THE EDINBURGH TRAM INQUIRY

Closing Submissions of Siemens Plc

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1.0 INTRODUCTION

1. Siemens is grateful to the Inquiry for the opportunity to make written closing submissions on the evidence that the Inquiry has before it.

2. Siemens understands that the purpose of the Inquiry is to make recommendations for better governance of major tram and light rail infrastructure projects.

3. A number of aspects covered in evidence to the Inquiry are not considered to be of relevance to Siemens. These include project governance, procurement strategy and Scottish elections in 2007 and Siemens makes no comment in respect of these matters.

4. Rather, Siemens respectfully wishes to direct the Inquiry to some of the key issues that it considers have arisen in evidence during the Inquiry and to confirm its position on these issues based on all of the evidence before the Inquiry.

1.1 Summary of Siemens' Position

5. In its submission to the Inquiry, the Light Rail Transit Association stated that it was Siemens' specialist resources and project management skills that delivered the project **[CZS00000037_0006]**.

6. The Edinburgh Tram Project was a strategically important project for Siemens. It was a high profile infrastructure project in a world heritage site. The Siemens press release issued on 19 May 2008, following contract award, reflected the importance of the Edinburgh Tram Project to Siemens:

"Siemens has a proven track record in the international light rail market for delivery and integration of infrastructure on time and to budget. Involvement in this prestigious project is an important milestone for Siemens in Scotland, where Siemens plc currently employs over 2900 people across numerous industries from transport to power generation to financial services", [Christian Roth, managing director for Siemens Transportation Systems UK].[1]

7. Siemens' press release also acknowledged that the contract included a ten year maintenance agreement and that TIE had plans to expand the network in the coming years. Thus, Siemens wanted this contract to be a success and the strategic objectives implicit in this press release, rather than the pursuit of short term financial advantage, informed its commercial and contract strategy.

8. The Inquiry has heard evidence critical of Siemens' pricing, both Off-Street and On-Street. Much of this evidence has been, at best, ill-informed and inaccurate, reflecting a manifest failure to recognise, acknowledge, quantify and accurately report to stakeholders the overwhelming impact of delay on the project's cost. This, it is submitted, is largely attributable to the fact that the matters which caused delay were a direct function of the risk allocation within the Infraco Contract and the administration of the Infraco Contract by TIE as these risks materialised, rather than any act or omission on the part of Infraco.

[1] https://www.siemens.com/press/en/pressrelease/?press=/en/pressrelease/2008/mobility/imotk200805031.htm

9. Siemens recognised, at an early stage, both the imperative for progress and the consequences of delay. Matters were accurately summarised in March 2010 by Siemens' Project Director, Miguel Berrozpe:

> *"The biggest enemy to the project is delay. Anything we can do to progress works and get others to progress works significantly reduces our risk and increases chances of viability and survival."* **[SIE00000219_0002]**

10. Siemens understood the corrosive impact of delay in terms of project viability and sustainability and sought to act accordingly. Despite these efforts, as the contractual disputes grew more acrimonious, the project became mired in delay, uncertainty and increasing cost.

11. At the outset, it might assist the Inquiry to set out, in tabular form, a summary of Siemens' price submissions from Contract Close[2] to final account[3].

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2 'Contract Close' is used to refer to the execution of the Infraco Contract, which occurred on 14 May 2008.

3 Table 1 is based upon Table 1 to Axel Eickhorn's second supplemental statement [TRI00000276_0002]. In respect of the Settlement Agreement and the Final Account, the On-Street Price is shown separately. The figures in Table 1 are explained at Section 10.1.

Date	Contract/Offer	Siemens Construction Works Price	Prolongation Conponent	Completion Date (Passenger Service)	Construction Completion- AIR-HAY Key Date	Construction Completion- AIR-York Place Key Date	Additional Period on Site (Months)	Additional Period On-Site due to On-Street
14/05/2008	Original Contract	£101,679,003	N/a	16/07/2011	09/11/2010	N/a	N/a	N/a
29/07/2010	Project Carlisle 1	£126,901,621	£26,005,862	19/11/2012	22/05/2012	N/a	16.18	N/a
11/09/2010	Project Carlisle 2	£118,601,221	£20,612,906	18/12/2012	21/06/2012	N/a	17.13	N/a
24/02/2011	Project Phoenix	£136,881,719	£35,157,646	22/09/2013	11/03/2013	N/a	26.27	N/a
15/09/2011	Settlement Agreement	£125,881,719 + £12,473,500 = £138,355,219	£25,167,727 + £6,121,600 = £31,289,327	20/05/2014	29/07/2013	21/11/2013	34.16	3.78
03/10/2014	Final Account	£125,881,719 + £12,425,430 = £138,307,149	£25,167,727 + £7,810,861 = £32,978,588	08/07/2014	21/08/2013	09/01/2014	35.77	4.64

Table 1- Siemens Price Submissions showing Movement in Completion Date and Prolongation Costs

12. This Table 1 indicates the ongoing slippage in planned completion and the corresponding movement in the Construction Works Price. In particular, it confirms that the movement in Siemens' price was primarily driven by the increased provision for project delay and disruption. More particularly, Table 1 shows that, as delays mounted and expenditure increased, Siemens' project costs were increasingly a function of time rather than scope.

13. In blunt terms, the reason Siemens' price increased was because the project duration doubled and Siemens was required to retain a highly specialist project team on site for an additional three years for reasons entirely beyond its control.

14. By contrast, as will be demonstrated in the course of this submission, a crude understanding of scope; arbitrary apportionments of price; a failure to properly

account for prolongation costs and change values; and a failure to provide an accurate account to stakeholders, characterised the various assessments made by TIE of Siemens' financial entitlement.

15. Thus, at Mar Hall, decision makers were faced with two competing narratives. By that stage, Siemens were 34 months into a 38-month programme and were faced with the prospect of being on-site for an extended period of more than 26 months. Siemens had, by then, largely exhausted its provisions for project management and project supervision. Furthermore, Siemens had substantially completed its design and had manufactured or procured over £33 million of materials and equipment. However, because of ongoing delays and lack of site access, only 8% of overall Siemens' installation works had been completed against a planned completion of 100% [**SIE00000304_0001**]. At this juncture, Siemens sought an additional payment of £35.2 million for resolution of accrued claims and change estimates and, in particular, for an extended presence on site until 22 September 2013.

16. By contrast, in its preparation for mediation, TIE advised the City of Edinburgh Council ("CEC") leaders that, despite the accrued delay to design and utility diversion works, the value of agreed and un-agreed change, and the significant prolongation and disruption of the Infraco Works, Siemens had no entitlement whatsoever to additional payment and that its true entitlement was £68.1 million, namely an effective refund of £33.5 million on its original Construction Works Price [**BFB00094604_0003**].

17. It was abundantly clear to Siemens at this point that TIE was incapable of providing stakeholders with the objective financial assessment essential for good decision making. TIE's consistently adversarial contract strategy, lack of objectivity and its outright hostility toward Infraco had merely served to delay agreement, at considerable cost to the City of Edinburgh.

18. Siemens prides itself on its open, collaborative and proactive relationships with clients. However, by 2011, Siemens was no longer prepared to accept a situation in which it bore the financial consequences of a flawed contract strategy and the costs and delays arising therefrom whilst TIE sought to maintain the fiction that the contract was "fixed price", that adjudication decisions were "mixed" and that Infraco was culpable for delay. In particular, Siemens was unprepared to permit TIE, essentially, to "raid" its Construction Works Price as a means to fund TIE's attempt to retrospectively fix the price and re-apportion risk.

19. The specialist skills and resources that Siemens and its project team brought to bear on this project deserved better than that.

1.2 Contract Background

20. By way of initial background, on 8 May 2007 Bilfinger Berger Civil UK Limited ("BBUK") and Siemens Plc ("Siemens"), entered into the Consortium Agreement [**TIE00079228**], which sought to regulate their relationship during the bid and post bid stages for the Edinburgh Tram Project.

21. On 14 May 2008, BBUK and Siemens, together known as 'Infraco'[4], entered into the Infraco Contract with tie Limited ('TIE') for the design, construction, commissioning, and maintenance of the Edinburgh Tram Network. On the same day, by a Minute of Variation to the Infraco Contract ("MoV1"), TIE, BBUK, Siemens and CAF agreed that CAF would become a party to the Infraco Contract. Also on this date, CAF became a member of the Consortium and a party to the Consortium Agreement, and TIE and Infraco agreed, with the consent of CAF, to novate both the Tram Supply Agreement and the Tram Maintenance Agreement ('the Tram Agreements') from TIE to Infraco. Clause 2.4 of the Consortium Agreement provided that Siemens (as opposed to BBUK) bore the risk and responsibility for CAF's Share of the Works and for the inclusion of CAF in the Consortium.

22. The scope of work to be undertaken by Siemens was known as 'Systems and Trackwork', which included the provision of On-Street and Off-Street trackwork, tramstop equipment, overhead line equipment, traction power supply, substations, tram detection systems, supervisory control and communication systems and equipment, stray current protection, electromagnetic compatibility and immunisation, and the provision of depot workshop equipment. BBUK was responsible for 'Civil and Building Works', and CAF's Share of the Works was defined as its obligations under the Tram Agreements.

23. Significantly, Siemens was also responsible for the System Integration process and for the management of system-wide technical interfaces.

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[4] BBUK and Siemens known separately as 'Infraco Member'

1.3 Phasing of the Infraco Works

24. For the benefit of the Inquiry, and in order to assist in the consideration of matters regarding price, Siemens, by way of preamble, sets out below a summary of the phasing of the Infraco Works, and its obligations in respect of testing, commissioning and system acceptance at each stage of the Infraco Works.

25. The most significant project milestone was 'Service Commencement', which represented substantial completion of the Infraco Works[5] and the commencement of 'Passenger Services'.

26. Further, within 12 months of Service Commencement, Infraco was required to achieve 'System Acceptance', which signified the satisfactory testing, commissioning and acceptance of the Edinburgh Tram Network in accordance with the Employer's Requirements[6].

27. During the construction phase, namely prior to Service Commencement, the Infraco Contract required Infraco to deliver the Infraco Works in defined 'Sections' and by specified Sectional Completion Dates. Liquidated and ascertained damages were recoverable by TIE in respect of any failure by Infraco to meet the Planned Sectional Completion Dates.

28. The Sections of the Infraco Works applicable to Phase 1a, including the applicable Sectional Completion Dates and the damages for non-completion, were as follows:

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5 Infraco Contract, Clause 45.5_[**CEC00036952_0114**]

6 Table 25 at Appendix 1 indicates that, post completion, Infraco was required to undertake and pass a Network Performance Test and a Network Reliability Test.

Section	Planned Sectional Completion	Damages
Section A (Depot)-completion of the Depot (including energisation) and the first tram delivered to the Site.	25 March 2010	£20,000 per week
Section B (Test Track)-completion of the test track (including energisation), assumed as Depot to Airport, and five Trams delivered to Site.	23 April 2010	£23,000 per week
Section C (Testing and Commissioning)-carrying out and completion of Phase 1a to Newhaven (including energisation) and the completion of all tests required by the Employer Requirements including those System Acceptance Tests that must be successfully completed prior to shadow running.	17 January 2011	£195,000 per week
Section D-completion of shadow running and commencement of revenue service approval obtained and the completion of all tests required by the Employer Requirements including those System Acceptance Tests that must be successfully completed to enable Service Commencement.	26 weeks after Certificate of Sectional Completion for Section C	£246,000 per week

Table 2- Sections, Sectional Completion Dates and Associated Liquidated Damages

29. These Planned Sectional Completion Dates were reflected in the 'Key Dates' in the contract Programme (rev. 0), at Schedule Part 15 to the Infraco Contract [**USB00000080_0002**]. These Key Dates are reproduced below at Table 3.

Key Dates		803	14-Apr-08	16-Jul-11	0
170	AWARD CONTRACT	0	14-Apr-0		0
270	Mobilisation	20	14-Apr-08	12-May-08	16
280	Commence Phase 1a	0	14-Apr-08		1189
281	Construction Completion Phase 1a Edinburgh Airpo	0		09-Nov-10	0
310	Commencement of Revenue Service Phase 1a Edi	0		09-May-11	0
311	Construction Completion Phase 1a Haymarket to N	0		17-Jan-11	0
312.8	Commencement of Revenue Service Phase 1a Hay	0		16-Jul-11	0
313	Section Completion A	0		25-Mar-10	0
314	Section Completion B	0		23-Apr-10	449
315	Section Completion C	0		17-Jan-11	180
325	Section Completion D	0		16-Jul-11	0

Table 3- Schedule Part 15 Infraco Programme (Rev.0) Key Dates

30. These 'Key Dates' indicate that *'Construction Completion Edinburgh Airport to Haymarket'* was planned to occur on 17 January 2011. In contrast, planned testing and commissioning obligations prior to Service Commencement are ongoing for a further period of 6 months, namely until 16 July 2011.

1.4 Overview of Testing, Commissioning and System Acceptance Obligations

31. In order to provide an overview of the nature and timing of Siemens' System[7] obligations, Siemens set out at Figure 2 to Appendix 1 a summary logic chart of its testing, commissioning and system acceptance obligations during the planned period of the Project.

32. This chart demonstrates the ongoing integration and commissioning obligations which were a condition precedent to Sectional Completion and Service Commencement. In addition, the post-completion obligations in regard to System Acceptance are indicated.

33. Siemens would ask the Inquiry to particularly note its testing obligations prior to Service Commencement. This is demonstrated by reference to the 'Key Dates' from the Rev 0 Programme shown in Table 3 above and the commissioning phase activities from the Rev 0 Programme shown in Table 4 below **[USB00000080_0003]**.

Commissioning Phase 1a Haymarket to Newhaven		126	18-Jan-11	16-Jul-11	0
312	System Integration Test; Phase 1a Haymarket to Ne	30	18-Jan-11	16-Feb-11	0
312.1	Test Running and Driver Familiarisation; Phase 1a I	30	17-Feb-11	18-Mar-11	0
312.2	T1 Post Commissioning Test completed; Phase 1a I	0		18-Mar-11	0
312.3	Test Running and Driver familiarisation performanc	30	19-Mar-11	17-Apr-11	0
312.4	T2 Performance Test completed; Phase 1a Haymar	0		17-Apr-11	0
312.5	Approval of HMRI; Phase 1a Haymarket to Newhav	0		17-Apr-11	0
312.6	Shadow running: Phase 1a Haymarket to Newhave	90	18-Apr-11	16-Jul-11	0
312.7	T3 Pre-Operations Test Completed; Phase 1a Hayr	0		16-Jul-11	0

Table 4- Commissioning Activities/Dates for Phase 1a Haymarket to Newhaven-Programme Rev.0

[7] In the Infraco Contract (as amended by the Settlement Agreement), 'System' means "*all infrastructure, plant, machinery, equipment (including Trams) and systems comprised in and required to deliver a fully functional and maintainable Initial Phase 1a.*"

34. The System Acceptance Tests required in order to achieve Sectional Completion are detailed in Table 43 to the Employer Requirements [**USB00000033_0316**]. This table is reproduced below at Table 25 to Appendix 1[8].

35. The express objectives of the process were to ensure that System performance, integrity, reliability, availability, and safety were rigorously tested and that the System and all component sub-systems were validated and verified against the Employer's Requirements.

36. A proper understanding of Siemens' pricing proposals requires an acknowledgement of the resources, preliminaries and risks associated with the full and proper discharge of these testing and commissioning obligations.

37. The potential risks include both damages and additional costs. In regard to damages for late completion, the stated rates of liquidated and ascertained damages in respect of Section C and Section D of the Infraco Works were £195,000 and £246,000 per week respectively. Because of the express Share of the Works and the indemnity provisions with the Consortium Agreement, any delay to completion due to delayed 'System Acceptance' was, in essence, a Siemens risk.

38. Further, the process of dynamic testing of integrated systems and the progressive testing of these systems and system interfaces in order to demonstrate performance against operational and safety standards always

[8] Section 23.11 of the Employer's Requirements expressly requires the completion of the System Acceptance Tests following physical completion in order to achieve System Acceptance [**USB00000033_0326**].

presents a risk that testing may reveal earlier non-compliances with their origins in the design, design integration or build phase of the project. In addition, as part of this process, Siemens was responsible for ensuring that the CAF Trams were fully integrated with the Infraco Works[9].

39. Thus, Siemens needed to ensure that it deployed and retained key design, commissioning, engineering, and management personnel in order to deliver System Acceptance and manage associated risks. The duration of this obligation was reflected in Clause 8.4 of the Infraco Contract[10].

9 Infraco Contract Clause 8.2 [**CEC00036952_0024**]

10 Clause 8.4 [System Integration] -"...*The Infraco shall make qualified personnel available to ensure system integration throughout the Term*." [**CEC00036952_0025**]

2.0 EVENTS FROM JANUARY TO MAY 2008

2.1 Request for Additional Monies - Rutland Square Agreement

40. In February 2008, as a direct result of the on-going delay to, and changes in, the scope of the proposed works and the slippage in both design delivery and Contract Close, Siemens and TIE agreed an increase of £3.8 million in Siemens' portion of the contract price. This agreement was recorded in the Rutland Square Agreement dated 7 February 2008 [**CEC01284179_0002**]. Pursuant to this agreement, a revised Construction Contract Price of £222,062,426 was recorded together with a 3-month slippage in the project programme.

41. Mr. Andrew Fitchie has characterised this agreement as a "price grab" by Siemens. In his oral evidence, in reference to paragraph 7.467 of his witness statement [**TRI00000102_C_0220**], Mr. Fitchie alleged that, in early February 2008, Siemens sought additional monies from TIE:

> *"The context here is the Rutland Square Agreement and what became known as a price grab, and Siemens came and asked for more money"* **[Inquiry Transcript 10 October 2017, page 56:3-5]**.

42. Separately, in his witness statement [**TRI00000102**], under the heading 'Employer's Requirements & Rutland Square Agreement', Mr. Fitchie stated that in 2007, TIE began to overhaul the Employer's Requirements. At paragraph 2.140 Mr. Fitchie expressly stated that:

"Revising the ERs post BAFO[11] would inevitably mean subsequent changes to Infraco proposals. The revisals allowed both BBS and the SDS provider to revisit their prices". **[TRI00000102_C_0028]**

43. Thereafter, at paragraph 2.141, Mr. Fitchie stated that this revision to the Employer's Requirements led to the Rutland Square Agreement, executed on 7 February 2008 **[TRI00000102_C_0028]**.

44. At paragraph 2.142 of his witness statement, Mr. Fitchie stated that the Rutland Square Agreement followed three days of negotiations at DLA Piper's ("DLA") offices and that Siemens demanded an additional sum of £8.5 million, in part due to the revised Employer's Requirements. Mr. Fitchie also stated that Siemens had issues with the System Design Service ("SDS") design availability and quality and required additional monies way by of contingency for this matter.

45. Siemens strongly rejects the assertion that the Rutland Square Agreement represented a '*price grab*' by Siemens. Whatever the motivation for these remarks, Siemens consider them to be unfounded. In particular, Siemens reject the implied assertion that it had underbid and was seeking to improve its position. Siemens has robust internal vetting and peer review procedures for all bids and has considerable expertise in this regard based on similar projects across different countries and continents.

[11] BAFO is an abbreviation for Best and Final Offer

46. Siemens was, and remains, satisfied that its pricing of the Infraco Works had made proper and adequate provision for its scope obligations. Michael Flynn addressed the matter of Siemens' pricing during oral evidence:

> *"In terms of the Siemens component, we go through quite a robust process in terms of making sure what we submit in bids is as robust as possible, and in the event that we're not sure about something, we'll exclude that or we'll qualify it or we'll do -- identify some provisional sums.*
>
> *So I think in terms of what we had to do, we as a company were quite comfortable that our price and how we set out our price was quite transparent and we were willing to stand behind it."* [**Transcript 6 December 2017, page 43:2-11**].

47. However, as stated by Michael Flynn at paragraph 53 of in his witness statement [**TRI00000151_0013**], the Wiesbaden Agreement did not provide the certainty required to expedite contract closure and:

> *"Unfortunately, notwithstanding the Wiesbaden agreement, tie continued to change the scope and terms from what was in our bid for the Infraco works. It seemed to be the case that there were changes made to the scope and terms by tie, but no appreciation for the consequences of those changes (essentially increased costs, risks and scheduling time)".*

48. Mr. Flynn further expanded upon this during oral evidence:

"I recall that there was an expectation that once we concluded Wiesbaden, then that was the end of the line in terms of changing the scope that affected us. But no sooner had Wiesbaden been signed than there was a change in the Employer's Requirements. I think there was a range of new changes falling out of that. There were also changes in the terms and conditions which would have increased some of our commercial risk." **[Transcript 6 December 2017, page 54:11-18].**

49. Mr. Flynn advised that the extent of changes were such that Siemens could no longer accommodate these within its existing price:

"and therefore it was necessary to basically seek recompense for that increase in scope and liability" [**Transcript 6 December 2017, page 54:20-22**].

50. Therefore, Siemens' actions were not opportunistic and did not represent a 'price grab'. Rather, they were a necessary and proportionate response to the changing demands of an indecisive client.

51. Accordingly, on 18 January 2008, Infraco wrote to TIE [**CEC01432556**] in order to identify and progress the matters required to enable Contract Close. The issues identified included:

- novation of CAF;
- novation of SDS;

- compatibility of CAF Tram with Developed Kinematic Envelope ("DKE"); and
- resolution of new Employer Requirements v3.2.

52. The resolution of these matters, particularly, the revision to the Employer's Requirements, led to the Rutland Square Agreement [**CEC01284179**].

53. In addition, pursuant to the express terms of the Rutland Square Agreement, the parties agreed that the project programme would be moved out by 3 months, that CAF would join the Consortium and that unforeseen risks arising out of misalignment between the CAF/TIE Tram Maintenance and Tram Supply Agreements and the Infraco Contract would be shared on a 50/50 basis. This latter risk was of particular concern to Siemens as, owing to the Consortium Agreement, the responsibility for CAF's performance rested with Siemens rather than BBUK [**TIE00079227**].

54. In oral evidence Mr. Flynn explained the particular significance of the changes to the Employer's Requirements for Siemens:

> *"The expectation was that our bid would be translated into the Employer's Requirements, but that didn't transpire, and other obligations -- other requirements were introduced."* [**Transcript 6 December 2017, page 55:2-5**].

55. Thus, whilst the Base Date Design Information ("BDDI") and any changes thereto was of fundamental importance to BBUK, for Siemens the Employer's Requirements were the primary drivers in the determination of its 'Systems &

Trackwork' scope obligations. In addition, because of the inherent nature of the System elements, changes made had a potential system-wide impact and, unlike construction changes, were not always location specific.

56. Whilst not a Siemens' document, the Design Due Diligence Summary Report [**DLA00006338**] produced by BBUK in February 2008 accurately describes the extent of design delay and uncertainty at that time:

> *" The evolution of the design programme and the fact that the target design completion date has slipped by 13 months over 2 years suggests that the design development process is not running smoothly and that there are significant risks that further slippages will occur.*
>
> *In accordance with TIE's original procurement concept a complete and issued for construction design would have been novated to the Infraco. The current design is far from meeting these requirements and, as consequence, a novation is considered to present significant and unforeseeable risks to overall success of the project."* **[DLA00006338_0009].**

57. The price increase in the Rutland Square Agreement was negotiated in full knowledge of the fact that TIE reserved the right to pursue alternative tenders. Clause 7 of the Rutland Square Agreement expressly provided that "*adherence to the terms and conditions of this Agreement is a condition to the BBS Consortium retaining its status as Preferred Bidder*" [**CEC01284179_0004**].

58. This possibility was reinforced by an email from TIE dated 21 February 2008 [**CEC01449336**] wherein TIE threatened Infraco with de-selection as preferred bidder due to delay in completing SDS novation:

> *"It is entirely untenable in my view that this deal will go ahead without the completion of this novation and it will be my duty in safeguarding the public purse to advise the City of Edinburgh Council that we should now deselect the current preferred bidders and pursue a different route. There should be no false illusions about my determined intent on this, whilst this will represent a disappointing setback it is altogether preferable to the alternative of concluding this contractual process without said novation being completed."*

59. Similarly, in his oral evidence Mr. Flynn confirmed that Siemens' pricing was not driven by any lack of competitiveness and that, in the context of the Rutland Square Agreement price increase, TIE had the right to go to the second bidder:

> *"Ultimately, if that was not acceptable to the client, they had rights under all of these agreements that were signed to actually give the contract to the second bidder. So again, it was one of those things where we were -- felt we were being quite transparent throughout, and tie always had the right to go to the second bidder.*" [**Transcript, 6 December 2017, Page 56:4-10]**.

60. In the face of allegations of a 'price grab', Siemens would also refer the Inquiry to the evidence of Tony Glazebrook, who was TIE's Engineering Services Director.

In the context of design completion and design approval prior to Contract Close and SDS novation, Mr. Glazebrook provided an engineering perspective on the allegation that Infraco had an "undeclared agenda" and stated that:

> *"I was sad to hear that, very sad, because certainly at the level I worked with, the engineers in Siemens and Bilfinger Berger, they were excellent. There was no -- I perceived no funny agenda or desire to inflate prices at all. None of that at all."* [**Transcript, 4 October 2017, Page 203:16-20]**.

61. Siemens therefore submits that the evidence of Michael Flynn should be preferred in this regard.

3.0 EVENTS AFTER CONTRACT CLOSE (MAY TO DECEMBER 2008)

3.1 Difficulties in Progressing the Infraco Works

61A Lack of Site Access

62. The simple reason that Siemens experienced difficulties in progressing the Infraco Works after Contract Close was because it was denied access to Site and to Designated Working Areas[12]. This fact is acknowledged in Axel Eickhorn's witness statement:

> *" As a consequence of no site access, Siemens could not undertake its works. Siemens' hands were tied in this respect"* [**TRI00000171_0025, paragraph 44**].

63. This fact was a direct consequence of the nature and timing of Siemens' share of the Infraco Works and the preceding client delays. The Consortium Agreement allocated the work between the parties as follows:

- Siemens - Systems and Trackworks; and
- BBUK - Civil and Building Works.

64. In addition, further to Amendment No. 2 to the Consortium Agreement, as between the Original Consortium Members (BBUK and Siemens), Siemens bore the risk and responsibility for CAF's Share of the Works and for the inclusion of CAF in the Consortium Agreement[13].

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12 By Clause 18.1.2 of the Infraco Contract, Infraco had an exclusive licence to enter and remain upon the Designated Working Areas for the duration of the time required for completion of the Infraco Works [**CEC00036952_0072**]

13 Initially confirmed by letter [**TIE00079227**].

65. Thus, at Contract Close, Siemens had ample incentive to proceed with its share of the Infraco Works in a prompt and efficient manner. However, as a matter of programme and construction logic, the commencement and execution of the Siemens 'Systems & Trackwork' scope was wholly dependent upon the completion of preceding activities by others. These dependencies were reflected in the contract Programme [**USB00000080]**.

66. Therefore, whilst Siemens was responsible for the laying of track, that activity could not commence unless and until TIE had diverted utilities beneath and to the side of the track and the ground improvement layer had been provided to support the Siemens' track slab. This dependency is shown graphically in the visualisation presented at the Mar Hall mediation and provided by Siemens to the Inquiry. Similarly, the completion of Systems installation, including line-side cabling and equipment, tram stops equipment, and depot equipment was wholly dependent on the completion of prior building and civil engineering works.

3.2 Alleged Failure to Mobilise Timeously

67. Notwithstanding the lack of access noted above, it is necessary for Siemens to respond to the assertion by TIE that Infraco failed to mobilise timeously. More specifically, the Inquiry has expressly referred to the allegations of delayed mobilisation contained in TIE letter dated 14 October 2008 [**DLA00001672**] and the concerns expressed by TIE over lack of visible progress in regard to both staff recruitment and key subcontractor appointment recorded in TIE's minutes of meeting dated 10 June 2008 [**DLA00001673**].

68. Siemens rejects the assertion that it failed to mobilise timeously or to appoint key subcontractors. As noted in Mr. Flynn's witness statement [**TRI00000151_0031**, paragraph 116.1], a number of people within Siemens' project team were mobilised before contract signature in order to support the contract negotiations. Axel Eickhorn also confirms that Siemens mobilised all required key personnel without delay [**TRI00000171_0010, paragraph 22.1.1**].

69. In addition, Axel Eickhorn confirms that, on 22 May 2008, Siemens mobilised its principal key-subcontractor, BAM Rail, and issued a formal 'Instruction to Commence' to BAM Rail to start the sub-contract works with immediate effect [**TRI00000171_0010, paragraph 22.1.1]**[14]. This was only one day after Siemens had executed its subcontract with BAM Rail on 21 May 2008 for the design and construction of trackwork and just 1 week after execution of the Infraco Contract. At this point, the first anticipated trackwork activity was planned for 21 October 2008, namely the laying of track (Activity ID 1129) in Section 2A between Haymarket and the Roseburn Junction[15]. Thus, Siemens had, in good faith, mobilised both its project personnel and it trackwork contractor in sufficient time to meet its programme obligations.

70. In support of this proposition, James Donaldson of BBUK, provided evidence that "*the general project mobilised in accordance with what was available*" [**Transcript 16 November 2017, page 105:16-17**].

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14 Exhibit AE5 to Axel Eickhorn's Second Supplemental Statement [**TRI00000276_0031**]

15 This first trackwork activity can be seen in the Infraco Programme (Schedule Part 15) [**USB00000080_0026**]

71. Importantly, at this point, Siemens was unaware of the significant delay to the completion of preceding activities by TIE, namely the MUDFA Utility Diversion works. As Mr Flynn put it:

> *"I don't recall Siemens being made aware of these issues with the utility diversion works at the time of submitting its bid. The Consortium was informed by tie that such works would be completed before the Contract was executed"* [**TRI00000151_0006**, **paragraph 23**].

72. Thus, the reality was that Siemens had mobilised and deployed to Edinburgh a full project team, comprising highly qualified and experienced personnel, in accordance with the planned programme of works. The majority of Siemens' senior staff[16] came from overseas, because of the international nature of such projects, and were on delegated contracts with Siemens (from Siemens AG) which made provision for both staff and their families. In addition, Siemens had invested considerable time and effort to ensure that its staff was familiar with the specific technical, environmental and regulatory regime for the project. Equally, Siemens' principal Key Subcontractor, BAM Rail had mobilised a full team from the Netherlands.

73. The cost of retaining these specialist project teams in Edinburgh became Siemens' single greatest project expense. [**Inquiry Transcript, 6 December 2017, Page 182: 12-21**].

[16] Referred to in the Infraco Contract as 'Key Personnel' [CEC00036952_0267].

3.3 Reasons for Difficulties Encountered

74. The immediate and ongoing difficulty that Siemens encountered in seeking to commence and progress the Infraco Works following mobilisation was, as stated above, the ongoing lack of access to Site and to Designated Working Areas.

75. The reasons for these difficulties are described below.

76. Unfolding MUDFA Delays

77. Following contract award, the true extent of delay to preceding client activities became apparent. In particular, the extent of delay to utility diversion became clear. Thus, having mobilised both its project team and its principal key subcontractor to commence work in accordance with the agreed contract Programme, the anticipated works sites and work access were not made available as a direct result of preceding delays to both design and MUDFA works.

78. In the latter part of 2008, it emerged that the MUDFA works were in significant delay. In this regard, immediately prior to TIE's letter to Infraco dated 14 October 2008 [**DLA00001672**], Infraco had, on 13 October 2008, [**DLA00001671**] advised TIE that, at that time, six months of delay to the contract programme had been notified. In addition, Infraco identified the need to establish a revised baseline for the project. Therein, Infraco proposed a structured approach to both the evaluation of delay and the re-programming of the works.

79. The evidence of John Casserly (TIE Commercial Manager for MUDFA) highlighted the true extent of the MUDFA delays prior to 'Contract Close' in May

2008 and the reporting within TIE of this delay both before and after Contract Close.

80. In oral evidence Mr. Casserly advised that both the lack of adequate site investigation in respect of utilities and the delay to MUDFA works were apparent in 2007 [**Transcript 18 October 2017, page 63:24-64:22**]. Mr. Casserly's evidence also indicates that these facts were communicated to TIE prior to Contract Close. However, TIE failed to communicate the extent of these delays to other parties, including stakeholders. By way of example, the 'Project Directors Report' attached to the Papers for the Tram Board Meeting on 4 June 2008 [**CEC00080738_0010**] indicated under the heading of "Progress_MUDFA" that:

> *"Overall, cumulative progress is approximately six weeks behind programme and, prior to mitigation, shows a two week impact on the Infraco programme. tie are currently agreeing Revision 7.0 of the MUDFA programme which will mitigate any likely impacts with agreement expected in Period 3:"*

81. By contrast, the 'MUDFA Sub Committee Report Papers for Meeting 4 June 2008' [**CEC01302139_0008**], also prepared by TIE, indicated in terms of 'overall performance to date' that of a planned total of 24,322 metres of utilities, only 15,288 metres (62%) had been completed. As Counsel to the Inquiry pointed out, this was roughly 40% less than what should have been done. Counsel went on to question Mr. Casserly why this information was not being reported to the Tram Project Board:

Q. "I can understand why advice would want to be given to the Board about particularly what is going to affect the other contracts.

A. Yes.

Q. But was there any discussion with you about why these figures, the 40 per cent behind schedule, were not being reported to the Tram Project Board?

A. No. As I say, we produced the numbers and we also sat in a monthly meeting, presented these numbers and showed all the figures. We weren't involved in the production of the reports that then went to the sub-committees of the boards." [**Transcript 18 October 2017, page 78:9-20**].

82. This 40% shortfall was markedly different to what was being reported to the Tram Project Board, particularly in light of Infraco's right to exclusive licence to enter and remain upon the Designated Working Areas pursuant to Clause 18.1.2 of the Infraco Contract.

83. The failure by TIE to complete utility diversion works was contrary to both the Pricing Assumptions in Schedule Part 4 and the Programme Assumptions in Schedule Part 15b (Programme) [**USB00000081**]. Pricing Assumptions 24[17] and 32[18] [**USB00000032_0008]** reflected the fact that the Programme was based upon the assumption that the MUDFA works would be completed in advance of,

[17] Pricing Assumption 24: *"That in relation to Utilities the MUDFA Contractor and/or Utility shall have completed the diversion of any utilities in accordance with the requirements of the Programme..."*

[18] Pricing Assumption 32: *"That the programming assumptions set out in Schedule Part 15 (Programme) remain true in all respects."*

and would not conflict with, the Infraco Works. In addition, the Programme Assumptions in Schedule Part 15 reflected the requirement for prior completion of utility diversion in advance of the Infraco Works.[19]

84. Had TIE been more forthcoming about the extent of these delays, then it would have been possible for the parties to consider robust and appropriate mitigation measures or to take a more informed view about contract mobilisation and activity sequence.

85. Delay to Design Delivery

86. The delay caused by the incomplete utility diversion was compounded by the ongoing delay to design delivery and the production of Issued For Construction ("IFC") drawings. At Contract Close, the agreed contract programme was already out of date because of the known misalignment between the contract Programme and the SDS Design Delivery Programme. The contract Programme was based upon Design Delivery Programme V26. However, at the date of contract, namely 14 May 2008, the current Design Delivery Programme was version V31, reflecting further slippage in required design deliverables in the period prior to contract.

87. The delay in the issue of IFC design was compounded by the delay in receipt of third party approvals and consents. Also, design changes were sought post approval. These matters are covered more fully by Martin Foerder in his witness statement [**TRI00000118_0054, paragraph 10.16**].

[19] Programme Assumptions in regard to MUDFA are set in Infraco Schedule Part 15b Programming Assumptions – final [**USB00000081_0002**]

88. As a direct result, Siemens was unable to provide work for its trackwork contractor, BAM Rail. In addition, Siemens was unable to plan its trackwork or systems operations because of the absence of an agreed programme which accurately reflected both the impact of preceding delays and the planned sequence of future work.

89. Further Compounding Factors

90. It is Siemens' position that the delay to site access caused by incomplete and delayed utility diversion and design delivery was compounded by the deficient mechanisms within the Infraco Contract for dealing with change arising as a result of Notified Departures; and further, that the allocation of risk and the express mechanisms for dealing with change meant that the Infraco Contract was not workable given TIE's pre-determined strategy in respect of Notified Departures.

91. Both of these matters are considered in more detail in the following section. In the context of TIE's contract strategy, the resolution of the misalignment in the Design Delivery Programme at Contract Close is also expressly considered.

3.4 Infraco Contract: Not Workable

92. Because of the risk allocation within the Infraco Contract, and, in particular, the pricing assumptions within Schedule Part 4, it was self-evident that the Infraco Works would be subject to change in light of the ongoing delay to and evolution of both the SDS design and the MUDFA works. Schedule Part 4 expressly

acknowledged the disconnect between the known facts and the assumed basis of pricing:

> *"It is accepted by tie that certain Pricing Assumptions have been necessary and these are listed and defined in Section 3.4 below. The Parties acknowledge that certain of these Pricing Assumptions may result in the notification of a Notified Departure immediately following execution of this Agreement. This arises as a consequence of the need to fix the Contract Price against a developing factual background. In order to fix the Contract Price at the date of this Agreement certain Pricing Assumptions represent factual statements that the Parties acknowledge represent facts and circumstances that are not consistent with the actual facts and circumstances that apply. For the avoidance of doubt, the commercial intention of the Parties is that in such circumstances the Notified Departure mechanism will apply."* [**USB00000032_0005, Clause 3.2.1**].

93. This state of affairs was acknowledged by Axel Eickhorn at paragraph 17 (line 7-10) of his witness statement [**TRI00000171_0007**]:

> *"It was apparent that, at the time the Infraco Contract had been signed, there were delays in the design process, the cost of which were not included in the contract price."*

94. In total, there were 43 Pricing Assumptions in Schedule Part 4. However, the sheer volume of changes which occurred post-contract was not anticipated by Siemens or, we suspect, by any of the other contracting parties. This fact,

combined with the procedural complexity and contractual priority afforded to the Clause 80 change provisions created a very difficult contracting environment.

95. From Siemens' perspective it rapidly emerged that the Infraco Contract was unworkable in the face of repeated 'falsification' of the Base Case Assumptions[20]. This, it is now clear, was, in large part, due to the pre-ordained 'tooth and nail strategy' adopted by TIE. The manner in which changes were deemed to arise and the necessity to agree these changes in accordance with Clause 80 in advance of construction caused particular difficulties. These difficulties were first encountered by BBUK in seeking to progress works whilst the MUDFA works were ongoing, as explained by James Donaldson during oral evidence:

> "*the change process, where you had to give estimates before you could proceed. Trying to follow the contract and every excavation you opened up, you found a change to ask, so therefore you had to follow the process. So it really just was -- it was -- it was unworkable, the actual contract in that context down there, to uncover all these changes and try and construct in parallel with it.*" [**Transcript, 16 November 2017, Page 107:21-108:4**]

96. In common with most major infrastructure contracts, the client sought to control the circumstances in which changes arose and the programme and cost impact of such changes. Thus, in pursuit of this objective, pursuant to Clause 80, works in respect of a 'TIE Change' could not commence until the change Estimate had been agreed or, alternatively, until the Estimate had been referred to the Dispute

[20] Mr. Robert Howie, QC. [CEC00407650_0013, third paragraph, line 1]

Resolution Procedure for determination and TIE had instructed Infraco to proceed with the TIE Change.[21]

97. This process was wholly appropriate for a client seeking to control changes to price and programme. However, what TIE seemed not to appreciate was the operation of these provisions where Changes arose as a result of the deeming provisions in Schedule Part 4 rather than as a result of a client decision to modify the Infraco Works:

> *"Paragraph 3.5 of Schedule Part 4 deemed any Notified Departures from the Base Case Assumptions as defined at para 2.2 of Schedule Part 4 to be a Mandatory tie Change, and that tie would be deemed to have issued a tie Notice of Change on the date that such a Notified Departure was notified by either party to the other, and therefore the change procedure set out in clause 80 of the Infraco Contract applied."* [**TRI00000171_0024- Axel Eickhorn witness statement, at paragraph 41**]

98. These deeming provisions combined with the establishment of comprehensive Base Case Assumptions meant that, via the mechanism of Schedule Part 4, TIE relinquished sole control over the instigation and implementation of TIE Changes. In this regard, Siemens would endorse the observation made in the course of a question by Senior Counsel to the Inquiry in regard to a draft version of Schedule Part 4, that:

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[21] Clause 80.15 [CEC00036952_0195]

"This generates a situation in which changes will be automatic. Tie would have no control over them." [**Transcript, Thursday 19 October 2017, page 182:24-25**]

99. Of particular significance was Pricing Assumption 1 in regard to design development. Because the SDS design contract was novated to Infraco post contract, the final development of the design was no longer controlled by TIE. In essence, design finalisation post contract gave rise to potential changes in the form of Notified Departures, depending on the nature and extent of design development.

100. Therefore, as the civil engineering design continued to evolve post contract, a significant number of 'Notified Departures' emerged and were notified by Infraco. Because such deemed changes were based upon departures from the Base Date Design Information ("BDDI") they were of relevance to the civil engineering works rather than 'Systems & Trackwork' and Siemens was not directly involved in the instigation of such changes.

101. In addition, Pricing Assumption No. 24, in regard to completion of utility diversions in accordance with the programme, gave rise to a significant number of Notified Departures as a result of the ongoing delay to the completion of the MUDFA works. Again, Siemens was not directly involved in these changes, as the completion of utility diversion was an not an immediate precursor or predecessor activity to 'System and Trackwork' operations. However, the cumulative effect of these pricing assumptions, and the Notifed Departures arising therefrom, generated a volume of change that was simply unmanageable.

102. In oral evidence, Alastair Maclean, Head of Legal Services, of CEC conceded, in the context of Schedule Part 4, that "*it was patently obvious there was a fundamental problem with that contract*" [**Inquiry Transcript, 20 September 2017, page 24:8-9**].

103. It is Siemens position that, because of the contractual arrangements and allocation of risk outlined above, and because of TIE's pre-ordained strategy in regard to Notified Departures, dispute was almost inevitable[22].

3.5 TIE's 'Tooth and Nail' Strategy

104. The evidence presented to the Inquiry indicates that, prior to Contract Close, in the face of these inevitable 'Notified Departures', TIE had two options, namely either to seek to minimise or mitigate the impact of these changes post contract or, alternatively, to anticipate and address these changes before Contract Close. Witnesses for TIE have stated that TIE adopted the former strategy in order not to compromise Contract Close.

105. A less generous interpretation of TIE's position is that its pre-ordained strategy was to contest each and every Notified Departure following contract award. Inquiry document **CEC01465908** indicates that on 31 March 2008, in light of the known Notified Departure in relation to the SDS Design Delivery Programme, Mr. Fitchie of DLA advised that Mr. McEwan and Mr. Bell – both of TIE - should seek to agree known changes prior to contract award:

[22] Siemens now understands that Dundas & Wilson came to a similar conclusion [**TRS00032182_0001**].

"The only approach open to tie, in my opinion is a factual one, not a contractual one (since the mechanism for Notified Departure puts the advantage with BBS by creating an automatic tie Change): to capture as many identified key changes that tie knows will be required and to attempt to fix them and agree their likely programme and/or cost impact with BBS prior to contract award, or at the least identify the reasonable range of programme and cost impacts." [**CEC01465908_0001**].

106. In an internal response to this email Mr. McEwan stated that:

" *My view is that if we pursue Andrew's steer on this, we will open up the whole can of worms on the Infraco contract cost overall, and that we have to take on the chin that the programme version is not consistent, get the deal signed and then fight the notified departure tooth and nail. I understand Andrew's point but if we were at all hopeful of getting this done by the 15 April (this year) we cannot take his suggested approach.*" [**CEC01465908_0001**].

107. It is Siemens' position that, whilst TIE may initially have sought to minimise and mitigate the impacts of Notified Departures, it had not made realistic provision either by way of risk contingency, or otherwise, to deal with the sheer extent of changes and was left with only one option: to contest and dispute notified changes. This view is reinforced by examination of internal TIE email dated 5 May 2008 [**CEC01294478**], which indicates that TIE were aware of 78 potential

Notified Departures, eight of which were considered to have a programme impact [**CEC01294479**].

3.6 Failure to Agree V26-V31 Programme Impact Prior to Contract

108. The TIE approach to Notified Departures following Contract Close was first evident to Siemens by its approach to the agreement of the impact of the delay to the SDS Design Delivery Programme.

109. As outline above, it has emerged during the Inquiry that TIE was advised to resolve the matter of the Design Delivery Programme misalignment prior to Contract Close [**CEC01465933**]. Infraco shared the same view. This is confirmed by Infraco's draft letter of 22 April 2008 [**SIE00000401**]. Whilst this letter was not sent, it provides a contemporaneous record of the Consortium's concerns. Therein, Infraco outlines its concern over the acknowledged misalignment between the SDS design and the Infraco Proposals with regard to price and programme. Infraco stated that:

> *"we firmly believe that these issues should be brought to a satisfactory conclusion before the award of a contract."* [**SIE00000401_0001**]

110. The draft letter also outlined Infraco's concern over the further delays to the Design Programme and the MUDFA works and the inevitable consequential strain on contractual relationships during the early stages of the Project. Infraco also outlined its concern that CEC should properly understand that it would be required to fund substantial increases in the Construction Works Price and a prolongation of the construction programme after contract award. In oral

evidence, Michael Flynn advised that this blunt message had been passed to TIE [**Transcript, 6 December 2017, Page 75:5-10**].

111. However, the misalignment with the Design Delivery Programme was not addressed or agreed before Contract Close. Thus, on 21 May 2008, Infraco notified TIE of the required revisions to the contract Programme to reflect this misalignment, including the associated extensions of time and Sectional Completion Dates in the form of INTC 001 [**CEC01288310**].

112. However, the extensions of time and the revised contract programme (Rev.1) were not agreed by TIE until 17 December 2008 [**CEC00578330_0001**[23]]. In addition, the cost implications of INTC 01 were not formally agreed until 30 October 2009, following formal mediation. The folly of this strategy was aptly described by Martin Foerder:

> *"So we basically were 14 months -- we needed 14 months to get a change agreed which was known when the contract was signed, which was completely ridiculous from our opinion."* [**Transcript, 5 December 2017, Page 113:15-18**]

113. Siemens would respectfully note that, contrary to footnote 853 to the SETE Group Submissions ('SETE Submission') dated 26 April 2018, it is not the case that this extension was *'in revision 1 of the programme at contract award*'.

114. The difficulties encountered in regard to the agreement of Programme Rev. 1 and the associated prolongation costs could have been wholly avoided had TIE

[23] Reference to 17 December 2008 in 3rd. paragraph refers to TIE written agreement to Programme Rev.1.

elected to resolve this matter prior to contract execution. This would have been the sensible and pragmatic course of action and it is submitted that, at the pre-award stage, TIE would have been in a better negotiating position.

115. This, in essence, was the advice proffered by Geoff Gilbert of TIE when first made aware of this Notified Departure in March 2008:

> *"My view is that we need to (a) confirm the agreements made with SDS on how the differences between V26 and V28 will be dealt with e.g. where and how they have agreed to pull back those dates. (b) identify the impact of these mitigations and any unmitigated changes from V26 on the BBS critical path. This presumably shows that their critical path is unaffected. Then agree this position with BBS. (c) include the agreed SDS mitigations in the Programme Schedule. This is I think the best that we can do to pin BBS and SDS down on this issue."* [**CEC01465933_0001**]

116. However, Mr. McEwan and Mr. Bell choose not to follow this advice.

3.7 Failure to Agree Realistic Programme or Consider Project Demobilisation

117. It is Siemens' position that both the MUDFA and design delays should have been acknowledged by TIE either prior to, or immediately after, Contract Close and that a logical and realistic baseline for the Infraco Works should have been agreed. It would have been far more cost effective for both TIE and Infraco to have delayed either Contract Close or, alternatively, the commencement of

works, until preceding utility diversion was sufficiently advanced to enable an orderly and logical sequence of works.

118. Similarly, Siemens considers that there was considerable merit in the proposal made by BBUK in December 2008 to suspend the works pending completion of design and utility diversions and agreement of revised price and programme.

119. In his witness statement [**TRI00000050_0016**], in response to question 19, Dr. Keysberg of BBUK explained that, on several occasions, he had recommended that:

> *"the works be suspended to allow the utilities to be diverted and the design completed. We would need to be paid for demobilising and mobilising again but I believed that overall this would save money and would be a much better way of working than in a fully disruptive mode."*

120. During oral evidence to the Inquiry on 16 November 2017, Dr. Keysberg further explained that costs were increasing because contractors, having been fully mobilised, were on standby or working in a "*completely disruptive mode*" [**Transcript 16 November 2017, page 37:18-38:14**]. Dr. Keysberg provided evidence regarding the benefit of demobilisation for a period of a year in light of the difficulties faced in late 2008 and early 2009 [**Transcript 16 November 2017, page 38:20-39:6]**.

121. This accords with the evidence given by Axel Eickhorn that Siemens could have mobilised BAM Rail a lot later, with resultant savings in cost:

" A significant part of the additional monies paid to Siemens as part of the Settlement Agreement were in respect of BAM Rail. Siemens also started our manufacturing programme in a timely manner which caused us problems later because we had to find suitable long term storage for all the equipment that was delivered to the site in accordance with the original Programme, but which could not be installed on site. Another example was a Site Manager who had to be stood down, as there was nothing that could be done on site." [**TRI00000171_0010**, paragraph 22.1.1, line 12-21].

122. However, TIE seemed unwilling or unable to countenance consideration of either a project suspension or a re-programming exercise. Whilst this may have been seen by TIE as an unpalatable option, it would have been preferable to the delay, dispute and impasse between the parties, which escalated as the risks identified in Schedule Part 4 materialised.

123. The stark reality was that in 2008, Siemens had mobilised it's staff and it's key-sub-contractors and had commenced its manufacturing process all in accordance with the contract Programme, in order to comply with its contractual obligations, despite the fact that the contract Programme did not represent a credible baseline for the Infraco Works and despite the fact that TIE was seemingly aware of the full extent of the delays to utility diversion prior to Contract Close.

124. In addition, during this initial period TIE continued to request that Infraco "*proceed and make all necessary arrangements to allow the earliest construction*

start as required by the mitigation obligations under the Infraco Contract" [**TIE00422564_0001**] despite the significant ongoing delay to the issue of IFC drawings and to its MUDFA works.

125. The difficulties faced by Siemens were addressed by Axel Eickhorn during oral evidence:

> *"The extent of the delays was not known. And, as I said, many items are long lead items, bespoke equipment, and it -- the extent of the delays was not clear. So you -- we had to avoid a scenario which -- where we were suddenly granted access to work sites, but the equipment wasn't there."* [**Inquiry Transcript 6 December 2017, page 151:13-18**]

126. Thus, both its terms of its resource mobilisation and its manufacturing process (particularly in regard to long lead items), Siemens could not risk being unprepared to proceed in accordance with the contract Programme. This was particularly the case as it appeared that, in furtherance of its robust contractual stance, TIE was actively seeking out evidence of potential 'Infraco Default', as demonstrated by document **CEC00944874**.

127. Consequently, Siemens was placed in an almost impossible position. It was confronted by a client who failed to acknowledge or communicate the true extent of preceding delay to both design and utility diversion but, instead, sought to insist that Siemens and BBUK proceed to mobilise and procure the delivery of the Infraco Works against an unachievable programme.

128. Further, having fully mobilised its staff and its sub-contractors, costs and liabilities continued to mount. In the absence of an agreed programme, Siemens increasingly faced the prospect of liquidated damages. In addition, Siemens was confronted by delay claims from both BAM Rail and from CAF. Furthermore, Siemens was required to find storage for the materials and equipment which it continued to manufacture and procure in compliance with the contract Programme, but for which no payment was forthcoming.

129. A simple demonstration of the impact and uncertainty created for Siemens is provided by reference to Siemens 'Bi-Weekly Team Briefing' held on 22 May 2009 [**SIE00000211_0002**], one year into the project. At item 3.1, with reference to the fact that Siemens was having to re-deploy its Installation Manager because of lack of available work, it was noted that:

> *"MBE explains to the Team that, due to the very slow or nearly zero progress of our installation, and the low probabilities of our "full production" of site works being at speed in the next 10 to 12 months, it has been agreed with TK top management to temporarily put on hold the position of Overall Installation Manager, currently held by Reinhold Schaefer. It has been agreed with Reinhold that he will still be in Edinburgh until June 30th, and then he will be repatriated to Germany for other projects."*

130. The immediate difficulty encountered on mobilisation, namely the lack of access to work sites due to delay to preceding activities, was compounded by the lack of

an updated Programme. As noted above, the required revisions to the contract Programme to reflect the misalignment with the SDS Design Delivery Programme, were notified by Infraco on 21 May 2008 in the form of INTC 01. However, the extensions of time and the revised Contract Programme (Rev.1) were not agreed by TIE until 17 December 2008 [**CEC00578330_0001**][24].

131. In the intervening period the works were subject to further delay and, by December 2008, the project was showing a '5-6 month delay' because of the ongoing slippage in the provision of design and the execution of utility diversion works [**CEC01123743_0001**] .

[24] Reference to 17 December 2008 in 3rd. paragraph refers to TIE written agreement to Programme Rev.1.

4.0 PRINCES STREET DISPUTE

4.1 Causes and Scope & Princes Street Supplemental Agreement

132. Questions regarding the Princes Street dispute and the subsequent Princes Street Supplemental Agreement ("PSSA") have been put to Siemens' witnesses and addressed in both oral and written evidence.

133. It is important to note that Siemens was not directly involved in the Princes Street dispute. Siemens understands that the dispute arose in or around February 2009 and that it related to Infraco's right to exclusive access to the Designated Working Areas in Princes Street. In particular, it reflected a concern on the part of BBUK that, because of the extent of utilities in Princes Street, the works would be subject to significant delay because of the failure of TIE to abide by and implement the Notified Departure mechanism.

134. Siemens also observe that the subsequent PSSA [**WED00000454**] was primarily designed to provide a means of reimbursement to BBUK for the execution of its works in Princes Street. In this regard Siemens notes the express definition of "Princes Street Works" at clause 1 to the PSSA:

> *"Princes Street Works" means the part of the Infraco Works that are to be carried out to construct and complete the civil engineering works elements of the Infraco Works in Princes Street within coordinates Section 1C (Chg 1380-1980) and Section 1D (Chg 0-280)."* [emphasis added]

135. The PSSA was executed on 20 March 2009[25] and enabled works to commence on Princes Street on 23 March 2009. Princes Street was reopened to traffic on 29 November 2009.

136. In September 2010, a dispute arose in relation to the respective valuation of the amounts properly due. TIE's valuation of the demonstrable cost properly due was £9,428,815, whereas Infraco sought payment in the sum of £12,447,726. In this dispute Siemens merely sought payment for the disruption costs of its trackwork sub-contractor, BAM Rail, and these costs were settled in full in the sum of £135,000 on 28 January 2011, prior to adjudication [**BFB00053258_0028**][26]. All other sums in respect of Systems and Trackwork to Princes Street were paid in accordance with the existing contract prices and payment milestones. The fact that Siemens' works in Princes Street were not paid on the basis of demonstrable cost is also acknowledged in an internal TIE email exchange in August 2010 [**TIE00683317**].

137. In his witness statement [**TRI00000151_0018**], at paragraph 75, Mr. Flynn confirmed this state of affairs:

> *"At the time, I considered this to be an issue for Bilfinger to deal with, as I believe the bulk of the dispute concerned utility diversions impacting on Bilfinger's ability to commence and complete its works. Siemens could not commence the majority of its works until Bilfinger's works on a section had*

25 The agreement was not finally executed until 29 May 2009 because of amendments required by CAF.

26 This agreement is confirmed by the inclusion of the sum of £135, 000 by Siemens in Project Phoenix in respect of *'Trackwork works disruption due to Princes Street works*' (SV-001a) [**BFB00053258_0028**]; The agreement had been formally confirmed by TIE on 28 January 2011.

completed. I may have been involved in discussions between the Consortium and tie regarding the dispute, albeit that I do not believe that the issues at the centre of the Princes Street dispute involved Siemens."

138. At paragraph 76 of his witness statement [**TRI00000171_0038**] Axel Eickhorn of Siemens also confirmed that this dispute in Princes Street mainly concerned BBUK. Mr. Eickhorn noted that, because preceding utility diversion works were incomplete, BBUK could not commence work in a "meaningful way". However, Mr. Eickhorn also noted his concerns regarding the planned sequence and method of working:

"The client had the idea that work should start in Princes Street to demonstrate to the public in a prominent place that the works were progressing. The client's idea was for BB to have resources on site at the same time as MUDFA to ensure maximum flexibility, albeit this would have led to additional costs and inefficiencies [Question 72 (b)]. If BB found utilities in an area in which it was working, MUDFA would carry out the necessary diversion, and the two would work hand in hand. This was in contrast to the planned method of working which entailed the sites being available to BB utility free. I recall evaluating the idea from Siemens' perspective and there was no objection on Siemens part since it would have allowed preceding works to be resolved making the site available for Siemens to carry out its scope of works more or less as planned. However. I did have some concerns that starting this new method of working in Princes Street carried risk, since this was the first major On-

Street section. It did not seem to be to be a convenient place to elaborate suitable methods of working together, and that such an exercise would have been better conducted in a less prominent and more isolated area away from the City Centre [Question 72 (b)]"

139. In essence, it appeared to Siemens that TIE was more interested in the appearance of progress rather than actual progress and that TIE had an obsession with the completion of work in Princes Street and the delivery of a first tram to Princes Street.

140. Siemens was also extremely frustrated both by the lack of access to Site and the ongoing inability of the parties to reach agreement. In light of this, in March 2009, Siemens presented a "Framework Concept" [**TRS00016833**] designed to unlock the Princes Street dispute and to expedite the works and provide work for its staff and subcontractors. As Mr Flynn put it:

"the direction of travel was such that good and useful people at Siemens were being tied up in unprofitable activity, rather than being able to carry out the works. Again, this was something that Siemens wanted to avoid. Generally speaking, Bilfinger were responsive to any attempt to move forwards, although tie did not always embrace new initiatives." [**TRI00000151_0019**, **paragraph 78**].

141. It was, and remains, Siemens' position that it would have been much more beneficial to progress the Infraco Works 'Off-Street', where there was significantly less impact due to incomplete utility diversion works. In this regard, Siemens

would agree with the oral evidence of James Donaldson of BBUK that Off-Street works could have been progressed in preference to Princes Street and that Princes Street works could have been delayed without delay to the overall works:

> *"Princes Street is only one area of the project. It wasn't in the critical path. That's why I'm saying you could have delayed it for a year, and for the overall completion, it would have made no difference."* [**Inquiry Transcript, 16 November 2017, Page 143:1-5**]

142. The non-criticality of the Princes Street works was also acknowledged internally by TIE, as evidenced by the Tram Project Board Papers for its meeting on 15 April 2009 [**CEC00888781**]. Therein, at item 1.14 of the Tram Project Board Minutes of Meeting for 24 March 2009, Mr. S. Bell of TIE records:

> *"Programme: SB outlines tie's optimistic and pessimistic view of the programme. He noted that the Princes Street works were not currently on the critical path as so were not affecting the Open for Revenue date. He also noted that the last two months were to have been spent agreeing a revised programme but the issues surrounding Princes Street had directed attention away from this."* [**CEC00888781_0009**].

143. Item 1.26 of the same minutes records that Princes Street had been a learning curve for all [**CEC00888781_0010**]. It is submitted that this confirms Mr. Eickhorn's observation that this learning curve should have been obtained Off-Street, in a less prominent part of the project. In addition, the focus by TIE on

Princes Street diverted attention away from agreement of a revised programme for the Infraco Works[27].

144. Instead however, TIE's prioritisation of Princes Street manifested itself initially in the PSSA and subsequently, against Infraco advice, in the delivery of the first tram to Princes Street, facilitated by Minute of Variation No. 3 to the Infraco Contract, dated 23 April 2010.

145. In addition, TIE's insistence that Princes Street be completed by Christmas 2009 led to inefficiencies and to poor workmanship. James Donaldson explained during his oral evidence that, in order to meet TIE's embargos and demands that work be finished by Christmas 2009, work was accelerated, with the introduction of weekend and night shift working, which was not efficient. [**Transcript, 16 November 2017, page 145:12-146:4**]. Furthermore, there was no time to provide joint sealant between the road/rail interface along Princes Street. The absence of this sealant and the lack of curing time for asphalt road covering led to the failure in Princes Street. This matter is addressed by Martin Foerder in his supplemental witness statement:

> *"Ultimately, the road/rail interface failed on Princes Street. We believed that a large part of why this occurred was because the asphalt works were carried out in cold, wet weather conditions in late November 2009 in order to achieve the deadline for handover of Princes Street imposed by tie."* [**TRI00000183, paragraph 4.5**]

[27] Item 1.14 of Tram Project Board Minutes of Meeting for 24 March 2009 [**CEC00888781_0009**]

146. The cause of failure is shown graphically in the 'Princes Street Presentation' [**SIE00000402**].

147. MOV2

148. Separately, on 3 June 2009 the parties entered into MoV2 [**BFB00053622**]. This minute of variation resolved the dispute which had arisen between the parties in February 2009 in regard to the calculation of head office overheads, and preliminaries in connection with a proposed Change in Princes Street[28].

[28] At paragraph 84 of his witness statement, Axel Eickhorn notes that MOV 2 was not directly related to Siemens Scope [TRI00000171_0041].

5.0 EVENTS IN 2009 FOLLOWING PSSA

5.1 Progress of MUDFA (including reasons for these difficulties)

149. Utility diversion works continued to incur delay throughout 2009 (and beyond). During the latter part of 2008 and the early part of 2009, Infraco had reported progress utilising the access dates shown in MUDFA Programme Rev. 7.9, issued on 3 October 2008.

150. The Executive Summary to Infraco Period Report No 2-1 to 25 April 2009 [**CEC00971600_0003**] records that the "*impact of design information from the current design issue programme and known access dates after MUDFA completion is to shift the original programme completion to 14 October 2012*". This represented a further slippage of over 13 months to that agreed in Programme Rev 1.

151. On 30 April 2009 TIE issued MUDFA Programme Revision 8 [**CEC00322635**], which indicated progress up to 28 March 2009. This programme showed a further slippage in utility diversion and indicated a completion date for MUDFA works of 16 December 2009. This was considered to be the first reliable indication of anticipated completion of utility diversion works.

152. On 8 July 2009 Infraco issued INTC 429, advising that a Notified Departure had occurred on the basis that the access dates were at variance with Pricing Assumption 3.4.24 (diversion of utilities) and 3.4.32 (Schedule Part 15 programme assumptions). Thereafter, on 6 August 2009 Infraco issued its Estimate in relation to INTC 429 and requested an extension of time to the

Planned Sectional Completion Dates [**CEC00322634**]. After mitigation, this Estimate indicated a revised Section D completion date of 20 May 2012 [**CEC00322634_0008**]. This Estimate formed the basis of the subsequent MUDFA Rev.8 adjudication.

153. Throughout the remainder of 2009, there was further slippage in the completion of utility diversion works and TIE failed to achieve the dates indicated in MUDFA Programme Revision 8. The Executive Summary to Infraco Period Report No 2-9 to 5 December 2009 [**CEC00624424_0003**] records that the "*incorporation of design information from the current design issue programme, actual progress on site and known access dates after MUDFA completion delayed the original programme completion to 23 October 2012*". The Period Report records that a number of the MUDFA Programme Revision 8 dates had not been achieved.

154. It is Siemens' position that, throughout 2009, the delayed completion of utility diversion works was the dominant cause of delay to the Infraco Works[29]. In this regard, Siemens note that on 13 November 2009, TIE offered Infraco an extension of time of nine months to Sectional Completion Dates (Sections A, B, C, and D) in conjunction with an agreement to suspend the MUDFA Revision 8 dispute resolution procedure [**DLA00001717**].

[29] The ongoing impact of MUDFA delay was captured in Siemens Team Briefing dated 6 February 2010, item 14: "*The delays in the city centre are caused by MUDFA. Tie have apparently not even started the design of the utility diversions in Constitution Street. The MUDFA Programme does not include the full design of on-street sections. We are still awaiting information from the client on this*." [**SIE00000217_0003, item 14-'Schedulding-MHE'**]

5.2 Progress of SDS (including reasons for these difficulties)

155. As a general observation, the work undertaken by SDS was primarily of relevance to the civil engineering scope rather than to Systems and Trackwork. Siemens undertook its own design. Matters where there were design interfaces with SDS were dealt with via agreed processes, including development workshops.

156. From a Siemens perspective the primary issue with design was the extent of design development and misalignment work required post novation. However, Siemens considers that this was generally well managed. Siemens would respectfully note the evidence of Mr. Glazebrook, who praised the management of design by Infraco post novation:

> "*It was apparent to me that once Infraco had come on board, they had a genuine and evidential desire to bring to a close the many outstanding design issues, and my recollection is that they were very helpful in trying to bring that resolution about.*" [**Transcript, Wednesday 5 October 2017, page 20:12-16**]

157. Siemens would also concur with the evidence given by Mr. Chandler of SDS in this regard:

> "*BSC were very strong in their leadership of the completion of the design. I think they were surprised at the level of uncertainty post contract award, and signing of the documents. They drove the completion very hard. So the leadership that -- in that sense definitely ramped up.*

Unfortunately the management and the completion of the design by tie and CEC didn't match that of BSC. So we didn't see the determination to complete, make all of the decisions, resolve the misalignment workshops and then complete the design such that we could issue the final issue for construction drawings, and BSC were incredibly frustrated by that." [**Transcript, Friday 13 October 2017, page 101:19-102:7**]

158. Siemens would respectfully observe that, after Mar Hall, the effective implementation of the self-certification regime and the approvals process by Infraco and CEC indicates where the difficulties in regard to design truly lay.

5.3 Progress of Infraco Works (including reasons for these difficulties)

159. Siemens made extremely limited progress in 2009 following the conclusion of the PSSA. The reason for this delay remained constant throughout 2008 and 2009, namely the denial of required access to Site and to Designated Working Areas because of the non-completion of preceding works[30].

160. Preceding civil engineering activities were delayed in 2009 principally because of incomplete utility diversion works and also because of the extent of dispute regarding Notified Departures arising, in the main, from required design development in respect of civil engineering works. This state of affairs was illustrated in the executive summary to Infraco's 'Period Report No. 2-2 to 23 May 2009' [**CEC00624376_0003**]:

[30] Axel Eickhorn witness statement, paragraph 106 [**TRI00000171_0050**].

"Virtually all construction works are impacted by external issues which require resolution through the change process of the contract."

161. The extent of civil engineering design changes was largely a consequence of the failure to complete design prior to Contract Close. This failure was compounded by TIE's refusal to acknowledge or process the resultant Changes in accordance with the Infraco Contract. In this regard, Siemens agrees with the comments of Martin Foerder:

"We managed the SDS team, but design did not cause the majority of the delay. The continued presence of the utilities and the fact that design had not been completed were the issues. The design should have been more-or-less completed at the time of novation. This was clearly not the case. The difficulty arose from TIE's failure and refusal to acknowledge that certain design changes were a Notified Departure with reference to the first Pricing Assumption at clause 3.4 of Schedule Part 4 and thereafter to instruct the changes. They would not do so." [**TRI00000095_0010**, paragraph 34].

162. On 8 June 2009, by email, BBUK advised TIE [**CEC00986647**] of its concern regarding the fundamental differences between the parties in regard to contract interpretation and, secondly, that it anticipated additional project costs in the range of £80 million to £100 million and a project overrun of 18 months.

163. In the second half of 2009 a number of disputes regarding Notified Departures crystallised between Infraco and TIE, which reflected the differences between the

parties in regard to contract interpretation. On 20 August 2009 TIE confirmed that it had sought and received approval to adopt a "*more formal contractual approach to resolve outstanding commercial issues*" [**CEC00738172_0002 (3.6)**].

164. On 24 August 2009 and 25 August 2009 TIE gave notice to Infraco that it was referring the disputes regarding alleged design changes to Gogarburn Bridge and Carrick Knowe Bridge to the Dispute Resolution Procedure. These disputes focused on whether Infraco Notification to TIE Change (INTC No. 111) dated 16 October 2008 and Infraco Notification to TIE Change (INTC 115) dated 7 May 2009 constituted Notified Departures. The subsequent adjudications considered whether the changed and/or additional work indicated upon the IFC drawings in respect of both bridge structures fell outwith 'normal design development' and constituted Notified Departures.

165. Separately, on 4 September 2009 Infraco referred the dispute regarding its Estimate (INTC No. 146) dated 14 May 2009 in respect of Russell Road Retaining Wall to the Dispute Resolution Procedure. The dispute considered whether the changes to the wall constituted a Notified Departure and, if so, what was the true and proper valuation of the changes.

166. Throughout 2009 the number of INTC's based upon Notified Departures continued to increase. The Infraco 'Period Report No 2-9 to 5 December 2009' [**CEC00624424_0003**] indicated that:

*"A total of 523 Changes have been notified to **tie** with a submitted estimated value of £68,686,000. 112 of these estimates have been partly agreed by issue of a tie Change Order in a total value of £7,861,000."*

167. In effect, the change process was becoming unworkable. The extent of change and the dispute regarding the proper notification, estimation and implementation of these alleged changes was having a direct impact on the regular progress of the Infraco Works.

168. At paragraph 19 of his witness statement [**TRI00000171_0008**], Axel Eickhorn explains that the design changes in the civil engineering design impacted upon the design and approval of the Siemens' element of the Infraco Works and that design changes needed to be identified, agreed and implemented. As a result, the design process was slowed down and severely hampered:

"In respect of Siemens' work, the changing designs did not have a significant impact upon its scope of the work, but had a daily effect in terms of the delay caused. Whilst it awaited finalised drawings, the resources Siemens had procured remained idle, or some of the work it could undertake could not be conducted in an efficient manner." [**TRI00000171_0009**, **paragraph 20**].

169. This statement accurately captures the fact that it was delay and disruption to its planned sequence of works, rather than scope changes which was driving Siemens' project costs.

170. The failure by TIE either to agree or dispute notified changes was an increasing source of frustration for Siemens. This sense of frustration is borne out in Axel Eickhorn's witness statement:

> *"I never understood why tie did not refer disputed changes to the dispute mechanism, to then be able to instruct the works and agree Estimates later through dispute resolution. I always felt that Siemens was a passenger in this situation, despite Siemens being largely ready to deliver on time (including ensuring all equipment and materials were ready for use and installation). As a consequence of no site access, Siemens' could not undertake its works. Siemens' hands were tied in this respect."* [**TRI00000171_0025**, paragraph 44].

171. As a general observation, the lack of progress throughout 2009 (and 2010) is shown in the Inquiry's own analysis of the Infraco Period Reports [**TRI00000177**], which indicates that in 2009 only 7% of work had been completed (4% at 31 January 2009 and 11% at 5 December 2009).

5.4 Attempts to Agree Construction Programme

172. In 2009, the absence of realistic programme continued to have a direct impact on Infraco's ability to plan and monitor its works. As noted in the BSC 'Period Report No 10 & 11' for the period to 31 January 2009 [**CEC01103816_0003**]:

> *"in the absence of a formal revision to the Contract programme, works are being planned and managed using the 12 week look-ahead programme*".

173. This was far from ideal. Accordingly, on 20 May 2009 submitted its proposed "Rev 2" of the contract programme [**CEC00974210**]. However, despite protracted dialogue between the parties a revised baseline programme was not agreed. In fact, it was not until the Settlement Agreement in September 2011 that a revised contract programme was agreed in respect of the Infraco Works.

174. Siemens' resource planning was particularly affected by the absence of a reliable and robust baseline programme because it was completely dependent on the progress of preceding activities by others over which it had no control and, accordingly, had limited ability to mitigate delays. In addition, trackwork activities required Siemens to provide BAM Rail with reasonable mobilisation periods. Also, as a linear activity, trackwork installation required the orderly release of working areas. The same problem applied to Overhead Line Installation, which had clear linear dependencies.

175. This lack of an agreed updated construction programme compounded the extremely *ad hoc* and disruptive method of working throughout the period prior to mediation and reinforced the view that it would have been better to suspend works whilst predecessor activities were properly planned and executed.

176. The extent of the ongoing impact on Siemens' activities is demonstrated by Siemens' MIS Report for March 2011, issued shortly after the Mar Hall mediation, which records that in overall terms, only 8.0% of installation works had been completed against a planned completion of 100% pursuant to Contract Programme Rev.1 [**SIE00000304_0001]**. As a measure of delay it should be

noted that this was two months after the original planned construction completion date for Phase 1a, namely 17 January 2011 (activity ID 311) **[USB00000080_0002**].

177. In his witness statement Martin Foerder confirmed the impact of the lack of an updated programme:

> *"By the time we went to Mediation in March 2011, we were 34 months into the original 38 month Infraco Contract period. Even at that stage, TIE could not provide any certainty as to the sequence and timing for completion of all the MUDFA Works. This had a massive effect on our ability to progress the works. By refusing to even acknowledge the effect this was having, and continually stating that we could mitigate any delay, TIE were simply exacerbating an already very difficult situation.* "[Witness Statement **TRI00000095_0032, Paragraph 101**].

178. Notwithstanding the lack of agreement, Infraco continued to update the programme in accordance with Clause 60 of the Infraco Contract. Thus, in each Period Report, Infraco provided an update of the baseline programme together with a 12 week look-ahead programme. In this regard, at paragraph 8 of his witness statement [**TRI00000033_0004]** James Donaldson of BBUK advised:

> *" The Construction Programme changed over time. All the utilities and all the changes were presented to TIE every month. Even though it was not approved, we kept on updating and progressing that programme."*

179. However, in the absence of reliable information from TIE regarding design and utility diversion, it was not possible to agree a revised contract programme.

5.5 Mitigation Strategy Adopted by Siemens

180. It has been put to Siemens' witnesses by the Inquiry that Infraco 'failed in its duty to take all reasonable steps to mitigate delay to the Infraco Works'. Siemens wholly rejects this assertion. As stated by Axel Eickhorn, Siemens actively sought ways to expedite its ability to carry out works on site:

> *"Siemens was overall concerned due to lack of access to carry out Siemens' scope of works and Siemens was incurring unplanned time related costs for its own staff and the staff of subcontractors."* [**TRI00000171_0040, paragraph 82**].

181. Faced with an ongoing lack of access, Siemens sought to mitigate and minimise delay to the Infraco Works both pursuant to its express contractual obligations and more generally. Axel Eickhorn addressed this accusation directly at paragraph 22.5.1 in his witness statement [**TRI00000171**]:

> *"It is not true to say that we failed to mitigate. Siemens was largely dependent upon completion of preceding works by others prior to commencement of our works. Siemens did a lot to mitigate and did so where possible including endeavouring to not have machinery on site when it was not needed. Another example was the effort BAM went to in order to rent Tamping Machines which are in high demand in the UK and*

Europe and it would be normal practice for there to be long lead times to hire the machines" [**TRI00000171_0012**].[31]"

182. Siemens had ample incentive to mitigate both in terms of time and cost. Particular considerations were:

(i) the contractual obligations imposed by Clause 6.5 and Clause 6.6 of the Infraco Contract to manage, mitigate and minimise all costs and to mitigate foreseeable losses and liabilities;

(ii) the considerable cost of retaining a highly experienced project team in Edinburgh, many of whom were wanted by other projects;

(iii) the ongoing liabilities incurred both towards BAM Rail for project delay and towards CAF for ongoing storage and maintenance of trams in Irun, Spain;

(iv) the significant cost being incurred in the manufacture and storage of specialist materials and equipment for the Edinburgh Tram Project;

(v) the increasing prospect of attempted recovery by TIE of Liquidated Damages in respect of sectional completion; and

(vi) the reputational damage caused to Siemens by the ongoing impasse with TIE and the negative press briefings issued by TIE.

183. The nature of Siemens' activities and, more importantly its dependence on the progress of preceding activities by others, meant that opportunities for mitigation

[31] Mr. Eickhorn also notes failure to obtain these extremely specialist tamping machines would have resulted in lengthy delays to the Infraco Works.

were limited. In addition, significant demobilisation of staff and subcontractors was not possible in light of the aggressive contract strategy adopted by TIE.

184. Where mitigation was possible either in terms of cost or programme, Siemens actively pursued available options. These included:

185. Postponement of Procurement

186. Where lead times permitted, Siemens delayed manufacture and procurement of materials and equipment. Accordingly, in mid-2009 Siemens decided that it would postpone material procurement where possible or practicable in light of the ongoing delay to site access. The Infraco 'Period Report 2-8 to 7 November 2009' [**CEC00775849_0046**] advised that:

> ***"****Delays to Site Availability*
>
> *In view of the magnitude of the overall programme delay exceeding one full year, Siemens confirms having deliberately postponed the procurement and/or the production process of several equipment and materials, in order to mitigate the "cost-over-time" factors (extended storage, expiration of manufacturer warranties, obsolescence for high-tech items, risk of theft, loss or damage)."*

187. Siemens adopted a balanced and sensible approach to these matters and weighed the benefit of deferred procurement with the risk of material shortage or delayed delivery. Thus, where items such as copper cable for the Overhead Line Equipment (OLE) were at risk of deterioration in storage then procurement was put on hold. However, in the Depot, where work was further progressed, Siemens

proceeded with the procurement of long-lead items including tram wheel lathe, underfloor lifting plant, washing plant, “Unimog” and a depot crane. In addition, Siemens needed to consider its factory production programme and the cost of halting production [**Inquiry Transcript, 6 December 2017, Page 152: 12-25**].

188. Guided Busway

189. In 2009, Siemens provided TIE with a proposal to change rail type from 'Direct Fixation' to 'Rheda City open', in an attempt to provide BAM Rail with work in the absence of available work sites. Siemens chose the guided busway because it was Off-Street and was largely unaffected by the ongoing delay to utility diversion. As stated by Axel Eickhorn during oral his evidence:

> *"The guided busway was a place which was relatively unaffected by any utility diversions, because there was already a structure in place for the buses to travel along, and Siemens in fact found an arrangement with our partner, Bilfinger, to even take over some of the construction works there, simply -- which we took on, on our own risk, to enable BAM to give BAM some work sites so that they wouldn't be idle."* [**Transcript, 6 December, page 158:10-17]**.

190. Thus, in order to progress the works, Siemens took over certain elements of work, at its own risk, in order to ensure it could maximise, to the best extent possible, the worksites available for BAM Rail. Axel Eickhorn, explained that, in undertaking the Guided Busway, Siemens "*incurred significant unrecovered expense in trying to find work for BAM*." [**TRI00000171_0013, paragraph 22.5.1**].

191. The pragmatic strategy adopted by Siemens and its eagerness to access the site and for work to be made available is evidenced by the minutes of Siemens' internal team briefing in May 2009:

> *"7.2 Guided Busway*
>
> *Original proposal was too expensive, rejected by tie. Consortium has already agreed to keep BB out of this Change (their price is too high, but they will not negotiate it down because is based upon established rates that BB do not want challenged). BAM is finalizing an offer "in one hand" that would allow it to fall into tie's budget, or, very close to it. As a risk management decision and in order to allow work to start there, Siemens would settle at tie's stated budget, even if Siemens' markup for this particular change is reduced."* [**SIE00000211_0005, at paragraph 7.2**]

192. The final cost to Siemens of these works was in excess of TIE's budget; however, this decision did enable BAM Rail to proceed with works when progress would otherwise not have been possible.

193. The execution of work outside Siemens' core competency was reflective of the frustration felt at the lack of progress[32].

194. Agreement of Estimates below Cost

195. Because of its frustration with the non-agreement of Estimates, Siemens compromised on cost in order to make progress. This is confirmed at paragraph 43 of Axel Eickhorn's witness statement:

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[32] Axel Eickhorn Witness Statement, paragraph 106 [**TRI00000171_0050**].

"From Siemens' perspective, the number of changes were of a lesser magnitude and its strategy was to try to agree with the client" **[TRI00000171_0025]**.

196. In addition, Siemens sought to compromise simply because of the difficulty of securing agreement from TIE:

"In terms of any difficulties which arose in agreeing Estimates with tie, the process of finding agreement was slow. Estimates were frequently disputed in relation to time and cost impact; and, sometimes, in relation to Siemens' works, it almost seemed like tie had a policy of not agreeing to anything. A lot of time was spent explaining how the Estimate had been arrived at, and providing details. Rates used in the Estimates were the subject of audit. My main contact at tie in this respect was finance director, Dennis Murray. Despite his seniority, I had the impression that there was simply no authority on the part of tie to approve the Estimates. In some cases, Siemens compromised on a cost contained in an Estimate knowing that the figure agreed would not cover the real cost just to gain some agreement and progress."]**TRI00000171_0025, paragraph 45**].

197. Thus, contrary to the assertion made by TIE that Estimates were excessive, Siemens agreed certain Estimates at below cost in order to secure agreement.[33] An example of this was EOT1, where Siemens met part of BAM's claim simply to

[33] In the context of alleged excessive Estimates, Siemens would also refer to paragraph 22.10 of Axel Eickhorn Witness Statement: "*On Siemens side all Estimates were calculated in accordance with the contract (actual or Estimated cost in the absence of rates). To add transparency to the Siemens pricing, rates were audited by external auditors in order to establish the actual costs*." [**TRI00000171_0017**]

secure agreement with TIE in regards to the correct methodology to be applied to calculation of prolongation[34].

198. In this regard Siemens wishes to respond to the assertion made in the SETE Submission[35] that Infraco built up a commercial team of 30 claims staff almost immediately. The truth is that Siemens had only 1 Change Manager. Siemens increased this resource later in the project in order to deal with the administrative burden of assessing the impact of the excessive number of changes which arose prior to mediation in 2011 [**TRI00000151_0017, paragraph 70**]. However, as Axel Eickhorn noted, whilst, over time, Siemens had to increase the size of its change team, Siemens had the process under control **[TRI00000171_0015, paragraph 22.8.3**].

199. More generally, this allegation is reflective of TIE's apparent lack of understanding in regards to Siemens' pricing. Siemens' scope was defined by the functionality and performance criteria stipulated in the Employer's Requirements rather than by the physical quantities of works shown on the BDDI information. Accordingly, Siemens approach to changes and to the pricing of changes differed from that which was appropriate to BBUK. This matter is accurately described by Axel Eickhorn at paragraph 96 of his witness statement [**TRI00000171_0046]:**

> *"Siemens' work was not primarily defined by quantities but by the Requirements. Therefore since Siemens elements were not described in the same precise manner in the Base Date Design Information, it was less*

[34] This matter is considered in more detail at Section 5.8 below.
[35] SETE Submission, page 90.

obvious when there was a change than for BB's scope. For example, the design would not state the functionality of a passenger information display that was required, and a change to this would have been less obvious than if more bricks were required in respect of BB's scope. For Siemens to have brought forward small claims (e.g. £100.00) would not have been efficient and Siemens had a more relaxed view to absorbing small value changes."

200. Thus, the best short-term and long-term strategy was to complete the works promptly and efficiently and, when permitted, Siemens did exactly that.

201. Proceeding with Work at Risk

202. Axel Eickhorn's witness statement records the fact that, notwithstanding the absence of agreed Estimates, Siemens proceeded at risk with a number of design changes in order to mitigate delay to the works:

"I believe that Siemens took a common sense approach to such matters. Over time, a sense of frustration emerged in the Siemens team about the difficulties to reach agreement on changes, especially given the numbers of changes that this concerned. However, mitigation was always sought and works continued wherever possible." [**TRI0000171_0026**, **paragraph 48**].

203. By way of example, in July 2009 Siemens proceeded to procure and instigate the completion of noise and vibration studies by its external consultant D2S in connection with 'floating slab' construction in On-Street sections of the Infraco

Works. These works were undertaken at risk, in the absence of formal instruction or change order from TIE. More importantly, these noise and vibration studies sought to minimise both the scope and cost to TIE of noise and vibration measures required in the construction of trackform in the On-Street works.

5.6 Contract Strategy adopted by TIE

204. The contract strategy adopted by TIE in 2009 was, in essence, set in place prior to Contract Close. In March 2008, rather than delay Contract Close and seek to agree a price and programme reflective of the incomplete nature of the SDS design and the utility diversion works, TIE chose to press on with the contract and to adopt a 'tooth and nail' strategy post contract.

205. In 2010 TIE adopted a much more aggressive strategy. This is considered below.

5.7 Further disputes - Nature of the Key Disputes

206. Because of the difference between the parties in regard to the proper interpretation of key contract provisions, a number of disputes were initiated by both TIE and Infraco. These adjudication decisions informed Infraco's approach as to the proper interpretation of the Infraco Contract. However, in respect of the key issues of principle, it is submitted that these decisions reflected Infraco's pre-existing interpretation and application of the Infraco Contract.

207. The adjudications initiated in 2009 by both TIE and Infraco in regard to Pricing Assumption 1, namely the issues surrounding 'normal design development', were directly related to the civil engineering works and the BDDI design

information. These disputes were of relevance to BBUK's scope of works and Siemens participated in these disputes and dispute procedures in name only.

208. In terms of Siemens' scope and in terms of the project, it is Siemens' view that the key disputes were those related to Murrayfield Underpass (INTC 109) and MUDFA Rev. 8 (INTC 429). These disputes were resolved in 2010 and are considered later in this submission.

5.8 Key dispute - EOT1 - Agreement of Estimate for V26-V31 Programme Impact

209. In 2009, the key dispute for Siemens was that which arose in regard to the true and proper valuation of INTC 0001 in connection with the change from version 26 to version 31 of the SDS Design Delivery Programme. In essence, this dispute concerned the correct method of valuation of prolongation costs.

210. The time element of this Notified Departure had been formally agreed on 18 March 2009, when TIE confirmed a 38 business-day extension of time to contract programme (Rev.0) [**CEC00322641**] following agreement of the Rev.1 Programme on 17 December 2008 [**CEC00578330_0001**][36].

211. On 19 February 2009, further to the agreement of Programme Rev.1, Infraco submitted its Estimate. Therein Infraco sought payment of £6,488,797 (BBUK and Siemens) and €558,679 Euros in respect of CAF.

[36] Reference to 17 December 2008 in 3rd. paragraph refers to TIE written agreement to Programme Rev.1.

212. On 3 June 2009 TIE provided an informal "Response to Prolongation Estimate in respect of INTC No. 1" [**CEC00851655_0007 (Appendix A)**]. Therein, TIE valued BBUK's element of the Estimate in the sum of £1,823,149.25. Separately, on 15 June 2009, TIE provided an informal "tie Commentary on Siemens' submission" [**CEC00951737_0003**]. In that document, TIE advised that the value it had placed on the BBUK element (£1,823,149.25) covered the entire Consortium.

213. Thus, in effect, TIE was advising that Siemens was not entitled to any additional prolongation costs. This was a wholly unacceptable position for Siemens. At this juncture, Infraco was projecting a completion date of 12 August 2012 (Period Report 2-2 to 23 May 2009**, CEC00624376_0003**). This represented a delay of 13 months. Further delays were anticipated. However, if TIE's valuation methodology were to prevail Siemens would be paid nothing for this delay.

214. Despite repeated discussions and exchanges of communication, the parties had been unable to agree the Estimate or the valuation methodology. On 11 August 2009 TIE referred the matter to the Dispute Resolution Procedure and on 20 August 2009 the parties exchanged position papers in relation to the dispute [**CEC00851655** & **CEC00951737**[37]**].**

215. The substantive issue in regard to Siemens' entitlement turned on the proper application of Clause 80.6 and of Appendices F and G to Schedule Part 4 [**USB00000032_0051**]. TIE's valuation of BBUK's entitlement in the sum of £1,823,149.25 was based upon the measurement and valuation of rates and prices for 'Preliminaries and General Items' deduced from Appendix F to

[37] Separately, TIE provided a more detailed Position Paper on 20 August 2009.

Schedule Part 4 pursuant to Clause 80.6.1 and/or 80.6.2. TIE expressly relied upon Section 8 of Schedule Part 4 which provided:

> "*Rates for certain items have been established for determining the value of tie Changes as noted in Appendix F."* [**USB00000032_0014**].

216. It was TIE's position that Appendix F to Schedule Part 4 summarised the amounts detailed in Appendix A2 of Schedule Part 4. TIE asserted that:

> *"Accordingly, the rates to be used for extension of time are the rates stated in the Appendix A2 Construction Works Price Analysis as they are the rates which can be deduced from the Spreadsheet No 2 of Appendix F."* [**CEC00951737_0003**].

217. Further, it was TIE's position that Clause 80.6 did not provide a separate mechanism for valuation of the entitlement of individual Infraco Members and that the valuation of Consortium Preliminaries undertaken in respect of BBUK "*should cover the core Siemens Consortium team*"[38].

218. TIE's position paper devoted considerable effort to explaining that Appendix A2, upon which TIE expressly relied for its rates and prices, was laid out in the manner of a preliminaries section of a bill of quantities with fixed and time related charges in respect of preliminaries and "method related charges". TIE also referred to the Standard Method of Measurement of Building Works ('SMM7') and the Civil Engineering Method of Measurement ('CESMM3') in the context of good

[38] [**CEC00951737_0005**]

practice in the measurement of building and civil engineering works (paragraph 3.10 to 3.18)[39].

219. Infraco's position paper [**CEC00851655**] explained that the spreadsheets in Appendix F solely related to BBUK activities and that no rates or prices existed in Appendix F for the CAF and Siemens elements of work. Instead, Siemens' and CAF's entitlement had been priced on the basis of Actual Cost or estimated Actual Cost in accordance with Clause 80.6.4 and paragraph 1.2 of Appendix G to Schedule Part 4, which provides that where Clause 80.6.3 or 80.6.4 apply "*then the valuation shall be on the basis of Actual Cost or estimated Actual Cost*." [**USB00000032_0052**].

220. What was of particular concern to Siemens was that, despite detailed discussions between the parties, TIE's position paper revealed a fundamental lack of understanding of how prices for system engineering were prepared[40]. TIE personnel were clearly more conversant with pricing of building and civil engineering works, with prescribed rules of measurement (i.e. SMM7 and CESMM), where bills of quantities are routinely used and where price is largely a function of the physical quantity of work undertaken. Thus, civil engineering changes can, in most cases, be valued by means of measurement and valuation at prescribed unit rates or rates analogous thereto.

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39 The arguments advanced at paragraph 3.9 to 3.18 of TIE's detailed Position Paper issued by TIE on 20 August 2009 (are broadly similar to those advanced in regard to DRP-1 Preliminaries Position Paper at paragraph 3.5 to 3.13 [**CEC01032609_0004**].

40 This seems to mirror the lack of understanding of engineering issues noted by Mr. Glazebrook [**Inquiry Transcript 4 October 2017, page 201: 13-19**]

221. By contrast, Siemens was providing a “Systems” solution with multiple interfaces and interdependencies, where scope is defined in terms of functionality rather than quantity, and where the cost of change does not readily admit to pre-agreement in the same manner as civil engineering works.

222. Equally concerning to Siemens was the fact that TIE was aware that Appendix F contained only BBUK rates and prices and, nevertheless, was prepared to advance a pricing methodology which would deprive Siemens of any recovery whatsoever for its prolongation costs. The frustration felt by Siemens is partially set out at page 4 of the Infraco's position paper [**CEC00851655_0005]**:

> *"Siemens had understood that tie had accepted the principle of using an estimated Actual Cost approach from discussions at the recent informal mediation and since then. Siemens has discussed the appropriate approach to establishing estimated Actual Costs and has even gone to the lengths of obtaining an independent audit report on aspects of their valuation. If will be disappointing if tie chooses to disregard the progress made in this regard."*

223. Siemens was also faced with the prospect of liability for CAF claims with no corresponding recovery under the Infraco Contract. At this point Siemens was actively considering litigation in light of the approach adopted by TIE. Siemens’ draft internal management report in October 2009 records that:

> *"Strategy: Pursue settlement first through mediation and then, if need be, adjudication. Should the principles of Siemens entitlement to estimated*

Actual Cost be not agreed, legal counsel advises to immediately refer the matter to Court, to avoid setting a negative precedent for all future EoT claims." [**SIE00000251_0032**]

224. On 30 October 2009, in mediation, Infraco and TIE agreed the amount of the Estimate in respect of INTC 001 in the sum of £3,524,000. The BBUK element was £2,225,000 and the Siemens element was £1,299,000. This agreement was recorded in a formal Memorandum of Understanding pursuant to which Infraco was required to provide a revised Estimate which fully substantiated the agreed amount, namely £3,524,000. In mediation, TIE further accepted that the correct basis of valuation of Siemens' entitlement was on the basis of Actual Cost/Estimated Actual Cost in accordance with Clause 80.6.3 and 80.6.4.

225. On 2 November 2009 Infraco provided its revised Estimate [**CEC00208535**] in accordance with the terms of the Memorandum of Understanding. The narrative provided by Siemens explained that it had disregarded certain costs in order to achieve a commercial settlement in respect of INTC 001. Siemens further advised that whilst the valuation methodology used in EOT1 would be utilised in future extension of time, the Estimate did not contemplate or include all costs and charges that might arise in respect of future extensions of time **[CEC00208535_0013, paragraph 1.6**].

226. As requested by TIE, at section 13 of its Estimate narrative, Siemens set out additional costs that would apply in future extension of time, but which had not been claimed in respect of INTC 001. These included:

- subcontractor costs for OLE and Traction Power Supply ("TPS");
- nominated subcontractor costs for high and low voltage installation;
- telecoms, Supervisory Control and Data Acquisition ("SCADA"), and Urban Traffic Controls ("UTC") subcontractor costs;
- Siemens traffic solutions;
- Siemens maintenance services;
- testing & commissioning personnel;
- materials & equipment escalation costs; and
- warehousing costs.

227. Siemens also expressly noted that it had settled escalation costs on a commercial basis and that it had agreed to meet part of the BAM Rail claim at its own expense.

228. Siemens would also ask the Inquiry to note that Siemens calculated its prolongation costs by reference to the period of contract over-run, namely the period between original Service Commencement Date (16/07/2011) and the revised Service Commencement Date (06/09/2011):

> *"The extent of Siemens' additional costs is therefore calculated for the additional period that the Siemens staff and Siemens sub-contractors will be effectively retained on the project beyond the original completion date and at the anticipated percentages of deployment."* [**CEC00208535_0017**, paragraph 3.5].

229. This methodology can be seem in action in Worksheet 1, where Siemens has calculated additional costs for staff and, for clarity of presentation, has shown these against July, August and September 2011, namely in the over-run period, rather than at the point the delay occurred [**CEC00208535_0038**]. However, the resources claimed represents the level of deployment at the time the delay event occurred, hence certain costs for contractors and resources which had not been deployed at the time of EOT1 were not claimed.

230. On 5 November 2009 [**CEC00578866**] TIE formally confirmed its agreement to the Infraco Estimate in respect of INTC 001 and the method of valuation. In respect of both CAF and Siemens, TIE confirmed that future extensions of time would be reimbursed on an actual cost or estimated actual cost basis. In respect of Siemens, TIE confirmed that subcontractor costs or business units not included in the agreed Estimate would be valued on a similar basis.

231. Siemens invites the Inquiry to bear these matters in mind when considering TIE's evaluation of Siemens' prolongation entitlement in respect of both Project Carlisle and Project Phoenix. In particular, Siemens would ask the Inquiry to note that Siemens' costs were audited by external accountants and that an agreed methodology was then reached for the valuation of prolongation. This agreed methodology contemplated that additional costs and cost centres would apply to future extension of time awards.

6.0 EVENTS IN 2010

6.1 Warehouse Contract for Siemens Materials & Equipment

232. On 27 January 2010 Siemens entered into a 'Warehousing Services' contract with Border Rail & Plant Limited ("BPL") under which BPL provided a dedicated warehouse at Broxburn for the storage and logistics management of Siemens goods, materials and equipment for the project.

233. The requirement for this dedicated facility was a direct consequence of premature mobilisation of Siemens and the insistence by TIE upon delivery against an outdated and unrealistic contract programme. This matter is addressed and explained by Axel Eickhorn at paragraph 22.1.1 of his witness statement [**TRI00000171_0010**]:

> *"Siemens also started our manufacturing programme in a timely manner which caused us problems later because we had to find suitable long term storage space for all the equipment that was delivered to site in accordance with the original Programme, but which could not be installed on site."* [**paragraph 22.1, line 15-20**]

234. Initially, Siemens had tried to find work-around solutions, using site containers [**SIE00000211_0002, paragraph 3.2**]. However, as delays accumulated, Siemens needed to provide a more permanent solution. The original duration was to be for 24 months - from 1 January 2010 to 31 December 2011. This contract period was twice extended because of the ongoing delay to the Infraco Works, and warehousing facilities were provided until 5 March 2014.

235. The final cost of this 'Warehousing Services' contract was in excess of £2 million, and this represented additional and unanticipated cost for which Siemens had made no contract provision[41].

6.2 Request for Payment for Siemens Materials & Equipment in Warehouse

236. Despite the measures taken by Siemens to delay procurement, the value of materials and equipment stored at Broxburn continued to increase because of the extent of preceding delays and the lack of access for Siemens and its subcontractors. In particular, the value of Traction Power Supply ('TPS') equipment was financially significant.

237. On 19 April 2010, following prior discussions, Siemens provided TIE with a draft vesting certificate for TPS materials and equipment stored in Broxburn in an attempt to secure partial payment from TIE. At this juncture the value of TPS equipment stored at Broxburn was £5,017,297 (excluding VAT).

238. On 10 May 2010 [**CEC01927619**] Siemens formalised this request by providing CEC with its proposed certificate of vesting in respect of the TPS materials at Broxburn and requested that TIE accepted transfer of materials. Pursuant to the terms of the vesting certificate, Siemens requested payment in the sum of £5,017,297. However, TIE never formally acknowledged this correspondence and no payment was forthcoming.

239. At this point Siemens was funding material procurement, a situation compounded by the non-payment/under-certification by TIE of preliminaries. The position is

[41] The final cost of this Warehouse Contract to Siemens was £2,138,923 (excluding VAT).

reflected in the comments of Alfred Brandenburger during the Siemens 'Bi-Weekly Team Briefing' on 19 April 2010 [**SIE00000220_0001**]:

> *"Cashflow is still a big problem for us-we're negative. We're trying to negotiate with tie to get paid for materials delivered. Tie have also made a move where they are paying diminished prelims over the period of delay: later they will pay if we've won the DRPs."* [**'Commercial-ABR'**]

240. The latter reference to "diminished prelims" actually refers to the decision taken by TIE in 2010 to start reducing preliminaries payment. It would appear, based upon his written and oral evidence, that this was a decision made by Mr. Rush. At page 10 of his witness statement [**TRI00000141_0010**] he states:

> *"I instigated a change and TIE stopped paying Preliminaries until what had been paid reflected what had been done. I think this hit Siemens more than Bilfinger Berger."*

241. The value of materials stored at Broxburn and elsewhere continued to increase throughout the remainder of 2010 due to the ongoing lack of access to site for Siemens and its subcontractors[42].

6.3 Early Commencement of Building Fixing by Siemens

242. In February 2010 Siemens commenced building fixings[43] in advance of programme in On-Street sections in order to help mitigate the overall project

[42] By the time of Carlisle 2 Proposal the value of materials held at Broxburn was in excess of £10 million.

[43] These fixings were used as a method of supporting the Overhead Line Equipment (OHLE) as an alternative to street poles.

delay. Siemens gave notice of this proposed course of action in its Period Report 2-12 to 27 February 2010 [**CEC00630014**]. Therein, at section 4.2.1, Siemens advised as follows:

> *"Building fixing installation is planned to commence February 2010, subject to granting of traffic management approval. Installation by Siemens will start several months ahead of the sequence defined in the Programme, to mitigate overall programme delay."* [**CEC00630014_0037, section 4.2.1**].

243. Siemens undertook these works on a goodwill basis, and without payment. However, in June 2010 Siemens chose to postpone these activities in Section 1A to Section 1C because of ongoing MUDFA delay and because TIE was considering de-scoping of the works in these locations. This was indicative of the ongoing lack of programme and scope certainty at that stage [**SIE00000403** & **CEC00189082**].

6.4 Delivery of First Tram to Princes Street-MOV3

244. On 26 March 2010 TIE issued a TIE Notice of Change No. 89, requesting Infraco to provide an Estimate for the additional costs and risks associated with the delivery of the first tram to Princes Street, rather than to the Depot at Gogar. The purpose of this was to enable TIE to put the first tram on public display between April 2010 and September 2010.

245. Infraco considered the display of the tram in Princes Street to be little more than a public relations exercise on the part of TIE and a distraction at a time when the

project was significantly behind schedule[44]. Infraco was also concerned by the risks associated with the proposed change. These concerns were reflected in Infraco's Estimate, provided on 9 April 2010. Infraco advised that the proposed TIE Change exposed the first tram to a number to risks and costs outwith the original Infraco Contract. Because of these risks, Infraco insisted upon a minute of variation to the Infraco Contract.

246. After protracted discussions and exchanges, on 23 April 2010, TIE issued Change Order No. 152, enclosing Minute of Variation No. 3 ("MOV 3"). The executed minute of variation addressed Infraco's concerns [**TIE00899938**]. The first tram was delivered to Princes Street on 25 April 2010.

247. In November 2010 the first tram was removed from Princes Street by TIE and placed in a storage location in Broxburn without Infraco involvement, contrary to the terms of MOV3. Infraco sought assurances from TIE that the storage conditions were suitable. In October 2011 the first tram was finally delivered to the Depot.

6.5 CAF Claims for Extensions of Time and Additional Costs

248. On 24 May 2010 CAF gave Infraco notice of its claims for extensions of time and additional costs arising from the occurrence of Compensation Events pursuant to Clause 49 of the Tram Supply Agreement. The basis of these claims was the fact that the Depot had not been completed and, accordingly, CAF was unable to

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44 "*The first tram delivered (UT2) continues to attract attention on Princes Street with over 74,000 visitors to date providing positive feedback*"-'Project Director Report-Period 05 [10/11]' to Tram Project Board Papers for Meeting 25 August 2010 [**CEC00013703_0016**]

deliver the second, third, fourth and fifth tram to the Depot by 10 May 2010, in accordance with the Tram Manufacturing and Delivery Programme. Accordingly, it was necessary for CAF to place these trams into storage at its factory in Irun, Spain. CAF's claim value was €880,922 Euros.

249. Although CAF was an Infraco Member, it was also entitled to pursue relief under the express terms of the Tram Supply Agreement, which had been novated to Infraco on 14 May 2008.

250. CAF provided further claims notifications pursuant to Clause 49 on 29 June 2010, 28 July 2010, 30 August 2010, 29 September 2010, 26 October 2010, 29 November 2010, 23 December 2010 and 28 January 2011 as tram manufacturing progressed and as the remainder of the tram fleet required storage.

251. In terms of the Consortium Agreement, as between the Original Consortium Members (BBUK and Siemens), responsibility for CAF's performance rested with Siemens. Thus, Siemens was required to respond to these claims and to assume responsibility for any liabilities arising.

252. Thus, as of May 2010, Siemens found itself in the position that: it was unable to progress its own works; it required additional storage for its materials and equipment as a direct result of this lack of progress; it was funding the provision of materials and equipment procured and delivered in accordance with the contract programme; and, additionally, it was faced with significant claims from both BAM Rail and CAF in respect of events over which it had no control.

6.6 Project Carlisle Proposals

253. In May 2010, under an initiative known as "Project Carlisle", Infraco agreed to develop a price proposal based upon a revised allocation of risk, a reduced scope of works and an new delivery programme. Following this initiative, Infraco presented two price proposals to TIE, namely "Carlisle 1", dated 29 July 2010, and "Carlisle 2", dated 11 September 2010.

254. These proposals are considered in some detail to assist the Inquiry and also to respond to various assertions made by TIE personnel in regard to these proposals.

255. By way of example, at page 8 of his witness statement [**TRI00000141**] Mr. Rush alleges that Siemens "*may have under-priced their Work*". Again, at page 23, Mr. Rush states that he has "*discovered that Siemens had forward bought materials and had pricing errors in their bid*." At page 25 of the same statement he speculates that, because of this suspected under-pricing, Siemens was opposed to a re-pricing for Project Carlisle which was analogous to the contract price.

256. Separately, Siemens was essentially accused by Mr. Dennis Murray of including "*estimated final costs in Project Carlisle offers without reference to contract price*" when calculating its Project Carlisle price [**TRI00000249_0011**, question 21].

257. These statements singularly fail to acknowledge that the Siemens price for both Carlisle 1 and Carlisle 2 was expressly based upon Siemens' share of the original Construction Works Price. It is submitted that the assertion by Mr. Rush that Siemens had under-priced its works is ill-informed, unsubstantiated and

altogether unwarranted. As previously noted, Michael Flynn gave evidence to the Inquiry that "*our price was quite transparent and we were willing to stand behind it."* [**Transcript 6 December 2017, page 43:2-11**].

6.7 Carlisle 1 Proposal

258. The express requirement for Project Carlisle, as detailed in TIE's letter dated 10 May 2010 [**CEC00307113**], was to produce a 'Guaranteed Maximum Price' based upon a revised scope and an accelerated programme for the Infraco Works. On 29 July 2010 Infraco provided its Project Carlisle 1 proposal [**TIE00885457**]. Therein, Infraco offered a Guaranteed Maximum Price ("GMP") of £433,290,146 and €5,829,805 (less amounts previously paid), for a reduced scope from Airport to a Terminus at the east end of Princes Street. The GMP was based upon a GMP programme, a reduced list of pricing assumptions and a revised change mechanism. The Siemens' component of the GMP was £126,901,621.

259. The "Project Carlisle Scope' at Appendix 4 of the proposal expressly provided that the GMP included the value of all materials and equipment which Siemens had already ordered for the scope east of the Terminus, namely between the east end of Princes Street and Newhaven[45] [**TIE00885457_0063 & 0064**].

260. The summary of Siemens' Project Carlisle 1 price at Appendix 1.2 of the Carlisle 1 proposal is reproduced below [**SIE00000106**].

[45] Siemens also undertook to provide an "itemised and materials schedule" for sections east of the Terminus.

SIEMENS

ETN - Edinburgh Tram Network **date: 29-07-2010**
Project Carlisle - Pricing

Overall Summary

Original Contract Value - Original CPA Split	£96.917.006,78
Deductions Project Carlisle - Airport to Terminal Point	-£3.704.441,04
Additional Costs Project Carlisle - Airport to Terminal Point [1]	£26.005.861,69
CPA Project Carlisle - Airport to Terminal Point	£119.218.427,43
Change Orders	£5.308.309,69
Additonal GMP Carlisle components	£2.374.883,46
Total GMP Project Carlisle [2]	£126.901.620,58

Table 5-Siemens Project Carlisle 1 Price Summary

261. This Project Carlisle 1 price was based upon the Siemens' share of the fixed portion of the original Construction Works Price. This *'firm and fixed'* portion of £231,797,342 is found at Appendix A to Schedule Part 4 [**USB00000032_0015**], and is exclusive of any provision for Value Engineering or Provisional Sums. This is explained more fully in Axel Eickhorn's Second Supplemental Witness Statement [**TRI00000276_0004**, paragraphs 11-12]:

> *"I should explain that Siemens' share of the original Construction Works Price is £101,679,003 in the Infraco Contract (as can be seen in **Table 1**). This sum however included estimated amounts in respect of Value Engineering works and Provisional Sums (which were subject to amendment by way of the change mechanism contained in Schedule Part 4 of the Infraco Contract).*
>
> *"Siemens' share of the original contract price, when excluding Value Engineering and Provisional Sums, was £96,917,007 (please see*

Appendix A of Schedule Part 4 of the Infraco Contract). The breakdown of this figure can be seen at document CEC00555849."

262. Inquiry document **CEC00555849** is a partial reproduction of Siemens' Contract Price Analysis ("CPA") at Contract Close. This document was provided to TIE on 14 May 2008. This document (in its native file format) provides a detailed breakdown of the Siemens Construction Works Price. Page 1 of this document indicates that the Siemens' price has three main components, namely:

Section A-Airport to Haymarket (Off-Street)	£38,390,377.20
Section B-Haymarket to Newhaven (On-Street)	£17,453,561.58
System Wide	£41,073,068.00
Total	£96,917,006.78

Table 6- Summary of Siemens Original Contract Value-CPA Split

263. A summary of the original CPA is also provided in Appendix 1.2 of the Project Carlisle 1 submission [**CEC00183919_0030**]. The most significant single item is 'System Wide' cost. The summary provided [**CEC00183919_0030**] indicates that this 'System Wide' sum primarily comprises Siemens' preliminaries (£24.8 million), design costs (£11.6 million) and Depot Communication & Control systems (£3.5 million). A further sum of £1.1 million relates to the provision of on-board signalling equipment to the tram fleet. These costs, by their nature, were not location specific, but were required for the effective design, management and system integration of the Infraco Works. The importance and materiality of this fact will be addressed later in the context of the various criticisms made of the Siemens' pricing submissions.

264. The remaining cost components were location specific and consisted of the equipment and installation costs between Airport and Haymarket ("Off-Street") and between Haymarket and Newhaven ("On-Street").

265. Put shortly, the Siemens' Project Carlisle price was prepared by way of addition to, and omission from, Siemens' share of the fixed portion of the Construction Works Price. This fact is self-evident from the Project Carlisle 1 price summary, reproduced at Table 5 above.

266. The pricing methodology adopted by Siemens sought to make proper allowance for the reduced scope of works, for known changes to that scope and for the additional prolongation and disruption costs associated with undertaking the Infraco Works in accordance with a revised and accelerated programme. This approach is explained in Axel Eickhorn's Second Supplemental Witness Statement (paragraphs 13-14) [**TRI00000276_0004**]:

> *"13. When preparing pricing proposals for settlement offers, including Project Carlisle 1, Siemens did not include estimated amounts in respect of Value Engineering and Provisional Sums as one of the main purposes of the proposals was to try to give tie cost certainty as far as possible.*
>
> *14. Accordingly, the base price used for Siemens calculations of its settlement proposals was the £96,917,007. Siemens then added on the costs which it was proposing to fix for the Provisional Sums and Value Engineering to demonstrate clearly the fixed cost proposed for these works.*

14.1. An example of this can be seen from the "Additional GMP Carlisle Components" line item of £2,374,883. This line item includes the sum of £2,087,086 for Urban Traffic Control measures. However, the Urban Traffic Control measures previously formed part of the "Provisional Sums" listed in Schedule Part 4, for which an estimated figure was included as part of the Siemens' share of the original Construction Works Price of £101,679,003."

267. Appendix 1.2 to the Carlisle 1 proposal [**CEC00183919_0028-0033**] shows the detailed make-up of the additions and omissions to the 'Original Contract Value', summarised at Table 5 above. In particular, the deductions to the Construction Work Price in the sum of £3,704,441 [**CEC00183919_0030**] and the additions of £26,005,861 [**CEC00183919_0031**] are indicated.

268. These additions and omissions are addressed in Axel Eickhorn's Second Supplemental Witness Statement [**TRI00000276_0005**, paragraphs 15]:

"15. The works comprising the line items in Table 3 are detailed on pages 30 to 33 of the Project Carlisle 1 submission but in summary:

15.1. the "Deductions Project Carlisle – Airport to Terminal Point" figure represents the amount that Siemens deducted from its initial proposed price as a consequence of the reduced scope for the works proposed under Project Carlisle 1; and

15.2. the "Additional Costs Project Carlisle – Airport to Terminal Point" mostly relate to the additional costs incurred by Siemens as a

consequence of the prolongation of the works, and consequential extended site presence (as described above)."

269. The most significant addition, namely the sum of £26,005,861 in respect of 'Additional Costs Project Carlisle-Airport to Terminal Point', primarily related to the additional cost associated with the completion of the Infraco Works in accordance with the accelerated programme of works shown in the GMP programme. The 'Key Dates' from the GMP programme are reproduced in Axel Eickhorn's Second Supplemental Witness Statement [**TRI00000276_0003, paragraph 7 and Table 2**].

270. These key dates indicate that, pursuant to the GMP programme, the revised Service Commencement Date was 19 November 2012, representing a project extension of 16 months on the original Service Commencement Date of 16 July 2011 in the contract Programme (rev. 0):

"9. Accordingly, Siemens' prolongation costs would be further increased under Project Carlisle 1 than they would under the Infraco Contract as Siemens would be required to employ staff and lease accommodation and materials (and other similar costs) for the additional time required to complete the construction works and the testing and commissioning phase. This was therefore accounted for as part of the price proposed by Siemens for the purposes of Project Carlisle 1." [**TRI00000276_0003]**

271. The Project Carlisle price also reflected the fact that, at the time of this submission, over 26 months of the original anticipated 38 month project duration

had elapsed, with only limited progress. At that time, Infraco was reporting actual progress of 20% for building and civil engineering works and an anticipated completion date of 10 December 2013 (Infraco Period Report No. 3-4, to 17 July 2010) [**BFB00003291_0021**]. The Siemens' MIS Report for July 2010 indicates that installation/commissioning activities were only 4% complete. The Project Carlisle price also reflected the significant additional costs incurred in contract management and legal input in respect of the ongoing impasse between the parties in regard to matters of contract interpretation and entitlement. During oral evidence Axel Eickhorn explained this "thickening" of resources when asked by Counsel to explain the provision of £26 million:

> *"I think it is a fairly good presentation or representation of the problem that we faced at the time, that we had mobilised our team, that our resources were on site already, sometimes being idle, and so we had to maintain these for longer, and that was in fact our most pressing risk that we saw at the time; the presence of the mobilised team and not only the early mobilisation that had taken place, but also the thickening of resources during the development of the project."* [**Inquiry Transcript, 6 December 2017, Page 182: 12-21**].

272. The calculation of the additional prolongation cost was undertaken on an Actual Cost/Estimated Actual Cost basis, in accordance with the principles established in the agreement of EOT1 (INTC 001)[46].

[46] [**CEC00208535** & **CEC00578866]**-Considered in more detail at Section 5.8 above.

273. The Siemens' price was based upon provision of 'Systems and Trackwork' materials and equipment for the entire alignment to the extent that these costs had already been incurred. Much of this material and equipment was already stored in Edinburgh at the time of Carlisle 1. This matter is addressed in Axel Eickhorn statement at paragraph 114 [**TRI00000171_0053**]:

> *"Thus, the truncation of the line did not provide significant savings in respect of the trackwork and system elements as most of the costs for materials and manufacturing had been committed already at this point in time."*

274. In his Supplemental Witness Statement [**TRI0000249_0011**] Mr. Murray of TIE states that:

> *"..the offers from Infraco were based upon a repricing of the works to arrive at a GMP. That is to say the offers were costs to complete based (using GMP amounts from their supply chain plus prelims plus risk) rather than contract sum based. Siemens had included estimated final costs in Project Carlisle offers without reference to contract price. This was not able to be reconciled with the approach taken by the tie QS team which was entitlement based upon contract sum plus change."* [**Question 21**]

275. This assertion is patently incorrect. Siemens has demonstrated above that its Carlisle 1 price was based upon it share of the original Construction Works

Price.[47] Furthermore, Siemens adopted a valuation methodology that would be recognisable to and understood by all quantity surveyors and cost consultants.

276. In this regard it is noted that Siemens has properly excluded amounts in respect of provisional sums and value engineering and provided firm prices for these items. Siemens has also made deductions in respect of the revised scope. Siemens has added the value of known changes directly related to the revised scope. Finally, Siemens has added sums to reflect the costs associated with the prolongation of the Infraco Works, as reflected in the GMP programme.

277. TIE may dispute the values derived by adoption of this methodology. However, it is submitted that any attempt to mischaracterise or dispute the nature of this methodology is entirely unjustified.

278. Furthermore, Siemens observes that question 21 put to Mr. Murray implies that "*the Project Carlisle discussions were seen, in essence, as a re-pricing exercise by Siemens*" [**TRI0000249_0011**]. This Inquiry question is based upon observations made in Inquiry Document **CEC00032056**. The specific observation made at item 6 of the 'Questions and Answers' section is framed in the following terms:

> *"DM asked tie to outline the critical ways in which this counter-proposal differed from the current contract arrangements. Tie explained that in terms of the new proposal, Infraco are responsible for producing a fit for*

[47] The speculation by Mr. Rush at page 25, paragraph 3 of his witness statement (**TRI00000141_0025**) is equally incorrect. Siemens was wholly comfortable with its Project Carlisle price and a pricing methodology that was "*analogous to the Contract Price".*

purpose tram network with any errors being to their account. All the pricing assumptions in schedule 4 of the contract will no longer exist. With the current contract BDDI was not the final design. Essentially this is a re-pricing exercise for the completed design. The ***tie*** *proposals are intended to give certainty. RJ advised that DLA are to propose a revision of clause 80 to the Infraco contract."* [emphasis added] [**CEC00032056_0004].**

279. This statement about re-pricing relates to BDDI, and the pricing assumptions in Schedule Part 4. These matters were largely irrelevant to Siemens' scope, which, as previously observed, was defined and informed by the Infraco Proposals and the Employer's Requirements and not by the BDDI. Also, this comment is made in the context of TIE's counter-proposal. Thus, the statement regarding re-pricing refers, in fact, to the re-pricing exercise undertaken by TIE in respect of the civil engineering scope as part of the preparation of its counter-proposal presented to Infraco on 24 August 2010 [**CEC00221164**]. In short, this comment does not relate to Systems and Trackwork and is not a reference to Siemens' pricing methodology. Rather it is a reference to the civil engineering scope and TIE's pricing methodology. Thus, Mr. Murray appears to be agreeing with a statement that was not made in regard to Siemens. This provides a graphic example of TIE's hostility to Infraco and how such hostility obscured objective analysis.

280. It is further observed that in their respective witness statements, Tom Aitchison [**TRI00000022_0074**, **paragraph 224]** and Alastair Maclean [**TRI00000055_0015**, **paragraph 49**] both note, in the context of the meeting to consider TIE's counter proposal [**CEC00032056**], that *"this was essentially a re-*

pricing exercise for the completed design" with the intention of giving TIE certainty in regard to Schedule Part 4 pricing assumptions.

281. For the reasons stated above, Siemens requests the Inquiry to prefer the evidence of Axel Eickhorn on this point.

282. On 24 August 2010 [**CEC00221164**] TIE rejected the Carlisle 1 proposal. By the same letter TIE presented Infraco with its own counter proposal for a line between Edinburgh Airport and Waverley Bridge for a revised Construction Works Price of £216,492,216. On 7 September 2010 TIE provided BBUK with further details of its counter proposal [**CEC00157666**].

283. Infraco's attitude to this proposal is encapsulated by Martin Foerder at paragraph 209 of his witness statement [**TRI00000095_0070**]:

> *"It was an entirely unrealistic proposal and one that could not be accepted by Infraco."*

284. A fuller reflection of Infraco's attitude to this counter proposal, and the sense of frustration felt, is provided in the preface to the Carlisle 2 proposal [**TIE00667410_0005]**:

> *"This Revised Infraco "Project Carlisle" Proposal takes into account its predecessor, dated 29 July 2010, and tie's letter dated 7 September 2010 (INF CORR 5990). We recognize the effort placed into preparing the 7 September 2010 letter and accompanying documents; however it falls considerably short of our threshold for acceptance. The overarching theme of the document presents a picture of the contract tie wishes they*

had executed with Infraco, and from a perspective that Infraco have no rights. As you are well aware, Infraco enjoys the express rights and remedies of the executed Infraco Contract and those afforded to it by the laws of the United Kingdom and European Union.

We have no intention to further use this document to convey our disappointment or to correct the many inaccurate, false, and slanderous statements in your letter."

285. In conjunction with the rejection of Carlisle 1, TIE adopted an extremely aggressive contract strategy. This is considered in more detail below. The attitude adopted by TIE in the calculation of its price appears to have been established by Mr. Rush in his email on 30 July 2010 [**CEC00337645**]. Therein, immediately following receipt of the Carlisle 1 proposal, Mr. Rush contemplates a counter-offer which must not exceed £220,000,000 and that "*areas of attack*" included "*£22 million of Siemens Prelims*".

286. This email confirms that Siemens' price was seen by TIE as a legitimate area of attack. It is Siemens' position that a combination of indifference and a lack of understanding characterised TIE's approach to Siemens' entitlement both in relation to Project Carlisle and in subsequent negotiations[48].

287. Furthermore, it is Siemens' position that the approach adopted by TIE at this time merely served to delay agreement and to increase the costs borne by CEC and the City of Edinburgh.

[48] Mr. Rush email dated 2 March 2011 confirms that TIE had "*no clear handle on the market cost of the Systems*" [**CEC02084603**]

6.8 Key Adjudication Decisions in 2010

288. For Siemens, the key adjudications decisions were Murrayfield Underpass (INTC 109) and MUDFA Rev. 8 (INTC 429). These adjudications, whilst not directly related to Siemens' scope of works, were of particular significance because of the wider principles of contract interpretation established by the respective adjudication decisions. In addition, these decisions reaffirmed the fundamental allocation of risk detailed in the Infraco Contract and in particular, within Schedule Part 4. In turn, these decisions undermined the contract strategy which TIE had adopted in relation to both programme and change management.

289. Both of these decisions are discussed below.

6.9 Murrayfield Underpass (INTC 109) Adjudication

290. INTC No. 109 consisted of an 'Infraco Notice of TIE Change' as a result of post contract amendment to the design of the civil engineering works to Murrayfield Underpass. Infraco contended that the requirement for permanent piling to the Murrayfield Underpass was a change in design principle between BDDI and IFC stage and, as such, constituted a Notified Departure and hence a change to the Infraco Works.

291. This adjudication considered whether an agreed Estimate was, as asserted by Infraco, a necessary pre-condition to the commencement of works in relation to a TIE Change or whether, alternatively, the express terms of Clause 34.1 (or alternatively pursuant to Clause 80.13) enabled TIE to instruct Infraco to

commence, carry out and complete the works which were the subject of INTC No. 109 in the absence of an agreed Estimate.

292. The existence of a Notified Departure was not disputed. However, it was TIE's position that it had a contractual entitlement to instruct or direct Infraco to proceed to execute varied work (whether the variation was disputed or not) pursuant to Clause 34.1 and 80.13 and that Infraco was obliged to comply with that instruction or direction, so that the works could proceed.

293. Infraco argued that TIE was only able to instruct Infraco to proceed with work where either the Estimate had been agreed or a disputed Estimate had been referred to the Dispute Resolution Procedure for determination in accordance with Clause 80.1.5.

294. The Dispute Notice was issued on 21 May 2010 and the Adjudicator's decision was made on 07 August 2010 [**BFB00053462**]. The Adjudicator decided that, as there was no agreed Estimate in respect of the works referred to in INTC No. 109, TIE could not oblige or require Infraco to commence or carry out those works [**BFB00053462_0012**].

295. The wider implication of this decision was that, in the absence of an agreed Estimate, Infraco was not obliged or permitted to commence or carry out works associated with a TIE Change (Mandatory or otherwise). In essence, Clause 80.13 of the Infraco Contract required that the parties agree the time and money consequences of each Estimate prepared in respect of a change before Infraco was permitted to carry out the work affected by the change.

296. Thus, in all instances where Infraco identified a TIE Change (by way of Notified Departure or otherwise) the works in question could not proceed unless or until the related Estimate was agreed or TIE (or Infraco) chose to refer the matter to dispute and TIE choose to instruct Infraco to proceed with the TIE Change pursuant to Clause 80.15.

6.10 MUDFA REV.8 (INTC 429)-Delays Arising from Incomplete Utilities Works

297. The MUDFA Rev.8 dispute arose from Infraco's request in 2009 for extensions of time to the Planned Sectional Completion Dates for the Works as a result of the late completion of the preceding MUDFA works (utility diversion). At the time of this dispute the MUDFA works were approximately two years behind schedule.

298. On 30 April 2009 TIE provided its MUDFA Rev.8 programme to Infraco, showing planned completion of utility diversion works [**CEC00322635**]. As a result, on 8 July 2009 Infraco issued INTC 429 in respect of the MUDFA delays [**CEC00322640**]. Infraco advised that the programme dates provided by TIE were at variance with Pricing Assumptions 3.4.24 and 3.4.32[49] and that, as a result, a Notified Departure had occurred. Also, pursuant to Clause 18.1.2, Infraco was entitled to exclusive access to the 'Designated Working Areas' and was not required to work concurrently with the MUDFA contractor.

299. On 06 August 2009 Infraco issued its Estimate in respect of INTC 429 seeking extensions of time to the Planned Sectional Completion Dates for Sections A, B,

[49] Pricing Assumption 3.4.24 and 3.4.32 reflected the fact that the Infraco Programme was based upon the assumption that the MUDFA works would be completed in advance of, and would not conflict with, the Infraco Works.

C and D in respect of delayed completion of MUDFA works in the period to 28 March 2009 [**CEC00322634**]. Infraco's assessment of the impact of MUDFA delay was based on a re-scheduling exercise rather than a retrospective delay analysis and utilised the forecast completion dates for the MUDFA Works in each of the intermediate sections (provided by TIE in the MUDFA Rev. 8 Programme) as the start milestones for the corresponding intermediate section of the Infraco Works.

300. TIE agreed that a Notified Departure had occurred and TIE further agreed that Infraco had an entitlement to an extension of time. However, TIE also considered that the execution of the MUDFA works was a "Compensation Event" rather than a change and that any failure to give possession or grant access in breach of Clause 18 could only be pursued under Clause 65 (Compensation Events). In addition, TIE rejected the assertion that Clause 18.1.2 granted an exclusive licence to Infraco to enter and remain upon the Designated Working Areas.

301. In addition, it was TIE's position that Infraco had not submitted a compliant Estimate in accordance with Clause 80. TIE alleged that Infraco had failed to consider effective mitigation measures in its Estimate (Clause 80.4.8) or to provide information on costs (Clause 80.4.10) and cost management (Clause 80.7). TIE also alleged that Infraco had provided a flawed delay analysis which failed to establish the nature or extent of the actual delays to the works attributable to the Notified Departure or the impact of Infraco's own activities.

302. The Adjudicator, Mr. Howie QC, issued his decision on 4 June 2010 and 16 July 2010 [**CEC00375600, CEC00407650** and **CEC00310163**].

303. The Adjudicator found that Infraco had properly pursued a Clause 80 variation claim rather than a Clause 18 (exclusive access) breach of contract claim.

304. The Adjudicator further found that Infraco was contractually entitled to refuse to work alongside a MUDFA Contractor in a Designated Working Area. In this regard Infraco was entitled to rely upon Clause 18.1.2 as a "shield" to argue that a given delay was "*both fully mitigated and attributed to the deemed tie 80 Change.*" [**CEC00407650_0011**].

305. However, in respect of Sections B, C and D of the Infraco Works it was found that Infraco had failed to prove the length of its entitlement because its calculation of delay "was erroneous as a matter of construction of contract." The Adjudicator found that no evidence was properly adduced on the length of delay to which Infraco was exposed by reason of the Notified Departure "when that delay is calculated on the correct basis", and that Infraco had "wrongly equiparated" a Designated Working Area with an intermediate section of the works and had wrongly created its delay analysis on the basis of the assumption that it did not need to work in an intermediate section if there was a MUDFA contractor working anywhere along the length of that intermediate section. Infraco had not adduced evidence in respect of the actual extent of the Designated Working Areas to which it was entitled to exclusive access and, further, it had not adduced evidence of the delay caused by being kept out of these Designated Working

Areas. In essence, Mr. Howie QC found that Infraco had failed to prove the effect on the Contract Programme of the falsification of the Base Case Assumption in regard to programme, which had formed the basis of the Notified Departure identified in INTC 429.

306. The Adjudicator found that the Designated Working Area issue did not affect Section A (Depot) and he awarded an extension of time of 154 calendar days.

307. More significantly perhaps, the adjudication established important points and principles with regard to the pursuit of further extension of time entitlement in respect of ongoing MUDFA delays, namely:

(i) MUDFA delay could be pursued by way of Clause 80 Change Order rather than pursuant to Clause 65 (Compensation Events) and the notification and evidential regime set out therein. Clause 65 and Clause 80 were mutually exclusive and where a Notified Departure had occurred it could only properly be claimed pursuant to Clause 80. The Adjudicator found that Infraco pursued the claim correctly as a Notified Departure pursuant to Clause 80, as opposed to a claim for breach of Clause 18.1.2 (which TIE had argued was the case and should be pursued under Clause 65). However, the method of delay analysis was consistent with Clause 65 rather than Clause 80.

(ii) Compliance with all of the provisions of Clause 80 was not a condition precedent to Infraco's right to obtain an extension of time.

(iii) When considering mitigation measures as part of an Estimate, Infraco was not required to consider accelerative measures unless already otherwise directed by TIE to do so. Additionally, Infraco should not be obliged to deploy additional resources or give up its contractual right in taking reasonable steps to mitigate.

(iv) When attempting to establish the delay attributable to a Notified Departure it was appropriate to estimate the impact on the Programme and the entitlement to an extension of time pursuant to Clause 80 by means of a prospective analysis, as opposed to a retrospective analysis of the actual impact of the Notified Departure.

308. The MUDFA decision was extremely damaging for TIE because, provided Infraco identified the appropriate size of Designated Working Areas, it could successfully pursue further extension of time claims in a similar manner, in the knowledge that its contract interpretation was correct.

309. In his witness statement [**TRI00000171_0057**] at paragraph 121 and 122, Axel Eickhorn observed in general terms that, with regard to the various adjudication decisions, whilst these decisions did not alter Siemens' overall interpretation of the Infraco Contract or Siemens' method of working that, "*the decisions gave the Consortium confidence that its strategy was justified*".

6.11 MUDFA Adjudication Decision & MUDFA 2 Estimate

310. On 28 July 2010, immediately prior to the Carlisle 1 proposal, Infraco received Mr. Howie's QC reasons for his decision in the MUDFA works (INTC 429) dispute

[**CEC00407650**]. Infraco immediately addressed the sole defect in its analysis of delay in connection with INTC 429, namely that it had "wrongly equiparated" a Designated Working Area with an intermediate section of the works.

311. The findings of Mr. Howie QC, informed the analysis of delay undertaken by Infraco in respect of MUDFA 2 (INTC 536). INTC 536 addressed the delays and additional costs associated with the ongoing delay and additional costs arising as a result of incomplete utility works based upon information made available by TIE in the period to 31 July 2010. This information confirmed the falsification of Pricing Assumptions 24 and 32.

312. On 17 September 2010 [**CEC00218112**] Infraco submitted its Estimate in respect of INTC 536. In its Estimate, Infraco established revised Sectional Completion Dates, based upon a fully mitigated programme, as follows:

- Section A-28 January 2011;
- Section B-13 April 2011;
- Section C-13 June 2012; and
- Section D-10 December 2012.

313. This represented a 461 calendar delay to the existing Service Commencement Date of 6 September 2011 established and agreed in connection with EOT 1 (INTC 001) [**SIE00000294_0002**]. In the calculation of delay Infraco adopted mitigation measures, including the removal of resource constraints and the introduction of instructed acceleration measures.

314. The Estimate evaluated the cost of delay to each of the Sectional Completion Dates in the total sum of £39,306,971 (Siemens and BBUK) and €4,971,623 (CAF).

315. The Siemens' cost element of the Estimate was £21,982,746 (Table 15) and was based upon the mechanism for calculation of prolongation costs agreed in connection with EOT 1 in November 2009 [**CEC00208535** & **CEC00578866**].

316. Siemens invites the Inquiry to note that the figures claimed in connection with INTC 536 are consistent with those claimed by Siemens for prolongation in the Carlisle 2 proposal, which is based upon similar completion dates. In addition, in both INTC 536 and Carlisle 2, the sums asserted are by way of addition to the Construction Works Price and are calculated using the same methodology and method of presentation. However, the INTC 536 Estimate reflected the fact that staff and subcontractors had now been fully mobilised. The Estimate demonstrates that the primary driver of project cost was incurred delay and disruption rather than project scope.

317. Subsequently, on 27 January 2011 [**TIE00354497**], in the absence of a formal response from TIE or a commitment to provide a response in regard to its Estimate, Infraco referred the matter to the Dispute Resolution Procedure.

6.12 Carlisle 2 Proposal

318. On 11 September 2010 Infraco submitted its Project Carlisle 2 proposal [**TIE00667410**], and thereby offered a GMP of £405,531,217 and €5,829,805 (less amounts previously paid) for a reduced scope from the Airport to

Haymarket, namely the Off-Street works. The GMP was based upon a GMP programme, a reduced list of pricing assumptions and a revised change mechanism. The Siemens' component of the GMP was £118,601,221.

319. The scope of works deliberately excluded On-Street works because, it was understood that, TIE did not want BBUK to undertake any further work on the streets of Edinburgh. Accordingly, Siemens concur with the statement at paragraph 209 of Martin Foerder's witness statement [**TRI0000095_0070**]:

> *"TIE had also requested BCUK not to do any further civil engineering works, except the remedial works in Princes Street. In discussions, TIE had stated that it was reflecting CEC's desire 'not to have Bilfinger Berger in Edinburgh Streets'."*

320. This fact was also acknowledged in the Carlisle 2 proposal, together with a commitment from Siemens to provide a quotation for Systems works east of Haymarket:

> *"To clarify, it is tie who do not want Infraco to undertake the work east of Haymarket. In the event that tie would require the E&M installation works (tram control, traffic control, SCADA Communications, electrification and Over Head Line systems) to be completed east of Haymarket, Siemens will be willing to enter into discussions with tie and provide a quotation to tie in response to a clear scope of work, programme and a standard set of terms and conditions issued by tie, in which Siemens would be a subcontractor to tie".* [**TIE00667410_0005**].

321. The Siemens price was calculated in the same manner as Carlisle 1. However the reduced scope of works was reflected in the revised price. This is confirmed by Axel Eickhorn, at paragraph 118 of his witness statement [**TRI00000171_0054**]:

> *"As in Project Carlisle 1, the Siemens element of the price proposed under Project Carlisle 2 was built up on the basis of the original Contract Price taking into account any scope omissions (as the line was shorter), reductions and additions and additional time related costs. The difference in price between the two Project Carlisle proposals reflected the omission of the On-Street section (although it must be noted that most of the Siemens equipment for this section had already been ordered, manufactured and/or delivered) and the shortened Programme (i.e. reduced additional time related costs)."*

322. However, Siemens concedes that this is not apparent from examination of Appendix 1.2 to the Carlisle 2 proposal [**TIE00667410**]. In light of this, in his second supplemental statement [**TRI00000276**], Axel Eickhorn provided further information in regard to the development and rationale behind the Siemens price proposals, including the Project Carlisle 2 price.

323. It is submitted that the confusion created has arisen from the manner of presentation, rather than the method of calculation, adopted by Siemens. However, the underlying methodology of price calculation is exactly the same as that adopted in Carlisle 1. It is hoped that this matter has now been clarified by

Mr. Eickhorn's second supplemental statement [**TRI00000276**] and the Inquiry is invited to accept his explanation.

324. At paragraph 22 and at Table 6 of his supplemental statement [**TRI00000276**], and in order to assist the Inquiry, Mr. Eickhorn reproduced a summary of the internal calculation that was used by Siemens to prepare its price proposal for Project Carlisle 2. This table is reproduced below (at Table 7):

SIEMENS	
ETN - Edinburgh Tram Network	**date: 11-Sep-2010**
Project Carlisle - revised Pricing	
Overall Summary	
Original Contract Value - Original CPA Split	£96,917,006.78
Deductions Project Carlisle - Airport to Haymarket	-£4,993,320.56
Additional Costs Project Carlisle - Airport to Haymarket [1]	£20,612,906.46
CPA Project Carlisle - Airport to Haymarket	£112,536,592.68
Change Orders	£5,123,140.01
Additonal GMP Carlisle components	£941,495.76
Total GMP Project Carlisle [2]	£118,601,228.45

Table 7-Siemens Project Carlisle 2 Price Summary

325. Siemens has also provided the Inquiry with a copy of this internal calculation file in its native file format. To re-iterate, the price summary reproduced above at Table 7 and the file provided together demonstrate that the price proposed by Siemens for Project Carlisle 2 was prepared using the same methodology as that used in Project Carlisle 1. However, the price was reduced because of the omission of the On-Street work east of Haymarket.

6.13 TIE Contract Strategy in 2010

326. In 2010 TIE adopted an extremely aggressive contract strategy. This appeared to coincide with the arrival of Mr. Rush. In particular, TIE adopted the following tactics:

- non-payment of preliminaries;
- instigation of audits and abuse of powers under Clause 104 'Information and Audit;
- attempted removal of Infraco key personnel;
- issue of Remediable Termination Notices and Underperforming Warning Notices; and
- issue of excessive amounts of correspondence.

327. These matters have been canvassed in some detail during oral hearings and Siemens has little to add to what has already been said by witnesses for Infraco. However, Siemens submits that two particular matters are worthy of comment:

328. Removal of Key Personnel

329. In July 2010 TIE sought the removal of Infraco's planner, Mr. Stephen Sharp pursuant to Clause 27 of the Infraco Contract [**CEC00167033_0002**]. TIE repeated this demand on 9 August 2010 and on 12 August 2010. Mr. Sharp was an extremely valued member of the Infraco team and provided planning services for both BBUK and Siemens. He was considered to be an extremely competent and experienced planner and his attempted removal was wholly unwarranted.

330. Issue of Remediable Termination and Underperforming Warning Notices

331. Between 9 August 2010 and 12 October 2010 TIE served 10 Remediable Termination Notices ("RTN") and 3 Underperforming Warning Notices ("UWN"') [**CEC02084518 to CEC02084529**]. These notices had no sound basis in law or in fact. However, this was an extremely time-consuming and expensive process and required the input of external legal counsel and deployment of additional resources as Infraco was required to respond to these notices, which included the provision of rectification plans[50].

332. The oral evidence of Mr. Brandon Nolan confirms that these notices were issued without any prior detailed forensic analysis. In the 'Conclusions' section to the McGrigors LLP report on termination dated 14 December 2010[51] it is noted that:

> *"At present, there is not yet a firm basis upon which to assess the strength of tie's position in relation to establishing whether there has been any Infraco Default. A detailed forensic investigation has not yet been carried out, nor has definitive expert opinion been sought. Both of those actions have now been put in train."* [**TIE00080959_0029**]

333. In oral evidence, Mr. Nolan confirmed there was concern as to the substance and form of these notices. [**Transcript, 7 December 2017, Page 180:5-7**]. Mr. Nolan also gave evidence that he had given TIE prior warning in regard to the advisability of issuing such notices:

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50 Clause 56.8 and Clause 90.1 required the provision by Infraco of Rectification Plans within prescribed timescales.

51 *'Report for tie Limited on Certain Issues Concerning Edinburgh Tram Project'*.

"Was it a surprise to you that if Remediable Termination Notices had been served, that that hadn't already been done?

A. It was more a matter of disappointment and the reason why I mention that is that I think in March, when I issued the last report that we looked at, I think I attended two more meetings at tie's offices, and it was mentioned that RTNs or Remediable Termination Notices were going to be embarked upon, and I said at that meeting: you have to approach this with proper forensic caution. You need to have the facts in place. And you need to be very specific in the default. It's a bit like drafting an interim interdict for a declarator -- sorry, not a declarator. Specific performance is the word I'm looking for. So that the recipient understands precisely what the default is, and what is required to rectify that default. I think what I said caused a bit of annoyance, to be perfectly honest.

Q. Is that what you said at the early part of 2010?

A. That's what I said in March, I think. But I wasn't invited back to any further meetings. That was it." [**Transcript, 7 December 2017, Page 180:25-181:21]**

334. It is indicative of the level of TIE's hostility towards Infraco and TIE's lack of objectivity that it embarked on a process of termination without any forensic investigation and against legal advice.

7.0 MEDIATION

7.1 Preparation including Estimates Prepared - Project Phoenix

335. On 24 February 2011 Infraco provided its Project Phoenix proposal [**BFB00053258**]. Project Phoenix was based upon a reduced scope of Infraco Works between Edinburgh Airport and Haymarket Viaduct, together with Enabling Works in Section 1A. The Project Phoenix proposal was based upon a reduced list of pricing assumptions, a revised change mechanism and a new delivery programme (the "PPP Programme"). Pursuant to the PPP Programme the Service Commencement Date was now 22 September 2013. Siemens' portion of the Project Phoenix Price was £136,881,719 **[BFB00053258_0010].**

336. The impact of this prolonged site presence is explained by Axel Eickhorn in his second supplemental witness statement:

> "*the Service Commencement Date (Section Completion D) is 22 September 2013, which is around 26 months later than the Service Commencement Date of 16 July 2011in the Infraco Contract. As with the previous proposals, Siemens would therefore incur prolongation costs for an additional 26 months in order to complete its works on the Edinburgh Tram line."* [**TRI00000276_0008**, **paragraph 29**].

337. In the preparation of its Project Phoenix price, Siemens adopted a different pricing methodology. This was done because, in February 2011, Siemens was in month 34 of the original 38 month programme. Calculation of price based upon the methodology adopted with Carlisle 1 and Carlisle 2 was no longer considered

a sound basis upon which to proceed. In particular, the decision to re-price reflected the reality on site at this time. At this stage, as indicated by Siemens' internal reporting, only 8% of overall Siemens installation works had been completed against a planned completion of 100% in accordance with Programme Rev.01 [**SIE00000304_0001**]. In addition, all “goodwill works” had ceased and progress on site had ground to a halt.

338. In addition, in the preceding months, Infraco had to withstand an extremely aggressive and hostile contract strategy and defend repeated notices of termination at considerable cost both financially and in terms of its relationship with, and goodwill towards, TIE.

339. In short, after almost three years on site, with little prospect of progress, increased costs from subcontractors, inflation/price escalation costs, exceptional costs for storage of materials and equipment, exceptional costs in respect of disputes and additional contract management/legal resource, additional financing costs due to TIE's deliberate policy of non-payment of preliminaries, and significant adverse currency movements, benchmarking of its Phoenix proposal against a contract price agreed three years earlier was simply no longer appropriate.

340. Instead, the Siemens' Project Phoenix price was based upon costings for each of its business units. As part of this process, Siemens sought competitive price proposals from BAM Rail [**SIE00000131**]. Siemens would invite the Inquiry to

note the express resource constraints upon which the PPP price and programme was prepared. These constraints are noted at Appendix 5 to Project Phoenix:

> *"To provide an efficient use of resources the PPP Programme has a restriction on the resources for trackworks of 2 Gangs that has no impact on the finish of installation works. Further, the PPP Programme has a restriction on the resources for OLE of 2 Gangs that is in conjunction with previous constraints on the Infraco construction programme."* **[BFB00053258_0163]**.

341. This level of resources has relevance with regard to consideration of the subsequent preparation and agreement of the Siemens' On-Street price.

342. In order to assist the Inquiry, Axel Eickhorn has provided a comparison of the Siemens' price for Project Phoenix and the Carlisle 2 price at Table 9 to his second supplemental statement [**TRI00000276_0009**]. This Table 9 ('Comparison of Carlisle 2 and Project Phoenix Price') is reproduced below (at Table 8).

On-Shore/Off-Shore/System	Carlisle Price	Comparable Phoenix Price	Price movement
Siemens Transport Solutions [UK]:			
UK Project Management	13,324,667	17,599,045	4,274,378
UK System Engineering	3,001,626	3,710,676	709,050
Trackwork	43,471,285	48,753,566	5,282,281
UK Depot Workshop	2,028,342	2,230,573	202,231
UK Electrification	6,003,202	6,130,889	127,687
Infrastructure	3,185,035	3,516,935	331,900
Insurance, Bonds and Financial Guarantees	1,712,358	372,687	-1,339,671
Rail Automation:			
Control & Information	5,111,939	5,059,277	-52,662
Communications	5,009,483	6,424,898	1,415,415
Siemens AG:			
Electrification, Automation and Depot Equipment	29,688,648	30,153,187	464,539
	112,536,585	123,951,733	11,415,148
Change Orders	5,123,140	2,165,627	- 2,957,513
Additional Carlisle Components	941,496	-	- 941,496
Core HVLV		1,997,897	1,997,897
Traffic Solutions		1,980,353	1,980,353
Finance costs		3,129,592	3,129,592
Risk		3,656,517	3,656,517
Overall Project Price	**118,601,221**	**136,881,719**	**18,280,498**

Table 8- Comparison of Carlisle 2 and Project Phoenix Price-Axel Eickhorn Table 9

343. At paragraph 34 Mr. Eickhorn explains that, between the submission of the Project Carlisle 2 Proposal and the Phoenix proposals, virtually all aspects of the works were adversely affected by the ongoing disputes regarding the interpretation and implementation of the Infraco Contract.

344. At paragraph 35 Mr. Eickhorn explains that, in that period, there had been a cessation of all "*goodwill works*" and works on the project had effectively halted. Accordingly, as part of the Project Phoenix proposal there was a recognition of

the need to remobilise[52] site resources and an acknowledgement of the consequential impact on the programme.

345. Mr. Eickhorn further explains the increase in the provision for prolongation between the Carlisle 2 and Project Phoenix proposals at paragraphs 36 and 37 [**TRI00000276_0010]:**

> *"Therefore, whilst there was only a five-month gap between submission of the Carlisle 2 and the Project Phoenix proposals, the revised programme underpinning Project Phoenix was much more extensive than in Project Carlisle 2 and required Siemens to be on site for a further nine months. Therefore, the time interval alone between Project Carlisle 2 and Project Phoenix proposals is not the dominant reason for the increase in price between these two proposals.*
>
> *The comparison shown in Table 9 illustrates how these prolongation costs increased the Siemens' price for each of its relevant business units. The table also shows an increase in the trackwork price, which increase was also predominantly a consequence of the extended project duration which necessitated a longer site presence for Siemens' sub-contractor, BAM Rail BV."*

346. Mr. Eickhorn also explains the increase in provision for risk and finance costs between Carlisle 2 and Project Phoenix at paragraphs 38 to 40 [**TRI00000276_0010]:**

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[52] Project Phoenix Proposal made express provision for a 20 working day remobilisation period following signature of required agreement and Project Phoenix Programme showed a corresponding remobilisation date of 29 April 2011 [**BFB00053258_0162 & 0167** ('Key Dates-Activity 1050)]

In addition to Siemens prolongation costs, Siemens also had to factor in the following into its pricing submission for Project Phoenix:

the number of Pricing Assumptions were significantly reduced in Project Phoenix to provide more price certainty for tie. This inevitably meant more risk had to be factored into the price proposed by Siemens to take account the risk that Siemens' itself was exposed to in incurring higher costs than envisaged; and

there were significant increases in the provisions for finance and risk costs. The increase for finance costs reflected the extent of ongoing under-payment from tie to Infraco, which meant Siemens had to finance its cash flow deficit. Siemens had paid out for materials. Further, Siemens was exposed to adverse currency fluctuations until payment was received from tie. Siemens had to pay to hedge against this risk, which arrangement needed to be extended given the extension of time proposed for the project."

347. The Project Phoenix price reflected the considerable increase in costs incurred in respect of both trackwork[53] and prolongation costs. In addition, the Project Phoenix price "overall summary" at Appendix 1.2 to Project Phoenix [**BFB00053258**] reflects the considerable commercial, contract management and legal costs incurred to that point as a result of the multitude of disputes and disagreements in regard to the Infraco Contract.

[53] The increased trackwork costs were a direct function of the delay and disruption of trackwork activities and were, in essence, a prolongation cost.

7.2 Section A Extension of Time Application

348. On 4 March 2011, prior to the mediation at Mar Hall, Infraco issued its Estimate in respect of the impact of various Infraco Notices of Change (INTCs) on Section A (Depot) [**CEC02087158_0003**]. In its Estimate, Infraco established revised Sectional Completion Dates as follows:

- Section A-09 November 2011;
- Section B-09 February 2012;
- Section C-26 September 2012; and
- Section D-13 May 2013.

349. Infraco valued the cost of this delay at £16,020,323 and €4,523,035 (CAF portion). Siemens' prolongation entitlement as part of this Estimate was £9,027,615. This sum was calculated using the same methodology as that agreed in respect of EOT1 in November 2009 [**CEC00208535** & **CEC00578866**].[54]

350. Siemens MIS Report Period February/March 2011 confirms that the Section A Estimate was submitted following an external review of the delay analysis and methodology contained in the Estimate [**SIE00000304_0003**].

7.3 TIE evaluation of Siemens Entitlement in respect of Project Phoenix

351. In the preparation of these Closing Submissions Siemens has had an opportunity to review TIE's valuation of "Infraco Entitlement" [**TIE00106500**] in connection

[54] This Estimate was reviewed by Acutus, on behalf of TIE, in May 2011 [**WED00000229**]

with Project Phoenix[55]. Therein, TIE undertakes a separate valuation in respect of each Infraco Member. In respect of the civil engineering scope the evaluation was largely based upon a re-measurement and valuation of the works with the benefit of bills of quantities prepared by Cyril Sweett based upon current IFC drawings.

352. The SETE Submission indicates that TIE's settlement position at Mar Hall was based on the assessments in this document[56].

353. With regard to Systems & Trackwork, the valuation was undertaken solely by TIE. TIE asserts that its Project Phoenix assessment "*is established from the Contract Sum analysis and Changes under the Infraco Contract are added*" [**TIE00106500_0002**].

354. TIE provides two assessments of Siemens (and Infraco's) entitlement, namely PP1A, using TIE's estimated changes values, and PP1B, using Siemens' (and Infraco's) submitted Estimate values. TIE also includes its assessment of preliminaries entitlement. At Section 10C of the SETE Submission it is confirmed that:

> *"Dennis Murray built up a settlement figure based on the contract price plus the value of all changes (current and anticipated) and additional sums for delay and extension of time."*

355. Thereafter, we are advised that this assessment added up to £247 million using TIE's estimate of the value of changes and delays, and £280 million using

55 Siemens had not previously seen or been provided with a copy this document.
56 SETE Submission, page 137 and footnote 824.

Infraco's estimates[57]. These sums correspond with the *'grand total'* value for Infraco in the PP1A and PP1B assessments [**TIE00106500_0015 &0016]**. The assessment made therein of Siemens' entitlement is £98,606,000 (PP1A) and £103,257,000 (PP1B).

356. Because of the central importance placed upon the assessment by Dennis Murray and his team, TIE's PP1A and PP1B calculations in **TIE00106500** are considered in detail. However, as an initial observation, given that TIE considered that Siemens' entitlement was either £98.6 million or £103.2 million, Siemens question why TIE led Mr. Brandon Nolan [**BFB00094604_003**], Dame Bruce [**CEC02084575_0013**] and others to believe that Siemens' entitlement was £68 million prior to negotiations at Mar Hall.

357. Siemens considers each principal component of TIE's assessment of Siemens' entitlement [**TIE00106500**], namely contract price, changes, preliminaries and prolongation entitlement (Sections 7.4 to 7.7 below).

7.4 Analysis of TIE's Assessment of Contract Price for Project Phoenix Scope

358. As set out in section 6.7 above, the *'firm and fixed'* price element on the Siemens' Price is £96,917,007:

> *"Siemens' share of the original contract price, when excluding Value Engineering and Provisional Sums, was £96,917,007 (please see Appendix A of Schedule Part 4 of the Infraco Contract). The breakdown of*

[57] SETE Submission, page 138

this figure can be seen at document CEC00555849." [**TRI00000276_0004** paragraph 12].

359. Siemens' CPA [**CEC00555849_0001**] indicates that the Siemens price has three main components, namely:

Section A-Airport to Haymarket (Off-Street)	£38,390,377.20
Section B-Haymarket to Newhaven (On-Street)	£17,453,561.58
System Wide	£41,073,068.00
Total	£96,917,006.78

Table 9-Summary of Siemens Contract Price Analysis

360. The most significant single item is system-wide costs. The CPA summary of system-wide costs is reproduced below.

Section Summary		
	Amount of:-	
	Preliminaries	£24,802,164.89
	Design	£11,605,508.01
	Accomodation Works	£0.00
	Tram Supply	£1,058,275.98
	Testing & Commissioning	£40,751.37
	Supervisory Control & Comms Systems	£3,492,980.08
	Spares	£45,878.46
	Third Party Works	£27,509.21
	Amount of System Wide to Main Summary	£41,073,068.00

Table 10-Summary of Siemens System Wide Costs-CEC0055849_0009

361. These costs, by their nature, were not location specific, but were required for the effective, design, management, installation, system integration, commissioning and system acceptance of the Infraco Works. This matter is addressed by Axel Eickhorn in his witness statement:

"It is not the case that apportionments can be applied across the board, since some activities are system wide, for example the preliminaries whereas other activities are specific to the scope. Matters such as design would have been mostly completed for the Project irrespective of whether the scope of what was to be constructed was to be narrowed. All equipment for the on street section would have been procured and available regardless of whether that On-Street section was to be built." [**TRI00000171_0061**, paragraph 133].

362. TIE partly acknowledges in its 'Infraco Entitlement' that these costs are not location specific:

"Siemens System Wide Works are work not specific to the geographical section from Airport to Haymarket but works may be completed such as to hand over to tie (if appropriate for use in the remaining works) to install." [**TIE00106500_0002**]

363. However, TIE promptly proceeded to ignore this fact. TIE stated that:

"For systems the Contract Price is established from the Contract Price Analysis and Changes under the Infraco Contract are added. The Contract Price Analysis includes Off street construction (38390) plus System Wide (4919) plus design (8124)." [**TIE00106500_0002**].

364. This is a misrepresentation of Siemens' price. As explained above, the provision for System-Wide in the Siemens CPA was £41,073,068 and not £4,919,086 [**TIE00106500_0002**].

365. The apportionment undertaken by TIE is provided in 'Document 1' [**TIE00106500_0007]**. The original (excel) version of this 'Document 1' is provided in Inquiry document **CEC00116090**. An extract from this file is provided at Table 11 to demonstrate TIE's methodology.

366. Table 11 demonstrates that TIE has, in fact, excluded the values for "Design" (£11,605,508) and "Prelims" (£22,440,295) from the total contract provision for system-wide of £41,073,068, to provide a residual value of £7,027,266. Thereafter TIE apportion this derived value between On-Street (£2,108,180) and Off-Street (£4,919,086) based upon an arbitrary 70/30 split:

Element		Construction Price	
		On Street	Off Street
Construction Price	55,843,938	17,453,561	38,390,377
System Wide	7,027,266	2,108,180	4,919,086
Design	11,605,508	3,481,652	8,123,856
Prelims	22,440,295		

Table 11- Extract from Inquiry Document CEC00116090

367. The apportionment of System-Wide costs is grossly inappropriate and it is submitted that its sole purpose is simply to reduce Siemens' entitlement. Three examples are provided to vouch this proposition. These are based upon the principal items of cost in the residual system-wide value of £7,072,266 derived by TIE, namely (i) 'Tram Supply', (ii) 'Supervisory Control & Comms System' and (iii) 'Testing & Commissioning'.

368. These three items and their respective item values are shown at page 8 and page 9 of **CEC00555849**.

369. First Example: Tram Supply

370. As can be seen from page 9 (Section Summary) of **CEC00555849**, Siemens' system-wide price included the sum of £1,058,275 for Tram Supply. For clarity, this section of Siemens' CPA is reproduced below:

Tram Supply	Tenderers shall make provision for all attendance costs associated with the supply of Trams (by others); including, but not limited to, management; overheads; profit; attendenance on the Tram Supplier; administration and all other costs excluding risk (where supply of tram costs are likely to be in the range of £65 million to £80 million)	£ -
	Supply only of Operational Radio Equipment for 27 trams and low profile antenna for 10 road vehicles	£ -
	Tram Detection Equipment for 27 trams-Signalling Onboard Equipment	£ 1,043,396.84
	Maintenance Vehice-Signalling Onboard Equipment - 1 set	£ 14,879.14
	Amount of Tram Supply to Section Summary	£1,058,275.98

Table 12-Extract from Siemens CPA (CEC00555849_0008)

371. It is self-evident from this extract that the cost provision of £1,058,275 related solely to the provision and installation by Siemens of on-board signalling equipment to each of the 27 CAF trams (plus 1 spare set for the 'maintenance vehicle'[58]). This was a system-wide cost; it was not specific or pro-rata to the length of the alignment or its geographical location. Project Phoenix was expressly based upon the provision of 27 trams and the truncated scope did not alter this fact or the need for Siemens to retain this price provision[59].

372. However, notwithstanding this, TIE proceeded to apportion this cost to the geographical sections of the works and to arbitrarily reduce Siemens' entitlement

58 Item 10.1 of Table 83 to the Employer Requirements [**USB00000033_0529**] required that Infraco (Siemens) provide a road-rail maintenance vehicle, known as a "Unimog". The truncation of the role did not alter this obligation.

59 Project Phoenix, page 149: " *For clarity, Infraco does not accept any reduction in the number of trams from that that required in the Tram Supply Agreement*" [**BFB00053258_0150**]

by 30% without any credible justification. Indeed, a credible assessment of Siemens' entitlement would, in fact, have increased this sum to reflect both price inflation and the disruption and delay to this activity.

373. Second Example: Supervisory Control & Comms System

374. The Siemens' CPA indicates that Siemens included the sum of £3,492,980 for 'Supervisory Control & Comms System' as part of its system-wide cost of £41,073,068 [**CEC00555849_0009**]. Inquiry Document **TIE00885457_0030** also indicates that in Section A (Airport to Haymarket) and Section B (Haymarket to Newhaven), Siemens included further separate sums of £1,581,699 and £1,612,356 for "Supervisory Control & Comms System"[60].

375. "Supervisory Control and Comms System" refers to the control system architecture for the supervisory management and control of the Edinburgh Tram Network. The system is designed to gather data from the network by way of tram-side equipment and from monitoring and control points and to relay this information to the Control Room in the Depot.

376. The costs for supply and installation works along the alignment, such as loop detectors (which report the location of the tram), were included with the alignment costs in Section A and Section B. However, the system-wide costs considered here, relate to the control systems, workstations, user interfaces, and Operational data network provided by Siemens in the control room in the Depot at Gogar.

[60] The sum of £1,581,699 for Off-Street and £1,612,356 are more clearly shown by reference to Project Carlisle at **TIE00885457_0030** as **CEC00555849** is an incomplete re-production of Siemens' CPA.

Thus, systems such as CCTV, PA, Passenger Information Delays ("PID") and traction power are controlled from the Depot. The sum of £3,492,980 represents the cost of providing this control architecture in the Depot. This cost is, by definition, system-wide. More importantly, the control centre is the focal point for the control and operation of the Edinburgh Tram Network. It is the means by which the day-to-day activities necessary for the safe operation of the tram network are planned, monitored, controlled and coordinated.

377. Accordingly, the apportionment exercise is patently wrong and wholly ignores the fact that the control system equipment required along the alignment had already been priced as part of Siemens price for Section A and Section B.

378. Third Example: Testing & Commissioning of Infrastructure

379. At page 8 of the CPA [**CEC00555849_0008**] under the heading "Preliminaries", Siemens made a provision of £2,361,870 for "Testing and Commissioning of Infrastructure"[61]. This represents a financial provision in respect of Siemens' obligations to ensure that the system and all sub-systems were rigorously tested and to ensure that the performance, integrity, reliability, availability, and safety of the system is verified and validated. The relevant extract from the CPA is reproduced below (at Table 13) for convenience:

[61] This sum should not be confused with the figure of £40,751 shown in Table 10; this lower sum relates to training [see **CEC00555849_0008**].

System Wide		Total GBP
Preliminaries	Site establishment & removal	£0.00
	Site accommodation; site services, equipment & vehicles	£0.00
	Management & supervision	£22,106,990.11
	Documentation & Manuals (including O & M)	£287,926.80
	Safety, Quality & Environmental requirements	£0.00
	Plant & Equipment	£0.00
	Method Related Charges	£0.00
	Temporary Works	£0.00
	Testing materials; soil etc	£0.00
	Testing & Commissioning of Infrastructure	£2,361,870.49
	Training	£45,377.49
	Amount of Preliminaries to Section Summary	£ 24,802,164.89

Table 13-Extract from Siemens' CPA (CEC00555849)-Preliminaries

380. These costs are, by definition, system-wide, as the System must pass the same system integration and system acceptance tests regardless of the length of the alignment. These activities are not proportionate to or otherwise a function of the length of the alignment. Rather, they are designed to test the integrity and reliability of the System, including all sub-systems and system interfaces.

381. Furthermore, as a result of Project Phoenix, the phasing of the Infraco Works did not alter and Infraco was still required to meet specific sectional completion obligations. Thus, regardless of the reduced scope, Infraco was required to complete testing, commissioning and system acceptance in respect of Section A (Depot), Section B (Test Track), Section C and Section D. This imposed sequence of testing is shown graphically in Figure 2 in Appendix 1. In particular, after the physical works are completed, Siemens was required to complete the

System Acceptance Tests[62] in order to achieve Sectional Completion of each Section of the Infraco Works and there was a distinct disconnect between the completion of the physical construction works and the System Acceptance Process.

382. Despite the system-wide nature of this financial provision, TIE again undertook a 30/70 apportionment between On-Street and Off-Street. Again, it is submitted that this apportionment exercise is wholly arbitrary. In his supplemental witness statement [**TRI0000249_0012**] Mr. Murray states that the Infraco Entitlement Paper was:

> *"the tie QS assessment of the ranges of Infraco entitlement on a "bottom up" basis that is working from the Contract Sum plus changes."*

383. The manner in which TIE arbitrarily removed large chunks of Siemens' price and converted a "System Wide" contract provision of £41.073 million to £4.919 million cannot reasonably be characterised as a calculation based on the "Contract Sum plus changes".

7.5 TIE Assessment of Changes Agreed and Changes to Agree

384. TIE's stated methodology in regard to Changes is detailed at page 3 ("Calculation Notes")[**TIE00106500_0003**]. TIE states that it has priced the Change Register in relation to Section 2A-7 (Airport-Haymarket) to incorporate agreed Changes, and

[62] The System Acceptance Tests, namely Tests T1, T2, T3, T4, and T5 are described at table 43 to Schedule Part 2 (**USB00000033_0316**)

alleged Changes by Infraco, where no agreement has been reached for Cost.[63] TIE states that these values are added to the Construction Work Price ("CWP") in sheets PP1A and PP1B.

385. In report PP1A, which uses TIE's estimate of change, TIE has included the sum of £593,000 for "Changes Agreed" in respect of Siemens' scope. However, in Report PP1B, which purportedly incorporated "Infraco estimate of change", TIE has again included the sum of £593,000 for "Changes Agreed", but has no provision whatsoever for un-agreed Changes ("Changes to Agree"). In report PP1B the 'Change to Agree' was supposed to "*represent the Infraco position based upon Estimate values submitted*" [**TIE00106500_0005**].

386. Both TIE's methodology and its calculation of value are flawed and operate to artificially reduce Siemens' true entitlement. By way of overview, at the time of Project Phoenix the total claimed value for Siemens' Changes was £35,121,292. This is indicated in the Change Register attached to 'Period Report No 3-12 to 26 February 2011' [**BFB00003289_0321**].

387. At that time, the value of agreed Changes in respect of Siemens scope was £4,815,282. Table 14 below is an extract from the Change Register provided with Infraco Period Report 2-12 [**BFB00003289**]. Siemens acknowledges that

[63] The reference to contamination in tie's Calculation Notes is not relevant to the Systems and Trackwork scope.

some of these changes relate to parts of the alignment other than Off-Street. However, some of these Changes remain relevant.[64]

388. By way of example, the sums of £1,637,514 and £176,252 shown in Table 14 in respect of power Connections Phase 1a are shown as a system-wide cost. These amounts relate to the provision of Scottish Power connections for traction power substations. The majority of these costs relate to Off-Street works. However, TIE has not reported these costs.

389. A further example of TIE's flawed methodology is provided by INTC 438 relating to noise and vibration studies in the agreed sum of £137,105. These studies were initiated by Siemens as a proactive, value engineering, exercise designed to save the client money. The objective was to investigate the extent of floating slab measures required in the On-Street sections of the works. Siemens could simply have relied upon the pre-existing allocation of risk contained in Pricing Assumption 29,[65] and the associated Notified Departure mechanism. Instead, Siemens, based upon its considerable experience with similar issues in inner city environments in Europe and elsewhere, sought to minimise the requirement for special floating slab measures. The necessary reports and surveys had already been completed prior to Project Phoenix. Therefore, this was an agreed entitlement which had already accrued. To now discover that such costs had not been reported by TIE to CEC merely serves to confirm the concerns held regarding TIE's assessment and reporting of Siemens' entitlement.

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64 Siemens acknowledges that in respect of INTC 76 it was required to substantiate its rates within its Estimate as actual costs.

65 Pricing Assumption 29 at Schedule Part 4 provided that "there shall be no special floating track measures required for vibration".

References						Location / Description	Change Order Details
INTC	tNC	tCO	Location	Section	Activity Identifier	Brief Description of Change	Siemens
1		116	SW	SW	Preliminaries	The Issued for Construction (IFC) dates from the Design Delivery Programme have been entered into the Schedule Part 15 Programme and there are differences from the Base Case Assumption resulting in a Notified Departure - SECTIONS A,B,C & D	1,299,000.00
50		22	On	SW ON	Traffic Signals	Various Traffic Signal requirements tie letter INF_CORR.038 16/7/8	30,550.32
76.1		184	Off	5C	Edinburgh Gateway Project	Gogar Depot Public Tramstop proposals Guide to Railway Improvement Projects (GRIP) options 4B & 4C2.	309,035.72
88	14	100	SW	SW	Utilities	Power Connections Phase 1a	1,637,514.00
88.1		100a	SW	SW	Utilities	Power Connections Phase 1a	176,252.41
121	16	103	SW	SW	Traffic Signals	Urban Traffic Controls (UTC) associated with delivery of the alignment	396,535.00
421		81	Off	5B	Trackform	Trackform change on the Guided Busway	550,000.00
438		83A	On	SW ON	Siemens	Noise & Vibration Surveys and Reports in the city centre (SIEMENS)	146,128.00
505		124	On	1D	Traffic Signals	Traffic signalling control at Junction 41 - Lothian Road/Charlotte Street/Princes Street	137,105.00
643		176	Off	6	Utilities	HV sub-station Gogar Depot - relocate switching station	125,943.82
644		185	Off	7A	Substations	Wayleave issues - Ingliston HV substation	7,218.00
860	104	210 tCOs	.	.		.	4,815,282.27

Table 14- Siemens' Share of Agreed changes at February 2011

390. In its "Infraco Entitlement" assessment, either in Report PP1A or PP1B there is no mention by TIE of un-agreed changes notified by Siemens at the time of Project Phoenix. Table 15 below provides an extract from the Change Register from the February 2011 Period Report to demonstrate the value of notified changes in regard to system wide, Off-Street and selected On-Street changes[66] which were un-agreed at that time [**BFB00003289**].

391. Table 15 demonstrates that the most significant un-agreed change is delay related, namely the MUDFA 2 (INTC 536) delay Estimate.

66 On-Street Changes where entitlement has already accrued are included. However, On-Street Changes which are no longer relevant to the revised scope are excluded. Hence the total value of Un-agreed changes is just over £24 million, rather than in excess of £27 million for all un-agreed Changes.

References						Location / Description	Value of Estimate / Change Order
INTC	tNC	tCO	Location	Section	Activity Identifier	Brief Description of Change	Siemens
103			Off	5C	S28 A8 Underpass	IFC Drawing Changes - A8 Underpass	140,011
160			Off	5B	S27 Edinburgh Park Bridge	IFC Drawing changes - Edinburgh Park Bridge	3,395
277	36		Off	7A	Design	Airport Tramstop Canopy tie in options.	30,217
305			On	1C	Underground Obstruction	Crawley Tunnel - insufficient ground cover	10,144
374d			Off	7A	Trackform	Gogar Landfill Area - Trackform Change	101,509
411			Off	SW OFF	Trackform	IFC Drawing Changes	149,757
412	48, 96		Off	6	Depot Building	Depot Floor - Pit for a manual bogie turntable	14,936
417	53		Off	7A	Design	BAA Dualling Future Proofing (Eastfield Avenue)	8,136
429			SW	SW	Preliminaries	Issue of MUDFA Programme Revision 8	738,292
452			Off	6	Depot Externals	West Depot Entry/Exit turnout	3,986
510			Off	7A	Ductwork	IFC drawing changes - Section 7A - Ducting and Cable Routes	566,936
521			On	1B	Siemens	Disaster Recovery Centre	37,217
536			SW	SW	Preliminaries	Incomplete Utility works	21,982,746
547			Off	6	Substations	Changes to power supply Substation, initially TNC 14 (Siemens)	47,742
612			SW	SW	OLE	OLE related planning consents	66,704
645			On	1C	Utilities	HV Jenners - Additional reinforcement	65,414
701			SW	SW	Siemens	Additional interlocking remould reset functions (Siemens)	36,303
717			Off	1C	Siemens	Updated non-contestable Costs and substations updated LV costs	2,739
860	104	210 tCOs	.	.		.	24,006,185

Table 15- Selected Un-Agreed changes at February 2011.

392. However, Table 15 also demonstrates that, apart from the delay claims, there were in excess of £1.2 million of un-agreed changes in respect of Off-Street works.[67] Furthermore, given that the costs claimed in respect of MUDFA Rev. 8 (INTC 429) related solely to Section A (depot), these costs should have properly been included in the Off-Street changes values.

67 Infraco Notice of tie Change "INTC" 645 (HV Jenners-Additional Reinforcement) is included because, despite the specified location, it is actually located Off-Street and related to non-recoverable costs for works at Bankhead.

393. INTC 305 (Crawley Tunnel), whilst an On-Street change, is included as it related to recoverable abortive costs in Princes Street. Also, INTC 521 (Disaster Recovery System) is included because the requirement for a disaster recovery, as an emergency/backup control room, was not location-specific.

394. The reality is that the apportionment undertaken in respect of these issues demonstrates a lack of understanding with regard to both system engineering and to Siemens' entitlements. In addition, there is a manifest failure by TIE to report properly to Stakeholders the extent of Siemens' accrued entitlements and the Client's liability for costs in respect of Project Phoenix, including known liabilities and exposure in respect of changes to, and delays and disruption of, the Infraco Works.

7.6 TIE Assessment of Siemens Preliminaries for Original Contract Period

395. It is submitted that the most erroneous facet of TIE's assessment of entitlement relates to the assessment of prolongation costs. By way of context, at the time of Project Phoenix in February 2011, Infraco was in month 34 of a planned 38 month programme of works. Figure 2 to Appendix 1 demonstrates that construction work to Haymarket should have finished on 17 January 2011, over a month before Project Phoenix. The contract provision made by Siemens for this 38 month programme was £24,802,164 [**CEC00555849_0008**] (Table 13 above).

396. Furthermore, at the time of Project Phoenix, Siemens had agreed its entitlement in respect of EOT1 (INTC 001) in the sum of £1,299,000. Thus, Siemens' agreed contract entitlement for preliminaries in February 2011 was £26,101,164 pursuant

to Programme Rev 1, which provided for a Service Commencement Date of 6 September 2011.

397. In the evaluation undertaken in both Report PP1A [**TIE00106500_0015**] and Report PP1B [**TIE00106500_0016**] TIE assessed Siemens' preliminaries entitlement in respect of the original contract duration, to be £16,278,000. This sum is £9.82 million less that Siemens' accrued entitlement at that time, namely £26.10 million and £8.52 million less than Siemens' contract provision for preliminaries, namely £24,802,164 (as shown in Table 13).

398. Integral to TIE's calculation is the apportionment exercise undertaken in respect of Siemens' contract price. In order to demonstrate this, the relevant parts of TIE's apportionment exercise are reproduced from document **CEC00116090**.

Element		Construction Price		Fixed Preliminaries		Time Related Preliminaries	
		On Street	Off Street	On street	Off Street	On street	Off Street
Systems Price							
Construction Price	55,843,938	17,453,561	38,390,377				
System Wide	7,027,266	2,108,180	4,919,086				
Design	11,605,508	3,481,652	8,123,856				
Prelims	22,440,295			1,683,021	3,927,052	5,049,067	11,781,155
Construction Works Price	96,917,007	23,043,393	51,433,319	1,683,021	3,927,052	5,049,067	11,781,155

Table 16-TIE Apportionment of Siemens Contract Price Provision for Preliminaries

399. TIE undertook two apportionment exercises in respect of Siemens preliminaries. Firstly, TIE isolated the provision of £22,106,990 for management and supervision within Siemens' Contract Price Analysis [**CEC00555849_0008**]. In Document 1 [**TIE00106500_0007**] TIE apportioned this Siemens' System-Wide provision between On-Street (£6,732,021) and Off-Street (£15,708207), based

upon an arbitrary 30/70 split. TIE then applied a 25/75 split to these figures to derive sums for “Fixed Preliminaries” and “Time Related Preliminaries” for both On-Street and Off-Street.

400. Fixed Preliminaries

401. For the “fixed element” TIE justified the apportionment as follows:

> *" It is calculated that 2/3 of the Fixed elements are for mobilisation and set up costs with 1/3 for demobilisation. In respect of Section B only a portion of the works was mobilised and an appropriate calculation is based upon only 1/3 for mobilisation and set up costs. Siemens are similarly calculated using 2/3 for mobilisation and setup."* [**TIE00106500_0003**]

402. Thus, TIE's calculation of Siemens' fixed preliminaries' entitlement is derived from a 2/3 apportionment (£3,740,000) made for mobilisation and setup in respect of the combined On-Street and Off Street fixed preliminaries (£1,683,021 + £3,927,052 = £5,610,000).

403. Time Related Preliminaries

404. In respect of time-related preliminaries the value derived is based upon the apportioned Off-Street value (£11,781,000) and 15% of the derived On-Street value (£5,049,000 x 15%=£757,000). Thus, the TIE assessment of Siemens’ time related preliminaries is £12,538,000 (£11,781,000 + £757,000).

405. Therefore, TIE's derived value for Siemens’ fixed and time-related preliminaries in respect of the original contract period is £16,278,000 (£3,740,000 +

£12,538,000). In comparison, Siemens' contract allowance is £24,802,164, as shown in Table 13 above.

406. The logic adopted by TIE is unsustainable and blatantly ignores the known facts. These are:

407. Firstly, Siemens' provision for “management and supervision” in the sum of £22,106,990 related primarily to its project team located at Edinburgh Park. Siemens did not have separate On-Street and Off-Street teams, rather it had one integrated team responsible for delivery of the Infraco Works. It was, by definition, a system-wide cost as these personnel were responsible for the management and execution of the design, construction, and installation of Systems and Trackworks and for commissioning, system integration and System Acceptance of the Infraco Works. Omission of the On-Street works would have made little difference to the composition of Siemens' project team. Siemens would still have required its Project Director, Commercial Director, Design Manager, Test & Commissioning Manger, Contracts Manager, Change Manager, Health and Safety Manager, Documents Manager, and other staff. TIE was co-located with Siemens and BBUK at Lochside Avenue and was fully aware of the make-up of the Siemens' team. Further, the apportionment ignores the specific monetary provisions made in both the Section A and Section B prices for management and supervision in these parts of the alignment.

408. Secondly, TIE ignores the fact that Siemens had mobilised both its project team and its Key-Subcontractor, BAM Rail, in May 2008 and that, in the 34 month

period between May 2008 and February 2011, these project teams had been dedicated to the delivery of the entire Phase 1a, and not merely the Off-Street works. This matter is explained more fully by Axel Eickhorn at paragraph 26 of in his second supplemental statement in the context of the Project Carlisle submissions [**TRI00000276_0007**]:

> *"Counsel to the Inquiry questioned me on the amount Siemens included in its settlement proposals in respect of system-wide costs. To explain, the system-wide costs mostly related to design and project management costs. At the point in time that Siemens was preparing its price for Project Carlisle 1 and Project Carlisle 2, much of these system-wide costs had already been committed or incurred, and the design works had mostly been completed. Consequently, the total value of the system-wide costs does not directly correlate to the scope of the works to be completed under the settlement proposals, and a reduction in scope would certainly not necessitate a proportionate reduction in the value of the system-wide costs. This can be seen from the table at* ***Exhibit AE3*** *which shows the allocation of system-wide costs in respect of the 'Original CPA Split' and the two Project Carlisle proposals."*

409. The modest adjustments to the provision for system-wide costs in respect of the earlier submissions for Project Carlisle 1 and Project Carlisle 2 are shown at Exhibit AE3 to Mr. Eickhorn's second supplemental statement [**TRI00000276_0027**].

410. Thirdly, TIE's calculation methodology ignores the fact that Project Phoenix represented an Infraco response to a client request for a truncated route and a revised delivery programme at an advanced stage of the original Programme. Instead, TIE proceeded to price Siemens' entitlement as if the Infraco Contract and the original scope did not exist. Thus, rather than make appropriate adjustments to the Construction Works Price by way of addition and omission, TIE sought to "hack" that price and to eviscerate a large part of Siemens' Construction Works Price.

7.7 TIE's Calculation of Siemens' Prolongation Entitlement

411. In document **TIE00106500** TIE has calculated Siemens entitlement to prolongation costs based upon an upper and lower view of extension of time entitlement, namely 38 weeks (Report PP1A) and 66 weeks (Report PP1B).

412. Based upon examination of Document 6 [**TIE00106500_0014**] it appears this sum is calculated as follows (Table 17):

Extension Estimate	Report PP1A	Report PP1B
EOT 1 (Agreed)	£1,299,000	£1,299,000
EOT 2 (22 weeks for Section A)	£380,000	£381,000
EOT 3 (not agreed)	£6,495,000	11,280,000
total	**£8,174,000**	**£12,960,000**

Table 17-Derivation of Siemens EOT Entitlement

413. In Report PP1A, based upon an assessed extension of time entitlement of 38 weeks, namely until 29 May 2012, TIE derived a prolongation entitlement of £6,495,000. Separately, in Report PP1B the EOT3 calculation is based upon an extension of time entitlement of 66 weeks, namely until 11 December 2012. The

derived value of £11,280,000 for EOT3 results in an increased provision of £12,960,000 for prolongation in Report PP1B[68] [**TIE00106500_0016**].

414. The provisions made by TIE are grossly inadequate for the following reasons:

415. The Period of Delay

416. As noted above, the calculation of prolongation entitlement in respect of EOT3 in report PP1A and Report P1B is based upon 38 weeks and 66 weeks respectively. These result in extended Service Commencement Dates of 29 May 2012 (Report PP1A) and 11 December 2012 (Report PP1B). By contrast, Project Phoenix was based upon a Service Commencement Date of 22 September 2013. This represents a prolonged site presence of over 106 weeks. Thus TIE is not reporting the true extent of delay or TIE's true potential liabilities.

417. The Costs of Delay

418. TIE has based its estimate of delay on the agreed value for the Siemens' element EOT 1 in the sum of £1,299,000. However, TIE has failed to properly implement the agreements reached with Siemens in regard to the calculation of the Actual Cost/estimated Actual Cost of prolongation. In particular, TIE has failed to modify its calculation to reflect the additional resources and sub-contractors on site, the requirement for warehousing, and the additional financing costs (resulting from

[68] No precise value is provided for Siemens in respect of EOT 2; accordingly, the total is derived after deduction of stated sums in regard to EOT1 and EOT3.

non-payment in respect of materials and preliminaries) which were not included in EOT1[69].

419. In particular, TIE is culpable of not having regard to the Estimate provided by Infraco in regard to MUDFA 2 (INTC 536). In this Estimate, based upon a Service Commencement Date of 10 December 2012, the Siemens' Estimate in the sum of £21,982,746 was calculated based upon the mechanism for calculation of prolongation costs agreed in connection with EOT 1 [**CEC00208535** & **CEC00578866**]. Thus, TIE was significantly under-reporting the true extent of Siemens' entitlement in regard to prolongation.

420. By way of context, at the time of the Mar Hall mediation Siemens had submitted Estimates in respect of delay and associated prolongation costs to a total value of approximately £32.3 million, as summarised below.

Description of Estimate	Reference	Revised Completion Date	Value
EOT 1	INTC 001	06-Sep-11	1,299,000
MUDFA Rev 8-	INTC 429	n/a	0
MUDFA 2	INTC 536	10-Dec-12	21,982,746
			£23,281,746
Section A EOT	Various INTC's	13-May-13	9,027,615
			£32,309,361

Table 18-Value of Delay Estimates submitted prior to Mar Hall Mediation

421. Whilst Siemens wholly acknowledge that, in the preparation of its assessment in February 2011, TIE would have been unaware of the Section A EOT Estimate

69 By way of example , as noted in Siemens MIS Report, between EOT1 in 2008 and MUDFA Rev.8, the Depot Workshop Equipment (DWE) staff has increased from 1 to 4 [SIE00000294_0002].

[**CEC02087158_0003**], TIE was aware of Estimates in the combined sum of £23.2 million based upon a revised completion date of 10 December 2012.

422. Siemens also considers that the description provided by TIE in regard to EOT 2 is misleading. EOT 2 is, in fact, related to the MUDFA Rev. 8 Estimate (INTC 429). The extension of time awarded, namely 154 days (22 weeks), related solely to Section A (Depot). Accordingly, these costs did not relate to the prolongation of the whole of the Infraco Works. Further, these costs were the subject of a change and should properly have been included as 'agreed' or 'un-agreed' change in Report PP1A and/or Report PP1B.

423. Further, the value of EOT 1 had been agreed in October 2009 and was the subject of a TIE Change. Thus, this sum was not properly a prolongation cost claim at the time of Project Phoenix.

424. The inadequacy of TIE's provision for preliminaries is best demonstrated by Report PP1A. Pursuant to TIE's methodology, Siemens' combined preliminaries entitlement is £24.452 million (£16.278 million + £8.174 million) based upon a completion date of 29 May 2012. The total sum of £24.45 million is £1.65 million less that Siemens accrued entitlement at that time, namely £26.10 million, based upon completion on 6 September 2011.

425. Thus, as with the EOT1 dispute, Siemens was expected to forgo its entitlement.

426. Finally, Siemens would note that in Report PP3 [**TIE00106500_0018**] TIE contrive to derive an assessment of entitlement in the sum of £73.446 million, which seems to remove any entitlement whatsoever for prolongation.

7.8 Summary of TIE Evaluation of Infraco Entitlement

427. It is Siemens' position that the assessment undertaken by TIE **[TIE00106500] i**s fatally flawed and does not represent a *bona fide* attempt to undertake an objective assessment of Siemens' entitlement in respect of Project Phoenix.

428. TIE's assessment of Siemens' entitlement in respect of Project Phoenix purports to be a bottom-up analysis of Siemens' entitlement for completion of works between Airport and Haymarket "established from the Contract Price Analysis and Changes under the Infraco Contract" [**TIE00106500_0002**].

429. At best it is an ill-informed "pro-rata"[70] calculation. However, in Siemens' view, it is, in fact, nothing more than a crude and arbitrary "raid" on Siemens' Construction Works Price, which fails properly to ascertain, and accurately to report to stakeholders, the extent of Siemens' true entitlement. In oral evidence Colin Smith stated that TIE's values were *"always at the lower end, optimistic end of value"* [**Inquiry Transcript, 14 March 2018, page 40:9-11**]. Separately, in a report to CEC dated 27 May 2012, Mr. Smith concluded that:

> *"It became apparent from the pre-mediation work outputs that tie's commercial assessments of the likely outcomes were of a very hard line when compared to the assessment of where the culpability for delay fell. It has become clear that the dominant cause of delay to the works was the delayed MUDFA utility diversions."* [**WED00000134_0233**].

430. Siemens consider this to be a fair assessment.

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[70] Description used by Mr. Nolan in regard to £68.1 million calculation in **BFB00094604_0003.**

7.9 Acutus Advice on Infraco EOT Entitlement

431. On 4 May 2011 Acutus provided TIE with estimated information in regard to Infraco's extension of time entitlement and TIE's potential liability for EoT awards under the Infraco Contract [**WED00000229**]. Acutus provided its best estimate of the upper and lower limits for utilities delays and design delays (incorporating Change Orders). The assessment made by Acutus included the Section A extension of time submitted by Infraco on 04 March 2011.

432. Based upon its assessment, Acutus advised that the lower and upper levels of entitlement in respect of Section D (Service Commencement) was 340 days (48.57 weeks) and 686 day (98 weeks) respectively [**WED00000229_0005**].

433. Based upon this entitlement and the pre-existing Service Commencement Date of 6 September 2011 pursuant to Programme Rev.1, the assessment would result in revised completion dates of 11 August 2012 (lower level) and 23 July 2013 (upper level).

434. These revised dates represent a significant advance on the upper and lower levels of entitlement which informed TIE's assessment of Infraco's prolongation entitlement in respect of Project Phoenix [**TIE00106500].** Therein, TIE's assessment was based upon upper and lower levels of entitlement in respect of Section D (Service Commencement) of 38 weeks (29 May 2012) and 66 weeks (11 December 2012).

435. Siemens note that in the SETE Submission there is no acknowledgement that the TIE assessment of prolongation entitlement was no longer in line with the

external advice from Acutus in May 2011. Furthermore, the SETE Submission fails to acknowledge the claimed value of £16,020,323[71] for Section A EOT. In particular, by reference to period 4-2, the SETE Submission asserts that the total value of all changes was £146 million[72]. However, this ignores the Section A EOT. The value of this Estimate is reflected in Period Report 4-3 where the stated total value for all changes is £165,797,161 [**BFB00003298_0036**]. This reflects the inclusion of the Section A EOT within the change register.

7.10 Mediation Objectives

436. The Infraco's mediation objectives were made clear in its mediation statement [**CEC02084511**], provided to TIE on 24 February 2011. The purpose of the mediation was seen as agreement of contractual arrangements and structures to enable delivery, at least in part, of the Edinburgh Tram Network.

437. The primary objectives for Infraco were stated to be the following:

- agreement to a revised scope of the Works for Edinburgh Airport to Haymarket;
- agreement to a price to be paid for that scope, and all other scope already undertaken outside the Airport to Haymarket corridor;
- removal of as many price exclusions as possible from the project price and/or transfer of risk/liability from TIE to Infraco in respect of known and quantifiable risks;

[71] Exclusive of CAF claim for €4,523,035 (CAF portion).
[72] SETE Submission, Page 140.

- agreement to a realistic programme for delivery of the revised scope;
- agreement to the revised terms and conditions for the Project;
- agreement to a simplified change mechanism to provide certainty in relation to payment for changes and which allowed the work to proceed;
- agreement to new methods for working and administration of the Infraco Contract to avoid issues that have arisen including (i) appointment of an appropriately qualified Employer Representative with full authority to act on behalf of CEC as client for the Project and (ii) creation of a project board; and
- agreement to the appointment of an independent third party intended to avoid or resolve disputes."

438. Siemens was keen to seek agreement as the substantial costs being incurred in keeping a highly skilled team of people, without any available work, was simply unsustainable. This proposition was amplified in Michael Flynn's oral evidence:

> *"Basically, we had quite a large team sitting in Edinburgh, not necessarily generating a lot of positive progress. The job had been ongoing for two to three years at that point. There was no light at the end of the tunnel, and ultimately it didn't look like there was any possibility of a happy ending. Therefore, a tremendous amount of frustration existed within the teams; but also corporately, the corporate organisations were getting quite irritated by what was happening."* [**Transcript, 6th December 2017, page129:1-10**]

439. Michael Flynn noted in his witness statement that at mediation:

> *"In the Consortium's case, we explained that we did not see resolution as foreseeable under the current circumstances with tie, and we wanted a substantive means of resolving the problems at hand-rather than something temporary and superficial."* [**TRI00000151_0029**, **paragraph 109**].

440. This reflected Siemens lack of confidence in TIE's ability to deliver the project.

7.11 MoV4-Prioritised Works

441. The express purpose of Minute of Variation 4 ('MoV4') was to give effect to the Mar Hall 'Agreed Key Points of Principle' [**CEC02084685_0001**] and to the Mar Hall 'Heads of Terms Following Mediation - March 2011' [**CEC02084685_0002**].

442. In particular, MoV4 was designed to give effect to clause 4.1 of the Mar Hall Heads of Terms, which required that on before 15 April 2011 the parties would agree (a) changes to their respective management teams and working practices and (b) the basis for carrying out the Prioritised Works. This matter is addressed by Axel Eickhorn at paragraph 182 of his witness statement [**TRI00000171-0074**]:

> "*MoV4 enabled the execution of these (Prioritised) works whilst CEC consulted with stakeholders and sought to obtain required funding for Initial Phase 1a*."

443. MoV4 also gave effect to the agreement reached at Mar Hall that Infraco would self-certify the civil and System and Trackwork design[73].

444. MoV4 also provided for cash flow payments to Siemens and BBUK; the payment to Siemens of £36.5 million for materials and equipment and for preliminaries. These payments were, first and foremost, cash flow payments:

> *"Such a payment was necessary from Siemens perspective because it had procured materials and paid sub-contractors, and its cumulative expenditure exceeded its cumulative income at that time. This arrangement was needed to normalise the position, including handing over the materials so that ownership would vest in the client"* [**TRI00000171_0075**, **paragraph 183**].[74]

445. At the time of MoV4, Siemens had procured approximately £33 million of materials and equipment. This comprised over £10.1 million in materials in the Broxburn warehouse, £11.7 million elsewhere in the UK, and a further £11.3 million off-shore. Siemens had been seeking payment for these materials since April 2010, as evidenced by document **CEC01927619**. The value of materials vested in CEC is addressed by Axel Eickhorn in his second supplemental statement [**TRI00000276_0012**]:

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73 Clause 3.5 of MoV4 [**CEC01731817_0006**].

74 As part of its Sub-contract with BAM Rail, Siemens had made an advance payment to BAM of Euro €13,984,800 in May 2008.

"49. As part of Minute of Variation 4 dated 20 May 2011 ***(CEC01731817)****, Siemens agreed to hand over and transfer title of certain material and equipment to the CEC.*

50. One of the reasons that Minute of Variation 4 was entered into was that the material in question had been paid for by Siemens and already used in the construction of the tram line or was held in storage. However, Siemens had not been paid for this material by tie as payment depended on completion of milestones which were continually delayed given the issues affecting the project and the disputes that arose. Accordingly, Minute of Variation 4 was entered into to accelerate payment to allow Siemens to recover the costs it had incurred. The parties' negotiations in this regard commenced almost a year earlier with a request from Siemens ***(CEC01927619)****.*

51. Accordingly and as explained during my oral evidence to the Inquiry, that the bulk of the materials that were transferred to the CEC as part of Minute of Variation 4 had already been used in what is known as Initial Phase 1a.

52. I was asked to indicate by the Inquiry what proportion, roughly, had already been used in construction and what was left in storage. Having had time to reflect and investigate, I estimate that around 90% of the materials handed over and transferred to CEC had already been used in the construction of the Edinburgh Tram line. Additionally, it should be

noted that after conclusion of the Settlement Agreement, Siemens worked with the CEC to reduce costs in respect of materials e.g. by agreeing beneficial terms for the cancellation of further orders which were no longer required given the agreed revised scope. I append at Exhibit AE4 a table which shows the savings that had been achieved from Siemens actions on behalf of CEC."

446. Thus, in summary terms, it is estimated by Siemens that CEC paid the approximate sum of £3 million for what became known as "Secondary Phase 1a Equipment".[75] The Inquiry has questioned the level of these payments. However, it is Siemens' position that these payments were wholly warranted given that materials and equipment had been manufactured and procured in accordance with the programme and, as a result of preceding delay, could not be incorporated or installed but, instead, had to stored at considerable cost to Siemens.

447. The comments from Mr. Jeffries [**TIE00687649**] regarding over-payment are addressed by Axel Eickhorn at paragraph 184 in his witness statement[76]:

"such an email was typical of the unhelpful tie behaviour that the Consortium had experienced prior to the Mar Hall mediation. In light of the accrued underpayment and the extent of materials procured to that date, the payment was fair and proportionate."

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75 Pursuant to the Settlement Agreement the Infract Contract incorporated a definition of 'Secondary Phase 1a Equipment'

76 Siemens note that the same email describes Mov4 as "unnecessarily complicated" and generally displays a hostility from TIE towards the proposed agreement.

448. These payments were key to rebuilding trust between the parties. In this regard Siemens would like to comment on the formal agreement of MOV 4 and the actions taken by the parties prior to formal agreement.

449. As between TIE/CEC, Siemens and BBUK, agreement was reached in respect of MOV 4 at 2.15 am on 16 April 2011 [**TIE00687724_0001**]. This agreement was not formally executed until 20 May 2011 and 10 June 2011 as a result of amendments required by CAF (these can be seen, for example, at pages 5 and 6 of MoV 4) [**CEC01731817]**. However, as between CEC and Infraco the parties proceeded in good faith, on the basis that agreement had been reached. Indeed, based upon the positive nature of the discussions with CEC following mediation, on 4 April 2011 Infraco commenced the Prioritised Work in the Depot in advance of MoV 4. This is confirmed at paragraph 3.2.1 in the "*Report on Progress since Completion of Heads of Terms to 8 April 2011*" [**CEC02083825_0009**] and in Infraco Period Report 4-2 to 21 May 2011 [**BFB00003297_0010**].

450. It was on this basis that both parties proceeded to implement MoV 4. Both CEC and Infraco were keen that the delay in finalisation of CAF's heads of terms [**CEC02083973_0009]**, and the subsequent delay in agreeing CAF's required amendments to MoV4, should not further delay the progress of the Prioritised Works. This is why payments were made by CEC in respect of MoV 4, prior to formal agreement. It was a pragmatic step, which saved the City money.

451. As part of MoV4 the parties agreed to amend the Planned Sectional Completion Date Section A to 16 December 2011. This corresponded to the date stipulated

in the PPP Programme attached to Appendix 5 to the Project Phoenix Proposal. The commencement of Prioritised Works in the Depot on 4 April 2011, in advance of execution of MoV4, had enabled Infraco to maintain this completion date.

452. Because of the delay in the finalisation of the Settlement Agreement, it was necessary for the parties to extend the deadline for negotiations imposed by MoV4. The first extension occurred on 24 August 2011 [**BFB00097699**] and the second occurred on 2 September 2011 [**TIE00899947**].

7.12 MoV4-Response to TIE Allegation of Additional Payments for Materials

453. Siemens notes that the SETE Submission seeks to advance the argument that, pursuant to MoV4, Infraco was paid monies for materials which were in addition to the sums agreed at Mar Hall. More particularly, it is asserted that *"£30m of costs under MOV4 over and above the amount recommended by TIE*"[77] should be added to the cost of the £362.5 million Mar Hall deal. It is asserted that this sum of £30 million was an additional premium which is part of "*the total cost of settlement at approximately £188m*."[78]

454. The SETE Submission asserts, in essence, that the Mar Hall deal of £362.5 million represented a premium of £115.5 million on Mr. Murray's total of £247 million and that payments to Infraco of £49 million represented a further additional settlement premium of £30 million. It is asserted that this sum is part of

[77] SETE Submission, Section 10D, page 143.
[78] SETE Submission, Section 10D, page 143.

an additional premium of £72.5 million (which also included £32 million for 'on street costs').

455. Siemens respectfully advise that this assertion confuses price with payment. It is self evident that the monies paid for On-Street works were not part of the £362.5 million Off-Street price. However, the material payments made by CEC to Siemens pursuant to MOV 4 were part of the £362.5 million agreement at Mar Hall. The Siemens' monies for materials, pursuant to MoV4, was a matter of payment rather than price. TIE is confusing process with substance. No additional monies were paid to Siemens for materials post Mar Hall and, in fact, as evidenced by Axel Eickhorn, Siemens refunded over £1.3 million to CEC in respect of materials and equipment after Mar Hall [**TRI00000276_0012 & 0028, paragraph 52 and Exhibit AE4**].

7.13 Agreement of the On-Street Target Price

456. Following the agreement and implementation of MoV 4 in April 2011, the parties sought to agree the On-Street Price. At Mar Hall on 10 March 2011, in the “Agreed Key Points of Principle” [**CEC02084685_0001**], the parties agreed a proposed price of £39 million in respect of the "*Edinburgh Tram Network from Haymarket to St. Andrew Square (excluding utilities) to be adjusted by reference to Target Price mechanism to be agreed*". It is relevant that a Target Price was not proposed by Infraco in regard to York Place, that TIE retained responsibility for all utility works and that the extension of the route to York Place required the design and construction of a new temporary tram stop by Infraco.

457. On 12 March 2011, in the “Mar Hall Heads of Terms Following Mediation- March 2011” [**CEC02084685_0003, Clause 5.4**], the 'On-Street Works' were defined as the Infraco Works from Haymarket to St. Andrew Square. At Clause 6.3 of this agreement it was agreed that:

> *"The On-Street Works will be paid for on a Target Cost basis. A Target Cost of £39 million is proposed. The mechanism for calculating and amending the Target Sum will be agreed."*

458. No programme was agreed at Mar Hall and no dates were specified in regard to the various Sectional Completion Dates required in the Infraco Contract. Instead, at Clause 8.1, the Heads of Terms notes that a programme and Sectional Completion Dates for the On-Street Works and the Off-Street Works shall be agreed between the parties "*to provide an optimum programme*" [**CEC02084685_0004**]. The only other express provision regarding completion was that the parties shall use reasonable endeavours to procure the completion of commissioning of the mini test-track and Depot (including access) and all ancillary works by 15 October 2011. This represented an improvement on the date proposed in the Project Phoenix Proposal [**BFB00053258_0007**] for completion of Section A, namely 16 December 2011.

459. Thus, at Mar Hall it was Siemens' expectation that the new programme would correspond to the Project Phoenix programme and to the Sectional Completion Dates proposed therein.

460. Initially that is what transpired. The parties agreed in MoV 4 to a revised Sectional Completion Date for Section A of 16 December 2011.[79] However, the programme began to slip once more. Thus, the prescribed programme in MoV 4, namely the 'Prioritised Works Programme', [**CEC01731817_0016, Schedule Part 1**] which was revised on 6 May 2011[80], indicated that Service Commencement had slipped to 25 January 2014. The Service Commencement Date specified in Project Phoenix had been 22 September 2013.

461. On 28 June 2011 Infraco issued its revised Programme 3a. This programme again reflected the slippage in the finalisation of the Settlement Agreement and the inclusion of the On-Street Works. The key dates from this programme are reproduced at Table 19 below and these indicate that the critical path, and hence completion, was driven by completion of the On-Street Works:

Activity ID	Activity Name	Original Duration	Start	Finish
Programme following Mediation 8-12 March 2011 rev 3a 110628		778	31-Mar-11	20-May-14
KEY DATES		766	15-Apr-11	20-May-14
1060	Sign MOV for carrying out the Prioritised Works	0		15-Apr-11*
1070	Re - mobilisation - Prioritised Works	10	15-Apr-11	03-May-11
1000	Sign MOV in Respect of Off Street Works (Other than Prioritised Works) and the On Street Works	0		01-Jul-11*
1050	Re - mobilisation	44	01-Jul-11	02-Sep-11
313	Section Completion A	0		16-Dec-11*
1100	Deliver/ handover of all remaining Siemens material to tie	0		10-Jan-12*
314	Section Completion B	0		07-Feb-13*
281	Construction Completion Phase 1a Edinburgh Airport to Haymarket	0		29-Jul-13
291	Construction Completion Edinburgh Airport to York Place	0		21-Nov-13
345	Section Completion C	0		19-Feb-14
310	Commencement of Revenue Service Phase 1a Edinburgh Airport to York Place	0		20-May-14
335	Section Completion D	0		20-May-14

Table 19- Key Dates from Programme Rev 3a dated 28 June 2011

79 Mov4, Clause 5.1.2 [**CEC01731817_0009**]

80 Whilst MoV4 had been agreed on 16 April 2011 as between Infraco and CEC, because of the delay in formal execution the parties took the opportunity to include the updated programme.

462. Thus, in seeking to agree a Target Price for the On-Street Works, Siemens was doing so against a moving programme and in the knowledge that the On-Street Works were driving the critical path for the Infraco Works.

463. Additionally, Siemens was now required to provide a Target Price for works to York Place rather than St. Andrew Square. Accordingly, it is Siemens' position that it was not unreasonable that the Target Price increased.

464. Axel Eickhorn directly address the impact of programme slippage in his witness statement at paragraph 187 [**TRI00000171_0076**]:

> *"The Inquiry has referred me to an exchange of emails in July 2011 (TIE00688914), whereby representatives of tie and CEC discussed Siemens' share of the proposed On-Street price. The Inquiry note that there appeared to be a difference of view between tie and Siemens over what had been agreed at Mar Hall, with the result that Siemens' proposed part of the on street price was £14m higher than tie thought acceptable. The increase was as a result of the duration of the Programme extending and there was a significant cost to keeping the project team running for a longer time as a consequence of including the On Street works again in the contract [Question 125 (a)]."*

465. Mr. Eickhorn was properly reflecting the fact that pursuant to Programme 3a Key Dates (set out in Table 19 above), completion of construction to Haymarket was planned to occur on 29 July 2013, whereas completion of the On-Street construction works was planned to occur on 21 November 2013, resulting in a

revised completion date of 20 May 2014, thereby requiring an extended site presence and a further delay to Siemens' System Acceptance activities. It was correct and appropriate that Siemens made provision for this extended period on Site. Mr. Eickhorn was also reflecting the fact that the Project Phoenix was based upon physical completion of construction works by 11 March 2013 (Activity 281). The Project Phoenix dates are shown at Table 7 of Axel Eickhorn's second supplemental statement reproduced at Table 20 below:

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
Project Phoenix Proposal rev 2		613	31-Mar-11	22-Sep-13	0
KEY DATES		612	31-Mar-11	22-Sep-13	0
1000	PROJECT PHOENIX - Signed Agreement	0		31-Mar-11*	0
1050	Re - mobilisation	20	31-Mar-11	29-Apr-11	14
1100	Deliver/ handover of all Siemens material to tie	0		12-Sep-11*	0
313	Section Completion A	0		16-Dec-11	412
314	Section Completion B	0		24-Sep-12	225
281	Construction Completion Phase 1a Edinburgh Airport to Haymarket	0		11-Mar-13	10
315	Section Completion C	0		24-Jun-13	0
310	Commencement of Revenue Service Phase 1a Edinburgh Airport to Haymarket	0		22-Sep-13	0
325	Section Completion D	0		22-Sep-13	0
COMMISSIONING PHASE EDINBURGH AIRPORT TO HAYMARKE		125	25-Mar-13	22-Sep-13	0

Table 20-Table 7 from Axel Eickhorn Second Supplemental Statement [TRI00000276_0008]

466. At paragraph 188 of his witness statement [**TRI00000171_0076**] Mr. Eickhorn directly addressed the allegations made regarding attempted price recovery:

> *"It is also worth noting that the reference to the Phoenix Siemens Price in Dennis Murray's email to Alan Coyle of 8 July 2011 is incorrect and the discount negotiated at Mar Hall was £11m, and not £14m as it is suggested that Siemens was trying to recover through the On Street Price. Bearing this in mind, the £14m additional cost related to the extension of time for the On-Street works which shifted the end date of the Project from September 2013 to May 2014. The £4m figure was the value of Siemens'*

construction milestones relating to the On-Street section of the Project. I should also make it clear that I never stated that this £14m was a "recovery of Siemens' losses as a result of the Mar Hall negotiations" as Vic Emery states in his email to Sue Bruce, dated 22 July 2011. It was not the case the case that Siemens was trying to reverse a discount that it previously had given."

467. Mr. Eickhorn is quite clear that the movement in the Siemens On-Street Target Price was due to the slippage in the programme:

"The Target Price had increased from the target price referred to in the post-mediation Heads of Terms. My understanding is that the time element was the dominant factor in the movement in the price, as a result of the precise termination point being defined as York Place which was a little further." [**TRI00000171_0081, paragraph 202, line 3-6**].

468. Mr. Eickhorn rejected the assertion that the price was inflated:

"It was not the case that the price of the On-Street works was inflated. Having regard to the detail, the Target Price was explainable and reasonable. The inclusion of the On-Street Works happened at the time when the Consortium's resources that were deployed in Edinburgh were at their peak for Siemens. This therefore resulted in additional time related costs as a result of maintaining additional resources at their peak for a longer period of time." [**TRI00000171_0081, paragraph 202, line 10-16**].

469. As clearly indicated in Table 19 to this submission, the completion date upon which the Settlement Agreement was based was 20 May 2014. This represented an 8 month slippage on the completion date contemplated in Project Phoenix, namely September 2013. Thus, Siemens wholly reject the assertion in “tie Commentary on the On-Street Pricing” that "*Extended Project Management claimed in 2014 when work is finished*" [**TIE00691425_0003**]. This is a patently incorrect. As a direct result of the slippage in the programme, Siemens was required to maintain a site presence until and beyond 20 May 2014. As Siemens show graphically in Figure 2 in Appendix 1, System Acceptance activities extend beyond physical completion of construction works and Siemens need to retain its project team whilst the On-Street works were being completed:

> "*Once a Section of the ETN is physically completed and the System Integration Tests are satisfactorily completed then the formal acceptance process requires the Infraco to carry out and pass a series of System Acceptance Tests (SATS) in order to achieve Sectional Completion.*" [**USB00000033_0316**]

470. TIE's analysis fails to recognise that the inclusion of the On-Street works and the slippage in the programme moves the completion date by 8 months from that contemplated at Mar Hall. Thus, Siemens needed to retain its project team during this period in order to complete its systems and trackwork activities and to commence and complete final System Acceptance Tests.

471. Siemens was not trying to recoup its Mar Hall position, as alleged by Mr. Murray [**TIE00688781**]. Rather, Siemens was making an appropriate provision for an unanticipated prolongation of the works arising from the inclusion of the On-Street work and the slippage in the programme.

472. The TIE position is that Siemens should have simply absorbed its costs and those of its sub-contractors, arising from an extended presence on site. This suggestion is simply unacceptable.

473. In the calculation of its On-Street Target Price of £12,474,500, Siemens makes the following provision of £6,121,600[81] for prolongation:

Item	Activity	Total Price
1	**STS UK Turnkey**	
1.1	Overall Project Management	1,493,375.86
1.2	Trackwork: Sub-system extended PM	£265,232.45
1.6	Infrastructure	316,119.90
2	**Subcontracts**	
2.1	Rail Automation UK	
	Sub-system specific extended PM	£187,580.98
2.2	Electrification UK	
	Sub-system specific extended PM	£169,778.72
2.3	Traffic Solutions	
	Sub-system specific extended PM	£110,539.16
2.4	Siemens AG (Germany)	
	RA PM (Rail Automation)	£457,335.22
	REL (Rail Electrification)	£182,973.81
	DWE (Depot Workshop)	£105,909.47
	SPM	£222,930.94
	BAM Rail EoT costs	£2,609,824.00
	Total	**£6,121,600.51**

Table 21 -Prolongation Costs included in On-Street Price

81 This table has been updated to include Infrastructure costs, which relate to provision of storage.

474. These sums are derived from Siemens' Target Cost Price Presentation [**TIE00100988**]. This file indicates that Siemens had claimed the cost of programme movement between the Service Commencement in the 'Prioritised Works Programme', [**CEC01731817_0016**, **Schedule Part 1**] namely 25 January 2014 and that in the Settlement Agreement, namely 20 May 2014.

475. Thus, as part of the negotiation of the On-Street Price Siemens has, in fact, agreed to absorb its prolongation costs in connection with the slippage in the programme between 22 September 2013 and 25 January 2014. Exhibit AE1 to Axel Eickhorn witness statement [**TRI00000171**] indicates that in the calculation of its original On-Street Target Price of £20,160,348, Siemens had claimed prolongation costs between 22 September 2013 and 20 May 2014. However, in the preparation of its revised Target Price of £14,480,150, Siemens reduced the time-related costs detailed in Table 21 by foregoing entitlement to prolongation costs for the period 22 September 2013 and 25 January 2014.

476. Thus, rather than seek to recover its position as alleged by TIE, Siemens was in fact absorbing the costs associated with the slippage in the programme.

477. In terms of methodology, as with the previous EOT calculations in respect of EOT1, MUDFA Rev 8 and MUDFA 2, Siemens have priced the overrun period in deriving the prolongation costs in Table 21 [82].

[82] This methodology is explained in more detail at paragraph 228 above.

478. Siemens also wish to advise that, in the agreement of the On-Street Price, Siemens agreed to relax the resource constraints specified in Project Phoenix. As stated above, the Project Phoenix proposal stated:

> "*To provide an efficient use of resources the PPP Programme has a restriction on the resources for trackworks of 2 Gangs that has no impact on the finish of installation works. Further, the PPP Programme has a restriction on the resources for OLE of 2 Gangs that is in conjunction with previous constraints on the Infraco construction programme.*" [**BFB00053258_0163**].

479. However, in the Settlement Agreement, Siemens agreed to the provision of an additional track gang:

> "*The Programme is based on the deployment of 3 track gangs and 2 OLE gangs. These resources are shared between On Street and Off Street Works. Should a delay occur on the On Street Works where the resource is not able to be redeployed to the Off Street Works, additional resources will be required to mitigate or negate any delay to the Off Street Works and vice versa.*" [**CEC02085650_0064**]

480. In addition, Infraco and Siemens committed to the radical traffic management plan proposed by Colin Smith, including concurrent working with the MUDFA contractor, as noted at paragraph 112 of Colin Smith's witness statement [**TRI00000143_0033**].

481. In order to ensure that it could meet these programme demands and to avoid delay and/or disruption claims from BAM Rail, Siemens decided to manage the On-Street trackworks and engaged 1stInrail on a 'labour-only' basis. Whilst this involved additional expense, it enabled Siemens to respond promptly to work-site availability. This was a key factor in the timely completion of the On-Street Works [**Axel Eickhorn Witness Statement, paragraph 126-TRI000000171_0059**].

482. Finally, in the context of its On-Street Price, Siemens would respectfully request the Inquiry note that the management of the On-Street works and compliance with the Schedule Part 45 regime was labour intensive and required Siemens to provide an additional office in Torphichen Street, and additional surveying and engineering resource.

483. These facets of Siemens' On-Street price are not acknowledged by TIE witnesses. As with the advice given to Mr. Nolan and Dame Bruce in respect of the Project Phoenix Price, it is Siemens' position that TIE is again guilty of not accurately reporting Siemens' true entitlement. Siemens respectfully request the Inquiry to prefer the evidence of Axel Eickhorn for the reasons stated above.

7.14 TIE Reliance on Faithful & Gould Report

484. Because the SETE Submission places express reliance upon the report provided to it by Faithful & Gould [**CEC01727000**], this report is considered here in the context of Siemens' On-Street Price.

485. The Faithful & Gould Report states that the current costs presented for the Siemens on-street works were extremely high and not value for money. At section 4.2.3 of its report, Faithful & Gould consider Siemens' System & Trackwork budget price of £14,480,150. The report considers that this price is high in that:

(i) the BAM price of £4.27 million was considered excessive and the track element should be £960,000. The BAM EOT claim should be an internal matter between Siemens and BAM and the BAM price should be reduced by approximately £3.3 million;

(ii) the risk provision of £907,685 was considered excessive;

(iii) there was excessive resource provision and Siemens have included project functions in Germany;

(iv) the Siemens costs for storage of £247,000 for material storage seemed excessive; and

(v) in Faithful & Gould's view, a further reduction in the region of £1-£1.5 million could be realised.

486. Siemens respectfully disagrees with these observations. What these views do not properly reflect is the time and risk inherent in execution of the On-Street Works. Axel Eickhorn acknowledged this fact in the context of Siemens' On-Street Target Price:

> *"In respect of Siemens, time-related costs was the dominant factor."* [**TRI00000171_0071, paragraph 172**].

487. Three aspects of Faithful & Gould's criticisms are considered below, namely prolongation, risk, and storage.

488. Prolongation

489. When Faithful & Gould comment that the BAM extension of time costs should be an internal matter between Siemens and BAM they are effectively saying that Siemens or BAM should absorb these costs. The execution of the On-Street works pursuant to the Rev 3a Programme required Siemens to be on site until 20 May 2014. This represents a prolongation of over 8 months from that contemplated in Project Phoenix. In its revised On-Street Price Siemens had, as stated above, fully absorbed the costs associated with the slippage between the Project Phoenix Programme and the Service Commencement in the 'Prioritised Works Programme', [**CEC01731817_0016**, **Schedule Part 1**] namely between 22 September 2013 and 25 January 2014. However, Siemens was unprepared to absorb any further prolongation costs. Further, BAM was properly entitled to seek recovery of these costs. Thus, Siemens' On-Street price makes provision for the prolongation of its site establishment between 25 January 2014 and 20 May 2014. The prolongation of the works also required the prolongation of time related functions in Germany.

490. Axel Eickhorn directly addressed the failure of the report to account for prolongation:

> *" In respect of paragraph 2.6 containing Faithful and Gould's assessment, they have entirely omitted to refer to the fact that it was not the value of*

the works that had led to the price; it was the Extension of Time." **[TRI00000171_0080, paragraph 201, line 11-14]**.

491. Mr. Eickhorn also noted that that detailed breakdowns for pricing had been provided by Siemens based upon audited rates.

492. Risk

493. As noted above, as part of the On-Street Price, Infraco and Siemens committed to the radical traffic management plan proposed by Colin Smith, including concurrent working with the MUDFA contractor, as noted at paragraph 112 of Colin Smith's witness statement [**TRI00000143_0033**].

494. As stated by Axel Eickhorn, working in parallel with the utility contractor created inefficiencies because the extent of outstanding conflicts was unknown. It is evident from the evidence of Colin Smith that TIE sought to persuade others that the cost of utility diversion would be relatively minimal. Infraco did not share this confidence. When asked about the extent of utilities indentified by Infraco in the visualisation presented at Mar Hall, Mr. Smith stated:

"What I understood then and know now are different. At the time I thought it was a potential smokescreen and how could it be so bad when MUDFA had already been executed. We are dealing with experienced contractors who are in a city centre and they would expect to come across utilities. Looking back and having had the experience of being involved in the project, I think from memory, I was told by TIE that something such as £1.9m would cover the cost of moving the utilities. Notwithstanding the

radical traffic management plan which I had asked for to improve the project, asking the contractors, BSC, to allow another contractor on their site, McNicholas, were concessions that were agreed once we were back on site again and working on the project. Today I would reflect back that £1.9m versus the final account of £19.8m tells me that, in hindsight, the Infraco utility conflicts statement was probably nearer the mark." [**TRI00000143_0033, paragraph 112**]

495. Siemens' provision for risk reflected its understanding of the extent of outstanding conflicts and the inefficiencies associated with parallel working and a radical traffic management plan. Siemens submit that its provision was realistic and justified. Siemens also submit that the evidence of Mr. Colin Smith confirms the optimistic nature of TIE's estimates at that time.

496. Storage

497. The average cost of the Broxburn Warehouse was £55,000/month[83]. In addition, Siemens was providing storage at other locations. Accordingly, whilst Faithful & Gould observe that these costs appear high, they are, on proper investigation, fully justified.

[83] Section 6.1 indicates that the Broxburn Warehouse was provided between January 2010 and March 2014 at a total cost of £2.138 million.

8.0 IMPLEMENTATION POST SETTLEMENT AGREEMENT

8.1 Operation of the Project

498. After the execution of the Settlement Agreement, it is Siemens' view that the project worked well. Efforts were made to accelerate completion and to assist with early Operator training. Matters are summarised by Mr. Eickhorn at paragraph 213 of his witness statement:

> *"After the Settlement Agreement efforts were made, in consultation with CEC, to expedite completion. To this end BSC agreed to a new section, namely Section B1 (mini test track), to facilitate driver training by the Operator. In addition, in large part due to the efforts of Siemens both Section C and Section D were completed ahead of the stated Planned Sectional Completion Dates in Programme Rev.4. Section C was completed on 12 March 2014, 28 days early. Section D was completed on 30 May 2014, 39 days early. From Siemens perspective, work was carried out on more fronts than had been envisaged and additional resources were deployed at the same time. By deploying very efficient working practices, wherever possible Siemens started its activities early and working in conjunction on site with the utility companies and BB, rather than waiting for the site to be fully completed for handover to Siemens."* [**TRI00000171_0085**].

499. Mr. Eickhorn also notes the positive impact of the new governance arrangements and the contributions made by Dame Bruce and Mr. Colin Smith:

"From Siemens' perspective, in overall terms, matters were improved by the new governance arrangements put in place post Mar Hall and the spirit of trust and co-operation generated between the parties. The personnel engagement and the openness displayed by Sue Bruce, Colin Smith, and generally by CEC staff was central to the project turnaround." [**TRI00000171_0087, paragraph 216.4**].

500. Unencumbered by the ongoing disputes which had beset the project, Siemens was finally provided with the required access needed to execute its works.

501. In addition, Infraco (and Siemens) proceeded to complete the design known as 'Secondary Phase 1a' for the remainder of the route to Newhaven.

8.2 Final System Acceptance

502. Following Service Commencement on 30 May 2014, Siemens undertook the task of preparing, managing and completing the remaining System Acceptance Tests, namely Test T4 and Test T5, and securing 'System Acceptance'. The Infraco Contract defines 'System Acceptance' as the first date upon which Tests T4 and T5 have both been satisfied in accordance with the requirements of the Infraco Contract. These tests can only be performed after the commencement of passenger service and are designed to test the performance of the system in operation.

503. The timescale for satisfactory completion of these tests was prescribed by Section 23.11 of the Employer's Requirements, namely within 12 months of Service Commencement **[USB00000033_0326]**[84].

504. Test T4-Network Performance Test

505. Test T4 is carried out over a 28 day consecutive period in order to establish that Initial Phase 1a can reliability operate the operational timetable, with tram punctuality of at least 99%. Test T4 is also required to demonstrate system reliability with interrupted Substation traction power supply and effective tram operation with an Uninterruptible Power Supply ("UPS").

506. On 7 October 2014 Test T4 was passed and on 10 February 2015 CEC issued a Network Certificate pursuant to Clause 47.3 of the Infraco Contract.

507. Test T5-Network Reliability Test

508. Test T5 is required to demonstrate the reliability of sub-systems during Passenger Service. Various sub-systems, such as Passenger Information Display, Operational Data Network, CCTV and SCADA are tested over consecutive Periods of 28 days, varying from 2 months to 6 months.

509. On 6 December 2014 Test T5 was passed and on 11 February 2015 CEC issued a Reliability Certificate pursuant to Clause 47.4 of the Infraco Contract.

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[84] Section 23.11 of Employer's Requirements: Within *twelve months of opening Initial Phase 1a to Passenger Service, Infraco shall undertake and pass the Network Performance (Test T4) and Network Reliability Test (Test T5) (as described in Sections 23.16 and 23.17)* **[USB00000033_0326]**

8.3 Final Account

510. On 30 October 2014 CEC issued the agreed Final Account Statement [**WED00000101**] in accordance with Clause 66.6 of the Infraco Contract. The Final Account Statement confirmed agreement in the VAT exclusive sum of **£427,206,309.52** in full and final settlement of all claims and entitlements.

511. The Final Account Summary in the Final Account Statement confirmed a final payment to Siemens of **£145,516,143.20**. The make-up of the Final Account for the Siemens' part was as follows:

Item	Description	Siemens
1	**Contract Sum**	
	Off-Street Price	125,881,719.02
	On-Street Price	12,473,499.74
	Infrastructure Maintenance Mobilisation	2,192,310.95
	Spare Parts	1,013,090.00
	Sub-total	**141,560,619.71**
2	**Adjustments to Contract Sum**	
	Off-Street	-48,069.71
	Sub-total	**-48,069.71**
3	**Clause 80 Changes**	**3,093,355.41**
4	**Schedule Part 45 Changes**	**910,237.79**
	Total (1+2+3+4)	**£145,516,143.20**

Table 22-Siemens Final Account Share

512. The movement in Siemens' price between Contract Close and Final Account is considered later on in this submission.

9.0 TRACKFORM

9.1 Confusion created by SDS evidence in respect of Trackform

513. Siemens considers that the evidence provided by Mr. Steve Reynolds for Parsons Brinkerhoff, in regard to trackform has caused significant confusion. In particular, Mr. Reynolds, who was Project Director for Parsons Brinkerhoff, was critical of Infraco's track design and linked the design of the trackform to the remedial works carried out in Princes Street in 2010. In essence, the evidence from SDS was that Infraco had proposed a trackform which was non-compliant, less robust, less safe and less buildable design than that proposed by SDS.

514. Mr. Reynolds was clearly anxious to counter accusations levelled against SDS's trackform namely that SDS were "*over-engineering and it was somehow gold-plated*" [**Transcript 12 October 2017, page 82:15-18**]. However, it is submitted that in so doing, Mr. Reynolds made statements which are not correct. We address these matters now.

515. Nature and Scope of Trackform

516. To assist the Inquiry Siemens deal firstly with matters of terminology and of scope. Figure 1 below, which is extracted from the Princes Street Presentation [**SIE00000402_0005**], shows the Rheda trackform design proposed by Infraco. The related construction and engineering requirements are more fully set out in the Infraco Proposals [**USB00000088_0231**].

517. The top 17cm (170mm) is made up of 'track covering layer', which originally consisted of asphalt. Beneath that sits the Rheda trackform. However, this trackform is covered by a 25cm (250mm) in-situ 'track concrete layer'. Beneath this is the necessary formation improvement layer.

518. As is clear from Figure 1, the requirement for the ground improvement layer is that it must be capable of providing a load bearing capacity (E_v^2) of 120 MN/m^2. Infraco was responsible for the design and selection of the Rheda trackform and track concrete layer. However, the design, thickness and material composition of the ground improvement layer was solely a matter for SDS and the Infraco's Proposals did not specify or prescribe the design of the ground improvement layer. Siemens merely required that the SDS designed ground improvement layer provided the requisite load-bearing capacity for its trackform.

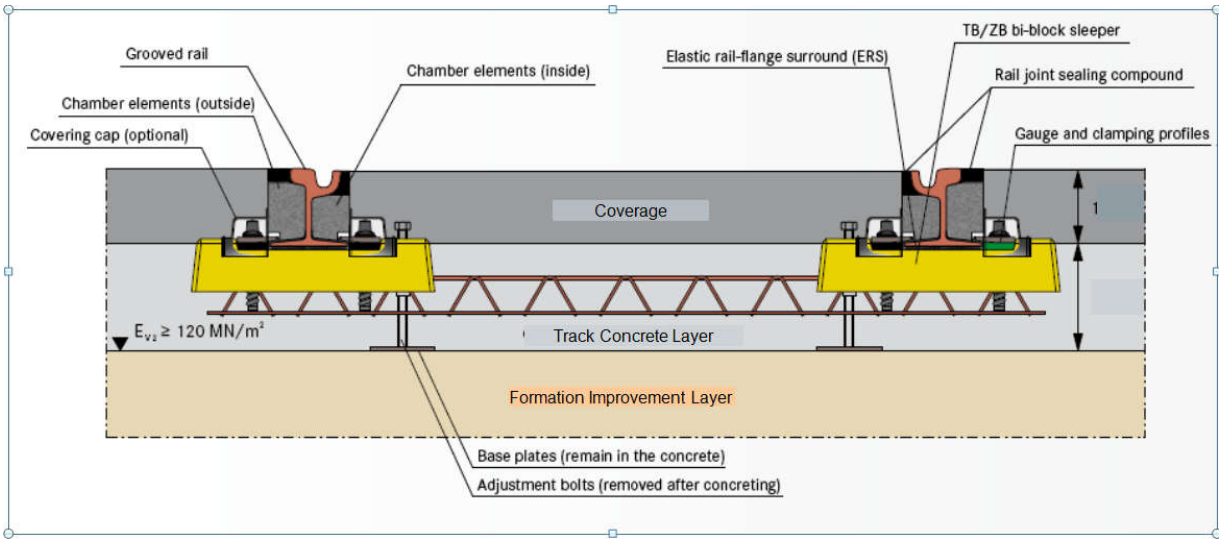

Figure 1-Rheda Trackform Construction [SIE00000402_0005]

519. Evidence given by SDS witnesses

520. Mr. Reynolds stated that SDS considered there was a need for a more complex trackform than that specified by Infraco [**Transcript 12 October 2017, page 41:1-4**] and he proceeded to justify this view:

> *"CHAIR OF THE INQUIRY: Whose view prevailed about trackform design?*
>
> *A. Well, interestingly, I think you could argue that we did, because much later on in the process, we were being pressured by tie to accept a much cheaper, much simpler trackform design, and we pointed out the risks inherent in doing that, and subsequently, when Princes Street was excavated, we were proved to be right. So the need for the more robust trackform design was proven then. Now, that ensured quality of delivery, but what that did mean was that the original BBS offer couldn't be implemented. It had to be the more robust solution.*
>
> *CHAIR OF THE INQUIRY: And that would involve additional cost.*
>
> *A. Yes."* [**Transcript 12 October 2017, page 41:9-23**]

521. Counsel for the Inquiry asked Mr. Reynolds to compare the SDS trackform with that proposed by Infraco. Mr. Reynolds responded as follows:

> *"In short, we defined what's known as full depth reconstruction, which is excavation of the base, the putting in place a sub-base underneath the immediate foundation for the trackform. So you're going down significant*

way into the roadway, using that as the example, whereas BBS had come up with an offer that was using a prefabricated trackform which would only require planing off, in their words, of the immediate surface and then insertion of that prefab trackform in place. So it was a much simpler solution." [**Transcript 12 October 2017, page 42:9-18**]

522. Mr. Reynolds stated that he understood that the Infraco's design, initially used on Princes Street, was unsuitable and "*had be changed for our [SDS] design later on*" [**Transcript 12 October 2017, page 42:25-43:1**]. Mr. Reynolds then proceeds to draw a direct causative link between the Infraco design and the subsequent faults in Princes Street and called into question the safety of Infraco's trackform on Princes Street:

"MR MACKENZIE: So in short, Mr Reynolds, why wasn't it possible to build the consortium's proposed trackform on Princes Street?

A. In our view it wouldn't have been safe because a further characteristic of the trackform design necessary for inner city circumstances like Princes Street, you need what's called void spanning, because you've got to anticipate that there will be cavities under the roadway, and subsequently when Princes Street was excavated, that's exactly what we found. You will get drainage channels. You will get all sorts of reasons why the sub-base may have moved, may have resulted in voids. So you need the trackform to be capable of spanning those voids so you don't get rail breakage, and obviously if you get rail breakage in an inner city

environment, you get a derailment. That's particularly unsafe. You need to be able to avoid that, obviously." [**Transcript 12 October 2017, page 43:19-44:11**].

523. Thus, Mr. Reynolds identified two main problems with the initial trackform in Princes Street, namely product specification and installation methodology. For Mr. Reynolds the Rheda system suffers from being a non-robust, prefabricated track solution. Secondly, Mr. Reynolds asserts the installation of this product merely consists of "planning off" the immediate road surface and dropping in the trackform.

524. Allied to this, Mr. Reynolds identifies a further fault, namely the lack of concrete shoulders to contain the trackform. Mr. Reynolds states that the absence of these concrete shoulders resulted in the cavities in Princes Street, due to heavy traffic cutting across the tracks " [**Transcript 12 October 2017, page 43:2-43:17**].

525. It is Mr. Reynolds' evidence that the initial Infraco design had to be subsequently changed to the SDS design to rectify these alleged defects [**Transcript 12 October 2017, page 42:24-43:1**].

526. The errors in Mr. Reynolds' evidence in regard to Infraco's trackform proposals are fully addressed in Martin Foerder's supplemental witness statement [**TRI00000183**], the contents of which Siemens agree with. However, there are a number of specific matters which Siemens wishes to address. These are set out below.

527. The Product

528. Mr. Reynolds characterisation of Infraco's trackform as "a prefabricated trackform which would only require planing off" is totally false. The Rheda trackform contains an integrated system of prefabricated sleeper blocks, with steel spacers, which hold the rails and maintain the required gauge. Once these blocks are correctly set in terms of line and level, the track concrete layer is placed which encases the prefabricated sleepers[85]. This system is used widely across Europe and is a safe and proven trackform solution.

529. The Installation

530. Infraco did not propose, as Mr. Reynolds suggests, to “plane-off” or "skim the surface" and drop in the trackform[86]. As detailed above, the Infraco trackform required a ground improvement layer beneath it in order to support it. SDS was responsible for the design of this ground improvement layer. This fact was acknowledged by Mr. Chandler in evidence:

> *"..SDS took responsibility for the formation up to the underside of trackform. So we still had a significant risk that if that formation failed, and we considered that should look like a reinforced concrete slab, obviously if that failed subsequently, Parsons Brinckerhoff would have been at risk for that failure. We would have been liable for that failure."* [**Transcript 13 October 2017, page 60:14-21**].

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85 This is clearly shown by the photos at Appendix 2-These photos are produced form Infraco's Princes Street Presentation [**SIE00000402_0006**]

86 **TRI00000124_0136**, paragraph 369.

531. It is Infraco's position that the size and material composition of this ground improvement layer was a matter for SDS. Siemens merely required that the ground improvement layer beneath the trackform provided the required support and stiffness for its trackform. However, this ground improvement layer designed by SDS was always an integral part of the final track design. This is made clear in the Infraco Proposals:

> *"Checking the substructure supplied by the civil contractor.*
>
> *This will be done by testing the formation, examining the survey-data and a visual and physical inspection of the provided substructure. The relevant value of E_{v2} (stiffness) is subject to the final development of the track design and confirmation by the SDS before commencing of works."* [**USB00000088_0231**].

532. Thus, whilst Siemens was opposed to the ubiquitous use of the concrete track improvement layer, it did ultimately accept that the risk of any failure lay with SDS and that SDS's views should prevail[87].

533. In regard to “planing off” of the road in connection with trackform construction, the SDS witnesses seem to have confused the matter of trackform construction with road reconstruction. For clarity, the matter of "full depth road reconstruction" is entirely separate from trackform. Pricing Assumption 12, to Schedule Part 4 [**USB00000032_0007**] refers to the planing back of the road surface, as opposed to full depth road reconstruction. This relates to the road construction either side

[87] Siemens refer the Inquiry to the comments on the Light Rail Transit Association in regard to the use of concrete [CZS00000037_0009].

of the track and is unrelated to trackform installation. The suggestion that Infraco could simply “plane off' the surface and drop in the trackform (together with the in-situ track concrete layer and the underlying ground improvement layer) is simply absurd[88].

534. Finally, Siemens would note that SDS witnesses have wrongly linked the surface defects in Princes Street with the trackform and the track improvement layer which sit below ground level. In this regard the evidence of the SDS witnesses is wrong and proceeds on the incorrect assumption that the trackform design in Princes Street had to be changed. This was not the case as SDS' reinforced concrete slab was used from the start in Princes Street. The track improvement layer, designed by SDS, was installed, as part of trackwork operations in Princes Street in 2009. This matter is made clear by the evidence of James Donaldson who stated that in 2009 Infraco constructed the Princes Street trackworks with the maximum 1.2 metre depth of concrete improvement layer:

> *"We put the maximum amount of improvement layer, capping improvement layer under the trackform. So again, we were down to the maximum depth required to fulfil the design requirements."* [**Transcript 16 November 2017, page 147:17-21**]

535. No remedial works were ever needed for the track improvement layer and the remedial works undertaken in Princes Street in 2010 were unrelated to the track

[88] The photos at Appendix 2 show trackwork installation in Princes Street.

improvement layer. Again, this matter is fully addressed in Martin Foerder's supplemental statement [**TRI00000183_0003, paragraph 3.8**].

10.0 COSTS INCURRED FOR VARIOUS PARTS OF THE WORKS

10.1 Monies Paid in Respect of Systems and Trackwork

536. Siemens address here the additional sums paid to it in respect of its share of the Infraco Works and the reasons for such additional payments. Whilst the Inquiry will wish to understand the reasons why the final project cost was £776 million, Siemens address here only the additional costs paid to it as part of the agreed Final Account in the sum of **£427,206,309.52**.

537. As noted in section 8.3 above, Siemens share of the final agreed value for the Infraco Works was £145,516,143.20. This sum expressly excluded sums to be paid in respect of the ongoing maintenance of the Edinburgh Tram Network. However, this sum does include sums for maintenance mobilisation and spare parts in advance of the start of maintenance services.

Description	Infraco Contract	Final Account	Difference
Off-Street Price	N/a	125,881,719	
On-Street Price	N/a	12,473,500	
Adjustments to Contract sum		-48,070	
Construction Works Price	£101,679,003	£138,307,149	**£36,628,146**
Clause 80 Changes	N/a	3,093,355	£3,093,355
Schedule Part 45 Changes	N/a	910,238	£910,238
Construction Works Price+Changes	£101,679,003	142,310,742	£40,631,739
Infrastructure Maintenance Mobilisation	1,769,292.00	2,192,311	423,019
Spare Parts	1,013,090.00	1,013,090	0.00
Final Contract Value	**£104,461,385**	**£145,516,143**	**£41,054,758**

Table 23-Comparison of Siemens' Contract Price and Final Account

538. To assist the Inquiry, and to help explain the evolution of its final account value, Siemens set out above (Table 23) in summary format the comparable figures for Systems and Trackwork in the Infraco Contract, including the differences between the respective Construction Works Prices and final prices[89].

539. The Siemens' share of the Construction Works Price at Contract Close was £101,679,003. The make-up of this figure is shown in Exhibit AE3 to Axel Eickhorn's Second Supplemental Statement [**TRI00000276**]. Between Contract Close and Final Account the Siemens share of the Construction Works Price increased by £36,628,146 to £138,307,149.

540. This increase of £36,628,146 is almost entirely a result of the extended contract duration. The original Service Commencement Date was 16 July 2011, and represented a project duration of 38 months.

541. As part of the Settlement Agreement, the Service Commencement Date was revised to 8 July 2014. This represents a project extension of 3 years and a project duration of almost 74 months.

542. In his Second Supplemental Witness Statement [**TRI00000276**] Axel Eickhorn has sought to assist the Inquiry by providing an explanation of the development and rationale behind the pricing proposals provided by Siemens between Contract Close and the Settlement Agreement. Table 1 to this supplemental statement shows the movement in the Siemens' share of the Construction Works Price and the corresponding movement in the Service Commencement Date.

89 The figures have been rounded the nearest pound.

543. To further assist the Inquiry Siemens has reproduced this table, with the addition of a column to show the prolongation costs applicable to each price submission.

Date	Contract/Offer	Siemens Construction Works Price	Prolongation Conponent	Completion Date (Passenger Service)	Construction Completion- AIR-HAY Key Date	Construction Completion- AIR-York Place Key Date	Additional Period on Site (Months)	Additional Period On-Site due to On-Street
14/05/2008	Original Contract	£101,679,003	N/a	16/07/2011	09/11/2010	N/a	N/a	N/a
29/07/2010	Project Carlisle 1	£126,901,621	£26,005,862	19/11/2012	22/05/2012	N/a	16.18	N/a
11/09/2010	Project Carlisle 2	£118,601,221	£20,612,906	18/12/2012	21/06/2012	N/a	17.13	N/a
24/02/2011	Project Phoenix	£136,881,719	£35,157,646	22/09/2013	11/03/2013	N/a	26.27	N/a
15/09/2011	Settlement Agreement	£125,881,719 + £12,473,500 = £138,355,219	£25,167,727 + £6,121,600 = £31,289,327	20/05/2014	29/07/2013	21/11/2013	34.16	3.78
03/10/2014	Final Account	£125,881,719 + £12,425,430 = £138,307,149	£25,167,727 + £7,810,861 = £32,978,588	08/07/2014	21/08/2013	09/01/2014	35.77	4.64

Table 24- Siemens Price Submissions showing Movement in Completion Dates and Prolongation Costs

544. The prolongation values in respect of each submission are explained below.

545. Original Contract

546. The make-up of the original Construction Work Price is set out in Inquiry document **CEC00555849** and at Appendix 1.2 of the Project Carlisle 1 submission [**CEC00183919_0030**]. No prolongation costs are applicable.

547. Project Carlisle 1

548. Table 24 above shows that the Service Commencement Date has slipped by over 16 months to 19 November 2012. The value of prolongation costs at this stage was £26,005,862. This sum is derived from the Project Carlisle submission

[**SIE00000106**]. This sum of £26,005,862 is primarily comprised of the additional provision of £13,990,133 for System Wide preliminaries and £7,858,271 for Off-Street preliminaries required for the management of trackworks, Overhead line installation and depot workshop installation [**TIE00885457_0031**]. The sum of £26,005,862 also included provisions to reflect the delay and disruption to work activities, such as additional design resource (£1,298,539) and increased trackwork costs (£2,309,568) [**TIE00885457_0031**]. The significant provisions made reflected the increase resources which Siemens had required as a result of adversarial nature of the contract and the lack of continuity of work to that point.

549. The significant increase in trackwork preliminaries also reflected the fact that Siemens needed to engage additional management resources in its trackwork team, in response to the substantial claims made by BAM in respect of the ongoing delay and disruption to trackwork activities [**TRI00000171_0059, paragraph 125**].

550. Project Carlisle 2

551. Table 24 indicates that the Service Commencement Date in respect of Carlisle 2 is 18 December 2012. The prolongation value of £20,612,906 is derived from Exhibit AE1 to Axel Eickhorn's second supplemental statement [**TRI00000276_0015** & **TRI00000179**]. This represents a programme slippage of over 26 months. The reduced provision for prolongation reflects the reduced risk associated with the exclusion of On-Street activities. Again, the provision for prolongation is primarily made up of the additional provision of £10,801,715 for

System Wide preliminaries and £7,391,542 for Off-Street preliminaries. However, as with Carlisle 1, Siemens also make provision to reflect the delay and disruption to design activities (£933,124) and to trackwork costs (£1,486,524) and reflected the required increase in resource provision to that date[90].

552. Project Phoenix

553. Table 24 indicates that, in accordance with the Project Phoenix Programme, the Service Commencement Date for Project Phoenix had slipped to 22 September 2013. The prolongation value of £35,157,646 is derived from Siemens' Project Phoenix Summary [**SIE0000400**], and is based upon the increased values for prolongation costs shown in Table 9 to Axel Eickhorn's second supplemental statement (reproduced at Table 8 above).

554. The increase of £14,544,740[91] in the provision for prolongation between Project Phoenix and Carlisle 1 (which is based on a similar scope) is primarily made up of the increased provision for Siemens project management (£4,274,378), trackwork (£5,282,281), extended system engineering (£709,050), and an increased provision for finance costs (£3,129,592). These figures indicate that the failure to reach agreement in respect of Carlisle 1 was a lost opportunity. Siemens would also note that Mr. John Swinney, MSP, noted in his witness statement that, in retrospect Carlisle 1 "*would have been a good deal*" [**TRI00000149_0103].**

90 Make-up of these sums shown in TRI00000276, Exhibit AE2 and native file provided to Inquiry.

91 The total consists of the sub-total of £11,415,148 for prolongation and £3,129,592 for finance costs. Figures derived from Table 8 above.

555. Settlement Agreement

556. Table 24 indicates that, in accordance with the new Programme (Rev 3a), the Service Commencement Date for the Infraco had slipped to 20 May 2014, an extended site presence of over 34 months. The Settlement Agreement was a commercial compromise, thus the provision for prolongation and disruption in the Settlement Agreement cannot be subject to precise calculation. However, based upon the post-mediation reconciliation conducted by Siemens [**SIE00000400**], the revised provision for prolongation is considered to be £25,167,727. This reduction is largely achieved by the significant concession made in regard to UK Project Management (£17,599,045 reduced to £15,785,199) and also the reduction for trackwork (£48,753,567 reduced to £43,728,770). The figure for On-Street prolongation costs of £6,121,600 is derived from Table 21 above (Prolongation Costs included in On-Street Price). These values are shown in Table 24. This movement in price is also shown in **SIE00000113**.

557. Thus Siemens calculates that, as part of the Settlement Agreement, CEC paid an additional sum of £31,289,327 in respect of Off-Street and On-Street prolongation and disruption costs.

558. Final Account

559. The value for On-Street prolongation has been increased to reflect the sum paid to Siemens pursuant to Clause 3.1(a) of the Settlement Agreement. This change was agreed in the sum of £1,689,261 in respect of PMC 20 'System Wide-Delay

in Signing' [**WED00000101_0005**]. The combined value of Off-Street and On-Street prolongation costs at final account is £32,978,588.

560. Summary

561. Siemens considers that, of the additional sums of £36.1 million paid to Siemens in respect of the Construction Works Price in the Settlement Agreement (see Table 23), prolongation costs account for approximately £31.3 million of this total.

562. This additional prolongation provision reflected both the extended contract duration and the additional resources required prior to the Settlement Agreement in order to administer an extremely adversarial contract with an exceptional number of changes, disputes, and subcontractor claims. The provision for prolongation also reflected the fact that the work completed prior to settlement had been undertaken in a piecemeal, ad-hoc and inefficient manner as a result of the ongoing lack of access and continuity of work.

563. Put bluntly, CEC paid additional monies to Siemens because of the protracted period of delay and disruption which had accrued during TIE's management of the project. The fact that the SETE Submission seeks to use the measure of cost/km[92] indicates an unwillingness or inability to accept the simple fact that the project cost more, not because of the cost of work undertaken, but because of the cost of 'non-work', namely the costs accrued when Siemens and BAM resources were idle, waiting for access, and unable to demobilise because of TIE's adherence to a failed contract strategy.

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11.0 CONCLUSION

564. As stated at the outset, Siemens prides itself on its reputation and strongly refutes any criticism of its conduct in this matter. It is hoped that, through being given the welcome opportunity to express its position in this submission, Siemens has demonstrated that throughout the course of the project, it acted in a consistent, fair, and wholly responsible manner despite the numerous and unprecedented difficulties it faced.

11 MAY 2018

Appendix 1 Overview of Siemens' Commissioning & System Acceptance Testing

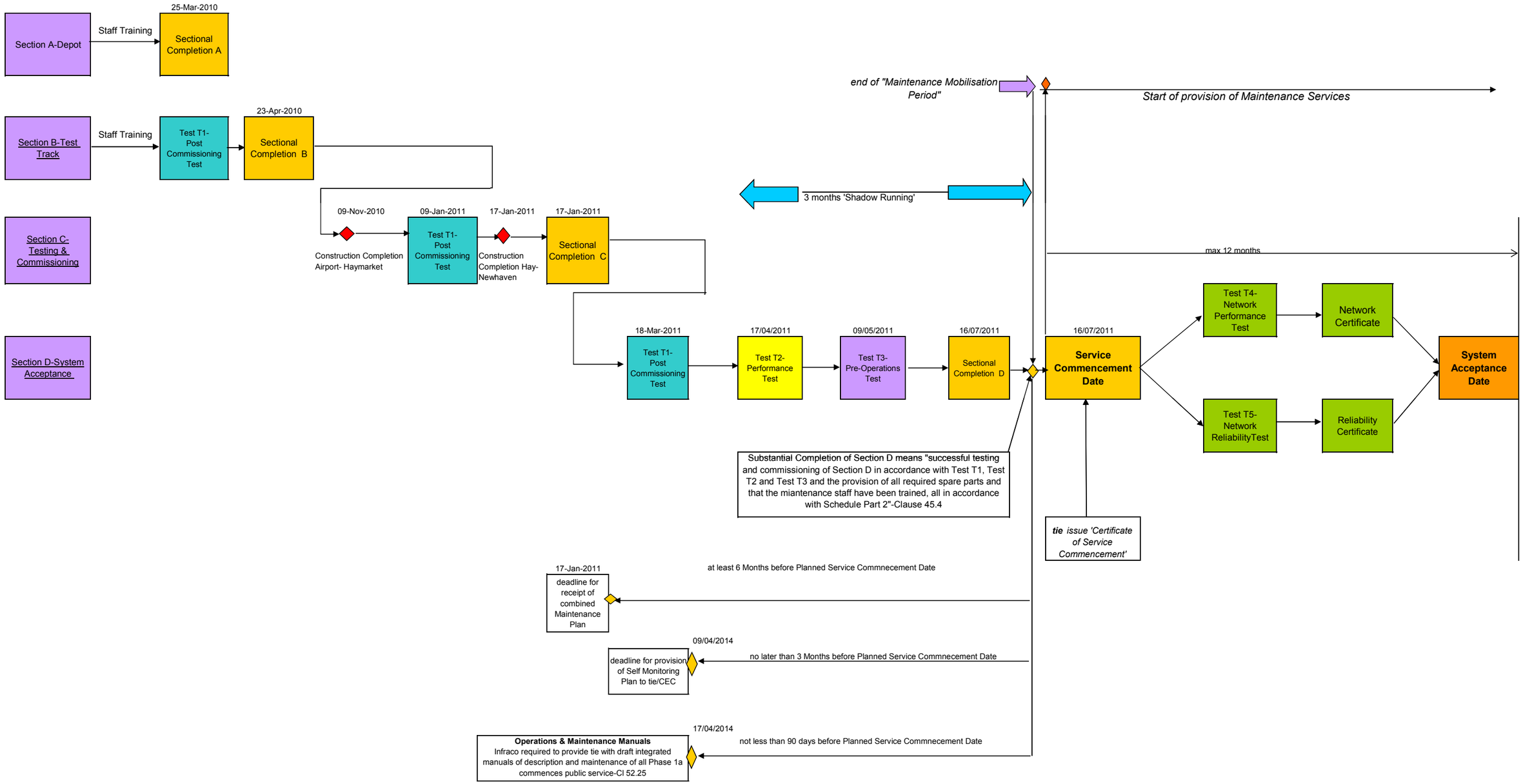
Prescribed System Acceptance Tests (SATs')

Test	Test Name	Test Description	Programme
T1	Post Commissioning Test	The test shall demonstrate and prove that each Section of the ETN in sequence is able to perform in an acceptably safe manner and deliver the required run times. Please refer to relevant section below. This is the gateway test to driver training.	Post Commissioning Test will immediately follow the successful commissioning of the nominated section and is a requirement for progressing into the Driver Training.
T2	Performance Test 1	After Section D has passed Test T1 then this test shall demonstrate and prove that Phase 1a of the ETN is able to perform satisfactorily to move into the three-month Shadow Running period. Please refer to relevant section below. This is the gateway test to shadow running.	Performance Test 1 will immediately preceed the Shadow Running period and is a requirement for progressing to this phase of the programme.
T3	Pre-operations Test	The test shall cover a seven day period during the latter part of the Shadow Running phase of the programme. The Test is the operation of the initial entry into service timetable and includes infrastructure, trams, and operations systems – Please refer to relevant section below.	Pre-operations Test shall immediately precede the Service Commencement Date.
T4	Network Performance Test	The Test shall be carried out over a 28 day period in Passenger Service to establish that the ETN can reliably operate the Operational Timetable – please refer to Please refer to relevant section below.	To be completed within twelve months of the Service Commencement Date.
T5	Network Reliability Test	Reliability Testing of certain sub-systems in Passenger Service – please refer to Please refer to relevant section below.	To be completed within twelve months of the Service Commencement Date.

Table 25 - System Acceptance Tests Prescribed at Table 43 to Employer Requirements

FIGURE 2-SECTIONAL COMPLETION & SYSTEM ACCEPTANCE TESTS

Dates/Activities Based Upon Programme Rev.O (Schedule Part 15 to Infraco Contract)(Not to Scale)



[1]. Pre System Acceptance Tests required prior to Sectional Completion including Factory Accetpance Tests, Site Acceptance Tests, Sub-System Integration Tests, and System Commissioning Tests

Appendix 2 Princes Street Trackwork Installation Photographs

Figure 3-Installation of Rheda Trackform on top of Track Improvement Layer in Princes Street

Figure 4-Pouring of Track Concrete Layer, encasing Rheda Trackform, after placement of Track