting the operations of Edinburgh Airport Limited. Details of the specific mitigation measures shall be included within the Construction Management Strategy identified under paragraph 9.2 above.

15.1.3 Measures to prevent dust shall include the following:

15.1.3.1 the hard surfacing of heavily used areas which will be kept clean by regular brushing and water spraying;

15.1.3.2 control of dust released from cutting or grinding of materials on the Maintenance Services;

15.1.3.3 the complete sheeting of all vehicles carrying dusty materials;

15.1.4 Where dust generating works are undertaken close to buildings so that there is a potential for soiling of windows and ledges with dust, the Tram Maintainer shall clean such windows and ledges as frequently as is necessary (and as a minimum, at least once per week) during periods of dust generating work and on completion of the Maintenance Services at that location. The Tram

Maintainer shall take precautions to prevent damage occurring as a consequence of cleaning works.

15.1.5 The Tram Maintainer shall take precautions to prevent the emission of smoke or fumes from vehicles and plant. Vehicles and plant shall be well maintained and measures shall be taken by the Tram Maintainer to ensure that engines and motors are not left running for long periods when not directly in use.

16. DISPOSAL OF WASTE AND CONTAMINATED MATERIALS

16.1 Waste

16.1.1 A waste management plan (**"WMP"**) shall be developed in accordance with "*Site Waste Management Plans: Guidance for Contractors and Clients*" (DTI 2004). The Tram Maintainer shall be responsible for the preparation of the WMP to address all of the approvals and consents which require to be obtained and the control measures and mitigation measures that shall be implemented. The WMP shall be subject to the approval of the Operator and the Client. The WMP shall in particular identify:

16.1.1.1 responsibilities for waste management;

16.1.1.2 the types and quantities of waste materials likely to be generated;

16.1.1.3 measures to be taken to minimise generation of waste;

16.1.1.4 proposals for recycling and/or re-use;

16.1.1.5 measures to be adopted for management of waste on the Site including enclosure, segregation, secure storage, sorting for recovery, and other on-site handling;

16.1.1.6 proposed treatment and disposal routes; and

16.1.1.7 licensing arrangements.

16.1.2 The Tram Maintainer shall implement and comply with the WMP.

16.1.3 The Tram Maintainer shall undertake monthly audits to demonstrate compliance with Statutory Requirements and the WMP. The Tram Maintainer shall set out its audit programme in the WMP and shall provide copies of the audit report to the Operator and Tram Maintainer.

17. PROTECTION OF THE WATER ENVIRONMENT

17.1 Waste Water and Run-off

17.1.1 The Tram Maintainer shall ensure that there shall be no washout from the Maintenance Services into watercourses.

17.1.2 No water shall be discharged into watercourses, but shall be filtered prior to discharge, or discharged onto a grassy area to soak away.

17.1.3 Waste water and site discharges to surface water or sewer shall only be permitted where the effluent quality and discharge location is acceptable to SEPA or Scottish Water (as appropriate). Water Environment (Controlled Activities) (Scotland) Regulations 2005 ("CAR") discharge authorisation shall be obtained by the Tram Maintainer if required prior to discharge.

17.1.4 The Tram Maintainer shall take suitable precautions to prevent the entry of pollutants into any bodies of water, and report any incidents to SEPA and Scottish Water.

17.1.5 Procedures for responding to potentially polluting shall be implemented in accordance with SEPA guidance.

17.2 Storage of Polluting Materials

17.2.1 The Tram Maintainer shall make provision to ensure that oil drums and containers or other potential contaminants are properly isolated and bunded and that no oil or other contaminants are allowed to reach watercourses or groundwater, including aquifers. Oil storage containers (both fixed and mobile) with a 200 litre capacity or greater shall be stored in compliance with the Water Environment (Oil Storage) (Scotland) Regulations 2006 (where applicable). Drip trays and other secondary containment measures shall be used by the Tram Maintainer where necessary to prevent spills during refuelling and operation of small static and mobile equipment. Storage locations for such materials shall be positioned away from watercourses. All surface water or other contaminated water which accumulates in bunds shall be removed by the Tram Maintainer by manually controlled positive lift pumps, and not by means of a gravity drain.

17.2.2 Refuelling shall be carried out by the Tram Maintainer in a designated area which is away from watercourses and drains.

17.2.3 Spill response kits containing equipment appropriate to the quantity and types of materials present on site shall be available for use by the Tram Maintainer in the event of a fuel spillage. Personnel shall be trained in their use.

17.3 Works in the Vicinity of Water

17.3.1 The Tram Maintainer shall take suitable precautions to prevent the entry of pollutants, including sediments and dusts, into any bodies of water, and report any incidents to SEPA.

17.4 Water Environment (Controlled Activity) (Scotland) Regulations 2005

Without prejudice to the foregoing terms of this paragraph 15, the Tram Maintainer shall comply with the terms of CAR where relevant to the Tram Maintainer.

18. ECOLOGY

18.1 Encroachment into Wildlife Areas

18.1.1 The Tram Maintainer shall take all reasonably practicable measures to minimise harm to and disturbance of wildlife caused by noise and vibration, dust and other air pollution.

18.1.2 Approval shall be obtained by the Tram Maintainer from Scottish Natural Heritage, SEPA, Scottish Executive Environment Group Wildlife Habitats Division ("**SEEG WHD**") and CEC, for detailed method statements for any Maintenance Services proposed at designated sites, including Special Protection Areas ("**SPA**")/'Ramsar' sites, Sites of Special Scientific Interest ("**SSSI**"), Sites of Interest for Nature Conservation ("**SINC**") and wildlife sites.

18.1.3 Applications for approval shall be made by the Tram Maintainer at least one calendar month prior to relevant Maintenance Services commencing.

18.2 Protected Species

18.2.1 In advance of any works, the Tram Maintainer shall employ suitably qualified professionals to check all working areas and any land within 30 metres of the

boundary of the working area (unless there is a boundary with a private third party within the 30 metres, in which case no checks shall be taken within the private land) for the presence of species protected by statute. Where protected species are identified, appropriate mitigation measures shall be agreed between the Tram Maintainer and the relevant authorities.

18.2.2 Where any habitat has to be cleared in the breeding bird season, typically March to June or July for most species, the habitat must be checked by the Tram Maintainer prior to removal for the presence of nesting wild birds, their nests and eggs and young. If found, no habitat shall be removed until nesting is complete, or unless other suitable mitigation is agreed in advance between the Tram Maintainer and Scottish Natural Heritage.

18.2.3 The Tram Maintainer shall be responsible for obtaining a licence from Scottish Natural Heritage for any work that may cause disturbance to a badger or involves the damage or destruction of a sett. Licence applications shall be made by the Tram Maintainer for any works within 10m, heavy machinery operating within 30m, and no works shall proceed until the required licences are obtained.

18.2.4 The Tram Maintainer shall be responsible for obtaining a licence from SEEG WHD for any work which may cause disturbance to otters or involve damage or destruction to an otter holt or lying up site or if any Maintenance Services are proposed within 30m of an otter holt or lying up site.

18.2.5 The Tram Maintainer shall be responsible for ensuring that all bridges and other built structures and mature and dead trees within the working area shall be checked by a licensed bat handler for their use by roosting or hibernating bats prior to felling or other potentially damaging operations. If found, mitigation measures shall be agreed between the Tram Maintainer, Scottish Natural Heritage and SEEG WHD and implemented, including review of the design to seek ways of avoiding loss of the roost. If avoidance is not possible, a licence shall be applied for by the Tram Maintainer from SEEG WHD for disturbance to a European Protected Species and / or destruction or damage to a breeding site or resting place. Alternative roost sites shall be provided in advance of any loss. Any loss of feeding habitat shall be compensated for by new habitat creation as detailed in the landscape and habitat management plan prepared and issued to the Tram Maintainer by the Client. All mitigation

measures for protected species shall be installed by the Tram Maintainer as early as possible so that use can be established at an early stage.

18.2.6 Where appropriate use of mitigation measures by target species will be positively encouraged using a variety of techniques e.g. feeding.

18.2.7 The Tram Maintainer's personnel and personnel engaged by any Sub-Contractors shall be briefed by a suitably qualified professional on measures for protected species as part of site induction.

18.3 Protection of Mature Trees

18.3.1 For the purposes of this paragraph, "trees" are defined as trees with a diameter of over 10cm girth at a height of 1.5 m above ground level.

18.3.2 All tree surgery operations shall comply with the British Standard (BS) 3998 "*Recommendations for Tree Work*" and a method statement addressing safety of workers and the public shall be prepared by the Tram Maintainer and implemented.

18.3.3 Felling shall be carried out in accordance with the Forestry Commission document "*Forest and Water Guidelines 2004*", which relates to the influence that woodland and trees can have on the freshwater environment, insofar as this is reasonably practicable and to the extent that they are applicable to the Maintenance Services.

18.3.4 Prior to felling, the Tram Maintainer shall procure that trees suitable as bat roosts shall be checked by a licensed bat handler for roosting and hibernating bats, and should any be identified, mitigation measures shall be agreed by the Tram Maintainer with Scottish Natural Heritage and SEEG WHD and the Tram Maintainer shall obtain any relevant licences.

18.3.5 Woody material generated shall be retained on the site as far as is reasonably possible and used as part of habitat creation measures.

18.4 Control of Invasive and Alien Species

18.4.1 If any invasive alien species listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended), are identified along the route, including Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum*

mantegazzianum) or Himalayan Balsam (*Impatiens glandulifera*), the Tram Maintainer shall develop a strategy to manage their presence. The strategy will ensure appropriate treatment of invasive alien species in accordance with approved methodology and will prevent the spread of the species within and outside the Edinburgh Tram Network

18.4.2 The Infraco shall comply with the DEFRA document "*Helping to Prevent the Spread of Invasive Non-native Species, Horticultural Code of Practice*" (March 2005), in so far as this is reasonably practicable and applicable to the Maintenance Services. Invasive alien species listed on Schedule 9, Part II of the Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland Act) 2004, will be treated in accordance with the Environmental Protection Act 1990. Japanese knotweed and giant hogweed and soils containing particles of these plants are regarded as controlled waste.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 19 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 19

TIE AND CEC POLICIES

Tram Project Environmental & Sustainability Policy Statement

The Edinburgh Tram project will deliver a new tram network for the City of Edinburgh.

tie recognises that the achievement of excellence in the delivery of such projects is underpinned by a systematic approach where concern for environmental and sustainability matters is fundamental and forms an integral part of its operations.

tie will adopt an environmental management system which conforms to the principles and requirements of BS EN ISO 14001 2004 Environmental Management Systems.

The management team:

- Is committed to good environmental management practice, including building sustainability into the project and the prevention of pollution.
- Shall promote a positive culture on environmental and sustainability issues through leadership and communication.
- Use effective communication within the team as a primary enabler of environmental good practice.
- Shall put in place suitable management arrangements for ensuring environmental matters are integral to the execution of the Tram project.
- Is committed to continual improvement of its environmental management arrangements.
- Will set environmental and sustainability objectives which shall be monitored and reviewed for effectiveness and suitability.
- Shall work with the relevant statutory bodies to comply with or exceed applicable legislation, regulations and contractual obligations.

It is recognised that everyone involved with **tie** has responsibilities for reducing our impact on the environment, good environmental practice must be considered a core value that is to be taken into account by all tie personnel and tie suppliers in all those activities they undertake for tie.

This policy will be communicated to **tie** personnel and **tie** suppliers so ensuring that they are aware of their own responsibilities within it. Additionally it will be made available to other interested third parties who may require it.

This policy shall be reviewed annually for continuing suitability.

Signed

Matthew Crosse
Project Director
27th February 2007

DOC NO	VERSION	STATUS	DATE	PROJECT	SHEET
DEL HSQE 101	2.0	Approved	27 Feb 07	Edinburgh Tram Network	1 of 1

Tram Project Safety Policy Statement

The Edinburgh Tram project will deliver a new tram network for the City of Edinburgh

The project will adopt a safety management system which conforms to the principles and requirements of OHSAS **18001** 1999 Occupational health and safety management systems - Specification or **HSG65: 2000** Successful Health & Safety Management

tie recognises that the control of health and safety aspects arising from the Edinburgh Tram project is an essential feature of our efficient operation

tie also recognises and accepts the responsibility of the Health and Safety at Work etc Act 1974 and associated legislation to provide and maintain safe working conditions and a healthy environment for all persons who may be affected by the Edinburgh Tram project The management team

- shall provide plant and systems of work that are safe and free from risks to health
- shall provide such information, instruction, training and supervision as is necessary to ensure the health and safety at work of all employees and those who may be affected by our work,
- shall maintain in a condition that is safe and free from risk to health any place of work under **tie**'s control and provide adequate facilities and arrangements for the welfare of employees at work
- shall safeguard visitors to all areas within **tie**'s control and any member of the public who may be affected by **tie**'s activities
- shall ensure that all information concerning health and safety pertaining to the Edinburgh Tram project is provided, where appropriate, to external sources
- shall encourage and promote a safety culture which will show best practises on the Edinburgh Tram project by showing leadership and commitment to health and safety issues
- set health and safety objectives which shall be monitored and reviewed for effectiveness and suitability

It is recognised that everyone involved with the Edinburgh Tram project is responsible for health and safety Health and safety must be considered as a core value that is to taken into account by Edinburgh Tram project staff and suppliers in all their project related activities

This policy shall be communicated to Edinburgh Tram project staff and suppliers

This policy shall be reviewed annually for continuing suitability

Signed

Matthew Crosse
Project Director
26th July 2007

DOC NO	VERSION	STATUS	DATE	PROJECT	SHEET
DEL HSQE 105	3 0	Approved	26 Jul 07	Edinburgh Tram Network	1 of 1

Cover Approval Sheet

Company Policy

Doc Ref.	PS 625
Rev	0.0
Status	Approved
Owner	HR Department

DRUGS & ALCOHOL POLICY

Document Approval

	Signature	Title	Date
Prepared By:	[redacted]	tie HSQE Manager	02/08/07
Approved By:		Engineering & Procurement Director	02/08/07
Authorised By:		HR & Corporate Affairs Director	02/08/07

tie has a responsibility to provide a safe and healthy working environment and recognises that this may be jeopardised by those who misuse alcohol and/or drugs within the working environment, or in a way that may affect themselves or others

The tie policy reflects the requirements of the Transport and Works Act 1992

tie will take all reasonable steps to ensure that employees, consultants and contractors are made aware of the content of this statement, legislation, standards and client requirements and the implications therein

Specific arrangements are detailed in the tie Drugs and Alcohol procedure

It is a requirement of tie that no employee, consultant or contractor shall

- Report or endeavour to report for duty in an unfit state due to alcohol or illegal drugs abuse;
- Be in possession of alcohol or illegal drugs in the workplace
- Consume alcohol or illegal drugs whilst on duty

When medication is prescribed or advised to an employee, they must advise the medical practitioner or pharmacist of the nature of their work so that appropriate information on the possible affects and the potential effect on workplace safety can be given. The employee must inform their manager and provide relevant and accurate details of the medication involved in order that they may obtain advice on what, if any, restrictions apply. The employee must comply with any restrictions imposed by their manager

tie policy permits assistance with the rehabilitation of employees that voluntarily seek help for alcohol or drug dependency or misuse problems. Staff must, however, seek assistance at the earliest opportunity. Subsequent discovery or disclosure prompted by an impending screening will not be acceptable

A programme of screening is in place within tie to

- Detect the use of drugs and/or alcohol by potential employees via employment medical screening
- Detect the use of drugs and/or alcohol by any person(s) via "random testing"
- Detect the use of drugs and/or alcohol by any person(s) involved in a safety critical incident via "for cause" testing where there are grounds to suspect that the actions of the person(s) led to the incident; and
- Detect the use of drugs and/or alcohol via "for cause" testing where abnormalities of behaviour prompt managerial intervention

tie require full compliance with this policy and shall take the appropriate disciplinary action in the event of any infringement

[redacted]

Willie Gallagher
Executive Chairman
02 August 2007

1.0 DOCUMENT CHANGE CONTROL HISTORY

Revision	Date	CR No	Reason for Change	Authorisation
A	16/11/2006		1st Issue of new document	
0.0	02/08/2007	0015	Re-draft in company template	02/08/2007

Tram Project Quality Policy Statement

The Edinburgh Tram project will deliver a new tram network for the City of Edinburgh.

The project will adopt a quality management system which conforms to the principles and requirements of BS EN ISO 9001:2000 Quality Management Systems.

tie recognises that the achievement of the objectives set for the Edinburgh Tram project requires that the project is underpinned by a systematic approach with a 'right first time' attitude. The management team:

- shall promote a positive culture through leadership and communication;
- use effective communication within the team as a primary enabler of quality;
- shall put in place suitable management arrangements for the effective execution of the Edinburgh Tram project;
- is committed to continual improvement of its management arrangements throughout the project life cycle;
- set quality objectives which shall be monitored and reviewed for effectiveness and suitability;
- will deliver a tram network that is fit for purpose, meeting the technical requirements of the project's stakeholders and being delivered to time and cost.

It is recognised that everyone involved with the Edinburgh Tram project is responsible for the quality of the delivery. Quality must be considered as a core value that is to taken into account by Edinburgh Tram project staff and suppliers in all their project related activities.

This policy shall be communicated to Edinburgh Tram project staff and suppliers.

This policy shall be reviewed annually for continuing suitability.

Signed

Matthew Crosse
Project Director
27th February 2007

DOC NO	VERSION	STATUS	DATE	PROJECT	SHEET
DEL HSQE 103	2.0	Approved	27 Feb 07	Edinburgh Tram Network	1 of 1

EDINBURGH TRAM LINES ONE AND TWO

NOISE AND VIBRATION POLICY

DECEMBER 2005

1 INTRODUCTION

This policy statement sets out the approach the promoter proposes to adopt to mitigate noise from the operation of Edinburgh Tram Lines One and Two. Impacts during construction will be covered by the Edinburgh Tram Lines One and Two Code of Construction Practice.

This policy has been developed in the absence of any statutory requirements for noise mitigation from rail systems in Scotland. Unlike the situation for new roads throughout the UK, and for new railways in England and Wales, there are no noise insulation regulations or other statutory requirements to control noise from railways in Scotland. The promoter therefore proposes to implement a noise scheme based upon non-statutory standards set out in this policy statement. These are set at significantly lower noise levels than apply for statutory noise insulation elsewhere and mitigation will be provided wherever it is reasonably practicable to do so. It is important to recognise that this is a non-statutory arrangement and there will be cases where there are practical limitations as to what can be achieved. This Policy clarifies how these circumstances will be addressed.

2 APPROACH

The promoter will undertake measures to mitigate significant noise impacts for residents and other noise sensitive receivers in the vicinity of the routes, following a tiered approach. In this, different options for mitigation will be considered in turn, taking into account what is reasonably practicable and acceptable to affected parties in the circumstances of each location potentially affected by noise. This policy will be applied in accordance with the principle of best practicable means [1].

(1) Best Practicable Means are defined in Section 72 of the Control of Pollution Act 1974 as those measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.

- Firstly, the promoter will define and apply strict noise emission standards when procuring all tram vehicles.

- Secondly, the promoter will use all reasonably practicable measures to avoid significant noise impacts through design of the track and trackbed.

- Thirdly, where these measures are not sufficient to mitigate significant impacts, the promoter will provide noise barriers to attenuate noise between the track and sensitive receivers.

- Fourthly, the promoter will offer noise insulation within residential properties where, after all reasonably practicable and acceptable attenuation at source is provided, residual noise levels would exceed given thresholds.

Noise sensitive receivers are defined to include all types of dwellings, schools, libraries, hospitals, theatres and concert halls, and places of worship currently bordering the route.

In defining what is reasonably practicable (ie what constitutes best practicable means), the promoter will take into account engineering feasibility, maintenance of driver sight lines, safe operation of the tram, safe interaction with road traffic, the safety of pedestrians and cyclists, and security and crime considerations. It will also take into account the cost of any proposed mitigation measure and the level of benefit achieved in terms of number of properties affected, the degree of noise reduction and the resulting noise levels, such that costs are not disproportionate to the benefits achieved. In defining what is acceptable the promoter will consult affected residents and take into account impacts on their amenity and that of other parties such a recreational user of facilities, and any other environmental concerns.

The application of these principles is further described below. A key aspect of their application is the definition of what constitutes a significant impact and this is set out in the next section before describing how this applies to the selection of appropriate noise mitigation measures at the four levels in the mitigation hierarchy.

3 *DEFINITION OF SIGNIFICANT NOISE IMPACT*

As noted above there are no statutory requirements for mitigating tram noise in Scotland. It is therefore necessary to define criteria to establish when noise mitigation should be considered. These have been based on the approach used in the Environmental Impact Assessments for Edinburgh Tram Lines

One and Two. The likelihood of exceeding these criteria will be determined in advance of construction by noise modelling [1].

Options for noise mitigation will start to be considered if the free-field noise level outside the window of any sensitive receiver exceeds either of the following noise target levels:

- for daytime noise, $L_{Aeq\ 0700\text{-}2300\ hours}$ 55 dB;

or

- for night time noise, $L_{Aeq\ 2300\text{-}0700\ hours}$ 45 dB

Where tram noise is predicted to be more than 3dB [2] above either of these thresholds, mitigation measures to reduce the adverse impact of noise will be considered according to the extent to which the pre-existing ambient ($L_{Aeq\ 1\ hour}$) noise level is increased, as follows

- Increase of 3-5 dB - mitigation considered on a case by case basis, and implemented if reasonably practicable and acceptable to affected parties.

- Increase of greater than 5 dB – mitigation implemented if reasonably practicable and acceptable to affected parties.

4 THE MITIGATION HIERARCHY

4.1 TRAM VEHICLE PROCUREMENT

The promoter will define and apply strict noise emission standards in the procurement of all tram vehicles. These will be decided following a review of achievable performance standards at the time of procurement of the tram vehicles and will be designed to reflect prevailing good standards at the time. The tram vehicle and the tram rails will be designed in a coordinated manner, so as to achieve the required performance standard in the circumstances to be encountered on the Edinburgh Tram system.

4.2 TRACK DESIGN

The promoter will adopt all reasonably practicable and acceptable measures to reduce noise at source by design of the track to attenuate noise. A variety of

(1) Predictions will be made at the final design stages by modelling and will take into account details of the track alignment and surrounding ground form between the track and the nearest building facade, the presence of natural barriers, the selected tram vehicle and the operating schedule.
(2) Exceedances of up to 3 dB are considered to be of marginal significance. In line with current guidance, 3 dB is taken as the limit of perception of change in environmental noise

measures may be available to contribute to noise reduction at source and the promoters will consider all current developments in the field in developing the final design for the scheme. These will include the use of grass track which is already planned along some sections of the route and installation of acoustic plenum structures alongside the tram rails if this is acceptable to HM Railways Inspectorate.

4.3 *Noise Barriers*

Where significant noise impacts are still predicted to occur, the promoter will consider the provision of noise screening structures within the tram corridor. The dimensions (length and height) and form of each structure will be determined by modelling and in consultation with affected properties. Where an attenuating structure proves not to be reasonably practicable or acceptable, or is only possible with reduced dimensions, the promoter will consider whether there are additional special measures that can be taken to mitigate noise that are proportionate in the circumstances of the case.

4.4 *Noise Insulation*

If approved the provisions of the Edinburgh Tram Line One and Two Bills will empower the promoter to set up a noise insulation scheme. This scheme will be as defined in the Noise Insulation (Railways and Other Guided Systems) Regulations 1996, which apply in England and Wales. Under this scheme noise insulation will be provided for residential properties, if tram noise reaches the qualifying façade levels:

- 68 dB $L_{Aeq\ 0600-0000\ hours}$ during the day and evening; and
- 63 dB $L_{Aeq\ 0000-0600\ hours}$ at night

Further details of the qualifying criteria and of the noise insulation package that will be offered are as set out in the Regulations.

Also, although it is intended that wheel squeal [1] on bends will be minimised through good design and operational practices, to address the possibility that this characteristic form of noise could, if it were to occur, cause sleep disturbance at night in residential properties, the promoter will also have discretionary powers to offer noise insulation (as otherwise prescribed under the Regulations) to affected residential properties taking account of the frequency and level of wheel squeal.

In addition, to address the possibility that for a particular reason a high peak noise level from the tram cannot be mitigated in an area where existing peak noise is currently low, noise insulation will be offered irrespective of tram L_{Aeq}

(1) Wheel Squeal is the distinctive tonal noise sometimes generated on very tight bends where tram wheel/track geometry and conditions are poor.

levels as follows. Where the tram free-field level exceeds $L_{Amax\ slow}$ 82 dB more than twice an hour at night (2300-0700 hours) insulation will be offered provided the tram $L_{Amax\ slow}$ is above the pre-existing ambient $L_{Amax\ slow}$ by at least 3dB (or 5dB at the discretion of the promoter, depending on frequency and local circumstances). The ambient $L_{Amax\ slow}$ will be the night-time $L_{Amax\ slow}$ from all other noise sources that is routinely exceeded at least twice an hour in the hours when the tram operates. This noise insulation offer would be over and above any others that may be offered under this policy.

5 *VIBRATION*

Trackforms will be designed adjacent to sensitive receptor buildings using Best Practicable Means to keep within the guideline levels of Vibration Dose Value (VDV) given in BS6472: 1992 below which the probability of adverse comments is low:

- Day (0700-2300 hours): 0.2 $m/s^{1.75}$; and
- Night (2300-0700 hours): 0.13 $m/s^{1.75}$.

In addition, the specification for the design of the tramway will include a Peak Particle Velocity (PPV) level no higher than 2mm/s at 2m from the rails.

6 *MAINTENANCE AND MONITORING*

The promoter is committed to maintaining the tram system, and in particular the wheel and rail surfaces, so as to minimise noise at sensitive receivers. For each section of the route a noise and vibration monitoring scheme will be established and results will be regularly reported. The noise and vibration monitoring scheme will be agreed with the City of Edinburgh Council's Environmental and Consumer Services department. Appendix 1 gives details of the proposed noise monitoring system and how it will avoid unnecessary increase in noise levels.

The Promoter will give due notice to the City of Edinburgh Council's Environmental and Consumer Services department and potentially affected residents of plans to carry out any potentially noisy maintenance activities at night such as rail grinding.

The operator will establish a policy on the appropriate use of vehicle audible warning devices in accordance with safe working practices, which will be

reviewed from time to time, for example if repeated complaints are received in certain areas.

The operator will co-operate with the City of Edinburgh Council's Environmental and Consumer Services Department in establishing appropriate sound levels for tram stop Public Address systems if complaints are received from occupiers of noise sensitive premises

APPENDIX 1

NOISE MONITORING PROCEDURES

A list of representative noise monitoring locations will be agreed with the City of Edinburgh Council's Environmental and Consumer Services department in consultation with local residents groups. The list will be reviewed from time to time.

Tram noise measurements will be carried out as prescribed below in the following circumstances.

- During commissioning of the scheme
- 3-6 months after commencement of passenger service.
- At intervals not exceeding 1 year thereafter.
- Upon reasonable request by the City of Edinburgh Council's Environmental and Consumer Services department.

At the agreed monitoring locations, measurements will be taken of the $L_{Amax,\ Slow}$ and SEL noise levels of a pass-by of each of the vehicles on each track, under normal operation. In the case of new works, the rails will be free from visible defects. The results of the noise monitoring will be published on the internet.

At any location, if the mean of the noise levels of all the vehicles measured on any one track is found to be 3 dB(A) or more greater than the mean measured on any previous occasion for an equivalent set of vehicles, then the track will be reground, or other appropriate work will be undertaken, as soon as reasonably practicable, assuming noise from particular vehicles has not skewed either average.

Monitoring will also be used to prevent any particular vehicle becoming excessively noisy, as follows. In the event that the maximum noise level of any vehicle is found to be 3 dB(A) or more greater than the mean then the wheels of that vehicle will be scheduled for re-turning as soon as reasonably practicable.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 20 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 20

REPORTING PERIOD END DATES

PERIOD END DATES (all Saturdays except 31st March)

CONSTRUCTION PERIOD					
	2007 / 08	**2008 / 09**	**2009 / 10**	**2010 / 11**	**2011 / 12**
1	28/04/2007	26/04/2008	02/05/2009	01/05/2010	30/04/2011
2	26/05/2007	24/05/2008	30/05/2009	29/05/2010	28/05/2011
3	23/06/2007	21/06/2008	27/06/2009	26/06/2010	25/06/2011
4	21/07/2007	19/07/2008	25/07/2009	24/07/2010	23/07/2011
5	18/08/2007	16/08/2008	22/08/2009	21/08/2010	20/08/2011
6	15/09/2007	13/09/2008	19/09/2009	18/09/2010	17/09/2011
7	13/10/2007	11/10/2008	17/10/2009	16/10/2010	15/10/2011
8	10/11/2007	08/11/2008	14/11/2009	13/11/2010	12/11/2011
9	08/12/2007	06/12/2008	12/12/2009	11/12/2010	10/12/2011
10	05/01/2008	03/01/2009	09/01/2010	08/01/2011	07/01/2012
11	02/02/2008	31/01/2009	06/02/2010	05/02/2011	04/02/2012
12	01/03/2008	28/02/2009	02/03/2010	05/03/2011	03/03/2012
13	31/03/2008	31/03/2009	31/03/2010	31/03/2011	31/03/2012

SERVICE PERIOD					
	2012 /13	**2013 / 14**	**2014 / 15**	**2015 / 16**	**2016 / 17**
1	28/04/2012	27/04/2013	26/04/2014	02/05/2015	30/04/2016
2	26/05/2012	25/05/2013	24/05/2014	30/05/2015	28/05/2016
3	23/06/2012	22/06/2013	21/06/2014	27/06/2015	25/06/2016
4	21/07/2012	20/07/2013	19/07/2014	25/07/2015	23/07/2016
5	18/08/2012	17/08/2013	16/08/2014	22/08/2015	20/08/2016
6	15/09/2012	14/09/2013	13/09/2014	19/09/2015	17/09/2016
7	13/10/2012	12/10/2013	11/10/2014	17/10/2015	15/10/2016
8	10/11/2012	09/11/2013	08/11/2014	14/11/2015	12/11/2016
9	08/12/2012	07/12/2013	06/12/2014	12/12/2015	10/12/2016
10	05/01/2013	04/01/2014	03/01/2015	09/01/2016	07/01/2017

11	02/02/2013	01/02/2014	31/01/2015	06/02/2016	04/02/2017
12	02/03/2013	01/03/2014	28/02/2015	05/03/2016	04/03/2017
13	31/03/2013	29/03/2014	31/03/2015	31/03/2016	31/03/2017
	2017 / 18	**2018 / 19**	**2019 / 20**	**2020 / 21**	**2021 / 22**
1	29/04/2017	28/04/2018	27/04/2019	02/05/2020	01/05/20
2	27/05/2017	26/05/2018	25/06/2019	30/05/2020	29/05/2021
3	24/06/2017	23/06/2018	22/06/2019	27/06/2020	26/06/2021
4	22/07/2017	21/07/2018	20/07/2019	25/07/2020	24/07/2021
5	19/08/2017	18/08/2018	17/08/2019	22/08/2020	21/08/2021
6	16/09/2017	15/09/2018	14/09/2019	19/09/2020	18/09/2021
7	14/10/2017	13/10/2018	12/10/2019	17/10/2020	16/10/2021
8	11/11/2017	10/11/2018	09/11/2019	14/11/2020	13/11/2021
9	09/12/2017	08/12/2018	07/12/2019	12/12/2020	11/12/2021
10	06/01/2018	05/01/2019	04/01/2020	09/01/2021	08/01/2022
11	03/02/2018	02/02/2019	01/02/2020	06/02/2021	05/02/2022
12	03/03/2018	02/03/2019	29/02/2020	06/03/2021	05/03/2022
13	31/03/2018	31/03/2019	31/03/2020	31/03/2021	31/03/2022
	2022 / 23	**2023 / 24**	**2024 / 25**	**2025 / 26**	**2026 / 27**
1	30/04/2022	29/02/2023	27/04/2024	26/04/2025	02/05/2026
2	28/05/2022	27/05/2023	25/05/2024	24/05/2025	30/05/2026
3	25/06/2022	24/06/2023	22/06/2024	21/06/2025	27/06/2026
4	23/07/2022	22/07/2023	20/07/2024	19/07/2025	25/07/2026
5	20/08/2022	19/08/2023	17/08/2024	16/08/2025	22/08/2026
6	17/09/2022	16/09/2023	14/09/2024	13/09/2025	19/09/2026
7	15/10/2022	14/10/2023	12/10/2024	11/10/2025	17/10/2026
8	12/11/2022	11/11/2023	09/11/2024	08/11/2025	14/11/2026
9	10/12/2022	09/12/2023	07/12/2024	06/12/2025	12/12/2026
10	07/01/2023	06/01/2024	04/01/2025	03/01/2025	09/01/2027
11	04/02/2023	03/02/2024	01/02/2025	31/01/2026	06/02/2027
12	04/03/2022	02/03/2024	01/03/2025	28/02/2026	06/03/2027
13	31/03/2022	31/03/2024	31/03/2025	31/03/2026	31/03/2027

Notes

- The later dates are more likely to change over time.
- The Reporting Periods run each year from 1st April to 31st March.
- Period One (P1) starts the first of April and generally finishes on the 4th Saturday following that date.
- Period Two (P2) starts on the next day (generally the 4th Sunday) and finishes on the 4th Saturday from that date.
- Periods Three through to Twelve follow at four weekly intervals.
- Period Thirteen starts the Sunday after the end Saturday of P12 and finishes on 31st March.

[redacted]

[redacted]

Director/Authorised Signatory
tie LIMITED

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 20 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 20

REPORTING PERIOD END DATES

PERIOD END DATES (all Saturdays except 31st March)

CONSTRUCTION PERIOD					
	2007 / 08	**2008 / 09**	**2009 / 10**	**2010 / 11**	**2011 / 12**
1	28/04/2007	26/04/2008	02/05/2009	01/05/2010	30/04/2011
2	26/05/2007	24/05/2008	30/05/2009	29/05/2010	28/05/2011
3	23/06/2007	21/06/2008	27/06/2009	26/06/2010	25/06/2011
4	21/07/2007	19/07/2008	25/07/2009	24/07/2010	23/07/2011
5	18/08/2007	16/08/2008	22/08/2009	21/08/2010	20/08/2011
6	15/09/2007	13/09/2008	19/09/2009	18/09/2010	17/09/2011
7	13/10/2007	11/10/2008	17/10/2009	16/10/2010	15/10/2011
8	10/11/2007	08/11/2008	14/11/2009	13/11/2010	12/11/2011
9	08/12/2007	06/12/2008	12/12/2009	11/12/2010	10/12/2011
10	05/01/2008	03/01/2009	09/01/2010	08/01/2011	07/01/2012
11	02/02/2008	31/01/2009	06/02/2010	05/02/2011	04/02/2012
12	01/03/2008	28/02/2009	02/03/2010	05/03/2011	03/03/2012
13	31/03/2008	31/03/2009	31/03/2010	31/03/2011	31/03/2012

SERVICE PERIOD					
	2012 /13	**2013 / 14**	**2014 / 15**	**2015 / 16**	**2016 / 17**
1	28/04/2012	27/04/2013	26/04/2014	02/05/2015	30/04/2016
2	26/05/2012	25/05/2013	24/05/2014	30/05/2015	28/05/2016
3	23/06/2012	22/06/2013	21/06/2014	27/06/2015	25/06/2016
4	21/07/2012	20/07/2013	19/07/2014	25/07/2015	23/07/2016
5	18/08/2012	17/08/2013	16/08/2014	22/08/2015	20/08/2016
6	15/09/2012	14/09/2013	13/09/2014	19/09/2015	17/09/2016
7	13/10/2012	12/10/2013	11/10/2014	17/10/2015	15/10/2016
8	10/11/2012	09/11/2013	08/11/2014	14/11/2015	12/11/2016
9	08/12/2012	07/12/2013	06/12/2014	12/12/2015	10/12/2016
10	05/01/2013	04/01/2014	03/01/2015	09/01/2016	07/01/2017

11	02/02/2013	01/02/2014	31/01/2015	06/02/2016	04/02/2017
12	02/03/2013	01/03/2014	28/02/2015	05/03/2016	04/03/2017
13	31/03/2013	29/03/2014	31/03/2015	31/03/2016	31/03/2017
	2017 / 18	**2018 / 19**	**2019 / 20**	**2020 / 21**	**2021 / 22**
1	29/04/2017	28/04/2018	27/04/2019	02/05/2020	01/05/20
2	27/05/2017	26/05/2018	25/06/2019	30/05/2020	29/05/2021
3	24/06/2017	23/06/2018	22/06/2019	27/06/2020	26/06/2021
4	22/07/2017	21/07/2018	20/07/2019	25/07/2020	24/07/2021
5	19/08/2017	18/08/2018	17/08/2019	22/08/2020	21/08/2021
6	16/09/2017	15/09/2018	14/09/2019	19/09/2020	18/09/2021
7	14/10/2017	13/10/2018	12/10/2019	17/10/2020	16/10/2021
8	11/11/2017	10/11/2018	09/11/2019	14/11/2020	13/11/2021
9	09/12/2017	08/12/2018	07/12/2019	12/12/2020	11/12/2021
10	06/01/2018	05/01/2019	04/01/2020	09/01/2021	08/01/2022
11	03/02/2018	02/02/2019	01/02/2020	06/02/2021	05/02/2022
12	03/03/2018	02/03/2019	29/02/2020	06/03/2021	05/03/2022
13	31/03/2018	31/03/2019	31/03/2020	31/03/2021	31/03/2022
	2022 / 23	**2023 / 24**	**2024 / 25**	**2025 / 26**	**2026 / 27**
1	30/04/2022	29/02/2023	27/04/2024	26/04/2025	02/05/2026
2	28/05/2022	27/05/2023	25/05/2024	24/05/2025	30/05/2026
3	25/06/2022	24/06/2023	22/06/2024	21/06/2025	27/06/2026
4	23/07/2022	22/07/2023	20/07/2024	19/07/2025	25/07/2026
5	20/08/2022	19/08/2023	17/08/2024	16/08/2025	22/08/2026
6	17/09/2022	16/09/2023	14/09/2024	13/09/2025	19/09/2026
7	15/10/2022	14/10/2023	12/10/2024	11/10/2025	17/10/2026
8	12/11/2022	11/11/2023	09/11/2024	08/11/2025	14/11/2026
9	10/12/2022	09/12/2023	07/12/2024	06/12/2025	12/12/2026
10	07/01/2023	06/01/2024	04/01/2025	03/01/2025	09/01/2027
11	04/02/2023	03/02/2024	01/02/2025	31/01/2026	06/02/2027
12	04/03/2022	02/03/2024	01/03/2025	28/02/2026	06/03/2027
13	31/03/2022	31/03/2024	31/03/2025	31/03/2026	31/03/2027

Notes

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- Period Two (P2) starts on the next day (generally the 4th Sunday) and finishes on the 4th Saturday from that date.
- Periods Three through to Twelve follow at four weekly intervals.
- Period Thirteen starts the Sunday after the end Saturday of P12 and finishes on 31st March.

[redacted]

[redacted]

Director/Authorised Signatory
tie LIMITED

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 21 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 21

RESPONSE

NOT USED (see Schedule 2 Parts 1, 2, 3)

This is Schedule 22 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 22

NOT USED

This is Schedule 23 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 23

BOND AND COLLATERAL WARRANTY

Part 1 - Performance Bond

(1) [◆] [SURETY]

- in favour of -

(2) [◆]

PERFORMANCE BOND

PERFORMANCE BOND

BETWEEN

(1) [◆], a company incorporated in [◆] under company number [◆] whose registered office is at [◆] ("**the Surety**"); and

(2) [◆], a company incorporated in [◆] under number [◆] and having its registered office at [◆] ("**Beneficiary**")

WHEREAS

A. **tie** entered into an agreement for the appointment of a contractor (hereinafter referred to as the "**Tram Maintenance Agreement**") dated [◆] with Construcciones y Auxiliar de Ferrocarriles S.A. (CAF) (the "**Tram Maintainer**") to maintain the tram vehicles on a light rapid transit system in Edinburgh known as the Edinburgh Tram Network.

B. Clause 46 (*Performance Bond and Collateral Warranties*) of the Tram Maintenance Agreement obliges the Tram Maintainer to deliver to the Beneficiary an unconditional irrevocable Performance Bond on the conditions and in the form set out in Schedule 23 Part 1 (*Performance Bond*) to the Tram Maintenance Agreement, issued by a surety acceptable to the Beneficiary and callable subject only to written notification by the Beneficiary.

C. In consideration of the Beneficiary accepting the Surety's obligations set out below in discharge of the Tram Maintainer's undertaking to provide a performance bond under Clause 46 (*Performance Bond and Collateral Warranties*) of the Tram Maintenance Agreement, the Surety hereby irrevocably and unconditionally agrees and undertakes to pay to the Beneficiary a sum not exceeding £1,000,000 (one million pounds) (the "**Bonded Amount**") and the Surety accordingly covenants with the Beneficiary and agrees as follows:

1. The Surety hereby covenants with the Beneficiary that following receipt by the Surety of a notice in writing from the Beneficiary in the form set out in Appendix 1 ("**Demand Notice**") that the Tram Maintainer has persistently and/or maliciously failed to perform or observe any of its duties and/or obligations arising under or in connection with the Tram Maintenance Agreement and/or has committed a persistent breach of any provision and/or has failed to fulfil any warranty or indemnity set out in the Tram Maintenance Agreement and/or has persistently failed to satisfy any of its liabilities under or in connection with the Tram Maintenance Agreement has occurred, the Surety shall forthwith (and in any event no later than five Business Days) pay to the Beneficiary in full and without any deductions whatsoever or any right of set-off, abatement or counterclaim, the sum due from the Tram Maintainer

under the Tram Maintenance Agreement as stated in the Demand Notice in immediately available funds by electronic transfer to the account nominated in the Demand Notice, not exceeding in aggregate the Bonded Amount.

2. The Beneficiary shall only be entitled to issue a Demand Notice to make a claim under this Performance Bond if it has:

2.1 provided the Surety with a written statement in the form set out in Appendix 2 (the "**Prior Written Notice**") which identifies the Tram Maintainer's default; and

2.2 given the Tram Maintainer fourteen Business Days' (following receipt of the Prior Written Notice) to rectify its performance; and

2.3 the Tram Maintainer has failed to rectify its performance.

3. Any Demand Notice must be made in writing signed by an authorised representative of the Beneficiary and a copy of the written statement identifying the default must accompany the Demand Notice.

4. Subject to Clause 2 above, upon receipt by the Surety of a Demand Notice from the Beneficiary, the Surety shall not be entitled or obliged to make any enquiry or proof or contestation or impose any further conditions on the Beneficiary (or the Tram Maintainer) and the Beneficiary shall not need to take any legal action against or to obtain the consent of the Tram Maintainer. The Beneficiary may make as many separate demands hereunder as the Beneficiary thinks fit. The Beneficiary shall not be obliged to exercise any other right or remedy the Beneficiary may have before making a demand under this Performance Bond.

5. A Demand Notice received from the Beneficiary in accordance with Clause 1, 2 and 3 above shall be conclusive evidence of the Surety's liability to pay to the Beneficiary and of the amount of the sum or sums which the Surety is liable to pay. The Surety's obligation to make payment under this Performance Bond shall be a primary, independent and absolute obligation and the Surety shall not be entitled to delay or withhold payment for any reason. The Surety's obligation hereunder shall not be affected by any act, omission, matter or thing which, but for this provision, might operate to release or otherwise exonerate the Surety from the obligations hereunder in whole or in part, including without limitation and whether or not known to the Surety or to the Beneficiary:

5.1 any time or waiver granted to the Beneficiary or to the Tram Maintainer;

5.2 the taking, variation, compromise, renewal or release of or the refusal or neglect to perfect or to enforce any rights, remedies or securities against the Beneficiary or the Tram Maintainer;

5.3 any legal limitation, disability or incapacity relating to the Beneficiary or the Tram Maintainer;

5.4 any variation of or amendment to the Tram Maintenance Agreement (or related documentation) or the works or services to be performed thereunder or any other document or security so that references to the Tram Maintenance Agreement in this Performance Bond shall include each such variation and amendment;

5.5 any unenforceability, invalidity or frustration of any rights or obligations of the Beneficiary or the Tram Maintainer under the Tram Maintenance Agreement or any other document or security; and

5.6 any other fact, circumstance, provision of statute or rule of law which might, were the Surety's liability to be secondary rather than primary, entitle the Surety to be released or discharged in whole or in part from the Surety's undertaking.

6. NOT USED.

7. NOT USED.

8. NOT USED.

9. The Surety's liability under this Performance Bond shall not be affected or reduced by the insolvency of the Tram Maintainer or its liquidation, receivership or other like temporary or permanent status.

10. The Beneficiary shall be at liberty to compromise, release, waive or neglect any security as it sees fit, without impairment of their rights under this Performance Bond.

11. Provided that any rectification work and/or maintenance work has been carried out to the Beneficiary's satisfaction in accordance with clauses 39 (*Effect on Termination or Expiry*) and 44 (*TUPE and Handover*), this Performance Bond shall cease to have effect on the earlier of: ninety days after the earlier of the Expiry Date or the date of termination of the Tram Maintenance Agreement; save in connection with any Demand Notice issued to the Surety in writing prior to the expiry of the said period of ninety days.

12. The Beneficiary shall be entitled to assign this Performance Bond without the consent of the Surety,

13. Any Prior Written Notice and any Demand Notice to be served by the Beneficiary pursuant to this Performance Bond shall be sent by the Beneficiary to the Surety, to the Surety's address at ***[Insert Address]*** (and if sent by special or recorded delivery shall be taken as having been received by the Surety on the date of receipt by the Surety as evidenced by the relevant certificate of delivery) or shall be delivered personally to the Surety at the address set out in this Clause (and shall be deemed to have been received at the time of delivery).

14. This Performance Bond shall be governed by and construed in accordance with the Laws of Scotland and the Parties hereby agree to submit to the exclusive jurisdiction of the Court of Session over any claim arising out of this Performance Bond.

15. A person who is not a party to this Performance Bond shall have no right to enforce any of the terms of this Performance Bond.

16. In this Performance Bond:

16.1 the words and expressions have the same meanings as in the Tram Maintenance Agreement and we shall be deemed to have full knowledge of the terms and conditions of the Tram Maintenance Agreement;

16.2 "person" includes any firm and any entity having legal capacity; and

16.3 the definitions given in the recitals apply to the rest of this Performance Bond.

IN WITNESS WHEREOF

EXECUTED for and on behalf of **[THE SURETY]**
at

on 200◆ by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of [THE BENEFICIARY **LIMITED]** at

on 200◆ by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

APPENDIX 1

DEMAND NOTICE

[date]

SURETY
[Address]
Attention: [Responsible Officer]

Dear Sirs

Performance Bond [◆] [Ref: ◆]
Edinburgh Tram Network - Construcciones y Auxiliar de Ferrocarriles S.A.

This is our formal demand for payment pursuant to Clause 1 of the above instrument issued by you in our favour for the amount of £[◆]. Please pay the sum of £[□] forthwith by electronic transfer to [◆ ***bank account details***].

We hereby certify that Construcciones y Auxiliar de Ferrocarriles S.A.(CAF) has failed to [◆ ***describe default***] [and has failed to rectify that default as at the date of this Demand]. In accordance with Clause 2 of the Performance Bond, we attach a certified copy of the relevant default notice.

Yours faithfully,

_____

_____
Director and authorised signatory
for and on behalf of [Beneficiary]

APPENDIX 2

PRIOR WRITTEN NOTICE

[date]

Construcciones y Auxiliar de Ferrocarriles S.A.
J.M. Iturrioz 26
20200
Beasain
(Guipuzcoa)
Attention: [Responsible Officer]

Dear Sirs

Performance Bond [◆] [Ref: ◆]

Edinburgh Tram Network - Construcciones y Auxiliar de Ferrocarriles S.A.

This is our formal notice that Construcciones y Auxiliar de Ferrocarriles S.A.(CAF) has failed to [◆ ***describe default***] [and has failed to rectify that default as at the date of this Notice]. In accordance with Clause 2 of the Performance Bond, Construcciones y Auxiliar de Ferrocarriles S.A. is hereby on written notice that if the default described above is not rectified within fourteen Business Days then [Beneficiary] may issue a Demand Notice.

Yours faithfully,

_____

_____
Director and authorised signatory
for and on behalf of [Beneficiary]

Part 2 - Collateral Warranty

(1) [*OTHER THIRD PARTY BENEFICIARY*]

- and -

(2) [CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)]

COLLATERAL WARRANTY IN FAVOUR OF *THIRD PARTY BENEFICIARY*] FROM [CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)]

relating to

THE TRAM MAINTENANCE AGREEMENT

AGREEMENT

BETWEEN

(1) **[[THIRD PARTY BENEFICIARY]** [(company number [◆]) whose registered office is at [□]] ***OR*** [carrying on business together in partnership under the name of [◆] at [◆]] ("**Beneficiary**") which expression shall include its successors and permitted assignees.; and

(2) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) – Spain ("**Tram Maintainer**")

BACKGROUND

A By an agreement in writing dated **[◆]** (the "**Tram Maintenance Agreement**"), **tie** appointed the Tram Maintainer to design, manufacture and supply Trams and supply documentation and associated equipment in connection with the Edinburgh Tram Network.

B It is a term of the Tram Maintenance Agreement that the Tram Maintainer shall enter into this Agreement with the Beneficiary.

IT IS AGREED as follows:

1. **DEFINITIONS AND INTERPRETATION**

In this Agreement:

1.1 the following words and expressions have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to clause 13);

"**Deliverables**" means all documents, information, reports, diagrams, records, method statements, risk assessments, manuals, schedules, databases, photographs, formulae, plans, specifications, drawings, details, calculations, models and simulations, the outputs and reports based on any models, programmes and all other material created and/or provided by the Tram Maintainer (or any other third party) in the performance of the Services and the Tram Maintainer's obligations under the Tram Maintenance Agreement;

"**Edinburgh Tram Network**" means the tramway which is to be designed, constructed and maintained in Edinburgh pursuant to the Infraco Contract and any network expansion, modification, line extension, spur, interconnection and any additional line which may be instructed), to be constructed in accordance with the Tram Legislation together with all associated works and facilities including all civil engineering and track works, Trams, infrastructure, plant, machinery and equipment installed or used for such tramway;

"**Good Industry Practice**" means using standards, practices, methods and procedures conforming to Law and exercising that degree of skill, care, diligence, prudence and foresight that would reasonably be expected from a large, reputable, professionally qualified, competent and skilled organisation experienced in carrying out activities of a similar nature, scope and complexity to those comprised in the Services, and seeking in good faith to comply with its contractual obligations and all duties owed by it;

"**Insurance Period**" means the period of insurance set out in part 1 of Schedule 4 (*Required Insurances*) of the Tram Maintenance Agreement;

"**Intellectual Property Rights**" means any rights in or to any patent, design right, utility model, trade mark, brand name, service mark, trade name, business name, logo, invention (whether registered or unregistered), domain name, semi-conductor right, topography right, software designs and/or other materials, source code, copyright, moral right, know-how, or rights in databases and any other rights in respect of any industrial or intellectual property, whether capable of being registered or not, including all rights to apply for any of the foregoing rights or for an extension, revival or renewal of any of the foregoing rights and any similar or analogous rights to any of the above, whether arising or granted under the law of Scotland or of any other jurisdiction;

"**Law**" means:

(a) any Act or instruments of the Scottish Parliament or the United Kingdom Parliament or subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, any exercise of the Royal Prerogative, and any enforceable community right within the meaning of section 2 of the European Communities Act 1972, and any bye-laws of CEC;

(b) any applicable guidance, policy, direction or determination issued by any regulatory body with which **tie**, CEC, the Client and/or the Tram Maintainer

is bound to comply (to include, for the avoidance of doubt, the **tie** and CEC policies) and to the extent not published or otherwise publicly available, is made available to the Tram Maintainer; and

(c) any applicable judgment of a relevant court of law which is a binding precedent,

in each case in force, or applicable, in Scotland;

"**Line One**" means the tramway works as authorised by the Edinburgh Tram (Line One) Act 2006;

"**Line Two**" means the tramway works as authorised by the Edinburgh Train (Line Two) Act 2006;

"**Party**" means each and any of the parties to this Agreement and Parties shall be construed accordingly;

"**Services**" means the works and services to be undertaken by the Tram Maintainer under the Tram Maintenance Agreement;

"**Tram Maintenance Agreement**" means the contract dated [□] made between the Client and the Tram Maintainer;

"**TEL**" means Transport Edinburgh Limited a company incorporated under the Companies Act with registered number SC269639 and having its registered office at 55 Annandale Street, Edinburgh, Midlothian, EH7 4AZ which shall include its successors in title and permitted assignees;

"**Trams**" means the tram vehicles to be provided for operation on the Edinburgh Tram Network; and

"**Tram Legislation**" means the Edinburgh Tram (Line One) Act, the Edinburgh Tram (Line Two) Act and such other legislation relative to the Edinburgh Tram Network as may be enacted from time to time;

1.2 unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender include all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a clause is a reference to a clause in this Agreement;

1.3 the list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation; and

1.4 where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

2. STANDARD OF CARE

2.1 The Tram Maintainer warrants and undertakes to the Beneficiary that it has carried out and shall carry out the Services and its other duties and obligations under the Tram Maintenance Agreement subject to and in accordance with the terms thereof.

2.2 In addition to and without derogation from clause 2.1, the Tram Maintainer warrants to the Beneficiary that:

2.2.1 in the performance of the Services and its other obligations under the Tram Maintenance Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent contractor experienced in carrying out works and services similar to the Services in connection with projects of a similar type, nature and complexity;

2.2.2 any design produced by the Tram Maintainer will satisfy in every respect any relevant performance specification or any requirement included or referred to in the Tram Maintenance Agreement and will be suitable in every respect for the purposes included in or reasonably to be inferred from the Tram Maintenance Agreement; and

2.2.3 any design produced by the Tram Maintainer will fully comply with Law.

2.3 The Tram Maintainer shall owe a duty of care to the Beneficiary in carrying out its duties and obligations under the Tram Maintenance Agreement.

3. MATERIALS

3.1 The Tram Maintainer warrants to the Beneficiary that it has not and shall not use any materials which at the time of use:

3.1.1 are known to be deleterious in the particular circumstances in which they are used (either to health and safety or to the durability of any works on which the Tram Maintainer is employed by the Client); or

3.1.2 contravene any relevant standard or code of practice issued from time to time by the BSI Group or under a European directive relating to standards; or

3.1.3 do not accord with the guidelines contained in the edition of the publication "Good Practice in Selection of Construction Materials" (Ove Arup & Partners) current at the date of specification of use; or

3.1.4 contravene Good Industry Practice.

4. COPYRIGHT LICENCE

4.1 The Tram Maintainer hereby grants to the Beneficiary an, royalty-free and exclusive licence to use such Intellectual Property Rights in the Deliverables as may be necessary, for operation and maintenance of the trams but, in any case, for manufacturing purposes, for the Beneficiary to use in relation to the [[Trams] ***OR*** [*other appropriate use*]]. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written agreement of the Tram Supplier.

4.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable prepared or provided by the Tram Maintainer in connection with the Edinburgh Tram Network is vested in any person other than the Tram Maintainer, the Tram Maintainer shall procure for the Beneficiary the benefit of such a licence as is referred to in clause 4.1 for the purposes referred to therein.

4.3 The Tram Maintainer shall, if so requested at any time, execute such documents and perform such acts as may be required fully and effectively to assure to the Beneficiary or any third party the rights referred to in this clause 4.

4.4 The Tram Maintainer shall provide to the Beneficiary a copy of any of the Deliverables as soon as reasonably practicable after receipt by the Tram Maintainer of a written request from the Beneficiary to do so, unless already delivered to the Beneficiary.

4.5 The Tram Maintainer undertakes to the Beneficiary that the use by the Beneficiary of any of the Deliverables for any purpose provided for in this clause 4 shall not infringe the rights of any third party in relation to the Deliverables.

5. REQUIRED INSURANCES

5.1 The Tram Maintainer undertakes that:

5.1.1 it has maintained and shall maintain during the performance of its obligations under the Tram Maintenance Agreement and the Insurance Period each of the insurances as follows:

5.1.1.1 not used;

5.1.1.2 Property Damage and Business Interruption Insurance on the terms described in Schedule 4 Part 1 to the Tram Maintenance Agreement;

5.1.1.3 Public and Products Liability Insurance on the terms described in Schedule 4 Part 1 of the Tram Maintenance Agreement;

5.1.1.4 Employer's Liability Insurance on the terms described in Schedule 4 Part 1 of the Tram Maintenance Agreement;

5.1.1.5 Comprehensive Motor Insurance on the terms described in Schedule 4 Part 1 of the Tram Maintenance Agreement; and

5.1.1.6 Directors' and Officers' Liability Insurance on the terms described in Schedule 4 Part 1 of the Tram Maintenance Agreement.

5.1.2 cover under the insurances is extended to include the Tram Maintainer's liabilities under this Agreement;

5.1.3 this Agreement has been disclosed to the Tram Maintainer's current insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement; and

5.1.4 the Tram Maintainer shall abide by the terms and conditions of insurance and shall not do or omit to do anything that might prejudice the cover or its right to make a claim.

5.2 As and when reasonably required by the Beneficiary, the Tram Maintainer shall produce for inspection documentary evidence that such insurance is being properly maintained.

5.3 If the insurer makes or attempts to make any material alteration or purports to withdraw the Tram Maintainer 's cover, or if the Tram Maintainer is unable to obtain insurance, the Tram Maintainer shall promptly give notice of this to the Beneficiary.

6. ASSIGNATION

6.1 The Tram Maintainer shall not assign, novate or otherwise transfer the whole or any part of the Agreement without the prior written agreement of the Beneficiary.

6.2 The Beneficiary shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers, TEL, the City of Edinburgh Council or any local authority; or

6.2.2 other body with no worse financial standing than that of the Beneficiary who takes over all or substantially all the functions of the Beneficiary; or

6.2.3 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form acceptable to the Sub-Contractor acting reasonably) by the Beneficiary or a person falling within clause 6.2.1; or

6.2.4 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) to any person not covered by clauses 6.2.1 or 6.2.2.]

6.2.5 without the consent of the Tram Maintainer to any person provided that no more than two such assignations will be permitted. Any assignations by the Beneficiary to a subsidiary or associated company of the Beneficiary or a member of the same group of companies will not count as an assignation;

6.2.2 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed).

6.3 The Tram Maintainer undertakes to the Beneficiary not to contend in any court proceedings under this Agreement that any person to whom the Beneficiary assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that the Beneficiary is named under this Agreement or any intermediate assignee of the Beneficiary escaped loss resulting from such breach by reason of the disposal of its interest in the same.

7. LIABILITY OF THE TRAM MAINTAINER

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by the law of contract, delict or otherwise.

7.2 The responsibility of the Tram Maintainer under this Agreement is not to be reduced or in any way released or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by the Beneficiary against a third party.

7.3 The rights and benefits conferred upon the Beneficiary by this Agreement are in addition to any other rights and remedies that the Beneficiary may have against the Tram Maintainer including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of the Tram Maintainer to the Beneficiary is to be determined in all respects in accordance with the terms of the Tram Maintenance Agreement and, in the event of any claim by the Beneficiary under this Agreement, the Tram Maintainer shall be entitled to rely upon any defence, right, limitation or exclusion under the Tram Maintenance Agreement as though the Beneficiary were named as the Client under it, except that:

7.4.1 the Beneficiary shall not be affected by any subsequent variation of the Tram Maintenance Agreement which would adversely affect the obligations owed by the Tram Maintainer or the waiver, compromise or withdrawal of any claim made by the Client; and

7.4.2 the Tram Maintainer shall not be entitled to exercise any right of set-off, retention or withholding against the Beneficiary to which the Tram Maintainer may be entitled against the Client.

7.4.3 In no event, the Tram Maintainer shall be responsible for indirect or consequential damages

8. NOTICES

8.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

8.2 Any notice given pursuant to this clause, if sent by special or recorded delivery, is deemed to have been received on proof of delivery.

9. RIGHTS OF THIRD PARTIES

9.1 A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

10. INVALID TERMS

10.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

10.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

10.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

11. VARIATIONS AND WAIVERS TO BE IN WRITING

11.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

12. WAIVER

12.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

12.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

13. JURISDICTION AND LAW

13.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding **[◆]** pages are executed as follows:

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of ***[third party beneficiary]*** at

on 200[◆] by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

This is Schedule 24 referred to in the foregoing Tram Maintenance Agreement between tie Limited and Construcciones Y Auxiliar de Ferrocarriles S.A. (CAF)

SCHEDULE 24

REVIEW PROCEDURE

1.0 INTRODUCTION

1.1 Except where otherwise agreed in writing, the provisions of this Schedule 24 (*Review Procedure*) shall apply whenever any course of action is required to be reviewed, approved, agreed, consented to or otherwise processed in accordance with the Agreement.

1.2 Each submission by the Tram Maintainer to the Client's Representative under the Review Procedure shall be accompanied by three hard copies and a soft copy (in agreed appropriate format) of the Train Maintainer's proposals) to be reviewed or a statement of the proposed course of action (the entire contents of a submission being referred to as a "Submitted Item"). In relation to each Submitted Item, the provisions of this Schedule 24 (*Review Procedure*) shall apply.

1.3 Within 20 Business Days of the date of receipt of a submission (or re-submission, as the case may be) of the Submitted Item to the Client's Representative (or such other period as the Parties may agree), the Client's Representative shall return one copy of the relevant Submitted Item to the Tram Maintainer endorsed (subject to and in accordance with paragraph 3 (*Grounds of Objection*)) "Level A - no objection", "Level B - proceed subject to comments" or "Level C - resubmit".

1.4 If the Client's Representative fails to return a copy of any Submitted Item within 20 Business Days (or within such other period as the Parties may agree in writing) of the date of its submission to the Client's Representative, then the Tram Maintainer shall re-submit the submitted items stating that it is a resubmitted item If the Client's Representative fails to return a copy of any Submitted Item within 5 Business Days of any re-submission, then the Client's Representative shall be deemed to have returned the Submitted Item to the Tram Maintainer endorsed "Level A - no objection".

1.5 If the Client's Representative makes an objection to any Submitted Item in accordance with paragraph 3 (*Grounds of Objection*), the Client's Representative shall state the ground upon which such objection is based and the evidence or other information necessary to substantiate that ground.

1.6 For the avoidance of doubt, the Client's Representative shall be entitled to make such comments on any Submitted Item on any grounds as he sees fit but, to the extent that the Client's Representative comments on a Submitted Item other than on the grounds specified in

paragraph 3 (*Grounds of Objection*), or fails to comply with the provisions of this paragraph 1, the Tram Maintainer may, at its discretion request written clarification of the basis for such comments and, if clarification is not received within 10 Business Days of such request by the Tram Maintainer refer the matter for determination in accordance with the Dispute Resolution Procedure.

1.7 Where any information that has been provided is updated, the new issues shall be provided promptly to the Client as soon as reasonably possible.

1.8 The Client's Representative shall be entitled to instruct the Tram Maintainer that a defined class of Deliverable or course of action may be submitted "for information" and not for review in accordance with this Schedule 24 (*Review Procedure*).

1.9 The Tram Maintainer shall ensure that each Submitted Item shall contain sufficient detail and shall be accompanied by sufficient information to enable the Client's Representative to assess the Submitted Item in accordance with Schedule 24 *(Review Procedure).*

1.10 Where a revised Submitted Item is submitted, the Tram Maintainer shall also ensure that such revision clearly identifies what revision to the proposal was made.

2. FURTHER INFORMATION

2.1 The Tram Maintainer shall submit any further or other information, drawings, data and documents (including details of calculations) that the Client's Representative reasonably requires to act in accordance with this Schedule 24 (*Review Procedure*). If the Tram Maintainer does not submit any such information, data and documents, the Client's Representative shall be entitled to object to the Submitted Item:

2.1.1 on the basis of the information, data and documents which have been provided; or

2.1.2 on the grounds that insufficient information, data and documents have been provided to enable the Client's Representative to act in accordance with this Schedule 24 (*Review Procedure*).

3. GROUNDS OF OBJECTION

3.1 The Client's Representative may object to any Submitted Item on the grounds set out in paragraph 2 (*Further Information*) above but otherwise may make objections in relation to a Submitted Item if, on the balance of probabilities, implementation of that Submitted Item:

3.1.1 would not be in accordance with this Agreement; and/or

3.1.2 would result in an increase to the Client's liabilities or potential or contingent liabilities under this Agreement; and/or

3.1.3 would be inefficient as to expenditure of resource/costs; and/or

3.1.4 would lead to a health and safety risk to any person or property; and/or

3.1.5 would lead to a breach of any Law or the terms of any Consent; and/or

3.1.6 would necessitate the obtaining of a new Law or the obtaining of a variation to an existing Law; and/or

3.1.7 would not be in accordance with any relevant environmental requirements; and/or

3.1.8 would not be in accordance with the Employer's Requirements; and/or

3.1.9 would adversely impact on the flexibility or ease of operation, run time, reliability, operating maintenance costs or revenues of the Edinburgh Tram Network; and/or

3.1.10 would materially adversely affect the Tram Maintainer's ability to perform its obligations under this Agreement; and/or

3.1.11 would materially adversely affect the Client's ability to perform its obligations or enforce its rights under this Agreement; and/or

3.1.12 would not be in accordance with Good Industry Practice; and/or

3.1.13 would prevent efficient procurement, construction, completion and/or commissioning of or under the Infraco Contract.

4. EFFECT OF REVIEW

4.1 Any Submitted Item which is returned or deemed pursuant to paragraph 1.4 to have been returned by the Client's Representative endorsed "Level A - no objection" shall be complied with and implemented by the Tram Maintainer.

4.2 If the Client's Representative returns the Submitted Item endorsed other than "Level A - no objection", the Tram Maintainer shall:

4.2.1 where the Client's Representative has endorsed the Submitted Item "Level B - proceed subject to comments", proceed with the performance of the Services in

accordance with the Tram Maintenance Programme but acknowledge and take into account the Client's Representative's comments; or

4.2.2 where the Client's Representative has endorsed the Submitted Item "Level C - resubmit", not act upon the Submitted Item, amend the Submitted Item to respond to the Client's Representative's objections and requirements, and re-submit the same to the Client's Representative in accordance with paragraph 4.3 unless the Tram Maintainer disputes that any such objection or proposed requirement is on grounds permitted by this Agreement, in which case the Tram Maintainer or the Client's Representative may refer the matter for determination in accordance with the Dispute Resolution Procedure and the Tram Maintainer shall not act on the Submitted Item until such matter is so determined or otherwise agreed provided that any referral to the Dispute Resolution Procedure is at the risk of the Tram Maintainer.

4.3 Where the Submitted Item has been endorsed *Level C*, the Tram Maintainer shall within 10 Business Days of receiving the returned Submitted Item, resubmit the Submitted Item as amended to the Client's Representative and the provisions of paragraphs 1.2 to 4 of this Schedule 24 *(Review Procedure)* shall apply (mutatis mutandis) to such re-submission.

4.4 The return or deemed return of any Submitted Item endorsed "Level A - no objection" or otherwise endorsed in accordance with paragraph 4.2.1 (*Level B* - proceed subject to comments) shall mean that the relevant Submitted Item may be used or implemented (subject to any comments made in accordance with paragraph 4.2.1) for the purposes for which it is intended. However, the return or deemed return of any Submitted Item howsoever endorsed shall not:

4.4.1 relieve the Tram Maintainer of its obligations under this Agreement; nor

4.4.2 constitute an acknowledgement, admission or acceptance by Client that the Tram Maintainer has complied with such obligations.

5. DISCLAIMER

5.1 No review, objection, comment or silence by the Client shall operate to:

5.1.1 exclude or limit the Tram Maintainer's obligations or liabilities under this Agreement (or the Client's rights under this Agreement); or

5.1.2 fix the Client with any express or implied obligations, duties or liabilities with respect to the Submitted Item.

5.2 For the avoidance of doubt, this information is supplementary to information required to be produced by the Tram Maintainer in order to satisfy the approval requirements of and Consents from other third parties and Relevant Authorities.

5.3 The Tram Maintainer shall promptly provide copies of all such submissions to the Client together with the responses to them as a matter of routine.

6. DOCUMENTATION FORMAT AND MANAGEMENT

6.1 The Tram Maintainer shall issue three hard copies and a soft copy (in appropriate agreed format) of all Submitted Items to the Client and compile and maintain a register of the date and contents of the submission for each Submitted Items.

6.2 The Tram Maintainer shall compile and maintain a register of the date of receipt and content of all Submitted Items that are returned or deemed to be returned by the Client's Representative.

6.3 All drawings shall be presented as A3 sized paper copies and drawings shall be prepared at their original size in a manner that allows them to be readily legible when reduced to A3 size. Original drawings shall not be greater than A0 in size.

7. VARIATIONS

7.1 No review, objection or comment or any failure to make objection or comment under this Schedule 24 (*Review Procedure*) by the Client shall constitute a Client Change

7.2 If, having received comments from the Client's Representative, the Tram Maintainer considers that compliance with those comments would amount to a Client Change, the Tram Maintainer shall within 10 Business Days of any comments being received, before complying with the comments, notify the Client of the same and, if it is agreed by the parties or determined pursuant to the Dispute Resolution Procedure that a Client Change would arise if the comments were complied with, the Client may proceed with the matter in accordance with Clause 16 (*Changes*).

7.3 Any failure by the Tram Maintainer to notify the Client within 10 Business Days of comments being received that it considers compliance with such comments of the Client's Representative would amount to a Client Change shall constitute an irrevocable acceptance by the Tram Maintainer that any compliance with the Client's comments shall be without cost to the Client and without any entitlement to any extension of time or other relief.

7.4 No alteration or modification to the scope, quality, quantity or nature of the Services arising from the development of the detailed design or from the co-ordination or integration of the design shall be construed or regarded as a Client Change.

[redacted]

Director/Authorised Signatory
tie LIMITED

[redacted]

Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

THIS IS SCHEDULE PART 20 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

SCHEDULE PART 20

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER UK LIMITED

- and -

(3) SIEMENS PLC

- and -

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A

NOVATION OF A TRAM MAINTENANCE AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **tie LIMITED** a company incorporated in Scotland under number SC230949 and having its registered office at City Chambers, High Street, Edinburgh EH1 1YJ ("**tie**") which expression shall include its successors, permitted assignees and transferees; and

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together the "**Infraco**" and each separately an "**Infraco Member**"); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) Spain ("**Tramco**") which expression shall include its successors, permitted assignees and transferees.

BACKGROUND

A By an agreement in writing dated ◆ 200◆ ("**Tram Maintenance Agreement**") **tie** appointed Tramco to provide services for the ongoing maintenance of Trams and for the supply of consumables and spares for the Trams in connection with the Edinburgh Tram Network. A copy of the Tram Maintenance Agreement is attached to this Agreement and initialled by the parties for the purpose of identification. This Agreement is supplemental to the Tram Maintenance Agreement.

B **tie** and Infraco have entered into a contract ("**Infraco Contract**") under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "**Client**" (as defined in the Tram Maintenance Agreement) under the Tram Maintenance Agreement and that Tramco shall owe all of the duties and obligations arising thereunder to Infraco by novating the Tram Maintenance Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

D **tie** wishes to be released from the Tram Maintenance Agreement and Tramco has agreed to release **tie**.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 In this Agreement the following additional words and expressions shall have the meanings set out opposite to them:

"**Effective Date**" means the last date of execution of this Agreement.

1.3 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.4 Unless otherwise defined hereunder, where the Tram Maintenance Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

2. RELEASE BY TRAMCO OF tie

2.1 Tramco releases and discharges **tie** from any and all duties, obligations and liabilities owed to Tramco under the Tram Maintenance Agreement and accepts the liability of Infraco under the Tram Maintenance Agreement in lieu of **tie**.

3. RELEASE BY tie OF TRAMCO

3.1 **tie** releases and discharges Tramco from the further performance of Tramco's duties and obligations under the Tram Maintenance Agreement.

4. ACCEPTANCE OF LIABILITY BY TRAMCO TO THE INFRACO

4.1 Tramco undertakes to Infraco to continue to perform all the duties and to discharge all the obligations of Tramco under the Tram Maintenance Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Maintenance Agreement in place of **tie**.

4.2 Tramco warrants to Infraco that, in respect of the duties and obligations which it has already performed under the Tram Maintenance Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the Tram Maintenance Agreement and otherwise in compliance with all of the terms and conditions thereof. Tramco warrants to Infraco that it shall be liable for any loss or damage suffered or incurred by Infraco arising out of any negligent act, default or breach by Tramco in the performance of its obligations under the Tram Maintenance Agreement prior to the Effective Date. Tramco shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 Without prejudice to Clauses 4.2 or 4.4, Tramco shall not contend under this Agreement that its liability to Infraco is affected or diminished by reason of **tie** having suffered no loss and/or any loss claimed to have been suffered by Infraco being different in character from that suffered by **tie**.

4.4 Tramco confirms it was aware at the time of entering into the Tram Maintenance Agreement that Infraco could suffer losses, damages, costs, expenses, claims, demands and proceedings as a result of Tramco's breach of the Tram Maintenance Agreement.

4.5 Without prejudice to the generality of this Novation, Tramco warrants and undertakes to Infraco that its duties and obligations under, the Tram Maintenance Agreement, whether required to be performed prior to the date hereof, have been and will be performed in accordance with the Tram Maintenance Agreement.

4.6 Tramco acknowledges that any breach of the warranties in this Agreement may cause Infraco to be in breach of the Infraco Contract and/or cause Infraco to suffer loss and/or damage.

4.7 The liability of Tramco to Infraco pursuant to the Tram Maintenance Agreement as novated by this Agreement (both in respect of the period prior to the Effective Date and after the Effective Date) shall not be affected by Infraco's assumption of liability to **tie** for Tram Maintenance Agreement in respect of the Edinburgh Tram Network pursuant to the Infraco Contract.

4.8 Tramco acknowledges that Infraco has and shall continue to rely upon all Services Carried out by Tramco under the Tram Maintenance agreement as novated by this Agreement.

4.9 For the avoidance of doubt, in accordance with Clause 45.5 of the Tram Maintenance Agreement save where expressly provided for in the Tram Maintenance Agreement, nothing in this Agreement shall expose either Party to the application of Indirect Loss.

5. VESTING OF REMEDIES AGAINST TRAMCO

All rights of action and remedies against Tramco under and pursuant to the Tram Maintenance Agreement vested in **tie** (including their accrued rights of action and remedies) shall automatically and without the need for any further action on the part of Infraco, vest in Infraco with effect from the Effective Date.

6. ACCEPTANCE OF LIABILITY BY INFRACO

With effect from the Effective Date Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the Tram Maintenance Agreement as novated by this Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Maintenance Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the Tram Maintenance Agreement prior to the Effective Date were the acts and omissions of Infraco.

7. VESTING OF REMEDIES AGAINST tie

As from the Effective Date, all rights of action and remedies under or pursuant to the Tram Maintenance Agreement vested in Tramco shall lie against Infraco and not **tie** whether or not such rights of action or remedies may have arisen prior to, on or after the Effective Date.

8. ACKNOWLEDGEMENT OF PAYMENT

Tramco acknowledges that all payments properly due to Tramco under the Tram Maintenance Agreement up to the Effective Date have been paid by **tie** (subject to confirmation of pending payments and the assurance that the Tramco will not suffer payment delays due to the novation process).

9. AMENDMENT OF TRAM MAINTENANCE AGREEMENT

tie, Tramco and Infraco agree that the terms of the Tram Maintenance Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF TRAM MAINTENANCE AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the Tram Maintenance Agreement and, except as specifically

amended by Appendix 1 of this Agreement, all the terms and conditions of the Tram Maintenance Agreement remain in full force and effect. **tie** hereby confirms that it has not exercised any rights and discretions in regard to the Tram Maintenance Agreement prior to the point of novation.

11. EQUIVALENT PROJECT RELIEF

tie acknowledges that in relation to any Dispute under the Infraco Contract where the Client's sole involvement in any Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then Infraco shall be entitled to recover its costs incurred in relation to such dispute pursuant to Clause 9A (Tramco Equivalent Project Relief) of the Tram Maintenance Agreement from **tie**. **tie** agrees to pay to the Infraco such reasonable costs unless the dispute proceeds to adjudication where such costs shall be paid as allocated between **tie** and the Tram Maintainer by the adjudicator following the Adjudication procedure.

The Infraco agrees that it shall minimise as far as reasonably practicable its administrative costs in relation to Equivalent Project Relief.

The Tram Maintainer agrees not to vexatiously claim under the Tram Maintenance Agreement or vexatiously use the Disputes Resolution Procedure.

12. The parties acknowledge that it is the intention for CAF S.A., subsequent to the Novation, to assign the Tram Maintenance Agreement to its wholly owned subsidiary CAF RAIL UK Limited and, upon provision of a duly completed Parent Company Guarantee, Client agreement shall not be unreasonably withheld.

13. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This clause does not affect any right or remedy of any person which exists or is otherwise available.

14. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages together with Appendix 1 which is annexed and subscribed as relative hereto and the copy of the Tram Maintenance Agreement which is attached and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Director _____

Full Name _____

Director _____

Full Name _____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Authorised Signatory _____

Full Name _____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

APPENDIX 1

Schedule of Amendments to the Tram Maintenance Agreement

Clause 9 - Terms Governing the Services

Insert the following new Clause 9.19:

9.19 In addition to the other requirements of this Clause 9, the Tram Maintainer shall support the Client as required in relation to the maintenance and provision of any records, drawings, registers, manuals and/or reports as may be required under the Infraco Contract in respect of the Services. Nevertheless, the level of information to be supplied will be agreed during the contract negotiation process in order to protect the Tram Maintainer's know-how from an Infraco that could be a competitor.

Insert at end of Clause 9.29 the following:

9.29 The Tram Maintainer acknowledges that it has a copy of the Infraco Contract and is deemed to be aware of the obligations, risks and liabilities assumed by the Infraco thereunder. Without prejudice to the foregoing, the Tram Maintainer shall be deemed to be fully aware of the adverse financial and other consequences for the Client which could arise under the Infraco Contract in consequence, in whole or in part, of a breach on the part of the Tram Maintainer of its obligations under this Agreement.

Clause 37 - Termination for Corrupt Gifts and Fraud

Delete Clause 37 (*Termination for Corrupt Gifts and Fraud*), in its entirety substitute therefore:

37.1 The Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) shall not commit any Prohibited Act.

37.2 If the Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) commits any Prohibited Act, then the Client shall be entitled to act in accordance with Clauses 37.3 to 37.8.

37.3 If a Prohibited Act is committed by the Tram Maintainer or by an employee of the Tram Maintainer not acting independently of the Tram Maintainer, then the Client may terminate this Agreement by giving notice to the Tram Maintainer.

37.4 If a Prohibited Act is committed by an employee of the Tram Maintainer acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement will terminate, unless within 30 days of receipt of such notice

the Tram Maintainer terminates that employee's employment and (if necessary) procures the performance of the relevant obligations by another person.

37.5 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party, and their employees) and not acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement shall terminate.

37.6 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party, and their employees) and acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement will terminate (but only if the said notice given under this Clause 36.6 is countersigned by **tie**) unless, within 30 days of receipt of such notice, the Tram Maintainer procures the termination of such party's employment and procures the performance of the relevant part of the Services by another person.

37.7 Any notice of termination under this Clause 37 (*Termination for Corrupt Gifts and Fraud*) shall specify:

37.7.1 the nature of the Prohibited Act;

37.7.2 the identity of the person whom the Client believes has committed the Prohibited Act; and

37.7.3 the date on which this Agreement will terminate, in accordance with the applicable provision of this Clause 37 (*Termination for Corrupt Gifts and Fraud*).

37.8 If this Agreement is terminated pursuant to this Clause 37 (*Termination for Corrupt Gifts and Fraud*) the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

Clause 56 - Assignation, Changes in Legal Status and Changes in Control and Subcontracting

Delete Clause 56.2 and substitute therefore:

56.2 The Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

56.2.1 to the Scottish Ministers, TEL, CEC Transport Scotland or any local authority; or

56.2.2 to any body with no worse financial standing than that of **tie** who takes over all or substantially all of the functions of **tie**; or

56.2.3 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to the Tram Maintainer acting reasonably) by **tie** or a person falling within Clause [56.2.1]; or

56.2.4 to the Operator; or

56.2.5 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) to any person not covered by Clauses 56.2.1, 56.2.2, 56.2.3 or 56.2.4 whose ongoing financial standing is no worse than **tie**.

……
Director/Authorised Signatory
tie LIMITED

……..
Director/Authorised Signatory
BILFINGER BERGER UK LIMITED

……..
Director/Authorised Signatory
SIEMENS PLC

……..
Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

NOVATION OF A TRAM MAINTENANCE AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **tie LIMITED** a company incorporated in Scotland under number SC230949 and having its registered office at City Chambers, High Street, Edinburgh EH1 1YJ ("**tie**") which expression shall include its successors, permitted assignees and transferees; and

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together the "**Infraco**" and each separately an "**Infraco Member**"); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa) Spain ("**Tramco**") which expression shall include its successors, permitted assignees and transferees.

BACKGROUND

A By an agreement in writing dated 13 May 2008 ("**Tram Maintenance Agreement**") **tie** appointed Tramco to provide services for the ongoing maintenance of Trams and for the supply of consumables and spares for the Trams in connection with the Edinburgh Tram Network. A copy of the Tram Maintenance Agreement is attached to this Agreement and initialled by the parties for the purpose of identification. This Agreement is supplemental to the Tram Maintenance Agreement.

B **tie** and Infraco have entered into a contract ("**Infraco Contract**") under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram

maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the "**Client**" (as defined in the Tram Maintenance Agreement) under the Tram Maintenance Agreement and that Tramco shall owe all of the duties and obligations arising thereunder to Infraco by novating the Tram Maintenance Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

D **tie** wishes to be released from the Tram Maintenance Agreement and Tramco has agreed to release **tie**.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 In this Agreement the following additional words and expressions shall have the meanings set out opposite to them:

"**Effective Date**" means the last date of execution of this Agreement.

1.3 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.4 Unless otherwise defined hereunder, where the Tram Maintenance Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

2. RELEASE BY TRAMCO OF tie

2.1 Tramco releases and discharges **tie** from any and all duties, obligations and liabilities owed to Tramco under the Tram Maintenance Agreement and accepts the liability of Infraco under the Tram Maintenance Agreement in lieu of **tie**.

3. RELEASE BY tie OF TRAMCO

3.1 **tie** releases and discharges Tramco from the further performance of Tramco's duties and obligations under the Tram Maintenance Agreement.

4. ACCEPTANCE OF LIABILITY BY TRAMCO TO THE INFRACO

4.1 Tramco undertakes to Infraco to continue to perform all the duties and to discharge all the obligations of Tramco under the Tram Maintenance Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Maintenance Agreement in place of **tie**.

4.2 Tramco warrants to Infraco that, in respect of the duties and obligations which it has already performed under the Tram Maintenance Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the Tram Maintenance Agreement and otherwise in compliance with all of the terms and conditions thereof. Tramco warrants to Infraco that it shall be liable for any loss or damage suffered or incurred by Infraco arising out of any negligent act, default or breach by Tramco in the performance of its obligations under the Tram Maintenance Agreement prior to the Effective Date. Tramco shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 Without prejudice to Clauses 4.2 or 4.4, Tramco shall not contend under this Agreement that its liability to Infraco is affected or diminished by reason of **tie** having suffered no loss and/or any loss claimed to have been suffered by Infraco being different in character from that suffered by **tie**.

4.4 Tramco confirms it was aware at the time of entering into the Tram Maintenance Agreement that Infraco could suffer losses, damages, costs, expenses, claims, demands and proceedings as a result of Tramco's breach of the Tram Maintenance Agreement.

4.5 Without prejudice to the generality of this Novation, Tramco warrants and undertakes to Infraco that its duties and obligations under, the Tram Maintenance Agreement, whether required to be performed prior to the date hereof, have been and will be performed in accordance with the Tram Maintenance Agreement.

4.6 Tramco acknowledges that any breach of the warranties in this Agreement may cause Infraco to be in breach of the Infraco Contract and/or cause Infraco to suffer loss and/or damage.

4.7 The liability of Tramco to Infraco pursuant to the Tram Maintenance Agreement as novated by this Agreement (both in respect of the period prior to the Effective Date and after the Effective Date) shall not be affected by Infraco's assumption of liability to **tie** for Tram Maintenance Agreement in respect of the Edinburgh Tram Network pursuant to the Infraco Contract.

4.8 Tramco acknowledges that Infraco has and shall continue to rely upon all Services Carried out by Tramco under the Tram Maintenance agreement as novated by this Agreement.

4.9 For the avoidance of doubt, in accordance with Clause 45.5 of the Tram Maintenance Agreement save where expressly provided for in the Tram Maintenance Agreement, nothing in this Agreement shall expose either Party to the application of Indirect Loss.

5. VESTING OF REMEDIES AGAINST TRAMCO

All rights of action and remedies against Tramco under and pursuant to the Tram Maintenance Agreement vested in **tie** (including their accrued rights of action and remedies) shall automatically and without the need for any further action on the part of Infraco, vest in Infraco with effect from the Effective Date.

6. ACCEPTANCE OF LIABILITY BY INFRACO

With effect from the Effective Date Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the Tram Maintenance Agreement as novated by this Agreement and to be bound by its terms and conditions in every way as if Infraco was and always had been a party to the Tram Maintenance Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the Tram Maintenance Agreement prior to the Effective Date were the acts and omissions of Infraco.

7. VESTING OF REMEDIES AGAINST tie

As from the Effective Date, all rights of action and remedies under or pursuant to the Tram Maintenance Agreement vested in Tramco shall lie against Infraco and not **tie** whether or not such rights of action or remedies may have arisen prior to, on or after the Effective Date.

8. ACKNOWLEDGEMENT OF PAYMENT

Tramco acknowledges that all payments properly due to Tramco under the Tram Maintenance Agreement up to the Effective Date have been paid by **tie** (subject to confirmation of pending payments and the assurance that the Tramco will not suffer payment delays due to the novation process).

9. AMENDMENT OF TRAM MAINTENANCE AGREEMENT

tie, Tramco and Infraco agree that the terms of the Tram Maintenance Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF TRAM MAINTENANCE AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the Tram Maintenance Agreement and, except as specifically amended by Appendix 1 of this Agreement, all the terms and conditions of the Tram Maintenance Agreement remain in full force and effect. **tie** hereby confirms that it has not exercised any rights and discretions in regard to the Tram Maintenance Agreement prior to the point of novation.

11. EQUIVALENT PROJECT RELIEF

tie acknowledges that in relation to any Dispute under the Infraco Contract where the Client's sole involvement in any Client Claim is in performing administrative functions in relation to the Client Claim, and not as an interested or affected party, then Infraco shall be entitled to recover its costs incurred in relation to such dispute pursuant to Clause 9A (Tramco Equivalent Project Relief) of the Tram Maintenance Agreement from **tie**. **tie** agrees to pay to the Infraco such reasonable costs unless the dispute proceeds to adjudication where such costs shall be paid as allocated between **tie** and the Tram Maintainer by the adjudicator following the Adjudication procedure.

The Infraco agrees that it shall minimise as far as reasonably practicable its administrative costs in relation to Equivalent Project Relief.

The Tram Maintainer agrees not to vexatiously claim under the Tram Maintenance Agreement or vexatiously use the Disputes Resolution Procedure.

12. The parties acknowledge that it is the intention for CAF S.A., subsequent to the Novation, to assign the Tram Maintenance Agreement to its wholly owned subsidiary CAF RAIL UK Limited and, upon provision of a duly completed Parent Company Guarantee, Client agreement shall not be unreasonably withheld.

13. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This clause does not affect any right or remedy of any person which exists or is otherwise available.

14. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding 5 pages together with Appendix 1 which is annexed and subscribed as relative hereto and the copy of the Tram Maintenance Agreement which is attached and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at EDINBURGH

on 14th MAY 2008 by:

Authorised Signatory [redacted]

Full Name WILLIAM GALLAGHER

Witness Signature [redacted]

Full Name ANDREW SUTHERLAND FITCHIE

Address DLA PIPER, RUTLAND SQUARE
EDINBURGH, EH1 2AA

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at EDINBURGH

on 14th MAY 2008 by:

Director [redacted]

Full Name V RICHMOND John Watson

Director [redacted]

Full Name GARY PETER DALTON

EXECUTED for and on behalf of **SIEMENS PLC**
at EDINBURGH

on 14 MAY 2008 by:

[redacted]

Authorised Signatory

C. ROTH

Full Name

[redacted]

Authorised Signatory

M. FLYNN

Full Name

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at EDINBURGH

on 13 MAY 2008 by:

[redacted]

Authorised Signatory

JESUS ARANAOLA

Full Name

[redacted]

Witness Signature

ANTONIO CAMPOS

Full Name

[redacted]

Address

REASAIN

APPENDIX 1

Schedule of Amendments to the Tram Maintenance Agreement

Clause 9 - Terms Governing the Services

Insert the following new Clause 9.19:

9.19 In addition to the other requirements of this Clause 9, the Tram Maintainer shall support the Client as required in relation to the maintenance and provision of any records, drawings, registers, manuals and/or reports as may be required under the Infraco Contract in respect of the Services. Nevertheless, the level of information to be supplied will be agreed during the contract negotiation process in order to protect the Tram Maintainer's know-how from an Infraco that could be a competitor.

Insert at end of Clause 9.29 the following:

9.29 The Tram Maintainer acknowledges that it has a copy of the Infraco Contract and is deemed to be aware of the obligations, risks and liabilities assumed by the Infraco thereunder. Without prejudice to the foregoing, the Tram Maintainer shall be deemed to be fully aware of the adverse financial and other consequences for the Client which could arise under the Infraco Contract in consequence, in whole or in part, of a breach on the part of the Tram Maintainer of its obligations under this Agreement.

Clause 37 - Termination for Corrupt Gifts and Fraud

Delete Clause 37 (*Termination for Corrupt Gifts and Fraud*), in its entirety substitute therefore:

37.1 The Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) shall not commit any Prohibited Act.

37.2 If the Tram Maintainer or anyone employed by it or acting on its behalf (including any Tram Maintainer Party) commits any Prohibited Act, then the Client shall be entitled to act in accordance with Clauses 37.3 to 37.8.

37.3 If a Prohibited Act is committed by the Tram Maintainer or by an employee of the Tram Maintainer not acting independently of the Tram Maintainer, then the Client may terminate this Agreement by giving notice to the Tram Maintainer.

37.4 If a Prohibited Act is committed by an employee of the Tram Maintainer acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of

termination and this Agreement will terminate, unless within 30 days of receipt of such notice the Tram Maintainer terminates that employee's employment and (if necessary) procures the performance of the relevant obligations by another person.

37.5 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party, and their employees) and not acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement shall terminate.

37.6 If a Prohibited Act is committed by anyone acting on behalf of the Tram Maintainer (excluding employees of the Tram Maintainer but including any Tram Maintainer Party, and their employees) and acting independently of the Tram Maintainer, then the Client may give notice to the Tram Maintainer of termination and this Agreement will terminate (but only if the said notice given under this Clause 36.6 is countersigned by **tie**) unless, within 30 days of receipt of such notice, the Tram Maintainer procures the termination of such party's employment and procures the performance of the relevant part of the Services by another person.

37.7 Any notice of termination under this Clause 37 (*Termination for Corrupt Gifts and Fraud*) shall specify:

37.7.1 the nature of the Prohibited Act;

37.7.2 the identity of the person whom the Client believes has committed the Prohibited Act; and

37.7.3 the date on which this Agreement will terminate, in accordance with the applicable provision of this Clause 37 (*Termination for Corrupt Gifts and Fraud*).

37.8 If this Agreement is terminated pursuant to this Clause 37 (*Termination for Corrupt Gifts and Fraud*) the provisions of Clause 38 (*Payment on Termination*) and Clause 39 (*Effect of Termination or Expiry*) shall apply.

Clause 56 - Assignation, Changes in Legal Status and Changes in Control and Subcontracting

Delete Clause 56.2 and substitute therefore:

56.2 The Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

56.2.1 to the Scottish Ministers, TEL, CEC Transport Scotland or any local authority; or

56.2.2 to any body with no worse financial standing than that of **tie** who takes over all or substantially all of the functions of **tie**; or

56.2.3 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to the Tram Maintainer acting reasonably) by **tie** or a person falling within Clause 56.2.1; or

56.2.4 to the Operator; or

56.2.5 with the prior written consent of the Tram Maintainer (such consent not to be unreasonably withheld or delayed) to any person not covered by Clauses 56.2.1, 56.2.2, 56.2.3 or 56.2.4 whose ongoing financial standing is no worse than **tie**.

[redacted]
Director/Authorised Signatory
tie LIMITED

[redacted]
Director
BILFINGER BERGER UK LIMITED

[redacted] .....
Authorised Signatory
SIEMENS PLC

[redacted] ...
Director/Authorised Signatory
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

THIS IS SCHEDULE PART 21 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

SCHEDULE PART 21

(1) TIE LIMITED

- and -

(2) BILFINGER BERGER (UK) LIMITED

- and -

(3) SIEMENS plc

-and-

(4) CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

COLLATERAL WARRANTY IN RESPECT OF A TRAM MAINTENANCE AGREEMENT IN FAVOUR OF tie FROM TRAMCO

relating to

THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **tie LIMITED** (company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London EC1A 4EJ which expression shall include its successors, permitted assignees and transferees; and

(3) **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey GU16 8QD which expression shall include its successors, permitted assignees and transferees,

(Bilfinger Berger UK Limited and Siemens plc together referred to as the "**Infraco**", which term shall include its successors and permitted assignees); and

(4) **CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF),** a company registered in Spain in the Corporate Register of Guipuzcoa: volume 983, sheet 144, page number SS-329, entry 239 and having its registered office at J.M. Iturrioz 26, 20200 Beasain (Guipuzcoa), Spain ("**Tramco**");

BACKGROUND

A By an agreement in writing dated ◆ 200◆ (the "**Tram Maintenance Agreement**"), **tie** appointed Tramco to provide services for the ongoing maintenance of Trams and further supply of consumables and spares for the Trams in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to carry out and/or manage the design, construction, installation, commissioning, tram procurement, system integration, infrastructure maintenance, tram maintenance and supply of related equipment and materials, trams and related infrastructure in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of Tramco, that Infraco shall take over the rights and liabilities of the Client under the Tram Maintenance Agreement by novating the Tram

Maintenance Agreement from **tie** to Infraco upon and subject to the terms of the Novation Agreement (as hereinafter defined).

D It is a term of the Tram Maintenance Agreement that Tramco shall enter into this Agreement with **tie,** if requested by **tie**, following the execution of the Novation Agreement.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to Clause 13);

"**Deliverables**" means all Technical Records, Tram Maintainer's Materials Project IPR, Software and including but not limited to , information, reports, records, diagrams, manuals, schedules, databases, photographs, formulae, consultation materials, drawings (including as-built drawings), plans, designs, specifications, details, calculations, models and simulations and outputs and reports based on any models or simulations, programmes and all other material created and/or produced by Tramco (or any Tram Maintainer Party or any other third party) and all other all written or documentary outputs to be prepared and delivered by Tramco in the performance of the Services and Tramco's other obligations under the Tram Maintenance Agreement;

"**Infraco Contract**" means the contract to be entered into or entered into by **tie** with Infraco as described in Recital B above;

"**Novation Agreement**" means the novation agreement entered into among **tie**, Tramco and Infraco relating to the novation of the Tram Maintenance Agreement;

"**Party**" means each and any of the parties to this Agreement and **Parties** shall be construed accordingly;

"**Tram Maintenance Agreement**" means the agreement dated [◆] and originally entered into by **tie** and Tramco, which has been novated to Infraco and Tramco pursuant to the Novation Agreement.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender include all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the Tram Maintenance Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

1.6 In the case of any unintended conflict between the definition or interpretation of words or expressions in this Agreement and in the Tram Maintenance Agreement, the Tram Maintenance Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

Tramco warrants and undertakes to **tie** that:

2.1 it has carried out and shall carry out and discharge the Services and all its other duties and obligations under the Tram Maintenance Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1:

2.2.1 Tramco warrants to **tie** that, in the performance of the Services and all its other duties and obligations under the Tram Maintenance Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent Tram maintainer experienced in performing services similar to the Services to be performed under the Tram Maintenance Agreement;

2.2.2 it owes a duty of care to **tie** in carrying out its duties and obligations under the Tram Maintenance Agreement; and

2.3 all obligations and duties on the part of Tramco set out in the Tram Maintenance Agreement which are expressed to be made in favour or given to **tie** shall be directly enforceable by **tie** pursuant to this Agreement following novation of the Tram Maintenance Agreement pursuant to the Novation Agreement.

3. COPYRIGHT LICENCE

3.1 Tramco hereby grants to **tie** a, royalty-free and exclusive licence to use such Project IPR and Tram Maintainer IPR as may be necessary for operation and maintanance of the trams but in any case for manufacturing purposes,for **tie** to use in relation to any projects associated with the Services and/or the operation and/or maintenance of the Edinburgh Tram Network, including the Trams. This licence shall carry the right to grant sub-licences, and be transferable to third parties, prior written approval from the Tram Maintainer. Tramco shall be liable for the Project IPR and the Tram Maintainer IPR only to the extent that it is used for the purposes for which it was intended.

3.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable in connection with the provision of the Services under the Tram Maintenance Agreement is vested in any person other than Tramco including any Tram Maintainer Party, Tramco shall procure for **tie** the benefit of such a licence as is referred to in clause 3.1 for the purposes referred to therein.

3.3 Tramco shall, if so requested at any time, execute such documents and perform such acts (including the grant to **tie** of a licence to use any Software related with operation

and maintenance) as may be required fully and effectively to assure to **tie** or any third party the rights referred to in this clause 3.

3.4 Tramco shall provide to **tie** a copy of any of the Deliverables which are to be provided to Infraco under the Tram Maintenance Agreement as soon as reasonably practicable after receipt by Tramco of a written request from **tie** to do so, unless already delivered to **tie**.

3.5 Tramco undertakes to **tie** that the use by **tie** of any of the Deliverables for any purpose provided for in this clause 3 shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES AND OCIP INSURANCES

4.1 Tramco undertakes to **tie** that:

4.1.1 it has maintained and shall maintain during the performance of its obligations under the Tram Maintenance Agreement each of the Required Insurances in accordance with the requirements of Clause 17 (*Required Insurances*) and Schedule 4 (*Required Insurances*) of the Tram Maintenance Agreement;

4.1.2 cover under the professional indemnity insurance is extended to include Tramco's liabilities under this Agreement;

4.1.3 this Agreement has been disclosed to Tramco's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement;

4.1.4 Tramco shall abide by the terms and conditions of insurance and not do or omit to do anything that might prejudice the cover or its right to make a claim; and

4.1.5 it has had disclosed to it details of the OCIP Insurances and that it shall abide by the terms and conditions of the insurances contained therein and shall not do or omit to do anything that might prejudice the cover or **tie**'s right to make a claim under the OCIP Insurances.

4.2 As and when required by **tie**, Tramco shall produce for inspection documentary evidence that the Required Insurances are being properly maintained.

4.3 Tramco shall not make any material alteration to the terms of the Required Insurances without **tie**'s prior approval which approval shall not be unreasonably withheld. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if Tramco is unable to obtain professional indemnity insurance, Tramco shall promptly give written notice of this to **tie**.

5. tie STEP-IN

5.1 Tramco shall not exercise nor seek to exercise any right of determination of the Tram Maintenance Agreement or to rescind the Tram Maintenance Agreement by reason of a Client Default or to otherwise discontinue the performance of any of Tramco's obligations in relation to the Tram Maintenance Agreement by reason of breach on the part of Infraco (or otherwise) without giving to **tie** not less than 21 days' written notice of its intention to do so and specifying in such notice the grounds for the proposed determination. Tramco shall for the period of any such notice diligently and properly continue to perform Tramco's obligations under the Tram Maintenance Agreement.

5.2 Any period stipulated in the Tram Maintenance Agreement for the exercise by Tramco of a right of determination shall nevertheless be extended as may be necessary to take account of the period of notice required under clause 5.1.

5.3 Compliance by Tramco with the provisions of clause 5.1 shall not be treated as a waiver of any breach on the part of Infraco giving rise to the right of determination nor otherwise prevent Tramco from exercising its rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 5.4.

5.4 The right of Tramco to determine the Tram Maintenance Agreement or to rescind the Tram Maintenance Agreement or to discontinue the performance of any of its obligations in relation to the Tram Maintenance Agreement shall cease if within the period of 21 days referred to in clause 5.1, **tie** gives written notice to Tramco:

5.4.1 requiring Tramco to continue with the performance of all its obligations under the Tram Maintenance Agreement;

5.4.2 acknowledging that **tie** is assuming all the obligations of Infraco (as "Client") under the Tram Maintenance Agreement; and

5.4.3 undertaking to Tramco to discharge all amounts payable to Tramco under the terms of the Tram Maintenance Agreement from the date on which such notice under this clause 5.4 is given to Tramco.

5.5 Upon compliance by **tie** with the requirements of clause 5.4, the Tram Maintenance Agreement shall continue in full force and effect as if the right of determination on the part of Tramco had not arisen and in all respects as if the Tram Maintenance Agreement had been made between **tie** and Tramco to the exclusion of Infraco.

5.6 Notwithstanding that as between Infraco and Tramco, Tramco's right of determination of its engagement under the Tram Maintenance Agreement may not have arisen the provisions of clause 5.5 shall nevertheless apply if **tie** gives written notice to Tramco and Infraco to that effect and **tie** complies with the requirements on its part under clause 5.4.

5.7 Tramco does not need to be concerned or required to enquire whether, and shall be entitled to assume that, as between Infraco and **tie**, the circumstances have occurred permitting **tie** to give notice under clause 5.6.

5.8 Tramco acting in accordance with the provisions of this clause 5 shall not incur any liability to Infraco arising out of the exercise by **tie** of its rights under this clause 5.

5.9 Save as otherwise set out in this Agreement, unless and until **tie** has given notice under this clause 5:

5.9.1 **tie** has no liability whatsoever to Tramco in respect of amounts payable to Tramco under the Tram Maintenance Agreement; and

5.9.2 **tie** has no authority to issue any direction or instruction to Tramco in relation to the performance of Tramco's obligations under the Tram Maintenance Agreement.

5.10 Without prejudice to the provisions of clauses 5.1 to 5.9 inclusive, if prior to the service of any notice under clause 5.4 Tramco is determined under the Tram Maintenance Agreement for any reason whatsoever Tramco shall, if required in writing so to do by **tie**, no later than 12 weeks after the date of such determination forthwith enter into a new agreement with **tie** on the same terms as the Tram Maintenance Agreement, but with such revisions as **tie** and Tramco may reasonably require to reflect altered circumstances and the fact that it is **tie** and not Infraco employing Tramco.

6. ASSIGNATION

6.1 Tramco shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of **tie**.

6.2 **tie** shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie**; or

6.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to Tramco) by **tie** or a person falling within clause 6.2.1; or

6.2.3 to City of Edinburgh Council or Transport Edinburgh Limited; or

6.2.4 to any other person with the prior written consent of Tramco (such consent not to be unreasonably withheld or delayed).

7. LIABILITY OF TRAMCO

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by law of contract, delict or otherwise.

7.2 The responsibility of Tramco under this Agreement is not to be reduced or in any way released or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

7.3 The rights and remedies conferred upon **tie** by this Agreement are in addition to any other rights and remedies that **tie** may have against Tramco including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of Tramco to **tie** is to be determined in all respects in accordance with the terms of the Tram Maintenance Agreement and this Agreement and, in the event of any claim by **tie** under or through this Agreement, Tramco shall be entitled to rely upon any defence, right, limitation or exclusion under the Tram Maintenance Agreement as though **tie** were named as Client under it, except that:

7.4.1 **tie** shall not be affected by any subsequent variation of the Tram Maintenance Agreement which would adversely affect the obligations owed by Tramco or the waiver, compromise or withdrawal of any claim made by Infraco; and

7.4.2 Tramco shall not be entitled to exercise any right of set-off, retention or withholding against **tie** to which Tramco may be entitled as against Infraco.

7.5 The liability of Tramco under this Agreement shall be no greater in extent than the liability of Tramco under the Tram Maintenance Agreement.

7.6 In no event, the Tram Maintainer shall be responsible for indirect or consequential damages

8. DELIVERY, TITLE TO PARTS AND OTHER PROPERTY

Notwithstanding any provision of the Tram Maintenance Agreement to the contrary, in respect of Tramco's performance of its obligations under the Tram Maintenance Agreement:

8.1 Tramco shall transfer to **tie** or such other party as shall be notified by **tie** to Tramco in writing, each Spare Part or Special Tool upon delivery of such item to the Depot.

8.2 Title to all Parts (including Spare Parts and Special Tools) supplied or provided by Tramco pursuant to the Tram Maintenance Agreement which are not already owned by **tie** and which are installed on the Trams in the course of or as the result of the performance of the Services shall vest in **tie** free and clear of other all Security Interests. Tramco shall at its own expense take all such steps and execute, and procure the execution of, all such instruments as **tie** may reasonably require to ensure that title so passes to **tie** according to applicable Law. Tramco shall transfer title in the Deliverables to **tie** or such other party as **tie** shall notify to Tramco in writing, on the Tram Maintenance Commencement Date.

8.3 Any Part at any time removed from a Tram shall remain the property of **tie** and Tramco undertakes (and shall procure that its sub-contractors so undertake) to clearly identify such Parts as belonging to **tie** and to keep all such Parts stored separately from any third party's property.

8.4 Tramco shall not have or acquire title to any Tram, **tie** Supplied Goods or Technical Records by reason of the performance of its obligations under the Tram Maintenance Agreement. Tramco hereby waives (in favour of **tie**) and undertakes to **tie** that it shall not exercise any lien it may have or acquire over any Tram, **tie** Supplied Goods,

Technical Records or Deliverables. The Tram maintainer will have the right to access the Technical Records, and to store copies of such for the performance of Services under this agreement, or for the purpose of interpretation of this agreement

8.5 Tramco shall at its own expense label or otherwise clearly identify at all times as being the property of **tie** any Parts and/or raw materials and/or spares for the Trams in Tramco's or its agent's or sub-contractor's possession or control in relation to which title has vested in **tie** pursuant to this Agreement or the Tram Maintenance Agreement and Tramco shall ensure that such items shall at all times in Tramco's (its agent's or sub-contractor's) possession or control be kept separate from Tramco's or any third party's goods.

8.6 On termination of the Tram Maintenance Agreement Tramco shall promptly deliver to **tie** or such other party as shall be notified by **tie** to Tramco in writing any Parts, Spares, Tram Maintainer's Materials, Deliverables or other materials the property of which is vested in **tie** by virtue of this Agreement or the Tram Maintenance Agreement or as **tie** shall direct and if it shall fail to do so, **tie** or its agents may enter any premises of Tramco or of any sub-contractor, remove such Parts, Spares, Tram Maintainer's Materials, Deliverables and other materials and recover the cost of doing so from Tramco.

8.7 Tramco shall incorporate provisions equivalent to those provided in clauses 8.4 to this 8.7 (mutatis mutandis) in every sub-contract.

9. CONSENT OF INFRACO

9.1 Infraco consents to the terms of this Agreement.

10. NOTICES

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by registered or recorded delivery post, is deemed to have been received 48 hours after being posted.

11. RIGHTS OF THIRD PARTIES

11.1 A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. INVALID TERMS

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. VARIATIONS AND WAIVERS TO BE IN WRITING

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. WAIVER

14.1 Save where expressly stated, no failure or delay by any Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver or any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 52.1 (*Dispute Resolution*) of the Tram Maintenance

Agreement and the provisions of the said Clause 52.1 (*Dispute Resolution*) and Schedule 9 (*Dispute Resolution Procedure*) and Schedule 10 (*Panels*) are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "**Parties**" shall be deemed to refer to **tie** and Tramco, any reference to "**Client**" shall be deemed to refer to **tie**, and notices to be given in connection therewith shall be given in accordance with Clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED**

at

on 2008 by:

Director _____

Full Name _____

Director _____

Full Name _____

EXECUTED for and on behalf of **SIEMENS PLC**
at

on 2008 by:

Authorised Signatory _____

Full Name _____

Authorised Signatory _____

Full Name _____

EXECUTED for and on behalf of
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A. (CAF)

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

THIS IS SCHEDULE PART 22 REFERRED TO IN THE FOREGOING AGREEMENT BETWEEN TIE AND THE INFRACO

(1) TIE LIMITED

- and -

(2) PARSONS BRINCKERHOFF LIMITED

PROVISION OF SYSTEM DESIGN SERVICES

relating to

THE EDINBURGH TRAM NETWORK

tie
Verity House
19 Haymarket Yards
Edinburgh
EH12 5BH

CONTENTS

AGREEMENT

BETWEEN

(1) **TIE LIMITED** a company incorporated under the Companies Act with registration number SC230949 and having its registered office at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ (the "Client") which expression shall include its successors in title and permitted assignees; and

(2) **PARSONS BRINCKERHOFF LIMITED** a company incorporated under the Companies Act with registration number 2554514 and having its registered office at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle Upon Tyne, NE4 7YQ (the "SDS Provider") which expression shall include its permitted assignees.

WHEREAS

A. **tie** requires a consultant to perform the Services (as hereinafter defined) in respect of the Edinburgh Tram Network (as hereinafter defined).

B. Pursuant to a notice published in the Official Journal of the European Union on 28 December 2004 with reference 2004/S252-217951, **tie** invited expressions of interest from appropriately qualified parties for the performance of the Services.

C. By competitive procurement process, conducted in accordance with Law, **tie** has selected the SDS Provider to perform the Services in accordance with this Agreement.

D. **tie** has issued a Letter of Appointment (as hereinafter defined) in response to the SDS Provider's Formal Offer (as hereinafter defined).

E. **tie** intends to appoint an infrastructure provider (the "**Infraco**") to complete the design, and carry out the construction, installation, commissioning and maintenance planning in respect of the Edinburgh Tram Network. It is further intended that the contract which the infrastructure provider will enter into with **tie** will require the infrastructure provider to accept responsibility for design and other work carried out by the SDS Provider for **tie** under the terms of this Agreement.

F. If required by **tie**, **tie** and the SDS Provider have agreed to the novation of this Agreement upon and subject to the terms of this Agreement to the infrastructure provider to be appointed by **tie**.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement (including the recitals and the Schedules), save as otherwise expressly stated or as the context otherwise requires, the following words and expressions shall have the meanings hereby ascribed to them:

"**Abortive Work**" means any work which cannot be used in relation to the Edinburgh Tram Network (but not including work occurring as part of the iterative process of design);

"**AFC**" means automatic fare collection;

"**Affected Party**" means a Party that is unable to comply with all or a material part of its obligations under this Agreement as a direct result of a Force Majeure Event;

"**Agreement**" means the main body of this document (as may be amended from time to time in accordance with this Agreement) together with the Schedules, and the Formal Offer, and the Letter of Appointment;

"**ALARP**" means as low as reasonably practicable;

"**Approval Bodies**" means any Relevant Authorities, planning authorities, roads authorities, HMRI, Network Rail and any other parties who are to issue Consents which may be required for the construction, installation, commissioning, completion and opening of the Edinburgh Tram Network;

"**BAA**" means BAA plc, a company incorporated under the Companies Act with registration number 1970855 and having its registered office at 130 Wilton Road, London, SW1V 1LQ which expression shall include its successors in title and assignees;

"**Background Information**" means all and any materials, documents, drawings, plans or other information in paper, electronic or any other form, relating in any way to this Agreement and the Tram Legislation (and the parliamentary process) and made available to the SDS Provider by **tie**, CEC and/or any of their respective members, officers, agents and/or advisers during the procurement competition relative to this Agreement or thereafter;

"**Business Day**" means any day other than a Saturday, Sunday or a public holiday recognised by CEC;

"**CCTV**" means closed circuit television;

"**CDM Regulations**" means the Construction (Design and Management) Regulations 1994 (S.I. 1994/3140) or any Regulations superceding these;

"**CEC**" means the City of Edinburgh Council and its successors and assignees whomsoever;

"**Cess**" means safe area at the side of the tram track;

"**Change in Control**" means any sale or disposal of any legal, beneficial or equitable interest in any or all of the share capital of a corporation or the control over the exercise of voting rights in a corporation or the control over the right to appoint or remove directors of a corporation;

"**Change in Law**" means the coming into effect after the last date of execution of this Agreement of:

(a) Legislation, other than any Legislation which on the date of this Agreement has been published:

(i) in a draft Bill as part of a Scottish Executive/Scottish Parliament or United Kingdom Government consultation paper;

(ii) in a Bill (including the Tram Bills);

(iii) in draft subordinate Legislation within the meaning of section 21(1) of the Interpretation Act 1978; or

(iv) as a proposal in the Official Journal of the European Communities;

(b) any Guidance (other than Guidance which on the date of this Agreement has been published (in draft or otherwise) in any Scottish Executive, Scottish Parliament or United Kingdom Government consultation paper (and/or on any Scottish Executive, Scottish Parliament or United Kingdom Government internet site)); or

(c) any applicable judgement of a relevant court of law which changes a binding precedent;

"Client Change" means any addition, modification, reduction or omission in respect of the Services or any other term of this Agreement instructed in accordance with Clause 7.2, Clause 15 (*Changes*) or Clause 29 (*Novation*);

"Client Change Order" means the written confirmation issued by the Client to proceed with a Client Change on the basis of an Estimate (as modified, if required);

"Client Default" means one of the following events:

(a) a failure by the Client to make payment of any amount of money that is certified in an Interim Certificate as due and payable by the Client to the SDS Provider under this Agreement exceeding 5% of the value of the Services to be performed under this Agreement (as such value is determined in accordance with this Agreement); or

(b) a breach by the Client of any of its material obligations under this Agreement which substantially frustrates or renders it impossible for the SDS Provider to perform its obligations under this Agreement for a continuous period of 30 days;

"Client Notice of Change" means a notice served by the Client pursuant to Clause 15.1, setting out the matters specified in Clause 15.2;

"Client Party" means any advisers appointed by the Client or any of the Client's employees, agents, contractors and sub-contractors of any tier and its or their directors, officers and employees (excluding the SDS Provider or any SDS Provider Party);

"Client's Representative" means the person or persons appointed by the Client from time to time and notified to the SDS Provider;

"Code" means the Scottish Ministers' Code of Practice on the Discharge of Functions by Public Authorities under the Freedom of Information (Scotland) Act 2002 as the same may be amended, varied or replaced from time to time;

"Code of Construction Practice" means the code which has been developed in conjunction with all relevant parties with regard to construction practices, environmental issues, safety issues and other aspects relative to the construction, installation and commissioning of the Edinburgh Tram Network;

"Commercially Sensitive Information" means the subset of Confidential Information listed in Schedule 5 (*Commercially Sensitive Information*) comprised of information:

(a) which is provided by the SDS Provider to the Client in confidence for the period set out in that schedule; and/or

(b) that constitutes a trade secret;

"**Confidential Information**" means any information which has been designated as confidential by either Party in writing or that ought to be considered as confidential (however it is conveyed or on whatever media it is stored) including information which relates to the business, affairs, properties, assets, trading practices, goods, services, developments, trade secrets, Intellectual Property Rights, know-how, personnel of either Party, all personal data and sensitive personal data within the meaning of the Data Protection Act 1998, and the Commercially Sensitive Information;

"**Consents**" means without limitation all permissions, consents, approvals, non-objections, certificates, permits, licences, agreements, statutory agreements and authorisations, Planning Permissions, traffic regulation orders, building fixing agreements, building control approvals, building warrants, and all other necessary consents and agreements from the Approval Bodies, or any Relevant Authority, any other relevant third parties whether required by Law or the Tram Legislation or under contract;

"**Construction Panel**" has the meaning given to it in Clause 28.19.1;

"**Construction Proposals**" means the proposals for the construction, installation and commissioning of the Edinburgh Tram Network to be developed by the Infraco;

"**Control Room**" means a centralised control room within the Depot which will facilitate tram servicing and maintenance;

"**Data Radio**" means a system that allows two way data communication for monitoring, control and recording between the Control Room and remote equipment eg trams, TPDS, PCC, PHC, sub-station equipment, TVM, PID, UTX and signals;

"**DCCB**" means direct current circuit breaker;

"**DDA**" means the Disability Discrimination Act 1995;

"**Deliverables**" means the Functional Requirements Specifications, the Technical Specifications and the items listed in Appendix 3 to Schedule 1 *(Scope of Services)*, and all other documents, information, reports, diagrams, bills of quantities, records, manuals, schedules, databases, reinforcement details, photographs, formulae, consultation materials, plans, designs, specifications, drawings (including as-built drawings), details, calculations, transport and other models and simulations, the outputs and reports based on any models, programmes and all other material created and/or provided by the SDS Provider (and/or any SDS Provider Party or any other third party) in the performance of the Services and the SDS Provider's other obligations under this Agreement;

"**Depot**" has the meaning given in paragraph 1.1.4 of Schedule 11 (*Requirements Specification for Overall System Operational and Performance Requirements*);

"**Design Manual**" means the design manual issued by CEC as may be amended from time to time;

"**Design and Technical Gateway Process**" means the process set out in Clause 7.3 of this Agreement;

"**Design and Technical Services**" means those services described in paragraph 2 of Schedule 1 (*Scope of Services*) as may be amended from time to time in accordance with this Agreement;

"Detailed Design Phase" means the phase described in paragraph 2.6 of Schedule 1 *(Scope of Services);*

"Detailed Design Phase Milestone Payment" means the sum of money identified in respect of the milestone payment for Detailed Design Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Detailed Design Phase Sub-Milestones" means the sub-milestones identified as occurring during the Detailed Design Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Detailed Design Phase Sub-Milestone Payments" means the sum of money identified in respect of each Detailed Design Phase Sub-Milestone in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Discriminatory Change in Law" means a Change in Law, the terms of which apply expressly to:

(a) the Edinburgh Tram Network; and/or

(b) the SDS Provider and not to other persons;

"Dispute" means any dispute, difference or unresolved claim between the Parties in connection with or arising from this Agreement;

"Dispute Resolution Procedure" means the procedure set out in Clause 28 (*Dispute Resolution Procedure*);

"DKE" means developed kinematic envelope;

"DNO" means district network operator;

"DPOFA" means the development partnering and operating franchise agreement between **tie** and the Operator dated 14 May 2004;

"Edinburgh Tram Network" means Line One and Line Two or either of them, as may be amended from time to time, together with any modification, line extension, spur, interconnection and any additional line which may be instructed by **tie;**

"Effective Date" shall have the meaning given in Clause 2.1;

"E&M" means electrical and mechanical;

"EMC" means electro magnetic current;

"Environmental Statement" means the environmental statements supporting each of the Tram Bills;

"Environmental Information Regulations" means the Environmental Information (Scotland) Regulations 2004, Scottish SI 2004/520;

"E & P" means electrification and power;

"Estimate" means the estimate to be provided by the SDS Provider pursuant to Clause 15.3;

"Final Persistent Breach Notice" has the meaning given in Clause 24.2;

"Financial Panel" has the meaning given to it in Clause 28.19.1;

"FOISA" means the Freedom of Information (Scotland) Act 2002 and any subordinate legislation made under this Act from time to time together with any guidance and/or codes of practice issued by the Scottish Information Commissioner in relation to such legislation;

"Force Majeure Event" means the occurrence after the Effective Date of:

(a) war, civil war, armed conflict or terrorism; or

(b) nuclear, chemical or biological contamination unless the source of the contamination is the result of actions by the SDS Provider or any SDS Provider Party; or

(c) pressure waves caused by devices travelling at supersonic speeds;or

(d) a natural disaster.

"Formal Offer" shall mean the tender for the Services issued by the SDS Provider and dated 13th May 2005 as the same has been amended and/or supplemented by letters and attachments from Mike Jenkins to Ian Kendall dated 8 June 2005 and 29 June 2005 and letters from David Hutchison to Ian Kendall dated 10 August 2005 and 2 September 2005;

"4ft" means the distance between inner sides of the two running rails of the track;

"Functional Requirements Specifications" means the Requirements Specification for Civil Engineering Works, the Requirements Specification for Overall System Operational and Performance Requirements, the Requirements Specification for Supervision, Command and Control Suite of Systems, the Requirements Specification for Electrification and Power, the Requirements Specification for Tram Vehicle, and the System-Wide Non-Functional Requirements as may be amended and developed from time to time;

"Funder's Direct Agreement" means the direct agreement to be entered into between any funder and the SDS Provider in relation to the Infraco Contract;

"General Change in Law" means a Change in Law which is not a Discriminatory Change in Law or a Specific Change in Law;

"Good Industry Practice" means using standards, practices, methods and procedures conforming to Law and exercising that degree of skill, care, diligence, prudence and foresight that would reasonably be expected from a large, reputable, professionally qualified, competent and skilled organisation experienced in carrying out activities of a similar nature, scope and complexity to those comprised in the Services, and seeking in good faith to comply with its contractual obligations and all duties owed by it;

"GSN" means global structured notation for safety cases;

"Guarantee Agreement" means the agreement guaranteeing the due, proper and complete performance of obligations of the SDS Provider and entered into among PB International Inc., PBC International Inc., the SDS Provider and **tie** dated on or around the date hereof;

"**Guidance**" means the any applicable guidance, direction or determination issued by any regulatory body with which the Client and/or the SDS Provider is bound to comply;

"**HCI**" means human computer interface;

"**HF**" means human factors;

"**HMRI**" means Her Majesty's Railway Inspectorate;

"**HSE**" means Health & Safety Executive;

"**HVAC**" means heating, ventilation and air conditioning;

"**IEC**" means International Electrotechnical Commission;

"**Indemnified Liabilities**" means actions, claims (including third party claims), demands, proceedings, losses, damages, liabilities, costs and expenses (including reasonable legal fees and expert witness fees);

"**Indemnified Parties**" has the meaning given in Clause 27.1;

"**Indirect Loss**" means any business interruption, loss of profits, loss of business, loss of business opportunity, loss of or damage to or corruption of data or loss of management time or time of other employees;

"**Information**" has the meaning given under section 73 of FOISA;

"**Infraco**" means the infrastructure provider to be appointed or appointed by **tie** in relation to the Edinburgh Tram Network;

"**Infraco Contract**" means the contract to be entered into or entered into by **tie** with the Infraco in relation to the completion of the design, and carrying out the construction, commissioning and maintenance planning of the Edinburgh Tram Network;

"**Insolvency Event**" means any of the following events:

(a) the SDS Provider is unable to pay its debts as they fall due or is insolvent or admits in writing inability to pay its debts as they fall due;

(b) the SDS Provider suspends for a period of two months making payments on all or any class of its debts or a moratorium is declared by the SDS Provider in respect of its indebtedness;

(c) the SDS Provider ceases business or announces an intention to do so;

(d) the SDS Provider (being an individual), such expression to include single members of a partnership (whether limited or not) becomes bankrupt or makes composition or arrangement with its creditors, or is the subject of an application to the Court for an interim order under the Insolvency Act 1986,

(e) the following are entered into:

(i) a voluntary arrangement (other than a solvent one) for a composition of debts of the SDS Provider;

(ii) a scheme of arrangement in respect of the SDS Provider pursuant to the Insolvency Act 1986 or the Companies Act 1985; or

(iii) a material composition or arrangement other than a solvent one with the SDS Provider's creditors;

(f) either of the following:

(i) the winding-up of the SDS Provider (including passing a shareholders' resolution or the presentation of a petition by the SDS Provider for the purpose of winding up the SDS Provider); or

(ii) its administration (including where an application is made by the SDS Provider, or petition is presented by the SDS Provider for or any meeting of its directors or members resolves to make an application for an administration order);

(g) an order for the winding-up or administration of the SDS Provider is made;

(h) any liquidator, judicial custodian, receiver, administrative receiver, administrator or the like is appointed in respect of the SDS Provider or any material part of the SDS Provider's assets;

(i) possession is taken of, or any execution or other process (other than on the dependence or inhibition) is levied or enforced upon, any material part of the property (whether real or personal) of the SDS Provider by or on behalf of any creditor or encumbrancer of the SDS Provider;

(j) anything analogous to any of the events mentioned in paragraphs (a) to (h) above occurs in relation to the SDS Provider under the law of any relevant jurisdiction; or

(k) in the event that **tie** has made a demand pursuant to the Guarantee Agreement for due, proper and complete performance of any of the SDS Provider's obligations, including indemnification against liabilities incurred by **tie** by reason of the SDS Provider's default under this Agreement and, in the opinion of **tie** (acting reasonably), no substantive action in response to such demand has been taken within a period of 14 days of the date of such demand. For the avoidance of doubt, this provision creates no requirement on **tie** to make such demand prior to any decision by **tie** on the operation of Clause 19 (*Termination on SDS Provider Default*);

"**Intellectual Property Rights**" means any rights in or to any patent, design right, utility model, trade mark, brand name, service mark, trade name, business name, logo, invention (whether registered or unregistered), domain name, semi-conductor right, topography right, software designs and/or other materials, source code, copyright, moral right, or rights in databases and any other rights in respect of any industrial or intellectual property, whether capable of being registered or not, including all rights to apply for any of the foregoing rights or for an extension, revival or renewal of any of the foregoing rights and any similar or analogous rights to any of the above, whether arising or granted under the law of Scotland or of any other jurisdiction;

"**Interim Certificate**" means any notice to be issued by the Client in accordance with Clause 12.3;

"Internal Resolution Procedure" means the procedure described in Clause 28.10;

"Joint Revenue Committee" means the consultant or consultants appointed by **tie** to perform transport modelling functions in relation to the Edinburgh Tram Network;

"Key Personnel" means those staff specified as such in Schedule 2 (*Key Personnel*);

"Law" means:

(a) any applicable Legislation;

(b) any applicable Guidance; and

(c) any applicable judgment of a relevant court of law which is a binding precedent,

in each case in force in Scotland;

"Legal Panel" has the meaning given to it in Clause 28.19.1;

"Legislation" means any Act or instruments of the Scottish Parliament or the United Kingdom Parliament or subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, any exercise of the Royal Prerogative, and any enforceable community right within the meaning of section 2 of the European Communities Act 1972;

"Letter of Appointment" means the letter from the Client to the SDS Provider dated 6th September 2005 accepting the SDS Provider's Formal Offer;

"Line One" means Sectors DHY6 (excluding the tramstop at Murrayfield and the alignment between that tramstop and the junction at Roseburn), HOT1, HOT2, HOT3, HOT4, HOT5, HOT6, HCT1, CTO1 and CTO2 as may be amended from time to time;

"Line Two" means Sectors ARP1, DHY1, DHY2, DHY3, DHY4, DHY5, DHY6 (excluding the tramstop at Haymarket and the alignment between that tramstop and the junction at Roseburn), and GNB1 as may be amended from time to time;

"Line One and Line Two" means Sectors ARP1, DHY1, DHY2, DHY3, DHY4, DHY5, DHY6, HOT1, HOT2, HOT3, HOT4, HOT5, HOT6, HCT1, CTO1, CTO2 and GNB1 as may be amended from time to time;

"Management Fees" means the sum of money identified in respect of management fees in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Master Project Programme" means the project programme to be prepared, maintained, updated and amended from time to time by **tie** and notified to the SDS Provider and as may be extended in accordance with Clause 7.5 of this Agreement;

"M & E" means mechanical and electrical;

"Milestone Completion Certificate" means the certificate to be issued by the Client in accordance with Clause 7.3 in relation to the completion of the Requirements Definition Phase, the System-Wide Preliminary Design Requirements, the Preliminary Design Phase and the Detailed Design Phase;

"Network Diagram" means the diagram identified in the Requirements Specification for Overall System Operational and Performance Requirements;

"Network Rail" means Network Rail Infrastructure Limited, a company incorporated under the Companies Act with registered number 2904587 and having its registered office at 40 Melton Street, London, NW1 2EE which shall include its successors in title and assignees;

"Notice of Adjudication" has the meaning given in Clause 28.16;

"Notification" has the meaning given in Clause 28.10.1;

"Novation Agreement" means the novation agreement to be entered into among **tie**, the SDS Provider and the Infraco in the form set out in Schedule 8 (*Novation Agreement*);

"OLE" means overhead line equipment;

"Open Book Basis" means the availability and disclosure (consistent with operation of Clause 14 (*Audit*)) of all underlying data and calculations used by the SDS Provider to create and justify costings and financial analysis presented to the Client;

"Operations Panel" has the meaning given to it in Clause 28.19.1;

"Operator" means Transdev Edinburgh Tram Limited, a company incorporated in Scotland under registered number SC267598 and having its registered office at Level 2, Saltire Court, 20 Castle Terrace, Edinburgh EH1 2ET, appointed by **tie** as operator under the DPOFA;

"ORS" means operational radio system;

"PA" means public address;

"Panels" has the meaning given to it in Clause 28.19;

"Parliamentary Undertakings" means any undertaking given to a Parliamentary Committee during the passage of the Tram Bills through the Scottish Parliament, and any undertaking or agreement given to any person in consideration of his refraining from opposition to the Tram Bills through the Scottish Parliament;

"Party" means each and any of the parties to this Agreement and "Parties" shall be construed accordingly;

"P3e" means Primavera 3e;

"PCC" means point control cabinet;

"Permitted Variation" means a Client Change, a change proposed by the SDS Provider or a Qualifying Change in Law, as agreed or determined to proceed in accordance with this Agreement;

"Persistent Breach Notice" has the meaning given in Clause 24.1;

"PHC" means point heating cabinet;

"PHP" means passenger help point;

"PID" means passenger information display;

"Planned Service Commencement Date" means the programmed date of service commencement of 31 December 2009 as may be amended from time to time by **tie** and notified to the SDS Provider;

"Planning Permission" means any planning permission, planning approval, approval of reserved matters. listed building consent, conservation areas consent and/or other consent or approval;

"Position Paper" has the meaning given in Clause 28.10.2;

"Preliminary Design Phase" means the phase described in paragraph 2.4 of Schedule 1 *(Scope of Services);*

"Preliminary Design Phase Milestone Payment" means the sum of money identified in respect of the milestone payment for Preliminary Design Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Preliminary Design Phase Sub-Milestones" means the sub-milestones identified as occurring during the Preliminary Design Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Preliminary Design Phase Sub-Milestone Payments" means the sum of money identified in respect of each Preliminary Design Phase Sub-Milestone in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"Programme" means the programme set out in Schedule 4 (*Programme*) (as maintained, updated and amended from time to time by the SDS Provider in accordance with this Agreement) as may be extended in accordance with Clause 7.5 of this Agreement which shall include the Programme Phasing Structure;

"Programme Phasing Structure" means the programme set out in Appendix 2 of Schedule 1 *(Scope of Services)* as may be amended by **tie** from time to time and notified to the SDS Provider;

"Prohibited Act" means:

(a) offering, giving or agreeing to give to **tie**, the Scottish Executive, CEC, or any **tie** Party or any other public body or any person owned or employed by any of them any gift or consideration of any kind as an inducement or reward:

  (i) for doing or not doing (or for having done or not having done) any act in relation to the obtaining or performance of this Agreement; or

  (ii) for showing or not showing favour or disfavour to any person in relation to this Agreement;

(b) paying commission or agreeing to pay commission to any person in connection with the award of this Agreement;

(c) committing any offence:

(i) under the Prevention of Corruption Acts 1889-1916 or section 68(2) of the Local Government (Scotland) Act 1973;

(ii) under any Law creating offences in respect of fraudulent acts; or

(iii) at common law in respect of fraudulent acts in relation to this Agreement or any other relevant agreement with **tie**, the Scottish Executive, CEC or any other public body; or

(d) defrauding or attempting to defraud or conspiring to defraud **tie**, CEC, the Scottish Executive or any other public body;

Any references within this Agreement to any "Prohibited Act" shall include acts outwith the United Kingdom and the references within the definition "Prohibited Act" to UK legislation shall be deemed to be amended to refer to legislation in other jurisdictions outside of the United Kingdom.

"Project IPR" means all Intellectual Property Rights in the Deliverables and the Specially Written Software and any other Intellectual Property Rights created in the performance of the Services which are specific in nature to the performance of the Services;

"Qualifying Change in Law" means:

(a) a Discriminatory Change in Law; and/or

(b) a Specific Change in Law;

"Referral Notice" has the meaning given in Clause 28.27;

"Referring Party" has the meaning given in Clause 28.16;

"Related Contract" has the meaning given in Clause 28.55;

"Related Dispute" has the meaning given in Clause 28.55;

"Relevant Authority" means any court with the relevant jurisdiction and any local authority, national authority or supra national agency, inspectorate, minister, Scottish Executive, body, official or public or statutory person of the government of the United Kingdom or of the European Union and "Relevant Authorities" shall be construed accordingly;

"Requests for Information" shall have the meaning set out in FOISA or any apparent request for information under FOISA, the Environmental Information Regulations or the Code;

"Required Insurances" means the insurances set out in Part 1 of Schedule 6 (*Required Insurances*) as may be amended from time to time in accordance with this Agreement;

"Requirements Definition Phase" means the phase described in paragraph 2.3 of Schedule 1 *(Scope of Services)*;

"Requirements Definition Phase Milestone Payment" means the sum of money identified in respect of the milestone payment for the Requirements Definition Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"**Requirements Definition Phase Sub-Milestones**" means the sub-milestones identified as occurring during the Requirements Definition Phase in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"**Requirements Definition Phase Sub-Milestone Payments**" means the sum of money identified in respect of each Requirements Definition Phase Sub-Milestone in Schedule 3 *(Pricing Schedule)* as may be adjusted from time to time in accordance with this Agreement;

"**Requirements Specification for Civil Engineering Works**" means the specification set out in Schedule 12 (*Requirements Specification for Civil Engineering Works*) as may be amended and developed from time to time in accordance with this Agreement;

"**Requirements Specification for Electrification and Power**" means the specification set out in Schedule 14 (*Requirements Specification for Electrification and Power*) as may be amended from time to time in accordance with this Agreement;

"**Requirements Specification for Overall System Operational and Performance Requirements**" means the specification set out in Schedule 11 (*Requirements Specification for Overall System and Operational Performance Requirements*) as may be amended and developed from time to time in accordance with this Agreement;

"**Requirements Specification for Supervision, Command and Control Suite of Systems**" means the specification set out in Schedule 13 (*Requirements Specification for Supervision, Command and Control Suite of Systems*) as may be amended and developed from time to time in accordance with this Agreement;

"**Requirements Specification for Tram Vehicle**" means the specification set out in Schedule 15 (*Requirements Specification for Tram Vehicle*) as may be amended and developed from time to time in accordance with this Agreement;

"**Responding Party**" has the meaning given in Clause 28.17;

"**Retention**" has the meaning given in Clause 12.7.1;

"**Review Procedure**" means the review procedure set out in Schedule 9 *(Review Procedure)*;

"**RSPG**" means Railway Safety Principles and Guidance, issued by HMRI under HSE;

"**RVAR**" means Rail Vehicle Accessibility Regulations;

"**SCADA**" means supervisory control and data acquisition system;

"**Schedules**" means Schedule 1 (*Scope of Services*), Schedule 2 (*Key Personnel*), Schedule 3 (*Pricing Schedule*), Schedule 4 (*Programme*), Schedule 5 (*Commercially Sensitive Information*), Schedule 6 (*Required Insurances*), Schedule 7 (*Draft Collateral Warranties*), Schedule 8 (*Novation Agreement*), Schedule 9 (*Review Procedure*), Schedule 10 *(Panels for the Dispute Resolution Procedure*), Schedule 11 (*Requirements Specification for Overall System Operational and Performance Requirements*), Schedule 12 (*Requirements Specifications for Civil Engineering Works*), Schedule 13 (*Requirements Specification for Supervision, Command and Control Suite of Systems*), Schedule 14 (*Requirements Specification for Electrification and Power*), Schedule 15 (*Requirements Specification for Tram Vehicle*), Schedule

16 (*System-Wide Non-Functional Requirements*), and Schedule 17 (*Agreement between the SDS Provider and the Joint Revenue Committee*), as the same may be amended from time to time in accordance with the terms of this Agreement;

"SDS Provider Default" means the events set out in Clause 19.1;

"SDS Provider IPR" means:

(a) all Intellectual Property Rights (including Intellectual Property Rights in relation to the SDS Provider Software) in respect of or derived from work product created or services performed by the SDS Provider in relation to the transportation sector (in particular the railway and light rail sectors) which the SDS Provider can demonstrate by documentary evidence were already existing and owned by or licensed to the SDS Provider prior to the Effective Date; and

(b) any modifications or developments of any of the rights listed in paragraph (a) above which are generic in nature and not specific to the performance of the Services;

"SDS Provider Party" means any sub-consultant, supplier, sub-contractor, specialist and/or any other party appointed by the SDS Provider in accordance with Clause 9 (*Sub-Letting and the Appointment of SDS Provider Parties*) to perform any part of the Services (and "SDS Provider Parties" will be construed accordingly);

"SDS Provider Software" means programs, the Intellectual Property Rights in which are (a) owned by the SDS Provider; and (b) used by the SDS Provider to carry out its obligations under this Agreement;

"SDS Provider's Representative" shall have the meaning given to it in Clause 10.8;

"SDS-JRC Modelling Suite" has the meaning given in paragraph 3.5.1 of Schedule 1 (*Scope of Services*);

"Sector" means each sector identified in the Programme Phasing Structure;

"Services" shall mean those services to be performed by the SDS Provider which are set out in Schedule 1 (*Scope of Services*) and for the avoidance of any doubt, shall include any variations pursuant to the provisions of this Agreement, and shall also include the other obligations which the SDS Provider is required to carry out as expressed under this Agreement;

"Service Commencement Date" means the date the Edinburgh Tram Network goes into passenger carrying service;

"Specially Written Software" means programs which are written by or on behalf of the SDS Provider specifically to enable the SDS Provider to carry out its obligations under this Agreement;

"Specific Change in Law" means any Change in Law which specifically applies to the provision of a service the same as or similar to the Services (but not to the provision of other services) but excluding the making, amendment or revocation of any traffic regulation order;

"Stage Build" means part of the Edinburgh Tram Network that once commissioned can be opened for Trial Operation;

"Sub-Milestones" means those sub-milestones identified in Schedule 3 (*Pricing Schedule*) as may be adjusted from time to time in accordance with this Agreement;

"Submitted Item" has the meaning given in paragraph 1.2 of Schedule 9 (*Review Procedure*);

"Sub-Sector" means each sub-sector identified in the Programme Phasing Structure;

"System-Wide Preliminary Design Requirements" means those high level requirements for the whole of the Edinburgh Tram Network described in paragraph 2.4 of Schedule 1 (*Scope of Services*);

"System-Wide Non-Functional Requirements" means the requirements set out in Schedule 16 (*System-Wide Non-Functional Requirements*) as may be amended and developed from time to time in accordance with this Agreement;

"TBC" means traction/brake controller;

"Technical Specifications" are the specifications to be prepared by the SDS Provider to describe the technical aspects of each part of the Edinburgh Tram Network which shall meet the Functional Requirements Specifications and shall allow all aspects of the Edinburgh Tram Network to be procured, constructed, installed, commissioned and maintained;

"Termination Date" means the date of termination expressed in a notice served in accordance with Clauses 19 (*Termination for SDS Provider Default)*, 20 (*Termination, Abandonment or Suspension of the Services by the Client*), 21 (*Termination for* the *Client Default*), 22 (*Termination for Corrupt Gifts and Payments*), 23 (*Termination by Reason of Force Majeure*) or 24 (*Persistent Breach*) (as appropriate);

"Third Party Software" means programs, the Intellectual Property Rights in which are (a) owned by a third party and (b) used by SDS Provider to carry out its obligations under this Agreement;

"tie" means a company incorporated under the Companies Act with registered number SC230949 and having its registered office at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ which shall include its successors in title and permitted assignees;

"tie Party" means any advisers appointed by **tie** or any of **tie's** agents, employees, contractors and sub-contractors of any tier and its or their directors, officers and employees (but excluding the SDS Provider, any SDS Provider Party) and statutory undertakers and utilities;

"TLA" means three letter acronym;

"Topics Register" means the central project register of all known issues relating to the design, construction, testing, commissioning, operation and maintenance of the Edinburgh Tram Network;

"TPDS" means tram position and detection system;

"Tram Bills" means the Edinburgh Tram (Line One) Bill and the Edinburgh Tram (Line Two) Bill,

"Tram Legislation" means the Edinburgh Tram (Line One) Bill and the Edinburgh Tram (Line Two) Bill, and after such Bills are enacted means the Edinburgh Tram

(Line One) Act, the Edinburgh Tram (Line Two) Act and such other legislation relative to the Edinburgh Tram Network as may be enacted from time to time;

"Tram Supplier" means the tram supplier to be procured by **tie** in relation to the supply of trams for the Edinburgh Tram Network;

"Tram Supply Contract" means the contract to be entered into by **tie** or other party with the Tram Supplier in relation to the supply of trams for the Edinburgh Tram Network;

"Transport Edinburgh Limited" means Transport Edinburgh Limited, (registered number SC269639) and having its registered office at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ which shall include its successors in title and permitted assignees;

"Trial Operation" means the timetabled operation by the Operator of the Edinburgh Tram Network prior to the Service Commencement Date;

"TRTS" means tram ready to start;

"TSS Provider" means the technical support services provider to be appointed by **tie**;

"TVM" means automatic ticket vending machine;

"UPS" means uninterruptible power supply;

"UTC" means urban traffic control;

"UTX" means urban traffic controller device;

"VDV" means vibration dose value;

"WBS" means work breakdown structure;

1.2 Unless the context requires otherwise:

1.2.1 words importing gender include masculine, feminine and neuter;

1.2.2 the singular includes the plural and vice versa;

1.2.3 a reference to any part, Clause, sub-clause or Schedule is, except where it is expressly stated to the contrary, a reference to such part, Clause or sub-clause of or Schedule to this Agreement;

1.2.4 a reference in any Schedule to any part, paragraph or sub-paragraph is, except where it is expressly stated to the contrary, a reference to such part, paragraph or sub-paragraph of that Schedule (as the case may be);

1.2.5 any reference to this Agreement or to any other document shall include any variation, amendment, or supplement to this Agreement or such document as expressly permitted under the terms of this Agreement;

1.2.6 any reference to any enactment, order, regulation or other similar instrument (including any EU instrument) (whether specifically named or not) shall be construed as a reference to the enactment, order, regulation or instrument as amended, replaced, consolidated or re-enacted and shall include any orders, consents, regulations, legally binding codes of practice or subordinate legislation (within the meaning of section 21(1) of the Interpretation Act 1978) made thereunder;

1.2.7 a reference to a person includes individuals, firms, partnerships, bodies corporate, joint ventures, government departments and any organisation capable of suing or being sued and references to any of the same include the others and their successors and assignees and transferees to the extent that such assignation and transfer are expressly permitted under the terms of this Agreement;

1.2.8 headings and the contents list are for convenience of reference only and do not affect the interpretation of this Agreement;

1.2.9 the ejusdem generis rule does not apply and the meaning of general words is not to be restricted by any particular examples preceding or following those general words;

1.2.10 a reference to a time of day is a reference to the time in Scotland;

1.2.11 subject to the restrictions imposed by this Agreement on subcontracting, an obligation to do something includes an obligation to procure it to be done;

1.2.12 an obligation not to do something includes an obligation not to wilfully allow it to be done;

1.2.13 the word "including" means "including without limitation";

1.2.14 a reference to "consent" shall mean consent in writing;

1.2.15 any reference to any Deliverable or course of action being reviewed, approved, agreed, consented to or otherwise processed in accordance with this Agreement means that the provisions of Schedule 9 (*Review Procedure*) shall apply except where otherwise agreed in writing by the Client.

1.3 This Agreement shall be interpreted and construed as a whole provided that in the event of any inconsistency or conflict between:

1.3.1 the main body of this Agreement and the Schedules, the main body of this Agreement shall prevail to the extent of any such inconsistency or conflict over the Schedules

1.3.2 the main body of this Agreement and the Schedules and the Formal Offer and/or the Letter of Appointment, the main body of the Agreement and the Schedules shall prevail to the extent of any such inconsistency or conflict over the Formal Offer and/or the Letter of Appointment

unless expressly stated otherwise by the Client.

1.4 In the case of any inconsistency or conflict between or in any of the documents forming the Agreement, or any inconsistency or conflict between the Agreement and any instructions from the Client or the Client's Representative, the SDS Provider shall notify the Client within 3 Business Days and the Client, subject to Clause 1.3, shall

issue in writing such further instructions as the Client considers appropriate in its absolute discretion to resolve the inconsistency or conflict.

1.5 Where a Party comprises two or more persons:

1.5.1 any obligations on the part of that Party contained or implied in this Agreement are deemed to be joint and several obligations on the part of those persons; and

1.5.2 references to that party include references to each and any of those persons.

2. TERM OF THIS AGREEMENT

2.1 This Agreement shall come into effect on the last date of execution of this Agreement and shall continue in effect until the date on which the SDS Provider is notified by the Client that the defects liability period for the Infraco Contract has ended in accordance with the terms of the Infraco Contract provided always that the Parties may agree to extend the term of this Agreement.

3. DUTY OF CARE, STANDARDS AND THE SERVICES TO BE PROVIDED

General

3.1 The Client hereby appoints the SDS Provider in accordance with the terms of this Agreement and the SDS Provider hereby accepts full responsibility and agrees to perform the Services and its other obligations under this Agreement fully and faithfully in the best interests of the Client.

3.2 The SDS Provider warrants to the Client that, in the performance of the Services and its other obligations under this Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent system design services provider experienced in performing services similar to the Services in connection with projects of a similar size, scope and complexity.

3.3 The SDS Provider shall (each as distinct and separate obligations) perform the Services and its other obligations under this Agreement (exercising the level of skill, care and diligence set out in Clause 3.2):

3.3.1 so as to comply in all respects with this Agreement;

3.3.2 so as to enable the Edinburgh Tram Network to be procured, constructed, installed, tested and commissioned, and thereafter operated and maintained;

3.3.3 in accordance with the SDS Provider's quality management system and plans;

3.3.4 so as to ensure compliance with the Functional Requirements Specifications and the Technical Specifications (as applicable);

3.3.5 in accordance with the Design Manual;

3.3.6 so as to ensure compliance with the Tram Legislation;

3.3.7 so as to ensure compliance with all applicable Law and Consents;

3.3.8 in accordance with the Parliamentary Undertakings;

3.3.9 in compliance with the Environmental Statements, and all other applicable environmental regulations and requirements;

3.3.10 so as to permit compliance with the Code of Construction Practice and with the Construction Proposals;

3.3.11 in accordance with Good Industry Practice;

3.3.12 to ensure that the design of the Edinburgh Tram Network is buildable;

3.3.13 to assist **tie** in ensuring that best value (pursuant to the Local Government (Scotland) Act 1973 as amended by the Local Government in Scotland Act 2003) has been secured in the performance of the Services;

3.3.14 in such manner so as not wilfully to detract from the image and reputation of **tie**, Transport Edinburgh Limited, CEC, the Scottish Executive or any project related to the performance of the Services;

3.3.15 in a manner that is not likely to be injurious to persons or property; and

3.3.16 using the Key Personnel and such other staff as may be approved by the Client for that type of work.

3.4 The SDS Provider shall to the extent necessary for the performance of its Services and its other obligations under this Agreement take due and proper account of the risks associated with the Edinburgh Tram Network arising from:

3.4.1 ground conditions (including climatic, geotechnical, ecological, environmental, hydrological and sub-surface conditions, any contamination and any archaeological finds);

3.4.2 use by third parties of any of the land which will form part of or be associated with or will be adjacent to the Edinburgh Tram Network;

3.4.3 the quality of any existing structures;

3.4.4 the obligations assumed or the undertakings given in any Parliamentary Undertakings relative to this Agreement; and

3.4.5 safety requirements and environmental matters.

3.5 The SDS Provider shall use best endeavours to ensure that the design of the Edinburgh Tram Network:

3.5.1 maximises construction productivity by reference to international best practice;

3.5.2 minimises disruption to the city of Edinburgh;

3.5.3 safeguards efficiency in the obtaining of Consents; and

3.5.4 optimises the Infraco's compliance with the Code of Construction Practice

3.6 The SDS Provider shall at all times keep itself fully informed about current professional standards and about all matters relating to, or which might have a bearing on, the performance of the Services and its other obligations under this Agreement.

3.7 The SDS Provider's duties and obligations under or pursuant to this Agreement will not be released, diminished or in any other way affected by any independent inquiry into any matter which may be made or carried out by the Client or by any firm, company or party on the Client's behalf nor by any action or omission of any such firm, company or party whether or not such action or omission might give rise to any independent liability of such firm, company or party to the Client.

3.8 The SDS Provider is deemed to have satisfied itself that it fully understands the scope and extent of the Services and its other obligations under this Agreement, and that it has sufficient information or will at the relevant time have sufficient information, to enable it to perform the Services and its other obligations under this Agreement.

3.9 The SDS Provider acknowledges that the Client will rely upon the skill and judgement of the SDS Provider in connection with all matters for which the SDS Provider is responsible under this Agreement.

Background Information

3.10 The SDS Provider acknowledges that certain Background Information has been made available to it in relation to this Agreement. The SDS Provider further acknowledges that **tie** does not give any warranty or undertaking as to the completeness, currency, accuracy or fitness for any purpose of any of the Background Information and, subject to the express provisions of this Agreement, neither **tie**, any **tie** Parties, nor any of its or their employees shall be liable to the SDS Provider in contract, delict (including breach of statutory duty), or otherwise as a result of:

3.10.1 any inaccuracy, error, defect, omission, unfitness for any purpose or inadequacy of any kind whatsoever in the Background Information; nor

3.10.2 any failure to make available to the SDS Provider any materials, documents, drawings, plans or other information relating to this Agreement;

provided that nothing in this Clause 3.10 shall exclude any liability in respect of any statements made or information provided fraudulently.

3.11 The SDS Provider acknowledges and confirms that as part of the Services it has conducted its own analysis and review of the Background Information and has before the execution of this Agreement, or upon receipt if received thereafter, satisfied itself as to the veracity, accuracy, reasonableness, scope, materiality, currency (where applicable) and completeness of all such Background Information upon which it places reliance.

Liasion and Compliance with Master Project Programme and Budget

3.12 The SDS Provider shall liaise with the Client, any Client Party, **tie**, any **tie** Party, the Tram Supplier, and any other parties as may be required by the Client or **tie** to facilitate the production, by such persons, of any information required from them, in order that the Services and its other obligations under this Agreement can be progressed according to the Master Project Programme and the Programme. The SDS Provider shall liaise with the Client, any Client Party, **tie**, any **tie** Party, the Tram Supplier, and any other parties as may be required by the Client or **tie** as often as is necessary in order to ensure that the Services and its other obligations under this Agreement are performed properly and in accordance with the terms of this Agreement.

3.13 The SDS Provider shall collaborate and liaise with the Client throughout the performance of the Services, inter alia, to ensure due consideration is given to the

type of materials and optimum and cost effective construction methods, construction programme and temporary works, as appropriate.

3.14 Where the Client, or other bodies or persons involved in related works or services appoint other consultants or use their own staff for purposes related to the Services or the SDS Provider's other obligations under this Agreement, the SDS Provider shall use all reasonable endeavours (including the use of liaison with such other bodies or persons) to ensure that the Services, the SDS Provider's other obligations under this Agreement and these related works are carried out together with the greatest economy and in accordance with the Master Project Programme and the Programme.

3.15 In performing the Services and its other obligations under this Agreement, the SDS Provider will have regard to the constraints imposed by the Master Project Programme and the Programme and to the objective of keeping the overall costs of the Services and its other obligations under this Agreement within any budgetary constraints agreed with the Client. If the SDS Provider considers that there may be a conflict between its obligations under this Clause 3.15 and the performance of the Services and/or the performance of any of the SDS Provider's obligations under this Agreement, it will within 3 Business Days give written notice of the same to the Client.

Provision of all labour, goods, materials and services

3.16 The SDS Provider shall provide all labour, goods, materials and services whether of a temporary or permanent nature required in and for the execution of the Services and its other obligations under this Agreement so far as the necessity for providing the same is specified in this Agreement or could reasonably be foreseen therefrom by a system design services provider experienced in work of similar nature and scope as the Services.

Prohibited Materials

3.17 The SDS Provider warrants to the Client that it has not specified for use and shall use the standard of skill and care provided for in Clause 3.2 not to specify for use and shall use such skill and care consistent with any supervisory and inspection responsibilities to be undertaken as part of the Services to see that there shall not be used, any materials which at the time of specification or use (as the case may be):

3.17.1 are known to be deleterious in the particular circumstances in which they are specified to be used (either to health and safety or to the durability of any works on which the SDS Provider is employed by the Client); or

3.17.2 contravene any relevant standard or code of practice issued from time to time by the BSI Group or under a European directive relating to standards; or

3.17.3 do not accord with the guidelines contained in the edition of the publication "Good Practice in Selection of Construction Materials" (Ove Arup & Partners) current at the date of specification of use; or

3.17.4 contravene Good Industry Practice.

CDM Regulations

3.18 The SDS Provider warrants to the Client that it shall carry out and fulfil the responsibilities of a "Designer" imposed by the CDM Regulations and shall co-operate with and supply any required information to any planning supervisor appointed by **tie** or the Infraco (as appropriate) in the performance by the planning supervisor of its obligations under the CDM Regulations. The SDS Provider shall notify the Client as soon as it becomes aware, or reasonably anticipates that it shall

have insufficient resources or the necessary competence to comply with its obligations under the CDM Regulations.

Mitigation and Open Book Accounting

3.19 The SDS Provider undertakes to co-operate with the Client in order to facilitate the performance of this Agreement and in particular will:

3.19.1 approach all pricing, estimating and budgeting functions on a collaborative and Open Book Basis;

3.19.2 use reasonable endeavours to avoid unnecessary complaints, disputes and claims against or with the Client;

3.19.3 not interfere with the rights of the Client in performing its obligations under this Agreement, nor in any other way hinder or prevent the Client from performing those obligations or from enjoying the benefits of its rights;

3.19.4 take reasonable steps to mitigate any costs, unnecessary acts, foreseeable losses and liabilities of the Client; and

3.19.5 take all reasonable steps to manage, minimise and mitigate all costs.

Investigations and Surveys

3.20 The SDS Provider shall notify the Client of any ground, physical, geophysical investigations or archaeological or ecological surveys or any other investigations or surveys which it intends to carry out.

Procurement Support

3.21 The SDS Provider shall make suitable facilities and resources available upon reasonable notice from the bidders for the Infraco Contract and the Tram Supply Contract to permit and facilitate the ability of these bidders to thoroughly examine, check and satisfy themselves as to the adequacy, correctness and suitability of the Deliverables which have been created by the SDS Provider and which the Infraco and the Tram Supplier will be adopting and making use of respectively in the Infraco Contract and the Tram Supply Contract. No additional costs shall be paid to the SDS Provider in respect of the provision of such suitable facilities and resources or the supply to bidders of any Deliverables as part of the procurement process.

3.22 The SDS Provider shall permit the bidders for the Infraco Contract and the Tram Supply Contract to carry out a due diligence exercise on this Agreement (including any commercial terms) prior to the award of the Infraco Contract and the Tram Supply Contract provided that **tie** shall procure that such bidders are required to enter into a confidentiality agreement or other agreement incorporating provisions on confidentiality.

3.23 The SDS Provider agrees to adhere to the bidding protocols be developed and issued by **tie** relative to the procurement of the Infraco Contract and the Tram Supply Contract which shall cover issues including interaction with the bidders, limits of assistance to be given to the bidders, confidentiality, collusion, development of the design and continuing performance of the Services.

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3.19.3 not interfere with the rights of the Client in performing its obligations under this Agreement, nor in any other way hinder or prevent the Client from performing those obligations or from enjoying the benefits of its rights;

3.19.4 take reasonable steps to mitigate any costs, unnecessary acts, foreseeable losses and liabilities of the Client; and

3.19.5 take all reasonable steps to manage, minimise and mitigate all costs.

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3.20 The SDS Provider shall notify the Client of any ground, physical, geophysical investigations or archaeological or ecological surveys or any other investigations or surveys which it intends to carry out.

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3.21 The SDS Provider shall make suitable facilities and resources available upon reasonable notice from the bidders for the Infraco Contract and the Tram Supply Contract to permit and facilitate the ability of these bidders to thoroughly examine, check and satisfy themselves as to the adequacy, correctness and suitability of the Deliverables which have been created by the SDS Provider and which the Infraco and the Tram Supplier will be adopting and making use of respectively in the Infraco Contract and the Tram Supply Contract. No additional costs shall be paid to the SDS Provider in respect of the provision of such suitable facilities and resources or the supply to bidders of any Deliverables as part of the procurement process.

3.22 The SDS Provider shall permit the bidders for the Infraco Contract and the Tram Supply Contract to carry out a due diligence exercise on this Agreement (including any commercial terms) prior to the award of the Infraco Contract and the Tram Supply Contract provided that tie shall procure that such bidders are required to enter into a confidentiality agreement or other agreement incorporating provisions on confidentiality.

3.23 The SDS Provider agrees to adhere to the bidding protocols be developed and issued by tie relative to the procurement of the Infraco Contract and the Tram Supply Contract which shall cover issues including interaction with the bidders, limits of assistance to be given to the bidders, confidentiality, collusion, development of the design and continuing performance of the Services.

Defects Rectification

3.24 The SDS Provider shall assist the Infraco as appropriate in the design and execution of any defects rectification relative to the Edinburgh Tram Network, and in obtaining a defects rectification certificate from **tie.**

System Integration

3.25 The SDS Provider shall liaise with the Operator as instructed by the Client in relation to:

3.25.1 system operation and related design issues;

3.25.2 commissioning and Trial Operation; and

3.25.3 operational defects.

3.26 The SDS Provider shall be responsible for ensuring that all elements of the design relative to the Edinburgh Tram Network **are compatible with system integration and** the SDS Provider shall make qualified personnel available to support the the Client in the discharge of its responsibilities to ensure system integration.

Traffic Management Protocol

3.27 The SDS Provider shall undertake the development of a traffic management protocol (with a view to this document becoming part of the Infraco Contract), and shall attend all meetings with the Client, **tie,** CEC, any other Relevant Authorities and the Operator to discuss traffic management issues.

4. DEVELOPMENT, REVIEW, FINALISATION AND DELIVERY OF THE DELIVERABLES

4.1 The SDS Provider shall develop and finalise the Deliverables in accordance with this Agreement, and the Client shall be entitled to review the Deliverables in accordance with Schedule 9 (*Review Procedure).*

4.2 The SDS Provider shall submit the design of any changes and any other Deliverables associated with any changes developed pursuant to Clause 15 (*Changes*) to the Client's Representative for review pursuant to Schedule 9 (*Review Procedure*).

4.3 The SDS Provider shall allow the Client's Representative, at any time, a reasonable opportunity to view any Deliverable at any stage of development, and this opportunity shall be made available to the Client's Representative as soon as reasonably practicable following receipt of any written request from the Client's Representative.

4.4 The SDS Provider shall establish and maintain a computerised database/repository which the Client, the Client's Representative, **tie**, any **tie** Parties and any other party reasonably required by **tie** may access remotely by computer (through an appropriate login/security regime) to view drawings comprised within the Deliverables and electronically store and/or print copies of such Deliverables.

4.5 The SDS Provider shall, as soon as reasonably practicable after the Effective Date, submit to the Client's Representative a submittal programme setting out the order in which each Deliverable is to be submitted. The SDS Provider may, as necessary, update such programme and shall submit the same from time to time to the Client's Representative so that the Client has at least 14 days' notice of any revision to the periods shown in the previous submittal programme and the SDS Provider shall submit to the Client's Representative five copies of each Deliverable no later than the end of the period shown in the submittal programme for that Deliverable.

4.6 Where the Client's Representative does not consider that the Client will be able to comply with the periods specified in Schedule 9 (*Review Procedure*) for indicating 'no objection' status or the making of objections in relation to any Deliverable because of the volume of documents to be received in accordance with the submittal programme, the Client's Representative may introduce an alternative timetable and the SDS Provider shall comply with such alternative timetable. Provided that, where the Client is unable to comply with the time periods set out in Schedule 9 (*Review Procedure*) and such inability is not due to any breach of this Agreement, omission or fault on the part of the SDS Provider, the introduction of an alternative timetable shall be treated as a Client Change and the terms of Clause 15 (*Changes*) shall apply.

4.7 During the preparation of the Deliverables, the Client and/or the Client's Representative shall at its discretion be entitled to call for a meeting to discuss the development of any Deliverable, and the SDS Provider shall give due consideration to any comments made by the Client or the Client's Representative at any such meetings. As soon as reasonably practicable following any such meeting, the SDS Provider will prepare and circulate to those attending the meeting a report listing the Deliverables discussed and any comments made at such meeting.

4.8 If it should be found that the Deliverables do not fulfil the requirements of this Agreement or the needs of any Approval Bodies, the SDS Provider shall at its own expense amend the Deliverable. Such amendment shall be made in accordance with Schedule 9 (*Review Procedure*) and such amendment and rectification shall ensure that the Deliverable shall satisfy the requirements of this Agreement and any Approval Bodies.

4.9 The SDS Provider shall provide the Client with all Deliverables in accordance with the terms of this Agreement and where no timescale for provision of such Deliverables is specified, such Deliverables shall be provided to the Client as soon as reasonably practicable. The SDS Provider shall provide to the Client, at no cost to the Client, five copies of the Deliverables in hard copy form and one copy in an agreed soft copy form (as appropriate to the format of the Deliverables). In respect of any further copies of a particular Deliverable, the Client may require or which tie may require, the SDS Provider agrees to absorb the reasonable copying charges or other reasonable charges for provision of the same to the Client as the Client requires and for the purposes of achieving all Consents.

4.10 In addition to the requirements of Clause 4.9, the SDS Provider shall provide to the Client, at no cost to the Client, five copies in hard copy form and one copy in an agreed soft copy form of the as-built drawings and any manuals prepared.

4.11 The SDS Provider accepts all risks arising from any conflicts, ambiguities, discrepancies, errors or omissions that subsequently appear within or between any of the Functional Requirements Specifications, the Technical Specifications and any of the other Deliverables, and the SDS Provider shall not be entitled to make any claim against the Client for an extension of time, payment or otherwise in respect of any such conflicts, ambiguities, discrepancies, errors or omissions.

4.12 The SDS Provider shall within 3 Business Days notify the Client upon becoming aware of any conflicts, ambiguities, discrepancies, errors or omissions within or between any of the Functional Requirements Specifications, the Technical Specifications, and any of the other Deliverables. Where there are any conflicts, ambiguities, discrepancies, errors or omissions, the SDS Provider shall provide with any notification its proposals for resolving such conflicts, ambiguities, discrepancies, errors or omissions in compliance with this Agreement. Such proposals could include the suggestion that no action is required. The SDS Provider shall proceed with its proposals to resolve any such conflicts, ambiguities, discrepancies, errors or omissions as soon as reasonably practicable. If the proposal from the SDS Provider

is that no action is required or the Client does not agree with the action proposed by the SDS Provider, the Client may notify the SDS Provider, within 10 Business Days of the SDS Provider's notice, to resolve any conflicts, ambiguities, discrepancies, errors or omissions in a different manner (which notification shall be binding on the SDS Provider).

4.13 The SDS Provider shall develop the Functional Requirements Specifications and the Technical Specifications using innovative solutions which are in accordance with Good Industry Practice.

5. CONSENTS

5.1 The SDS Provider shall (at its own cost and expense):

5.1.1 obtain and maintain in effect all Consents which may be required for the construction, installation, commissioning, completion and opening of the Edinburgh Tram Network as is consistent with, required by or contained within the Services; and

5.1.2 implement each Consent within the period of its validity and in accordance with its terms.

5.2 The SDS Provider shall provide copies of such Consents to the Client's Representative. At the request of the SDS Provider, the Client may at its discretion render appropriate assistance, without any obligation, in relation to obtaining any Consent.

5.3 Acknowledgement by the Client of the copies of Consents provided to them pursuant to Clause 5.2 shall not in any way affect the SDS Provider's obligations or relieve the SDS Provider from its obligations pursuant to this Clause 5 (*Consents*) or otherwise.

5.4 The SDS Provider shall provide the Client with a programme of Consents to be obtained within 30 days of the Effective Date and shall update the programme on a monthly basis showing progress and any new Consents to be obtained. The Client shall be entitled to request information in relation to the progress of the application for any such Consent and the Consent itself and the SDS Provider shall provide the same at no cost to the Client.

6. QUALITY ASSURANCE

6.1 The SDS Provider shall operate a quality management system, and comply with such system. Such quality management system shall be reflected in appropriate quality management plans, the standard of which shall comply with BS EN 150 9001:2000. Such plans shall be developed in accordance with the Review Procedure.

6.2 If in the opinion of the Client, any Deliverable is not prepared in accordance with the SDS Provider's quality management system or with any other provision of the Agreement, the Client shall so inform the SDS Provider in writing giving reasons. Such non-compliance shall be treated as an error or omission in the performance of the Services and the provisions of Clause 18 (*Errors and/or Omissions in the* Services) shall apply.

6.3 Compliance with any such approved quality management system shall not relieve the SDS Provider from any of its other duties, obligations or liabilities under this Agreement.

7. PROGRESS

7.1 Master Project Programme, Programme Phasing Structure and Programme

7.1.1 The SDS Provider shall progress the Services with due expedition and in a timely and efficient manner without delay, to achieve timeous completion of the Services (or any part thereof) and its other obligations under this Agreement in accordance with the Master Project Programme and unless otherwise agreed with the Client, the SDS Provider shall adhere to that Master Project Programme with due diligence.

7.1.2 Within 30 days of the Effective Date, the SDS Provider shall update the Programme with detailed programme information and shall thereafter maintain update and amend the Programme in accordance with the requirements set out in paragraph 4 of Schedule 1 *(Scope of Services)* and/or at additional or other intervals as may be reasonably required by the Client. Any updates or amendments to the Programme shall be approved by the Client in accordance with the Review Procedure or as may be otherwise agreed in writing by the Client.

7.2 The SDS Provider shall carry out the Services required in respect of the Requirements Definition Phase, the System-Wide Preliminary Design Requirements, the Preliminary Design Phase, and the Detailed Design Phase in the order of "criticality" (with "A" being the most critical), sequence and dates shown in the Programme Phasing Structure PROVIDED ALWAYS that the Client may at any time require the SDS Provider to stop, amend and/or accelerate such order of performance in respect of the whole or any part of the Requirements Definition Phase, the System-Wide Preliminary Design Requirements, the Preliminary Design Phase and/or the Detailed Design Phase. Any such stop, amendment or acceleration shall be complied with as soon as reasonably practicably by the SDS Provider subject to the following procedure (unless otherwise agreed by the Parties):

7.2.1 the SDS Provider shall provide an Estimate to the Client for any required stop, amendment or acceleration within 5 Business Days of any request from the Client;

7.2.2 any Estimate provided by the SDS Provider shall include the opinion of the SDS Provider (acting reasonably) on the following matters:

7.2.2.1 whether relief from compliance with any of its obligations under this Agreement is required as a result of the required stop, amendment or acceleration;

7.2.2.2 any impact on the performance of the Services;

7.2.2.3 any impact on the Master Project Programme and the Programme, and any requirement for an extension of time;

7.2.2.4 any amendment required to the Agreement as a result of the required stop, amendment or acceleration,

7.2.2.5 the proposed method of delivery of the required stop, amendment or acceleration;

7.2.2.6 proposals to mitigate the impact of the required stop, amendment or acceleration; and

7.2.2.7 any increase or decrease in any sums due to be paid to the SDS Provider (including any milestone payments and lump sum payments) as a result of the required stop, amendment or acceleration.

7.2.3 the valuation of any required stop, amendment or acceleration shall be added to or deducted from the sums due to be paid to the SDS Provider as the case may be and shall be ascertained, by the Client as follows:

7.2.3.1 by measurement and valuation at the rates and prices for similar work in Schedule 3 *(Pricing Schedule)* insofar as such rates and prices apply;

7.2.3.2 if such rates and prices do not apply by measurement and valuation at rates and prices deduced therefrom insofar as it is practical to do so;

7.2.3.3 if such rates and prices do not apply and it is not practicable to deduce rates and prices therefrom by measurement and/or valuation at fair rates and prices; or

7.2.3.4 if the value of the required stop, amendment or acceleration cannot properly be ascertained by measurement and/or valuation, the value of the resources and labour employed thereon, as appropriate, in accordance with the basis of rates for provisional work set out in Schedule 3 (*Pricing Schedule*);

provided that where any required stop, amendment or acceleration would otherwise fall to be valued under Clauses 7.2.3.1 and 7.2.3.2 above, but the Client's Representative is of the opinion that the instruction therefor was issued at such a time or was of such content as to make it unreasonable for the alteration or addition to be so valued, the value of the required stop, amendment or acceleration shall be ascertained by measurement and/or valuation at fair rates and prices.

7.2.4 The SDS Provider shall include in the Estimate evidence demonstrating that:

7.2.4.1 the SDS Provider has used all reasonable endeavours to minimise (including by the use of competitive quotes) any increase in costs and to maximise any reduction of costs;

7.2.4.2 the SDS Provider has, where required by the Client, sought competitive quotes from persons other than the SDS Provider Parties in pursuance of its obligation under Clause 7.2.4.1 above;

7.2.4.3 the SDS Provider has investigated how to mitigate the impact of the required stop, amendment or acceleration; and

7.2.4.4 the required stop, amendment or acceleration will, where relevant, be implemented in the most cost-effective manner.

7.2.5 As soon as reasonably practicable after the Client receives the Estimate, the Parties shall discuss and agree the issues set out in the Estimate. From such discussions the Client may modify its original instruction in relation to the required stop, amendment or acceleration, and the Client may require the SDS Provider to seek and evaluate competitive tenders. In each case, the SDS Provider shall, as soon as practicable, and in any event not more than

14 days after receipt of such instruction, notify the Client of any consequential changes to the Estimate.

7.2.6 If the Parties cannot agree on the contents of the Estimate, then either Party may refer the Estimate for determination in accordance with the Dispute Resolution Procedure

7.2.7 As soon as reasonably practicable after the contents of the Estimate have been agreed or determined pursuant to the Dispute Resolution Procedure the Client shall:

7.2.7.1 confirm its instruction in relation to the required stop, amendment or acceleration; or

7.2.7.2 withdraw its instruction in relation to the required stop, amendment or acceleration.

7.2.8 If the Client does not confirm its instruction in relation to the required stop, amendment or acceleration within 30 days of the contents of the Estimate having been agreed or determined pursuant to Clause 7.2.7, then the instruction in relation to the required stop, amendment or acceleration shall be deemed to have been withdrawn.

7.3 Design and Technical Gateway Process

Gateway from the Requirements Definition Phase to the preparation of the System-Wide Preliminary Design Requirements

7.3.1 The SDS Provider shall, within 3 Business Days, notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the Requirements Definition Phase and that all matters to be agreed during the Requirements Definition Phase have been agreed between the SDS Provider and the Client. Without limitation, the SDS Provider shall not serve such notice until the Services described in paragraph 2.3 of Schedule 1 (*Scope of Services*) have been completed.

7.3.2 If the Client agrees that all of such Services have been completed and/or the relevant matters agreed, the Client shall issue a Milestone Completion Certificate and notify the SDS Provider in writing within 10 Business Days that the preparation of the System-Wide Preliminary Design Requirements can commence. Subject to Clause 7.2 and notwithstanding that a Milestone Completion Certificate may have been issued by the Client, the SDS Provider shall not commence the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) until the Client shall have confirmed such commencement by notice in writing to the SDS Provider.

7.3.3 To the extent that the Client considers that any Services have not been completed by the SDS Provider and/or the relevant matters agreed, the Client shall within 10 Business Days notify the SDS Provider in writing accordingly, including details of the further activities to be carried out by the SDS Provider in order to complete such Services.

7.3.4 After receiving any notification from the Client under Clause 7.3.3, the SDS Provider shall within 3 Business Days re-notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the Requirements Definition Phase and that all matters to be agreed during the Requirements Definition Phase have been agreed between the SDS Provider and the Client, and the provisions of Clauses 7.3.1 to 7.3.3 shall apply mutatis mutandis to such re-notification.

7.3.5 To the extent that some but not all of the Services in respect of the Requirements Definition Phase have been completed and/or relevant matters agreed, the Client may, in its sole discretion, notify the SDS Provider in writing that the preparation of the System-Wide Preliminary Design Requirements shall commence and in such circumstances:

7.3.5.1 the Client may direct that some or all of the preparation of the System-Wide Preliminary Design Requirements shall be commenced; and

7.3.5.2 the SDS Provider shall continue to provide the Services in respect of the Requirements Definition Phase until (i) the relevant Services have been completed, and (ii) all matters to be agreed during Requirements Definition Phase have been agreed between the SDS Provider and the Client, or until the Client otherwise directs;

PROVIDED ALWAYS that the Client shall not issue a Milestone Completion Certificate in respect of the Requirements Definition Phase until all of the Services have been completed and/or the relevant matters agreed.

Gateway from the preparation of the System-Wide Preliminary Design Requirements to the Preliminary Design Phase in respect of each Sub-Sector

7.3.6 The SDS Provider shall within 3 Business Days notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the preparation of the System-Wide Preliminary Design Requirements and that all matters to be agreed in respect of the preparation of the System-Wide Preliminary Design Requirements have been agreed between the SDS Provider and the Client. Without limitation, the SDS Provider shall not serve such notice until the relevant Services described in paragraph 2.4 of Schedule 1 (*Scope of Services*) have been completed to a high level for the whole System.

7.3.7 If the Client agrees that all of such Services have been completed and/or the relevant matters agreed, the Client shall issue a Milestone Completion Certificate and notify the SDS Provider in writing within 10 Business Days that the Preliminary Design Phase in respect of each Sub-Sector can commence. Subject to Clause 7.2 and notwithstanding that a Milestone Completion Certificate may have been issued by the Client, the SDS Provider shall not commence the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) until the Client shall have confirmed such commencement by notice in writing to the SDS Provider.

7.3.8 To the extent that the Client considers that any Services have not been completed by the SDS Provider and/or the relevant matters agreed, the Client shall within 10 Business Days notify the SDS Provider in writing accordingly, including details of the further activities to be carried out by the SDS Provider in order to complete such Services.

7.3.9 After receiving any notification from the Client under Clause 7.3.8, the SDS Provider shall within 3 Business Days re-notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the System-Wide Preliminary Design Requirements and that all matters to be agreed during the System-Wide Preliminary Design Requirements have been agreed between the SDS Provider and the Client, and the provisions of Clauses 7.3.6 to 7.3.9 shall apply mutatis mutandis to such re-notification.

7.3.10 To the extent that some but not all of the Services in respect of the preparation of the System-Wide Preliminary Design Requirements have been completed and/or the relevant matters agreed, the Client may, in its sole discretion, notify the SDS Provider in writing that the Preliminary Design Phase in respect of each Sub-Sector or Sector (as appropriate) shall commence and in such circumstances:

7.3.10.1 the Client may direct that some or all of the Services in respect of the Preliminary Design Phase shall be commenced; and

7.3.10.2 the SDS Provider shall continue to provide the Services in respect of the preparation of the System-Wide Preliminary Design Requirements until (i) the relevant Services have been completed, and (ii) all matters to be agreed in respect of the preparation of the System-Wide Preliminary Design Requirements have been agreed between the SDS Provider and the Client, or until the Client otherwise directs.

PROVIDED ALWAYS that the Client shall not issue a Milestone Completion Certificate in respect of the preparation of the System-Wide Preliminary Design Requirements until all of the Services have been completed and/or the relevant matters agreed.

Gateway from the Preliminary Design Phase in respect of each Sub-Sector or Sector (as appropriate) to the Detailed Design Phase in respect of each Sub-Sector or Sector (as appropriate)

7.3.11 In respect of each Sub-Sector or Sector (as appropriate), the SDS Provider shall within 3 Business Days notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the Preliminary Design Phase in respect of each Sub-Sector or Sector (as appropriate) and that all matters to be agreed in respect of the Preliminary Design Phase in respect of each Sub-Sector or Sector (as appropriate) have been agreed between the SDS Provider and the Client. Without limitation, the SDS Provider shall not serve such notice until the Services described in paragraph 2.4 of Schedule 1 (*Scope of Services*) have been completed.

7.3.12 If the Client agrees that all of such Services have been completed and/or the relevant matters agreed in respect of a Sub-Sector or Sector (as appropriate), the Client shall issue a Milestone Completion Certificate within 10 Business Days. Subject to Clause 7.2 and notwithstanding that a Milestone Completion Certificate may have been issued by the Client, the SDS Provider shall not commence the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) until the Client shall have confirmed such commencement by notice in writing to the SDS Provider.

7.3.13 To the extent that the Client considers that any Services have not been completed by the SDS Provider and/or the relevant matters agreed, the Client shall within 10 Business Days notify the SDS Provider in writing accordingly, including details of the further activities to be carried out by the SDS Provider in order to complete such Services.

7.3.14 After receiving any notification from the Client under Clause 7.3.13, the SDS Provider shall within 3 Business Days re-notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the Preliminary Design Phase in respect of such Sub-Sector or Sector (as appropriate) and that all matters to be agreed during the

Preliminary Design Phase in respect of such Sub-Sector or Sector (as appropriate) have been agreed between the SDS Provider and the Client, and the provisions of Clauses 7.3.11 to 7.3.13 shall apply mutatis mutandis to such re-notification.

7.3.15 To the extent that some but not all of the Services to be carried out pursuant to the Preliminary Design Phase in respect of a Sub-Sector or Sector (as appropriate) have been completed and/or the relevant matters agreed, the Client may, in its sole discretion, notify the SDS Provider in writing that the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) shall commence and in such circumstances:

7.3.15.1 the Client may direct that some or all of the Services to be performed pursuant to the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) shall be commenced; and

7.3.15.2 the SDS Provider shall continue to provide the Services to be carried out pursuant to Preliminary Design Phase in respect of such Sub-Sector or Sector (as appropriate) until (i) the relevant Services have been completed, and (ii) all matters to be agreed in respect of the Preliminary Design Phase in respect of such Sub-Sector or Sector (as appropriate) have been agreed between the SDS Provider and the Client, or until the Client otherwise directs.

PROVIDED ALWAYS that the Client shall not issue a Milestone Completion Certificate in respect of the Detailed Design Phase for such Sub-Sector or Sector (as appropriate) until all of the Services have been completed and/or the relevant matters agreed.

Completion of the Detailed Design Phase in respect of each Sub-Sector or Sector (as appropriate)

7.3.16 In respect of each Sub-Sector or Sector (as appropriate), the SDS Provider shall within 3 Business Days notify the Client when the SDS Provider considers that it has completed each of the Services to be carried out pursuant to the Detailed Design Phase in respect of each Sub-Sector or Sector (as appropriate) and that all matters to be agreed in respect of the Detailed Design Phase in respect of each Sub-Sector or Sector (as appropriate) have been agreed between the SDS Provider and the Client. Without limitation, the SDS Provider shall not serve such notice until the Services described in paragraph 2.6 of Schedule 1 (*Scope of Services*) have been completed.

7.3.17 If the Client agrees that all of such Services have been completed and/or the relevant matters agreed in respect of a Sub-Sector or Sector (as appropriate), the Client shall issue a Milestone Completion Certificate within 10 Business Days.

7.3.18 To the extent that the Client considers that any Services have not been completed by the SDS Provider and/or the relevant matters agreed, the Client shall within 10 Business Days notify the SDS Provider in writing accordingly, including details of the further activities to be carried out by the SDS Provider in order to complete such Services.

7.3.19 After receiving any notification from the Client under Clause 7.3.18, the SDS Provider shall within 3 Business Days re-notify the Client when the SDS

Provider considers that it has completed each of the Services to be carried out pursuant to the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) and that all matters to be agreed during the Detailed Design Phase in respect of such Sub-Sector or Sector (as appropriate) have been agreed between the SDS Provider and the Client, and the provisions of Clauses 7.3.16 to 7.3.18 shall apply mutatis mutandis to such re-notification.

7.4 Delays

7.4.1 Within 3 Business Days of the SDS Provider becoming aware of the likelihood of delay to the performance of any element of the Services such that the Master Project Programme and the Programme are unlikely to be met, the SDS Provider shall notify the Client, informing the Client of the reasons, the likely delay and any measures, with estimated costs, which may mitigate the delay.

7.4.2 Following such notification, the SDS Provider shall promptly provide the Client with all necessary information to enable the Client to approve any amendments to the Master Project Programme and the Programme which the SDS Provider wishes to make in accordance with Clause 7.4.1.

7.4.3 If the Client instructs the SDS Provider to mitigate the delay, any such mitigation shall be at the SDS Provider's expense if the delay was the fault of the SDS Provider, otherwise any costs associated with such instruction will be dealt with as a variation in accordance with Clause 15 (*Changes*).

7.5 Extensions of Time

7.5.1 If for any other reason outwith the control of the SDS Provider and not arising out of the SDS Provider's breach of this Agreement or the SDS Provider's negligent or wilful act or omission, the SDS Provider considers that the SDS Provider is entitled to an extension of time for completion of the Services, the SDS Provider shall within 10 Business Days of becoming aware of such possible entitlement to an extension of time, request an extension of time from the Client stating the reason for the request and clearly indicating the length and basis of calculation of the extension of time requested.

7.5.2 Subject to Clause 7.5.3, within 10 Business Days of receipt of such notice the Client shall respond, either:

(i) agreeing to the extension of time and consequent amendment of the Programme or the Master Project Programme; or

(ii) granting an amended extension of time and consequent amendment of the Programme or the Master Project Programme; or

(iii) clearly stating the further information required before reaching a decision; or

(iv) rejecting the request, clearly stating the Client's reason for doing so.

7.5.3 The SDS Provider shall not be entitled to any extension of time if and to the extent that the SDS Provider could (where such action is within the power of the SDS Provider and the SDS Provider could be reasonably expected to take such action, having regard to the scope and nature of the Services), by the exercise of the standard of skill, care and diligence provided for in Clause 3.2, have prevented or reduced the requirement for such extension of time.

7.6 Client Decisions & Information

7.6.1 Within 3 Business Days of the SDS Provider finding that a Client decision or information essential to the continuity of the Services or to achieving the Master Project Programme and the Programme is likely to be required, the SDS Provider shall give notice of that requirement to the Client with full supporting information including the date by which such decision or information is required to ensure that there is no delay to the continuity of the Services.

7.6.2 The Client shall within 7 days, in liaison with the SDS Provider, determine and notify the SDS Provider in writing of the date by which the decision is to be made or the information is to be provided.

7.6.3 In the event that the Client's notified date or the Client's actual decision or provision of information results in delay to the continuity of Services the matter shall be treated as an extension of time in accordance with Clause 7.5.

7.6.4 Where the SDS Provider makes any recommendation to the Client requiring the decision and agreement of the Client to proceed, any reasonably foreseeable effect of the application of that recommendation not fully described and evaluated by the SDS Provider using the standard of skill, care and diligence provided for in Clause 3.2 to the Client at the time of the recommendation or earlier shall be the full responsibility of the SDS Provider.

7.7 Abortive Work

7.7.1 Immediately that the SDS Provider becomes aware that any element of Services is likely to be Abortive Work for any reason, the SDS Provider shall notify the Client of:

(i) the probable nature of the Abortive Work;

(ii) the cause of the Abortive Work being abortive;

(iii) the estimated effect of the Abortive Work in terms of cost, of time in completion of the Services and of any other matters in relation to the Agreement; and

(iv) any measures to be taken which may mitigate that effect.

7.7.2 The SDS Provider and the Client shall jointly investigate, and the Client shall determine the actual extent of any Abortive Work.

7.7.3 Payment by the Client to the SDS Provider in respect of any Abortive Work which has been carried out by the SDS Provider shall be determined as a variation in accordance with Clause 15 (*Changes*) of this Agreement provided always that no payment shall be due for Abortive Work which has resulted from any fault of the SDS Provider and/or any breach by the SDS Provider of its obligations under this Agreement.

8. KEY PERSONNEL, STAFF AND PROVISION OF ACCOMMODATION FOR THE CLIENT IN EDINBURGH

8.1 The SDS Provider shall ensure that:

8.1.1 the Key Personnel shall have day-to-day responsibility for and be involved in the performance of the Services; and

8.1.2 in addition to the Key Personnel, there shall at all times be a sufficient number of staff (including all relevant grades of supervisory staff) available for the provision of the Services in accordance with this Agreement. This obligation shall include ensuring that there are sufficient staff to cover periods of holiday, sickness and other absences and anticipated and actual peaks in servicing the Client's requirements for the Services.

8.2 The SDS Provider shall locate staff at such locations as the SDS Provider considers convenient for the Project, provided that:

8.2.1 the SDS Provider acknowledges that it will not be entitled to any reimbursement from the Client in relation to the travel of any person to or from Edinburgh, or for the accommodation or subsistence of any person visiting Edinburgh; and

8.2.2 the Client will require the SDS Provider to make the Key Personnel available for meetings in Edinburgh at such times as the Client may, in its sole discretion, direct; and

8.2.3 the SDS Provider's Representative and other members of the SDS Provider's staff (as the Client may reasonably require) shall be required to be located in Edinburgh or such other location as may be reasonably required by the Client.

8.3 The SDS Provider shall ensure that there are no changes to the Key Personnel without the Client's prior written consent (such consent not to be unreasonably withheld or delayed in the case of a change necessitated by sickness or reasonable annual, maternity, paternity or compassionate leave or where one of the Key Personnel's employment ceases) and that any replacement persons shall be of at least equivalent status and ability to the person whom they replace.

8.4 The SDS Provider shall use all reasonable endeavours to ensure the continuity of the personnel assigned to perform the Services and shall select Key Personnel having careful regard to those persons' existing work load and other planned commitments.

8.5 The SDS Provider shall ensure that its Key Personnel and staff shall:

8.5.1 have the level of skill, experience and authority appropriate (i) to the Services to which such staff are allocated and (ii) the standards to be achieved pursuant to this Agreement; and

8.5.2 receive such training and supervision as is necessary to ensure the proper performance of this Agreement and compliance with all regulatory requirements appropriate to and required for the performance of the Services in accordance with this Agreement.

8.6 All Key Personnel should have a nominated deputy who shall be capable of fulfilling the duties of the person to whom they are deputising in the event of their absence and who shall be kept fully informed of project status in the relevant area.

8.7 The SDS Provider shall not, during the period of this Agreement, contract or retain as an adviser or consultant, any person currently or previously employed or engaged as appropriate in the previous 3 months by the Client unless the prior written approval of the Client has been obtained.

8.8 The Client shall be at liberty to object to and require the SDS Provider to remove from the performance of the Services any person employed by the SDS Provider (including any person from any permitted SDS Provider Party) who in the reasonable opinion of the Client misconducts itself or is incompetent or negligent in the performance of its duties or persists in any conduct which is prejudicial to safety or health, and such persons shall not be again employed upon the Services without the permission of the Client. No compensation shall be payable by the Client in respect of such objection and removal.

8.9 If the Client gives the SDS Provider notice that any member of staff should be removed from involvement in the Services, the SDS Provider shall immediately comply with such notice.

8.10 The SDS Provider shall (and shall procure that the Key Personnel, its staff employed in the performance of the Services and the SDS Provider Parties) comply with all regulatory requirements appropriate to and required for the performance of the Services and any rules, regulations and instructions from the Client's Representative.

8.11 Unless co-located with **tie**, the SDS Provider shall provide a dedicated office space at the offices of the SDS Provider for four **tie** personnel with a meeting table for six, desks, chairs, storage, phones, use of printers, photocopiers, fax, an independent IT connection with a dedicated separate line and the usual welfare facilities.

9. SUB-LETTING AND THE APPOINTMENT OF SDS PROVIDER PARTIES

9.1 The SDS Provider shall not sub-let the whole of the Services.

9.2 Subject to Clause 9.3, the SDS Provider may sub-let part of the Services with the prior written approval of the Client to a sub-consultant, supplier, sub-contractor, specialist and/or other party for performance of that specific part of the Services.

9.3 The SDS Provider shall supply all relevant information (including curriculum vitae, financial and legal information, information on relevant experience and technical capacity, insurance details and the methodology for provision of the sub-let services) required by the Client to enable a decision to be made by the Client on the suitability of the proposed sub-consultant, supplier, sub-contractor, specialist and/or other party to perform the relevant part of the Services. The Client's decision on the use of any sub-consultant, supplier, sub-contractor, specialist and/or other party shall be final.

9.4 The SDS Provider shall be wholly responsible for the performance of the Services including any part of the Services carried out by any SDS Provider Party appointed by the SDS Provider.

9.5 Within 14 days of any written request from the Client, the SDS Provider shall procure collateral warranties from Corderoy, Halcrow and Ian White Associates, and shall use reasonable endeavours to procure the execution of a collateral warranty by any other SDS Provider Party in the Client's or **tie's** favour or in favour of such other party as may be reasonably required by the Client, and in a form acceptable to the Client (acting reasonably).

10. MANAGEMENT OF THE SERVICES

10.1 The Client's Representative shall:

10.1.1 be responsible for the day to day supervision of the Services to be performed by the SDS Provider;

10.1.2 exercise the functions and powers of the Client in relation to the Project which are identified in this Agreement;

10.1.3 exercise such other functions and powers of the Client under this Agreement as the Client may notify to the SDS Provider from time to time; and

10.1.4 be the primary point of contact for the SDS Provider with the Client;

and the SDS Provider shall observe, and shall procure that any SDS Provider Parties observe, all reasonable instructions of the Client and the Client's Representative in relation to this Agreement. The SDS Provider shall not and shall procure that any SDS Provider Parties shall not act upon any instruction from any other party unless confirmed by the Client or the Client's Representative in writing. If the SDS Provider or any SDS Provider Parties shall receive any such instructions, the SDS Provider shall notify the Client or the Client's Representative immediately.

10.2 The Client's Representative shall be entitled at any time, by notice in writing to the SDS Provider, to authorise any other persons to exercise the functions and powers of the Client delegated to him, either generally or specifically. Until further notice from the Client, any act of any such person shall, for the purposes of this Agreement, constitute an act of the Client's Representative and all references to "the Client's Representative" in this Agreement (apart from this Clause 10 (*Management of the Services*)) shall be taken as references to such person so far as they concern matters within the scope of such person's authority.

10.3 The Client may by notice in writing to the SDS Provider change the identity of the Client's Representative. The Client shall consult with the SDS Provider prior to the appointment of any replacement for the Client's Representative, taking account of the need for liaison and continuity in respect of this Agreement. Such change shall have effect on the date specified in the written notice.

10.4 During any period when a Client's Representative has not been appointed (or when the Client's Representative is unable through illness, incapacity or any other reason whatsoever to carry out or exercise his functions under this Agreement), the Client shall carry out the functions which would otherwise be performed by the Client's Representative.

10.5 No decision, act or omission of the Client, or the Client's Representative shall, except as otherwise expressly provided in this Agreement:

10.5.1 in any way relieve or absolve the SDS Provider from, modify, or act as a waiver or personal bar of, any liability, responsibility, obligation or duty under this Agreement;

10.5.2 in the absence of an express written instruction or authorisation issued by the Client under Clause 15 (*Changes*), constitute or authorise a variation; or

10.5.3 be construed as restricting or binding the Client in any way save with regard to the specific project matters to which it relates.

10.6 The SDS Provider shall be entitled to treat all instructions and directions of the Client's Representative as those of the Client provided always that such instructions or directions of the Client's Representative are in writing, are not in conflict with or are inconsistent with this Agreement or any other express instructions or directions of the Client, and the SDS Provider shall not be required to determine whether an express

authority has in fact been given. The SDS Provider shall, as soon as reasonably practicable, bring to the attention of the Client any instructions or directions that are given to the SDS Provider that are ambiguous or in conflict or are inconsistent, and the Client will verify such instructions in writing.

10.7 If for any reason the Client's Representative considers it necessary to give any instructions or directions orally, then, provided that the Client confirms such instruction or direction within five Business Days, such oral instruction or direction shall be deemed to be an express instruction or direction of the Client.

10.8 The SDS Provider shall appoint a representative ("SDS Provider's Representative") who shall:

10.8.1 act as the principal point of contact for the Client, and the Client's Representative in relation to all matters related to this Agreement;

10.8.2 have full authority to act on behalf of the SDS Provider for all purposes of this Agreement, and the Client and the Client's Representative shall be entitled to treat all instructions and directions of the SDS Provider's Representative as those of the SDS Provider;

10.8.3 manage and co-ordinate the provision of the Services by the SDS Provider (and any SDS Provider Party) and the integration of provision of the Services with the tasks being performed by the Client's internal team and the other advisers appointed by the Client; and

10.8.4 liaise with the Client's Representative in relation to various matters including the scope of the Services to be carried out from time to time.

10.9 The SDS Provider may by written notice to the Client change the identity of the SDS Provider's Representative. Where the SDS Provider wishes to do so, it shall by written notice to the Client propose a substitute for approval, taking account of the need for liaison and continuity in respect of the provision of the Services and the Master Project Programme and the Programme when the change is proposed. Such appointment shall be subject to the prior written approval of the Client (not to be unreasonably withheld or delayed).

10.10 The SDS Provider shall also nominate a deputy to the SDS Provider's Representative. During any period when the SDS Provider's Representative is unable through illness, incapacity, annual leave or any other reason whatsoever to carry out or exercise his functions under this Agreement, such deputy shall carry out the functions which would otherwise be performed by the SDS Provider's Representative.

11. METHODS OF PAYMENT

11.1 The fees for the performance of the Services shall be a combination of:

11.1.1 milestone payments incorporating sub-milestone payments, as set out in Schedule 3 *(Pricing Schedule)*, or as may be otherwise agreed by the Client in accordance with this Agreement;

11.1.2 a fixed lump sum or sums as set out in Schedule 3 *(Pricing Schedule)*, or as may be otherwise agreed by the Client in accordance with this Agreement; and/or

11.1.3 a time based fee as may be agreed by the Client in accordance with this Agreement and in accordance with the relevant rates set out in Schedule 3 (*Pricing Schedule*) to this Agreement.

11.2 Any applications for payments for sums due under this Agreement shall be made in accordance with the procedure set out in Clause 12 (*Arrangements for Invoicing and Payment*) and any payment which is due to the SDS Provider shall be paid by the Client in accordance with the procedure set out in Clause 12 (*Arrangements for Invoicing and Payment*).

11.3 During the Requirements Definition Phase, the SDS Provider shall make applications for Requirements Definition Phase Sub-Milestone Payments in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) for completed Requirements Definition Phase Sub-Milestones up to a cumulative value of fifty per cent (50%) of the total value of the Requirements Definition Phase Milestone Payment. The SDS Provider shall not make application for payment for any incomplete Requirements Definition Phase Sub-Milestones and the Client's decision as to whether any Requirements Definition Phase Sub-Milestone is complete shall be final. The SDS Provider shall make an application for payment of the remaining fifty per cent (50%) of the total value of the Requirements Definition Phase Milestone Payment following the issue of the Milestone Completion Certificate by the Client in respect of the Requirements Definition Phase.

11.4 The SDS Provider shall make an application for payment in respect of the System-Wide Preliminary Design Requirements in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) following the issue of the Milestone Completion Certificate by the Client for the System-Wide Preliminary Design Requirements.

11.5 During the Preliminary Design Phase, the SDS Provider shall make applications for Preliminary Design Phase Sub-Milestone Payments in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) for completed Preliminary Design Phase Sub-Milestones in respect of each Sub-Sector or Sector (as appropriate) up to a cumulative value of eighty per cent (80%) of the total value of the Preliminary Design Phase Milestone Payment for the relevant Sub-Sector or Sector (as appropriate). The SDS Provider shall not make application for payment for any incomplete Preliminary Design Phase Sub-Milestones and the Client's decision as to whether any Preliminary Design Phase Sub-Milestone is complete shall be final. The SDS Provider shall make an application for payment in respect of the remaining twenty per cent (20%) of the total value of the Preliminary Design Phase Milestone Payment for the relevant Sub-Sector or Sector (as appropriate) following the issue of the Milestone Completion Certificate by the Client in respect of the Preliminary Design Phase for the relevant Sub-Sector or Sector (as appropriate).

11.6 During the Detailed Design Phase, the SDS Provider shall make applications for Detailed Design Phase Sub-Milestone Payments in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) for completed Detailed Design Phase Sub-Milestones in respect of each Sub-Sector or Sector (as appropriate) up to a cumulative value of eighty per cent (80%) of the total value of the Detailed Design Phase Milestone Payment for the relevant Sub-Sector or Sector (as appropriate). The SDS Provider shall not make application for payment for any incomplete Detailed Design Phase Sub-Milestones and the Client's decision as to whether any Detailed Design Phase Sub-Milestone is complete shall be final. The SDS Provider shall make an application for payment in respect of the remaining twenty per cent (20%) of the total value of the Detailed Design Phase Milestone Payment for the relevant Sub-Sector or Sector (as appropriate) following the issue of the Milestone Completion Certificate by the Client in respect of the Detailed Design Phase for the relevant Sub-Sector or Sector (as appropriate).

11.7 The SDS Provider shall make applications for payment in respect of any fixed lump sum or sums in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) up to the agreed value of the fixed lump sum or sums and the Client shall not be liable to pay the SDS Provider any additional sum of money in relation to the Services to which the fixed lump sum or sums relates, unless agreed expressly in writing by the Client in accordance with this Agreement.

12. ARRANGEMENTS FOR INVOICING AND PAYMENT

12.1 Subject to Clause 11 (*Methods of Payment*), the SDS Provider shall submit each application for payment in respect of any sub-milestones, milestones, fixed lump sum or sums and any other fees, costs and/or expenses agreed in accordance with this Agreement, which are being claimed by the SDS Provider for the previous calendar month, to the Client's Representative within three Business Days following the final date of each calendar month

12.2 Each application for payment shall:

12.2.1 set out the sub-milestone payments claimed;

12.2.2 set out the milestone payments claimed;

12.2.3 include any Milestone Completion Certificates;

12.2.4 set out the proportion of any fixed lump sum or sums claimed in an updated cost loaded programme in electronic form (P3e) together with two hard copies of all supporting documentation

12.2.5 set out the proportion of Management Fees claimed in an updated cost loaded programme in electronic form (P3e) together with two hard copies of all supporting documentation;

12.2.6 set out any other fees claimed in an updated cost loaded programme in electronic form (P3e) together with two hard copies of all supporting documentation;

12.2.7 set out any other costs and/or expenses where it has been agreed in writing that such costs and/or expenses shall be charged to the Client;

12.2.8 a forecast of the fees and any associated costs and/or expenses which the SDS Provider estimates could be claimed for the next two months following the month which is the subject of the application for payment, together with a breakdown of the tasks and workstreams which relate to such forecast.

12.3 The Client shall procure that the Client's Representative shall, subject to any clarifications as are in the Client's opinion (acting properly and reasonably) necessary, certify by notice in writing (an "Interim Certificate") to the SDS Provider that part of the sum claimed in the application for payment which is approved by the Client and give reasons why any part of the sum claimed has not been certified and the value of the sums involved no later than 10 Business Days after the date on which application for payment was received by the Client.

12.4 Subject to Clause 12.7, the SDS Provider shall submit a VAT invoice to the Client within seven days of the date of the Interim Certificate and to the value of the said Interim Certificate. Payment will become due to the SDS Provider on the date of issue of said Interim Certificate by the Client and subject to Clause 12.5 the final date for payment by the Client of such valid VAT invoice shall be 30 days from the date of issue of the Interim Certificate by the Client.

12.5 If the SDS Provider is late in submitting its application for payment to the Client by more than three Business Days after the required timescales in Clause 12.1, payment in respect of any amount certified in an Interim Certificate, shall become due to the SDS Provider on the date of receipt of the relevant valid VAT invoice by the Client in respect of the late application for payment, and the final date for payment of such valid VAT invoice shall be made by the Client to the SDS Provider within 30 days of the first date of the calendar month following receipt of the valid VAT invoice.

12.6 If the SDS Provider is late in submitting a valid VAT invoice to the Client by more than three Business Days after the required timescales in Clause 12.4, payment in respect of any amount certified in an Interim Certificate, shall become due to the SDS Provider on the date of late receipt of the relevant valid VAT invoice by the Client and the final date for payment of such late valid VAT invoice shall be made by the Client to the SDS Provider within 30 days of the first date of the calendar month following receipt of the late valid VAT invoice.

12.7 **Retention**

12.7.1 Prior to the date of execution of the Novation Agreement by the SDS Provider and the date of execution of the Funder's Direct Agreement by the SDS Provider, the SDS Provider shall submit a VAT invoice to **tie** for ninety seven per cent (97%) of the sum certified in each relevant Interim Certificate. **tie** shall retain three per cent (3%) of such sums certified in each relevant Interim Certificate (the **"Retention"**). Payment will become due to the SDS Provider on the date of issue of such Interim Certificate by **tie** and subject to Clauses 12.5 and 12.6, the final date for payment of such valid VAT invoice shall be 30 days from the date of issue of the Interim Certificate.

12.7.2 Within 30 Business Days of the date of execution of the Novation Agreement by the SDS Provider and the date of execution of the Funder's Direct Agreement by the SDS Provider or the SDS Provider being notified in writing by **tie** that the Novation Agreement is not to be executed by the SDS Provider and/or that that the Funder's Direct Agreement is not to be executed by the SDS Provider, the SDS Provider shall issue a valid VAT invoice to **tie** for one hundred per cent (100%) of the total of all Retentions retained in accordance with Clause 12.7.1.

12.7.3 Payment will become due to the SDS Provider on the date of receipt of the valid VAT invoice by **tie** and the final date for payment of such valid VAT invoice by **tie** shall be 30 days from the date of receipt of such valid VAT invoice.

12.7.4 The SDS Provider shall be entitled to offer, and **tie** may at its sole discretion accept, a retention bond, in lieu of the operation of Clauses 12.7.1 to 12.7.3 above:

12.7.4.1 the SDS Provider shall ensure that the retention bond is available and in full force and effect as from the last date of execution of this Agreement until

(a) the date of execution of the Novation Agreement by the SDS Provider and the date of execution of the Funder's Direct Agreement by the SDS Provider; or

(b) the SDS Provider being notified in writing by **tie** that the Novation Agreement is not to be executed by the SDS Provider and/or that the Funder's Direct Agreement is not to be executed by the SDS Provider;

12.7.4.2 the retention bond shall be issued in a form and by a surety acceptable to **tie** and shall be expressed as irrevocable and unconditionally payable forthwith on demand to **tie** in an amount of £500,000 by electronic transfer of funds to an account nominated by **tie**, upon written notification from **tie** to the surety that the SDS Provider has failed to execute the Novation Agreement and the Funder's Direct Agreement, when requested by **tie** pursuant to Clauses 29.1 and 29.7 of this Agreement. Demand for payment under the retention bond shall not be subject to any further action or recourse being taken by **tie**;

12.7.4.3 **tie** shall release the original retention bond to the surety on its satisfaction as to due execution of the Novation Agreement and the Funder's Direct Agreement or following the SDS Provider being notified in writing by **tie** that the Novation Agreement is not to be executed by the SDS Provider and/or that the Funder's Direct Agreement is not to be executed by the SDS Provider. In the event that the credit rating of the surety is at any time downgraded, **tie** shall be entitled to require the SDS Provider to arrange for the issue of a replacement retention bond issued at no cost to **tie** by a different surety acceptable to **tie**;

12.7.4.4 subject to Clause 12.7.4.5 below, the issue and continued validity of a retention bond shall be a condition precedent to payment by **tie** to the SDS Provider under this Agreement;

12.7.4.5 failure by the SDS Provider to provide and maintain an acceptable retention bond (or a replacement therefor) shall constitute a breach and Clauses 12.7.1 to 12.7.3 above shall operate forthwith without further notice from **tie**. Acceptance of a retention bond following failure to provide or maintain shall be at **tie**'s discretion.

12.8 **Adjustments to the Milestone Payments, Lump Sums and Rates**

12.8.1 Without prejudice to Clause 12.3, any milestone payments, and/or lump sum or sums payments, or other sums set out in Schedule 3 (*Pricing Schedule*) to this Agreement or agreed in accordance with this Agreement will not be adjusted except by the express written agreement of the Client where there has been a variation of the Services in accordance with Clause 15 (*Changes*);

12.8.2 The rates set out in Schedule 3 (*Pricing Schedule*) to this Agreement shall not be adjusted;

12.9 **Payments to SDS Provider Parties**

12.9.1 Where, with the agreement of the Client, the SDS Provider has appointed any SDS Provider Parties, no additional payments shall be made over and above any fixed lump sum or sums, and/or any milestone payments and/or sub-milestone payments, or the rates set out in Schedule 3 (*Payment Schedule*) to this Agreement, unless expressly agreed by the Client in writing.

12.9.2 Where the Client has expressly agreed in writing that payment shall be made by the Client for the services of SDS Provider Parties, the SDS Provider shall apply for such payment in accordance with Clause 12.1.

12.10 **Interest on Late Payments**

12.10.1 In the event of failure of the Client to make payment in accordance with this Clause 12 (*Arrangements for Invoicing and Payment*), the Client shall pay to the SDS Provider interest upon any payment not paid by the final date for payment at a rate per annum equivalent to 2 per cent above the Base Rate of the Royal Bank of Scotland current on the date upon which such payment first becomes overdue adjusted to reflect any changes to the rate during the period over which the payment remains overdue.

12.11 **SDS Provider to remain responsible:**

12.11.1 The final payment for any Services shall not be interpreted as being the satisfaction of the Client that the Services have been performed in accordance with the Agreement.

12.11.2 The responsibility of the SDS Provider for the Services shall not come to an end solely by reason of the making of any payment therefor.

13. SET-OFF

13.1 Subject to Clause 13.2 and Clause 27.4, the Client may deduct any amount payable by the SDS Provider to the Client whether by way of damages or in respect of any loss or expense sustained by the Client by reason of the SDS Provider's breach of this Agreement from any other payment or payments due to be made to the SDS Provider by the Client under this Agreement.

13.2 Any notice of intention to withhold payment shall be served by the Client at least three days prior to the final date for payment calculated in accordance with Clause 12 *(Arrangements for Invoicing and Payment)* and such notice shall state the sums being withheld and the detailed reason or detailed reasons for such withholding. Where an effective notice of intention to withhold payment is given, but on the matter being referred to the Dispute Resolution Procedure, it is decided that the whole or part of the amount should be paid, the decision shall be construed as requiring payment not later than:

13.2.1 7 days from the date of the decision, or

13.2.2 the date which, apart from the notice, would have been the final date for payment,

whichever is the later.

13.3 The SDS Provider shall be entitled to payment of interest as provided in Clause 12.10.1 in respect of the relevant part of any payments which have been withheld in accordance with Clause 13.2 but are subsequently determined as being payable by the Client to the SDS Provider either by agreement between the Parties or a decision following a referral to the Dispute Resolution Procedure. The interest shall be calculated for the period between the date when the relevant part of the payment should have been paid but for the notice of intention to withhold payment and the date on which payment is made by the Client in accordance with Clause 13.2.

14. AUDIT

14.1 The SDS Provider shall produce to the Client any documents or provide any information relevant to the performance of the Services or any part thereof as the Client's auditors may require and shall provide any documents or information reasonably required by the Client in respect of any SDS Provider Parties.

14.2 Proper books, vouchers, accounts and records relating to the Services and any services being performed by SDS Provider Parties shall be maintained by the SDS Provider at its place of business and shall be available for inspection by the Client or any officer authorised by the Client at all reasonable times during the duration of the Agreement and for six years after the termination or expiry of this Agreement.

15. CHANGES

Client Changes

15.1 Unless expressly stated in this Agreement or as may otherwise be agreed by the Parties, Client Changes shall be dealt with in accordance with this Clause 15 (*Changes*). If the Client requires a Client Change, it must serve a Client Notice of Change on the SDS Provider.

15.2 A Client Notice of Change shall:

15.2.1 set out the proposed Client Change in sufficient detail to enable the SDS Provider to calculate and provide the Estimate in accordance with Clause 15.3 below;

15.2.2 require the SDS Provider to provide the Client within 18 days of receipt of the Client Notice of Change with an Estimate, and specify whether any competitive quotes are required; and

15.2.3 set out how the Client wishes to pay (where relevant) for any proposed Client Change.

15.3 As soon as is reasonably practicable, and in any event within 18 days after having received a Client Notice of Change, the SDS Provider shall deliver to the Client the Estimate. The Estimate shall include the opinion of the SDS Provider (acting reasonably) on:

15.3.1 whether relief from compliance with any of its obligations under this Agreement is required during or as a result of the implementation of the proposed Client Change;

15.3.2 any impact on the performance of the Services;

15.3.3 any impact on the Master Project Programme and the Programme, and any requirement for an extension of time;

15.3.4 any amendment required to the Agreement as a result of the implementation of the proposed Client Change,

15.3.5 the proposed method of delivery of the proposed Client Change;

15.3.6 proposals to mitigate the impact of the proposed Client Change; and

15.3.7 any increase or decrease in any sums due to be paid to the SDS Provider (including any milestone payments and lump sum payments) as a result of the implementation of the proposed Client Change.

15.4 The valuation of any Client Changes made in compliance with this Clause 15 (*Changes*) shall be added to or deducted from the sums due to be paid to the SDS Provider as the case may be, and shall be ascertained by the Client as follows:

15.4.1 by measurement and valuation at the rates and prices for similar work in Schedule 3 *(Pricing Schedule)* insofar as such rates and prices apply;

15.4.2 if such rates and prices do not apply by measurement and valuation at rates and prices deduced therefrom insofar as it is practical to do so;

15.4.3 if such rates and prices do not apply and it is not practicable to deduce rates and prices therefrom by measurement and/or valuation at fair rates and prices; or

15.4.4 if the value of the Client Change cannot properly be ascertained by measurement and/or valuation, the value of the resources and labour employed thereon, as appropriate, in accordance with the basis of rates for provisional work set out in Schedule 3 (*Pricing Schedule*);

provided that where any Client Change would otherwise fall to be valued under Clauses 15.4.1 and 15.4.2 above, but the Client's representative is of the opinion that the instruction therefor was issued at such a time or was of such content as to make it unreasonable for the alteration or addition to be so valued, the value of the Client Change shall be ascertained by measurement and/or valuation at fair rates and prices.

15.5 The SDS Provider shall include in the Estimate evidence demonstrating that:

15.5.1 the SDS Provider has used all reasonable endeavours to minimise (including by the use of competitive quotes) any increase in costs and to maximise any reduction of costs;

15.5.2 the SDS Provider has, where required by the Client, sought competitive quotes from persons other than the SDS Provider Parties in pursuance of its obligation under Clause 15.5.1 above;

15.5.3 the SDS Provider has investigated how to mitigate the impact of the Client Change; and

15.5.4 the proposed Client Change will, where relevant, be implemented in the most cost-effective manner, including showing that when such expenditure is incurred Changes in Law that are foreseeable at that time have been taken into account by the SDS Provider.

15.6 If the SDS Provider does not intend to use its own resources to implement any proposed Client Change, it shall:

15.6.1 demonstrate that it is appropriate to subcontract the implementation of such Client Change; and

15.6.2 comply with Good Industry Practice with the objective of ensuring that it obtains best value for money when procuring any SDS Provider Party or Deliverable required in relation to the proposed Client Change.

15.7 As soon as reasonably practicable after the Client receives the Estimate, the Parties shall discuss and agree the issues set out in the Estimate. From such discussions the Client may modify the Client Notice of Change, and the Client may require the SDS Provider to seek and evaluate competitive tenders. In each case the SDS Provider shall, as soon as practicable, and in any event not more than 14 days after receipt of such modification, notify the Client of any consequential changes to the Estimate.

15.8 If the Parties cannot agree on the contents of the Estimate, then either Party may refer the Estimate for determination in accordance with the Dispute Resolution Procedure provided that the SDS Provider shall not be obliged to implement any proposed Client Change where:

15.8.1 the Client does not have the legal power or capacity to require the implementation of such proposed Client Change; or

15.8.2 implementation of such proposed the Client Change would

15.8.2.1 be contrary to Law;

15.8.2.2 not be technically feasible;

15.8.2.3 substantially and materially increases the probability of a substantial non-compliance with this Agreement by the SDS Provider; or

15.8.2.4 be outwith the specific competence of the SDS Provider either in performing the activity required by the Client Change or in supervising a SDS Provider Party to carry out the activity required by the Client Change.

15.9 As soon as reasonably practicable after the contents of the Estimate have been agreed or determined pursuant to the Dispute Resolution Procedure the Client shall:

15.9.1 issue a Client Change Order ; or

15.9.2 withdraw the Client Notice of Change.

For the avoidance of doubt, the SDS Provider shall not commence work until instructed through receipt of a Client Change Order.

15.10 If the Client does not issue a Client Change Order within 30 days of the contents of the Estimate having been agreed or determined pursuant to Clause 15.9, then the Client Notice of Change shall be deemed to have been withdrawn.

Restrictions on Entitlements to Relief for a Client Change

15.11 The SDS Provider shall not be entitled to any extension of time, payment or relief in respect of any Client Change if and to the extent that the SDS Provider could (where such action is within the power of the SDS Provider and the SDS Provider could be reasonably expected to take such action, having regard to the scope and nature of the Services), by the exercise of reasonable foresight and diligence, have prevented or materially reduced the requirement for such Client Change.

15.12 If, having received instructions from the Client or the Client's Representative, the SDS Provider considers that compliance with those instructions would amount to a Client Change, the SDS Provider shall within 10 Business Days of any instructions being received, notify the Client of the same and, if it is agreed by the parties or determined pursuant to the Dispute Resolution Procedure that a Client Change would arise if the

instructions were complied with, the Client may proceed with the instruction in accordance with this Clause 15 (*Changes*).

15.13 Any failure by the SDS Provider to notify the Client within 10 Business Days of instructions being received that it considers compliance with such instructions from the Client or the Client's Representative would amount to a Client Change shall constitute an irrevocable acceptance by the SDS Provider that any compliance with the Client's or the Client Representative's comments shall be without cost to the Client and without any entitlement to any extension of time or other relief.

15.14 Any failure by the SDS Provider to notify the Client within 10 Business Days of becoming aware of any other matter or occurrence which could amount to a Client Change shall constitute an irrevocable acceptance by the SDS Provider that in being instructed to deal with such matter or occurrence as a Client Change, the SDS Provider shall not be entitled to any costs, extension of time or other relief. in respect of such Client Change.

Changes proposed by the SDS Provider

15.15 Within 10 Business Days of the SDS Provider becoming aware of the need or desirability for a variation to the Services, the SDS Provider shall notify the Client of the reasons, consequential effects including any increase or reduction in costs, and options available to mitigate these effects with a recommendation for action by the Client.

15.16 If the Client wishes to proceed with a variation proposed by the SDS Provider, the Client shall serve a Client Notice of Change on the SDS Provider and Clauses 15.2 to 15.11 shall be adhered to by the Client and the SDS Provider.

Change Control Register

15.17 The SDS Provider shall maintain a change control register which shall detail the status and gives summary information on all withdrawn, potential and confirmed variations under this Agreement.

16. QUALIFYING CHANGE IN LAW

16.1 If a Qualifying Change in Law occurs or is to occur, then either Party may write to the other to express an opinion on its likely effects, giving details of its opinion of:

16.1.1 any necessary change in the Services;

16.1.2 whether any changes are required to the terms of this Agreement to deal with the Qualifying Change in Law; or

16.1.3 whether relief from compliance with any obligations under this Agreement is required as a result of the Qualifying Change in Law;

in each case giving in full detail the procedure for implementing the Qualifying Change in Law. Responsibility for any costs of such implementation (and any resulting variation to payments due under this Agreement or other payment method at the Client's discretion) shall be dealt with in accordance with Clauses 16.2 and 16.3 below.

16.2 As soon as reasonably practicable after receipt of any notice from either Party under Clause 16.1 above, the Parties shall discuss and agree the issues referred to in Clause 16.1 above and any ways in which the SDS Provider can mitigate the effect of the Qualifying Change in Law and the SDS Provider shall:

16.2.1 provide evidence to the Client that the SDS Provider has used and will continue to use all reasonable endeavours (including where appropriate and practicable the use of competitive quotes) to minimise any increase in costs and maximise any reduction in costs;

16.2.2 demonstrate how the effects of the Qualifying Change in Law will be mitigated;

16.2.3 demonstrate that the relevant changes will be implemented in the most cost-effective manner, including showing that when expenditure is incurred or has been incurred, foreseeable Changes in Law at that time have been taken into account by the SDS Provider; and

16.2.4 give evidence as to how the Qualifying Change in Law has affected the fees and/or costs of similar consultants.

16.3 As soon as reasonably practicable after the issues referred to in Clause 16.2 have been agreed between the Parties or determined pursuant to the Dispute Resolution Procedure, the Client shall give a Client Notice of Change and the provisions of Clause 15 (*Changes*) shall apply except that the SDS Provider shall be obliged to implement the change in all circumstances (except to the extent that such change is not necessary to implement the Qualifying Change in Law). The Client shall issue a Client Change Order once it has been agreed or determined pursuant to the Dispute Resolution Procedure. In assessing the value of the change, the Client shall pay the agreed amount less the agreed threshold of £15,000 for each and every event. The Client will, at its sole discretion, determine the scope of each and every event.

16.4 Except as otherwise expressly provided in this Agreement, the SDS Provider shall be responsible for any increase in its costs and shall not be entitled to any relief from its obligations under this Agreement to the extent that the same is caused as a result of a General Change in Law.

17. REQUIRED INSURANCES

17.1 The SDS Provider shall, at its own cost, procure that each of the Required Insurances is taken out, comes into effect and is maintained with reputable insurers authorised to carry out insurance business in the United Kingdom and otherwise in accordance with the requirements of Schedule 6 (*Required Insurances*).

17.2 The Required Insurances referred to in this Clause 17 (*Required Insurances*) shall be effected with insurers approved by the Authority, such approval not to be unreasonably withheld or delayed. The SDS Provider shall not make any material alteration to the terms of the Required Insurances without the Client's prior approval (which approval shall not be unreasonably withheld). If any such material alteration to the Required Insurances is made, the SDS Provider shall complete the questionnaire set out in Part 3 of Schedule 6 (*Required Insurances*) duly endorsed by its insurance broker. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if the SDS Provider is unable to obtain professional indemnity insurance, the SDS Provider shall promptly give notice of this to the Client.

17.3 The SDS Provider shall ensure that its insurance broker gives the Client as soon as reasonably practicable after any of the Required Insurances is taken out, replaced or renewed, a letter of undertaking in the form set out in Part 2 of Schedule 6 (*Required Insurances*).

17.4 The SDS Provider shall provide satisfactory evidence to the Client that the Required Insurances have been effected and are being maintained. The SDS Provider shall

upon request produce to the Client confirmation of the payment of current insurance premiums.

17.5 The SDS Provider shall confirm to the Client in writing on or around the date of the first and each subsequent anniversary of the Effective Date that the Required Insurances continue to be maintained. The SDS Provider shall, when required by the Client, make available for inspection by the Client, documentary evidence that such Required Insurances are being properly maintained. For the avoidance of doubt, the Client acknowledges that there may be a delay between the renewal date and issue of such evidence and such delay will not be deemed to be a failure of the SDS Provider to provide evidence of cover.

17.6 If the SDS Provider shall fail upon request to produce to the Client satisfactory evidence that there is in force the Required Insurances referred to in this Clause 17 (*Required Insurances*) or is otherwise in breach of this Clause 17 (*Required Insurances*), the Client may, on behalf of the SDS Provider, effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Client as aforesaid from any monies due or which may become due to the SDS Provider.

17.7 The SDS Provider shall increase the limit of indemnity and amend the terms of the third party liability insurance set out in Schedule 6 (*Required Insurances*) if required by the Client in order to meet the requirements of any third party including Network Rail and BAA with regard to any of the Services to be performed by the SDS Provider in accordance with this Agreement. Any costs associated with such increase and/or amendment shall be paid by the SDS Provider.

17.8 The SDS Provider shall not take any action or fail to take any reasonable action or (insofar as it is reasonably within its power) permit or allow others to take or fail to take any action (including failure to disclose any fact) as a result of which any of the Required Insurances may be rendered void, voidable, unenforceable or suspended or impaired in whole or in part or which may otherwise render any sum paid out under any relevant policy repayable in whole or in part.

17.9 The supply to the Client of any insurance policy or insurance certificate or renewal certificate or other evidence of compliance with this Clause 17 (*Required Insurances*) shall not imply, or be taken as, acceptance by the Client that:

17.9.1 the extent of insurance cover is sufficient and its terms are satisfactory; or

17.9.2 in respect of any risks not insured against, insurable interests or parties not insured, an acceptance by the Client that the same were uninsurable.

18. ERRORS AND/OR OMISSIONS IN THE SERVICES

18.1 If during the performance of the Services and/or where the SDS Provider has completed the Services, the Client becomes aware of any error or omission in the performance of the Services or of any other breach of this Agreement, the Client shall notify the SDS Provider, who shall, at its own expense and in liaison with the Client and/or any other party or parties nominated by the Client, rectify any error or omission or breach, or where this is agreed by the Client to be impracticable or undesirable, take such other agreed steps to address the error or omission.

18.2 Any direct costs to the Client of remedying any such errors or omissions or breaches shall be paid by the SDS Provider to the Client.

18.3 These arrangements shall in no respect diminish the Client's ability to recover damages from the SDS Provider for losses incurred by the Client consequent upon the error or omission or breach in question.

19. TERMINATION FOR SDS PROVIDER DEFAULT

19.1 The Client may terminate this Agreement upon giving written notice to the SDS Provider, and this Agreement shall terminate on the date falling 30 days after the service of such notice if:

19.1.1 the SDS Provider breaches any material provision or requirement of the Agreement; or

19.1.2 the circumstances envisaged by Clause 33.7 apply;

19.1.3 following a written warning and the removal of any member of the Key Personnel, any replacement member of the Key Personnel is, in the opinion of the Client, incompetent to perform any of his duties;

19.1.4 the SDS Provider conducts itself in a manner which the Client considers to be incompatible with the performance of the Services, and/or in such manner so as to wilfully detract from the image and reputation of the Client, **tie**, CEC, Transport Edinburgh Limited, the Scottish Executive or any project related to the performance of the Services, or

19.1.5 any partner or director of the SDS Provider directly involved with this Agreement is expelled from or sanctioned by his relevant professional Institute or Institution, thus compromising the performance of the Services; or

19.1.6 an Insolvency Event occurs; or

19.1.7 the SDS Provider fails to resolve a conflict of interest in accordance with Clause 31 (*Conflict of Interest)* to the reasonable satisfaction of the Client; or

19.1.8 there is a change in legal status of the SDS Provider or a Change in Control of the SDS Provider which is materially prejudicial to the performance of the Services.

19.2 The SDS Provider shall immediately notify the Client of

19.2.1 any resolution or decision by the SDS Provider or the board of directors of the SDS Provider or a decision by any director of the SDS Provider to seek legal or financial advice pertaining to the solvency of the SDS Provider; and/or

19.2.2 any presentation of any petition for the purpose of winding up the SDS Provider or any petition for an administration order.

20. TERMINATION, ABANDONMENT OR SUSPENSION OF THE SERVICES BY THE CLIENT

20.1 The Client may terminate this Agreement at any time and for whatever reason upon giving written notice to the SDS Provider, and this Agreement shall terminate on the date falling 60 days after the date of service of such written notice.

20.2 At any time the Client may decide to postpone or abandon any part of the Services and, if the Client decides to postpone or abandon any part of the Services, the Client may by notice in writing to the SDS Provider seek to vary the Services either by excluding the Services (or any part thereof) to be performed by the SDS Provider, or

by suspending performance of the same, and in such notice the Client shall specify the Services affected.

20.3 Unless otherwise notified in writing by the Client, if the Client shall not have required the SDS Provider to resume the performance of Services in respect of the whole or any part of the Services suspended under Clause 20.2 within a period of 12 months from the date of the notice, the Agreement shall forthwith automatically terminate in whole if the whole of the Services has been terminated or in part, if part of the Services has been terminated.

20.4 The SDS Provider shall, upon receipt of any notice in accordance with this Clause 20 (*Termination, Abandonment or Suspension of the Services by the Client)* terminating, suspending or abandoning the whole or any part of the Services, proceed in an orderly manner but with all reasonable speed and economy to take such steps as are necessary to bring to an end or suspend (as appropriate) the Services and its other obligations under this Agreement. The Client and the SDS Provider shall meet within 7 days of the said receipt of such notice to assess the costs arising.

21. TERMINATION OR SUSPENSION FOR CLIENT DEFAULT

21.1 If a Client Default has occurred and the SDS Provider wishes to terminate this Agreement, the SDS Provider must serve a termination notice on the Client within 30 days of becoming aware of the Client Default. Failure to do so shall be a waiver of the right to terminate.

21.2 The SDS Provider shall specify in the termination notice the type of the Client Default which has occurred entitling the SDS Provider to terminate.

21.3 Provided the SDS Provider has complied with Clauses 21.1 and 21.2, this Agreement shall terminate on the day falling 60 days after the date on which the Client receives the termination notice, unless the Client rectifies the Client Default within 60 days of receipt of the termination notice.

21.4 The SDS Provider shall not be entitled to, and shall not purport to, terminate this Agreement or accept any repudiation of this Agreement, except as expressly provided in this Clause 21 (*Termination for Client Default*) or Clause 23 (*Termination by Reason of Force Majeure*).

21.5 If the Client shall fail to pay the SDS Provider in full any amount properly due and payable under this Agreement by the final date for payment in accordance with the requirements of Clause 12 (*Arrangements for Invoicing and Payment*) and no effective notice to withhold payment has been given by the Client to the SDS Provider, the SDS Provider may, after giving the Client 60 days' notice in writing of the same, stating the ground or grounds on which it is intended to suspend performance, suspend the performance of the Services until payment in full is made by the Client.

22. TERMINATION FOR CORRUPT GIFTS AND PAYMENTS

22.1 The SDS Provider or anyone employed by it or acting on its behalf (including any SDS Provider Party) shall not commit any Prohibited Act.

22.2 If the SDS Provider, or anyone employed by it or acting on its behalf (including any SDS Provider Party), commits any Prohibited Act, then the Client shall be entitled to act in accordance with Clauses 22.3 to 22.7.

22.3 If a Prohibited Act is committed by the SDS Provider or by an employee of the SDS Provider not acting independently of the SDS Provider, then the Client may terminate this Agreement by giving notice to the SDS Provider.

22.4 If a Prohibited Act is committed by an employee of the SDS Provider acting independently of the SDS Provider, then the Client may give notice to the SDS Provider of termination and this Agreement will terminate, unless within 30 days of receipt of such notice the SDS Provider terminates the employee's employment and (if necessary) procures the performance of the relevant part of the Services by another person.

22.5 If a Prohibited Act is committed by anyone acting on behalf of the SDS Provider (excluding employees of the SDS Provider but including any SDS Provider Party, and their employees) and not acting independently of the SDS Provider, then the Client may give notice to the SDS Provider of termination and this Agreement will terminate.

22.6 If a Prohibited Act is committed by anyone acting on behalf of the SDS Provider (excluding employees of the SDS Provider but including any SDS Provider Party, and their employees) and acting independently of the SDS Provider, then the Client may give notice to the SDS Provider of termination and this Agreement will terminate, unless within 30 days of receipt of such notice the SDS Provider terminates that party's employment and procures the performance of the relevant part of the Services by another person.

22.7 Any notice of termination under this Clause 22 (*Termination for Corrupt Gifts and Payments*) shall specify:

22.7.1 the nature of the Prohibited Act;

22.7.2 the identity of the person whom the Client believes has committed the Prohibited Act; and

22.7.3 the date on which this Agreement will terminate, in accordance with the applicable provision of this Clause 22 (*Termination for Corrupt Gifts and Payments*).

23. TERMINATION BY REASON OF FORCE MAJEURE

23.1 Neither Party shall be entitled to bring a claim for a breach of obligations under this Agreement by the other Party or incur any liability to the other Party for any losses or damages incurred by that other Party to the extent that a Force Majeure Event occurs and such party is directly prevented from carrying out such obligations by that Force Majeure Event provided that such prohibition on bringing a claim and exclusion of liability shall not operate if and to the extent that:

23.1.1 the Affected Party could, by the exercise of reasonable foresight and diligence, have prevented or reduced the effect of the Force Majeure Event; and

23.1.2 the Affected Party could, whether before or after the occurrence of the Force Majeure Event, have reduced or eliminated the resulting breach of its obligations under this Agreement by taking reasonable steps.

23.2 On the occurrence of a Force Majeure Event, the Affected Party shall notify the other Party as soon as reasonably practicable, specifying details of the Force Majeure Event and providing evidence of its effect on the obligations of the Affected Party and any action proposed to remove or mitigate its effect.

23.3 The Parties shall enter into bona fide discussions with a view to alleviating the effects of such Force Majeure Event, and if the terms or measures to remove the effect of the Force Majeure Event cannot be agreed on or before the date falling 12 months after the date of the commencement of the Force Majeure Event or by the end of such longer period as the Parties may have agreed, or such Force Majeure Event is continuing or its consequence remains such that the Affected Party is unable to comply with all or a material part of its obligations under this Agreement for a period of more than 12 months after the date of the commencement of the Force Majeure Event or by the end of such longer period as the Parties may have agreed, either Party shall have the option to terminate this Agreement by written notice to the other.

23.4 The Parties shall at all times following the occurrence of a Force Majeure Event use all reasonable endeavours to prevent and mitigate the effects of any delay to the performance of the Services and the SDS Provider shall at all times during which a Force Majeure Event is subsisting take all steps in accordance with Good Industry Practice to overcome or minimise the consequences of the Force Majeure Event.

23.5 The Affected Party shall notify the other party as soon as reasonably practicable after the Force Majeure Event ceases or no longer causes the Affected Party to be unable to comply with its obligations under this Agreement. Following such notification, this Agreement shall continue to be performed on the terms existing immediately prior to the occurrence of the Force Majeure Event.

24. PERSISTENT BREACH

24.1 If a breach by the SDS Provider of any of its obligations under this Agreement has occurred more than once then the Client may serve a notice ("Persistent Breach Notice") on the SDS Provider:

24.1.1 specifying that it is a Persistent Breach Notice;

24.1.2 giving reasonable details of the breach; and

24.1.3 stating that such breach is a breach which, if it occurs frequently or continues, may result in a termination of this Agreement.

24.2 If, following service of such a Persistent Breach Notice, the breach specified has continued or occurred once again after the date falling 30 days after the date of service of the Persistent Breach Notice and before the date falling 365 days after the date of service of such notice, then the Client may serve another notice ("Final Persistent Breach Notice") on the SDS Provider:

24.2.1 specifying that it is a Final Persistent Breach Notice;

24.2.2 stating that the breach specified has been the subject of a prior Persistent Breach Notice within the period of 365 days prior to the date of service of the Final Persistent Breach Notice; and

24.2.3 stating that if such failure is not remedied within 7 days or is remedied and occurs once or more within the 180 day period after the date of service of the Final Persistent Breach Notice, this Agreement may be terminated with immediate effect.

25. PAYMENT FOLLOWING TERMINATION OR SUSPENSION

25.1 No compensation shall be payable by the Client to the SDS Provider for termination of this Agreement whether under contract, delict (including negligence), breach of (or

compliance with) statutory duty, restitution or otherwise but without prejudice to payments due under Clause 25.3.

25.2 Within 30 days of termination of this Agreement and following receipt of a valid VAT invoice, the Client shall pay to the SDS Provider:

25.2.1 any undisputed sums due from the Client to the SDS Provider pursuant to Clauses 11 (*Methods of Payment*) and 12 (*Arrangements for Invoicing and Payment*);

25.2.2 any entitlement to demobilisation costs pursuant to Clause 25.3; and

25.2.3 any sums due to the SDS Provider in respect of any work in progress which have not been certified in accordance with Clause 12 (*Arrangements for Invoicing and Payment*) provided that the calculation of such sums have been certified as follows:

25.2.3.1 the SDS Provider shall have provided the Client with a valuation of all work in progress in relation to the Services in accordance with the provisions of Clause 15.4 and subject to Clause 11 (*Methods of Payment*) and, for the avoidance of doubt, subject to any agreed milestone or lump sum payments set out in Schedule 3 (*Pricing Schedule*) or as agreed otherwise in accordance with this Agreement;

25.2.3.2 **tie** shall, subject to any clarifications as are in **tie's** opinion (acting properly and reasonably) necessary certify by notice in writing to the SDS Provider that part of the work in progress which is approved by **tie** and give reasons why any part of the work in progress has not been certified and the value of the sums involved no later than 10 Business Days after the date on which such valuation was received. **tie's** valuation of such work in progress shall be final and binding.

25.3 The Client shall make payment to the SDS Provider of any demobilisation costs which have been demonstrably and reasonably incurred by the SDS Provider in respect of:

25.3.1 termination for Client Default pursuant to Clause 21 *(Termination or Suspension for Client Default);* or

25.3.2 termination or abandonment pursuant to Clause 20 *(Termination, Abandonment or Suspension of the Services by the Client*); or

25.3.3 suspension pursuant to Clause 20 *(Termination, Abandonment or Suspension of the Services by the Client*).

25.4 The SDS Provider shall use all reasonable endeavours to minimise and mitigate any such demobilisation costs and the Client shall not be liable to pay the SDS Provider for such demobilisation costs to the extent that the SDS Provider has failed to minimise or mitigate such demobilisation costs or to the extent that such demobilisation costs have arisen out of the SDS Provider's breach of this Agreement or any negligent or wilful act or omission by the SDS Provider.

25.5 Within 30 days of termination of this Agreement, the SDS Provider shall pay to the Client any sums due from the SDS Provider to the Client pursuant to this Agreement.

25.6 This Agreement shall terminate automatically on the expiry of this Agreement unless it shall have been terminated earlier in accordance with the provisions of this Agreement. The SDS Provider shall not be entitled to any compensation on expiry of the Agreement.

25.7 Within 30 days of expiry of this Agreement, the Client shall pay to the SDS Provider any undisputed sums due from the Client to the SDS Provider in accordance with Clauses 11 (*Methods of Payment*) and 12 (*Arrangements for Invoicing and Payment*).

25.8 Within 30 days of expiry of this Agreement, the SDS Provider shall pay to the Client any sums due from the SDS Provider to the Client pursuant to this Agreement.

25.9 Either Party may refer any Dispute about disputed sums to the Dispute Resolution Procedure. If it is determined pursuant to the Dispute Resolution Procedure that the whole or part of any disputed amount is due to either the Client or the SDS Provider, the Client or the SDS Provider (as appropriate) shall raise an invoice within 30 days in respect of such determined amount and payment shall be made by the relevant Party within 60 days of the receipt of such invoice.

25.10 In the event of the Agreement being terminated under Clause 19 *(Termination for SDS Provider Default)* or Clause 22 (*Termination for Corrupt Gifts and Payments*) or Clause 24 (*Persistent Breach*), the Client shall be entitled to recover from the SDS Provider all losses, liabilities damages, penalties, fines, forfeitures, and the costs and expenses incident thereto (including without limitation legal costs of defence) sustained by the Client by such termination, and, without prejudice to the generality of this provision, the Client may forthwith employ and pay persons to carry out, manage and complete the Services and recover the costs of so doing from the SDS Provider.

25.11 In any case in which the Client has required the SDS Provider to suspend the carrying out of the Services, the Client may at any time within the period of 12 months from the date of the Client's notice served in accordance with Clause 20.2 (or such longer period as may be notified in writing by the Client) require the SDS Provider in writing to resume the performance of such Services. In such event, if the SDS Provider needs to perform any additional services in connection with the resumption of the Services, the Client shall pay the SDS Provider fair and reasonable costs in respect of the performance of such additional services which shall be treated as a Client Change and agreed in accordance with Clause 15 (*Changes*).

26. EFFECTS OF TERMINATION OR EXPIRY

26.1 Subject to Clause 25.2, the SDS Provider shall not have any other right or remedy against the Client on termination of this Agreement.

26.2 Subject to any exercise by the Client of its rights to perform, or to procure a third party to perform, the obligations of the SDS Provider, the Parties shall continue to perform their obligations under this Agreement, notwithstanding the giving of any notice of default or breach or termination notice, until the termination of this Agreement becomes effective.

26.3 Any termination or expiry of this Agreement shall not prejudice or affect the accrued rights or claims of either Party.

26.4 On expiry of this Agreement or any earlier termination of this Agreement for whatever reason, all Deliverables shall be handed to the Client, provided that the SDS Provider may retain one copy of any Deliverable where such copy is required for the purposes of Law or any recognised regulatory requirement or for record purposes (where the Client acting reasonably agrees). The provisions of Clause 33 (*Confidential*

Information) will continue to apply to these Deliverables beyond expiry of this Agreement or any earlier termination for whatever reason.

26.5 In order to aid the progress of the performance of the Services, the Client may make available to the SDS Provider various information, materials and documents. On expiry of this Agreement or any earlier termination of this Agreement for whatever reason, all such information, materials and documents shall be returned to the Client provided that the SDS Provider may retain one copy of any information, materials and documents where such copy is required for the purposes of Law or any recognised regulatory requirement. The provisions of Clause 33 (*Confidential Information*) will continue to apply to such information, materials and documents beyond expiry of this Agreement or any earlier termination for whatever reason.

26.6 Completion or termination of the Services shall not affect the SDS Provider's obligations under Clauses 3 *(Duty of Care, Standards and the Services to be provided)*, 11 (*Methods of Payment*), 12 *(Arrangements for Invoicing and Payment)*, 13 *(Set-Off)*, 14 *(Audit)*, 17 (*Required Insurances*), 18 *(Errors and/or Omissions in the Services)*, 25 (*Payment Following Termination or Suspension*), 26 (*Effects of Termination or Expiry*), 27 (*Indemnity by SDS Provider*), 28 (*Dispute Resolution Procedure*), 32 (*Copyright and Intellectual Property*) and 33 (*Confidential Information*). Those obligations shall continue in full force and effect.

27. INDEMNITY BY SDS PROVIDER, LIABILITY AND SOLE REMEDY

27.1 The SDS Provider shall indemnify the Client and its officers, agents and employees ("Indemnified Parties") from and against any and all claims, suits, losses, liabilities damages, penalties, fines, forfeitures, and the costs and expenses incident thereto (including without limitation any legal costs of defence) which any of the Indemnified Parties may hereafter incur, become responsible for, or pay out as a result of or in connection with:

27.1.1 any of the SDS Provider's, or its employees' or any SDS Provider Party's negligent or wilful acts or wilful omissions in the performance of the Services; or

27.1.2 breach of any term or provision of this Agreement ; or

27.1.3 breach of any Law; or

27.1.4 any non-performance or delay in performance of the SDS Provider's obligations under this Agreement.

27.2 The Parties acknowledge and agree that the only rights available to them to terminate this Agreement are those expressly set out in this Agreement and that neither Party shall be entitled to exercise a right to terminate or rescind or accept the repudiation of this Agreement under any other right whether arising in common law or statute or otherwise howsoever (other than for fraud or a fraudulent misrepresentation).

27.3 Nothing in this Agreement shall exclude or limit the liability of either Party for:

27.3.1 death or personal injury caused by that Party's negligence or the negligence of anyone for whom that Party is vicariously liable;

27.3.2 fraud or fraudulent misrepresentation; or

27.3.3 any breach of warranty given as to valid and marketable title, freedom from unduly onerous burdens and conditions or entitlement to possession by action of prescription; or

27.3.4 of the SDS Provider, for any breach of this Agreement or any delict (including negligence) or other liability arising prior to termination of this Agreement;

provided that nothing in this Clause 27.3 shall confer on either Party rights or remedies that they would not otherwise have.

27.4 Subject to Clause 27.3, neither party shall be entitled to claim damages for breach of this Agreement, in delict (including negligence), breach of statutory duty or on any other basis whatsoever to the extent that such damages claimed by that Party are for Indirect Losses suffered by that Party provided that for the avoidance of doubt, nothing in this 27.4 shall affect either Party's liability to the other Party, in respect of any claim, action, proceedings or demand against such other Party by a third party in connection with Indirect Loss suffered.

27.5 The SDS Provider shall not be relieved or excused of any responsibility, liability or obligation under this Agreement by the appointment of any SDS Provider Party. The SDS Provider shall, as between itself and the Client, be responsible for the selection, pricing, performance, acts, defaults, omissions, breaches, delict and offences of any SDS Provider Party. All references in this Agreement to any act, default, omission, breach, delict or offence of the SDS Provider shall be construed to include any such act, default, omission, breach or delict of any SDS Provider Party.

27.6 Notwithstanding any other term of this Agreement, except as detailed in Clauses 27.3.1, 27.3.2 and 27.3.3, the SDS Provider's total liability hereunder whether in contract, delict or howsoever arising shall not exceed the sum of £10,000,000 in respect of each and every claim other than in respect of claims arising from pollution or contamination where the limit of indemnity of £10,000,000 applies to any one claim and in aggregate during the policy period.

28. DISPUTE RESOLUTION PROCEDURE

28.1 The Parties agree that this Clause 28 (*Dispute Resolution Procedure*) shall have effect for the resolution of any Dispute.

28.2 Any Dispute shall, in the first instance, be referred to the Internal Resolution Procedure in accordance with Clause 28.10.

28.3 Neither Party shall commence any court proceedings until the procedures in Clauses 28.10 to 28.57.3 have been completed, under exception that Clause 28 (*Dispute Resolution Procedure*) shall not apply so as to prevent either Party seeking an interim order, or interim relief, in the Scottish courts.

28.4 In the event that any court proceedings whatsoever are initiated by either Party against the other, the Parties agree that the Court of Session, Scotland, shall have exclusive jurisdiction.

28.5 Neither Party shall be entitled to suspend the performance of its undisputed obligations under this Agreement merely by reason of the reference of any Dispute to the Dispute Resolution Procedure contained in this Clause 28 (*Dispute Resolution Procedure*).

28.6 Subject to the Client's discretionary rights set out in Clause 28.55 to Clause 28.57.3 to require that a Dispute and a Related Dispute (as defined in Clause 28.55) be dealt with together at an appropriate stage of the Dispute Resolution Procedure, the provisions of this Clause 28 (*Dispute Resolution Procedure*) are mandatory and binding upon the Parties.

28.7 Unless a Party refers a Dispute to the Dispute Resolution Procedure contained in this Clause 28 (*Dispute Resolution Procedure*) within three months of the date on which the event, matter or situation giving rise to the Dispute first occurred, such Party shall be deemed to have irrevocably waived any right to refer such Dispute to the Dispute Resolution Procedure, under exception that if such Party was not aware, and could not with reasonable diligence have been aware, that such event, matter or situation had occurred, this Clause 28.7 shall have effect as if for the reference herein to the date on which such event, matter or situation occurred, there was substituted a reference to the date when such Party first became, or could with reasonable diligence have become, aware that such event, matter or situation had occurred. This Clause 28.7 is without prejudice to the right of either Party to raise in defence to any Dispute any defence (including, without prejudice to the foregoing generality, any defence of retention, compensation or set-off) which would otherwise be available to it.

28.8 Except in relation to the matters provided for in Clauses 28.15 to Clause 28.54 and subject to the provisions of Clause 28.9, in the event that either Party pursues any Dispute under the Dispute Resolution Procedure, and in the event that such Party fails to observe any time limit or timescale provided for in this Clause 28 (*Dispute Resolution Procedure*) in relation to the pursuit or progression of such Dispute, such Party shall, immediately upon such failure occurring, be deemed to have irrevocably waived any right to pursue or progress such Dispute any further. In that event, such Party shall be deemed to have elected not to have referred such Dispute or to have withdrawn such Dispute from the Dispute Resolution Procedure and shall be deemed to have irrevocably waived any right to refer any Dispute arising from the same or substantially the same Dispute or similar circumstances to the Dispute Resolution Procedure and shall be liable for payment of the whole fees incurred by any mediator or adjudicator who has acted in respect of such Dispute. This Clause 28.8 is without prejudice to the rights of either Party to raise in defence to any Dispute any defence (including, without prejudice to the foregoing generality, any defence of retention, compensation or set-off) which would otherwise be available to it.

28.9 Notwithstanding the provisions of Clause 28.8, in the event that a Party who pursues any Dispute under the Dispute Resolution Procedure fails to observe any time limit or timescale provided for in this Clause 28 (*Dispute Resolution Procedure*) in relation to the pursuit or progression of the Dispute, the other Party may elect to waive such failure, in which event the time limit or timescale to which such failure relates shall be extended at the discretion of such other Party and the Dispute shall progress in accordance with the Dispute Resolution Procedure, subject that all other time limits and timescales provided for in this Clause 28 (*Dispute Resolution Procedure*) which are affected by such extension shall be deemed to have been extended to give effect to such extension of the time limit or timescale to which such failure relates.

Internal Resolution Procedure

28.10 The following procedure is the Internal Resolution Procedure referred to in Clause 28.2:

28.10.1 In the event of any Dispute arising, the SDS Provider's Representative andthe Client's Representative shall seek to resolve the Dispute at a meeting to be convened within three Business Days of written notification by either Party to the other that it wishes to initiate the Internal Resolution Procedure in respect of that Dispute ("Notification"). Such Notification shall be given in accordance with the provisions of Clause 36 (*Notices*) of this Agreement.

28.10.2 Further meetings may follow the meeting referred to in Clause 28.10.1, but in any event, if the Dispute is not resolved within seven Business Days of Notification, each Party shall, before the expiry of the period of ten Business

Days from Notification, serve, in accordance with the provisions of Clause 36 (*Notices*) of this Agreement, a written position paper ("Position Paper") upon the other Party. Each Party's Position Paper shall state in reasonable detail that Party's position and required objectives in relation to the Dispute, any required redress, and, where possible, any comments on the other Party's position.

28.10.3 Upon such service of a Position Paper by the Party initiating or pursuing the Dispute, the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) shall seek to resolve the Dispute by meeting in good faith to discuss and negotiate upon the Dispute without recourse to legal or other proceedings.

28.10.4 In the event that resolution of the Dispute is achieved by the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client, the resolution shall be reduced to writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties.

28.10.5 Unless concluded by a written legally binding agreement, all discussions and negotiations connected with the Dispute shall be conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

28.11 In the event that any Dispute is not resolved by the Internal Resolution Procedure within a period of thirty Business Days from Notification (or longer if so agreed by the Parties) then the following provisions of this Clause 28.11 shall apply;

28.11.1 The Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client or their respective deputies in the event of their unavailability) shall, within a further period of five Business Days, seek to agree that the Dispute shall be resolved by any one of the following procedures:

28.11.1.1 mediation in accordance with Clauses 28.12 to 28.14; or

28.11.1.2 adjudication in accordance with Clause 28.15 to 28.54 in which event the Referring Party must give its Notice of Adjudication to the other Party within five Business Days of the date of expiry of the period of thirty five Business Days from Notification (or longer if so agreed by the Parties); or

28.11.1.3 litigation before the Court of Session, Scotland, in which event the Summons or Petition in any such litigation shall be signetted and served within ten Business Days of the date of expiry of the period of thirty-five Business Days from Notification (or longer if so agreed by the Parties).

28.11.2 In the event that the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) are unable to agree that the Dispute be resolved by the procedures described in Clauses 28.11.1.1 to 28.11.1.3, the Party initiating or pursuing the Dispute shall refer the Dispute to mediation (and thereafter adjudication if necessary) in accordance with Clauses 28.12 to 28.14.

Mediation

28.12 The Parties shall attempt in good faith to resolve the Dispute by a procedure of mediation in accordance with the Centre for Effective Dispute Resolution mediation rules or Model Mediation Procedure in force at the commencement of the mediation, (or in the event that the Centre for Effective Dispute Resolution has ceased to exist as at the time of the commencement of the mediation, mediation rules or a model mediation procedure offered by any other body offering commercial mediation services which shall be selected by the Client), which procedure shall be commenced within five Business Days of the date of expiry of the period of thirty-five Business Days from Notification (or longer if so agreed by the Parties). In the event that any provision of such mediation rules or model mediation procedure conflicts with any provision of this Clause 28 (*Dispute Resolution Procedure*), the provisions of this Clause 28 (*Dispute Resolution Procedure*) shall take precedence. In the event that any timescales contained in such mediation rules or model mediation procedure conflicts with the timescales referred to in this Clause 28 (*Dispute Resolution Procedure*), the timescales contained in such mediation rules or model mediation procedure shall be amended accordingly such that the timescales referred to in this Clause 28 (*Dispute Resolution Procedure*) shall be adhered to.

28.13 In the event that resolution of the Dispute is achieved in consequence of such mediation procedure, such resolution shall be reduced to writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties. Unless concluded by a written legally binding agreement, all discussions and negotiations connected with the mediation procedure referred to in Clause 28.12 shall be conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

28.14 If any Dispute to which this Clause 28 (*Dispute Resolution Procedure*) relates is not resolved by the mediation procedure referred to in Clauses 28.12 and 28.13 within a period of 55 Business Days from Notification (or longer if so agreed by the Parties), the mediation procedure shall be terminated and, unless the Party initiating or pursuing the Dispute withdraws the Dispute, the Dispute shall within a further 5 Business Days, be referred to adjudication in accordance with Clauses 28.15 to 28.54.

Adjudication

28.15 In the event that either Party refers a Dispute to adjudication in terms of Clause 28.11.1 or 28.14, or exercises a statutory right available to it (if any) under the Housing Grants Construction and Regeneration Act 1996 to raise adjudication proceedings, such adjudication shall be conducted in accordance with Clauses 28.15 to 28.54 wherein any reference to "days" is a reference to calendar days.

Notice of intention to seek adjudication

28.16 Either Party may give written notice (the "Notice of Adjudication") of its intention to refer the Dispute to adjudication and the Party giving such notice shall be the "Referring Party".

28.17 The Notice of Adjudication shall be given to the other Party and the Party receiving the Notice of Adjudication shall be the "Responding Party".

28.18 The notice of adjudication shall set out briefly:

28.18.1 the nature and a brief description of the Dispute and of the parties involved;

28.18.2 details of where and when the Dispute has arisen;

28.18.3 the nature of the redress which is sought; and

28.18.4 the names and addresses of the Parties (including the addresses which the Parties have specified for the giving of notices).

28.19 The adjudicator selected to consider the Dispute shall be selected from one of the panels ("Panels") appointed by the Parties in accordance with the following:

28.19.1 There shall be four Panels, one in respect of legal matters, ("Legal Panel") one in respect of construction matters and construction/operation interface matters ("Construction Panel"), one in respect of operational and maintenance matters ("Operations Panel") and one in respect of financial matters ("Financial Panel").

28.19.2 Each Panel shall be comprised of four members, who are listed in Schedule 10 *(Panels for the Dispute Resolution Procedure)* to this Agreement.

28.19.3 If any member of a Panel resigns or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties as a member of the Panel, a replacement shall be appointed by the Parties as soon as practicable. Any such replacement shall be wholly independent of the Client, any Client Party, the SDS Provider, any SDS Provider Party, **tie**, any **tie** Party, City of Edinburgh Council or any Relevant Authority, any Approvals Body, the Tram Supplier or any equipment supplier or any party associated with the Edinburgh Tram Network, and any successor to or subsidiary or parent of any of the aforementioned parties. If the Parties are unable to agree on the identity of such replacement(s), the President or Vice President for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers shall appoint such replacement(s) within thirty days of any application for such appointment by either Party.

28.20 The Referring Party shall at the same time as giving the Notice of Adjudication to the Responding Party, send to each of the members of the relevant Panel a copy of the Adjudication Notice and a request that each member of the relevant Panel advises both Parties within three days as to whether or not he is able and willing to act. The Parties shall attempt to agree within two further days as to which one of the members of the relevant Panel who responded indicating that they are able and willing to act shall be requested to act as adjudicator. In the event that such agreement is reached, the Referring Party shall, within a further period of one day, request the member of the relevant Panel upon whom agreement has been reached to act as adjudicator. In the event that such agreement is not reached, the Responding Party shall, within a further period of two days, select one of the members of the relevant Panel who responded indicating that they are able and willing to act and the Referring Party shall request that member to act as adjudicator;

28.21 If no member of the relevant Panel indicates that he is able and willing to act within three days of receiving a request to act as adjudicator, the Referring Party shall request the Chairman or the Vice-Chairman for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers to select a person to act as adjudicator.

28.22 Any person appointed, requested or selected to act as adjudicator in accordance with Clause 28.20, 28.21 and 28.24 shall be a natural person acting in his personal capacity. A person appointed, requested or selected to act as an adjudicator shall be wholly independent of the Client, any Client Party, the SDS Provider, any SDS Provider Party, **tie**, any **tie** Party, City of Edinburgh Council or any Relevant

Authority, any Approvals Body, the Tram Supplier or any equipment supplier or any party associated with the Edinburgh Tram Network, and any successor to or subsidiary or parent of any of the aforementioned parties.

28.23 The request referred to in Clause 28.20 shall be accompanied by a copy of the Notice of Adjudication.

28.24 The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers must communicate the selection of an adjudicator to the Referring Party within three days of receiving a request to do so.

28.25 Where The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers fails to comply with Clause 28.24, the Referring Party may:

28.25.1 agree with the other Party to the Dispute to request a specified person to act as adjudicator; or

28.25.2 request any other adjudicator nominating body to select a person to act as adjudicator. An "adjudicator nominating body" shall mean a body (not being a natural person and not being a Party to the Dispute) which holds itself out publicly as a body which will select an adjudicator when requested to do by a Referring Party.

28.26 The person requested to act as adjudicator in accordance with the provisions of Clause 28.20 or 28.21 shall indicate whether or not he is willing to act within two days of receiving the request.

28.27 Where an adjudicator has been selected in accordance with Clause 28.20, 28.21 or 28.24, the Referring Party shall, not later than seven days from the date of the Notice of Adjudication, refer the Dispute in writing (the "Referral Notice") to the adjudicator.

28.28 A Referral Notice shall be accompanied by copies of, or relevant extracts from the Agreement and such other documents as the Referring Party intends to rely upon.

28.29 The Referring Party shall, at the same time as he sends to the adjudicator the documents referred to in Clauses 28.27 and 28.28, send copies of those documents to the Responding Party.

28.30 The adjudicator may, with the consent of the Parties to those disputes, adjudicate at the same time on more than one Dispute under the Agreement.

28.31 The Parties may agree to extend the period within which the adjudicator may reach a decision in relation to all or any of these Disputes.

28.32 An adjudicator may resign at any time on giving notice in writing to the Parties.

28.33 An adjudicator must resign where the Dispute is the same or substantially the same as one which has previously been referred to adjudication, and a decision has been taken in that adjudication.

28.34 Where an adjudicator ceases to act under Clauses 28.32 or 28.33, or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties;

28.34.1 the Referring Party may serve a fresh notice in accordance with Clauses 28.16 to 28.19 and shall in accordance with Clauses 28.20 to 28.29 request an adjudicator to act; and

28.34.2 if requested by the new adjudicator, the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

28.35 The Parties to a Dispute may at any time agree to revoke the appointment of the adjudicator and in such circumstances the fees and expenses of that adjudicator shall, subject to Clause 28.36, be determined and payable in accordance with Clauses 28.52 to 28.53.

28.36 Where the revocation of the appointment of the adjudicator is due to the default or misconduct of the adjudicator, the Parties shall not be liable to pay the adjudicator's fees and expenses.

Powers of the Adjudicator

28.37 The adjudicator shall:

28.37.1 act impartially in carrying out his duties and shall do so in accordance with any relevant terms of the Agreement and shall reach his decision in accordance with Scots law; and

28.37.2 avoid incurring unnecessary expense.

28.38 The adjudicator may take the initiative in ascertaining the facts and the law necessary to determine the Dispute, and shall decide on the procedure to be followed in the adjudication. In particular, he may:

28.38.1 request either Party to supply him with such documents as he may reasonably require including, if he so directs, any written statement from either Party supporting or supplementing the Referral Notice and any other documents given under Clauses 28.27 to 28.28;

28.38.2 conduct the adjudication in the English language and decide whether a translation of any document is to be provided and, if so, by whom, by when, and at whose cost;

28.38.3 meet and question either Party and their representatives;

28.38.4 subject to obtaining any necessary consent from a third party or the Parties, make such site visits and inspections as he considers appropriate, whether accompanied by the Parties or not;

28.38.5 subject to obtaining any necessary consent from a third party or the Parties, procure the carrying out of any tests or experiments, and make directions as to the conditions for and responsibility for the cost of the same;

28.38.6 obtain and consider such representations and submissions as he requires, and, provided he has notified the Parties of his intention, appoint experts, assessors or legal advisers;

28.38.7 give directions as to the timetable for the adjudication, any deadlines, or limits as to the length of written documents or oral representations to be complied with; and

28.38.8 issue other directions relating to the conduct of the adjudication.

28.39 The Parties shall comply with any request or direction of the adjudicator in relation to the adjudication.

28.40 If, without showing sufficient cause, a Party fails to comply with any request, direction or timetable of the adjudicator made in accordance with his powers, fails to produce any document or written statement requested by the adjudicator, or in any other way fails to comply with a requirement under these provisions relating to the adjudication, the adjudicator may:

28.40.1 continue the adjudication in the absence of that Party or of the document or written statement requested;

28.40.2 draw such inferences from that failure to comply as may, in the adjudicator's opinion, be justified in the circumstances;

28.40.3 make a decision on the basis of the information before him, attaching such weight as he thinks fit to any evidence submitted to him outside any period he may have requested or directed;

28.40.4 disqualify any part or parts of that Party's submissions affected by the failure to comply; and

28.40.5 grant the other Party proper opportunity to consider and respond to any evidence or representation made late.

28.41 Subject to any agreement between the Parties to the contrary, either Party may be assisted by, or represented by, such advisers or representatives (whether legally qualified or not) as he considers appropriate.

28.42 The adjudicator shall consider any relevant information submitted to him by either Party and shall make available to them any information to be taken into account in reaching his decision.

28.43 The adjudicator and the Parties shall not disclose to any other person any information or document provided in connection with the adjudication which the Party supplying it has indicated is to be treated as confidential, except to the extent that disclosure is required by law or is necessary for the purposes of, or in connection with, the adjudication, or the information is already in the public domain.

Adjudicator's Decision

28.44 Unless otherwise agreed in accordance with Clause 28.56.1 or 28.57.1, the adjudicator shall reach his decision not later than:

28.44.1 twenty eight days after the date of the Referral Notice mentioned in Clause 28.25;

28.44.2 forty two days after the date of the Referral Notice if the Referring Party so consents; or

28.44.3 such period exceeding twenty eight days after the Referral Notice as the Parties may, after the giving of that notice, agree.

28.45 Where the adjudicator fails, for any reason, to reach his decision in accordance with Clause 28.44:

28.45.1 either of the Parties to the Dispute may serve a fresh notice in accordance with Clause 28.16 to 28.19 and shall request an adjudicator to act in accordance with Clauses 28.20 to 28.29; and

28.45.2 if requested by the new adjudicator the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

28.46 As soon as possible after he has reached a decision, the adjudicator shall deliver a copy of that decision to each of the Parties.

28.47 The adjudicator shall decide the matters in Dispute and may make a decision on different aspects of the Dispute at different times.

28.48 The adjudicator may take into account any other matters which the Parties agree should be within the scope of the adjudication or which are matters under the Agreement which he considers are necessarily connected with the Dispute and, in particular, he may:

28.48.1 open up, review and revise any decision taken or any notice certifying payment given by any person referred to in the Agreement, unless the Agreement states that the decision or notice certifying payment is final and conclusive;

28.48.2 decide that any of the Parties to the Dispute is liable to make a payment under the Agreement (whether in sterling or some other currency) and, subject to the terms of the Agreement, when that payment is due and the final date for payment.

28.49 The adjudicator shall provide written reasons for his decision.

Effect of the Decision

28.50 In his decision, the adjudicator may, if he thinks fit, order either or both of the Parties to comply peremptorily with his decision or any part of it. In the absence of any directions by the adjudicator relating to the time for performance of his decision, the Parties shall be required to comply with any decision of the adjudicator immediately on delivery of the decision to the Parties in accordance with Clause 28.46.

28.51 The decision of the adjudicator shall be binding on the Parties, and they shall comply with it, until the Dispute is finally determined by legal proceedings or by agreement between the Parties.

28.52 The adjudicator shall be entitled to the payment of such reasonable amount as he may determine by way of fees and expenses incurred by him and the Parties shall be jointly and severally liable to pay that amount to the adjudicator.

28.53 Without prejudice to the right of the adjudicator to effect recovery from either Party in accordance with Clause 28.52, the Parties shall each be liable to pay one-half share of the adjudicator's fees and expenses.

28.54 The adjudicator shall not be liable for anything done or omitted in the discharge or purported discharge of his functions as adjudicator unless the act or omission is in bad faith, and any employee or agent of the adjudicator shall be similarly protected from liability.

Related Disputes

28.55 Notwithstanding the terms of Clauses 28.2, 28.3, 28.6, 28.7, 28.8 and 28.9, in the event that a dispute or potential dispute under, or in connection with any contract associated with the Edinburgh Tram Network (referred to in this Clause 28 *(Dispute Resolution Procedure)* as "Related Contracts"), has arisen or arises out of substantially the same issues of fact and/or law (as the case may be) as a Dispute

under this Agreement (a "Related Dispute"), then providing that the Related Contract contains dispute resolution provisions in terms substantially the same as set out in this Clause 28 *(Dispute Resolution Procedure)* (save for necessary changes), the Client may require and direct that the Dispute and the Related Dispute be dealt with together at an appropriate stage of the Dispute Resolution Procedure.

28.56 In the event that a Related Dispute has already been referred to the decision of an adjudicator in accordance with the provisions of the Related Contract, and the Client is of the opinion that a Dispute is to be (but has not yet been) referred to adjudication under this Clause 28 *(Dispute Resolution Procedure)*, the Client may refer the Dispute, or may by notice in writing to the SDS Provider require that the Dispute be referred (as the case may be) to the adjudicator appointed under the Related Contract to decide upon the Related Dispute, and:

28.56.1 the adjudicator shall, if practicable, hear the Dispute at the same time as the Related Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator);

28.56.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator), the adjudicator shall have power (if so requested bythe Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator; and

28.56.3 the Client shall procure that, as soon as practicable, the other party or parties to the Related Dispute shall give the SDS Provider copies of the Related Contract, the referral notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

28.57 In the event that a Dispute has already been referred to the decision of an adjudicator, and the Client is of the opinion that a Related Dispute is to be (but has not yet been) referred to adjudication, the Client may refer the Related Dispute to the adjudicator appointed under this Clause 28 (*Dispute Resolution Procedure*) to decide upon the Dispute, and:

28.57.1 the Adjudicator shall, if practicable, hear the Related Dispute at the same time as the Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator);

28.57.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator), the adjudicator shall have power (if so requested by the Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator;

28.57.3 as soon as practicable, the Client shall give to the SDS Provider copies of the Related Contract, the referral notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

29. NOVATION, COLLATERAL WARRANTY IN FAVOUR OF TIE, FUNDER'S DIRECT AGREEMENT AND AGREEMENT BETWEEN THE JOINT REVENUE COMMITTEE AND THE SDS PROVIDER

Novation

29.1 **tie** intends to enter into an infrastructure supply contract with the Infraco. It is a material condition of this Agreement that the SDS Provider shall, if and at the time requested by **tie,** enter into and execute a Novation Agreement with **tie** and the Infraco in the form set out in Schedule 8 (*Novation Agreement*).

29.2 Notwithstanding the provisions of Clause 15 *(Changes),* **tie** may in its absolute discretion require the reduction of the scope of the Services prior to the execution of the Novation Agreement by the SDS Provider. If required, the SDS Provider shall within 5 Business Days of any request from **tie,** carry out a valuation of all work in progress in relation to the Services in accordance with the provisions of Clause 15.4, and subject to Clause 11 (*Methods of Payment*) and, for the avoidance of doubt, subject to any agreed milestone or lump sum payments set out in Schedule 3 (*Pricing Schedule*) or as agreed otherwise in accordance with this Agreement. **tie** shall, subject to any clarifications as are in tie's opinion (acting properly and reasonably) necessary, certify by notice in writing to the SDS Provider that part of the work in progress which is approved by **tie** and give reasons why any part of the work in progress has not been certified and the value of the sums involved no later than 10 Business Days after the date on which such valuation was received. **tie's** valuation of such work in progress shall be final and binding.

29.3 If the scope of the Services is reduced by **tie**, then within 30 Business Days of the date of execution of the Novation Agreement by the SDS Provider, the SDS Provider shall submit a valid VAT invoice to **tie** for the work in progress certified by **tie** in respect of the services which have been removed from the Services to be performed by the SDS Provider.

29.4 Payment will become due to the SDS Provider on the date of receipt of the valid VAT invoice by **tie** and the final date for payment by **tie** of such valid VAT invoice shall be 30 days from the date of receipt of such valid VAT invoice.

29.5 Within 10 days of any request from **tie,** the SDS Provider shall provide an Estimate of any changes proposed by the bidders for the Infraco Contract to the scope of the Services or the Deliverables, which have been notified by **tie** to the SDS Provider.

Collateral Warranty in favour of tie

29.6 On the date of execution of the Novation Agreement referred to in Clause 29.1, the SDS Provider shall execute a collateral warranty agreement in favour of **tie** in the form contained in Schedule 7 (*Collateral Warranty Agreement*) and provide the same as executed to **tie** on that date.

Funder's Direct Agreement

29.7 On the date of execution of the Novation Agreement, the SDS Provider shall, if required by **tie,** execute a Funder's Direct Agreement and provide the same as executed to the Infraco on that date.

Agreement between the Joint Revenue Committee and the SDS Provider

29.8 It is a material condition of this Agreement that the SDS Provider shall enter into and execute an agreement with the Joint Revenue Committee substantially in the form set out in Schedule 17 *(Agreement between the SDS Provider and the Joint Revenue Committee*), within 10 Business Days of the appointment of the Joint Revenue Committee by **tie.** Failure to enter into such agreement shall constitute a breach of this Agreement but shall not relieve the SDS Provider of any of its obligations in relation to the SDS-JRC Modelling Suite or otherwise under this Agreement. The SDS Provider shall provide **tie** with a duly certified executed copy of the agreement with Joint Revenue Committee entered into pursuant to this Clause 29.8 within 5 Business Days of its execution.

29.9 The SDS Provider shall be responsible for the development, testing, validation, commissioning and deployment of a transport modelling suite (the SDS-JRC Modelling Suite) as stipulated in Section 3.5 of Schedule 1 *(Scope of Services)*, such Deliverable to be approved by **tie** by 31 March 2006.

30. ASSIGNATION, CHANGES IN LEGAL STATUS AND CHANGES IN CONTROL

30.1 Without prejudice to Clause 9 *(Sub-Letting and the Appointment of SDS Provider Parties)*, the SDS Provider shall not assign, novate or otherwise transfer the whole or any part of the Agreement without the prior written agreement of the Client.

30.2 In addition to and without prejudice to the provisions of Clause 29.1 and the Novation Agreement to be entered into in accordance with Clause 29.1, the Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

30.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie** who, as a result of any Change in Law, takes over all or substantially all the functions of **tie**; or

30.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to the SDS Provider) by tie or a person falling within Clause 30.2.1; or

30.2.3 to CEC or Transport Edinburgh Limited; or

30.2.4 with the prior written consent of the SDS Provider (such consent not to be unreasonably withheld or delayed).

30.3 If the legal status of the SDS Provider shall change in any way, the Client shall be informed by the SDS Provider in writing, immediately.

30.4 If there is a Change of Control in the SDS Provider, the Client shall be informed immediately by the SDS Provider in writing.

31. CONFLICT OF INTEREST

31.1 The SDS Provider shall:

31.1.1 be responsible for ensuring that no conflict of interest arises in respect of its duties under the Agreement;

31.1.2 make all possible enquiries to ensure that there is no conflict of interest prior to its assuming the duties required of it under the terms of the Agreement; and

31.1.3 consult and advise the Client if the SDS Provider considers that a conflict of interest arises or if he considers that a conflict of interest may exist or may arise or may be foreseeable and shall furnish the Client with such information as shall enable the Client to determine whether or not a conflict of interest has arisen.

32. COPYRIGHT AND INTELLECTUAL PROPERTY

32.1 All SDS Provider IPR shall continue to be owned by the SDS Provider.

32.2 The SDS Provider hereby:

32.2.1 assigns by way of future assignation to the Client with full title guarantee the Project IPR which is created by it and shall procure that Project IPR created by any SDS Provider Party is also so assigned, for all of the residue of the term of such rights and all renewals or extensions thereof and together with all accrued causes of action in respect thereof;

32.2.2 grants to the Client a non-exclusive perpetual irrevocable royalty free licence to use such SDS Provider IPR as may be necessary for the Client to use in relation to any projects associated with the Services;

32.2.3 grants to the Client the right to grant non-exclusive non-assignable sub-licences to third parties for such lengths of time as the Client may reasonably require and otherwise on the same terms as the licence granted to the Client pursuant to Clause 32.2.2 above, to use the SDS Provider IPR referred to in that Clause (other than in relation to Third Party Software which is subject to the provision of Clause 32.9) in so far as is necessary or desirable for such third party to use such SDS Provider IPR in relation to any projects associated with the Services;

32.3 For the avoidance of doubt, the persons to whom the Client may grant sub-licences pursuant to Clause 32.2.3 above shall include:

32.3.1 any Client Party;

32.3.2 the Operator and any party other than the Operator providing support to **tie** in relation to the Edinburgh Tram Network;

32.3.3 **tie** and any **tie** Party;

32.3.4 bidders for the Infraco Contract and the Tram Supply Contract;

32.3.5 the Tram Supplier;

32.3.6 any party providing maintenance in relation to the Edinburgh Tram Network;

32.3.7 the Joint Revenue Committee;

32.3.8 any party appointed by **tie** to carry out utilities diversions; and

32.3.9 any assignee or transferee under this Agreement.

32.4 The Client hereby grants to the SDS Provider a non-exclusive revocable royalty free licence for the duration of this Agreement to use such Project IPR as is owned by it as may be necessary for the SDS Provider to use solely and exclusively for the purpose of performing the Services.

32.5 The copyright of this Agreement and any data or software supplied to the SDS Provider by the Client, shall remain solely with the Client.

32.6 The SDS Provider shall at any time and from time to time hereafter at the request of the Client execute all such documents and do all such further acts as may be required in order to vest the rights referred to in Clause 32.2.1 in the Client.

32.7 The SDS Provider waives any and all moral rights held or to be held by the SDS Provider in the Deliverables and the Project IPR and shall procure that all of the SDS Provider Parties who are authors of the whole or any part of the Deliverables or the Project IPR waive and abandon in writing all moral rights.

32.8 The SDS Provider agrees that all rights in the Project IPR shall remain the property of the Client and the SDS Provider shall retain no rights in the Project IPR beyond the licence granted in Clause 32.4 above. The SDS Provider shall be entitled to use such Project IPR only on the terms set out herein and solely for the purpose of the performance of the Services. In particular, otherwise as permitted in this Agreement herein, the SDS Provider shall not disclose, assign, sub-licence, lease, rent or otherwise dispose of the Project IPR.

32.9 To the extent that any of the Deliverables are generated by or maintained on a computer or similar system, the SDS Provider shall use all reasonable endeavours to procure for the benefit of the Client, at no charge or at the lowest reasonable fee, the grant of a licence or sub-licence for any relevant Third Party Software on the same terms as the SDS Provider Software is licensed to the Client, to enable the Client or its nominee to access and otherwise use (subject to the payment by the Client of the relevant fee, if any) such Deliverables in connection with this Agreement. As an alternative, the SDS Provider may provide such Deliverables in a format which may be read by software generally available at reasonable prices in the market at the relevant time or in hard copy format.

32.10 The SDS Provider shall ensure the back-up and storage in safe custody of the Deliverables in accordance with Good Industry Practice. Without prejudice to this obligation, the SDS Provider shall submit to the Client's Representative for approval its proposals for the back-up and storage in safe custody of the Deliverables and the Client shall be entitled to object if the same is not in accordance with Good Industry Practice. The SDS Provider shall comply, and shall cause all the SDS Provider Parties to comply, with all such proposals to which the Client Representative has given his or her approval. The SDS Provider may vary its procedures for such back-up and storage subject to submitting its proposals for change to the Client Representative, who shall be entitled to object on the basis set out above.

32.11 Where a claim or proceeding is made or brought against the Client or its permitted licensees which arises out of the infringement of any Intellectual Property Rights in any Deliverables or other materials provided by the SDS Provider or any SDS

Provider Party to the Client then the SDS Provider shall indemnify and keep the Client indemnified on demand at all times from and against all Indemnified Liabilities arising in connection with such claim or proceedings.

32.12 For the purposes of this Clause 32 (*Copyright and Intellectual Property*), "use" shall include the acts of copying, modifying, adapting and translating the material in question and/or incorporating them with other materials and the term "the right to use" shall be construed accordingly.

32.13 The provisions of this Clause 32 (*Copyright and Intellectual Property*) shall apply during the continuance of this Agreement and after its termination howsoever arising, and immediately following termination howsoever arising, the SDS Provider shall provide the Client with:

32.13.1 a copy of the object code for the Third Party Software and the SDS Provider Software on media that is reasonably acceptable to the Client;

32.13.2 a copy of the source code for the Specially Written Software on media that is reasonably acceptable to the Client; and

32.13.3 a copy of all documentation, manuals and other technical information relating to the Third Party Software, the Specially Written Software and the SDS Provider Software that is reasonably required by the Client to operate, manage and support the Third Party Software, the Specially Written Software and the SDS Provider Software.

32.14 The SDS Provider shall not reproduce or publish any document or matter relating to the Services or this Agreement, either alone or in association with any other body or person, without the prior written consent of the Client.

33. CONFIDENTIAL INFORMATION

33.1 Each Party:

33.1.1 shall treat all Confidential Information belonging to the other Party as confidential and safeguard it accordingly; and

33.1.2 shall not disclose any Confidential Information belonging to the other Party to any other person without the prior written consent of the other Party, except to such persons and to such extent as may be necessary for the performance of the Agreement or except where disclosure is otherwise expressly permitted by the provisions of this Agreement.

33.2 The SDS Provider shall take all necessary precautions to ensure that all Confidential Information obtained from the Client under or in connection with the Agreement:

33.2.1 is given only to such of the staff and professional advisors or SDS Provider Parties engaged to advise it in connection with the Agreement as is strictly necessary for the performance by the SDS Provider of the Services and its other obligations under this Agreement and only to the extent necessary for the performance by the SDS Provider of the Services and its other obligations under this Agreement;

33.2.2 is treated as confidential and not disclosed (without prior approval) or used by any staff or such professional advisors or SDS Provider Parties otherwise than for the purposes of the Agreement.

33.3 Where it is considered necessary in the opinion of the Client, the SDS Provider shall ensure that staff or such professional advisors or SDS Provider Parties sign a confidentiality undertaking before commencing work in connection with the Agreement.

33.4 The SDS Provider shall not use any Confidential Information it receives from the Client otherwise than for the purposes of the Agreement.

33.5 The provisions of Clauses 33.1 to 33.4 shall not apply to:

33.5.1 any information which is or becomes public knowledge (otherwise than by breach of this Clause 33);

33.5.2 any information which was in the possession of the receiving Party, without restriction as to its disclosure, before receiving it from the disclosing Party;

33.5.3 any information which is received from a third party who lawfully acquired it and who is under no obligation restricting its disclosure;

33.5.4 any information which is independently developed without access to the Confidential Information;

33.5.5 any disclosure pursuant to a statutory, legal or parliamentary obligation placed upon the Party making the disclosure, including any requirements for disclosure under FOISA, the Code, or the Environmental Information Regulations pursuant to Clauses 33.7 to 33.11(inclusive);

33.5.6 any disclosure by **tie** of this Agreement including the SDS Provider's fees and commercial terms, any information relating to the design of any aspect of the Edinburgh Tram Network and such other information as may be reasonably required for the purpose of conducting a due diligence exercise with any bidders for the Infraco Contract and the Tram Supply Contract and their advisers;

33.5.7 any disclosure by **tie** or the Client of this Agreement and any related information to the TSS Provider;

33.5.8 any information which is required to be disclosed to that Party's insurers and/or legal advisers subject to Clauses 33.2 and 33.3;

33.5.9 any registration of information in respect of the Consents and any property registration required;

33.5.10 any disclosure of information by the Client or **tie** to Transport Edinburgh Limited, CEC, Partnerships UK Limited, any department, office or agency of the Scottish Executive or the UK government;

33.5.11 any disclosure for the purpose of:

33.5.11.1 the examination and certification of **tie**'s, the Client's or the SDS Provider's accounts; or

33.5.11.2 any examination (pursuant to applicable Law) of the economy, efficiency and effectiveness with which **tie** has used their resources or funding made available to them including any examination pursuant to the Local Government (Scotland) Act 1973 as amended by the Local Government in Scotland Act

2003 of whether the Client has secured best value in the performance of its functions

33.5.12 any disclosure of Confidential Information obtained from the SDS Provider:

33.5.12.1 to any government department or any other local government authority or public authority equivalent in status to **tie.** All government departments or any other local government authority or public authority equivalent in status to **tie** receiving such Confidential Information shall be entitled to further disclose the Confidential Information to other government departments or any other local government authority or public authority equivalent in status to **tie** on the basis that the information is confidential and is not to be disclosed to a third party which is not part of any government department or any other local government authority or public authority equivalent in status to **tie**; or

33.5.12.2 to any person engaged in providing any services to the Client for any purpose relating to or ancillary to the Agreement;

provided that in disclosing information under this Clause 33 (*Confidential Information*) the Client discloses only the information which is necessary for the purpose concerned and requires that the information is treated in confidence and that a confidentiality undertaking is given where appropriate.

33.6 Nothing in this Clause shall prevent either Party from using any techniques, ideas or know-how gained during the performance of the Agreement in the course of its normal business, to the extent that this does not result in a disclosure of Confidential Information or an infringement of Intellectual Property Rights.

33.7 In the event that the SDS Provider fails to comply with this Clause 33 (*Confidential Information*), the Client reserves the right to terminate the Agreement by notice in writing in accordance with Clause 19.1.

33.8 The SDS Provider acknowledges that **tie** is subject to the requirements of FOISA and the Environmental Information Regulations and shall assist and cooperate with **tie** (at the SDS Provider's expense) to enable **tie** to comply with these Information disclosure requirements. **tie** agrees that it shall comply with the terms of the Code in respect of the discharge of its obligations under FOISA.

33.9 The SDS Provider shall and shall procure that the SDS Provider Parties shall:

33.9.1 transfer the Request for Information to **tie** as soon as practicable after receipt and in any event within two Business Days of receiving a Request for Information;

33.9.2 provide **tie** with a copy of all Information in its possession or power in the form that **tie** requires within five Business Days (or such other period as **tie** may specify) of **tie** requesting that Information; and

33.9.3 provide all necessary assistance as reasonably requested by **tie** to enable **tie** to respond to a Request for Information within the time for compliance set out in section 10 of FOISA or regulation 5 of the Environmental Information Regulations.

33.10 **tie** shall be responsible for determining at its absolute discretion whether the Confidential Information and/or any other Information:

33.10.1 is exempt from disclosure in accordance with the provisions of the Code, FOISA or the Environmental Information Regulations;

33.10.2 is to be disclosed in response to a Request for Information, and

33.11 in no event shall the SDS Provider respond directly to a Request for Information unless expressly authorised to do so by **tie**.

33.12 The SDS Provider acknowledges that **tie** may be obliged, pursuant to the Code, FOISA, or the Environmental Information Regulations to disclose Information:

33.12.1 without consulting with the SDS Provider, or

33.12.2 following consultation with the SDS Provider and having taken its views into account.

33.13 The SDS Provider shall ensure that all information and Deliverables produced in the course of the Agreement or relating to the Agreement is retained for disclosure and shall permit the Client and **tie** to inspect such records as requested from time to time.

33.14 The SDS Provider acknowledges that any lists or schedules provided by it outlining Confidential Information are of indicative value only and that **tie** may nevertheless be obliged to disclose Confidential Information in accordance with Clause 33.9.

33.15 Any public relations material, press releases, public presentations or conference engagements in relation to this Agreement planned by the SDS Provider requires the Client's and **tie**'s prior written approval.

34. WAIVER

34.1 Save where expressly stated, no failure or delay by the Client to exercise any right or remedy in connection with this Agreement will operate as a waiver of it or of any other right or remedy nor will any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

34.2 The SDS Provider agrees that no waiver shall occur or be deemed to have occurred unless or until a clear and unequivocal express waiver of a clearly identified default is contained in a written notice by the Client to the SDS Provider expressly for the purpose of effecting such waiver.

34.3 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

35. ENTIRE AGREEMENT

35.1 Except where expressly provided otherwise in this Agreement, this Agreement constitutes the entire agreement between the Parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings concerning the subject matter of this Agreement.

35.2 Each of the Parties confirms to the other that it has neither been induced to enter into this Agreement in reliance on, nor has it made, any representation or warranty except those contained or referred to in this Agreement.

35.3 Any representations or warranties other than those contained or referred to in this Agreement are superseded and extinguished by this Agreement.

35.4 Each Party irrevocably and unconditionally waives all rights and remedies which it might otherwise have had in relation to any representations or warranties other than those contained or referred to in this Agreement.

36. NOTICES

36.1 Any notice or notification required or authorised to be given under this Agreement by one Party to the other shall be:

36.1.1 in writing;

36.1.2 sent by one of the following methods:

(i) pre-paid registered or recorded delivery post or facsimile transmission addressed to the Party to which it is given at:

(a) in the case of notices given to the Client: **tie**, Verity House, 19 Haymarket Yards, Edinburgh EH12 5BH, fax number 0131 622 8301, attention: Projects Director, or such other address or fax number in the United Kingdom as the Client may notify the SDS Provider from time to time for that purpose; or

(b) in the case of notices given to the SDS Provider, Parsons Brinckerhoff Limited, 2nd Floor, 100 Queen Street, Glasgow, G1 3DF, fax number 0141 222 6901 ,attention: David Hutchison or such other address or fax number in the United Kingdom as the SDS Provider may notify the Client from time to time for that purpose; or

(ii) facsimile transmission addressed to the Client's Representative or the SDS Provider's Representative (as appropriate) at a facsimile number notified to the giving Party by the receiving Party for the service of notices under this Agreement from time to time; or

(iii) personal delivery into the hands of:

(a) in the case of notices given to the Client, the Client's Representative; or

(b) in the case of notices given to the SDS Provider, the SDS Provider's Representative.

(iv) e-mail to:

(a) in the case of notices given to the Client, the Client's Representative; or

(b) in the case of notices given to the SDS Provider, the SDS Provider's Representative.

36.1.3 be deemed duly served:

(i) if sent by pre-paid registered or recorded delivery post, 2 clear Business Days after posting; or

(ii) if sent via facsimile transmission or personal delivery, on the day of issue of the relevant fax confirmation receipt or such personal delivery (as appropriate), unless that day is not a Business Day in which case it shall be deemed duly served on the next Business Day thereafter; or

(iii) if sent via e-mail, the date of written acknowledgement by the Party to whom the notice was served.

37. CONSENT AND APPROVAL

37.1 The giving of any consent or approval by or on behalf of the Client shall not in any way relieve the SDS Provider of any of its obligations under the Agreement or of its duty to ensure the correctness, accuracy or suitability of the matter or thing which is the subject of the consent or approval.

37.2 Failure by the Client to disapprove or object to any matter or thing shall not prejudice its power subsequently to take action under the Agreement in connection therewith.

38. DISCRIMINATION

38.1 The SDS Provider shall not (and the SDS Provider shall insert a clause to this effect in each contract with any SDS Provider Party) unlawfully discriminate within the meaning and scope of the provisions of the Equal Pay Act 1970, the Sex Discrimination Act 1975, the Race Relations Act 1976, the Disability Discrimination Act 1995, the Employment Equality (Sexual Orientation) Regulations 2003 and the Employment Equality (Religion or Belief) Regulations 2003.

39. FURTHER ASSURANCE

39.1 Each Party shall at the reasonable request and cost of the other (save where it is expressly provided that the cost of such act or execution shall be for that party's account) do any act or execute any document that may be necessary to give full effect to this Agreement.

40. APPLICABLE LAW

40.1 This Agreement, any document completed or to be completed in accordance with its provisions and any matter arising from it or any such document shall be governed by and construed in accordance with Scots law.

40.2 Subject to Clause 28 (*Dispute Resolution Procedure*), the Parties hereby irrevocably submit to the exclusive jurisdiction of the Court of Session in relation to this Agreement, any such document and any such matter.

41. VARIATIONS TO BE IN WRITING

No variation, or alteration of any of the provisions of this Agreement shall be effective unless it is in writing and signed by both Parties.

42. NO PARTNERSHIP OR AGENCY

42.1 Nothing in this Agreement shall be construed as creating a partnership between the Client and the SDS Provider.

42.2 The SDS Provider shall not (and shall procure that the SDS Provider Parties shall not) act or purport to act as agent for the Client in relation to any matter unless specifically authorised in writing under this Agreement by the Client. The SDS

Provider shall not be entitled to bind the Client in any way or to create any liability or cause of action against the Client and shall not hold itself out (and shall procure that no SDS Provider Party shall hold itself out) as having any such authority or power

43. INVALID TERMS

If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

43.1 that term shall to that extent be deemed not to form part of this Agreement; and

43.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

44. THIRD PARTY RIGHTS

Subject to any other express provision of this Agreement, a person who is not party to this Agreement shall have no right to enforce any term of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding 75 pages together with Schedules One to Seventeen (inclusive) which are annexed and signed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED** at EDINBURGH

on 19TH SEPTEMBER 2005 by:

[redacted]

Authorised Signatory

MICHAEL WILLIAM DAVIS HOWELL

Full Name

[redacted]

Witness Signature

ALAN McLEOD CASSELS

Full Name

RUTLAND BUILDING

Address

RUTLAND SQUARE

EDINBURGH

EXECUTED for and on behalf of **PARSONS BRINCKERHOFF LIMITED** at EDINBURGH

on 19TH SEPTEMBER 2005 by:

[redacted]

Attorney

MICHAEL MAHN JENKINS

Full Name

[redacted]

Witness Signature

ALAN McLEOD CASSELS

Full Name

RUTLAND BUILDING

Address

RUTLAND SQUARE

EDINBURGH

This is Schedule One referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE ONE

SCOPE OF SERVICES

1. General

1.1 The SDS Provider shall:

1.1.1 perform all Design and Technical Services;

1.1.2 give all general technical support described in this Schedule One;

1.1.3 perform all management services described in this Schedule One; and

1.1.4 assist the Client as may be required in accordance with this Agreement.

2. Design and Technical Services

2.1 General

2.1.1 The SDS Provider shall undertake all design and produce the Deliverables necessary to enable the Edinburgh Tram Network to be procured, constructed, tested and commissioned (taking account of the need to fully co-ordinate these activities, including with other physically-related projects, so as to minimise overall disruption) to meet the requirements of the Master Project Programme, and then operated and maintained.

2.1.2 The SDS Provider shall produce a design which shall deliver overall system functionality, capability and achieve the performance requirements of the Edinburgh Tram Network.

2.1.3 The SDS Provider shall produce a tram service simulation that will demonstrate the achievement of the required run times and service performance as the design progresses.

2.1.4 The SDS Provider shall ensure that the design covers all aspects of the Edinburgh Tram Network and the associated works adjacent to the proposed alignment.

2.1.5 The SDS Provider shall undertake all necessary research, surveys and investigations necessary to support the provision of a cost effective design.

2.1.6 The SDS Provider is responsible for ensuring that there are no gaps and omissions in the specification and design of the Edinburgh Tram Network.

2.1.7 The SDS Provider shall demonstrate that the detailed design has properly considered and adopted the most advantageous whole life cost solutions.

2.1.8 The SDS Provider shall deliver designs and/or Technical Specifications which shall include:

2.1.8.1 detailed alignment and associated civil and structural works;

2.1.8.2 specifications of sub system functionality and technical requirements for the following E & M system components:

- trams;
- tram track;
- OLE;
- traction and auxiliary power supply network (including network reinforcement if required);
- signals and control system (for both tram and highway traffic control);
- communication systems;
- integrated fare collection equipment;
- security systems; and
- depot systems and associated maintenance plant and equipment.

2.1.8.3 the infrastructure required to support the above E&M system components, which includes:

- civil and structural engineering works (formation, structures, retaining walls and the like);
- track formation;
- road works;
- traffic management systems;
- tram stops;
- depot, buildings and associated external works;
- substation buildings and associated external works;
- foul and surface water drainage systems;
- building services (M&E) infrastructure;
- building works associated with the Edinburgh Tram Network's E&M systems;
- environmental mitigation measures;
- hard and soft landscaping; and
- stray current and EMC control systems.

2.2 Design Approach

The SDS Provider shall approach the Design and Technical Services in a structured manner using a recognised 'V' life cycle model with regard to the integration of design engineering, systems engineering and safety engineering activities. The SDS Provider shall carry out the Design and Technical Services over three phases:

- Requirements Definition Phase;
- Preliminary Design Phase; and
- Detailed Design Phase.

2.3 Requirements Definition Phase

2.3.1 By the end of the Requirements Definition Phase, the SDS Provider shall have produced a set of Functional Requirements Specifications and the means by which they will be tested that have been agreed with the Client in accordance with the Review Procedure, such that the Preliminary Design Phase can commence.

2.3.2 During the Requirements Definition Phase, the SDS Provider shall:

2.3.2.1 develop the Functional Requirements Specification into full system requirement specifications that broadly align with the WBS;

2.3.2.2 identify and produce a series of management plans including; safety management/engineering, project management, environmental management, configuration management, verification and validation which will inform and direct the preliminary and detailed design processes;

2.3.2.3 undertake technology reviews such that the SDS Provider considers that the selected technologies will meet the requirements developed in this Requirements Definition Phase;

2.3.2.4 produce the initial safety case strategy, using GSN, and define the proposed arguments and the required supporting evidence to be provided;

2.3.2.5 record agreed requirements by a suitable means, such as a requirements database;

2.3.2.6 carry out and conclude early safety engineering activities such that 'safety' requirements are identified, assessed for risk and a hazard log initiated;

2.3.2.7 undertake any surveys required and incorporate relevant findings into the Functional Requirements Specifications and the Technical Specifications to be prepared by the SDS Provider;

2.3.2.8 deliver all Deliverables for the Requirements Definition Phase as are identified in Appendix 3 of this Schedule 1 (*Scope of Services*) ; and

2.3.2.9 define in detail the format for the drawings and documents to be produced as part of the Services, ensuring that all requirements for manufacture, construction, commissioning, operation, maintenance, land and property agreements, utilities diversions, access,

wayleaves, servitudes and other third party agreements relative to the Edinburgh Tram Network, may be readily provided in appropriate formats from the same source computer files. If required bythe Client, the SDS Provider shall also detail the format for drawings and documents which are to be produced outwith the scope of the Services

2.3.3 The SDS Provider shall be responsible for undertaking and reporting on (inclusive of interpretative analysis) the following surveys along with any other surveys necessary to inform the design of the Edinburgh Tram Network including:

- ground penetrating radar;
- ground investigation and geotechnical surveys;
- contamination, pollution, air and water quality surveys;
- photographic surveys;
- topographical surveys;
- hydrographic surveys;
- archaeological surveys;
- structural, building & cellar surveys;
- condition of structure surveys;
- undertake Network Rail asset investigation study and prepare accurate engineering drawings for input into the detailed design process and Network Rail agreements;
- environmental and ecological surveys;
- noise and vibration baseline surveys;
- pre and post construction noise and vibration surveys;
- pre-condition dilapidation surveys of vulnerable third party structures;
- frontager surveys;
- radio surveys;
- traffic & public transport surveys;
- computer traffic/transport modelling; and
- 3-D representational modelling

The resultant analysis and reports from those surveys are to be used to develop the Functional Requirements Specifications and the Technical Specifications and to set base lines against which the impact of the Edinburgh Tram Network can be measured when built.

2.4 Preliminary Design Phase

2.4.1 By the end of the Preliminary Design Phase, the SDS Provider shall have produced a preliminary design for each Sector or Sub-Sector (as appropriate) to such a level that the SDS Provider, the Client and the relevant Approval Bodies are satisfied that when progressed, the detailed design in respect of each Sector or Sub-Sector (as appropriate) will deliver the agreed and specified system functionality, be acceptably safe, constructable, will comply with the Design Manual and deliver the Functional Requirements Specification agreed at the end of the Requirements Definition Phase.

2.4.2 The SDS Provider shall, initially at a high level for the whole of the Edinburgh Tram Network, and thereafter at a detailed level for each Sector or Sub-Sector (as appropriate) in the order referred to in the Programme Phasing Structure and Clauses 7.2 and 7.3 of the Agreement:

2.4.2.1 develop the track alignments and the associated track layout arrangements for the Edinburgh Tram Network;

2.4.2.2 define tramstop and substation locations;

2.4.2.3 propose appropriate technologies and agree the adoption of these for Edinburgh Tram Network with the Client;

2.4.2.4 prepare generic details for each type(s) of tramstop layouts/arrangements, including equipment, lighting, building services and signage;

2.4.2.5 carry out the preliminary design of the depot(s) layout and arrangement including trackwork, maintenance equipment control centre and staff facilities;

2.4.2.6 develop system architectures for supervisory control and communications and electrification and power elements;

2.4.2.7 demonstrate that all elements of the preliminary design meet the Functional Requirements Specifications, especially those related to run-time, performance/reliability, integrated ticketing and safety;

2.4.2.8 undertake such safety analysis that will allow further development of the safety case concurrent with the design to prove that the Edinburgh Tram Network is acceptably safe;

2.4.2.9 further develop the Functional Requirements Specifications for the infrastructure, systems and the trams such that it is ensured that the preliminary design of the infrastructure, systems and the trams are compatible and meet the Requirements Specification for Overall System Operational and Performance Requirements;

2.4.2.10 prior to the review of the whole preliminary design for the Edinburgh Tram Network (or part thereof), the SDS Provider shall produce for review the foreseen costs of taking that design forward to construction and commissioning;

2.4.2.11 produce a migration plan that shows constructability and commissioning of the design as well as user training and

compliance with programmed dates for entering operational service; and

2.4.2.12 deliver all Deliverables for Preliminary Design Phase as are identified in Appendix 3 of this Schedule 1 (*Scope of Services*).

2.5 Technology Reviews

The SDS Provider shall undertake comparative technology reviews so as to identify the most appropriate ways of delivering the functionality required of the Edinburgh Tram Network and its component parts. This shall include:

- establishing the latest dates for any modification of elements of design where the opportunity exists to change the specification as a result of advances in proven technology;
- investigating the feasibility of proven wireless telecommunication systems such as:
  - monitoring, control and recording of voice radio communications between the control centre and the trams, passenger help points and public address systems;
  - monitoring, control and recording of remote equipment data via radio;
  - monitoring, control and recording of real-time CCTV video images via wireless means; and
  - updating and control of passenger information displays by Data Radio means;
- ensuring the Edinburgh Tram Network has the most relevant ticketing, management and information systems; and
- illustrating the advantages and disadvantages relevant to moving from an Edinburgh Tram Network designed to deliver the operational and performance requirements (stated in the Requirements Specification for Overall System Operational and Performance Requirements) with a 40 metre long 100% low floor tram to a 30 (+) metre long 70% (partial) low floor tram.

The SDS Provider shall conclude the comparative technology reviews during the early part of the Preliminary Design Phase and this shall include:

- a scoping study outlining the areas to be investigated;
- a programme outlining the latest date for modification of any specifications within the overall programme together with interaction of activities; and
- reports and presentations analysing and assessing the options and justifying the final selections of technologies in terms of time, cost, quality, safety, risk and maintainability.

2.6 Detailed Design

2.6.1 By the end of the Detailed Design Phase for each Sector or Sub-Sector (as appropriate) the SDS Provider shall have:

2.6.1.1 produced and delivered to the Client, the detailed design and specification of all the works, associated sub-systems and components and their associated installation drawings/schedules, test specifications, manuals and records (all of which shall have been approved in accordance with the Review Procedure); and

2.6.1.2 produced the detailed design of the Edinburgh Tram Network for each Sector or Sub-Sector (as appropriate), in the order referred to in the Programme Phasing Structure and Clauses 7.2 and 7.3 of the Agreement, such that the detailed design has full approval of the Client and the relevant Approval Bodies and such that the Edinburgh Tram Network as designed can be constructed, installed, tested and commissioned by Infraco and then operated and maintained.

2.6.2 The SDS Provider shall:

2.6.2.1 build upon the work done in the Preliminary Design Phase and produce detailed Deliverables for all elements of the infrastructure and associated systems for the Edinburgh Tram Network from which construction, installation, testing and commissioning activities can commence and be satisfactorily concluded;

2.6.2.2 produce procurement specifications and associated schedules for all E&M systems and sub-systems for the Edinburgh Tram Network;

2.6.2.3 produce a costed programme of the design and its construction;

2.6.2.4 gain all relevant planning and other approvals and consents including traffic regulation orders (during construction and post-opening) to enable construction works to proceed in accordance with the requirements of the Master Project Programme;

2.6.2.5 produce the plan for the installation/testing/commissioning of the Edinburgh Tram Network and associated sub-systems;

2.6.2.6 ensure that E&M system suppliers produce appropriate training plans for operations and maintenance staff (including manuals) and trial running plans;

2.6.2.7 demonstrate that all elements of the detailed design meet the requirements agreed, especially those related to run-time, performance/reliability and safety;

2.6.2.8 undertake such safety analysis that will allow development of the safety case concurrent with the detailed design to prove that the system once constructed and operational will be acceptably safe;

2.6.2.9 finalise the Technical Specifications such that it is ensured that the design of the infrastructure systems and the trams are compatible;

2.6.2.10 at the review of the detailed design for each Sector or Sub-Sector (as appropriate) and prior to the review of the detailed design for the whole of the Edinburgh Tram Network (or part thereof), the SDS

Provider shall produce for review the foreseen cost of taking that detailed design forward to construction and commissioning; and

2.6.2.11 deliver all Deliverables for the Detailed Design Phase as are identified in Appendix 3 of this Schedule 1 (*Scope of Services*).

2.7 Key Design Elements

2.7.1 The SDS Provider shall design:

2.7.1.1 the route from Haymarket to Ocean Terminal via Princes Street so as to:

- provide a look and feel that is at one with its surroundings whilst not detracting from the design elsewhere on the Edinburgh Tram Network;
- provide an efficient and effective means of constructing the tramline(s) with and without centre OLE poles that minimises disruption to Princes Street and Leith Walk and their users;
- provide a satisfactory interaction of trams, buses, pedestrians and other road users; and
- ensure a run time and performance that sustains economic success for the operation of the Edinburgh Tram Network by fully meeting the Functional Requirements Specifications.

2.7.1.2 The SDS Provider shall review the advantages and disadvantages of providing a chord at the south end of St. Andrew Square for use in perturbed circumstances and special events so that tram services from Picardy Place can traverse the chord and return towards Picardy Place on the clockwise track. Such review should contemplate the provision of removable OLE poles and wires and provide outline sketches and costs for providing this facility at St. Andrew Square.

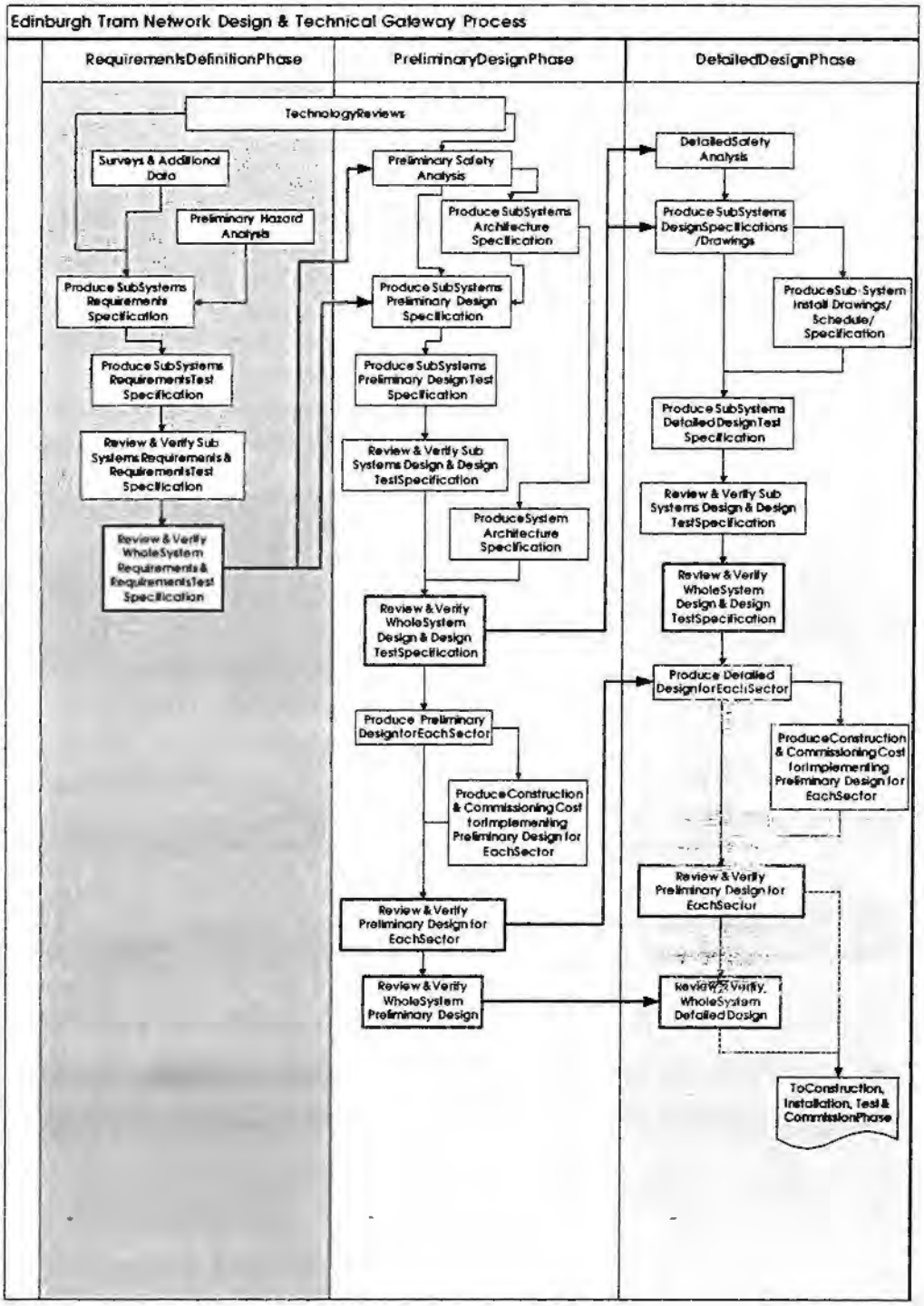
2.7.1.3 The SDS Provider shall establish early in the Preliminary Design Phase the effective use of proven radio communications for voice and data transmission as an early priority as this will influence the design and constructability of the Edinburgh Tram Network.

2.7.1.4 The SDS Provider shall establish early in the Preliminary Design Phase the parameters by which effective harmony of the infrastructure with the tram is achieved and therefore allow the Client to market test the tram manufacturers. Such design harmonisation shall ensure that tram types which meet the requirements are in current production and are likely to remain so at the time of likely procurement.

2.8 Design Review Process

2.8.1 The SDS Provider shall submit his Deliverables for review in accordance with the Review Procedure.

2.8.2 The SDS Provider shall comply with the Design and Technical Gateway Process. An example of how this Design and Technical Gateway Process will operate is set out below:



3. General Technical Support

3.1 Procurement and Construction Support

3.1.1 The SDS Provider shall produce all technical documentation required for the procurement of the Infraco Contract and thereafter technical documentation to facilitate the construction and the commissioning of the Edinburgh Tram Network. This documentation shall be structured to provide the most detailed information for each part of the Edinburgh Tram Network, either as applicable to the technical element, or as is available reflecting the then current status of the design detail of the Sector or Sub-Sector. This documentation shall include drawings, Technical Specifications, bills of quantities, schedules of materials, a maintenance plan (including lifecycle) and schedules, and other items of documentation as may be required for procurement, construction, and pricing purposes.

3.1.2 In relation to the procurement of the Infraco Contract, the SDS Provider shall:

- answer queries/clarifications;
- attend meetings;
- confirm design details and rework any of the SDS Provider's design as necessary;
- assist in the technical review of tenders;
- review programmes and provide variance reports; and
- review cost plans and provide variance reports.

3.1.3 There will be in addition, a period when the SDS Provider, whilst continuing to work for the Client, will need to assist the bidders for the Infraco Contract in the development of their tenders.

3.1.4 The SDS Provider shall produce all technical documentation required for the procurement of the Tram Supply Contract. This documentation shall include drawings, Technical Specifications and other items of documentation as may be required for procurement, construction, maintenance and pricing purposes.

3.1.5 In relation to the procurement of the Tram Supply Contract, the SDS Provider shall:

- answer queries/clarifications;
- attend meetings;
- confirm design details and rework any of the SDS Provider's design as necessary;
- assist in the technical review of tenders;
- review programmes and provide variance reports; and
- review cost plans and provide variance reports.

3.1.6 The SDS Provider shall provide **tie** with expert advice and documentation in relation to other procurement activities for the Edinburgh Tram Network as required, including:

- preparation of tender documentation including bills of quantities and other documentation required for procurement purposes;
- answering queries/clarifications;
- attending meetings;
- confirming design details and reworking any of the SDS Provider's design as necessary;
- assisting in the technical review of tenders;
- maintenance plans (including lifecycle);
- review programmes and provide variance reports; and
- review cost plans and provide variance reports.

3.1.7 For the avoidance of doubt, the SDS Provider shall only be required to provide technical design support for the management and the making good of defects until the date falling one year after the Service Commencement Date.

3.2 Utilities

3.2.1 The SDS Provider shall provide assistance to **tie** with the management of an advanced utilities diversion programme. This shall include:

- assessing the need for and acquiring relevant data relating to the presence and location of all buried and above ground utility services;
- agreeing the need for and extent of diversions;
- undertaking critical design and developing a strategy for all utilities diversions to minimise diversion requirements and out-turn costs;
- ensuring appropriate servitudes for access and possessions management;
- preparing C4 cost schedules;
- preparation of documentation (excluding the contract terms) associated with the proposal to appoint a single service agreement with a specialist contractor to carry out advanced utility diversions;
- activities required to support the utilities diversion process including, but not limited to, traffic management plans/traffic regulation orders, site meetings and all necessary re-designs;
- management of unidentified diversions and design re-work/modifications on an as required basis;
- on-site attendance on an as-required basis; and

- attendance at all meetings on an as-required basis.

3.2.2 The SDS Provider shall be responsible for the determination and design of all other utility diversions which are to be undertaken by Infraco.

3.3 Stakeholder Management

3.3.1 The SDS Provider shall assist the Client to minimise the adverse impact of the implementation of the Edinburgh Tram Network on stakeholders (both statutory and non statutory) and the general public. This shall include:

- securing, implementing and incorporating into the design all necessary Network Rail, BAA and other third party agreements;
- assisting by providing all technical details relevant to the compulsory purchase order process and land acquisition process (including wayleaves and servitudes);
- liasing with CEC, Scottish Executive, Historic Scotland, World Heritage Trust, Scottish Natural Heritage and others as required by the Client in relation to the performance of the Services;
- participating as appropriate in community liaison groups;
- providing input to information initiatives (media releases, newsletters, web site etc);
- assisting with the development and maintaining of a communications protocol for dealing with all stakeholders affected by the design & future construction of the Edinburgh Tram Network;
- assisting with the discharge of all Parliamentary Undertakings in relation to objectors and recording all actions taken in relation to stakeholder management; and
- management of the technical interface with Network Rail, BAA and other third parties.

3.4 Operations Development Support

3.4.1 The SDS Provider shall facilitate unity of the design of the Edinburgh Tram Network with the development of the Infraco Contract which shall include:

- liasing closely with the Operator to ensure consistency with operational aspirations and design constraints;
- providing support to obtain operational approvals and consents in respect of the Edinburgh Tram Network;
- providing technical support on public transport integration;
- providing technical support on systems integration; and
- providing technical support on the development of operational plans and management systems; and

- provide technical support with regard to operational interfaces with CEC traffic management systems.

3.5 Transport Modelling

3.5.1 Following the appointment by **tie** of the Joint Revenue Committee ("JRC") provided for pursuant to the DPOFA, the SDS Provider shall engage with the JRC to develop, test and commission a comprehensive and interdependent hierarchical transport modelling suite (the "SDS-JRC Modelling Suite") with the capability to model both wide area and localised impacts of the tram and of the different public transport service integration patterns on patronage.

3.5.2 The SDS Provider shall be jointly and severally responsible with the JRC for the planning, production and fitness for purpose of the SDS-JRC Modelling Suite which should demonstrate in simulation (as required under Section 3.5.9 below) that it meets all SDS Provider's individual requirements (both pre and post novation of the SDS Provider's contract) alongside the modelling needs and objectives of the JRC.

3.5.3 The SDS-JRC Modelling Suite shall be developed by a dedicated joint team combining equal contribution from both parties' relevant resources and skills and whose first task will be to prepare a composite model specification, work programme and resource submission for **tie's** approval. The joint team shall be located in the same office during the development, calibration and validation works on the SDS-JRC Modelling Suite which shall be capable of withstanding an independent audit at any stage of its life cycle.

3.5.4 Before approving the SDS-JRC Modelling Suite, **tie** may notify adjustment or further verification and calibration work following the initial demonstration and the SDS Provider shall make provision for this to be carried out before the SDS-JRC Modelling Suite is deployed.

3.5.5 The SDS-JRC Modelling Suite must be fully commissioned and approved by **tie** on or before 31 March 2006. The SDS Provider shall be jointly and severally responsible with the JRC for applying the SDS-JRC Modelling Suite to produce a model forecast scenario approved by **tie** for the first year after entry into public service of the Edinburgh Tram Network.

3.5.6 The SDS-JRC Modelling Suite shall be developed in order to produce all required outputs by the simplest functional principles. It shall satisfy the Scottish Executive STAG requirements and conform in all material aspects to the Department for Transport "Transport Analysis Guidance" as set out in the website WebTAG.

3.5.7 The outputs from the SDS-JRC Modelling Suite shall be robust and comprehensible and in a form which can subsequently be easily interrogated, using intuition and engineering judgement.

3.5.8 Throughout the life of the commission, the SDS Provider shall ensure the SDS-JRC Modelling Suite is regularly calibrated, updated and maintained (including upgrades) to resolve any issues that become apparent during use and to prevent it becoming obsolete.

3.5.9 The SDS-JRC Modelling Suite shall be capable of local modelling within the city centre and at key junctions in order to simulate with requisite precision the interaction of capacity, congestion and Edinburgh Tram Network design and operation. The SDS Provider and the JRC should ensure that the

modelling suite is technologically current and that any novel features have been adequately tested. The SDS-JRC Modelling Suite shall function to:

- at a lower level, model the highly complex interaction between competing public transport, traffic movements and Level 1 tram priority in the city centre at multiple junctions and key interchanges;
- at the higher level, model congestion at key junctions in the wider network area and overall travel demands in the surrounding areas;
- iterate until a state of equilibrium is reached between supply and demand.

3.5.10 The SDS Provider and the JRC shall be jointly and severally responsible for ensuring that the SDS-JRC Modelling Suite is capable of supporting the performance of the SDS Provider and of the JRC under their respective mandates with **tie**. The SDS-JRC Modelling Suite shall be configured to include the following applications, in addition to any application the SDS Provider considers necessary to answer its own or **tie's** requirements:

- public transport demand and patronage/revenue forecasting capable of modal disaggregation;
- detailed traffic junction design recognition and evaluation and wider area effect assessment;
- temporary traffic diversion and traffic regulation order impact analysis.

3.5.11 The SDS-JRC Modelling Suite shall be competent and responsive in relation to requested specific inputs for project evaluation tools, financial and economic case analysis (including funding options analysis) and risk assessment. The SDS-JRC Modelling Suite shall be sensitive to the interaction of the SDS Provider's detailed tram line design with vehicular traffic, pedestrians and other urban infrastructure users and capable of generating responses relevant for designing countermeasures to alleviate adverse knock-on affects in the wider area transport network.

3.5.12 The correction of any fault or incapacity in the SDS-JRC Modelling Suite shall be the joint and several responsibility of the SDS Provider and the JRC.

3.5.13 Copyright and all intellectual property rights in (and all related work in progress) the SDS-JRC Modelling Suite shall vest in **tie.** Use of the models by SDS Provider shall be by licence from **tie**.

3.6 Topics Register

3.6.1 The SDS Provider shall participate in the management of the Topics Register.

3.6.2 The Topics Register is used to record all issues as they arise that require to be specifically addressed. The record is then amended as appropriate to track the manner in which issues have been resolved to the satisfaction of project. The SDS Provider is required to add to, or respond to issues as appropriate and attend regular review meetings at which the Topics Register will be updated and actions assigned.

4. Management Services

4.1 Project Management and Programme Requirements

4.1.1 The SDS Provider shall ensure all that Services and any advance works are organised and programmed to meet the overall requirements of the Master Project Programme. This shall include:

- updating the construction strategy for the Edinburgh Tram Network;
- integration with new projects e.g. Capital Streets and CETM;
- identifying long lead time works;
- defining the extent of advance works;
- establishing diversionary works agreements;
- maintaining, managing & updating relevant sub-programmes including all approvals and traffic regulation orders;
- maintaining, managing and updating relevant risk and issue registers; and
- managing all cost reporting including the impact of changes.

4.1.2 The SDS Provider shall prepare, update, maintain and amend (as required) the Programme which will be coincident to and aligned with that of the Client and the Master Project Programme. All programme updates and reports shall be electronically transmitted to the Client's Representative to enable progress monitoring at intervals, which will be agreed, but are likely to be weekly and monthly. This shall include as a minimum:

- initial outline of the Programme in Primavera P3e for detailed implementation;
- Programme to follow the detailed WBS and Programme Phasing Structure as outlined in Appendices 1 and 2 to this Schedule 1 (*Scope of Services*);
- Programme to be cost and resource (named) loaded down to activities;
- all resource reporting / time sheet and cost allocation to be coded to suit the WBS activities. The coding of activities and resources to be agreed with **tie**;
- time sheets to be completed weekly against planned works as generated by Primavera P3e, any deviations to be reported in a weekly slippage report and notification of remedial actions to be authorised by the Client's Representative;
- weekly time sheets are to be submitted by 09:00hrs on the Tuesday following the relevant week;

- Programme to be updated and submitted weekly with all cost and resources;
- monthly progress reporting to include as a minimum and to be issued 3 working days before the progress meeting:
    - planned versus actual cost and resource summary;
    - progress against milestones;
    - earned value report;
    - 4 week forecast;
    - 8 week critical impact notice (any internal or external factor which may affect programme delivery); and
    - labour histograms detailing planned, actual and forecast across all disciplines;
- programming input as required by the Client; and
- attendance at meetings as required by the Client.

4.1.3 Work Breakdown Structure (WBS)

4.1.3.1 The SDS Provider shall structure the project using a suitable WBS in the form as outlined in Appendix 1 to this Schedule 1 (*Scope of Services*) and as is agreed by **tie**. Sufficient detail shall be included in the WBS to show adequate control of both internal and external resource. Deliverables must be clearly defined and denoted by a milestone which accords with the requirements of the Master Project Programme.

4.1.3.2 The WBS for this project should be designed to run from commencement of the Requirements Definition Phase through to the opening of the Edinburgh Tram Network to public service. The WBS should be segregated into both work type within discipline (in order to assist the SDS Provider and the Infraco to monitor, control and report on their specific roles) and is further divided into Stage Builds, Sectors and Sub-Sectors (as appropriate) to assist in the monitoring of progress along the Edinburgh Tram Network to aid integration of design, construction and commissioning.

4.1.3.3 The following WBS commitments are required from SDS Provider:

- **Requirements Definition Phase:** all documentation, programme costings etc. to be at WBS level;
- **Preliminary Design Phase:** all documentation, programme costings etc. to be at WBS level within each Stage Build, Sector or Sub-Sector (as appropriate);
- **Detailed Design Phase:** all documentation, programme costings etc. to be at WBS level within each Stage Build, Sector or Sub-Sector (as appropriate).

4.1.4 Cost/Spend Curves

The SDS Provider shall submit cost/spend tables and cumulative curves to match the achievement of major deliverables and activities within the WBS.

4.1.5 Critical Path

The SDS Provider shall ensure that tasks within the plans must be logically linked to ensure a critical path is derived, and show clearly any internal and external dependencies, constraints, hold and checkpoints that the SDS Provider believes are required for the successful completion of the project. Actual progress shall detail the named resource/s used.

4.1.6 Resource Assignment

The SDS Provider shall ensure that all tasks on the plan are resourced and coded to an agreed coding structure to show the manpower required to complete the project on time. The manpower is required to be named personnel. However, if this is not possible in all cases, then generic skills and professions that are required for each task shall be clearly stated.

4.2 Risk Management

4.2.1 The SDS Provider shall adopt a process of risk management which shall include providing input to the risk allocation matrices to demonstrate the risk retention, sharing and transfer.

4.2.2 The SDS Provider shall:

Prepare and maintain a project risk management plan which shall confirm the objectives of the plan, the roles and responsibilities of the SDS Provider, the definitions of risk categorisation and impact, the risk management process and how the plan will be applied throughout the scheme development, design, procurement and construction phases of the Edinburgh Tram Network. This plan should indicate the critical success factors, key areas of focus and individuals involved.	To be delivered by the SDS Provider to the Client within 1-month of the Effective Date and shall be maintained by the SDS Provider throughout the term of the Agreement

Prepare and maintain an assumptions register to record all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability assumptions and consequent risks to the Edinburgh Tram Network throughout scheme development, design, procurement and construction phases. The SDS Provider shall ensure that the assumptions register contributes to the project risk register referred to below.	Agree format with the Client's designated risk manager (as notified to the SDS Provider from time to time) within 1-month of the Effective Date. The register shall be maintained by the SDS Provider throughout the term of the Agreement
Maintain close liaison with the **tie** project team, the Operator, stakeholders, the Tram Supplier and **tie**'s technical, legal, financial and other advisors, regarding risk matters. The SDS Provider shall facilitate risk management meetings to support the scheme development, design, procurement and construction phases of the Edinburgh Tram Network. Liaison to include assistance with the risk identification procedure which is being carried out by the Client and attendance at management workshops which shall be facilitated by the SDS Provider to allow a sharing of previous experience.	Monthly meeting with the Client and **tie**'s project team (as notified to the SDS Provider from time to time) and ongoing liaison with **tie**'s project team, the Operator, stakeholders, the Tram Supplier and the **tie**'s technical, legal, financial and other advisers throughout the term of the Agreement
Prepare and maintain a project risk register to summarise all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability risks to the Edinburgh Tram Network and their proposed mitigation. The project risk register should include analysis of each risk in terms of 'likelihood' and 'impact' prior to and following mitigation, responsible owner of each risk and graphical summaries of risk profile. The risks to be addressed should include strategic, commercial, economic, legal and regulatory, organisational, environmental, technical, operational and infrastructure risks.	Agree format of the project risk register with the Client's designated risk manager (as notified to the SDS Provider from time to time within 1-month of the Effective Date. The SDS Provider shall maintain, update and circulate the project risk register to parties designated by the Client from time to time on a bi-monthly basis throughout the term of the Agreement
Prepare and submit a risk progress report to the Client on the status of risk management and mitigation giving a summary of new risks identified, new assumptions, key matters to be resolved and achievements. This report should indicate "Red-Amber-Green" (RAG) status on key components including planning permissions, specification compliance, incomplete design, programme for outstanding work, adequacy of investigations	Agree format with the Client's designated risk manager (as notified to the SDS Provider from time to time) within 1-month of the Effective Date and submit monthly report to the Client's said risk manager throughout the term of the Agreement

Required Action from the SDS Provider	Timing/Frequency
and surveys, constructability, compliance with CDM Regulations, Design Manual compliance, optimisation of run-time, interface design, Parliamentary objector concession, approvals which require to be obtained from the Client or the Client's Representative (for example approvals required in accordance with the Review Procedure), Consents and certification	
Prepare and maintain a cost and programme contingency report indicating the recommended capital cost and programme contingency allowances to be considered. Report should also summarise the recommended mitigation for the construction and installation phase, the commissioning and defects resolution phase under the Infraco Contract (as such terms are defined in the Infraco Contract) and operational phase, including details of any residual development risks. Report should include a detailed quantitative risk analysis using the Monte Carlo simulation (*@RISK4.5 and Pertmaster Project Risk or equivalents*) for both cost and programme components.	Submit final report to the Client within 1-month prior to publication of OJEU Notice (as notified by the Client to the SDS Provider) for the Infraco Contract. Report to be updated on quarterly basis thereafter throughout the term of the Agreement and submitted to the Client's designated risk manager (as notified to the SDS Provider from time to time)
Prepare and maintain a design construction risk report, indicating the risks to be considered by Infraco during remaining scheme development and construction including construction sequence, construction methodologies, access, quality, approvals, security, safety, public relations and compliance with Parliamentary Bill and objector requirements.	Submit final reportto the Client's designated risk manager (as notified to the SDS Provider from time to time) within 1-month prior to the appointment of Infraco.
Prepare and maintain a design operation risk report indicating the risks to be considered by the Operator during remaining scheme development, the construction and installation phase under the Infraco Contract, the commissioning and defects resolution phase under the Infraco Contract and operational phase including maintenance, lifecycle replacement, quality, approvals including HMRI, security, safety, public relations and compliance with Parliamentary Bill and objector requirements.	Submit final report to the Client's designated risk manager (as notified to the SDS Provider from time to time) within 3-months prior to start of commissioning and defects resolution phase under the Infraco Contract.

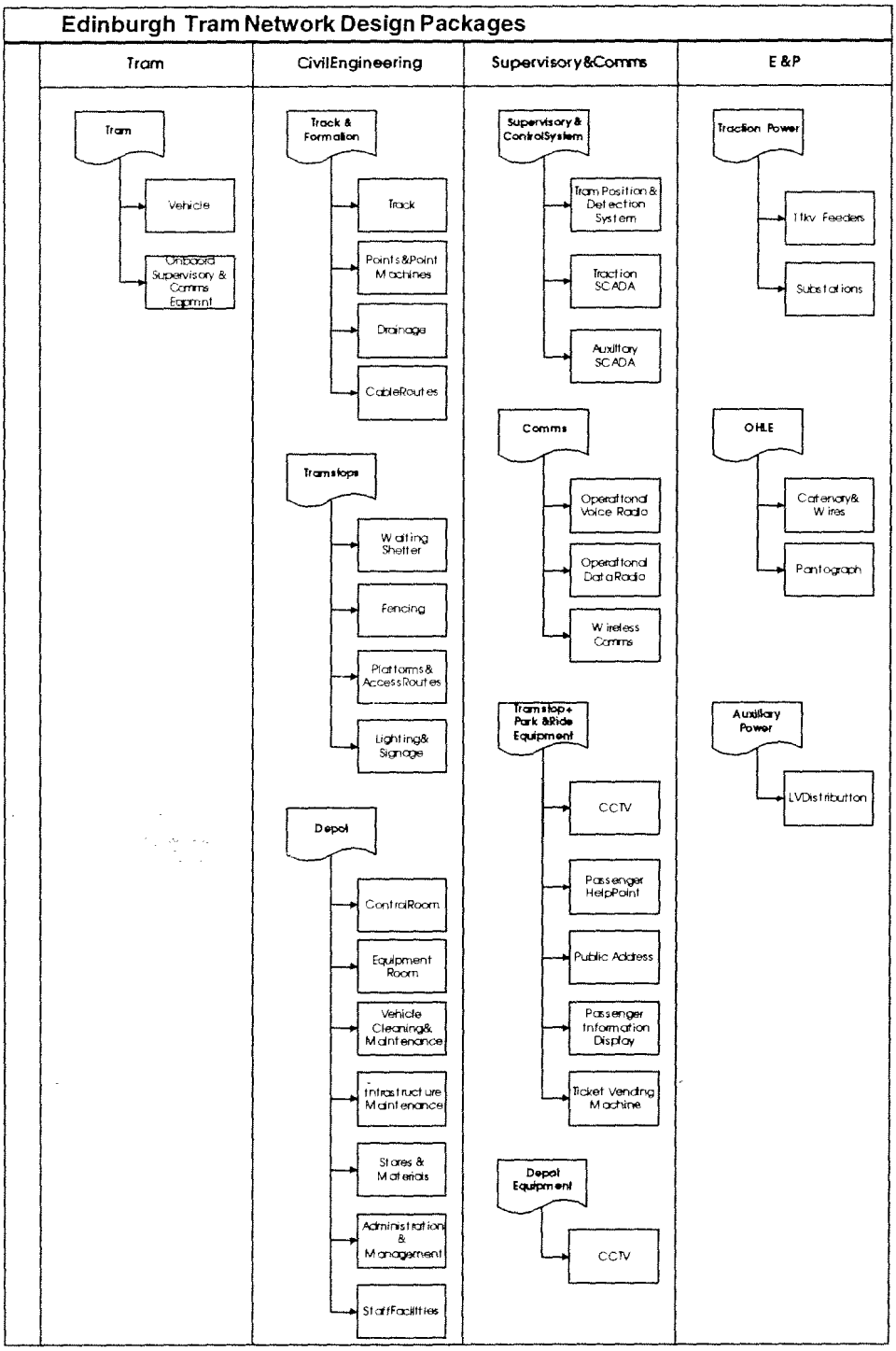
Report to include HAZOP risk assessment for the scheme and detail contingency plans.	

4.3 Financial Modelling

4.3.1 The SDS Provider shall provide inputs to the financial modelling process for the Edinburgh Tram Network which shall include capex and opex (including routine maintenance and lifecycle costs) estimates.

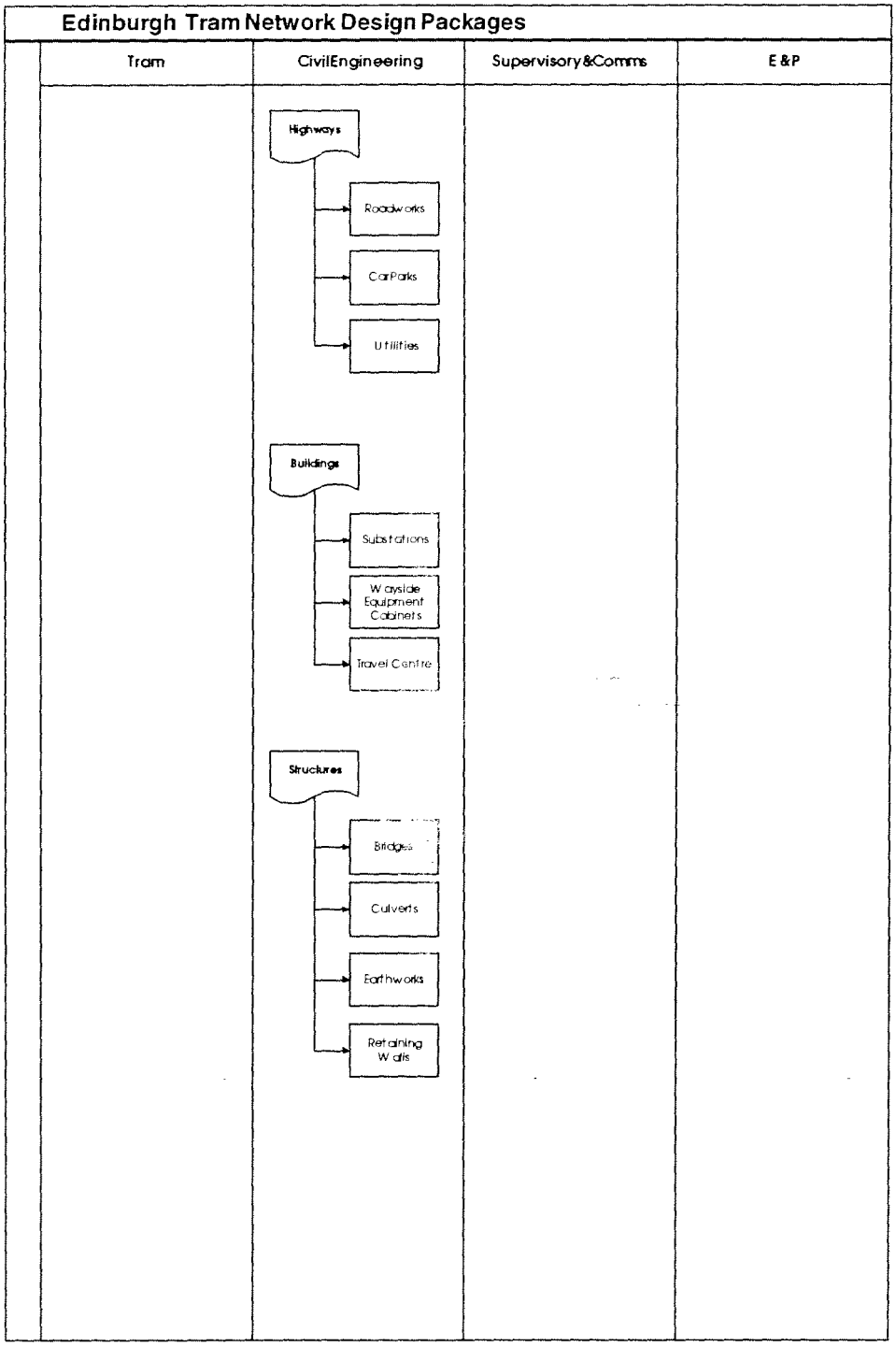
APPENDIX 1

WORK BREAKDOWN STRUCTURE



APPENDIX 1

CONT'D



APPENDIX 2

Programme Phasing Structure

APPENDIX 2

Programme Phasing Structure

Stage Build	Description	Sector		Sub-sector		Criticality	Commissioning Sequence for Trial Running(Line 1&2 and Line 2only)	Commissioning Sequence for Trial Running(Line 1only)	Preliminary Design Approved By	Detailed Design Approved By
ARP	Airport - Gogarburn	ARP1	Airport - Gogarburn (inc)			C	3		28-Feb-06	30-Sep-06
DHY	Depot - Haymarket	DHY1	Gogaburn (exc) - Gyle & Depot (inc)			A1	1		30-Nov-05	30-Mar-06
		DHY2	Gyle (exc) - Edinburgh Park (inc)			C			28-Feb-06	30-Sep-06
		DHY3	Edinburgh Park (exc) - South Gyle Acess (inc)			C	2		28-Feb-06	30-Sep-06
		DHY4	South Gyle Acess (exc) - Soughton Road North (inc)			C			28-Feb-06	30-Sep-06
		DHY5	Soughton Road North (exc) - Murrayfield (exc)	DHY5a	Soughton Road(exc)-Balgreen Road(inc)	B			30-Jan-06	30-May-06
				DHY5b	Balgreen Road(exc)-Murrayfield(exc)				30-Jan-06	30-May-06
		DHY6	Murrayfield (inc) - Haymarket (inc)			A(2)	3		30-Nov-05	30-Mar-06
HOT	Haymarket - Ocean Terminal	HOT1	Haymarket (exc) - St.Andrew Square (inc)	HOT1a	Haymarket(exc)-Shandwick Place(inc)	A(1)	4	3 (section now includes Haymarket Tramstop)	30-Nov-05	30-Mar-06
				HOT1b	Shandwick Place(exc)-Princes St West(inc)					
				HOT1c	Princes St West(exc)-Waverley Bridge(inc)					
				HOT1d	Waverley Bridge(exc)-St.Andrew SQ.(inc)					
		HOT2	St.Andrew SQ.(exc)-Picardy Place(inc)			A(2)	4	3	30-Nov-05	30-Mar-06
		HOT3	Picardy Place (exc) - Foot of the Walk (inc)	HOT3a	Picardy Place(exc)-MacDonald Rd(inc)	A(2)	5	2	30-Nov-05	30-Mar-06
				HOT3b	MacDonald Rd(exc)-Balfour St(inc)					
				HOT3c	Balfour St(exc)-Foot of the Walk(inc)					

		HOT4	Foot of the Walk (exc) - Ocean Drive (inc)	HOT4a	Foot of the Walk(exc)-Constitution St(inc)	A(3)	6	1	30-Nov-05	30-May-06
				HOT4b	Constitution St(exc)-Ocean Drive(inc)					
		HOT5	Ocean Drive (exc) - Ocean Terminal (inc)			A(3)	6	1	30-Nov-05	30-May-06
		HOT6	Leith Depot & Connections			D	5	1	30-Mar-06	30-Nov-06
HCT	Haymarket - Crewe Toll	HCT1	Haymarket (exc) - Crewe Toll (inc)	HCT1a	Roseburn Jct(exc)-Roseburn(inc)	D	4	4	30-Mar-06	30-Nov-06
				HCT1b	Roseburn(exc)-Ravelston Dykes(inc)				30-Mar-06	
				HCT1c	Ravelston Dykes(exc)-Craigleith(inc)				30-Mar-06	
				HCT1d	Craigleith(exc)-W.General Hosp-Crewe Toll(inc)				30-Mar-06	
CTO	Crewe Toll - Ocean Terminal	CTO1	Crewe Toll (exc) - Granton Square (inc)	CTO1a	Crewe Toll(exc)-W. Granton(inc)	D	5	5	30-Mar-06	30-Nov-06
				CTO1b	W. Granton(exc)-Caroline Pk(inc)				30-Mar-06	
				CTO1c	Caroline Pk(exc)-Granton Waterfront(inc)				30-Mar-06	
				CTO1d	Granton Waterfront(exc)-Granton Sq.(inc)				30-Mar-06	
		CTO2	Granton Square (exc) - Ocean Terminal (inc)	CTO2a	Sea Wall Survey	A1	6	6	30-Nov-05	28-Feb-07
				CTO2b	Granton Sq.(exc)-Lower Granton Rd	E	6	6	30-Mar-06	
				CTO2c	Lower Granton Rd-Newhaven Rd					
				CTO2d	Newhaven Rd-Ocean Terminal(exc)					
GNB	Gogarburn - New bridge	GNB1	Gogaburn (exc) - Newbridge (inc)			F	7		30-Mar-06	28-Feb-07

APPENDIX 3

Deliverables

Indicative Document Deliverables Listing for SDS Scope of Supply

Function	Requirements Definition												
	Requirements Spec	Preliminary HIRA	Project Management Plan	Operational & Performance Spec	Quality Management Plan	Safety Management Plan	Configuration Management Plan	Verification & Validation Plan	Preliminary Safety Case Arguments (GSN	List of Applicable Standards	Requirements Test Spec	Requirements Database Populated	Hazard Log &/Risk Register
Systemwide	√	√	√	√	√	√	√	√	√	√	√	√	√
Tram & Vehicles	√	√							√	√	√	√	√
Civil Engineering													
Track & Formation													
Track	√	√							√	√	√	√	√
Points & Point Machines/Actuators	√	√							√	√	√	√	√
Drainage	√	√							√	√	√	√	√
Cable Routes	√	√							√	√	√	√	√
Fencing	√	√							√	√	√	√	√
Highways													
Roadworks	√	√							√	√	√	√	√
Pedestrians Areas & Crossings	√	√							√	√	√	√	√
Car Parks	√	√							√	√	√	√	√
Road Traffic Management	√	√							√	√	√	√	√
Utilities	√	√							√	√	√	√	√
Buildings													
Substations	√	√							√	√	√	√	√
Travel Centre	√	√							√	√	√	√	√
General	√	√							√	√	√	√	√
Structures													
Bridges & Subways	√	√							√	√	√	√	√
Culverts	√	√							√	√	√	√	√
Earthworks	√	√							√	√	√	√	√
Retaining Walls	√	√							√	√	√	√	√
Tramstops													
Waiting Shelter	√	√							√	√	√	√	√
Cable Routes	√	√							√	√	√	√	√
Platforms & Access	√	√							√	√	√	√	√
Lighting & Signage	√	√							√	√	√	√	√
Fencing	√	√							√	√	√	√	√
Depot													
Control Room	√	√							√	√	√	√	√
Equipment Rooms	√	√							√	√	√	√	√
Vehicle Cleaning & Maintenance	√	√							√	√	√	√	√
Infrastructure Maintenance	√	√							√	√	√	√	√
Stores & Materials	√	√							√	√	√	√	√
Administration & Management	√	√							√	√	√	√	√
Staff Facilities	√	√							√	√	√	√	√
External Works	√	√							√	√	√	√	√
Supervisory/Control & Communications													
Supervisory & Control System													
Tram Position & Detection System	√	√							√	√	√	√	√
Traction SCADA	√	√							√	√	√	√	√
Auxiliary SCADA	√	√							√	√	√	√	√
Telecommunications													
Operational Voice Radio	√	√							√	√	√	√	√
Operational Data Radio	√	√							√	√	√	√	√
Wireless Communications	√	√							√	√	√	√	√
Tramstop Equipment													
CCTV	√	√							√	√	√	√	√
Passenger Help Points	√	√							√	√	√	√	√
Public Address Systems	√	√							√	√	√	√	√
Passenger Information Displays	√	√							√	√	√	√	√
Ticket Vending Machines	√	√							√	√	√	√	√
Depot Equipment													
CCTV	√	√							√	√	√	√	√
Control Room	√	√							√	√	√	√	√
Equipment Rooms	√	√							√	√	√	√	√
Electrification & Power													
Traction Power													
[illegible]	√	√							√	√	√	√	√
[illegible]	√	√							√	√	√	√	√
OHLE													
[illegible]	√	√							√	√	√	√	√
[illegible]	√	√							√	√	√	√	√
Auxiliary Power													
[illegible]	√	√							√	√	√	√	√

Edinburgh Tramway

Indicative Document Deliverables Listing for SDS Scope of Supply

		Function
	Requirements Definition	Requirements Spec
		Preliminary HIRA
		Project Management Plan
		Operational & Performance Spec
		Quality Management Plan
		Safety Management Plan
		Configuration Management Plan
		Verification & Validation Plan
		Preliminary Safety Case Arguments (GSN
		List of Applicable Standards
		Requirements Test Spec
		Requirements Database Populated
		Hazard Log & Risk Register

Edinburgh Tramway

Indicative Document Deliverables Listing for SDS Scope of Supply

Function	Preliminary Design																														
	Project Management Plan	Quality Management Plan	Safety Management Plan	Configuration Management Plan	Verification & Validation Plan	List of Applicable Standards	System Architecture Spec	System Preliminary Design Spec	System Preliminary Design Test Spec	Functional Hazard Analysis	Preliminary Cause Consequence Analysis	Hazard Log & Risk Register	Requirements Spec/Database	Scheme Plan	Power Distribution Schematic	Safety Case (SSN)	Environmental Management Plan	System Integration Plan	Interface Specification	Planning Approvals	Signage Specification	Run Time Simulation	Tramway Alignment Drawings (1:500)- Topology/plan/horizontal/vertical/track/form	Architectural Drawings 1:50 - GA/Elevations	Architectural Drawings 1:100 - Generic Tramstop : Plans/Elevations/Sections/Equipment/Signs	Architectural Drawings 1:100 - St Andrew Square Tramstop : Plans/Elevations/Sections/Equipment/Signs	Architectural Drawings 1:100 - Princes St/Leith Walk Style Tramstop : Plans/Elevations/Sections/Equipment/Signs	Landscape Drawings (1:500) - Generic/Special Tramstops & Depot	Architectural Drawings 1:100 - Depot : GA/Elevations/Sections/Equipment/Signs
Systemwide	Update	Update	Update	Update	Update	Update	√	√	√	√	√	Update	Update			√	√	√	√	√	√	√									
Tram & Vehicles							n/a	n/a	n/a	√	√	Update	Update			√			√	√	√	√									
Civil Engineering																															
Track & Formation																															
Track							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Points & Point Machines/Heaters							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√	√								
Drainage							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Cable Routes							√	√	√	√	√	Update	Update	√		√			√	√	√	√	√								
Fencing							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Highways																															
Roadworks							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Pedestrians Areas & Crossings							√	√	√	√	√	Update	Update	√		√			√	√	√	√									
Car Parks							√	√	√	√	√	Update	Update			√			√	√	√	√									
Road Traffic Management							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Utilities							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Buildings																															
Substations							√	√	√	√	√	Update	Update		√	√			√	√	√	√	√								
Travel Centre							√	√	√	√	√	Update	Update		√	√			√	√	√	√	√								
General							√	√	√	√	√	Update	Update		√	√			√	√	√	√	√								
Structures																															
Bridges & Subways							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Culverts							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Earthworks							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Retaining Walls							√	√	√	√	√	Update	Update			√			√	√	√	√	√								
Tramstops																															
Waiting Shelter							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√				
Cable Routes							√	√	√	√	√	Update	Update	√		√			√	√					√	√	√				
Platforms & Access							√	√	√	√	√	Update	Update			√			√	√	√	√	√		√	√	√	√			
Lighting & Signage							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√	√			
Fencing							√	√	√	√	√	Update	Update			√			√	√			√		√	√	√	√			
Depot																															
Control Room							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Equipment Rooms							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Vehicle Cleaning & Maintenance							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Infrastructure Maintenance							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Stores & Materials							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Administration & Management							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
Staff Facilities							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√						√	
External Works							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√				√		√	
Supervisory/Control & Communications																															
Supervisory & Control System																															
Tram Position & Detection System							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Traction SCADA							√	√	√	√	√	Update	Update		√	√			√	√	√	√									
Auxiliary SCADA							√	√	√	√	√	Update	Update		√	√			√	√	√	√									
Telecommunications																															
Operational Voice Radio							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Operational Data Radio							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Wireless Communications							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Tramstop Equipment																															
CCTV							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√				
Passenger Help Points							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√				
Public Address Systems							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√				
Passenger Information Displays							√	√	√	√	√	Update	Update		√	√			√	√	√	√			√	√	√				
Ticket Vending Machines							√	√	√	√	√	Update	Update's		√	√			√	√	√	√			√	√	√				
Depot Equipment																															
CCTV							√	√	√	√	√	Update	Update's		√	√			√	√	√	√		√							
Control Room							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√							
Equipment Room							√	√	√	√	√	Update	Update		√	√			√	√	√	√		√							
Electrification & Power																															
Traction Power																															
Line Feeders							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Substations							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
OHLE																															
Catenary & Wires							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									
Portal/cantilever							√	√	√	√	√	Update	Update			√			√	√	√	√									
Auxiliary Power																															
LV Distribution							√	√	√	√	√	Update	Update	√	√	√			√	√	√	√									

Edinburgh Tramway

Indicative Document Deliverables Listing for SDS Scope of Supply

Function
Project Management Plan
Quality Management Plan
Safety Management Plan
Configuration Management Plan
Verification & Validation Plan
List of Applicable Standards
System Architecture Spec
System Preliminary Design Spec
System Preliminary Design Test Spec
Functional Hazard Analysis
Preliminary Cause Consequence Analysis
Hazard Log & Risk Register
Requirements Spec/Database
Scheme Plan
Power Distribution Schematic
Safety Case (GSN)
Environmental Management Plan
System Integration Plan
Interface Specification
Planning Approvals
Signage Specification
Run Time Simulation
Tramway Alignment Drawings (1:500)- topology/plan/horizontal/vertical/trackform
Architectural Drawings 1:50 - GA/Elevations
Architectural Drawings 1:100 - Generic Tramstop : Plans/Elevations/Sections/Equipment/Signs
Architectural Drawings 1:100 - St Andrew Square Tramstop : Plans/Elevations/Sections/Equipment/Signs
Architectural Drawings 1:100 - Princes St/Leith Walk Style Tramstop : Plans/Elevations/Sections/Equipment/Signs
Landscape Drawings (1:500) - Generic/Special Tramstops & Depot
Architectural Drawings 1:100 - Depot : GA/Elevations/Sections/Equipment/Signs

Documents to be structured by Section within Scope Book

Preliminary Design

Indicative Document Deliverables Listing for SDS Scope of Supply

Function	Project Management Plan	Quality Management Plan	Safety Management Plan	Configuration Management Plan	Verification & Validation Plan	List of Applicable Standards	System Architecture Spec	System Design Spec	System Design Test Spec	Functional Hazard Analysis	Detailed Cause Consequence Analysis	Hazard Log & Risk Register	Requirements Spec/Database	Scheme Plan	Power Distribution Schematic	Detailed Layout Drawings/Location Plans	Wiring Schedules & Diagrams	Safety Case (GSN)	Cable Route & Duct Layout	Installation Drawings	Procurements Specifications	Installation, Test & Commissioning Plans and Records/Certificates	Detailed Design					
																							Training Plans	Bill of Quantities	Layout Drawings	Interface Schedules	Planning Approvals	Bonding Plan
Systemwide	Update	Update	Update	Update	Update	Update	Update	Update	Update	Update	√	Update	Update					Update					√			√		
Tram & Vehicles							n/a	n/a	n/a	√	√	Update	Update					Update			√			√				
Civil Engineering																												
Track & Formation																		Update										√
Track							√	√	√	√	√	Update	Update			√		Update		√	√	√		√	√		√	
Points & Point Machines/Heaters							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	
Drainage							√	√	√	√	√	Update	Update			√		Update		√	√	√		√	√		√	
Cable Routes							√	√	√	√	√	Update	Update	Update		√	√	Update	√	√	√	√		√	√		√	
Fencing							√	√	√	√	√	Update	Update			√		Update		√	√	√		√	√		√	
Highways																												
Roadworks							√	√	√	√	√	Update	Update			√		Update		√	√	√		√	√		√	
Pedestrians Areas & Crossings							√	√	√	√	√	Update	Update	Update		√	√	Update	√	√	√	√		√	√		√	
Car Parks							√	√	√	√	√	Update	Update			√	√	Update	√	√	√	√		√	√		√	
Road Traffic Management							√	√	√	√	√	Update	Update			√	√	Update		√	√	√		√	√		√	
Utilities							√	√	√	√	√	Update	Update			√	√	Update		√	√	√		√	√		√	
Buildings																												
Substations							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	√
Travel Centre							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
General							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Structures																												
Bridges & Subways							√	√	√	√	√	Update	Update			√		Update	√	√	√	√		√	√		√	
Culverts							√	√	√	√	√	Update	Update			√		Update	√	√	√	√		√	√		√	
Earthworks							√	√	√	√	√	Update	Update			√		Update	√	√	√	√		√	√		√	
Retaining Walls							√	√	√	√	√	Update	Update			√		Update	√	√	√	√		√	√		√	
Tramstops																												
Waiting Shelter							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	√
Cable Routes							√	√	√	√	√	Update	Update	Update		√	√	Update	√	√	√	√		√	√		√	
Platforms & Access							√	√	√	√	√	Update	Update			√	√	Update	√	√	√	√		√	√		√	
Lighting & Signage							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	√
Fencing							√	√	√	√	√	Update	Update			√		Update		√	√	√		√	√		√	
Depot																												
Control Room							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Equipment Rooms							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Vehicle Cleaning & Maintenance							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Infrastructure Maintenance							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Stores & Materials							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Administration & Management							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Staff Facilities							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
External Works							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Supervisory/Control & Communications																												
Supervisory & Control System																												
Tram Position & Detection System							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	
Traction SCADA							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Auxiliary SCADA							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Telecommunications																												
Operational Voice Radio							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	
Operational Data Radio							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	
Wireless Communications							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	
Tramstop Equipment																												
CCTV							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	√
Passenger Help Points							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Public Address Systems							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Passenger Information Displays							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Ticket Vending Machines							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Depot Equipment																												
CCTV							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Control Room							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Equipment Rooms							√	√	√	√	√	Update	Update		Update	√	√	Update	√	√	√	√		√	√		√	
Electrification & Power																												
Traction Power																												
1.1kv Feeders							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	√
Substations							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	√
OHLE																												
Catenary & Wires							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	√
Pantograph							√	√	√	√	√	Update	Update			√	√	Update	√	√	√	√		√	√		√	
Auxiliary Power																												
Lv Distribution							√	√	√	√	√	Update	Update	Update	Update	√	√	Update	√	√	√	√		√	√		√	√

Edinburgh Tramway

Indicative Document Deliverables Listing for SDS Scope of Supply

Detailed Design

Function	Project Management Plan	Quality Management Plan	Safety Management Plan	Configuration Management Plan	Verification & Validation Plan	List of Applicable Standards	System Architecture Spec	System Design Spec	System Design Test Spec	Functional Hazard Analysis	Detailed Cause Consequence Analysis	Hazard Log & Risk Register	Requirements Spec/Database	Scheme Plan	Power Distribution Schematic	Detailed Layout Drawings/Location Plans	Wiring Schedules & Diagrams	Safety Case (GSN)	Cable Route & Duct Layout	Installation Drawings	Procurements Specifications	Installation, Test & Commissioning Plans and Records/Certificates	Training Plans	Bill of Quantities	Layout Drawings	Interface Schedules	Planning Approvals	Bonding Plan

← *Documents to be structured by* Sector within Stage Build →

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Edinburgh Tramway

Indicative Document Deliverables Listing for SDS Scope of Supply

Function	Tramway Alignment Drawings (1:500)-topology/plan/horizontal/vertical/trackform	Tramway Alignment Drawings Haymarket - St.Andrew Square - Ocean Terminal (1:200)-topology/plan/horizontal/vertical/trackform	Tramway Alignment Drawings Cross Sections	Table of Horizontal & Vertical Alignments with Chainage	General Arrangement Drawings (1:500) - surface/underground/site limits/site clearance etc.	General Arrangement Drawings - Haymarket-St.Andrew Square-Ocean Terminal(1:200) - surface/underground/site limits/site clearances etc.	Route & Accommodation Drawings (1:500)	Route & Accommodation Drawings - Haymarket-St.Andrew Square-Ocean Terminal(1:200)	Structure Drawings (1:100)	General Arrangement Drawings (1:50) - Existing Structures/remedial works & mods.	Foundation Drawings	Structural Arrangement Drawings (1:200)	Architectural Drawings 1:50 - GA/Elevations/Sections	Architectural Drawings 1:10 - Doors/Frames/Grilles	Architectural Drawings 1:100 - Tramstop: Plans/Elevations/Sections/Equipment/Signs	Architectural Drawings 1:10 - Tramstop: Equipment/Handrails/Signs	Landscape Drawings (1:500 & 1:100) - Tramstops	Architectural Drawings 1:100 - Depot: GA/Elevations/Sections/ext brickwork/drainage/ceiling/setting out	Architectural Drawings 1:10 - Depot: fittings/handrails/pits/cladding/doors/frames etc.
Systemwide																			
Tram & Vehicles																			
Civil Engineering																			
Track & Formation																			
Track	√	√	√	√	√	√	√	√											
Points & Point Machines/Heaters	√	√	√		√	√	√	√											
Drainage	√	√	√		√	√	√	√											
Cable Routes	√	√	√		√	√	√	√											
Fencing	√	√	√		√	√	√	√											
Highways																			
Roadworks	√	√	√	√	√	√	√	√											
Pedestrian Areas & Crossings	√	√	√	√	√	√	√	√											
Car Parks					√	√	√	√											
Road Traffic Management	√	√	√		√	√	√	√											
Utilities	√	√	√		√	√	√	√											
Buildings																			
Substations					√	√					1:100 & 1:20	√	√	√					
Travel Centre					√	√					1:100 & 1:20	√	√	√					
General					√	√					1:100 & 1:20	√	√	√					
Structures																			
Bridges & Subways	√	√	√		√	√	√	√	√	√									
Culverts	√	√	√		√	√	√	√	√	√									
Earthworks	√	√	√		√	√	√	√	√	√									
Retaining Walls	√	√	√		√	√	√	√	√	√									
Tramstops																			
Waiting Shelter					√	√	√	√							√	√			
Cable Routes					√	√	√	√							√	√			
Platforms & Access	√	√	√		√	√	√	√							√	√	√		
Lighting & Signage					√	√	√	√							√	√	√		
Fencing	√	√	√		√	√	√	√							√	√	√		
Depot																			
Control Room					√	√					1:100 & 1:20	√	√	√				√	√
Equipment Rooms					√	√					1:100 & 1:20	√	√	√				√	√
Vehicle Cleaning & Maintenance					√	√					1:100 & 1:20	√	√	√				√	√
Infrastructure Maintenance					√	√					1:100 & 1:20	√	√	√				√	√
Stores & Materials					√	√					1:100 & 1:20	√	√	√				√	√
Administration & Management					√	√					1:100 & 1:20	√	√	√				√	√
Staff Facilities					√	√					1:100 & 1:20	√	√	√				√	√
External Works					√	√					1:100 & 1:20	√	√	√			√	√	√
Supervisory/Control & Communications																			
Supervisory & Control System																			
Tram Position & Detection System																			
Traction SCADA																			
Auxiliary SCADA																			
Telecommunications																			
Operational Voice Radio																			
Operational Data Radio																			
Wireless Communications																			
Tramstop Equipment																			
CCTV							√	√							√	√			
Passenger Help Points							√	√							√	√			
Public Address Systems							√	√							√	√			
Passenger Information Displays							√	√							√	√			
Ticket Vending Machines							√	√							√	√			
Depot Equipment																			
CCTV													√	√					
Control Room													√	√					
Equipment Rooms													√	√					
Electrification & Power																			
Traction Power																			
[illegible] Feeders							√	√											
Substations							√	√											
OHLE																			
Catenary & Wire					√	√	√	√											
Pantograph																			
Auxiliary Power																			
[illegible]							√	√											

TIE00899941_0115

Indicative Document Deliverables Listing for SDS Scope of Supply

Function	Tramway Alignment Drawings (1:500) - topology/plan/horizontal/vertical/trackform	Tramway Alignment Drawings Haymarket - St. Andrew Square - Ocean Terminal (1:200) - topology/plan/horizontal/vertical/trackform	Tramway Alignment Drawings Cross Sections	Table of Horizontal & Vertical Alignments with Chainage	General Arrangement Drawings (1:500) – surface/underground/site limits/site clearance etc.	General Arrangement Drawings - Haymarket-St.Andrew Square-Ocean Terminal(1:200) - surface/underground/site limits/site clearance etc.	Route & Accommodation Drawings (1:500)	Route & Accommodation Drawings – Haymarket-St.Andrew Square-Ocean Terminal(1:200)	Structure Drawings (1:100)	General Arrangement Drawings (1:50) - Existing Structures/remedial/works & mods.	Foundation Drawings	Structural Arrangement Drawings (1:200)	Architectural Drawings 1:50 - GA/Elevations/Sections	Architectural Drawings 1:10 – Doors/Frames/Grilles	Architectural Drawings 1:100 - Tramstop : Plans/Elevations/Sections/Equipment/Signs	Architectural Drawings 1:10 - Tramstop : Equipment/Handrails/Signs	Landscape Drawings (1:500 & 1:100) - Tramstops	Architectural Drawings 1:100 - Depot : GA/Elevations/Sections/ext brickwork/drainage/ceiling/setting out	Architectural Drawings 1:10 - Depot : fittings/handrails/pits/cladding/doors/frames etc.
	← Documents to be structured by Sector within Stage Build →																		

[redacted]

Director/Authorised Signatory
tie Limited

[redacted]

Director / Authorised Signatory
Parsons Brinckerhoff Limited

This is Schedule Two referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE TWO

KEY PERSONNEL

David Calver	Project Manager
David Simmons	Deputy Project Manager
Andy Dixon	Chief Engineer
Chris Mason	Deputy Chief Engineer
Rick Finc	Approvals Manager
Colin MacDonald	Construction Manager
Bob Clark	Stakeholder Manager
Billy Johnston	Safety; Quality, Systems Assurance Manager

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Three referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE THREE

PRICING SCHEDULE

SDS CONTRACT: PRICING SCHEDULE - OVERALL SUMMARY

SDS Contract Value

Tender amount				£25,472,581
Provisional additional work				£1,702,000 dt
				£23,770,581

Deduct

Modelling		£1,215,000		
SDG	£116,400			
	£35,000	£151,400 dt		
		£1,063,600 + 7%	£1,138,052	
Modelling risk			£550,000	
Funding			£100,000	
Mobilisation			£100,000	£1,888,052 dt
				£21,882,529

Add

Provisional Additional Work		£1,664,550
	Contract Value	**£23,547,079**
		=========

EDINBURGH TRAM NETWORK: PRICING SCHEDULE

The following Schedule is subject to the foregoing Overall Summary

TENDER SUMMARY, LINES 1 and 2 Combined

SDS Management	**£6,041,339.00**
Design	**£13,914,242.00**
Further Scope	**£2,600,000.00**
Provisional Additional Work	**£1,702,000.00**
Transport Modelling	**£1,215,000.00**
Tender Summary Carried to Formal Offer, Lines 1 and 2 Combined	**£25,472,581.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

TENDER SUMMARY, LINE 1

SDS Management	£4,544,175.00
Design	£10,896,399.00
Further Scope	£1,700,000.00
Provisional Additional Work	£1,702,000.00
Transport Modelling	£972,000.00
Tender Summary Carried to Formal Offer, Line 1	£19,814,574.00

TENDER SUMMARY, LINE 2

SDS Management	£2,910,167.00
Design	£7,164,992.00
Further Scope	£1,700,000.00
Provisional Additional Work	£1,702,000.00
Transport Modelling	£972,000.00
Tender Summary Carried to Formal Offer, Line 2	£14,449,159.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

SDS MANAGEMENT, LINE 1

	SDS Management	Time/Lump Sum	£
	Tenderers shall price here for all non-quantity related elements of the work. Examples of this would be head office overheads, management required throughout the project, mobilisation, demobilisation, insurance etc., Tenderers shall detail and price each item individually and confirm if the items are time related or lump sum prices. In addition to the above Tenderers shall price separately the following items:		
a	Professional indemnity insurance		£inc
b	All other insurances		£inc
c	Co location of core team in offices provided by tie. Number of staff in core team to be confirmed. (14 no.). Potential fee saving £140,000k, subject to space confirmation.		£nil c/f
d	Infraco Procurement Services		£inc
e	Allowance for price inflation over the duration of the SDS contract. This item does not remove the liability of the Tenderer to provide a fixed price Tender		£inc
	Price inflation covered to end 2009		
f	Commissioning support		£inc
g	SDS support for management of defects		£exc
	To be paid as Additional Provisional Work		
	Other SDS Management		
	Mobilisation fee	Lump Sum	£300,000.00
	SDS Project and Technical Management	Time	£4,244,175.00
	SDS Management Carried to Tender Summary, Line 1		£4,244,175.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

SDS MANAGEMENT, LINE 2

	SDS Management	Time/Lump Sum	£
	Tenderers shall price here for all non-quantity related elements of the work. Examples of this would be head office overheads, management required throughout the project, mobilisation, demobilisation, insurance etc.,		
	Tenderers shall detail and price each item individually and confirm if the items are time related or lump sum prices.		
	In addition to the above Tenderers shall price separately the following items:		
a	Professional indemnity insurance	£	inc
b	All other insurances	£	inc
c	Co location of core team in offices provided by tie. Number of staff in core team to be confirmed. (14 no.). Potential fee saving £140,000k, subject to space confirmation.	£	nil c/f
d	Infraco Procurement Services	£	inc
e	Allowance for price inflation over the duration of the SDS contract. This item does not remove the liability of the Tenderer to provide a fixed price Tender	£	inc
	Price inflation covered to end 2009		
f	Commissioning support	£	inc
g	SDS support for management of defects	£	exc
	To be paid as Additional Provisional Work		
	Other SDS Management		
	Mobilisation fee	Lump Sum	£300,000.00
	SDS Project and Technical Management, including expenses	Time	£2,610,167.00
	SDS Management Carried to Tender Summary, Line 2		£2,610,167.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

SDS MANAGEMENT, LINES 1 and 2, Combined

	SDS Management	Time/Lump Sum	£
	Tenderers shall price here for all non-quantity related elements of the work. Examples of this would be head office overheads, management required throughout the project, mobilisation, demobilisation, insurance etc		
	Tenderers shall detail and price each item individually and confirm if the items are time related or lump sum prices.		
	In addition to the above Tenderers shall price separately the following items:		
a	Professional indemnity insurance	£	inc
b	All other insurances	£	inc
c	Co location of core team in offices provided by tie. Number of staff in core team to be confirmed. (20 no.). Potential fee saving £200,000k, subject to space confirmation	£	nil c/f
d	Infraco Procurement Services	£	inc
e	Allowance for price inflation over the duration of the SDS contract. This item does not remove the liability of the Tenderer to provide a fixed price Tender	£	
	Price inflation covered to end 2009		
f	Commissioning support	£	inc
g	SDS support for management of defects	£	exc
	To be paid as Additional Provisional Work		
	Other SDS Management		
	Mobilisation fee	Lump Sum	£500,000.00
	SDS Project and Technical Management	Time	£5,541,339.00
	SDS Management Carried to Tender Summary, Lines 1 and 2 Combined		£0.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN MASTER SUMMARY, LINE 1

Requirements Definition	**£1,074,157.00**
Preliminary Design	**£4,268,697.00**
Detail Design	**£5,553,545.00**
Design Carried to Tender Summary, Line 1	**£10,896,399.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN MASTER SUMMARY, LINE 2

Requirements Definition	£1,074,157.00
Preliminary Design	£2,651,483.00
Detail Design	£3,439,352.00
Design Carried to Tender Summary, Line 2	£7,164,992.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN MASTER SUMMARY, LINES 1 and 2 COMBINED

Requirements Definition	£1,074,157.00
Preliminary Design	£5,565,699.00
Detail Design	£7,274,386.00
Design Carried to Tender Summary, Lines 1 and 2 Combined	£13,914,242.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: REQUIREMENTS DEFINITION

Sub milestone	PAYMENT MILESTONES (PM)	PM 1
	Indicative Document Deliverable List	REQUIREMENTS DEFINITION £
a	**Systemwide**	**£32,647.00**
b	**Tram & Vehicles**	**£21,765.00**
	Civil Engineering	
c	**Track & Formation**	**£76,177.00**
	Track	
	Points & Point Machines/Heaters	
	Drainage	
	Cable Routes	
	Fencing	
d	**Highways**	**£315,592.00**
	Roadworks	
	Pedestrians Areas & Crossings	
	Car Parks	
	Road Traffic Management	
	Utilities	
e	**Buildings**	**£51,206.00**
	Substations	
	Travel Centre	
	General	
f	**Structures**	**£370,004.00**
	Bridges & Subways	
	Culverts	

	Earthworks	
	Retaining Walls	
g	**Tramstops**	**£32,647.00**
	Waiting Shelter	
	Cable Routes	
	Platforms & Access	
	Lighting & Signage	
	Fencing	
	Page Totals £ Carried Forward	**£900,038.00**

DESIGN WORK: REQUIREMENTS DEFINITION (Continued)

Sub Milestone	**PAYMENT MILESTONES (PM)**	**PM 1**
	Indicative Document Deliverable List	**REQUIREMENTS DEFINITION**
	Page Totals £ Brought Forward	**£900,038.00**
	Supervisory/Control & Communications	**£97,942.00**
h	**Supervisory & Control System**	
	Tram Position & Detection System	
	Traction SCADA	
	Auxillary SCADA	
i	**Telecommunications**	
	Operational Voice Radio	
	Operational Data Radio	
	Wireless Communications	
j	**Tramstop Equipment**	
	CCTV	
	Passenger Help Points	

	Public Address Systems	
	Passenger Information Displays	
	Ticket Vending Machines	
	Electrification & Power	**£76,177.00**
k	**Traction Power**	
	11kv Feeders	
	Substations	
l	**OHLE**	
	Catenary & Wires	
	Pantograph	
m	**Auxillary Power**	
	LV Distribution	
n	**Depot**	
	Control Room	
	Equipment Rooms	
	Vehicle Cleaning & Maintenance	
	Infrastructure Maintenance	
	Stores & Materials	
	Administration & Management	
	Staff Facilities	
	External Works	
o	**Depot Equipment**	**£**
	CCTV	
	Control Room	
	Equipment Rooms	
	Total Requirements Definition Cost £ Carried to Design Master Summaries for Line 1, Line 2, and Lines 1 and 2 Combined	**£1,074,157.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN SUMMARY, LINE 1

Sector	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	All Costs Carried from Tramstop Build Up	£	£
DHY6	Murrayfield/Haymarket	£153,783.00	£200,995.00
HOT1	Haymarket/Shandwick Place	£153,783.00	£200,995.00
HOT1	Shandwick Place/Prince Street West	£153,783.00	£200,995.00
HOT1	Prince Street West/Waverley Bridge	£153,783.00	£200,995.00
HOT1	Waverley Bridge/St Andrews Square	£153,783.00	£200,995.00
HOT1	St Andrews Square/Picardy Place	£153,783.00	£200,995.00
HOT2	Picardy Place/Macdonald Road	£153,783.00	£200,995.00
HOT2	Macdonald Road/Balfour Street	£153,783.00	£200,995.00
HOT2	Balfour Street/Foot of Walk	£153,783.00	£200,995.00
HOT3	Foot of Walk/Constitution Street	£153,783.00	£200,995.00
HOT3	Constitution Street/Ocean Drive	£153,783.00	£200,995.00
HOT4	Ocean Drive/Ocean Terminal	£153,783.00	£200,995.00
HOT 5	Leith Depot and Connections	£153,783.00	£200,995.00
	Page Totals £ Carried Forward	£1,999,179.00	£2,612,935.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	PM 2	PM 3
Sector	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	Page Totals £ Brought Forward	£1,999,179.00	£2,612,935.00

HCT	Roseburn Junction/Roseburn (Part Tram Stop)	£153,783.00	£200,995.00
HCT	Roseburn/Ravelston Dykes	£153,783.00	£200,995.00
HCT1	Ravelston Dykes/Craigleith	£153,783.00	£200,995.00
HCT1	Craigleith/Western General Hospital	£153,783.00	£200,995.00
HCT1	Western General Hospital/Crewe Toll	£153,783.00	£200,995.00
CTO1	Crewe Toll/West Granton	£153,783.00	£200,995.00
CTO1	West Granton/Caroline Park	£153,783.00	£200,995.00
CTO1	Caroline Park/Granton Waterfront	£153,783.00	£200,995.00
CTO1	Granton Waterfront/Granton Square	£153,783.00	£200,995.00
CTO2	Granton Square/Lower Granton Road	£153,783.00	£200,995.00
CTO2	Lower Granton Road/Newhaven Road	£153,783.00	£200,995.00
CTO2	Newhaven Road/Ocean Terminal	£153,783.00	£200,995.00
	Leith Depot (1 Nr)	£212,060.00	£264,335.00
	Systemwide	£127,237.00	£158,601.00
	Trams	£84,825.00	£105,734.00
	Total Preliminary Design Costs £ Carried to Design Master Summary, Line 1	£4,268,697.00	
	Total Detailed Design Costs £ Carried to Design Master Summary, Line 1		£5,553,545.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN SUMMARY, LINE 2

Sector	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	All Costs Carried from Tramstop Build Up	£	£
ARP1	Airport/Ingliston Park and Ride	£153,783.00	£200,995.00
ARP1	Ingliston Park and Ride/Gogarburn Depot Halt	£153,783.00	£200,995.00
DHY1	Gogarburn Depot Halt/Gyle/Depot/Connections	£153,783.00	£200,995.00
DHY2	Gyle/Depot/Connections/Edinburgh Park	£153,783.00	£200,995.00
DHY3	Edinburgh Park/South Gyle	£153,783.00	£200,995.00
DHY4	South Gyle/Saughton Road	£153,783.00	£200,995.00
DHY5	Saughton Road/Balgreen Road	£153,783.00	£200,995.00
DHY5	Balgreen Road/Murrayfield	£153,783.00	£200,995.00
DHY6	Murrayfield/Haymarket	£153,783.00	£200,995.00
HOT1	Haymarket/Shandwick Place	£153,783.00	£200,995.00
HOT1	Shandwick Place/Prince Street West	£153,783.00	£200,995.00
HOT1	Prince Street West/Waverley Bridge	£153,783.00	£200,995.00
HOT1	Waverley Bridge/St Andrews Square	£153,783.00	£200,995.00
HOT1	St Andrews Square/Picardy Place	£153,783.00	£200,995.00
GNB2	Ingliston West/Newbridge	£153,783.00	£200,995.00
	Gogarburn Depot (1 Nr)	£208,930.00	£273,069.00
	Systemwide	£81,485.00	£90,815.00
	Trams	£54,323.00	£60,543.00
	Total Preliminary Design Costs £ Carried to Design Master Summary, Line 2	£2,651,483.00	
	Total Detailed Design Costs £ Carried to Design Master Summary, Line 2		£3,439,352.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE
DESIGN SUMMARY. LINES 1 and 2 Combined

Sector	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	All Costs Carried from Tramstop Build Up	£	£
ARP1	Airport/Ingliston Park and Ride	£153,783.00	£200,995.00
ARP1	Ingliston Park and Ride/Gogarburn Depot Halt	£153,783.00	£200,995.00
DHY1	Gogarburn Depot Halt/Gyle/Depot/Connections	£153,783.00	£200,995.00
DHY2	Gyle/Depot/Connections/Edinburgh Park	£153,783.00	£200,995.00
DHY3	Edinburgh Park/South Gyle	£153,783.00	£200,995.00
DHY4	South Gyle/Saughton Road	£153,783.00	£200,995.00
DHY5	Saughton Road/Balgreen Road	£153,783.00	£200,995.00
DHY5	Balgreen Road/Murrayfield	£153,783.00	£200,995.00
DHY6	Murrayfield/Haymarket	£153,783.00	£200,995.00
HOT1	Haymarket/Shandwick Place	£153,783.00	£200,995.00
HOT1	Shandwick Place/Prince Street West	£153,783.00	£200,995.00
HOT1	Prince Street West/Waverley Bridge	£153,783.00	£200,995.00
HOT1	Waverley Bridge/St Andrews Square	£153,783.00	£200,995.00
HOT1	St Andrews Square/Picardy Place	£153,783.00	£200,995.00
HOT2	Picardy Place/Macdonald Road	£153,783.00	£200,995.00
HOT2	Macdonald Road/Balfour Street	£153,783.00	£200,995.00
	Page Totals £ Carried Forward	£2,460,528.00	£3,215,920.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	PM 2	PM 3
Sector	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN

	Page Totals £ Brought Forward	£2,460,528.00	£3,215,920.00
HOT2	Balfour Street/Foot of Walk	£153,783.00	£200,995.00
HOT3	Foot of Walk/Constitution Street	£153,783.00	£200,995.00
HOT3	Constitution Street/Ocean Drive	£153,783.00	£200,995.00
HOT4	Ocean Drive/Ocean Terminal	£153,783.00	£200,995.00
HCT	Roseburn Junction/Roseburn (Part Tram Stop)	£153,783.00	£200,995.00
HCT	Roseburn/Ravelston Dykes	£153,783.00	£200,995.00
HCT1	Ravelston Dykes/Craigleith	£153,783.00	£200,995.00
HCT1	Craigleith/Western General Hospital	£153,783.00	£200,995.00
HCT1	Western General Hospital/Crewe Toll	£153,783.00	£200,995.00
CTO1	Crewe Toll/West Granton	£153,783.00	£200,995.00
CTO1	West Granton/Caroline Park	£153,783.00	£200,995.00
CTO1	Caroline Park/Granton Waterfront	£153,783.00	£200,995.00
CTO1	Granton Waterfront/Granton Square	£153,783.00	£200,995.00
CTO2	Granton Square/Lower Granton Road	£153,783.00	£200,995.00
CTO2	Lower Granton Road/Newhaven Road	£153,783.00	£200,995.00
CTO2	Newhaven Road/Ocean Terminal	£153,783.00	£200,995.00
GNB2	Ingliston West/Newbridge	£153,783.00	£200,995.00
	Gogarburn Depot (1 Nr)	£208,930.00	£273,069.00
	Systemwide	£169,158.00	£221,089.00
	Trams	£112,772.00	£147,393.00
	Total Preliminary Design Costs £ Carried to Design Master Summary, Lines 1 and 2 Combined	£5,565,699.00	

Total Detailed Design Costs £ Carried to Design Master Summary, Lines 1 and 2 Combined		£7,274,386.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAM LINE 1, Systemwide

	PAYMENT MILESTONES (PM)	PM 2	PM 3
Sub milestone	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
a	Systemwide	£127,237.00	£158,601.00
	Total Systemwide Preliminary and Detailed Design, Line 1, £ Carried to Design Summary, Line 1	£127,237.00	£158,601.00

TRAM LINE 1, Systemwide

TRAM LINE 1, Trams

PAYMENT MILESTONES (PM)	PM 2	PM 3
Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	£	£
Trams	£84,825.00	£105,734.00
Total Trams Preliminary and Detailed Design, Line 1, £ Carried to Design Summary, Line 1	£84,825.00	£105,734.00

TRAM LINE 1, Trams

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAM LINE 2, Systemwide

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
a	Systemwide	£81,485.00	£90,815.00
	Total Systemwide Preliminary and Detailed Design, Line 2, £ Carried to Design Summary, Line 2	£81,485.00	£90,815.00

TRAM LINE 2, Systemwide

TRAM LINE 2, Trams

PAYMENT MILESTONES (PM)	PM 2	PM 3
Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	£	£
b Trams	£54,323.00	£60,543.00
Total Trams Preliminary and Detailed Design, Line 2, £ Carried to Design Summary, Line 2	£54,323.00	£60,543.00

TRAM LINE 2, Trams

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAM LINES 1 and 2 Combined, Systemwide

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
a	Systemwide	£169,158.00	£221,089.00
	Total Systemwide Preliminary and Detailed Design, Lines 1 and 2, £ Carried to Design Summary, Lines 1 and 2, Combined	£169,158.00	£221,089.00

TRAM LINES 1 and 2 Combined, Systemwide

TRAM LINES 1 and 2 Combined, Trams

	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
b	Trams	£112,772.00	£147,393.00
	Total Trams Preliminary and Detailed Design, Lines 1 and 2, £ Carried to Design Summary, Lines 1 and 2, Combined	£112,772.00	£147,393.00

TRAM LINES 1 and 2 Combined, Trams

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Airport / Ingliston Park and Ride

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Waiting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00
h	**Tramstop Equipment**		

h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrification & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Airport / Ingliston Park and Ride

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Ingliston Park and Ride to Gogarburn Depot Halt

Sub milestone	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Waiting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrification & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Gogarburn Depot Halt to Gyle and Depot Plus Connections

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Waiting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN	PM 3 DETAILED DESIGN
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrification & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
		£153,783.00	£200,995.00

TRAMSTOPS: Gogarburn Depot Halt to Gyle and Depot Plus Connections

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Gyle and Depot Plus Connections to Edinburgh Park

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: Gyle and Depot Plus Connections to Edinburgh Park

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Edinburgh Park to South Gyle

SUB MILESTONE	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00
d2	Culverts	£5,809.00	£7,593.00

d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00
h	**Tramstop Equipment**		

h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: South Gyle

	PAYMENT MILESTONES (PM)	PM 2	PM 3
SUB MILESTONE	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
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a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
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b4	Road Traffic Management	£7,433.00	£9,715.00
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	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
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g2	Operational Data Radio	£1,538.00	£2,010.00
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h2	Passenger Help Points	**£308.00**	**£402.00**
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h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: South Gyle

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Soughton Road to Balgreen Road

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
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e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
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e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
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g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
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h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Soughton Road to Balgreen Road

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Balgreen Road to Murrayfield

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
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c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
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d1	Bridges & Subways	£29,047.00	£37,965.00
d2	Culverts	£5,809.00	£7,593.00

d3	Earthworks	£11,619.00	£15,186.00
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e	**Tramstops**		
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e3	Platforms & Access	£1,538.00	£2,010.00
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	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
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g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00
h	**Tramstop Equipment**		

h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Balgreen Road to Murrayfield

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Murrayfield to Haymarket

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
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	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
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h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
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h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Murrayfield to Haymarket

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Haymarket to Shandwick Place

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
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c3	General	£342.00	£447.00
d	**Structures**		
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d2	Culverts	£5,809.00	£7,593.00
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	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
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g3	Wireless Communications	£1,538.00	£2,010.00

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h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Haymarket to Shandwick Place

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Shandwick Place to Princes Street West

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00
d2	Culverts	£5,809.00	£7,593.00

d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00
h	**Tramstop Equipment**		

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Princes Street West to Waverley Bridge

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxiliary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Princes Street West to Waverley Bridge

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Waverley Bridge to St. Andrews Square

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN	PM 3 DETAILED DESIGN
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detail Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: Waverley Bridge to St. Andrews Square

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: St. Andrews Square to Picardy Place

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: St. Andrews Square to Picardy Place

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Picardy Place to MacDonald Road

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: Picardy Place to MacDonald Road

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: MacDonald Road to Balfour Street

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: MacDonald Road to Balfour Street

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Balfour Street to Foot of Walk

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Balfour Street to Foot of Walk

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Foot of Walk to Constitution Street

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Foot of Walk to Constitution Street

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Constitution Street to Ocean Drive

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Ocean Drive to Ocean Terminal

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Leith Depot and Connections

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
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e3	Platforms & Access	£1,538.00	£2,010.00
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e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN	PM 3 DETAILED DESIGN
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
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h	**Tramstop Equipment**		
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h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
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j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Leith Depot and Connections

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Roseburn Jumction to Roseburn

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
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e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: Roseburn Jumction to Roseburn

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Roseburn to Ravelston Dykes

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
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e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
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g	**Telecommunications**		
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g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Ravelston Dykes to Craigleith

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
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e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
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	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Ravelston Dykes to Craigleith

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Craigleith to Western General Hospital

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	**£1,538.00**	**£2,010.00**
h2	Passenger Help Points	**£308.00**	**£402.00**
h3	Public Address Systems	**£308.00**	**£402.00**
h4	Passenger Information Displays	**£923.00**	**£1,206.00**
h5	Ticket Vending Machines	**£1,538.00**	**£2,010.00**
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	**£1,794.00**	**£2,345.00**
j2	Substations	**£2,392.00**	**£3,127.00**
k	**OHLE**		
k1	Catenary & Wires	**£4,784.00**	**£6,253.00**
k2	Pantograph	**£598.00**	**£782.00**
l	**Auxillary Power**		
l1	LV Distribution	**£2,392.00**	**£3,127.00**
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	**£153,783.00**	**£200,995.00**

TRAMSTOPS: Craigleith to Western General Hospital

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Western General Hospital to Crewe Toll

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	**PAYMENT MILESTONES (PM)**	**PM 2**	**PM 3**
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Western General Hospital to Crewe Toll

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Crewe Toll to West Granton

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Crewe Toll to West Granton

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: West Granton to Caroline Park

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: West Granton to Caroline Park

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Caroline Park to Granton Waterfront

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

	PAYMENT MILESTONES (PM)	**PM 2**	**PM 3**
SUB MILESTONE	**Indicative Document Deliverable List**	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Granton Waterfront to Granton Square

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Granton Waterfront to Granton Square

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Granton Square to Lower Granton Road

	PAYMENT MILESTONES (PM)	PM 2	PM 3
SUB MILESTONE	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Granton Square to Lower Granton Road

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Lower Granton Road to Newhaven Road

SUB MILESTONE	PAYMENT MILESTONES (PM) / Indicative Document Deliverable List	PM 2 PRELIMINARY DESIGN £	PM 3 DETAILED DESIGN £
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Lower Granton Road to Newhaven Road

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Newhaven Road to Ocean Terminal

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Newhaven Road to Ocean Terminal

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN

TRAMSTOPS: Ingliston West to Newbridge

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
	Civil Engineering		
a	**Track & Formation**		
a1	Track	£8,372.00	£10,943.00
a2	Points & Point Machines/Heaters	£598.00	£782.00
a3	Drainage	£1,196.00	£1,563.00
a4	Cable Routes	£1,196.00	£1,563.00
a5	Fencing	£598.00	£782.00
b	**Highways**		
b1	Roadworks	£24,776.00	£32,382.00
b2	Pedestrians Areas & Crossings	£2,478.00	£3,238.00
b3	Car Parks	£2,478.00	£3,238.00
b4	Road Traffic Management	£7,433.00	£9,715.00
b5	Utilities	£12,388.00	£16,191.00
c	**Buildings**		
c1	Substations	£1,025.00	£1,340.00
c2	Travel Centre	£342.00	£447.00
c3	General	£342.00	£447.00
d	**Structures**		
d1	Bridges & Subways	£29,047.00	£37,965.00

d2	Culverts	£5,809.00	£7,593.00
d3	Earthworks	£11,619.00	£15,186.00
d4	Retaining Walls	£11,619.00	£15,186.00
e	**Tramstops**		
e1	Wailting Shelter	£1,538.00	£2,010.00
e2	Cable Routes	£1,281.00	£1,675.00
e3	Platforms & Access	£1,538.00	£2,010.00
e5	Lighting & Signage	£513.00	£670.00
e5	Fencing	£256.00	£335.00
	Page Totals £ Carried Forward	£126,442.00	£165,261.00

DESIGN WORK: PRELIMINARY AND DETAILED DESIGN (Continued)

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	**PRELIMINARY DESIGN**	**DETAILED DESIGN**
	Page Totals £ Brought Forward	£126,442.00	£165,261.00
	Supervisory/Control & Communications		
f	**Supervisory & Control System**		
f1	Tram Position & Detection System	£3,076.00	£4,020.00
f2	Traction SCADA	£1,538.00	£2,010.00
f3	Auxillary SCADA	£1,538.00	£2,010.00
g	**Telecommunications**		
g1	Operational Voice Radio	£1,538.00	£2,010.00
g2	Operational Data Radio	£1,538.00	£2,010.00
g3	Wireless Communications	£1,538.00	£2,010.00

h	**Tramstop Equipment**		
h1	CCTV	£1,538.00	£2,010.00
h2	Passenger Help Points	£308.00	£402.00
h3	Public Address Systems	£308.00	£402.00
h4	Passenger Information Displays	£923.00	£1,206.00
h5	Ticket Vending Machines	£1,538.00	£2,010.00
	Electrifcation & Power		
j	**Traction Power**		
j1	11kv Feeders	£1,794.00	£2,345.00
j2	Substations	£2,392.00	£3,127.00
k	**OHLE**		
k1	Catenary & Wires	£4,784.00	£6,253.00
k2	Pantograph	£598.00	£782.00
l	**Auxillary Power**		
l1	LV Distribution	£2,392.00	£3,127.00
	Total Preliminary and Detailed Design Costs £ Carried to Design Summary	£153,783.00	£200,995.00

TRAMSTOPS: Ingliston West to Newbridge

DESIGN PRICING SCHEDULE: Leith Depot (1Nr) Preliminary and Detailed Design.

SUB MILESTONE	PAYMENT MILESTONES (PM)	PM 2	PM 3
	Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
		£	£
D/1	**Depot**		
D/1a	Control Room	£10,603.00	£13,217.00
D/1b	Equipment Rooms	£10,603.00	£13,217.00
D/1c	Vehicle Cleaning & Maintenance	£31,809.00	£39,650.00
D/1d	Infrastructure Maintenance	£31,809.00	£39,650.00
D/1e	Stores & Materials	£10,603.00	£13,217.00
D/1f	Administration & Management	£21,206.00	£26,433.00
D/1g	Staff Facilities	£21,206.00	£26,433.00
D/1h	External Works	£21,206.00	£26,433.00
D/2	**Depot Equipment**		
D/2/a	CCTV	£10,603.00	£13,217.00
D/2/b	Control Room	£21,206.00	£26,434.00
D/2/c	Equipment Rooms	£21,206.00	£26,434.00
	Total Preliminary Design Costs £ Carried to Design Summary, Line 1	£212,060.00	
	Total Detailed Design Costs £ Carried to Design Summary, Line 1		£264,335.00

DESIGN PRICING SCHEDULE: Gogarburn Depot (1Nr) Preliminary and Detailed Design.

PAYMENT MILESTONES (PM)	PM 2	PM 3
Indicative Document Deliverable List	PRELIMINARY DESIGN	DETAILED DESIGN
	£	£
Depot		
Control Room	£10,446.00	£13,653.00
Equipment Rooms	£10,446.00	£13,653.00
Vehicle Cleaning & Maintenance	£31,340.00	£40,961.00
Infrastructure Maintenance	£31,340.00	£40,961.00
Stores & Materials	£10,447.00	£13,653.00
Administration & Management	£20,893.00	£27,307.00
Staff Facilities	£20,893.00	£27,307.00
External Works	£20,893.00	£27,307.00
Depot Equipment		
CCTV	£10,446.00	£13,653.00
Control Room	£20,893.00	£27,307.00
Equipment Rooms	£20,893.00	£27,307.00
Total Preliminary Design Costs £ Carried to Design Summaries, Line 2 and Lines 1 and 2 Combined	£208,930.00	
Total Detailed Design Costs £ Carried to Design Summaries, Line 2 and Lines 1 and 2 Combined		£273,069.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

FURTHER SCOPE, LINE 1

Further Scope	£
The items specifically detailed within the design pricing schedules are indicative and Tenderers are to detail here any further scope of work required to fulfill their full obligations under the SDS contract as detailed within these Tender Documents.	
Tenderers shall detail below additional specific items, with values, required to complete the SDS scope and not detailed elsewhere within the design pricing schedule.	
Payment of fees to statutory and other bodies	£200,000.00
Surveys	£1,500,000.00
Further Scope Carried to Tender Summary, Line 1	£1,700,000.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

FURTHER SCOPE, LINE 2

Further Scope	£
The items specifically detailed within the design pricing schedules are indicative and Tenderers are to detail here any further scope of work required to fulfill their full obligations under the SDS contract as detailed within these Tender Documents.	
Tenderers shall detail below additional specific items, with values, required to complete the SDS scope and not detailed elsewhere within the design pricing schedule.	
Payment of fees to statutory and other bodies	£200,000.00
Surveys	£1,500,000.00
Further Scope Carried to Tender Summary, Line 2	£1,700,000.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

FURTHER SCOPE, LINES 1 and 2 COMBINED

Further Scope	£
The items specifically detailed within the design pricing schedules are indicative and Tenderers are to detail here any further scope of work required to fulfill their full obligations under the SDS contract as detailed within these Tender Documents.	
Tenderers shall detail below additional specific items, with values, required to complete the SDS scope and not detailed elsewhere within the design pricing schedule.	
Payment of fees to statutory and other bodies	£300,000.00
Surveys	£2,300,000.00
Further Scope Carried to Tender Summary, Lines 1 and 2 Combined	£2,600,000.00

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

Provisional Additional Work

	Provisional Additional Work	Hours	Rate	Amount £
	Provisional Additional Work shall only have authority for payment and execution when instructed by tie, or authorised tie Representative prior to the work being carried out. The values contained in this section shall be deducted if not instructed by tie.The rates stated shall include all overheads, profit, non-productive overhead and time, holiday allowance, travelling, administration etc., and shall be the all-in rate for the respective grade of personnel. The rates shall apply for both the Lead and Sub Consultants.			
a	Senior Designer	4,500.00	£68.00	£306,000.00
b	Principle Designer	6,000.00	£85.00	£510,000.00
c	Graduate Designer	6,000.00	£55.00	£330,000.00
d	Senior CAD Technician	3,000.00	£49.00	£147,000.00
e	CAD Technician	5,000.00	£38.00	£190,000.00
f	Technical Support Rates valid to end 2009, exclude travel and subsistence	3,000.00	£38.00	£114,000.00
g	Additional payment of fees to statutory and other bodies			£5,000.00
h	Management, Uplift, oncost and profit		%	incl
I	Travel, subsistence	Provisional Sum		£100,000.00

Provisional Additional Work Carried to Tender Summaries for Line 1, Line 2, and Line 1 and 2 Combined		**£1,702,000.00**

EDINBURGH TRAM NETWORK: SDS PRICING SCHEDULE

TRANSPORT MODELLING

		£
a	Line 1 Transport Modelling Allow for all works required to complete the traffic modelling within the SDS scope of works as per Clause 3.5 of the Scope of Services	£972,000.00
	Transport Modelling Carried to Tender Summary, Line 1	£972,000.00

		£
b	Line 2 Transport Modelling Allow for all works required to complete the traffic modelling within the SDS scope of works as per Clause 3.5 of the Scope of Services	£972,000.00
	Transport Modelling Carried to Tender Summary, Line 2	£972,000.00

		£
c	Lines 1 and 2 Combined, Transport Modelling Allow for all works required to complete the traffic modelling within the SDS scope of works as per Clause 3.5 of the Scope of Services	£1,215,000.00
	Transport Modelling Carried to Tender Summary, Lines 1 and 2 Combined	£1,215,000.00

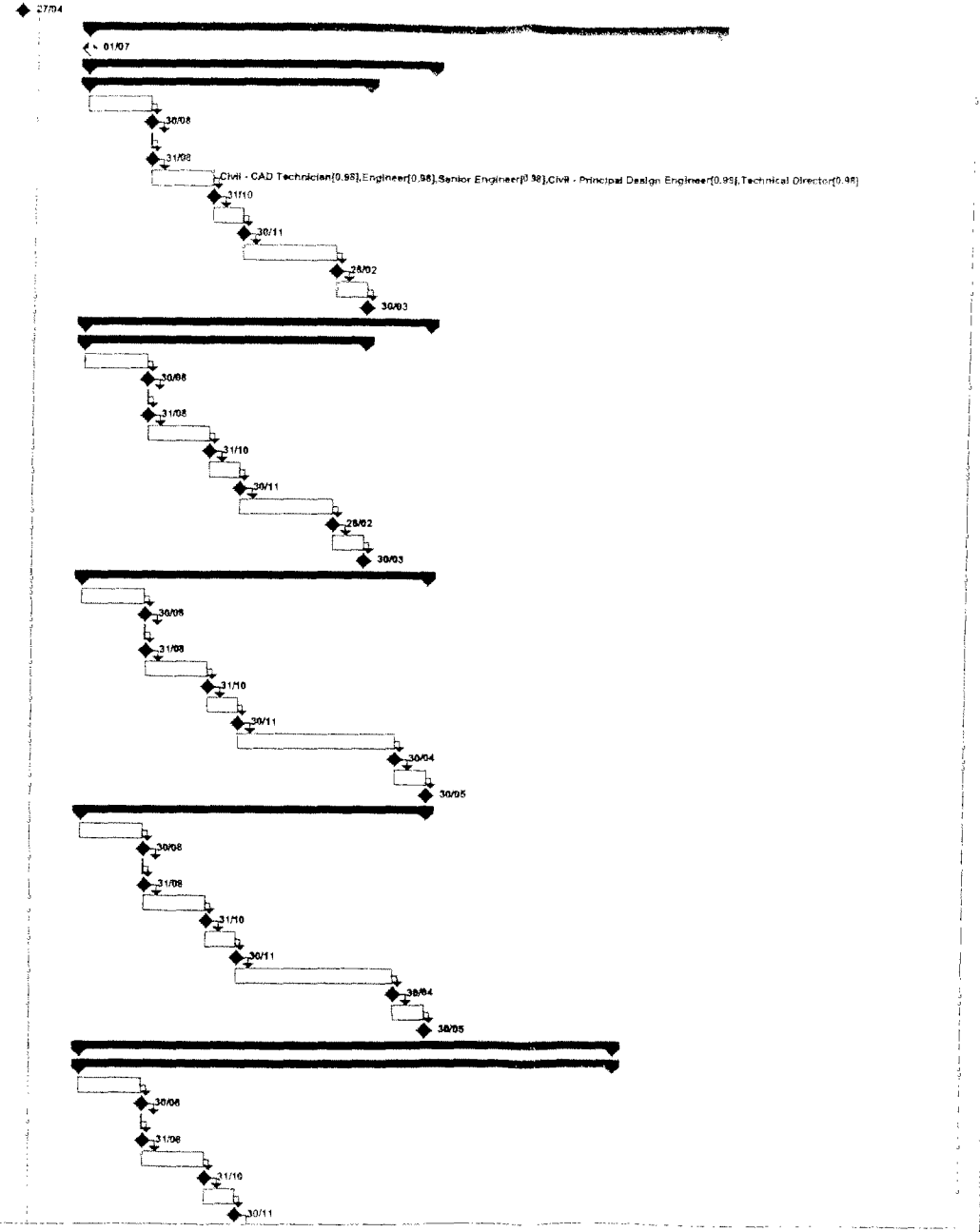
[redacted] [redacted]

Director/Authorised Signatory
TIE LIMITED

Director/Authorised Signatory
PARSONS BRINCKERHOFF LIMITED

Edinburgh Tram Network - Line One - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
0	**Edinburgh Tram Network - Line One - System Design Services - Outline Desig**	0	**477 days**	**Wed 27/04/05**	**Wed 28/02/07**	**204,375 hrs**
1	1 Project Management	100	0 days	Wed 27/04/05	Wed 27/04/05	0 hrs
4	**2 EDINBURGH TRAM SDS PROVIDER**	200	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**204,375 hrs**
5	2.1 CONTRACT AWARD = START DATE	200.1	0 days	Fri 01/07/05	Fri 01/07/05	0 hrs
6	**2.2 St Andrews Sq - Foot of the Walk**	200.4	**236 days**	**Fri 01/07/05**	**Tue 30/05/06**	**32,700 hrs**
7	**2.2.1 St. Andrew Square (exc) - Picardy Place (inc)**	200.4.2	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
8	2.2.1.1 Requirements Definition	200.4.2	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
9	2.2.1.2 Submit RD Deliverables for Approval	200.4.2	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
10	2.2.1.3 RD Approvals Period	200.4.2	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
11	2.2.1.4 Receive Requirements Definition Approval	200.4.2	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
12	2.2.1.5 Preliminary Design	200.4.2	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
13	2.2.1.6 Submit PD Deliverables for Approval	200.4.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
14	2.2.1.7 PD Approvals Period	200.4.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
15	2.2.1.8 Receive Preliminary Design Approval	200.4.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
16	2.2.1.9 Detailed Design	200.4.2	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
17	2.2.1.10 Submit DD Deliverables for Approval	200.4.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
18	2.2.1.11 DD Approvals Period	200.4.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
19	2.2.1.12 Receive Detailed Design Approval	200.4.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
20	**2.2.2 Picardy Place (exc) - Foot of the Walk (inc)**	**200.4.3**	**238 days**	**Fri 01/07/05**	**Tue 30/05/06**	**24,525 hrs**
21	**2.2.2.1 Picardy Place (exc) - Macdonald Road (inc)**	**200.4.3.**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
22	2.2.2.1.1 Requirements Definition	200.4.3	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
23	2.2.2.1.2 Submit RD Deliverables for Approval	200.4.3	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
24	2.2.2.1.3 RD Approvals Period	200.4.3	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
25	2.2.2.1.4 Receive Requirements Definition Approval	200.4.3.	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
26	2.2.2.1.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
27	2.2.2.1.6 Submit PD Deliverables for Approval	200.4.3.	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
28	2.2.2.1.7 PD Approvals Period	200.4.3.	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
29	2.2.2.1.8 Receive Preliminary Design Approval	200.4.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
30	2.2.2.1.9 Detailed Design	200.4.3	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
31	2.2.2.1.10 Submit DD Deliverables for Approval	200.4.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
32	2.2.2.1.11 DD Approvals Period	200.4.3.	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
33	2.2.2.1.12 Receive Detailed Design Approval	200.4.3.	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
34	**2.2.2.2 Macdonald Road (exc) - Balfour Station (inc)**	**200.4.3.**	**238 days**	**Fri 01/07/05**	**Tue 30/05/06**	**8,175 hrs**
35	2.2.2.2.1 Requirements Definition	200.4.3	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
36	2.2.2.2.2 Submit RD Deliverables for Approval	200.4.3	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
37	2.2.2.2.3 RD Approvals Period	200.4.3.	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
38	2.2.2.2.4 Receive Requirements Definition Approval	200.4.3	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
39	2.2.2.2.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
40	2.2.2.2.6 Submit PD Deliverables for Approval	200.4.3.	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
41	2.2.2.2.7 PD Approvals Period	200.4.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
42	2.2.2.2.8 Receive Preliminary Design Approval	200.4.3.	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
43	2.2.2.2.9 Detailed Design	200.4.3	106 days	Thu 01/12/05	Sun 30/04/06	4,987.5 hrs
44	2.2.2.2.10 Submit DD Deliverables for Approval	200.4.3.	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
45	2.2.2.2.11 DD Approvals Period	200.4.3	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
46	2.2.2.2.12 Receive Detailed Design Approval	200.4.3	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
47	**2.2.2.3 Balfour Station (exc) - Foot of the Walk (inc)**	**200.4.3.**	**238 days**	**Fri 01/07/05**	**Tue 30/05/06**	**8,175 hrs**
48	2.2.2.3.1 Requirements Definition	200.4.3.	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
49	2.2.2.3.2 Submit RD Deliverables for Approval	200.4.3.	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
50	2.2.2.3.3 RD Approvals Period	200.4.3	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
51	2.2.2.3.4 Receive Requirements Definition Approval	200.4.3	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
52	2.2.2.3.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
53	2.2.2.3.6 Submit PD Deliverables for Approval	200.4.3.	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
54	2.2.2.3.7 PD Approvals Period	200.4.3.	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
55	2.2.2.3.8 Receive Preliminary Design Approval	200.4.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
56	2.2.2.3.9 Detailed Design	200.4.3.	106 days	Thu 01/12/05	Sun 30/04/06	4,987.5 hrs
57	2.2.2.3.10 Submit DD Deliverables for Approval	200.4.3	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
58	2.2.2.3.11 DD Approvals Period	200.4.3	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
59	2.2.2.3.12 Receive Detailed Design Approval	200.4.3	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
60	**2.3 Foot of the Walk (exc) - Ocean Drive (inc)**	**200.4.4**	**368 days**	**Fri 01/07/05**	**Thu 30/11/06**	**32,700 hrs**
61	**2.3.1 Foot of the Walk (exc) - Constitution Street (inc)**	**200.4.4.**	**368 days**	**Fri 01/07/05**	**Thu 30/11/06**	**8,175 hrs**
62	2.3.1.1 Requirements Definition	200.4.4	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
63	2.3.1.2 Submit RD Deliverables for Approval	200.4.4	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
64	2.3.1.3 RD Approvals Period	200.4.4	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
65	2.3.1.4 Receive Requirements Definition Approval	200.4.4	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
66	2.3.1.5 Preliminary Design	200.4.4	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
67	2.3.1.6 Submit PD Deliverables for Approval	200.4.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
68	2.3.1.7 PD Approvals Period	200.4.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
69	2.3.1.8 Receive Preliminary Design Approval	200.4.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs

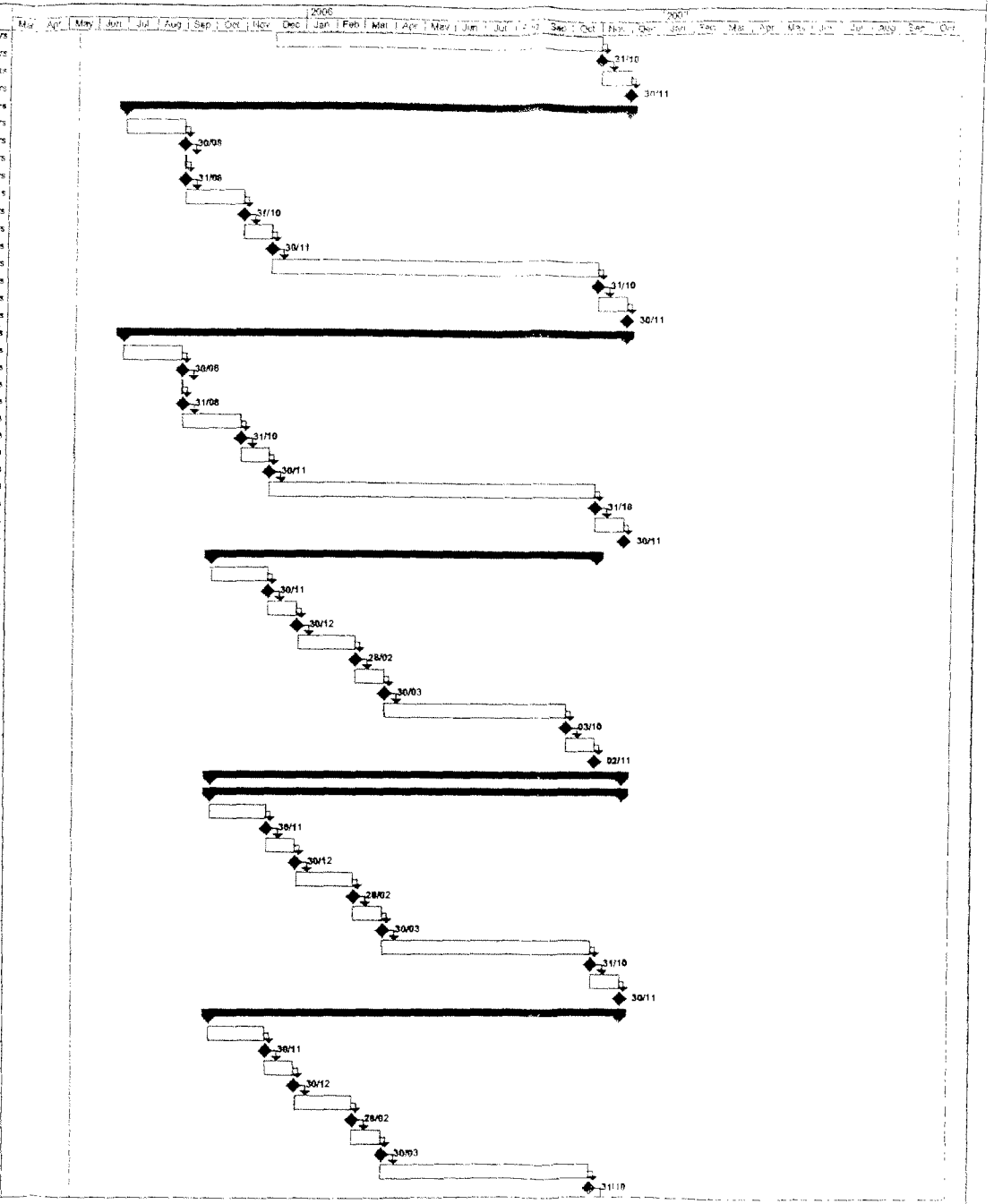


Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Thu 12/05/05 10:09 — Page 1 — Line 5 = Common map

Edinburgh Tram Network - Line One - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
70	2.3.1.9 Detailed Design	200.4.4	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
71	2.3.1.10 Submit DD Deliverables for Approval	200.4.4	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
72	2.3.1.11 DD Approvals Period	200.4.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
73	2.3.1.12 Receive Detailed Design Approval	200.4.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
74	**2.3.2 Constitution Street (excl - Ocean Drive (inc)**	**200.4.4.**	**368 days**	**Fri 01/07/05**	**Thu 30/11/06**	**8,175 hrs**
75	2.3.2.1 Requirements Definition	200.4.4	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
76	2.3.2.2 Submit RD Deliverables for Approval	200.4.4	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
77	2.3.2.3 RD Approvals Period	200.4.4	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
78	2.3.2.4 Receive Requirements Definition Approval	200.4.4	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
79	2.3.2.5 Preliminary Design	200.4.4	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
80	2.3.2.6 Submit PD Deliverables for Approval	200.4.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
81	2.3.2.7 PD Approvals Period	200.4.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
82	2.3.2.8 Receive Preliminary Design Approval	200.4.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
83	2.3.2.9 Detailed Design	200.4.4	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
84	2.3.2.10 Submit DD Deliverables for Approval	200.4.4.	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
85	2.3.2.11 DD Approvals Period	200.4.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
86	2.3.2.12 Receive Detailed Design Approval	200.4.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
87	**2.3.3 Ocean Drive (exc) - Ocean Terminal (inc)**	**200.4.5**	**368 days**	**Fri 01/07/05**	**Thu 30/11/06**	**8,175 hrs**
88	2.3.3.1 Requirements Definition	200.4.5.	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
89	2.3.3.2 Submit RD Deliverables for Approval	200.4.5.	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
90	2.3.3.3 RD Approvals Period	200.4.5	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
91	2.3.3.4 Receive Requirements Definition Approval	200.4.5	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
92	2.3.3.5 Preliminary Design	200.4.5	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
93	2.3.3.6 Submit PD Deliverables for Approval	200.4.5	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
94	2.3.3.7 PD Approvals Period	200.4.5.	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
95	2.3.3.8 Receive Preliminary Design Approval	200.4.5.	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
96	2.3.3.9 Detailed Design	200.4.5.	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
97	2.3.3.10 Submit DD Deliverables for Approval	200.4.5.	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
98	2.3.3.11 DD Approvals Period	200.4.5.	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
99	2.3.3.12 Receive Detailed Design Approval	200.4.5.	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
100	**2.3.4 Leith Depot & Connections**	**200.4.6**	**283 days**	**Mon 03/10/05**	**Thu 02/11/06**	**8,175 hrs**
101	2.3.4.1 Requirements Definition	200.4.6	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
102	2.3.4.2 Submit RD Deliverables for Approval	200.4.6.	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
103	2.3.4.3 RD Approvals Period	200.4.6	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
104	2.3.4.4 Receive Requirements Definition Approval	200.4.6.	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
105	2.3.4.5 Preliminary Design	200.4.6	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
106	2.3.4.6 Submit PD Deliverables for Approval	200.4.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
107	2.3.4.7 PD Approvals Period	200.4.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
108	2.3.4.8 Receive Preliminary Design Approval	200.4.6.	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
109	2.3.4.9 Detailed Design	200.4.6.	133 days	Fri 31/03/06	Tue 03/10/06	4,987.5 hrs
110	2.3.4.10 Submit DD Deliverables for Approval	200.4.6	0 days	Tue 03/10/06	Tue 03/10/06	0 hrs
111	2.3.4.11 DD Approvals Period	200.4.6	22 days	Wed 04/10/06	Thu 02/11/06	0 hrs
112	2.3.4.12 Receive Detailed Design Approval	200.4.6	0 days	Thu 02/11/06	Thu 02/11/06	0 hrs
113	**2.4 HAYMARKET CREWE TOLL**	**200.5**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**32,700 hrs**
114	**2.4.1 Roseburn Junction (exc) - Roseburn (inc)**	**200.5.1**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
115	2.4.1.1 Requirements Definition	200.5.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
116	2.4.1.2 Submit RD Deliverables for Approval	200.5.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
117	2.4.1.3 RD Approvals Period	200.5.1.	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
118	2.4.1.4 Receive Requirements Definition Approval	200.5.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
119	2.4.1.5 Preliminary Design	200.5.1.	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
120	2.4.1.6 Submit PD Deliverables for Approval	200.5.1.	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
121	2.4.1.7 PD Approvals Period	200.5.1.	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
122	2.4.1.8 Receive Preliminary Design Approval	200.5.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
123	2.4.1.9 Detailed Design	200.5.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
124	2.4.1.10 Submit DD Deliverables for Approval	200.5.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
125	2.4.1.11 DD Approvals Period	200.5.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
126	2.4.1.12 Receive Detailed Design Approval	200.5.1.	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
127	**2.4.2 Roseburn (exc) - Ravelston Dykes (inc)**	**200.5.2**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
128	2.4.2.1 Requirements Definition	200.5.2.	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
129	2.4.2.2 Submit RD Deliverables for Approval	200.5.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
130	2.4.2.3 RD Approvals Period	200.5.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
131	2.4.2.4 Receive Requirements Definition Approval	200.5.2.	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
132	2.4.2.5 Preliminary Design	200.5.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
133	2.4.2.6 Submit PD Deliverables for Approval	200.5.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
134	2.4.2.7 PD Approvals Period	200.5.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
135	2.4.2.8 Receive Preliminary Design Approval	200.5.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
136	2.4.2.9 Detailed Design	200.5.2	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
137	2.4.2.10 Submit DD Deliverables for Approval	200.5.2	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

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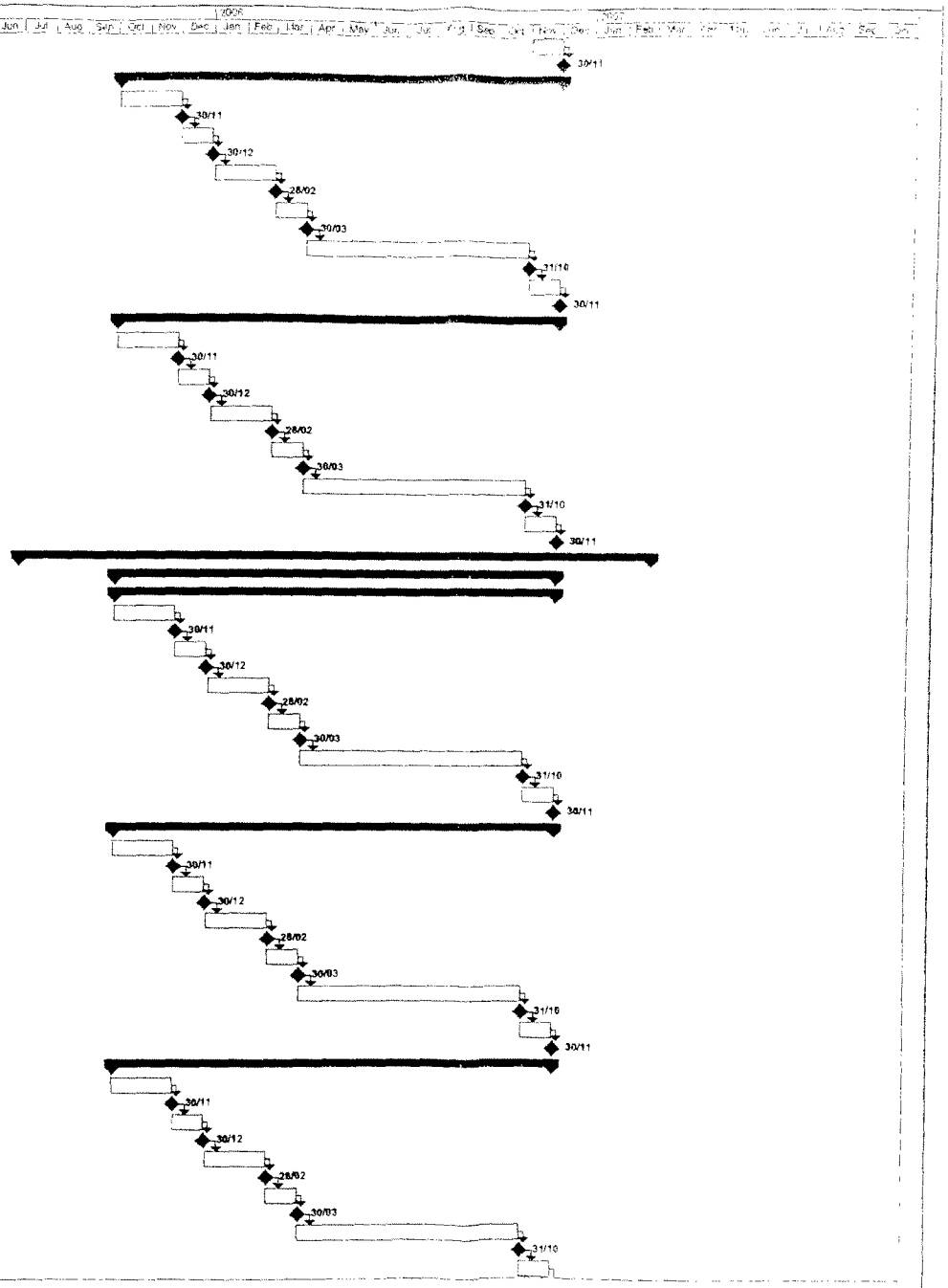
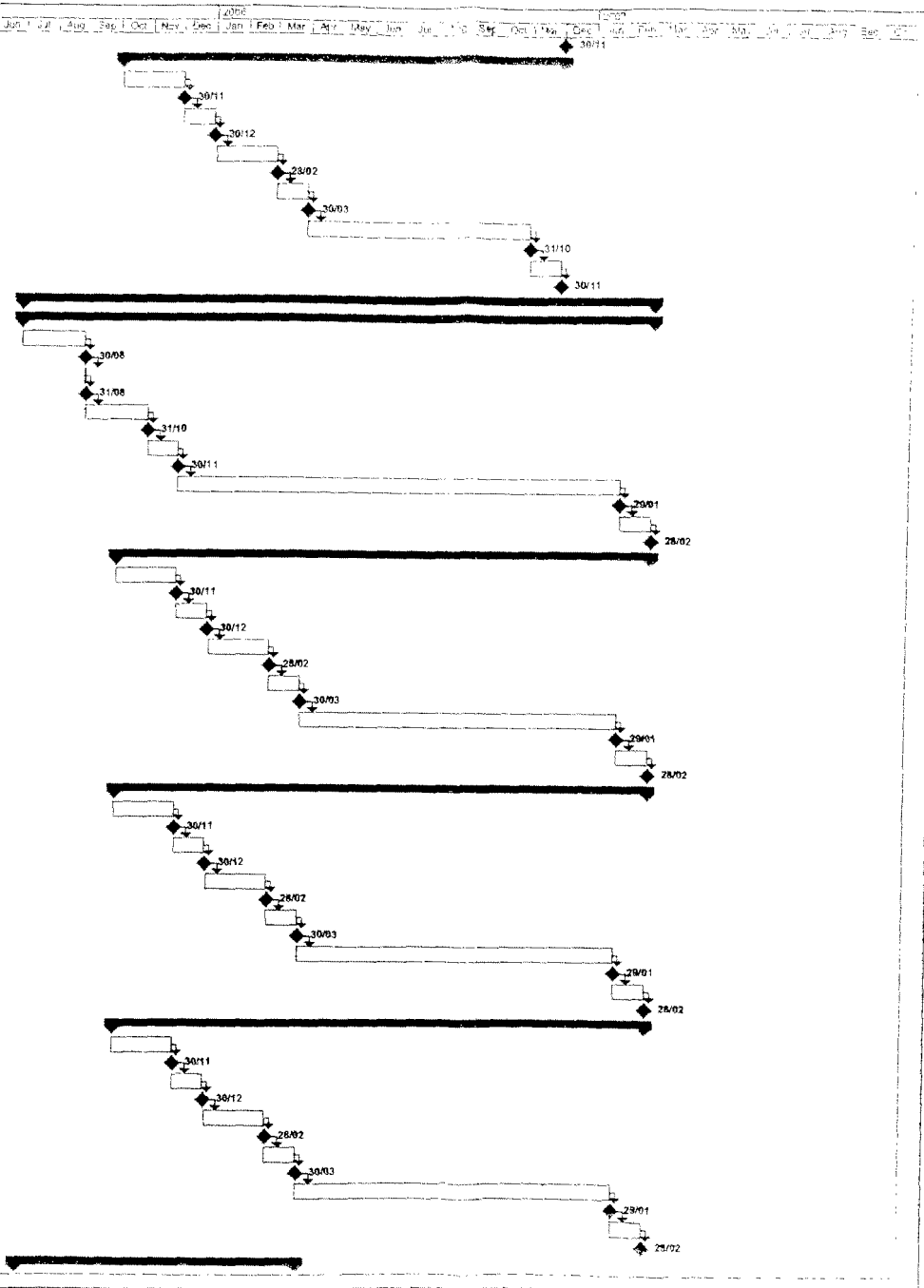
ID	Task Name	WBS	Duration	Start	Finish	Work
138	2.4.2.11 DD Approvals Period	200.5.2	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
139	2.4.2.12 Receive Detailed Design Approval	200.5.2	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
140	**2.4.3 Ravelston Dykes (exc) - Craigleith (inc)**	**200.5.3**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
141	2.4.3.1 Requirements Definition	200.5.3	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
142	2.4.3.2 Submit RD Deliverables for Approval	200.5.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
143	2.4.3.3 RD Approvals Period	200.5.3	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
144	2.4.3.4 Receive Requirements Definition Approval	200.5.3	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
145	2.4.3.5 Preliminary Design	200.5.3	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
146	2.4.3.6 Submit PD Deliverables for Approval	200.5.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
147	2.4.3.7 PD Approvals Period	200.5.3	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
148	2.4.3.8 Receive Preliminary Design Approval	200.5.3	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
149	2.4.3.9 Detailed Design	200.5.3	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
150	2.4.3.10 Submit DD Deliverables for Approval	200.5.3	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
151	2.4.3.11 DD Approvals Period	200.5.3	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
152	2.4.3.12 Receive Detailed Design Approval	200.5.3	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
153	**2.4.4 Craigleith (exc) - W. General Hospital - Crewe Toll (inc)**	**200.5.4**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
154	2.4.4.1 Requirements Definition	200.5.4	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
155	2.4.4.2 Submit RD Deliverables for Approval	200.5.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
156	2.4.4.3 RD Approvals Period	200.5.4	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
157	2.4.4.4 Receive Requirements Definition Approval	200.5.4	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
158	2.4.4.5 Preliminary Design	200.5.4	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
159	2.4.4.6 Submit PD Deliverables for Approval	200.5.4	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
160	2.4.4.7 PD Approvals Period	200.5.4	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
161	2.4.4.8 Receive Preliminary Design Approval	200.5.4	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
162	2.4.4.9 Detailed Design	200.5.4	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
163	2.4.4.10 Submit DD Deliverables for Approval	200.5.4	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
164	2.4.4.11 DD Approvals Period	200.5.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
165	2.4.4.12 Receive Detailed Design Approval	200.5.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
166	**2.5 CREWE TOLL OCEAN TERMINAL**	**200.6**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**85,400 hrs**
167	**2.5.1 Crewe Toll (exc) - Granton Square (inc)**	**200.6.1**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**32,700 hrs**
168	**2.5.1.1 Crewe Toll (exc) - W. Granton (inc)**	**200.6.1**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
169	2.5.1.1.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
170	2.5.1.1.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
171	2.5.1.1.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
172	2.5.1.1.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
173	2.5.1.1.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
174	2.5.1.1.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
175	2.5.1.1.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
176	2.5.1.1.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
177	2.5.1.1.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
178	2.5.1.1.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
179	2.5.1.1.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
180	2.5.1.1.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
181	**2.5.1.2 W. Granton (exc) - Caroline Park (inc)**	**200.6.1**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
182	2.5.1.2.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
183	2.5.1.2.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
184	2.5.1.2.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
185	2.5.1.2.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
186	2.5.1.2.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
187	2.5.1.2.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
188	2.5.1.2.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
189	2.5.1.2.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
190	2.5.1.2.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
191	2.5.1.2.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
192	2.5.1.2.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
193	2.5.1.2.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
194	**2.5.1.3 Caroline Park (exc) - Granton Waterfront (inc)**	**200.6.1**	**303 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
195	2.5.1.3.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
196	2.5.1.3.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
197	2.5.1.3.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
198	2.5.1.3.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
199	2.5.1.3.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
200	2.5.1.3.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
201	2.5.1.3.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
202	2.5.1.3.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
203	2.5.1.3.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
204	2.5.1.3.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
205	2.5.1.3.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Edinburgh Tram Network - Line One - System Design Services - Outline Design Programme

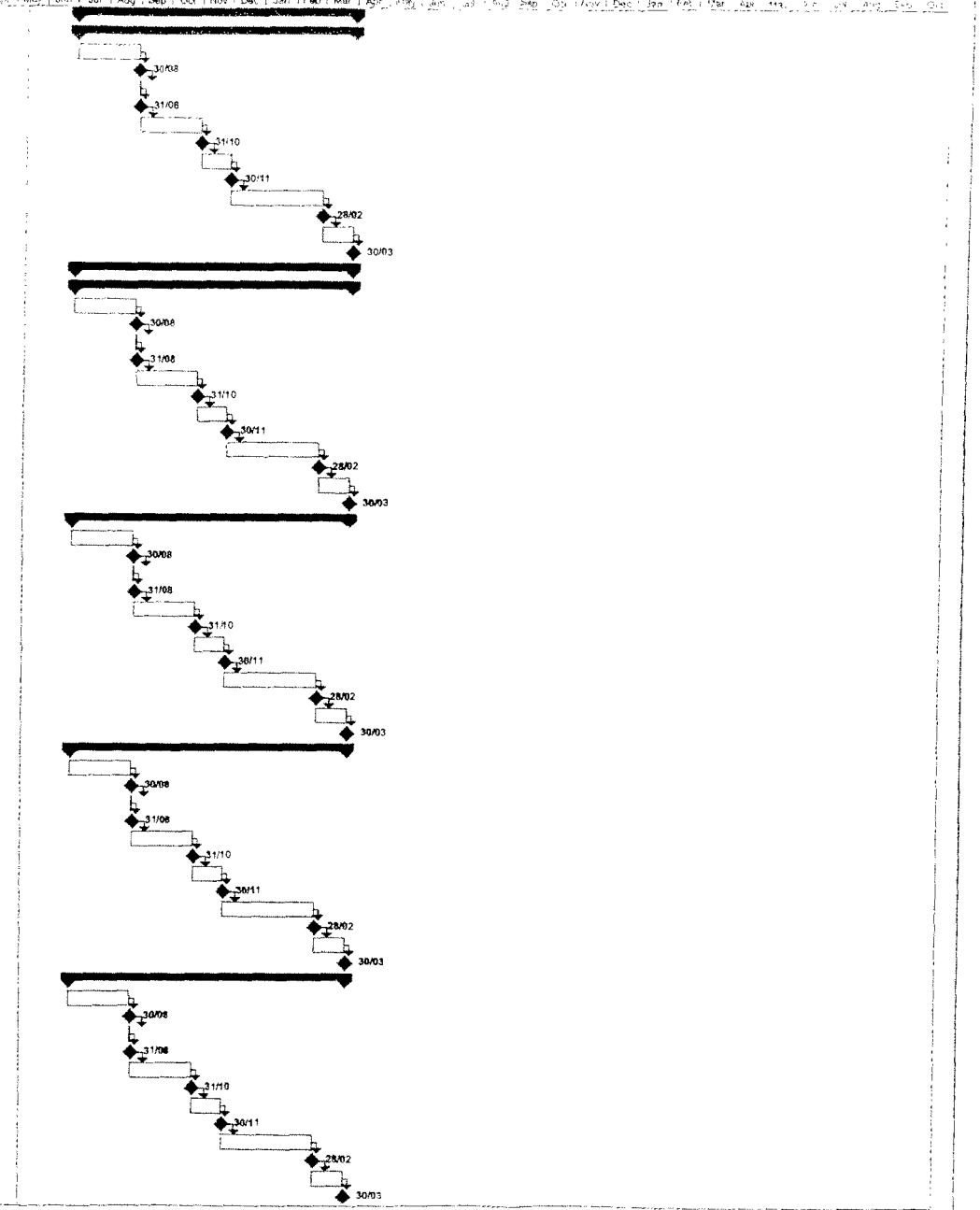
ID	Task Name	WBS	Duration	Start	Finish	Work
206	2.5.1.1.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
207	2.5.1.4 Granton Waterfront (exc) - Granton Square (Incl	200.6.1	363 days	Mon 03/10/05	Thu 30/11/06	8,175 hrs
208	2.5.1.4.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
209	2.5.1.4.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
210	2.5.1.4.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
211	2.5.1.4.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
212	2.5.1.4.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
213	2.5.1.4.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
214	2.5.1.4.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
215	2.5.1.4.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
216	2.5.1.4.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
217	2.5.1.4.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
218	2.5.1.4.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
219	2.5.1.4.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
220	**2.5.2 Granton Square (exc) - Ocean Terminal (Inc)**	**200.6.2**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**32,700 hrs**
221	**2.5.2.1 Sea Wall Survey**	**200.6.2**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**8,175 hrs**
222	2.5.2.1.1 Requirements Definition	200.6.2	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
223	2.5.2.1.2 Submit RD Deliverables for Approval	200.6.2	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
224	2.5.2.1.3 RD Approvals Period	200.6.2	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
225	2.5.2.1.4 Receive Requirements Definition Approval	200.6.2	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
226	2.5.2.1.5 Preliminary Design	200.6.2	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
227	2.5.2.1.6 Submit PD Deliverables for Approval	200.6.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
228	2.5.2.1.7 PD Approvals Period	200.6.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
229	2.5.2.1.8 Receive Preliminary Design Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
230	2.5.2.1.9 Detailed Design	200.6.2	302 days	Thu 01/12/05	Mon 29/01/07	4,987.5 hrs
231	2.5.2.1.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
232	2.5.2.1.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
233	2.5.2.1.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
234	**2.5.2.2 Granton Square (exc) - Lower Granton Road (Inc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
235	2.5.2.2.1 Requirement Definition	200.6.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
236	2.5.2.2.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
237	2.5.2.2.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
238	2.5.2.2.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
239	2.5.2.2.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
240	2.5.2.2.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
241	2.5.2.2.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
242	2.5.2.2.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
243	2.5.2.2.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
244	2.5.2.2.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
245	2.5.2.2.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
246	2.5.2.2.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
247	**2.5.2.3 Lower Granton Road (exc) - Newhaven Road (Inc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
248	2.5.2.3.1 Requirements Definition	200.6.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
249	2.5.2.3.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
250	2.5.2.3.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
251	2.5.2.3.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
252	2.5.2.3.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
253	2.5.2.3.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
254	2.5.2.3.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
255	2.5.2.3.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
256	2.5.2.3.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
257	2.5.2.3.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
258	2.5.2.3.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
259	2.5.2.3.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
260	**2.5.2.4 Newhaven Road (exc) - Ocean Terminal (exc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
261	2.5.2.4.1 Requirements Definition	200.6.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
262	2.5.2.4.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
263	2.5.2.4.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
264	2.5.2.4.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
265	2.5.2.4.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
266	2.5.2.4.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
267	2.5.2.4.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
268	2.5.2.4.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
269	2.5.2.4.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
270	2.5.2.4.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
271	2.5.2.4.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
272	2.5.2.4.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
273	**2.6 EDINBURGH TRAM SDS PROVIDER**	**200**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**40,875 hrs**



Task · Progress · Summary · External Tasks · External Milestone
Split · Milestone · Project Summary · External Milestone · Deadline

Edinburgh Tram Network - Line One - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
274	**2.6.1 DEPOT HAYMARKET**	200.3	193 days	Fri 01/07/05	Thu 30/03/06	6,175 hrs
275	**2.6.1.1 Murrayfield (inc) - Haymarket (incl**	200.3.6	193 days	Fri 01/07/05	Thu 30/03/06	6,175 hrs
276	2.6.1.1.1 Requirements Definition	200.3.6	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
277	2.6.1.1.2 Submit RD Deliverables for Approval	200.3.6	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
278	2.6.1.1.3 RD Approvals Period	200.3.6	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
279	2.6.1.1.4 Receive Requirements Definition Approval	200.3.6	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
280	2.6.1.1.5 Preliminary Design	200.3.6	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
281	2.6.1.1.6 Submit PD Deliverables for Approval	200.3.6	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
282	2.6.1.1.7 PD Approvals Period	200.3.6	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
283	2.6.1.1.8 Receive Preliminary Design Approval	200.3.6	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
284	2.6.1.1.9 Detailed Design	200.3.6	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
285	2.6.1.1.10 Submit DD Deliverables for Approval	200.3.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
286	2.6.1.1.11 DD Approvals Period	200.3.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
287	2.6.1.1.12 Receive Detailed Design Approval	200.3.6	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
288	**2.6.2 HAYMARKET St Andrews Square**	**200.4**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**32,700 hrs**
289	**2.6.2.1 Haymarket (exc) - Shandwick Place (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**6,175 hrs**
290	2.6.2.1.1 Requirements Definition	200.3.6	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
291	2.6.2.1.2 Submit RD Deliverables for Approval	200.3.6	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
292	2.6.2.1.3 RD Approvals Period	200.3.6	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
293	2.6.2.1.4 Receive Requirements Definition Approval	200.3.6	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
294	2.6.2.1.5 Preliminary Design	200.3.6	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
295	2.6.2.1.6 Submit PD Deliverables for Approval	200.3.6	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
296	2.6.2.1.7 PD Approvals Period	200.3.6	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
297	2.6.2.1.8 Receive Preliminary Design Approval	200.3.6	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
298	2.6.2.1.9 Detailed Design	200.3.6	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
299	2.6.2.1.10 Submit DD Deliverables for Approval	200.3.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
300	2.6.2.1.11 DD Approvals Period	200.3.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
301	2.6.2.1.12 Receive Detailed Design Approval	200.3.6	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
302	**2.6.2.2 Shandwick Place (exc) - Princes Street West (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**6,175 hrs**
303	2.6.2.2.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
304	2.6.2.2.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
305	2.6.2.2.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
306	2.6.2.2.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
307	2.6.2.2.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
308	2.6.2.2.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
309	2.6.2.2.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
310	2.6.2.2.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
311	2.6.2.2.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
312	2.6.2.2.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
313	2.6.2.2.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
314	2.6.2.2.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
315	**2.6.2.3 Princes Street West (exc) - Waverley Bridge (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**6,175 hrs**
316	2.6.2.3.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
317	2.6.2.3.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
318	2.6.2.3.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
319	2.6.2.3.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
320	2.6.2.3.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
321	2.6.2.3.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
322	2.6.2.3.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
323	2.6.2.3.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
324	2.6.2.3.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
325	2.6.2.3.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
326	2.6.2.3.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
327	2.6.2.3.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
328	**2.6.2.4 Waverley Bridge (exc) - St. Andrew Square (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**6,175 hrs**
329	2.6.2.4.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
330	2.6.2.4.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
331	2.6.2.4.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
332	2.6.2.4.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
333	2.6.2.4.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
334	2.6.2.4.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
335	2.6.2.4.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
336	2.6.2.4.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
337	2.6.2.4.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
338	2.6.2.4.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
339	2.6.2.4.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
340	2.6.2.4.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Thu 12/05/05 10:00

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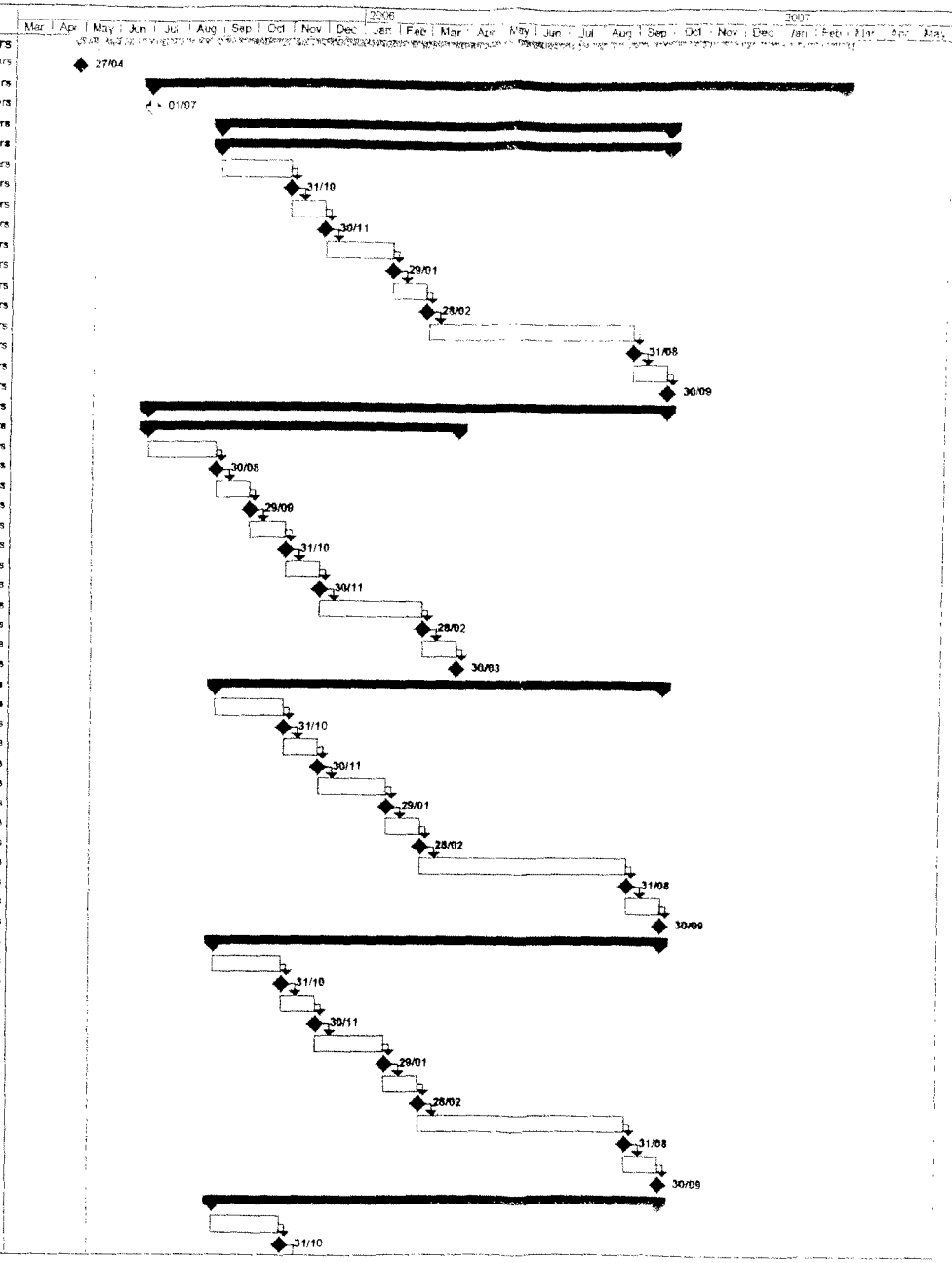
Edinburgh Tram Network - Line Two - System Design Services - Outline Design Programme

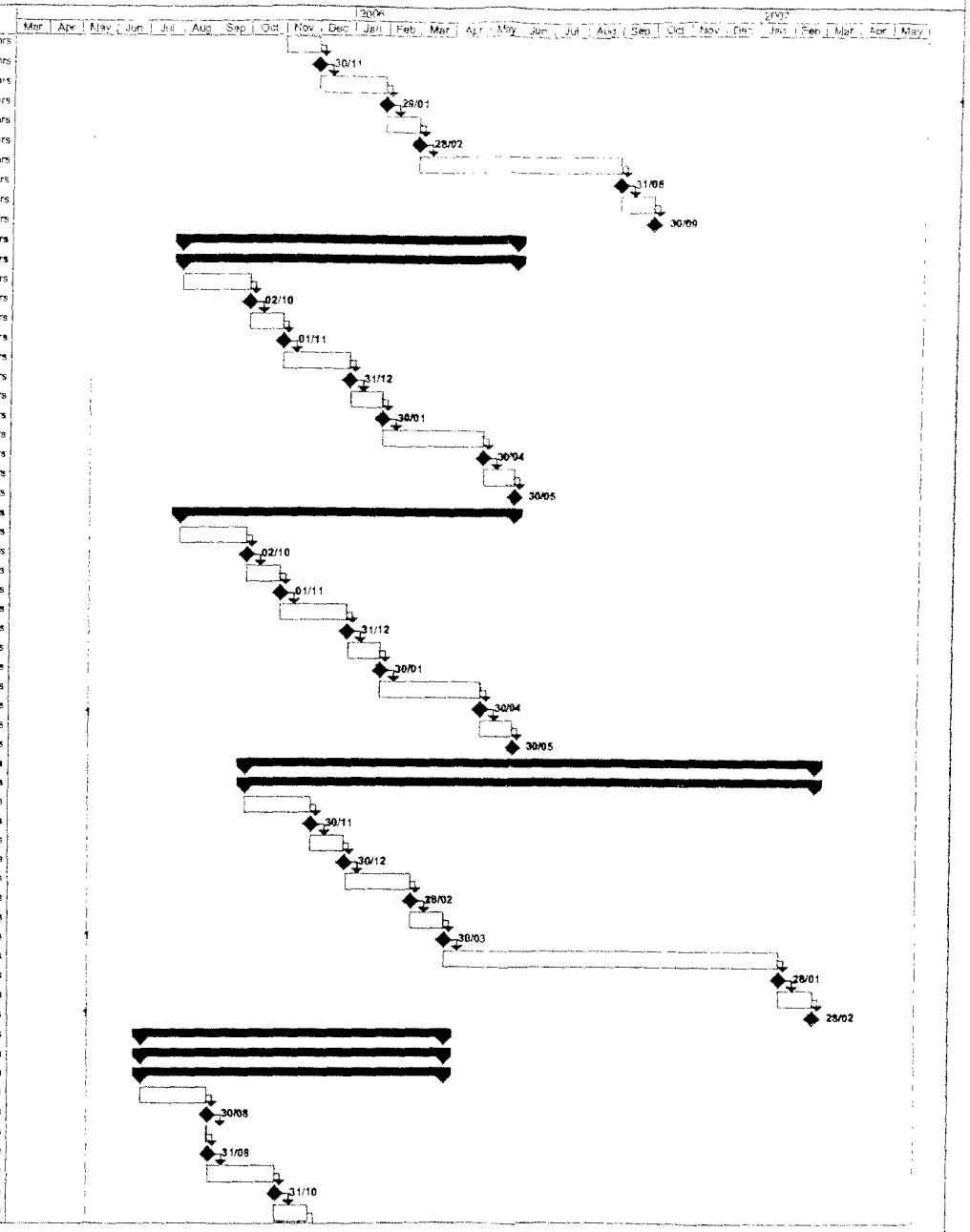
ID	Task Name	WBS	Duration	Start	Finish	Work
0	**Edinburgh Tram Network - Line Two - System Design Services - Outline Desig**	**0**	**477 days**	**Wed 27/04/05**	**Wed 28/02/07**	**106,275 hrs**
1	1 Project Management	100	0 days	Wed 27/04/05	Wed 27/04/05	0 hrs
4	**2 EDINBURGH TRAM SDS PROVIDER**	**200**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**85,400 hrs**
5	2.1 CONTRACT AWARD / START DATE	200.1	0 days	Fri 01/07/05	Fri 01/07/05	0 hrs
6	**2.2 AIRPORT GOGARBURN**	**200.2**	**281 days**	**Thu 01/09/05**	**Sat 30/09/06**	**5,175 hrs**
7	**2.2.1 Airport - Gogarburn (Inc)**	**200.2.1**	**281 days**	**Thu 01/09/05**	**Sat 30/09/06**	**5,175 hrs**
8	2.2.1.1 Requirements Definition	200.2.1	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
9	2.2.1.2 Submit RD Deliverables for Approval	200.2.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
10	2.2.1.3 RD Approvals Period	200.2.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
11	2.2.1.4 Receive Requirements Definition Approval	200.2.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
12	2.2.1.5 Preliminary Design	200.2.1	40 days	Fri 02/12/05	Sun 29/01/06	1,575 hrs
13	2.2.1.6 Submit PD Deliverables for Approval	200.2.1	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
14	2.2.1.7 PD Approvals Period	200.2.1	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
15	2.2.1.8 Receive Preliminary Design Approval	200.2.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
16	2.2.1.9 Detailed Design	200.2.1	130 days	Fri 03/03/06	Thu 31/08/06	4,987.5 hrs
17	2.2.1.10 Submit DD Deliverables for Approval	200.2.1	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
18	2.2.1.11 DD Approvals Period	200.2.1	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
19	2.2.1.12 Receive Detailed Design Approval	200.2.1	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
20	**2.3 DEPOT HAYMARKET**	**200.3**	**324 days**	**Fri 01/07/05**	**Sat 30/09/06**	**32,700 hrs**
21	**2.3.1 Gogarburn (exc) - Gyle & Depot (Inc)**	**200.3.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
22	2.3.1.1 Requirements Definition	200.3.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
23	2.3.1.2 Submit RD Deliverables for Approval	200.3.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
24	2.3.1.3 RD Approvals Period	200.3.1	22 days	Wed 31/08/05	Thu 29/09/05	0 hrs
25	2.3.1.4 Receive Requirements Definition Approval	200.3.1	0 days	Thu 29/09/05	Thu 29/09/05	0 hrs
26	2.3.1.5 Preliminary Design	200.3.1	22 days	Fri 30/09/05	Mon 31/10/05	1,575 hrs
27	2.3.1.6 Submit PD Deliverables for Approval	200.3.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
28	2.3.1.7 PD Approvals Period	200.3.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
29	2.3.1.8 Receive Preliminary Design Approval	200.3.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
30	2.3.1.9 Detailed Design	200.3.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
31	2.3.1.10 Submit DD Deliverables for Approval	200.3.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
32	2.3.1.11 DD Approvals Period	200.3.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
33	2.3.1.12 Receive Detailed Design Approval	200.3.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
34	**2.3.2 Gyle (exc) - Edinburgh Park (inc)**	**200.3.2**	**281 days**	**Thu 01/09/05**	**Sat 30/09/06**	**8,175 hrs**
35	2.3.2.1 Requirements Definition	200.3.2	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
36	2.3.2.2 Submit RD Deliverables for Approval	200.3.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
37	2.3.2.3 RD Approvals Period	200.3.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
38	2.3.2.4 Receive Requirements Definition Approval	200.3.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
39	2.3.2.5 Preliminary Design	200.3.2	40 days	Fri 02/12/05	Sun 29/01/06	1,575 hrs
40	2.3.2.6 Submit PD Deliverables for Approval	200.3.2	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
41	2.3.2.7 PD Approvals Period	200.3.2	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
42	2.3.2.8 Receive Preliminary Design Approval	200.3.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
43	2.3.2.9 Detailed Design	200.3.2	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
44	2.3.2.10 Submit DD Deliverables for Approval	200.3.2	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
45	2.3.2.11 DD Approvals Period	200.3.2	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
46	2.3.2.12 Receive Detailed Design Approval	200.3.2	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
47	**2.3.3 Edinburgh Park (exc) - South Gyle Acess (Inc)**	**200.3.3**	**281 days**	**Thu 01/09/05**	**Sat 30/09/06**	**8,175 hrs**
48	2.3.3.1 Requirements Definition	200.3.3	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
49	2.3.3.2 Submit RD Deliverables for Approval	200.3.3	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
50	2.3.3.3 RD Approvals Period	200.3.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
51	2.3.3.4 Receive Requirements Definition Approval	200.3.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
52	2.3.3.5 Preliminary Design	200.3.3	41 days	Thu 01/12/05	Sun 29/01/06	1,575 hrs
53	2.3.3.6 Submit PD Deliverables for Approval	200.3.3	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
54	2.3.3.7 PD Approvals Period	200.3.3	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
55	2.3.3.8 Receive Preliminary Design Approval	200.3.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
56	2.3.3.9 Detailed Design	200.3.3	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
57	2.3.3.10 Submit DD Deliverables for Approval	200.3.3	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
58	2.3.3.11 DD Approvals Period	200.3.3	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
59	2.3.3.12 Receive Detailed Design Approval	200.3.3	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
60	**2.3.4 South Gyle Access (exc) - Saughton Road North (Inc)**	**200.3.4**	**281 days**	**Thu 01/09/05**	**Sat 30/09/06**	**8,175 hrs**
61	2.3.4.1 Requirements Definition	200.3.4	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
62	2.3.4.2 Submit RD Deliverables for Approval	200.3.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Edinburgh Tram Network - Line Two - System Design Services - Outline Design Programme

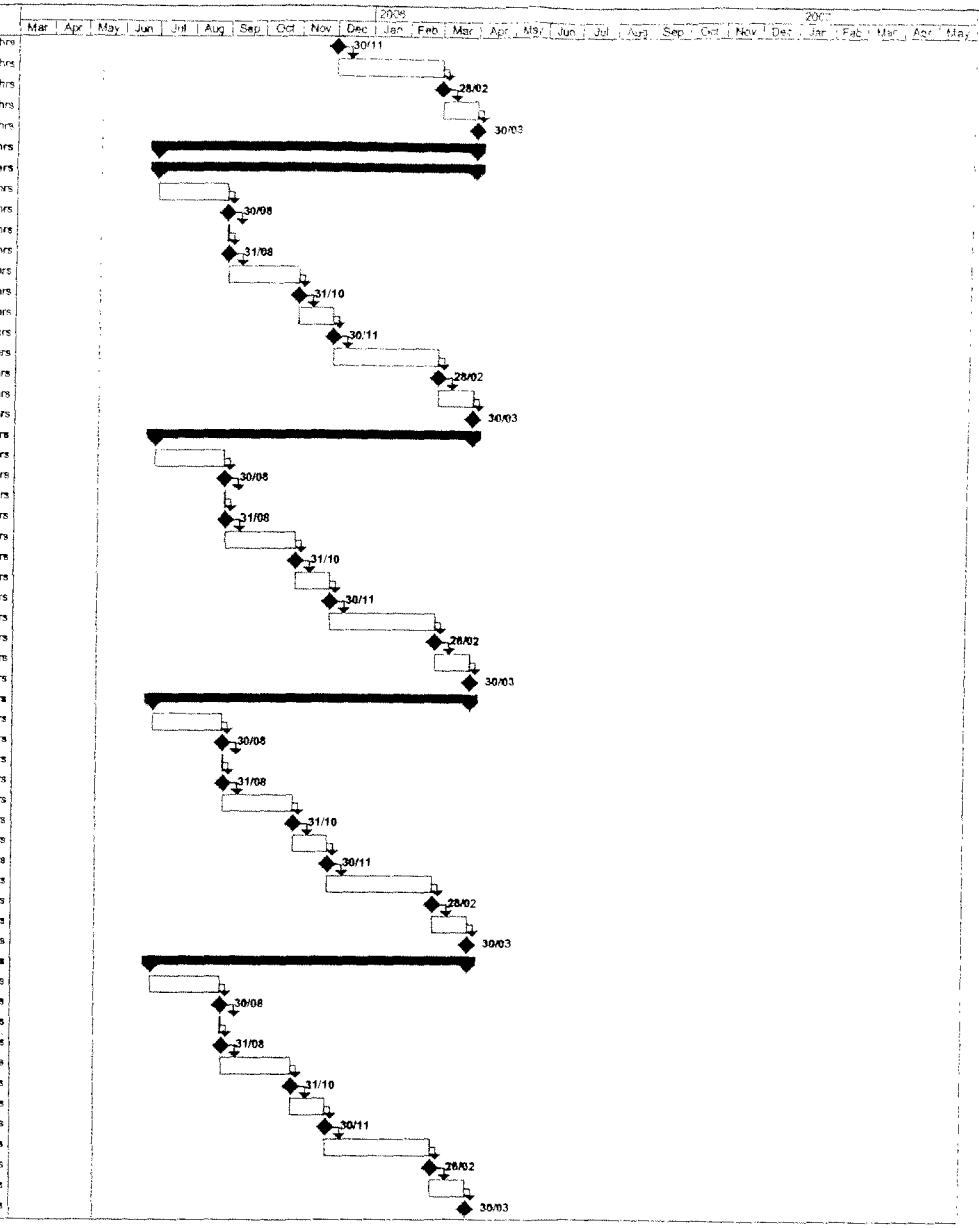
ID	Task Name	WBS	Duration	Start	Finish	Work
63	2.3.4.3 RD Approvals Period	200.3.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
64	2.3.4.4 Receive Requirements Definition Approval	200.3.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
65	2.3.4.5 Preliminary Design	200.3.4	41 days	Thu 01/12/05	Sun 29/01/06	1,575 hrs
66	2.3.4.6 Submit PD Deliverables for Approval	200.3.4	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
67	2.3.4.7 PD Approvals Period	200.3.4	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
68	2.3.4.8 Receive Preliminary Design Approval	200.3.4	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
69	2.3.4.9 Detailed Design	200.3.4	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
70	2.3.4.10 Submit DD Deliverables for Approval	200.3.4	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
71	2.3.4.11 DD Approvals Period	200.3.4	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
72	2.3.4.12 Receive Detailed Design Approval	200.3.4	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
73	**2.4 Saughton Road North (exc) - Murrayfield (exc)**	**200.3.5**	**213 days**	**Wed 03/08/05**	**Tue 30/05/06**	16,350 hrs
74	**2.4.1 Saughton Road North (exc) - Balgreen Road (inc)**	**200.3.5**	**213 days**	**Wed 03/08/05**	**Tue 30/05/06**	8,175 hrs
75	2.4.1.1 Requirements Definition	200.3.5	42 days	Wed 03/08/05	Sun 02/10/05	1,612.5 hrs
76	2.4.1.2 Submit RD Deliverables for Approval	200.3.5	0 days	Sun 02/10/05	Sun 02/10/05	0 hrs
77	2.4.1.3 RD Approvals Period	200.3.5	22 days	Mon 03/10/05	Tue 01/11/05	0 hrs
78	2.4.1.4 Receive Requirements Definition Approval	200.3.5	0 days	Tue 01/11/05	Tue 01/11/05	0 hrs
79	2.4.1.5 Preliminary Design	200.3.5	42 days	Wed 02/11/05	Sat 31/12/05	1,575 hrs
80	2.4.1.6 Submit PD Deliverables for Approval	200.3.5	0 days	Sat 31/12/05	Sat 31/12/05	0 hrs
81	2.4.1.7 PD Approvals Period	200.3.5	21 days	Mon 02/01/06	Mon 30/01/06	0 hrs
82	2.4.1.8 Receive Preliminary Design Approval	200.3.5	0 days	Mon 30/01/06	Mon 30/01/06	0 hrs
83	2.4.1.9 Detailed Design	200.3.5	64 days	Tue 31/01/06	Sun 30/04/06	4,987.5 hrs
84	2.4.1.10 Submit DD Deliverables for Approval	200.3.5	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
85	2.4.1.11 DD Approvals Period	200.3.5	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
86	2.4.1.12 Receive Detailed Design Approval	200.3.5	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
87	**2.4.2 Balgreen Road (exc) - Murrayfield (exc)**	**200.3.5**	**213 days**	**Wed 03/08/05**	**Tue 30/05/06**	8,175 hrs
88	2.4.2.1 Requirements Definition	200.3.5	42 days	Wed 03/08/05	Sun 02/10/05	1,612.5 hrs
89	2.4.2.2 Submit RD Deliverables for Approval	200.3.5	0 days	Sun 02/10/05	Sun 02/10/05	0 hrs
90	2.4.2.3 RD Approvals Period	200.3.5	22 days	Mon 03/10/05	Tue 01/11/05	0 hrs
91	2.4.2.4 Receive Requirements Definition Approval	200.3.5	0 days	Tue 01/11/05	Tue 01/11/05	0 hrs
92	2.4.2.5 Preliminary Design	200.3.5	42 days	Wed 02/11/05	Sat 31/12/05	1,575 hrs
93	2.4.2.6 Submit PD Deliverables for Approval	200.3.5	0 days	Sat 31/12/05	Sat 31/12/05	0 hrs
94	2.4.2.7 PD Approvals Period	200.3.5	21 days	Mon 02/01/06	Mon 30/01/06	0 hrs
95	2.4.2.8 Receive Preliminary Design Approval	200.3.5	0 days	Mon 30/01/06	Mon 30/01/06	0 hrs
96	2.4.2.9 Detailed Design	200.3.5	64 days	Tue 31/01/06	Sun 30/04/06	4,987.5 hrs
97	2.4.2.10 Submit DD Deliverables for Approval	200.3.5	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
98	2.4.2.11 DD Approvals Period	200.3.5	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
99	2.4.2.12 Receive Detailed Design Approval	200.3.5	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
100	**2.5 GOGARBURN - NEWBRIDGE**	**200.7**	**387 days**	**Mon 03/10/05**	**Wed 28/02/07**	8,175 hrs
101	**2.5.1 Gogarburn (exc) - Newbridge (inc)**	**200.7.1**	**387 days**	**Mon 03/10/05**	**Wed 28/02/07**	8,175 hrs
102	2.5.1.1 Requirements Definition	200.7.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
103	2.5.1.2 Submit RD Deliverables for Approval	200.7.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
104	2.5.1.3 RD Approvals Period	200.7.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
105	2.5.1.4 Receive Requirements Definition Approval	200.7.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
106	2.5.1.5 Preliminary Design	200.7.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
107	2.5.1.6 Submit PD Deliverables for Approval	200.7.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
108	2.5.1.7 PD Approvals Period	200.7.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
109	2.5.1.8 Receive Preliminary Design Approval	200.7.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
110	2.5.1.9 Detailed Design	200.7.1	218 days	Fri 31/03/06	Sun 28/01/07	4,987.5 hrs
111	2.5.1.10 Submit DD Deliverables for Approval	200.7.1	0 days	Sun 28/01/07	Sun 28/01/07	0 hrs
112	2.5.1.11 DD Approvals Period	200.7.1	23 days	Mon 29/01/07	Wed 28/02/07	0 hrs
113	2.5.1.12 Receive Detailed Design Approval	200.7.1	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
114	**3 EDINBURGH TRAM SDS PROVIDER**	**200**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	40,875 hrs
115	**3.1 DEPOT HAYMARKET**	**200.3**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	8,175 hrs
116	**3.1.1 Murrayfield (inc) - Haymarket (inc)**	**200.3.6**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	8,175 hrs
117	3.1.1.1 Requirements Definition	200.3.6	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
118	3.1.1.2 Submit RD Deliverables for Approval	200.3.6	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
119	3.1.1.3 RD Approvals Period	200.3.6	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
120	3.1.1.4 Receive Requirements Definition Approval	200.3.6	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
121	3.1.1.5 Preliminary Design	200.3.6	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
122	3.1.1.6 Submit PD Deliverables for Approval	200.3.6	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
123	3.1.1.7 PD Approvals Period	200.3.6	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Edinburgh Tram Network - Line Two - System Design Services - Outline Design Programme

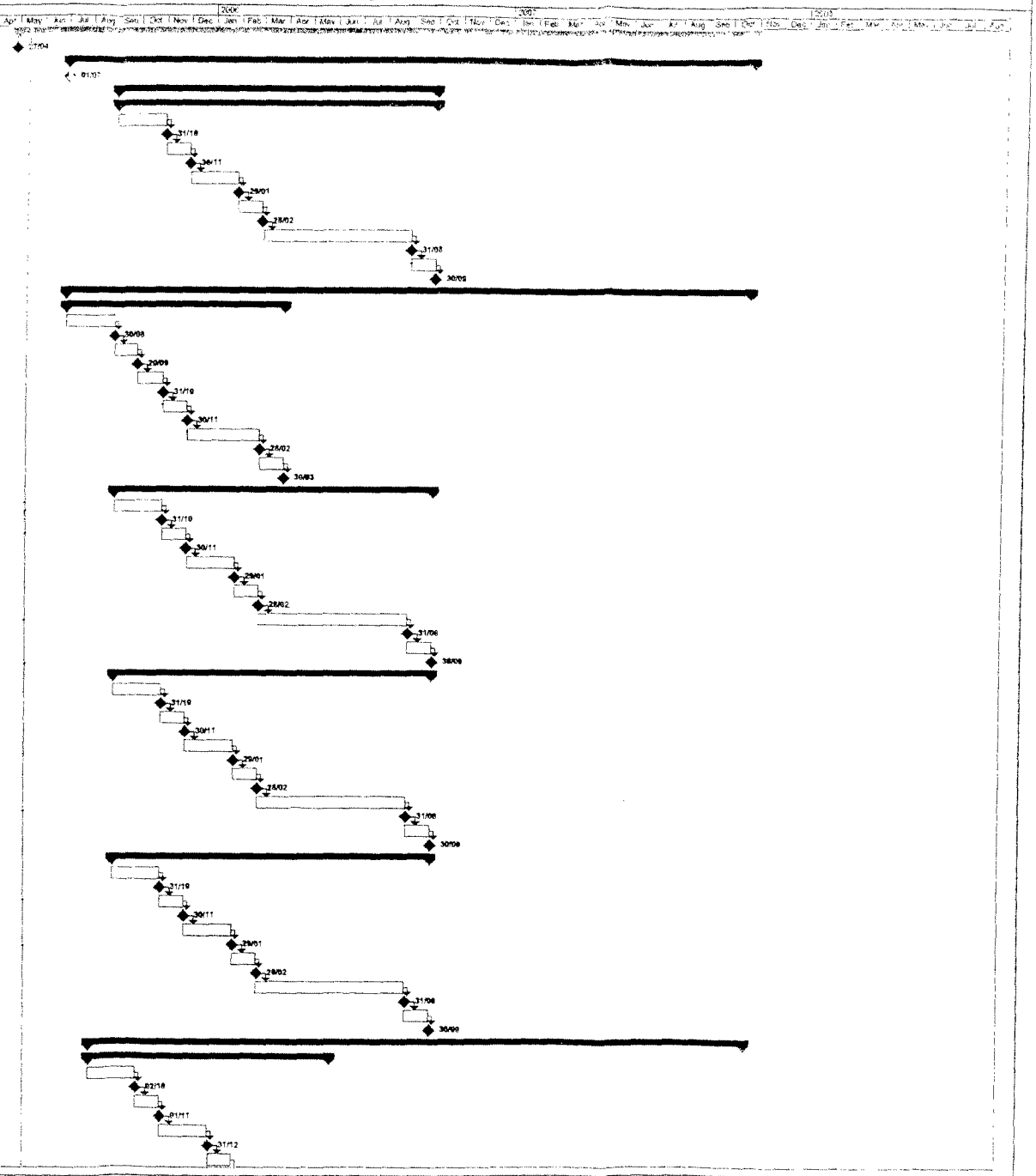
ID	Task Name	WBS	Duration	Start	Finish	Work
124	3.1.1.8 Receive Preliminary Design Approval	200.3.6	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
125	3.1.1.9 Detailed Design	200.3.6	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
126	3.1.1.10 Submit DD Deliverables for Approval	200.3.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
127	3.1.1.11 DD Approvals Period	200.3.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
128	3.1.1.12 Receive Detailed Design Approval	200.3.6	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
129	**3.2 HAYMARKET St Andrews Square**	**200.4**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**32,700 hrs**
130	**3.2.1 Haymarket (exc) - Shandwick Place (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
131	3.2.1.1 Requirements Definition	200.3.6	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
132	3.2.1.2 Submit RD Deliverables for Approval	200.3.6	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
133	3.2.1.3 RD Approvals Period	200.3.6	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
134	3.2.1.4 Receive Requirements Definition Approval	200.3.6	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
135	3.2.1.5 Preliminary Design	200.3.6	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
136	3.2.1.6 Submit PD Deliverables for Approval	200.3.6	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
137	3.2.1.7 PD Approvals Period	200.3.6	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
138	3.2.1.8 Receive Preliminary Design Approval	200.3.6	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
139	3.2.1.9 Detailed Design	200.3.6	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
140	3.2.1.10 Submit DD Deliverables for Approval	200.3.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
141	3.2.1.11 DD Approvals Period	200.3.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
142	3.2.1.12 Receive Detailed Design Approval	200.3.6	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
143	**3.2.2 Shandwick Place (exc) - Princes Street West (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
144	3.2.2.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
145	3.2.2.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
146	3.2.2.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
147	3.2.2.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
148	3.2.2.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
149	3.2.2.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
150	3.2.2.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
151	3.2.2.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
152	3.2.2.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
153	3.2.2.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
154	3.2.2.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
155	3.2.2.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
156	**3.2.3 Princes Street West (exc) - Waverley Bridge (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
157	3.2.3.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
158	3.2.3.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
159	3.2.3.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
160	3.2.3.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
161	3.2.3.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
162	3.2.3.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
163	3.2.3.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
164	3.2.3.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
165	3.2.3.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
166	3.2.3.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
167	3.2.3.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
168	3.2.3.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
169	**3.2.4 Waverley Bridge (exc) - St. Andrew Square (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
170	3.2.4.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
171	3.2.4.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
172	3.2.4.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
173	3.2.4.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
174	3.2.4.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
175	3.2.4.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
176	3.2.4.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
177	3.2.4.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
178	3.2.4.9 Detailed Design	200.4.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
179	3.2.4.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
180	3.2.4.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
181	3.2.4.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs



Task | Progress | Summary | External Tasks | External Milestone
Split | Milestone | Project Summary | External Milestone | Deadline

Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
0	Edinburgh Tram Network - Lines One & Two - System Design Services - Out	0	648 days	Wed 27/04/05	Thu 25/10/07	269,775 hrs
1	Project Management	100	0 days	Wed 27/04/05	Wed 27/04/05	0 hrs
4	2 EDINBURGH TRAM SDS PROVIDER	200	603 days	Fri 01/07/05	Thu 25/10/07	269,775 hrs
5	2.1 CONTRACT AWARD / START DATE	200.1	0 days	Fri 01/07/05	Fri 01/07/05	0 hrs
6	2.2 AIRPORT GOGARBURN	200.2	281 days	Thu 01/09/05	Sat 30/09/06	8,175 hrs
7	2.2.1 Airport - Gogarburn (inc)	200.2.1	281 days	Thu 01/09/05	Sat 30/09/06	8,175 hrs
8	2.2.1.1 Requirements Definition	200.2.1	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
9	2.2.1.2 Submit RD Deliverables for Approval	200.2.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
10	2.2.1.3 RD Approvals Period	200.2.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
11	2.2.1.4 Receive Requirements Definition Approval	200.2.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
12	2.2.1.5 Preliminary Design	200.2.1	40 days	Fri 02/12/05	Sun 29/01/06	1,575 hrs
13	2.2.1.6 Submit PD Deliverables for Approval	200.2.1	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
14	2.2.1.7 PD Approvals Period	200.2.1	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
15	2.2.1.8 Receive Preliminary Design Approval	200.2.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
16	2.2.1.9 Detailed Design	200.2.1	130 days	Fri 03/03/06	Thu 31/08/06	4,987.5 hrs
17	2.2.1.10 Submit DD Deliverables for Approval	200.2.1	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
18	2.2.1.11 DD Approvals Period	200.2.1	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
19	2.2.1.12 Receive Detailed Design Approval	200.2.1	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
20	2.3 DEPOT HAYMARKET	200.3	603 days	Fri 01/07/05	Thu 25/10/07	63,400 hrs
21	2.3.1 Gogarburn (exc) - Gyle & Depot (inc)	200.3.1	183 days	Fri 01/07/05	Thu 30/03/06	8,175 hrs
22	2.3.1.1 Requirements Definition	200.3.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
23	2.3.1.2 Submit RD Deliverables for Approval	200.3.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
24	2.3.1.3 RD Approvals Period	200.3.1	22 days	Wed 31/08/05	Thu 29/09/05	0 hrs
25	2.3.1.4 Receive Requirements Definition Approval	200.3.1	0 days	Thu 29/09/05	Thu 29/09/05	0 hrs
26	2.3.1.5 Preliminary Design	200.3.1	22 days	Fri 30/09/05	Mon 31/10/05	1,575 hrs
27	2.3.1.6 Submit PD Deliverables for Approval	200.3.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
28	2.3.1.7 PD Approvals Period	200.3.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
29	2.3.1.8 Receive Preliminary Design Approval	200.3.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
30	2.3.1.9 Detailed Design	200.3.1	63 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
31	2.3.1.10 Submit DD Deliverables for Approval	200.3.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
32	2.3.1.11 DD Approvals Period	200.3.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
33	2.3.1.12 Receive Detailed Design Approval	200.3.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
34	2.3.2 Gyle (exc) - Edinburgh Park (inc)	200.3.2	281 days	Thu 01/09/05	Sat 30/09/06	8,175 hrs
35	2.3.2.1 Requirements Definition	200.3.2	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
36	2.3.2.2 Submit RD Deliverables for Approval	200.3.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
37	2.3.2.3 RD Approvals Period	200.3.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
38	2.3.2.4 Receive Requirements Definition Approval	200.3.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
39	2.3.2.5 Preliminary Design	200.3.2	40 days	Fri 02/12/05	Sun 29/01/06	1,575 hrs
40	2.3.2.6 Submit PD Deliverables for Approval	200.3.2	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
41	2.3.2.7 PD Approvals Period	200.3.2	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
42	2.3.2.8 Receive Preliminary Design Approval	200.3.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
43	2.3.2.9 Detailed Design	200.3.2	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
44	2.3.2.10 Submit DD Deliverables for Approval	200.3.2	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
45	2.3.2.11 DD Approvals Period	200.3.2	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
46	2.3.2.12 Receive Detailed Design Approval	200.3.2	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
47	2.3.3 Edinburgh Park (exc) - Boath Gyle Access (inc)	200.3.3	281 days	Thu 01/09/05	Sat 30/09/06	8,175 hrs
48	2.3.3.1 Requirements Definition	200.3.3	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
49	2.3.3.2 Submit RD Deliverables for Approval	200.3.3	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
50	2.3.3.3 RD Approvals Period	200.3.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
51	2.3.3.4 Receive Requirements Definition Approval	200.3.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
52	2.3.3.5 Preliminary Design	200.3.3	41 days	Thu 01/12/05	Sun 29/01/06	1,575 hrs
53	2.3.3.6 Submit PD Deliverables for Approval	200.3.3	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
54	2.3.3.7 PD Approvals Period	200.3.3	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
55	2.3.3.8 Receive Preliminary Design Approval	200.3.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
56	2.3.3.9 Detailed Design	200.3.3	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
57	2.3.3.10 Submit DD Deliverables for Approval	200.3.3	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
58	2.3.3.11 DD Approvals Period	200.3.3	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
59	2.3.3.12 Receive Detailed Design Approval	200.3.3	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
60	2.3.4 Boath Gyle Access (exc) - Saughton Road North (inc)	200.3.4	281 days	Thu 01/09/05	Sat 30/09/06	8,175 hrs
61	2.3.4.1 Requirements Definition	200.3.4	43 days	Thu 01/09/05	Mon 31/10/05	1,612.5 hrs
62	2.3.4.2 Submit RD Deliverables for Approval	200.3.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
63	2.3.4.3 RD Approvals Period	200.3.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
64	2.3.4.4 Receive Requirements Definition Approval	200.3.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
65	2.3.4.5 Preliminary Design	200.3.4	41 days	Thu 01/12/05	Sun 29/01/06	1,575 hrs
66	2.3.4.6 Submit PD Deliverables for Approval	200.3.4	0 days	Sun 29/01/06	Sun 29/01/06	0 hrs
67	2.3.4.7 PD Approvals Period	200.3.4	22 days	Mon 30/01/06	Tue 28/02/06	0 hrs
68	2.3.4.8 Receive Preliminary Design Approval	200.3.4	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
69	2.3.4.9 Detailed Design	200.3.4	132 days	Wed 01/03/06	Thu 31/08/06	4,987.5 hrs
70	2.3.4.10 Submit DD Deliverables for Approval	200.3.4	0 days	Thu 31/08/06	Thu 31/08/06	0 hrs
71	2.3.4.11 DD Approvals Period	200.3.4	21 days	Fri 01/09/06	Sat 30/09/06	0 hrs
72	2.3.4.12 Receive Detailed Design Approval	200.3.4	0 days	Sat 30/09/06	Sat 30/09/06	0 hrs
73	2.3.5 Saughton Road North (exc) - Murrayfield (exc)	200.3.5	580 days	Wed 03/08/05	Thu 25/10/07	24,525 hrs
74	2.3.5.1 Saughton Road North (exc) - Balgreen Road (inc)	200.3.5	213 days	Wed 03/08/05	Tue 30/05/06	8,175 hrs
75	2.3.5.1.1 Requirements Definition	200.3.5	42 days	Wed 03/08/05	Sun 02/10/05	1,612.5 hrs
76	2.3.5.1.2 Submit RD Deliverables for Approval	200.3.5	0 days	Sun 02/10/05	Sun 02/10/05	0 hrs
77	2.3.5.1.3 RD Approvals Period	200.3.5	22 days	Mon 03/10/05	Tue 01/11/05	0 hrs
78	2.3.5.1.4 Receive Requirements Definition Approval	200.3.5	0 days	Tue 01/11/05	Tue 01/11/05	0 hrs
79	2.3.5.1.5 Preliminary Design	200.3.5	42 days	Wed 02/11/05	Sat 31/12/05	1,575 hrs
80	2.3.5.1.6 Submit PD Deliverables for Approval	200.3.5	0 days	Sat 31/12/05	Sat 31/12/05	0 hrs
81	2.3.5.1.7 PD Approvals Period	200.3.5	21 days	Mon 02/01/06	Mon 30/01/06	0 hrs



Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | External Milestone | Deadline

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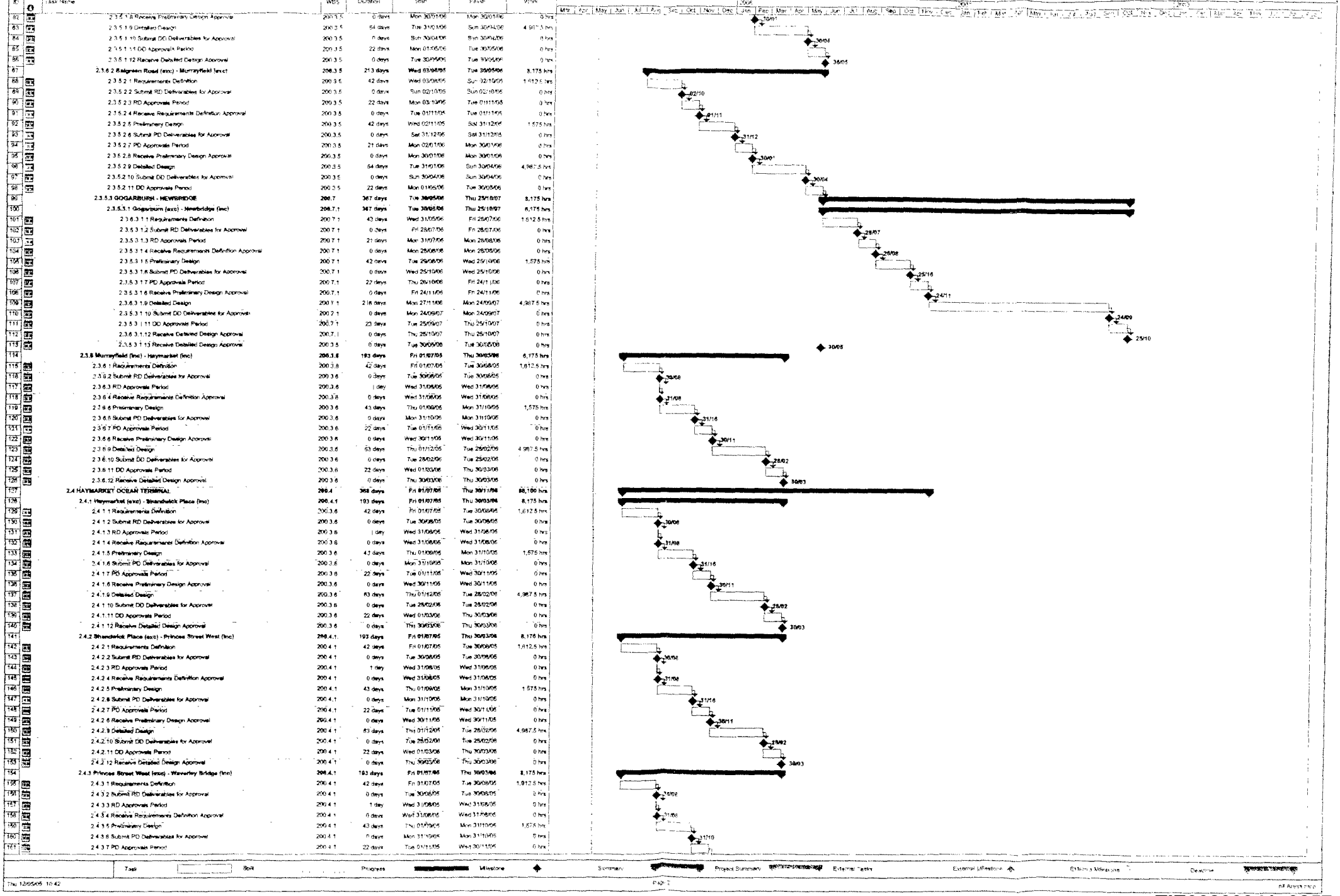
Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme



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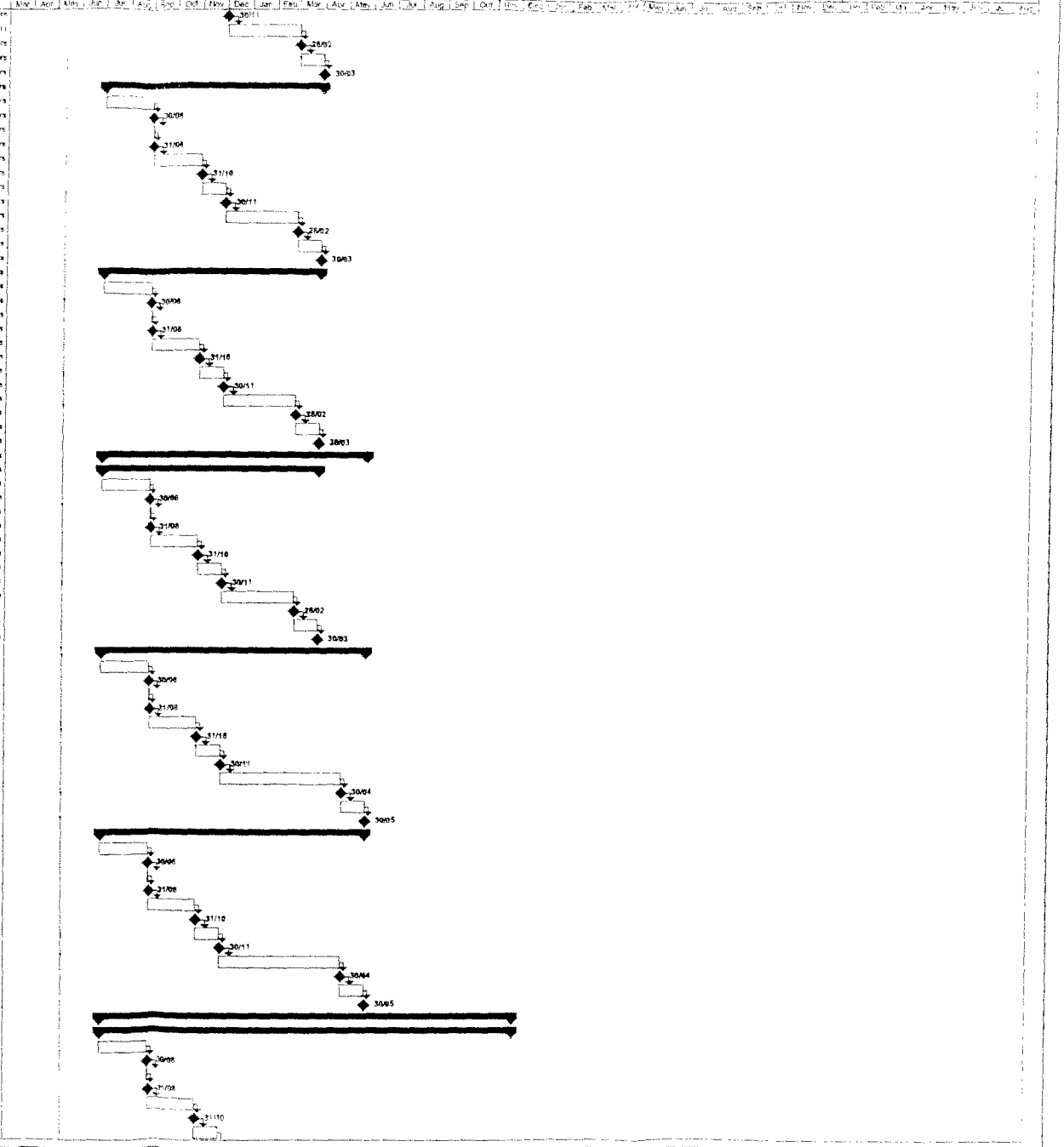
Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
163	2.4.3.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
164	2.4.3.9 Detailed Design	200.4.1	83 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
165	2.4.3.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
166	2.4.3.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
167	2.4.3.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
168	**2.4.4 Waverley Bridge (exc) - St. Andrew Square (inc)**	**200.4.1**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
169	2.4.4.1 Requirements Definition	200.4.1	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
170	2.4.4.2 Submit RD Deliverables for Approval	200.4.1	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
171	2.4.4.3 RD Approvals Period	200.4.1	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
172	2.4.4.4 Receive Requirements Definition Approval	200.4.1	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
173	2.4.4.5 Preliminary Design	200.4.1	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
174	2.4.4.6 Submit PD Deliverables for Approval	200.4.1	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
175	2.4.4.7 PD Approvals Period	200.4.1	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
176	2.4.4.8 Receive Preliminary Design Approval	200.4.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
177	2.4.4.9 Detailed Design	200.4.1	83 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
178	2.4.4.10 Submit DD Deliverables for Approval	200.4.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
179	2.4.4.11 DD Approvals Period	200.4.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
180	2.4.4.12 Receive Detailed Design Approval	200.4.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
181	**2.4.5 St. Andrew Square (exc) - Picardy Place (inc)**	**200.4.2**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
182	2.4.5.1 Requirements Definition	200.4.2	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
183	2.4.5.2 Submit RD Deliverables for Approval	200.4.2	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
184	2.4.5.3 RD Approvals Period	200.4.2	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
185	2.4.5.4 Receive Requirements Definition Approval	200.4.2	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
186	2.4.5.5 Preliminary Design	200.4.2	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
187	2.4.5.6 Submit PD Deliverables for Approval	200.4.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
188	2.4.5.7 PD Approvals Period	200.4.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
189	2.4.5.8 Receive Preliminary Design Approval	200.4.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
190	2.4.5.9 Detailed Design	200.4.2	83 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
191	2.4.5.10 Submit DD Deliverables for Approval	200.4.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
192	2.4.5.11 DD Approvals Period	200.4.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
193	2.4.5.12 Receive Detailed Design Approval	200.4.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
194	**2.4.6 Picardy Place (exc) - Foot of the Walk (inc)**	**200.4.3**	**238 days**	**Fri 01/07/05**	**Tue 30/05/06**	**24,525 hrs**
195	**2.4.6.1 Picardy Place (exc) - Macdonald Road (inc)**	**200.4.3**	**193 days**	**Fri 01/07/05**	**Thu 30/03/06**	**8,175 hrs**
196	2.4.6.1.1 Requirements Definition	200.4.3	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
197	2.4.6.1.2 Submit RD Deliverables for Approval	200.4.3	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
198	2.4.6.1.3 RD Approvals Period	200.4.3	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
199	2.4.6.1.4 Receive Requirements Definition Approval	200.4.3	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
200	2.4.6.1.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
201	2.4.6.1.6 Submit PD Deliverables for Approval	200.4.3	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
202	2.4.6.1.7 PD Approvals Period	200.4.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
203	2.4.6.1.8 Receive Preliminary Design Approval	200.4.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
204	2.4.6.1.9 Detailed Design	200.4.3	83 days	Thu 01/12/05	Tue 28/02/06	4,987.5 hrs
205	2.4.6.1.10 Submit DD Deliverables for Approval	200.4.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
206	2.4.6.1.11 DD Approvals Period	200.4.3	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
207	2.4.6.1.12 Receive Detailed Design Approval	200.4.3	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
208	**2.4.6.2 Macdonald Road (exc) - Balfour Station (inc)**	**200.4.3**	**236 days**	**Fri 01/07/05**	**Tue 30/05/06**	**8,175 hrs**
209	2.4.6.2.1 Requirements Definition	200.4.3	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
210	2.4.6.2.2 Submit RD Deliverables for Approval	200.4.3	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
211	2.4.6.2.3 RD Approvals Period	200.4.3	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
212	2.4.6.2.4 Receive Requirements Definition Approval	200.4.3	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
213	2.4.6.2.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
214	2.4.6.2.6 Submit PD Deliverables for Approval	200.4.3	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
215	2.4.6.2.7 PD Approvals Period	200.4.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
216	2.4.6.2.8 Receive Preliminary Design Approval	200.4.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
217	2.4.6.2.9 Detailed Design	200.4.3	106 days	Thu 01/12/05	Sun 30/04/06	4,987.5 hrs
218	2.4.6.2.10 Submit DD Deliverables for Approval	200.4.3	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
219	2.4.6.2.11 DD Approvals Period	200.4.3	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
220	2.4.6.2.12 Receive Detailed Design Approval	200.4.3	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
221	**2.4.6.3 Balfour Station (exc) - Foot of the Walk (inc)**	**200.4.3**	**236 days**	**Fri 01/07/05**	**Tue 30/05/06**	**8,175 hrs**
222	2.4.6.3.1 Requirements Definition	200.4.3	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
223	2.4.6.3.2 Submit RD Deliverables for Approval	200.4.3	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
224	2.4.6.3.3 RD Approvals Period	200.4.3	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
225	2.4.6.3.4 Receive Requirements Definition Approval	200.4.3	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
226	2.4.6.3.5 Preliminary Design	200.4.3	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
227	2.4.6.3.6 Submit PD Deliverables for Approval	200.4.3	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
228	2.4.6.3.7 PD Approvals Period	200.4.3	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
229	2.4.6.3.8 Receive Preliminary Design Approval	200.4.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
230	2.4.6.3.9 Detailed Design	200.4.3	106 days	Thu 01/12/05	Sun 30/04/06	4,987.5 hrs
231	2.4.6.3.10 Submit DD Deliverables for Approval	200.4.3	0 days	Sun 30/04/06	Sun 30/04/06	0 hrs
232	2.4.6.3.11 DD Approvals Period	200.4.3	22 days	Mon 01/05/06	Tue 30/05/06	0 hrs
233	2.4.6.3.12 Receive Detailed Design Approval	200.4.3	0 days	Tue 30/05/06	Tue 30/05/06	0 hrs
234	**2.4.7 Foot of the Walk (exc) - Ocean Drive (inc)**	**200.4.4**	**366 days**	**Fri 01/07/05**	**Thu 30/11/06**	**16,350 hrs**
235	**2.4.7.1 Foot of the Walk (exc) - Constitution Street (inc)**	**200.4.4**	**366 days**	**Fri 01/07/05**	**Thu 30/11/06**	**8,175 hrs**
236	2.4.7.1.1 Requirements Definition	200.4.4	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
237	2.4.7.1.2 Submit RD Deliverables for Approval	200.4.4	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
238	2.4.7.1.3 RD Approvals Period	200.4.4	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
239	2.4.7.1.4 Receive Requirements Definition Approval	200.4.4	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
240	2.4.7.1.5 Preliminary Design	200.4.4	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
241	2.4.7.1.6 Submit PD Deliverables for Approval	200.4.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
242	2.4.7.1.7 PD Approvals Period	200.4.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs



Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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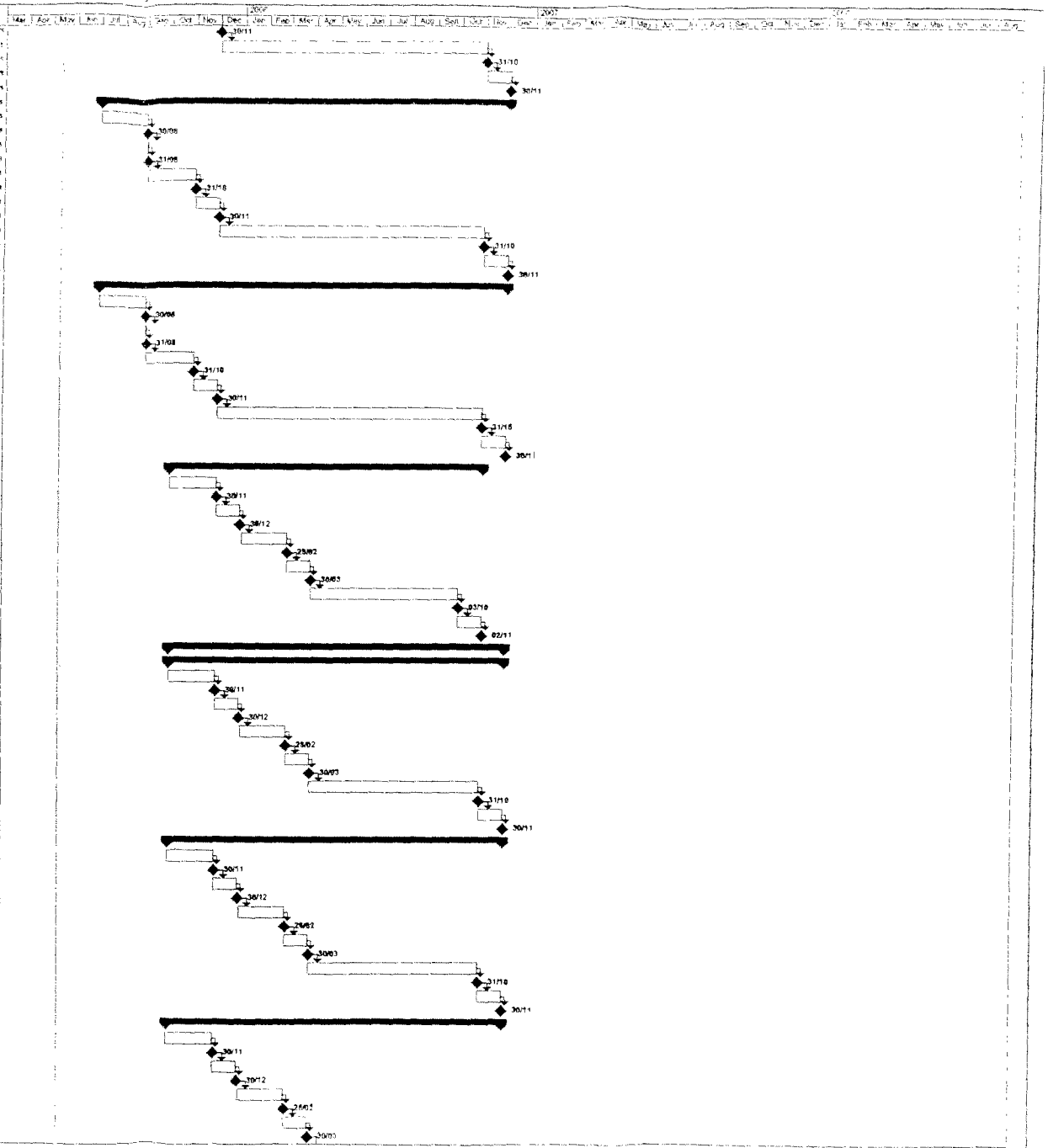
Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
242	2.4.7.1.8 Receive Preliminary Design Approval	200.4.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
243	2.4.7.1.9 Detailed Design	200.4.4	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
244	2.4.7.1.10 Submit DD Deliverables for Approval	200.4.4	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
245	2.4.7.1.11 DD Approvals Period	200.4.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
246	2.4.7.1.12 Receive Detailed Design Approval	200.4.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
247	2.4.7.2 Constitution Street (exc) - Ocean Drive (inc)	200.4.4	368 days	Fri 01/07/05	Thu 30/11/06	8,175 hrs
248	2.4.7.2.1 Requirements Definition	200.4.4	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
249	2.4.7.2.2 Submit RD Deliverables for Approval	200.4.4	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
250	2.4.7.2.3 RD Approvals Period	200.4.4	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
251	2.4.7.2.4 Receive Requirements Definition Approval	200.4.4	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
252	2.4.7.2.5 Preliminary Design	200.4.4	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
253	2.4.7.2.6 Submit PD Deliverables for Approval	200.4.4	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
254	2.4.7.2.7 PD Approvals Period	200.4.4	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
255	2.4.7.2.8 Receive Preliminary Design Approval	200.4.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
256	2.4.7.2.9 Detailed Design	200.4.4	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
257	2.4.7.2.10 Submit DD Deliverables for Approval	200.4.4	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
258	2.4.7.2.11 DD Approvals Period	200.4.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
259	2.4.7.2.12 Receive Detailed Design Approval	200.4.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
260	2.4.8 Ocean Drive (exc) - Ocean Terminal (inc)	200.4.5	368 days	Fri 01/07/05	Thu 30/11/06	8,175 hrs
261	2.4.8.1 Requirements Definition	200.4.5	42 days	Fri 01/07/05	Tue 30/08/05	1,612.5 hrs
262	2.4.8.2 Submit RD Deliverables for Approval	200.4.5	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
263	2.4.8.3 RD Approvals Period	200.4.5	1 day	Wed 31/08/05	Wed 31/08/05	0 hrs
264	2.4.8.4 Receive Requirements Definition Approval	200.4.5	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
265	2.4.8.5 Preliminary Design	200.4.5	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
266	2.4.8.6 Submit PD Deliverables for Approval	200.4.5	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
267	2.4.8.7 PD Approvals Period	200.4.5	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs
268	2.4.8.8 Receive Preliminary Design Approval	200.4.5	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
269	2.4.8.9 Detailed Design	200.4.5	238 days	Thu 01/12/05	Tue 31/10/06	4,987.5 hrs
270	2.4.8.10 Submit DD Deliverables for Approval	200.4.5	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
271	2.4.8.11 DD Approvals Period	200.4.5	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
272	2.4.8.12 Receive Detailed Design Approval	200.4.5	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
273	2.4.9 Leith Depot & Connections	200.4.6	383 days	Mon 03/10/05	Thu 02/11/06	8,175 hrs
274	2.4.9.1 Requirements Definition	200.4.6	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
275	2.4.9.2 Submit RD Deliverables for Approval	200.4.6	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
276	2.4.9.3 RD Approvals Period	200.4.6	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
277	2.4.9.4 Receive Requirements Definition Approval	200.4.6	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
278	2.4.9.5 Preliminary Design	200.4.6	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
279	2.4.9.6 Submit PD Deliverables for Approval	200.4.6	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
280	2.4.9.7 PD Approvals Period	200.4.6	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
281	2.4.9.8 Receive Preliminary Design Approval	200.4.6	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
282	2.4.9.9 Detailed Design	200.4.6	133 days	Fri 31/03/06	Tue 03/10/06	4,987.5 hrs
283	2.4.9.10 Submit DD Deliverables for Approval	200.4.6	0 days	Tue 03/10/06	Tue 03/10/06	0 hrs
284	2.4.9.11 DD Approvals Period	200.4.6	22 days	Wed 04/10/06	Thu 02/11/06	0 hrs
285	2.4.9.12 Receive Detailed Design Approval	200.4.6	0 days	Thu 02/11/06	Thu 02/11/06	0 hrs
286	2.5 HAYMARKET CREWE TOLL	200.5	383 days	Mon 03/10/05	Thu 30/11/06	32,700 hrs
287	2.5.1 Roseburn Junction (exc) - Roseburn (inc)	200.5.1	383 days	Mon 03/10/05	Thu 30/11/06	8,175 hrs
288	2.5.1.1 Requirements Definition	200.5.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
289	2.5.1.2 Submit RD Deliverables for Approval	200.5.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
290	2.5.1.3 RD Approvals Period	200.5.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
291	2.5.1.4 Receive Requirements Definition Approval	200.5.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
292	2.5.1.5 Preliminary Design	200.5.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
293	2.5.1.6 Submit PD Deliverables for Approval	200.5.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
294	2.5.1.7 PD Approvals Period	200.5.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
295	2.5.1.8 Receive Preliminary Design Approval	200.5.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
296	2.5.1.9 Detailed Design	200.5.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
297	2.5.1.10 Submit DD Deliverables for Approval	200.5.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
298	2.5.1.11 DD Approvals Period	200.5.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
299	2.5.1.12 Receive Detailed Design Approval	200.5.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
300	2.5.2 Roseburn (exc) - Ravelston Dykes (inc)	200.5.2	383 days	Mon 03/10/05	Thu 30/11/06	8,175 hrs
301	2.5.2.1 Requirements Definition	200.5.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
302	2.5.2.2 Submit RD Deliverables for Approval	200.5.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
303	2.5.2.3 RD Approvals Period	200.5.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
304	2.5.2.4 Receive Requirements Definition Approval	200.5.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
305	2.5.2.5 Preliminary Design	200.5.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
306	2.5.2.6 Submit PD Deliverables for Approval	200.5.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
307	2.5.2.7 PD Approvals Period	200.5.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
308	2.5.2.8 Receive Preliminary Design Approval	200.5.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
309	2.5.2.9 Detailed Design	200.5.2	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
310	2.5.2.10 Submit DD Deliverables for Approval	200.5.2	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
311	2.5.2.11 DD Approvals Period	200.5.2	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
312	2.5.2.12 Receive Detailed Design Approval	200.5.2	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
313	2.5.3 Ravelston Dykes (exc) - Craigleith (inc)	200.5.3	383 days	Mon 03/10/05	Thu 30/11/06	8,175 hrs
314	2.5.3.1 Requirements Definition	200.5.3	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
315	2.5.3.2 Submit RD Deliverables for Approval	200.5.3	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
316	2.5.3.3 RD Approvals Period	200.5.3	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
317	2.5.3.4 Receive Requirements Definition Approval	200.5.3	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
318	2.5.3.5 Preliminary Design	200.5.3	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
319	2.5.3.6 Submit PD Deliverables for Approval	200.5.3	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
320	2.5.3.7 PD Approvals Period	200.5.3	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
321	2.5.3.8 Receive Preliminary Design Approval	200.5.3	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs



Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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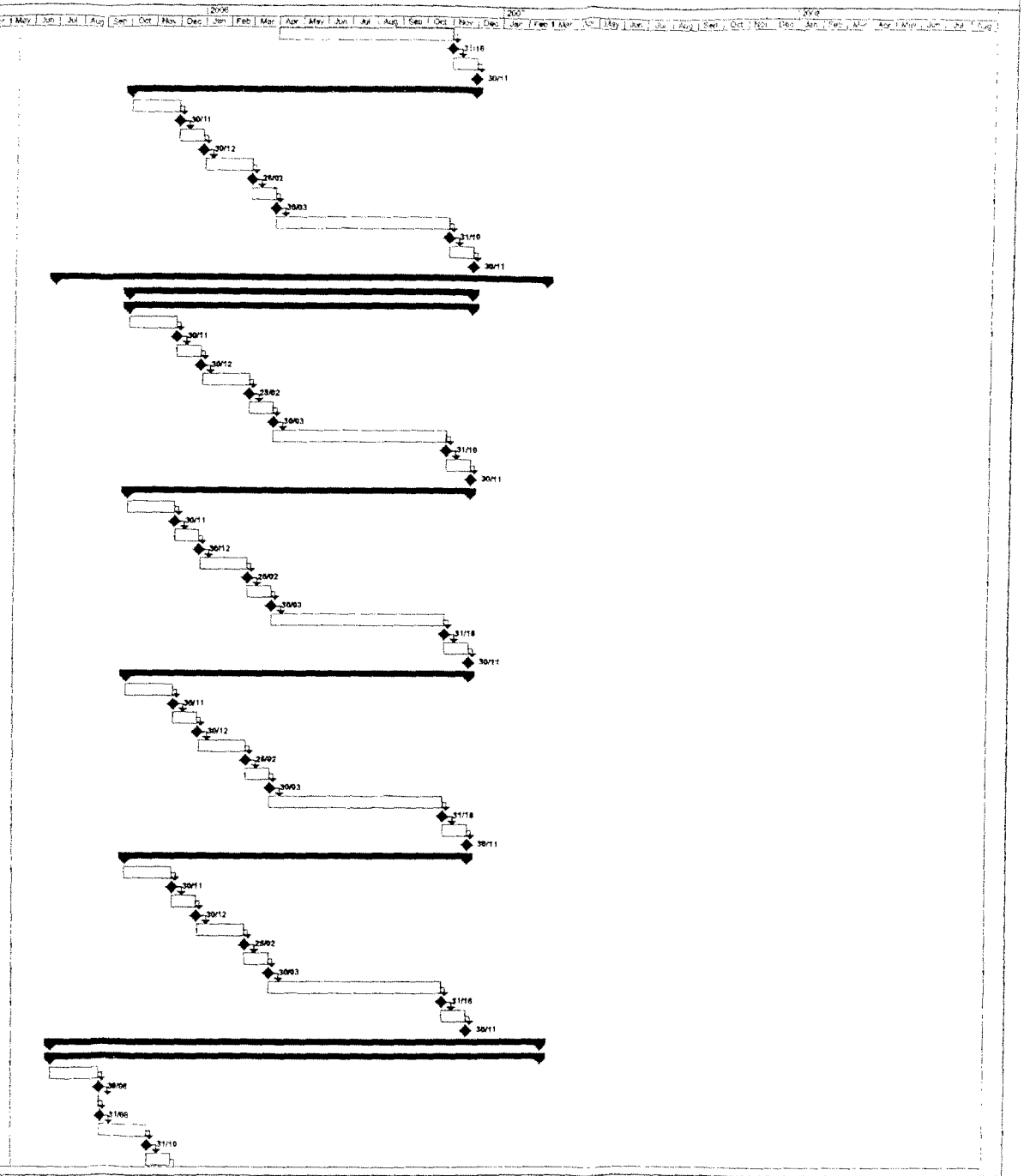
Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
322	2.5.3.9 Detailed Design	200.5.3	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
323	2.5.3.10 Submit DD Deliverables for Approval	200.5.3	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
324	2.5.3.11 DD Approvals Period	200.5.3	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
325	2.5.3.12 Receive Detailed Design Approval	200.5.3	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
326	**2.5.4 Craigleith (exc) - W. General Hospital - Crewe Toll (inc)**	**200.5.4**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
327	2.5.4.1 Requirements Definition	200.5.4	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
328	2.5.4.2 Submit RD Deliverables for Approval	200.5.4	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
329	2.5.4.3 RD Approvals Period	200.5.4	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
330	2.5.4.4 Receive Requirements Definition Approval	200.5.4	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
331	2.5.4.5 Preliminary Design	200.5.4	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
332	2.5.4.6 Submit PD Deliverables for Approval	200.5.4	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
333	2.5.4.7 PD Approvals Period	200.5.4	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
334	2.5.4.8 Receive Preliminary Design Approval	200.5.4	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
335	2.5.4.9 Detailed Design	200.5.4	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
336	2.5.4.10 Submit DD Deliverables for Approval	200.5.4	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
337	2.5.4.11 DD Approvals Period	200.5.4	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
338	2.5.4.12 Receive Detailed Design Approval	200.5.4	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
339	**2.6 CREWE TOLL OCEAN TERMINAL**	**200.6**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**65,400 hrs**
340	**2.6.1 Crewe Toll (exc) - Granton Square (inc)**	**200.6.1**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**32,700 hrs**
341	**2.6.1.1 Crewe Toll (exc) - W. Granton (inc)**	**200.6.1**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
342	2.6.1.1.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
343	2.6.1.1.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
344	2.6.1.1.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
345	2.6.1.1.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
346	2.6.1.1.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
347	2.6.1.1.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
348	2.6.1.1.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
349	2.6.1.1.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
350	2.6.1.1.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
351	2.6.1.1.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
352	2.6.1.1.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
353	2.6.1.1.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
354	**2.6.1.2 W. Granton (exc) - Carolina Park (inc)**	**200.6.1**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
355	2.6.1.2.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
356	2.6.1.2.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
357	2.6.1.2.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
358	2.6.1.2.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
359	2.6.1.2.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
360	2.6.1.2.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
361	2.6.1.2.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
362	2.6.1.2.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
363	2.6.1.2.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
364	2.6.1.2.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
365	2.6.1.2.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
366	2.6.1.2.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
367	**2.6.1.3 Carolina Park (exc) - Granton Waterfront (inc)**	**200.6.1**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
368	2.6.1.3.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
369	2.6.1.3.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
370	2.6.1.3.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
371	2.6.1.3.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
372	2.6.1.3.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
373	2.6.1.3.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
374	2.6.1.3.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
375	2.6.1.3.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
376	2.6.1.3.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
377	2.6.1.3.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
378	2.6.1.3.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
379	2.6.1.3.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
380	**2.6.1.4 Granton Waterfront (exc) - Granton Square (inc)**	**200.6.1**	**383 days**	**Mon 03/10/05**	**Thu 30/11/06**	**8,175 hrs**
381	2.6.1.4.1 Requirements Definition	200.6.1	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
382	2.6.1.4.2 Submit RD Deliverables for Approval	200.6.1	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
383	2.6.1.4.3 RD Approvals Period	200.6.1	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
384	2.6.1.4.4 Receive Requirements Definition Approval	200.6.1	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
385	2.6.1.4.5 Preliminary Design	200.6.1	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
386	2.6.1.4.6 Submit PD Deliverables for Approval	200.6.1	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
387	2.6.1.4.7 PD Approvals Period	200.6.1	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
388	2.6.1.4.8 Receive Preliminary Design Approval	200.6.1	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
389	2.6.1.4.9 Detailed Design	200.6.1	153 days	Fri 31/03/06	Tue 31/10/06	4,987.5 hrs
390	2.6.1.4.10 Submit DD Deliverables for Approval	200.6.1	0 days	Tue 31/10/06	Tue 31/10/06	0 hrs
391	2.6.1.4.11 DD Approvals Period	200.6.1	22 days	Wed 01/11/06	Thu 30/11/06	0 hrs
392	2.6.1.4.12 Receive Detailed Design Approval	200.6.1	0 days	Thu 30/11/06	Thu 30/11/06	0 hrs
393	**2.6.2 Granton Square (exc) - Ocean Terminal (inc)**	**200.6.2**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**32,700 hrs**
394	**2.6.2.1 Sea Wall Survey**	**200.6.2**	**432 days**	**Fri 01/07/05**	**Wed 28/02/07**	**8,175 hrs**
395	2.6.2.1.1 Requirements Definition	200.6.2	42 days	Fri 01/07/05	Thu 30/08/05	1,612.5 hrs
396	2.6.2.1.2 Submit RD Deliverables for Approval	200.6.2	0 days	Tue 30/08/05	Tue 30/08/05	0 hrs
397	2.6.2.1.3 RD Approvals Period	200.6.2	1 day	Wed 31/08/05	Wed 31/08/05	8 hrs
398	2.6.2.1.4 Receive Requirements Definition Approval	200.6.2	0 days	Wed 31/08/05	Wed 31/08/05	0 hrs
399	2.6.2.1.5 Preliminary Design	200.6.2	43 days	Thu 01/09/05	Mon 31/10/05	1,575 hrs
400	2.6.2.1.6 Submit PD Deliverables for Approval	200.6.2	0 days	Mon 31/10/05	Mon 31/10/05	0 hrs
401	2.6.2.1.7 PD Approvals Period	200.6.2	22 days	Tue 01/11/05	Wed 30/11/05	0 hrs



Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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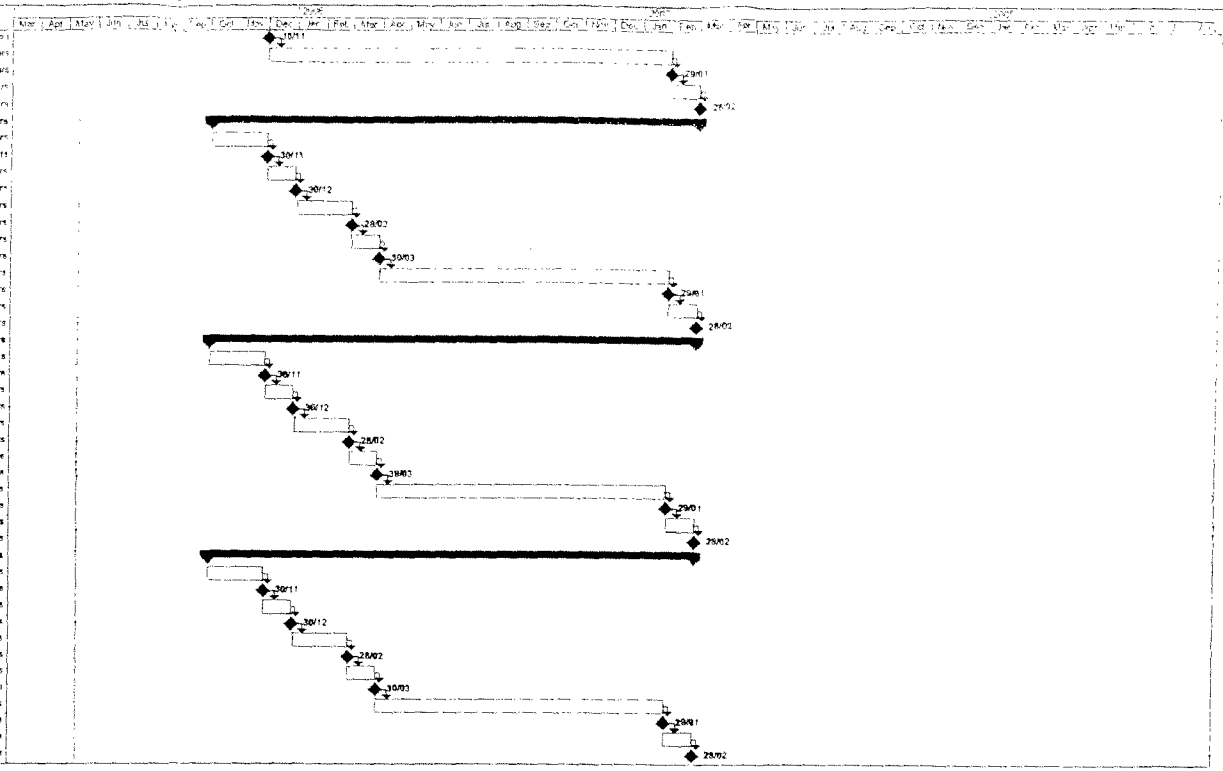
Edinburgh Tram Network - Lines One & Two - System Design Services - Outline Design Programme

ID	Task Name	WBS	Duration	Start	Finish	Work
402	2.6.2.1.8 Receive Preliminary Design Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
403	2.6.2.1.9 Detailed Design	200.6.2	162 days	Thu 01/12/05	Mon 29/01/07	4,987.5 hrs
404	2.6.2.1.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
405	2.6.2.1.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
406	2.6.2.1.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
407	**2.6.2.2 Granton Square (exc) - Lower Granton Road (inc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
408	2.6.2.2.1 Requirements Definition	200.6.2	42 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
409	2.6.2.2.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
410	2.6.2.2.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
411	2.6.2.2.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
412	2.6.2.2.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
413	2.6.2.2.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
414	2.6.2.2.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
415	2.6.2.2.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
416	2.6.2.2.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
417	2.6.2.2.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
418	2.6.2.2.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
419	2.6.2.2.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
420	**2.6.2.3 Lower Granton Road (exc) - Newhaven Road (inc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
421	2.6.2.3.1 Requirements Definition	200.6.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
422	2.6.2.3.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
423	2.6.2.3.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
424	2.6.2.3.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
425	2.6.2.3.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
426	2.6.2.3.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
427	2.6.2.3.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
428	2.6.2.3.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
429	2.6.2.3.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
430	2.6.2.3.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
431	2.6.2.3.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
432	2.6.2.3.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs
433	**2.6.2.4 Newhaven Road (exc) - Ocean Terminal (exc)**	**200.6.2**	**367 days**	**Mon 03/10/05**	**Wed 28/02/07**	**8,175 hrs**
434	2.6.2.4.1 Requirements Definition	200.6.2	43 days	Mon 03/10/05	Wed 30/11/05	1,612.5 hrs
435	2.6.2.4.2 Submit RD Deliverables for Approval	200.6.2	0 days	Wed 30/11/05	Wed 30/11/05	0 hrs
436	2.6.2.4.3 RD Approvals Period	200.6.2	21 days	Thu 01/12/05	Fri 30/12/05	0 hrs
437	2.6.2.4.4 Receive Requirements Definition Approval	200.6.2	0 days	Fri 30/12/05	Fri 30/12/05	0 hrs
438	2.6.2.4.5 Preliminary Design	200.6.2	42 days	Mon 02/01/06	Tue 28/02/06	1,575 hrs
439	2.6.2.4.6 Submit PD Deliverables for Approval	200.6.2	0 days	Tue 28/02/06	Tue 28/02/06	0 hrs
440	2.6.2.4.7 PD Approvals Period	200.6.2	22 days	Wed 01/03/06	Thu 30/03/06	0 hrs
441	2.6.2.4.8 Receive Preliminary Design Approval	200.6.2	0 days	Thu 30/03/06	Thu 30/03/06	0 hrs
442	2.6.2.4.9 Detailed Design	200.6.2	217 days	Fri 31/03/06	Mon 29/01/07	4,987.5 hrs
443	2.6.2.4.10 Submit DD Deliverables for Approval	200.6.2	0 days	Mon 29/01/07	Mon 29/01/07	0 hrs
444	2.6.2.4.11 DD Approvals Period	200.6.2	22 days	Tue 30/01/07	Wed 28/02/07	0 hrs
445	2.6.2.4.12 Receive Detailed Design Approval	200.6.2	0 days	Wed 28/02/07	Wed 28/02/07	0 hrs



Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Thu 12/05/05 10:42

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This is Schedule Five referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE FIVE

COMMERCIALLY SENSITIVE INFORMATION

The SDS Provider's bid in relation to the provision of the Services, sent under cover of the SDS Provider's formal offer dated 13th May 2005, together with the subsequent correspondence detailed within the definition of "Formal Offer" in this Agreement shall be considered as Commercially Sensitive Information for the purposes of this Agreement.

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Six referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE SIX

REQUIRED INSURANCES

Part 1

Required insurances

1. PROFESSIONAL INDEMNITY INSURANCE

Insured Party:	The SDS Provider
Coverage:	The legal liability of the SDS Provider as a result of any negligent act, error, or omission in the performance of its professional activities and duties in connection with the Services.
Limit of Indemnity:	Minimum £10,000,000 on an each and every claim basis and on an aggregate basis in respect of pollution and contamination claims and date recognition claims. There is no requirement to maintain cover in respect of asbestos or terrorism related claims.
Period of Insurance:	From the Effective Date for 12 months and thereafter each further 12 month period until the earlier of 12 years from the completion by the SDS Provider of the Services and its obligations under this Agreement or 12 years from the Termination Date.
Extensions:	The insurance must include the following minimum extensions: General Indemnity to Principals/Main Contractors Vicarious Liability for Sub-Consultants Worldwide Jurisdiction
Maximum Permitted Deductible:	GBP 25,000 each and every claim.

2. THIRD PARTY LIABILITY INSURANCE

Insured Party:	The SDS Provider
Coverage:	The legal liability of the SDS Provider for death, injury, illness, disease contracted by third party persons or loss of or damage to property arising out of or in connection with the Services.
Limit of Indemnity:	Unlimited as to the number of occurrences in each 12 month period in respect of death or injury to persons. For all other occurrences, a minimum of £5,000,000 any one occurrence (unlimited as to number of occurrences in the Period of Insurance stated below) in respect of third party liability and £5,000,000 any one occurrence and in the aggregate in any one 12 month period of insurance in respect of products liability and in annual aggregate in respect of pollution and contamination claims.

Period of Insurance:	From the Effective Date for 12 months and thereafter each further 12 month period until the earlier of Termination Date or the completion by the SDS Provider of the Services and its obligations under this Agreement.
Minimum Extensions	The insurance must include the following minimum extensions: Contractual Liability Liability for loss or damage to buildings temporarily occupied Cross Liabilities Clause Includes Liability for Sub-Contractors Worldwide Jurisdiction Includes Minimum Network Rail and/or BAA Insurance Requirements
Maximum Permitted Deductible:	GBP 500 each and every loss in respect of property damage claims, nil excess for bodily injury claims.

3. EMPLOYERS LIABILITY INSURANCE

Insured Party:	The SDS Provider
Coverage:	The legal liability of the SDS Provider for death, injury, illness, disease contracted by employees of the SDS Provider caused by or arising out of or in connection with the Services.
Limit of Liability	Minimum limit of indemnity of £10,000,000 any one occurrence or series of occurrences arising from one original cause or event.
Period of Insurance:	From the Effective Date for 12 months and thereafter each further twelve month period until the earlier of the completion by the SDS Provider of the Services and its obligations under this Agreement or the Termination Date.
Extensions	The insurance must include the following minimum extensions: Contractual Liability Cross Liabilities Clause General Indemnity to Principals/Main Contractors Worldwide Jurisdiction
Maximum Permitted Deductible:	GBP 500 any one claim/occurrence

Part 2

Form of Brokers Letter of Undertaking

To: [THE CLIENT]

Dear Sirs

We confirm in our capacity as insurance brokers that the Required Insurances specified in Clause 17 (*Required Insurances*) and Schedule 6 *(Required Insurances)* of the Agreement dated ◆ between Parsons Brinckerhoff Limited (the "SDS Provider") and the Client as defined therein are, as at the date hereof, in effect in respect of the risks set out in the attached completed insurance questionnaire ref SLF/LED/310299/1/4515105 dated 7 and 11 April 2005 and clarified on 8 June 2005.

We have arranged the Required Insurances on the basis of the information and instructions given by the SDS Provider. We have not made any particular or special enquiries regarding the Required Insurances beyond those that we would normally make in the ordinary course of arranging the insurances on behalf of our insurance broking clients.

The confirmations set out in this letter are given by reference to our state of knowledge at the date hereof.

Pursuant to instructions received from the SDS Provider, we hereby undertake in respect of the interests of the SDS Provider and the Client in the Required Insurances referred to in the attached completed quetionnaires:

1. to use reasonable endeavours in order that the policy provides full coverage for the Required Insurances when the same is issued, substantially in the form set out in Schedule 6 (*Required Insurances*) of the Agreement;

2. to advise the Client :

   2.1 promptly after receiving notice of any insurer's cancellation or suspension of any of the Required Insurances or receiving notice of the intended cancellation or suspension of any of the Required Insurances;

   2.2 promptly upon our receipt from the SDS Provider of any notice of any changes proposed to be made to the Required Insurances which, if effected, would result in a material reduction in limits or coverage (including in respect of extensions of cover) or in an increase in deductibles, exclusions or exceptions;

   2.3 of any default in the payment of any premium for any of the Required Insurances;

   2.4 at least 14 days prior to the expiry of any of the Required Insurances if we have not received written renewal instructions from the SDS Provider or if we receive written instructions to renew, to advise the Client of the details thereof; and

   2.5 on receipt of notice of any act or omission of the SDS Provider or any SDS Provider Party which will invalidate or render unenforceable in whole or in part, any of the Required Insurances;

3. no later than 14 days (in respect of certificates) and as soon as reasonably practicable in respect of policies, to supply you copies of certificates and confirmations of renewal and all policy documents (or confirmation of the terms of such policy documents where such policy documents cannot be made available) in respect of the Required Insurances;

4. to disclose to the Client any fact, change of circumstance or occurrence is material to the risks insured against under the Required Insurances;

5. to treat as confidential all information in relation to the Required Insurances supplied to us by the SDS Provider or any SDS Provider Party or the Client and not to disclose, without the written consent of the Client, such information to any third party other than the insurers under the Required Insurances, unless required to do so by law or any regulatory authority; and

6. to notify the Client as soon as reasonably practicable prior to our ceasing to act as brokers to the SDS Provider, unless impracticable because of circumstances beyond our control, in which case we shall notify the Client as soon as reasonably practicable upon becoming aware that we shall cease, or have ceased, so to act.

Where insurers wish any of the Required Insurances to be cancelled for reasons of non-payment of premium, we will request those insurers to give you a reasonable opportunity of paying such amounts outstanding before issuing notice of cancellation on behalf of such insurers.

The above undertakings are given subject to our continuing appointment for the time being as insurance brokers to the SDS Provider in relation to the Required Insurances concerned and the monitoring and handling of claims in relation to the SDS Provider, and our obligations set out in this letter shall automatically cease upon termination of our appointment.

For the avoidance of doubt all undertakings and other confirmations given in this letter relate solely to the Required Insurances. They do not apply to any other insurances and nothing in this letter should be taken as providing any undertakings or confirmations in relation to any other such insurance that ought to have been placed or may at some future date be placed by other brokers.

This letter is given by us on the instructions of the SDS Provider and with the SDS Provider's full knowledge and consent as to its terms as evidenced by the SDS Provider's signature below for each and every correspondence that may be necessary.

This letter shall be governed by and shall be construed in accordance with Scots Law and any dispute as to its terms shall be submitted to the exclusive jurisdiction of the courts of Scotland.

Yours faithfully

.....

For and on behalf of (Insurance Broker)

.....

For and on behalf of (The SDS Provider)

Part 3

Insurance Questionnaire

1.0	PUBLIC & PRODUCTS LIABILITY	
1.1	Name & Address of Insurers	
1.2	Policy Number(s)	
1.3	Renewal Date	
1.4	Limits of Indemnity in respect of (Please state whether any one occurrence or in the aggregate)	
	a. Public Liability	£
	b. Products Liability	£
	c. Subsidence, Collapse, Vibration or Removal or Weakening of Support	£
	d. Fire & Explosion	£
	e. Pollution	£
	f. Any other "inner" limit	£
1.5	Is the policy subject to a heat warranty or condition of any sort and/or any height or depth restrictions. If so attach copies?	YES/NO
1.6	Is Contractual Liability included?	YES/NO
1.7	Does the policy include liability for damage to premises temporarily occupied for the performance of works therein or thereon?	YES/NO
1.8	Does the policy include a cross liability provision and a General Indemnity to Principals/Main Contractors Clause?	YES/NO
1.9	What limitations apply in respect of cover for loss or damage due to defective design, workmanship or materials?	
1.10	What excess(es) are applicable?	
1.11	Is the policy extended to include financial loss?	YES/NO (If YES state limit £)
1.12	Does the policy:	
	a) include liability for acts of sub-contractors	YES/NO
	b) Respond to judgements made outside the UK	YES/NO
1.13	Is cover subject to any material exclusions or limitations?	YES/NO

	(If YES please supply copies thereof)	
1.14	**Have you ever undertaken or are you currently undertaking work on behalf of Network Rail or British Airports Authority ?** **(if yes please state which or both)**	YES/NO
1.15	**Does your policy extend to include the minimum insurance requirements of either Network Rail or British Airports Authority?** **(if yes please state which or both)**	YES/NO
2.0	**EMPLOYERS LIABILITY**	
2.1	**Name & Address of Insurers**	
2.2	**Policy Number(s)**	
2.3	**Renewal Date**	
2.4	**Limit of Indemnity**	£
2.5	**Is the policy subject to a heat warranty or condition of any sort and/or any height or depth restrictions? If so attach copies.**	YES/NO
2.6	**Is Contractual Liability included?**	YES/NO
2.7	**What is the definition of "employee"?**	
2.8	**Does the policy include a cross liability provision and a General Indemnity to Principals/Main Contractors Clause?**	YES/NO
2.9	**Does the policy respond to judgements made outside UK?**	YES/NO
3.0	**PROFESSIONAL INDEMNITY**	
3.1	**Name & Address of Insurers**	
3.2	**Policy Number(s)**	
3.3	**Renewal Date**	
3.4	**Limit of Indemnity**	i. any one event £ ii. in the aggregate £
3.5	**Scope of professional duties insured as stated in the policy.**	
3.6	**What excess(es) are applicable?**	
3.7	**Is cover included for sub-consultants?**	YES/NO
3.8	**Is cover included for the costs of mitigation of loss**	YES/NO
3.9	**Does the policy include a General Indemnity to Principals/Main Contractors Clause?**	YES/NO
3.10	**Is cover subject to any material**	YES/NO

exclusions or limitations? **(If YES please supply copies thereof)**	
3.11 Does the policy respond to judgements made outside UK	YES/NO

DECLARATION:

We confirm that the foregoing details are accurate and that the above policies are subject to no special terms, conditions and exceptions other than those referred to above. We also confirm that all premiums due to date have been paid.

Signed .....

Position .....

Name .....

Date .....

For and on behalf of

.....

.....

.....

This form should be completed by your Insurers or your Registered Insurance Brokers ONLY.

The above information is agreed on behalf of the Tenderer by the Tenderer's Authorised Representative:

Name .....

Signed .....

For and on behalf of .....

Date .....

[redacted] [redacted]

Director/Authorised Signatory

TIE LIMITED

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Seven referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE SEVEN

COLLATERAL WARRANTY IN FAVOUR OF TIE

(1) PARSONS BRINCKERHOFF LIMITED

- and -

(2) TIE LIMITED

- and -

(3) [*INFRACO*]

COLLATERAL WARRANTY IN FAVOUR OF TIE FROM THE SDS PROVIDER

relating to

THE PROVISION OF SYSTEM DESIGN SERVICES FOR THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **PARSONS BRINCKERHOFF LIMITED** (Company Number 2554514) whose registered office is at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle Upon Tyne, NE4 7YQ (**"SDS Provider"**);

(2) **TIE LIMITED** (Company Number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ (**"tie"**) which term shall include its successors and permitted assignees); and

(3) **[INFRACO]** (Company Number ◆) whose registered office is at ◆ (**"Infraco"**).

BACKGROUND

A By an agreement in writing dated [◆] 2005 (the **"SDS Agreement"**), **tie** appointed the SDS Provider to provide system design services in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to complete the design and carry out the construction, installation, commissioning and maintenance planning in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of the SDS Provider, that the Infraco shall take over the rights and liabilities of the "Client" under the SDS Agreement by novating the SDS Agreement from **tie** to Infraco upon and subject to the terms of the Novation Agreement (as hereinafter defined).

E It is a term of the SDS Agreement that the SDS Provider shall enter into this Agreement with **tie** following the execution of the Novation Agreement.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions have the following meanings, unless the context requires otherwise:

"Agreement" means this document (as amended from time to time pursuant to Clause 14);

"Deliverables" means the Functional Requirements Specifications, the Technical Specifications and the items listed in Appendix 3 to Schedule 1 *(Scope of Services)* of the SDS Agreement, and all other documents, information, reports, records, diagrams, bills of quantities, manuals, schedules, databases, reinforcement details, photographs, formulae, consultation materials, plans, designs, specifications, drawings (including as-built drawings), details, calculations, transport and other models and simulations, the outputs and reports based on any models, programmes and all other material created and/or provided by the SDS Provider (and/or any SDS Provider Party or any other third party) in the performance of the Services and the SDS Provider's other obligations under the SDS Agreement;

"Infraco Contract" means the contract to be entered into or entered into by **tie** with the Infraco in relation to the completion of the design, and carrying out the construction, commissioning and maintenance planning in respect of the Edinburgh Tram Network;

"Novation Agreement" means the novation agreement entered into among **tie**, the SDS Provider and the Infraco;

"Party" means each and any of the parties to this Agreement and Parties shall be construed accordingly;

"SDS Agreement" means the agreement dated [◆] originally entered into by the SDS Provider and **tie**, which has been novated to the Infraco and the SDS Provider.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender include all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement;

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation; and

1.4 Where a party comprises two or more persons:

1.4.1 any obligations on the part of that party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the SDS Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement;

1.6 In the case of any unintended conflict between the definition or interpretation of words or expressions in this Agreement and the SDS Agreement, the SDS Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

The SDS Provider warrants and undertakes to **tie** that:

2.1 it has carried out and shall carry out its Services and other duties and obligations under the SDS Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1;

2.2.1 the SDS Provider warrants to **tie** that, in the performance of the Services and its other obligations under the SDS Agreement it shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly

qualified and competent system design services provider experienced in performing services similar to the Services in connection with projects of a similar size, scope and complexity; and

2.2.2 it owes a duty of care to **tie** in carrying out its duties and obligations under the SDS Agreement.

3. COPYRIGHT LICENCE

3.1 The SDS Provider hereby grants to **tie** an irrevocable, perpetual, royalty-free and non-exclusive licence to use such Project IPR and SDS Provider IPR as may be necessary for **tie** to use in relation to any projects associated with the Services. This licence shall carry the right to grant sub-licences, and be freely transferable to third parties. The SDS Provider shall be liable for the Project IPR and the SDS Provider IPR only to the extent that it is used for the purposes for which it was intended.

3.2 In so far as ownership of the copyright and any other Intellectual Property Rights in any Deliverable prepared or provided by the SDS Provider in connection with the Edinburgh Tram Network is vested in any person other than the SDS Provider including, without limitation, any SDS Provider Party, the SDS Provider shall procure for **tie** the benefit of such a licence as is referred to in clause 3.1 for the purposes referred to therein.

3.3 The SDS Provider shall, if so requested at any time, execute such documents and perform such acts (including the grant to **tie** of a licence to use any SDS Provider Software and/or any Third Party Software and/or any Specially Written Software) as may be required fully and effectively to assure to **tie** or any third party the rights referred to in this clause 3.

3.4 The SDS Provider shall provide to **tie** a copy of any of the Deliverables as soon as reasonably practicable after receipt by the SDS Provider of a written request from **tie** to do so.

3.5 The SDS Provider undertakes to **tie** that the use by **tie** of any of the Deliverables for any purpose provided for in this clause 3 shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES

4.1 The SDS Provider undertakes that:

4.1.1 it has maintained and shall maintain during the performance of its obligations under the SDS Agreement each of the Required Insurances in accordance with the requirements of Clause 17 (*Required Insurances*) and Schedule 6 (*Required Insurances*) of the SDS Agreement;

4.1.2 cover under the professional indemnity insurance is extended to include the SDS Provider's liabilities under this Agreement;

4.1.3 this Agreement has been disclosed to the SDS Provider's current professional indemnity insurers or brokers (as the case may be) and shall be disclosed to any future professional indemnity insurers or brokers providing the insurance required by this Agreement; and

4.1.4 the SDS Provider shall abide by the terms and conditions of insurance and not do or omit to do anything that might prejudice the cover or its right to make a claim.

4.2 As and when required by **tie**, the SDS Provider shall produce for inspection documentary evidence that such insurance is being properly maintained.

4.3 The SDS Provider shall not make any material alteration to the terms of the Required Insurances without **tie's** prior approval which approval shall not be unreasonably withheld. If the insurer makes or attempts to make any material alteration or purports to withdraw cover, or if the SDS Provider is unable to obtain professional indemnity insurance, the SDS Provider shall promptly give notice of this to **tie**.

5. TIE STEP-IN

5.1 The SDS Provider shall not exercise nor seek to exercise any right of determination of the SDS Agreement or to rescind the SDS Agreement by reason of a Client Default or to otherwise discontinue the performance of any of the SDS Provider's obligations in relation to the SDS Agreement by reason of breach on the part of the Infraco (or otherwise) without giving to **tie** not less than 21 days' written notice of its intention to do so and specifying in such notice the grounds for the proposed determination. The SDS Provider shall for the period of any such notice diligently and properly continue to perform the SDS Provider's obligations under the SDS Agreement.

5.2 Any period stipulated in the SDS Agreement for the exercise by the SDS Provider of a right of determination shall nevertheless be extended as may be necessary to take account of the period of notice required under clause 5.1.

5.3 Compliance by the SDS Provider with the provisions of clause 5.1 shall not be treated as a waiver of any breach on the part of the Infraco giving rise to the right of determination nor otherwise prevent the SDS Provider from exercising its rights after the expiration of the notice unless the right of determination shall have ceased under the provisions of clause 5.4.

5.4 The right of the SDS Provider to determine the SDS Agreement or to rescind the SDS Agreement or to discontinue the performance of any of its obligations in relation to the SDS Agreement shall cease if within the period of 21 days referred to in clause 5.1, **tie** gives written notice to the SDS Provider:

5.4.1 requiring the SDS Provider to continue with the performance of all its obligations under the SDS Agreement;

5.4.2 acknowledging that **tie** is assuming all the obligations of the Infraco (as "Client") under the SDS Agreement; and

5.4.3 undertaking to the SDS Provider to discharge all amounts payable to the SDS Provider under the terms of the SDS Agreement.

5.5 Upon compliance by **tie** with the requirements of clause 5.4, the SDS Agreement shall continue in full force and effect as if the right of determination on the part of the SDS Provider had not arisen and in all respects as if the SDS Agreement had been made between **tie** and the SDS Provider to the exclusion of the Infraco.

5.6 Notwithstanding that as between the Infraco and the SDS Provider, the SDS Provider's right of determination of its engagement under the SDS Agreement may not have arisen the provisions of clause 5.5 shall nevertheless apply if **tie** gives written notice to the SDS Provider and the Infraco to that effect and **tie** complies with the requirements on its part under clause 5.4.

5.7 The SDS Provider does not need to be concerned or required to enquire whether, and shall be entitled to assume that, as between the Infraco and **tie**, the circumstances have occurred permitting **tie** to give notice under clause 5.6.

5.8 The SDS Provider acting in accordance with the provisions of this clause 5 shall not incur any liability to the Infraco.

5.9 Unless and until **tie** has given notice under this clause 5:

5.9.1 **tie** has no liability whatsoever to the SDS Provider in respect of amounts payable to the SDS Provider under the SDS Agreement (except in relation to the sums referred to in Clause 8 of this Agreement); and

5.9.2 **tie** has no authority to issue any direction or instruction to the SDS Provider in relation to the performance of the SDS Provider's obligations under the SDS Agreement.

5.10 Without prejudice to the provisions of clauses 5.1 to 5.9 inclusive, if prior to the service of any notice under clause 5.4 the SDS Provider is determined under the SDS Agreement for any reason whatsoever the SDS Provider shall if required in writing so do to by **tie** no later than 12 weeks after the date of such determination forthwith enter into a new agreement with **tie** on the same terms as the SDS Agreement, but with such revisions as **tie** and the SDS Provider may reasonably require to reflect altered circumstances and the fact that it is **tie** and not the Infraco employing the SDS Provider.

6. ASSIGNATION

6.1 The SDS Provider shall not assign, novate or otherwise transfer the whole or any part of the Agreement without the prior written agreement of **tie**.

6.2 **tie** shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

6.2.1 to the Scottish Ministers or any local authority or other body with no worse financial standing than that of **tie** who, as a result of any Change in Law, takes over all or substantially all the functions of **tie**; or

6.2.2 to any other person whose obligations under this Agreement are unconditionally and irrevocably guaranteed (in a form reasonably acceptable to the SDS Provider) by **tie** or a person falling within clause 6.2.1; or

6.2.3 to CEC or Transport Edinburgh Limited; or

6.2.4 with the prior written consent of the SDS Provider (such consent not to be unreasonably withheld or delayed).

6.3 The SDS Provider undertakes to **tie** not to contend in any court proceedings under this Agreement that any person to whom **tie** assigns or has assigned its rights under this Agreement or any of them in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that such person is an assignee and not the original contracting party under this Agreement or by reason that **tie** is named under this Agreement or any intermediate assignee of **tie** escaped loss resulting from such breach by reason of the disposal of its interest in the same.

7. LIABILITY OF THE SDS PROVIDER

7.1 No provision of this Agreement is intended to exclude any obligation or liability which would otherwise be implied whether by law of contract, delict or otherwise.

7.2 The responsibility of the SDS Provider under this Agreement is not to be reduced or in any way released or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

7.3 The rights and benefits conferred upon **tie** by this Agreement are in addition to any other rights and remedies that **tie** may have against the SDS Provider including (without prejudice to the generality of the foregoing) any remedies in delict.

7.4 Subject to the other provisions of this Agreement, the liability of the SDS Provider to **tie** is to be determined in all respects in accordance with the terms of the SDS Agreement and, in the event of any claim by **tie** under this Agreement, the SDS Provider shall be entitled to rely upon any defence, right, limitation or exclusion under the SDS Agreement as though **tie** were named as Client under it, except that:

7.4.1 **tie** shall not be affected by any subsequent variation of the SDS Agreement which would adversely affect the obligations owed by SDS Provider or the waiver, compromise or withdrawal of any claim made by the Infraco; and

7.4.2 the SDS Provider shall not be entitled to exercise any right of set-off, retention or withholding against **tie** to which the SDS Provider may be entitled as against the Infraco.

7.5 The liability of the SDS Provider under this Agreement shall be no greater in extent than the liability of the SDS Provider under the SDS Agreement.

8. PAYMENT TO THE SDS PROVIDER IN RESPECT OF RETENTIONS AND REDUCTIONS IN THE SCOPE OF SERVICES

8.1 **tie** shall make payment of any sums which have been agreed to be due to the SDS Provider in accordance with Clause 12.7.3 and/or Clause 29.4 of the SDS Agreement, in the amounts and the timescales set out within these said Clauses.

9. CONSENT OF INFRACO

9.1 The Infraco consents to the terms of this Agreement.

10. NOTICES

10.1 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the party concerned at its address set out in this Agreement or to such other addresses as may be notified by such party for the purposes of this clause.

10.2 Any notice given pursuant to this clause, if sent by registered or recorded delivery, is deemed to have been received 48 hours after being posted.

11. RIGHTS OF THIRD PARTIES

11.1 A person who is not a party to this Agreement shall have no right to enforce any term of this Agreement.

12. INVALID TERMS

12.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable

12.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

12.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

13. VARIATIONS AND WAIVERS TO BE IN WRITING

13.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

14. WAIVER

14.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

14.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

15. JURISDICTION AND LAW

15.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

15.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with Clause 28 (*Dispute Resolution Procedure*) of the SDS Agreement and the provisions of the said Clause 28 and Schedule 10 (*Panels to the Dispute Resolution Procedure*) are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" shall be deemed to refer to **tie** and the SDS Provider, any reference to "Client" shall be deemed to refer to **tie**, the reference to "Clause 36" shall mean Clause 10 of this Agreement.

IN WITNESS WHEREOF these presents on this and the preceding ◆ pages are executed as follows:

EXECUTED for and on behalf of **PARSONS BRINCKERHOFF LIMITED** at

on 2005 by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **TIE LIMITED**
at

on 2005 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **[INFRACO]** at

on 2005 by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

[redacted] [redacted]

Director/Authorised Signatory

TIE LIMITED

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Eight referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE EIGHT

NOVATION AGREEMENT

(1) tie

- and -

(2) INFRACO

- and -

(3) PARSONS BRINCKERHOFF LIMITED

NOVATION OF SYSTEM DESIGN SERVICES AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **TIE LIMITED** (Company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ (**"tie"**);

(2) **[INFRACO]** (company number ◆) whose registered office is at ◆ (**"Infraco"**);

(3) **PARSONS BRINCKERHOFF LIMITED** (company number 2554514) whose registered office is at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle Upon Tyne, NE4 7YQ (**"SDS Provider"**).

BACKGROUND

A By an agreement in writing dated [◆] 2005 (**"SDS Agreement"**) **tie** appointed the SDS Provider to provide system design services in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract under which Infraco has been appointed to complete the design and carry out the construction, installation, commissioning and maintenance planning in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of the SDS Provider, that the Infraco shall take over the rights and liabilities of the "Client" under the SDS Agreement by novating the SDS Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.3 Unless otherwise defined hereunder, where the SDS Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement;

2. RELEASE BY THE SDS PROVIDER OF TIE

2.1 The SDS Provider releases and discharges **tie** from any and all duties, obligations and liabilities owed to the SDS Provider under the SDS Agreement and accepts the liability of the Infraco under the SDS Agreement in lieu of **tie**.

3. RELEASE BY TIE OF THE SDS PROVIDER

3.1 **tie** releases and discharges the SDS Provider from the further performance of the SDS Provider's duties and obligations under the SDS Agreement.

4. ACCEPTANCE OF LIABILITY BY THE SDS PROVIDER TO THE INFRACO

4.1 The SDS Provider undertakes to continue to perform all the duties and to discharge all the obligations of the SDS Provider under the SDS Agreement and to be bound by its terms and conditions in every way as if the Infraco was and always had been a party to the SDS Agreement in place of **tie**.

4.2 The SDS Provider warrants to the Infraco that, in respect of the duties and obligations which it has already performed under the SDS Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the

SDS Agreement. The SDS Provider warrants to the Infraco that it shall be liable for any loss or damage suffered or incurred by the Infraco arising out of any negligent act, default or breach by the SDS Provider in the performance of its obligations under the SDS Agreement prior to the date of this Agreement. The SDS Provider shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**).

4.3 The liability of the SDS Provider to the Infraco pursuant to the SDS Agreement shall not be affected by the Infraco's assumption of liability for design to **tie** pursuant to the Infraco Contract.

4.4 The SDS Provider acknowledges that the Infraco has and shall continue to rely upon all Services carried out by the SDS Provider.

5. VESTING OF REMEDIES AGAINST SDS PROVIDER

All rights of action and remedies against the SDS Provider under and pursuant to the SDS Agreement vested in **tie** shall from the date of this Agreement vest in the Infraco.

6. ACCEPTANCE OF LIABILITY BY THE INFRACO

The Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the SDS Agreement and to be bound by its terms and conditions in every way as if the Infraco was and always had been a party to the SDS Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the SDS Agreement prior to the date of this Agreement were the acts and omissions of the Infraco.

7. VESTING OF REMEDIES AGAINST TIE

All rights of action and remedies under or pursuant to the SDS Agreement vested in the SDS Provider shall from the date of this Agreement lie against the Infraco and not **tie**.

8. ACKNOWLEDGEMENT OF PAYMENT

The SDS Provider acknowledges that all fees and expenses properly due to the SDS Provider under the SDS Agreement up to the date of this Agreement have been paid by **tie** except sums which have been agreed to be due to the SDS Provider in accordance with Clause 12.7.3 and/or Clause 29.4 of the SDS Agreement and which have not been paid by **tie**.

9. AMENDMENT OF SDS AGREEMENT

tie, the SDS Provider and the Infraco agree that the terms of the SDS Agreement shall be and are varied in the manner set out in Appendix 1 to this Agreement.

10. AFFIRMATION OF SDS AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the SDS Agreement and, except as specifically amended by Appendix 1 of this Agreement, all the terms and conditions of the SDS Agreement remain in full force and effect.

11. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This Clause does not affect any right or remedy of any person which exists or is otherwise available.

12. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it.

IN WITNESS WHEREOF these presents on this and the preceding [◆] pages together with Appendix 1 which is annexed and subscribed as relative hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED** at

on 2005 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **[INFRACO]** at

on 2005 by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **PARSONS BRINCKERHOFF LIMITED** at

on 2005 by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

7.5.1.2 by the issuing of a Client Change Order in respect of the Services to which Clause 7.5.1.1 does not apply; or

7.5.1.3 by reason of any other breach by the Client of this Agreement; or

7.5.1.4 by reason of any breach by the Infraco of the Infraco Contract.

then in any such event the SDS Provider shall forthwith notify the Client of:-

(a) the cause of the delay;

(b) the SDS Provider's estimate of the likely effect of such delay upon the Programme and the Master Project Programme;

(c) the estimated additional cost that shall be incurred; and

(d) any acceleration measures which the SDS Provider could take to mitigate the effects of such delay and an estimate of the costs thereof.

7.5.2 The SDS Provider shall, subject to any instruction to accelerate the Services pursuant to Clause 7.5.3, be entitled to such adjustment to the Programme as may in all circumstances be fair and reasonable, provided always that the SDS Provider's entitlement to an extension of time for any event listed in Clauses 7.5.1.1 and 7.5.1.2 above shall in no circumstances exceed (in respect of such event) the extension of time (if any) to which the Client is entitled for the identical event under the Infraco Contract. An extension of time shall not be granted where the cause of the Services having been delayed, affected or suspended is due to any act, omission, default or breach of the Agreement by the SDS Provider or its employees, agents or servants or any SDS Provider Party.

7.5.3 The Client shall issue a Client Change Order to authorise any agreed acceleration of the Programme and/or increased costs as a result of delays notified under Clause 7.5.1.

7.5.4 If the Services are delayed in circumstances other than those entitling the SDS Provider to an extension of time as set out in Clause 7.5.1 or as a result of a Force Majeure Event, the SDS Provider shall inform the Client at the earliest opportunity and shall give an estimate of the likely effect upon the Programme. The SDS Provider at his own expense shall take such acceleration measures as are necessary to achieve the requirements of the Programme.

7.5.5 The SDS Provider shall not be entitled to and shall be deemed to have irrevocably waived any entitlement to any extension of time unless the SDS Provider has:

7.5.5.1 within 10 Business Days of becoming aware of the circumstances or occurrences which have caused or are likely to cause delay to the SDS Provider in the performance of the Services notified the Client in writing; and

7.5.5.2 within 10 Business Days after such notification submitted by further written notice to the Client detailed particulars of any extension of time to which it may consider itself entitled in order that such submission may be investigated at the time; and

7.5.5.3 wherever applicable, complied with the requirements of any Clause under this Agreement requiring timely notice to be given.

7.5.6 Any notice under 7.5.5.1 or 7.5.5.2 above shall give full particulars to the extent then possible of the cause of the delay and of its probable duration and where appropriate reasonable estimate of any direct and indirect costs likely to result therefrom together with any other relevant details.

Clause 15 - Changes

Insert the following new Clause 15.15

15.15 Except in relation to a breach of this Agreement or the Infraco Contract by the Client or unless otherwise agreed by the Client in writing, the SDS Provider's entitlement to additional payment or an extension of time for a Permitted Variation shall in no circumstances exceed (in respect of such Permitted Variation) the extension of time (if any) and/or additional payment (if any) to which the Infraco is entitled under the Infraco Contract for the identical Permitted Variation. The SDS Provider's entitlement to such extension of time or additional payment under this Agreement shall in no circumstances exceed that proportion of the Infraco's entitlement to an extension of time or additional payment under the Infraco Contract to which the Infraco becomes entitled in respect of the entitlement claimed by the SDS Provider. An extension of time and/or additional payment shall not be granted where the cause of the Permitted Variation is due to any act, omission, default or breach of the Agreement by the SDS Provider, its employees, agents or servants or any SDS Provider Party.

Clause 19 - Termination for SDS Provider Default

Delete Clause 19.1.3 and substitute therefore "Clause not used".

Clause 20 - Termination, Abandonment or Suspension of the Services by the Client

Delete Clause 20.1 and substitute therefor:

20.1 In the event that the Infraco Contract is terminated, this Agreement shall terminate unless the SDS Provider is notified that **tie** (or another nominated party) requires to step into this Agreement.

Clause 22 - Termination for Corrupt Gifts and Payments

Delete Clause 22 (Termination for Corrupt Gifts and Payments in its entirety) substitute therefor:

22.1 The SDS Provider or anyone employed by it or acting on its behalf (including any SDS Provider Party) shall not commit any Prohibited Act.

22.2 If the SDS Provider or anyone employed by it or acting on its behalf (including any SDS Provider Party) commits any Prohibited Act, then the Client may terminate this Agreement with immediate effect by giving notice to the SDS Provider.

Clause 30 - Assignation, Changes In Legal Status And Changes In Control

Delete Clause 30.2 and substitute therefor:

30.2 The Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

30.2.1 to an assignee permitted in accordance with the terms of the Infraco Contract; or

30.2.2 with the prior written consent of the SDS Provider (such consent not to be unreasonably withheld or delayed).

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Nine referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE NINE

REVIEW PROCEDURE

1. Introduction

1.1 Except where otherwise agreed in writing, the provisions of this Schedule 9 (*Review Procedure*) shall apply whenever any Deliverable or course of action is required to be reviewed, approved, agreed, consented to or otherwise processed in accordance with the Agreement.

1.2 Each submission by the SDS Provider to the Client's Representative under the Review Procedure shall be accompanied by five copies of the proposed Deliverable (in appropriate agreed format) to be reviewed or a statement of the proposed course of action (the entire contents of a submission being referred to as a "Submitted Item"). In relation to each Submitted Item, the provisions of this Schedule 9 (*Review Procedure*) shall apply.

1.3 Within 20 Business Days of the date of receipt of a submission (or re-submission, as the case may be) of the Submitted Item to the Client's Representative (or such other period as the Parties may agree), the Client's Representative shall return one copy of the relevant Submitted Item to the SDS Provider endorsed (subject to and in accordance with paragraph 3 (*Grounds of Objection*)) "Level A - no objection", "Level B - proceed subject to comments" or "Level C - resubmit".

1.4 If the Client's Representative fails to return a copy of any Submitted Item within 20 Business Days (or within such other period as the Parties may agree in writing) of the date of its submission to the Client's Representative, then the SDS Provider shall re-submit the submitted item. If the Client's Representative fails to return a copy of any Submitted Item within seven days of any re-submission, then the Client's Representative shall be deemed to have returned the Submitted Item to the SDS Provider endorsed "Level A - no objection".

1.5 If the Client's Representative makes an objection to any Submitted Item in accordance with paragraph 3 (*Grounds of Objection*), the Client's Representative shall state the ground upon which such objection is based and the evidence or other information necessary to substantiate that ground.

1.6 For the avoidance of doubt, the Client's Representative shall be entitled to make such comments on any Submitted Item on any grounds as he sees fit but, to the extent that the Client's Representative comments on a Submitted Item other than on the grounds specified in paragraph 3 (*Grounds of Objection*), or fails to comply with the provisions of this paragraph 1, the SDS Provider may, at its discretion request written clarification of the basis for such comments and, if clarification is not received within 10 Business Days of such request by the SDS Provider refer the matter for determination in accordance with the Dispute Resolution Procedure.

1.7 Where any information that has been provided is updated, the new issues shall be provided promptly to the Client as soon as reasonably possible.

1.8 The Client's Representative shall be entitled to instruct the SDS Provider that a defined class of Deliverable or course of action may be submitted "for information" and not for review in accordance with this Schedule 9 (*Review Procedure*).

1.9 The SDS Provider shall ensure that each Submitted Item shall contain sufficient detail and shall be accompanied by sufficient information to enable the Client's Representative to assess the Submitted Item in accordance with Schedule 9 *(Review Procedure).*

1.10 Where a revised Submitted Item is submitted, the SDS Provider shall also ensure that such revision clearly identifies what revision to the Deliverable was made.

2. Further Information

2.1 The SDS Provider shall submit any further or other information, data and documents that the Client's Representative reasonably requires to act in accordance with this Schedule 9 (*Review Procedure*). If the SDS Provider does not submit any such information, data and documents, the Client's Representative shall be entitled to object to the Submitted Item:

2.1.1 on the basis of the information, data and documents which have been provided; or

2.1.2 on the grounds that insufficient information, data and documents have been provided to enable the Client's Representative to act in accordance with this Schedule 9 (*Review Procedure*).

3. Grounds of Objection

3.1 The Client's Representative may object to any Submitted Item on the grounds set out in paragraph 2 (*Further Information*) above but otherwise may make objections in relation to a Submitted Item if, on the balance of probabilities, implementation of that Submitted Item:

3.1.1 would not be in accordance with this Agreement; and/or

3.1.2 would result in an increase to the Client's liabilities or potential or contingent liabilities under this Agreement; and/or

3.1.3 would be inefficient as to expenditure of resource/costs; and/or

3.1.4 would lead to a health and safety risk to any person or property; and/or

3.1.5 would lead to a breach of any Law or the terms of any Consent; and/or

3.1.6 would necessitate the obtaining of a new Law or the obtaining of a variation to an existing Law; and/or

3.1.7 would not be in accordance with any relevant environmental requirements; and/or

3.1.8 would not be in accordance with the Functional Requirements Specifications or the Technical Specifications; and/or

3.1.9 would adversely impact on the flexibility or ease of operation, run time, reliability, operating maintenance costs or revenues of the Edinburgh Tram Network; and/or

3.1.10 would materially adversely affect the SDS Provider's ability to perform its obligations under this Agreement; and/or

3.1.11 would materially adversely affect the Client's ability to perform its obligations or enforce its rights under this Agreement; and/or

3.1.12 is not in accordance with the SDS Provider's quality plans; and/or

3.1.13 would not be in accordance with Good Industry Practice; and/or

3.1.14 would prevent efficient procurement, construction, completion and/or commissioning of or under the Infraco Contract; and/or

3.1.15 prevent Service Commencement being achieved by the Planned Service Commencement Date.

4. Effect of Review

4.1 Any Submitted Item which is returned or deemed pursuant to paragraph 1.4 to have been returned by the Client's Representative endorsed "Level A - no objection" shall be complied with and implemented by the SDS Provider subject to Clauses 7.2 and 7.3 of the Agreement.

4.2 If the Client's Representative returns the Submitted Item endorsed other than "Level A - no objection", the SDS Provider shall:

4.2.1 where the Client's Representative has endorsed the Submitted Item "Level B - proceed subject to comments", proceed with the performance of the Services (subject to Clauses 7.2 and 7.3 of the Agreement) but acknowledge and take into account the Client's Representative's comments;

4.2.2 where the Client's Representative has endorsed the Submitted Item "Level C - resubmit", not act upon the Submitted Item, amend the Submitted Item to respond to the Client's Representative's objections and requirements, and re-submit the same to the Client's Representative in accordance with paragraph 4.3 unless the SDS Provider disputes that any such objection or proposed requirement is on grounds permitted by this Agreement, in which case the SDS Provider or the Client's Representative may refer the matter for determination in accordance with the Dispute Resolution Procedure and the SDS Provider shall not act on the Submitted Item until such matter is so determined or otherwise agreed provided that any referral to the Dispute Resolution Procedure is at the risk of the SDS Provider.

4.3 Where the Submitted Item has been endorsed *Level C*, the SDS Provider shall within 10 Business Days of receiving the returned Submitted Item, resubmit the Submitted Item as amended to the Client's Representative and the provisions of paragraphs 1.2 to 4 of this Schedule 9 *(Review Procedure)* shall apply (mutatis mutandis) to such re-submission.

4.4 The return or deemed return of any Submitted Item endorsed "Level A - no objection" or otherwise endorsed in accordance with paragraph 4.2.1 (*Level B* - proceed subject to comments) shall mean that the relevant Submitted Item may be used or implemented (subject to any comments made in accordance with paragraph 4.2.1) for the purposes for which it is intended. However, the return or deemed return of any Submitted Item howsoever endorsed shall not:

4.4.1 relieve the SDS Provider of its obligations under this Agreement; nor

4.4.2 constitute an acknowledgement, admission or acceptance by Client that the SDS Provider has complied with such obligations.

5. Disclaimer

5.1 No review, objection, comment or silence by the Client shall operate to (i) exclude or limit the SDS Provider's obligations or liabilities under this Agreement (or the Client's rights under this Agreement) or (ii) fix the Client with any express or implied obligations, duties or liabilities with respect to the Submitted Item.

5.2 For the avoidance of doubt, this information is supplementary to information required to be produced by the SDS Provider in order to satisfy the approval requirements of and Consents from other third parties and Approval Bodies. These include those required for:

5.2.1 local planning authorities;

5.2.2 local roads authorities;

5.2.3 HMRI;

5.2.4 Network Rail;

5.2.5 statutory undertakers; and

5.2.6 the Scottish Executive.

5.3 The SDS Provider shall promptly provide copies of all such submissions to the Client together with the responses to them as a matter of routine.

6. Documentation Format and Management

6.1 The SDS Provider shall issue five copies (in appropriate agreed format) of all Submitted Items to the Client and compile and maintain a register of the date and contents of the submission for each Submitted Items.

6.2 The SDS Provider shall compile and maintain a register of the date of receipt and content of all Submitted Items that are returned or deemed to be returned by the Client's Representative.

6.3 All drawings shall be presented as A3 sized paper copies and drawings shall be prepared at their original size in a manner that allows them to be readily legible when reduced to A3 size. Original drawings shall not be greater than A0 in size.

7. Variations

7.1 No review, objection or comment or any failure to make objection or comment under this Schedule 9 (*Review Procedure*) by the Client shall constitute a Client Change

7.2 If, having received comments from the Client's Representative, the SDS Provider considers that compliance with those comments would amount to a Client Change, the SDS Provider shall within seven days of any comments being received, before complying with the comments, notify the Client of the same and, if it is agreed by the parties or determined pursuant to the Dispute Resolution Procedure that a Client Change would arise if the comments were complied with, the Client may proceed with the matter in accordance with Clause 15 (*Changes*).

7.3 Any failure by the SDS Provider to notify the Client within seven days of comments being received that it considers compliance with such comments of the Client's Representative would amount to a Client Change shall constitute an irrevocable acceptance by the SDS Provider that any compliance with the Client's comments

shall be without cost to the Client and without any entitlement to any extension of time or other relief.

7.4 No alteration or modification to the scope, quality, quantity or nature of the Services arising from the development of the detailed Design or from the co-ordination or integration of the Design shall be construed or regarded as a Client Change.

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is Schedule Ten referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE TEN

PANELS FOR THE DISPUTE RESOLUTION PROCEDURE

CONSTRUCTION / OPERATIONAL

Alan Wilson
[redacted]
Chesterfield
DERBYSHIRE
S42 [redacted]

Peter Chapman
Somersby House
Stokesheath Road
OXSHOTT
SURREY KT22 0PS

Tony Canham
[redacted]
Thorpe St Andrew
NORWICH
NR7 [redacted]

Guy Cottam
[redacted]
Upper Limpley Stoke
BATH
BA3 [redacted]

FINANCIAL

Nigel Lowe
Nigel Lowe Consulting Limited
27 Old Gloucester Street
LONDON
WC1N 3XX

John Hunter
Hunter Consulting
Commercial Centre
Stirling Enterprise Park
STIRLING
FK7 7BF

Bryan Porter
[redacted]
Newton Mearns
GLASGOW

G77[redacted]

Eric Mouzer
[redacted]
Edgebaston
BIRMINGHAM
B11[redacted]

LEGAL

Gordon Reid, QC
[redacted]
FIFE
KY15[redacted]

Robert Howie, QC
[redacted]
EDINBURGH
EH9[redacted]

Lord Dervaird (Prof. John Murray QC)
[redacted]
EDINBURGH
EH3[redacted]

Gordon Coutts, QC
[redacted]
EDINBURGH
EH3[redacted]

Angus Glennie, QC
[redacted]
Oxton
Lauder
BERWICKSHIRE
TD2[redacted]

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

This is the Schedule 11 referred to in the foregoing Agreement between the Client and the SDS Provider

Requirements Specification for

Overall System Operational & Performance Requirements

Contents : Schedule 11

1 OVERALL SYSTEM OPERATIONAL & PERFORMANCE REQUIREMENTS

1.1 Routes

The routes for the proposed Edinburgh Tram Network are as set out in the Edinburgh Tram (Line One) Bill and the Edinburgh Tram (Line Two) Bill

1.1.1 Line 1

A north Edinburgh loop connecting the city centre with Leith, Newhaven and Granton and passing through the Waterfront Development Area. The route, which comprises approximately 16km of double track and 23 tramstops, runs from Haymarket along the former Roseburn railway corridor, along the shore front to Ocean Terminal Shopping Centre and onwards to Leith returning to the city centre via Leith Walk. The route through the city centre to Haymarket, will be via Princes Street.

Line 1 comprises Stage Builds; HOT, HCT and CTO, as referred to in the Programme Phasing Structure.

1.1.2 Line 2

A western corridor from the city centre to the Gyle, Edinburgh Park, the Airport and Newbridge, with extensions possible in the future to Livingston or South Queensferry. The route comprises approximately 15 km of double track, the majority of which is fully segregated from other traffic, and 14 tramstops. The preferred corridor approximately follows the main Edinburgh-Glasgow railway line between Haymarket and the new station at Edinburgh Park, then heading north west to the Gyle, Gogarburn, Edinburgh International Airport and Newbridge.

Line 2 comprises Stage Builds; ARP, DHY and GNB, as referred to in the Programme Phasing Structure.

1.1.3 Line 3

At this stage it is envisaged that a potentially expanded tramway may include a southern corridor which will be about 9 km long from the city centre to the south east of the city. The preliminary alignment may follow approximately the Nicholson Street - Minto Street corridor from the city to Cameron Toll and continues past the new Edinburgh Royal Infirmary before swinging to the east to Craigmillar, Fort Kinnaird and terminating at the New Craighall park & ride.

All three lines are represented in the diagram below:

Further possible expansion, potentially including Line 3 may be added to the core network. This expansion could potentially take the form of interconnections, spurs and/or line extensions on Line Two possibly towards Dalmeny/South Queensferry and Livingston and Line Three towards Musselburgh. Any expansion will probably require additional approvals, infrastructure and increased tram fleet and do not form part of the requirements for the initial phase of the project which is the subject of this suite of Functional Requirements Specifications.

1.1.4 Depot

It is envisaged that the Edinburgh Tram Network will ultimately have one depot facility located at Gogar , connected to the running tramway of line 2. However, the parliamentary process currently allows for both a depot at Leith and one at Gogar. Two depot preliminary designs shall be required to be produced. The depot or depots to be installed as part of the Edinburgh Tram Network are referred to herein as the "Depot".

This installation will facilitate all tram servicing and maintenance and be the location of a centralized Control Room .

1.2 Service Patterns and Frequency

The Edinburgh Tram Network shall be available for operation 365 days per year.

1.2.1 Normal Service Weekdays

1.2.1.1 Granton - Haymarket - St. Andrew Square - Ocean Terminal - Granton

This part of the Edinburgh Tram Network will operate as a circular service operating in both clockwise and anti-clockwise directions.

For the section route from Roseburn Jct – Granton Square - Ocean Terminal, the overall system shall be capable of supporting a minimum service requirement of 6 trams/hour indefinitely, but subject to further business case and revenue development by **tie** shall be designed for a service equivalent to 8 trams/hour indefinitely from the outset of tram operation. Future revenue predictions show that future proofing to support a service equivalent to 12 trams/hour shall be required in this design.

1.2.1.2 Airport - Haymarket – St. Andrew Square - Ocean Terminal

This part of the tramway will operate on an end to end basis in each direction.

For the section of route from Edinburgh International Airport to Roseburn Jct, the overall system shall be capable of supporting a service equivalent to 8 trams/hour indefinitely from the outset of tram operation. Future revenue predictions show that future proofing to support a service equivalent to 12 trams/hour shall be required in this design.

1.2.1.3 Common Corridor (Roseburn Junction - Princes Street - Ocean Terminal)

The common corridor shall facilitate the sum of service levels required for the non-common sections referred to in paragraph 1.2.1.1 and 1.2.1.2. This equates to peak hour services operating to a timetable based on a minimum service requirement of 14 trams/hour indefinitely, but subject to further business case and revenue development by **tie** shall be designed for a service equivalent to16 trams/hour indefinitely from the outset of tram operation. Future revenue predictions show that future proofing to support a service equivalent to 24 trams/hour shall be required in this design.

1.2.1.4 Gogarburn – Newbridge

From the Line 2 alignment at Gogarburn, a branch to Newbridge shall be designed which shall be capable of supporting a service equivalent to 8 trams/hour indefinitely from the outset of tram operation.

1.2.2 Operating Hours

The tramway shall have operating hours that will facilitate the following first and last tram services:

	Weekdays		Saturday		Sunday	
	First Departure	Last Departure	First Departure	Last Departure	First Departure	Last Departure
From Airport to City Centre	05:10	23:40	05:10	23:40	05:10	23:50
From Ocean Terminal to City Centre via Leith Walk	05:00	24:00	05:00	24:00	07:00	24:00
From Ocean Terminal to City Centre via Granton	05:00	24:00	05:00	24:00	07:00	24:00
From City Centre to Airport	04:30	24:00	04:30	01:00	04:30	00:30
From City Centre to Ocean Terminal via Leith Walk	05:00	24:00	05:00	24:00	07:00	24:00
From City Centre to Ocean Terminal via Granton	05:00	24:00	05:00	24:00	07:00	24:00

1.3 Special Workings

At certain times in the year, festivals, Hogmanay and other special events will generate the need to close Princes Street and/or Saint Andrew Square to all traffic. Under such circumstances the Edinburgh Tram Network will operate as follows:

Restriction	Tram Service	Revised Origin - Destination
Princes Street Closed/St. Andrew Square Open	Line 1	Operates between Shandwick Place and St Andrew Square via Ocean Terminal and visa versa
	Line 2	Operates between Edinburgh International Airport and Shandwick Place and visa versa
	Line 3	Potentially operates between New Craighall and St Andrew Square and visa versa
Princes Street and St. Andrew Square Closed	Line 1	Operates between Shandwick Place and Picardy Place via Ocean Terminal and visa versa. (Trams will use York Place Crossover to turnback)
	Line 2	Operate between Edinburgh International Airport and Shandwick Place and visa versa
	Line 3	Operates between New Craighall and North Bridge and visa versa

1.4 Journey times

Edinburgh Tram Network operations shall support the following key journey times:

1. Line 1 - Ocean Terminal to Ocean Terminal Clockwise shall have an end to end journey including layover of 45mins.
2. Line 1 - Ocean Terminal to Ocean Terminal Anti-clockwise shall have an end to end journey including layover of 45mins.
3. Line 2 - Airport to Ocean Terminal; each direction shall have an end to end journey time including layover currently envisaged at 35mins. All run time assumptions shall be agreed by **tie**.
4. Common corridor - The section between Haymarket and St Andrew Square tramstops shall have end to end journey times in each direction of 8 mins
5. Common corridor - The section between St Andrew Square and Ocean Terminal shall have their end to end journey times in each direction proven and agreed by **tie**.

1.5 Performance/Reliability

The system shall be designed and constructed to operate without unreasonable duress on Operations personnel in Normal, Degraded and Abnormal Modes as defined below.

- ***Normal Mode*** means the number of tram services as prescribed in the headway/timetable requirements.
- ***Degraded Mode*** means restricted operations resultant from failure of one or more components of the Edinburgh Tram Network.
- ***Abnormal Mode*** means the occurrence of extreme loading on a part of the Edinburgh Tram Network resultant from causes such as major disruption, whether caused through tramway elements or third party interference.

The Edinburgh Tram Network shall be designed such that during peak-hours service it achieves at least 80% of all tram journeys between the places listed below and shall be completed no more than 2 minutes late:

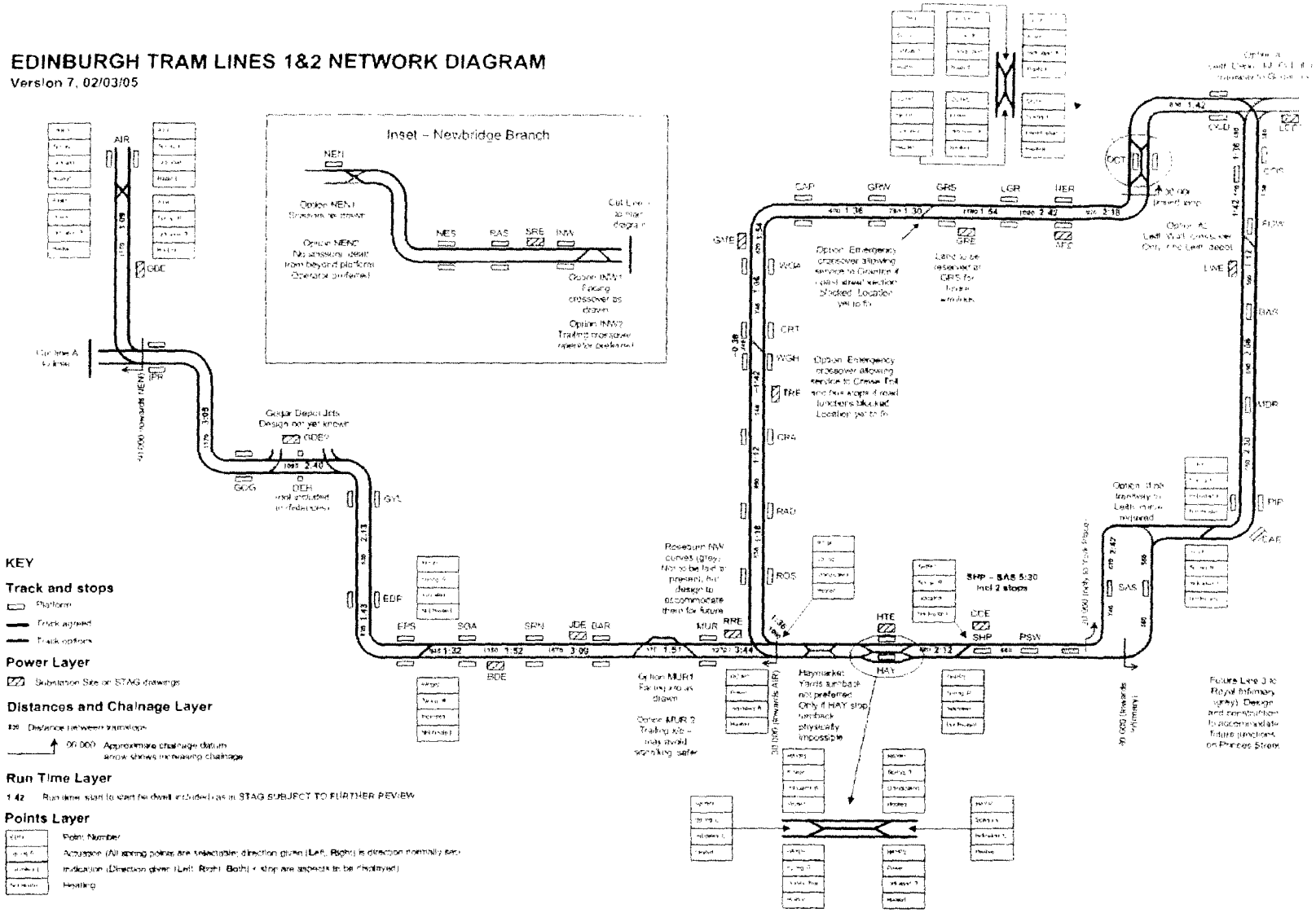
Airport – Haymarket and visa versa

Haymarket – St. Andrew Square – Ocean Terminal and visa versa

Haymarket – Granton Square – Ocean Terminal and visa versa

1.6 Tram Network Schematic applicable to this commission

The permanent way alignment and tramstop locations are depicted below:



Director/Authorised Signatory
TIE LIMITED

Director/Authorised Signatory
PARSONS BRINCKERHOFF LIMITED

This is the Schedule 12 referred to in the foregoing Agreement between the Client and the SDS Provider

Requirements Specification for

Civil Engineering Works

Contents - Schedule 12

2 REQUIREMENTS SPECIFICATION FOR CIVIL ENGINEERING WORKS

2.1 General

This Requirements Specification for Civil Engineering Works sets out the functional requirements that **tie** requires to be met.

2.2 Track & Formation

2.2.1 Trackform and gauge

A standard railway track form with steel rails set to standard gauge and a standard tram track comprising grooved rail set to the same gauge shall be provided that is compatible with the Edinburgh Tram Network's tram fleet. Rail shall be continuously welded wherever possible. The use of fish-plated joints shall be avoided.

Track form and its alignment shall be designed as an integral component of the Edinburgh Tram Network taking account of the interaction with the tram and its running gear (wheel/rail interface), the need to meet the overall specified ride quality and journey time parameters and Edinburgh Tram Network whole life cost assessment.

2.2.2 Rail types

The rails used shall be selected from a family of rails that shall present the same profile to the wheel throughout the Edinburgh Tram Network. All rails used shall be readily available and used in significant quantities in Europe. S49 rail and its related grooved rail sections is one such option.

The selected wheel profile shall be demonstrated to be compatible with the rail profile in terms of the risk of derailment, noise, wear and vibration.

The safety of the selected wheel and rail combination shall also be proven and demonstrated at points and crossings.

On ballasted sections of the route, road/rail equipment will be used for maintenance tasks such as tamping. These machines are likely to present heavy rail wheel profiles to the track. It shall be possible to pass wheels that are of standard heavy profile through points. For this purpose, this may be achieved by having check rails that are bolted into position and consequently can be removed for this purpose. The passage of these wheels through the crossings can be achieved by inserting suitable packing into the crossing itself to lift the wheels.

2.2.3 Miscellaneous

An integrated approach shall be taken to the lubrication of the wheel/rail interface, preferably with no trackside rail lubricators and all track lubrication being carried out by the tram.

Any trackside cables shall be in ducts. Cable troughs shall not be used.

Any cables crossing the track on ballasted sections that terminate on the track shall be in orange plastic ducts as used by Network Rail.

On street, the track shall include regular spare cross track ducts to facilitate future utilities diversions or new services. The size and frequency of these ducts is to be agreed with **tie**.

Special track forms shall be used at sensitive locations to ensure sufficient noise and vibration control. These locations will be identified by the SDS Provider in agreement with **tie.**

2.2.4 Alignment and geometry

Details are included in the System Wide Non- Functional Requirements.

2.2.5 Trackform Construction Operation and Maintenance

A form of track construction shall be provided that will

- facilitate ease of construction and minimise disruption during the construction phase within the City of Edinburgh (Haymarket - Princes St - Ocean Terminal)
- comply with the Code of Construction Practice
- minimise the potential for stray current, bonding and corrosion issues
- be designed for simplicity of overall maintenance and ease of track replacement and relaying, especially on-street sections;
- comply with the operational noise and vibration requirements as stated in System-Wide Non-Functional Requirements.
- reduce, as far as is practicable, the disruption to other highway users caused by the repair or replacement of such trackwork.

2.2.6 Points & Point Machines

All turn-outs, crossings and interruptions to the continuity of the rail head shall be equipped with flange running sections or other design which minimises joint noise.

The design shall minimise flange squeal through tight radii and through junctions.

Points shall be provided with two movable blades so mounted to allow the use of magnetic track brakes and their safe passage through the point and crossing.

All points shall be freely trailable.

The moving parts of turn-outs shall not be located on pedestrian crossings or in areas of heavy crossing and turning movements by road vehicles.

The location of turn-outs and crossovers shall be positioned to minimise operational noise and vibration and visual intrusion caused by associated OLE.

Switches and crossings shall be designed so that they are capable of through stressing as required.

Point machines outside the Depot shall all be capable of manual operation by tram drivers using a red point bar that is carried in each cab of all trams. There shall only be one type of point bar.

All point machines shall be from the same family of machines and provided by the same supplier.

On the highway, point machines shall be installed in the "4ft", and on segregated track they shall be installed in the "cess" to facilitate maintenance.

All combinations of points and point machines shall be validated to demonstrate to tie that:

- the machines can exert sufficient force under all foreseeable circumstances to move the point blade into the required position

- in the Depot, any tram driver can safely operate all points without risk of injury and the points shall close reliably under all foreseeable operational conditions
- the wheel/rail interface at the toes of the points is such that there is no derailment risk under all combinations of wheel wear, rail wear, and detection settings
- detection settings have adequate maintenance tolerances to ensure that point detection setting testing is required no more than monthly on all points.
- the points will lock reliably under all foreseeable operating conditions.

The documentation that validates of these specific items shall be submitted to **tie** for approval in accordance with the Review Procedure.

2.2.7 Drainage

The Edinburgh Tram Network shall have a drainage system which at least achieves accepted EU or BS standards and Good Industry Practice.

The drainage of all new bridge structures shall be positive and, unless otherwise required by the relevant local authority, all surface water shall be piped to the local storm water sewer systems by a defined drainage path.

Particular attention shall be paid to ensure that surface water drainage systems in the vicinity of traction sub-stations and cable ducts are routed to avoid any risk of flooding of electrical equipment areas.

In street track, the track drainage system shall incorporate an insulated break from the storm water system.

Drainage proposals shall be approved by the relevant Water Utility, Environment Agency, and the Highway Authority.

Any new flows into existing drains and the methods of connection shall be authorised by Scottish Water, SEPA and Roads Authority.

2.2.8 Formation

The trackbed/roadbed shall be designed and specified for construction so as to avoid the need for excessive or frequent maintenance or repair.

2.2.9 Cable Routes

The trackform shall include all associated equipment including, where necessary, but without limitation to, drainage, ducts for power supply, signalling and telecommunications cables, traction earth and stray current systems. The location of the necessary associated equipment shall be clearly indicated on the agreed trackform drawings.

2.2.10 Pedestrian crossing points of track on off-carriageway sections

The surface at crossing points shall be level with the top of the running rails and surfaced in non-slip materials. These materials shall be in harmony with the character of the locality whilst providing clear indication to all users (including the visually impaired) of the correct point to cross the track and the extent of the Edinburgh Tram Network environment outside of the highway.

Crossings and approach ramps to them shall be accessible to those with disabilities, including users of wheelchairs.

Crossings shall be illuminated, to the same intensity as platforms, or pedestrian routes they serve, whichever is the higher, or otherwise as required by HMRI.

2.2.11 Roadworks

Horizontal clearances between kerb lines of roads and tram network structures shall be not less than those set out in the relevant Department of Transport technical memoranda and the Department of Transport publication, "Roads and Traffic in Urban Areas" (or Scottish equivalent) and shall meet the requirements of the HMRI.

2.2.12 Road Surface Design

The integration of the Edinburgh Tram Network alignment, highway design and highway markings must minimise the risk of road vehicles skidding on the rails.

2.3 Travel Centre

An Edinburgh Tram Network information and ticket sales facility shall be provided at Edinburgh International Airport interchange.

2.4 Tramstops

The main functions of a tramstop are to:

- provide a secure and comfortable environment for passengers on the Edinburgh Tram Network to wait for their intended tram service.
- provide a location at which intending tramway passengers can purchase a valid ticket.
- provide the means by which passengers can board and/or disembark trams.
- provide a point at which intending passengers are made aware of tram service timetables, their current punctuality and imminent tram arrival/departures.

2.4.1 Location

The Edinburgh Tram Network shall have tramstops provided at the locations shown in the Network Diagram contained in the Requirements Specification for Overall System Operational & Performance Requirements.

Tramstops and their surroundings shall be designed to provide safe and effective pedestrian circulation.

Key views and vistas of the City of Edinburgh shall not be unnecessarily interrupted.

2.4.2 Engineering Principles

The design of each tramstop shall compliment the public realm taking into account architectural form, colours and corporate branding such that they become commonly recognisable.

Tramstops shall provide the necessary functionality described herein and in doing so shall avoid unnecessary clutter.

The overall design of the tramstop shall ensure functionality is achieved as a whole. The tramstop shelter shall provide a clean, dry and safe area for passengers to wait but must not conflict with the CCTV surveillance system's aims to enhance security of passengers and react to any activation of the emergency PHP.

Tramstop design shall not leave any unlit areas on the tramstop platform and access routes thereto/therefrom.

Materials used shall be scratch resistant and easy to clean and repair/replace.

All access routes and platforms top surfaces shall be slip resistant and durable.

Transition zones shall be designed so as to be clearly differentiated by those who are visually impaired.

Unless required for proven safety requirements, handrails shall not be provided.

2.4.3 Access

Each tramstop shall provide access to all areas that conforms to the prevailing Disability Discrimination Act.

Access to tramstops shall as near as practicable to a direct route from key passenger generators that the tramstop serves.

Wherever practicable pedestrian access routes shall be designed to use street lighting as the sole or primary means of illumination.

Access route dimensions shall be appropriate for the prescribed level of pedestrian activity.

2.4.4 Platforms

Tramstop platforms and ancillary works shall maintain consistency of alignment with the Edinburgh Tram Network's permanent way.

Platforms shall provide passengers with a clear view of an arriving tram.

Platforms shall facilitate level access for boarding and disembarking from trams.

Tripping hazards shall be avoided.

The length of platform available for boarding/disembarking from trams shall be at least 4m greater than the distance between the outside front edge of the front most passenger door opening and the rear outside edge of the rear most passenger door opening of the tram.

Each platform shall be of sufficient area to accommodate the projected passenger flow for each location and shall have as a recommended minimum of 2m clear circulation width, but widths shall be designed to be commensurate with anticipated passenger and pedestrian demand.

Safety ramps shall be provided at each end of all platforms and shall conform to the HSE and Department of Transport's Requirements (produced by HMRI) and the Railways and Other Transport Systems (Approval of Works, Plant and Equipment) Regulations 1994.

2.4.5 Waiting Shelter

Waiting shelters on platforms shall not prohibit passengers within the shelter from having a clear view of an arriving tram.

Waiting shelters shall provide the means to distribute power and communications to/from equipment located at the tramstop.

The waiting shelter shall provide for seating (with backrests), signage, lighting, PIDs, PHPs, public address equipment, advertising and where practicable, ticket vending machine to be located within it.

Two litterbins shall be provided on each platform located at mid-points between the waiting shelter and each end of the platform.

Litterbins shall be designed to deter and eliminate opportunity for vandalism and/or terrorism.

Litterbins shall be provided such that each tramstop will require only one litter collection per operating day.

Waiting shelters shall permit future alteration to the capacity in terms of volume of passengers and equipment to meet emerging needs.

Tramstop waiting shelters shall be of elegant but functional design and provide protection to passengers from sun, wind and driven rain/snow.

Waiting shelters shall not permit climbing and/or its use by person(s)/object(s) coming into contact with the OLE.

Waiting shelters canopies shall be designed so as not to form a receptacle for litter/debris.

The shelter structure, roof and wall panels shall be available, as far as possible, 'off the shelf' in order to facilitate effective repair and maintenance.

2.4.6 Equipment

All equipment sited at tramstops shall have power provided in accordance with the Requirements Specification for Electrification and Power.

Equipment placed on platforms shall not prohibited passengers from having a clear view of an arriving tram.

The following minimum equipment level as referred to in the Requirements Specification for Supervision, Command and Control Suite of Systems shall be provided on each tramstop platform:

The minimum equipment level for any tramstop will be:

- 1 x CCTV camera per platform
- 1 x PA per platform
- 1 x Double-sided PID per platform
- 1 x PHP per platform
- 1 x Automated TVM per platform

Additional CCTV and PHP shall be provided where adequate security cannot be provided by the minimum equipment level.

All tramstop equipment, including where practicable, the automated ticket vending machine shall be located and/or integrated within the tramstop waiting shelter.

2.4.7 Signage

Each tramstop shall contain signage that displays the corporate branding.

The tramstop name shall be displayed prominently in several locations at that tramstop.

Signage of the tramstop name shall be displayed such that it is visible from arriving trams at the earliest possible opportunity.

Signage shall be clearly visible under all lighting conditions and in all weathers.

Directional signage showing entrance/exit routes to/from the tramstop platform and signage directing passenger to the relevant platform for their service shall be provided at all tramstops and park & ride sites.

2.4.8 Lighting

Lighting shall be provided to engender a safe and attractive environment in which intending passenger can wait.

All signage shall be illuminated.

Lighting design shall be the same or complimentary to adjacent highway lighting.

Lamps shall be able to be replaced during normal Edinburgh Tram Network operating hours without disruption to service.

Wherever practicable, lighting columns at tramstops should provided for the mounting and operation of CCTV cameras and radio/wireless communication antennae where used.

2.5 Depot

2.5.1 Site

The Depot site in sector DHY1 (Gogar) would be located in the vicinity of Edinburgh International Airport and may have constraints imposed on its design by aviation authorities. The potential Depot site at Leith would not have these constraints.

The Depot track layout shall be based on nominal 40m cars, noting requirement for shunting moves by two coupled cars. The SDS Provider is required to evaluate this against a move to 30+m cars.

Stabling shall be provided for the total number of cars in the fleet as derived from the technology review and service pattern/run time requirements.

Delivery of trams by road shall be afforded with minimum impact on other facilities.

Segregation of all rail and road vehicle movements shall be provided wherever practicable.

The Depot track and stabling layout shall be robust in operation with single failures of vehicles or pointwork causing a blockage of other tram movements. Single-ended stabling roads shall be avoided.

Point levers shall lay flat.

Logical walking routes and access in stabling shall be provided.

Water and 110V power shall be provided to each stabling berth.

Overall layout shall be operationally logical in the flow of vehicles, particularly when vehicles are entering or leaving service. A bypass road shall be provided past the washer.

Sanding and washing facilities shall be provided in a sheltered environment adjacent to but not part of the vehicle workshop space.

Depot layout shall allow the building(s) to be expanded with minimal disruption to normal operations.

Depot layout shall minimise disturbance to neighbours from sources such as artificial lighting and noise.

The orientation of the building within the Depot layout shall take into consideration aspects of solar gain and the view from the Control Room.

Car parking for XX vehicles, with provision for future expansion to XY vehicles; also cycle/motorcycle parking; locations for service vehicles and appropriate locations for visitors shall be provided. The values of XX and XY shall be agreed with **tie**.

Allowance shall be made in the layout adjacent to the Depot building for additional temporary office facilities for e.g. commissioning staff, including electricity and water services.

2.5.2 Security

The Depot site shall be secure and fitted with CCTV surveillance and any other necessary security systems as appropriate.

Controlled entry for pedestrians (staff to nearest tramstop and visitors), trams and road vehicles shall be allowed with appropriate access control for each. Access control shall be switchable between a reception area (for daytime use) and the Control Room.

The Depot perimeter fence shall be at least 2.4m high and shall have a continuous concrete strip foundation. It shall be a weldmesh or paling fence - interlaced wire is not acceptable. It shall be plastic coated or galvanised.

The Depot road entrance shall have two separate vehicle gates for entry and exit, and additionally a pedestrian gate on the footway. The vehicle entry gate shall be capable of being opened, and the pedestrian gate released, from either the Control Room or the Depot reception, or by a member of staff presenting a security card to a reader at the gate. The vehicle gate shall re-close once a vehicle has passed through. The pedestrian gate shall close automatically and re-lock when it closes.

Intercoms shall be provided from each of the two entry gates (pedestrian and vehicle) to reception and to the Control Room. There shall be two vehicle entry intercom positions on the same pole, one at a convenient height for car drivers and one for HGV drivers, who shall be able to use them whilst in the driving seats of their vehicles. There shall be one security card reader at the lower position and one with the intercom at the pedestrian gate.

Any equipment in the centre of the road (gateposts, islands, intercom/card reader pole) shall be removable if required to allow tram movement by road if this is designed to do be done through the same access.

The vehicle exit gate shall open automatically when a vehicle approaches it from the within the Depot.

The tram entry/exit locations shall be provided with manual gates which shall be normally left open. At these gateways, there shall be a microwave detector which shall sound a single brief distinct audible warning in the Control Room whenever the beam is interrupted by a person or larger object.

2.5.2.1 Depot CCTV

The entire Depot perimeter and together with the tram entrance junctions shall be under CCTV surveillance, the images from which shall be displayed real-time in the Control Room. The cameras shall form part of the network CCTV system.

A dedicated camera shall be provided to view the Depot entrance. The image from this camera shall be available on a monitor in the Depot reception area when access is being controlled from there.

2.5.3 Buildings & Services

The main Depot building shall accommodate the following requirements:

Auxiliary supplies shall be supplied from the traction substation; a UPS is to be installed for defined functions to be agreed.

The traction supply shall include an appropriate earthing scheme and interlocking with relevant workshop equipment and appropriate indication to maintenance staff and tram drivers.

The Depot maintenance building shall be designed and constructed for 40m nominal length trams. and for maintenance of an initial fleet of XX cars, including the staff to

operate and maintain a system of respective size. Expansion to support a larger fleet size and system of 1.33 times the value XX shall be possible without disruption to the existing operations. The SDS Provider is required to evaluate this against a move to 30+m cars.

Provision of appropriate network cabling throughout the building for the independent supply of IT systems shall be made.

All appropriate furnishings shall be supplied.

All finishes shall be appropriate to area and type of use within the building and in materials with a long life in a largely 24/7 environment.

The office and welfare facilities shall support the staff numbers required for the initial and expanded system (numbers to be defined with **tie**).

The building shall also house training and meeting rooms, a secure room for cash, storage areas, maintenance workshops, supervisory offices and a stores area for both small items and large/heavy items.

The Control Room shall have an adjacent lobby area and preferably a viewing area from an adjacent corridor.

Natural light in offices shall be maximised and all rooms are to be placed within the building in locations appropriate to their function.

The layout of an agreed part of the office/training areas shall be able to be simply changed in layout for changing requirements. A specific example of this is the initial need for a large training room (XX people), with smaller areas preferred thereafter.

The building design shall avoid noise being transmitted through the roof space between the workshop, upper floor offices, training areas if at all possible, while retaining flexibility for future changes to layout.

An adequate open area shall be provided in the vehicle workshop, alongside the workshops, for flexible future use.

Space shall be provided throughout the relevant parts of the building to drive a loaded fork lift truck.

Appropriate networks of 110V and compressed air shall be provided.

Air conditioning shall be provided in the Control Room and consideration shall be given as to whether it would be cost effective for the office areas also to be so fitted.

There shall be sufficient maintenance pit space provided. The layout, cross-sections of such pit space shall facilitate the optimisation of those aspects of tram maintenance for which inspection pits are required.

Lighting in the main workshop and other areas shall be placed so that light is given where required for work to take place, including when trams are present. The lighting shall also be readily accessible for maintenance (lamp change).

2.5.4 Maintenance

2.5.4.1 Maintenance Shed Doors

The Depot doors shall be bi-parting, i-folding with clear panels for through visibility. They shall be power-operated with push-button controls both inside and outside. The open and close buttons shall be press and hold whilst the door moves, rather then press and walk away, to ensure that the door does not open or close onto an obstruction or person.

In the event of power failure or door operating equipment failure, it shall be possible for one person to operate the doors manually. It shall be possible to change doors to manual mode from ground level.

A design of door without a bottom track is strongly preferred.

A design of door which does not have the actuation equipment at the top, near the OLE, is strongly preferred.

The doors must include an appropriate hole or insulated edge to accommodate the (live) OLE when they are closed.

Door leaves shall be bonded and earthed so that should they inadvertently come into contact with the OLE, the fault resistance will be sufficiently low to ensure an immediate circuit breaker trip without damage to the doors or equipment.

2.5.4.2 Workshop & Mobile Equipment

The following requirements shall be provided:

- A comprehensive provision of all workshop fixed tools, staging, storage racking, cupboards, benches, lockers, mobile tools and equipment and hand tools shall be specified.
- The scope shall include all staging and high-level access platforms required for the tram maintenance.
- An under floor wheel lathe appropriate to the type of tram and running gear. A key requirement being the ability to reprofile a complete tram in a single shift, with an appropriate definition of cut. Data collection facilities shall be provided.
- This shall include equipment for tram interior cleaning and infrastructure cleaning, although the requirement for the supply of these items has yet to be confirmed.
- Specialist tools, jigs and test equipment that are properly included in the scope of the "Tram Vehicle Supply Contract" and other supply subcontracts need not be specified. However, the scopes of supply shall be reviewed to ensure that there are no gaps in the supply arrangements.
- Appropriate battery charging equipment for trams and fork lift truck and associated ventilation equipment for this and other relevant activities shall be provided.
- A battery-powered fork lift truck of appropriate capacity and terrain capability shall be provided.
- Special workshop facilities, including test benches shall be provided, appropriate to the trams and other fixed equipment to be supplied, for hydraulic equipment and electronic equipment.

2.5.4.3 Sand Plant

A sand dispensing plant shall be provided at the Depot located as appropriate to facilitate effective maintenance, turnround of trams back into service. The sand silo need not be located in a building.

The sand silo must have a capacity of at least 30 tons, so that it will accept a full lorry-load.

Tram drivers will be expected to fill their own trams without assistance. One driver must be able to fill a tram from empty within five minutes (measured from one tram leaving the sand station to the next leaving the sand station). This rate of filling must

be sustainable for thirty minutes. In no circumstances may the interval between two successive trams exceed ten minutes.

The physical condition of the sand must remain in accordance with the procurement specification when the sand is delivered to the tram sandboxes.

Delivery must cease automatically when a box is full.

The sand plant delivery nozzles shall be compatible with the sand filling inlets on the tram.

Interlocking and indication (preferably standard tram signals) must be provided so that the indicators do not change to proceed unless all nozzles are stowed and clear of the tram.

2.5.4.4 Wash Plant

The wash plant shall be located inside a shelter (though the shelter need not extend the full length of the tram being washed). It shall be designed such that it will operate effectively at all temperatures of 0°c and above and it must be effective in washing trams at the ambient temperature.

In front of the wash plant and a tram length apart shall be the end wash pads, with lances / rotary brushes supplying detergent solution from the wash, and drainage.

2.5.4.5 Road – Rail Vehicle

A road-rail vehicle appropriate to the alignment and nature of the system shall be provided. Basic requirements include a Hiab-type crane of a capacity to be agreed, and exchangeable body pallets. A man basket shall be supplied.

Particular attention shall be applied to the suitability of the vehicle and its equipment for working on the OLE. This shall include a large working platform which does not need outriggers down so it can be moved quickly between structures, and moved along the track and highway slowly with people on the platform inspecting the OLE.

Options for tram towing capacity (and technical provisions) shall be considered as part of the development of this Requirements Specification for Civil Engineering Works.

A range of optional equipment for attachment to the vehicle shall be supplied. The possible options shall be investigated and agreed with **tie**.

A facility for groove cleaning is required. This may take the form of an exchangeable module to fit on the road-rail vehicle.

2.5.4.6 Shunter

The wheel lathe road should be unwired and a battery shunter provided to move trams over the wheel lathe.

2.5.4.7 Lifting Equipment

It shall be possible to:

- Unload a bogie from a lorry (and load it).
- Move a bogie from where it will be taken out from under the tram to anywhere it may be worked on.
- Take any roof box off the roof of the tram. Any removal of roof boxes shall be accomplished sideways over the overhead access platform and guard rails.

An appropriate set of lifting equipment, suited to the layout of the vehicle workshop, including an overhead traversing crane and options for semi-portal and/or travelling mono-hoists shall be provided.

A drained pad is required with a water and power supply for a pressure washer, accessible to bogies by rail (so they can be cleaned off after being extracted and can have salt washed off after winter) and to road vehicles (again, for washing underneath). The ideal location is outside but on the lifting road.

2.5.4.7.1 Lifting equipment – Trams

Equipment to lift a complete tram and/or parts of a complete vehicle shall be supplied. There is a strong preference for built-in equipment to leave an uninterrupted floor space when not in use, as well as avoiding handling jacks, trailing cables and minimising set-up time. There is a further preference for lifting under bogies than under sections of track. It must be possible to lift/drop any bogie or combination. Therefore, stands to support the vehicle with any combination of bogies removed are also required.

2.5.4.8 Accommodation bogies

An accommodation bogie to replace any of the tram bogies and which allows the vehicle to be moved around the Depot shall be provided.

An additional requirement is for a "bogie" or equivalent to support the disconnected end of a split tram. This must also be moveable at low speed. This might be based on the above or be a separate item (There is no requirement for both facilities to be available simultaneously).

2.5.4.9 Paint Booth

An appropriate paint system shall be provided (not involving isocyanates or other hazardous materials) for panel and patch repairs. An appropriate spray booth is to be provided (not whole vehicle).

2.5.5 Re-railing Equipment

An appropriate package is required. This needs to match the vehicle type and the special characteristics of the alignment. The equipment shall be packed together either as a module to fit the road-rail vehicle or to fit in a separate road vehicle. Options shall be discussed with **tie**.

The equipment will depend on the vehicle fittings e.g. if it has external jacking pockets or internal jacking holes in the floor. There may be a requirement for more than one set of traversing gear.

2.5.6 Stores

External storage facilities shall be provided for large items and for a limited amount of hazardous materials.

Layout to allow ease of road vehicle deliveries, inc. loading sand delivery into the silo, taking into account the likely types of pressure discharge, and of large deliveries to the inside stores.

The lorry delivery point shall be so located that the lorry does not need to pass under any OLE, and such that whilst connected to the delivery point, the tipping body cannot come within 3m of any live OLE, and such that it does not prevent road vehicle movements in the Depot.

2.6 Utilities

Wherever possible, the Edinburgh Tram Network shall be designed such that there is no requirement to divert existing public utilities. Where this is not achievable, then diversionary works shall as far as possible be undertaken as part of an 'advanced works' programme with the relevant public utility organisation.

[redacted]

Director/Authorised Signatory
TIE LIMITED

[redacted]

Director/Authorised Signatory
PARSONS BRINCKERHOFF LIMITED

This **is the Schedule 13 referred to in the foregoing Agreement between the Client and the SDS Provider**

Requirements Specification for

Supervision, Command & Control Suite of Systems

Contents : Schedule 13

3 SUPERVISION, CONTROL & COMMUNICATIONS

3.1 General

Supervision, control and communications for the Edinburgh Tram Network will be centralised in a Control Room and supporting equipment room located at the Depot.

The Edinburgh Tram Network's tram position and detection sub-system ("TPDS") shall provide for the safe movement and overall regulation of trams running on the Edinburgh Tram Network. Such sub-system shall be primarily carried on-board the tram.

Although the tram driver shall be responsible for safe tram operation driving on 'line of sight', the command, signalling, control and communications system shall provide the personnel in the Control Room with the tram regulation and performance monitoring facilities needed to achieve the target headway for the core period and the timetable.

The Edinburgh Tram Network and all system components shall be configurable to ensure the ability to maintain tram services under all reasonably foreseeable conditions, albeit that some peripheral functions may be operating in degraded mode.

The Edinburgh Tram Network shall be configured such that in the event of single failure there shall be no loss of data and no requirement for excessive actions on the part of the Control Room staff.

Where there are connections or any exchange of data between subsystems, each system shall be such that any failure in another system shall not cause a failure of the system, (except in the functionality between the two systems concerned).

3.2 Operational Requirements

The supervisory, control and communication system shall enable compliance with the Requirements Specification for Overall System Operational and Performance Requirements and the System Wide Non Functional Requirements.

3.3 Sub-Systems

The supervisory, control and communication system shall comprise a number of sub-systems.

3.3.1 Tram Position and Detections System (TPDS)

The TPDS sub-system shall detect the location and position of trams anywhere on the Edinburgh Tram Network.

The TPDS sub-system shall be capable of accepting and processing the following information from each tram:

- Tram number
- Run number
- Destination
- Driver staff number
- Driver duty number
- Whether the tram is in service or not

This information shall be transmitted in real time to the Control Room from each tram. The tram driver shall input this information at the start of turn of duty and the system will then automatically update at the start of each trip.

TPDS shall provide data of tram positions such that the PID sub-system can be updated automatically in real-time. The PIDs shall display accurate information for both timetabled and untimetabled trams for which destination information is available, so that PIDs will display correctly even during periods of disruption.

On approach to a tram's destination, TPDS shall be capable of providing updates to the PIDS sub-system such that the tramstop PID can display the tram's next destination.

TPDS shall be able to automatically call for the setting of power points at junctions for the required route in advance of the tram approaching the junction. Once the points have been confirmed as being correctly 'set', an indication of such shall be given to the tram driver and Control Room operators. This functionality shall be based with the local point controller, being suitably protected from abuse, and not rely on communication between the remote location and the Control Room.

Where there is a tramstop on the approach to a signalled installation, then it shall detect a 'Ready-to-Start' signal operated by the driver of the tram from a cab control.

TPDS shall be interfaced with the urban traffic control system and provide information as to the approach of trams. This information shall be used by the local traffic signal controller to provide the agreed Tram junction priority. Tram priority at junctions shall be level 1. Where this priority level cannot be achieved level 2 shall be attained.

TPDS interfaces shall be compatible with the highway traffic-light system and shall enable the provision of visual indication to the drivers of trams of the ability to proceed or the need to stop.

At signalled road junctions where there is a divergent tramway junction ahead, TPDS shall detect which route the tram will take and may be required to provide such indication to the tram driver via an appropriate tram signal.

There shall be sufficient redundancy provided in the interface between TPDS and the UTC controller such that failure of one input and/or one output will not cause the interface to fail. As a guideline this should be of the order of 3 x tram approach inputs and 1 x departure input.

Additional signalling features in accordance with Good Industry Practice for safety enhancement and to achieve operational flexibility shall be provided where appropriate. Such features shall comply with the relevant signalling and signage standards.

At road junctions, provision shall be made so that in the event of failure of tram detection, the signal sequence may be initiated by a command from the Control Room through UTC to the local UTC interface.

3.3.2 Passenger Information Display System (PIDS)

Double-sided PIDs shall be provided on each tramstop platform. Such PIDs shall be mounted in such a way and position that restricts their vulnerability to vandalism and persons attempting to climb them.

Double-sided PIDs shall be provided at each park & ride site. Such PIDs shall be mounted in such a way and position that restricts their vulnerability to vandalism.

For each tramstop, 1 x PID shall be provided per platform face and shall be mounted in a suitable position such that it can be seen from within the shelter and from as much of the platform area as possible.

Additional PID's and signage shall be provided as appropriate at Edinburgh International Airport, Ocean Terminal and Haymarket.

Under normal and degraded modes of operation ('normal' and 'degraded' being defined in paragraph 1.5 of the Requirements Specification for Overall System Operational & Performance Requirements) the displays shall be updated automatically via data transmitted from the tram. Dependent upon system architecture the routing of such data communication may be from the tram via the Control Room equipment (for TPDS and PIDS) and then to the relevant tramstop PIDs rather than communicated directly from the tram to the relevant PIDs.

Provided that the next three tram service arrivals at a tramstop platform are expected within the ensuing 30 minute period, the PID for that platform shall display the destinations of these services and the expected number of minutes before their arrival.

PIDs shall be of a type and be sited so as to be legible to passengers in all reasonable prevailing lighting conditions.

PIDs shall be capable of allowing a limited selection of messages and free-form text to be displayed, at selected individual, selected groups or at all tramstops on command from the Control Room.

All PIDs shall display the current time using time source and format stated in the System-Wide Non-Functional Requirements.

3.3.3 Telephony

A telecommunications system shall be provided that allows communication with all internal Edinburgh Tram Network organisation members and external parties but not with trams.

All voice communications to and from the Control Room shall be recorded and played back.

Emergency telephone lines must be provided to allow contact with and from the following organisations regardless of any failure of the main PABX. Such facilities need not necessitate individual handsets but may consider a single handset (on the relevant operator workplaces) with priority displays and call buttons:

1. Fire Control Room
2. Police Control Room
3. Ambulance Control Room
4. Airport Control Room
5. Network Rail Edinburgh Waverley PSB
6. City of Edinburgh Urban Traffic Control
7. One other phone, the number to be used only by staff and others working near the Edinburgh Tram Network to report emergencies at worksites.

3.3.4 Public Address (PA)

A public address system shall be provided at each tramstop. Such equipment shall be mounted in such a way and position that restricts their vulnerability to vandalism.

The PA system shall enable the Control Room to provide audible information to passengers at selected individual, selected groups or at all tramstops. This facility shall be provided by:

1. the Operator selecting a pre-recorded announcement(s) from a library of such announcements.
2. the Operator directly making a voice announcement from the Control Room.

The PA system shall avoid noise carry and nuisance to any neighbouring properties whilst remaining audible on the platform concerned.

There shall be two volume settings for the PA system, one setting for daytime operation and one for night time operation. Such settings shall be pre-determined by time of day will automatically switch when those preset times are reached. These preset times shall be capable of amendment by the Operator and will be different for weekdays, Saturday and Sunday.

Volume settings shall be capable of being manually switched from the Control Room.

3.3.5 Operational Radio System (ORS)

A radio system shall provide a two-way communication enabling voice and data exchanges between the Control Room and

1. drivers on board individual or all trams
2. drivers of road and other support vehicles for the Edinburgh Tram Network. There may be up to 5 of these vehicles.
3. Individually or in groups with other mobile Edinburgh Tram Network operations staff using hand portable equipment along the Edinburgh Tram Network and in the Depot.

Communication shall be reliable, continuous and free from interference over the entire Edinburgh Tram Network.

Primary means of initiating radio calls to individual trams from the Control Room shall be achieved by mouse click(s) on the relevant tram represented on the TPDS display.

The attention of Control Room staff to a tram making a radio call to the Control Room shall be achieved by appropriate graphical and audible representations on both the TPDS and ORS HCI's.

All radio calls shall also be capable of being made and received via the ORS HCI.

All communications shall be via the Control Room. Direct calling between outstation radios is not required and shall not be available.

When an outstation wishes to call the Control Room, they shall insert a call request message. The Control Room will then call them back.

When the Control Room calls an outstation, the outstation radio shall "ring" and the outstation operator shall answer the call and speak first.

All outstation radios shall be equipped with an emergency call facility. When an emergency call is received at the Control Room, a distinct audible and visual alarm shall appear on the Control Room ORS HCI. It shall not be possible for a Control Room operator to cancel an emergency call without answering it.

The ORS shall be able to send 'short codes'. Such short codes can be sent to individual trams, groups of trams or to all trams and be configurable by the user's administrator. They shall consist of the following:

Status Message	Status Meaning	Control to Tram	Tram to Control
CHANGE	Change Active Unit ?		✓
ACK MESS	Status message acknowledge		✓
ACK CALL	Group Voice Call Acknowledge		✓
###-DEP	Departure from departure points, where ### is the three letter code for each departure tramstop. This feature may not be implemented.		✓
DELAY	Delay to Report		✓
FAULT	Defect to Report		✓
NEWCREW	Crew Change Complete		✓
HELP	Police Required		✓ (see note below)
EXIT	Depot Exit Request		✓
ENTRY	Depot Entry Request		✓
RELIEF	Crew Relief Request		✓
XO-DONE	Crossover / Turnback complete		✓
STABLED	Tram Stabled		✓
CREWGONE	Driver Leaving Tram – will report back		✓
ALL-STOP	Stop Immediately	✓	
STOPNEXT	Wait Next Stop	✓	
FIREMEN	Beware Fire Engines	✓	
FIREGONE	Fire Engines Clear	✓	

Notes:

1. the "HELP" code can also be sent from the hand portable and from the road vehicle radios.
2. The emergency call functionality may also require the use of short codes

There shall be at least 50% spare capacity for additional codes.

When the Control Room sends a single voice message to all trams and requests the tram drivers to acknowledge receipt, the radio system shall present a list of all trams and their status to the Control Room operator via the ORS HCI. The status shall be coloured to identify:

1. trams that have acknowledged the message, in green
2. trams that do not have active radios, in amber
3. trams that have not acknowledged the message in red.

This will enable the Control Room staff to identify any trams that have not acknowledged the call.

A similar arrangement shall apply to codes sent to trams.

The ORS shall record all voice communications and store such recordings at the Control Room in accordance with the System Wide Non Functional Requirements for data recording.

3.3.6 Passenger Help Points (PHP)

Clearly visible and signed PHPs shall be provided at each tramstop. Such equipment shall be mounted in such a way and position that restricts their vulnerability to vandalism.

Clearly visible and signed PHPs shall be provided at each park & ride site. Such equipment shall be mounted in such a way and position that restricts their vulnerability to vandalism.

PHPs shall be capable of being activated in two modes; normal and emergency. There shall be two buttons provided, one for each mode, and each clearly signed for their intended use.

Operation of a PHP by the 'emergency button' shall give an immediate indication and audible alarm presented to all Operator workplaces and the overview display at the Control Room. In addition it shall cause the relevant platform CCTV camera to focus on the PHP, overriding any sequential scanning for that camera.

The help point and operation of it shall be compliant with the prevailing Disability Discrimination Act.

The video image received during the period the camera is in the pre-set shot mode shall be continuously recorded together with time, date and location data.

The unit shall provide two-way speech facilities between the unit and the Control Room. Such voice communication shall be recorded by the CCTV sub-system and data stored in accordance with the System Wide Non Functional Requirements for data recording.

The Control Room operator shall be able to terminate the call, reset the alarm unit and override the camera controls. Once a PHP call has been cleared by the Operator, the CCTV camera shall return to its original position/sequence of scans unless the Operator has taken manual control of the camera.

3.3.7 Closed Circuit Television (CCTV)

CCTV camera(s) shall be provided at each tramstop platform and be able to pan and zoom both automatically within preset limits and under manual control. Such equipment shall be mounted in such a way and position that restricts their vulnerability to vandalism.

The CCTV surveillance system shall be of digital design.

All CCTV cameras shall be enclosed in domes to camouflage their position.

The CCTV system shall provide surveillance for ticket machines, shelters, buildings and other structures, the platform and their walking and access routes.

The CCTV system shall be provided at all park and ride sites and cover the cark park, paths to and from it, ticket vending machines, PHPs, shelters, buildings and other structures. It shall provide such CCTV to the same standard as that specified above in relation to tramstops.

At park & ride sites, a CCTV camera shall be positioned at the vehicular entrance/exit point such that clear images of vehicles and their registration plates can be displayed and recorded.

The CCTV surveillance system shall comprise colour cameras and all associated equipment to permit the remote viewing and recording of video images in real time 24 hours/day, 365 days/year.

CCTV recorded images and printed images shall comply with Home Office guidelines (or Scottish equivalent) and provides clear undistorted colour video images over the

entire operating range under all lighting and weather conditions, with image quality sufficient for unambiguous identification of persons for prosecution purposes.

The CCTV system shall support the facility to review recorded images, freeze frame, Rugby date and time stamp, any view and provide printed images of incidents without interruption to continuous CCTV surveillance operation.

The CCTV system shall provide for no-dwell zones to inhibit panning into neighbouring properties.

Stored viewing patterns shall be provided for each of the two banks of CCTV displays provided in the Control Room. Viewing patterns shall be capable of creation, amendment or deletion by the Edinburgh Tram Network operator/maintainer.

The CCTV system shall automatically position and zoom-in if the PHP is activated. Upon such activation the CCTV system shall record both CCTV images and the voice communication of the PHP unit.

The CCTV system shall be compatible with and allow image transfer to/from the UTC room and the local Police system.

3.3.8 Supervisory Collection and Data Acquisition System (SCADA)

A SCADA system shall be provided that will provide the HCI to monitor and control the Edinburgh Tram Network's traction power system and monitor and log data relating to Edinburgh Tram Network equipment.

The SCADA system shall be located in the equipment room of the Depot and be connected to remote equipment by a suitable communications medium.

3.3.8.1 Traction Power

The SCADA sub-system shall permit the controller to isolate and/or earth any section of the traction power system by making a minimal number of mouse clicks, or equivalent, from the SCADA HCI power diagram.

The SCADA sub-system shall monitor the status of the traction power system.

If abnormal conditions/events occur they shall be detected by the SCADA sub-system and transmitted to the Control Room in the form of an alert.

Alerts received at the Control Room shall be filtered, grouped and prioritised with only those that require Control Room staff action being indicated on the SCADA HCI in the Control Room.

All alerts shall be targeted to a particular user/group of users and have a nomenclature that is unambiguous and easy to comprehend by that user.

The SCADA sub-system shall permit the controller to remotely control motorised isolators from the SCADA HCI power diagram.

The SCADA sub-system shall permit the controller to open individual circuit breakers by making no more than one or two mouse clicks, or equivalent, from the SCADA HCI power diagram.

Closing of an individual circuit breaker or isolator to render the equipment 'live' shall require at least three mouse clicks in different places on the SCADA HCI power diagram.

The Operator shall be able to isolate and earth all electrical sections between adjacent sub-stations or between a sub-station and the end of the Edinburgh Tram Network route by making no more than two mouse clicks, or equivalent, from the SCADA HCI power diagram. This operation will initiate a sequence of switching operations, the progress and completion of which shall be indicated to the Operator

via the SCADA HCI power diagram. Should any operation in this sequence 'time out' or fail an visual and audible alarm shall be generated to the Operator and the sequence be suspended by the system.

Switching sequences shall be able to be created, edited and deleted by the system administrator.

The current status of the traction power system shall be displayed to the controller at all times.

All events within the traction power system shall be logged and be able to be retrieved for analysis.

3.3.8.2 Tramway Equipment

The SCADA sub-system shall monitor and log the events of all Edinburgh Tram Network equipment connected via the chosen communications medium. Equipment to be monitored and logged shall include:

- Tram position & detection devices
- ORS
- PHPs
- TEL
- Voice recording devices
- Point control equipment
- Point heating equipment
- Tram signals
- Point indicators
- Trackside cabinets/housings
- TRTS
- Point detection
- UPS (if supplied)
- All communications bearer systems
- PIDs
- CCTV cameras
- CCTV recording devices
- Public address system
- Equipment room HVAC devices
- Depot sand hopper levels
- Automated TV Ms
- UTC interface
- Tramstop cabinets/housings
- Tramstop lighting
- Power sub-stations

The SCADA sub-system shall provide spare capacity for at least 10% of additional alarms to be connected to the system. Configuration of such alarms shall be undertaken by the Edinburgh Tram Network's operations/maintenance personnel.

Alerts received at the Control Room shall be filtered, grouped and prioritised with only those that require Control Room staff action being indicated on the SCADA HCI in the Control Room.

All alerts shall be targeted to a particular user/group of users and have a nomenclature that is unambiguous and easy to comprehend by that user.

3.3.9 Fare Collection System

Fare collection and ticket issuing for the Edinburgh Tramway shall be effected through the provision of automatic TVMs

The system shall be configured such that in the event of single failure there shall be no loss of data and no requirement for excessive actions on the part of the Control Room staff.

Where there are connections or any exchange of data between subsystems, each system shall be such that any failure in another system shall not cause a failure of the system.

3.3.9.1 Automated Ticket Vending Machine (TVM)

TVMs shall have a proven record of successful use (defined as greater than 99% operational availability) in a similar environment and be capable of interfacing to the SCADA system used on the Edinburgh Tram Network.

One automated TVM shall be provided on each tramstop platform and wherever practicable shall be integrated into the tramstop shelter.

TVMs shall permit the user to select the type of ticket required and tender the relevant fare in as simple as possible manner. To achieve this they shall have an easily understood sequence of events to obtain a ticket and tender fare that is clearly displayed to the user.

Automated TVMs shall:

- accept UK coins of no less value than 5 pence and all UK bank notes, including all Scottish bank notes.
- accept all major credit/debit cards.
- be capable of easy conversion to Euro currency
- give correct change in the fewest number of coins/notes permissible
- have sufficient ticket, cash box and change capacity to carry out all normal transactions daily
- Once fare has been tendered successfully the TVM shall print the ticket and make it available to the user via an appropriate output means.

TVMs shall communicate reliably and effectively with the Edinburgh Tram Network's SCADA system. It is an objective that cabling for power and telecommunications is kept to a minimum. To achieve this alternative means of transmitting data from the TVM's to the SCADA system shall be considered. These may include internet or wireless technologies.

TVMs shall be weatherproof and vandal resistant, in particular with respect to maintaining clarity of display of the human-computer interface, under all reasonable lighting conditions.

TVMs shall conform to the power design of the Edinburgh Tram Network, in terms of EMC, standards, consumption and earthing.

3.4 Control Room

The Control Room shall be located at the Depot. It shall have access to/from the main administration and support offices located at the Depot.

The Control Room shall provide Control Room staff and especially the shift controller and duty manager with clear visibility of the entrance and exit tracks and associated

infrastructure of the Depot complex with the main tramway and at least one end of Depot shed tracks and stabling apron tracks.

3.4.1 Staffing Levels

The Control Room shall be designed to provide sufficient and effective area for the following operations personnel.

3.4.1.1 Duty Manager

The duty manager is responsible for overall control of the Edinburgh Tram Network and the safety of its operation.

The duty manager is also required to be present to 'book' tram-crew on and off duty.

3.4.1.2 Shift Controller

The shift controller is responsible for the minute by minute operation of the Edinburgh Tram Network ensuring service perturbations risks are minimised and tram-crew are aware of the current state of the Edinburgh Tram Network.

3.4.1.3 Information & Security Supervisor

The information & security supervisor provides support to the duty manager and shift controller by monitoring the positions of trams, monitoring and editing of PIDs, monitoring of CCTV and PHPs. This post will also take the primary role in ensuring passenger information and security.

3.4.1.4 Support

The Control Room will also need to allow for the provision of a support post to the information & security supervisor under certain perturbed situations.

3.4.2 Facilities

The duty manager is required to 'book' tram-crew on/off duty and needs to physically see crew before they take their turn of duty in order to be convinced that they are in an appropriate condition to commence duty. The Control Room shall provide for this without the need for tram-crew to enter the Control Room.

A diagrammatic representation of the Edinburgh Tram Network shall be provided in the Control Room that is clearly visible to all Control Room personnel. Such representation, which may take the form of a plasma type display, shall be capable of displaying the same views as stated in paragraph 3.4.5.1.1 herein.

A means of displaying replays of recorded CCTV surveillance images and voice recordings from the ORS and/or TEL sub-systems shall be provided in the Control Room and one of the Depot meeting rooms.

Sufficient printing and facsimile services shall be provided to maintain effective operations.

3.4.3 Systems

HCIs to the following sub-systems and grouping shall be provided in the Control Room:

Group	Sub-system within the Group
1	TPDS - Tram Position and Detection System
	PCC - Point Control System
	PHC – Point Heating System Alarms/Alerts
	PIDS - Passenger Information Display System (at Tramstops/Park & Ride Sites)
	UTC - Urban Traffic Control (interface to Highways Traffic Signals and Control)
	+ link to ORS to initiate radio call to tram from TPDS display
2	TEL - Telephony System
	PA - Public Address System (at Tramstops/Park & Ride Sites)
	PHP - Passenger Help Points (at Tramstops/Park & Ride Sites)
	+ link to CCTV when CCTV sub-system detects PHP activated
3	ORS - Operational Voice Radio Communications (Control to/from Tram and portable handsets)
4	CCTV - Closed Circuit Television Surveillance
	+ link to PHP sub-system when PHP is detected as being activated
5	SCADA – both traction power and auxillary SCADA high priority alarms/indications

Complete integration of all sub-systems is not required. Moreover, grouping of sub-systems or part thereof shall be provided and displayed via an appropriate HCI to the relevant operator position as defined in paragraph 3.4.5.

Operator access and security to relevant systems and parts thereof shall be governed by passwords/logons.

3.4.4 Example Configuration

An example configuration of the Control Room layout showing staffing and system HCIs is included below:

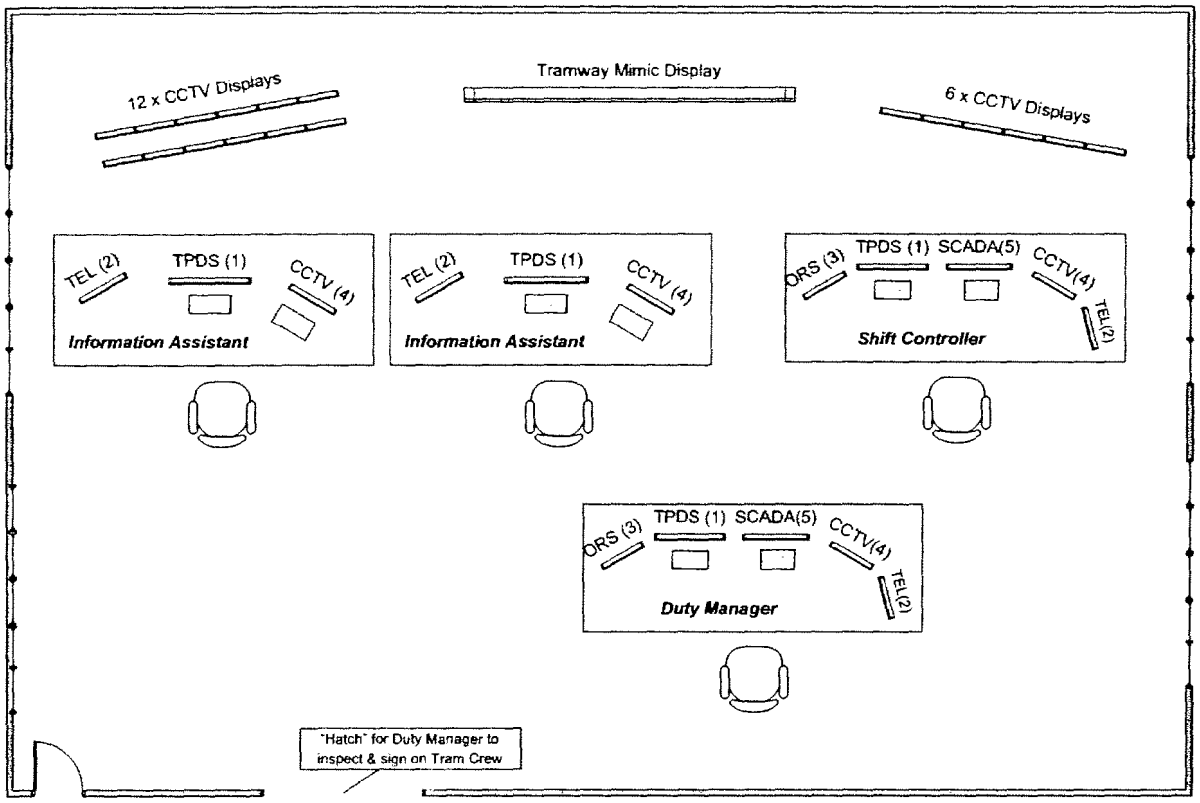


Figure 1 - Numbers in bracket represent HCI Groupings stated in section 1.3.3

3.4.5 Operator Workplaces

All operator workplaces shall be of similar design to maintain the aesthetics of the Control Room.

3.4.5.1 Duty Manager

The duty manager's work place shall be located such that he can clearly see and interact with all the operations of the Control Room.

The duty manager's workplace shall provide:

3.4.5.1.1 TPDS

There shall be a display, mouse and keyboard for interaction with TPDS to:

1. View the current state of the infrastructure
2. View the current position of trams
3. View the punctuality of trams on the Edinburgh Tram Network
4. View and acknowledge all alerts and alarms
5. Input a tram signal demand via the UTC system
6. Allow the updating of the PIDS sub-system with adhoc or pre-programmed suite of text messages.
7. Initiate a radio call to a tram via the ORS by mouse click on the appropriate tram represented on the display.

The keyboard shall be retractable when not in use.

3.4.5.1.2 SCADA

There shall be a display, mouse and keyboard for interaction with the SCADA sub-system to:

1. Provide full access to command and monitor the traction power sub-system.
2. Command the heating of points in the event of the thermostatic control failing
3. Provide indication of restricted alarms sets from remotely located infrastructure and ticketing equipment.

The keyboard shall be retractable when not in use.

3.4.5.1.3 ORS

There shall be touch screen interface to the ORS that permits:

1. Initiation/receipt of radio calls to any/all tram(s) and other vehicles fitted with ORS.
2. Initiation/receipt of radio calls to any/all portable radio handsets.
3. Initiation/receipt of radio calls to any/all PA and PHP devices.
4. Provides audible and visual alarms for emergency radio calls received. Such alarms shall be displayed so as to clearly differentiate between normal events and emergency events.
5. Use of 'short radio codes'.

3.4.5.1.4 CCTV

There shall be a display and console for the selection and monitoring of CCTV images from remotely located cameras.

This display and console shall automatically display the image of the location where a PHP is detected to have been activated.

This console shall be able to select those images that are required to be displayed on any CCTV display in the Control Room. Priority of selection shall be governed by the Edinburgh Tram Network operating procedures.

3.4.5.1.5 TEL

There shall be a touch screen interface to the TEL, (and PA and PHP sub-systems if not provided for by ORS voice radio) that provides for:

1. Initiation/receipt of telephone calls to any/all users on the exchange provided.
2. Priority and high integrity Initiation/receipt of telephone calls to/from emergency services.
3. Audible and visual alarms for PHP calls received.
4. Making of public address announcements at individual, grouped or all tramstops and/or park & ride sites.

3.4.5.2 Shift Controller

The operator workplace provided for the shift controller shall be a complete replica of that provided for the duty manager.

In addition the shift controller shall be given clear visibility of the mimic display and the bank of 6 CCTV displays located at the front of the Control Room.

3.4.5.3 Information & Security Supervisor

The information & security supervisor workplace shall provide HCI for:

3.4.5.3.1 TPDS

There shall be a display, mouse and keyboard for monitoring of:

1. View the current state of the infrastructure
2. View the current position of trams
3. View the punctuality of trams on the Edinburgh Tram Network
4. Allow the updating of the PIDS with adhoc or pre-programmed suite of text messages.
5. Initiate a radio call to a tram via the ORS by mouse click on the appropriate tram represented on the display.

The keyboard shall be retractable when not in use.

3.4.5.3.2 CCTV

There shall be a display and console for the selection and monitoring of CCTV images from remotely located cameras.

This display and console shall automatically display the image of the location where a PHP is detected to have been activated.

This console shall be able to select those images that are required to be displayed on a predetermined 10 display of the bank of 12 displays at the front on the Control Room near this workplace and that of the support workplace.

3.4.5.3.3 TEL

There shall be a touch screen interface to the TEL, (and PA and PHP sub-systems if not provided for by ORS voice radio) that provides for:

1. Initiation/receipt of telephone calls to any/all users on the exchange provided.
2. Initiation/receipt of priority telephone calls to/from emergency services.
3. Audible and visual alarms for PHP calls received.
4. Making of PA announcements at individual, grouped or all tramstops and/or park & ride sites.

3.4.5.4 Support

The operator workplace provided for the support post shall be a complete replica of that provided for the information & security supervisor.

The support post shall have clear visibility to the bank of 12 CCTV displays provided for the information & security supervisor. The support post shall via desktop console be able to select at will 3 CCTV images to be displayed on these displays.

3.5 Equipment Room

3.5.1 Facilities

The equipment room shall be located as close to the Control Room as reasonable practicable.

The equipment room shall provide HVAC, lighting, power and other buildings services to provide effective habitation for the centralised terminals of all subsystems deployed upon the Edinburgh Tram Network and the HCIs thereof.

The equipment room shall provide HVAC, lighting and other buildings services to provide effective habitation for those people required to access the HCIs of the Edinburgh Tram Network sub-systems located in the equipment room.

Appropriate facilities shall be provided to mitigate, detect and extinguish risks associated with the outbreak of fire.

An appropriate means of facilitating uninterrupted data and voice communication between the equipment room and Control Room shall be provided for those sub-systems that are present at the operator workplaces, mimic diagrams, display banks and any emergency override facilities.

3.5.2 Systems

'Head end' components of the following sub-systems shall be present in the equipment room:

- TPDS
- ORS
- PHPs
- TEL
- Voice recording devices
- Point control equipment
- Point heating equipment
- SCADA
- All communications bearer systems
- PID
- CCTV surveillance
- CCTV recording devices
- Public address system
- Automated ticket vending
- UTC interface

3.5.3 Workplaces

Workplaces in the equipment room shall be of similar design to their equivalents in the Control Room but their users shall require a greater level of more detailed access. Such access shall be governed by password and user groups membership.

The following workplaces shall be present in the equipment room:

1. Display, mouse and keyboard for interaction with TPDS and PIDS sub-systems, the ORS sub-system and the UTC sub-system.
2. Touch screen interface to the TEL, PA, and PHP sub-systems
3. Touch screen interface to the ORS sub-system

4. Displays and console for the selection and monitoring of CCTV images from remotely located cameras.
5. Display, mouse and keyboard for interaction with the SCADA sub-system.
6. HCI(s) for the purpose of archiving and retrieving logged data

3.6 Tramstop Equipment

The architecture of the system shall ensure that, in general, all equipment associated with vehicle detection, relays, interlocking, point heating and point control, shall be situated in apparatus cabinets at the appropriate tramstops or point locations.

The minimum equipment level for any tramstop will be:

- 1 x CCTV camera per platform
- 1 x PA per platform
- 1 x PID per platform
- 1 x PHP per platform
- 1 x automated TVM per platform

Additional CCTV and PHP shall be provided where adequate security cannot be provided by the minimum equipment level.

Wherever practicable, equipment associated with the operation and control of PA, PID, PHPs and automated TVM shall be integrated into the design of the tramstop's passenger waiting shelter. Associated tail cables/other connections shall be sourced from sub-surface, prefabricated housings of materials such 'aqueduct'.

3.7 Trackside Equipment

The minimum amount of equipment shall be mounted at the trackside.

3.7.1 Equipment Cabinets & Housings

Separate cabinets/housings shall be provided for point control and/or point heating equipment. Such cabinets/housings shall be discretely located as close to the associated points as practicable.

Sub-surface, prefabricated housings of materials such 'aqueduct' shall be considered for use in housing trackside equipment such as point controllers and point heating controllers.

Trackside cabinets/housings shall provide the appropriate HVAC conditions that will ensure continuous operation of those sub-systems therein.

3.7.2 Communications Transmission

An integrated communications infrastructure shall be provided that is suitable for the satisfactory transfer of all data, telephone and other signals required for controlling, monitoring and communicating with equipment distributed throughout the Edinburgh Tram Network.

Wherever practicable, communication between two or more items of trackside equipment and from trackside equipment to the Control Room shall be by such means that permits minimal trackside cabling and an acceptable level of system integrity.

The schematic below provides an indication of the communication channels required:

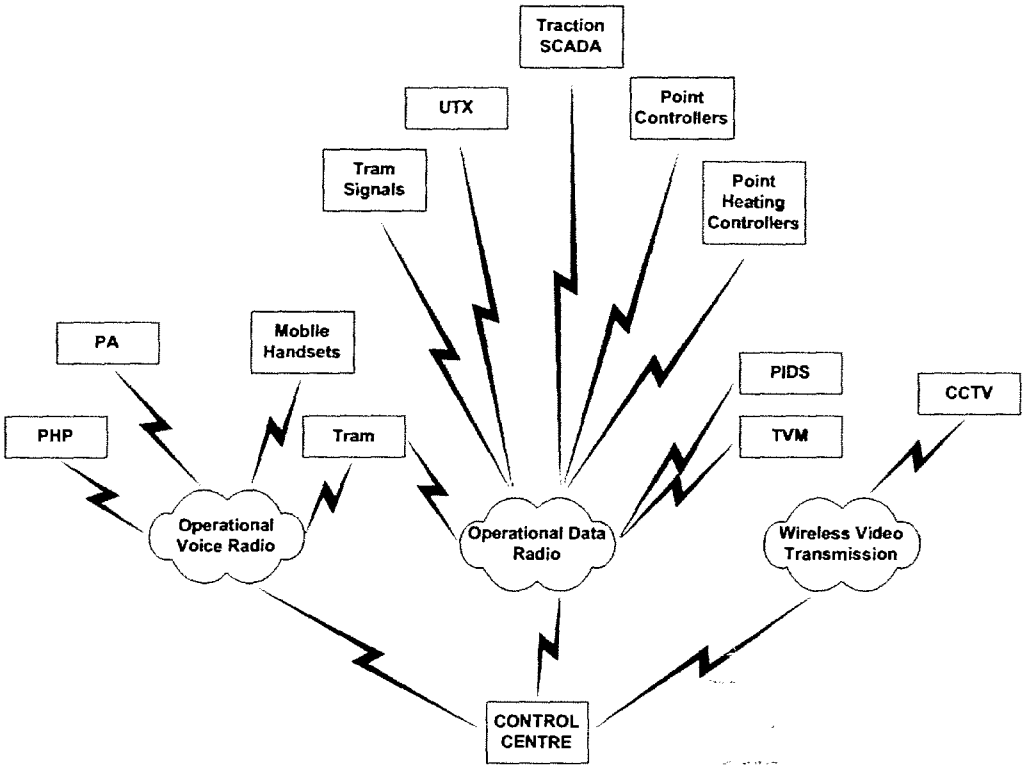


Figure 2 : Example Telecommunications Configuration

The communications bearer and associated electronic equipment shall be configured so as to provide automatic re-routing in the event of failures such that any loss of facility is confined to that given locality and does not affect the operation of the transmission system and facilities at any other location.

3.7.3 Points & Crossovers

3.7.3.1 Route Setting

Point controllers shall command powered point machines to be activated when valid data is received from an approaching tram.

There shall be a fallback mode for all junctions. The parameters of this will be agreed with **tie.**

Powered points shall not be able be activated whilst a tram is occupying the switching zone or by a following tram until the rear bogie of a preceding tram is clear of the moveable point blades.

Points situated within the highway shall not move until the approaching tram is in sufficiently close proximity to the switch blades so as to deter pedestrians from being on the switches.

All powered points shall be detected and have point indicators fitted at a suitable position at the trackside.

All point indicators shall be of Yellow Bar LED design.

The tram driver shall be able to clearly observe point indicators, where provided, and be able to stop before the points if they fail to respond to a command. Location of point indicators will require agreement with the Edinburgh Tram Network operator and HMRI.

Composite alarm circuits to detect any faulty operation or failure of the separate components of point control packages shall be provided and initiate an alarm to the Control Room.

3.7.3.2 Point Heating

All powered points and emergency crossovers shown on the Edinburgh Tram Network diagram (as defined in the Requirements Specification for Overall System Operational & Performance Requirements) shall have heating mechanisms to prevent failure to operate during cold, snowy and icy weather conditions.

Points heating mechanisms shall activate automatically by sensing that a predetermined temperature has been reached.

Point heating control mechanisms shall have the facility to be activated upon command from the Control Room.

3.7.4 Signals

All tramway signals shall be of LED design.

Position of tramway signals shall be agreed with **tie**.

3.7.5 Power Supplies

A suitable power supply shall be provided in the equipment room at the Control Room that ensures that all equipment necessary to the continuing smooth operation of the Control Room can operate uninterrupted.

A dual supply changeover arrangement, with high integrity circuit breakers is preferred to a single large UPS. The power changeover function shall not itself cause the failure of any systems so powered, the loss of information or an interruption to the availability to any sub-system for more than 20 seconds.

Equipment connected directly to the running rails (e.g. point mechanisms) shall have insulation between rail and that equipment to prevent the flow of traction return current.

3.7.6 Cables

Trackside cabling shall be kept to minimal levels and alternative means of data transmission and power distribution considered. This could include radio communication for operational equipment with retail equipment such as TVMs communicating via internet or mobile phone links.

In all cases of installation, cables shall be protected from damage and view throughout their entire length by the use of appropriate ducting.

3.8 Tram Borne Supervisory, Control & Communication Equipment

3.8.1 Tram Position & Detection System (TPDS)

The tram shall carry such equipment that permits the following data to be input, gathered and transmitted between the vehicle and the Control Room:

- Tram position and which cab is in use
- Tram number
- Run number (unit diagram number)
- Service destination

- Driver number
- Driver duty number
- Whether tram is in/out of service

The tram shall initiate such message(s) that inform the Control Room and enable the updating of the PID sub-system of its destination.

3.8.2 Operational Radio System (ORS)

Nomenclature for tram radio call signs shall be the same as the vehicle number.

All voice communications involving the tram driver shall be via a handsfree method so as to minimise distraction of the driver from his driving responsibilities.

In the event that an on-board PHP is activated and the tram driver is involved in a radio call, the radio call shall not be interrupted. An alert of the help point activation shall be indicated to the tram driver.

The tram shall carry a mobile radio handset which includes both a microphone and an earpiece. This can be used in the event that the normal handsfree method of communication becomes unavailable or impractical – for example when the radio call is of a sensitive nature to those who may overhear it.

Where the tram driver instigates an on-board public address, this shall take precedence over any incoming radio calls received during the duration of public address. All radio calls received during this time shall be clearly indicated to the driver at the time of receipt.

When the tram is required to change direction of travel; e.g. after arrival at a terminus, the tram driver shall not be required to make any input to the ORS sub-system as he takes up occupation of the 'now leading' cab.

[redacted]

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TIE LIMITED

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This is the Schedule 14 referred to in the foregoing Agreement between the Client and the SDS Provider

Requirements Specification for

Electrification & Power

Contents : Schedule 14

4 ELECTRIFICATION & POWER REQUIREMENTS

4.1 General

The traction power supply system shall be a 750V or 1500V nominal DC system, fed through overhead contact wire and with traction return through the running rails.

The appearance of the finished overhead contact wire system (OLE) is of paramount importance and will receive detailed consideration through the planning approval process.

4.2 Traction Power Supply System

4.2.1 Modelling and Capacity

The full input parameters for the traction system modelling shall be agreed by **tie** in advance. Parameters should be chosen conservatively, but not so that in combination an unrealistically severe combination of parameters arises. The system shall be designed to support:

1. the peak service pattern,
2. the assumed rail, track construction, bonding, OLE and any parallel feeding arrangements,
3. trams of 40m nominal length,
4. all trams at AW2 loading, and with full auxiliary electrical loading,
5. service disruption, simulated by an appropriate means e.g. by an additional load drawn by each tram,
6. capacity for system expansion (see paragraph 4.2.3)
7. no spurious circuit breaker trips, and
8. any one substation in bypass for an indefinite period.

Only substation locations identified by tie may be used for the simulation and design.

As part of the traction power system design, an integrated holistic approach shall be taken with other subsystems including the OLE and the track and bonding details.

4.2.2 Electrical System Design

The electrical system design shall include the preparation of the protection scheme and the calculation of settings for the protection arrangements at each substation while supporting the traction supply to the requirements included in Section 4.2.1.

The normal OLE feeding arrangement shall be double end feeding to each section between substations. Inter-tripping arrangements are therefore required. Cascade tripping resulting from a single fault shall be avoided.

Accessible voltages shall be demonstrated to achieve the relevant EN and HMRI requirements under fault conditions and/or conditions of service disruption.

4.2.3 Capacity for System Expansion

The traction power supply network design shall support any potential Line 3 service over the common section of route. If certain equipment can be omitted from the initial scheme, being only required for the enhanced services to be operated over the common section, then this may be omitted for the initial supply, but the buildings shall

accommodate its future introduction and it shall be able to be installed and commissioned without disruption to normal service.

In addition the E & P design shall accommodate increase in service to 12 services per peak hour per route as described in the Requirements Specification for Overall System Operational & Performance Requirements.

4.2.4 Depot Traction Supply

The Depot site tracks, including those in the vehicle workshop, shall be electrically insulated from the main line, and tied to a common earthing system for the whole Depot site. The location of the IBJs is to be selected taking into account the operational, track layout and OLE requirements.

The Depot traction supply shall be drawn from the main line when the Depot traction substation is not available. This reconfiguration shall be able to be implemented via SCADA.

A foreseeable single failure in the High Voltage supply to the Depot substation shall not result in an interruption to either the Depot traction or to any of the Depot ancillary supply of more than 5 minutes, with no requirement for manual switching.

4.3 Substations

4.3.1 Substations Requirements and Facilities

Detailed interface requirements for the sub-station shall be provided such that a finished building suitable for immediate installation of the electrical equipment and cabling is achieved. This shall include surface finishing and level tolerances in particular. The substation floor and walls shall be sealed to control dust generation.

Underground substations shall not be provided unless proven absolutely necessary. However, where substations are underground, all necessary ventilation, drainage, access and egress requirements shall be provided.

Ventilation shall be provided to ensure both the system performance in hot weather and that the equipment does not suffer from dampness, dust and condensation in cold weather. Forced ventilation can be provided, and thermostatically controlled background heating is required.

The layout of and access arrangements to all substations, particularly the Depot substation, must be accepted by **tie**. This shall facilitate effective training and certification of maintenance staff being implemented. Sufficient access shall be provided to all substations such that the largest component can be replaced without dismantling any of the substation structure.

An appropriate locking system for access doors shall be provided. An intruder system shall be provided that is activated by door contacts and when so activated shall provide an alert to the Control Room via SCADA.

Internal emergency lighting shall be provided and adequate external lighting for access and egress.

All substations shall have the ability to connect an external generator via socket and plug and an interlocked isolator. This shall provide all 400V AC services inside the substation to facilitate maintenance and fault investigation.

The substation building layout should include space for the inclusion of an energy storage device (see also paragraph 4.3.4 below).

All substation equipment shall be of low flammability in order to ensure that fire suppression is not required. Fire detection shall be provided and indicated in the Control Room by SCADA.

4.3.2 Incoming DNO Supplies

The integrity of the incoming DNO supplies to the substations shall be considered at part of their siting. It is important that adjacent substations are not fed from the same ring mains.

4.3.3 Flywheel energy storage

An option for the inclusion of flywheel energy storage at substations shall be considered. This should be addressed as a marginal cost on the scope of supply and a prediction of the energy saved from a separate power supply model.

4.4 Overhead Line Equipment (OLE)

4.4.1 General Requirements

Appearance of the OLE is of paramount importance throughout the Edinburgh Tram Network. The appearance must be appropriate to the location and visual intrusion shall be minimised. The visual appearance may need to include the contact wire stagger in certain areas.

The type of equipment selected (including e.g. auto-tensioned; fixed termination; catenary support; central mast with balanced bracket arms; side masts with cantilever arms; span wire construction etc.) over each section of the route must be appropriate to the area and to the tramway operating speed requirement in that location. The use of building fixings shall be maximised.

Where poles supports are provided, the shape and colour shall be considered as part of the visual approach. It is not necessary to minimise the total number of poles but rather to minimise their overall visual impact.

Consideration shall be given to individual replacement by poles in future, should building alterations require their removal on a temporary or permanent basis.

4.4.2 OLE Components

The use of twin contact wires is not permitted. Where necessary, buried parallel feeders may be considered as part of the traction power system network design. On certain sections of the route, aerial parallel insulated feeders may be considered.

Care shall be taken in specifying the standard components from which the overall OLE system will be assembled.

The part of the OLE that must be considered as 'live' should be minimised, with particular reference to minimising the impact on third-party maintenance alongside the route. The area considered as 'live' should preferably not exceed the width of the DKE of the pantograph head.

If 'parafil' or an equivalent material is to be used as part of the standard components, rigorous quality control measures for its installations shall be ensured.

Particular care shall be taken with the design for minimum visual impact of the parallel bonding between the contact wires, and of the feeder cabling from trackside isolators and at substations. Similarly, particular care must be taken with the overall visual impact and vandal-resistance of balance weight installations, where these are used.

The appearance around the base of support poles will also be of importance in certain areas. Consideration also needs to be given to the ease of replacement of poles if damaged by e.g. errant road vehicles.

4.4.3 Electrical Sectioning and DC Feeding Arrangements

The E & P system shall have both adjacent overhead lines in the same electrical section such that any outage will sever the system. Consequently most substations will only require two DCCBs and a bypass isolator. Line proving shall be a standard feature on all DCCBs.

Electrical sectioning of the overhead line shall be designed taking full account of the following criteria.

- It shall permit sectional energisation refer to the System Wide Non-Functional Requirements while allowing subsequent adjacent sections to be erected with minimum disruption to the energised sections.
- Electrical sections shall be such that crossovers and turnbacks can be used to turn trams with the overhead line isolated on the side of the crossover that is furthest from the city centre.
- Where trams are to be reversed, for instance at a crossover, the section insulators shall be placed to allow two coupled 40m nominal length cars to be reversed (e.g. in a recovery situation).
- Where there are centre platforms, the OLE should be able to be isolated and earthed in the centre platform, with trams able to run through the tramstop on the outer two lines. Also, when the OLE is isolated on one side of the tramstop, trams should be able to operate from the opposite side of the tramstop and turn back in the centre platform. This could be achieved with a changeover switch.
- At a terminus, either platform should be able to be isolated and earthed by the operation of manual isolators.

4.4.4 Section Insulators

Section insulators shall in general be non-gapping (make before break) and shall not require trams to coast through them. They should be positioned on straight track where possible and at a point where current flowing to or from the tram is normally low.

However, section insulators which isolate the overhead line in workshop tracks shall be gapping, so that even if a tram enters a dead section, the dead section is not rendered live by the passage of the pantograph.

4.4.5 Wire Height and Gradient

Generally, the wire shall be as high as practicable to:

- Mitigate HMRI's requirement for minimum wire heights where a support has failed.
- Reduce the risk of contact with wires from over height road vehicles, window cleaners carrying ladders and any third party work.

Contact wire gradients adopted must take account of the expected tram operating speed in the area and an appropriate standard for the installation.

4.4.6 Pantograph

The tram pantograph sub-system shall be supplied as part of the OLE scope of supply for free-issue to the tram manufacturer.

The pantograph must be able to be raised manually when the tram battery is discharged. It is expected that the pantograph will in principle be of the 'power up/ spring down' type.

4.4.7 Integration with Street Lighting

It is expected that on certain sections of route, an integrated design of OLE poles and streetlighting will be required. This should seek to optimise the spacing of support poles and minimise visual intrusion. An appropriate electrical feeding and earthing scheme must be developed and approved by HMRI. This should minimise the additional components required to be attached to support poles and take account of the maintenance approach to be adopted for the street lighting.

4.4.8 Depot

OLE sectioning shall allow maintenance tasks e.g. on washer without disruption to other operations.

Adequate traction power supply for whole fleet stabled overnight and individual tram movements shall be provided.

4.4.8.1 OLE in Maintenance Workshop

Each maintenance berth shall be capable of being isolated separately.

Live line status indication shall be provided for:

1. For tram drivers, standard LRT signals outside doors to each wired part of vehicle workshop, showing STOP when line dead and PROCEED when line live.
2. For staff in the shed, Red (live or dead but not earthed) / Green (earthed) indicators at each berth. Should be visible from as much of the shed as possible, from the rolling stock office and (preferably) from the window from the Control Room into the vehicle workshop.

Vehicle workshop OLE shall be high (partly for safety, partly because it facilitates pantograph set-up).

4.4.8.2 Safety Interlocking system

A safety interlocking system shall be provided that is essentially mechanical key system that shall prevent:

1. Access to a tram roof when the OLE above it is not earthed, either by preventing access to the gantry or by preventing access from gantry to tram.
2. Use of overhead crane where there is a conflict with live OLE;
3. Use of overhead crane where it would run into a tram on jacks.

If there is tram roof equipment near the ends, such that a person working on it is at risk of falling off the end, end gates to high level shall be provided and interlocked such that OLE cannot be live whilst a gate is across.

4.5 Control and Monitoring

4.5.1 SCADA

All circuit breakers shall normally be remotely controlled by the SCADA system, but may also be locally controlled at the substations.

All isolators outside the Depot shall be operated remotely by SCADA and shall provide indications to the Control Room through SCADA.

4.5.2 High integrity emergency isolation system

This system is separate from the SCADA system and shall have no common failure modes with the SCADA system. The Control room shall have the facility to initiate an isolation (not earthing) of all of the overhead line sections by opening the associated DCCBs for:

1. The Depot only, and
2. All other overhead line sections.

4.5.3 Traction Power Supply Isolators

All isolators outside the Depot shall be motorised. Isolators shall generally have three positions, with the common pole connected to the overhead line. The positions are:

1. **Normal** - connecting overhead line to feeder
2. **Earth** - connecting overhead line to rail
3. **Bypass** - connecting overhead line to bypass position on the adjacent isolator at the substation concerned.

The position shall be indicated locally (physically) at the isolator, as well as remotely in the Control Room via SCADA.

Isolators shall be easily locked in the earth position to provide safe isolation of the OLE.

Isolators shall be able to be hand wound whilst maintaining interlocking with DC supply.

In trackside cabinets, the relative positions of the individual isolators are to be geographically consistent with the electrical sections being switched.

All isolators in the Depot shall be manually operated, with two positions, closed to feeder and closed to earth.

4.6 Auxiliary Supplies

4.6.1 Tramstops

A standard approach to the supply of auxiliary power to tramstop locations shall be adopted. This approach shall meet the following criteria:

- The integrity of the supply shall be appropriate to the equipment being powered, and to the overall architecture of the network systems including communications, tramstop equipment, and tram signalling and point control equipment.
- The standard scheme needs to take account of the standard equipment to be provided at every tramstop, and the specific additional needs at certain individual tramstops, including those with three platforms rather than two.
- An element of additional supply shall be provided at each tramstop for future additional provisions.
- Provision for a socket for cleaning equipment shall be included.
- Provision shall be made to feed the auxiliary supply locally by an external supply (e.g. a generator) via plug/socket and isolator).
- Take consideration of the cost of supplying power to tramstops overall.
- Size and shape of the equipment cabinet at the tramstop, including the other equipment required as well as the power supply.

- The integration of the equipment enclosure into the overall tramstop design, which may be by integration into a standard shelter 'kit of parts' or could be placed under the surface of the platform.
- Avoidance of bulky enclosures is required and an overall scheme without a UPS at each tramstop is essential.
- If higher integrity supplies are required, then consideration should be given to feeding from the nearest substations; possibly from the substation in each direction with an automatic changeover switch in case of failure of one or other supply.

Also refer to Requirements Specification for Civil Engineering Works, Requirements Specification for Supervision, Command and Control Suite of Systems and System Wide Non Functional Requirements.

4.6.2 Along the line

All auxiliary supplies to equipment alongside the track shall be specified, with appropriate supplies to the nature of equipment. This may be expected to include 400V AC supplies if necessary to supply any lifts and point heating equipment.

4.6.3 Street lighting/furniture & signs

All auxiliary supplies to street furniture, bollards, signs etc are to be specified.

All auxiliary supplies to streetlighting are to be specified. It is expected that some streetlighting may be attached to buildings and some may be integrated with OLE poles. The feeding arrangements shall be arranged logically with the intended future division of responsibility for the lighting, particularly in respect of footpaths and access to tramstops.

[redacted]

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This is the Schedule 15 referred to in the foregoing Agreement between the Client and the SDS Provider

Requirements Specification for

Tram Vehicle

Contents - Schedule 15

5 TRAM VEHICLE

5.1 Design principles

The tram provided for the Edinburgh Tram Network shall comply with the following general design criteria:

- high safety standards
- high reliability, minimum maintenance requirement and ease of repair
- proven design and technology
- low floor access
- ease of cleaning
- modern and attractive appearance
- low weight
- low environmental impact
- meet access requirements for the disabled
- prevent the possibility of persons climbing on the sides or roof of the tram and from being able to 'surf' on it.

5.2 Minimum safety standards

Not withstanding the general safety requirements mandated in current relevant standards, the following minimum standards shall apply for the tram design:

(i) internal cubicles, access panels, etc. shall be lockable in order to prevent access by passengers but shall be easily accessible by operating staff;
(ii) care shall be taken to prevent injury by or in movable parts in the trams;
(iii) external and internal projections and finger traps shall be avoided as far as practicable;
(iv) internal fixtures shall be safely secured.

5.3 Physical Requirements

The tram design shall meet the following requirements:

(i) Trams shall be capable of running together for emergency operation only, i.e., one tram recovering a failed tram. Normal service trams shall comprise one tram;
(ii) trams in normal or emergency operation as defined in (i) shall be capable of negotiating the minimum radius horizontal and vertical curves specified in the System Wide Non Functional Requirements and maintain acceptable wheel flange wear and noise;
(iii) The tram shall be designed to have a minimum service life as specified in the System Wide Non Functional Requirements.

5.4 System Elements

5.4.1 Climatic and environmental conditions

The tram shall be capable of normal operation in all climatic and environmental conditions found on the proposed route as described in the System Wide Non Functional Requirements.

5.4.2 Alignment and gauge details

The tram shall be capable of traversing track and gauge as specified in the System Wide Non Functional Requirements.

5.4.3 Network Rail infrastructure compatibility

The tram shall not import additional risk onto Network Rail infrastructure.

5.4.4 Traction Power supply

The traction power shall be collected from an OLE.

5.5 Overall design and performance

5.5.1 Overall configuration and layout

The tram body shall be approximately 2.65m wide externally. If a tenderer wishes to propose a tram with external projections (such as mirrors, camera pods, or footsteps) which will render the tram wider than this in plan view, details must be provided at the time of tender. Note that footsteps are likely to be required in order to comply with RVAR.

5.5.2 Crash worthiness

Easily replaceable energy absorption devices shall be provided at both ends of the tram such that frontal and rearward collisions, at speeds up to 5 km/hr, shall be fully absorbed without causing permanent deformation of the car body structure;

5.5.3 Materials

The tram shall be designed to be resistant to fire in accordance with the relevant UK or European standard. The onus to demonstrate equivalence of standards rests with the supplier.

5.5.4 Interior design

All passenger areas of trams shall be provided with a heating and ventilation system that maintains a constant acceptable ambient temperature during transit between tramstops and during boarding and alighting at tramstops when operating in all prevailing climatic and environmental conditions on the proposed route.

Able-bodied passengers shall be able to move along the entire length of the passenger accommodation of the tram.

Movement within the tram shall be made as safe as practicable. Care and attention shall be given to provide a safe passenger environment.

The free and safe movement of passengers shall be facilitated by the incorporation of handrails, grabpoles and an interior free of tripping hazards and sharp corners throughout the tram.

For the avoidance of doubt in this context, steps may be included to permit the movement of passengers to/from areas where there is a difference in the height of the floor of the tram.

All passenger areas of trams shall be provided with windows in all side walls to maximise visibility for passengers. This requirement shall also apply to draught screens and separation walls to the driver's cabs.

All seats shall be at least 450mm wide.

5.5.5 Saloon Lighting

Interior lighting shall provide glare free, uniformly distributed illumination in passenger areas, to a level of between 280-350 lux;

Emergency internal lights, hazard lights and radio must all function for at least 30 mins after disconnection from the overhead power supply. Emergency internal lighting shall provide a minimum illumination of 30 lux at floor level shall be evenly distributed in each passenger area of the tram; their operation shall be independent from the overhead line power supply. Uniformity of illuminance shall not be less than a factor of 0.4

5.5.6 Floor height and headroom

Headroom throughout the seating areas shall be 2.3m to ceiling in the low floor areas and where uneven floor height is proposed then 2.1m to ceiling in the high floor areas.

High floor areas shall be minimised and shall be no more that one third of the overall salon floor area.

5.5.7 Driver's cab

The driver's cabs shall be air-conditioned and the temperature shall be controllable by the driver. Air conditioning in both cabs shall be switched on or off from either cab but temperature selection shall be only available from the cab in use.

An internal cab to saloon door is required.

When changing ends, insertion of the driver's key and the operation of one switch shall switch on all of the equipment needed to enable the tram to be driven from that cab. Subsystems which are always needed shall not be separately switched.

The layout of controls and switches shall be agreed with **tie**.

A separate track brake button shall be provided, as well as the hazard brake on the driver's controller required by HMRI Guidance.

Driver control of sanding shall be provided as well as automatic control under conditions of wheel slip or wheel slide.

At least one cab shall display an odometer calibrated in km.

Windscreen wiper control shall be by means of a multi-position switch having intermittent, continuous slow and continuous fast positions.

There shall be a separate push button which operates wipers and windscreen washers for as long as it is held down, and provides one additional sweep of the wipers after it is released.

A mirror giving a view into the saloon is required.

A generally translucent mesh fabric sun blind is required, with an opaque strip extending 150mm up from the bottom edge. The blind must be capable to be deployed whilst driving. It need be retractable only at stops.

The configuration of the cab partition and the windscreen shall be such as to avoid confusing internal reflections in the windscreen at night. If this cannot be achieved, then blinds or curtains shall be provided to screen saloon lighting from the cab at night.

The following features that relate to instruction of tram drivers shall be provided:

- A tram driver can be under instruction when a tram is in passenger service. Consequently it must be possible for an instructor and a driver to be inside the

cab with the cab/saloon door closed, and the instructor must be comfortably and safely located in the cab.

- The instructor must be able to apply the tram hazard or safety brakes quickly.
- The instructor must be seated and secure in the cab to the extent that he/she can apply the brakes even when the tram is performing unpredictably.

It shall be possible to drive the tram from each end of the tram.

The driver's cab shall be separated from the passenger area by a glazed partition providing good passenger visibility through the cab windscreen.

The drivers cab may extend to the full width of the tram.

The design of the driver's cab shall be undertaken to sound human factors practice.

Windscreens and cab windows shall be designed to maximise the degree of all round vision. A clear unobstructed view of the road/track ahead shall be provided.

Cab and glazing surfaces shall be designed to minimise the incidence of reflections during all hours of tram operation and all expected environmental conditions.

The following controls should be conveniently placed for the driver's free hand when the tram is in motion:

First priority:

- Audible warnings (bell, horn)
- Track brake
- Indicators

Second priority:

- Manual sand
- Windscreen washer and wiper controls
- Headlamp dip / main beam

The following controls shall be conveniently placed close together for use when the tram is at a tramstop:

- Door controls
- Rear-view normal mode push button
- Tram Ready To Start (junction calling when at a stop close to the junction)
- Tram punctuality display against timetable or headway

5.5.7.1 Driver's seat

Unless the seat is purpose-designed for the tram, it shall be a seat specifically designed for bus applications rather than for other vehicles such as heavy goods vehicles, as it must be capable of being adjusted many times per day without any damage.

5.5.7.2 Storage

Both cabs on each tram shall provide storage for:

- A points handle, typically a red steel bar about 1m long. This must be placed so the driver can easily take it with them when leaving the cab, and so it can be stowed and unstowed without risk of damage to the cab finishes or equipment
- A first-aid box
- A fire extinguisher

- A place to hang a driver's coat, where it will not interrupt his view in any direction.
- A place to hold two A5 ring binders of timetables, information and procedures.
- A place to clip an A5 sheet of paper, which can be conveniently referred to by the driver (whilst at a tramstop), and which does not obscure any controls or gauges.
- A handlamp

5.5.7.3 Rear View Equipment

Whilst mirrors may be acceptable, CCTV is the preferred rear-view equipment. If fitted, it must function as follows:

The "normal" view, displayed whenever the tram is in motion, shall have two screens in the cab, one on the left and one on the right side of the desk, and the images in them shall be the same as would be seen in mirrors.

The "tramstop" view shall be displayed between the doors being enabled at a stop and all doors being proved closed. In this view, the monitor on the platform side (the side on which the doors are enabled) shall show the same as in normal view. The other monitor shall display the image from the rear camera on the platform side.

A push button on the cab desk shall provide changeover from tramstop to normal mode for as long as it is held down, to allow a driver to check that nothing is overtaking the tram at an on-street stop whilst the doors are closing.

CCTV images must remain clear enough to see a cyclist overtaking the tram before it sets off from an in-street tramstop, even when it is raining, dark, under street lighting and there are car headlamps shining towards the cameras. In practice, the only application of CCTV on a UK street-running tramway so far had to use cameras which were colour by day and monochrome by night, with automatic changeover in low light.

Rain affects CCTV both by creating additional reflections and on the camera housings themselves; the system must cope adequately with both.

If mirrors are to be offered, they must be adjustable from the cab and heated. If only the mirrors in the active cab are heated, then the mirror must be clear of frost or condensation within one minute of the cab being made active, in an ambient temperature of -10°c.

If mirrors are provided, they must remain available at all times on street-running sections and must be included within the DKE. On off-street sections, if the mirrors are not to be included within the DKE, they must fold in, but must deploy automatically at a standstill.

The tram shall be fitted with cab-to-cab intercom facilities. The intercom facility will also provide communication between all four cabs when two trams are coupled during the recovery of a defective tram.

5.6 Communications systems – functionality and priorities

Spatial provision shall be made in the most appropriate part of the tram for ORS and TPDS sub-system equipment and the associated cabling, support equipment, microphones, speakers, antennae and power supplies.

5.7 Bogies

5.7.1 Bogie Systems

5.7.1.1 Sanding System

The tram shall be equipped with a system which deposits sand ahead of the driven wheels in the direction of travel both automatically, when wheelslip or wheelslide is detected, and manually under control of the driver. Sand shall be deposited on at least two locations on each rail.

The tram sand boxes shall have sufficient capacity for a full day's service under all conditions of weather and loading.

A means of ascertaining the sand level in the sandboxes shall be provided, visible from within the tram.

The tram sandboxes shall be filled from the outside the tram using a sand dispensing plant. In the event of failure of the plant, it shall also be possible to fill the tram manually, and if any special equipment is required for this, the tram manufacturer shall provide it.

The tram manufacturer shall provide a specification for the sand to be used. This shall be provided within 30 days of contract award, for use by the sand plant manufacturer. The tram manufacturer shall also provide the contact details of at least one UK supplier of compliant sand. This information shall be provided at least three months before the date on which the first tram is programmed to operate outside the Depot.

5.7.1.2 Flange Lubrication Equipment

At least one bogie of the tram shall be equipped with flange lubrication equipment on all wheels. Both sides of the flange shall be lubricated. It shall be capable of being programmed to operate on the basis of either location, or of a time interval, or a combination.

5.8 Propulsion and braking equipment

5.8.1 Performance

The tram power equipment shall be designed to conform to the nominal voltage. It is envisaged that nominal voltage will be either 750 volt dc or 1,500 volt dc.

The harmonic generation from the propulsion and control equipment shall not interfere with trainborne or trackside systems or third party infrastructure.

The traction equipment shall be capable of detecting and automatically managing wheel slip and wheel slide.

5.8.2 Braking equipment

The service brake application shall be capable of retardation at an acceptable rate at all specified tare and laden conditions and the jerk rate shall be limited so as to not cause discomfort to standing passengers.

For emergency braking applications the jerk rate shall be limited as far as practicable without compromising emergency braking performance.

5.9 PASSENGER DOORS

The tram shall be capable of providing data of the number of passengers boarding and disembarking at each tramstop.

Provision for passengers to validate their travel tickets on boarding the tram and on disembarking shall be made at a suitable point(s).

5.9.1 Door system performance

The tram shall accept a door enable command from the driver when the tram speed is below 10km/h, but the doors shall not become enabled until the tram is at a standstill. If, having been enabled, the tram speed then rises above 10km/h, the enable command shall be cancelled.

To prevent the doors being enabled on the wrong side, the door enable shall be interlocked and programmed with the correct side for the platform at each tramstop along the route. This feature must be capable of being over-ridden by the driver (for example, if the tram uses an unusual platform at a terminus), but such over-ride must require the driver to press at least one additional button which shall not be located adjacent to the other door controls in the cab.

The time from the tram coming to rest to doors being fully open in response to a prompt passenger demand, plus the time from the driver pressing the door close button to the tram moving off, shall be less than 12 seconds. The doors themselves shall move from closed to fully open or vice versa in less than 3 seconds.

5.9.2 Sealing

The door sealing arrangement will be designed to exclude the ingress of water in all weather conditions found on the proposed route and when passing through the Depot washing plant.

5.9.3 Door guidance system

The guidance mechanism shall not be a swing plug mechanism.

5.9.4 Passenger door operation

The following controls shall be fitted in each cab for driver control of the doors:

- Door enable controls for the left and right sides separately. It must be possible to enable both sides simultaneously. The enable buttons should each be located on the appropriate side of the cab desk.
- One door open button, which will open any doors not previously enabled, provided the tram is at a stand.
- One door close button, which will close all doors which are open. This will be the normal mode of door closing at tramstops other than termini.

The door enabled indicator lights at the doors shall illuminate, and the door enabled tone start, simultaneously with the door actually becoming available.

A door shall re-close automatically, with warning tone, if no obstacle is detected for twenty seconds (configurable). This will be the normal mode of door closing at termini.

When all doors are closed and traction is available, an audible signal, distinct from all other tones and quieter and less offensive than any alarm tone, shall sound in the cab in use. This is preferred to a lamp or other visual signal as the driver already has to view the platform and check ahead before moving off.

Unless a separate external cab door is provided, the door nearest each cab on each side (four doors in total) shall be provided with local internal and external door open and close switches operated by driver's key. These shall be spring-loaded centre-off, turned one way to open and the other to close. Any door opened using a local switch shall be capable of being closed either using the appropriate local switch or the "door close" button in an active cab. The purpose of these switches is to allow local control of the door by a driver who needs to leave and re-enter a passenger-carrying tram, for example to operate points, at a place which is not a tramstop.

In addition, unless a separate cab door is provided, a separate control shall be provided in the cab to allow the tram driver to open and close the nearside front passenger door separately. This is to allow the driver to open and close this door separately at the crew change halt at the Depot.

The door enabled tone required by RVAR shall be audible from both inside the tram and on the platform. This may require an additional external sounder if, in order to be heard outside, the internal one is uncomfortably loud for passengers on the tram.

5.10 Communication systems

5.10.1 Close circuit television

The tram shall be fitted with internal CCTV which shall record digital images covering:

- The whole of the saloon, with sufficient clarity to enable individuals to be identified for evidential purposes;
- The views ahead/back from the cabs.

The resolution of recorded images and recording speed of images shall be of a quality from which it would be capable of being reliably used as part of an accident investigation and in respect of the saloon images be of a quality to gain a conviction in the event of illegal activity.

The recorded CCTV images will be capable of being retained on the tram for 72 hours at which point the system will restart recording and erase the retained image.

CCTV images must be capable of being taken from the tram for subsequent retention and analysis. This must be done using a removable data storage medium rather than by data transfer.

All software required for off tram viewing, editing and analysis must be provided by the manufacturer.

5.10.2 Event Recorder

The tram shall include a data recorder capable of providing time, speed and distance information at 1m resolution or better for the last day's operations, and at 10m resolution or better for the last 7 days' operations. Additionally the start and end of the following events shall be recorded:

- Horn
- Bell
- Traction
- Brake
- Hazard brake
- Safety brake
- Track brake

- Door enable left present
- Door enable right present
- Manual sand command present
- Tram Ready to Start (TRTS)
- Hazard lights
- Left indicator
- Right Indicator

Software enabling event recorder download data to be interrogated and displayed in both graphical and tabular format shall be provided. The software shall also enable all of the data to be exported into Excel for further analysis.

The data shall be recorded onto a removable data storage medium. The data recorded shall include the tram number.

5.10.3 Public address system

Audible announcements for destination and stops shall be made by means of a digital voice announcement system. The supplier shall supply a copy of any necessary equipment and software needed to upload new and amended announcements or to alter the times and places at which announcements are made.

Additionally, the tram shall be fitted with both internal and external public address systems, selectable individually by the driver.

The following are additional to the requirements of the RVAR:

- RVAR permit audible announcements between stops to be omitted where the run time between stops is less than two minutes. This option is to be used wherever possible.

- At a stop, in addition to the RVAR requirement of announcing the next stop and destination, the equipment must also be capable of announcing the current stop. The form of the announcement to be provided initially shall be:

    - "This is <name of current stop>. This tram is for <name of destination>. The next stop is <name of next stop>." It shall be initiated by the door enable, and there shall be a short delay so that the door enable tone is finished before the announcement starts.

5.10.4 Passenger Information Systems

The tram shall be fitted with six external destination displays, one at each end above the cab and two on each side, one near each end. The side displays should not be obscured by open doors.

- The visual displays shall display, successively:

    - Screen 1: Tram to
    - Screen 2: <Destination> (see separate proposal for Line1)
    - Screen 3: Next Stop
    - Screen 4: <Next Stop>

Stepping to the next stop name shall take place on arrival at a stop

- After leaving the stop before a terminus, the external destination indicators shall change to show the destination of the next trip, so that the tram arrives at the terminus with the correct next destination already displayed.

5.10.5 Passenger Alarm Systems

Passenger alarm devices shall be located in the saloon area.

Request "Stopping Buttons" are to be provided and compliant with RVAR and should:

- become operable when doors are proved closed at a tramstop.
- when the first one is pressed, sound a single audible warning in the cab, illuminate a warning light in the cab and illuminate the tram stopping indicators required by the RVAR in the saloon.
- no further audible warning in the cab from subsequent button pushes.
- positioned such that they can easily activated by any passenger intending to disembark, but should not be positioned such that they can be inadvertently activated by standing passengers.

Request stop from the wheelchair spaces should:

- illuminate a different warning light in the cab.
- create a door open request for the nearest door, so it opens as soon as enabled.
- override the automatic close on that door for the next opening.

All request stop indications should be cancelled by the next door enable command

5.11 Towing or Propelling a dead tram

An empty tram shall be capable of both hauling and propelling (but not both simultaneously) another empty tram, which is incapable of movement under its own power, between any two points on the system under the climate conditions described in the System Wide Non-Functional Requirements.

As well as mechanical coupling, the following control facilities shall be provided on a coupled pair of trams:

- Track brake control of both trams from the cab in use
- Through intercom between all cabs
- Through control and power to hazard lights and marker lights

The intercom, marker lights and hazard lights shall be operational on both trams even if the tram being assisted has no battery power available.

[redacted]

Director/Authorised Signatory
TIE LIMITED

[redacted]

Director/Authorised Signatory
PARSONS BRINCKERHOFF LIMITED

This is the Schedule 16 referred to in the foregoing Agreement between the Client and the SDS Provider

System-wide Non-Functional Requirements

Contents : Schedule 16

6 SYSTEM WIDE NON-FUNCTIONAL REQUIREMENTS

6.1 General

This is intended to capture and state those non-functional requirements that are applicable to all elements of the Edinburgh Tram Network. It should therefore be read and applied in conjunction with the other sections of this document relating to the various sub-systems.

6.2 Usability

The Edinburgh Tram Network shall be designed and constructed for left-hand running under line of sight operation.

The maximum speed for the Edinburgh Tram Network shall be 80 km/h.

All vehicles and tram network enclosed premises shall be designated no-smoking environments.

6.2.1 Control Room

Operator workplaces shall be designed and constructed such that they conform to good HF practice.

6.2.2 Environmental Conditions

Equipment may be installed in a number of differing environments depending on location and site conditions. Notwithstanding this, all equipment shall be capable of continuous operation.

The Edinburgh Tram Network shall function in accordance with the Requirements Specification for Overall System & Performance Requirements taking cognisance of factors including electrical interference, dust, vibration, supply voltage variations, radio signal variations, solar radiation, temperature, humidity, salt, mist, wind, precipitation etc. The existence of any of these factors shall not reduce the performance nor shorten the working life of the Edinburgh Tram Network.

Table 6-1: Edinburgh Climate Data shows the average climatic conditions for the region. All equipment shall be suitable for a working life as defined in section 6.2.4 under these conditions, unless otherwise agreed by the reviewing body.

Equipment housings/enclosures and the equipment contained therein shall be capable of operating at a temperature 15^{0}C higher than the upper limit specified in Table **6-1** and at a temperature of 5 ^{0}C lower than the lowest ever recorded as specified in Table **6-1**.

Equipment housings/enclosures, cable routes etc. shall be such that with doors closed, all covers in place and all internal equipment correctly mounted and fully operational, the temperature rise at any free air point shall not vary from ambient by more than 10^{0}C unless otherwise agreed.

All equipment housings/enclosures that contain electronic equipment shall be so equipped to minimise the occurrence of condensation.

6.2.3 Climatic Conditions

Edinburgh (eastern Scotland)

Sunshine (average hours per day)		Temperatures								Precipitation and humidity				Wet days (more than 0.1 mm/0.004 in)	
		Average daily				Highest recorded		Lowest recorded		Relative humidity		Average monthly precipitation			
		minimum		maximum						900	x				
		°C	°F	°C	°F	°C	°F	°C	°F	%		mm	in		
Jan	2	1	34	6	42	14	57	-8	17	84		57	2	17	Jan
Feb	3	1	34	6	43	14	58	-9	15	83		39	2	15	Feb
March	4	2	36	8	46	20	68	-6	21	81		39	2	15	March
April	5	4	39	11	51	22	72	-4	25	75		39	2	14	April
May	6	6	43	14	56	24	76	-1	31	76		54	2	14	May
June	6	9	49	17	62	28	83	3	37	75		47	2	15	June
July	5	11	52	18	65	28	83	6	42	78		83	3	17	July
Aug	4	11	52	18	64	28	82	4	40	80		77	3	16	Aug
Sept	4	9	49	16	60	25	77	1	33	80		57	2	16	Sept
Oct	3	7	44	12	54	20	68	-2	28	82		65	3	17	Oct
Nov	2	4	39	9	48	19	67	-4	24	83		62	2	17	Nov
Dec	1	2	36	7	44	14	58	-7	20	84		57	2	18	Dec

Based on readings for 30 years at 55°55' N, 3°11' W, altitude 134 m/440 ft.

Table 6-1: Edinburgh Climate Data

The size, colour, and location of all trackside equipment cabinets/housings, lighting columns, CCTV columns and the like shall comply with the requirements of the relevant Local Authority Planning Department.

Where used, the size, colour and location of lighting columns, CCTV columns and the like shall comply with the requirements of the relevant Local Authority Planning Department.

6.2.4 Edinburgh Tram Network Life-Cycle

Unless otherwise specified in this Agreement, the Edinburgh Tram Network and its components shall be designed for a working life cycle as defined in **Table 6-2 : System life**

System Element	System Life
Tram	30 years
CCTV	15 years
TVMs	15 years
PHPs	15 years
PIDs	15 years
PA	10 years
Radio communication systems	15 years
Control Room equipment	15 years
Signalling equipment	20 years
OLE	40 years
Track & formation	30 years off street 50 year on street
Points & crossovers	25 years
Buildings	50 years
Bridges & structures	120 years

Table 6-2 : System life

Where the life expectancy may be constrained by the availability of replacement components, it will be acceptable to achieve the design life through the use of a replacement sub-unit using different components provided that such components shall not be detrimental to the operational and performance requirements and uphold the Edinburgh Tram Network safety case. This shall be demonstrated through the approved amendments to the relevant cause consequence analysis.

6.2.5 Alignment & Gauge

Track form and its alignment shall be designed as an integral component of the Edinburgh Tram Network taking account of the interaction with the tram and its running gear (wheel/rail interface), the need to meet the overall specified ride quality and journey time parameters and Edinburgh Tram Network whole life cost assessment.

6.2.5.1 Horizontal Alignment

The following horizontal alignment criteria shall be assumed:-

[illegible]	[illegible]	[illegible]	[illegible]
H1	Minimum curve radius		
H1.1	Slab track	25m	
H1.3	Ballasted track, main line and unanchored.	150m	Tighter radii can be accommodated if accompanied by proposals to anchor track in an effective way.
			Ride comfort issue. Alternatives of 2 seconds transit time or outer axle rejected.
H3	Absolute minimum length of stralght alignment between reverse curves	10m	
H4	Stralght alignment in front of the platform limit		Dependent on vehicle geometry; to be confirmed once tram selected and DDA doors nominated.
H5	Length of tram stop platform (between tops of ramp)		Will be set at 4m longer than the distance between the outer edges of the outer tram doors, to provide a plus or minus 2m stopping tolerance for the tram.
H7	Minimum horizontal radius in tram stops	Straight	Issues are horizontal gaps between doors and platforms and the risk of collision between tram and platform edge. General note covers point on derogation
H8	Transition curves	clothoid Spiral	
H9	Minimum transition curve length		This is a ride quality and speed issue, covered adequately elsewhere. There may also be constraints from the selected tram, as yet unknown.
H10	Turnout geometry		
H10.1	Crossing design must accommodate curve in turnout		Turnout crossing geometry through which regular scheduled

	direction. Straight legs in turnout curve are not permitted.		moves are made through the turnout leg shall avoid use of straight legs on this leg
	Slab track	4mm/m	Set by tram, but this is not the complete picture as far as "twist" is concerned. The tram will have other limits that relate to combinations of horizontal and vertical geometry.
	Ballasted track		Less than for slab track to allow for maintenance and construction tolerances. To be established by the SDS Provider and agreed with **tie**. See section on tolerances at end of document
C4	Maximum cant gradient		While around 1:300 is likely to be the minimum design figure, certainly for street/slab track, this is another one where the requirements of manufacturers should be canvassed in respect of the present generation of vehicles. A maintenance tolerance (in respect of ballasted track) and an installation tolerance for any track needs to be taken away from what the manufacturers are happy with to get a nominal design figure.

6.2.5.2 Parameters for Comfort

Ref	Parameters for Comfort	Requirement	Comment
C1	Maximum cant deficiency	150 mm	More detailed study required
C2	Maximum cant		
C2.1	running lines	150mm	But check that the applied cant can be applied and maintained for the typical short length curves (is there enough room for the transitions) and will it stay there. Worth looking at concrete-based trackform of some kind for the sharper curves.
C2.2	Platforms	Desirable 0mm Absolute 15mm	Absolute value only to be adopted if there is a need to accommodate cross falls that can not be avoided.
C2.3	switches and crossings	All must lie in the same plane	Princes St/David St turnout will probably have to be on an inclined plane
C5	Maximum rate of change of cant with time	80mm/s	Linked to ride quality and passenger comfort and the tram may also set limits for this.
C6	Maximum jerk (rate of change of lateral acceleration)	0.4m/s^3	This doesn't seem unreasonable as an empirical effort; given standing passengers in particular will have more expectation of longitudinal jerk rather than lateral. Potentially big issue with conductors It is agreed that this should be a specific requirement, which could be related to any untransitioned curve and all pointwork, but it needs to be recognised as additive to whatever is specified for ride quality, which it has been assumed is not intended to be addressed in this document.
C7	Maximum vertical acceleration	0.3m/s^3	Not considered to be a parameter that is likely to impact on run times. NB there may be issues with the achievable speed being governed by the OLE and its ability to match the profile and the minimum acceptable gradient of contact wire/track.

Parameters for Comfort		Requirement	Comment
C8	Maximum design speed	80km/hr	The alignment should be designed for this speed but tram selected may have a slightly lower top speed.

6.2.5.3 Vertical Alignment

The following vertical alignment criteria shall be assumed (V to be inserted in km/hr):-

Vertical Alignment		Requirement	Comment
V1	Desirable minimum vertical track radius plain line		500m hog or sag seems a reasonable starting point, but this is an item which will be set by the selected tram. It is clear that there are some critical locations in Edinburgh which will challenge whatever limit is set, particularly for 100% low floor cars. We need to be certain about this and the other design criteria being set. Tram suppliers will be provided with the current St Andrew Sq alignment for them to confirm if their tram(s) can use this alignment. A key related issue is the risk of a person being trapped under the front of the tram.
V1.1	Sag (MM/FM quote parabolic curve)	( )	
V1.2	Hog (MM/FM quote parabolic curve)	( )	
	Crest		Desirable infinity, absolute min 5000m
	Dip		Desirable infinity, absolute min 1000m

6.2.5.4 Combined horizontal and vertical geometry

There will be constraints on combinations of vertical and horizontal geometry. These will include:

- Combination of vertical curves and horizontal curves
- Combination of gradients and horizontal curves

6.2.5.5 Gradients.

The following criteria relating to gradient shall be assumed:

Gradient		Requirement	Comment
G1	Maximum gradient		
G1.2	Absolute	8%	Any increase on 8% will exclude 2/3 motored tram s, and would result in a step change in tram costs.
G2	Maximum gradient Tram Stops		
G2.1	Normal	Level	
G2.2	Absolute		Minimise this as gradients impact on run time, and reduce accessibility.
G3	Maximum gradient stabling area and Depot	Level	
			HMRI Part G revised

6.2.5.6 Other features

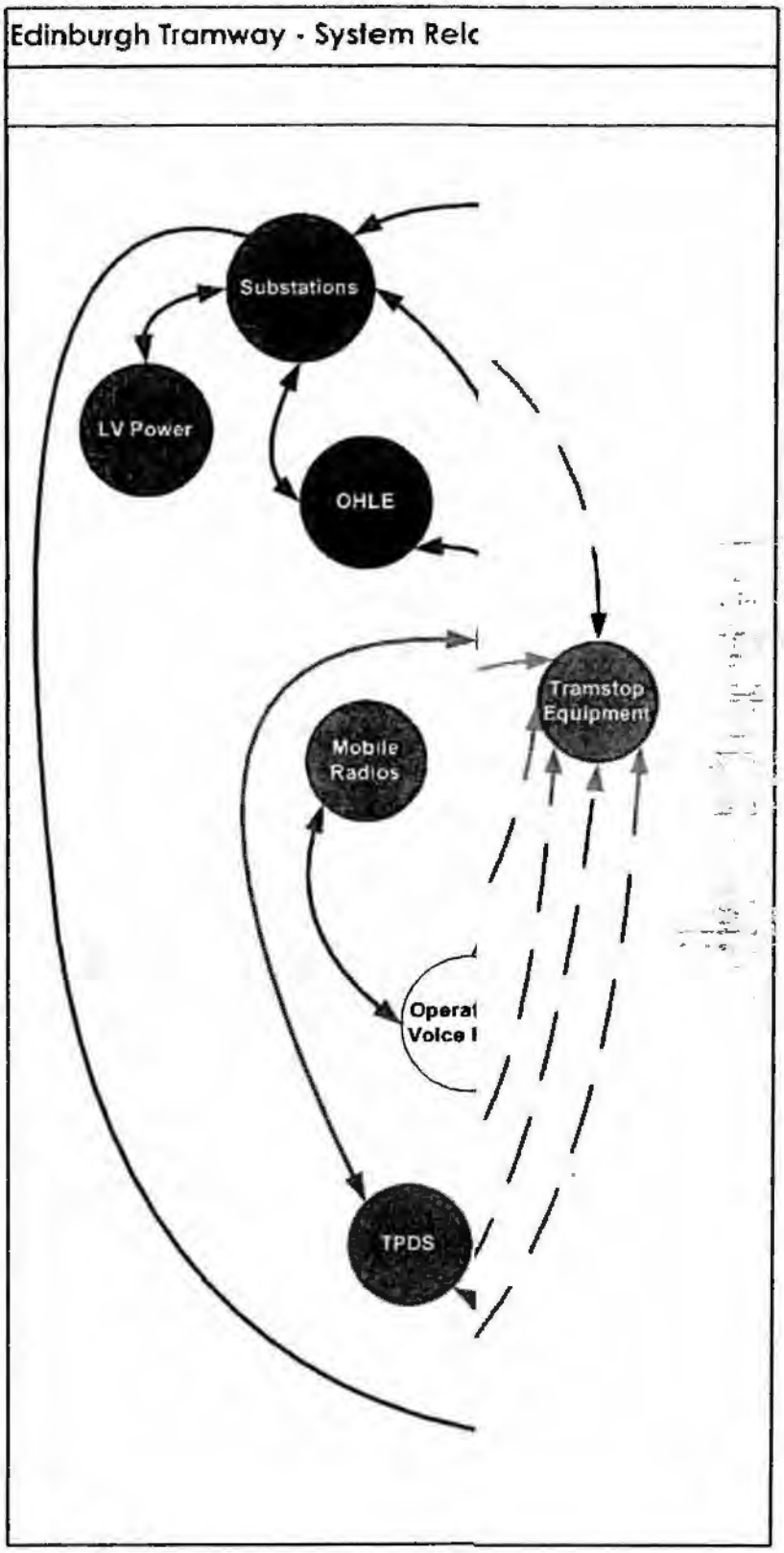
The tolerances on alignment and gauge shall form a coherent and achievable set of tolerances for the Edinburgh Tram Network. Construction and maintenance tolerances shall be separately defined for each parameter. A full set of parameters that will protect the safety and performance of the Edinburgh Tram Network shall be included.

6.2.5.7 Lineside speed signs

The Edinburgh Tram Network shall be signed at speeds that are integer multiples of 5 km/h. Speed signs shall be rationalized in conjunction with the Operator. The signed speeds shall be an input to any run time modelling.

6.3 System/Sub-System Relatio

The following diagram is intended to c



6.4 Nomenclature

6.4.1 Tramstops and Substations

Substations shall have the third character "E" (for Electricity). Names of Substations shall not be the same as tramstops.

Tramstop acronyms shall avoid having the third letter "E" to avoid potential confusion with substations.

Tramstop and Substation acronyms are set out in the table below.

Tramstops				**Sub-stations**	
Haymarket to Ocean Terminal to Haymarket:		Airport to Haymarket:		All have third character E (for Electricity). This shall be avoided in selecting tramstop acronyms.	
HAY	Haymarket	AIR	Airport	GBE	Gogar Bridge Road
SHP	Shandwick Place	IPR	Ingliston Park and Ride	GDE	Gogar Depot
PSW	Princes Street West	GOG	Gogarburn	BDE	Bankhead Drive
WAB	Waverley Bridge (Proposed)	(DEH)	Depot Halt (Staff Only)	JDE	Jenner's Depository
SAS	St Andrew Square	GYL	Gyle	RRE	Russell Road
PIP	Picardy Place	EDP	Edinburgh Park	HTE	Haymarket Terrace
MDR	McDonald Road	EPS	Edinburgh Park Station	CCE	Coates Crescent
BAS	Balfour Street	SGA	South Gyle Access	CAE	Cathedral
FOW	Foot of the Walk	SRN	Soughton Road North	LWE	Leith Walk
COS	Constitution Street	BAR	Balgreen Road	LDE	Leith Depot
OCD	Ocean Drive	MUR	Murrayfield	ANE	Annfield
OCT	Ocean Terminal	HAY	Haymarket	GRE	Granton Road
NER	Newhaven Road			GME	Granton Mains East
LGR	Lower Granton Road	OTHER NOMINATED LOCATIONS		TRE	Telford Road
GRS	Granton Square				
GRW	Granton Waterfront	ROJ	Roseburn Junction		
CAP	Caroline Park				
WGA	West Granton Access				
CRT	Crewe Toll				
WGH	Western General Hospital				
CRA	Craigleith				
RAD	Ravelston Dykes				
ROS	Roseburn				
OTHER NOMINATED LOCATIONS					
YOP	York Place (crossover)				

6.4.2 Directions

Line One shall be described as "Inner Circle" for clockwise directions, and "Outer Circle" for anticlockwise directions.

Therefore, AIR to ROJ is "Inbound", and ROJ to AIR is "Outbound".

	Description	Route
I/B	Inbound	Between AIR and ROJ
O/B	Outbound	
I/C	Inner Circle	Line 1
O/C	Outer Circle	

6.4.3 Items of Equipment

Acronym	Meaning
AFC	Automatic Fare Collection
CCTV	Closed Circuit Television
DCCB	Direct Current Circuit Breaker
HCI	Human Computer Interface
HF	Human Factors
HVAC	Heating, Ventilation and Air Conditioning
OHLE	Overhead Line
ORS	Operational Radio System
PA	Public Address
PCC	Point Control Cabinet
PCC	Point Control System
PHC	Point Heating Cabinet
PHP	Passenger Help Point
PID	Passenger Information Display
SCADA	Supervisory Control and Data Acquisition System
TBC	Traction/Brake Controller
TEL	Telephony
TLA	Three letter acronym
TPDS	Tram Position and Detection System
UTC	Urban Traffic Control

6.4.4 Points

The nomenclature for points shall consist of:

- the three letter acronym for the adjacent tramstop or other location
- the letter "P"
- a sequential number. Even numbers on the Outer Circle and Outbound lines, odd numbers on the Inner Circle and Inbound lines.

Point acronyms are as set out on the Edinburgh Tram Network diagram.

6.4.5 Other equipment

The following nomenclature shall be defined and agreed with **tie**:

- TVMs
- Signals
    - off street
    - on street
- PIDs
- etc

6.4.6 Chainage

There shall be a single "Chainage System Definition Document" that links all of the project's chainage systems together such that the distance between any two points on the whole Edinburgh Tram Network can be easily determined from:

1. The chainage of one point
2. The chainage of the second point, and
3. The Chainage system definition document

The chainage system shall have no two points with the same chainage distance anywhere on the network. This will be achieved as set out in the Edinburgh Tram Network diagram.

This chainage system for Line One shall start at 0.000 km at Ocean Terminal and runs clockwise through SAS, HAY and GRS back to OCT, finishing at about 16.000 km.

The short outbound or easterly route through St Andrew Square along the southern and eastern sides that is not included in the above shall have a separate chainage running from 20.000km to about 20.400 through the section where there is single track.

Line Two chainages shall start at ROJ at a notional 30.000 km and increment to AIR.

Newbridge Spur chainages shall start at 50.000 km at EPS and increment to NEW.

The potential Line 3 shall start at St Andrew Square at a notional 60.000 km and increment to the end of Line 3.

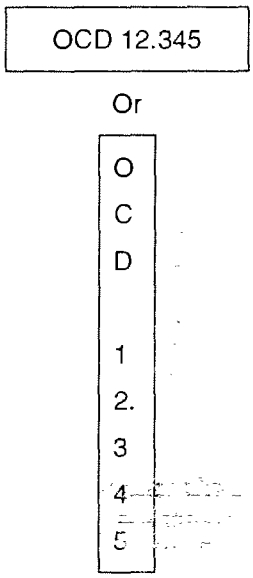
6.4.7 OLE Fixings

These shall all be uniquely identified with the following information

- The TLA of the tramstop that is closest to the fixing
- Operator's chainage, eg "12.345"

An example of an OLE pole fixing identification plate follows.

Building fixings shall be similarly identified, but the format may be



The ROJ area shall be effectively identified using this system.

6.4.8 Generation of Acronyms

The following process is used to convert names into acronyms:

1. Start with the name that consists of a number of words that is to be converted into an acronym, and a blank acronym of known required length.
2. Take the initial letter of each word in the name and put them together.
3. If this is longer than the required acronym, truncate it to fit
4. If this is shorter than the required acronym, insert the second letter onwards from the first word in the name into the acronym after the first letter in the acronym until the required length is achieved.
5. Check that there are no ambiguities with other acronyms that are already in use. If so, the acronym produced by the above process may be altered.

Examples follow:

Name	**Acronyms**
Foot Of The Walk	FOTW, FOW,FW,F,
Airport	AIRP, AIR,AI,A

6.5 International

All text shall be in English (UK)

All date formats shall use dd-mmm-yy i.e. 21-Oct-03

Time format shall be hh:mm:ss and use the 24 hour clock i.e. 18:10:36.

All sub-systems shall be configured to use Rugby time as the prime means of timekeeping.

All events and communications, including recorded ones, shall be date and time stamped using Rugby Time.

All recorded public address announcements shall be made using the English Language.

6.6 Data Capture & Retention

The fixed system shall capture all system level and sub-system level events and record them onto hard disk storage in the equipment room of the Depot. Such hard disk shall be capable storing at least 28 days worth of events before overwriting.

All radio and telephone voice communications shall be recorded and stored on hard disk in the equipment room for 28 days before overwriting.

All CCTV images shall be recorded and stored on suitable media in the equipment room for 28 days before overwriting.

The systems shall provide prior to the system automatically overwriting hard disk data in order this data can be written to other media such as CD or DVD.

Data capture shall be defined and actioned such that it supports the management information systems of the Edinburgh Tram Network.

The merits of data recording being done locally and downloaded to a central store out of tram service hours shall be analysed and reported.

6.7 Performance/Reliability

The integration and/or interface between all sub-systems shall enable the Operator to respond to all events that are presented to the Operator via the relevant Operator HCI with no more than 1 second delay.

The Edinburgh Tram Network shall be designed and constructed to operate without unreasonable duress on operations personnel in Normal, Degraded and Abnormal modes.

- ***Normal Mode*** can be defined as meeting the number of tram services as prescribed in the headway/timetable requirements.
- ***Degraded Mode*** can be defined as restricted operations resultant from failure of one or more components of the system.
- ***Abnormal Mode*** can be defined as the occurrence of extreme loading on a part of the system resultant from causes such as major disruption, whether caused through tramway elements or third party interference.

Overall System performance in terms of reliability and availability shall be demonstrated through cause consequence analysis and subsidiary fault tree and Markov analysis.

The tram fleet shall not suffer a failure requiring a tram to be towed or pushed more often than once per 200000km.

6.7.1 Noise

The Edinburgh Tram Network shall be designed so as not to generate excessive noise pollutions levels. Options for noise mitigation shall be considered if the free-field noise level outside the window of any sensitive receiver exceeds either of the upper values specified in PAN56 0 for noise exposure category A *i.e.*:

1. for daytime noise, $L^{Aeq\ 0700\text{-}2300\ hours}$ 55 dB;

or

2. for night time noise, $L^{Aeq\ 2300\text{-}0700\ hours}$ 45 dB.

Theses parameters shall be reviewed and validated for acceptability and any changes agreed with **tie**.

Where tram noise is predicted to be more than 3dB 0 above either of these thresholds, mitigation measures to reduce the adverse impact of noise will be considered according to the extent to which the pre-existing ambient ($L^{Aeq,\ 1\ hour}$) noise level is increased, as follows:

1. Increase of 3-5 dB - mitigation considered on a case by case basis, and implemented if reasonably practicable and acceptable to affected parties.
2. Increase of greater than 5 dB - mitigation implemented if reasonably practicable and acceptable to affected parties.

6.7.2 Vibration

Trackforms adjacent to sensitive receptor buildings shall be designed using best practicable means to keep within the guideline levels of Vibration Dose Value (VDV) given in BS6472, 1992 below which the probability of adverse comments is low:

- Day (0700-2300 hours) 0.4 $m/s^{1.75}$; an
- Night (2300-0700 hours) 0.13 $m/s^{1.75}$.

Theses parameters shall be reviewed and validated for acceptability and any changes agreed with **tie**.

6.8 Legal

The Edinburgh Tram Network shall comply with all Law.

The Edinburgh Tram Network shall comply with local data protection legislation

The Edinburgh Tram Network shall comply with the prevailing Disability Discrimination Act.

The Edinburgh Tram Network shall comply with Health & Safety at Work Act (1974) at all stages during its life-cycle.

An appropriate quality management system equivalent to ISO 9001 shall be in place throughout the Edinburgh Tram Network life-cycle.

Civil Aviation Authority, Airport Operators Association & General Aviation Awareness Council 'Safeguarding of Aerodromes Advice Note 3' shall apply to those sectors of the Edinburgh Tram Network that interact with air traffic.

All cables and equipment enclosures shall comply with the latest applicable IEC standards.

6.9 Safety

The systems shall provide alarms and indications to users in such a way that does not cause the users undue distractions and/or stress in any mode of operation.

All hazards and risks shall be demonstrated to have been eliminated or mitigated to be ALARP.

The following minimum safety deliverables and documentation shall be provided:

a) Preliminary hazard analysis report

b) Hazard log

c) Safety management plan

d) Hazard identification and risk analysis/assessment documentation

e) Cause consequence analysis

f) Safety assessment & audit reports

g) Phased safety cases constructed using GSN

h) HMRI declaration of no objection that if constructed according to design a certificate of authority/authority to operate would be likely.

Earthing of electronic equipment shall be required to reduce the effects of interference with other equipment on the Edinburgh Tram Network and its neighbours as well as providing adequate personal safety to operations and maintenance staff and Tramway users. Where any conflict arises between these two, personal safety shall always take precedence.

6.10 Security

Authorised access to electronic systems shall be controlled by login(s) and password(s).

Authorised access to appropriate functions of the System and its sub-systems shall be allocated and governed by the users' login and password.

Physical entry access security shall be provided for all remotely located equipment cabinets/housings. This can take the form of key locks or an electronic locking device such as swipe cards.

Appropriate protection shall be provided to both centrally and remotely located equipment to counter unauthorised access and/or vandalism.

6.11 Development

The Edinburgh Tram Network shall be designed, developed and constructed to meet the requirements of the most recent edition of the Railway Safety Principles and Guidance Part 2 Section G "Tramways".

Design and development of the System shall follow the spirit and principles of Engineering Safety Management - Yellow Book 3.

The architecture of the System shall initially be designed and constructed to meet the requirement for Lines 1 and 2. However, the architecture shall contain sufficient room for expansion to cater for the later addition of Line 3 without noticeable degradation of performance.

Design, development and construction shall be undertaken to conform to the Stage Build and Sectorisation shown in Table 6.3.

Table 6.3: Stage Build and Sector Details. It should not be inferred that sectors and stage builds are sequential, indeed design, development and construction shall be undertaken to achieve to optimum end to end project timescale.

Table 6-3 : Stage Build and Sector Details

Stage Build	Description	Sector		Sub-sector		Criticality	Commissioning Sequence for Trial Running(Line 1&2 and Line 2only)	Commissioning Sequence for Trial Running(Line 1only)	Preliminary Design Approved By	Detailed Design Approved By
ARP	Airport - Gogarburn	ARP1	Airport - Gogarburn (inc)			C	3		28-Feb-06	30-Sep-06
DHY	Depot - Haymarket	DHY1	Gogaburn (exc) - Gyle & Depot (inc)			A1	1		30-Nov-05	30-Mar-06
		DHY2	Gyle (exc) - Edinburgh Park (inc)			C			28-Feb-06	30-Sep-06
		DHY3	Edinburgh Park (exc) - South Gyle Acess (inc)			C	2		28-Feb-06	30-Sep-06
		DHY4	South Gyle Acess (exc) - Soughton Road North (inc)			C			28-Feb-06	30-Sep-06
		DHY5	Soughton Road North (exc) - Murrayfield (exc)	DHY5a	Soughton Road(exc)-Balgreen Road(inc)	B			30-Jan-06	30-May-06
				DHY5b	Balgreen Road(exc)-Murrayfield(exc)				30-Jan-06	30-May-06
		DHY6	Murrayfield (inc) - Haymarket (inc)			A(2)	3		30-Nov-05	30-Mar-06
HOT	Haymarket - Ocean Terminal	HOT1	Haymarket (exc) - St.Andrew Square (inc)	HOT1a	Haymarket(exc)-Shandwick Place(inc)	A(1)	4	3 (section now includes Haymarket Tramstop)	30-Nov-05	30-Mar-06
				HOT1b	Shandwick Place(exc)-Princes St West(inc)					
				HOT1c	Princes St West(exc)-Waverley Bridge(inc)					
				HOT1d	Waverley Bridge(exc)-St.Andrew SQ.(inc)					
		HOT2	St.Andrew SQ.(exc)-Picardy Place(inc)			A(2)	4	3	30-Nov-05	30-Mar-06
		HOT3	Picardy Place (exc) - Foot of the Walk (inc)	HOT3a	Picardy Place(exc)-MacDonald Rd(inc)	A(2)	5	2	30-Nov-05	30-Mar-06
				HOT3b	MacDonald Rd(exc)-Balfour St(inc)					
				HOT3c	Balfour St(exc)-Foot of the Walk(inc)					
		HOT4	Foot of the Walk (exc) - Ocean Drive (inc)	HOT4a	Foot of the Walk(exc)-Constitution St(inc)	A(3)	6	1	30-Nov-05	30-May-06
				HOT4b	Constitution St(exc) Ocean Drive(inc)					

		HOT5	Ocean Drive (exc) - Ocean Terminal (inc)			A(3)	6	1	30-Nov-05	30-Mar-06
		HOT6	Leith Depot & Connections			D	5	1	30-Mar-06	30-Nov-06
HCT	Haymarket - Crewe Toll	HCT1	Haymarket (exc) - Crewe Toll (inc)	HCT1a	Roseburn Jct(exc)-Roseburn(inc)	D	4	4	30-Mar-06	30-Nov-06
				HCT1b	Roseburn(exc)-Ravelston Dykes(inc)				30-Mar-06	
				HCT1c	Ravelston Dykes(exc)-Craigleith(inc)				30-Mar-06	
				HCT1d	Craigleith(exc)-W General Hosp-Crewe Toll(inc)				30-Mar-06	
CTO	Crewe Toll - Ocean Terminal	CTO1	Crewe Toll (exc) - Granton Square (inc)	CTO1a	Crewe Toll(exc)-W. Granton(inc)	D	5	5	30-Mar-06	30-Nov-06
				CTO1b	W. Granton(exc)-Caroline Pk(inc)				30-Mar-06	
				CTO1c	Caroline Pk(exc)-Granton Waterfront(inc)				30-Mar-06	
				CTO1d	Granton Waterfront(exc)-Granton Sq.(inc)				30-Mar-06	
		CTO2	Granton Square (exc) - Ocean Terminal (inc)	CTO2a	Sea Wall Survey	A1	6	6	30-Nov-05	28-Feb-07
				CTO2b	Granton Sq.(exc)-Lower Granton Rd	E	6	6	30-Mar-06	
				CTO2c	Lower Granton Rd-Newhaven Rd					
				CTO2d	Newhaven Rd-Ocean Terminal(exc)					
GNB	Gogarburn - New bridge	GNB1	Gogaburn (exc) - Newbridge (inc)			F	7		30-Mar-06	28-Feb-07

6.12 Implementation

An Edinburgh Tram Network Stage Build shall be available for trial running once all components excluding TVMs have been installed, tested and commissioned.

Testing staff shall have an appropriate level of independence from those staff designing that sub-system.

The system shall have operating instructions for the Edinburgh Tram Network as a whole and all individual sub-systems consolidated into an overall operations manual. This data shall be produced in hard copy form and available as an on-line database available to operations personnel.

Cables shall be clearly identified at each end of the cable connections by labels. Related drawings shall describe the labelling conventions.

Where cables are to be provided, they shall contain sufficient slack to permit reasonable disturbance during maintenance.

An asset register shall be produced in readiness for Infraco to populate with actual equipment data, serial numbers etc. This asset register shall be capable of being tagged to digitised O/S and linked to as built, maintenance etc. drawings and records.

6.13 Maintainability

The system shall have maintenance instructions for the Edinburgh Tram Network as a whole and all individual sub-systems consolidated into an overall maintenance manual. This data shall be produced in hard copy form and available as an on-line database available to maintenance personnel.

Maintenance instructions shall be available for download to remote/portable diagnostics terminals.

Performance, reliability, fault/failure data shall be available that enables analysis for product improvement.

Data shall be presented to maintenance staff such that potential causes of faults/failures are clearly identified.

Hardware components shall be easily accessible and not required specialist equipment for their removal or replacement.

Connectors shall be used which permit fast and easy disconnection and replacement of faulty/failed components.

Maintenance regimes and spares holding levels shall be determined through the fault tree and Markov analysis and ratified by the verification and validation process.

Spares that have potential long lead times shall be identified once the Edinburgh Tram Network architecture has been produced.

The Edinburgh Tram Network shall be designed to facilitate inspection, repairs, maintenance and fault finding without interruption to Edinburgh Tram Network operations and performance.

Maintenance regimes, component replacement programmes and spares holdings shall take due cognisance of the outputs of the cause consequence analysis undertaken.

Initial spares provided shall be sufficient for an operational period of 5 years from the date of Edinburgh Tram Network handover to the Operator. These spares shall include provision for damage and vandalism. The Edinburgh Tram Network design shall be underwritten such that all equipment/system suppliers shall warrant that all

equipment in the design shall be available for the operational period specified earlier and that they shall give the Operator a minimum of 12 months notice where after that period they intend to cease supply of that component.

Equipment housings/enclosures and their contents; i.e. racks etc. shall not exceed 2 metres in height, unless specifically agreed by the reviewing body.

The lowest mounting point, plug-in group or terminal block shall not be less than 400mm above floor level unless specifically agreed by **tie**.

6.14 Training

An indicative training plan for all users of the Edinburgh Tram Network shall be produced.

[redacted]

Director/Authorised Signatory
TIE LIMITED

[redacted]

Director/Authorised Signatory
PARSONS BRINCKERHOFF LIMITED

This is the Schedule Seventeen referred to in the foregoing Agreement between the Client and the SDS Provider

SCHEDULE SEVENTEEN

AGREEMENT BETWEEN THE SDS PROVIDER AND THE JOINT REVENUE COMMITTEE

(1) PARSONS BRINCKERHOFF LIMITED
- and -

(2) STEER DAVIES & GLEAVE LIMITED

AGREEMENT

relating to

THE EDINBURGH TRAM NETWORK

AGREEMENT

BETWEEN

(1) **PARSONS BRINCKERHOFF LIMITED** a company incorporated under the Companies Act with registration number 2554514 and having its registered office at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle Upon Tyne, NE4 7YQ (the "**SDS Provider**") which expression shall include its permitted assignees.

and

(2) **STEER DAVIES & GLEAVE LIMITED**, a company incorporated under the Companies Act with registration number 01883830 and having its registered office at Barbican House, 26 - 34 Old Street, London, EC1V 9QQ (the "**JRC**") which expression shall include its permitted assignees.

BACKGROUND

(A) **tie** is a wholly owned subsidiary of the City of Edinburgh Council ("the Council") and **tie** is funded directly by the Council for the delivery of projects included in the Council's Local Transport Strategy.

(B) **tie** has appointed the Parties (as hereinafter defined) to provide technical consultancy services to support (a) the design, construction and operation of the Edinburgh Tram Network (as hereinafter defined), and (b) requisite public transportation service integration and revenue forecasting.

(C) Accordingly, the Parties intend in terms of this Agreement to work together to deliver a bespoke transport modelling suite to **tie** for deployment in relation to the Edinburgh Tram Network and its integration into the transport environment in the City of Edinburgh.

IT IS HEREBY AGREED

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, unless the context otherwise requires:

"Agreement" means this document (as amended from time to time pursuant to Clause 14);

"Confidential Information" means any information which has been designated as confidential by either Party in writing or that ought to be considered as confidential (however it is conveyed or on whatever media it is stored) including information which relates to the business, affairs, trade secrets, properties, assets, trading practices, goods, services, developments, trade secrets, intellectual property rights, know-how, personnel, advisors and suppliers of either Party and all personal data and sensitive personal data within the meaning of the Data Protection Act 1998;

"Edinburgh Tram Network" has the meaning given in the **tie** Appointments;

"FOISA" means the Freedom of Information (Scotland) Act 2002 and any subordinate legislation made under that Act from time to time together with any guidance and/or codes of practice issued by the Scottish Information Commissioner in relation to such legislation;

"Infraco Contract" means the contract or contracts to be entered into or entered into by **tie** for the provision of the Edinburgh Tram Network infrastructure and operating systems;

"Party" means each and any of the parties to this Agreement and Parties shall be construed accordingly;

"**tie**" means **tie** limited, the wholly owned subsidiary of Edinburgh City Council responsible for the development and delivery of the Edinburgh Tram Network; and

"**tie** Appointment " means the agreement under which each party provides services to **tie**, and **tie** Appointments should be construed accordingly.

1.2 In this Agreement, except where the context otherwise requires:

1.2.1 words importing gender include masculine, feminine and neuter;

1.2.2 the singular includes the plural and vice versa;

1.2.3 a reference to any part, Clause, sub-clause or Schedule is, except where it is expressly stated to the contrary, a reference to such part, Clause or sub-clause of or Schedule to this Agreement;

1.2.4 a reference in any Schedule to any part, paragraph or sub-paragraph is, except where it is expressly stated to the contrary, a reference to such part, paragraph or sub-paragraph of that Schedule (as the case may be);

1.2.5 any reference to this Agreement or to any other document shall include any variation, amendment, or supplement to such document expressly permitted under the terms of this Agreement;

1.2.6 any reference to any enactment, order, regulation or other similar instrument (including any EU instrument) (whether specifically named or not) shall be construed as a reference to the enactment, order, regulation or instrument as amended, replaced, consolidated or re-enacted and shall include any orders, consents, regulations, legally binding codes of practice or subordinate legislation (within the meaning of section 21(1) of the Interpretation Act 1978) made thereunder;

1.2.7 a reference to a person includes individuals, firms, partnerships, bodies corporate, joint ventures, government departments and any organisation capable of suing or being sued and references to any of the same include the others and their successors and assignees and transferees to the extent that such assignment and transfer are expressly permitted under the terms of this Agreement;

1.2.8 headings and the contents list are for convenience of reference only and do not affect the interpretation of this Agreement;

1.2.9 the ejusdem generis rule does not apply and the meaning of general words is not to be restricted by any particular examples preceding or following those general words;

1.2.10 an obligation to do something includes an obligation to procure it to be done;

1.2.11 an obligation not to do something includes an obligation not to wilfully allow it to be done;

1.2.12 the word "including" means "including without limitation"; and

1.2.13 a reference to "approval" or "consent" shall mean consent in writing.

2. TERM OF AGREEMENT

2.1 This Agreement shall come into effect on the last date of execution hereof and shall continue in effect until the date on which the defects liability period for the Infraco Contract is confirmed by **tie** to have ended.

3. COLLABORATIVE WORKING

3.1 The Parties agree as part of their respective mandates pursuant to the relevant **tie** Appointment to collaborate on the development, testing, validation, commissioning and approval of a comprehensive independent hierarchical transport modelling suite ("the SDS-JRC Modelling Suite") as defined and stipulated in the Parties' respective **tie** Appointments.

3.2 The Parties shall plan, execute and deliver the completed and fully functional SDS-JRC Modelling Suite to **tie** on the basis of joint and several liability for its timely and efficient production and its fitness for purpose. The Parties agree to indemnify one another in respect of any loss or damage incurred by reason of a failure to comply with an obligation under this Agreement or under their respective **tie** Appointments arising from or in connection with the design, production or commissioning of the SDS-JRC Modelling Suite.

4. MODEL SPECIFICATION

4.1 The Parties shall prepare a composite specification together with a detailed staged work programme and resourcing plan to submit to **tie** no later than 30 working days after the formal appointment of the JRC. The development, testing and commissioning process shall be resourced by a team selected by the Parties to combine equal contribution of practical know how, market experience and technical specialism. The joint team shall be co located at a location to be mutually agreed between the Parties.

5. INITIAL FORECAST

5.1 The Parties shall deploy the SDS-JRC Modelling Suite to generate a model revenue forecast scenario for the first year of public service operations of the Edinburgh Tram Network and shall obtain **tie's** approval of the resultant forecast.

6. MODEL MAINTENANCE

6.1 Subject to Clause 6.1, the Parties have agreed that they shall be jointly and severally responsible at all times to **tie** in relation to:

6.1.1 the correction of any single or recurring fault or incapacity; and

6.1.2 the regular calibration, updating and maintenance (including upgrades against obsolescence.

6.2 After the date on which **tie** confirms that the Edinburgh Tram Network has completed its defects liability period, the Parties have agreed that JRC shall carry primary responsibility, as between the Parties, with regard to the routine maintenance and guardianship of the SDS-JRC Modelling Suite, in addition to those functions stated above.

7. INTELLECTUAL PROPERTY RIGHTS

7.1 The Parties rights with regard to intellectual property rights (including copyright in design rights or exclusive know how) in the SDS-JRC Modelling Suite and the work

product from the performance of this Agreement shall be vested pursuant to **tie** Appointments.

7.2 The Parties shall be entitled to use the SDS-JRC Modelling Suite under a royalty free license from **tie** granted pursuant to **tie** Appointments.

8. INTEGRITY AND CUSTODY OF THE MODEL

8.1 Neither Party shall make any adjustment or modification to the SDS-JRC Modelling Suite without the prior consent of both the other Party and **tie**. The parties shall discuss and agree with **tie** as to appropriate custody of a master copy final version of the model as approved by **tie.**

9. CONFIDENTIALITY

9.1 Each Party shall treat all Confidential Information belonging to the other Party as confidential and safeguard it accordingly.

9.2 Each Party shall not disclose any Confidential Information belonging to the other Party to any other person without the prior written consent of the other Party, except to **tie** and to such persons and to such extent as may be necessary for the performance of the Agreement or except where disclosure is otherwise permitted by the provisions of this Agreement.

9.3 The provisions of Clauses 9.1 and 9.2 shall not apply to any Confidential Information received by one Party from the other:

9.3.1 which is or becomes public knowledge (otherwise than by breach of this Clause);

9.3.2 which was in the possession of the receiving Party, without restriction as to its disclosure, before receiving it from the disclosing Party;

9.3.3 which is received from a third party who lawfully acquired it and who is under no obligation restricting its disclosure;

9.3.4 is independently developed without access to the Confidential Information; or

9.3.5 which must be disclosed pursuant to a statutory, legal or parliamentary obligation placed upon the Party making the disclosure, including any requirements for disclosure under FOISA.

10. FOISA

10.1 Each Party acknowledges that **tie** is subject to the requirements of FOISA and shall assist and cooperate with the other Party to enable both Parties to comply with any information disclosure requirements to which **tie** directs it is subject under FOISA.

10.2 Each Party shall provide the other Party with a copy of any request from **tie** for information under FOISA in relation to this Agreement and the Parties shall act jointly to furnish a response in the format and within the timescales set out in FOISA.

11. ASSIGNATION

11.1 Neither Party shall assign or otherwise dispose of any interest in, or rights or obligations under this Agreement in whole or in part to any person, save as may be approved in advance in writing by **tie**.

12. PROJECT RECORDS

12.1 The Parties shall in accordance with Good Industry Practice keep and maintain detailed records regarding the activities in relation to the performance of this agreement and shall keep such records for at least twelve years following expiry or termination of this Agreement.

12.2 The records referred to in Clause 12.1 shall be kept in good order and in such form as to be capable of technical and financial audit.

13. JURISDICTION AND DISPUTE RESOLUTION

13.1 This Agreement, any document completed or to be completed in accordance with its provisions and any matter arising from it or any such document shall be governed by and construed in accordance with Scots law.

13.2 The Parties hereby irrevocably submit to the exclusive jurisdiction of the Court of Session in relation to this Agreement, any such document and any such matter.

13.3 Any difference or dispute arising from or in connection with this Agreement shall be referred to the Parties for resolution pursuant to the process stipulated in the **tie** Appointments.

14. VARIATIONS AND WAIVERS TO BE IN WRITING

14.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought and has been approved in writing by **tie**.

15. WAIVER

15.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

15.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent, cumulative and do not operate to exclude one another or any rights or remedies provided by law.

16. NO PARTNERSHIP OR DILUTION OF DUTIES

16.1 Nothing in this Agreement shall be construed as:

16.1.1 creating a partnership between the Parties; or

16.1.1 diluting in any way the duties owed by each Party under separate agreement with **tie.**

17. NOTICES

17.1 Any notice or notification required or authorised to be given under this Agreement by one Party to the other shall be:

17.1.1 in writing;

17.1.1 sent by one of the following methods:

17.1.1.1 pre-paid registered or recorded delivery post or facsimile transmission addressed to the Party to which it is given at:

(a) in the case of notices given to the SDS Provider, Parsons Brinckerhoff Limited, Royal Exchange House, 2nd Floor, 100 Queen Street, Glasgow, G1 3DF, fax number 0141 222 6901 attention: David Hutchison, or such other address in the United Kingdom as the SDS Provider may notify the JRC from time to time for that purpose; or

(b) in the case of notices given to the JRC, Steer Davies & Gleave, 28-32 Upper Ground, London, SE1 9PD, fax number 020 7827 9850, attention Steve Hewitt or such other address in the United Kingdom as the JRC may notify the SDS Provider from time to time for that purpose; or

17.1.1.2 facsimile transmission addressed to the SDS Provider or the JRC as appropriate) at a facsimile number notified to the giving Party by the receiving Party for the service of notices under this Agreement from time to time; or

17.1.1.3 personal delivery to the respective addresses of the Parties as specified in clause 17.1.2.1

17.1.2 be deemed duly served:

17.1.2.1 if sent by pre-paid registered or recorded delivery post, 2 clear days after posting; or

17.1.2.2 if sent via facsimile transmission or personal delivery, on the day of issue of the relevant fax confirmation receipt or such personal delivery (as appropriate), unless that day is not a business day in which case it shall be deemed duly served on the next business day thereafter.

18. INVALID TERMS

18.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable

18.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

18.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

19. THIRD PARTY RIGHTS

19.1 Save that **tie** shall be entitled to rely upon the undertakings given by the Parties in this Agreement, any person who is not Party to this Agreement shall have no right to enforce any term of this Agreement.

IN WITNESS WHEREOF these presents consisting of this and the [◆] preceding pages are executed as follows:

EXECUTED for and on behalf of **PARSONS BRINCKERHOFF LIMITED**

at ◆ on ◆ by

Director/Authorised Signatory: .....

Full Name: .....

Witness: .....

Full Name: .....

Address: .....

EXECUTED for and on behalf of **STEER DAVIES & GLEAVE LIMITED**

at ◆ on ◆ by

[Authorised Signatory]: .....

Full Name: .....

Witness: .....

Full Name: .....

Address: .....

[redacted]

Director/Authorised Signatory

TIE LIMITED

[redacted]

Director/Authorised Signatory

PARSONS BRINCKERHOFF LIMITED

(1) tie

- and -

(2) INFRACO

- and -

(3) PARSONS BRINCKERHOFF LIMITED

NOVATION OF SYSTEM DESIGN SERVICES AGREEMENT

in respect of

EDINBURGH TRAM NETWORK

AGREEMENT

AMONG

(1) **TIE LIMITED** (Company number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**");

(2) **BILFINGER BERGER UK LIMITED**, a company incorporated in England and Wales under number 02418086 and having its registered office at 150 Aldersgate Street, London, EC1A 4EJ, which expression shall include its successors, permitted assignees and transferees and **SIEMENS PLC**, a company incorporated in England and Wales under number 00727817 and having its registered office at Faraday House, Sir William Siemens House, Frimley, Camberley, Surrey, GU16 8QD, which expression shall include its successors, permitted assignees and transferees, acting jointly and severally (together the "**Infraco**");

(3) **PARSONS BRINCKERHOFF LIMITED** (company number 2554514) whose registered office is at Amber Court, William Armstrong Drive, Newcastle Business Park, Newcastle Upon Tyne, NE4 7YQ ("**SDS Provider**").

BACKGROUND

A By an agreement in writing dated 19 September 2005 ("**SDS Agreement**") **tie** appointed the SDS Provider to provide system design services in connection with the Edinburgh Tram Network.

B **tie** and Infraco have entered into a contract of even date ('**Infraco Contract**') under which Infraco has been appointed to complete the design and carry out the construction, installation, commissioning and maintenance planning in respect of the Edinburgh Tram Network.

C **tie** and Infraco have agreed, with the consent of the SDS Provider, that the Infraco shall take over the rights and liabilities of the "Client" under the SDS Agreement by novating the SDS Agreement from **tie** to Infraco upon and subject to the terms of this Agreement.

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions given in the recitals to this Agreement apply to this Agreement.

1.2 Clause headings in this Agreement are for the convenience of the parties only and do not affect its interpretation.

1.3 Unless otherwise defined hereunder, where the SDS Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement.

1.4 In this Agreement the following words and expressions shall have the meanings hereby ascribed to them

"**Design Delivery Programme**" has the meaning given in Appendix 1 to this Agreement;

"**Disclosure Statement**" means Appendix, Part 5 (together with all the documents attached to or referred to in it);

"**EAL**" means Edinburgh Airport Limited a subsidiary of BAA plc and the operator of Edinburgh Airport;

"**Employer's Requirements**" has the meaning given in the Infraco Contract;

"**Incentivisation Payment**" means the sum of £1,000,000;

"**Infraco Contract**" has the meaning given in Appendix 1 to this Agreement;

"**Infraco Proposals**" has the meaning given in the Infraco Contract;

"**Issued for Construction Drawings**" has the meaning given in Appendix 1 to this Agreement;

"**SRU**" means the Scottish Rugby Union;

"**Third Party Agreements**" means the Parliamentary Undertakings, Third Party Agreements and other undertakings or commitments entered into at the date of this Agreement by CEC or **tie** in relation to the Edinburgh Tram Network and listed in Appendix Part 6 (in so far as the same have been supplied to the SDS Provider);

"**tie Change Order**" has the meaning given in the Infraco Contract and shall include a confirmation of a Mandatory tie Change and a Notified Departure (as defined in the Infraco Contract);

"**Tram Legislation**" means the Edinburgh Tram (Line One) Act 2006 and the Edinburgh Tram (Line Two) Act 2006, which received Royal Assent on 8 May 2006 and 27 April 2006 respectively and which confer on CEC all requisite authorities and statutory powers to procure the construction, operation and maintenance of the Edinburgh Tram Network;

2. RELEASE BY THE SDS PROVIDER OF TIE

2.1 The SDS Provider releases and discharges **tie** from any and all duties, obligations and liabilities owed to the SDS Provider under the SDS Agreement and accepts the liability of the Infraco under the SDS Agreement in lieu of **tie**.

2.2 The Parties acknowledge that the SDS Provider and **tie** shall enter into a separate agreement in respect of certain design services connected to the implementation of utilities diversionary works for the Edinburgh Tram Network and that scope of work is not novated under this Agreement.

3. RELEASE BY TIE OF THE SDS PROVIDER

3.1 **tie** releases and discharges the SDS Provider from the further performance of the SDS Provider's duties and obligations under the SDS Agreement.

4. ACCEPTANCE OF LIABILITY BY THE SDS PROVIDER TO THE INFRACO

4.1 The SDS Provider undertakes to continue to perform all the duties and to discharge all the obligations of the SDS Provider under the SDS Agreement and to be bound by its terms and conditions in every way as if the Infraco was and always had been a party to the SDS Agreement in place of **tie**.

4.2 The SDS Provider warrants and undertakes to the Infraco that:

4.2.1 in respect of the duties and obligations which it has already performed under the SDS Agreement, it has performed those duties and obligations in accordance with the standards of skill and care set out in the SDS Agreement; and

4.2.2 subject to Clause 12.1:

(a) the SDS Provider is not aware having made due and diligent enquiry, of any breaches by **tie** of the SDS Agreement and there is no dispute or claim subsisting nor are there any circumstances existing which might give rise to any dispute or claim relative to the SDS Agreement;

(b) the information set out at Appendix Part 4 (*Design and Deliverable Status*) is true, complete and accurate in all respects and is not misleading;

(c) the Deliverables completed by the SDS Provider to the date of this Agreement and listed in Appendix Part 4:

(A) are in all respects in compliance with the SDS Agreement and, without prejudice to the foregoing generality:

(i) the Tram Legislation;

(ii) all applicable Law and Consents;

(iii) the Parliamentary Undertakings;

(iv) the Environmental Statements, and all other applicable environmental regulations and requirements;

(v) will permit compliance with the Code of Construction Practice; and

(vi) the Third Party Agreements (and in the case of SRU the draft Third Party Agreement);

(B) is so as to enable the Edinburgh Tram Network on completion of construction, testing and commissioning to be sited (and thereafter be operated and maintained)within the limits of deviation under the Tram Legislation save as expressly indicated in the Disclosure Statement,

(d) the design as fully developed pursuant to the SDS Agreement following the date of this Agreement shall continue to meet the requirements of Clause 4.2.2(c)(A) and (B) and on the basis of the standard of reasonable skill and care exercised pursuant to clause 3.2 of the SDS Agreement that

(i) the designs and Deliverables completed prior to the date of this Agreement comply with the Employer's Requirements

(ii) the designs and Deliverables as will be completed after the date of this Agreement will comply with the Employer's Requirements,

provided that in circumstances where compliance with the Employer's Requirements is dependant upon further design development to be undertaken by the Client (and which is out with the Services provided by SDS), the SDS Provider's obligation pursuant to this Clauses 4.2.2(d) shall be limited to having produced or producing designs and Deliverables that are capable of allowing Infraco to develop a design which is compliant with the Employer's Requirements.

(e) save in respect of any Consents which are the responsibility of **tie** in terms of Clause 19 of the Infraco Contract, the Consents listed at Appendix Part 2 (*Consents Programme*) are all the Design Stage Consents which are required to enable the Edinburgh Tram Network to be procured, constructed, installed, tested and commissioned, and thereafter operated and maintained in accordance with the Infraco Contract;

(f) it has received no Client Notice of Change or any other instruction from **tie** to vary any term of the SDS Agreement (whether pursuant to Clause 15 and 29.2 of the SDS Agreement or otherwise) and, subject to Clause 9.1 below, it has agreed no variation, alteration of the SDS Agreement; and

(g) no Change in Law has come into effect or is anticipated to come into effect which would have a material adverse impact on the Deliverables completed or to be completed pursuant to the SDS Agreement

The SDS Provider warrants and undertakes to the Infraco that it shall be liable for any loss or damage suffered or incurred by the Infraco arising out of any negligent act, default or breach by the SDS Provider in the performance of its obligations under the SDS Agreement prior to the date of this Agreement. The SDS Provider shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by **tie** (or suffered or incurred to the same extent by **tie**) or is different to or arises on a different basis to any loss or damage which would have been suffered or incurred by **tie**.

4.3 The SDS Provider undertakes and warrants to the Infraco that its design is consistent with and delivers the Edinburgh Tram Network runtime set out in the Employers' Requirements , which runtime supersedes that set out in the SDS Agreement.

4.4 The liability of the SDS Provider to the Infraco pursuant to the SDS Agreement shall not be affected by the Infraco's assumption of liability for design to **tie** pursuant to the Infraco Contract.

4.5 The SDS Provider acknowledges that the Infraco has and shall continue to rely upon all Services carried out by the SDS Provider.

4.6 **tie** warrants that it has received a report from the SDS Provider (annexed at Part B of Appendix Part 7) setting out the misalignments between the Deliverables completed prior to the date of this Agreement and the Employer's Requirements and that it has issued initial instructions (in the form of the letter annexed at Part A of Appendix Part 7) to the SDS Provider in relation to addressing all such misalignments. Upon completion of the work entailed to resolve the misalignments, the SDS Provider confirms to **tie** and the Infraco that such Deliverables shall be consistent with the Employer's Requirements.

4.7 As soon as reasonably practicable, the Parties shall commence and expeditiously conduct a series of meetings to determine the development of the Infraco Proposals and any consequential amendment to the Deliverables (the "**Development Workshops**"). The matters to be determined at the Development Workshops shall be those set out in the report annexed at Part C of Appendix Part 7 (the "**Misalignment Report**"), together with any items identified as "items to be finalised in the SDS/BBS alignment workshops" in Appendix 4 to be dealt with in the following order of priority and objective unless otherwise agreed:

1 Roads and associated drainage and vertical alignment with the objective of minimising the extent of full depth reconstruction for roads thus minimising cost and construction programme duration

2. Structures value engineering, including track fixings to structures with the objective of enabling BBS to realise the Value Engineering savings for the structures identified in Schedules 4 and 30 of the Infraco Contract (Pricing and Infraco Proposals respectively)

3. OLE Design with the objective of identifying and agreeing the actions, responsibilities and programme to enable Infraco to implement their proposals for OLE as identified in the Infraco Proposals

4. Trackform with the objective of completing an integrated design to enable BBS to implement their proposals for trackform

5. Sub-station buildings with the objective of resolving the misalignment between Infraco Proposals and SDS Design with the minimum of changes to accommodate the Infraco Proposals for substations.

The following to be reviewed at the end of the Development Workshop to identify any issues arising from the above items:

1. Earthworks

2. Landscaping

3. OLE Foundations

4. Alignment

5. Site Clearance

6. Tramstops

7. all other items in the Misalignment Report together with any items identified as "items to be finalised in the SDS/BBS alignment workshops" in Appendix 4.

At the Development Workshop, the Parties shall also develop a strategy for co-operation between the SDS Provider and the Infraco to manage design development and the necessary interface between the Infraco's design and the design developed by the SDS Provider.

4.8 The product of the Development Workshops shall be a report signed by each of the Parties to detail the conclusions in respect of each matter and the payments to be made to the SDS provider in respect of the work to be carried out by the SDS Provider as a result of the conclusions set out in the report. Any consequential **tie** Change Orders or instructions shall be appended to such report as and when the same are issued. **tie** shall pay the SDS Provider for the work required for the Development Workshop on an hourly rate basis in accordance with the hourly rates set out in Appendix Part 8 and the SDS Provider agrees that the Infraco shall not be liable to make such payments to the SDS Provider. For the avoidance of doubt, the Infraco and **tie** agree that any amendment to the Deliverables completed prior to the date of this Agreement as set out in this report will be a Mandatory **tie** Change under the Infraco Contract, and a Client Change under the SDS Agreement.

5. VESTING OF REMEDIES AGAINST SDS PROVIDER

5.1 All rights of action and remedies against the SDS Provider under and pursuant to the SDS Agreement vested in **tie** (as Client) shall from the date of this Agreement vest in the Infraco.

5.2 Subject to Clause 12.1, **tie** warrants to the Infraco that there is no dispute or claim subsisting (save to the extent that the same are fairly disclosed in the Disclosure Statement), nor are there any circumstances existing which might give rise to any dispute or claim by the SDS Provider against **tie** relative to the SDS Agreement.

5.3 **tie** shall indemnify the Infraco against all loss, injury and damage that the Infraco may incur as a consequence of any dispute or claim by the SDS Provider or circumstance referred to in Clause 5.2 above identified in the Disclosure Statement which relates to the SDS Provider and **tie's** dealings under the SDS Agreement prior to the date of this Agreement.

6. ACCEPTANCE OF LIABILITY BY THE INFRACO

6.1 The Infraco undertakes to perform all the duties and to discharge all the obligations of **tie** under the SDS Agreement and to be bound by its terms and conditions in every way as if the Infraco was and always had been a party to the SDS Agreement in place of **tie** and as if all acts and omissions of **tie** under or pursuant to the SDS Agreement prior to the date of this Agreement were the acts and omissions of the Infraco.

6.2 The Infraco undertakes to pay the SDS Provider the amounts set out in Appendix Part 4 in respect of the outstanding work identified in Appendix Part 4 in accordance with the terms of the SDS Agreement.

7. VESTING OF REMEDIES AGAINST TIE

7.1 All rights of action and remedies under or pursuant to the SDS Agreement vested in the SDS Provider shall, save in respect of those sums identified in Clauses 8.1 and 8.8 from the date of this Agreement lie against the Infraco and not **tie**.

7.2 Without prejudice to Clause 4.2.2(a), the SDS Provider waives all right to claim against Infraco in respect of any breach of the SDS Agreement by **tie** prior to the date of this Agreement.

8. ACKNOWLEDGEMENT OF PAYMENT AND INCENTIVE

8.1 The SDS Provider acknowledges that all fees and expenses properly due to the SDS Provider under the SDS Agreement up to the date of this Agreement have been paid by **tie** other than

any payments which become due under Clause 29.3 of the SDS Agreement or due as a consequence of the further instruction to be issued by **tie** pursuant to Clauses 4.6 or 4.8 to be paid by **tie**.

8.2 **tie** and SDS acknowledge that **tie** has paid SDS in respect of its existing claims for prolongation and SDS confirms to **tie** and the Infraco that it has accepted such payments, when made in full and final settlement of any and all claims of whatever nature existing and/or available to it prior to the date of execution of this Agreement.

8.3 **tie** warrants to Infraco that all fees and expenses properly due to the SDS Provider under the SDS Agreement up to the date of this Agreement have been paid by **tie**.

8.4 The parties agree that Infraco will have no liability in relation to the payments referred to in Clause 8.1 or 8.8.

8.5 **tie** has released the retention bond (in accordance with clause 12.7.4 of the SDS Agreement)

8.6 Subject to Clause 4.2.1, the SDS Provider warrants to the Infraco that Appendix Part 4 contains an accurate status and identification confirmation of all Deliverables produced by the SDS Provider up to the date of this Agreement.

8.7 The parties agree that Appendix Part 4 contains (i) an accurate description of the balance of the Deliverables to be completed; and (ii) the agreed price for completion of the Deliverables.

8.8 **tie** shall pay to the SDS Provider the Incentivisation Payment 14 days after the provision of the last required Issued for Construction Drawing save that the Incentivisation Payment shall be reduced by the sum of £8,928.57 in respect of each occasion that the SDS Provider does not achieve the provision of Issued for Construction Drawings by the dates identified in the Design Delivery Programme save where **tie** and the SDS Provider otherwise agree. No further or other reduction can be made to the Incentivisation Payment whether by abatement set off or counterclaim.

8.9 For the purposes of Clause 8.8 any extension of time granted to the SDS Provider pursuant to Clause 7.5.2 of the SDS Agreement in respect of any Issued for Construction Drawings shall be ignored save where the cause of the entitlement to an extension of time is a circumstance or occurrence entitling the Infraco to an extension of time and that such circumstance or occurrence is a **tie** Change (as defined in the Infraco Contract).

9. AMENDMENT OF SDS AGREEMENT

9.1 **tie**, the SDS Provider and the Infraco agree that the terms of the SDS Agreement shall be and are varied in the manner set out in Appendix Part 1 to this Agreement.

9.2 Subject to Clause 9.1, **tie** warrants to Infraco that it has not issued any Client Notice of Change or any other instruction to the SDS Provider to vary any term of the SDS Agreement (whether pursuant to clause 15 of the SDS Agreement, clause 29.2 of the SDS Agreement or otherwise) and it has agreed no variation, alteration of the SDS Agreement.

10. AFFIRMATION OF SDS AGREEMENT

The terms and conditions of this Agreement represent the entire agreement between the parties relating to the novation of the SDS Agreement and, except as specifically amended by Appendix Part 1 of this Agreement, all the terms and conditions of the SDS Agreement remain in full force and effect.

11. RIGHTS OF THIRD PARTIES

A person who is not party to this Agreement shall have no right to enforce any term of this Agreement. This Clause does not affect any right or remedy of any person which exists or is otherwise available.

12. WARRANTIES

12.1 The warranties set out in Clause 4.2.2(a) to-(g) and Clause 5.2, are subject only to any matter which is fully and fairly disclosed to the Infraco in the Disclosure Statement (with sufficient details to enable the Infraco to identify the nature and scope of the matter disclosed and to make an informed assessment of the matter concerned and its significance to the Infraco and/or the design, construction, installation, testing, commissioning, operation and or maintenance of the Edinburgh Tram Network).

12.2 Save as provided in Clause 12.1 no information of which Infraco has knowledge (actual, constructive or imputed) shall prejudice any claim being made by Infraco under any of the warranties set out in Clauses 4.2, 4.3, 5.2, 8.3, 8.6 and 9.2 (the "**Warranties**") nor shall it affect the amount recoverable under any such claim and neither the rights and remedies of Infraco nor the SDS Provider's or **tie**'s (as the case may be) liability in respect of the Warranties shall be affected by any investigation made by or on behalf of Infraco.

any event, matter or circumstance which comes to its knowledge which is, or may constitute, a breach of, or which is, or may be, inconsistent with, any of the Warranties given by that Party in this Agreement or the disclosures given by that Party in the Disclosure Statement.

13. LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with Scots law and the Scottish Courts shall have jurisdiction with regard to all matters arising under it. This Agreement shall be a "Related Contract" for the purpose of clause 28 of the SDS Agreement and Clause 97 (Dispute Resolution Procedure) of the Infraco Contract.

IN WITNESS WHEREOF these presents on this and the preceding ~~7~~ 10 pages together with the Appendix in ~~8~~ 9 Parts which is annexed hereto are executed as follows:

EXECUTED for and on behalf of **TIE LIMITED** at Edinburgh on ~~13~~ 14 May 2008 by:

Authorised Signatory [redacted]

Full Name WILLIAM GALLAGHER

Witness Signature [redacted]

Full Name STEVEN BELL

Address 13 NEW RAD

LEISMAHAGOW.

EXECUTED for and on behalf of **SIEMENS PLC** at Edinburgh on ~~13~~ 14 May 2008 by:

Authorised Signatory [redacted]

Full Name C. ROTH

Authorised Signatory [redacted]

Full Name M. FLYNN

EXECUTED for and on behalf of **BILFINGER BERGER UK LIMITED** at Edinburgh on 14 May 2008 by:

Director [redacted]

Full Name Richard John Walker

Director [redacted]

Full Name Barry Steve Dalton

EXECUTED for and on behalf of **PARSONS BRINCKERHOFF LIMITED** at Edinburgh on 14 May 2008 by:

Director [redacted]

Full Name Stephen Christopher Reynolds

Witness Signature [redacted]

Full Name Christopher Ian Tatnall

Address 25 Wilton Road

London SW1

This is the Appendix referred to in the foregoing Novation Agreement among tie, Infraco and Parsons Brinkerhoff Limited

APPENDIX PART 1

SCHEDULE OF AMENDMENTS TO THE SDS AGREEMENT

Clause 1 – Definitions and Interpretation

1.1 Amend existing definitions:

Background Information

Insert ", the Client" after "CEC"

Change in Law

Add "(d) any new requirement for any statutory Consent other than a statutory Consent the need for which had been published on 7 August 2007."

Client Change

Add 'and any amendment to the Consents Programme and/or the Design Delivery Programme (other than one necessitated by a breach of this Agreement by the SDS Provider) and any change made to the Employer's Requirements or Infraco Proposals made after the date of the Novation Agreement

Edinburgh Tram Network

Delete "**tie**" and replace with "the Client"

Insolvency Event

(k) delete references to "**tie**" and replace with "the Client" in each place

Delete **Master Project Programme** and replace with Programme

Planned Service Commencement Date means the date specified for service commencement in the Infraco Contract

Programme

Delete the entire definition and replace with "means the Consents Programme and/or the Design Delivery Programme, as the context may require"

Programme Phasing Structure

Delete "**tie**" and replace with "the Client"

1.1 Insert the following new definitions:

Client Designs means designs and information which are being provided by the Client;

Compensation Event has the meaning given in the Infraco Contract;

Consents Programme means the document in Appendix Part 2 to the Novation Agreement as amended or updated from time to time in accordance with this Agreement

Construction Programme means the programme included in Schedule Part 15 of the Infraco Contract and as may be updated in accordance with the terms of the Infraco Contract such programme to contain the Consents Programme, Design Delivery Programme and the construction activities programme.

Design Delivery Programme means the document in Appendix Part 2 to the Novation Agreement as amended or updated from time to time in accordance with this Agreement

Design Management Plan means the document which forms part of Part 14 of the Schedule to the Infraco Contract and has that name;

Design Stage Consents means the Consents (including Consents in respect of Client Designs) listed in Table A below and any further Consents which may be required for the construction, installation, commissioning, completion and opening of the Edinburgh Tram Network as is consistent with, required by or contained within the Services.

Table A

	Consent	Approval Body
Railways and Aviation	HMRI	HMRI
	Network Rail	Network Rail
	Airport/Aviation Consents, including EAL Permissions and EAL Works Data, to the extent that the same are Deliverables under the SDS Agreement.	Edinburgh Airport Limited/BAA/CAA/NATS
Planning	Listed Building Consent	CEC Planning Authority
	Prior Approval	CEC Planning Authority
	Planning Permission	CEC Planning Authority
	Conservation Area Consent	CEC Planning Authority
	Scheduled Monument Consent	Scottish Executive & Historic Scotland
	Advertisement Consent	CEC Planning Authority
Traffic Management	Road Technical Approvals relating to structures, lighting, traffic signals, road markings, safety and geometry and drainage.	CEC Roads Authority
Environment Ecological	Badger Licence	Scottish Natural Heritage
	Otter holt/disturbance licence	Scottish Natural Heritage
	Bat Licence	Scottish Natural Heritage

	Appropriate Assessment	Competent Authority
Drainage **CAR**	CAR General Binding Rules	SEPA
	CAR Registration	SEPA
	CAR Licence	SEPA
	Water/Wastewater Connection	Scottish Water
Construction	Technical Approval	CEC Bridges/CEC Roads
	Building Warrant	CEC Building Standards
Radio	OFCOM licence	OFCOM
Design Consultation	Third Party Design Consultation	Third parties
Undertakings	Parliamentary Undertakings	Parliament and third parties
Agreements	Third Parties approval and consents	Third parties

Infraco Proposals has the meaning given in the Infraco Contract;

Infraco Works has the meaning given in the Infraco Contract

Issued for Construction Drawings means those Deliverables necessary for Infraco to commence construction of the relevant part of the Infraco Works and as shown on the Design Delivery Programme which have been fully approved by all Approval Bodies and in accordance with the Review Procedure;

Novation Agreement means the agreement for novation of the SDS Agreement entered into between **tie**, the Infraco, and the SDS Provider, dated on or about the date of the Infraco Contract

Quality Management System means the quality management system entitled Bilfinger Berger - Siemens (BBS) Consortium, Edinburgh Tram Network Infraco, PROJECT MANAGEMENT PLAN INCLUDING QUALITY PLAN utilised by the Infraco and dated 12 February 2008, as amended from time to time in accordance with the Infraco Contract;

Relief Event has the meaning given in the Infraco Contract

Clause 2 – Term of this Agreement

Delete Clause 2 and substitute therefore:

This Agreement shall come into effect on the last date of execution of this Agreement. The rights and obligations imposed on the SDS Provider to perform the services set out in Schedule 1 (Scope of Service) shall continue (unless expressly provided otherwise in Schedule 1 to this Agreement) until the date on which the SDS Provider is notified by the Client that the Patent Defects Rectification Period (as defined in the Infraco Contract) has expired. For the avoidance of doubt, the liability of the SDS Provider in respect of any breach of this Agreement or negligence in the performance of the Services shall continue in full force and effect notwithstanding any notification by the Client pursuant to this Clause 2.1.

Clause 3 - Duty of Care, Standards and the Services to be Provided

3.3.4 Insert "Employer's Requirements" after "Technical Specifications".

3.3.14 Insert ", the Client, Bilfinger Berger, Siemens" after "the Scottish Executive"

3.10 Delete references to "**tie**" and "**tie** Parties" and replace with references to "the Client" and "Client Parties" respectively.

3.18 Replace "planning supervisor" with "CDM coordinator".

Insert the following new Clauses:

3.28 The SDS Provider is aware and has knowledge of all the terms and conditions of the Infraco Contract and the SDS Provider shall not cause the Infraco to be in breach of the provisions of the Infraco Contract to be observed and performed and complied with by the Infraco in so far as they relate and apply to the Services, and is further aware and has taken and shall continue to take full account of the obligations to be undertaken and the liabilities which may be incurred by the Infraco therein in relation to the Services.

3.29 The SDS Provider acknowledges that any breach by it of this Agreement may result in the Infraco committing breaches of and becoming liable for damages under the Infraco Contract and other contracts made by it in connection with the Infraco Contract and may occasion further loss or expense to the Infraco in connection with the Infraco Contract and such other contracts and all such damage, loss and expense is hereby agreed to be within the contemplation of the Parties as being the probable results of any such breach by the SDS Provider. Subject to Clause 27.6 and 27.7, the SDS Provider shall indemnify the Infraco against all such damage, loss and expense.

3.30 The SDS Provider shall observe, perform and comply with all the provisions of the Infraco Contract (in so far as the same has been supplied to the SDS Provider) on the Infraco's part to be observed, performed and complied with insofar as they relate and apply to the performance of the Services and the SDS Provider shall be liable to the Infraco for:

3.30.1 any breach, non-observance or non-performance for which the SDS Provider is responsible of any of the provisions of the Infraco Contract in so far as they relate and apply to the performance of Services; and

3.30.2 any act or omission for which the SDS Provider is responsible which involves the Infraco in any liability to **tie** and/or the Tram Supplier under the provisions of the Infraco Contract in so far as they relate and apply to the performance of Services; and

3.30.3 any claim, damage, loss or expense due to or resulting from any negligence or breach of duty for which the SDS Provider is responsible.

3.31 Provided that the Client has received the necessary design and other information from the SDS Provider in accordance with the Design Delivery Programme to allow it to develop the Client Designs, the Client shall, as soon as reasonably practicable, provide to the SDS Provider such Client Designs and, save where the SDS Provider has an obligation pursuant to this Agreement to obtain such information or instructions from another party, such other information and instructions as are necessary to enable the SDS Provider to comply with the Consents Programme and/or the Design Delivery Programme.

Clause 4 - Development, Review, Finalisation and Delivery of the Deliverables

4.4 Delete reference to tie in third line and replace with "the Client".

Delete Clause 4.5 and insert the following new Clause 4.5

4.5 The SDS Provider shall submit to the Client's Representative five copies of each Deliverable no later than the date shown in the Design Delivery Programme.

4.6 Delete "submittal programme" and replace with "Design Delivery Programme".

4.8 Delete all after 'Approval Bodies' and add: "the SDS Provider shall amend the Deliverable. Such amendment shall be at the SDS Provider's cost except where such amendment is required in order for the Deliverable to meet the requirements of any Approval Bodies, where such requirements are:

4.8.1 inconsistent with or in addition to the Infraco Proposals or the Employer's Requirements;

4.8.2 not reasonable given the nature of the Approval Body; or

4.8.3 not reasonably foreseeable within the context of the Infraco's Proposals or the Employer's Requirements,

in which case such amendment shall be a Client Change. All such amendments shall be made in accordance with Schedule 9 (*Review Procedure*) and shall ensure that the Deliverable shall satisfy the requirements of this Agreement and any Approval Bodies.

4.11/4.12 Insert "Employer's Requirements" in line 3 after "Technical Specifications"

Insert the following new Clause 4.14:

4.14 In addition to the other requirements of this Clause 4, the SDS Provider shall support the Client as reasonably required in relation to the maintenance and provision of any records, drawings, registers, manuals and/or reports as may be required under the Infraco Contract.

Clause 5 – Consents

Delete Clause 5.1 and substitute therefor:

5.1 The SDS Provider shall (at its own cost and expense):

5.1.1 submit applications which are valid and complete for (and/or for renewal or extension as appropriate of) all Design Stage Consents in accordance with the timetable set out in the Consents Programme and thereafter (subject to Clause 7.5) obtain and maintain in effect all Design Stage Consents;

5.1.2 implement each Design Stage Consent within the period of its validity and in accordance with its terms; and

5.1.3 observe and comply with the terms of each Consent (not being a Design Stage Consent) obtained from time to time in connection with the construction, installation, commissioning, completion and opening of the Edinburgh Tram Network.

Clause 5.2 - Delete "Consents" and replace with "Design Stage Consents".

Delete 5.4 and substitute therefor:

5.4 The SDS Provider shall update the Consents Programme not less than 3 Business Days prior to each Reporting Period End Date, showing progress and identifying any new Consents (whether or not Design Stage Consents) to be obtained. Subject to Clauses 7.5 and 15 no other changes to the Consents Programme shall be permitted without the consent in writing of the Client. The Client shall be entitled to request information in relation to the progress of the application for any such Consent and the Consent itself and the SDS Provider shall provide the same at no cost to the Client.

Insert new Clauses:

5.5 Without prejudice to Clause 5.1.1, the SDS Provider shall inform the Client as soon as practicable after becoming aware that a Design Stage Consent (or its extension and/or renewal) will not be obtained by the programmed date set out in the Consents Programme.

5.6 Where an application for a Design Stage Consent (or its extension and/or renewal) is denied, the SDS Provider shall notify the Client of the reasons given by the Approval Body for declining to issue or renew the Design Stage Consent and shall provide all appropriate supporting documentation to the Client.

5.7 Subject to Clause 5.8 below, failure to obtain a Design Stage Consent from the relevant Approval Body in respect of a design which the SDS Provider is responsible for preparing by the date on which it is shown as required in the Design Delivery or Consents Programme shall not be a breach of this Agreement and shall be a Compensation Event.

5.8 Clause 5.7 shall apply following the inability of the SDS Provider to obtain (or maintain) a Design Stage Consent for which it is responsible and in accordance with the Consents Programme contained in the SDS Novation Agreement, provided that:

5.8.1 the SDS Provider

(i) has complied with clauses 5.5 and 5.6;

(ii) has used reasonable endeavours to afford the Infraco a period of 3 Business Days from notification under Clauses 5.5 or 5.6 to meet with the relevant Approval Body with a view to resolving the situation and supports them by its attendance at such meeting; The SDS Provider acknowledges that **tie** is entitled to attend the meeting

(iii) has acted timeously in order to mitigate the impact of the failure to obtain or renew the Consent;

5.8.2 the SDS Provider has ensured timely provision of adequate required information to the relevant Approval Body in accordance with the Consents Programme, the Design Delivery Programme, the agreed requirements of the Approval Body and the Design Management Plan.

5.8.3 the inability to obtain or renew the Consent is not the result of the SDS Provider reprioritising the Consents Programme and/or the Design Delivery Programme (save where such reprogramming or prioritisation is the direct result of a Client Change, an extension of time pursuant to Clause 7.5, a Relief Event or a Compensation Event) such that the relevant Approval Body has insufficient time or information in which to respond to an altered timescale;

5.8.4 there has been a failure of the relevant Approval Body to respond in accordance with the agreed requirements of the Approval Body and timescales set out in the Design Management Plan or Design Delivery Programme or, if none has been stipulated, any reasonable timescale, provided that this failure has not been caused by inadequate or late submissions by the SDS Provider with regard to other Consents;

5.8.5 the failure to obtain or renew the Consent is not a consequence of a failure of the SDS Provider to perform its obligations under the SDS Agreement in terms of the quality or content of the relevant Deliverables and as required pursuant to the Design Management Plan, the Design Delivery Programme or the Consents Programme and, where relevant, Clause 10 (*Design Development and Finalisation*); or

5.8.6 the failure to obtain or renew a Consent is as a consequence of the quality or content of Client Design.

5.9 For the avoidance of doubt, clause 5.7 shall apply where, and to the extent, that a Consent in respect of a submission for Prior Approval is sought and the relevant Approvals Body

5.9.1 requires changes to design which could not reasonably have been anticipated from the previous formal or informal consultations or communications with the Approvals Body; or

5.9.2 does not deliver the Consent within the period stated in the Consents Programme or such Consents Programme updated in accordance with these terms.

5.10 Clause 5.8.3 shall not apply to a Prior Approval Consent where the Approval Body, acting reasonably, has agreed in writing to a proposal from the SDS Provider to changes in the sequencing, packaging and timescales set out in the Design Management Plan or the Consents Programme, provided that the SDS Provider has provided reasonable advance notice to **tie** and to the Approvals Body including full details of the proposed changes.

Clause 6 – Quality Assurance

6.1 Delete "a quality management system, and comply with such system" and replace with "and comply with the Quality Management System".

6.2 Delete "SDS Provider's quality management system" and replace with "Quality Management System".

Clause 7.1 – Master Project Programme, Programme Phasing Structure and Programme

7.1 Amend to delete reference to "Master Project Programme" and substitute "Programme".

Clause 7.5 - Extensions of Time:

Delete Clause 7.5 and substitute therefor:

7.5.1 If the SDS Provider shall be delayed in the execution of the Services:

7.5.1.1 by any circumstances or occurrence (other than a breach of this Agreement by the SDS Provider) entitling the Infraco to an extension of time for completion or stage completion of the Infraco Contract including, without limitation, any Relief Event or Compensation Event; or

7.5.1.2 by the issuing of a Client Change Order in respect of the Services to which Clause 7.5.1.1 does not apply; or

7.5.1.3 by reason of any other breach by the Client of this Agreement (save to the extent caused or contributed to by breach of this Agreement by the SDS Provider)to the extent not caused or contributed to by breach of the Infraco Contract by tie or any Relief Event or Compensation Event; or

7.5.1.4 by reason of any circumstances to which Clause 5.8.6 applies, irrespective of whether it entitles the Infraco to an extension of time or Compensation Event under the Infraco Contract.

then in any such event the SDS Provider shall forthwith notify the Client of:-

(a) the cause of the delay;

(b) the SDS Provider's estimate of the likely effect of such delay upon the Consents Programme and/or the Design Delivery Programme;

(c) the estimated additional cost that shall be incurred; and

(d) any acceleration measures which the SDS Provider could take to mitigate the effects of such delay and an estimate of the costs thereof

and, in the case of any event listed in Clauses 7.5.1.1 and/or 7.5.1.2, shall include such information as Infraco would be required to provide pursuant to Clause 65.2 of the Infraco Contract in respect of such event and/or circumstance.

7.5.2 Subject to compliance with Clause 7.5.1, the SDS Provider shall, subject to any instruction to accelerate the Services pursuant to Clause 7.5.3, be entitled to such adjustment to the Consents Programme and/or the Design Delivery Programme as may in all circumstances be fair and reasonable in respect of any event or circumstance under Clause 7.5.1, provided always that the SDS Provider's entitlement to an extension of time for any event listed in Clauses 7.5.1.1 and 7.5.1.2 above shall in no circumstances exceed (in respect of such event) the extension of time (if any) to which the Client is entitled for the identical event under the Infraco Contract. An extension of time shall not be granted where the cause of the Services having been delayed, affected or suspended is due to any act, omission, default or breach of the Agreement by the SDS Provider or its employees, agents or servants or any SDS Provider Party.

7.5.3 The Client shall issue a Client Change Order to authorise any agreed acceleration of the Consents Programme and/or the Design Delivery Programme and/or increased costs as a result of delays notified under Clause 7.5.1.

7.5.4 If the Services are delayed in circumstances other than those entitling the SDS Provider to an extension of time as set out in Clause 7.5.1 or as a result of a Force Majeure Event, the SDS Provider shall inform the Client at the earliest opportunity and shall give an estimate of the likely effect upon the Consents Programme and/or the Design Delivery Programme. The SDS Provider at his own expense shall take such acceleration measures as are necessary to achieve the requirements of the Consents Programme and/or the Design Delivery Programme.

7.5.5 The SDS Provider shall not be entitled to and shall be deemed to have irrevocably waived any entitlement to any extension of time unless the SDS Provider has:

7.5.5.1 within 10 Business Days of becoming aware of the circumstances or occurrences which have caused or are likely to cause delay to the SDS Provider in the performance of the Services notified the Client in writing; and

7.5.5.2 within 10 Business Days after such notification submitted by further written notice to the Client detailed particulars of any extension of time to which it may consider itself entitled in order that such submission may be investigated at the time; and

7.5.5.3 wherever applicable, complied with the requirements of any Clause under this Agreement requiring timely notice to be given.

7.5.6 Any notice under 7.5.5.1 or 7.5.5.2 above shall give full particulars to the extent then possible of the cause of the delay and of its probable duration and where appropriate (and that without prejudice to Clause 7.5A)reasonable estimate of any direct and indirect costs likely to result therefrom together with any other relevant details.

7.5A Additional Costs

7.5A.1 In the event that a Compensation Event causes the SDS Provider to incur costs beyond such costs which were reasonably anticipated to be incurred by the SDS Provider but for the occurrence of the Compensation Event (which for these purposes shall include any breach of this Agreement by the Client to the extent caused or contributed to by breach of the Infraco Contract by tie) then without prejudice to Clause 7.5 the SDS Provider shall be entitled to claim costs under this Agreement.

7.5A.2 To claim costs, the SDS Provider must, as soon as practicable, and in any event within 10 Business Days after it first became aware that the Compensation Event had caused or is likely to cause the SDS Provider to incur additional costs:

(a) give to the Client a notice of its claim for costs and full details of the nature of the Compensation Event, the date of occurrence and its likely duration;

(b) include in any notice given under Clause 7.5A.2(a) full details of any costs claimed including:

(i) details of the costs or losses which are not Indirect Losses;

(ii) mitigation measures adopted and why unsuccessful; and

(iii) any acceleration or other measures which the Infraco could take to mitigate the effects of any delay or non-performance and, where applicable, an estimate of the costs thereof;

provided that where a Compensation Event has a continuing effect, such that it is not practicable for SDS Provider to submit full details in accordance with this Clause 7.5A.2 then the SDS Provider shall instead submit to the Client:

(A) a statement to that effect with reasons, together with interim written particulars (including details of the likely consequences of the Compensation Event on the SDS Provider's ability to comply with its obligations under this Agreement and an estimate of the likelihood and likely extent of the delay or non-performance and the costs incurred); and

(B) thereafter, further interim written particulars until the actual costs incurred (if any) are ascertainable, whereupon the SDS Provider shall as soon as reasonably practicable, submit to tie the items referred to in Clause 7.5A.2(b);

(c) demonstrate to the reasonable satisfaction of the Client that:

(i) the SDS Provider and the SDS Provider Parties could not reasonably have avoided such occurrence or consequences by steps which they might reasonably be expected to have taken;

(ii) the Compensation Event is the direct cause of the additional costs; and

(iii) the SDS Provider is using reasonable endeavours to perform its obligations under this Agreement.

7.5A.3 In the event that the SDS Provider has complied with its obligations under Clause 7.5A.2, then the SDS Provider shall be paid the amount of any direct and demonstrable additional cost as may be reasonable in the circumstances of the Compensation Event, provided always that the SDS Provider's entitlement to such costs shall in no circumstances exceed (in respect of such event) a fair and reasonable proportion of the costs (if any) to which the Client is entitled for the identical event under the Infraco Contract. An entitlement to additional costs shall not be granted where the cause of the Compensation Event is due to any act, omission, default or breach of the Agreement by the SDS Provider or its employees, agents or servants or any SDS Provider Party.

7.5A.4 The SDS Provider shall notify the Client if at any time it receives or becomes aware of any further information relating to the Compensation Event, giving details of that information to the extent that such information is new or renders information previously submitted materially inaccurate or misleading.

7.5A.5 If the Parties cannot agree the extent of the extension of time or relief required or the additional costs claimed or the Client disagrees that a Compensation Event has occurred (or as to its consequences) or that the SDS Provider is entitled to any additional costs, either Party may refer the matter for determination in accordance with the Dispute Resolution Procedure.

7.5A.6 The Client shall, in assessing any delay or extension of time or costs for the purpose of Clause 7.5 and/or this Clause 7.5A:

(a) not take into account any event or cause of delay or costs which is caused by any negligence, omission, default, breach of contract or breach of statutory duty of the SDS Provider or any SDS Provider Parties;

(b) take into account an event or cause of delay or costs only if and to the extent that the SDS Provider establishes to the satisfaction of the Client that the SDS Provider has used its reasonable endeavours to adjust the order and sequence in which the SDS Provider proposes to carry out the Services in such a manner as to minimise the effects of the delay in, or if possible to avoid altogether any delay in, the progress of the Services and mitigate the costs.

7.5A.7 The SDS Provider shall not be entitled to and shall be deemed to have irrevocably waived any entitlement to any extension of time and/or additional costs in respect of any failure by the SDS Provider to:

(a) manage the required interface with CEC in so far as this forms part of the Services; or

(b) manage any required interface with any Approval Body and/or third party where consent or approval is required at any stage of the Services; or

(c) identify any instructions which are required from the Client and/or tie in order to progress the Services in accordance with the Consents Programme and/or the Design Delivery Programme,

provided that following the occurrence of a Compensation Event nothing in this Clause 7.5A.7 shall prevent any required interfaces with CEC, any Approval Body and/or third party, or instructions which are required from the Client and/or tie from being taken into account when considering extensions of time in accordance with Clause 7.5 and/or additional costs in accordance with Clause 7.5A.

7.5A.8 Notwithstanding the occurrence of a Compensation Event, the SDS Provider shall continue to carry out the Services unless otherwise agreed in connection with Clause 7.5 and/or this Clause 7.5A.

Clause 9 – Sub-letting and the Appointment of SDS Provider Parties

Delete Clause 9.5.

Clause 11 – Methods of Payment

In Clause 11.6

In line five, replace "eighty per cent (80%)" with "ninety per cent (90%)"

In line nine, after the word "final.", delete the remaining wording and replace with:

"The SDS Provider may make application for payment in respect of the remaining ten per cent (10%) of the total value of the Detailed Design Phase Milestone payment:

11.6.1 in the case of Detailed Design Phase Deliverables which are required to be submitted to CEC for Technical Approval or Prior Approval pursuant to the Design Management Plan, on the date of their submission provided that such submission is made on or before the date of submission required by the Design Delivery Programme; or.

11.6.2 in the case of all other Deliverables (including, without limitation, any Detailed Design Phase Deliverables not submitted on or before the date of submission required by the Design Delivery Programme), following the issue of the Milestone Completion Certificate by the Client in respect of the relevant Detailed Design Phase for the relevant sub-sector or sector (as appropriate)."

Clause 15 - Changes

Insert the following new Clauses 15.18 and 15.19

15.18 Except in relation to a breach of this Agreement by the Client or unless otherwise agreed by the Client in writing, the SDS Provider's entitlement to additional payment or an extension of time for a Permitted Variation shall in no circumstances exceed (in respect of such Permitted Variation) the extension of time (if any) and/or additional payment (if any) to which the Infraco is entitled under the Infraco Contract for the identical Permitted Variation. The SDS Provider's entitlement to such extension of time or additional payment under this Agreement shall in no circumstances exceed that proportion of the Infraco's entitlement to an extension of time or additional payment under the Infraco Contract to which the Infraco becomes entitled in respect of the entitlement claimed by the SDS Provider. An extension of time and/or additional payment shall not be granted where the cause of the Permitted Variation is due to any act, omission, default or breach of the Agreement by the SDS Provider, its employees, agents or servants or any SDS Provider Party.

15.19 Clause 15.18 shall not apply in connection with additional payment due to the SDS Provider for Services relating to Deliverables in respect of 'Identified Value Engineering' or 'Further Value Engineering' (both as defined in Schedule Part 4 of the Infraco Contract) .

Clause 19 - Termination for SDS Provider Default

Delete Clause 19.1.3 and substitute therefore "Clause not used".

Clause 20 - Termination, Abandonment or Suspension of the Services by the Client

Delete Clause 20.1 and substitute therefor:

20.1 In the event that the Infraco Contract is terminated, this Agreement shall terminate. Such termination shall be deemed to have occurred under Clause 20 unless the Infraco Contract is terminated as a result of any circumstances specified in Clause 19 whereupon the provisions of Clause 25.3 shall not apply in such event.

Clause 22 - Termination for Corrupt Gifts and Payments

Delete Clause 22 (Termination for Corrupt Gifts and Payments in its entirety) substitute therefor:

22.1 The SDS Provider or anyone employed by it or acting on its behalf (including any SDS Provider Party) shall not commit any Prohibited Act.

22.2 If the SDS Provider or anyone employed by it or acting on its behalf (including any SDS Provider Party) commits any Prohibited Act, then the Client may terminate this Agreement with immediate effect by giving notice to the SDS Provider.

Clause 27 – Indemnity by SDS Provider, Liability and Sole Remedy

Insert new Clauses:

27.7 If the SDS Provider fails to achieve the provision of Issued for Construction Drawings identified in the Design Delivery Programme by the date set out in the Design Delivery Programme for the release of the Issued for Construction Drawings (or within such longer period as is agreed by the Client), the SDS Provider will pay the Client liquidated damages at the rate of £8,928.57 in respect of each failure.

27.8 The SDS Provider will not be liable to pay liquidated damages:

27.8.1 to the extent that the failure to achieve the release date for Issued for Construction Drawings is the failure of **tie** or the CEC to approve the SDS submission of the design Deliverables within the requisite periods set by the Design Management Plan and/or Design Delivery Programme (as appropriate); or

27.8.2 if and to the extent that the total aggregate liquidated damages under Clause 27.7 in respect of submissions under this Agreement exceeds £1,000,000.

27.9 In the event that it is agreed by the Parties or determined pursuant to Clause 28 (*Dispute Resolution Procedure*) that the Deliverable (including the relevant Issued for Construction Drawings) was not submitted in accordance with the Agreement in terms of packaging, process, or the content or quality was inadequate or insufficient, the limits set out in Clause 27.7 and 27.8 shall not apply and the SDS Provider shall be liable to the full extent under this Agreement.

27.10 The liquidated damages set out in Clause 27.7 are a genuine pre-estimate of losses incurred by the Client resulting from failure by the SDS Provider to achieve the relevant release date

and the Parties shall not seek to challenge the application or recovery of such amounts on the basis of this underlying calculation.

27.11 Notwithstanding the generality of Clause 27.1, the SDS Provider shall indemnify the Client from all loss, costs, claims, damages, expenses and liabilities incurred by the Client pursuant to Clause 77.5 of the Infraco Contract caused by a breach of this Agreement by the SDS Provider in relation to the exercise of powers under the Tram Legislation (in so far as the same are to be carried out by Infraco pursuant to the Infraco Contract) excluding the construction and maintenance activities associated with the Infraco Works.

27.12 Each of the obligations of the SDS Provider under this Agreement shall be interpreted as a separate and independent obligation so that Infraco shall have a separate claim and right of action in respect of every breach of each obligation (including without limitation each failure to comply with Clauses 4.5 and/or 5.1.1).

27.13 The SDS Provider shall not be entitled to any common law rights including (but not limited to) rights to damages or any other rights under contract, delict or otherwise (other than specific implement, interim specific implement, interdict, interim interdict or any action for payment) in relation to any breach of this Agreement by the Client to the extent caused or contributed to by breach by tie of the Infraco Contract or any other Compensation Event. The SDS Provider's sole right to an extension of time and/or relief from the performance of its obligations and/or to claim costs in connection with a Compensation Event shall be as set out in Clause 7.5 and 7.5A, respectively.

27.14 The SDS Provider shall not be responsible for the quality or content of Client Design. The SDS Provider shall undertake a general review of Client Design on receipt of the same from the Client, and shall report to the Client with details of any element which is patently inconsistent with the requirements of an Approval Body as applied to design submitted previously.

Clause 28 – Dispute Resolution Procedure

Delete Clause 28 and replace with:

28.1 The Parties agree that this Clause 28 (*Dispute Resolution Procedure*) shall have effect for the resolution of any Dispute.

28.2 Any Dispute shall, in the first instance, be referred to the Internal Resolution Procedure in accordance with Clause 28.10.

28.3 Neither Party shall commence any court proceedings until the procedures in Clauses 28.10 to 28.57A6 have been completed, under exception that Clause 28 (*Dispute Resolution Procedure*) shall not apply so as to prevent either Party seeking an interim order, or interim relief, in the Scottish courts.

28.4 In the event that any court proceedings whatsoever are initiated by either Party against the other, the Parties agree that the Court of Session, Scotland, shall have exclusive jurisdiction.

28.5 Neither Party shall be entitled to suspend the performance of its undisputed obligations under this Agreement merely by reason of the reference of any Dispute to the Dispute Resolution Procedure contained in this Clause 28 (*Dispute Resolution Procedure*).

28.6 Subject to the Client's **tie**'s discretionary rights set out in Clause 28.55 to Clause 28.57.3 to require that a Dispute and a Related Dispute (as defined in Clause 28.55) be dealt with together at an appropriate stage of the Dispute Resolution Procedure, the provisions of this Clause 28 (*Dispute Resolution Procedure*) are mandatory and binding upon the Parties. For the avoidance of doubt nothing in this Schedule 9 shall be intended to disapply section 80(2) and 79(2) of the Edinburgh Tram (Line One) Act 2006 and the Edinburgh Tram (Line Two) Act 2006 (together the "**Tram Acts**") respectively.

28.7 Not used

28.8 Where either Party refers a Dispute to the Dispute Resolution Procedure, such Party shall not have waived nor be deemed to have waived any right to pursue or progress such Dispute in the event that such Party fails to observe any time limit or timescale provided for in this Clause 28.

28.9 Not used

Internal Resolution Procedure

28.10 The following procedure is the Internal Resolution Procedure referred to in Clause 28.2:

28.10.1 In the event of any Dispute arising, the SDS Provider's Representative and the Client's Representative shall seek to resolve the Dispute at a meeting to be convened within three Business Days of written notification by either Party to the other that it wishes to

initiate the Internal Resolution Procedure in respect of that Dispute ("Notification"). Such Notification shall be given in accordance with the provisions of Clause 36 (*Notices*) of this Agreement.

28.10.2 If following the meeting referred to in Clause 28.10.1 the Dispute is not resolved or in the event that a meeting has not been convened within 3 Business Days pursuant to Clause 28.10.1, each Party shall, before the expiry of the period of seven Business Days from Notification, serve, in accordance with the provisions of Clause 36 (*Notices*) of this Agreement, a written position paper ("Position Paper") upon the other Party. Each Party's Position Paper shall state in reasonable detail that Party's position and required objectives in relation to the Dispute; any required redress, and, where possible, any comments on the other Party's position.

28.10.3 Upon such service of a Position Paper by the Party initiating or pursuing the Dispute, the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) shall seek to resolve the Dispute by meeting in good faith to discuss and negotiate upon the Dispute without recourse to legal or other proceedings.

28.10.4 In the event that resolution of the Dispute is achieved by the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client, the resolution shall be reduced to writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties.

28.10.5 Unless concluded by a written legally binding agreement, all discussions and negotiations connected with the Dispute shall be conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

28.11 In the event that any Dispute is not resolved by the Internal Resolution Procedure within a period of twenty Business Days from Notification (or longer if so agreed by the Parties) then the following provisions of this Clause 28.11 shall apply:

28.11.1 the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) shall, within a further period of five Business Days, seek to agree that the Dispute shall be resolved by any one of the following procedures:

28.11.1.1 mediation in accordance with Clauses 28.12 to 28.14; or

28.11.1.2 adjudication in accordance with Clauses 28.15 and 28.54; or

28.11.1.3 litigation before the Court of Session, Scotland, in which event the Summons in any such litigation shall be signeted and served within ten Business Days of the date of expiry of the period of 60 Business Days following the conclusion of the internal resolution procedure under Clause 28.10;

28.11.2 in the event that the Chief Executive (or equivalent) of the SDS Provider and the Chief Executive (or equivalent) of the Client (or their respective deputies in the event of their unavailability) are unable to agree that the Dispute be resolved by one of the procedures described in Clauses 28.11.1.1 to 28.11.1.3, the Party initiating or pursuing the Dispute shall refer the Dispute to mediation (and thereafter adjudication if necessary) in accordance with Clauses 28.12 and 28.14.

Mediation

28.12 The Parties shall attempt in good faith to resolve the Dispute by a procedure of mediation in accordance with the Centre for Effective Dispute Resolution mediation rules or Model Mediation Procedure in force at the commencement of the mediation, (or in the event that the Centre for Effective Dispute Resolution has ceased to exist as at the time of the commencement of the mediation, mediation rules or a model mediation procedure offered by any other body offering commercial mediation services which shall be selected by the Client). In the event that any provision of such mediation rules or model mediation procedure conflicts with any provision of this Clause 28 (*Dispute Resolution Procedure*), the provisions of this Clause 28 (*Dispute Resolution Procedure*) shall take precedence. In the event that any timescales contained in such mediation rules or model mediation procedure conflicts with the timescales referred to in this Clause 28 (*Dispute Resolution Procedure*), the timescales contained in such mediation rules or model mediation procedure shall be amended accordingly such that the timescales referred to in this Clause 28 (*Dispute Resolution Procedure*) shall be adhered to.

28.13 In the event that resolution of the Dispute is achieved in consequence of such mediation procedure, such agreed resolution shall be recorded in writing and, once it is signed by the duly authorised representatives of both Parties, shall be binding on the Parties. Unless concluded by a written legally binding agreement, all discussions and negotiations (including written submissions made and documents produced in relation thereto) connected with the mediation procedure referred to in Clause 28.12 shall be

conducted in confidence and without prejudice to the rights of the Parties in any future legal or other proceedings. Nor may such matters be produced or relied upon in evidence in any such proceedings.

28.14 If any Dispute to which this Clause 28 (*Dispute Resolution Procedure*) relates is not resolved by the mediation procedure referred to in Clauses 28.12 and 28.13 within a period of 30 Business Days from the referral of the Dispute to mediation (or longer if so agreed by the Parties), the mediation procedure shall be terminated and unless the Party initiating or pursuing the Dispute withdraws the Dispute, the Dispute shall within 60 days of the termination of the mediation procedure be referred to adjudication in accordance with Clauses 28.15 to 28.54.

Adjudication

28.15 In the event that either Party refers a Dispute to adjudication in terms of Clause 28.11.1 or 28.14, or exercises a statutory right available to it (if any) under the Housing Grants, Construction and Regeneration Act 1996 to raise adjudication proceedings in relation to "construction operations" (within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996) which are not Authorised Works as defined in the Tram Acts, such adjudication shall be conducted in accordance with Clauses 28.15 to 28.54, wherein any reference to "days" is a reference to calendar days.

Notice of intention to seek adjudication

28.16 Either Party may give written notice (the "**Notice of Adjudication**") of its intention to refer the Dispute to adjudication and the Party giving such notice shall be the "**Referring Party**".

28.17 The Notice of Adjudication shall be given to the other Party and the Party receiving the Notice of Adjudication shall be the "**Responding Party**".

28.18 The Notice of Adjudication shall set out briefly:

28.18.1 the nature and a brief description of the Dispute and of the parties involved;

28.18.2 details of where and when the Dispute has arisen;

28.18.3 the nature of the redress which is sought; and

28.18.4 the names and addresses of the Parties (including the addresses which the Parties have specified for the giving of notices).

28.19 The adjudicator selected to consider the Dispute shall be selected from one of the panels ("**Panels**") appointed by the Parties in accordance with the following:

28.19.1 there shall be three Panels, one in respect of legal matters, ("**Legal Panel**") one in respect of construction and operational matters ("**Construction/Operational Panel**"), and one in respect of financial matters ("**Financial Panel**");

28.19.2 each Panel shall be comprised of at least four members, who are listed in Schedule 10 (*Panels for the Dispute Resolution Procedure*) to this Agreement;

28.19.3 if any member of a Panel resigns or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties as a member of the Panel, a replacement shall be appointed by the Parties as soon as practicable. Any such replacement shall be wholly independent of the Client, any Client Party, the SDS Provider, any SDS Provider Party, **tie**, any **tie** Party, City of Edinburgh Council or any Relevant Authority, any Approvals Body, the Tram Supplier or any equipment supplier or any party associated with the Edinburgh Tram Network, and any successor to or subsidiary or parent of any of the aforementioned parties. If the Parties are unable to agree on the identity of such replacement(s), the President or Vice President for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland shall appoint such replacement(s) within thirty days of any application for such appointment by either Party.

28.20 The Referring Party shall at the same time as giving the Notice of Adjudication to the Responding Party, send to each of the members of the relevant Panel a copy of the Notice of Adjudication and a request that each member of the relevant Panel advises both Parties within three days of the date of the Notice of Adjudication as to whether or not he is able and willing to act. The Referring Party shall at their sole discretion be entitled to select which of the Panels is the relevant Panel in light of the subject matter of the Dispute. The Parties shall attempt to agree within two further days as to which one of the members of the relevant Panel who responded indicating that they are able and willing to act shall be requested to act as adjudicator. In the event that such agreement is reached, the Referring Party shall, within a further period of one day, request the member of the relevant Panel upon whom agreement has been reached to act as adjudicator. In the event that such agreement is not reached, the Responding

Party shall, within a further period of two days, select one of the members of the relevant Panel who responded indicating that they are able and willing to act and the Referring Party shall request that member to act as adjudicator.

28.21 If no member of the relevant Panel indicates that he is able and willing to act within three days of receiving a request to act as adjudicator, the Referring Party shall request the President or the Vice President for the time being of The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland to select a person to act as adjudicator.

28.22 Any person appointed, requested or selected to act as adjudicator in accordance with Clause 28.20, 28.21 and 28.24 paragraphs shall be a natural person acting in his personal capacity. A person appointed, requested or selected to act as an adjudicator shall be wholly independent of the Client, any Client Party, the SDS Provider, any SDS Provider Party, **tie**, any **tie** Party, City of Edinburgh Council or any Relevant Authority, any Approvals Body, the Tram Supplier or any equipment supplier or any party associated with the Edinburgh Tram Network, and any successor to or subsidiary or parent of any of the aforementioned parties.

28.23 The requests referred to in Clause 28.20 shall be accompanied by a copy of the Notice of Adjudication.

28.24 The Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland must communicate the selection of an adjudicator to the Referring Party within three days of receiving a request to do so.

28.25 If the Chartered Institute of Arbitrators (Scottish Branch) or the Institution of Civil Engineers or the Law Society of Scotland fails to comply with Clause 28.24, the Referring Party may:

28.25.1 agree with the other Party to the Dispute to request a specified person to act as adjudicator; or

28.25.2 request any other adjudicator nominating body to select a person to act as adjudicator. An "adjudicator nominating body" shall mean a body (not being a natural person and not being a Party to the Dispute) which holds itself out publicly as a body which will select an adjudicator when requested to do so by a Referring Party.

28.26 The person requested to act as adjudicator in accordance with the provisions of Clause 28.20 or 28.21 shall indicate whether or not he is willing to act within two days of receiving the request.

28.27 Where an adjudicator has been selected and appointed in accordance with Clause 28.20, 28.21 or 28.24, paragraph the Referring Party shall not later than seven days from the date of the Notice of Adjudication refer the Dispute in writing (the "**Referral Notice**") to the adjudicator.

28.28 The Referral Notice shall be accompanied by copies of, or relevant extracts from the Agreement and such other documents as the Referring Party intends to rely upon.

28.29 The Referring Party shall, at the same time as he sends to the adjudicator the documents referred to in Clauses 28.27 and 28.28, send copies of those documents to the Responding Party.

28.30 The adjudicator may, with the consent of the parties to those Disputes, adjudicate at the same time on more than one Dispute under the Agreement.

28.31 The Parties may agree to extend the period within which the adjudicator may reach a decision in relation to all or any of these Disputes.

28.32 An adjudicator may resign at any time on giving notice in writing to the Parties.

28.33 An adjudicator must resign where the Dispute is the same or substantially the same as one which has previously been referred to adjudication, and a decision has been taken in that adjudication.

28.34 Where an adjudicator ceases to act under Clauses 28.32 or 28.33 or dies or becomes incapax or ill to the extent of being unable to reasonably discharge his duties:

28.34.1 the Referring Party may serve a fresh notice in accordance with Clauses 28.16 to 28.19 and shall in accordance with Clauses 28.20 to 28.29 request an adjudicator to act; and

28.34.2 if requested by the new adjudicator, the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

28.35 The Parties to a Dispute may at any time agree to revoke the appointment of the adjudicator and in such circumstances the fees and expenses of that adjudicator shall,

subject to Clause 28.36, be determined and payable in accordance with Clauses 28.52 to 28.53.

28.36 Where the revocation of the appointment of the adjudicator is due to the default or misconduct of the adjudicator, the Parties shall not be liable to pay the adjudicator's fees and expenses.

Powers of the Adjudicator

28.37 The adjudicator shall:

28.37.1 act impartially in carrying out his duties and shall do so in accordance with any relevant terms of the Agreement and shall reach his decision in accordance with Scots law; and

28.37.2 avoid incurring unnecessary expense.

28.38 The adjudicator may take the initiative in ascertaining the facts and the law necessary to determine the Dispute, and shall decide on the procedure to be followed in the adjudication. In particular, he may:

28.38.1 request either Party to supply him with such documents as he may reasonably require including, if he so directs, any written statement from either Party supporting or supplementing the Referral and any other documents given under Clauses 28.27 to 28.28;

28.38.2 conduct the adjudication in the English language and decide whether a translation of any document is to be provided and, if so, by whom, by when, and at whose cost;

28.38.3 meet and question either Party and their representatives;

28.38.4 subject to obtaining any necessary consent from a third party or the Parties, make such site visits and inspections as he considers appropriate, whether accompanied by the Parties or not;

28.38.5 subject to obtaining any necessary consent from a third party or the Parties, procure the carrying out of any tests or experiments, and make directions as to the conditions for and responsibility for the cost of the same;

28.38.6 obtain and consider such representations and submissions as he requires, and, provided he has notified the Parties of his intention, appoint experts, assessors or legal advisers;

28.38.7 give directions as to the timetable for the adjudication, any deadlines, or limits as to the length of written documents or oral representations to be complied with; and

28.38.8 issue other directions relating to the conduct of the adjudication.

28.39 The Parties shall comply with any request or direction of the adjudicator in relation to the adjudication.

28.40 If, without showing sufficient cause, a Party fails to comply with any request, direction or timetable of the adjudicator made in accordance with his powers, fails to produce any document or written statement requested by the adjudicator, or in any other way fails to comply with a requirement under these provisions relating to the adjudication, the adjudicator may:

28.40.1 continue the adjudication in the absence of that Party or of the document or written statement requested;

28.40.2 draw such inferences from that failure to comply as may, in the adjudicator's opinion, be justified in the circumstances;

28.40.3 make a decision on the basis of the information before him, attaching such weight as he thinks fit to any evidence submitted to him outside any period he may have requested or directed;

28.40.4 disqualify any part or parts of that Party's submissions affected by the failure to comply; and

28.40.5 grant the other Party proper opportunity to consider and respond to any evidence or representation made late.

28.41 Subject to any agreement between the Parties to the contrary, either Party may be assisted by, or represented by, such advisers or representatives (whether legally qualified or not) as he considers appropriate.

28.42 The adjudicator shall consider any relevant information submitted to him by either Party and shall make available to them any information to be taken into account in reaching his decision.

28.43 The adjudicator and the Parties shall not disclose to any other person any information or document provided in connection with the adjudication which the Party supplying it has indicated is to be treated as confidential, except to the extent that disclosure is required by law or is necessary for the purposes of, or in connection with, the adjudication, or the information is already in the public domain.

Adjudicator's Decision

28.44 Unless otherwise agreed in accordance with paragraph Clause 28.56.1 pr 28.57.1 the adjudicator shall reach his decision not later than:

28.44.1 twenty eight days after the date of the Referral Notice mentioned in Clause 28.25;

28.44.2 forty two days after the date of the Referral if the Referring Party so consents; or

28.44.3 such period exceeding twenty eight days after the Referral Notice as the Parties may, after the giving of that notice, agree.

28.45 Where the adjudicator fails, for any reason, to reach his decision in accordance with Clause 28.44;

28.45.1 either of the Parties to the Dispute may serve a fresh notice in accordance with Clause 28.16 to 28.19 and shall request an adjudicator to act in accordance with Clauses 28.20 to 28.29; and

28.45.2 if requested by the new adjudicator the Parties shall supply him with copies of all documents which they had made available to the previous adjudicator.

28.46 As soon as possible after he has reached a decision, the adjudicator shall deliver a copy of that decision to each of the Parties.

28.47 The adjudicator shall decide the matters in Dispute and may make a decision on different aspects of the Dispute at different times.

28.48 The adjudicator may take into account any other matters which the Parties agree should be within the scope of the adjudication or which are matters under the Agreement which he considers are necessarily connected with the Dispute and, in particular, he may:

28.48.1 open up, review and revise any decision taken or any notice certifying payment given by any person referred to in the Agreement, unless the Agreement states that the decision or notice certifying payment is final and conclusive;

28.48.2 decide that any of the Parties to the Dispute is liable to make a payment under the Agreement (whether in sterling or some other currency) and, subject to the terms of the Agreement, when that payment is due and the final date for payment.

28.49 The adjudicator shall provide written reasons for his decision.

Effect of the Decision

28.50 In his decision, the adjudicator may, if he thinks fit, order either or both of the Parties to comply forthwith with his decision or any part of it. In the absence of any directions by the adjudicator relating to the time for performance of his decision, the Parties shall be required to comply with any decision of the adjudicator immediately on delivery of the decision to the Parties in accordance with Clause 28.46.

28.51 The decision of the adjudicator shall be binding on the Parties, and they shall comply with it, until the Dispute is finally determined by legal proceedings or by agreement between the Parties.

28.52 The adjudicator shall be entitled to the payment of such reasonable amount as he may determine by way of fees and expenses incurred by him and the Parties shall be jointly and severally liable to pay that amount to the adjudicator.

28.53 Without prejudice to the right of the adjudicator to effect recovery from either Party in accordance with Clause 28.52, the adjudicator may by direction determine the apportionment between the parties of liability for his fees and expenses.

28.54 The adjudicator shall not be liable for anything done or omitted in the discharge or purported discharge of his functions as adjudicator unless the act or omission is in bad faith, and any employee or agent of the adjudicator shall be similarly protected from liability.

Related Disputes

28.55 In the event that a Dispute arising under, out of or in connection with this Agreement which in the opinion of the Client relates to a dispute or difference arising out of or in connection with any agreement associated with the Edinburgh Tram Network between

the Client and a third party (a "**Related Contract**") all such disputes or differences being referred to as a "**Related Dispute**", then providing that the Related Contract contains dispute resolution provisions in terms substantially the same as set out in this Clause 28 (*Dispute Resolution Procedure*) (save for necessary changes), the Client may required and direct that the Dispute and the Related Dispute be dealt with together at an appropriate stage of the Dispute Resolution Procedure.

Referral of a Dispute under this Agreement to a Related Adjudicator

28.56 In the event that a Related Dispute has already been referred to the decision of an adjudicator ("**Related Adjudicator**") in accordance with the provisions of the Related Contract, and the Client or the SDS Provider (as the case may be) is of the opinion, acting reasonably, that a Dispute is to be (but has not yet been) referred to adjudication under this Clause 28 (*Dispute Resolution Procedure*), the Client may refer the Dispute or may by notice in writing to the SDS Provider require that the Dispute be referred (as the case may be) to the Related Adjudicator. The Client and the SDS Provider agree that, without fettering or restricting the adjudicator's power and authority in any way, it is their intention that such adjudicator shall, insofar as is relevant, practicable and appropriate, come to the same conclusion as to the facts and apply the same reasoning and analysis in reaching a decision on the Dispute as the adjudicator's conclusions, reasoning and analysis applied by him as Related Adjudicator in the Related Dispute, and:

28.56.1 the adjudicator shall, if practicable, hear the Dispute at the same time as the Related Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations", which are not Authorised Works, within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator);

28.56.2 except in the event that the Dispute or the Related Dispute relates to "construction operations", which are not Authorised Works, within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the adjudicator), the adjudicator shall have power (if so requested by the Client) to make

his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator; and

28.56.3 the Client shall procure that, as soon as practicable, the other party or parties to the Related Dispute shall give the SDS Provider copies of the Related Contract, the Referral Notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

The Client's request to consolidate a Related Dispute with a Dispute

28.56A1 Where a Related Dispute has been referred to adjudication the Client may by written notice request the adjudicator (copied to the SDS Provider and to the other party to the Related Dispute) to consolidate the Related Dispute with the Dispute with a view to allowing all questions arising out of the Dispute and the Related Dispute to be disposed of in the adjudication. Where the Client requests the adjudicator to consolidate the Dispute and Related Dispute then the Client shall (or may procure that the other party to the Related Dispute shall) as soon as practicable, and in any case within fourteen (14) of the referral of the Dispute to the adjudicator, give to the adjudicator conducting the adjudication under this Agreement and also to the other parties to the Dispute and the Related Dispute the following particulars:

28.56A1.1 a copy of the relevant Related Contract;

28.56A.1.2 a preliminary statement from the Client and/or, as the case may be, the other party to the Related Dispute setting out:

28.56A.1.2.1 the basis and the grounds for consolidation of the Related Dispute and the Dispute;

28.56A.1.2.2 the cases of the parties to the Related Dispute;

28.56A.1.2.3 any relief sought by the parties to the Related Dispute; and

28.56A.1.2.4 a list of any documents served in relation to the Related Dispute.

Any such particulars sent by the Client or the other party to the Related Dispute (as the case may be) to the adjudicator shall be sent at the same time to the SDS Provider and the other party to the Related Dispute (as the case may be)

28.56A.2 On receiving the particulars set out in Clause 28.56A.1 provided that such particulars have been received within fourteen (14) days of the referral of the Dispute to the adjudicator, the adjudicator shall if he considers that the Dispute and the Related Dispute are substantially the same or connected one to the other, immediately request that the parties to the Dispute and the other party to the Related Dispute attend a meeting with the adjudicator with a view to determining whether or not the Dispute and the Related Dispute should be consolidated. If the Adjudicator and all the relevant parties agree, they may hold a telephone conference call instead of a meeting, and in such event references in Clauses 28.56A.3 to 28.56A.5 to a meeting or to attending a meeting, shall mean a telephone conference call and taking part in such a telephone conference call.

28.56A3 The Client shall use its reasonable endeavours to procure that an authorised representative or nominee of the other party to the Related Dispute shall attend the meeting with the adjudicator referred to in Clause 28.56A.2. The Client and the SDS Provider each agree to send an authorised representative or nominee to any meeting of this kind under this Agreement or under a Related Contract, which they may be requested to attend.

28.56A4 At the meeting referred to in Clause 28.56A.2, the Party which has not requested the adjudicator to consolidate the Dispute with the Related Dispute shall, as a preliminary matter, either:

28.56A4.1 confirm to the adjudicator that it accept the proposed consolidation of the Related Dispute with the Dispute; or

28.56A4.2 inform the adjudicator that it does not accept the proposed consolidation of the Related Dispute with the Dispute.

Decision to Consolidate

28.56A5 Where Clause 28.56A4.1 applies, or if the SDS Provider's authorised representative or nominee does not attend the meeting referred to in Clause 28.56A2 above (having received due notice thereof) the adjudicator shall if he considers that the Dispute and the Related Dispute are substantially the same or connected one to the other immediately issue a decision consolidating the Dispute and the Related Dispute and shall have the authority and the power referred to in Clause 28.56A7 below.

28.56A.6 Where Clause 28.56A4.2 above applies, or if the SDS Provider's authorised r representative or nominee attends the meeting referred to in Clause 28.56A2 above but does not confirm to the adjudicator whether or not it accepts or does not accept the proposed consolidation of the Related Dispute with the Dispute, the adjudicator shall issue within one (1) Business Day of the meeting referred to in Clause 28.56A2 above his written decision as to whether or not the Dispute and the Related Dispute are substantially the same or connected. If the adjudicator considers that the Dispute and the Related Dispute are not substantially the same or not connected one to the other, or has failed or is unable to reach a decision within 1 Business Day of the meeting referred to in Clause 28.56A2, the Dispute and the Related Dispute shall not be consolidated. If the adjudicator considers that the Dispute and the Related Dispute are substantially the same or connected one to the other the adjudicator shall immediately issue a decision consolidating the Dispute and the Related Dispute and the adjudicator shall have the authority and the power referred to in Clause 28.56A7 below.

28.56A7 The adjudicator shall have the authority and power to consolidate the Dispute and the Related Dispute and to direct that all procedural and/or evidential matters arising in both the Dispute and the Related Dispute are dealt with in whatever manner the adjudicator considers shall lead to the fair and expeditious resolution of both the Dispute and the Related Dispute and the parties (including the other party to the Related Dispute) shall thereafter abide by and implement such consolidation and any such direction and any decision of the adjudicator. For the foregoing purposes:

28.56A7.1 unless the context otherwise requires, the provisions of the adjudication rules in this Clause 28 shall apply as between the Client and the other party to the Related Dispute, as they apply between the Client and the SDS Provider in relation to the Dispute; and

28.56A7.2 the adjudicator shall have the same authority and powers as if the Related Dispute constituted a dispute or difference between the Client and the SDS Provider.

28.56A8 In the event that the Related Dispute is consolidated with the Dispute, the adjudicator shall reach a decision on the Dispute and the Related Dispute at the same time and in any event within twenty eight (28) days of the earlier of the referral of the Dispute or the referral of the Related Dispute, or such longer period as is agreed by the parties to the Dispute and the Related Dispute after the date that the Related Dispute has been consolidated with the Dispute. The adjudicator shall be entitled to extend the said

period of twenty eight (28) days by up to fourteen (14) days with the consent of the party by whom the Dispute and (where applicable) the Related Dispute were referred.

Referral of a Related Dispute to the Adjudicator

28.57 In the event that a Dispute has already been referred to the decision of an adjudicator, and the Client is of the opinion that a Related Dispute is to be (but has not yet been) referred to adjudication, the Client may refer the Related Dispute to the adjudicator appointed in relation to the Dispute under this Clause 28 (*Dispute Resolution Procedure*). The Client and the SDS Provider agree that, without fettering or restricting the adjudicator's power and authority in any way, it is their intention that the adjudicator shall, insofar as is relevant, practicable and appropriate, come to the same conclusion as to the facts and apply the same reasoning and analysis in reaching a decision on the Related Dispute as the adjudicator's conclusions, reasoning and analysis applied by him as adjudicator in relation to the Dispute under this Agreement. The adjudicator shall:

28.57.1 if practicable, hear the Related Dispute at the same time as the Dispute and shall request such extension of time for producing his decision or award as he may require in order to reach a decision in respect of each of the Dispute and the Related Dispute at the same time. The Parties shall agree to such request for an extension of time, except in the event that the Dispute or the Related Dispute relates to "construction operations" which are not Authorised Works within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator).

28.57.2 except in the event that the Dispute or the Related Dispute relates to "construction operations" which are not Authorised Works within the meaning ascribed to that term by the Housing Grants, Construction and Regeneration Act 1996 (if applicable) (unless otherwise agreed by the Parties, all parties to the Related Dispute and the Adjudicator), the adjudicator shall have power (if so requested by the Client) to make his decisions or awards in the Dispute and the Related Dispute in such a manner as if the rules applicable in the Court of Session, Scotland as to the joining of one or more defenders or third parties or conjoining actions were applicable to the Parties to the Dispute and the Related Dispute, and to the adjudicator; and

28.57.3 as soon as practicable, the Client shall give to the SDS Provider copies of the Related Contract, the Referral Notice in the Related Dispute and any other documentation provided to the adjudicator by any party to the Related Dispute.

Consolidation of a Dispute under this Agreement with a Related Dispute

28.57A1 In the event that, subject to Clause 28.57A3, an adjudicator under a Related Contract ("**Related Adjudicator**"), who is permitted pursuant to the Related Contract to do so, decides that a Dispute under this Agreement be consolidated with a Related Dispute with which the Related Adjudicator is dealing under the Related Contract, then:

28.57A1.1 notwithstanding anything in the adjudication rules in this Schedule 9, with effect from the time of such decision, the adjudicator shall cease to have authority or jurisdiction to determine the Dispute which shall instead be determined by the Related Adjudicator and the appointment of the adjudicator under this Agreement shall cease;

28.57A.1.2 such decision shall be binding on the Client and the SDS Provider and both of them shall acknowledge the appointment of the Related Adjudicator as the adjudicator of the Dispute;

28.57A.1.3 the Client and the SDS Provider shall be jointly liable with the other party to the relevant Related Contract for the Related Adjudicator's reasonable fees and expenses including those reasonable fees and expenses of any specialist consultant or adviser (excluding legal) appointed by the Related Adjudicator in accordance with the adjudication procedure in the Related Agreement, in respect of the period after the date on which the Dispute is consolidated with the Related Dispute pursuant to a decision of the Related Adjudicator;

28.57A1.4 without prejudice to the right of the Related Adjudicator to effect recovery from either party in accordance with Clause 28.57A1.3, the Client and the SDS Provider agree that the Related Adjudicator may by direction determine the apportionment between the parties of liability for his fees and expenses referred to in Clause 28.57A.1.3; and

28.57A.1.5 notwithstanding anything to the contrary a Dispute under this Agreement shall only be consolidated with a Related Dispute, if the

Related Adjudicator receives particulars of the Dispute within fourteen (14) days of the referral of the Related Dispute to the Related Adjudicator under the Related Contract.

28.57A2 Where the Related Adjudicator receives a request under the Related Contract, that a Dispute under this Agreement be consolidated with a Related Dispute with which he is dealing under the Related Agreement, the Client and the SDS Provider acknowledge that the Related Adjudicator may immediately request that they, together with the other party to the Related Dispute, attend a meeting with the Related Adjudicator with a view to determining whether or not the Dispute and the Related Dispute should be consolidated. If the Related Adjudicator and all the relevant parties agree, they may hold a telephone conference call instead of a meeting, and in such an event references in Clauses 28.57A3 to 28.57A5 to a meeting or to attending a meeting shall mean a telephone conference call and taking part in such a telephone conference call.

28.57A3 The Client and the SDS Provider each agree to send an authorised representative or nominee to any meeting of this kind under this Agreement or under a Related Agreement, which they may be requested to attend.

28.57A4 At the meeting referred to in Clause 28.57A2, the Party which has not requested the Related Adjudicator to consolidate the Related Dispute with the Dispute shall, as a preliminary matter, either:

28.57A4.1 confirm to the Related Adjudicator that it accepts the proposed consolidation of the Dispute with the Related Dispute; or

28.57A4.2 inform the Related Adjudicator that it does not accept the proposed consolidation of the Dispute with the Related Dispute.

28.57A5 Where Clause 28.57A4.1 applies, or if the SDS Provider's authorised representative or nominee fails to attend the meeting referred to in Clause 28.57A.2 above (having received due notice thereof), the Related Adjudicator shall if he considers that the Dispute and the Related Dispute are substantially the same or connected one to the other, immediately issue a decision consolidating the Dispute and the Related Dispute and shall have the authority and the power to consolidate the Dispute and the Related Dispute and to direct that all procedural and/or evidential matters arising in both the Dispute and the Related Dispute are consolidated in whatever manner the Related Adjudicator considers shall lead to the fair and expeditious resolution of both the Dispute and the Related Dispute and the parties (including the party to the Related

Dispute) shall thereafter abide by and implement such consolidation and any such direction.

28.57A6 Where Clause 28.57A4.2 applies or if the SDS Provider's authorised representative or nominee attends the meeting referred to in Clause 28.57A.2 but does not confirm to the Related Adjudicator whether or not that the SDS Provider accepts or does not accept the proposed consolidation of the Dispute with the Related Dispute, the Related Adjudicator shall within one (1) Business Day of the meeting referred to in Clause 28.57A.2 issue his written decision as to whether or not the Dispute and the Related Dispute are substantially the same or connected. If the Related Adjudicator considers that the Dispute and the Related Dispute are not substantially the same or not connected one to the other, or has failed or is unable to reach a decision within 1 Business Day of the meeting referred in Clause 28.57A.2, the Dispute and the Related Dispute shall not be consolidated. If the Related Adjudicator considers that the Related Dispute and the Dispute are substantially the same or connected one to the other, the Related Adjudicator shall immediately issue a decision consolidating the Dispute and the Related Dispute and shall have the authority and the power to consolidate the Dispute and the Related Dispute and to direct that all procedural and/or evidential matters arising in both the Dispute and the Related Dispute are consolidated in whatever manner the Related Adjudicator considers shall lead to the fair and expeditious resolution of both the Dispute and the Related Dispute and the parties (including the party to the Related Dispute) shall thereafter abide by and implement such consolidation and any such direction.

Clause 29 – Novation, Collateral Warranty in favour of tie, Funder's Direct Agreement and Agreement between the Joint Revenue Committee and the SDS Provider

Insert new Clause:

29.10 Within 14 days of the execution of the Novation Agreement, the SDS Provider shall use best endeavours to deliver to **tie** a collateral warranty agreement duly executed by Halcrow and the SDS Provider in favour of **tie** substantially in the form set out in Appendix Part 3 to the Novation Agreement.

Clause 30 - Assignation, Changes In Legal Status And Changes In Control

Delete Clause 30.2 and substitute therefor:

30.2 The Client shall be entitled to assign, novate or otherwise transfer the whole or any part of this Agreement:

30.2.1 to an assignee permitted in accordance with the terms of the Infraco Contract; or

30.2.2 with the prior written consent of the SDS Provider (such consent not to be unreasonably withheld or delayed).

Clause 32.2.1 – Delete "with full title guarantee"

Schedule 1 – Scope of Services

Amend to include the services set out in Appendix Part 4.

Delete paragraph 3.2.1

Amend paragraph 3.2.2 to include 'prior to the date of the Novation Agreement' after shall.

Amend paragraph 2.1.1 to include after 'all design' in the first line, the words 'other than Client Design',

Schedule 3 – Pricing Schedule – Provisional Additional Work

Delete references to **tie** and **tie Representative** and replace with "Client" and "Client's Representative", respectively.

Schedule 9 – Review Procedure

In paragraphs 1.3 and 1.4 replace "20 Business Days" with "10 Business Days".

In paragraph 3.1.15 replace "prevent Service Commencement" with "would prevent a Certificate of Service Commencement (as defined in the Infraco Contract)".

In paragraph 4.3 insert "and to **tie**" after "Client's Representative".

Insert new sub-clauses:

5.2.7 SEPA;

5.2.8 Historic Scotland;

5.2.9 SNH;

5.2.10 EAL; and

5.2.11 Transport Scotland.

APPENDIX PART 2

CONSENTS PROGRAMME AND DESIGN DELIVERY PROGRAMME

PART A - PROGRAMME ASSUMPTIONS AND CONSTRAINTS

Edinburgh Tram Network

Edinburgh Project Detailed Design Plan - Assumptions & Constraints Report

Doc. Ref: ULE90130-SW-REP-00302 V3

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14 May 2008

CONTENTS

1 INTRODUCTION

Version 31 of the SDS design Programme was issued to tie on 25 April 2008. This version of the design programme incorporates tie requested amendments and modifications resulting from numerous programme meetings specifically aimed to achieve early release of design to meet the Infraco Construction Programme start dates.

These amendments often require modification of the design processes used by SDS in the development of the design, obtaining of Approvals and Consents and the quality control/review procedures. Some of the measures used to achieve early release of the design are in the control of SDS and others rely upon third parties to achieve the IFC dates.

This is a schedule of the modifications to the PB design process and approvals and consents periods. As shown on V31.

2 SCHEME WIDE

2.1 Approvals

2.1.1 The SDS Detailed Design Programme assumes a CEC Prior Approval period of 40 days for all submissions unless stated.

2.1.2 The SDS Detailed Design Programme assumes a CEC Technical Approval period of 40 days for all submissions unless stated.

2.1.3 The SDS Detailed Design Programme assumes all approvals bodies will not exceed the number of days shown. Should the length of time be extended SDS will not meet the stated IFC dates.

2.1.4 It has been assumed that tie's review period will occur in parallel with approvals once the design is complete. tie reviews will not affect the critical path. This approach has been agreed by tie in order to speed IFC delivery.

2.1.5 Informal Consultation ensures CEC comments are captured prior to formal submission for Prior & Technical Approval. The SDS Detailed Design Programme therefore assumes that SDS should receive minimal or no comments after formal approval period provided that the comments received during the informal consultation period are incorporated into the SDS design.

2.1.6 Approvals and Consents resulting from Third Party Agreements, and other consents (with exception of Network Rail, ScotRail, SEPA and BAA) have been programmed into the Approvals and Consents Tracker linked to the Detailed Design Programme.

2.2 Design Assurance

2.2.1 The SDS Detailed Design Programme assumes Design Assurance Statements are produced on a subsection basis post acceptance of all approvals for the subsection. Formal handover of design between disciplines is an iterative process throughout the development of the Detailed Design. The formal IDC process between the relevant disciplines at the completion of the design will complete the process.

2.3 Surveys

2.3.1 Surveys are planned in order to fill gaps and shortcomings in existing information and will be scheduled in accordance with the critical areas and production of detailed design. These include topographical surveys, ground investigations, photographic & archaeological surveys. Some surveys are dependant on Third Parties, Network Rail, for example, will require land access and method statement approval.

2.4 Power

2.4.1 Support to Stray Current Working Party 5 through 10 are currently on hold. tie have commenced stray current negotiations directly with InfraCo including the convening of a separate SCWP, excluding SDS. A letter has been forwarded to tie clarifying the situation. It is assumed that SDS will do no further work in this area.

2.5 As-Built Drawings

2.5.1 The SDS Provider will provide as-built drawings within 4 weeks of receipt of all necessary information from the Infraco.

3 SECTION 1A

3.1 Tower Place Bridge

3.1.1 Tower Place Bridge is programmed to commence detailed design at risk of the preliminary design not being approved by TAA. This was at ties request (28 March 2008) and adds 5 weeks of risk of abortive work and time delay.

3.1.2 IFC is dependant on procuring water-born surveys.

3.1.3 Tower Place Bridge batch now has to go through full planning approval as it is outside the LOD, therefore the approval duration is 60 days, as shown in V31.

3.1.4 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

3.2 Victoria Dock Entrance Bridge

3.2.1 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

3.3 Lindsay Road Retaining Wall

3.3.1 Lindsay Road is programmed to commence detailed design at risk of the preliminary design not being approved by TAA. This adds 50 working days of risk of abortive work and time delay.

3.3.2 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

3.3.3 Lindsay Road batch has to go through full planning approval as it is now outside the LOD, therefore the duration has been increased to 60 days, as shown in V31.

3.3.4 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

3.4 Newhaven Retaining Wall & Roadway Junction

3.4.1 Newhaven Retaining Wall & Roadway Junction batch has to go through full planning approval as it is now outside the LOD, therefore the approval duration has been increased to 60 days, as shown in V31.

3.5 Batch 1/02a (Bypass):

3.5.1 Batch 1/02a submission is subject to confirmation of requirements from CEC (design & approval).

4 SECTION 1B

4.1 Roads

4.1.1 V31 of the SDS Detailed Design Programme shows a delay in receiving roads technical approval/comments. The SDS programme has assumed comments/approval will be received by 30 May 08.

5 SECTION 1C

5.1 York Place Tramstop & OLE:

5.1.1 The York Place Tramstop & OLE batch has to go through full planning approval as it is now outside the LOD, therefore the duration has been increased to 60 days for a full Planning Application as indicated in V31.

5.2 Roads:

5.2.1 1C Roads has been split into 3 sections under change estimate 336: IC1 London Road to Section 1B start, IC2 London Road to York Place (Picardy Place), IC3 York Place to Section 1D start. The V31 of the SDS design programme has been split to reflect this.

6 SECTION 2A

6.1 Russell Rd Bridge

6.1.1 Updating to comments (& creation of IFC drawings) has been reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (28 March 2008). Should comments be received requiring amendments to Prior Approval/TAA submission then turnaround may not be possible in 5 days.

6.1.2 The SDS Detailed Design Programme assumes CEC will approve the technical addendum submission in 2 weeks rather than the standard 8 weeks (this has been instructed by tie).

6.1.3 SDS has been instructed by tie to issue IFC drawings post TAA agreement although Prior approval and subsection IDC completion is outstanding at this time. This is undertaken at ties risk.

6.1.4 tie has instructed SDS to prepare Issue for Construction (IFC) drawings for Russell Road Bridge to be ready for signature by 23 May 2008 provided that Prior Approval is granted by CEC by that date and provided that the Prior Approval is not granted with conditions that would require changes to those IFC drawings.

6.2 Haymarket Station Viaduct

6.2.1 Updating to comments (& creation of IFC drawings) reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (28 March 2008). Should comments be received requiring amendments to Prior Approval submission then turnaround may not be possible in 5 days.

6.2.2 Prior Approval is to be submitted at ties risk as final RSA comments have not been fully accommodated at time of Prior Approval submission.

6.2.3 The SDS Detailed Design Programme assumes CEC will take batch 2/01 off hold the day after Prior Approval submission (30th April 08).

7 SECTION 3A

7.1 Coltbridge Viaduct

7.1.1 Coltbridge Viaduct now has to go through full Planning Approval, therefore the approval duration has been increased to 60 days, as shown in V31.

8 SECTION 5A

8.1 Murrayfield Stop Retaining Wall

8.1.1 SDS is taking 6 working days risk by progressing design CAT checking in parallel with design.

8.1.2 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks, due to BBS procurement purposes.

8.2 Batch 5/06:

8.2.1 Updating to comments (& creation of IFC drawings) reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (23 April 2008). Should comments be received requiring amendments to Prior Approval submission then turnaround may not be possible in 5 days.

8.3 Murrayfield Stadium Retaining Wall

8.3.1 As requested by tie (28 March 2008), SDS have split Murrayfield Stadium Retaining Wall from the combined CATIII & Network Rail Approval (with Baird Drive, Balgreen Road Retaining Wall & Murrayfield Training Pitches) in order to accelerate design by 4 weeks. Tie are to ensure Network Rail are comfortable with this approach and will review the design in the specified timescales. There is a risk to SDS that at short notice CATIII check may be not be complete.

8.4 Batch 5/07

8.4.1 Batch 5 / 07 was previously on hold due to ongoing discussions between tie/SRU relating to the Third Party Agreement. SDS acknowledge receipt of the instruction to issue the Prior Approval on the basis of the current SDS design. SDS understand that this does not satisfy the aspirations of both tie and SRU for a redesign of Roseburn Street Viaduct and that under most circumstances that this would result in SRU rejecting the Prior Approval proposals.

8.4.2 SDS will issue the Prior Approval on the 23 May 08 on the basis that tie will negotiate the approval with SRU and issue further instructions at a later date regarding the VE exercise (Roseburn Street Viaduct). At this time SDS will advise tie of any associated change resulting from the VE proposals.

8.4.3 Updating to comments (& creation of IFC drawings) reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (23 April 2008). Should comments be received requiring amendments to Prior Approval submission then turnaround may not be possible in 5 days.

8.5 Baird Drive

8.5.1 Prior to V27 of the SDS Detailed Design Programme, SDS were designing at risk on the detailed design & CATII check, before the PD is approved by tie and TAA. Due to this V29 assumes SDS are working at risk for 15 working days (subject to timely approval). SDS have also undertaken to issue for Prior Approval at risk before the PD TAA is approved and detailed design is complete. This has been done to improve timescales and obtain approvals early. There is a risk to SDS of design change and resubmission for Prior Approval. SDS have also reduced CAT check timescales from 30 days to 10 days to improve the IFC delivery date.

8.6 Balgreen Rd Retaining Wall

8.6.1 Post V27 of the SDS Detailed Design Programme, SDS agreed to relink the programme to bring IFC back to 15 Aug 08, saving Approx 3 weeks. SDS have reduced the NR comment period to 2 weeks from 4 (as they will not comment until TAA is received). SDS prior to V27 issue of the SDS Detailed Design Programme are designing at ties risk on the detailed design & CATII check before the PD is approved by tie and TAA. V27 shows SDS taking at least 15 working days of risk(subject to timely approval). SDS have also undertaken to issue for Prior Approval at risk before the PD is approved and detailed design is complete, to improve timescales and obtain approvals early. There is a risk to SDS of design change and resubmission for Prior Approval, this is done at ties risk.

8.7 Balgreen Road Tram Bridge

8.7.1 Prior to V27 issue SDS were designing at risk on the detailed design & CATII check, before the PD is approved by tie and TAA. Due to this V29+ assumes SDS are working at risk for 35 working days (subject to timely approval). SDS have also undertaken to issue for Prior Approval at risk before the PD TAA is approved and detailed design is complete. This has been done to improve timescales and obtain approvals early. Risk to SDS of design change and resubmission for Prior Approval.

8.8 Balgreen Road NR Access Bridge

8.8.1 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

8.8.2 Delivery of the Access bridge is dependant on Network Rail approvals. We have looked at options for the proposed bridge and discussed them with NR. NR agrees the option that re-uses the existing abutments is acceptable in theory but SDS are to submit the back up information to support this before they give their final approval.

Supporting information comprise:

1. Form A

2. Proposed headroom

3. Detailed analysis of the abutments suitability for the retention and reuse of existing substructures within the proposed scheme following the requirements detailed within Railtrack Group Standard GC/RC/5510

The analysis of the abutment requires additional investigation. SDS are programming for trial pitting and probing behind the abutments to prove the thickness and condition of the abutment walls. Initial enquiries with NR indicate possessions will be required even though we are a distance from the running lines.

In the meantime, SDS are pursuing alternative means of obtaining this information, using radar from the front of the abutments from the roadside. Should this be successful SDS will carry out further studies to cover the full height of the abutments and supplement this information with hand dug trial pits behind the abutments.

Key risks out of SDS's control are:

Delays in appointing contractors

Delay in gaining access for the investigation / surveys

The trial holes show the abutments to be worse than expected.

Network Rail do not approve our submission and the design has to be amended.

There is also a risk raised by the preferred contractor in that the client may wish us to guarantee the design life of the existing abutment to 120 years. This would be unusual as network rail themselves do many deck replacements on existing abutments. Hence the importance of obtaining the additional information.

9 SECTION 5B

9.1 Roads

9.1.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

9.1.2 The time between completing IDC and issuing for Technical Approval has been reduced from 10 days to 5 days, subject to commercial agreement on LDs, as requested by tie (23 April 2008). This turnaround may not be possible in 5 days.

9.2 South Gyle Access Bridge

9.2.1 Updating to comments (& creation of IFC drawings) has been reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (28 March 2008). Should comments be received requiring amendments to Prior Approval submission then turnaround may not be possible in 5 days.

9.2.2 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 6 weeks rather than the standard 8 weeks as requested by tie.

9.2.3 On 23 April 08 tie instructed SDS to prepare Issue for Construction (IFC) drawings for South Gyle Access Bridge to be ready for signature by 23 May 2008 provided that Prior Approval is granted by CEC by that date and provided that the Prior Approval is not granted with conditions that would require changes to those IFC drawings (as they are being draughted at risk).

9.3 Bankhead Drive Retaining Wall

9.3.1 Updating to comments (& creation of IFC drawings) has been reduced to 5 days from 10 days subject to commercial agreement on LDs at ties request 28 March 2008.

9.4 Carrick Knowe

9.4.1 V27 of the SDS Detailed Design Programme IFC dates were brought forward from V26 (IFC 22 July) to assist with construction start dates as requested by tie. IDC performed in isolation from rest of the subsection. There is a risk of change due to the impact of changes to design of the rest of the sub-section

10 SECTION 5C

10.1 Roads 5C

10.1.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

10.1.2 Updating to comments (& creation of IFC drawings) has been reduced to 5 days from 10 days subject to commercial agreement on LDs as requested by tie (23 April 2008). Should comments be received requiring amendments to Prior Approval submission then turnaround may not be possible in 5 days.

10.2 Drainage

10.2.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

10.3 Gyle stop Retaining Walls

10.3.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 6 weeks rather than the standard 8 weeks as requested by tie.

10.4 A8 Underpass

10.4.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 3 weeks rather than the standard 8 weeks at ties request.

10.4.2 The programme has been accelerated at risk from V27 as requested by tie. Design time reduced by 1 week. CATII check at risk as accelerated at risk by 3 weeks. 1 day only allowed for IDC, a reduction from 10 days. The IDC performed standalone, rather than as part of the subsection.

10.4.3 In order to ensure confidence and understanding of the design quickly, a presentation to TAA has been scheduled into the programme once the design is complete.

10.5 Gogarburn Tram Stop

10.5.1 Tie has instructed SDS to break the Gogarburn tramstop out of batch 5/22 to allow the earliest possible production of IFC drawings for the line of route otherwise contained in that batch.

11 SECTION 6

11.1 General

11.1.1 The SDS Detailed Design Programme assumes that the Gogarburn depot site is selected over preference of the Leith depot, and no further development of a design for a depot at Leith is required.

11.1.2 The detailed cladding design and secondary steel detailed design will be undertaken by the contractor depending on final selection of cladding materials.

11.2 Earthworks

11.2.1 Earthworks batch has been split out to allow construction of earthworks in advance of securing approval for the entire depot. CEC approval of this strategy required.

11.3 Drainage

11.3.1 The drainage design has been split out and accelerated as requested by tie. There is a risk of rework/abortive work if amendments are required once the IDC for the entire section has been completed.

11.4 Roads

11.4.1 The SDS Detailed Design Programme shows13 August 08 for IFC as requested by tie. The programme has taken out 9 days between IDC completion and issue to TAA. The programme also assumes there will be no comments and roads team work at risk to compile IFC drawings while waiting for Technical approval. This may not be possible and is subject to commercial agreement on LDs.

11.5 Depot Access Bridge

11.5.1 The IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12 SECTION 7A

12.1 Gogarburn Bridge

12.1.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 6 weeks rather than the standard 8 weeks as requested by tie.

12.1.2 The IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12.2 Gogar Culvert One

12.2.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

12.2.2 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12.3 Gogar Culvert Two

12.3.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

12.3.2 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12.4 Gogar Culvert Three

12.4.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

12.4.2 The IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12.5 Gogarburn Retaining Wall One

12.5.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

12.5.2 V29 onwards of the SDS Detailed Design Programme assumes SDS will be working at risk for 40 working days by continuing with detailed design before PD approvals have been received.

12.5.3 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

12.6 Gogarburn Retaining Wall Two

12.6.1 The SDS Detailed Design Programme assumes CEC will approve the technical submission in 4 weeks, as requested by tie, rather than the standard 8 weeks.

12.6.2 V29 onwards of the SDS Detailed Design Programme assumes SDS will be working at risk for 40 working days by continuing with detailed design before PD approvals.

12.6.3 IDC has been unlinked from the subsection IDC as requested by tie. The risk of change coming from the IDC process is therefore with tie.

PART B - CONSENTS PROGRAMME AND DESIGN DELIVERY PROGRAMME

APPENDIX PART 3

HALCROW COLLATERAL WARRANTY

(1) HALCROW GROUP LIMITED

- and -

(2) tie LIMITED

COLLATERAL WARRANTY

relating to the

PROVISION OF DESIGN SERVICES FOR THE EDINBURGH TRAM NETWORK

CONTENTS

AGREEMENT

BETWEEN

(1) **HALCROW GROUP LIMITED** (Company Number 03415971) whose registered office is at Vineyard House, 44 Brook Green, London, W6 7BY (the "**Consultant**") and

(2) **tie LIMITED** (Company Number SC230949) whose registered office is at City Chambers, High Street, Edinburgh, Midlothian, EH1 1YJ ("**tie**") which term shall include its successors and permitted assignees).

BACKGROUND

A. By an agreement in writing dated 19 September 2005 (the "**SDS Agreement**"), **tie** appointed Parsons Brinckerhoff Limited (the "**SDS Provider**") to provide system design services in connection with the Edinburgh Tram Network.

B. The SDS Provider appointed the Consultant to provide design services and technical and civil engineering expertise and support (the "**Services**") as the SDS Provider's sub-consultant pursuant to an agreement dated [◆] 2005 (the "**Halcrow/PB Agreement**").

C. It is a term of the SDS Agreement that the SDS Provider shall procure the provision of a Collateral Warranty in favour of **tie** from the Consultant.

IT IS AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and expressions have the following meanings, unless the context requires otherwise:

"**Agreement**" means this document (as amended from time to time pursuant to clause 10);

"**Deliverables**" means the Sub-Consultant Deliverables under the Halcrow/PB Agreement, as determined in accordance with Clause 4.1 of the Haclrow/PB Agreement and Schedule 1 (*Scope of Services)* to the Halcrow/PB Agreement;

"Intellectual Property Rights" means any rights in or to any patent, design rights, utility model, trade mark , brand name, service mark , trade name, business name, logo, invention (whether registered or unregistered), domain name, semi-conductor

right, topography right, software design, and/or other materials, source code, copyright, moral right or rights in databases and any other rights in respect of any industrial or intellectual property, whether capable of being registered or not, including all rights to apply for any of the foregoing rights or an extension , revival or renewal of any of the foregoing rights and any similar or analogous rights to any of the above, whether arising or granted under the laws of Scotland or of any other jurisdiction.

"**Party**" means each and any of the parties to this Agreement and Parties shall be construed accordingly.

1.2 Unless the context requires otherwise:

1.2.1 words importing:

1.2.1.1 the singular include the plural and vice versa; and

1.2.1.2 one gender include all other genders.

1.2.2 a reference to:

1.2.2.1 persons includes firms, companies, corporations, partnerships, trusts, authorities and other incorporated and/or unincorporated bodies; and

1.2.2.2 a recital, clause or schedule is a reference to a recital, clause or schedule of or to this Agreement.

1.3 The list of contents and clause headings in this Agreement are included for convenience only and do not affect its interpretation.

1.4 Where a Party comprises two or more persons:

1.4.1 any obligations on the part of that Party contained or implied in this agreement are deemed to be joint and several obligations on the part of those persons; and

1.4.2 references to that Party shall include references to each and any of those persons.

1.5 Unless otherwise defined hereunder, where the Halcrow/PB Agreement defines a meaning to any capitalised word or expression used in this Agreement, the same meaning shall be given to it in this Agreement;

1.6 In the case of any unintended and patent conflict between the definition or interpretation of words or expressions in this Agreement and the Halcrow/PB Agreement, the Halcrow/PB Agreement shall prevail save where by express words or where it is apparent from the context that the contrary is intended in this Agreement.

2. STANDARD OF CARE

The Consultant warrants and undertakes to **tie** that:

2.1 it has carried out and shall continue to carry out its Services and other duties and obligations under the Halcrow/PB Agreement subject to and in accordance with the terms thereof; and

2.2 in addition to and without derogation from clause 2.1;

2.2.1 the Consultant warrants to **tie** that, in the performance of the Services and its other obligations under the Halcrow/PB Agreement it has exercised and shall exercise a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent system design services and technical and civil engineering services provider experienced in performing services similar to the Services in connection with projects of a similar size, scope and complexity to the Edinburgh Tram Network; and

2.2.2 it owes a duty of care to **tie** in carrying out its duties, obligations and scope of services under the Halcrow/PB Agreement in terms of 2.2.1 above.

3. COPYRIGHT LICENCE

3.1 The Consultant hereby grants to **tie** an irrevocable, perpetual, royalty-free and non-exclusive licence to use any and all of its own Intellectual Property Rights contained in the Deliverables as may be necessary for **tie** to use in relation to any projects associated with the Services. This licence shall carry the right to grant sub-licences, and be freely transferable to third parties. The Consultant shall be liable for any claims arising from the use by **tie** of such Intellectual Property Rights only to the extent that they are used by **tie** for the purposes for which they were intended.

3.2 Subject to **tie** paying the Consultant's reasonable photocopying charges, the Consultant shall provide to **tie** a copy of any of the Deliverables as soon as reasonably practicable after receipt by the Consultant of a written request from **tie** to do so.

3.3 The Consultant undertakes to **tie** that the use by **tie** of any of the Deliverables shall not infringe the rights of any third party in relation to the Deliverables.

4. REQUIRED INSURANCES

4.1 The Consultant undertakes that it has maintained and shall maintain during the performance of its obligations under the Halcrow/PB Agreement all insurance cover in accordance with the requirements of the Halcrow/PB Agreement;

As and when reasonably required by tie, the Consultant shall produce for inspection documentary evidence that such insurance is being properly maintained.

4.2 The Consultant shall at times maintain insurance to comply with its obligations to carry insurance cover following completion of the Services.

5. ASSIGNATION

5.1 The Consultant shall not assign, novate or otherwise transfer the whole or any part of this Agreement without the prior written agreement of **tie**.

5.2 Subject to notice being served on the Consultant, **tie** shall be entitled to assign the whole of this Agreement (and any such assignee shall be entitled to assign once only) to any person taking tie's interest in the Edinburgh Tram Network (but not a party to whom **tie** or any assignee may enter into one or more contracts whereupon that party takes responsibility for all or any of the Consultant's performance and/or services) without the consent of the Consultant. No further or other assignations shall be permitted.

5.3 The Consultant undertakes to **tie** not to contend in any legal or court proceedings under this Agreement that any person to whom **tie** assigns or has assigned its rights under this Agreement in accordance with the foregoing provisions of this clause is to be precluded from recovering any loss resulting from any breach of this Agreement (whenever happening) by reason that (i) such person is an assignee and not the original contracting party under this Agreement, or (ii) **tie** is named under this Agreement and any intermediate assignee of **tie** escaped loss resulting from such breach by reason of the disposal of its interest in the same.

6. LIABILITY OF THE CONSULTANT

6.1 The responsibility of the Consultant under this Agreement is not to be reduced or in any way released or limited by any enquiry or inspection by or on behalf of any person notwithstanding that such enquiry or inspection may give rise to a claim by **tie** against a third party.

6.2 Subject to the other provisions of this Agreement, the liability of the Consultant to **tie** is to be determined in all respects in accordance with the terms of the Halcrow/PB Agreement and, in the event of any claim by **tie** under this Agreement, the Consultant shall be entitled to rely upon any defence, right, limitation or exclusion under the Halcrow/PB Agreement as though **tie** were named as Client under it.

6.3 The liability of the Consultant under this Agreement shall be no greater in nature or extent than the liability of the Consultant under the Halcrow/PB Agreement. Further and notwithstanding any similar or other limitations which may be included in the Halcrow/PB Agreement (and therefore upon which the Consultant may rely by virtue of clause 6.2 and this clause 6.3), the total aggregate liability of the Consultant arising under or in connection with this Agreement, whether in contract, delict or howsoever arising shall be limited to £10,000,000 (TEN MILLION POUNDS except in respect of death and personal injury caused by its negligence, or in the case of fraud or fraudulent misrepresentation.

6.4 Further and without prejudice to the foregoing, the aggregate liability of the Consultant arising out of or in connection with this Agreement shall be further limited to that proportion of loss or damage (including interest and costs) suffered by **tie** which is attributable to the Consultant having regard to the contribution to such loss and damage by any other person, and each other person who has contributed to the loss and damage shall conclusively be deemed to have paid to **tie** a sum equivalent to the proportion of the loss and damage which is attributable to its contribution to the same. For the avoidance of doubt, in calculating the SDS Provider's contribution for the purposes of this clause, the SDS Provider's contractual assumption of responsibility for services performed by the Consultant shall not be taken into account.

NOTICES

6.5 Any notice required to be given under this Agreement is to be hand delivered or sent by prepaid registered or recorded delivery post to the Party concerned at its address

set out in this Agreement or to such other addresses as may be notified by such Party for the purposes of this clause.

6.6 Any notice given pursuant to this clause, if sent by registered or recorded delivery, is deemed to have been received 48 hours after being posted.

7. RIGHTS OF THIRD PARTIES

7.1 Save as in accordance with clause 5, a person who is not a Party to this Agreement shall have no right to enforce any term of this Agreement save through the operation of clause 5 (*Assignation*).

8. INVALID TERMS

8.1 If any term of this Agreement shall be held to any extent to be invalid, unlawful or unenforceable:

8.1.1 that term shall to that extent be deemed not to form part of this Agreement; and

8.1.2 the validity and enforceability of the remainder of this Agreement shall not be affected.

9. VARIATIONS AND WAIVERS TO BE IN WRITING

9.1 No variation, alteration or waiver of any of the provisions of this Agreement shall be effective unless it is in writing and signed by or on behalf of the Party against which the enforcement of such variation, alteration or waiver is sought.

10. WAIVER

10.1 Save where expressly stated, no failure or delay by either Party to exercise any right or remedy in connection with this Agreement shall operate as a waiver of it or of any other right or remedy nor shall any single or partial exercise preclude any further exercise of the same, or of some other right or remedy. A waiver of any breach of this Agreement shall not be deemed to be a waiver of any subsequent breach.

10.2 The Parties' rights and remedies under this Agreement are, except where provided otherwise in this Agreement, independent and cumulative.

11. JURISDICTION AND LAW

11.1 This Agreement is governed by and is to be construed according to Scots law and the Scottish courts shall have jurisdiction in relation to all matters arising under it.

11.2 The Parties agree that any dispute in relation to this Agreement shall be conducted in accordance with clause 28 (*Dispute Resolution Procedure*) of the Halcrow/PB Agreement and the provisions of the said clause 28 are deemed to be incorporated mutatis mutandis in respect of this Agreement provided that any reference to "Parties" shall be deemed to refer to **tie** and the Consultant, any reference to "Client" shall be deemed to refer to **tie**.

IN WITNESS WHEREOF these presents on this and the preceding 7 pages are executed as follows:

EXECUTED for and on behalf of **HALCROW PLC**

at

on 2008 by:

Director/Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

EXECUTED for and on behalf of **tie**

at

on 2008 by:

Authorised Signatory _____

Full Name _____

Witness Signature _____

Full Name _____

Address _____

_____

APPENDIX PART 4

Design and Deliverable Status

PARSONS BRINCKERHOFF LIMITED

SDS CONTRACT

NOVATION AGREEMENT
Appendix Part 4

14 May 2008

Table of Contents

1 Introduction

This document defines the status of the SDS Agreement between **tie** and SDS at the point of Novation. The report details:-

- The status of deliverables completed to date and remaining to be completed for the currently defined scope of services.
- The requirement for future additional services to be provided by SDS for the management of the Approvals process for the Infraco designs.
- The requirement for future additional Construction Support Services to be provided by SDS to the Infraco.

2 Current Scope of Services

2.1 Overview

The scope of work covered by the SDS Agreement is defined as four Phases of work:-

1. Phase I Requirements Definition
2. Phase II Preliminary Design
3. Phase III Detailed Design
4. Phase IV Construction Support

3 Phase I Status

3.1 Scope of Work

Phase I is complete

4 Phase II Status

4.1 Scope of Work

Phase II is complete

5 Phase III Status

5.1 Scope of Work

5.1.1 Overview

The Deliverables to be produced by SDS for the Edinburgh Tram Network under Phase III of the SDS Agreement can be categorised as Detailed Design packages delivered to the client and submissions presented for Prior and Technical Approvals.

Phase III is not complete. The Phase III scope of work will be completed under the terms of the SDS Agreement.

The following sections provide an analysis of current status for each category of deliverable.

5.1.2 Detailed Design Packages - Status as at 13 May 2008

Total Number of Packages	Total Delivered	Total Remaining to be Delivered
329	296	33

5.1.3 Prior Approvals - Status as at 13 May 2008

Total Number of Prior Approvals	Total Approved	Total Remaining to be Approved
63	22	41

5.1.4 Technical Approvals – Status as at 13 May 2008

Total Number of Technical Approvals	Total Approved	Total Remaining to be Approved
128	30	98

5.2 Changes

The table of rates for provisional additional work to be used for the pricing of changes to scope is as follows:-

Reference	Role	Hourly Rate
GD	Graduate Designer	£55.00
SD	Senior Designer	£78.00
PD	Principal Designer	£95.00

CT	CAD Technician	£38.00
ST	Senior CAD Technician	£49.00
TS	Technical Support	£38.00

5.3 Team Location and Office Accommodation

Office space for the SDS Phase III Team is to be supplied free of charge by tie to SDS for the duration of the involvement of the team

6 Phase IV Status

6.1 Scope of Work

No work has yet been started under Phase IV. The Phase IV scope of work will be completed under the terms of the SDS Agreement.

Office space for the SDS Phase IV Team is to be supplied free of charge by tie to SDS for the duration of the involvement of the team in supporting Infraco.

7 Additional Scope – Siemens Management Services

7.1 General

As a result of the request from tie and Infraco SDS will provide an additional service beyond that required by the SDS Agreement during the construction phase of the project to support Infraco to secure Approvals and Consents for client design (as defined in the SDS agreement).

This will be where Infraco complete the systems design with final component selections and will be primarily,

- OLE systems design,
- Signalling and Comms,
- Passenger Information Displays
- Tram Stop Furniture
- Automatic Fare Collection equipment
- CCTV equipment
- Public Address equipment
- Track Finishes
- Substation building modifications
- System wide security systems
- Depot equipment.

The team will support Infraco with technical and prior approvals and will also support Infraco with their duty to discharge outstanding planning and prior approval conditions scheduled by the Approvals Authorities in the formal responses to the SDS prior approvals applications.

7.2 Responsibilities of the SDS Support team

SDS will provide personnel with experience of the prior and technical approval processes on the Edinburgh Tram Scheme and the procedures employed by City of Edinburgh Council in registering and approving planning, prior approvals and technical approvals. The SDS team will advise Infraco on these procedures and give guidance on obtaining the outstanding approvals and consents. This will include advice on the content and style of applications as required by CEC, the format of documents to be issued, the timescales for processing of applications and the support of these applications during the process of securing the approval.

During the production of the submissions SDS will advise Infraco on the local knowledge that SDS has gained during the formal and informal consultations SDS previously managed by SDS and the history of the development of the design and any likely requirements of the Approvals Bodies. SDS will also review the submissions produced by the Infraco design teams prior to submission by Infraco and advise on any areas likely to cause objection or rejection of the prior or technical approval.

SDS will support Infraco in their informal consultation process with the Approvals Bodies and with the formal process of making the applications with CEC.

7.3 Programme

The SDS Design Support Team will liaise with the Infraco, tie and SDS planners to inform the Infraco Project Planner of the progress of the Client design approvals and consents.

7.4 Design Checks

In reviewing the Client design SDS will advise Infraco of any errors highlighted in the review process that will impact on the approval of the design. SDS will also advise of any errors or quality control issues that are identified during the review but will not be responsible for quality checking of the Client design.

7.5 Reporting

A weekly report (or as otherwise agreed) will be produced to record the issues being addressed by the SDS Design Support Team. This will detail;

- Progress of the prior, technical and planning approvals;
- The number of prior, technical and planning approvals, the number issued for approval, the number approved and the number of informal consultations in progress.
- New Issues Arising,
- Details of the design issue, location, cause (deviation from SDS design/ design error/programme issue etc) status of resolution,
- Status of any Changes instructed to the design by Approvals Bodies to secure the approval and consent (where applicable)
- Status of resolution of ongoing issues

- Design Progress including target completion dates
- Additional support required from Client/tie etc for the resolution of outstanding issues

7.6 Resources

The SDS Design Support Team is as indicated on the resource chart attached, but is nominally three Principal Engineers, one Document Controller/administration person and one CAD technician.
SDS proposes that there is a dedicated engineer for Section 1 of the route, one engineer for Sections 2, 5 and 7 and a further engineer dedicated to supporting SDS in their completion of the design at the depot.

The SDS Design Support Team will report to the Infraco Design Manager. The Infraco Design Manager will be the link with the Client design teams and will be responsible for instructing the Infraco designers in any amendments proposed to the Infraco design at the suggestion/recommendation of the SDS Design Support Team.

The SDS Design Support Team shall lead the negotiations to secure Approvals and Consents for the Infraco related design. The Infraco shall provide all necessary technical support for this process as is required by the SDS Design Support Team.

The SDS Design Support Team will not be responsible for securing the Approvals and Consents for Infraco related design and will perform a supporting and advisory role to Infraco in securing these consents.

7.7 Commercial

The SDS Design Support Team as required above will be a dedicated project team permanently based in Edinburgh. This will be charged and paid by Infraco on a time at contract rates basis (the rates set out in Appendix Part 8 of this Agreement). The team will be nominally as indicated on the organisation chart. This will be flexible in that the team will be increased and decreased to suit project programme demands and as required by Infraco. The team size will be reviewed on a monthly basis and amended as required/agreed.

Additional specialist resources will be made available when requested by Infraco upon request, subject to availability, and this will be charged on a time and expense basis with durations as agreed.

Timesheets will be presented for signature by a nominated Infraco representative for all staff forming part of the Site Support team on a weekly basis and copies made available.

Office space for the SDS Design Support Team is to be supplied free of charge by tie to SDS for the duration of the involvement of the team in supporting Infraco.

Site transport and any specialist equipment required to carry out the above additional services are to be supplied free of charge to SDS by tie.

8 Additional Scope – Construction Support Services

8.1 Design

8.1.1 General

As a result of the request from tie and the Infraco, SDS will provide an additional Design service beyond that required for Phase IV of the Scope of Work during the construction phase of the project of on-site design support. This is intended to provide design clarification to the construction team on site and address technical queries and issue design clarifications as they arise in so far as this is additional to the Services required for Phase IV of the Scope of Work. The aim is to provide on-the-spot design solutions where possible and fast turn around where additional clarification/advice is required in order to minimise disruption to the construction progress. Where required, the SDS design support team will seek clarification from the wider project Design Team and advise on design solutions/requirements. The team will also review the temporary works method statements and confirm that that there is no adverse impact on the SDS permanent works design. The SDS team will review the Inspection and Test Plan with a view to identifying potential programme conflicts and practical problems for implementation.

8.1.2 Drawings

Where reasonably required by an Infraco (with tie's agreement acting reasonably) request for clarification the team will produce design sketches to assist the construction team and these will also be used to inform the as-built drawing production by incorporating the design clarifications where amendments have to be made to the detailed design of the scheme.

8.1.3 Approvals and Consents

Where design produced by the Construction Support Team requires amendment to the design that has been the subject of an Approval or Consent the Construction Design Support Team will advise the Infraco of the likely implications based upon experience prior to the change being made. This consent may be a technical approval from the Technical Approval Authority, a Prior Approval matter from CEC local planning authority or a third party consultee. The Construction Design Support Team will inform the SDS Approvals and Consents Construction Support team of the issues, supply the additional design clarification sketches to support the team in securing the Approval and consent.

8.1.4 Survey

In support of the construction team it may be necessary to undertake additional surveys on site. The Construction Design Support Team, will provide a written scope for the survey required. If it is necessary to procure this survey from sources external to the project the Construction Support team will manage the procurement of the service providing written quotations to enable the surveys to be undertaken in a timely manner.

8.1.5 Confirmation of Verbal Instructions

The Construction Design Support Team will manage the Confirmation of Verbal Instructions (CVI) process that will be introduced to control the on site design support process. Verbal instructions given to or received from the tie or the Infraco construction team on site will be reinforced by the issue of a Confirmation of Verbal Instructions (CVI) for record purposes. The team will also manage a register of these CVIs and record the status of outstanding issues.

8.1.6 Additional Design

The Construction Support Team will manage the Request For Information procedure implemented to track the progress of technical queries. The process will be used to manage the technical questions being asked of the Construction Support Team and the associated responses. In cases where the Construction Design Support Team cannot answer the design query themselves they will seek additional support from the relevant technical design function. This may be the SDS designers or the the Infraco design teams. A Request For Information (RFI) form will be generated clarify the design points. The Construction Design Support Team will liaise with the designers to resolve the design issue and mitigate where possible construction programme delays by prioritising design issues with the design teams. Where additional design is required from the SDS team the Construction Design Support Team will inform the Infraco of the design change and will assist to prepare the relevant change instruction.

8.1.7 Health and Safety

The Construction Support Team will assist the Infraco Contractor with the provision of design information for incorporation into the Health and Safety file in accordance with CDM recommendations.

8.1.8 Programme

The Construction Design Support Team will liaise with the Infraco, tie and SDS planners to inform the project programme of the implication of on site generated design change. This will include additional detailed design time, approval and consent related amendments and impacts on the critical path activities. The Construction Design Support Team will work with the Infraco, tie and the rest of the SDS Construction support team to mitigate construction programme delay through prioritisation of the design amendment responses.

8.1.9 Design Checks

Where design is produced by the Construction Design Support Team as a result of a tie instruction or the Infraco request for clarification that requires checking by the discipline teams e.g. structures, OLE, track etc this process will be managed by the Construction Design Support Team. An assessment of the level of design check required will be made by the Construction Design Support Team and notified in the weekly status report and on the CVI form for the issue.

In pursuance of the general obligations of Infraco and SDS the Construction Support Team will also provide assistance to Infraco by checking that subcontractors, suppliers and the Infraco designs themselves have no adverse impacts on the Permanent Design works and ensure that a suitable level of Infraco Inspection and Testing is incorporated.

8.1.10 As Built Drawings

Where additional design is produced in support of the construction team by the Construction Support Design Team, the SDS design drawings will be updated to reflect the changes in preparation for the production of the As-Built Design Drawings.

8.1.11 Reporting

A weekly report will be produced to record the issues being addressed by the Construction Design Support Team. This will detail;

Critical Issues Summary

- Details of the issue, Location, cause (deviation from SDS design/ design error/programme issue etc) status of resolution, reason for delay in resolution and impact of the delay

New Issues Arising,

- Details of the design issue, Location, cause (deviation from SDS design/ design error/programme issue etc) status of resolution,
- Status of the Change instructions (where applicable
- New RFI s
- Photographic records

Status of resolution of Ongoing issues

- Design Progress including target completion dates
- Approval and Consent progress
- Additional support required from the Infraco/tie etc for the resolution of outstanding issues

RFI Commentary

- Outstanding RFI responses and owners prioritised on the basis of programme delay/importance

- New RFIs
- Updated RFI register

Resources

The Design support team is as indicated on the resource chart attached, but is nominally three Principal Engineers, one CAD technician and administrative support and Project Management.

8.2 Inspection

8.2.1 General

The role of the Inspection Team is to provide an overview of the construction as the work progresses. The aim is to enable SDS to comment upon the construction and the compliance with the SDS design. Inspections will be done by a combination of frequent sampling of the construction works as they progress and for some elements of the works e.g. bridges and more rigorous inspection regime. The inspection teams will be expected to provide a report on the construction works undertaken and work with the Infraco Construction Supervision team to advise of issues that, if not addressed, will result in a non-compliant construction to the SDS design and project specifications. The aim of the team will be to minimise abortive works and provide documentary support to the Infraco Construction Quality Plans and Procedures.

The field inspectors will advise on issues where there are overlapping codes, specification standards, and individual interpretations from architects, engineers and the construction team, and will work in conjunction with the Infraco, tie and the Construction Support Design Team to resolve the construction related issues as they arise in a timely manner to avoid delays as the construction progresses.

The Inspectors will not be responsible for the quality of Construction and will not be expected to approve the construction or elements of the works. The inspectors will, however, be responsible for a review of the documentation produced by the Infraco as part of their quality procedures during construction and comment on the works undertaken against these procedures.

The Inspectors will be expected to report instances where the methods of construction are not as described by the Contractor's method statements, the design drawings, Code of Construction Practise, the design specifications, the Quality Plan etc.

8.2.2 Duties and Responsibilities

The Inspectors will form an integral part of the Infraco construction team. The team will review the construction works as they progress and advise on the compliance with the SDS design as required by the Infraco Construction Quality Plan. The reviews undertaken will include

8.2.3 Ground Investigation

Review of the Infraco GI results for the testing is undertaken and assistance to ensure that the correct are applying the appropriate treatment/mitigation measures required for the trackbed.

- On an ad hoc basis witness the testing and inspection methods to ensure consistency and adherence to the method statement/procedure.

8.2.4 Earthworks

- Checks that the profiles constructed are as indicated on the design drawings
- Checks that the types of reinforced earth materials and installation are in accordance with the SDS design and materials specification.
- Where poor ground is discovered ensure that the correct treatment is used to mitigate to obtain the desired formation quality

8.2.5 Drainage

- Checks that drainage is installed in accordance with designs and specifications for the project.
- Confirm that materials used are in accordance with those specified

8.2.6 Bridges

The inspectors will have a key role in assessing the adherence to the design for the construction of the bridges including;

- pile sizes and locations,
- Testing of concrete being poured on site, methods of testing and adherence to the design requirements,
- Compaction of the concrete and suitable methods,
- Cover to reinforcement prior to concreting,
- In the case of remedial/repair welding processes and procedures, correct paint specifications for anti rust protection, quality of galvanising,
- Inspections will be undertaken to validate that the bridges are constructed using materials that conform to the drawings and specification provided by SDS for the construction.
- Correct reinforcement at correct spacing
- Quality of the finishes achieved on site.

8.2.7 Quality

The Inspection team will not be responsible for ensuring the quality of the construction of the infrastructure and this will remain the responsibility of tie and the Infraco, but will assist with clarification of the design to enable the Infraco to comply with the Construction Quality Plan.

8.2.8 Resources

The team will be as shown on the organisation chart but will in principal consist of three inspectors, one dedicated to bridges, one roads and another architectural issues. The inspectors will be supported by an assistant and a CAD operator and Project Management support.

8.3 Commercial - Fees for Construction Support Services

The Construction Support Team as required above will be a dedicated project team permanently based in Edinburgh. This will be charged on a time at contract rates basis, (the rates set out in Appendix Part 8 of this Agreement). The team will be nominally as indicated on the organisation chart. This will be flexible in that the team will be increased and decreased to suit project programme demands and as required by the Infraco and tie. The team size will be reviewed on a monthly basis and amended as required/agreed.

Additional specialist resources will be made available when requested by the Infraco and tie upon request, subject to availability, and this will be charged on a time and expense basis with durations as agreed.

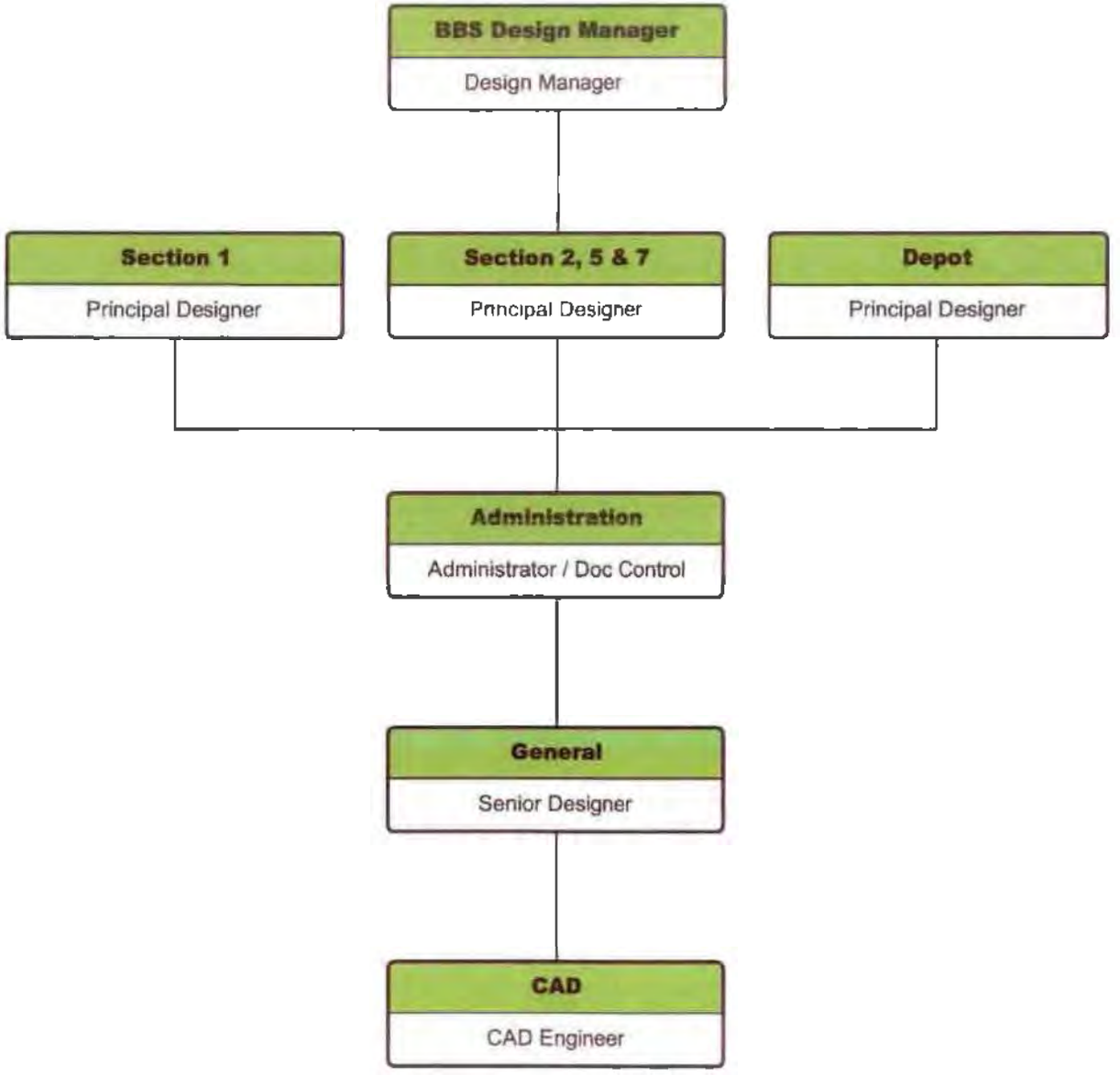
Timesheets will be presented for signature by a nominated Infraco representative for all staff forming part of the Site Support team on a weekly basis and copies made available.

Office space for the SDS Design Support Team is to be supplied free of charge by tie to SDS for the duration of the involvement of the team in supporting Infraco.

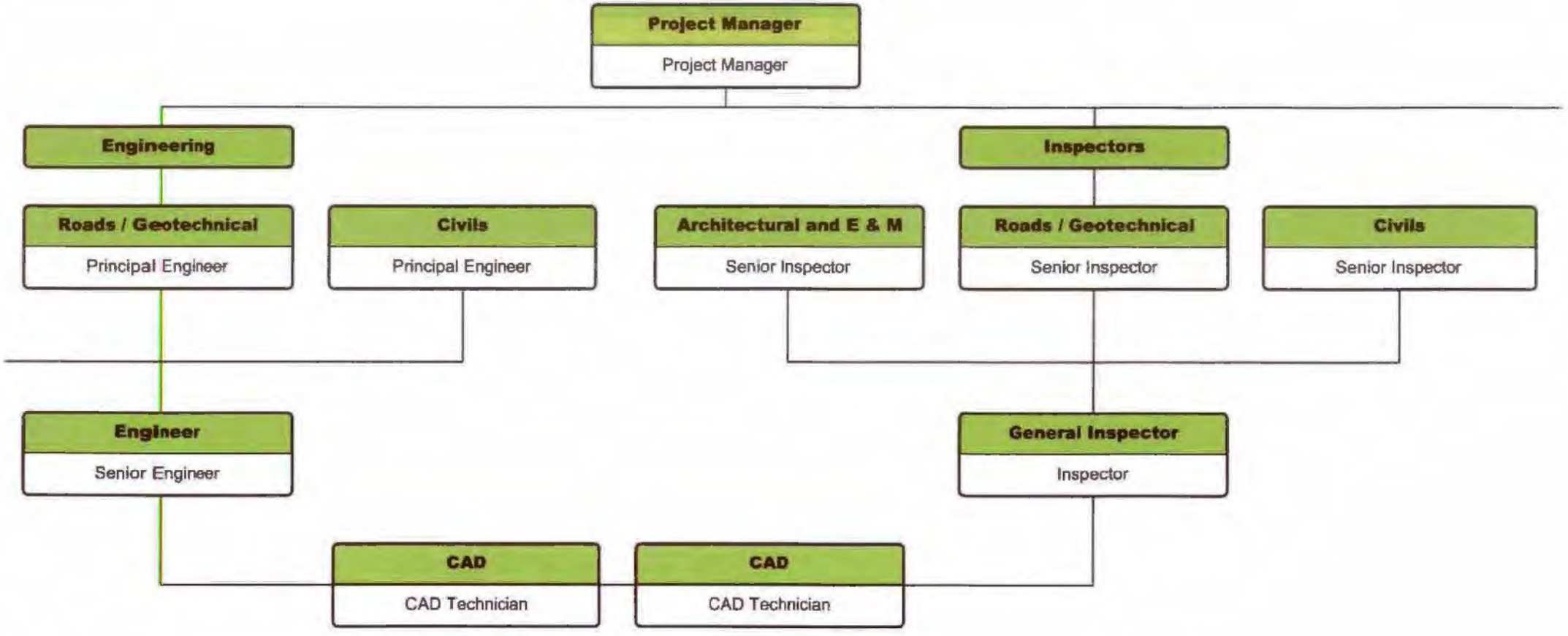
Site transport and any specialist equipment required to carry out the above additional services are to be supplied free of charge to SDS by tie.

9 Cost to Complete

Total Contract Sum	**£ 31,906,128.00**	
Certified and Paid to Date	**£ 25,922,313.00**	
Balance to Complete	£ 4,983,815.00	
Detailed Design Deliverables	£ 2,204,792.00	
Construction Support	£ 1,104,023.00	
Extended Construction Support	£ 1,000,000.00	Provisional Sum
Design Support Team	£ 675,000.00	Provisional Sum



Construction Support Services



Capability Split

Discipline	Item	Description	BBS	SDS	Comments/ exceptions
Approvals		Identify the powers sought by the bills and how these affect the range of approvals and consents normally required		Yes	
Approvals		Identify the requirements generated through Parliamentary Undertakings and Third Party Agreements		Yes	
Approvals		Identify the requirements of the Tram Design Manual		Yes	
Approvals		Effective communication to the designers of the design constraints imposed by the above		Yes	
Approvals		Facilitate liaison between designers and approving bodies to assist in ensuring that the evolving design is most likely to meet approval and consent requirements		Yes	
Approvals		Examine the evolving design to ensure that approvals and consents arising from the works proposed are identified		Yes	
Approvals		Communicate, with the support of the designers, the design works to the appropriate authorities for the purpose of obtaining consents using the pre-agreed channels identified in the consents protocol		Yes	
Approvals		Provide a mechanism or forum to ensure that potential conflicts between approval and consent requirements and design features are investigated and mitigated		Yes	
Approvals		Manage the consents protocol to ensure the optimum delivery of consents		Yes	
Approvals	**Drainage**	Outfall consents		Yes	
Approvals	**Depot Design**	Planning Process and Approvals		Yes	
Civils	**Bridges**	Murrayfield Viaduct		Yes	
Civils	**Bridges**	Existing Water of Leith Bridge		Yes	
Civils	**Bridges**	Existing Balgreen Road Bridge		Yes	
Civils	**Bridges**	Balgreen Road Bridge		Yes	
Civils	**Bridges**	Soutyh Gyle Access Road Bridge		Yes	
Civils	**Bridges**	A8 Underpass		Yes	

Civils	**Bridges**	Depot Access Road Bridge		Yes	
Civils	**Bridges**	Gogar Burn Bridge		Yes	
Civils	**Retaining Walls**	Baird Drive Retaining Wall		Yes	
Civils	**Retaining Walls**	Balgreen Road Retaining Wall No. 1		Yes	
Civils	**Retaining Walls**	Balgreen Road Retaining Wall No.2		Yes	
Civils	**Retaining Walls**	Bankhead Drive Retaining Wall (South Gyle Access)		Yes	
Civils	**Retaining Walls**	Gyle Retaining Wall		Yes	
Civils	**Retaining Walls**	Glasgow Road Retaining Wall		Yes	
Civils	**Bridges**	Approval in Principle (AIP)		Yes	
Civils	**Bridges**	Detailed design and approvals		Yes	
Civils	**Bridges**	Structure gauge drawings		Yes	
Civils	**Bridges**	Transition slabs	Yes		With BBS as part of the trackform
Civils	**Retaining Walls**	Approval in Principle (AIP)		Yes	
Civils	**Retaining Walls**	Ravelston Dykes Access Ramp		Yes	

Civils	**Bridges/Ret. Walls**	All contamination assessment / advice / interpretation.		Yes	**As per the SDS Agreement,** The SDS Provider shall be responsible for undertaking and reporting on (inclusive of interpretative analysis) surveys necessary to inform the SDS design of the Edinburgh Tram Network. The resultant analysis and reports from those surveys are to be used to develop the Functional Requirements Specifications and the Technical Specifications and to set base lines against which the impact of the Edinburgh Tram Network can be measured when built. There is no Clause within the SDS Contract stating that SDS will freely and contractually provide "**All contamination assessment / advice / interpretation."The relevant Change Instruction to SDS in accordance with the SDS Contract would be required to provide this additional consultant service.**
Civils	**Power**	Power distribution equipment foundation design		Yes	To be finalised in SDS/BBS alignment workshops
Civils	**OLE**	OLE support foundation design		Yes	To be finalised in SDS/BBS alignment workshops
Civils	**Accommodation Works**	Layout and Details		Yes	
Civils	**Bridges/Ret. Walls**	Review Client's Data for Design Scope		Yes	

Civils	**Bridges/Ret. Walls**	Review of previous factual Interpretive Report where available		Yes	
~~**Civils**~~	~~**Bridges/Ret. Walls**~~	~~Final Geotechnical Interpretive Report~~	-	~~Yes~~	-
~~**Civils**~~	~~**Bridges/Ret. Walls**~~	~~Individual Structures Interpretive Reports~~	-	~~Yes~~	-
Civils	**Bridges/Ret. Walls**	Review and resolve contaminated sites		Yes	If necessary
Civils	**Bridges/Ret. Walls**	Brief for any additional SI required for permanent works design		Yes	BBS to advise following due diligence
Civils	**Bridge**	EARL structure at New Ingliston			
Civils	**Derailment Containment**	Derailment containment as part of structures inc guided busway		Yes	
Civils	**Derailment Containment**	Derailment containment as part of the track form	Yes		Where required
Civils	**Existing Sewers, Drainage or other Utilities under Highways / Tramway**	Investigation and condition survey		Yes	
Civils	**Existing Sewers, Drainage or other Utilities under Highways / Tramway**	Design of any remedial or strengthening measures		Yes	

Civils	**Existing Sewers, Drainage or other Utilities under Highways / Tramway**	Design of any protection measures, bridging slabs or structures		Yes	
Civils	**Existing Sewers, Drainage or other Utilities under Highways / Tramway**	Design of New Side or Top Entries to existing sewers, drainage and the like		Yes	
Civils	**Bridges**	Haymarket Station Viaduct		Yes	
Civils	**Bridges**	Leith Walk Railway Bridge		Yes	
Civils	**Bridges**	Tower Place Bridge		Yes	
Civils	**Bridges**	Victoria Dock Entrance Bridge		Yes	
Civils	**Bridges**	Roseburn Terrace Bridge		Yes	
Civils	**Bridges**	Coltbridge Viaduct		Yes	
Civils	**Bridges**	St George's School Access Bridge		Yes	
Civils	**Bridges**	St George's School Access Footbridge		Yes	
Civils	**Bridges**	Ravelston Dykes Bridge		Yes	
Civils	**Bridges**	Craigleith Drive Bridge		Yes	
Civils	**Bridges**	Holiday Inn Access Bridge		Yes	
Civils	**Bridges**	Queensferry Road Bridge		Yes	
Civils	**Bridges**	Groathill Road South Bridge		Yes	
Civils	**Bridges**	Telford Road Bridge		Yes	
Civils	**Bridges**	Drylaw Drive Bridge		Yes	
Civils	**Bridges**	Crewe Road Gardens Bridge		Yes	
Civils	**Bridges**	Russell Road Bridge		Yes	
Civils	**Bridges**	Carrick Knowe Underbridge		Yes	
Civils	**Bridges**	Existing Saughton Road Bridge		Yes	

Civils	**Bridges**	Existing Broomhouse Road Bridge		Yes	
Civils	**Bridges**	Edinburgh Park Station Bridge		Yes	
Civils	**Retaining Walls**	Rosebum corridor – locations to be confirmed following review of Baseplans and LHMP		Yes	
Civils	**Retaining Walls**	Ferry Road Retaining Wall		Yes	
Civils	**Retaining Walls**	Lindsay Road Retaining Wall		Yes	
Civils	**Retaining Walls**	Russell Road Retaining Wall No. 1		Yes	
Civils	**Retaining Walls**	Russell Road Retaining Wall No. 2		Yes	
Civils	**Retaining Walls**	Haymarket Depot Retaining Wall No. 1		Yes	
Civils	**Retaining Walls**	Haymarket Depot Retaining Wall No. 2		Yes	
Civils	**Retaining Walls**	Haymarket Depot Retaining Wall No. 3		Yes	
Civils	**Retaining Walls**	Gogar Burn Retaining Wall No. 1		Yes	
Civils	**Retaining Walls**	Gogar Burn Retaining Wall No. 2		Yes	
Civils	**Bridges**	Gogar Culvert One		Yes	
Civils	**Bridges**	Gogar Culvert Two		Yes	
Civils	**Bridges**	Approval in Principle (AIP)		Yes	
Civils	**Bridges**	Design and approvals		Yes	
Civils	**Bridges**	Piling Design Loads		Yes	
Civils	**Bridges**	Structure gauge drawings		Yes	
Civils	**Bridges**	Transition slabs+C440	Yes		With BBS as part of trackform
Civils	**Box Culverts**	Approval in Principle (AIP)		Yes	
Civils	**Ret. Walls**	Approval in Principle (AIP)		Yes	
Civils	**New Parapets to Existing Bridges**	Approval in Principle (AIP)		Yes	
Civils	**Bridges/Ret. Walls**	Detailed design and approvals		Yes	
Civils	**Bridges/Ret. Walls**	Review Client's Data for Design Scope		Yes	
Civils	**Bridges/Ret. Walls**	Review of previous factual Interpretive Report where available		Yes	

~~**Civils**~~	~~**Bridges/Ret. Walls**~~	~~Final Geotechnical Interpretive Report~~	-	~~Yes~~	-
Civils	**Bridges/Ret. Walls**	Review and resolve contaminated sites		Yes	
Civils	**Bridges/Ret. Walls**	Ground modelling / ground water modelling requirements.		Yes	
~~**Civils**~~	~~**Bridges/Ret. Walls**~~	~~All contamination assessment / advice / interpretation.~~	-	~~Yes~~	-
Civils	**Existing Structures such as Bridges or Buildings**	Investigation and condition survey		Yes	
Civils	**Existing Structures such as Bridges or Buildings**	Design of any remedial or strengthening measures		Yes	
Civils	**Existing Structures such as Bridges or Buildings**	Design of any protection measures for permanent works		Yes	
Civils	**Existing Structures such as Bridges or Buildings**	Design of any protection measures during construction	Yes		
Civils	**Existing Subways, Culverts, Cellars under Highways / Tramway**	Investigation and condition survey	Yes		Pre construction condition surveys for construction methodology to be BBS scope. SDS has done sufficient surveys to inform the permanent design but not the pre construction survey related to the construction methodology.

Civils	**Existing Subways, Culverts, Cellars under Highways / Tramway**	Design of any remedial or strengthening measures		Yes	
Civils	**Existing Subways, Culverts, Cellars under Highways / Tramway**	Design of any protection measures, bridging slabs or structures		Yes	
Civils	**Bridges/Ret. Walls**	Procure any additional SI required and associated Factual Reports	Yes		
Civils	**Bridges/Ret. Walls**	Detailed design and approvals		Yes	
Civils	**Bridges/Ret. Walls**	Review Client's Data for Design Scope		Yes	
Civils	**Bridges/Ret. Walls**	Review of previous factual Interpretive Report where available		Yes	
~~**Civils**~~	~~**Bridges/Ret. Walls**~~	~~Final Geotechnical Interpretive Report~~	-	~~Yes~~	-
Civils	**Bridges/Ret. Walls**	Brief for any additional SI required		Yes	To be finalised in SDS/BBS alignment workshops
Depot		Depot building layout design, architectural design, landscaping and access roads, car parking, external storage, site security and resolution of environmental matters		Yes	
Depot		Depot yard layout and amenities, lighting and fencing		Yes	

Depot		Depot access control facility (including communications system to control room)		Yes	SDS to take design to performance spec and design power & comms ducting; BBS sub-contractor will do final design of gate itself
Depot		Civil engineering foundations design the depot building C514		Yes	
Depot		Location & design of traction power substation building		Yes	
Depot		Design of traction power substation equipment	Yes		
Depot		Design of site wide drainage and drainage attenuation requirements		Yes	
Depot		Design and location of commucation and security systems facilities - systems	Yes		
Depot		Design and location of communication and security systems facilities - building services		Yes	
Depot		Design of LV power supply - building services		Yes	
Depot		Design of UPS provision (split building / systems)	Yes		
Depot		Cable routing and ducting (external) - layout and design		Yes	
Depot		Workshop plant layouts		Yes	Based on input from information from suppliers & maintainers
Depot		Workshop equipment foundations, power, water, air supplies		Yes	Based on input from information from suppliers & maintainers
Depot		Specification of workshop and yard maintenance equipment	Yes		Definitely not SDS - depends on CAF/BBS split agreement
Depot		Design co-ordination of Structures and Civil Engineering, building services, Roads and Utilities and Architectural disciplines		Yes	
Depot *		Design co-ordination of Track, OLE, Supervisory Control and Comunications, traction Power Distribution, LV transformer	Yes		

Depot		Co-ordination of depot maintenance plant with tram design specification		Yes	
Depot		General Arrangement		Yes	
Depot		Detailed depot workshop Equipment Design including fixings and loadings	Yes		(for Infraco Scope of work)
Depot		Civil, Building and Architectural design and approvals		Yes	
Depot		Suppliers' & Manufacturers' Drawings	Yes		SDS to check
Depot		Space planning including offices, rest area, canteen, locker rooms		Yes	
Depot		Substation civil design (Foundations)		Yes	
Depot		Outline Building M & E Services Design and Performance Specification for Small Power and Lighting, HVAC, Telephones, LAN, Plumbing, Fire Protection, Earthing and Lightning Protection, etc		Yes	
Depot		Outline Design of Yard M & E Services and Performance Specification for LV power distribution, water supply, compressed air, Fire Protection, Earthing, etc		Yes	
Depot		Detailed Design of Yard M & E Services Design such as LV power distribution, water supply, compressed air, Fire Protection, Earthing, etc		Yes	
Depot		Utilities Design to / from Boundary limits		Yes	
Depot		Workshop tools and maintenance/cleaning equipment. Includes equipment in yard area.	Yes		(for Infraco Scope of work)
Depot		Mechanical interlocking for equipment/OLE interfaces	Yes		Requires input from many parties inc SDS, TEL, CAF
Depot		Depot building amenities, waste and drainage facilities		Yes	
Depot		Fire engineering requirements		Yes	
Depot	**Operation Control Centre**	Detailed Room Layout Design		Yes	
Depot	**Operation Control Centre**	Workstation design	Yes		

Environmental	**Archaeology**	Archaelogy Investigations		Yes	
Environmental	**Archaeology**	Identify sites and produce watching brief		Yes	
Environmental	**Survey**	Void Location Survey		Yes	Any additional void location required by BBS trackform choice to be instructed by BBS
Environmental	**Exhumations**	Brief and scope		Yes	
Environmental	**Monuments**	Brief and scope		Yes	
Environmental	**Ecology**	Brief and scope		Yes	
Environmental	**Tree Felling**	Brief and scope		Yes	
Environmental	**Contaminated land**	Brief and scope		Yes	
Environmental	**Exhumations**	Methodology for removal/mitigation	Yes		
Environmental	**Monuments**	Methodology for removal/mitigation	Yes		
Environmental	**Ecology**	Methodology for removal/mitigation	Yes		
Environmental	**Tree Felling**	Methodology for removal/mitigation	Yes		
Environmental	**Contaminated land**	Methodology for removal/mitigation	Yes		
Environmental	**Noise**	Study / Report		Yes	
Environmental	**Noise**	Post construction measurement		Yes	
Environmental	**Noise**	Detailed design for noise mitigation measures		Yes	
Environmental	**Vibration**	Study / Report		Yes	
Environmental	**Vibration**	Detailed design of track form to mitigate vibration	Yes		
Environmental	**Hydrology Survey**	Hydrology Survey		Yes	
Environmental	**Survey**	Survey		Yes	
Environmental		Preparing and updating from time to time the project Environmental Management Plan		Yes	
Environmental		Provision of environmental advice to the designers		Yes	
Environmental		Input into the design requirements tracker		Yes	
Environmental		Input into the approvals and consents tracker		Yes	

Environmental		Specifying the nature and extent of necessary Archaeoligical, Ecological and other Environmental Surveys		Yes	
Environmental		Preparing the applications necessary for Environmental Licenses		Yes	
Environmental		Attendance at design review meetings as appropriate		Yes	
Environmental		Environmental input and advice to the overall drainage design and the layouts to boundary limits		Yes	
Environmental		Drainage/interceptor design, including pumping and balancing ponds		Yes	
Environmental		Overall drainage design and layouts to boundary limits		Yes	
Environmental		Drainage / interceptor design. Includes pumping and balance ponds etc.		Yes	
Geotechnical		Preparation of methodology of rolling programme for inspection & test of ground conditions	Yes		
Geotechnical		Design of a phased ground investigation to delineate and characterise the prevailing geotechnical hazards		Yes	
Geotechnical		Supervision of GI fieldworks and the preparation of laboratory testing schedules		Yes	For scope of design that SDS have produced or have agreed to complete at the point of novation. Changes to the design that result in SDS rework are additional services.
Geotechnical		Preparation of an interpretative report presenting out conclusions and recommendations associated with mitigating the identified geotechnical hazards		Yes	
Geotechnical		Register of embankments and cuttings		Yes	
Geotechnical		Plan layouts of embankments and cuttings on the tram route		Yes	
Geotechnical		Preparation of cross sections of embankments and cuttings demonstrating land clearances		Yes	
Geotechnical		Perparation of cross sections of embankments and cuttings detailing typical construction (excluding foundation details)		Yes	

Geotechnical		Embankment and cutting drainage concept design (excluding track drainage and drainage of remaining off-street areas)		Yes	
Geotechnical		Provision of geotechnical design parameters for structural design		Yes	
Geotechnical		Completing the Scottish trunk roads geotechnical certification process to the satisfaction of Transport Scotland		Yes	
~~**Geotechnical**~~	~~**Earthworks**~~	~~Cut & Fill Analysis (Roseburn Corridor)~~	-	~~Yes~~	-
Landscape Architecture		Brief and scope		Yes	
Landscape Architecture		Detailed design		Yes	
Landscape Architecture		Cross referencing of landscape requirements onto Engineering plans		Yes	
Landscape Architecture	**Landscaping Street Furniture**	Detailed design and approvals		Yes	
Landscape Architecture	**Fencing Works**	Layout and Details		Yes	
Landscape Architecture	**Boundaries**	Fencelines and fences		Yes	
Lighting	**Lighting**	Cycleways and paths		Yes	
Lighting	**Lighting**	Park and Ride facilities		Yes	
Lighting	**Highways / Street Lighting**	Outline design and approval (including foundation design)		Yes	
Lighting	**Highways / Street Lighting**	Detailed design and approvals (including foundation design)		Yes	
Lighting	**Highways / Street Lighting**	Identify Power supplies from existing sources		Yes	
Lighting	**Highways / Street Lighting**	Power supply from new source		Yes	

Lighting	**Highways / Street Lighting**	OLE/Street lighting to accord with lighting design		Yes	
Lighting	**Tramway Lighting**	Outline design and approval		Yes	
Lighting	**Tramway Lighting**	Detailed design and approvals		Yes	
Lighting	**Tramway Lighting**	Power supply		Yes	
OLE	**OLE**	Outline design and approvals		Yes	
OLE	**OLE**	Detailed design - catenary	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Approvals - catenary		Yes	SDS to be instructed to manage this process and all approvals that are not in current SDS scope
OLE	**OLE**	Detailed design - auto tensioned	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Approvals - auto tensioned		Yes	SDS to be instructed to manage this process and all approvals that are not in current SDS scope
OLE	**OLE**	Building Fixing Report including design/approvals (excluding detailed wiring design and detailed building fixings locations)		Yes	To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Pantograph interface and performance characteristics	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Typical cross sections and detailed cross sections	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Proposal for poles, wiring arrangements and the tensioning equipment	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Technical and performance specification for the OLE	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Proposal for equipment type and method of supporting the equipment along the route, including the wall fixings	Yes		To be finalised in SDS/BBS alignment workshops

OLE	**OLE**	Detailed pole and wall fixing locations (easting and northing coordinates) and the detailed wiring design		Yes	Provided auto-tensioning used in city centre
OLE	**OLE**	Detailed wiring layout design	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Detailed survey work including building fixing location, height and condition; ground condition and pole location surveys		Yes	To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Depot OLE Design	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Specify forces & moments for masts	Yes		To be finalised in SDS/BBS alignment workshops
OLE	**OLE**	Mast foundations		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Substation external and Distribution design and approvals		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Substation internal and Distribution design and approvals	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Specify ducting requirements & mast to receive power supply	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Design ducting from substation to specified mast		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Substation Civil / Building design		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Substation Fencing design		Yes	
Power	**Power Supplies**	Substation Lighting design		Yes	
Power	**Power Supplies**	Earthing and Lightning Protection		Yes	
Power	**Stray Current**	Draft stray current management position paper		Yes	Completed
Power	**Stray Current**	Stray current management going forward	Yes		

Power	**Stray Current**	Typical detail sketches of stray current track slab and structure solutions	Yes		
Power	**Earthing and Bonding**	Outline schematic cabling routing, earthing and bonding arrangements		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Earthing and Bonding**	Draft system earthing policy		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Earthing and Bonding**	Typical detail sketches of earthing and bonding solutions as required		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Earthing and Bonding**	Detail designs of earthing and bonding solutions as required	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Earthing and Bonding**	Selection of specific earthing & bonding components	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Determine traction power distribution equipment and principal component locations	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Specification of traction power equipment and draft typical principal component locations	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Relevant schematics and diagrams showing trackside traction equipment		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Review overhead line /cable make-up proposed	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Define overhead line/cable electrical make-up conductor and cable sections and cable materials	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Review traction supply substation positions proposed	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Define traction supply substation positions and rating	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Overhead line/cable make-up and traction supply substation positions input into Traction Power Study	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Review results of traction power study. Revise make-up and traction supply substation positions and ratings as necessary	Yes		To be finalised in SDS/BBS alignment workshops

Power	**Power Supplies**	Track power feeding and sectioning diagrams for main lines and Depot	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Traction supply substation schematic drawings	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Feed track bed electrical stray current control requirements to track discipline	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Feed traction power distribution design information for the depot building and track system within the Depot complex, incorporating isolator interlocking with Depot plant and the items within the general scope above, to the Overhead Line Equipment and Depot disciplines	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Work in conjunction with the Auxiliary Power discipline to specify the optimum method of supplying the Depot services power supply requirements, and feed into the appropriate Specifications		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Traction power design report on overhead line/cable electrical make-up, traction supply substation positions, ratings, tram loadings, protection settings, load/fault discrimination, pantograph voltages and rail touch voltages.	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Draft traction supply substation equipment specification for traction supply substation procurement	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Feed overhead line / cable electrical make-up, including parallel support cabling, feeder cabling and feeder and section isoltors, to OLE discipline	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Feed traction power SCADA requirements to Systems and Communicaztions discipline	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Specify to Scottish Power the high and low voltage supply requirements as apporpriate for traction, Depot services and substation building services	Yes		To be finalised in SDS/BBS alignment workshops
Power	**LV supply**	LV supply along route		Yes	
Power	**Switch heating**	Switch heating specification	Yes		To be finalised in SDS/BBS alignment workshops

Power	**Permanent Way**	Points heating	Yes		To be finalised in SDS/BBS alignment workshops
Power	**Earthing and Bonding**	Earthing and bonding design (of furnitire at tram stops)		Yes	
Power	**Power Supplies**	Depot Auxilliary Power Supplies		Yes	BBS to validate once equipment Is known
Power	**Power Supplies**	Depot Traction Power supplies	Yes		
Power	**Power Supplies**	Power distribution equipment foundation design		Yes	To be finalised in SDS/BBS alignment workshops
Power	**Power Supplies**	Depot Substation and Distribution Design	Yes		To be finalised in SDS/BBS alignment workshops
Roads & Utilities	**Register**	Junction register		Yes	
Roads & Utilities		Horizontal layouts of roads and junctions on the tram route including pedestrian crossings according to the agreed base line (i.e. STAG incorporating Parliamentary Agreements and **tie** Change Notifications)		Yes	
Roads & Utilities		Consultation with CEC & tie including preparation of realistic alternative layouts for road and junction horizontal layouts		Yes	
Roads & Utilities		Assessment of the preliminary p-way design		Yes	
Roads & Utilities		Integration of the preliminary p-way design		Yes	
Roads & Utilities		Integration of tramstop positioning where situated on-street		Yes	
Roads & Utilities		Preparation of cross sections along the on-street sections demonstrating available lane widths and permitted clearances		Yes	
Roads & Utilities		Preparation of cross sections detailing typical carriageway construction, footways construction, crossfalls, kerb heights and OLE pole locations (excluding foundation details)		Yes	
Roads & Utilities		Road markings		Yes	
Roads & Utilities		Prelim pedestrian and cycleway requirements for on-street areas and road crossings including Roseburn Corridor		Yes	

Roads & Utilities		Assessment of existing traffic signal controller condition and capability	Yes		To be part of UTC provisional sum
Roads & Utilities		Assessment of existing urban traffic control (and proposed UTMC) system capability	Yes		To be part of UTC provisional sum
Roads & Utilities		Preliminary layout of depot access road		Yes	
Roads & Utilities		Road safety Audit Stage 1		Yes	
Roads & Utilities		Road safety Audit Stage 2		Yes	
Roads & Utilities		Road safety Audit Stage 3	Yes		SDS to support BBS
Roads & Utilities		Determination of the preliminary extent of works by assessment of the preliminary pway vertical alignment against existing ground levels, preliminary vertical design at discrete locations only, and assessment of current road condition		Yes	
Roads & Utilities	**Roads Survey**	Roads Condition Survey	Yes		BBS carrying out under tie change
Roads & Utilities	**TRO**	Preparation of traffic management plan based on preliminary roads design		Yes	
Roads & Utilities	**TRO**	Identification of permanent traffic management measures required along the route		Yes	
Roads & Utilities	**TRO**	Preparation of TRO plans and associated technical schedules for submission to Dundas & Wilson and CEC including revocations		Yes	
Roads & Utilities	**TTRO**	Review and design draft remporary traffic management arrangements on the route necessary for construction		Yes	
Roads & Utilities	**TTRO**	Identify existing and possible temporary traffic diversion routes on the wider road network including modifications required to infrastructure, bus stops, parking and loading.	Yes		
Roads & Utilities	**TTRO**	Consult with bus companies, police, fire department, CEC etc through the TTRO working group	Yes		
Roads & Utilities	**TTRO**	Prepare draft temporary traffic management drawings and TTRO plans and technical schedule for submission to CEC		Yes	
Roads & Utilities	**Utilities**	Define the utility apparatus diversion design parameters		Yes	Not Infraco Scope

Roads & Utilities	**Utilities**	Develop combined utility drawings incorporating the information received from tie and the ground penetrating radar survey		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Identification of potential conflicts within 2m of the swept path		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Reference each conflict on the plan drawings and recording information on oa schedule		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Catagorisation of potential apparatus conflicts within a pre-agreed envelope outside the swept path		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Design for utility apparatus diversion or protection within the agreed utility clearance zone (i.e. swept path + 0.45m & 1.2m depth)		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Liaise with each utility owner to obtain actual details on size, material and invert level of all identified conflicts and to discuss proposed apparatus diversions or protections		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Assess potential future utiliy maintenance work problems (safe working widths and traffic management implications)		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Utilities Trial Pits to inform design		Yes	Not Infraco Scope
Roads & Utilities	**Utilities**	Identification of environmental/archaelogical 'hot spots'		Yes	
Roads & Utilities	**Roads Alignment**	Outline Approval		Yes	
Roads & Utilities	**Roads Alignment**	Detailed design and approvals		Yes	
Roads & Utilities	**Highways Junctions**	Outline Approval		Yes	
Roads & Utilities	**Highways Junctions**	Traffic Flows / Priorities -Detailed Design		Yes	
Roads & Utilities	**Highways Junctions**	Traffic Signalling - Staging & Phasing		Yes	
Roads & Utilities	**Highways Junctions**	Traffic Signalling - Detailed Design for Hardware	Yes		

Roads & Utilities	**Highways Junctions**	Traffic Signalling - Capability of Signal Controllers	Yes		
Roads & Utilities	**Highways Junctions**	Traffic Signalling - Analysis & Settings - detailed design	Yes		
Roads & Utilities	**Highways Junctions**	Traffic Signalling - Analysis & Settings - in-service adjustment with trams	Yes		CEC would wish this to be carried out by BBS during the first 6 months of operation - would be a tie change if CEC confirm
Roads & Utilities	**Highways Junctions**	Traffic Signalling - Analysis & Settings - in-service adjustment without trams	Yes		
Roads & Utilities	**Highways Junctions**	Urban Traffic Control (UTC) -Detailed Design and interface between UTC & Signals and definition of required UTC functionality (excluding specification of UTC upgrade where not triggered by introduction of the tram scheme)	Yes		Limited to the Interface, any UTC functionality is not part of Infraco scope
Roads & Utilities	**Highways Junctions**	Urban Traffic Control (UTC) -Detailed Design and interface	Yes		Limited to the road traffic and tram signals
Roads & Utilities	**Highways Junctions**	Detailed junction layout design and approvals		Yes	
Roads & Utilities	**Pavement Design**	Detailed design and approvals		Yes	
Roads & Utilities	**Pavement Design**	Calculation of Residual Design Life for overlaid existing pavements		Yes	
Roads & Utilities	**Safety Fences and Barriers**	Detailed design and approvals		Yes	SDS scope as part of overall track design - does not depend on choice of track form
Roads & Utilities	**Handrails**	Detailed design and approvals		Yes	SDS scope as part of roads design
Roads & Utilities	**Road Furniture excl Traffic Lights**	Detailed design and approvals		Yes	SDS scope as part of roads design

Roads & Utilities	**Traffic Lights**	Location and detailed design and approvals for Hardware, Phasing & Functionality		Yes	
Roads & Utilities	**Traffic Lights**	Power Supply Design	Yes		SDS to design from arrival point of power from supplier to signal
Roads & Utilities	**Traffic Lights**	Cabling and ducting		Yes	
Roads & Utilities	**Tramway Furniture**	Detailed design		Yes	SDS scope as part of tram stop design
Roads & Utilities	**Tramway Furniture**	Power Supply Design	Yes		SDS to design from arrival point of power from supplier to tramstop furniture
Roads & Utilities	**Tramway Furniture**	Cabling and ducting		Yes	
Roads & Utilities	**Road Signs and Markings**	Detailed design and approvals		Yes	
Roads & Utilities	**Footpaths**	Detailed design and approvals		Yes	
Roads & Utilities	**Cycle paths**	Detailed design and approvals		Yes	
Roads & Utilities	**Highways Pedestrian Crossings**	Detailed design and approvals		Yes	
Roads & Utilities	**Non-Tram Ducts / Crossings**	Detailed design and approvals. PB to supply tram related duct requirements and cross sections. Coordination and spatial planning to be undertaken by Halcrow.		Yes	
Roads & Utilities	**Ducts / Crossings**	Detailed design and approvals for traffic signalling.		Yes	

Roads & Utilities	**Ducts / Crossings**	Incorporate / coordinate all ducting on Engineering Plans		Yes	
Roads & Utilities	**Hard Landscaping**	Standard Drawings, Layout Drawings and approvals for surface finishes in highways areas		Yes	
Roads & Utilities	**Hard Landscaping**	Standard Drawings, Layout Drawings and approvals for surface finishes in tramway areas		Yes	
Roads & Utilities	**MX Moss Model**	Review of Client's MX Road Model		Yes	
Roads & Utilities	**MX Moss Model**	Roads Alignment		Yes	
Roads & Utilities	**Earthworks**	Detailed design and approvals (Related to Highways)		Yes	
Roads & Utilities	**Earthworks**	Special drainage details and approvals (Related to Highways)		Yes	
Roads & Utilities	**Earthworks**	Ground improvement / solum design for tram logging (if required)		Yes	
Roads & Utilities	**Existing Utilities**	Utilities Diversion Works design		Yes	
Roads & Utilities	**Existing Utilities**	Design of protection works to existing utilities		Yes	
Roads & Utilities	**Drainage**	Design of all new drainage works associated with highways works		Yes	
Roads & Utilities	**Drainage**	Design of connections of Tramway drainage to highways drainage		Yes	
Roads & Utilities	**Drainage**	Design of connections of new drainage to existing drainage - local connections		Yes	
Roads & Utilities	**Drainage**	Design of connections of new drainage to existing drainage - remote runs to connections		Yes	
Roads & Utilities	**Traffic Management**	Local and wide area		Yes	
Roads & Utilities	**Footway**	Design and approvals for footway along Roseburn Corridor		Yes	
Roads & Utilities	**Earthworks**	Cut & Fill Analysis (on street)		Yes	
Roads & Utilities		Traffic modelling for local and wide-area traffic models		Yes	
Roads & Utilities		Design of sub-station access roads from the existing road layout to the sub station compound but excluding the compound layout		Yes	
Roads & Utilities		Design of Park and Ride facilities		Yes	

Roads & Utilities		Reinstatement / making good car parks (e.g. Airport Hilton Hotel, Morrison's Supermarket at the Gyle and First ScotRail car park at Haymarket)		Yes	
Roads & Utilities		Reinstatement / making good Haymarket Station forecourt including taxi-ranks and bus stop		Yes	
Roads & Utilities		Relocation of major existing on-street infrastructure, inc. listed monuments		Yes	
Roads & Utilities		Drainage surveys to establish existing drainage and invert levels through Roseburn corridor. Co-ordination with CEC		Yes	
Roads & Utilities		Design of drainage · Design of drainage for off-street track sections (e.g. the Roseburn Corridor) including identification of outfalls and obtaining outfall agreements with SEPA		Yes	
Roads & Utilities	**Drainage**	Drainage survey (including invert levels if required) - Roseburn Corridor		Yes	
Run Time	**Runtime modelling**			Yes	
Run Time	**Runtime modelling**	O&TP Simulations used to verify the design concepts of track alignment, tram design, operating principles, traction power network principles, tramstop positioning and design, turnback/terminus facilities		Yes	
Run Time	**Runtime modelling**	Timetable development following agreement of the runtime simulations principles for fleet sizing and layover estimation		Yes	
Run Time	**Runtime modelling**	Simulation of the Track design during Preliminary Design Phase to ensure compliance with the principles of Operation		Yes	
Run Time	**Runtime modelling**	Simulation of the complete Tramway for infrastructure, operations and traction power network design during the detailed design phase to verify the PB detailed design		Yes	
Run Time	**Operating Input**	Review of operational issues affecting infrastructure design e.g. operational speed limits, timetables etc.		Yes	
Supervisory, Control & Communications	**Tram Signalling**	Outline design and approvals		Yes	

Supervisory, Control & Communications	**Tram Signalling**	Detailed design and approvals	Yes		
Supervisory, Control & Communications	**Telecomms, Radio**	Outline design and approvals		Yes	
Supervisory, Control & Communications	**Telecomms, Radio**	Detailed design and approvals	Yes		
Supervisory, Control & Communications	**CCTV Systems**	Outline design and approvals		Yes	CCTV coverage specification by SDS.
Supervisory, Control & Communications	**CCTV Systems**	Detailed design and approvals	Yes		
Supervisory, Control & Communications	**SCADA Systems**	Outline design and approvals		Yes	
Supervisory, Control & Communications	**SCADA Systems**	Detailed design and approvals	Yes		
Supervisory, Control & Communications		Tram position and detection system	Yes		
Supervisory, Control & Communications	**Passenger Info**	Passenger information display system	Yes		
Supervisory, Control & Communications	**Telecomms**	Telephone network	Yes		

Supervisory, Control & Communications	**Passenger Info**	Public address system	Yes		
Supervisory, Control & Communications	**Radio**	Operational radio system	Yes		
Supervisory, Control & Communications	**Passenger Info**	Passenger help/passenger emergency help points system	Yes		
Supervisory, Control & Communications	**CCTV Systems**	Closed circuit television system	Yes		
Supervisory, Control & Communications		Define loop location	Yes		To be finalised in SDS/BBS alignment workshops
Supervisory, Control & Communications		Detailed design of loop equipment and system functionality	Yes		
Supervisory, Control & Communications		Supervisory control and data acquisition	Yes		
Supervisory, Control & Communications		Operational data network	Yes		
Supervisory, Control & Communications		Depot control room - lighting, windows, building services		Yes	
Supervisory, Control & Communications		Depot equipment room	Yes		

Supervisory, Control & Communications	**Radio**	Tramborne supervisory control and communications equipment	Yes		
Supervisory, Control & Communications	**CCTV Systems**	CCTV Design Specification		Yes	Included in technical specification
Supervisory, Control & Communications	**PA System**	PA Acoustic Specification		Yes	Included in technical specification
Supervisory, Control & Communications	**Depot CCTV**	Depot CCTV for operations within Depot	Yes		to be monitored in OCC only
Supervisory, Control & Communications	**Security**	Locations and design of security systems within Depot		Yes	
Supervisory, Control & Communications	**Security**	Locations and design of communication systems within Depot	Yes		
System Assurance		To ensure, and provide a record of, assurance that the ETN has achieved an acceptable level of system safety, reliability, availability and maintainability performance	Yes		
System Assurance		To ensure all ETN requirements are met through a controlled process of Validation & Verification (V&V)	Yes		Working from SDS baseline and system
System Assurance		Occupational Health and Safety	Yes		
System Assurance		Project risk	Yes		
System Assurance		Safety risk during construction	Yes		
System Assurance	**RAM**	Reliability, availability, maintainability studies - definition		Yes	

System Assurance	**RAM**	Reliability, availability, maintainability studies - validate	Yes		
Topographical Survey	**Topographical Survey**	Review Client's Data for Design Purposes		Yes	
Topographical Survey	**Topographical Survey**	Brief for any additional Topographical Survey required		Yes	
Topographical Survey	**Topographical Survey**	Scope for procurement of any additional Topographical Survey required		Yes	
Track	**MX Moss Model**	Review of Client's MX Model		Yes	
Track	**MX Moss Model**	Track Alignment (vertical & horizontal)		Yes	
Track	**MX Moss Model**	Depot track layout		Yes	
Track	**Permanent Way**	Plain Line -Detailed design and approvals		Yes	
Track	**Permanent Way**	S&C - Detailed design and approvals		Yes	
Track	**Permanent Way**	Trackbed civil foundation design and approval		Yes	
Track	**Permanent Way**	Tramway drainage design and approvals (off-street running including Roseburn corridor)		Yes	
Track	**Permanent Way**	Surface finishes in hard landscaped areas - Layout and standard details only in tramway area		Yes	
Track	**Permanent Way**	Point machines, control and indication	Yes		
Track	**Permanent Way**	Typical tramway cross sections		Yes	
Track	**Permanent Way**	Wheel/rail interface study		Yes	
Track	**Permanent Way**	Wheel/rail interface management in ongoing design	Yes		
Track	**Permanent Way**	Assumed design tram vehicle study		Yes	Completed
Track	**Permanent Way**	Structure gauge and clearance		Yes	

Track	**Permanent Way**	Specification of the provision and installation of signs and markers related to speed restrictions; track location, distance and geometry; track-infrastructure spatial relationship; tram vehicle fouling points; safety		Yes	
Track	**Permanent Way**	Tramway categorisation/tramway definitions and extents		Yes	
Track	**Permanent Way**	Trackwork specification	Yes		
Track	**Permanent Way**	Tram vehicle arrestment devices, ie measures to prevent trams running off track at termini	Yes		
Track	**Permanent Way**	Depot track layout with allowance for (but no design of) civil engineering structures (bridges, retaining walls etc) buildings, plant, internal roads, hard standings, car parks, approach tracks and access roads for road vehicles and tram vehicle deliveries.		Yes	
Track	**Permanent Way**	Track alignment - vertical & horizontal		Yes	
Track	**Permanent Way**	Rheda City track form design including rail, chamber elements, rail fastening system, sleepers, cover layer and track supporting layer and the stiffness of that track form	Yes		
Track	**Permanent Way**	Civil engineering design (including drainage) to accommodate the Rheda City trackform		Yes	
Track	**Permanent Way**	Specification of surface treatment for a given CBR		Yes	
Track	**Permanent Way**	Specification of surface finish and/or cover layer		Yes	
Track	**Drainage**	Specification of Drainage of grooved rails and drainage within the trackform (e.g. ballasted & grasstrack)	Yes		
Track	**Permanent Way**	S&C outline design (geometry and components)		Yes	
Track	**Permanent Way**	S&C detailed design components	Yes		
Track	**Drainage**	Design of connections of new drainage to existing drainage - local connections		Yes	
Track	**Drainage**	Design of connections of new drainage to existing drainage - remote runs to connections		Yes	
Track		Specification of switch heating	Yes		
Track		Specify number and size of ducts	Yes		

Track		Ducting layout and details		Yes	
Track		Transition Zones	Yes		
Track		Specify cant limits for track	Yes		
Track		Raods geometry to accommodate track		Yes	
Track		Rail section schedule	Yes		
Track		Schedule of geometry speed restrictions		Yes	
~~**Track**~~	-	~~Input to Bill of Quantities (produced by Corduroy)~~	-	~~Yes~~	~~Completed~~
Track	**S&C equipment**	Point motors, detectors, indicators, controls	Yes		
Track	**Drainage**	Drainage for ballasted track		Yes	
Track	**Permanent Way**	Depot track layout and details		Yes	
Track	**Permanent Way**	Depot track foundation and details		Yes	
Track	**Permanent Way**	Depot track drainage and details		Yes	
Track	**Permanent Way**	Identification of areas sensitive to Noise & Vibration		Yes	
Track	**Permanent Way**	Specification of floating slab (if necessary)	Yes		
Track	**Permanent Way**	Design of floating slab (if necessary)	Yes		
Tram Stops	**Stops**	Haymarket		Yes	
Tram Stops	**Stops**	Shandwick Place		Yes	
Tram Stops	**Stops**	Princes Street		Yes	
Tram Stops	**Stops**	St Andrews Square (South St David St)		Yes	
Tram Stops	**Stops**	St Andrews Square (North St Andrew St)		Yes	
Tram Stops	**Stops**	Picardy Place		Yes	
Tram Stops	**Stops**	McDonald Place		Yes	
Tram Stops	**Stops**	Balfour Street		Yes	
Tram Stops	**Stops**	Foot of the Walk		Yes	
Tram Stops	**Stops**	Constitution Street		Yes	
Tram Stops	**Stops**	Ocean Drive		Yes	
Tram Stops	**Stops**	Ocean Terminal		Yes	
Tram Stops	**Stops**	Newhaven Road		Yes	
Tram Stops	**Stops**	Lower Granton Road		Yes	
Tram Stops	**Stops**	Granton Square		Yes	
Tram Stops	**Stops**	Caroline Park		Yes	

Tram Stops	**Stops**	West Granton Access		Yes	
Tram Stops	**Stops**	Crewe Toll		Yes	
Tram Stops	**Stops**	Western General Hospital (Telford Road)		Yes	
Tram Stops	**Stops**	Graigleith		Yes	
Tram Stops	**Stops**	Ravelston Dykes		Yes	
Tram Stops	**Stops**	Roseburn		Yes	
Tram Stops	**Stops**	Murray field		Yes	
Tram Stops	**Stops**	Balgreen Road		Yes	
Tram Stops	**Stops**	Saughton Road North		Yes	
Tram Stops	**Stops**	South Gyle Access		Yes	
Tram Stops	**Stops**	Edinburgh Park South		Yes	
Tram Stops	**Stops**	Edinburgh Park		Yes	
Tram Stops	**Stops**	Gyle		Yes	
Tram Stops	**Halt**	Depot Halt (Staff only)		Yes	
Tram Stops	**Stops**	Gogarburn		Yes	
Tram Stops	**Stops**	Ingliston Park and Ride		Yes	
Tram Stops	**Stops**	Airport		Yes	
Tram Stops	**Drawings**	Layout Drawings and approvals		Yes	
Tram Stops	**Civils Design**	Detailed civil, structural and architectural design and approvals		Yes	
Tram Stops	**Drawings**	Suppliers' & Manufacturers' Drawings	Yes		BBS as part of procurement of the shelter and stop equipment
~~**Tram Stops**~~	~~**Drawings check**~~	~~Suppliers' and Manufacturers' Drawings Check, Review and Comments~~	~~Yes~~	-	Not needed as a separate activity
Tram Stops		Detailed component selection tram stop furniture	Yes		BBS as part of procurement of the shelter and stop equipment
Tram Stops	**LV Power**	LV Power Supply design		Yes	
Tram Stops	**Passenger Info**	Provision for Passenger Information system		Yes	To be finalised in SDS/BBS alignment workshops
Tram Stops	**Passenger Info**	Component selection Passenger Information system	Yes		BBS as part of procurement of the shelter and stop equipment

Tram Stops	**Passenger Info**	Integrated Fare Collection System		Yes	
Tram Stops		Disability Discrimination Act		Yes	
Tram Stops		Pedestrian Crossings between platforms and access to platforms from public highway.		Yes	
Tram Stops		Platform Design		Yes	
Tram Stops		Platform finishes		Yes	
Tram Stops		Tactile surfacing		Yes	
Tram Stops		Guardrails c/w handrails and tapping rails		Yes	
Tram Stops		Procurement of Shelters based on SDS specification	Yes		BBS as part of procurement of the shelter and stop equipment
Tram Stops		Procurement of Shelter seating based on SDS specification	Yes		BBS as part of procurement of the shelter and stop equipment
Tram Stops		Shelter signage		Yes	
Tram Stops		Shelter drainage		Yes	
Tram Stops		Platform lighting		Yes	
Tram Stops		Platform drainage		Yes	
Tram Stops		Stop names/signage		Yes	
Tram Stops		Emergency lighting (as appropriate)		Yes	
Tram Stops		Stop Equipment cabinet	Yes		BBS - in line with other equipment cabinets
Tram Stops		Cable ducts and draw pits		Yes	
Tram Stops		Procurement of Waste Bins based on SDS specification	Yes		BBS as part of procurement of the shelter and stop equipment
Tram Stops		Internally illuminated logo		Yes	
Tram Stops		Structure to location map		Yes	
Tram Stops		Structure to information maps		Yes	
Tram Stops		Staff toilets		Yes	
Tram Stops		All necessary facilities for the Mobility impaired		Yes	
Tram Stops		Secure Cycle Parking - at limited stops only		Yes	
Tram Stops		Landscaping/roads works		Yes	
Tram Stops		Ducting/cable Layout and details		Yes	

Tram Stops	**Civils**	Access ramps requiring civil engineering or geotechnical design input		Yes	
Tram Stops	**Civils**	Accomodation for but not the design of - CCTV, PA system, Passenger Information Displays, Clocks, Passenger help points, OLE supports		Yes	
Tram Stops	**Civils**	Design of civils to support CCTV, PA system, Passenger Information Displays, Clocks, Passenger help points, OLE supports		Yes	
Tram Stops	**Civils**	Provision within the Tramstop design for the installation of Ticket Vending Machines (TVM), inclusive of foundations, cable ducting (for power, control, indication and alarm cabling) from the TVM to the associated Stop Equipment Cubicles		Yes	
Tram Stops	**Tramstop furniture**	Tramstop furniture footings		Yes	
Tram Stops	**Stop access**	Design of footpath approaches to tramstops		Yes	
Trams	**Tram vehicle**	Performance Specification			
Trams		Review and update of Tram Requirement Specification			
Trams		Review and development of Tram Interface Specification			
Trams		Review of other Requirement Specifications and supporting documents as required			
Trams		Develop Tram delivery plan			
Trams		Develop Tram maintenance plan			
Trams		Develop Tram spares plan			
Trams		Develop Tram life-cycle costing plan			
Trams		Develop Tram design approval/factory inspection/testing witnessing plan			
~~**Trams**~~	-	~~Support to the InfraCo Milestone and Testing plan~~	~~Yes~~	~~Yes~~	Identified separately in construction support proposal
Trams		Develop Tram Supply Agreement document			
Utilities	**Utilities**	Define the utility apparatus diversion design parameters		Yes	Not Infraco Scope

Utilities	**Utilities**	Develop combined utility drawings incorporating the information received from tie and the ground penetrating radar survey			Not Infraco Scope
Utilities	**Utilities**	Identification of potential conflicts within 2m of the swept path			Not Infraco Scope
Utilities	**Utilities**	Reference each conflict on the plan drawings and recording information on oa schedule			Not Infraco Scope
Utilities	**Utilities**	Catagorisation of potential apparatus conflicts within a pre-agreed envelope outside the swept path			Not Infraco Scope
Utilities	**Utilities**	Preliminary design for utility apparatus diversion or protection			Not Infraco Scope
Utilities	**Utilities**	Liaise with each utility owner to obtain actual details on size, material and invert level of all identified conflicts and to discuss proposed apparatus diversions or protections			Not Infraco Scope
Utilities	**Utilities**	Assess potential future utiliy maintenance work problems (safe working widths and traffic management implications)			Not Infraco Scope
Utilities	**Utilities**	Identification of environmental/archaelogical 'hot spots'.			
Utilities	**Utilities**	Utilities Trail Pits			Not Infraco Scope
	Clearance	Platform edge string - tram clearance		Yes	
	Documentation	Requirement specs for training, ops and maint documentation in respect of Structures and Roads.		Yes	
	Retaining Walls	Retaining walls at Depot		Yes	
	Bridges/Ret. Walls	Ground modelling / ground water modelling requirements.		Yes	
-	~~**Earthworks**~~	~~Cut & Fill Analysis (off street, excl Roseburn Corridor)~~	~~Yes~~	-	~~SDS - as they have carried out this work since this was last circulated~~
	Track support	Track formation design		Yes	
	Base Plans	General Arrangement Drawings (1:500) and approvals		Yes	
	Demolition	Verify extent of demolition works required		Yes	

	Demolition	Demolition Method Statement and Temporary Works designs	Yes		
	Demolition	Design of permanent works to any remaining party walls and the like.		Yes	Only as identified in Infraco Scope
	Drainage	Flow studies of surrounding areas		Yes	
	Drainage	Design of drainage diversion works		Yes	
	Drainage	Design of protection works to existing drainage (including Roseburn Corridor)		Yes	
	EMI / EMC	Study, policy, management		Yes	
	Technology Reviews			Yes	
		Off street furniture including lamp posts		Yes	
		Parking, loading, access review/provision		Yes	
	Noise	Design of mitigation measures		Yes	
	Vibration	Design of mitigation measures		Yes	
	NR Survey	Network Rail Asset Survey		Yes	
	Radio	Radio Survey		Yes	
	Photo Survey	Photographic Survey		Yes	
	EMC	EMC Survey		Yes	Completed
	EMC	EMC Strategy		Yes	Completed
	EMC	EMC Plan	Yes		
	EMC	EMC Testing	Yes		
	Site Clearance	Layout Drawings		Yes	
	Earthing & Bonding	E&B Plan	Yes		
	Earthing & Bonding	E&B Design	Yes		
	Earthing & Bonding	E&B Testing	Yes		

	Safety	System Safety Strategy		Yes	SDS to complete in relation to SDS design then maintained by Infraco until handed to operations
		System Safety Management Plan		Yes	
	RAM	System RAMS Analysis		Yes	
		System RAMS Plan		Yes	
	V&V	System Verification & Validation Plan		Yes	
~~**Construction Support**~~	-	~~Quality assurance of construction of civils to design~~	-	~~Yes~~	-
~~**Construction Support**~~	-	~~Quality assurance of installation of systems to design~~	~~Yes~~	-	-
Construction Support		Additional design to overcome unforeseen ground conditions, utilities etc		Yes	
Construction Support		Additional design and other responses to Contruction Stage TQs		Yes	

APPENDIX PART 5

Disclosure Statement

(with attachments)

Part A - SDS Disclosures

With regard to clause 4.2.2 (a) to (g) of the Agreement the SDS provider confirms the following:

4.2.2 (a) the SDS Provider is not aware having made due and diligent enquiry, of any breaches by **tie** of the SDS Agreement and there is no dispute or claim subsisting nor are there any circumstances existing which might give rise to any dispute or claim relative to the SDS Agreement;

NO DISCLOSURE

4.2.2 (b) the information set out at Appendix Part 4 (*Design and Deliverable Status*) is true, complete and accurate in all respects and is not misleading;

NO DISCLOSURE

4.2.2 (c) the Deliverables completed by the SDS Provider to the date of this Agreement and listed in Appendix Part 4:

(A) are in all respects in compliance with the SDS Agreement and, without prejudice to the foregoing generality:

(i) the Tram Legislation;

NO DISCLOSURE

(ii) all applicable Law and Consents;

NO DISCLOSURE save where the Deliverables completed to date do not comply with the provisions of the Public Realm Design Workbook (other than existing requirements set out in the Tram Design Manual and the City of Edinburgh Council Standards for Streets) referred to in a letter dated 10 April from

CEC to **tie**, a copy of which was provided to the SDS Provider by CEC.

(iii) the Parliamentary Undertakings;

NO DISCLOSURE

(iv) the Environmental Statements, and all other applicable environmental regulations and requirements;

NO DISCLOSURE

(iv) will permit compliance with the Code of Construction Practice; and

NO DISCLOSURE

(vi) the Third Party Agreements (and in the case of SRU the draft Third Party Agreement);

NO DISCLOSURE save that the Deliverables may not comply with the section 75 agreements set out as the eight items under the heading SECTION 75 AGREEMENTS of Appendix Part 6.

(B) is so as to enable the Edinburgh Tram Network on completion of construction, testing and commissioning to be sited (and thereafter be operated and maintained)within the limits of deviation under the Tram Legislation save as expressly indicated in Appendix Part 9,

NO DISCLOSURE

4.2.2 (d) the design as fully developed pursuant to the SDS Agreement following the date of this Agreement shall continue to meet the requirements of Clause 4.2.2(c)(A) and (B) and on the basis of the standard of reasonable skill and care exercised pursuant to clause 3.2 of the SDS Agreement that

(i) the designs and Deliverables completed prior to the date of this Agreement comply with the Employer's Requirements

Upon completion of the work entailed to resolve the misalignments (as referred to in Clause 4.6).

(ii) the designs and Deliverables as will be completed after the date of this Agreement will comply with the Employer's Requirements,

NO DISCLOSURE

provided that in circumstances where compliance with the Employer's Requirements is dependant upon further design development to be undertaken by the Client (and which is out with the Services provided by SDS), the SDS Provider's obligation pursuant to this Clauses 4.2.2(d) shall be limited to having produced or producing designs and Deliverables that are capable of allowing Infraco to develop a design which is compliant with the Employer's Requirements.

4.2.2 (e) save in respect of any Consents which are the responsibility of **tie** in terms of Clause 19 of the Infraco Contract, the Consents listed at Appendix Part 2 (*Consents Programme*) are all the Design Stage Consents which are required to enable the Edinburgh Tram Network to be procured, constructed, installed, tested and commissioned, and thereafter operated and maintained in accordance with the Infraco Contract;

NO DISCLOSURE

4.2.2 (f) it has received no Client Notice of Change or any other instruction from **tie** to vary any term of the SDS Agreement (whether pursuant to Clause 15 and 29.2 of the SDS Agreement or otherwise) and, subject to Clause 9.1 below, it has agreed no variation, alteration of the SDS Agreement; and

NO DISCLOSURE

4.2.2 (g) no Change in Law has come into effect or is anticipated to come into effect which would have a material adverse impact on the Deliverables completed or to be completed pursuant to the SDS Agreement

NO DISCLOSURE

With regard to clause 5.2 of the Agreement the SDS provider confirms the following:

5.2 **tie** warrants to the Infraco that there is no dispute or claim subsisting (save to the extent that the same are fairly disclosed in the Disclosure Statement), nor are there any circumstances existing which might give rise to any dispute or claim by the SDS Provider against **tie** relative to the SDS Agreement

NO DISCLOSURE

Part B - tie Disclosures

In respect of the **tie** warranties under this Agreement (specifically Clause 9.2), **tie** discloses the attached letter in terms of variations to the SDS Agreement for Key Personnel.

Steve Reynolds
Parsons Brinckerhoff,
Edinburgh Tram Network Project,
Citypoint,
65 Haymarket Terrace,
Edinburgh,
EH12 5HD

Our Ref: DEV-COR-812

Date: 2nd October 2007

Dear Steve,

Edinburgh Tram Network
System Design Services (SDS): Key Personnel and Other Staff

Further to discussions at the Critical Issues meeting of 28th Sept 2007, I confirm that the attached list of personnel are those we require (as a minimum) to be retained on the project, dedicated to the production of the design deliverables and until their completion. The list indicates both personnel to be retained at tie offices and also those working on the project but based at other locations.

We note that an updated Organisational Chart is to be issued shortly and it is our expectation that our requirements will be reflected in respect of the attached list of personnel, in compliance with ***Clause 8*** of The Agreement. Can you please let me have, as soon as possible, the Org Chart both as hard copy and pdf.

If you wish to discuss this list please contact me as soon as possible. In any case we might need to discuss the normal locations of those named people.

Yours sincerely

Tony Glazebrook

cc Matthew Crosse, Geoff Gilbert, Steven Bell

tie Limited
Verity House, 19 Haymarket Yards, Edinburgh EH12 5BH
tel [redacted] www.tie.net
Registered in Scotland No. 230949 at City Chambers, High Street, Edinburgh EH1 1YJ

ETN

SYSTEM DESIGN SERVICES (SDS)

KEY PERSONNEL and STAFF - DETAILED DESIGN PHASE

Project Management and Engineering Staff

Steve Reynolds (at least 4 days per week) - PD [Edinburgh]

Jason Chandler – PM [Edinburgh]

Chris Mason - Engineering Manager [Edinburgh]

Kate Shudall - Section Design Manager [Edinburgh]

Scott Ney - Section Design Manager [Edinburgh]

Carla Jones - Chief Planner [Edinburgh]

Simon Price - EMC

Chris Lee - System Safety

Martin Conroy - NR liaison

Tom Kelly [Edinburgh]

Bruce Ennion [Edinburgh]

Brian McCrear (Halcrow, MUDFA) [Edinburgh]

Chris Reid (Halcrow, MUDFA) [Edinburgh]

Tony Bishop - Interface Management

Malcolm Curry – System Integration

Tony Goodyear

Engineering Section Heads

Track - Tony Jory

Structures – Colin Walker (Halcrow) and Paul McQuade (PB)

Roads – M Bisset and Jim Guild

Depot & Transslope – Ian Brown

SCC – John Christofferson

Traffic Modelling - Warren Murphy

System Safety – Angus Park

OLE – Farhad Janani

Traction power etc – Dave Pennington

Stray current etc - Les Brunton

MUDFA – David Pluse

APPENDIX PART 6

Third Party Agreements

AGREEMENTS TO BE CONCLUDED

1. Plot 108 - SRU - to be concl.

1.1 Draft Minute of Agreement between The City of Edinburgh Council and Scottish Rugby Union plc.

1.2 Letter to Faber Maunsell from Carl Bro dated 19 December 2005.

2. Stanley Casinos - to be concluded

2.1 Draft Minute of Agreement between The City of Edinburgh Council and Stanley Casinos Limited.

ETL1 AGREEMENTS

3. ADM Milling - Chancelot Mill at Western Harbour

3.1 Minute of Agreement between The City of Edinburgh Council and ADM Milling Limited dated 23 January 2006.

3.2 Associated Documents - objection letter, plan and draft Agreement.

4. BAE System - Selex - Crewe Toll to Drylaw

4.1 Minute of Agreement between The City of Edinburgh Council and Selex Sensors and Airborne Systems Limited dated 20 and 25 January 2006.

4.2 Associated Documents - objection letter, plans, draft Agreement.

5. Crown Estate Commissioners - Lower Granton Rd

5.1 Associated Documentation:

Letter to Alan Menzies, Crown Estate Solicitor, dated 26 March 2004.

Internal emails dated 19 April, 21 and 22 May 2007.

Objection letter.

6. Forth Ports - Constitution St to Granton Harbour

6.1 Minute of Agreement between The City of Edinburgh Council and Forth Ports PLC dated 15 February 2006.

6.2 Associated Documents: Objection Letter, Plans, Code of Construction Practice, draft Agreements.

7. Holyrood-Elphinstone Group - Granton Harbour

7.1 Minute of Agreement between The City of Edinburgh Council and Holyrood Services Limited dated 17 December 2004.

7.2 Associated Documents: Objection Letter, Plan, unsigned agreement.

8. Ocean Terminal - Ocean Dr

8.1 Minute of Agreement between The City of Edinburgh Council and Ocean Terminal Limited dated 10 and 15 February 2006.

8.2 Associated Documents: Objection Letter, Plan, draft agreement, CoCP.

9. Port Greenwich - Secondsite Agreement - West Granton Road

9.1 Minute of Agreement between The City of Edinburgh Council, National Grid Property Holdings Limited, Port Greenwich Limited and WM Morrison Supermarkets Plc, dated 28 February 2006 (not fully executed).

10. Royal Yacht Britannia - Ocean Terminal

10.1 Minute of Agreement between The City of Edinburgh Council and The Royal Yacht Britannia Trust dated 14 and 23 February 2006.

10.2 Associated Documents: Objection Letter, Plan, draft agreement, CoCP.

ETL 1 + 2 AGREEMENTS

11. Caledonian Ale House - Haymarket

11.1 Grant offer to the City of Edinburgh Council for Purchase of The Caledonian Ale House and 27 Roseburn Street dated 26 October 2005.

11.2 Schedule of Condition referred to in the lease between The City of Edinburgh Council and David Elliot.

11.3 Associated Documents: unsigned lease, 2 objection letters , withdrawal letter, completion statement, valuation report.

12. CGM Edinburgh Ltd - Haymarket

12.1 Minute of Agreement between The City of Edinburgh Council and CGM (Edinburgh) Limited with the Consent of the Governor and Company of the Bank of Scotland dated 13 May 2005, 16 May 2005 and 19 May 2005.

12.2 Associated Documents: 2 objection letters, plans 1, 2 and 3A.

13. The Institute of Chartered Accountants Scotland

13.1 Minute of Agreement between The City of Edinburgh Council and The Institute of Chartered Accountants for Scotland dated 27 September 2006 and 23 October 2006. (ETL1)

13.2 Minute of Agreement between The City of Edinburgh Council and The Institute of Charted Accountants for Scotland dated 27 September 2006 and 23 October 2006. (ETL2)

13.3 Associated Documents: assurance letter from **tie** to ICAS dated 11 October 2005, 4 draft agreements (Line 1), 2 draft agreements (Line 2), 6 correspondence letters, 3 objection letters.

14. Kenmore Capital Edinburgh Limited

14.1 Minute of Agreement between The City of Edinburgh Council and Kenmore Capital Edinburgh Limited with the consent of The Governor and Company of the Bank of Scotland unsigned.

14.2 Associated Documents: objection letter, 2 plans, unsigned agreement.

15. Land Securities Trillium

15.1 Minute of Agreement between The City of Edinburgh Council and Trillium (Prime) Property GP Limited and Land Securities Trillium dated 2 September 2005 and 14

September 2005 and registered in the Books of Council and Session on 19 September 2005.

15.2 Associated Documents: route plan, title plan, objection letter, unsigned agreement.

16. Norwich Union Life and Pensions

16.1 Minute of Agreement between The City of Edinburgh Council and Norwich Union Life and Pensions Limited, National Car Parks Limited and George Watt Limited dated 3 May 2007 and 23 May 2007.

16.2 Closure letter and Associated Documents: 2 letters and 1 objection letter.

16.3 Position statement and Associated Documents: 2 withdrawal letters, position statement, objection letter, 3 letters.

17. Trustees of the City Point Unit Trust

17.1 Minute of Agreement between The City of Edinburgh Council and the Trustees of the City Point Unit Trust dated 10 May 2006.

18. Verity Trustees Limited

18.1 Minute of Agreement between The City of Edinburgh Council and the Verity Trustees Limited dated 28 October 2005 and 4 November 2005.

18.2 Associated Documents: email, 4 plans, 2 letters, objection letter, 2 notices of objection, 2 unsigned agreements.

ETL 2 AGREEMENTS

19. BAA Edinburgh Airport

19.1 Minute of Agreement between The City of Edinburgh Council and Edinburgh Airport Limited dated 14 September 2005.

19.2 Associated Documents: meeting note, airport masterplan, combined utilities plan, signed depot plan, signed terminal plan, signed plan, draft minute of agreement, signed agreement, 8 emails, 3 letters, 2 draft letters.

19.3 Licence between The City of Edinburgh Council and Edinburgh Airport Limited dated 28 January and 25 February 2008.

19.4 Agreement to Lease between The City of Edinburgh Council and Edinburgh Airport Limited dated 20 and 25 February 2008.

20. BRB Residuary

20.1 Minute of Agreement between The City of Edinburgh Council and BRB (Residuary) Limited dated 31 January 2006 and 9 February 2006.

20.2 Associated Documents: objection letter (line 1), objection letter (line 2).

21. Clerical Medical Investment Group

21.1 Minute of Agreement between The City of Edinburgh Council and the Clerical Medical Investment Group with the consent of Clerical Medical and General Life Assurance Society dated 2 June 2006 and 14 June 2006.

21.2 Associated Documents: objection letter, letter of closure.

22. FSH Nominees Limited

22.1 Minute of Agreement between The City of Edinburgh Council and FSH Nominees Limited and FSH (Edinburgh) Services Limited and Frogmore Developments Limited and Salmon Harvester Properties Limited dated 25 November 2005 and 2 December 2005 and 6 December 2005.

22.2 Associated Documents: position statement, COCP, Unsigned agreement, plan, email, objection letter.

23. Marshall Food Group Limited (Grampian Country Foods)

23.1 Minute of Agreement between the City of Edinburgh Council and Marshall Food Group Limited dated 14 and 23 September 2005.

23.2 Associated Documents: Recommendation letter, drawing, unsigned agreement, report, objection letter.

24. RJ and JB McLean

24.1 Missives between The City of Edinburgh Council and Roderick James McLean and Julie Bremner McLean dated October 2005.

24.2 Associated Documents: Letter enclosing missives, drawing and objection letter.

25. JPSE Limited (Jenners)

25.1 Minute of Agreement between The City of Edinburgh Council and JPSE Limited dated 18 January 2006 and 27 January 2006.

25.2 Associated Documents: revised - unsigned agreement, plan, unsigned agreement, objection letter, unrevised - unsigned agreement, plan, signed drawing, signed agreement, signed agreement, objection letter.

26. McDonalds Restaurant Limited

26.1 Minute of Agreement between The City of Edinburgh Council and McDonalds Restaurant Limited dated 8 November 2005 and 18 January 2005.

26.2 Associated Documents: letter enclosing agreement, COCP, signed agreement, objection letter.

27. Murrayfield Indoor Sports Club

27.1 Minute of Agreement between The City of Edinburgh Council and George Russell, George Manson, John Small, the trustees of Murrayfield Indoor Sports Club dated 25 October 2005 and 2 November 2005.

27.2 Associated Documents: Drawing, unsigned agreement, objection letter.

28. New Edinburgh Limited

28.1 Minute of Agreement between The City of Edinburgh Council and Edinburgh Park (Management) Limited dated 7 October 2005 and 4 October 2005.

28.2 Associated Documents: Letter from The City of Edinburgh Council to New Edinburgh Limited dated 7 October 2005, plan 1 included within s75 agreement, plan 2 Revision L, Plan 5, 4 signed drawings, signed agreement.

29. New Ingliston Limited

29.1 Minute of Agreement between The City of Edinburgh Council and New Ingliston Limited and Highland Properties Limited dated 8 November 2005 and 9 November 2005.

29.2 Associated Documents: 3 letters, 1 withdrawal letter, 1 letter from planning committee, COCP, 3 plans, unsigned agreement, 2 objection letters, summary report.

30. Trustees of Hanover Property Unit Trust

30.1 Minute of Agreement between The City of Edinburgh Council and Trustees of Hanover Property Unit Trust and RBSI Custody Bank Limited and RBSI Trust Company Limited dated 12 October 2005 and 12 December 2005.

30.2 Associated Documents: drawing, 2 objection letters, report, unsigned agreement.

31. The Royal Highland Agricultural Society of Scotland

31.1 Minute of Agreement between The City of Edinburgh Council and The Royal Highland Agricultural Society of Scotland dated 8 November 2005 and 9 November 2005.

31.2 Associated Documents: 2 comfort letters, objection letter, unsigned agreement, withdrawal letter, plan.

32. Safeway Morrisons - Gyle

32.1 Agreement between The City of Edinburgh Council and Safeway Stores Limited and WM Morrison Supermarkets plc with the consent of Universities Superannuation Scheme Limited dated 13 November 2005, 24 November 2005 and 15 March 2005.

33. Stakis Limited

33.1 Minute of Agreement between The City of Edinburgh Council and Stakis Limited dated 13 September 2005 and 20 September 2005.

33.2 Associated Documents: signed agreement - position statement, 2 letters, signed pages of agreement, 3 signed plans. Unsigned agreement - objection letter, Note of telecom, copy of agreement.

34. UGC Properties Limited

34.1 Minute of Agreement between The City of Edinburgh Council and UGC Properties Limited and Unipart Automotive Limited dated 25 October 2005 and 21 November 2005.

34.2 Associated Documents: reminder letter, 2 objection letters, unsigned agreement, plan.

35. Universities Superannuation Scheme

35.1 Minute of Agreement between The City of Edinburgh Council and Universities Superannuation Scheme Limited with the consent of Safeway Stores Ltd and WM Morrison Supermarkets plc dated 15 November 2005 and 9 December 2005 and 23 December 2005.

35.2 Associated Documents: memorandum, objection letter, design manual, unsigned agreement, plan, COCP.

36. West Craigs Ltd

36.1 Minute of Agreement between The City of Edinburgh Council and Meadowfield Developments Limited dated 25 November 2005 and 28 November 2005.

36.2 Associated Documents: 2 letters, 1 objection letter, unsigned agreement, plan.

ROUTE WIDE AGREEMENTS

37. Adshel

37.1 Minute of Agreement between The City of Edinburgh Council and Adshel Limited dated 27 September 1996 and 15 October 1996.

37.2 Street Furniture Operating Lease between the City of Edinburgh Council and More Group UK Limited dated 3 August 1999 and 2 August 1999.

38. British Transport Police

38.1 Agreement letter between The City of Edinburgh Council and British Transport Police dated 11 November 2005.

38.2 Agreement letter between The City of Edinburgh Council and British Transport Police dated 11 November 2005.

38.3 Associated Documents: 2 objection letters.

39. BT

39.1 Minute of Agreement between The City of Edinburgh Council and British Telecommunications Plc dated 7 February 2006 and 25 January 2006.

39.2 Associated Documents: documental transmittal register.

40. Cable and Wireless

40.1 Minute of Agreement between The City of Edinburgh Council and Cable and Wireless UK dated 5 October 2006.

41. Easynet

41.1 Minute of Agreement between The City of Edinburgh Council and Easynet Telecommunications Limited dated 1 December 2006 and 28 November 2005.

42. Historic Scotland

42.1 Associated Documents: 2 letters, 2 objection letters, protocol.

43. Network Rail

43.1 Minute of Agreement between tie Limited and The City of Edinburgh Council and Network Rail Infrastructure Limited dated 17 June 2005 and 21 June 2005.

43.2 Asset Protection Agreement between tie Limited and The City of Edinburgh Council and Network Rail Infrastructure Limited dated 13 and 14 March 2008.

43.3 Associated Documents: 2 objection letters.

44. NTL Group Limited

44.1 Minute of Agreement between **tie** and The City of Edinburgh Council and NTL Group Limited and NTL National Networks Limited dated 17 October 2005 and 18 October 2005 and 10 October 2005.

44.2 Associated Documents: objection letter.

45. Royal Mail

45.1 Minute of Agreement between The City of Edinburgh Council and Royal Mail Group Plc and Post Office Limited dated 2 March 2006 and 8 February 2006.

45.2 Associated Documents: 2 letters, objection letter.

46. First Scotrail

46.1 Minute of Agreement between The City of Edinburgh Council and tie Limited and The City of Edinburgh Council and First Scotrail Limited dated 1 November 2005 and 27 October 2005.

46.2 Associated Documents: proposal, 4 letters, 2 objection letters.

47. Scottish Water

47.1 Minute of Agreement between tie Limited and The City of Edinburgh Council and Scottish Water dated 20 June, 23 June and 3 August 2005.

47.2 Associated Documents: 2 objection letters, 1 letter.

48. Thus PLC

48.1 Minute of Agreement between tie Limited and The City of Edinburgh Council and Thus Plc dated 7 December 2005 and 1 December 2005.

49. Transco PLC

49.1 Minute of Agreement between tie Limited and The City of Edinburgh Council and Transco Plc and Scottish Gas Networks Limited.

49.2 Side letter dated 7 December 2005.

49.3 Associated Document: 4 objection letters and 1 letter

SECTION 75 AGREEMENTS

50. CAPITAL CITY HOMES - OUT WITH LoD

50.1 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Capital City Homes dated 5 January 2006 and 9 January 2006.

50.2 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Capital City Homes dated 20 January 2006 and 26 January 2006.

50.3 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Capital City Homes dated 7 November 2006 and 11 November 2006.

51. CLYDESIDE INVESTMENT PROPERTIES

51.1 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Clydeside Investment Properties dated 14 November 2005 and 23 November 2005.

52. FORTH PORTS - Granton Harbour

52.1 Minute of Agreement between The City of Edinburgh Council and Forth Ports Plc dated 19 June 2003 and 20 June 2003.

52.2 Minute of Agreement between The City of Edinburgh Council and Forth Ports Plc dated 28 June 2002

53. NEL

53.1 Letter enclosing Minute of Agreement between The City of Edinburgh Council and New Edinburgh Limited and tie Ltd and The Edinburgh Branded Hotel and Leisure LLP with the consent of The Governor and Company of The Bank of Scotland dated 17, 19, 23, 13 August 2005 and 1 and 8 September 2005.

53.2 Letter enclosing Minute of Agreement between The City of Edinburgh Council and New Edinburgh Limited with the consent of The Governor and company of the Bank of Scotland dated 5 December 2006 and 9 January 2006.

54. RBS - GOGAR

54.1 Minute of Agreement between The City of Edinburgh Council and The Royal Bank of Scotland Plc dated 6 November 2002 and 8 November 2002.

54.2 Associated Documents: 5 photos, 9 emails, meeting note, GI Survey Report 1, GI Survey Report 2, GI Survey Report 3, GI Survey Report 4, GI Survey Report 5, Gogarburn Tram Stop Cost Excel 1, Gogarburn Tramstop Costs version 2, draft minute of amendment, RBS-CEC meeting agenda, RBS meeting note, 2 letters to I Turnball, 1 draft letter, 4 plans.

55. SECONDSITE - PORT GREENWICH

55.1 Minute of Agreement between The City of Edinburgh Council Limited and Port Greenwich Limited dated 28 February 2006.

55.2 Associated Documents: 2 objection letters, 2 accompanying drawings, letter to accompany minute of agreement, s75 agreement.

56. SKILLS EXPRESS - OUTWITH LoD

56.1 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Skill Express Limited dated 27 April 2005 and 3 May 2005.

57. TUSCAN DAWN - OUTWITH LoD

57.1 Letter enclosing Minute of Agreement between The City of Edinburgh Council and Tuscan Dawn Limited dated 29 September 2005 and 3 October 2005.

FURTHER AGREEMENTS

58. Marks & Spencer Plc

58.1 Minute of Agreement is in draft form and is not available - terms match the Safeway Stores and WM Morrisons Agreement. Relevant obligations have been flowed down to Schedule 13.

59. Edinburgh and Lothian Badgers Group

59.1 Letter to Patricia Alderson, Edinburgh and Lothian Badgers Group dated 18 November 2005 (ETL 1).

59.2 Letter to Patricia Alderson, Edinburgh and Lothian Badgers Group dated 7 November 2005 (ETL 2).

A. **CLOSURES**

	ETL 1
1.	**CALA MANAGEMENT - CONSTITUTION ST.** Letter to Kevin Whitaker, Cala Management from **tie**, dated 7 September 2005. Letter to Jane Sutherland, PBU from Ledingham Chalmers regarding CALA Management Limited dated 8 September 2005.
2.	**DEWAR, R - NEW ORCHARDFIELD** Letter to Robert Dewar from **tie** dated 3 November 2006.
3.	**S. FRAME - TELFORD DR.** Letter to Simon Frame from **tie** dated 19 March 2007.
4.	NORMAN, DOWNIE & KERR - CONSTITUTION ST. Letter to Jack Kerr, from **tie** dated 14 September 2005.
5.	J. PEARSON, OCEAN DRIVE Letter to Ewan Kennedy, from **tie**, dated 25 August 2005 enclosing letter to J. Pearson, from **tie**, dated 19 August 2005. Letter to Ms. J.H. Pearson from **tie**, dated 17 March 2005 Letter to Judith Pearson from **tie**, dated 21 February 2006. Draft Minute of Agreement, dated 17 May 2005
6.	M. SCOTT, OCEAN DRIVE Letter to Mr. Scott from **tie** dated 2 February 2007.
	ETL 1 + 2
7.	**SCOTTISH ENTERPRISE - HAYMARKET** Letter to Kirsty Ramsay from **tie** dated 15 February 2007

8.	**VERISCOLOUR - CLIFFORD TERRACE** Letter to Bonar Mackenzie dayed 14 September 2005
	ETL 2
9.	**COLLINSON CERAMICS** Letter of Closure from **tie** Limited to Collinson Ceramics dated 19 October 2005.
10.	**CUSTOM PROJECTS LIMITED - ROSEBURN STREET** Draft Minute of Agreement between The City of Edinburgh Council and Customs Projects Limited.
11.	**FRANK EARLEY (PROLAMINATES)** Correspondence with Frank Earley dated 5 April 2007.
12.	**GRAY'S MILL COACHWORKS** Draft Minute of Agreement between The City of Edinburgh Council and Gray's Mill Coachworks.
13.	**D. KAUR** Letters to Davidson Chalmers LLP regarding Dalwinder Kaur dated 21 October and 18 November 2005.
14.	**MRM COACHWORKS** Letter of Closure to Mr. James Gibb from **tie** dated September 2005
15.	**NATIONAL CAR PARKS** Letter of Closure to Mr. Sutherland from **tie** dated 14 November 2005 Draft Minute of Agreement between The City of Edinburgh Council, Norwich Union Life and Pensions Limited, National Car Parks Limited and George Watt Limited.

16.	**NATS LIMITED** Email from Kate Shudall to Elaine Cropley dated 22 January 2007.
17.	**NCR VANGUARD** Letter of Closure from **tie** Limited to Vanguard Rental (UK) Limited dated 11 October 2005.
18.	**NULAP** Letter to NULAP from **tie** dated 23 September 2005.
19.	**PD LABELS** Letter to PD Labels from **tie** date 16 September 2005 Draft Minute of Agreement between The City of Edinburgh Council and PD Labels.
20.	**TNT EXPRESS** Letter to AD Pratt regarding TNT Express Services UK and Ireland dated 10 January 2007.
21.	**VIKING INTERNATIONAL (T/A STEPGRADE MOTOR ACCESSORIES LIMITED)** Letter of Closure from **tie** Limited to Fairhurst Estates Limited in relation to Viking International dated 11 October 2005.

B. COMFORTS AND ASSURANCES

	CLG ASSURANCES
	Please see separate **tie** summary of CLG Commitments (version 2) dated 24 August 2007 (contained on CD).
1.	**BAIRD DRIVE CLG**
2.	**CRAIGLEITH CLG**
3.	**DRYLAW TELFORD RESIDENTS**
4.	**ELBG - BADGER GROUP**

5.	FRUWCA - ROSEBURN CORRIDOR
6.	**GARSCUBE TERRACE RESIDENTS**
7.	GROATHILL AVENUE RESIDENTS
8.	**LEITH BLG**
9.	**LEITH CLG**
10.	LOWER GRANTON ROAD CLG
11.	**RATHO STATION CLG**
12.	**ROSEBURN BLG**
13.	**ROSEBURN CORRIDOR PUBLIC NOTICE** (in relation to environmental mitigation)
14.	TRINITY STARBANK CLG
15.	**WEST END CLG**
	ETL 1
22.	**ABERCASTLE HOLDINGS - TOWER PLACE** Letter to Mrs Dewar, Burness, in relation to Abercastle Holdings, from **tie** dated 5 November 2007.
23.	**ALEXANDER LATTO** Letter to Derek Latto from **tie** dated 2 September 2005.
24.	**G BARKER** Letter to G Barker dated 11 October 2005.
25.	**BAXTERS** Letter to Mr McLuckie (Baxters Foodservice Ltd) dated 5 November 2007.
26.	**BHS**

	Letter to Biggart Baillie Solicitors regarding BHS Ltd. dated 21 May 2007.
27.	**A BOURNE** Letter to Alison Bourne dated 13 January 2005.
28.	**MR & MRS CAMPBELL** Letter to Mr Ken Robertson dated 5 November 2007.
29.	**J CAMPBELTON** Letter to John Campbelton regarding Plot 30 - Tower Street dated 20 December 2006.
30.	**CARDPOINT** Letter to Sharon Riley (Cardpoint) dated 5 November 2007.
31.	**CAVERSHAM TRADING** Letter to Gillespie MacAndrew WS LLP regarding Caversham Trading Limited dated 10 January 2007.
32.	**CEC (THOMSON G)** Email to Clare Norman and George Duke regarding CEC buildings on Smith Place dated 21 December 2006.
33.	**MR AND MRS CLARKE** Letter to MR M and Ms D Clarke dated 22 April 2005.
34.	**CONELL - GUARINO** Letter to Ms Irene Connel-Guarino regarding Plot 30-Tower Street dated 4 January 2007.
35.	**MS C CONNOR** Email from Elaine Cropley in relation to Caryn Connor dated 25 October 2007, attaching email from Pauline Goldie to Caryn Connor dated 24 October 2007.
36.	**MR AND MRS CRASKE**

Letter to John and Alison Craske dated 24 March 2005.
37. A DEAN Letter to Anthony White and Ann Dean dated 24 March 2005.
38. DEBENHAMS Letter to Biggart Baillie Solicitors regarding Debenhams Plc dated 21 May 2007.
39. MR DEGG Email to Mr Degg regarding Ocean Drive dated 21 December 2006.
40. MR DONAGHUE Letter to Mr D Donaghue dated 24 March 2005 and letter to Mr D Donaghue dated 22 April 2005.
41. F DOUGLAS Letter to Fiona Douglas regarding Plot 30 - Tower Street dated 11 December 2006.
42. KJ DREW Letter to Ms Kristian Jayne Drew dated 5 November 2007.
43. R DRYSDALE Letter to Mr R Drysdale dated 24 March 2005.
44. G DUFF Email to Graham Duff dated 20 April 2005.
45. G&A DUNCAN Letter to George & Audrey Aileen Duncan dated 21 December 2006.
46. EDINBURGH MASONIC CLUB Letter to Walter Sneddon dated 27 January 2005.

47.	**MS L FLEMING** Email from Elaine Cropley dated 25 October 2007, attaching email from Alasdair Sim to Laura Fleming dated 24 October 2007.
48.	**MRS MEM FORREST** Letter to Mrs Forrest dated 22 April 2005.
49.	**C FOSTER** Letter to Christopher Foster dated 3 November 2006.
50.	**GARLANDS** Letter to Gillian Nicoll of Garlands Florists dated 10 July 2007.
51.	**S GAYNOR - TOWER STREET** Email to Sheila Gaynor dated 21 December 2006.
52.	**F GERMI - ELM ROW** Letter to Francesco Germi dated 17 March 2005.
53.	**MR GHULAM** Note of meeting between Andy Dixon, Bob Clarke and Mr Ghulam dated 14 November 2006.
54.	**G GILBERT - OCEAN DR** Letter to Gary Gilbert dated 19 February 2004.
55.	**AM GILLON** Letter to Anne Marie Gillon dated 11 December 2006.
56.	**L HAGGERTY & L HILL** Draft Letter to Ms L Haggerty and Ms L Hill dated 17 March 2005.

57.	**MR HANNAN AND SPENCE** Draft Letter to Ms Spence and Mr Hannan dated 22 April 2005.
58.	**M HETHERINGTON - TOWER STREET** Letter to Leslie Wolfson & Co regarding Murray Hetherington dated 10 January 2007.
59.	**MR AND MRS HUDSON** Draft Letter to Lorna and Nick Hudson dated 11 April 2005.
60.	**E. INNES - CONSTITUTION STREET** Draft Letter to Eric Innes dated 17 March 2005, issued by email on 11 April 2005.
61.	**IRISH LIFE ASSURANCE** Email to Caroline Hood regarding Ocean Point dated 21 December 2006.
62.	**MR AND MRS JOY** Letter to Mr and Mrs Joy dated 3 March 2006.
63.	**MR AND MRS KANE - LEITH WALK** Letter to Mrs Kane dated 10 July 2007
64.	**R KEEN** Letters to Ms Rachel Keen dated 17 March 2005, 15 January 2007 and 29 January 2007.
65.	**MR AND MRS LAIRD - OCEAN WAY** Notes of Meeting between Andy Dixon, Bob Clarke and Mr & Mrs Laird dated 14 February 2007.
66.	**PROF LANG - OCEAN DRIVE** Letter to Professor Margaret Lang dated 21 December 2006.

67.	**LOTHIAN HEALTHCARE - LEITH WALK** Letter to Murray Duncanson, Chief Executive, Lothian Primary Care NHS Trust dated 20 March 2006.
68.	**F&G LOW - OCEAN DRIVE** Letter to Georgia Low dated 19 February 2004 and acknowledgement from Fergus Low dated 11 March 2004.
69.	**MAD JACKS BACK - ELM ROW** Letter to Kate Mackenzie dated 9 July 2007.
70.	**L MARSH - CONSTITUTION STREET** Letter to Lynne Marsh regarding Plot 30 - Tower Street dated 11 December 2006, and email dated 11 December 2006.
71.	**MR MCKEOWN - COLTBRIDGE AVENUE** Email to Brian McKeown dated 2 November 2006.
72.	**C MCLEOD - CRAIGLEITH ROAD** Email to Steve Mitchell regarding Carolyn McLeod dated 12 August 2005.
73.	**L MCNAUGHT - CONSTITUTION STREET** Letter to Mrs Lee-Anne McNaught dated 18 October 2005.
74.	**H & O MILNE** Letter to Odell Milne regarding Wester Coates Terrace dated 5 December 2006. Letter from Odell Milne dated 22 May 2007.
75.	**MR MINTO** Minute of Meeting regarding Mr Minto dated 26 March 2004.

76.	**MR & MRS MURPHY** Letter to Ms Jill Murphy dated 27 July 2005. Letter to Adams Lawyers and Estate Agents dated 1 November 2005. Letter from **tie** Limited to Mr and Mrs Murphy dated 22 December 2005.
77.	**D O'CARROLL** Letter to Derek O'Carroll dated 17 March 2005.
78.	**MR & MRS PARNELL** Draft letter to Karen Hamilton regarding Andrew & Birgitta Parnell.
79.	**MS PEIFFER - TOWER STREET** Letter to Doreen Peiffer regarding Plot 30 - Tower Street dated 8 January 2007.
80.	**MR PENDER** Email to Martin Pender dated 15 March 2005.
81.	**POLICE BOX COFFEE BARS** Letters to Gordon Coutts Thomson dated 20 January 2005 and various "chasers".
82.	**A PRITCHARD** Email to Mr Pritchard, undated.
83.	**F RENNIE** Letter to Mrs F Rennie regarding Plot 30 - Tower Street dated 11 December 2006.
84.	**C ROONEY** Letter to Ms C Rooney dated 24 March 2005.
85.	**N SANTER** Email to Nicki Santer dated 18 October 2007.

86.	**S SCOTLAND** Letter to Miss Samantha Scotland regarding Plot 30 - Tower Street dated 22 January 2007.
87.	**M SCOTT - OCEAN DRIVE** Letter to Marshall Scott regarding Ocean Drive dated 4 January 2007.
88.	**SCOTTISH NATURAL HERITAGE** Letter to Jane Sutherland regarding Scottish Natural Heritage dated 26 August 2005 and letter to Iain Rennick, Scottish Natural Heritage, dated 26 August 2005.
89.	**N SHEEHAN - TOWER STREET** Letter to Natalie Sheehan regarding Plot 20 - 4/6 Constitution Street dated 4 February 2004.
90.	**I SHIRLEY - TIMBER BUSH** Letter to Ian Shirley dated 19 June 2006.
91.	**MRS SMITH - RENNIE'S ISLE** Letter to Mrs Smith dated 5 November 2007.
92.	**C SPROTT - TOWER PLACE** Letter to Ms Sprott dated 20 February 2007.
93.	**N STANSFIELD** Letter to Nick Stansfield dated 10 July 2007.
94.	**P TOSH** Letter to Pamela Tosh and Neil Willett dated 22 April 2005.
95.	**TRADITIONAL BARBERS - LEITH WALK** Letter to Janet Dunbar regarding Traditional Barbers dated 9 July 2007.

96.	**WEL - WEST HARBOUR ROAD** Letter to Colin MacKenzie from Waterfront Edinburgh Limited dated 3 January 2007.
97.	**JB WILKEN** Letter to JB Wilken dated 22 April 2005.
98.	**B WILLIAMS - TOWER STREET** Letter to Gordon D Hamilton regarding Mrs B Williams, Plot 30 - Tower Street dated 22 January 2007.
99.	**YES INDEED** Letter to Mr David Levy of Yes Indeed t/a Dead Sea Spa dated 5 November 2007.
	ETL 1 + 2
100.	**CLOWES DEVELOPMENTS - COATES CRESCENT** Letter to Ms Alison Welsh regarding Clowes Development (Scotland) Ltd. dated 18 December 2006.
101.	**MR CULLEN - BALBIRNIE PLACE** Email to Elaine Cropley regarding telephone call between Geoff Duke and Mr Cullen dated 12 December 2006.
102.	**M DUTHIE - ROSEBURN MALTINGS** Letter to Margaret Duthie dated 21 June 2005.
103.	**EURO - HOSTELS - PRINCES STREET** Email to Ian Curry regarding Euro-Hostels dated 9 December 2005.
104.	**A HARKNESS - ATHOLL PLACE** Letter to Alistair Harkness dated 17 March 2005.

105.	**HAYMARKET YARDS LTD** See Minute of Agreement dated 27 October 2005.
106.	**HODKINSON & MITCHELL - ROSEBURN MALTINGS** Letter to Darren Hodkinson and Jacqueline Mitchell dated 16 September 2005 and email to Darren Hodkinson dated 26 July 2006.
107.	**I MUNRO - BALBIRNIE PLACE** Email to Mr Munro dated 12 July 2005.
108.	**NEW LOOK RETAILERS** Letter to Biggart Baillie Solicitors regarding New Look Retailers Ltd dated 21 May 2007 and email to Anna Veal, New Look dated 22 January 2007.
109.	**H REYNOLDS - BALBIRNIE PLACE** Letter to Miss H. T. Reynolds dated 30 May 2005.
110.	**J ROBERTSON - BALBIRNIE PLACE** Letter to Jane Robertson dated 25 July 2005.
111.	**L SMITH - ROSEBURN MALTINGS** Letter to Lynsey Smith dated 18 October 2005.
112.	**STARBUCKS** Letter to Biggart Baillie Solicitors regarding Starbucks Coofee Company Ltd dated 21 May 2007.
113.	**C SYME - BALBIRNIE PLACE** Letter to Christian Syme dated 7 April 2005.

ETL 2
114. E BALL Letter to Mrs E. J. Ball dated 30 May 2005.
115. D BREWSTER Letter to Mr D Brewster dated 15 October 2003.
116. CHRIS HOLMES CABINET MAKERS Letter to Chris Holmes dated 3 November 2005 attaching Schedule of Undertakings. Meeting between Chris Holmes, Julie Logan and Richard Walker dated 21 September 2005.
117. DAVID FLATMAN LTD Note of telephone call from Lizzie Flatman dated 3 November 2006.
118. A HAMILTON Letter to Mr Hamilton and Ms Sansom dated 17 August 2004 and various.
119. L. McTIGHE Notes of meeting between Geoff Duke, Cliff Hutt, Alasdair Sim and Libby McTighe dated 26 May 2004.
120. ROSEBURN GARAGE Letter to Mr Khalil, Roseburn Motors, dated 21 October 2005 and letter dated 30 September 2005.
121. MR AND MRS SEATH Emails between various in March 2005 in relation to badgers at Gogar Castle. Email from Caroline Stornie to David Milne in relation to Mr and Mrs Seath dated 23 May 2007.

122.	**SERVISAIR** Letter to Jim Shapton, Servisair (UK) Ltd, dated 16 November 2005 enclosing Schedule of Undertakings. Preceding correspondence.
123.	**STAPLES UK RETAIL LTD PLOT** Letter to Richard Smalley dated 21 December 2006.
124.	**J STEVENSON** Letter to Jeffrey Stevenson dated 23 June 2005.
125.	**THAMES RICO - NEWBRIDGE SERVICE STATION** Letter to Sarah MacLeod re Thames Rico, dated 21 April 2006 enclosing letter of comfort and draft Side Agreement.
126.	**P TORRENT** Email to Peter Torrent dated 21 December 2006.
127.	**K WILSON** Letters to K Wilson dated 3 August 2005, 30 March 2005 and 11 October 2005.

C. LICENCES

128.	**EAL** Licence between CEC and Edinburgh Airport Limited (undated version)
129.	**FORTH PORTS** Licence to Occupy by Forth Ports plc in favour of CEC, dated 29 March 2007. Letter from D & W to **tie** dated 3 April 2007 enclosing Forth Ports Licence.
130.	**NIL**

Licence to Occupy by New Ingliston Limited in favour of CEC, dated 21 June 2007 and 22 June 2007.

131. WEST CRAIGS

Licence to Occupy by West Craigs Limited in favour of CEC, dated 25 June 2007 and 3 July 2007.

D. UNDERTAKINGS

ETL 1

132. A BOURNE

Letter to Mrs A Bourne dated 30 May 2005.

Letter to "Resident" dated 16 December 2004.

Letter to Mrs Bourne dated 13 January 2005.

133. M CLARKE

Letter to Mark Clarke dated 21 February 2006.

134. P CRAIK

Letter to Patricia Craik dated 29 June 2005.

Letter to P Craik dated 12 January 2005

135. D HARTE - CONSTITUTION STREET

Email to Deirdre Harte dated 18 July 2006.

136. J MURPHY

Letter to Mr and Mrs Murphy dated 22 December 2005.

137. J PEARSON

Letter to Judith Pearson dated 21 February 2006.

138.	**POLICE BOX COFFEE BARS - PICARDY PLACE**
	Letter to Gordon Coutts Thomson dated 20 January 2005 and various "chaser" letters.
139.	**WCTAG - WESTER COATES**
	Letters to Odell Milne dated 21 February 2006.
140.	**WESTERN GENERAL HOSPITAL**
	Letter to Professor James Barbour OBE, NHS Lothian, dated 6 February 2006.
	ETL 2
141.	**BEAUCHAMP INVESTMENTS - RUSSELL ROAD**
	Letter to Tim Mallett dated 11 August 2005.
	Letter to John Lee, ASO Property Services (UK) Ltd, dated 2 May 2007.
	Letter to Joanne Plant, Farningham McCreadie Partnership re Royal Mail Sorting Office, dated 2 May 2007.
	Emails between D & W and tie and tie and David Marwick.
142.	**EDINBURGH LEISURE - CARRICK KNOWE GOLF COURSE**
	Email to Alasdair Dunlop dated 15 January 2007.
143.	**REDPATH MCLEAN - RUSSELL ROAD**
	Email in relation to call with Keith McLean dated 23 March 2007.

APPENDIX PART 7

Part A - Letter of Instruction dated 5 May 2008

Steve Reynolds
Persons Brinckerhoff
Citypoint
65 Haymarket Terrace
Edinburgh
EH12 5HD

Our Ref: PD.CORR.071SB/JS

Date: 5 May 2008

Dear Steve,

Employer's Requirements Alignment Review

tie instructed SDS to carry out reviews of its design against the Employer's Requirements version 3.5a "to identify areas of misalignment included in the SDS scope". SDS delivered its review to **tie** on 16 April.

I wrote to you on 23 April setting out **tie**'s clarifications and instructions following your review of the Employer's Requirements. Since that letter my team has been working with yours to provide some further clarification where that has been necessary and helpful. This letter therefore expands on and supersedes that earlier letter.

SDS has subsequently been instructed to update that review to take account of version 4 of the Employer's Requirements (ERs).

As your review was conducted in parallel with the review of the Infraco proposals it highlighted a number of issues that have been tackled in the exercise to align the SDS design with the Infraco proposals. Those issues are dealt with in a separate letter.

The SDS review also raised comments about a number of areas that are not within the scope of work that SDS still needs to complete. Those comments are rendered redundant by agreement on the scope of work to complete and confirmation of omissions and so are not dealt with in this letter.

This leaves a small number of issues where **tie** needs to clarify issues and/or instruct SDS to change its current design.

Provision of a Standby Generator at the Depot

I can confirm that it is no longer **tie**'s intention to have a permanent diesel standby generator facility (including associated housing) at the depot Instead there should be provision of hard standing for a temporary generator including the necessary service connections.

tie instructs SDS to update its drawings to reflect this situation.

Tram vehicle

SDS has already had a large amount of information about the chosen CAF tram including DKE analysis, loading information for the vehicle and for structures and confirmation of the tram length.

Following finalisation of the Tram Supply Agreement (which will coincide with signature of the Infraco contract and SDS Novation) **tie** will issue SDS with the technical information that accompanies the signed Tram Supply Agreement. Where this contains information not previously released to SDS and

[redacted]
Citypoint 65 Haymarket Terrace Edinburgh EH12 5HD
Direct dial: [redacted]
e-mail:steven.bell@tie.ltd.uk
web www.tie.ltd.uk
[redacted]

changes. Where there are subsequent changes to that tram vehicle technical information that impact on the Infrastructure design tie will instruct the relevant changes.

Tram Stop Equipment

tie confirms that the tram stop equipment to be included in the design is as set out in the Schedule attached to Scott Ney's e-mail to Neil Renilson of 28 January 2008 at 1346 with the following changes:

- Public Announcement system to be provided at Edinburgh Airport tramstop with the capability of announcements being relayed from the Tram control centre and from the kiosk at Edinburgh Airport
- Cycle parking to be provided at Gogarburn tramstop as part of the detailed design to be undertaken following provision of concept design by the Royal Bank of Scotland
- Ticket machine numbers shall be changed at the following stops:
  - Ingliston Park & Ride to be 6 not 2
  - Shandwick Place to be 6 not 4
  - McDonald Road to be 4 not 2
  - Balfour Street to be 4 not 2

tie instructs SDS to complete its design including the changes set out above. tie recognises that the SDS design to date does not include ticket validators. tie does not instruct the inclusion of validators at this time.

Network diagram – ballasted track at tramstops

SDS has commented that the Network diagram issued by Siemens on 22 February 2008 includes ballasted track within certain tramstops. Following earlier consultations with HMRI and the Independent Competent Person SDS does not consider ballasted track at a tramstop to be acceptable and so the SDS design does not align with the network diagram in that respect. tie considers that this is in all probability an issue caused by the scale of the network diagram. However, for the avoidance of doubt, tie instructs SDS to continue with its existing design without ballasted track at tramstops.

Depot staffing

SDS has sought clarification on the number of staff to be allowed for at the depot. tie confirms that the 361 staff (rising to 403 once Phase 1b is in operation) would be spread across 3 shifts. tie understands that as a result the SDS design is compliant with the ERs.

Crew relief facilities

SDS has sought confirmation of the requirements for crew relief facilities at Ocean Terminal and Edinburgh Airport. At Ocean Terminal tie confirms that it is the intention that crew should use existing facilities within the Ocean Terminal complex.

tie formally withdraws Change Notice CNS109 Rev 1 for Edinburgh Airport Tram Kiosk. Instead tie instructs SDS as follows to align with the ERs:

SDS to design facilities at Edinburgh Airport tram stop as follows:

- CONCOURSE –
  - area within barriers is the "paid area";
  - whole platform and exit area to be barriered to enable ticket checking of all arriving

and departing passengers;
- standing capacity for 100 passengers within paid area;
- 2 closable gates required in barrier at entrance point;
- 2 closable gates required in barrier at exit point

- TRAVEL SHOP/INFORMATION/TICKET OFFICE
  *minimum 12 sq m incorporating –
  - 2 Customer Service hatches;
  - mains power;
  - lighting;
  - heating;
  - communications cabling connections;
  - 1 external access door from within "paid area";
  - 1 internal access door to adjacent staff toilet

- STAFF TOILET
  *additional to 12 sq m Travel Shop –
  - coterminous with Travel Office;
  - single cubicle;
  - wheelchair accessible;
  - wash hand basin;
  - hot and cold water;
  - direct "internal" access door to/from Travel Shop;
  - separate external access door from "paid area"

- TICKET VENDING MACHINES –
  - minimum 3 on exit route (within paid area);
  - minimum 6 on entrance route (outwith paid area)

- TROLLEY PARK –
  - minimum capacity 150 trolleys (stacked)

Design of these facilities (but not track) may extend beyond the Limits of Deviation where necessary up to a nominal 5 metres. This design information is required in the first instance to inform a workshop with BAA to deal with design interfaces and construction methodologies north of Eastfield Road.

Any further change to the SDS design required following that workshop shall be a **tie** change.

Picardy Place

Following further consideration of development opportunities in the Picardy Place area of Edinburgh, City of Edinburgh Council has instructed **tie** to proceed with a variant to the SDS design for a gyratory. I enclose a letter and drawings provided by CEC.

tie instructs SDS to amend its design for Picardy Place in accordance with the CEC letter and drawings with the following further clarifications and instructions arising from further discussions between CEC and stakeholders since their original letter:

- **tie** instructs SDS to incorporate the technical information supplied from TSS to develop the finalised roads design
- **tie** instructs SDS to incorporate the updated bus stop locations at Picardy Place received from TEL

tie instructs SDS urgently to prepare a revised approval plan for Picardy Place that minimises the impact of this change on the production of Issue for Construction drawings for Section 1C. This plan would need to be agreed with tie, BBS and CEC; tie would facilitate the necessary discussions to secure that agreement.

Provision of survey/setting out equipment

tie confirms that, following the recent changes to clause 3.9.3 of the ERs, SDS is required to meet its existing obligation of providing Issue for Construction drawings with setting out information but SDS is not required to provide any survey or setting out equipment – that is the responsibility of Infraco.

Systems branding

tie instructs SDS to continue with its existing design that allows for future branding details to be incorporated once these are confirmed and accepts that incorporation of final branding into SDS design in the future will be a tie change.

Design life

Further to Damian Sharp's letter of 11 March (DES-ADM-1251) on design life and for the avoidance of doubt, tie instructs that no change is required to the SDS design as a result of the relaxation of the design life criteria.

Ingliston Park & Ride

tie instructs SDS to design pedestrian access between Phase 2 of the Ingliston Park & Ride presently under construction and the tram stop in its revised location. tie further instructs SDS to design vehicular and pedestrian access between Phase 2 of the park & ride and the substation building. This design shall allow horizontal latitude for a future turnback halt on the Newbridge line.

Quality management

tie confirms that SDS's existing accreditation to ISO9001 and ISO14001, if maintained, is sufficient compliance with the Quality Management requirements of the ERs. In particular, tie accepts that ISO9004 and ISO10005 – 1995 are not required for the SDS scope of work .

Environmental Management Plan

SDS has expressed concern at the inclusion of a specific sustainability obligation in the ERs which could be interpreted as adding to SDS's existing obligations. SDS already has an obligation to design in accordance with industry good practice which includes consideration of sustainability issues and SDS considers that it has reflected this obligation in its design.

tie accepts that the inclusion of sustainability in Clause 17.3.2 of the ERs as an explicit obligation does not extend SDS's existing obligations to follow industry good practice.

Cabinets

tie clarifies that the use of "cabinets" within Section 19 of the ERs should be read to include what SDS has previously described as "panels" and "cubicles" and the associated housings.

Tramstop platform length

tie has reviewed its specification for platforms in the light of the CAF tram selected by tie and does not instruct any change to the SDS design on these grounds. tie also does not instruct any further validation studies from SDS in relation to the tramstop platform length.

New Technology

tie recognises that SDS has designed the Edinburgh Tram Network taking account of available and proven technology at the time of design development. Where any of the items of equipment that are still to be procured are outwith the technologies for which SDS might reasonably have been expected to allow, tie accepts that any changes to the infrastructure as a result of procurement of new technology would be a tie change.

Standards

Section 8 of the ERs covers standards in general. In addition there are specific references to particular standards throughout the technical sections of the complete document.

Sections 8.1 to 8.3 of the final version of the ERs make clear the obligations of Infraco in delivering the Edinburgh Tram Network as to the use of either nominated standards or, in the event that no specific UK tram standard exists, the requirement to chose an appropriate standard and to justify that choice as being applicable to tramways and to ETN in particular.

The wording of these clauses has been accepted by both BBS and CAF.

There then follows a long list of "Applicable Standards". It is noted that these standards come from a variety of organisations and sources. Orlginally these standards were only within the main body of the technical sections of the earlier versions of the ERs (v1.2 for example). At a later revision they were gathered together in this table for convenience. However they also remain in their original place in the main document. Therefore the original source and selection of these appropriate standards was made by SDS as a deliverable to tie.

This list has exhaustively been discussed with BBS. Initially it was proposed to alter this table to reflect the actual standards contained within the BBS Technical Proposals. This applied in the main to the Systems (Siemens) part of the proposals. However it was agreed that the table should be left substantially as it was but that elsewhere in the systems requirements part of the ERs alternatives would selectively be allowed. This is reflected in the revised text of later sections.

Separately at Section 17.2.6 Infraco is required to abide by the requirements of ROGS in particular for Safety Verification. Our Independent Competent Person has made the selection and justification of standards a prime issue in the assurance of tie's Safety Verification process. This is no different to the approach the HMRI would have taken under the previous legislation. However it will have to be addressed thoroughly.

Therefore when SDS presents its Design Assurance Statements the following must apply:

- SDS are required to list all of the standards from whatever source they have used in the development of their infrastructure design.
- SDS must further justify the choice of each particular standard or any proposed derogations from them as required by section 8 of the ERs v3.6b. This shall include those standards which SDS may have employed specifically to design the interfaces with the several M&E Systems together with the Trackform and the Trams. All of this will form a part of the Safety

Documentation to be provided by SDS as a part of the Inter Disciplinary Checks of the Design Packages.

BBS will be required to do likewise in developing the detailed design of the trackform and M&E Systems from that in their current proposals. CAF are required to do likewise for the tram.

It will be a BBS responsibility to ensure that overall the choice of standards will give the required System Engineering and Integration of the ETN.

If to meet these overall requirements SDS are required to review or change any standards which up to that point they have used then a Change may be appropriate. However, this will depend on SDS demonstrating that their original choice of applied standard was appropriate given their knowledge and instructions at that time.

Yours sincerely,

Steven Bell
Project Director – Edinburgh Tram

Copy to: Damian Sharp, Dennis Murray, Tony Glazebrook, Andy Steel – TSS

APPENDIX PART 7

Part B - SDS Provider's Report on Employer's Requirements dated 18 April 2008

SDS Response to tie request for comments/comparison ER V3.6, V3.5a, 3.6b and the SDS Design & Procurement Documentation.

It is noted that tie have removed a considerable amount of detailed technical information from earlier versions of their document. Such information was originally included to provide readers with clarification in respect of functionality, technical parameters, appearance, operability, etc. Its removal leaves readers to interpret and form opinions as to what is required by tie to provide the Tram service requested. This results in differing interpretations and a number of proposals all of which may be fully compliant with ties generic requirements but differ from each other.

It should also be noted that SDS have provided tie with their recommendations in the form of procurement specifications and drawings all of which have successfully been through the tie review processes during their development and some of which have been used by tie as the basis for their Infraco Procurement Process. Whilst SDS have passed comment and observations on the BBS offer (See SDS report dated 26.03.08) within the limited time made available to them SDS remain of the opinion that the responsibility for the choice of alternatives to their procurement documentatic

SDS remain firmly of the opinion that any change impact to the SDS Detail Design and associated documentation as the result of this tie policy will ne

Note

Sheet numbers on this Review Document refer to sheet numbers in ERv3.1.

SDS note changes in the Sheet Numbers of ER v3.6a and again in ER v3.6b

Readers to refer to ER Clause numbers only.

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - Item closed	tie Ref
	7	1.1	Bullet 1 - UTC	To carry out and or manage the design of UTC is outwith our contract. **Non-compliant.** UTC Design outwith SDS works		1
	7	1.1	Bullet 4 - Tram Supply Agreement	Need SDS to review the Tram Supply Agreement (the signed version). Require tie letter re weight/length/width. **Non-compliant**	tie have confirmed with SDS that tie accept responsibility of known or unknown impacts **tie** correspondence awaited 3.6b **tie** deleted 'as a minimum' from opening statement.	2
	7	1.1	Bullet 5 - Operators Scope	Need to see "Operators Scope of Supply as summarised". **Need to review document to assess compliance.** Tie to provide.	SDS awaiting formal issue by tie	3
	7	1.1	Bullet 7 - MUDFA	Not clear if it suggests MUDFA nominated to Infraco. Check ITN.Need to have a precise understanding what this bullet point means. Have BBS qualified their tender offer against MUDFA/Utilities work.	SDS awaiting formal issue by tie"	4
	8	1.1	Bullet 12 - Geographical Section ? Is this defined and what relevance does it have? Is it intended to have Sectional Completion which will necessitate Sectional testing, commissioning, warranty, payment etc	SDS design does not cater for geographical and /or sectional completion. **Non-compliant**	tie have confirmed with SDS that this is a BBS issue and a BBS risk relating to Systems and equipment capability" SDS remain of the opinion this refers to the introduction into service of geographical sections. SDS repeat that they have not catered for geographical or sectional completion in their work and would require additional cost and time to accommodate any implication to their work on this tie requirment.	5
	8	1.2	Bullet 18 - Stakeholder Management	SDS Stakeholder Management closed out after Detail Design workshops	tie have confirmed with SDS that this is a BBS responsibility".	6
	9	1.2	Bullet 1 - Tram Supply Agreement	Tram Agreement not viewed by SDS. **Compliance check to be done prior to signature**	tie confirmed as 2 above - tie risk	7

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - Item closed	tie Ref
1 Introduction	9	1.2	Bullet 9 - Power Supply	Note no mention of network reinforcing the SP system (or costs).	tie have confirmed this is an Infraco responsibility and not that of SDS. Provisional Sum included by BBS SDS are of the opinion this is the SP Network Reinforcing that is refered to and not the ETN Traction Power Network reinforcing	7
	10	1.2	Bullet 1 - Free Issue Equipment	Note no list of "free issue" agreed equipment between Imfraco/Tram. Needs confirmation	tie have confirmed this is an Infraco responsibility and not that of SDS. BBS/CAF Dialogue ongoing, Impact on Siemens Scope only*.	8
	10	1.2	Bullet 2 - TVMs	Confirm the quantity and location. See comment below.(SDS design is based upon agreed quatntities of TVM's)*.	tie have advised SDS that tie/TEL to make clear and agree with SDS a process for flexing future quantities or specifications. Nothing yet forthcoming	9
	10	1.2	Bullet 12 - Generator	Still mention of Dissel Generator? Change Order to Change drawings. **Non-compliant**	tie to write to SDS confirming the way forward SDS remain confused as to which Generator tie are deleting and in what form and where is the hardstanding to be provided. tie to provide SDS with clear instructions as to their requirement	10
	11	1.2	Bullet 9 - Temp Power Supplies	Temporary power designs not in SDS scope. Note here it only describes "management of" not "design of". So who designs. **Non-compliant**	tie have confirmed with SDS that this is a BBS responsibility* SDS remain confused as to which Power Supplies tie are refering to. Is those required to bring the system into service or the site construction supplies? tie to provide SDS with clear instructions as to their requirement	11
	11	1.3	Paragraph 1 - Phase 1a/1b split	**SDS Non compliant**. Design Change required for Phase 1a/1b design separation. Note item 5 Design Drawings for 1a only to be provided. SDS do not have this. Only 1a/1b combined. Assume SDS do no further design work on Phase 1b from date of Novation and are paid for re-design and documentation of 1a? All design documentation and reports include the Design of Phase 1a & 1b for SDS.	tie to issue change order to SDS defining their requirments* The SDS design continues on the basis of a full 1a/1b construction	12
	11	1.3	Points 2,3,4,5	**Non compliant**. SDS require change order as all designs include designs to be installed as Phase 1a and 1b. Cannot be split as designed. See SDS report on subject.	As 12 above The SDS design continues on the basis of a full 1a/1b construction	13
					SDS note that certain of this Section 2 is incorrectly identified as Section 25 in the headers. SDS note that the Network Diagram - Siemens Issue 22.02.08 - proposes ballasted track within certain tramstops. This would not be acceptable to SDS nor, in the opinion of SDS HMRI or the equivalent. See SDS also letter 02.04.08 which indicates a number of other concerns in respect of this Siemens diagram.	
	19	2.6	Tram length 43.6m?	SDS Non-compliant until instructed on tram length. **Non-compliant** **SDS note that Tram length now quoted by tie as 44.0m**	tie confirmed to SDS that tie are to write to SDS confirming earlier instructions (verbal SDS(Dolan/Ennion) tie (Mathew Crose) at meeting) confirming acceptance of Depot as designed by SDS.*	14
	14	2.2	Sheet 14 - Operational Timetable - in accordance with Section 1 ?	Not defined in Section 1 of ER	SDS note text has ben corrected by tie	15
		General	Traction power Supply Isolators	The original SDS Operational & Performance (Requirement document differs from the ER's in a number of technical areas. An example is Motorised Isolators. **Non-compliant**	tie have confirmed with SDS that tie to write to SDS confirming that tie do not require Motorised Isolators throughout and that SDS will not be impacted as the result of this tie change* Awaited by SDS - tie to issue a letter to enable SDS to close out this item.	16

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - item closed	tie Ref
2 Ops & Performance	17	2.4	Tramstop Schedule	SDS design for Picardy Place is Centre Platform. **Non-compliant**	SDS note the schedule has been corrected by tie"	17
	18	2.2	Fig 2. Network diagram	**Non-compliant.** Examples= Ocean Terminal track configuration/1a/1b split/Depot entry,.	tie have advised SDS to review BBS/Siemens Network diagram which has subsequently been commented on in the SDS review of the BBS/Siemens bid. SDS have serious concerns in respect of the Siemens proposal to put ballast through Platforms etc. This design aspect is not supported by SDS as previous experience with HMRI has shown acceptance cannot be gained.See also Section 26 trackwork below.	18
	19	2.5	Bullet 3. Staffing	Implies designed for 361 Staff. Across 3 shifts or all at once? SDS not compliant with 403 **Non-compliant**	SDS advised tie are to clarify their requirments in a letter to SDS". awaited.	19
	32	2.15	"Detail in 8"?	What is "detailed in 8"? Note, four comfort stops. Only Haymarket is designed for facilities. **Non-compliant**	Whilst the text has been corrected SDS still await instructions as to ties changed requirments	20
	33	2.16		Change required for tram punctuality measure of 99%. Not as SDS Contract wording. ("not early" changed to "no more than one minute early") **Non-compliant**	tie advised SDS this is a BBS reponsibility and they consider SDS have completed their obligation in this respect. BBS will be obliged to to "reflect the law of physics"	21
			Section 2.16 Sheet 33	Last two paragraphs. How can we design such that it operates "safely and effectively" in all modes when "failures and disruptions to tramway and/or highway" is included. **Non-compliant**	As 21 above	22
			Section 2.19 bullet 3 "Set out in"?	Still not completed. **Non-compliant**	SDS note this has been corrected	23
	9		Phase 1a/1b split	SDS design does not take account of the possible split of Phase 1a & 1b. **Non-compliant**	As 12 above	24
	10		TVMs	SDS do not have the necessary details of the TVM's to incorporate the necssary information into their design at Stops and the Depot. **Non-compliant**	As 12 above	25
	16	Fig 2	Fig 2 - Network Diagram	SDS design is not compliant with the **tie** Network Diagram **Non-compliant** Note non-controlled diagram	As 12 above - See also SDS response in 18 above	26
	19	2.8	2.6 - Stabling of Trams	Stabling of 27 Trams? Initial accomodation of 361. SDS design for 150 with initial accomodation for 100 as instructed. **Non-compliant**	As 12 above	27
	32	2.15	2.15 - Comfort Break Locations	New Comfort Break Locations identified - see also 25.6 Tram Stops - below. **Non-compliant**	tie have advised SDS that their requirments are to be as SDS design" however SDS remain unclear as to ties requirments and await an instruction.	28
	33	2.16	2.16 - Performance Monitoring	Are these Performance Monitoring Locations and if so SDS are non compliant as we have not had this information? **Non-compliant**	tie have confirmed with SDS that this is not an SDS issue and is a BBS obligation" Formal confirmation is awaited..	29
	31	2.12	Electicity consumption linked to run time model.	SDS power simulation runs by SDS only not electricity consumption. **Non-compliant.**	tie have confirmed with SDS that this is not an SDS issue and is a BBS obligation.also that Power Consumption modelling was not part of SDS role"	30
	31	2.12	Update run-time model	3 month frequency update outside SDS Agreement. **Non-compliant**	tie have confirmed with SDS that this is not an SDS issue and is a BBS obligation".	31
	32	2.1.3	Operational allowances	Changed to reflect the 1a/1b split. **Non-compliant.**	tie advised this is to be addressed in a later version" and whilst SDS note this is so SDS still require instructions on ties requirments for 1a & 1b Split.	32

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - Item closed	tie Ref
	50	3.6.2	1st Para graph - 'using the same' or ' using a similar'. Why not specify the Design approach? - last line 'any' or 'all'	Confirm "similar" not "same".	tie have advised SDS this is to be addressed in a later version* V3.6b wording amended by tie.	
	51	3.6.2	Again reference is made to SDS whereas SDS obligations are in the SDS Agreement which is to be novated. The numerous design activities which the Infraco are to carry out appear to have been disregarded.	Require recognition of Infraco design	Even though it may be covered in the proposed Scope Split SDS remain of the opinion that the design responsibilities of the Infraco should be recognised in this clause. As is stated in V3.6 the SDS design 'approach' shall be set out in SDS Agreement however for the avoidance of doubt SDS can see no reason why the Infraco Design responsibilities should not be clear and unambiguous. *This is an important and urgent item to be agreed/confirmed with tie/SDS/Infraco (Prior to novation):*	
	53	3.6.3	Modelling for Temporary Traffic diversions and Impacts	Not an SDS obligation.	tie have advised SDS that this is not an SDS obligation but that BBS may request SDS to manage/procure modelling which will be the subject of a separate discussion and SDS assume agreement.* SDS consider this can only be progressed by means of a Change Instruction to SDS to carry out any modelling. Full scope to be provided by tie for SDS consideration. SDS note in ER v3.6b that this obligation has been left in and SDS remain of the opinion, as has been verified by tie in thier Email referenced below, this is not an SDS responsibility.	
	42	3.1	Section 3.1- The definitions/descriptions are not the same as SDS Agreement. Clarity is required by tie where differences occur. SDS will not be responsible for claims that BBS definition leads in hierachy when SDS is Novated.	Table 19 contains many abbreviations although headed definitions. **Non-compliant**	tie have confirmed this issue is to be sorted by tie Project Director to the satisfaction of SDS* - As at the date of this report SDS still await clarification. Transdev defined as the Operator does this comply with ROGS which SDS note is not referenced?	
	42	3.1		Approval and Consents, **Non Compliant.** This is an example as the ER's Definitions are not in accordance with SDS Agreement Definitions. Other examples,	As 36 above	
	42	3.1		Operator. (Read Transdev). No ref to TEL as Operator.	As 36 above	
	42	3.1		GSN - Goal Structured Notation In SDS GSN - Global Structured Notation	As 36 above	
	42	3.1		Consents	As 36 above	
	42	3.1		DDA 1995 missing in ER's	As 36 above	
	42	3.1		DKE- Different in content	As 36 above	
	42	3.1		EMC- Electromatic Magnetic Current	As 36 above	
	42	3.1		Environmental Statement	As 36 above	
	42	3.1		JRC	As 36 above	
	42	3.1		Review Procedure	As 36 above	
	42	3.1		Service Commencement date+	As 36 above	
	46	3.5	Submittals Schedule	Not seen by SDS. Cannot sign up to this until viewed/studied. **Non-compliant**	tie have confirmed with SDS that this is not an SDS obligation*. Formal confirmation required	

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - Item closed	tie Ref
3 General	50	3..6.1	1st bullet point	Co-ordination not the responsibility of SDS. **Non-compliant**	tie have confirmed with SDS that these words do not oblige SDS to coordinate" Formal confirmation required	49
	51	3.6.2	last bullet Point.	Updates to the documents as listed is outwith SDS Scope. **Non-compliant.**	tie have confirmed with SDS that they are only obliged to fulfil their requirements under their contract however Mathew Crosse will review this particular SDS concern" Nothing has been forthcoming. SDS remain concerned at the wording of this sub clause . As BBS are responsible for the 'complete design of the ETN including the achievement of full compliance with the ER's'. SDS assumes this includes the responsibility for the SDS work which forms part of the overall design however tie have already reviewed significant elements of such work and used it for procurement purposes.. Bearing in mind the dilution of the Employers Requirements and the fact that they are now open to numerous interpretations then SDS have a concern that tie may put a different interpretation on what has been considered by them to comply with the ER's. Despite the SDS design and procurement documentation having passed through the quite vigorous tie review procedure comments have already been made by tie that SDS have over-engineered elements their design.	50
	51	3.6.3	SDS obligations	Reference is made to SDS whereas SDS obligations are in the SDS Agreement which is to be novated. The numerous design activities which the Infraco are to carry out appear to have been disregarded. **Non-compliant.**	tie advised this is to be addressed in a later version" however ... PARK pending BBS approval and acceptance of SDS suggested revised wording to these issues SDs remain of the opinion that this issue has not been adequatly addresses even though consideration is being given to theinclusion of a Scope Split document. As was requested by tie, SDS have provided BBS with some proposed revised wording to replace wording in their bid document however the BBS response does not, in the opinion of SDS, provide sufficient protection to ALL parties thus minimising the risk of misunderstandings in the future and impact on the ETN Project.	51
	53	3.6.3	SDS obligations complete.	**Non- compliant.** Modelling for Temporary Traffic diversions. TTRO to be the sole responsibility of BBS. **Non-compliant**	As 35 above	52
				What is meant by 'any new technologies'.? There is much 'new' that the Infraco are to provide as part of their Works. Note	tie advised this is to be addressed in a later version" however SDS note wording remains in v 3.6a. SDS cannot be responsible for theimplications of the introduction of new technology whatsoever form it is and would seek cost and time implcations of any inpact on their works.	53
	49	3.5	Section 3.5 - Errors in bookmark.	Requires completion before signing. Errors in bookmark.	tie advised this is a 'typo' and will be clarified in later version" **Appears V3.6a corrected.**	54
	50	3.6.2	Section 3.6 - Design	Note. "Design" not defined in Contract Definitions.	tie have advised SDS that they are of the opinion this term does not require to be defined" SDS remain of the opinion that the various roles and responsibilities are to be identified, scheduled and agreed between all parties prior to novation.	55
	50	3.6.1	Section 3.6.1. Bullet 1 - Training	Not the same as SDS description. "Taking account of Emp Req". Training plus documents etc. **Non-compliant**	tie have confirmed with SDS that these words do not oblige SDS to 'train' nor provide training deliverables."	56

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - tie information and assistance of tie GREEN - Item closed	tie Ref
	50	3.6.1	Section 3.6.1. Bullet 2 - Power consumption	Our Tram simulation or BBS? We do not have power consumption responsibility. **Non compliant.** Service Performance and power consumption not defined or specified in ER's	As 30 above	57
	50	3.6.1	Section 3.6.1. Bullet 3	**Non-compliant** as there are no technical aspects defined within the ER's. See note at head of table. **Non-compliant**	tie have confirmed with SDS that the SDS design has been based upon the original tie Requirments Specifications. tie have relaxed some of the specifications to allow flexibility for Infraco proposals. In respect of Infraco's design scope Infraco must stand behind the obligations contained within this bullet, but likewise SDS must also underpin their design scope too[1]. SDS remain firmly of the opinion this this is without SDS incurring additional cost or time to their obligations and expect this issue to be defined within the tie proposed Scope Split document and with the inclusion of suitable wording in the ER's yet to be agreed between all parties. Please provide acceptable additional words to Scope Split document	58
	50	3.6.1	Section 3.6.1. Bullet 5 &6	Ensure the total input is provided by Infraco. They HAVE carried out Due Diligence on SDS design. Subject is now closed.	See 58 above Please provide acceptable additional words to Scope Split document	59
		3.8		Buildability Reports	SDS notes these are the responsibility of the Infraco. SDS have a concern as to the implications on their design work. A statement of acceptability is required from BBS (prior to Novation)	
		3.9.3	General	Change in wording between 3.5a and 3.5b	SDS note the change in BBS obligations from the *'provision of survey/setting out services'* to the *'provision of survey/setting out equipment'* SDS confirm with **tie** that thet such 'services' do not form part of their obligations under the terms of their Agreement with **tie** **tie** to acknowledge	
		3.12	General	Training - ER v3.6b	SDS note the reference to the Training responsibilities being contained in Section 40 - Maintenance. As an observation, SDS do not understand where the necessary training is specified to cover the operation of the various elements of the ETN,which SDS would suggest is essntial before the commencement of any form of energisation or operation. SDS arealso aware of and agree with the early tie proposals for the Infraco to be responsible for the maintenace of all elements of the ETN required to be in service during the testing, commissioning and trial running up to the point of the ETN entering commercial service having been proovedby the Infraco to be functioning correctly and to the standard and the requirments of the approving bodies to allow it to enter commercial service.SDS suggest this may not now be the case and seek clarification.	

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assistance of tie GREEN - item closed	tie Ref
	61	3.11	Documentation	As -built, construction and manufacturing drawings will be provided by SDS in accordance with the SDS Agreement. Not manufactured drawings or E&M Drawings by Siemens. **Non-compliant.**	See 34 above SDS are concerned at the suggestion that such documentation should be available 'prior to or on completion of Agreement' SDS are firmly of the opinion it is essential that such documentation is available to all operatives, maintainers and other parties prior to the commencement of any form of operation be it energisation or whatever to ensure such operatives have been fully trained and in possession of the necessary information to carry out their duties.	60
	74	8.3	Standards	SDS have completed design on standards approved by tie. Non-compliant	tie have confirmed with SDS that this requirement relates to Infraco and it is for the Infraco to 'sort out' any variance" SDS remain of the opinion this could involve them in cost and time for which they would require reimbursement. A clarification/confirmation statement to be provided by tie (prior to novation)	61
	74	8.3	The Infraco's Responsibilities' appears somewhat out of context and must surely extend to more than System Integrator?	Total responsibility of Infraco	tie have confirmed with SDS that their comment is noted" SDS do not understand the implication of this tie response/statement and remain firmly of the opinion that the responsibility for System Integrator must be that of the Infraco.	62
	75	8.3.1	Table appears to have been disconected from Sheet 72 which refers to standards.	tie to correct	tie advised this is a 'typo' and will be clarified in later version" Appears to have been corrected in V3.6	63
4 Use of industry Standard Equipment			No comments			64

Section	Sheet No	Clause	Issue	Comment	RED - Ongoing - tie Change Order and/or clarification still required. ORANGE - for information and assurance of tie GREEN - Item closed	tie Ref
5 System Identity & Branding			New SDS comment 27.03.07.		SDS are concerned at the potential implications of the tie introduction of 'Branding' and their impact on planning approvals in the event ties aspirations do not meet the Planners desires SDS seek sight of the Appendix 1 as referenced in ER v3.6b which identifies that *'the output of the specialist contractor shall be a documemented set of guidelines whih shall incorporated into these Employers requirements as Appendix 1'.* SDS would require a change order from tie covering the implication of all changes to their designs.	65
6 Design Life	65	6	The Infrastructure Systems and Equipments ? If some of the design lives are shorter than the 15 years stipulated as a minimum is the infraco responsible for it's renewal during the 15 Years?	Design life is not as per the SDS Agreement. ~~Non-compliant~~	tie have confirmed with SDS that tie will write to SDS 'enabling relaxation' of SDS from their specification obligations where they were more onerous at the time of the Agreement than they are today as noe stated in the ER's. SDS have received a letter (tie letter 11.03.08) however SDS seek assurances that any additional costs and time incurred by SDS resulting from changes to drawings and other documentation will be met by tie Letter to tie in place (Prior to novation)	66
	65	6	Table 21	Non-compliant. See CCTV/PID's/Sigs/OLE etc	See 66 above.	67
7 Extensibility	67	7	Various tables	We cannot confirm compliance to ambiguous statements example is "Unclear if included in initial construction or "Ductwork to locations where additional signalling **MIGHT** be provided". **Non-compliant**	tie advised these will be clarified in later version' SDS seek assurances that any additional costs and time incurred by SDS resulting from changes to drawings and other documentation will be meet by tie' Some wording amended in V3.6a i.e. now reads 'allowance in design where additional signals might be provided' Still considered ambiguous.	68
	67	7	Instruction req'e re 1a/1b split	SDS design does not take account of the possible split of Phase 1a & 1b. **Non-compliant**	See 12 above SDs remain confused as to ties requirments as the request is for a full delta design at Roseburn Junction. tie to clarify	69
	70	7	SDS not refining Depot design for single type tram	**Non-compliant**	tie have advised SDS to review wording in subsequent issue of ER Wording deleted in V3.6a	70
	71	7	Ducts minor inconsistancies. See sheet 188, Table 39	~~SDS design does include for 20% allowance for spares. Non-compliant~~	20% allowance made in SDS design, which is based upon SDS procurement specification requirements. Any required changes (cost & time) to SDS ductwork requirments (drawings, cross sections etc) would need formal instructions SDS have confirmed with tie' that they are able to achive this 20% allowance based upon thier Infrastructure Design and their Procurement Documentation and not necessarily the BBS proposal. tie to instruct/clarify	71
	68	7	P&R allowance for termination of Phase 3 service has been added to Scope	**Non-compliant**	tie have advised SDS to review wording in subsequent issue of ER' however SDS have not received formal change instuctions to accommodate changes in their design.	72

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	69	7	Depot - reference to 8 Berths - Incorrect only 4 available other 2 are service roads serving Wheel Lathe/Tram wash & sanding plant.	**Non-compliant**	tie have advised SDS to review wording in susequent issue of ER*. Wording revised in V3.6a	73
8 Standards	72	8.1/8.2	SDS design is particular to BS where stated in the SDS design documentation.	**Non-compliant.** Each European Standard must be reviewed to ensure the correct level of technical compliance with the BS as designed. SDS have a concern at the statement that the standards to be used shall be those applicable before the Effective Date. SDS effective date is 19th Dec 2005	tie have advised SDS that any variance will have to be addressed by BBS- SDS advised Project Director that they are of the opinion this will need be resolved by tie/BBS prior to novation SDS now note that references are made to standards specified in the Agreemenmt. SDS have not had sight of such standards. This item to be closed prior to novation	74
	72	8.1	HMRI versus ROGs	**SDS remain Non-compliant** **SDS also seek clarification as to who are are the relavent parties as defined within ROGS.**	tie confirmed with SDS that a Change Order would be required to accommodate any implications to SDS Works SDS seek clarification.	75
	74	8.3	8.3 bullet point conflicts with 8.2	**Non-compliant. SDS have completed their design prior to Infraco and will not be changing the design on the identification and selection of the Infraco equipment without change instruction**	tie are of the opinion this is 'sorted' however SDS remain of the opinion that this issue falls into the same category as 75 above This item to be closed prior to novation	76
9 Geotechnical	117	9	Geo surveys to inform the design have previously been carried out by SDS.	**Non-compliant with 5th para.** The SDS design cannot facilitate the future nature of geotechs.	tie have suggested some wording revisions including 'reasonably practicle'. SDS have difficulty with such wording as such wording still leads to dispute in as much as it fails to deine in whose opinion it is or is not reasonable*.	77
10 Environmental			No comments			78
11 Surveys			No comments			79
12 Project Management Process			No comments			80

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13 Permits & Approvals			No comments			01
14 Human Factors			No comments			02
15 RAMS			The E&M equipment is supplies by Infraco and the minimum availability percentage achievements need to be verified by BBS	Availability percentages to be confirmed by Infraco	SDS observation for the assistance of tie	03
16 EMC	177	16	The responsibility for the design of the Systems and Equipments i.e. those items which may or may not interfere with Network Rail and other Third Party/Stakeholders lies with the Infraco. It follows that the necessary work to manage the EMC interfaces must be provided by the Infraco suppliers and designers.	Infraco EMC Systems Designer responsibility.	tie have confirmed with SDS that the RAMS figures for BBS Equipments are clearly BBS responsibilities tie advised they are to write to SDS - still awaited by SDS Could be defined in Scope Split?	04
	177	16.2	Last paragraph	**Non-compliant.** Tie have written the EMC Strategy.	tie have confirmed with SDS that EMC obligations are with BBS *'other than that stated in SDS Agreement'* *SDS believe this to be a contradictory statement and seek ties clarification of EMC responsibilities.* Could be defined in Scope Split?	05
17 Health, Safety, Quality & Environment	178	17.1	EMC out of context. Tie to amend.	Incomplete statement	Table 4.3 contained in this Section does not correctly reflect the the design responsibilities of the various parties. The Infraco are responsible for many aspects of Design as well as being Design Manager. References are made to ROGS whilst ROGS is not referenced elsewhere in the ER's	06
	178	17.1	Quality Management	**Non-compliant.** SDS only working to iso 9001 in Agreement.	tie confirmed with SDS that a Change Order would be required to accommodate any implications to SDS Works. No change in v3.6a	07

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	181	17.2.6	SDS design to HMRI requirement.	SDS not aware of safey verification scheme prepared by tie. Require review/study prior to signature	tie confirmed with SDS that a Change Order would be required to accommodate any implications to SDS Works". No change in V3.6a. Instruction not received.	88
	182	17.3.2	E&AP	SDS are working to their Environmental Management Plan in accordance with Agreement.	SDS are of the opinion tie have added a requirment covering 'sustainability' which is not one of their obligation v3.6 requires BBS to develop the SDS EMPlan to include Sustainability. SDS consider they do not have any involvment in this process.	89
18 Cable & Ducting	188	18.2	SDS are not fully compliant and may also not necessarily be compliant with Infraco interpretaion of Employers Requirements (Drainage).	**Not compliant.** See note at top of table.	tie have advised SDS that tie would write to clarify their requirements" Letter still awaited SDS note that Section 18 has been omitted from v3.5a and 3.6a and, incorrectly in the opinion of SDS, dispersed within the document reference to cable installation appears to now be limited to Traction Cables contained in Section 31. What about AC cables etc	90
	189	18.2	SDS do not use, nor would they recommend the use of cable troughs in non segregated areas as is allowable by ER's.	**Non-compliant**	tie advised this is a 'typo' and will be clarified in later version" A check v3.6 indicates this may have been deleted as the result of relocating the contents of Section 18. SDS observation remains.	91
	187	18.1	18.1 SDS cannot find the cable identification requirements.	? Tie to advise	tie have advised SDS that this issue is not set out anywhere and is considered open" SDS remain of the opinion the very detailed work carried out by them on the subject of cable indetification in association with the operator and the tie technical team should be adopted on the ETN system	92
	190	18.4	essential cable joints.	SDS design attempts to avoid cable jointing.	tie have advised SDS that SDS may have misunderstood this requirement as it relates to maintenance" - SDS are still unable to agree and repeat that their procurment documentation/design attempts to avoid unnecessary cable joints.	93
19 Cabinets	192/193	19	SDS are not fully compliant and may also not necessarily be compliant with Infraco interpretaion of Employers Requirements.	For cabinets read panels or cubicles. (As described in SDS documentation)	tie have advised SDS that they may consider reviewing this issue with BBS" Not actioned SDS believe tie to advise	94
20 Advance Works			No comment		Omitted from v3.6a	95
21 Utilities MUDFA	195		Sheet 195. para 7	The design of MUDFA works within the scope of the SDS Agreement is being carried out by SDS.	tie have advised SDS to review new wording in later version of Ear's as this whole section is to be upreved by tie" SDS are of the opinion the following wording should be included in the first line of paragraph 2 as follows *.... to clear the ground where possible, in compliance with the MUDFA Contract, of utilities ....*	96

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	195		Sheet 195, para 8	SDS understood that MUDFA works was not to be novated to INFRACO. The statement "Infraco undertakes all utilities……..due to be undertaken by the MUDFA contractor" would suggest otherwise. Clarity is required here for SDS prior to signature.	as 96 above	97
	200		Sheet 200, para 1	SDS require to see the technical submission from INFRACO on utilities. The MUDFA Contract is volumous and covers majority of items for utility diversionary works. The INFRACO ER's is a one page document and a table. Nothing is definitive and SDS would advise tie contractual/legal dept's review this point of note.	As 96 above	98
22 Locks & Key Suiting			No comment			99
23 Testing & Commissioning	216	Fig 7	Figure 7 - Sheet 216 - Incorrectly refers to SDS Provider. The obligations contained in this table should apply to The Infraco inclusive of his Design responsibilities.	Change to Infraco	tie have advised SDS that references to both Infraco and BBS have been removed from a later version of ER* Table 7 removed from v3.6a SDS note the inclusion of wording in Table 46 Sheet 286 - where tie are incorrectly in the opinion of SDS, limiting the acceptability of proposed detail design to that of the SDS deliverables.. As SDS have emphasised the Infraco have the responsibility to carry out the design of the Systems and equipments which sit within the Infrastructure designed by SDS SDS suggest it is of equal importance to tie that it is these Systems and equipments are proved to be compliant.	100
	217	23.2	23.2 - Sheet 217 - Programme & Risk Register. No its not? Its possibly the Testing Programme which should be a sub programme of The Infracos suite of programmes	tie to confirm	tie have advised SDS to review wording in susequent issue of ER REVIEW Needs Project Risk register Text revised however Fig 10 incomplete	101
	219	23.4.2	23.4.2 Sheet 219 - Why exclude CCTV which is the most hungry data transfer item?	tie to amend	tie have advised SDS to review wording in susequent issue of ER REVIEW	102
24 Trams			Tram Supply agreement to be provided to SDS for review.	tie to supply agreement	See item 2 above	103
					Note - V3.6 has this Tramstop Section 25 incorrectly identified in the header as Section 26. Clause 25.4.7 Sheet 367 - Public Address - incorrectly cross references to 35.13.2 - workstation Capabilities. SDS suggest this should be 35.6.1 - PA Clause 25.4.9 Sheet 370 - PHP's - incorrectly cross references to 35.13.2 as above. SDS suggest this should be 35.8:1 SDS note that Ticket Validators are not being sought at Tramstops - SDS seek clarification as Section 36 clearly seeks the provision of Ticket Validators which SDS are not been requested to accomodate. See also TVM's below	
stops	321	25.2	Nominal Tram vehicle up to 43m + 2m overrun - SDS Scope 40m platforms	Non-compliant	See item 2 above As previously advised to tie the SDS Design does not accommodate + or - 2m	104
	324	25.3.2	0	Non-compliant	tie have advised SDS to review wording in susequent issue of ER v3.6a allows for the SDS design however alternatives can be offered.	105

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25 Tram	326	25.4.2	Glass Roof Shelter - not CEC approved SDS design - avoided on grounds of maintenance	**Non-compliant**	tie have advised SDS to review wording in susequent issue of ER v3.6a the choice of roof material has been deleted.	106
	332	25.6	Toilet & WHB facilities have not been added at Airport/Ocean Terminal/Granton Sq - SDS are aware of Haymarket only.	**Non-compliant**	See Item 28 above	107
26 Track			See email and attachment dated 30/01/08 timed 18.18 hrs Chandler/Crosse.	Criteria contained in V3.1 ER's was superseded on 21/02/07. **Non compliant**	tie are of the opinion SDS should provide justification of their track alignment" No further action from SDS who remain of the opinion the choice of Trackform remains that of tie and the Infraco SDS note v3.6a refers to SDS Surface Finishes Documents ULE90130-SW-DRG-00069, 70, 71 the content of which from their review of the BBS Bid SDS believes are not being complied with.	108
27 Roads & Utilities	362/364	27.5.2/27.7	UTC.	UTC not by SDS	See Item 1 above See also Item 21 above 27.3 references are made to consultation with owners of roads under private ownership during the design process. SDs consider they have completed the necessary consultation sufficient to develpop their design in all areas where they have not been prevented from so doing. 27.5.2 SDS are of the opinion they have consulted with the relavent parties in order to progress their roads design. Any additional work as the result of tie accepting a design or a proposal which differs from that provided by SDS and reviewed by tie can only be progressed via the change control process thus ensuring SDS are not adversly impacted in terms of cost and time. 27.5.2 - SDS are of the opinion any additional work required to be carried out by SDS as the result of the requirments of this clause shall be the subject of the cahnge controlmprocedure to ensure SDS are not adversly impacted in terms of cost and time. 27.9 - SDS seek sight of Schedule 21 (Paragraph 3 refers)	109
	365	27.9	11th bullet point. Obtain actual details.	Where actual records exist. Some SUC records missing.	tie have advised SDS to review new wording in later verison of ER's as this whole section is to be upreviewed by tie" Revised wording added by tie in V3.6a	110
	366	27.9	Missing provision of MUDFA	As-built drawings to acceptable design requirement	tie have advised SDS to review new wording in later verison of ER's as this whole section is to be upreviewed by tie" See Item 21 above This clause says certain utility movements are part of the Infraco Works however elsewhere in this document it says they will be the subject of Change orders	111
28 Structures			Tram weight, width, length.	**Non compliant**	As previous SDS Design of Depot Access Bridge is two structures NOT one as is referenced in Table 60 v3.6a.Sheet 413.	112

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29 Depot	380	29.8	Boundary Fence Concrete footing	~~SDS told to delete hence SDS design non compliant.~~	tie have advised SDS to review wording in susequent issue of ER* SDS note this requirement has now been deleted by tie. tie are now seeking 'a suitably robust security fence' v3.6 which, bearing in mind the presence of ballast within the depot and the ease of its removal to provide access under such fence, SDS remain of the opinion a concrete footing should be provided.	113
	381	29.8	Service Track states Hand wash Windscreen - SDS instructed Automatic End Wash plant as confirmed later in ERV3 hence SDS design non compliant in this respect.	**Non -compliant**	tie have confirmed that they are of the opinion that the SDS design exceeded their requirements.* SDS are only able to refer to the various reviews carried out by tie, their operator and their technical representatives when such facilities where agreed as appropriate to the ETN. v3.6a seeks hand and wash. See also item 115 below Additional/revised SDS detailing may be required to meet this requirement.	114
	381	29.8	Spec for Lothian Bus wash	Specification performance required	tie have advised SDS that the provision of of the tram wash plant is with BBS and that any detailed specific adjustments will be during the procurement of this plant* SDS note that the Tram Wash plant (Item 1.4) is to be provided by the Infraco and SDS seek early builders information (Physical dimensions, loadings, builders works, drainage, power etc) in prder to accomodate this particular plant within their design. Any impact on the SDS works already carried out may be the subject of the Change Control Procedure.	115
	388	29.11	29.11 A staff work point Desk etc added to lobby of Control Room Suite hence SDS design non compliant as this facility is not accomodated.	**Non -compliant**	tie have advised SDS that they are to instruct SDS as to this change in their requirments* Still awaited by SDS	116
	431	29.17.3	Over door heaters now added to workshop, hence SDS design non compliant	**Non -compliant**	tie have advised SDS that they are to instruct SDS as to this change in their requirements* Still awaited by SDS. SDS note that v3.6a states that the provision of such heaters is an option lying with the Infraco. SDS seek clarification.	117
	383	29.9	Bullet 8. Fire extinguishing systems throughout the building	Not part of SDS Design other than Depot equip room. **Non-compliant**	tie have advised SDS that they are to be compliant with the Bldg Regs and that any change to the words will be agreed with BBS and SDS.* SDS remain of the opinion they do comply with the Bldg Regs however their design for Fire Extinguishing Systems is limited to the Depot Equipment Room and NOT throughout the building as tie are now calling for. SDS seek clarification of the new tie v3.6a wording associated with this tie requirement i.e. Extinguishing v Suppression	118
30 Traction Power			SDS Traction Power very detailed design, produced for tie procurement and planning purposes, does not now comply with tie ER V3.1	Manually operated isolators an example. **Non-compliant**	tie have confirmed with SDS that the design responsibility for Traction Power is that of BBS* Whilst SDS acknowledge this assurance the issue of impact on the alterations to the SDS work already carried out needs to be resolved Cabling information has been moved from the now redundant Section 18 Cables and SDS note that tie are now requesting that LV cables and Traction Supply cables are drumed to the maximum to minimise cable joints however this does not apply to 11kV Cables which in fact are probably more joint critical than the remainder..	119
	438	30.2.1	Traction power Supply Isolators	The original SDS Operational & Performance |Requirement document differs from the ER's in a number of technical areas. An example is Motorised Isolators. **Non-compliant**	As 16 above	120
	437 & 442	30.1	Bullet 1 - Tram Traction Substation enclosure ? Is this the enclosure/security fence surrounding the Traction Substation building?	SDS have provided security fencing as part of the SDS design.	tie have advised SDS that BBS design will be to SDS design in these respects* SDS seek clarification of this statement as their review of the BBS Submission indicates otherwise. SDS seek clarification	121

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	437 & 438	30.1	Bullet 2 - Metering etc is usually the responsibility of the consumer not the construction contractor Whilst provision has to be made for the accommodation and connections for metering are tie asking The Infraco to provide this facility? On what basis does he determine the tariff acceptable to TEL?	**Non-compliant.** SDS make provision for metering and have advised tie that obligation to procure this metering is required. SDS do not specify this from Scottish Power.	tie have confirmed with SDS that tie will ensure appropriate arrangements and responsibilities with BBS and SP and that a Provisional Sum has been included for these purposes. tie suggest detail is to be agreed.SDS note there still appears to be instruction to BBS to arrange for SP to provide the metering'. SDS confirms that such 'detail' has already been the subject of discussions and agreements between tie/SP/SDS and the tie technical advisors and the subject of many minuted meetings which have been copied to all parties. SDS note that such agreements are not being reflected in the tie documentation nor the BBS bid .	122
	438	30.2	Manual - operated track feeder isolators.	Last paragraph - SDS have developed a coordinated protection network between the DC rectifier circuit breaker, AC Rectifier Circuit Breaker and DC Track Feeder Breakers. **Non-compliant**	tie have confirmed with SDS that the BBS approach to electrical protection, although different to that previously developed and reviewed by SDS/SP/tie and their technical advisors, is considered by tie* to be an acceptable coordinated approach* SDS question of this has been approved by SP.	123
	443	30.5	Scottish Power and manual isolators.	Following a series of detailed operational discussions with tie's Operator Transdevtheir technical Advisors and incorporating our own operational experience of other tram systems, the SDS design offers motorised isolators for three principal reasons: 1. To meet tie's aspirations for automated full section isolation & earthing regimes. 2. To meet tie's aspirations for operational flexibility, speed of response to electrical emergencies, and availability of re-configuration options. 3. To ensure that TPS design is highly available and meets tie's aspirations for RAM and FHA. Whilst manual isolators offer a VE approach, they compromise the achievement of these aspirations. If manual isolators are proposed SDS would question the benefit of motorised earthing. The track feeder cb is the point of disconnection not isolation under UK practice. For an earth to be applied the system needs be switched at the isolation point. As the isolation point is considered to be the trackside isolator under accepted UK practice, which is manual under this proposal, the operator would need to be present to effect the isolation hence is in a position to manually apply the earth. To apply a motorised would require a re-definition of typical UK practice to define the track feeder circuit breaker as the point (This may present a difficulty for the HMRI ROGS Competent Person).' **Non-compliant**	tie have confirmed with SDS that the design responsibility is that of BBS and that some drafting inconsistencies have been corrected in the later version of the ER's* tie to confirm with SDS the way tie wish to progress this issue. As previously stated by SDS any impact on SDS designs and documentation to be the subject of instruction from tie.	124
	438	30.1	Provision for 11kV supply to Depot	SDS design includes the requirment for an 11kV supply to the Depot Services transformer not just 'provision for'.	SDS word preference is noted by tie* SDS note that the BBS obligation remains 'provision shall also be made' from which it could be inferred that, even with the addition of the tie wording in Clause 30.2.3 and elsewhere, somebody else will provide the actual supply necessary to power the depo 30.3 Protection still does not refer to the need to comply with the protection requirments discussed and agreed by SDS, tie and ties technical advisors with SP SDS remain concerned that the tie v3.6 ER Clause 30.2.3 still does not reflect the SDS understanding of the SP letter to tie defining the SP requirments for HV Switchgear and protection. SDS remains of the opinion the diluted wording contained in v3.6 could lead to differences of opinions as to who is providing what to whose requirments.	125

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	441	30.4	Generator	Generator is not now a client requirement. Instruction required to change. **Non-compliant**	See Item 10 above SDS are still not able to fully understand tie requirments in respect of Diesel Emergency Supplies and seek early clarification to enable their Depot Design to progress Clause 30.4 Sheet 584 still refers to the 'separate generator' and cross references to Section 29 - sheet 570 Clause 29.17 - which itself refers to a 'fixed standby generator' SDS remain confused as to ties requirments as tie have informally advised this generator has been removed and a hard standing is to be provided (See Item 10 above and Clause 1.2 - Sheet 17 Bullet 12) SDS seek urgent clarification as to ties requirments and suggest tie establish what BBS have allowed for in their price, as any removal of the permaant Diesel Alternator would include all its associated controls, pipework, exhaust, cooling, cabling, building enclosure and have implications to the LV Switchboard - not insignificant potential savings.	126
31 OLE	467	31.5	Environmental Criteria	Environmental Criteria not part of Ers	tie have advised SDS to review wording in subsequent issue of ER* Wording not changed SDS suggest this is a cross reference to 3.6.4?	127
	469	31.14.2	Parallel feeders/messenger wire	SDS design only parallel feeders **Non-compliant**	tie have confirmed with SDS that they believe this approach by BBS to be more competative and robust then that previously agreed by tie and their technical advisors. SDS would expect to receive costs and time associated with any implication they have to accomodate as the result of this BBS/tie change	128
32 Stray Current			No comment			129
33 Low Voltage Architecture	482		UPS	SDS are non compliant as they have provided for ties requirements in respect of UPS for 3 hours. **Non-compliant**	tie have advised SDS to review wording in subsequent issue of ER **tie** suggest their requirement will reflect SDS proposal.* SDS note that **tie** have put the onus on BBS to determine the necessary duration of the various UPS Systems. SDS seek immediate instructions from **tie** advising SDS of the way forward bearing in mind SDS are required to accommodate the necessary UPS Equipments within their Detail Design of the Infrastructure. SDS to be reimbursed with all additional costs and time implications	130
34 Earthing & Bonding			Compliant	The actual requirements for Earthing and Bonding are shown in the SDS Technical Specifications. As elsewhere, a considerable amount of what is considered by SDS as necessary Technical detail has been removed from the V3.1. It follows that the specific SDS design, whilst being compliant with the requirements **tie** have required in the past may not reflect the principles, proposals and technical solutions now being considered by **tie** and their Infraco.	tie note this comment and refere to Item 65 above. SDS seek clarification as to any impact on their documentation SDS request tie to note that ULE90130-SW-REP-00071 V3 was issued to tie on 30th March 2007. SDS seek clarification of the version issued to BBS and how the BBS proposals differ from the Detail Design E & B accomodation work carried out by SDS to date.	131

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35 SC&C	489	35.3.2	The only coms link between the TPDS & UTC is for a traffic signal phase request. No allowance has been made in the SDS design for the monitoring, reporting and logging of a failure which at the same time reverts the road traffic signal to priority signalling.	**Non-compliant**	tie have confirmed with SDS that tie design of the SC&C is a BBS responsibility. SDS would seek cost and time in respect of any impact on their design documentation SDS note minor changes to the wording in ER v3.6 however these do not impact on the SDS principle already advised to tie. SDS note however that tie propose to use SCADA for the local control of Substations and SDS have commented that they would not be happy with this use of such technology in their review of the BBS/Siemens Bid Sea SDS document issued to tie. SDS also note the additional statement which appears to relate bandwidth to the number of cameras on the system. (Sheet 650) SDS remain of the opinion that the bandwidth is also a function of the quantity of data being transmitted from each camera in terms of frames per second (camera functionality and picture quality and availability) and this is equally as important as the total number of cameras.	132
	491	35.4	Bus tracker on PIDs not allowed for in SDS design - neither display nor communication.	**Non-compliant**	As 132 above	133
	492	35.4.1	No provision has been made for 'trip numbers' nor 'bus service details'	**Non-compliant.** (Question link provision)		134
	512	35.10.4	PB have proposed TCP/IP communications for Status & faults for much of the Tramstop equipment instead of SCADA as called for by tie*	**Non-compliant**	As 132 above	135
36 Integrated Fare Collection	550	36.1	SDS design allows for a maximum of 2 TVM's per platform	**Non-compliant.** Validators not included as part of SDS design.	As 9 above - SDS note the proposal for a MINIMUM of two TVM's per platform tie to issue Change order to SDS.	136
	550	36.2	ER's Ticket Validators or smart card Validators - both are specified?	**Non-compliant.** Validators not included as part of SDS design.	tie have advised SDS that they will investigate this issue and advise* - nothing forthcoming SDS have not allowed for anyTicket validators in their design. tie* have not quantified the number or dimensions of these items. tie to advise SDS by Change order...	137
	550	36.3	Where are TVM Docking Stations to be located?	SDS advise lobby of Depot Control Room. Tie to confirm.	tie have advised SDS that they will write to SDS instructing them as to their requirments* - nothing forthcoming.	138
	552	36.5.3	System interfaces 36.5.3?	**Non-compliant.** Validators not included as part of SDS design. Equipment onTable 86 not yet part of SDS scope	tie have advised SDS that the IFC interface is an BBS issue and not that of SDS SDS have not allowed for anyTicket validators in their design. **tie** have not quantified the number or dimensions of these items. **tie** to advise SDS by Change order..	139
37 System Integration	554	37.5.1	Management of the design. Should read design.	Within the SDS Agreement SDS are to design (and have designed) the civil and building infrastructure and prepare (and have prepared) Procurement Specifications for the E&M Systems elements of ETN.	As 34 above	140
38	557	38	SDS design process	In accordance with the design as proposed by SDS in accordance with the SDS Agreement. ie the civil and building infrastructure SDS are to prepare (and have prepared) Procurement Specifications for the E&M Systems elements of ETN).	As 34 above	141

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39 Project Programme	559	39.2	Incorrectly refers to 'Bidders' and "Tenderer's"	tie to correct	tie have advised SDS to review wording in susequent issue of ER Issue closed	142
			reference to PAB Parsons Brinckerhoff rather than SDS?	tie to correct	tie references to Contracting Parties appears to have been deleted - Sheet 770 v3.5a.. SDS wonder how tie are able to determine who is responsible for a particular Programme activity?	143
	624	39.9	Phase refers to SDS Design but nothing for Infraco design, Energisation, Trainng, Testing (Works, Site, Trial Running etc)	tie to correct	tie have advised SDS to review wording in susequent issue of ER* Phase (Sheet 772) now titled Phase Codes (SDS) SDS seek clarification as to what tie are advising. Before Novation.	144
	625	38.1	Again reference to SDS Design but no Infraco Design! No references to other significant WBS activities Procurement, Manufacture, Testing (Works,Site,Trial Running etc) Training, Documentation etc	Coding and phasing to be corrected	tie have advised SDS to review wording in susequent issue of ER SDS still do not see any references to the many other project critical activities other than Construction in what SDS would consider to be part of the necessary WBS SDS still are unable to see any references to Dynamic Tram Testing and commisioning on site (Test Track, power, energisation, training etc).	145
		39.2		Project Programme	Reference is made in the text to delivery being in accordance with the Programme. SDS resquest clarification as to which Programme - is this the Project Programme?	146
	626	39.14	Only SDS Design shown. Lack of recognision that Infraco do design, Tramco do Design. What relevence has Requirments Definition etc to the Infraco?	tie to correct	tie have advised SDS to review wording in susequent issue of ER* SDS see little improvement in the ER V3.6a as the design work to be done by Tramco does not appear to be monitored LBS, WBS,	146
	626	39.14	TTRO's	TTRO's not SDS Scope. Infraco to provide	tie to write* SDS await receipt of this tie letter.	147
40 Maintenance			No comment.		See 59b above	148
				* See tie Project Director (M C) Email to SDS dated 22.02.08 timed at 14.39Hrs in response to SDS comments on v3.1.	SDS await formal confirmation of the contents of this Email as detailed above and the issue of the necessary instructions and change orders from tie to correct the situation.	
				Non compliant - to be interpreted as non-compliant with ER's v3.1, remaining non compliant with v3.6a and v3.6b but compliant with tie/SDS Agreement		

APPENDIX PART 7

Part C - SDS Provider's Report on Infraco Proposals dated 27 March 2008

Infraco Civils Proposals - PB Commentary

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Accommodation Works			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		PB seeks clarification of this statement which is used on many occasions. i.e Which IFC Design has BBS allowed for to construct? Is this the SDS design or some varient which BBS is considering when refering to 'finalising design'
Building (Depot)												x	
Liaison on steelwork design for Depot Building may be required to allow BBS to comply with BAA requirements for notice period to lower crane jibs if BAA require use of the auxiliary runway. Any re-design is unlikely or minimal		Liaise with structural steel subcontractor on design of steelwork, where required, to allow BBS to comply with BAA requirements for notice period to lower crane jibs if BAA require use of the auxiliary runway.										x	BAA risks are assumed to remain with tie
Drainage			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		
Requirements for maximising use of and connection to existing drainage network to be confirmed.		Review and complete design	x	x	x	x	x	x	x	x	x		
Earthworks			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Earthworks Design	x	x	x	x	x	x	x	x	x		

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Requirements for excavation and filling below Earthworks Outline to be designed and specified and assessment of anticipated formation conditions		Standard Details for treatment of low CBR or Stiffness or Soft Material; excavate and replace with class 6, Lime Modification, Geotextiles	x	x	x	x	x	x	x	x	x		PB has carried out sufficient SI /GI to inform the design. With reference to the Scope Split meetings a rolling programme of SI /GI is to be carried out by BBS. PB will provide a suite of treatments which can be applied when the requirements are established by BBS. Note that this scope of work will be impacted by the lower void spanning capacity of BBS's Trackform offering in comparison with the PB reference design.
		Extent; length, width and depth of areas requiring earthworks below Earthworks Outline	x	x	x	x	x	x	x	x	x		
Formation requirements to be confirmed.		CBR or Stiffness Requirements at Formation for Highways and Track	x	x	x	x	x	x	x	x	x		
Requirements for excavation and disposal of contaminated material, and refilling of void, to be designed and specified.		Extent; length, width and depth of areas requiring earthworks below Earthworks Outline and materials to be used for refilling where required	x	x	x	x	x	x	x	x	x		It is assumed that BBS carries the risk associated with the discovery of contaminated land. It is also assumed that BBS carries the risk associated with Archaeological remains.
Special Geotechnical measures, e.g. embankment slope steepening (by selection of fill type, re-inforced earth) cut slope steepening (by slope drains, buttresses, soil nails) soft ground treatment (by surcharging/consolidation, load transfer platforms) to be designed and specified.		embankment slope steepening (by selection of fill type, re-inforced earth) cut slope steepening (by slope drains, buttresses, soil nails) soft ground treatment (by surcharging/consolidation, load transfer platforms) to be designed and specified.	x			x	x	x	x	x	x		

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Design special Geotechnical measures for Gogar Landfill Site. Solution to be dev		Design solution to be developed with BBS Engineers for surcharge embankment with appropriate consolidation period and excavation and replacement in the vicinity of Gogarburn Bridge East Abutment									x		
Geometry			x	x	x	x	x	x	x	x	x		
Horizontal Alignment			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		
Confirmation required that alignment is compatible with CAF Tram DKE and LOD.		Incorporate CAF Tram DKE in Design	x	x	x	x	x	x	x	x	x		Change required to wording. Confirmation required that the CAF Tram is compatible with the alignment.
Landscaping			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		
OLE Foundations			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design	Information from BBS to be issued on OLE poles, including loadings.	Design OLE Foundations	x	x	x	x	x	x	x	x	x		PB is preparing a suite of standard OLE base designs which should cover the requirement
Roads			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Subject to survey, pavement design to be developed and finalised to minimise work scope		Pavement design is to be revised to a plane and re-surface (new regulating and surface course only) when survey information is available and where it confirms the feasability of this design solution Note This activity is an alternative to the Vertical Alignment activity above)	x	x	x	x	x	x	x	x			PB cannot identify where this approach may apply. Clarification sought from tie. Any surveys to be carried out and paid for by BBS.
Further pavement surveys and assessments are required.		GPR and/or Pavement Condition surveys as required by xxxx (above)	x	x	x	x	x	x	x	x			Clarification sought from tie.
Site Clearance			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x		x	x	x	x	x	x		
Design to be completed to IFC status and all design consents and approvals obtained.		Complete Design			x								

Infraco Civils Proposals - PB Commentary

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Sub-station Buildings			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design	Information on Sub-station equipment to be supplied to SDS by BBS	Complete Design	x	x	x	x	x	x	x	x	x		For the purposes of the Infraco Procurment SDS has provided comprehensive procurement information, including detailed and dimensioned drawings, schematics, wiring diagrams, protection diagrams etc all of which are based upon the many tie/tie technical advisors/Transdev and Scottish Power meetings. All substation equipment performance and functionality has been approved by SP as have the equipment layouts within the associated substations which themselves have progressed through planning. Completion of the Sub-station designs is to be a BBS responsibility
Sytems and Power Cable Ducts			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design	Information on cabling requirements to be supplied to SDS by BBS	Design duct group and spacing to accommodate cabling requirements and incorporate information on drawings	x	x	x	x	x	x	x	x	x		Comprehensive SDS cable duct drawings and layouts have been produced based upon the tie approved SDS design and procurement documentation. The cabling requirements may change dependent upon the BBS proprietary solution. Identification of scope and incorporation on drawings to be BBS responsibility

Infraco Civils Proposals - PB Commentary

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Trackform			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design			x	x	x	x	x	x	x	x	x		All Trackform design and development issues are to be the responsibility of BBS. PB provides the horizontal and vertical alignment design together with Civils infrastructure design outwith the Trackform envelope. All design within the envelope is assumed to be the responsibility of BBS. PB (SDS) will not engage in agreement and iapproval in relation to the BBS Trackform design.
Cross sections required to reflect BBS's selected Track System, including minimum track construction depths (top of rail to formation) with corresponding formation condition requirements.	SDS believe that loadings are required to enable them to complete this Design activity	Incorporate BBS selected Trackform on drawings and confirm minimum track construction depth and corresponding formation condition requirement as Pricing Assumption or at some other depth condition measure to be agreed/approved by SDS, BBS, tie and CEC	x										
				x	x	x	x	x	x	x	x	x	
Tramstops			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		
Vertical Alignment			x	x	x	x	x	x	x	x	x		
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Complete Design	x	x	x	x	x	x	x	x	x		
Revise alignment, where possible and where Programme permits for on-street section to minimise Roads work-scope.		Revise, generally raise, vertical alignment of Track	x										It is assumed that PB will complete the SDS Alignment Design as currently agreed and that any changes which are deemed to be possible will be instructed and paid for when they are identified and agreed

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Revise alignment, where possible and where Programme permits to minimise Roads work-scope.		Revise, generally raise, vertical alignment of Track		x	x	x	x						The SDS alignment is designed to accommodate the most economical vertical and horizontal passege of the tram throughout its journey. It should also be noted that any change in the track alignment may impact other aspects of the infrastructure e.g tramstops.
Revised alignment required to facilitate direct fixing of rails to structures and guideway.		Revise, lower, vertical alignment of Track	x						x				Trackform issue - BBS responsibility
Revised alignment required to facilitate direct fixing of rails to structures		Revise, lower, vertical alignment of Track					x	x		x	x		

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Structures **Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design**													
W1 Lindsay Road		Complete Design	x										
S16 Victoria Dock Entrance		Complete Design	x										
S17 Tower Place		Complete Design	x										
S18 Leith Walk Railway		Complete Design		x									
W3 Russell Road (Wall) No 1		Complete Design						x					
W4 Russell Road (Wall) No 2		Complete Design						x					
W18 Murrayfield Tramstop (Wall)		Further GI required to inform Design						x					
S21B Murrayfield Stadium (Wall)		Complete Design						x					
S21C Murrayfield Stadium Underpass		Complete Design						x					
S21D Murrayfield Training Pitches		Complete Design						x					
W8 Baird Drive		-						x					
S22 Balgreen Road (A and B)		-						x					
W9 Balgreen Road (Wall)		Complete Design							x				
S26 South Gyle Access Road		Complete Design							x				
W11 Bankhead Drive Tramstop (Wall)		Complete Design							x				
W19 Gyle Tramstop (Wall)		Complete Design								x			
S29 Gogar Burn		Complete Design									x		
S30, 31 and 34 Gogarburn Culverts 1,2 and 3		Complete Design									x		
W14 and 15 Gogarburn Walls 1 and 2		Complete Design									x		

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Possible Re-design													
S21A Roseburn Street Viaduct								x					
Possible re-design to reduce scope and cost.		Re-Design to 2 separate single span structures with re-inforced earth walled embankments replacing removed spans											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
Further GI required to confirm foundation design.		Further GI, in conjunction with GI for W18 (see above) to ascertain extent of soft layer											
Re-design required to allow cost efficient fabrication of structural steel.	Appoint steelwork sub-contractor	Liaise with BBS and steelwork sub-contractor and re-design/re-detail accordingly											
S21E Water of Leith								x					
Subject to Programme allowance, redesign pier foundations to improve buildability.		Re-design with 2 No larger dia bored piles (mono-piles), one per column. Design a direct connection to the columns, to be made within the pile casing. Pile casings will be cut off at river bed level											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
Re-design required to allow cost efficient fabrication of structural steel.	Appoint steelwork sub-contractor	Liaise with BBS and steelwork sub-contractor and re-design/re-detail accordingly											
S23 Carrick Knowe									x				
Completed design to have foundations outwith Track Support Zone ?		Review and Revise Design											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.

Infraco Civils Proposals - PB Commentary

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
S27 Edinburgh Park Station Viaduct									x				
Possible re-design to reduce scope and cost		Redesign piers with flared tops and/or crossheads so that pre-cast deck beams can be placed without the need for Temporary Works (temporary beam supports)											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
Completed design to have foundations outwith Track Support Zone		Review and Revise Design											
S28 A8 Underpass										x			
Subject to Programme allowance, re-design to incorporate a more economical piling solution along with further GI to confirm ground water regime.		subject to programme allowance, re-design secant piles as contiguous piles											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
Re-design for BT duct crossing (over structure)		re-design section of underpass to facilitate construction under BT duct											
S19 Haymarket Viaduct							x						
Requirements for a design condition survey of the existing wall.													Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
Requirements for special foundations at Pier 4 and Abutment E to be confirmed.													
S20 Russell Road							x						
Possible re-design (subject to programme allowance) of sub-structure to improve buildability													Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.
S32 Depot Access Bridge (or Depot Access Bridges)												x	

Scope of Work	Information from BBS to SDS	Description of Design completion activities	1A	1B	1C	1D	2A	5A	5B	5C	7A	6	PB Comments
Design to be completed to IFC status, all design consents and approvals obtained and BBS will construct IFC Design		Design to be completed from basic information, discussed at meeting on xxxx between BBS and SDS. The DABs are to be 2 separate structures. BBS will work with SDS to develop a cost effective Design											Clarification sought from tie on what has been accepted in relation to this part of the BBS Civils Offer.

APPENDIX PART 8

SDS Hourly Rates

The table of rates for provisional additional work to be used for the pricing of changes to scope is as follows:-

Reference	Role	Hourly Rate
GD	Graduate Designer	£55.00
SD	Senior Designer	£78.00
PD	Principal Designer	£95.00
CT	CAD Technician	£38.00
ST	Senior CAD Technician	£49.00
TS	Technical Support	£38.00

APPENDIX PART 9

LOD Register

Schedule of Works Outwith the LOD

Section	Description	Reference	Source	Temporary or Permanent
1A	Footway along Lindsay Road adjoing Forth Ports area (to be confirmed)	CR253, ULE90130-01-HRL00001, 2	Roads	Permanent
1A	Lindsay Road - required for lowering of Roadway	CR253, ULE90130-01-HRL00001, 2	Roads	Permanent
1A	Lindsay Road Retaining Wall (revised as part of Forth Ports change - to be confirmed with detailed design)	CR253, ULE90130-01-HRL00001, 2	Structures	Permanent
1A	Realigned Ocean Drive and footpath / cycleway	CR253, ULE90130-01-HRL00002	Roads	Permanent
1A	Connection to Access Drive 1 (as part of Forth Ports change - to be confirmed with detailed design)	CR253, ULE90130-01-HRL00002	Roads	Permanent
1A	Connection to Access Drive 2 (as part of Forth Ports change - to be confirmed with detailed design)	CR253, ULE90130-01-HRL00002	Roads	Permanent
1A	Footpath along Scottish and Southern Substation	CR253, ULE90130-01-HRL00002	Roads	Permanent
1A	Realignment of Bus loop at Cruise Berth	CR253, ULE90130-01-HRL00002	Roads	Permanent
1A	Pavements along revised Ocean Drive (to be confirmed due to Forth Ports change)	CR252, 253 ULE90130-01-HRL00002, 3, 4	Roads	Permanent
1A	Ocean Drive 'bypass' road and associated elements, subject to instruction to proceed with layout agreement with Forth Ports / CEC	CR252, ULE90130-01-HRL00004	Roads	Permanent
1A	Rennies Isle Road markings, kerb line, paving	ULE90130-01-HRL00005	Roads	Permanent
1A	Tower Place Bridge - widen to include footpath (to be confirmed with detailed design)	CR 278, ULE90130-01-HRL00005	Structures	Permanent
1A	Tower Place Bridge - steps, ramp, ancillaries	ULE90130-01-HRL00005	Structures / Accommodation works	Permanent
1A	Stanley Casino Car Park - Road Markings, signage, kerbing, fencing, landscaping (to be finalised)	ULE90130-01-HRL00006, 7	Roads / Accommodation works	Permanent
1A	Pavements along Ocean Drive	ULE90130-01-TAL-00002 to 00006	Roads	Permanent
1A	Ocean Drive / Tower Place Paving	ULE90130-01-HRL00006	Roads	Permanent
1A	Casino Car Park	CR254, ULE90130-01-HRL00007	Roads	Permanent
1A	Constitution Street, Tower Street - Road surface / Markings, signal infrastructure, signage, kerbing	ULE90130-01-TAL-00006	Roads	Permanent
1A	Constitution Street, Baltic Street - Road Markings, signage	ULE90130-01-TAL-00007	Roads	Permanent
1A	Baltic Street - closure of the side street (remedial works, signing)	Comments from CEC walkthrough 31 July (A Conway) / ULE90130-01-TAL-00007	Roads	Permanent
1A	Bernard Street - roadworks to tie into existing condition / CEC project	CR259, ULE90130-01-HRL00007	Roads	Permanent / Temporary
1A	Constitution Street, Bernard Street- Road Markings, signage	ULE90130-01-HRL00007	Roads	Permanent
1A	Constitution Street, Mitchell Street - Road Markings, signage	ULE90130-01-HRL00007	Roads	Permanent
1A	Constitution Street, Maritime Lane - Road Markings, signage	ULE90130-01-HRL00007	Roads	Permanent
1A	Constitution Street, Queen Charlotte Street - Road Markings, signage	ULE90130-01-TAL-00008	Roads	Permanent
1A	Street Lighting Section 1A	ULE90130-01-TAL-00001, 00006 to 00009	Lighting	Permanent
1A	Constitution Street east side north of Queen Charlotte Street, opposite Bernard Street Tramstop - paving	ULE90130-01-HRL00008	Roads	Permanent
1A	Constitution Street, Coatfield Lane - paving	ULE90130-01-HRL00008	Roads	Permanent
1A	Constitution Street, Kirkgate - signage and paving	ULE90130-01-HRL00008	Roads	Permanent
1B	FOTW Junction - Road Markings, kerbing, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Great Junction Street - Site clearnace, surfacing	ULE90130-01-HRL00010	Roads	Permanent
1B	Duke Street - Road surfacing	ULE90130-01-HRL00010	Roads	Permanent
1B	Leith Walk, Kirk Street - Road Surfacing	ULE90130-01-HRL00010	Roads	Permanent

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Section	Description	Reference	Source	Temporary or Permanent
1B	Basestation at James Street (Leith Walk area) to provide coverage in and around this area.	HB#40411	SCC	Permanent
1B	Leith Walk, Crown Place - Road Markings, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Leith Walk, Cassalbank Street - Road Markings, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Leith Walk, Crown Street - Road Markings, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Leith Walk, Jane Street - Road Markings, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Leith Walk, Manderston Street - Road Markings, signage	ULE90130-01-TAL-00010	Roads	Permanent
1B	Leith Walk, Springfield Street - Road Markings, signage	ULE90130-01-TAL-00011	Roads	Permanent
1B	Leith Walk Depot - within LLAU		Substation	Permanent
1B	Leith Walk, Steads Place - Road markings	ULE90130-01-HRL00011	Roads	Permanent
1B	Leith Walk, Smiths Place - Road Markings, signage	ULE90130-01-TAL-00011	Roads	Permanent
1B	Leith Walk, Lorne Street - Road Markings, signage	ULE90130-01-TAL-00011	Roads	Permanent
1B	Leith Walk, Jameson Place - Road Markings, signage	ULE90130-01-HRL00012	Roads	Permanent
1B	Leith Walk, Balfour Street - Road Markings, signage	ULE90130-01-HRL00011	Roads	Permanent
1B	Leith Walk, Arthur Street - Road Markings, signage	ULE90130-01-TAL-00012	Roads	Permanent
1B	Leith Walk, Dalmaney Street - Road Markings, signage	ULE90130-01-HRL00013	Roads	Permanent
1B	Leith Walk, Iona Street - Road Markings, signage	ULE90130-01-TAL-00012	Roads	Permanent
1B	Leith Walk, Pilrig Street - Road Markings, signage	ULE90130-01-HRL00013	Roads	Permanent
1B	Leith Walk, McDonald Street - Road Markings, signage	ULE90130-01-TAL-00013	Roads	Permanent
1B	Leith Walk, Brunswick Street - Road Markings, signage	ULE90130-01-TAL-00013	Roads	Permanent
1B	Leith Walk, Gayfield Square - Road Markings, signage	ULE90130-01-TAL-00015	Roads	Permanent
1B	Street Lighting Section 1B	ULE90130-01-TAL-00010 00011 and 00013	Lighting	Permanent
1C	Annadale Street - Road Markings	ULE90130-01-HRL00016	Roads	Permanent
1C	London Road - Road Markings, signage	ULE90130-01-TAL-00015	Roads	Permanent
1C	Ancillary works for closure of Blenheim Place on London Road (to be confirmed)	ULE90130-01-TAL-00015	Roads	Permanent
1C	Union Place - road surfacing	ULE90130-01-HRL00016	Roads	Permanent
1C	interfacing with Central Monitoring Facility (CFM) to extend CCTV coverage to/from that location. This connection will be made from Cathedral Sub-station where it will then be transported via 3rd Party Service Provision such as BT	HB#40411	SCC	Permanent
1C	Picardy Place - road surfacing	ULE90130-01-HRL00015, 16	Roads	Permanent
1C	Broughton Street - road markings	ULE90130-01-HRL00016	Roads	Permanent
1C	Cathedral Substation and associated ducting on Elder Street and Cathedral Lane	ULE90130-01-TAL-00016	Substation / Roads	Permanent
1C	Street lighting along York Place	ULE90130-01-TAL-00016 and 00017	Lighting	Permanent
1C	Queen Street - road markings	ULE90130-01-HRL00017	Roads	Permanent
1C	North East Lane- Road markings, site clearance	ULE90130-01-HRL00017	Roads	Permanent
1C	N St Andrew Lane - Road markings, site clearance	ULE90130-01-HRL00017	Roads	Permanent
1C	Clyde Street - Road markings	ULE90130-01-HRL00017	Roads	Permanent
1C	St Andrew Square - Road markings, site clearance, surfacing	ULE90130-01-HRL00018	Roads	Permanent
1C	George Street - Road markings, site clearance	ULE90130-01-HRL00018	Roads	Permanent
1C	Rose Street - Road surfacing	ULE90130-01-HRL00018	Roads	Permanent
1C	Register Street - Road markings	ULE90130-01-HRL00018	Roads	Permanent
1C	Waverley Bridge - Road markings	ULE90130-01-HRL00018	Roads	Permanent
1C	Meuse Lane - Road markings and surfacing	ULE90130-01-HRL00019	Roads	Permanent
1C	Princes Street east of LOD - Road markings	ULE90130-01-HRL00019	Roads	Permanent
1C	Street Lighting Section 1C	ULE90130-01-TAL-00014 00016, to 00020	Lighting	Permanent
1C	Princes Street, Hanover Street - Road Markings, signal infrastructure, signage, kerbing	ULE90130-01-TAL-00019	Roads	Permanent
1C	Princes Street, The Mound - Road markings, signage	ULE90130-01-TAL-00019	Roads	Permanent
1C	Frederick Street Road works, signage (to be finalised with detailed design)	ULE90130-01-TAL-00019, 20	Roads	Permanent

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Section	Description	Reference	Source	Temporary or Permanent
1D	Charlotte Square - south side - Road Signage	HB#71652, ULE90130-01-TAL-00021	Roads	Temporary or Permanent
1D	Charlotte Square junction with South Charlotte Street - Road Signage	HB#71652, ULE90130-01-TAL-00021	Roads	Temporary or Permanent
1D	Princes Street, South Charlotte Street - Road Markings, signal infrastructure, signage, kerbing	ULE90130-01-TAL-00021	Roads	Permanent
1D	Princes Street, Lothian Road - Roadmarkings, signage and kerbing	ULE90130-01-TAL-00022	Roads	Permanent
1D	North side of Princes Street opposite junction with Lothian Road - Road signage	HB#71652	Roads	Permanent
1D	Northern end of Lothian Road - Road Signage	HB#71652	Roads	Temporary or Permanent
1D	Princes Street, Queensferry Street - Road markings, signage, kerbing	ULE90130-01-TAL-00022	Roads	Permanent
1D	Basestation at Edinburgh Castle (an existing radio site that gives coverage to an large portion of the Tram Network for radio coverage and towards any future requirements)	HB#40411	SCC	Permanent
1D	Street Lighting - Section 1D	ULE90130-01-TAL-00021 00023 and 00024	Lighting	Permanent
1D	Canning Street - Road markings, signage, taxi stance	ULE90130-01-TAL-00023	Roads / TRO	Permanent
1D	Atholl Crescent, Canning Street - Road markings, signage	ULE90130-01-HRL00023	Roads	Permanent
1D	Atholl Crescent, Canning Street Lane - Road markings, signage	ULE90130-01-HRL00023	Roads	Permanent
1D	Manor Street - Road markings, signage, signal infrastructure	ULE90130-01-HRL00023	Roads	Permanent
1D	Palmerston Place - Road markings, signage, signal infrastructure	ULE90130-01-HRL00023	Roads	Permanent
1D	Palmerston Place opposite junction with Palmerston Place Lane - Road signage	HB#71652	Roads	Permanent
1D	Palmerston Place at junction with West Maitland Street - Road signage	HB#71652	Roads	Permanent
1D	South end of Manor Place - Road Signage	HB#71653	Roads	Permanent
1D	Atholl Crescent Lane - Road markings	ULE90130-01-TAL-00023	Roads	Permanent
1D	West Maitland Street, Manor Place - Road markings, signage, lighting, signal infrastructure	ULE90130-01-TAL-00023	Roads / Lighting	Permanent
1D	Clifton Terrace, Morrison Street - Road markings, lighting, signage, signal infrastructure	ULE90130-01-TAL-00024	Roads / Lighting	Permanent
1D	Clifton Terrace, Grosvenor Street - Road markings, signage, kerbing	ULE90130-01-TAL-00024	Roads	Permanent
1D	Clifton Terrace, Dalry Road - Road markings, signage	ULE90130-01-TAL-00024	Roads	Permanent
1D	Torphican Place / Palmerston Place to two-way and street lighting	CR258	Roads	Permanent
1D	Torphichen Street - Road markings, signage, signal infrastructure	ULE90130-01-HRL00023	Roads	Permanent
1D	Torphichen Place - street lighting	ULE90130-01-HRL00023	Lighting	Permanent
1D	Morrison Street - Road markings, signage, signal infrastructure	ULE90130-01-HRL00024	Roads	Permanent
1D	Morrison Street close to junction with the Morrison Link - Road signage	HB#71652	Roads	Permanent
1D	Northeast end of Dalry Road - Road signage	HB#71652	Roads	Permanent
1D	Dalry Road (opposite Caledonian Place) - Road signage	HB#71652	Roads	Permanent
1D	Relocation of taxi stances (to be confirmed upon instruction to work outwith LOD)	To be confirmed upon instruction from tie	Roads	Permanent
1D	Approach signing (A8, Dalry Road, Palmerston Place, Lothian Road, South Charlotte Street)	To be confirmed upon instruction from tie	Roads	Permanent
Section Wide	TRO Requirements	To be confirmed upon detailed design	TRO	Permanent
Section Wide	Wider area works (to be finalised upon issuance of VO)	To be confirmed upon instruction from tie	Roads	Permanent
Section Wide	Traffic Calming - Haymarket Area (to be finalised upon issuance of VO)	To be confirmed upon instruction from tie, CR 315	Roads	Permanent

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Section	Description	Reference	Source	Temporary or Permanent
2A	Street Lighting Section 2A	ULE90130-02-OLE-00001	Lighting	Permanent
2A	OLE Section 2A - feed	ULE90130-02-OLE-00002	OLE	Permanent
2A	Drainage connection point at Haymarket Yards (2A-2)	HB# 59917	Ralph Shackleton	Permanent
2A	New access to east of Haymarket Tramstop - road markings and kerb / road works outside LOD within LLAU	02-HRL-00100	Roads	Permanent
2A	Haymarket Terrace north of Citypoint road kerb / markings outside LOD	02-HRL-00100	Roads	Permanent
2A	Haymarket Terrace north of Citypoint road sign outside LOD	02-HRL-00100	Roads	Permanent
2A	Haymarket Terrace north of Citypoint ped signals on north side outside LOD	02-HRL-00501	Roads	Permanent
2A	Haymarket Terrace north of Citypoint Limit of Construction outside LOD	02-HRL-00001	Roads	Permanent
2A	Haymarket Terrace north east Haymarket Tramstop ped signals and pavement on north side outside LOD	02-HRL-00501	Roads	Permanent
2A	Haymarket car park - kerbs / markings outside LOD - within LLAU	02-HRL-00501	Roads	Permanent
2A	Haymarket car park - ducting outside LOD - within LLAU	02-HRL-00801	Roads	Permanent
2A	Road / access south of ICAS Building - road markings and surfacing outside LOD within LLAU	02-HRL-00501 and 00901	Roads	Permanent
2A	Road / access south of ICAS Building -Limit of Construction outside LOD within LLAU	02-HRL-00001	Roads	Permanent
2A	South east of ICAS Building - sign outside LOD	02-HRL-00501	Roads	Permanent
2A	South west end of Haymarket Yards - Limit of Construction outside LOD but within LLAU	02-HRL-00002	Roads	Permanent
2A	South west end of Haymarket Yards - Dropped kerb partly outside LOD but within LLAU	02-HRL-00902	Roads	permanent
2A	West arm of Roseburn Delta Junction - Limit of Construction outside LOD and LLAU	02-HRL-00501	Roads	Permanent
2A	road and retaining wall at the back of Verity House, on NWR land for new access road outwith LoD and LLAU due to NWR Platform zero retaining wall and fencle line encroaching into the LLAU	02-HRL-00002	Roads	Permanent
3A	Street Lighting - Wester Coates Terrace & Easter Drylaw Drive (within LLAU)	ULE90130-03-LTG-00002 and 00009	Lighting	Permanent
3A	Roads - Proposed footpath to Telford Drive (within LLAU)	03-HRL-00909		Permanent
3A	Roads - Roseburn Terrace - Road/ped. crossing markings	03-HRL-00100		Permanent
3A	Roads - Roseburn Terrace - ped. crossing cabling (within LLAU)	03-HRL-00800		Permanent
3A	Landscaping - West of Roseburn Tramstop - proposed landscaping	HB# 51851	LHMP	Permanent
3A	Structures - Coltbridge Viaduct - Proposed cantilevered walkway extends over airspace of LLAU (<1m)			Permanent
3A	Roads - Queensferry Road - Tying in kerbs at south kerb (east side)	03-HRL-00008		Permanent
3A	Roads - Wester Coates Terrace - Road surfacing/sign (within LLAU)	03-HRL-00502 and 00902		Permanent
3A	Substation/Roads - South Groathill Ave Sub - drop kerb	03-HRL-00507		Permanent
3A	Roads - Maidencraig Crescent - New ped. access proposed signage	03-HRL00506		Permanent
3A	Roads - Maidencraig Crescent - New ped. access (within LLAU)	03-HRL00906		Permanent
3A	Landscaping Outwith LOD at Maidencraig Crescent	HB# 51851	LHMP	Permanent
3A	Tramstops - Craigleith Tramstop - tactile paving for stepped ped. access	03-STP-00027		Permanent
3B	Street Lighting - Ferry Rd & West Granton Rd - proposed lighting	ULE90130-03-LTG-00011 and 00014	Lighting	Permanent
3B	Drainage connection point (3B-1)	HB# 59917	Ralph Shackleton	Permanent

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Section	Description	Reference	Source	Temporary or Permanent
3B	Roads - Ferry Road east and west of tramway - junction detector loops	03-HRL-00011		Permanent
3B	Roads - West Granton Road east and west of tramway - junction detector loops	03-HRL-00014 & 00831		Permanent
3B	Substations - Granton Mains East substation (within LLAU)			Permanent
3B	Roads - footpath from West Granton Access to West Pilton March (partially extends into LLAU from LoD)	03-HRL-00014		Permanent
3C	Street Lighting - Lighting column to south side of Waterfront Avenue, East of tram crossing	ULE90130-03-LTG-00016	Lighting	Permanent
3C	Drainage connection point (3C-1)	HB# 59917	Ralph Shackleton	Permanent
3C	Drainage connection point (3C-2)	HB# 59917	Ralph Shackleton	Permanent
3C	Junction 104 - Road markings & kerb re-alignment	03-HRL-00016		Permanent
3C	Roads - Junctions 105-108 - Road markings/HF surfacing, kerb re-alignment ped. crossing & traffic signal detector loops	03-HRL-00016 to 00018		Permanent
3C	Roads - Junctions 105 - Crown re-grading of Waterfront Avenue to both sides of the tramway crossing			Permanent
3C	Roads - Junction 108a (north of) - Road markings, kerb re alignment & traffic signal detector loops	03-HRL-00018 and 00867		Permanent
3C	Roads - Junction 108b (north of) - Road markings, kerb re alignment & traffic signal detector loops	03-HRL-00018 and 00865		Permanent
3C	Tramstops - Caroline Park - landscape tie-in	03-STP-00061		Permanent
3C	Tramstops - Saltire Square - paving tie-in	03-STP-00071		Permanent
3C	Roads - Junction 109 - Kerb line (partially) for stopped-up Oxcraig Street	03-HRL-00018		Permanent
3C	Roads - Oxcraig Street signage	03-HRL-00564		Permanent
3C	Roads - Junctions 110 - Road markings/HF surfacing, re-grading, kerb re-alignment ped. crossing & traffic signal detector loops	03-HRL-00019		Permanent
3C	Substation - Granton View Substation (within LLAU)			Permanent
3A	Landscaping design - west of Rosebum Tramstop (within LLAU)			
3A	Structures - cantilever walkway to west side of Coltbridge Viaduct (in mid-air)			
3A	Landscaping - between Craigleith Tramstop and Maidencraig Crescent/Maidencraig Court			
3A	Roads - Stepped access from Telford Drive to Rosebum Cycle/footway to north of existing substation			
3A	Lighting - erection of lighting column on footpath between Rosebum Corridor/Easter Drylaw Drive (within LLAU)			
3A	Landscaping - Drylaw Recreation ground			
3B	Roads - realignment (vertical/horizontal) of footpath from West Pilton March to West Granton Road (within substation LLAU) where LOD is too narrow.			
3B	Roads - Creation of public space. Extension of footpath design and width beyond LOD into substation LLAU, including design of low level wall at northeast corner of LLAU for Granton Mains East substation.			
3C	Roads - crown regrading of road for short distance beyond LoD at both crossings of Waterfront Avenue			
3C	Spine Road - Tram route crosses Spine Road where LOD is too narrow. New traffic islands, signal heads and road markings outwith LOD			
3C	Roads - installation of traffic signalisation, road markings for 3 no. minor access roads to north side of Waterfront Avenue (Spine Road) and associated pedestrian crossing points			

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Section	Description	Reference	Source	Temporary or Permanent
3C	Roads - installation of pedestrian crossing signalisation at corner of junction of Waterfront Avenue/West Harbour Road and associated pedestrian crossing point tactile paving and kerbing			
3C	Roads - Chestnut Street, road markings			
3C	Roads - installation of traffic signalisation at junction of West Harbour Road/Pickfords entrance and associated pedestrian crossing point tactile paving. Relocation of existing gated access (boundary and accomodation)			
3C	Roads - regrading of southern 50m (approx.) of Middle Pier Road and footways			
3C	Granton Square - bus interchange			
5A	Street Lighting Section 5A	ULE90130-05-LTG-00001 to 00003	Lighting	Permanent
5A	OLE Section 5A - feed	ULE90130-05-OLE-00001	OLE	Permanent
5A	Russell Road and sorting office boundary - Limit of Construction outside of LOD but within LLAU	05-HRL-00002	Roads	Permanent
5A	To east of offices near Haymarket Central Junction - Limit of Construction outside LOD and LLAU	05-HRL-00002	Roads	Permanent
5A	Kerb / road works and Limit of Construction to the south of the Bowling Green outside LOD - most within LLAU	05-HRL-00002	Roads	Permanent
5A	Kerb / road works and Limit of Construction to the north of Murrayfield Tramstop including new footway and ped crossing outside LOD - some within LLAU	05-HRL-00002 800 and 902	Roads	Permanent
5A	**Murrayfield** Temporary- replacement/maintenance of existing Scotrail fence on the outbound platform to be undertaken on the boundary of the LOD.	#70512	Ian Brown	Temporary
5A	Murrayfield Training pitch moves		Ian Brown	Permanent
5A	Turnstiles at Murrayfield Stadium - Accomodation works	ULE90130-05-ACC-00034	Mungo Stacy	Permanent
5B	Street Lighting Section 5B	ULE90130-05-LTG-00009, 00011, 00012, 00014, 00018 and 00019	Lighting	Permanent
5B	**Carrick Knowe** Earthworks north of railway spill outwith LoD as advised by CEC - do not build retaining wall - this is CEC Leisure land.	ULE90130-05-	David Raeside	Permanent
5B	**Saughton:** Permanent - 2 proposed foothpaths are being introduced to provide access to tramstop.These are introduced either end of stop southwards to join existing foothpath on Broomhouse Drive.These are completely outside the LOD but there is the need to provide pedestrians access to the tram without having to constrain them to using the access within LOD on Saughton Road North.(see attached PDF). Limit of Construction - 2 Footpaths are being demolished - outside the LOD but within the LLAU.	#70512 05-HRL-00010, 11 and 12	Ian Brown	Permanent
5B	Saughton Tramstop - landscape tie in	05-STP-00027	John Ramsay	Permanent
5B	We are proposing to relocate two bus stops on Bankhead Avenue (opposite South Gyle Access). Current and proposed locations are outside of the LoD. Ie Limit of Construction outside the LOD	ULE90130-05-HRL-00015	Roads	Permanent
5B	Immediately SE of South Gyle Tramstop - Limit of Construction and road markings outside LOD some in LLAU	ULE90130-05-HRL-00015 and 00134	Roads	Permanent
5B	South Gyle Tramstop - associated Pedestrian crossing	05-STP-00036	Roads	Permanent
5B	Bankhead Drive SE of South Gyle Access - Limit of Construction and road works outside LOD	ULE90130-05-HRL-00015 and 00135	Roads	Permanent
5B	Edinburgh Park Station - zone behind outbound platform-interface works with NR land	HB#70467	Ian Brown	Permanent
5B	Edinburgh Park Station Tramstop - paving tie in	05-STP-00048	Ian Brown	Permanent

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Section	Description	Reference	Source	Temporary or Permanent
5B	Edinburgh Park Station - Permanent Works - Remodelled access footpath link to Currys to be constructed outside the LOD but within the LLAU. Limit of Construction outside the LOD some within LLAU	HB #72057 05-HRL-00018	Ian Brown	Permanent
5B	East of Junction 202A - Roadworks / marking / footway relaignment outside LOD	05-HRL-00132 00943	Roads	Permanent
5B	West of Junction 202A - limit of Construction outside the LOD/LLAU	05-HRL-00017	Roads	Permanent
5B	Bollard outside LOD (only just)	05-HRL-00535	Roads	Permanent
5B	Bankhead Drive / Bankhead Avenue Traffic Signals and Associated Ducting outside the LOD some within LLAU.	05-HRL-00834	Roads	Permanent
5B	Bankhead Drive substation - limit of Construction outside the LOD some within LLAU.	05-HRL-00014	Roads	Permanent
5B	Bankhead Drive substation - road realignmentoutside the LOD some within LLAU	05-HRL-00014	Roads	Permanent
5B	Bankhead Drive junction - limit of Construction outside the LOD some within LLAU.	05-HRL-00017	Roads	Permanent
5B	Stenhouse Drive - road markings outside the LOD and LLAU	05-HRL-00009	Roads	Permanent
5B	Stenhouse Drive - pavement works outside the LOD and LLAU	05-HRL-00934 and 00935	Roads	Permanent
5C	Street Lighting Section 5C	ULE90130-05-LTG-00022, 00023, 00025 and 00026	Lighting	Permanent
5C	Edinburgh Park- relocation works to the footpath link ramped structure	HB#70467	Ian Brown	Permanent
5C	Edinburgh Park- Limit of Construction re above relocation works to the footpath link ramped structure	05-HRL-00021	Ian Brown	Permanent
5C	Trees planting outwith LoD at NEL's request north of Lochside ave	HB#70468	Kate Shudall	Permanent
5C	South west of Gyle Tramstop - kerb realignment outside LOD - within LLAU	05-HRL-00563	Roads	Permanent
5C	Gyle Tramstop - landscape tie in	05-STP-00004	Roads	Permanent
5C	South of Gyle Tramstop - ducting outside LOD - some within LLAU	05-HRL-00861	Roads	Permanent
5C	South of junction of Lochside Crescent Lochside Avenue - footway works outside LOD	05-HRL-00962	Roads	Permanent
5C	East of junction 205 - Limit of Construction outside LOD	05-HRL-00023	Roads	Permanent
5C	Northwest of junction 205 - Limit of Construction outside LOD - within LLAU	05-HRL-00023	Roads	Permanent
5C	East end, north side of Lochside Avenue - sign outside LOD	05-HRL-000562	Roads	Permanent
5C	South east and north of Gogarburn Tramstop - Limit of Construction outside LOD some within LLAU	05-HRL-00026	Roads	Permanent
5C	Depot Earthworks - potentially soil nails will be required outwith the LOD - underneath the A8 Underpass - TBC	TBC	David Raeside	Permanent
6	Gogarburn Roundabout - Signage outside LOD some in LLAU	06-HRL-00007	Roads	Permanent
6	Junction 208 Signs outside LOD some in LLAU (in centre of roundabout, depot access and w of junction)	06-HRL-00501	Roads	Permanent
6	Junction 208 - ducting outside LOD but within LLAU	06-HRL-00800	Roads	Permanent
6	Gogarburn Roundabout Safety Barrier, footway works outside LOD but within LLAU	06-HRL-00901	Roads	Permanent
6	Gogarburn Roundabout - Limit of Construction outside LOD but within LLAU	06-HRL-00001	Roads	Permanent
6	Gogarburn Depot - Limit of Construction outside LOD some within LLAU some outside	06-HRL-00002	Roads	Permanent
5C	Constuction work of Gyle tramstop retaining wall to be undertaken outside the LOD.	HB #70741	Andy Groves	Temporary
5C	Drainage connection point (5C-2) on South Gyle Broadway	HB# 59917	Ralph Shackleton	Permanent
5C	Temporary works to construct the A8 Underpass required due to Utility routes and diversions	HB#70402 HB#70403	Paul McQuade	Temporary

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Section	Description	Reference	Source	Temporary or Permanent
5C	Earthworks/construction work to be undertaken outside the LOD (but within the LLAU). This is to remove earth bund on current Gogarburn tramstop location in order to achieve the level which the Pway design has been based on	HB #70741	Ian Brown	Temporary
5C	LOD issue at Gogarburn. Options are highlighted below (refer source for sketches): - ask tie to amend the LOD/LLAU as the present location of the foothpath is the "natural desire line" for pedestrians (Option 1) - ammend the footpath to follow the back of the LOD as shown in Option 2 (although it is not preferred). -get the road moved eastwards and narrow the foothpath (Option 3)	HB #72056	Ian Brown	Permanent
7A	Earthworks may be requried to go outwith the LOD at the Gogar Landfill site due to extent of contaminted land	TBC	David Raeside	Permanent
7A	Earthworks may be requried to go outwith the LOD along NIL and FSH land	TBC	David Raeside	Permanent
7A	Street Lighting Section 7A	ULE90130-07-LTG-00007 and 00008	Lighting	Permanent
7A	Any works to outfalls eg headwalls and scour protection, may be outside the LOD since the LOD follows the water line on the West bank.	HB# 59917	Ralph Shackleton	Permanent
7A	Badger fencing along Gogar Farm Access Road	ULE90130-SW-ENV-00038	Kat Dennis (HB#69860)	Permanent
7A	Marking out of badger and otter exclusion areas during construction works	ULE90130-SW-ENV-00037, ULE90130-SW-ENV-00040, ULE90130-SW-ENV-00047	Kat Dennis (HB#69860)	Temporary
7A	Archaeological Investigation Works around Nether Gogar (Church, old mill and pill box sites) as specified in the "Edinburgh Tram: Specification for Archaeological Works Line 2" and drawings ULE90130-07-DRG-00072, ULE90130-07-DRG-00073, and ULE90130-07-DRG-00074. This report has not yet been formally issued to tie but is expected to be finalised by the end of next week following a review by CEC archaeologist John Lawson.	Edinburgh Tram: Specification for Archaeological Works Line 2 and drawings ULE90130-07-DRG-00072, ULE90130-07-DRG-00073, and ULE90130-07-DRG-00074	Kat Dennis (HB#69860)	Temporary
7A	Badger fencing (temporary) across the unfenced section of the A8 south of the Gogar Drain as specified in the parliamentary agreement with the Edinburgh and Lothians Badger Group (subject to agreement with the landowner) - see extract in KD email (HB# 69860).	ELBG Agreement	Kat Dennis (HB#69860)	Temporary
7A	Airport Tramstop - Kiosk and ticketing facility and pedestrian links	CNS109	Ian Brown	Permanent
Line 2	There may be some localised works along the Network rail corridor outwith the LoD between the Tram route and the Network rail lines, although this may be minimal.	HB#70402	Paul McQuade	Temp & Perm
7A	Gogar Farm Access Road - Limit of Construction outside LOD some within LLAU	07-HRL-00003	Roads	Permanent
7A	Gogarburn Tramstop - Limit of Construction outside LOD some within LLAU	07-HRL-00001	Roads	Permanent
7A	Ingliston Park and Ride - Limit of Construction ouside LOD some within LLAU	07-HRL-00007	Roads	Permanent
7A	Hilton Hotel - works to car park (including kerb and marking alterations) outside LOD some within LLAU some outside	07-HRL-00800 / 00507	Roads	Permanent

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Director/Authorised Signatory
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