

20.5

tie Remediable Termination Notice in respect of Design
Trackwork and Responses thereto.

Bilfinger Berger UK Limited EDI			
Date Received	08 SEP 2010	Scanned	
File Number			
Action			
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FAO Mr Martin Foerder
 Bilfinger Berger – Siemens – CAF Consortium
 9 Lochside Avenue
 Edinburgh Park
 Edinburgh
 EH12 9DJ

Our Ref: INF-CORR 5995

Date: 8 September 2010

Dear Sirs

**INFRACO CONTRACT
 REMEDIABLE TERMINATION NOTICE
 INFRACO DEFAULT (a): DESIGN:TRACKWORKS**

Enclosed is a Remediable Termination Notice in respect of Infraco Default (a) under the Infraco Contract.

We look forward to receiving your rectification plan within 30 Business Days of the date of this Remediable Termination Notice.

Yours faithfully,



Steven Bell
Project Director Edinburgh Trams

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REMEDIABLE TERMINATION NOTICE

INFRACO DEFAULT (a): DESIGN: TRACKWORKS

1. Infraco Default (a)

1.1 The Infraco has failed to deliver a fully integrated, assured design for the on-street trackworks (chainage 100000 to chainage 131247), in breach of its obligations under the Infraco Contract, including pursuant to:

- 1.1.1 Clause 7.1 - to carry out and complete the Infraco Works fully and faithfully in accordance with the Infraco Contract;
- 1.1.2 Clause 7.2 - to ensure that, in carrying out and completing the Infraco Works, the Infraco exercises a reasonable level of professional skill, care and diligence to be expected of a properly qualified and competent professional contractor experienced in carrying out works and services of a similar nature to the Infraco Works in connection with projects of a similar scope and complexity;
- 1.1.3 Clause 8.1.6 - to ensure that certain key elements of the system integration of the Infraco Works are implemented, including ensuring that safety assurances and the Case for Safety will be achieved at the issue of a Certificate of Sectional Completion;
- 1.1.4 Clause 8.5 - to ensure that all elements of design (which form part of the Infraco Works) relative to the Edinburgh Tram Network ("ETN") are compatible with system integration and to make qualified personnel available to ensure system integration throughout the Term;
- 1.1.5 Clause 10.9 - to ensure that the Deliverables fulfil the requirements of the Infraco Contract and meet the needs of Approval Bodies (as defined under the Infraco Contract);
- 1.1.6 Clause 11.3 - to procure that the SDS Provider shall carry out and complete the SDS Services in accordance with the SDS Agreement;
- 1.1.7 Paragraph 2.8.1 of Part C of Schedule Part 14 (*Design Review Procedure*) - to provide a Design Assurance Statement along with each design package;
- 1.1.8 Sections 3.6.1 of Schedule Part 2 (*Employer's Requirements*) - to achieve the Deliverables necessary to enable the ETN to be constructed, tested and commissioned and brought into commercial service and consistent with the requirements for the Case for Safety;
- 1.1.9 Section 3.6.1 of Schedule Part 2 (*Employer's Requirements*) - to approach the design 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;
- 1.1.10 Section 3.6.2 of Schedule Part 2 (*Employer's Requirements*) - to undertake such supplementary analysis that will allow further development of the Case for Safety

concurrent with any design undertaken to prove that the ETN is acceptably safe;
and

1.1.11 Section 17.2.6 of Schedule Part 2 (*Employer's Requirements*) - to design and execute the Infraco Works using safety management and procedures to demonstrate that the ETN is safe to introduce into service as defined by the Safety Management System under the Railway and Other Guided Transport Systems (Safety) Regulations 2006 ("ROGS"), to develop the Case for Safety to the satisfaction of the Competent Person and the Project Safety Certification Committee; and to undertake all Infraco Works in accordance with tie's written safety verification scheme requirements.

1.2 Individually and cumulatively, these breaches materially and adversely affect the carrying out and completion of the Infraco Works.

1.3 This is an Infraco Default (a) under the Infraco Contract.

2. Nature of Infraco Default which requires to be rectified

2.1 Pursuant to the Infraco Contract

2.1.1 the scope of the Infraco Works includes all aspects of design (excluding utilities design);

2.1.2 the Infraco is obliged to achieve complete system integration under the Infraco Contract;

2.1.3 in order for the Infraco to obtain a Permit to Commence Works from tie for any Designated Working Area, the Infraco must identify the necessary third party approvals and controls;

2.1.4 the Review Procedure (Schedule Part 14 of the Infraco Contract) envisages an integrated design and the delivery of Design Assurance Statements for each design package;

2.1.5 the Employer's Requirements are clear that system integration (spanning all elements of the Infraco Works, including design) is a fundamental part of the Infraco Contract; and

2.1.6 delivery of an integrated and assured design forms part of the necessary requirements in order for the Infraco to complete their Case for Safety.

2.2 Under the SDS Agreement (and the SDS Novation Agreement), the SDS Provider is required to perform its design obligations in order to feed in to the Infraco's responsibilities in relation to design integration, including ensuring that all elements of the design relative to the ETN are compatible with system integration.

2.3 Despite the Infraco having constructed approximately one kilometre of on-street trackworks between Lothian Road and Waverley Bridge, the Infraco has not delivered an integrated, assured, design for these on-street trackworks. As a consequence, tie does not have an integrated, assured, design as it ought to have from the Infraco and tie is unable to issue a Permit to Commence Works pursuant to the Code of Construction Practice for on-street trackworks.

2.4 Despite the Infraco being able to enter and remain upon Designated Working Areas (as most recently illustrated in letter from tie dated 2 September 2010 (reference: INF CORR 5860)) for the purpose of constructing the Infraco Works, the Infraco's breach of its design obligations by not delivering an integrated, assured, design prevents tie from issuing Permits to Commence Works for on-street trackworks.

3. Material and Adverse Effect

3.1 The said on-street trackworks are critical to the substantial completion of Section C of the Infraco Works. The failure to have a Permit to Work for these on-street trackworks has a material and adverse effect on the carrying out and completion of the Infraco Works.

3.2 The Infraco's failures interfere with tie's rights to be able to demonstrate to the Independent Competent Person that the requirements of ROGS are being met, as there is no complete, integrated and assured design for the on-street trackworks.

3.3 The Infraco's failures interfere with tie's rights pursuant to the Infraco Contract (including Section 37 of the Employer's Requirements) to be provided with a totally integrated ETN with all systems, subsystems and interfaces working efficiently and harmoniously together as one and which is able to be operated and maintained in full compliance with the requirements of the ETN and appropriate Consents and which satisfies the Infraco's system integration responsibility throughout all phases of the Infraco Works and which is successfully integrated with the equipment and substations being provided by the Infraco Parties and others, and which is the result of a design co-ordination system and subsystem development function between contracts.

3.4 Individually and cumulatively, the Infraco's breach has a material and adverse effect on the carrying out and completion of the Infraco Works.

4. Relevant Correspondence

4.1 The lack of an integrated, assured design has been the subject of much discussion between the Parties and it is understood between the Parties that the Infraco has not delivered an integrated, assured design as at the date of this Remediabale Termination Notice. The lack of an integrated, assured design has been verbally admitted by the Infraco and has been referred to in writing (including, for example, email exchange between Steven Bell and Miguel Berrozpe, entitled "Design Assurance", dated from 2 July 2010 until 5 July 2010 and email exchange between Anthony Rush and Miguel Berrozpe, entitled "Trackform Workshop", dated 11 August 2010 and 30 August 2010). The lack of an integrated, assured design has been the subject of correspondence between the Infraco and the SDS Provider (including letter from the Infraco to the SDS Provider dated 28 May 2010, reference: 25.1.201.CBr.2707).

4.2 The Nichols Audit Report dated 1 March 2010 states the findings of the Audit on Design Assurance, System Integration and Best Value which was carried out on 28 January 2010. This Report was communicated to the Infraco by letter on 10 March 2010 (reference: INF CORR 4510/RB). This Report recognises that as at that date there is no assured, integrated design and there is no integrated design programme being maintained and utilised by the Infraco.

4.3 The Infraco's letter (ref: 25.1.201/BDo/5937) of 9 June 2010 admitted that the works carried out to Section 1C/D (i.e. on Princes Street) are not in accordance with the Infraco Contract and acknowledged that there is no integrated, assured design for the works.

- 4.4 The Infraco has failed to take steps to rectify their failure after being asked to by tie, including by the following correspondence:

Date	Reference
8 April 2010	INF CORR 4736
24 May 2010	INF CORR 5133
15 June 2010	INF CORR 5346
18 June 2010	INF CORR 5400

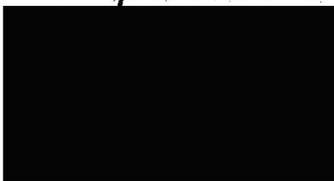
- 4.5 The Infraco has failed to attend workshops held on the following dates to seek to rectify their failure:

Date	Workshop title
11 August 2010	Trackform Workshop

5. Rectification Plan

- 5.1 tie looks forward to receipt of a comprehensive rectification plan from the Infraco addressing this Infraco Default (a) within 30 Business Days of the date of this Remediable Termination Notice.

for and on behalf of tie Limited



Project Director

8 September 2010 Date



~~For The Attention of Martin Foerster~~
Project Director
Bilfinger Berger Siemens CAF Consortium
~~9 Lochside Avenue~~
~~Edinburgh Park~~
~~Edinburgh EH12 9DJ~~

Our Ref: INF CORR 6466

Your Ref: ETN(BSC)tiesc&ABC
#502181

Our Ref: INF CORR 5995

Date: 15th October 2010

Dear Sirs

**Edinburgh Tram Project – Infraco Contract
Remedial Termination Notice (~~Design Trackwork~~)**

We refer to your letter reference ~~ETN(BSC)TIESC&ABC#052181~~ and our Remedial Termination Notice served in accordance with Clause 90.1.2 under cover of our letter INF CORR 5995 dated 8th September 2010.

We note your intention to submit a rectification plan to address the Infraco Default and your request for an extension of 5 Business Days. ~~tie~~ agrees to your request and we look forward to receiving your rectification plan on or before the 26th October 2010.

Yours faithfully



Steven Bell
Project Director – Edinburgh Tram

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CEC02084522_0007

Our ref: ETN(BSC)TIE=T&ABC#052171
Your ref: INF CORR 5995

Bilfinger Berger-Siemens-CAF
Consortium

26 October 2010

Bilfinger Berger Civil EDI		
Date Sent	26 OCT 2010	BW
File Number		
Action		
Distribution		

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For the attention of Steven Bell – Project Tram Director

Dear Sirs

**Edinburgh Tram Network Infraco
Infraco Contract: Alleged Remediable Termination Notice (Design: Trackworks)**

We refer to your letter dated 8 September 2010 (INF CORR 5995) which purports to enclose a Remediable Termination Notice in relation to matters associated with Infraco's obligations to deliver a fully integrated, assured design for the on-street trackworks under the Infraco Contract.

As at the date of writing you have served Remediable Termination Notices in respect of a total of 10 matters. None of these matters have been the subject of referrals to dispute resolution. It appears to us that tie has abandoned the contractual mechanism for resolution of disputes. This may be because every major issue of principle has been decided against tie in adjudication. However, that is no justification for now abusing the termination provisions of the contract. It is clear that tie is now pursuing a policy of serving a Remediable Termination Notice in respect of each and every grievance it may have, regardless of the significance of each grievance and its implications for the Infraco Works. Whilst we will respond to each Remediable Termination Notice in turn, we object to tie's adoption of this policy.

For the avoidance of doubt this letter does not nor is it intended to constitute a rectification plan. While we do not consider that the allegations set out in the Notice are true or constitute an Infraco Default, we will submit a rectification plan under separate cover on even date of this letter to comply with the extension of time granted by you under cover of letter dated 15 October 2010 (INF CORR 6466).

We summarise our response to the Notice as follows:

1. The Notice does not identify a breach or breaches of contract by Infraco.
2. The alleged breach or breaches do not materially and adversely affect the carrying out and/or completion of the Infraco Works.
3. The Notice does not therefore identify an Infraco Default (a).
4. Your letter does not therefore constitute a valid Remediable Termination Notice.
5. Any attempt to terminate the Infraco Contract on the basis of this alleged Notice will be entirely without contractual basis.

This is further explained as follows:

1. No Breach of Contract

The Notice alleges a number of breaches which are unfounded and it is far from clear in specifying what factual circumstances give rise to the alleged breaches of contract. We have done our best to interpret the basis of the allegations made. Following this analysis, we consider that the alleged breaches of contract appear to fall into three categories:

- (a) Failure to ensure management of the SDS Provider;
- (b) Failure to ensure System Integration and provide a Case for Safety;
- (c) Failure to observe duty of care and general obligations.

We shall deal with each of these matters in turn.

1.1 Failure to ensure management of the SDS Provider (Clause 11.3)

You do not detail the specific respects in which you consider that we are in breach of our obligations under Clause 11.3, accordingly it is difficult to address this allegation. We note that you refer, as "relevant correspondence", to a letter from Infraco to the SDS Provider dated 28 May 2010 reference: 25.1.201.CBr.2707. This letter was in fact dated 28 May 2009 so is more than 17 months old and the issues identified within it have been addressed.

The BSC Design Management Plan and Systems Integration Plan sets out the approach we have taken to management of the SDS Provider. We have complied with and continue to fully comply with the terms of these plans. Compliance has been reviewed by tie in audits on systems integration and design assurance held on 28 August 2009 (TSA 0901) and 1 October 2009 (TSA 0903) and any issues raised have been closed out. Compliance has been further demonstrated in Infraco's own audit on design management held on 18 May 2010. As such we do not consider that the terms of Clause 11.3 have been breached by Infraco.

1.2 Failure to ensure System Integration and Case for Safety

1.2.1 Failure to Comply with Paragraph 2.8.1 of Part C of Schedule Part 14 (Design Review Procedure – issuance of Design Assurance Statements or "DAS"), and allegations of lack of integration more generally:

The Notice alleges that Infraco are in breach of our obligations in paragraph 2.8.1 of Part C of Schedule Part 14, to provide a Design Assurance Statement along with each design package. We note that "design package" is not a defined term in the Infraco Contract. We refer to the BSC Design Management Plan which proposes a two step approach for compliance with our obligations: (i) individual DAS per "design packages" consisting of either main system scope disciplines or civil works in specific sections, and (ii) an integrated and over-arching DAS "for the combination of all design elements relevant for each geographic sub-section", at such time as all design elements are complete (see paragraph 2.7.3 of tie's Design Management Plan).

The fact that a DAS has not been produced for an element of work does not mean that the design is not integrated. Rather each DAS is simply a statement that provides assurance of how the various design requirements set out in Paragraph 2.8.1 of Part C of Schedule

Part 14 have been satisfied. It acts retrospectively to provide, at completion of a certain "design package", an auditable trail of all the related processes and steps having been successfully completed throughout the Design Management Process. The integration process adopted by Infraco is described in Infraco's design procedures, all of which have been submitted to tie and have been endorsed Level A or Level B. Infraco has a comprehensive record of these procedures being applied.

Pursuant to these procedures we have submitted DAS for a number of design packages, and we are in the process of concluding the "integrated DAS statements" for different geographical sections where the DAS covering all individual design elements already exists. The email correspondence between Steven Bell and Miguel Berrozpe entitled "Design Assurance" between 2 July 2010 to 5 July 2010 cannot be used as evidence or admission of a breach because it simply sets out the process being applied.

At the date of the Notice, Infraco had not submitted a DAS for the on-street trackworks design package. This does not constitute a breach of our contractual obligations or an Infraco Default but is simply a consequence of numerous changes (both tie Changes and Infraco's Proposals) relating to the Design Management Process, which have affected, and continue to affect, the conclusion of this design package. At the date of service of the Notice, elements of scope relating to on-street trackworks were still to be agreed by tie, and are subject to INTCs (e.g. floating slab), final designs are awaiting tie approval and information is outstanding from tie in relation to the satisfactory completion of the Utilities Diversion Works, directly affecting the ability to use the fully integrated design produced by Infraco for on-street trackworks.

As set out above, the design of the on-street trackworks is still in progress and will be carried out to meet Infraco's contractual requirements. Accordingly, as stated above we will submit a rectification plan to tie under separate cover. We clarify that this plan will include not only actions to be completed by Infraco, but also by tie and other parties.

1.2.2 *Failure to Comply with Clause 8.1.6*

We confirm that Infraco is working in accordance with its obligations under the Infraco Contract to ensure that certain key elements of the system integration of the Infraco Works are implemented. This includes ensuring that safety assurances and the Case for Safety are achieved at the issue of a Certificate of Sectional Completion. Given that a Certificate of Sectional Completion has not been issued we are at a loss to understand why you allege that this obligation has been breached.

1.2.3 *Failure to Comply with the Employer's Requirements:*

You identify four alleged breaches of the Employer's Requirements. We respond as follows:

- (a) **Section 3.6.1 (Design: General Obligations):** It is not clear in what respects you consider that we are in breach of this obligation but we assume your specific concern relates to the Case for Safety for trackworks. Deliverables setting out how Infraco will meet its obligations in relation to the Case for Safety have been submitted to tie and have been endorsed either Level A or Level B. We have submitted the Case for Safety (Trackwork) which has now been endorsed by tie at Level B. If any adverse comments by tie or by the Independent Competent Person ("ICP"), or any subsequent developments or changes to the design, necessitate amendments to the Case for Safety (Trackwork), Infraco has and will continue to incorporate these and re-submit

the amended version. We consider that our obligations at this time have been fully complied with, and as such there is no breach.

- (b) **Section 3.6.1 (Design: General Obligations):** We do not accept that there has been a breach of this requirement. A "V" life cycle model was developed and incorporated in the Project Management Plan and the Preliminary Case for Safety (Systems). These documents have been reviewed by us and the Project Safety Certification Committee and endorsed either Level A or Level B. The approach set out in these documents has been and continues to be followed by us.
- (c) **Section 3.6.2 (Design Approach):** The development of the Case for Safety is an ongoing obligation and we regularly undertake supplementary analysis to allow its further development. Agreed processes are in place to ensure that Infracore continues to fulfil its obligations in this regard. There has been no breach of Infracore's obligations in this regard. This is demonstrated in Section 4.4.2.3 of the Preliminary Case for Safety (System) which identifies the ongoing supplementary analysis which has been undertaken to date.
- (d) **Section 17.2.6 (The Railways and Other Guided Transport Systems (Safety) Regulations 2006) ("ROGS"):** You do not detail the specific respects in which you consider that we are in breach of this section which makes it difficult to answer your allegations. In fulfilment of our obligations under ROGS, we have, from contract signature attended and actively participated in the Project Safety Certification Committee in accordance with its written Safety Verification requirements. We consider that the Case for Safety is being developed to the satisfaction of the Independent Competent Person and Project Safety Certification Committee. We are not aware of any current objections from either party as regards Infracore's identification of the Safety Risks or the process and implementation of the Safety Management System. In light of the above, we do not consider there has been any breach of the obligations in this section. Any adverse comments that have been and are subsequently received have been and will continue to be properly addressed.

1.2.4 *Failure to Comply with Clause 8.5 and Clause 10.9*

All elements of our design relative to the Edinburgh Tram Network are compatible with system integration, and we continue to make qualified personnel available to ensure systems integration throughout the term. As such we do not consider that we are in breach of Clause 8.5.

In the event that any Deliverables have been found not to fulfil the requirements of the Infracore Contract or any Approvals Body, such deliverables have been amended accordingly. This is a process that has been, and will continue to be, applied by Infracore and as such there has been no breach of Clause 10.9.

1.3 *Failure to observe a duty of care and general obligations (Clauses 7.1 and 7.2)*

We assume that the general allegations of breach relate to Infracore's alleged failures in relation to management of the SDS Provider, issuance of DAS statements, systems integration and the Case for Safety. For the reasons set out above, we do not accept that we are in breach of the specific obligations as alleged by you. Without any other specific allegations of breach being made we do not agree that we are in breach of our general obligations as set out in Clauses 7.1 and 7.2.

2. **Carrying out and/or Completion of the Infraco Works not materially and adversely affected**

None of the alleged breaches identified by you materially and adversely affects the carrying out and completion of the Infraco Works. If carrying out of any Infraco Works is impeded because sections of the on-street trackworks design are still being finalised, this is simply a consequence of changes (both tie Changes and Infraco's Proposals) relating to the Design Management Process, which have affected, and continue to affect, the conclusion of this design package.

You also allege that Infraco's failure to deliver an integrated, assured design for the on-street trackworks has prevented tie from issuing Permits to Commence Works pursuant to the Code of Construction Practice. The documentation required to be submitted by Infraco in terms of paragraph 3.4 of Schedule Part 3 (*Code of Construction Practice*) is the Permit to Commence Works Form which identifies 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 Infraco's safety management system.

A fully integrated, assured design is not a condition precedent to the issue by tie of a Permit to Commence Works. According to tie's own Design Management Plan any design endorsed with Level A or B "may be used or implemented for the purposes for which it is intended". All our on-street trackworks design (irrespective of whether they may be still subject to changes) are endorsed with Level A or B. The fact that a fully integrated, assured design is not a precondition to tie issuing a Permit to Commence Works is further supported by tie's approach to date which clearly demonstrates that the issue of a Permit to Commence Works is in no way linked with the existence of a fully integrated, assured design.

There is no basis in the Infraco Contract for tie alleging that it is unable to issue a Permit to Commence Works because of any alleged failure to deliver a fully integrated, assured design. On the contrary, it is tie's failure to issue Permits to Commence Works in circumstances where it is clearly obliged to do so under the Infraco Contract which is adversely affecting the completion of the Infraco Works and frustrating Infraco's efforts to proceed with the works in the relevant Sections.

3. **No Infraco Default (a)**

It follows from the preceding paragraphs that the circumstances you narrate in your Notice do not meet the definition of "Infraco Default (a)" in the Infraco Contract Schedule Part 1, contrary to your assertion.

4. **Letter INF CORR 5995 is not a valid Remediable Termination Notice**

As no Infraco Default has occurred, you have no right to serve any Remediable Termination Notice as you have purported to do.



SIEMENS



5. No right to Terminate

No grounds for termination can arise from this alleged Remediable Termination Notice.

We invite you to withdraw your purported Remediable Termination Notice served with letter INF GORR 5995.

Yours faithfully,



M Förder
Project Director
Bilfinger Berger Siemens CAF Consortium

cc: R. Walker
M. Flynn
A. Campos
M. Berrozpe
A. Urriza



ETN Project
Trackwork design

DESIGN: ONSTREET TRACKWORKS
RECTIFICATION PLAN
(COMPLETION PLAN)
26 October 2010

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EXECUTIVE SUMMARY

The Infraco is fully committed to completion and delivery of an integrated, assured design for the on-street trackworks pursuant to its obligations under the Infraco Contract, including those listed by tie in the attachment to its letter dated 8 September 2010 ref INF CORR 5995.

In order to achieve this objective, the Infraco is fully committed to meeting all of its contractual obligations, some of which are ongoing or not yet due. This Plan demonstrates in detail how Infraco proposes this to be completed.

The Infraco remains committed to the execution of the trackworks in a safe and efficient manner and with a minimum of disruption to the City of Edinburgh and will provide the necessary design accordingly, integrated with other related design packages and disciplines and with all final necessary assurances. Details are provided further below in this Plan.

In evidence of this commitment and, without prejudice to the Infraco's position explained in our letter ETN(BSC)TIE=T&ABC#052171 that reasons cited by tie in its letter INF CORR 5995 do not constitute an Infraco Default, this Plan describes how the Infraco will complete and deliver "*a fully integrated, assured design for the on-street trackworks (chainage 100000 to chainage 131247)*".

We emphasise that, in addition to actions by the Infraco, this Plan also requires actions and a level of co-operation and engagement, as envisaged by the Infraco Contract, from tie, CEC and others to ensure its success.

The Infraco requests a commitment from all parties to support this Plan and, to this end, tie and CEC are invited to open an immediate dialogue with Infraco, through which any questions or clarifications can be answered, in preference to summary rejection of this plan.

1 INTRODUCTION

This document is prepared in response to the alleged Remediable Termination Notice (Design: Trackwork) issued under tie letter dated 8 September 2010 (INF CORR 5995). The alleged Infraco Default is *“the Infraco has failed to deliver a fully integrated, assured design for the on-street trackworks (chainage 100,000 to chainage 131,247)”*.

The Infraco design (including its integration with each and all related disciplines listed below in “Scope of Design”) is at an advanced stage of development, but is not currently capable of being completed for the following reasons:

- Certain aspects of said design are still subject to the provisions of Clause 80 that are either not agreed or have yet to be instructed, or where information has not yet been provided by tie. This plan addresses the necessary actions proposed to progress and close out these matters.
- Since Princes Street was opened to traffic in November 2009, analysis carried out by in-house experts of Bilfinger Berger, Siemens, Parsons Brinkerhoff, BAM, Rail One, numerous independent, acknowledged experts from Technical University Dresden, Verkehrs Consult, Leipzig, Transport Research Laboratory (TRL), Mott McDonald, different independent trackwork suppliers and elsewhere. The Infraco has been developing various potential improvements in the existing, integrated on-street trackworks design, based on lessons learned from defects found in Princes Street in the vicinity of the rails. While design has had only minimal contribution to defects on Princes Street, we identified certain design improvements that would provide benefits in the economy, efficiency and effectiveness of executing works in the specific environment of the ETN (i.e. considering issues of weather, construction sequence, as well as local requirements, standards, plant and workmanship used in road

ETN Project
Trackwork design

construction). In addition, in advance of tram running the bus use on Princes Street near or on the rails has been in excess of design assumptions. As explained in Infraco letter dated 17 September 2010, (25.1.201/KDR/6728), the integrated design that was issued for Princes Street can be built in other on-street locations.

The on-street trackworks design, including its integration with other design packages defined in section "Scope of Design" below, has been progressed using sound processes of design management and integration and is now substantially complete, except for certain design changes that have not been agreed yet, details of which are provided in Section 3 of this Plan. The final Design Assurance Statements (DAS) cannot be completed due to a significant number of issues outwith the control of the Infraco, such as changes pending and new Informatives being raised by CEC. These DAS's will be provided when all the necessary steps listed in these statements are concluded and documented. This Plan explains how all aspects of the integrated on-street trackwork design will be concluded using these same processes, culminating in the final DAS. This Plan is therefore, in effect, a Completion Plan.

This Plan has been designed to fulfill the stated requirements in section 2 of the Remediable Termination Notice attached to tie's letter INF CORR 5995 dated 8 September 2010.

Design integration

The attachment to tie's letter INF CORR 5995 dated 8 September 2010 purports that Infraco is in breach of its obligations to integrate and assure its design. We consider that there are reliable integration processes in place, which have been endorsed by tie with levels of review A and B and which are being systematically and consistently applied by Infraco and other parties involved (including tie, in some processes).

Within this Plan, in addition to addressing the contents of tie's letter INF CORR 5995, cognisance has also been taken of recent correspondence from tie, including the

Independent Competent Person's (ICP) comments in his report for Period 6, 2010-2011 Document No: DEL.HSQE. The authority and validity of the processes being applied by Infraco is explained in Appendices B, C and D to this Plan and should provide confidence that these processes are generating integrated, assured designs.

As part of this Plan, set out in detail in Section 3, the Infraco proposes to **meet with tie, CEC the ICP and other key stakeholders in the overall process** to fully explain the integration and assurance processes and ensure they are fully understood, including the timing of final DAS. The Infraco expects that the above meeting(s) will enable tie's and other tie Parties' acknowledgement that the design processes applied by Infraco will provide an assured and integrated design in accordance with the requirements of the Infraco Contract.

Design Assurance Statements (DAS)

System integration and assurance is continuously built into the processes being implemented by the Infraco. These processes have been and will continue to be implemented until final completion and issue of the integrated DAS. We acknowledge that the final integrated DAS based upon geographical areas, as well as some of the documentation and auditable trail related to the integration processes, have not yet been submitted to tie. These will be submitted in due course and the current status does not, therefore, constitute an Infraco Default. The purpose of such documentation is to provide, retrospectively, an auditable trail of design integration having taken place. This Plan includes a roadmap of when and how Infraco intends to submit the relevant documentation to tie and necessarily includes dependencies on resolution of issues outwith Infraco control – in particular tie and CEC. We clarify that many deliverables depend on the outcome of decisions to be taken by tie, CEC or other parties outside the control of Infraco, due to which, any periods indicated in our roadmap must be deemed approximate.

Although it appears that the lack of the final DAS has created concern to tie, the fact that the DAS have not yet been issued is not evidence that the corresponding design

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assurance requirements and processes are not being met. Final DAS will be provided to tie to confirm that the design assurance requirements and processes have been met.

Infraco letter dated 5 August 2010 (25.1.291/SN/6311), provided tie with reasons why a final DAS could not be submitted.

Permit to Commence Works

The Infraco's position in relation to the role of a Permit to Commence Works is covered in full in the Infraco's letter, reference ETN(BSC)TIE=T&ABC#052171 dated 26 October 2010. This is not, however, material to the completion of design, or, indeed, to this Plan, so it is not dealt with within this document.

2 SCOPE OF DESIGN COVERED BY THIS PLAN

The scope of design in this Plan is limited to on-street trackwork design (integrated with other elements of the ETN design, as listed below) between chainage 100,000 and chainage 131,247, and follows the scope outlined in the attachment to tie letter INF CORR 5995, although the principles of this Plan also apply more generally.

Specifically, the main related design elements which interface and are being integrated with the on-street trackworks design are:

- a) The trackform design;
- b) Trackwork substructure;
- c) Track drainage;
- d) Road coverage;
- e) Road drainage;
- f) Ductwork within the road;
- g) Earthing and bonding related to the tram system;
- h) Loops embedded into the road and thus to be integrated with both roadworks and trackwork;
- i) Clearances (DKE etc), particularly with respect to kerbs, tramstops, side structures, poles etc;
- j) Signaling equipment (e.g. points machines, track circuits, points heating etc) directly connected to the rails.
- k) Special vibration mitigation measures in particularly sensitive areas
- l) Specific design aspects of the rolling stock (particularly rail/wheel interface)

The Infraco confirms that the on-street trackworks design is at an advanced stage of progress, including Issued for Construction (IFC) drawings that can be built in the on-street sections. We also confirm that the integration between all above elements has taken place.

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Design work continuing at the time of writing this Plan are:

1. Minor improvements of the designs used in Princes Street, based on lessons learned, phasing and traffic use ahead of tram operations.
2. Close out of Level B endorsements (not a prerequisite to commence works, but, rather, for the final DAS and Case for Safety)
3. IDC Close-out lists
4. Discharge of CEC Informatives to conditional approvals
5. Design of trackwork over a shallow clearance dock bridges (tie change)
6. Design of trackwork over utility structures that cannot be moved (tie change)
7. Floating slab design and locations (tie change)
8. Design of trackwork where the contractual utility-free depth is not available. In these areas, special design solutions are required. (tie change)
9. Final Design Assurance Statements, retrospectively

The extent of on-street design affected by items 5, 6, 7 and 8 is indicated graphically in the plan at Appendix G. Each of the above design headings is described in more detail within the Completion Plan in Section 3.

3 COMPLETION PLAN

3.0 Kick-off agreement and analysis of the Plan

Fundamental to this Plan is the engagement and support of all necessary resources involved (both Infraco parties and tie parties). To this end, the Plan includes a process of explanation and clarification with both tie, CEC and the ICP.

The following stages are therefore planned:

Item	Action	Who	When
1	Meeting with tie to understand any queries or clarifications required from tie on the underlying Infraco processes or the Plan itself and to obtain acceptance of a further meeting with the ICP	Infraco and tie	Within 5 Business Days of agreement to meeting
2	Infraco to confirm to tie any follow-up information that Infraco understands is required by tie, following the above meeting – tie to agree	Infraco tie	Plus 2 Business Days
3	Submit the further information confirmed at 2) above	Infraco	Plus 5 Business Days
4	Meeting with tie, the ICP and any other parties or stakeholders at the discretion of tie, to clarify and respond to any questions on the Integration and Assurance processes.	Infraco Tie ICP and others if required	Plus 10 Business Days

3.1 General improvements in the on-street track / road integrated design

The existing design is already integrated and is capable of being built without the problems experienced in Princes Street, provided that conditions during installation are respected and construction controls / method statements are strictly adhered to. This has been confirmed to the Infraco by a number of inhouse and independent external experts. To a large extent, the defects that became apparent in Princes Street were caused by reasons of execution and, more particularly, the environmental conditions, rather than design [refer Infraco letter dated 17 September 2010 (25.1.201/KDR/6728)].

In discussion both with experts and with those tasked with implementation, since Princes Street was opened to traffic in November 2009, we have identified that some minor design improvements to the on-street trackform / roads combined and integrated design would provide benefits in the economy, efficiency and effectiveness of executing works in the specific environment of the ETN (i.e. considering issues of weather, construction sequence, as well as local requirements, standards, plant and workmanship used in road construction)

Minor design improvements which are currently the subject of discussion, may involve some minor changes in the material of the asphalt base course, the aggregate size of the binder course, and the resulting implementation details. Notably, cognisance has also been taken of the Office of the Rail Regulator (ORR) Guidance document and the difficulties encountered in all other on-street tram systems in the UK.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	Infraco and External expert review of drawings and IDR/IDC	Infraco Siemens Lots Experts	Complete

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Item	Action	Who	When
2	Infraco to revise and complete the drawings	Infraco	Approx 10 Business Days in parallel with 3 & 4
3	Initial discussions with CEC following SDS submission of trackform details to close out Informatives	Infraco CEC	W/c 25/10/10 Awaiting confirmation from CEC
4	CEC technical approval as an integrated design for track and road, if required by CEC	CEC	30 Business Days
5	Submission of revised drawings to tie for review under Schedule Part 14 and tie RoR	Infraco tie	Plus 5 Business Days
6	Tie Review and issue of RoR	tie	Plus 10 Business Days
7	Issue for Construction	Infraco	Plus 5 Business Days
8	Review and update of method statements before execution of any works under enhanced design	Infraco Subcontractors	In parallel. Complete within plus 5 Business Days

3.2 IDC Close out lists

Save as for the aforementioned areas where design is not yet complete, integration of the elements/disciplines listed in Section 2 of this Plan is substantially complete, with only the closeout protocols of the already conducted final Interdisciplinary Design Checks (IDC) to be formalised.

The Interface Management process, culminates in the IDC process, which generates integrated design certification. Prior to this, however, representatives of the various interfacing design disciplines have jointly reviewed and agreed that all technical interfaces and interdisciplinary integration requirements have been fulfilled. This IDR

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(Interdisciplinary Design Review) process is iterative, with progressive improvement in integration of the underlying designs. By the time the IDC takes place, comments are generally minor in nature.

It is the Infraco's intention to deal with IDC close out comments by categorising them as follows:

- Comments that require minor amendment of the related Deliverables. These comments are currently being incorporated into the Deliverables, which, when finalised, will be submitted to tie in accordance with Schedule Part 14 of the Infraco Contract.
- Comments that do not require any modification of the related Deliverables e.g. minor, secondary or collateral information in a drawing, and would not materially contribute to any risk executing nor later in operating/maintaining the Infraco Works. These comments are listed in the closeout report for traceability purposes only, and will be incorporated in the final "as built documentation" but do not, in the Infraco's opinion, require to be incorporated before that point.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	CEC technical approval	CEC	30 Business Days from submission to CEC
2	IDC Meeting	Infraco SDS Operator	To be scheduled

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Item	Action	Who	When
3	Close out list identifies action to be taken	Infraco	Target 10 Business Days after IDC Meeting
4	Drawings revised (where identified as necessary)	Infraco	Included in 3
5	Issue for construction	Infraco	Included in 3

3.3 Close out of tie Record of Review comments accompanying Level B Endorsements

All designs and reports relating to trackworks have been sent to tie for review under the Infraco Contract Schedule Part 14 (*Design Review Procedure and design Management Plan*). In the particular case of on-street trackwork, there have been 18 submissions to tie involving 50 drawings/reports. Analysis of tie's comments on a per drawing/report basis, 18 drawing/reports have been endorsed Level A, 15 endorsed Level B and 15 are still awaiting the latest Record of Review (RoR) from tie (these generally being resubmission after earlier RoR comments having been addressed). It is noted that, at present, the majority of tie's Record of Review Comments have been successfully closed, save as those included at Appendix E of this Plan.

RoR comments are in two categories, which are generally dealt with depending on category, as follows:

- Mandatory comments pursuant to Schedule Part 14, tie's RoR
Comments are currently being acknowledged and taken into account in the drawings/reports when proceeding with the Works. If appropriate, drawings/reports are formally revised to incorporate the comments and re-issued to tie as a new revision, who then conducts a further review.
- Advisory comments
The Infraco is considering these comments and, where in agreement that they should be taken into account, the drawings/reports are being revised accordingly. As with Mandatory comments, revised drawings will be issued to tie for further review.

It is the Infraco's preference to hold workshops with tie to work through RoR comments, as this has been found to be the most practical and quickest way to close them out. A workshop was held on Wednesday 20 October 2010. All agreed changes to drawings will be implemented as described above and further information or clarifications requested will be provided..

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	Workshop with tie	Infraco tie	20 October 2010 (Complete)
2	Update RoR	Infraco	20 November 2010
3	All comments closed out	Infraco	10 December 2010

3.4 Dock bridges

Designs for the two dock bridges at Tower Place and Victoria Dock Entrance are currently being progressed by Infraco in collaboration with the SDS Provider and are now at an advanced stage of development. These are the subject of a tie Change in respect of transition slabs and Earthing & Bonding arrangements, although these have not been agreed with tie.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

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Item	Action	Who	When
1	INTC process. Tie agreement to change and estimates (submitted)	tie	Tie to advise
2	SDS issue the drawings for IDR	SDS	Completed
3	IDR process with IDR comments being returned to SDS	Infraco Siemens Lots	Completed
4	Re-issue of drawings for integration process	SDS	20 Business Days after tie confirmation of 1)
5	Interface clarification IDR/IDC	BSC SDS BAM	Plus 10 Business Days
6	CEC Approval process	CEC	30 Business Days
7	Issue for construction	Infraco	Plus 10 Business Days

3.5 Special trackwork design in areas of insufficient clearance

There are four outstanding designs relating to trackwork within the on-street areas covered by this Plan, wherein specific design solutions are required to accommodate the reduced depth available:

- a) Scottish Power cable tunnel;
- b) 275KV HV cable Arther Street to Dalmeny Street;
- c) Leith railway tunnel;
- d) Culvert at North Constitution Street

The four items above will require special design solutions as the Infraco has not been provided with the guaranteed 1200mm depth free of utilities and it is noted by the Infraco that tie will not be able to move these obstructions. These are the subject of a tie Change which is currently not agreed.

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The assumption at present is that the trackform will remain unchanged, but the supporting layer will require a special solution. There may be design impacts on ducting, drainage, etc, which will become apparent during design integration.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	Agree INTC status with tie	tie	Complete
2	Provide estimates for design work (INTC process)	Infraco	Complete
3	Obtain tie agreement to estimates for design work	tie	Tie to advise
4	SDS/Infraco to carry out design	Infraco	Plus 20 Business Days
5	Integration IDR/IDC process with Infraco and trackwork subcontractor	SDS Infraco BAM	Plus 10 Business Days
6	tie review under Schedule Part 14	tie	10 Business Days
7	CEC approval period of integrated designs under roads technical approval, if necessary	CEC	30 Business Days
8	Issue for Construction	Infraco	Plus 10 Business Days

3.6 Special trackworks / roadworks design in areas requiring floating slab to mitigate vibration and groundborne noise

A generic floating slab system has been designed and can be adapted for locations where groundborne noise and vibration investigations reveal an unacceptable risk of violating targets stipulated in the Noise and Vibration Policy document for the project.

In fact, the Rheda system does not exceed the targets referred to above, but the SDS Provider recommended designing to secondary noise and vibration levels, which is more onerous than the Policy document. The Infraco commissioned a study by Belgian noise and vibration specialists D2S, which identified areas that would require a floating slab using these more onerous levels and a recommendation was put to tie.

It is understood that tie is also considering some areas additional to Infraco's recommendations and the Infraco is currently awaiting tie's instructions.

All floating slab requirements are subject to a tie change. Estimates have been provided to tie under INTC 515.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	Estimates for design work	Infraco	Completed
2	Tie to confirm extent of floating slab ie D2S identified areas plus options currently being considered by tie – by issue of a TCO	tie	Tie to advise
3	Design work	SDS BAM	Plus 20 Business Days

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Item	Action	Who	When
4	Integration IDR/IDC process	SDS Infraco BAM	Plus 10 Business Days
5	Review by tie under Schedule Part 14	Tie	Plus 10 Business Days
6	CEC for roads technical approval	CEC	Plus 30 Business Days
7	Issue for Construction	Infraco	Plus 10 Business Days

3.7 Special design solutions over utilities that encroach into the 1.2m utility-free depth

In addition to the structures referred to in 3.5 above, the Infraco has been advised of circa 200 known instances where the MUDFA utilities diversions have not been achieved at the required depth and special design solutions will need to be developed by Infraco once detailed, fully assured, as-built MUDFA data from ties provided, or excavation reveals the extent of the problem. A schedule of these is included at Appendix F. Completion of MUDFA utility diversions will enable the Infraco to gain access and the opportunity to obtain the necessary survey data necessary for completion of these design solutions. The Rheda trackform system includes a generic solution for such short areas of reduced clearance, as indicated in the Infraco Proposals, and it is envisaged by the Infraco that the final design will be based on this generic solution and will be developed in accordance with the Infraco Contract change process once the details are known.

The exact scope of the shallow utilities problem is not known by the Infraco at present. Any information that tie can provide may assist by reducing the survey work required and in categorising the circa 200 known cases and possibly reduce the number of the design solutions. These will be the subject of a tie Change, but categories are likely to be:

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- a. Below formation level (yet above the 1.2m utility free zone)
- b. Above formation level but below track improvement layer (whatever form this takes)
- c. Within the track improvement layer
- d. Within the trackform depth

For clarification, formation level will vary from location to location depending on the EV2 values found upon testing the opened-up ground.

In order to complete this exercise, the following steps represent the Infraco's plan. Each step is logically a prerequisite to the next step:

Item	Action	Who	When
1	Tie to provide fully assured data from its MUDFA works	Tie	Tie to advise
2	Tie to clarify whether whether surveys are required	Tie	Tie to advise
3	Raise INTC to carry out survey work	Infraco	Plus 10 Business Days
4	Produce estimates for survey work	Infraco	Plus 10 Business Days
5	Agree estimates for survey work with tie	Infraco Tie	Plus 10 Business Days
6	Carry out surveys and collect survey data	Infraco	Plus 90 Business Days
7	Provide estimates for design work (INTC process)	Infraco	Plus 20 Business Days
8	Obtain tie agreement to estimates for design work	Tie Infraco	Plus 20 Business Days
9	SDS to carry out design	Infraco	Resources to be agreed once scope and extent of work is known

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Item	Action	Who	When
10	Integration IDR/IDC process with Infraco and trackwork subcontractor	Infraco Subcontractors	Plus 10 Business Days for each batch of drawings. Dependent on scope and extent
11	Submit integrated design for review by tie under Schedule Part 14 and tie RoR	Infraco tie	Plus 10 Business Days for each batch of drawings. Dependent on scope and extent
12	CEC for roads technical approval	Infraco	Plus 30 Business Days for each submission
13	Issue for Construction	SDS	Plus 10 Business Days for each tranche

3.8 CEC Close-out of Informatives

It is noted that Paragraph 2.5.1 of Part C of Schedule Part 14 of the Infraco Contract explicitly states that “The systems design and tram vehicle are not subject to CEC Technical Approval; they are subject to design review by tie.” This obligation to submit trackform designs to tie has been discharged by Infraco.

Where tie’s Record of Review indicates that the submission or part of a submission should also be submitted to CEC for technical review, for example track drainage, or aspects of OLE, this has, indeed, then been submitted to CEC.

The SDS Provider has already obtained Conditional Approval to the reference trackform design under Roads Technical Approvals and has submitted details of the Rheda trackforms to CEC to close out four related Informatives.