

**MULTI-UTILITIES DIVERSION FRAMEWORK AGREEMENT**

**BETWEEN**

**TIE LIMITED**

Employer

**AND**

**CARILLION UTILITY SERVICES LIMITED**

Contractor

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**Interim Submission re: Schedule 4 - Rates and  
Prices to Work Section:-**

**Leith Walk Broughton Street – Constitution Street  
(1A 01 01, 1B 01 01, 1B 02 01 and 1C 04 01)**

**Resulting from matters which entitle the Contractor  
to additional payment**

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September 2009

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**APPENDICES**

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## 1.0 INTRODUCTION

1.1. This interim submission substantiates Carillion Utility Services Limited's (the "Contractor") entitlement to further payment from Tie Limited ("tie") in terms of the Multi-Utilities Diversion Framework Agreement dated 4<sup>th</sup> October 2006 (the "Agreement") for delay and disruption and reduction in productivity output in the MUDFA Works (the "Works") suffered by the Contractor as a consequence of events for which the Contractor has no responsibility, in respect of the Work Sections, Leith Walk Broughton Street to Constitution Street (1A 01 01, 1B 01 01, 1B 02 01, 1C 04 01)

This submission will show that (i) the conditions upon which the Contractor priced the rates and prices contained in Schedule 4 of the Agreement ("the Schedule Four Rates and Prices") have changed beyond recognition, compromising those Schedule Four Rates and Prices; (ii) further to Settlement Agreement No2 dated 19<sup>th</sup> and 23<sup>rd</sup> March 2009, tie have been unable to or have failed to provide a sufficiently detailed and reliable design to allow the Contractor to construct the Works; and (iii) there have been significant events that tie have caused or failed to control but for which they are responsible, and which have delayed or disrupted the regular progress of the Works.

Work Sections 1A 01 01, 1B 01 01, 1B 02 01 & 1C 04 01) have been chosen as further examples depicting the type of delay and disruption the Contractor has encountered in carrying out the Works, and similar submissions are being prepared in respect of the significantly affected remaining Work Sections and finalising those previously submitted where the Works were incomplete. .

1.2. When the Contractor prepared its Schedule Four Rates and Prices as part of the tender exercise it did so on the basis of the following:-

- tie would comply with the terms of the Agreement;
- The Schedule 8 Programme;
- The tender drawings incorporated into the Agreement;
- That the quantities outlined in Schedule 4 of the Agreement broadly reflected the scope of Works, given that the Tender Drawings did not identify diversionary routes;
- tie would issue approved, accurate and robust Issued for Construction (IFC) drawings and design related information in accordance with the Schedule 8 Programme, via the Work Order process under clause 8 of the Agreement; and
- tie would provide all approved and integrated Traffic Management Plans/Designs and Temporary Traffic Regulation Orders (TTRO's) by 9<sup>th</sup> January 2007;

tie has repeatedly failed to comply with its obligations under the Agreement and as a direct consequence of those failures, the underlying bases for the Schedule Four Rates and Prices have been compromised and the Schedule 4 Rates and Prices are no longer applicable for the Works carried out by the Contractor.

1.3. The details contained in this submission relate only to those events occurring between 1<sup>st</sup> October 2008 and 31 August 2009.

1.4. The contents of this submission are:

1.4.1. this introduction,

1.4.2. a synopsis which shows that tie have been unable to manage the design of the Works or circumstances such that the Contractor's

- regular progress of the Works was delayed and disrupted, reducing its productivity output,
- 1.4.3. a section detailing the basis of the Contractor's contractual entitlement to further payment,
  - 1.4.4. an as planned v. as built programme comparison (for three of the four Work Sections) that demonstrates the delays and shows the disruptive effect of each delaying event,
  - 1.4.5. an overview for two of the four Work Sections that diagrammatically depicts each relevant event and the circumstances,
- 1.5. The submission will demonstrate that the main reasons why the Contractor has suffered delay and disruption to the regular progress of the Works and a consequent reduction in productivity output are as follows:
- 1.5.1. Changes to the Works,  
changes to the design of the Works and design inadequacies,
  - 1.5.2. tie failing to instruct the execution of the Works envisaged in the Agreement timeously,
  - 1.5.3. late information and resolution by tie of issues raised by the Contractor,
  - 1.5.4. tie's inability to manage and co-ordinate stakeholders and their requirements,
  - 1.5.5. tie's failure to respond timeously to important correspondence and requests for information,
  - 1.5.6. tie's inability to obtain the required Traffic Management ("TM") as detailed in the Work Order to provide the necessary uninterrupted space for the construction of the Works.
- 1.6. The Contractor further considers that tie's failure to properly administer the Work Order procedure in accordance with clause 8 of the Agreement by failing to (i) properly issue Work Orders (incorporating all information for

construction); (ii) formally agree Work Order Proposals and (iii) issue Work Order Confirmation Notices has led to a situation in which the Contractor has not been provided with a completed design for each Work Section or Work Site as tie were obliged to provide in accordance with the Agreement, thereby causing delay and disruption to the Works. This information has then had to be significantly altered during the course of the Works. In many instances tie has failed to conclude Work Orders with the Contractor and, rather than withdrawing them, has allowed the Works and Services to progress in accordance with the Programme, in effect varying the procedure provided for in Clause 8.8 of the Agreement.

- 1.7. tie have generally failed to provide the Contractor with fully completed IFC drawings and designs and in many instances in order to progress the Works, have provided information which has been issued but not finally approved. In particular the design took no account of congested services that led to numerous changes which a competent designer could have expected. This submission will also show that notwithstanding the delay and disruption caused to the Works by tie, the Contractor has sought to comply with the Agreement and, given the available information, has provided the requisite notifications and information pursuant to the provisions of the Agreement.
- 1.8. The Contractor has assessed that as a result of the delay and disruption suffered, there is an entitlement to an additional payment of £5,142,774 for these single Work Sections.

## 2.0 SYNOPSIS OF EVENTS

- 2.1 The purpose of this section is to explain in general terms how **tie** has failed to comply with its contractual obligations and consequently delayed and disrupted the regular progress of the Works and caused the Contractor to suffer a reduced productivity output.
- 2.2 The Contractor and **tie** executed the Agreement on the 4<sup>th</sup> October 2006.
- 2.3 In terms of the Agreement the Contractor was to carry out the Works in respect of the Edinburgh Tram Network for Work Sectors 1, 2, 4, 5, & 6 which works comprised, amongst others, the undertaking of Pre-Construction Services from 3<sup>rd</sup> October 2006 to 22<sup>nd</sup> December 2006 and the Construction Works from the 2<sup>nd</sup> March 2007 until 27<sup>th</sup> June 2008, these dates being detailed in the Schedule 8 Programme to the Agreement.
- 2.4 The responsibility to design the Works lay with **tie**, who employed the SDS Provider SDS to carry out this design. The Contractor's responsibility was to liaise with SDS in order to review the design for buildability and support SDS in obtaining Temporary Traffic Regulation Orders during the Pre-Construction phase and thereafter to construct and install the Works, all of which is described in Schedule 1 to the Agreement - "Scope of Works and Services".
- 2.5 The Agreement states that the Construction Works in any Work Section shall not be commenced until the relevant Works Order Confirmation Notice has been issued for that Work Section.<sup>1</sup> Prior to Construction Works being commenced in any Work Section, **tie** was obliged to issue a Work Order to include the Work Order Requirements<sup>2</sup>. The Work Order Requirements had to include amongst other things:

*8.9.1 the scope and description of the works, services and supplies required from the MUDFA Contractor;*

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<sup>1</sup> Clause 8.3 of Agreement

<sup>2</sup> Clause 8.8.1 of Agreement



- 8.9.2 *the design and drawings for the required works;*
- 8.9.3 *any additional requirements including any requirements in relation to specification, reinstatement (whether temporary or permanent), quality control and testing and commissioning in addition or as an alternative to the requirements set out in Schedule 3 (Specification);*
- 8.9.4 *any additional requirements from the Utilities including any requirements for liaison in respect of any enabling works and/or any Utilities Works;*
- 8.9.5 *any additional requirements from any third party affected by the proposed works;*
- 8.9.6 *the required Land Consents;*
- 8.9.7 *any additional programme constraints;*
- 8.9.8 *any additional construction constraints including any amendments to Schedule 2 (Technical Requirements);*
- 8.9.9 *the pre-construction health and safety plan and instructions from the planning supervisor;*
- 8.9.10 *any requirements or additional requirements for site establishment, accommodation and vehicles or other mobilisation activities; and*
- 8.9.11 *a request for an update to the relevant part of the Anticipated Final Account and any additional requirements for pricing.*

Thereafter the Contractor was obliged to produce a Work Order Proposal responding to the Work Order, including all of the information required by

clause 8.10 of the Agreement<sup>3</sup>. It is clear from the terms of the Agreement that (subject to some limited exceptions) tie were obliged to produce a fully detailed design for an entire Work Section in order for the Contractor to be able to comply with its obligations to provide a Work Order Proposal. Furthermore, in terms of clause 8.8.1 the Work Orders were to be provided by tie to the Contractor in accordance with the Programme. On receipt of the Work Order Proposal, tie were then meant to either raise a Work Order Confirmation Notice, withdraw the Work Order or discuss the Work Order Proposal with Carillion with a view to modifying or agreeing it<sup>4</sup>. tie has repeatedly failed to follow this procedure.

2.6 By way of an example and to put this in context in relation to the present Work Section, what the Contractor actually expected and was entitled to receive was a fully detailed design for Leith Walk Broughton Street to Constitution Street Work Sections 18-20 (Rolling Work Area 2) at least 18 days prior to the 02 March 2007.

2.7 In fact, what was received by the Contractor from tie were the following Work Sections:

2.7.1 1A/WSI/001/001 March 2007

2.7.2 1B/WSI/001/001 August 2008

2.7.3 1B/WSI/001/002 October 2007

2.7.4 1C/WSI/004/001 April 2008

2.8 The design for these Work Sections was provided between five and thirteen months later than originally programmed.

2.9 Accordingly tie did not timeously comply with their obligation under the Agreement to issue as part of the Work Order Requirements the scope and

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<sup>3</sup> Clause 8.8 of Agreement

<sup>4</sup> Clause 8.8.3 of Agreement

description of the works, services and supplies nor the design and drawings required for works.

- 2.10 It will be obvious that tie's failure to administer the procedure for Work Orders and provide timeous designs and other information had a major impact on the progress of the Works. In an effort to maintain progress, there were discussions held in June 2007, before commencement of the Leith Walk Construction Works, regarding the discovery of uncharted existing services – an additional 60% having been discovered during diversion works on Ocean Drive than had being identified by ground penetrating radar. The discussions resulted in the Contractor proposing the excavation of 132 trial holes based on IFA drawings. The trial holes were instructed on 29 July 2007 (CVI 17152). Thereafter the IFC drawings were received on 31 August 2007 and diversion works commenced on 3 September 2007.
- 2.11 It is clear that the design was not sufficiently advanced for tie to be able to issue a compliant Work Order for the Work Section. The Contractor considers that tie have failed to administer the design as envisaged by the Agreement and it is clear that tie have been unable to provide a fully detailed design prior to commencement of the Works, which is the basis upon which the Contractor tendered the Schedule 4 Rates and Prices.
- 2.12 Central to the Contractor's efficient method of working was the provision of accurate IFC drawings and related design information, together with fully configured and compatible Traffic Management plans and designs, TTRO's etc<sup>5</sup> The IFC drawings were not intimated to the Contractor by tie in accordance with the Programme.
- 2.13 In practice tie has been unable to provide a fully detailed design, and in a number of instances has required the Contractor to commence the Works based upon drawings that are issued for approval as opposed to construction<sup>6</sup>. Furthermore, drawings that have been issued for a Work

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<sup>5</sup> Clauses 3.1 to 3.5 of the Provision of System Design Services

<sup>6</sup> Appendix B. Item No 2 IFA Drawing

Sections have proven in a number of instances to be inaccurate or inadequate and produced without due skill and care or attention to the prevailing conditions. The most obvious examples of these are:

- the bedding and surround details had to be re-designed so that services could cross over the Scottish Power Tunnel.
- No account had been taken of manholes located within the Developed Kinematic Envelope Limits such that a separate Work Order had to be issued for Side Entry Manholes.
- A complete re-design of the BT and the gas diversions was required for Manderston Street which took several iterations to finalise.
- No account was taken of the underground structures at Baxter's Place and the Playhouse.
- The design for the water diversions at Baltic Street junction was incompatible with the TM requirements to maintain free flowing traffic.
- The design of many of the diversions crossing Constitution Street took no account of the existing main sewer.

All of these issues meant that the Contractor had to instruct many changes to the design in a piecemeal manner. Also the Contractor failed to obtain agreement for the Traffic Management as envisaged in the Work Order due to the influence of various Stakeholders and had to issue a Traffic Management Matrix which restricted the closure of certain roads at the same time.

2.14 As a result, in an attempt to comply with the Programme and mitigate delay to the Works, the Contractor has been compelled to accept partial designs and proceed with both procurement and construction on that basis.

2.15 This approach of providing the design in a piecemeal fashion in breach of the Agreement has led directly to the Contractor being unable to procure or

efficiently resource the construction of the Works and led to a corresponding reduction in productivity output.

## 2.16 Change to the scope of Work. (Relevant only to 1A 01 01 and 1C 04 01)

2.16.1 Upon receipt of the IFC drawings the Contractor identified an increase in the quantity of diversions per linear metre ("lm") of tram track to be installed which increase went way beyond anything that could have been reasonably anticipated. This increase is demonstrated in Work Sections 1A 01 01 & 1C 04 01 in the tables below:

Work Sector	Track Length (TL)	Schedule Four (All Diversions)	Interim Final Account Increase	% Increase	Schedule Four (Road Crossings)	Interim Final Account Increase	% Increase
1A 01 01	660	3357	3716	111	607	939	156

Work Sector	Track Length (TL)	Schedule Four (All Diversions)	Interim Final Account Increase	% Increase	Schedule Four (Road Crossings)	Interim Final Account Increase	% Increase
1C 04 01	440	1581	3234	205	199	836	420

2.16.2 Fundamentally, the enormous increase in diversions meant that the Work Section was more congested than envisaged when the Schedule Four Rates and Prices were prepared and consequently the work is

less efficient than the Contractor could have envisaged when pricing the tender.

2.17 When actual construction finally commenced on 01 October 2008 in, Leith Walk a number of issues caused the Contractor to suffer delay and disruption to the regular progress of the Works.

**2.18 Key events causing delay and disruption to Work Sections:- Broughton Street to Constitution Street (1A 01 01, 1B 01 01, 1B 02 01, 1C 04 01)**

2.19 Multiple events have occurred in this Work Section which have impacted on the Works, causing delay and disruption to the regular progress of the Works. A summary of the key factors that have affected this Work Section are as follows;

2.20 Not used

2.21 One of the main factors is undoubtedly the impact that revised Traffic Management restrictions imposed on the Contractor by the late introduction of a matrix which directly affected the installation of the 400 diameter trunk water main. Had the Contractor been able to obtain TM in accordance with the Work Order they would have been more productive.

2.22 Agreeing the design of the bed and surround for the diversion crossing the SP tunnel took an inordinate amount of time to finalise with the SU's as no thought had been given to any of the diversions which crossed over the tunnel. In the same Work Section there were also a number of structures which the IFC drawings took no account of. Consequently the Contractor was either instructed to remove parts of these structures or alternatively realign the diversions which involved additional temporary works.

2.23 Gas diversions additional to that shown on the IFC drawings were required to be installed at Gayfield Square and an additional BT diversion was required to be installed between Brunswick Road and McDonald Road.

- 2.24 At Annandale Street 3 no BT diversions were instructed to be combined however, this proved to not to be feasible due to the SP tunnel, uncharted obstructions and the inability to install BT ducts which would comply with LN 550 specification. Consequently the Contractor was then instructed to revert back to the IFC design. Also a BT chamber was revised from a chamber to a large manhole.
- 2.25 The IFC drawings did not detail any washouts for the 400 mm trunk water main at McDonald Rd. Consequently sections of the water main already installed had to be removed and re-installed including the washouts. This delayed and disrupted the final connections and tie ins which had already been impacted by the restrictions imposed by the TM matrix. At the same junction the Contractor received an instruction as part of a new Work Order to install a side entry manhole which meant the previously laid 180mm water main had to be re-diverted.
- 2.26 At Pilrig Street Scottish Water were unable to fully isolate the system to complete all of the water main connections because of faulty valves and their poor understanding of their network status resulting in low water pressure within the existing system.
- 2.27 At Dalmeny Street the Contractor was instructed to install an additional SP diversion for 275kv cabling which crossed over Leith Walk.
- 2.28 Side Entry manholes (3no) were additionally instructed at the junction of Balfour St, Jamieson Place and New Orchard Field all of which were within close proximity to each other. When the Contractor came to install these it was evident that no account was taken of the designed and installed 400mm & 180mm water main or other existing infrastructure. A similar circumstance was repeated at Stead's Place where 1no side entry manhole was required to be installed.
- 2.29 At Manderston Street the whole of the junction design had to be revised for BT and gas diversions which significantly delayed and disrupted the Works; firstly because of the number of iterations for BT to achieve a compliant design and secondly, because the instruction to tie in to the existing gas

mains was rescinded by SGN. This led to the Contractor being instructed to revert back to the IFC drawings and additionally took into account the condition of the existing network. The disruption to this location was further complicated by INFRACO being allowed into the Work Section as planned and then taking longer to complete their works.

2.30 At Castle Bank Street the designed cross connection could not be installed and was relocated in the vicinity of Kirk Street, thus extending the installation. Other issues thereafter developed with regard to the tie-ins, including a buried manhole and the condition of the existing system, all of which meant that the connection point for the 180mm was extended into Great Junction Street.

2.31 At Queen Charlotte Street a further side entry manhole was instructed, the design took no account of existing congested services.

2.32 Additional water mains were instructed on Bernard Street.

2.33 At Baltic Street Junction the connection points were not located as shown on the IFC drawings and subsequently Scottish Water made a further requirement for all connections to be completed simultaneously which required a revised TM scheme involving complete closure of the junction. It was recognised by tie that this was not a feasible option and SDS are currently redesigning the diversions.

2.34 On Constitution Street the design took no account of the existing sewer, which impacted on the cross over diversions, and congested services on South Side which resulted in the works being abandoned until tie were able to produce a buildable design.

2.35 In summary tie's design for this Work Section was incomplete or alternatively had not been properly researched.

None of the foregoing are issues for which the Contractor is contractually responsible or which the Contractor could have envisaged when tendering for



the Works. Consequently, the Works have been delayed and disrupted, the Contractor's productivity output has been reduced and the Schedule 4 Rates and Prices are no longer applicable. The Schedule 4 Rates and Prices were calculated upon a range of outputs, and that those outputs have not been achieved. As a result, the Schedule 4 Rates and Prices fall to be reviewed on the basis set out in Section 3 hereof and the Contractor is entitled to further payment from ~~the~~ in respect of the delay, disruption and reduced productivity output suffered by the Contractor as a consequence of failings on the part of ~~the~~.

### 3.0 CONTRACTUAL ENTITLEMENT

3.1 The Schedule 4 Rates and Prices were based on certain assumptions and conditions which were submitted and fully discussed with tie during the tender process. In particular they were based on:-

(a) The tender drawings and associated linear meterage of diversions as set out in the schedule 4 quantities;

(b) The prime cost and provisional sums which established the maximum additional diversions over and above the linear meterage contained in item (a);

(c) The potential reduction and mitigation of this total through the value engineering incentive.

(d) The Schedule 8 contract programme which defined the sequence, and method of operation of the Works;

(e) Stakeholder constraints;

(f) Completion of all enabling works and advance construction works necessary to support MUDFA Construction Services schedule adherence, by no later than 27 February 2007;

(g) The completion of the issued for construction ("IFC") drawings and design related information by no later than 21<sup>st</sup> December 2006;

(h) The preparation of robust and accurate IFCs and design related information to support both Carillion's contract objectives and schedule adherence under the schedule 8 contract programme.

(i) The completion of all traffic management design and temporary traffic regulation orders by 9<sup>th</sup> January 2007 by tie's consultant.

(j) The operation of the Agreement in accordance with its terms and conditions by tie as employer, project sponsor and project manager.

3.2 As a result of the issues mentioned above and later in this submission, these assumptions and conditions have not been achieved and as such the whole foundation of the Schedule 4 Rates and Prices has been compromised. Accordingly the Schedule 4 Rates and Prices fall to be revised.

3.3 Clause 51 of the Agreement deals with measurement and valuation of the Works and provides as follows:-

"51.1 tie's Representative shall except as otherwise stated, ascertain and determine by re-measurement the value in accordance with the Agreement of the work done in accordance with the Agreement.

51.2 Notwithstanding that the actual quantities carried out in respect of any item is greater or less than those stated in the Bills of Quantities, there shall be no increase or decrease in the rates in the Bills of Quantities in consequence thereof."

It is implicit in the terms of clause 51 of the Agreement that revisions can be made to the Schedule 4 Rates and Prices other than as a result of an increase in quantities alone. This analysis of the terms of the Agreement is strengthened by the terms of Schedule 1 to the Agreement.

Clause 2.36 of Schedule 1 to the Agreement provides as follows:-

"The MUDFA Contractor shall ensure that the Anticipated Final Account is compiled using appropriate rates and prices from the Bill of Quantities. Where the MUDFA Contractor considers that an item of work varies materially from the work described in the Bill of Quantities, the MUDFA Contractor shall provide details, including estimates of labour, plant and materials from the Bills of Quantities for the proposed item of work, for approval by tie."

Clause 3.3 of Schedule 1 to the Agreement is in exactly the same terms. Clearly the Agreement envisages that where the Work carried out varies materially from the work described in the Bill of Quantities, the Schedule 4 Rates and Prices fall to be revised accordingly.

- 3.4 For the reasons explained elsewhere in this submission the work carried out by the Contractor and the conditions in which the Contractor was to carry out the Works bears no relation to the Work the Contractor tendered for. In particular, the Schedule 4 Rates and Prices assumed an average productivity output of 4.74 metres per team per day (including auxiliaries) which rate of productivity has been analysed and agreed by **tie**. As a consequence of the issues since 1<sup>st</sup> October 2008, the Contractor has not been able to achieve its intended productivity output per team day (based on a 10 hour day) in each Work Section as set out below:

Work Section	Intended Productivity (lm per gang day)	Actual Productivity (lm per gang day)
1A 01 01	5.43	1.22
1B 01 01	6.06	0.44
1B 01 02	5.37	0.89
1C 04 01	5.14	1.25

The reduced productivity is due to circumstances which are not the Contractors responsibility. Accordingly, the Schedule 4 Rates and Prices fall to be revised to reflect actual productivity and the variation in the work from that tendered for by the Contractor and described in the Bill of Quantities.

- 3.5 Even if **tie** considers the Contractor is not contractually entitled to revise the Schedule 4 Rates and Prices on the basis set out above (which is denied) the terms of the Agreement envisage that Changes to the Works are to be dealt with through the Clause 46 Change Procedure which also allows the Schedule 4 Rates and Prices to be revised. "**tie** Changes" are defined in the Agreement, as meaning:-

"any addition, modification, reduction or omission in respect of the MUDFA Works or any other term in this Agreement instructed in accordance with Clause 46 (Changes)"

There have been extensive changes to the Works and ~~tie~~ have rarely operated the full procedure set out in clause 46 and in a number of instances in order to maintain progress have sought to obviate the need for an Estimate from the Contractor, by applying clause 46.5 of the Agreement. Nonetheless, ~~tie~~ Changes are to be valued by applying clause 46.6 of the Agreement, which provides:-

"46.6 The valuation of any ~~tie~~ changes made in compliance with this Clause 46 (*Changes*) shall be added to or deducted from the sums due to be paid to the MUDFA Contractor as the case may be, and shall be ascertained by ~~tie~~ as follows:

46.6.1 by measurement and valuation at the rates and prices for similar work carried out under similar conditions in Schedule 4 (*Bills of Quantities*) insofar as such rates and prices apply;

46.6.2 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;

46.6.3 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

46.6.4 if the value of the ~~tie~~ 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 4 (*Bills of Quantities*);

provided that where any ~~tie~~ Change would otherwise fall to be valued under Clauses 46.6.1 or 46.6.2 above, but ~~tie~~'s representative is of the opinion that the instruction therefore 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 Change shall be ascertained by measurement and/or valuation at fair rates and prices."

- 3.6 Accordingly, in the circumstances clauses 46.6.2 and/or clauses 46.6.3 can be applied in order to value the Changes to the Works by amending the Schedule 4 Rates and Prices.
- 3.7 In addition, as submitted previously the Agreement provides that in respect of each Work Section, the Work Order Requirements shall include the design and drawings for the required Works. The contractual mechanisms for changing the Works are drafted on the basis that the would comply with the obligation to produce such designs and drawings. As previously submitted the failed to comply with those contractual obligations.
- 3.8 The opening words of Clause 46 envisage that there may be other means of agreeing the Changes without applying the clause 46 procedure, and as a matter of fact that is the way in which the Agreement has operated in many instances. As narrated in this submission, the has changed the Works by means of revised drawings, through the TQ procedure, by verbal instruction and by correspondence. The volume of Changes for just one Work Section can be seen from Section 4 of this submission. In some instances the have applied the clause 46 procedure in full, in some instances the procedure has been applied in part, but in other instances the procedure has been ignored and instead instructions have been issued by the which the Contractor has complied with in good faith in order to maintain the progress of the Works.
- 3.9 In circumstances where clause 46 of the Agreement has not been complied with, and even if the considers the Contractor does not have any entitlement to further payment in accordance with Clause 46 of the Agreement (which is denied), clause 14.3 provides the Contractor with a remedy. The remedy being the right to be paid the amount of any direct costs as may be reasonable in complying with an instruction of the's Representative which involves the Contractor in delaying or disrupting its arrangements or methods of construction so as to cause the Contractor to incur cost beyond

that reasonably to have been foreseen by the Contractor. Furthermore, the clause provides that if such instruction requires any variation to any part of the Works, the instruction shall be deemed to have been given pursuant to clause 46 and consequently valued in accordance with clause 46.6 referred to above. The Contractor has received numerous such instructions. Accordingly these instructions can be valued under clause 46.6 by amending the Schedule 4 Rates and Prices.

- 3.10 Finally, Clause 10 of the Agreement deals specifically with instances where adverse physical conditions and artificial obstructions are discovered in the Works. Clause 10.4 expressly provides that the risk involved in encountering such adverse conditions or artificial obstructions is not to be borne by the Contractor and provides that the Contractor is entitled to both an extension of time and additional payment for direct additional costs incurred in relation to such conditions. The Contractor has encountered a large number of such conditions and obstructions and accordingly would be entitled to further payment from ~~tie~~ in respect of the additional costs the Contractor has incurred in dealing with those obstructions/conditions.
- 3.11 In these circumstances Carillion is entitled, for the reasons narrated in this submission, to revise the Schedule 4 Rates and Prices to reflect the actual circumstances in which it was required to carry out the Works, particularly as a result of changes to the Works and as a result of various breaches of the Agreement by ~~tie~~. The revision of the Schedule 4 Rates and Prices results in an entitlement to payment of an additional sum of ~~in~~ in respect of this Work Section. The evaluation of this sum is contained in Appendix F.

## 5.0 EXPLANATION OF THE QUANTUM ENTITLEMENT - 1A 01 01

- 5.1. The calculation of Carillion's Entitlement for the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009 is attached at Appendix F. Carillion contends that it is entitled to a further sum of £930,150 in respect of this period for Work Section 1A 01 01.
- 5.2. Carillion's tendered rate of productivity has been reduced as a direct consequence of the circumstances in which it was required to carry out the Works all will be more fully set out in Section 4. As a direct result, the Schedule 4 Rates and Prices fall to be revised to reflect actual productivity.
- 5.3. The calculation does this by comparing actual team days per lm (linear metre) of diversion compared to the planned team days per lm over the whole period and then producing a revised rate per lm of diversion which is applied to the quantity of work actually executed in each Work Section thus revising the Schedule 4 Rates and Prices to arrive at the true value of work carried out by Carillion.
- 5.4. Logic
- 5.4.1. The planned productivity output figure of an average of 4.74 lm per team per day (incl auxiliaries but excluding reinstatement), based on an 8hr day, has been accepted by tie as accurately reflecting the tendered productivity level for the whole project. Reference is made to an e-mail from John Casserley of tie to Taryne Lowe of Carillion dated 14<sup>th</sup> October 2008 in which tie adopted the Schedule 4 Rates and Prices productivity output as part of a calculation to analyse previous Carillion entitlement to additional payment. Furthermore, as part of the March 2009 settlement between Carillion and tie it was agreed by the parties that Carillion had suffered delay and disruption to resources employed by it, resulting in additional incurred costs, and agreement was reached in relation to the element of the settlement sum to be paid with



reference to delay and disruption by establishing the reduced productivity associated with that delay and disruption. This analysis was based upon a model produced jointly by the parties. The model applied the same Schedule 4 Rates and Prices productivity output of 4.74 lm per team per day (including auxiliaries).

- 5.4.2. The average planned productivity output figure for each individual Work Section varies from the figure of 4.74 lm per day dependant on the scope of work contained in that Work Section.

Carillion have analysed the tender nett Bill of Quantities to derive the **average labour & plant rate per lm** for each Work Section (for 1A 01 01 the relevant figure is £172.91 per lm) and also the average planned Work Section productivity output figure (for 1A 01 01 the relevant figure is 4.35 lm per day). On the basis that Carillion originally planned to use their own labour which had to be disbanded due to the late design in 2007, the tender labour rates have been increased for the extra over cost of using specialist sub-contract labour to give an enhanced labour and plant rate per lm (for 1A 01 01 the relevant figure is £192.96 per lm)

- 5.4.3. Carillion have recalculated the average planned Work Section productivity output per team day (based on a tendered 8 hr day) for each individual Work Section to the average planned productivity (when working a 10 hr day) to derive the **enhanced average planned Work Section productivity output** (for 1A 01 01 the relevant figure is 5.43 lm per day). Carillion have analysed the work actually carried out in each Work Section on a weekly basis from October 2008 to August 2009 using the actual lm of diversion achieved (from the monthly applications for payment), actual hours worked (from record sheets plus a 10% allowance for Hiab drivers which serve all the Work Sections) excluding hours spent on re-works by Carillion, based on an actual 10hr day, and calculated the **average actual Work Section productivity output per team per day** for the relevant period (for 1A

01 01 the relevant figure is 1.22 lm per day). Carillion have then divided the average actual Work Section productivity output by the enhanced average planned Work Section productivity output to derive a factor to increase the rate per lm (for 1A 01 01 the relevant factor is 4.45).

5.4.4. Carillion have then pro-rated the enhanced average labour and plant rate per lm by the factor to give a new rate per lm for the actual diversions (for 1A 01 01 the relevant figure is £858.88 per lm)

5.4.5. The new rate per lm is then multiplied by the actual lm achieved in the relevant period to derive the enhanced sum due (for 1A 01 01 the relevant figure is £841,705). Carillion then:-

5.4.5.1. add an 8.07% allowance to the enhanced sum to compensate for disruption to reinstatement Labour and Plant not allowed for in the calculation. The calculation of the figure of 8.07% is contained on page 4 of Appendix F (for 1A 01 01 the relevant figure is £67,926)

5.4.5.2. consider the previously certified value of diversion work for the relevant period and:

5.4.5.3. reduce the enhanced sum due by the certified value of diversion work (for 1A 01 01 the relevant figure is £169,456)

5.4.5.4. reduce the enhanced sum due by the certified labour and plant value of Change Control based on an average 47.82% (for 1A 01 01 the relevant figure is £30,615)

5.4.6. Carillion thereafter add:-

5.4.6.1. 7% for price fluctuations for the labour and plant element only based on the formulae contained in the CARP (for 1A 01 01 the relevant figure is £49,669);

5.4.6.2. 8.8% for the tender Mark-up in addition to the nett Bill of

Quantities rates (for 1A 01 01 the relevant figure is £66,812)

5.5. This therefore calculates the true value of work carried out by Carillion at revised Schedule 4 Rates and Prices reflecting actual productivity for each Work Section. When calculated for Work Section 1A 01 01 this gives rise to an additional entitlement of £826,042.

5.6. However, account then requires to be taken of Work Section preliminaries which are calculated on page 2 of Appendix F as follows:

5.6.1. Carillion divide the new labour and plant rate per lm by the average labour and plant rate per lm using a weighted average for each of the Work Sections to give a Work Section factor to apply to the Work Section preliminaries (i.e. this gives a factor of 4.68).

5.6.2. Carillion then multiply the Work Section preliminaries by the Work Section factor less the average to give an entitlement for the increased labour and plant rate (i.e. £1,063,053).

5.6.3. Carillion then add 10.8% to the preliminaries for price fluctuations (i.e. £114,810). Carillion then add 8.80% for the tender Mark-up in addition to the nett Bill of Quantities rates (i.e. £103,652) giving a total preliminaries claim of £1,281,515 (for 1A 01 01 the relevant pro-rated figure is £104,109). When the additional preliminaries figure of £104,109 is added to the additional entitlement for the Work Section of £826,042 this gives rise to a total additional entitlement for Work Section 1A 01 01 of £930,150.

## 5.7. Reasonableness

5.7.1. This method of calculation of Carillion's Entitlement is reasonable, in accordance with the provisions of the MUDFA and is similar to that applied in previous discussions and settlements between the parties. A similar method of calculation provided the basis for the March 2009 settlement. On page 2 of 4 of the March 2009 settlement, at paragraph

4.2 it is stated:-

5.7.1.1. "4.2 Contract Works

5.7.2. Delay and disruption to the resources employed by Carillion resulting in additional incurred costs. Agreement has been reached by establishing the reduced productivity associated with this element based upon a model produced in conjunction with Carillion to deal with the delay and disruption measures set out in Section 2.2 above."

5.8. Conclusion

5.8.1. In summary it is clear that Carillion has encountered a number of issues for which Carillion has no contractual responsibility which have delayed, disrupted and reduced productivity output during the course of the Works. Carillion are not adequately reimbursed for these issues via payment applying the Schedule 4 Rates and Prices which accordingly fall to be revised to reflect actual productivity. The methodology used to calculate the Carillion Entitlement does this in accordance with the Agreement and Carillion are entitled to be paid the additional sum for Work Section 1A 01 01 of £930,150 in respect of the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009.

## 5.0 EXPLANATION OF THE QUANTUM ENTITLEMENT – 1B 01 01

5.1 The calculation of Carillion's Entitlement for the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009 is attached at Appendix F. Carillion contends that it is entitled to a further sum of £1,088,884 in respect of this period for Work Section 1B 01 01.

5.2 Carillion's tendered rate of productivity has been reduced as a direct consequence of the circumstances in which it was required to carry out the Works all will be more fully set out in Section 4. As a direct result, the Schedule 4 Rates and Prices fall to be revised to reflect actual productivity.

5.3 The calculation does this by comparing actual team days per lm (linear metre) of diversion compared to the planned team days per lm over the whole period and then producing a revised rate per lm of diversion which is applied to the quantity of work actually executed in each Work Section thus revising the Schedule 4 Rates and Prices to arrive at the true value of work carried out by Carillion.

### 5.4 Logic

5.4.1 The planned productivity output figure of an average of 4.74 lm per team per day (incl auxiliaries but excluding reinstatement), based on an 8hr day, has been accepted by tie as accurately reflecting the tendered productivity level for the whole project. Reference is made to an e-mail from John Casserley of tie to Taryne Lowe of Carillion dated 14<sup>th</sup> October 2008 in which tie adopted the Schedule 4 Rates and Prices productivity output as part of a calculation to analyse previous Carillion entitlement to additional payment. Furthermore, as part of the March 2009 settlement between Carillion and tie it was agreed by the parties that Carillion had suffered delay and disruption to resources employed by it, resulting in additional incurred costs, and agreement was reached in relation to the element of the settlement sum to be paid with

reference to delay and disruption by establishing the reduced productivity associated with that delay and disruption. This analysis was based upon a model produced jointly by the parties. The model applied the same Schedule 4 Rates and Prices productivity output of 4.74 lm per team per day (including auxiliaries).

- 5.4.2 The average planned productivity output figure for each individual Work Section varies from the figure of 4.74 lm per day dependant on the scope of work contained in that Work Section.

Carillion have analysed the tender nett Bill of Quantities to derive the average labour & plant rate per lm for each Work Section (1B 01 01 the relevant figure is £165.35 per lm) and also the average planned Work Section productivity output figure (for 1B 01 01 the relevant figure is 4.84 lm per day). On the basis that Carillion originally planned to use their own labour which had to be disbanded due to the late design in 2007, the tender labour rates have been increased for the extra over cost of using specialist sub-contract labour to give an enhanced labour and plant rate per lm (for 1B 01 01 the relevant figure is £183.84 per lm)

- 5.4.3 Carillion have recalculated the average planned Work Section productivity output per team day (based on a tendered 8 hr day) for each individual Work Section to the average planned productivity (when working a 10 hr day) to derive the **enhanced average planned Work Section productivity output** (for 1B 01 01 the relevant figure is 6.06 lm per day). Carillion have analysed the work actually carried out in each Work Section on a weekly basis from October 2008 to August 2009 using the actual lm of diversion achieved (from the monthly applications for payment), actual hours worked (from **record sheets plus a 10% allowance for Hiab drivers which serve all the Work Sections**) excluding hours spent on re-works by Carillion, based on an actual 10hr day, and calculated the **average actual Work Section productivity output per team per day** for the relevant period (for 1B

01 01 the relevant figure is 0.44 lm per day). Carillion have then divided the average actual Work Section productivity output by the enhanced average planned Work Section productivity output to derive a factor to increase the rate per lm (for 1B 01 01 the relevant factor is 13.71).

5.4.4 Carillion have then pro-rated the enhanced average labour and plant rate per lm by the factor to give a new rate per lm for the actual diversions (for for 1B 01 01 the relevant figure is £2,519.84 per lm)

5.4.5 The new rate per lm is then multiplied by the actual lm achieved in the relevant period to derive the enhanced sum due (for 1B 01 01 the relevant figure is £919,741). Carillion then:-

5.4.5.1 add an 8.07% allowance to the enhanced sum to compensate for disruption to reinstatement Labour and Plant not allowed for in the calculation. The calculation of the figure of 8.07% is contained on page 4 of Appendix F (for 1B 01 01 the relevant figure is £74,223)

5.4.5.2 consider the previously certified value of diversion work for the relevant period and:

5.4.5.3 reduce the enhanced sum due by the certified value of diversion work (for 1B 01 01 the relevant figure is £60,353)

5.4.5.4 reduce the enhanced sum due by the certified labour and plant value of Change Control based on an average 47.82% (for 1B 01 01 the relevant figure is £30,122)

5.4.6 Carillion thereafter add:-

5.4.6.1 7% for price fluctuations for the labour and plant element only based on the formulae contained in the CARP (for 1B 01 01 the relevant figure is £63,244);

5.4.6.2 8.8% for the tender Mark-up in addition to the nett Bill of

Quantities rates (for 1B 01 01 the relevant figure is £85,072)

5.5 This therefore calculates the true value of work carried out by Carillion at revised Schedule 4 Rates and Prices reflecting actual productivity for each Work Section. When calculated for Work Section 1B 01 01 this gives rise to an additional entitlement of £1,051,805.

5.6 However, account then requires to be taken of Work Section preliminaries which are calculated on page 2 of Appendix F as follows:

5.6.1 Carillion divide the new labour and plant rate per lm by the average labour and plant rate per lm using a weighted average for each of the Work Sections to give a Work Section factor to apply to the Work Section preliminaries (i.e. this gives a factor of 4.68).

5.6.2 Carillion then multiply the Work Section preliminaries by the Work Section factor less the average to give an entitlement for the increased labour and plant rate (i.e. £1,063,053).

5.6.3 Carillion then add 10.8% to the preliminaries for price fluctuations (i.e. £114,810). Carillion then add 8.80% for the tender Mark-up in addition to the nett Bill of Quantities rates (i.e. £103,652) giving a total preliminaries claim of £1,281,515 (for 1B 01 01 the relevant pro-rated figure is £37,079). When the additional preliminaries figure of £37,079 is added to the additional entitlement for the Work Section of £1,051,805 this gives rise to a total additional entitlement for Work Section 1B 01 01 of £1,088,884.

## 5.7 Reasonableness

5.7.1 This method of calculation of Carillion's Entitlement is reasonable, in accordance with the provisions of the MUDFA and is similar to that applied in previous discussions and settlements between the parties. A similar method of calculation provided the basis for the March 2009 settlement. On page 2 of 4 of the March 2009 settlement, at paragraph



4.2 it is stated:-

5.7.1.1 "4.2 Contract Works

5.7.2 Delay and disruption to the resources employed by Carillion resulting in additional incurred costs. Agreement has been reached by establishing the reduced productivity associated with this element based upon a model produced in conjunction with Carillion to deal with the delay and disruption measures set out in Section 2.2 above."

**5.8 Conclusion**

5.8.1 In summary it is clear that Carillion has encountered a number of issues for which Carillion has no contractual responsibility which have delayed, disrupted and reduced productivity output during the course of the Works. Carillion are not adequately reimbursed for these issues via payment applying the Schedule 4 Rates and Prices which accordingly fall to be revised to reflect actual productivity. The methodology used to calculate the Carillion Entitlement does this in accordance with the Agreement and Carillion are entitled to be paid the additional sum for Work Section 1B 01 01 of £1,088,884 in respect of the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009.

## 5.0 EXPLANATION OF THE QUANTUM ENTITLEMENT – 1B 01 02

- 5.1 The calculation of Carillion's Entitlement for the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009 is attached at Appendix F. Carillion contends that it is entitled to a further sum of £1,573,785 in respect of this period for Work Section 1B 01 02.
- 5.2 Carillion's tendered rate of productivity has been reduced as a direct consequence of the circumstances in which it was required to carry out the Works all will be more fully set out in Section 4. As a direct result, the Schedule 4 Rates and Prices fall to be revised to reflect actual productivity.
- 5.3 The calculation does this by comparing actual team days per lm (linear metre) of diversion compared to the planned team days per lm over the whole period and then producing a revised rate per lm of diversion which is applied to the quantity of work actually executed in each Work Section thus revising the Schedule 4 Rates and Prices to arrive at the true value of work carried out by Carillion.

### 5.4 Logic

- 5.4.1 The planned productivity output figure of an average of 4.74 lm per team per day (incl auxiliaries but excluding reinstatement), based on an 8hr day, has been accepted by tie as accurately reflecting the tendered productivity level for the whole project. Reference is made to an e-mail from John Casserley of tie to Taryne Lowe of Carillion dated 14<sup>th</sup> October 2008 in which tie adopted the Schedule 4 Rates and Prices productivity output as part of a calculation to analyse previous Carillion entitlement to additional payment. Furthermore, as part of the March 2009 settlement between Carillion and tie it was agreed by the parties that Carillion had suffered delay and disruption to resources employed by it, resulting in additional incurred costs, and agreement was reached in relation to the element of the

settlement sum to be paid with reference to delay and disruption by establishing the reduced productivity associated with that delay and disruption. This analysis was based upon a model produced jointly by the parties. The model applied the same Schedule 4 Rates and Prices productivity output of 4.74 lm per team per day (including auxiliaries).

- 5.4.2 The average planned productivity output figure for each individual Work Section varies from the figure of 4.74 lm per day dependant on the scope of work contained in that Work Section.

Carillion have analysed the tender nett Bill of Quantities to derive the **average labour & plant rate per lm** for each Work Section (1B 01 02 the relevant figure is £175.58 per lm) and also the average planned Work Section productivity output figure (for 1B 01 02 the relevant figure is 4.30 lm per day). On the basis that Carillion originally planned to use their own labour which had to be disbanded due to the late design in 2007, the tender labour rates have been increased for the extra over cost of using specialist sub-contract labour to give an **enhanced labour and plant rate per lm** (for 1B 01 02 the relevant figure is £194.58 per lm)

- 5.4.3 Carillion have recalculated the average planned Work Section productivity output per team day (based on a tendered 8 hr day) for each individual Work Section to the average planned productivity (when working a 10 hr day) to derive the **enhanced average planned Work Section productivity output** (for 1B 01 02 the relevant figure is 5.37 lm per day). Carillion have analysed the work actually carried out in each Work Section on a weekly basis from October 2008 to August 2009 using the actual lm of diversion achieved (from the monthly applications for payment), actual hours worked (from record sheets plus a 10% allowance for Hiab drivers which serve all the Work Sections)

excluding hours spent on re-works by Carillion, based on an actual 10hr day, and calculated the average actual Work Section productivity output per team per day for the relevant period (for 01 02 the relevant figure is 0.89 lm per day). Carillion have then divided the average actual Work Section productivity output by the enhanced average planned Work Section productivity output to derive a factor to increase the rate per lm (for 1B 01 02 the relevant factor is 6.03).

5.4.4 Carillion have then pro-rated the enhanced average labour and plant rate per lm by the factor to give a new rate per lm for the actual diversions (for 1B 01 02 the relevant figure is £1,174.07 per lm)

5.4.5 The new rate per lm is then multiplied by the actual lm achieved in the relevant period to derive the enhanced sum due (for 1B 01 02 the relevant figure is £1,384,232). Carillion then:-

5.4.5.1 add an 8.07% allowance to the enhanced sum to compensate for disruption to reinstatement Labour and Plant not allowed for in the calculation. The calculation of the figure of 8.07% is contained on page 4 of Appendix F (for 1B 01 02 the relevant figure is £111,708)

5.4.5.2 consider the previously certified value of diversion work for the relevant period and:

5.4.5.3 reduce the enhanced sum due by the certified value of diversion work (for 1B 01 02 the relevant figure is £207,004)

5.4.5.4 reduce the enhanced sum due by the certified labour and plant value of Change Control based on an average 47.82% (for 1B 01 02 the relevant figure is £46,317)

5.4.6 Carillion thereafter add:-

- 5.4.6.1 7% for price fluctuations for the labour and plant element only based on the formulae contained in the CARP (for 1B 01 02 the relevant figure is £86,983);
- 5.4.6.2 8.8% for the tender Mark-up in addition to the nett Bill of Quantities rates (for 1B 01 02 the relevant figure is £117,005)
- 5.5 This therefore calculates the true value of work carried out by Carillion at revised Schedule 4 Rates and Prices reflecting actual productivity for each Work Section. When calculated for Work Section 1B 01 02 this gives rise to an additional entitlement of £1,446,608.
- 5.6 However, account then requires to be taken of Work Section preliminaries which are calculated on page 2 of Appendix F as follows:
- 5.6.1 Carillion divide the new labour and plant rate per lm by the average labour and plant rate per lm using a weighted average for each of the Work Sections to give a Work Section factor to apply to the Work Section preliminaries (i.e. this gives a factor of 4.68).
- 5.6.2 Carillion then multiply the Work Section preliminaries by the Work Section factor less the average to give an entitlement for the increased labour and plant rate (i.e. £1,063,053).
- 5.6.3 Carillion then add 10.8% to the preliminaries for price fluctuations (i.e. £114,810). Carillion then add 8.80% for the tender Mark-up in addition to the nett Bill of Quantities rates (i.e. £103,652) giving a total preliminaries claim of £1,281,515 (for 1B 01 02 the relevant pro-rated figure is £127,177). When the additional preliminaries figure of £127,177 is added to the additional entitlement for the Work Section of £1,446,608 this gives rise to a total additional entitlement for Work Section 1B 01 02 of £1,573,785..

## 5.7 Reasonableness

5.7.1 This method of calculation of Carillion's Entitlement is reasonable, in accordance with the provisions of the MUDFA and is similar to that applied in previous discussions and settlements between the parties. A similar method of calculation provided the basis for the March 2009 settlement. On page 2 of 4 of the March 2009 settlement, at paragraph 4.2 it is stated:-

5.7.1.1 "4.2 Contract Works

5.7.2 Delay and disruption to the resources employed by Carillion resulting in additional incurred costs. Agreement has been reached by establishing the reduced productivity associated with this element based upon a model produced in conjunction with Carillion to deal with the delay and disruption measures set out in Section 2.2 above."

## 5.8 Conclusion

5.8.1 In summary it is clear that Carillion has encountered a number of issues for which Carillion has no contractual responsibility which have delayed, disrupted and reduced productivity output during the course of the Works. Carillion are not adequately reimbursed for these issues via payment applying the Schedule 4 Rates and Prices which accordingly fall to be revised to reflect actual productivity. The methodology used to calculate the Carillion Entitlement does this in accordance with the Agreement and Carillion are entitled to be paid the additional sum for Work Section 1B 01 02 of £1,573,785 in respect of the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009.

## 5.0 EXPLANATION OF THE QUANTUM ENTITLEMENT – 1C 04 01

- 5.1 The calculation of Carillion's Entitlement for the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009 is attached at Appendix F. Carillion contends that it is entitled to a further sum of £1,550,955 in respect of this period for Work Section 1C 04 01.
- 5.2 Carillion's tendered rate of productivity has been reduced as a direct consequence of the circumstances in which it was required to carry out the Works all will be more fully set out in Section 4. As a direct result, the Schedule 4 Rates and Prices fall to be revised to reflect actual productivity.
- 5.3 The calculation does this by comparing actual team days per lm (linear metre) of diversion compared to the planned team days per lm over the whole period and then producing a revised rate per lm of diversion which is applied to the quantity of work actually executed in each Work Section thus revising the Schedule 4 Rates and Prices to arrive at the true value of work carried out by Carillion.

### 5.4 Logic

- 5.4.1 The planned productivity output figure of an average of 4.74 lm per team per day (incl auxiliaries but excluding reinstatement), based on an 8hr day, has been accepted by tie as accurately reflecting the tendered productivity level for the whole project. Reference is made to an e-mail from John Casserley of tie to Taryne Lowe of Carillion dated 14<sup>th</sup> October 2008 in which tie adopted the Schedule 4 Rates and Prices productivity output as part of a calculation to analyse previous Carillion entitlement to additional payment. Furthermore, as part of the March 2009 settlement between Carillion and tie it was agreed by the parties that Carillion had suffered delay and disruption to resources employed by it, resulting in additional incurred costs, and agreement was reached in relation to the element of the

settlement sum to be paid with reference to delay and disruption by establishing the reduced productivity associated with that delay and disruption. This analysis was based upon a model produced jointly by the parties. The model applied the same Schedule 4 Rates and Prices productivity output of 4.74 lm per team per day (including auxiliaries).

- 5.4.2 The average planned productivity output figure for each individual Work Section varies from the figure of 4.74 lm per day dependant on the scope of work contained in that Work Section.

Carillion have analysed the tender nett Bill of Quantities to derive the **average labour & plant rate per lm** for each Work Section (1C 04 01 the relevant figure is £183.96 per lm) and also the average planned Work Section productivity output figure (for 1C 04 01 the relevant figure is 4.12 lm per day). On the basis that Carillion originally planned to use their own labour which had to be disbanded due to the late design in 2007, the tender labour rates have been increased for the extra over cost of using specialist sub-contract labour to give an **enhanced labour and plant rate per lm** (for 1C 04 01 the relevant figure is £205.07 per lm)

- 5.4.3 Carillion have recalculated the average planned Work Section productivity output per team day (based on a tendered 8 hr day) for each individual Work Section to the average planned productivity (when working a 10 hr day) to derive the **enhanced average planned Work Section productivity output** (for 1C 04 01 the relevant figure is 5.14 lm per day). Carillion have analysed the work actually carried out in each Work Section on a weekly basis from October 2008 to August 2009 using the actual lm of diversion achieved (from the monthly applications for payment), actual hours worked (from record sheets plus a 10% allowance for Hiab drivers which serve all the Work Sections)



excluding hours spent on re-works by Carillion, based on an actual 10hr day, and calculated the average actual Work Section productivity output per team per day for the relevant period (for 1C 04 01 the relevant figure is 1.25). Carillion have then divided the average actual Work Section productivity output by the enhanced average planned Work Section productivity output to derive a factor to increase the rate per lm (for 1C 04 01 the relevant factor is 4.12).

- 5.4.4 Carillion have then pro-rated the enhanced average labour and plant rate per lm by the factor to give a new rate per lm for the actual diversions (for 1C 04 01 the relevant figure is £844.86 per lm)
- 5.4.5 The new rate per lm is then multiplied by the actual lm achieved in the relevant period to derive the enhanced sum due (for 1C 04 01 the relevant figure is £1,446,406). Carillion then:-
- 5.4.5.1 add an 8.07% allowance to the enhanced sum to compensate for disruption to reinstatement Labour and Plant not allowed for in the calculation. The calculation of the figure of 8.07% is contained on page 4 of Appendix F (for 1C 04 01 the relevant figure is £116,725)
- 5.4.5.2 consider the previously certified value of diversion work for the relevant period and:
- 5.4.5.3 reduce the enhanced sum due by the certified value of diversion work (for 1C 04 01 the relevant figure is £314,946)
- 5.4.5.4 reduce the enhanced sum due by the certified labour and plant value of Change Control based on an average 47.82% (for 1C 04 01 the relevant figure is £82,141)
- 5.4.6 Carillion thereafter add:-

5.4.6.1 7% for price fluctuations for the labour and plant element only based on the formulae contained in the CARP (for 1C 04 01 the relevant figure is £81,623);

5.4.6.2 8.8% for the tender Mark-up in addition to the nett Bill of Quantities rates (for 1C 04 01 the relevant figure is £109,795)

5.5 This therefore calculates the true value of work carried out by Carillion at revised Schedule 4 Rates and Prices reflecting actual productivity for each Work Section. When calculated for Work Section 1C 04 01 this gives rise to an additional entitlement of £1,357,462

5.6 However, account then requires to be taken of Work Section preliminaries which are calculated on page 2 of Appendix F as follows:

5.6.1 Carillion divide the new labour and plant rate per lm by the average labour and plant rate per lm using a weighted average for each of the Work Sections to give a Work Section factor to apply to the Work Section preliminaries (i.e. this gives a factor of 4.68).

5.6.2 Carillion then multiply the Work Section preliminaries by the Work Section factor less the average to give an entitlement for the increased labour and plant rate (i.e. £1,063,053).

5.6.3 Carillion then add 10.8% to the preliminaries for price fluctuations (i.e. £114,810). Carillion then add 8.80% for the tender Mark-up in addition to the nett Bill of Quantities rates (i.e. £103,652) giving a total preliminaries claim of £1,281,515 (for 1C 04 01 the relevant pro-rated figure is £193,494). When the additional preliminaries figure of £193,494 is added to the additional entitlement for the Work Section of £1,357,462 this gives rise to a total additional entitlement for Work Section 1C 04 01 of £1,550,955.

## 5.7 Reasonableness

5.7.1 This method of calculation of Carillion's Entitlement is reasonable, in accordance with the provisions of the MUDFA and is similar to that applied in previous discussions and settlements between the parties. A similar method of calculation provided the basis for the March 2009 settlement. On page 2 of 4 of the March 2009 settlement, at paragraph 4.2 it is stated:-

5.7.1.1 "4.2 Contract Works

5.7.2 Delay and disruption to the resources employed by Carillion resulting in additional incurred costs. Agreement has been reached by establishing the reduced productivity associated with this element based upon a model produced in conjunction with Carillion to deal with the delay and disruption measures set out in Section 2.2 above."

## 5.8 Conclusion

5.8.1 In summary it is clear that Carillion has encountered a number of issues for which Carillion has no contractual responsibility which have delayed, disrupted and reduced productivity output during the course of the Works. Carillion are not adequately reimbursed for these issues via payment applying the Schedule 4 Rates and Prices which accordingly fall to be revised to reflect actual productivity. The methodology used to calculate the Carillion Entitlement does this in accordance with the Agreement and Carillion are entitled to be paid the additional sum for Work Section 1C 04 01 of £1,550,955 in respect of the period 1<sup>st</sup> October 2008 to 31<sup>st</sup> August 2009.

## 6.0 Glossary of Terms

Term	Description
(1C-03-02)	York Place to St Andrews Work Site
(1D-01-01)	Haymarket to Shandwick Place Work Site
(2A-01-01)	Haymarket Yards
<b>A</b>	
AMIS	Alfred McAlpine Infrastructure Services
<b>B</b>	
BT	British Telecom
<b>C</b>	
CW	Cable and Wireless
CO	Change Order
CS	Construction Services
CUS	Carillion Utility Services
CVI	Confirmation Of Verbal Instruction / Record Sheet
<b>D</b>	
Delay Schedule	Contained within Appendix A
DKE	Developed Kinematic Envelope
<b>E</b>	
EOT	Extension Of Time
<b>H</b>	
HAVS regulations	Hand Arm Vibration Syndrome Regulations
HV	High Voltage
<b>I</b>	
IFA	Issued for Approval
IFC	Issued for Construction
<b>L</b>	

LV	Low Voltage
<b>M</b>	
MUDFA	Multi Utility Diversion Framework Agreement
<b>P</b>	
PE	Polyethylene
Programme 7.9	New base line programme after settlement agreement no 2
PU	Public Utilities
<b>R</b>	
RAT	Risk And Trade Off
<b>S</b>	
SDS	tie Ltd Designers
SGN	Scotland Gas Networks
SP	Scottish Power
SU	Statutory Utility
SW	Scottish Water
<b>T</b>	
tie Ltd	The Client
TM	Traffic Management
TMRP	Traffic Management Review Panel
TQ	Technical Query
TTRO's	Temporary Traffic Regulation Orders
<b>V</b>	
VM	Virgin Media

**W**

WO	Work Order
WOCN	Work Order Confirmation Notice
WOP	Work Order Proposal
WOR	Work Order Requirement
Work Section	A sub-section of a Work Sector
Work Site	Any Work Site within any Work Section