1.1 IFC / INTC Interface – Infraco response time to production of an IFC

1.1.1 Investigations to date have identified significant inconsistencies as to the timescales taken by the Infraco to raise / close out on INTC's against IFC's. Notably, there are a number of instances where the Infraco has taken an inordinate amount of time to produce INTC's following the IFC issue date. Examples for Section 5A are as follows:-

1.1.2 **INTC 147 Murrayfield Retaining Walls (S21D):**

1) this INTC was issued by the Infraco on the **14/10/2008** (**Doc01**[1]).

2) The IFC itself was issued on **01/08/2008**.

3) The INTC was therefore issued circa **74 calendar days after IFC issue**.

4) The Estimate for same was issued on **13/08/2009** (**Doc02**[2]) i.e. **303 days** after the INTC and around **281 calendar days** later than required by the Contract.

5) As a consequence, the overall INTC / Estimate process took the Infraco around **377 calendar days from issue of IFC**.

1.1.3 **INTC 414 Murrayfield Stadium Underpass (S21C):**

1) this INTC (including the corresponding Estimate) was issued by the Infraco on the **16/06/2009** (**Doc03**[3]).That Estimate however included a combined Estimate for Russell Road Underbridge and Murrayfield Stadium Underpass. tie required that the Infraco split the Estimate into the relevant structures.

2) the initial IFC was issued on 25/07/2008, the latest IFC was issued on **20/01/2009**.

3) The INTC (and Estimate) was therefore issued circa **147 calendar days after the latest IFC issue**.

4) The split Estimate for same was submitted on **03/09/2009** (25.1.201/CF/3418 – **Doc04**). **79 days** after the initial combined Estimate.

5) A further Estimate was submitted for same (now covered under INTC667a) on **29/10/2010** (25.1.201/GMD/C/02/7256 – **Doc05**). This was **421 days** after the split Estimate.

6) As a consequence, the overall INTC / Estimate process has taken the Infraco around **647 calendar days** from issue of IFC.

[1] 25.1.201/IO/683
[2] 25.1.201/IO/3273
[3] 25.1.201/CF/2833

1.1.4 Those periods from IFC to Estimate issue are considered to be highly unreasonable and contrary to the Infraco's obligation to proceed with the Infraco Works with due expedition. It is also concerning in that it is difficult to be certain that the current list of (known) INTC's is a comprehensive / exhaustive list thereby reflecting / capturing all Changes considered by the Infraco to flow from the IFC process.

1.2 Infraco Letter dated 11 December 2008

1.2.1 The Infraco's letter ref. 25.1.201/MRH/1134 (**Doc06**) provides some 'insight' into its 'IFC to INTC' processes and timescales (up to and including the provision of the corresponding Estimate). The timescales set out therein however (ranging from 17 to 22 weeks) are significantly longer than appears either reasonable or necessary. Certainly the periods quoted are at odds with the requirements of Clause 80 (initially 18 business days).

"4 Infraco Default" (e): Failure to produce Estimates - INTC 625

1.1 INTC 625: (Murrayfield Corridor RW's Ground Improvement)

1.1.1 INTC 625 was issued on the **28/07/2010** (**Doc01**[1]), under the heading of '*Murrayfield Corridor Retaining Walls Ground Improvement*'. As at that date a period of **673 days** had elapsed beyond the date on which the Infraco had originally planned to commence foundation works to Murrayfield Retaining Walls (S21B)[2] (i.e. beyond 23/09/08).

1.1.1.1 INTC 625 was the subject of discussion between the Parties at a meeting held on the 13/08/2010. In the Infraco's letter dated 03/09/2010[3] specific reference was made to a proposed solution for same to be discussed with **tie**'s Colin Neil during week commencing 13/09/2010.

1.1.1.2 In its letter dated 21/12/2010 (**Doc02**[4]) **tie** instructed the Infraco to proceed with the works with due expedition, pursuant to clause 34.1. In doing so it stated that that the Infraco's failure to submit an Estimate was preventing the works from progressing to Murrayfield Retaining Wall S21B.

1.1.1.3 The Infraco finally submitted its Estimate (containing 3no. options for **tie**'s instruction) on **20/01/2011** (**Doc03**[5]). Notably that Estimate was submitted **154 days** later than the 18 days provided by the Contract.

1.1.1.4 **Note 1:** This INTC is a key element in unlocking commencement in Section 5A. Resolution of INTC 625 is also likely to have a consequential effect on INTC's 106, 109, 147 & 667/667a. While the contractual process now (but only very recently) requires **tie** action, it is notable that **tie**'s ability to close out this issue was both dependent on and hindered by the (late) receipt of the relevant Estimate for INTC 625.

1.1.1.5 **Note 2:** there is also a question about whether the Estimate as submitted was as complete as it could / should have been given the time taken to produce same, inasmuch as certain options put forward require *further* site investigation work.

1.2 Chronology of Events surrounding INTC 625 (for information)

1.2.1.1 Preceding events in the period 23/09/08 (planned commencement of foundations) to 28/07/10 (the issue dated of INTC 625) can be summarised as follows:-

1) Prior to the commencement of groundworks to the Murrayfield Railway Corridor the Infraco was aware that ground investigation works were required. Note 13 of the IFC drawing

[1] Infraco letter ref: 25.1.201.BOc.6329
[2] Rev 01 Programme Updated for V31 & Mitigation
[3] Infraco letter ref: 25.1.201/SN/6630
[4] Infraco letter ref: INF CORR 6969/SBa
[5] Infraco Letter ref: 25.1.201/GA/7871

ULE90130-05-RTW-00441 Rev 11 dated **25/07/2008** with respect to the Railway Corridor (amongst other things) states:

"Field Dynamic Testing should be undertaken to prove the minimum thickness of competent strata of 6m below formation level..."

2) We understand from tie that the Infraco did undertake ground investigations circa August / September 2008 but refused to provide **tie** with results flowing from same. Evidence re same has yet to be located.

3) In its letter dated 18/06/09[6] tie addressed this point noting that it had not yet received details of proposed ground improvement measures.

4) Further Ground Investigations were carried out on the 11/03/2010 (by Raeburns) on behalf of the Infraco.

S) Following analysis of the Ground Investigation results, the SDS provider informed the Infraco that the depth of soft deposits below the plan areas of priority structures S21B to S21D was greater in certain areas than that interpreted from the original Ground Investigation Data available to SDS at the time of the Detailed Design.

6) Consequent to the above the Infraco concluded that the foundation details for the Murrayfield Underpass (S21C) and the Murrayfield Reinforced Earth Retaining Walls (S21B) & (D) required revision.

7) Subject to that opinion on 28/07/2010 the Infraco issued INTC 625. In doing so the Infraco requested an extension of time (of 10 weeks) to return an Estimate.

1.2.1.2 As at 23/02/2011 resolution has yet to be reached on the above. Furthermore, resolution of INTC625 (and the choice of soil stabilisation adopted) *may* result in the release of further IFC drawings and, as a consequence, further / additional INTC's for this and other adjacent structures.

[6] tie letter ref: INF CORR 1684/TC

BILFINGER BERGER Civil

SIEMENS

CAF

Bilfinger Berger–Siemens– CAF Consortium

BSC Consortium Office
9 Lochside Avenue
Edinburgh Park
Edinburgh
EH12 9DJ
United Kingdom

Phone: [redacted]
Fax: +44 (0) 131 452 2990

Our ref: **25.1.201/BOc/6329**
Your ref:

28 July 2010

Bilfinger Berger Civil EDI			
Date Sent	28 JUL 2010 BW		
File Number			
Action			
Distribution			

tie limited
CityPoint
65 Haymarket Terrace
Edinburgh
EH12 5HD

For the attention of Steven Bell – Tram Project Director

Dear Sirs,

Edinburgh Tram Network Infraco
Infraco Contract – Infraco Notification of tie Change (INTC) No 625
Murrayfield Corridor Retaining Walls Ground Improvement

We have been notified by the SDS Provider that the additional GI information provided by BSC to SDS demonstrates that the depth of soft deposits below the plan areas of Structures S21B to S21D are greater in certain areas than interpreted from the original GI data available to SDS at the time of Detailed Design.

As a consequence of the above, the foundation details for the structures and reinforced earth retaining walls require to be revised to account for the different ground conditions.

We have raised an INTC number 625 for this Change, and confirm that we require an extension of 10 weeks for return of the Estimate due to the requirement to procure a method of stabilization from a specialist groundworks contractor to meet the performance requirements of the Specification.

Yours faithfully,

[redacted]

M Foerder
Project Director
Bilfinger Berger Siemens CAF Consr

cc: SRo, MHu, DGo

Privileged and confidential – prepared in contemplation of mediation
FOISA exempt

Privileged and confidential – prepared in contemplation of mediation
FOISA exempt

Edinburgh Trams

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

Our Ref: INF CORR 6969/SBa

Your Ref:
25.1.201/KDr/6830

Date: 21 December 2010

Dear Sirs,

Edinburgh Tram Network- Infraco
Infraco Contract – Cessation of Works
Section 5A - INTC 106 - IFC Drawings Murrayfield Retaining Wall S21B

We refer to BSC letter reference 25.1.201/KDR/6860 dated 29 September 2010 and tie letters reference INF CORR 6358, dated 04 October 2010 and reference INF CORR 6441/SC, dated 13 October 2010.

You notified us in your letter (reference 25.1.201/KDR/6860) that you will "cease work" on works associated with the INTCs listed in your letter, which includes INTC 106.

We do not accept that the works associated with INTC 106 are a Notified Departure. You have never demonstrated that the facts and circumstances are such as to amount to a Notified Departure.

You have not responded to the email sent on the 15th October 2010 from S. Bateman (tie) to G. Angus (Infraco) in respect of the status of INTC 106 and requesting your confirmation of availability to attend a meeting to review the alleged INTC.

Notwithstanding that we hold that you are in breach of your obligations to proceed with the Infraco Works with due expedition, we have instructed you by letter dated 13th October 2010 (reference: INF CORR 6441/SC) to proceed with the works associated with INTC 106 forthwith. We again instruct you pursuant to Clause 34.1 to proceed with the works in question with due expedition.

Citypoint Offices, 65 Haymarket Terrace, Edinburgh, EH12 5HD
Tel: +44 (0) [redacted] Email: info@edinburghtrams.com Fax: +44 (0) 131 623 8601 Web: www.edinburghtrams.com

In addition we refer to INTC 625 (Murrayfield Corridor Retaining Walls Ground Improvement) which was submitted under cover of letter dated 28th July 2010 (reference 25.1.201/BOc/6329).

A meeting was held on the 13th August 2010 between tie and BSC to review and discuss the contents of INTC 625. Following the meeting BSC confirmed under cover of letter dated 3rd September 2010 (reference 25.1.201/SN/6630) that an Estimate would be submitted on the 6th October 2010. As of the 16th December 2010 no Estimate has been received.

The failure by BSC to submit an Estimate against INTC 625 in accordance with clause 80.4 of the Infraco Contract is preventing the works to Murrayfield Retaining Wall S21B.

We also note that you are not progressing the site clearance works associated with Murrayfield Stadium Retaining Wall S21B (which do not form part of INTC 106), in breach of your contractual obligations. We instruct you pursuant to clause 34.1 to proceed with these works with due expedition.

Yours faithfully,

[redacted]

Steven Bell
Project Director

Privileged and confidential – prepared in contemplation of mediation
FOISA exempt

Bilfinger Berger–Siemens– CAF Consortium

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9 Lochside Avenue
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Phone: [redacted]
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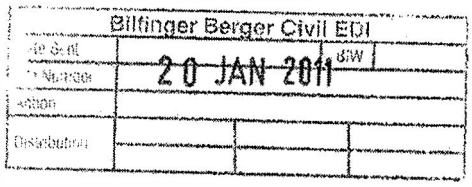
Our ref: **25.1.201/GA/7871**



19 January 2011

tie limited
CityPoint
65 Haymarket Terrace
Edinburgh
EH12 5HD

For the attention of Steven Bell – Project Tram Director

Dear Sirs,

Edinburgh Tram Network Infraco
Infraco Notification of tie Change (INTC) No. 625
Murrayfield Corridor Ground Improvement

We refer to the above and attach herewith initial details of three solution options together with our estimate (VAT exclusive) for each.

The options, together with estimate values, are as follows;

a)	Trenchmix only **(pages 00-68)**	£773,672.74
b)	Trenchmix (S505, S21C&B) and Vibro-columns (S21D) **(see pages 69-90)**	£750,709.05
c)	Vibro-columns only **(see pages 91-99)**	£601,618.74

We draw your attention to the clarifications / exclusions contained within the Infraco estimates, in particular the provisional nature of the estimate values at this time.

We would at this stage recommend proceeding with Option C , but would advise that some advance works, testing and design are required in order to finally determine the suitability of this solution. Whilst an allowance is made for these costs within the estimates, in the event that it is not possible to fully implement Option C, there may be abortive costs and a requirement to adopt a less economical solution in certain areas.

It is our intention to discuss these options with yourselves and jointly advance a solution that is to our mutual benefit. Clearly however, progression of works is entirely dependant upon issue of appropriate tie Change Orders and we look forward to receiving your full co-operation in this regard.

Please contact our Mr Brian Walker or Graeme Angus at your earliest convenience to arrange a meeting to discuss these proposed solutions and to facilitate progressing of further works.

Yours faithfully,

[redacted]
M Foerder
Project Director
Bilfinger Berger Siemens CAF Consortium

cc: DG, KR, JD, CG, PS (Siemens), DS (CAF)

Enc: Estimate for INTC 625: Options A, B & C

[redacted]

BILFINGER BERGER UGER SIEMENS SIEMENS HF CAF

EDINBURGH TRAM NETWORK : INFRACO CONTRACT : ESTIMATE SUMMARY

INTC Nr		625	
BRIEF DESCRIPTION		Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)	
PRE ESTIMATE SUBMISSION INFORMATION			
1	Origin of Change	tie Notice of Change issued under Clause 80.1	
		Deemed tie Change under Schedule Part 4	✓
		Mandatory tie Change under Schedule Part4 paragraph [3.1]	✓
		tie or tie Representative instruction considered to be a tie Change under Clause 80.20	
2	Clause 80.2.1	Details of tie Change upon which the Estimate is based	None provided.
3	Clause 80.2.3	Have tie set out how they wish to pay for the proposed tie Change?	No.
4	Clause 80.2.4	Have tie set out any changes they believe are required to the terms of the Agreement?	No.
		Have tie set out any changes they believe are required to the terms of the SDS Contract?	No.
5	Valuation Method	Clause 80.6.1 Rates and Prices for similar work in App F to Schedule Part 4 (Pricing)	✓
		Clause 80.6.2 Deduced Rates and Prices	
		Clause 80.6.3 Fair Rates and Prices	✓
		Clause 80 6.4 Actual Cost	✓
6	Clause 80.3	Was an Extended period of time requested for the return of the Estimate?	No.
THE OPINION OF THE INFRACO on			
7	Clause 80.4.1	Whether relief required from compliance with any Infraco obligations under the Agreement?	No
8	Clause 80.4.2	Any impact on the performance of the Infraco Works and the performance of the Edinburgh Tram Network?	None required.
9	Clause 80.4.3	Any impact on the Programme and any requirement for an extension of time	It is likely that the increased scope of works will have an impact on programme. Impact excluded from this estimate.
10	Clause 80.4.4	Any Consents and/or Traffic Regulation Orders (or any amendment or revision required to existing)?	No
11	Clause 80.4.4	Any update of the Consents Programme required?	No
12	Clause 80.4.5	Any new 3rd Party agreements required?	No
13	Clause 80.4.6	Any amendment required to the Agreement or the Key Subcontracts?	No
14	Clause 80.4.7	Proposed method of delivery of the proposed tie change	As Approved Infraco Proposals and Method Statements
15	Clause 80.4.8	Proposals to mitigate the impact of the proposed tie change	To be assessed following review of impact on programme.
16	Clause 80.4.9	Confirmation of changes to the terms of the Agreement and/or the SDS Contract proposed by tie and any further changes necessary to give effect to the proposed tie change	None required.
THE ESTIMATE SUBMISSION			
17	Clause 80.7.1	Evidence of endeavours to minimise any increase in costs and to maximise any reduction of costs	Alternative design solutions considered / to be considered.
18	Clause 80.7.2	Evidence that, where required, appropriate and practicable, we have sought competitive quotes	Package Contractor considered a number of suppliers and their technical solutions, adopting to proceed with best technical and commercial assessed solution.
19	Clause 80.7.3	Evidence that Infraco has investigated how to mitigate the impact of the tie Change	To be assessed following review of impact on programme.
20	Clause 80.7.4	Evidence that the tie Change will, where relevant, be implemented in the most cost effective manner	Change valued per Cl 80.
21	Clause 80.11	Whether the tie Change requires a change in respect of Design work to be carried out by SDS?	Yes
22	Supporting Information	Appendix A - Drawing Register	✓
		Appendix B - Programme	✓
		Appendix C - Derived Rates	✓
		Appendix D - Other Supporting Information	✓

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Edinburgh Tram Project
INTC 625 Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)

Summary of Changes Identified

Item	Brief Description		Amounts Infraco	Further Comment
1	Trenchmix walls solution		£ 416,778.72	
2	Attendances		£ 76,327.17	
3	SDS Design Costs		£ 20,000.00	
4	Sheet Piling		£ 45,079.92	
5	Temporary Works design (sheet piling)		£ 20,154.24	
	Construction Works Value		£ 578,340.06	
	Head Office Overheads and Profit on elements of Actual Cost for Civil Engineering Works	10%	£ 51,326.01	
			£ 629,666.07	
	Consortium Preliminaries	7.40%	£ 42,797.16	
	Other Preliminary Elements	17.50%	£ 101,209.51	
	Estimate Total		**773,672.74**	

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Edinburgh Tram Project
INTC 625 Section SA - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)

Estimate

Item	Description	UNIT	Quantity BDDI	Quantity IFC	Quantity +/-	Unit Rate	Unit Rate Source	Value BDDI	Value IFC	Value +/-	Item Allocation	Comment
1	Trenchmix Solution (measured by volume of ground to be improved, ref drg RTW-992 rev 2)	m3		11,352.00	11,352.00	36.71	Derived from forecast Actual Cost, see Appendix C		416,778.72	416,778.72	1	
2	GC attendances for Bachy Soletanche(measured by volume of ground to be improved, ref drg RTW-992 rev 2)	m3		11,352.00	11,352.00	6.72	Derived from forecast Actual Cost, see Appendix C		76,327.17	76,327.17	2	(GC) Graham Construction
3	SDS Design Costs	Sum		1.00	1.00	20,000.00	Indicative, ref A Dolan		20,000.00	20,000.00	3	
4	Sheet Piling	m2		696.00	696.00	64.77	Sch 4 page 206 item 51		45,079.92	45,079.92	4	
5	Temporary Works design (sheetpiling)	Sum		1.00	1.00	20,154.24	Derived from forecast Actual Cost, see Appendix C		20,154.24	20,154.24	5	
	Total to Summary Page								578,340.06	578,340.06		
	Estimate Summary Page											
	Construction Works Value								578,340.06	578,340.06		
	Head Office Overheads and Profit on elements of Actual Cost for Civil Engineering Works						Sch 4 Appendix G Cl 1.3 (a)	10%		51,326.01		Applied to Items 1, 2 & 5
	Head Office Overheads and Profit on elements of Actual Cost for Systems and Track Works						Sch 4 Appendix G Cl 1.3 (b)	17%				
	Estimate Sub-total									629,666.07		
	Consortium Preliminaries						Sch 4 Appendix G Cl 1.3	7.40%		[illegible]		
	Other Preliminary Elements						Minute of Variation	17.50%		101,209.51		
	EstimateTotal									[illegible]		

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Clarifications / Exclusions

1 Unless listed below, any exclusions / qualifications / assumptions detailed within Graham Construction (GC) letter 17/12/10 are not applicable to this estimate and are deemed to be catered for within the BBUK Risk provision.
2 Infraco has used best endeavours to provide an accurate estimate for consideration and discussion. Pending selection / finalisation of ground improvement option, the estimate is to be considered Provisional in all respects,
3 It is confirmed that Infraco has used all reasonable endeavours to establish suitability of proposed design solution using the information available and included within the estimate submission. However should for any reason whatsoever, during the evolution of the design up to and including issue of IFC drawings or during the progress of ground improvement works, the proposed solution changes or is rendered unsuitable, it may be necessary for Infraco to withdraw or amend its estimate.
4 Please note that the quotation provided by our Subcontractor remains open for acceptance until 31 May 2011. Beyond this date, it may be necessary to withdraw or amend the Infraco estimate.
5 It is assumed ground improvement works will be undertaken in one visit to site.
6 No provision within the estimate for disposing of surplus material or contaminated material. It is currently anticipated that there will be no requirement for same.
7 Estimate and proposed solution assumes acceptance by SDS and any other relevant party of the technical Considerations listed within the Bachy Soletanche proposal.
8 It is assumed that there will be no restrictions placed on the proposed method of working by external parties, for example Network Rail or SRU. In respect of Network Rail, our current opinion is that the ground improvement works, including temporary works, can be undertaken in a 'fail safe' manner, without need for Possession working / nighttime working etc. It is assumed that any Rail Protection staff / Rail Monitoring costs will be paid for by tie under INTC 640.
9 Proposed ground improvement solution has been developed from SDS response to TQ1809, which includes drawing ref ULE90130-GS-RTW-00992 Rev 2. For clarity, we confirm that a trenchmix solution is allowed for within the areas denoted as 'Dig out and replace' as it is considered that this provides the most cost effective solution.
10 No provision within the estimate for dealing with services of any nature, known or otherwise. It is assumed these will be dealt with separately under other INTC's.
11 It is acknowledged that there may be a requirement to adjust / amend estimates provided for other INTCs, e.g. to take account of conflicts with ground improvement commencement levels and earthworks detailed on structures drawings.

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Appendix A

Edinburgh Tram Project
INTC 625
Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)
Drawings Used in the preparation of the Estimate

Item	Drawing Number	Status	Comments
	ULE90130-05-RTW-00992 Rev 2	IEA	

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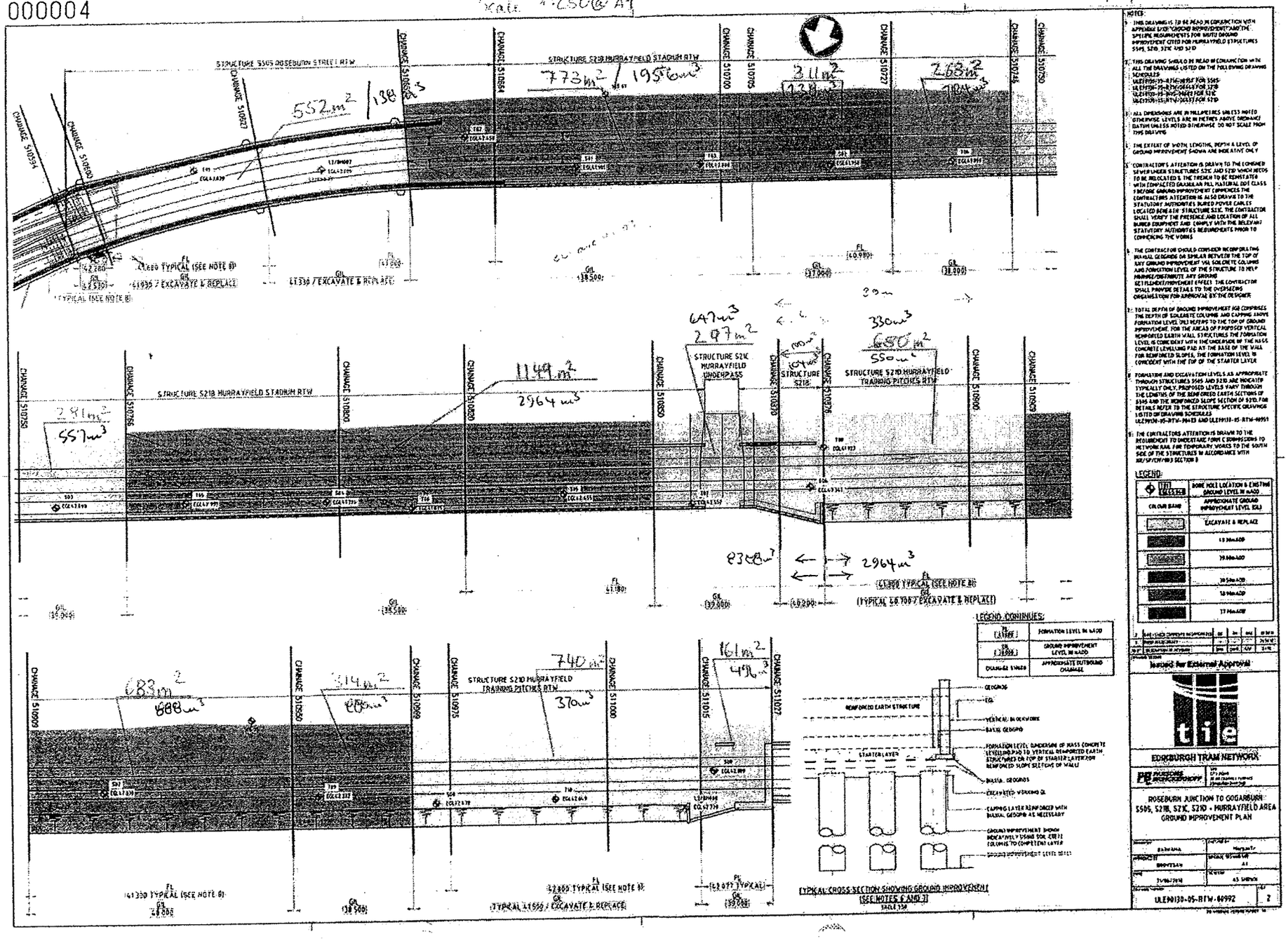

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Appendix B

Edinburgh Tram Project
INTC 625
Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)

Programme Information

It is likely that the additional scope of works will have an impact on programme.
Programme impact is excluded from this estimate.

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Edinburgh Tram Project Appendix C

INTC 625

Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)

Derived Rates

Item	Description	Quantity	UNIT	Rate	Total
1	Trenchmix Solution				
	a refer Graham Construction letter 17 Dec, incorporating Bachy Soletanche quotation dated 23/11/2010	1	Sum	£248,855.00	£248,855.00
	b Graham Construction O&P	12.5%			£31,106.88
	c BBUK Risk (to lump sum)	10%			£27,996.19
					£307,958.06
	Divide by volume associated with footprint between chainage 510594 to 510876		m3		8388
	Rate per m3				**£36.71**
2	Grahams Construction attendances for Bachy Soletanche, refer GC letter 17/12/10.				
	a Piling platform	1	Sum	£13,069.80	£13,069.80
	b Drainage / Pumping / Ground water control, allow £5k set-up/demob £1.5k per wk running costs, say	1	Sum	£10,000.00	£10,000.00
	c Water supply , incl deliver etc	1	Sum	£20,860.00	£20,860.00
	d Machine in attendance	1	Sum	£1,644.50	£1,644.50
	Graham Construction O&P	12.5%			£5,696.79
	BBUK Risk (to lump sum)	10%			£5,127.11
					£56,398.20
	Divide by volume associated with footprint between chainage 510594 to 510876		m3		8388
	Rate per m3				**£6.72**
5	Temporary Works design (sheet piling), refer Graham Construction letter 17/12/10 .				
	a Tony Gee costs	1	Sum	£17,914.88	£17,914.88
	b Graham Construction O&P	12.5%			£2,239.36
	Sum				**£20,154.24**

* Estimate from GC letter 17/12/10, with Infraco comments added *

Change Estimate for Ground Improvement between Ch 510,594 - 510,876
S238 / S21C and S505 Work Package (Part)

GRAHAM Construction

Costs Item	Description	Qty	Unit	Rate	Total		Infraco Comments
	Sheet Piles Works						
	In accordance with Drg S109019/SK/E21/SK7 Rev D and S109019/SK/E21/SK3/Rev D						
	Ch 510,620 - Ch 510,664 - 44m of 9m long sheet piles = 396m2						
	Ch 510,664 - Ch 510,700 - 36m of 4.5m long sheet piles = 162m2						
	Ch 510,700 - Ch 510,720 - 20m of 5.5m long sheet piles = 138m2					Extent to be determined once regrading carried out on site	
	Establishment of piling Plant	1	sum	10,672.00	~~10,672.00~~	refer to SPI Quote (see NOC 013)	Use Schedule 4 rate - Infraco estimate
	Supply and Install sheet piles	696	m2	98.90	~~68,834.40~~	refer to SPI Quote (see NOC 013)	Use Schedule 4 rate - Infraco estimate
	Establishment of piling plant for extraction	1	sum	6,786.00	~~6,786.00~~	refer to SPI Quote (see NOC 01 3)	Use Schedule 4 rate - Infraco estimate
	Extract Sheet piles	696	m2	10.10	~~7,029.60~~	refer to SPI quote (see NOC 013)	Use Schedule 4 rate - Infraco estimate
	Insurances	3%	%	93,272.00	~~2,798.16~~	refer to SPI quote (see NOC 013)	Use Schedule 4 rate - Infraco estimate
	Credit for return of sheet piles returned in re-usable condition	696	m2	61.80	~~43,012.80~~	Subject to remeasurement based on qty returned in re-usable condition	Use Schedule 4 rate - Infraco estimate
	Bachy Soletanche						
1	Construct Trenchmix Walls including design development, mobilisation and testing	1	sum		248,855.80	This element of the quotation is submitted on back to back basis with Bachy's quotation and is subject to any clarifications, exclusions, technical considerations etc as stated within the Bachy Soletanche Proposal	Included in Infraco estimate
2	Standing time for rig and crew due to delays beyond our control		hr	111.00		Rate Only	Obstructions - separate INTC
3	Develop Design	1	sum	5,000.00	-	Included within item 1 if works proceed - chargable if completed and works do not proceed for whatever reason	Infraco estimate to be qualified.
4	Pre-works Binder Testing	1	sum	10,000.00	-	Included within item 1 if works proceed - chargable if completed and works do not proceed for whatever reason	Infraco estimate to be qualified.
	GC Attendances on Bachy Soletanche						
	Provision of platform for piling and soil mixing work = 106m x 10m x 0.50m thick	530	m3	24.66	13,069.80	Provisional Subject to Design - Sch 4 Pg 135 Item	Included in Infraco estimate.
	Pumping / Drainage / Groundwater Control	1	item	Excluded	Excluded		Make allowance within Infraco estimate.
	Delivery of Tanker	1	item	420.00	420.00	Refer to attached Truck Plant Services Quotation	Included in Infraco estimate.
	Water Supply - 4 weeks x 6 days x £840 day (2 nr 25,000ltr tankers per day @ £420)	24	days	840.00	20,160.00	Refer to attached Truck Plant Services Quotation	Included in Infraco estimate.
	Flygt uplift and clean of tank	1	item	280.00	280.00	Refer to attached Truck Plant Services Quotation	Included in Infraco estimate.
	Spoil Removal / waste management - 13 tonne machine	50	hours	32.89	1,644.50	Digger attendance	Included in Infraco estimate.
	Design Costs						
	Tony Gee Design Costs - costs to date	1	sum	12,914.88	12,914.88		Included in Infraco estimate.
	Tony Gee design costs - to finalise design etc and deal with approvals	1	Sum	5,000.00	5,000.00	Provisional Sum	Included in Infraco estimate.
	Line monitoring	1	Item	10,000.00	~~10,000.00~~	Provisional Sum - As per NOC 13	Covered by INTC 640, separate.
	Staff Time						
5	Staff Time associated with pricing of change	1	Item	15,434.09	~~15,434.09~~		Disallowed
	Risk						
6	Risk Allowance	4.50%	Item	346,905.83	~~13,876.23~~		Disallowed risk not specified.
	Programme Implications / Costs						
7	Programme Implications / Costs				TBA	Est requested to review programme implications	Infraco estimate to be qualified.
	Total				~~394,711.81~~		
	Overheads and Profit @ 12.5%	12.50%	%	379,277.77	47,409.72		% applicable where GC rates / prices used.
	Extra over Value of Proposed Change:				442,121.54		

Qualifications / Clarifications / Exclusions:

1. Change Estimate has been prepared on the basis of a wall 282m in length from Ch 510594 to chainage 510876 as indicated on drawing ULE90130-05-RTW-00992 rev2 and assumes that the commencing platform will nominally be 41m AOD
2. This Change Estimate is prepared based on soils information provided in "Bilfinger Berger UK Ltd, Edinburgh Tram Project Murrayfield Section, Report on Ground Investigation, Contract No. 20920 (12 August 2005)
3. This Changes Estimate if valid for works complete by the end of May 2011
4. This Changes Estimate has been prepared on the basis of one visit to site to complete the works. Any additional works will be additional to the attached quotation.
5. All qualification, clarifications etc included within Bachy's rates apply equally to this change estimate
6. We would refer you to the Technical Considerations within the attached Bachy Soltanche Proposal.
7. Change Estimate is provided subject to NWR approval of proposed Scheme and technique - Estimate would be revised to incorporate any NWR requirements
8. This change Change estimate is prepared on the basis of ground improvement up to underside of S238 wall foundation.
9. Priced in accordance with TQ1809 as superseeded by Drg ULE901 30-05-RTW-00992 Rev 2 as superseeded by Bachy Soltanche quotation attached
10. Please note this change estimate and proposal is not compliant with TQ1809 Section 5 Stabilisation Strategy 5.1 Performance Requirements in relation the minimal settlement criteria.
11. Change estimate has been prepared on the basis that the water table is at such a level to allow proposed technique to be successful. Any drainage or groundwater control will be additional to this change estimate

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Appendix D

Edinburgh Tram Project
INTC 625
Section 5A - Murrayfield Corridor Ground Improvement (Chainage 510594 to 511027)

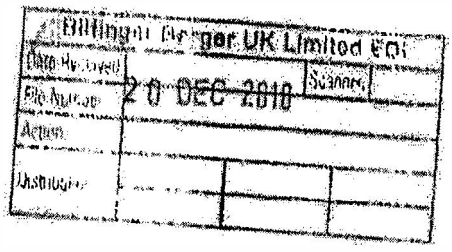
Other Supporting Information

1 Graham Construction letter of 17 December 2010 ref BN/Site/S21B/CE
2 SDS response to TQ 1809

000009

GRAHAM
CONSTRUCTION

Lochside House
Lochside Way
Edinburgh Park
Edinburgh
EH12 9DT



Our Ref: BN/Site/S218/CE
Your Ref:

17 December 2010

Bilfinger Berger Civil UK Ltd
BSC Consortium Office
9 Lochside Avenue
Edinburgh Park
Edinburgh
EH12 9DJ

For the attention of Mr Martin Foerder

Edinburgh Tram Network – Ground Improvement Proposal – Ch 510,594 – Ch 510,876

Dear Sir,

Please find enclosed our Change Estimate in respect of the Ground Improvement Proposal currently under consideration between Ch 510,594 – Ch 510,876 for your information.

This Change Estimate has been developed based on the response to TQ 1809, subsequent drawing ULE90130-05-RTW-00992 and as superceeded by Bachy Soletanche Ltd letter and proposal ref P29851. Our Change Estimate has developed on a back-to-back basis with the Bachy Soletanche Ltd proposal and is submitted subject to the conditions, preamble, commercial clarifications and technical considerations included within said proposal.

We have not yet considered the programme implications of this proposed change and we will advise of any implications and associated costs following agreement of final proposal.

We would welcome the opportunity to meet and discuss this further however in the interim if you have any further queries or require any further information please do not hesitate to contact the undersigned.

Yours faithfully
for John Graham (Dromore) Limited

[redacted]
Jonny Kerr
Project Manager

Telephone:
Mobile: [redacted]
Email: jonny.kerr@graham.co.uk

Enc: Change Estimate, Bachy Soletanche Ltd letter P29851 and attachments, ULE90130-05-RTW-00992 Rev2, TQ1809, S109019 SK02 Rev D, S109019 SK03 Rev D, SPI Quote dated 09/06/10, Water Tanker Quote

Copy: Jane MacDonald - Bilfinger Berger UK (email only)
Graeme Angus – Bilfinger Berger UK (email only)
Brian Walker – Bilfinger Berger UK (email only)
John Rainey - GRAHAM Construction (email only)

000010

Colin McKeever - GRAHAM Construction (email only)
Barry Green - GRAHAM Construction (email only)
Craig Letson - GRAHAM (email only)
File - HQ (email to Tracy McConville) and Site (File Ref: 1A)

Project Site Address:
GRAHAM Construction, Edinburgh Trams Project Office, 16 Russell Road, Edinburgh, EH11 2DJ

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[illegible]

000012

MASTER SHORT TENDER - CFA PILING (amended July 2008)

Tender Reference : P29851

Tender Title : **Edinburgh Tram - Murrayfield Retaining Walls**

Tender Date : 23 November 2010

000013

Our Ref: P29851

23 November 2010

Graham Construction

Edinburgh Tram Project Office
16 Russell Road
Edinburgh
EH12 5NE

For the Attention of Jonny Kerr

Dear Sirs

Edinburgh Tram - Murrayfield Retaining Walls

We thank you for your recent enquiry for ground improvement in connection with the above project and have pleasure in submitting our proposals for the works.

Our tender comprises of the contents of this letter together with the attached Bill of Quantities, Commercial Clarifications, Technical Considerations, the FPS Schedule of Attendances and Facilities.

This price, which is exclusive of VAT, and on a fixed price basis for works complete by the end of May 2011 unless withdrawn by us in writing within that period.

We have assumed that the wall is 282 linear metres in length and runs from chainage 510594 to chainage 510876 as indicated on drawing ULE90130-05-RTW-00992 rev2.

This tender is based on the soils information provided in the enquiry, i.e.Bilfinger Berger UK Ltd, Edinburgh tram Project Murrayfield Section, Report on Ground Investigation, Contract No. 20920 (12 August 2008).

This offer is made on the basis of Edinburgh Tram: Structure 21B and 21D. Murrayfield Reinforced Earth Embankment/Retaining wall, Ground stabilisation/improvement specification and the contents of this letter.

We have priced to complete our works in one uninterrupted visit to site. We would expect to complete the foundation construction within 3 working weeks and require an additional week for mobilisation and demobilisation of our equipment at site.

This tender is subject to the availability of plant, materials and personnel at the time an order is to be placed and is conditional upon a satisfactory site visit once accesses and platforms have been formed.

We trust that this tender will be of interest and would be happy to meet with you to discuss it in detail, if you would like to discuss any aspect of this letter please contact Phil Myles (phil.myles@bacsol.co.uk mob. [redacted]

Yours faithfully

Phil Myles

PREAMBLE

- We have based the lump sum price on a wall 282m in length and assume that the commencing platform level will nominally be 41m AOD we retain the right to review our price if the as built dimensions are different from these assumptions.
- **Standing Time** - Defined as time lost during our site working hours for reasons outwith our control excepting breakdowns or for time dealing with obstructions. The time will be recorded from cessation of normal working until normal working is resumed.
- **Items 3&4 on Bill of Quantities** – We will require payment for our time and effort if we are instructed to carry out design work or binder testing (which will be required to confirm the appropriate soilmix) should the works not proceed or be awarded to a different contractor than BSL.

Bill of Quantities

ITEM NO	DESCRIPTION	QTY	UNIT	RATE	£ p
1	Construct Trenchmix Walls including design development, mobilisation and testing		Sum		248,855.00
2	Standing time for rig and crew due to delays beyond our control		Hr	512.00	Rate Only
3	Develop Design (included within item 1 if work awarded to Bachy Soletanche)		Sum	5,000.00	Rate Only
4	Pre-works Binder Testing (included within item 1 if work awarded to Bachy Soletanche)		Sum	10,000.00	Rate Only
				TOTAL PRICE	£248,855.00

P29851
23 November 2010

Commercial Clarifications

C.1 This offer is made on the condition that we enter into a contract with you (referred to hereafter as the "Client") under a JCT 2005 Standard Building Sub-Contract (SBCSub/A and SBCSub/C) including any published amendments thereto issued by the JCT up to the date of this offer. This offer shall be a numbered document in the Sub-Contract (hereafter referred to as the "contract") save for paragraphs C.2, C.4 and C.9 below which shall be Articles of the contract and take precedence over the terms included in the contract conditions should they be in, or capable of, conflict

C.2 Unless agreed to the contrary, payment is to be received by ourselves within 14 days of the date of each of our monthly applications. No money shall be deducted by way of retention. A Parent Company Guarantee (PCG) can be provided (if required) from our immediate parent in lieu of retention to cover a maximum of 3% of the contract sum. The PCG will be reduced to 1½% at the anticipated date of practical completion of our work on site. The PCG will become null and void (whether returned to the surety or not) at a date 6 months thereafter

C.3 Subject to paragraph C.4 and notwithstanding any other conditions which may appear in the contract in respect of any alleged breach of contract or otherwise, no deduction or "set off" shall be made from sums due to us without prior notification and submission to us of verified costs. Payment for work carried out under the contract shall not be withheld or reduced as a result of disputes between the Client and any other company within the Bachy Soletanche Holdings (Europe) group of companies

C.4 Notwithstanding any provision of the contract:

C.4.1 our total aggregate liability in contract, tort, for breach of statutory duty or otherwise under and in connection with the contract for costs, losses, expenses, damages or any other liability the Client may incur or be liable for including for delay pursuant to paragraph C.4.2 below shall not exceed the total aggregate amount of 10% of our tender sum provided always that we shall not be liable for any loss of actual or anticipated profit or any indirect, special or consequential cost, expense, loss or damage; and

C.4.2 our total aggregate liability for delay under or in connection with the contract shall not exceed the total aggregate amount of £1,000.00 per week or 1% of our tender sum whichever is the lower unless agreed otherwise in writing prior to contractual commitment.

C.5 The wording of any form of Warranty or Bond (if required) in respect of the works must be agreed by us prior to contractual commitment. Unless expressly stated elsewhere in this offer, the cost of providing a warranty or bond is not included in the tender sum.

C.6 No liability will be accepted for delay or for the cost of remedial works to piles displaced from their required positions by obstructions. Subject to paragraph C.4 above, if any defects are found in any piles, liability will only be accepted for delay or for the cost of remedial works if we have received timely written notification of the defect and provided the opportunity to rectify the defect ourselves.

C.7 No liability will be accepted for any loss or damage to underground walls, structures or services or for loss or damage to adjacent property. Subject to paragraph C.4 above we shall be indemnified in full by the Client for such loss, damage or delays caused unless the cause of such loss or damage relates directly to our negligence.

C.8 Noise, vibration and nuisance will be kept to a reasonable level compatible with normal plant usage to complete the works specified. Typical values may be found in the British Standard Code of Practice for noise control applicable to piling operations: BS 5228, part 4, 1992. If our work programme or methods are to be subjected to further conditions from any source whatsoever, we require to be instructed in writing as to the alternative action we are to take. All additional costs resulting from complying with such instructions shall be reimbursed to us and the period for completion of the works extended as necessary.

C.9 Should the actual ground conditions encountered be different to that referred to in this offer we shall notify the Client as soon as reasonably practical. We shall require to be instructed by the Client on any steps to be taken and reserve the right to seek (1) reimbursement of the additional costs incurred as a result of any changes in the ground conditions and (2) an appropriate extension of time for completion of works.

C.10 Where any opening up for inspection, testing and reinstatement is instructed and the work, the subject of such instruction, is found to be in accordance with the contract, then any costs and expense in respect thereof shall be reimbursed to us and an appropriate extension of time granted for completion of the works.

C.11 Our stated period for completion excludes the following: - Approval periods, notice to commence, delays due to circumstances beyond our control, public and or industry holidays, pile testing and installation of reaction system, integrity testing, variations (including standing or obstruction time) and provisional items

C.12 Our current insurances are as follows; - Employers Liability - £25m, Professional Indemnity - £10m (in the aggregate for any one year), Public Liability - £10m and Contractors All Risks - £5m.

C.13 All plant which is the property of this company shall remain in our ownership but for the purposes of any contract shall be deemed to be hired plant and as such shall not be taken and sold by the Client in an attempt to recover a debt, alleged or otherwise.

C.14 If we are required under the contract to design work then we shall have in respect of any defect or insufficiency in the design the same liability as a contractor who se duty it is to use reasonable skill and care in the preparation of such design.

C.15 The prices in this tender allow for work proceeding during our normal working hours without disruption in an agreed logical sequence commensurate with the particular nature of the works. Our normal working hours are between 0700 - 19.00hrs (Monday – Friday) and 0700 – 1400hrs (Saturday - BSL option)

C.16 We require 3 copies of all relevant and current construction status drawings and schedules 15 working days prior to commencement on site. Later receipt of construction information, whether it incorporates revisions or not, may result in additional design, procurement and/or delay - in such circumstances the Client shall be liable for the additional costs we incur and the period for completion shall be extended appropriately.

C.17 CDM Regulations - If a Pre-tender Health and Safety Plan was not received with your enquiry documents we reserve the right to amend our offer after having received this information.

C18 In the event that health and welfare facilities are not provided by the Client, Bachy Soletanche Ltd will provide basic health and welfare facilities for up to 10 of our employees. This will be charged at a rate of £850.00 / visit for mob/demob and at a supply rate of £425 / week (minimum charge of 4 weeks to apply).

FEDERATION OF PILING SPECIALISTS (May 2006)

COMPANY NAME. BACHY SOLETANCHE LIMITED

CONTRACT NAME [illegible]

TENDER REF [illegible]

SCHEDULE OF ATTENDANCES AND FACILITIES TO BE PROVIDED BY THE CLIENT TO A PILING OR DIAPHRAGM WALLING SPECIALIST

For the purposes of this document the following definitions shall apply:

Specialist	Piling/Diaphragm Walling Specialist
Client	Person directly employing the Specialist
Specialist Works -	Any operation or installation undertaken by the Specialist.
Working Surfaces -	Any platform, ramp, lay-down, storage area or the like required to be used by the Specialist.

The following attendances and facilities shall be provided and maintained at all times (including additional working hours if necessary) for the duration of and in relation to the Specialist Works, free of charge to the Specialist and in a manner so as not to disrupt or restrict the regular progress of the Specialist Works.

1. **Notices and Approvals.** Giving all notices and obtaining all necessary approvals, licences and sanctions, including but not limited to any method statement and/or design submission approvals, planning consents, party wall agreements, wayleaves, easements, possessions, rights of way or access and the like from third parties.

2. **Rates and Fees.** Payment of any rates or fees which may become payable due to occupation of the Specialist Works.

3. **Design Information.** No later than three working weeks (or other period as agreed) in advance of the programmed commencement of the Specialist Works on site, provide the Specialist with complete and final construction issue drawing(s), specification(s), pile/panel load schedule(s) in electronic spreadsheet format, and other relevant information required to undertake the Specialist Works. Any variations to these documents to be notified in the agreed contract in hard copy format.

4. **Existing Services.** Accurate setting out and clear and robust marking or exposing on site the exact location of existing underground/overhead services and providing a drawing on which their positions in line and level are accurately plotted relative to the Specialist Works. Protection, diversion or removal of such services to prevent damage from the Specialist Works. The location and sealing off of all disused pipes or ducts in order to prevent the entry of concrete, grout, slurry or drilling fluids during construction. Subsequent to the foregoing, issue to the Specialist's authorised representative on site a permit to dig or similar document to [illegible]

5. **Obstructions.** Prior removal of overhead, surface or ~~underground obstructions which may impede the Specialist Works and backfilling of excavations and voids with a suitable material which will not obstruct or be deleterious to the works but which will ensure the stability of the Specialist Works and will maintain compliance with Items 11, 12 and 13.~~

6. **Shoring/Underpinning.** Shoring and underpinning as necessary, including the removal, replacement or adjustment of timbering or shoring which may impede the Specialist Works.

7. **Clearance.** The provision of clearance around working positions and protection to adjacent works, structures (including underground structures), third party property and other site boundary constraints, to allow the execution of the Specialist Works.

8. **Fencing, Hoardings, etc.** Hoardings, fences, noise and splash barriers, statutory warnings, signage, lighting or the like as necessary to protect the works, plant, materials, personnel and to provide protection to third party property and members of the general public at or adjacent to the site boundaries. This shall include protection from concrete/slurry splashing, exhaust, oil, grease etc.

9. **Traffic.** Control or diversion of road, rail or water borne traffic, including all necessary arrangements and payment of charges in connection with any road closures, lane rental and/or suspension of parking bays, rail possessions and the like.

10. **Watching.** Provision of security to safeguard the plant, equipment, materials on the site and the Specialist Works.

11. **Access.** Full, free, controlled and uninterrupted access onto the site(s) from hard road to Working Surfaces designed, installed, maintained and repaired as required under Item 13, including protective cons and all other equipment and measures necessary to ensure the safety of pedestrians and to avoid the risk of damage to third party property, including [illegible] services. Such access to facilitate the safe erection, operation and movement on, off and around the site(s) to and between lay-down, working and storage areas, pile/panel positions and test piles/panels, for plant including provision and where necessary relocation of ramps, including to concrete agitators, to a gradient not steeper than 1 in 10.

12. **Hardstanding and Storage Areas.** Provision and subsequent removal of conveniently situated hardstanding and storage areas designed, installed, maintained and repaired as required under Item 13 to facilitate the safe operation and erection of plant and equipment, storage of plant, equipment and materials, offices, sheds and the manufacture of reinforcing cages.

~~13. Working Platform. [illegible]~~

14. **Surface Water and Groundwater.** Any pumping or drainage required to keep the site free of flooding, surface water or any water and slurry arising from the Specialist Works.

15. **Health, Safety and Welfare.** Health, safety and welfare facilities as required to comply with the Construction (Health, Safety and Welfare) Regulations 1996 in particular Regulation 22 and Schedule 6 and any other statutory regulations or rules, orders or regulations of any authority having powers related to the Specialist Works. Such facilities as a minimum to include the supply of drinking water, washing facilities including hot and cold running water, male and female changing/drying and toilet facilities.

16. **Environmental.** Attendances, facilities and licences to comply with environmental legislation and directives or regulations of the Environment Agency and other statutory bodies.

17. **Temporary Lighting.** Background and task lighting to Working Surfaces to allow safe working and safe access and egress and to facilitate execution of the Specialist Works.

18. **Water Supply.** Within the working, storage and preparatory operation areas, potable water supply at mains pressure/take-off points and sufficient for the operations, including (where applicable) charging of bores, bentonite/drilling fluid mixing, concrete/grout mixing and cleaning of plant.

~~19. Electricity. [illegible]~~

~~20. Communication Facilities. [illegible]~~

~~21. Guide Walls. [illegible]~~

22. **Setting Out.** Provision of clear, accurate and robust setting out and levels, checking and maintenance of individual pile/panel positions as necessary throughout the contract, provision of permanent datum points, base lines, standard grid lines as required and as built survey information.

~~23. Checking. [illegible]~~

~~24. Attendant Excavator. [illegible]~~

25. **Spoil Removal and Waste Management.** Classification, removal from site and disposal of excavated or displaced material including arisings, slurry and excess concrete from the Specialist Works in accordance with current legislation, instructions or regulations of the Environment Agency and other statutory bodies including notification to the Environment Agency where arisings are classified as hazardous waste. Classification and disposal from site of wastewater from the Specialist Works (such as concrete washout from agitators) and ready mixed concrete delivery trucks to comply with current legislation, including for filtering or the provision of settlement tanks as appropriate.

26. **Wheel and Road Cleaning.** Manned wheel cleaning facilities and/or road cleaning as necessary.

27. **Protection.** Protection of the works when taken over by other trades or contractors or when the Specialist has left site, whichever occurs first.

~~28. Empty Bore/Panel Reinstatement. Backfilling of any empty bore/panel excavation [illegible] deleterious to the works but which will ensure the stability of the Specialist Works and will maintain compliance with Items 11, 12 and 13.~~

~~29. Building up. [illegible]~~

~~30. Trimming. [illegible]~~

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Edinburgh Tram - Murrayfield Retaining Walls

Technical Considerations

Specification

We can confirm that our tender design is based on achieving the 35 mPa soil stiffness and a 200 kPa bearing pressure plus max settlement of 25mm. It is unlikely that our alternative will confirm with the specification in every respect but it is designed to meet the key performance requirements and we understand that it will be necessary to work with your designer to produce an appropriate specification for the works if you choose this solution. Additionally we confirm that we can provide assistance with load transfer design if you require us to do so.

The typical cross section on the contract drawings state that a biaxial geogrid will be required but our method will only require a uniaxial geogrid which may provide you some saving.

Contamination

An initial look at the information provided in relation to the soil chemistry suggests that there are some contaminants present that could increase the setting time of the cementitious grout but other than this there does not appear to be any reason to be concerned about the overall performanoe of the wall. The petroleum contamination which can also affect slurries appears to be near the surface.

Soil Sample

If we proceed with the works we will require a sample of soil of 250kg representative of the site conditions but not too favourable i.e. containing a reasonable amount of clay so that we can assess setting time and the approprate w/c ration for the soils. We have made an allowance within our price for obtaining this sample.

Quantities

We have taken a view on the working platform level and assume that this is nominally at 41m for the purpose of pricing and we note that the ground improvement depth is variable between approximately 2.5m and 4m depth. This is within the depth range for Trenchmix.

We have based our solution on trenches set 1.25m apart centre to centre and assumed that the centre of the first trench would be at approximately 1,4m from the edge of the railway embankment which is understood to be at the position of the existing stone wall. This spacing will be reviewed as part of the design development.

We accept that there is a risk of striking obstructions in the soil. We are willing to accept the risk of natural obstructions within our offer and may need to move the line of the wall to accommodate obstructions that cannot be removed easily. We will not accept the risk of striking man made obstructions which have not been identified and catered for within our design. We will work with you to design problems out should they occur but we would expect that you will give us appropriate extensions of time and pay our costs should any events of this nature stop the works.

We will require a supply of water to our works each day of minimum 35m3 per shift to assist with mixing and control of dust.

The Trenchmix process requires the excavation of a starter trench to contain the slurry and any excess material caused by the mixing. This trench has a volume of c.0.8m3 per lin metre of Trench. We will excavate this trench and backfill it on completion of the mixing. Dependent on the structure of the soil there may be a slight increase in volume of material in the trench and if this is the case we will require the Main Contractor to dispose of this spoil. We have made no allowance in our tender for any disposal of materials.

The Trenchmix process itself does not produce any untreated spoil.

P29851
23 November 2010

000018

Edinburgh Tram - Murrayfield Retaining Walls

We will require a suitable working surface to track our rig which weighs around 35 tonnes but typically a reasonably sturdy platform suitable for an equivalent sized excavator will be sufficient.

A lay down area will be required for storage of equipment and materials.

P29851
23 November 2010

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Working Platform Certificate (FPS/WPC/3)

Feb 2008

000020

BILFINGER BERGER UK Limited	**Technical Query**	Form : EG1-3 Rev : B Page : 1 of 2

Project: Edinburgh Tram Network	**Date: 19.05.2010**
Section / Work Section 5	**Ref. Number: TQ 1809**
From: Bilfinger Berger Siemens Consortium	
To: PB	**Answer required by: 25.05.2010**

Murrayfeild S21B to S21D

Following site tests bore hole to rock level and Dtp's carried out along Section 05, Murrayfeild S21B to S21D, please find attached our site sketch ref BSC-SK-05-118v1 showing the postions and results of the tests.

Please advise if any the results verify the design intent as indicate and advise of any replacement measures that may be required to satisfy the designer prior to construction.

Signed: W. Hume Name: Wallace Hume

for and on behalf of Bilfinger Berger Civil UK Limited

External Distribution:	**Internal Distribution:**

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BILFINGER BERGER UK Limited	Technical Query	Form: P99-3 Rev: 8 Page: 2 of 2

Reply:

The additional GI information demonstrates that the depth extents of soft deposits below the plan areas of Structures S21B and S21D are greater in certain areas than interpreted from the original GI data available at the time of Detailed Design.

The foundation details for the retaining wall (currently shown on IFC drawings as excavation of soft materials to various depths and replacement with compacted granular fill) will need to be revised to account for the change in ground conditions.

The proposed foundation solution will now comprise ground improvement through a combination of:

1. **Excavation of soft deposits and replacement with compacted granular fill under the supervision of a suitably qualified and experienced geotechnical engineer from the Design Organisation for the more shallow depths of soft materials, as originally proposed;**
2. **In-situ soil improvement via cement stabilisation whereby cement columns are created to the base of the Made Ground/Alluvial deposits using in-situ deep dry soil mixing techniques with CEM 1 cement binder. This technique will be used to provide a foundation solution for the deeper depths of soft materials.**

The proposed foundation options are depicted in draft Drg No. ULE90130-05-RTW-00992 v1. The requirements for ground improvement through cement stabilisation are defined in the attached draft performance specification which is currently being incorporated into Appendix 6/13 of the Specification.

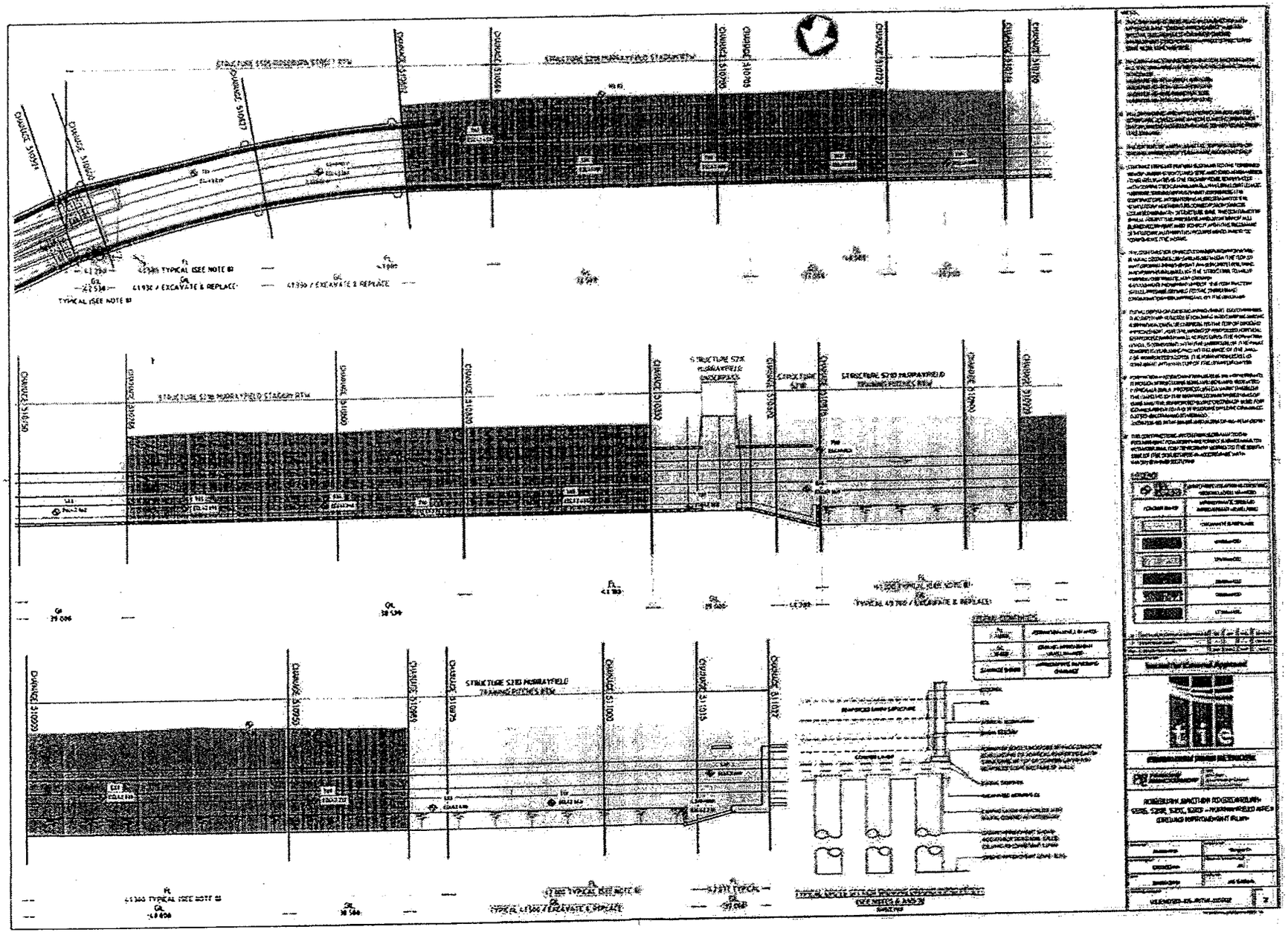
The design of the reinforced earth retaining wall elements above the foundations is unaffected by the change to the foundation solution. However, BSC will need to demonstrate to the Designer that in-situ soil improvement has achieved the specified performance requirements via the submission of the results of zone testing before construction of the reinforced earth retaining wall above the foundations can take place.

A Design Change Request will be submitted shortly for revisions required to the Design and Specification packages for Structures S21B, S21D, S21C and S505 to address the change in ground conditions.

Signed: [redacted] Name: A Dolan Date: 25/06/10

for and on behalf of:

External Distribution:	Internal Distribution:



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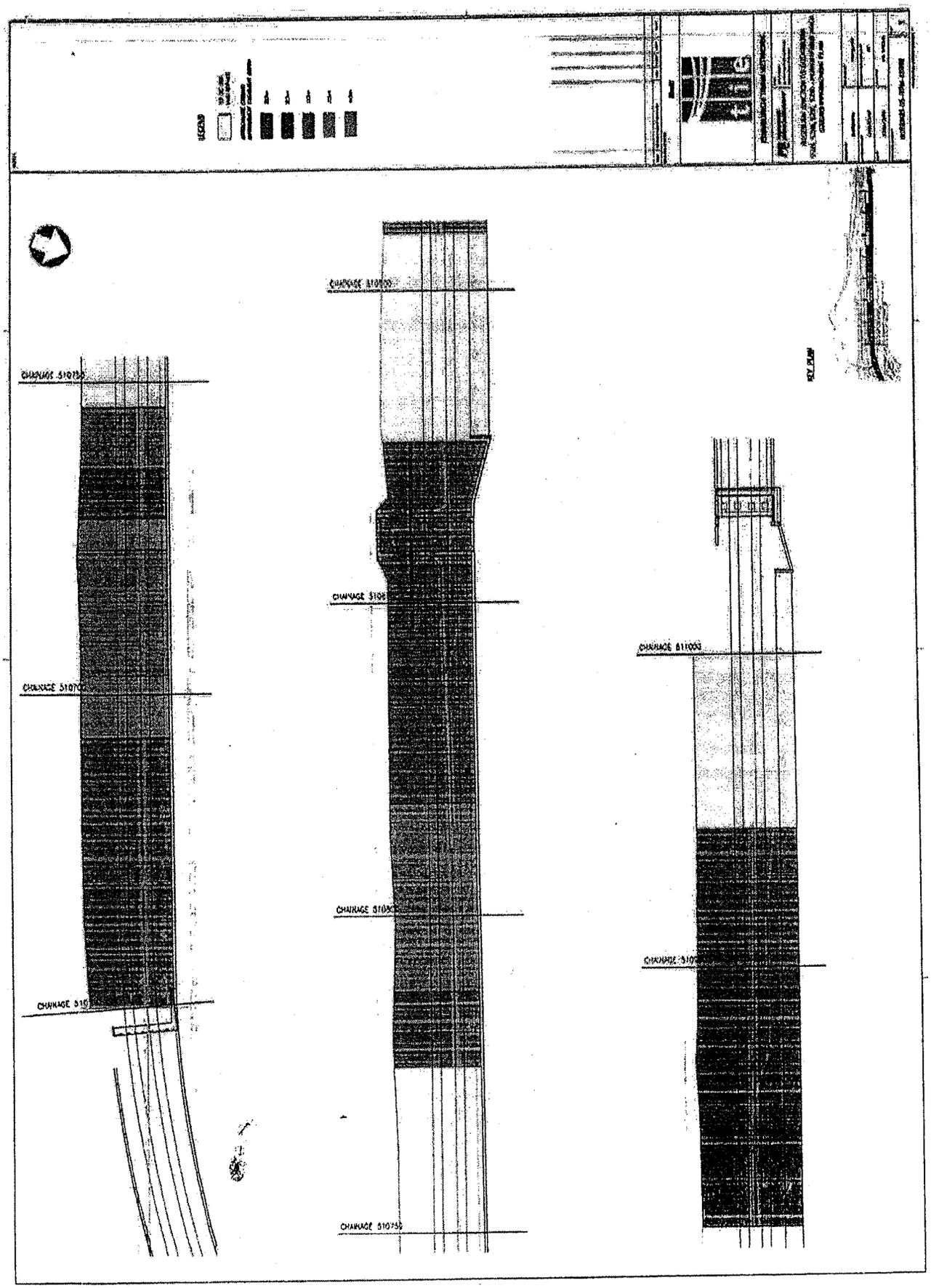


Edinburgh Tram: Structure S21B and S21D, Murrayfield Reinforced Earth Embankment /Retaining wall

Ground Stabilisation/Improvement Specification

1 Introduction

This specification presents background information on Structure S21B and describes the reclamation strategy and requirements for stabilisation to allow construction of the reinforced earth embankment structure.

This specification should be read in conjunction with the other specification items, in particular the earthworks specification.

2 Background Information

The site forms part of the Edinburgh Tram Line 1 project, structures S21B and S21D. Both are reinforced earth structures which will be constructed to carry the tram. Both structures will be constructed adjacent/adjoining an existing Network Rail (NR) railway embankment. It has been agreed with NR that construction of the reinforced earth embankment will have limited effect on the existing NR railway embankment.

The preliminary ground investigation indicated ground conditions to be suitable to allow construction of the reinforced earth embankment via excavation and replacement of the weak strata with suitable fill.

However on receipt of addition ground investigation data it was found that the site is underlain by a significant thickness of soft Made Ground and Alluvial Sand/Clay.

The Made Ground and Alluvial Sand/Clay were found to be unsuitable as a foundation stratum, as it would likely result in some places in bearing failure or excessive settlements outside of the design tolerances.

In-situ ground improvement techniques have been proposed to increase the soil strength/stiffness (Young's Modulus) of the formation strata to allow construction of the reinforced earth embankment.

3 Ground Investigation

A significant amount of intrusive ground investigation works have been carried out along the route of the embankment, including boreholes, trial pits, in-situ and laboratory testing, and groundwater monitoring. This is included in the Site Information pack along with the Approval in Principal document (AIP).

The ground investigation data can be summarised as follows:-

Made Ground generally described as soft brown sandy/ashy gravelly clay with cobbles of brick and sandstone, encountered from ground level to between 0.60m bgl (below ground level) and 4.00m bgl. The Made Ground is underlain by a mixture of alluvial Sand and Clay which was found to be very soft/very loose becoming firm/medium dense with depth, generally encountered between 0.60m bgl (S02) and 5.00m bgl (S02). The alluvial sand/clay was predominantly underlain by a medium dense becoming very dense with depth sand/gravel, where the medium dense sand/gravel was absent a stiff becoming very stiff sandy gravelly Clay (Glacial Till) was encountered. Groundwater levels appear to be relatively high within the weak alluvial strata. This specification should be read in conjunction with the Ground Investigation Factual Report (Bilfinger Berger UK Ltd, Edinburgh Tram Project, Murrayfield Section, Ground Investigation Factual Report, August 2008).

4 Health and Safety Considerations/Constraints

The major constraint is the potential instability of the Made Ground/Alluvial strata during construction.

Loss of lateral support or lack of groundwater control which could result in serious risk of excessive settlement or shear failure of the (presumably similar) strata beneath the adjacent NR track. In-situ ground improvement techniques are therefore required to prevent any detrimental effects on the existing NR embankment by removal of the need to excavate to significant depths. However care should still be taken to ensure that the stability of the embankment is not detrimentally affected.

5 Stabilisation strategy

5.1 Performance requirements

The requirements for stabilisation are to create a stable and safe formation with will allow minimal settlement of the existing NR embankment (<10mm) and tram embankment (<25mm).

Based on these constraints a stiffness of 35,000kPa shall be achieved at 28days in the upper Made Ground and Alluvial deposits.

Based on programme restrictions preliminary testing trials will not be possible, therefore an in-situ trial during the main works to prove the suitability of the binder mix shall be undertaken.

5.2 Stabilisation method

It is envisaged that in-situ deep dry soil mixing techniques are used to form columns, using CEM 1 cement binder at an initial rate of 5% by dry weight. The columns shall be taken to the base of the Made Ground/Alluvium deposits (whichever is deepest). Anticipated depths of treatment are shown in drawing ULE90130-05-RTW-00992. Actual depths will be proven periodically during the works.

Alternative cement binder percentages will be considered if proven to meet the performance criteria. Levels less than 3% cement are considered unacceptable.

Reference should be made to the advice, best practice, design, and construction guidance given in the BRE Design Guide Soft Soil Stabilisation published as part of the EuroSoilStab project, Project No. BE 96-3177.

5.3 Testing

The Contractor shall propose with the returned tender a frequency and means of validation of the ground improvement appropriate to the proposed method, for approval by the Design Organisation.

Testing shall be carried out in accordance with BS 1377:1990 or equivalent standard.

On completion, the contractor shall provide a validation report describing the extent and method of ground improvement, additives, test results and conclusions.

Testing results shall be provided to the design organisation to allow construction of the reinforced earth retaining wall elements to commence.

6 Column Stabilisation

6.1 Pre-installation Procedure

Before installation of the works, the following conditions shall be checked and documented, in accordance with BRE Design Guide Soft Soil Stabilisation BE 96-3177:-

Data for binders

- Production date and delivery date.
- Storage conditions.
- Transportation.
- Storage temperature.
- Test to confirm the binder quality.
- Binder components.
- Water type/quality.

Plant/Equipment

- Type of equipment.
- Design of mixing tool.
- All other relevant data.

Site description

- Location and site elevation level.
- Geotechnical conditions.
- Weather conditions during installation.
- Photos of the site.
- State of eventual soil contamination.

Column data

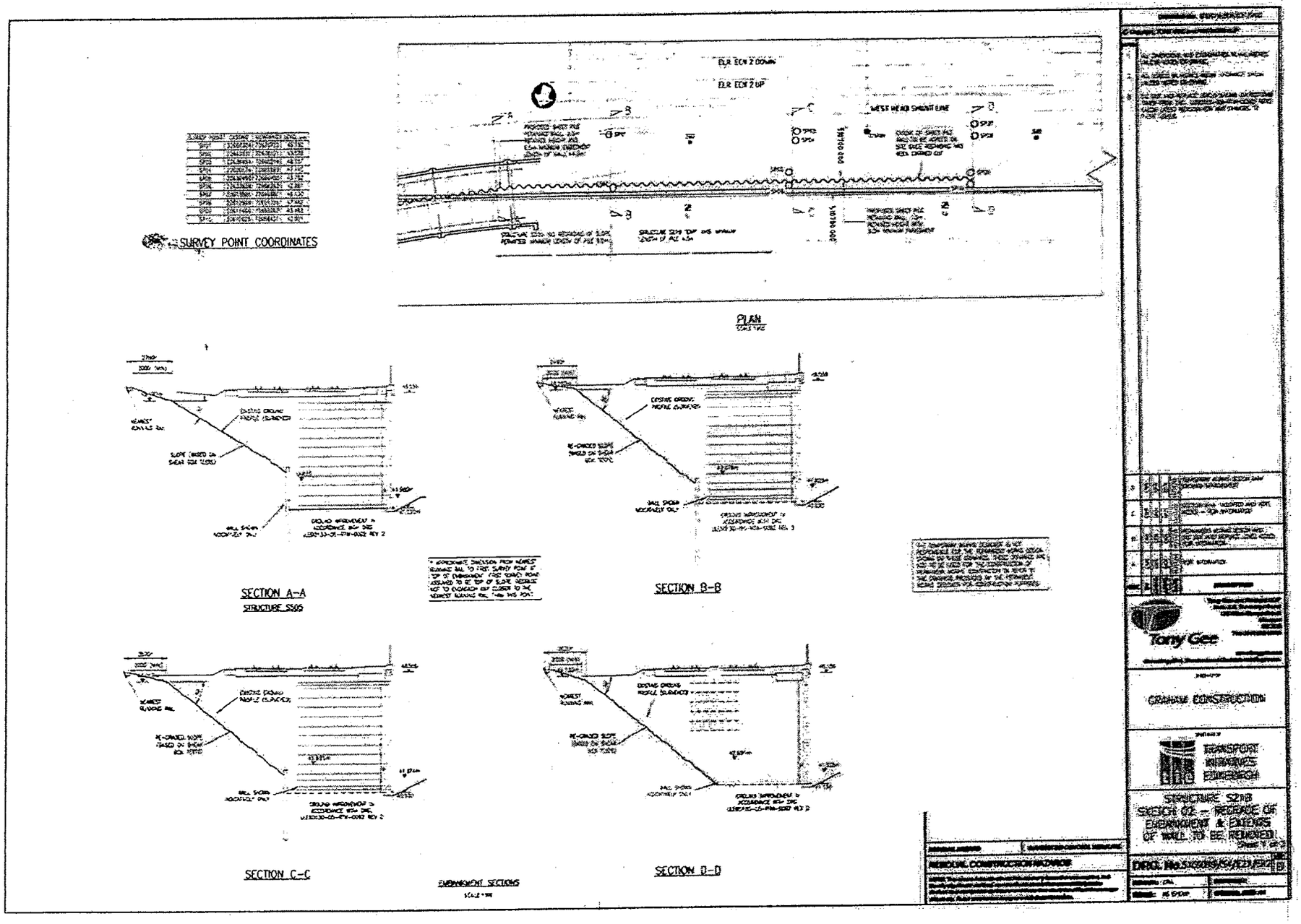
- Diameter (m).
- Amount of binder (kg/m or litre/min).
- Mixing energy (J/m^3).
- Lifting speed, (mm/s and mm per revolution)
- Rotation speed, (rpm).
- Length (m).
- Column top level (m OD).
- Column tip Level (m OD).
- Feeding pressure, max (MPa)
- Exhaust pressure, (inside Kellybar) at mixing tool level.
- Water to cement weight ratio (if applicable).
- Ratio of grout/additives.

6.2 During installation procedure

During installation the following shall be continuously monitored in accordance with BRE Design Guide Soft Soil Stabilisation BE 96-3177:-

- Binder output, (kg/m and kg/m^3).
- Mixing energy, (J/m^3)
- Lifting speed, (mm/s and mm per revolution)
- Rotation speed, (rpm)
- Feeding pressure at rig.
- Exhaust pressure (inside Kellybar) at mixing tool level.

Feeding pressure shall be released after installation. Surface heave shall be monitored visually both around one single column and around the whole stabilised area, in accordance with BRE Design Guide Soft Soil Stabilisation BE 96-3177. The accuracy shall be +/-1mm. one point each $200m^2$ will be sufficient.


SURVEY POINT COORDINATES
PLAN
SECTION A-A
STRUCTURE S505
SECTION B-B
SECTION C-C
SECTION D-D
EMBANKMENT SECTIONS
Tony Gee
GRAHAM CONSTRUCTION
TRANSPORT INFRASTRUCTURE EDINBURGH
STRUCTURE S218
SECTION 02 - REGRADE OF EMBANKMENT & EXTENTS OF WALL TO BE REMOVED
RESIDUAL CONSTRUCTION HAZARDS

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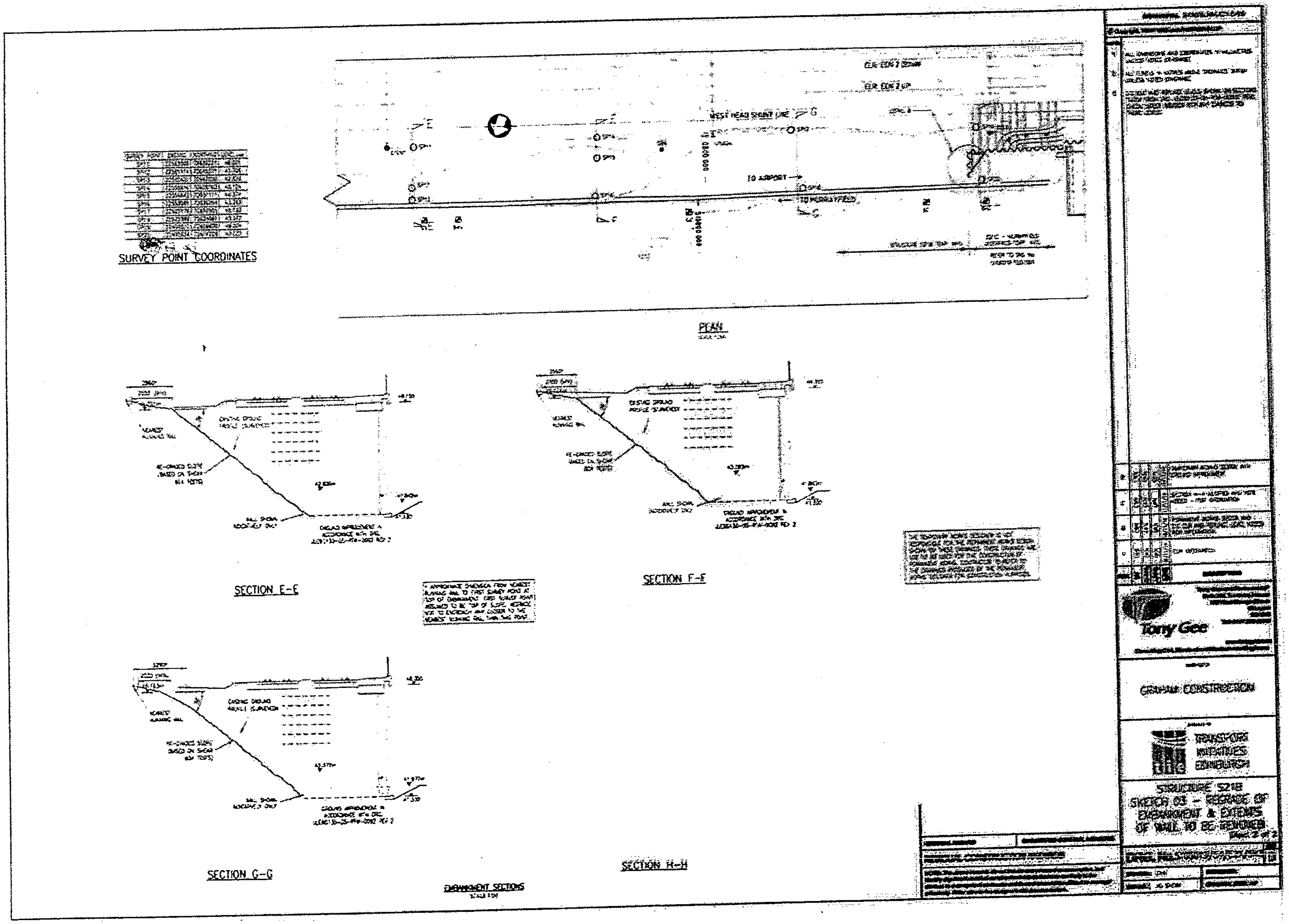

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Reference E3699A/SDB/10

9th June 2010

Graham Construction
Floor 1
16 Russell Road
Edinburgh
EH12 5NE

By e-mail to Daniel.hood@graham.co.uk

For the attention of: Mr Daniel Hood

Dear Sirs,

RE: Murrayfield Retaining Wall S21B- Steel Piling & Associated Works

We thank you for your valued enquiry received 28th May 2010, relating to the above project and are pleased to provide our most competitive quotation for these works for the re-measurable sum of:-

£122,754.88 (after credits)
(Net, exclusive of VAT)

All works are to be measured on completion in accordance with the attached Bill of Quantities, and are deemed to include the following particular items:

(a) We have based our offer on the following:

Drawings RTW 00441/11, 00442/7, ECR05/2008, ECR05/2016

Site Investigation, As enquiry

We have allowed for the supply, installation and extraction of temporary sheet piles based on a plan length of 187.5lmm.

(b) The piles are subject to availability and price at the time of any order all piles supplied are deemed to be from our stocks based on a mixture of equal or greater capacity than specified.

(c) **Full payment for all temporary piles, as supplied by Steel Pile Installations Ltd, is required in tandem with the measured items, with the credit becoming applicable following extraction and evaluation of damage. Non-compliance is deemed to be an irrevocable instruction to revert to weekly hire charges. Any such hire is subject to a minimum period of eight weeks (time on site) at the rate of £15.00 per tonne per full week with transport at the rate of £625.00 per 25 tonne load each way.**

(d) We are not fully aware of the particular requirements with regard to the programming of the works, and have not been able to visit site to ascertain for ourselves the location of the proposed piling work, access thereto, obstructions or any other matter that may affect our operations. We will require a firm and level access, and working area, to within 4.6m of any pile to be installed, or extracted, (as measured from the centre point of the Rig/Crane).

(e) We have allowed for driving the piles using an ABI leader rig incorporating a 1200KN high frequency vibratory hammer. We have allowed for an element of backdriving the piles to final level with an impact hammer of maximum energy not exceeding 1200kgm. A 50 tonne capacity mobile/crawler crane working at a safe distance will unload and handle the piles. We will extract the piles using a leader rig with a variable moment vibratory hammer. We will work to an agreed safe method of pitching and driving the piles adjacent to the railway.

(f) We note that borehole data has been provided and stress that we be excused without penalty from attempting to drive or extract any piles that reach practical refusal as defined in our standard terms and conditions or, if applicable, as defined by the Piling Foreman on Site. **Please refer to clause 5 of our standard conditions**

(g) All risk in connection with foreseeable / unforeseeable obstructions and / or ground conditions (inclusive of water) is to be out-with the context of this quotation, whether connected with the driving of piles, extracting of piles, pile design or any other associated activity. This clause is mandatory and consequently is deemed part of any contract hereby arising, irrespective of any counter clauses, contract conditions, or the like. Any consequential lost time is to be reimbursed as indicated within section 5 of the attached Sub-Contract Terms.

(h) Piling with a vibratory or impact hammer may, by its very nature, be noisy and give rise to vibration. We take all reasonable steps to minimise nuisance and damage but can accept no liability in this connection. We have made no allowance for the use of specialist equipment with regard to noise and / or vibration, except where stated otherwise

(i) Inflows of water can be expected in cofferdams, or retaining walls, below the water table. All costs incurred in dealing with the ingress of water are the responsibility of the Main Contractor.

(j) Commencement date is subject to availability of Piling Rig and associated equipment

(k) We have allowed in our price for working normal working hours (minimum of 10.5 hours, 7.30 am – 6 pm) and for the work to be completed without interruption during two visits to site as follows:-

Installation	-	3.0 weeks
Extraction	-	2.5 weeks

(l) We draw your particular attention to clause 2.5 of our sub-contract terms – **"No deduction of money by way of retention shall be allowed"**, unless agreed prior to commencement of the works.

(m) Day-work rate or standing time for any reason beyond our responsibility including suspension will be charged for at the rates as stated in our bill of quantities per rig crew

(a) All temporary goods, as supplied by Steel Pile Installations Ltd. are deemed to remain the property of Steel Pile Installations Ltd. until paid for in full, with any "supply and return" arrangement being strictly a financial one which does not imply any transfer of ownership in any way whatsoever. This statement is deemed to override any terms and conditions, or contracts, signed or unsigned, which contradict the same

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(b) We require full payment for temporary piles when delivered to site, the appropriate credits being agreed on receipt of the piles into the stockholders yard on completion of the sub-contract works, all subject to mutually acceptable payment terms

(c) If it is intended to cast concrete up against the sheet piles, then it is deemed to be the responsibility of the Principal Contractor to provide a suitable form of bond breaker. A minimum requirement would be fibreboard and/or polythene

(d) 'Daily Returns' detailing events and resources will be submitted at site level for approval, failure to provide a signature is deemed as acceptance of the full contents of this record

(e) In the event of postponement of the works less than **five working days** prior to the planned date for commencement on site (due to circumstances outside of our control) we reserve the right to either charge for labour and plant at standing time rates if resources cannot be relocated adequately in time to avoid a direct financial loss to Steel Pile Installations Limited or to rearrange the commencement date to maintain continuity of work for our resources

(f) Any sheet pile layout will be a 'best fit' solution to suit full pile widths and readily available corner profiles. During installation plan lengths on piles installed will vary due to the rolling tolerances applied to each and every clutch i.e. +/- 2% on a single pile width. When combined with installation tolerances there may be significant variation on plan lengths between any given two points

Within our quotation the following assumptions have been made:-

- Access will be available for our piling equipment from the access points to the work location
- Good working platforms will be available as indicated above.
- Off loading areas will be available for all piles with good access for articulated Lorries, any double handling of piles to be undertaken by the main contractor, to and from, the respective work locations

We take this opportunity to attach one copy of our "Sub-Contract Terms". These, along with all of the above, should be incorporated into any contract arising here from and will take precedence over any other terms and conditions, stated or implied, in the case of dispute, except where specifically contradicted by the written contents of this letter

We trust the attached to be of interest and look forward to further discussions in due course.

FOR STEEL PILE INSTALLATIONS LTD

[redacted]

Stephen Brake

[redacted]

stephen.brake@spi.co.uk

VISIT OUR WEB SITE: www.spi.co.uk

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[illegible] PILE INSTALLATIONS LTD

BILL OF QUANTITIES

Estimate No 83690 Murrayfield Retaining Wall 821 B

ITEM	DESCRIPTION	QUANT	UNIT	RATE	PRICE
	INSTALLATION				
1	Mobilisation of Plant & Labour		Sum	£10,872.00	
1a	Subsequent visit to site				Not Priced
1b	Site moves				Not Priced
1c	Internal site moves				Not Priced
1d	Site Preliminaries				
2	Preparation of Preliminary Design Calcs				Not Priced
3	Noise & Vibration Monitoring Equipment				
3.1	Carriage to and from site				Not Priced
3.2	Vibration Monitoring Equipment				Not Priced
3.3	Noise Monitoring Equipment				Not Priced
4	Soil loosening				Not Priced
5	Pile Installation-Supply, handle, pitch & drive				
5.1	Temporary piles [illegible] Grade S270GP [illegible]	2150.1	Sq m	99.00	£213,259.07
5.2					
5.3					
5.4					
5.5					
5.6					
6	Extra Over Item 5 for corner or junction pile				
6.1					
6.2					
6.3					
6.4					
6.5					
6.6					
7	Flame Cut piles during installation in [illegible] n.e. 500mm		Item	17.00	Rate Only
8	Other Items				
9	Subcontractors				
10	Provisional sums and day works				Not Applicable
11	Daywork & Standing rate, Pile Installation		Rig Hr	£[illegible]	Rate Only
	FRAMING				
12	Supply and Install framing				Not Applicable
13	Daywork & Standing rate, Framing Installation				
14	Additional visit / Removal of framing				Not Priced
		DUE ON INSTALLATION			£223,130.07

[illegible] 10 98

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[illegible] LTD

BILL OF QUANTITIES

Estimate No 83899 **Murrayfield Retaining Wall 8218**

ITEM	DESCRIPTION	QUANT	UNIT	RATE	PRICE
	EXTRACTION				
15	Mobilisation of Plant & Labour		sum		£6,718.00
15.1	Subsequent visit to site				Not Priced
15.2	Site moves				Not Priced
15.3	Internal site moves				Not Priced
16	Extraction of piles				
16.1	Temporary piles L6 [illegible] Grade S 270GP [illegible]	2156.3	Sq m	10.10	[illegible]
16.2					
16.3					
16.4					
16.5					
16.6					
17	[illegible] standing time, extraction		[illegible]	£220.00	Rate Only
	EXTRACTION sub total)				£28,314.03
	CREDIT				
18	Credit reusable piles				
18.1	Temporary piles L6 [illegible]	2156.3	Sq m	-61.80	-£133,258.34
18.2					
18.3					
18.4					
18.5					
18.6					
19	Credit for [illegible] removed by you				
	CREDIT (sub total)				-£133,258.34
20	Add Insurance at 3%				£3,869.82
	TENDER TOTAL (Nett)				-£122,754.[illegible]

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STEEL PILE INSTALLATIONS LTD
SUB-CONTRACT TERMS.

1 THE CONTRACT

1.1 These terms and covering letter must be incorporated in any order or contract between us. In the event of any conflict on conditions of contract, these terms and covering letter will take precedence. Acceptance of this offer shall not constitute a contract unless confirmed by us in writing.

1.2 Any instruction to proceed issued prior to the signing of an agreed contract will be deemed to be confirmation of acceptance of all our terms.

1.3 Unless mentioned elsewhere this offer is net and not subject to discount.

2 FINANCIAL AND MEASUREMENT

2.1 Unless otherwise stated in this offer the work is subject to remeasurement and quantities used in the offer are for estimating purposes only. Measurement of the driven area of length piles for payment purposes will be taken as the area or length of pile pitched and not that described by any other method of measurement. The area of sheet piles shall be the length of the pile multiplied by the girth measured along the centre line. No reduction will be allowed for any un-driven length of pile.

2.2 The value of work done and materials supplied will be applied for on a monthly basis, with payment due 30 days from the application date. Payments received after 30 days of the application date will be subjected to a surcharge of 2.5% compounded, per 28 day period or part thereof.

2.3 All goods are deemed to remain the property of SPI Ltd, until paid for in full. This statement is deemed to override any terms and conditions, or contracts, signed or unsigned, which contradict the same.

2.4 No deduction of monies or "set off" against payments due will be allowed without our written consent.

2.5 No deduction of money by way of retention shall be allowed.

2.6 All additional works not expressly set out in the Bill of Quantities shall be valued at cost plus 20%.

2.7 The total amount of any damages (liquidated and/or ascertained) will be limited to a maximum of £1000 per week or 5% of our tender price, whichever is the smaller.

2.8 No allowance has been made in our tender price for the provision of a performance bond, deed, or a collateral warranty.

2.9 Our quotation excludes V.A.T.

3 ATTENDANCES (TO BE PROVIDED FREE OF CHARGE BY THE CLIENT)

3.1 Permissions, approvals, notices, licences, sanctions, wayleaves, easements, possessions, rights of way and access for the execution of the piling works, and any payment of rent, rates or the like for occupation of the site.

3.2 Adequate protection of our completed works and of our plant and equipment.

3.3 Adequate hoardings, fencing, noise and splash barriers, statutory warning signs, flagmen, traffic management, clearances and the like as necessary to protect the works, plant, materials, personnel, third party property and the general public.

3.4 Adequate firm and level access and working area suitable for the delivery, storage and use of our piling plant, equipment and materials to within 4.5 metres of piles to be driven or extracted (as measured from the centre-point of the crane/rig). Access to be suitable for delivery using low loaders and standard articulated lorries. Access ramps to be no steeper than 1 in 10. Protective mats, and other measures necessary, to be provided to minimise the damage to third party property such as road surfaces and kerbs. Access and working areas to be maintained throughout our time on site.

3.5 Pumping, dewatering or drainage to keep the site free of surface water or any water arising from the operations.

3.6 Welfare and safety facilities to comply with statutory regulations. In operations over or near water, provision and maintenance of proper and efficient life saving equipment including amongst other items safety boats, netting, life-belts and life-rings etc.

3.7 Accurate setting out and checking of pile positions, lines and levels at such times so as not to delay piling operations. Checking to be carried out during and on completion of the work and before plant has left site.
Provision of permanent datum points, base lines and structural grid lines.

3.8 Provision, and subsequent backfilling, of a leader trench for piling hammer clearances:-

Vibratory driving: -	1.2m each side of the pile face, for a depth of 0.5 metres below top of piles.
Percussive driving: -	0.5m each side of the pile face, for a depth of 1.6 metres below top of piles.
Vibrationless driving: -	0.85m each side of the pile face, for a depth of 0.6 metres below top of piles.
	1.35m (for dummy piles) at changes of direction.

3.9 Prior removal of all overhead, surface, and underground obstructions with voids backfilled to commencing level with suitable material which will not obstruct the piling work but will ensure stability of piling plant

3.10 Existing services (both overhead and underground) to be located and exposed and clearly marked out on site. A drawing to be provided clearly showing their positions relative to the piling work. Adequate protection, diversion or removal of such services to prevent damage from the piling operations.
Permit to dig / pile, and hot works permit to be issued to our piling foreman.

3.11 Other items (if required):-
a) Suitable background and task lighting.
b) Potable water supply at mains pressure adjacent to our work.
c) Removal and disposal of any arisings from our operations so as not to impede our progress.
d) Shoring and underpinning.

4 PROGRESS

4.1 This tender is based on continuous and orderly weekday working and unless otherwise stated is based on the normal working day being 07.30 to 18.00 hours with the option for weekend work at our discretion.

4.2 Every endeavour will be made to work to an agreed programme but starting dates and periods for completion are estimated only, and no liability for direct or consequential losses will be accepted in respect of delays howsoever arising.

4.3 Any agreed completion date shall be subject to a fair extension of time for any delays or disruption which could not have been foreseeable by a Specialist Piling Contractor. We shall be entitled to reimbursement for any loss and expense resulting from such delays and/or disruption.

5 SUPPLY, DRIVING AND EXTRACTION

5.1 In the event of difficult driving or of encountering obstructions or other physical conditions (whether reasonably foreseeable or not) which obstruct defied or otherwise impede the penetration of piles to design depth, SPI Ltd shall be entitled to standing time pending an agreed method of proceeding. All extra costs incurred in consequence of such matters including the costs of any materially altered method of driving or of any special or substantially more expensive or more protracted method of driving will be charged to the Client.

5.2 Piles will be driven to within 50mm of agreed levels or refusal, whichever occurs first. Refusal being defined as being one of the following:-
a) 10 blows of the specified hammer for 25mm of penetration, followed by a maximum time period of 3 minutes to a maximum blow count of 25 blows per 25mm penetration.
b) 1 minute of continual driving with the specified vibratory hammer fails to achieve 75mm of penetration.
c) Distortion occurs to the head of the pile.
In either event the limit of driving will be proved over a period not exceeding five minutes. Upon reaching these limits, piles will be deemed to be at refusal and driving ceased.
Should SPI Ltd be instructed to bring to site more powerful and/or more expensive equipment for driving, all associated costs will be borne by the Client.

5.3 The definition of practical refusal for vibrationless jacking techniques is deemed to be that state when the maximum available jacking force achievable fails to achieve pile movement, or when pile deformation under load takes place.

5.4 Any undertaking to extract piles is only to the extent that they can be extracted using the specified pile extractor. After 15 minutes effort any pile which has not moved more than 25mm will be deemed to have refused extraction. If however a pile has moved more than 25mm after 10 minutes effort but is not fully extracted SPI Ltd will continue until the total time spent trying to extract the pile is equal to 3 minutes per metre of pile length. If the pile is then not fully extracted it will equally be deemed to have refused extraction. Piles which have refused extraction will be charged as the measured item for extraction, as if the piles had been successfully extracted.
Should SPI Ltd be instructed to bring to site more powerful and/or more expensive equipment for extracting all associated costs will be paid for by the Client.

5.5 Except where deflected by obstructions or varying ground conditions, we shall endeavour to drive piles to within:-
+/ - 70mm of the given line at commencing level
1:75 of vertical for vertical piles
1:25 of design rake for raking piles
50mm of the required level (unless prior refusal is reached)
Burning off to within 25mm of given level, and a minimum of 250mm above water level.

SPI Ltd accept no responsibility should piles be deflected, moved, declutched, drawn down, bent or distorted out of line or otherwise fail to achieve design due to ground conditions whether foreseeable or not.
All corner work will be carried out to a maximum of one pile/one pair of piles in any one direction.

5.6 All piles are supplied in mild steel, without paint or surface treatment unless specified elsewhere.

5.7 Unless otherwise stated, the following have been excluded from our quotation: - bracing, framing or other support after driving, excavation, removal from site of excavated materials and provision of clutch sealant.

5.8 During pile extraction there can be a tendency for material to adhere to the piles. We shall not be responsible for any associated reinstatement or costs attributable to such occurrences. The Client is to provide a positive break against the piles if casting concrete against them (minimum requirement fibreboard and polythene)

5.9 During installation and extraction of piles there can be a tendency for settlement to occur adjacent to the pile line as the work improves the density of adjacent soils. We do not accept liability or the like resulting from this effect.

5.10 With certain piling plant and equipment it is only possible to drive full section piles and fabricated corners. As a consequence the installed layout will be a best fit solution. Any effect this may have on the overall scheme and consequential costs will be the Client's responsibility.

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5.11 When using Quiet and Vibration-free equipment, such as the "Tosa Still Worker" abrupt changes in the direction of the pile run are achieved using dummy piles placed outside the proposed pile line and require 1350mm clearance.
Each individual pile run commences with the use of a reaction stand for which we shall require the provision of a level and solid area 6m x 6m in plan 500mm below the proposed finish pile head level. A similar free facility will be required to enable pile extraction.
A water supply, equivalent to a minimum pressure of 4-6 bar and an output of 110 gallons per minute, discharging into a 6 cubic yard skip is required for water jetting/pile lubrication purposes and is to be provided free of charge. When water jetting is used the water should naturally disperse into the surrounding strata. In the unlikely event that the water affects adjacent structures we are unable to accept responsibility for any damage caused. Disposal of surplus water is to be the responsibility of the Client.

6 ENVIRONMENTAL

6.1 Conventional vibratory/ impact pile driving and extraction is by its nature noisy and gives rise to vibration. We take all reasonable steps to minimise nuisance and damage but accept no liability in this connection.

6.2 The Client should satisfy himself that all the requirements of the relevant authorities, such as Local Environmental Health Office, have been complied with.

6.3 In the event that work is delayed or the specified equipment is required to be modified or changed, all standing time and additional costs are deemed recoverable from the Client.

7 TEMPORARY MATERIALS

7.1 Temporary materials once they are on site will be paid for in full without reduction for 'credit'. The materials will remain the property of SPI Ltd at all times with the 'supply and return' arrangement being solely a financial one which does not imply any transference of ownership. Credit for good, sound, re-saleable materials as described in the Bill of Quantities will become due as Clause 2 once they have been measured, agreed and removed from site. Steel Sheet piles have no 'credit' or recovery value if the sound reusable length of a given pile has fallen below the length given in the table below. However, as a concession sections may be downgraded into a lower category. In the event of temporary materials not being returned the measure against the credit item will be reduced by the actual tonnage not returned and not the nominal quantity which may have been charged in the supply item. Our decision as to whether any materials are damaged is final and binding. In addition there will be an extra charge equal to 30% of the value of any unreturned or unused material calculated at the basis rate for new material from Arcelor RPS UK Ltd. Unless stated otherwise all rates include for a single use of sheet piles only, additional uses to be chargeable at the rate of £90.00 per tonne.

MINIMUM ACCEPTABLE SOUND REUSABLE LENGTHS FOR STEEL PILES

Approx Section Modulus (cm3/m)	800	1200	1600	2000	2500	3200
Minimum Length (m)	5	6	7	8	9	10

8 INSURANCES (detailed policy terms on request)

8.1 Employers Liability: £10m any one claim.

8.2 Public/Products Liability: £10m any one and/or series of occurrences arising out of any one event. Product Insurance £10m any one claim and in the aggregate for any one period of insurance.

8.3 Contract Works/Plant: £1,000,000 limit / maximum contract value reduced to £500,000 for work adjacent to/in/over tidal & or inland water where plant is land based. £1m for own/hired- in plant any one loss.

8.4 Professional Indemnity: £5m any one loss and for £10m in the aggregate in the insurance period.

8.5 Marine Insurance, for any work involving the use of floating/submerged plant is excluded and must be covered by the Clients Insurances.

9 DESIGN

9.1 Our limit for any design work carried out by ourselves is limited to that of a competent professional exercising reasonable skill and care.

9.2 Sheet piles deflect to an indeterminate degree which may result in settlement or subsistence for which we accept no liability. This should be closely monitored and should be arrested before becoming excessive.

9.3 Sheet piling has a limited range of stability. Should the piles be subject to increased loading or over-excavation this may lead to instability. We can accept no liability should this occur.

9.4 Inflows of water can be expected through piles below the water table. All costs in dealing with the ingress of water are the responsibility of the Client.

9.5 After installation we do not have a presence on site, and it is the Clients responsibility to inspect the structure and maintain records in compliance with current Health and Safety Regulations.

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STEEL PILE INSTALLATIONS LTD

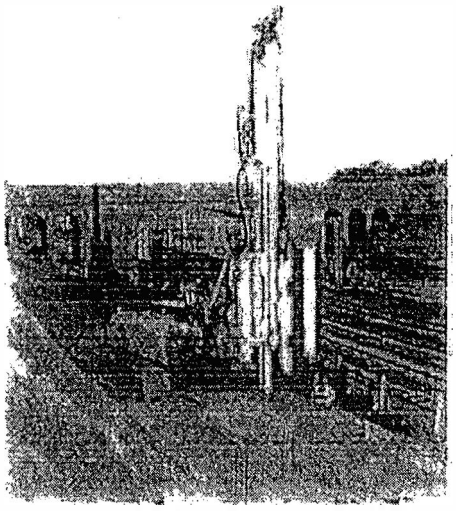
APPENDIX B.

ABI TM 14/17 Telescopic Leader Rig details c/w MRZV 20S 1000Kn Vibratory Hammer

000038

Steel Pile Installations Ltd
Bessemer Suite, Ironworks House, Warton Road, Carnforth, Lancashire LA5 9EX
Tel: [redacted] Fax: 0845 450 7476 E-mail: info@spil.co.uk

ABI TM 14/17 TELESCOPIC LEADER RIG



SPECIFICATIONS

Rig Weight:	56.7 Tonnes (with MRZV 20S Vibratory Hammer).
Carrier:	SR35T-C
Width of Tracks (Retracted):	3.30 Metres (Transport Mode)
Width of Tracks (Extended)	4.20 Metres
Transport Height (from underside of tracks):	3.40 Metres
Length of Tracks:	5.10 Metres
Tail Swing:	3.71 Metres

WORKING LIMITS

Maximum Pile Length (with MRZ 20S Vibratory Hammer):	17.3 Metres.
Maximum Auger Length (with MDBA 3000 Auger Drive attachment):	17.2 Metres
Maximum Driver Pile Length (with HPH 2400 Impact Hammer attachment):	16.0 Metres.
Maximum Winch Capacity:	5.0 Tonnes
Maximum Pile Weight (on single pitching chain):	3.2 Tonnes

OPTIONAL ATTACHMENTS

- HPH 2400 2.0 Tonne Hydraulic Impact Hammer (5.9 Tonnes)
- MDBA 3000 3.0 Tonnes/Metre Auger Drive (2.1 Tonnes)
- MDBA 6000 6.0 Tonnes/Metre Auger Drive (2.0 Tonnes)

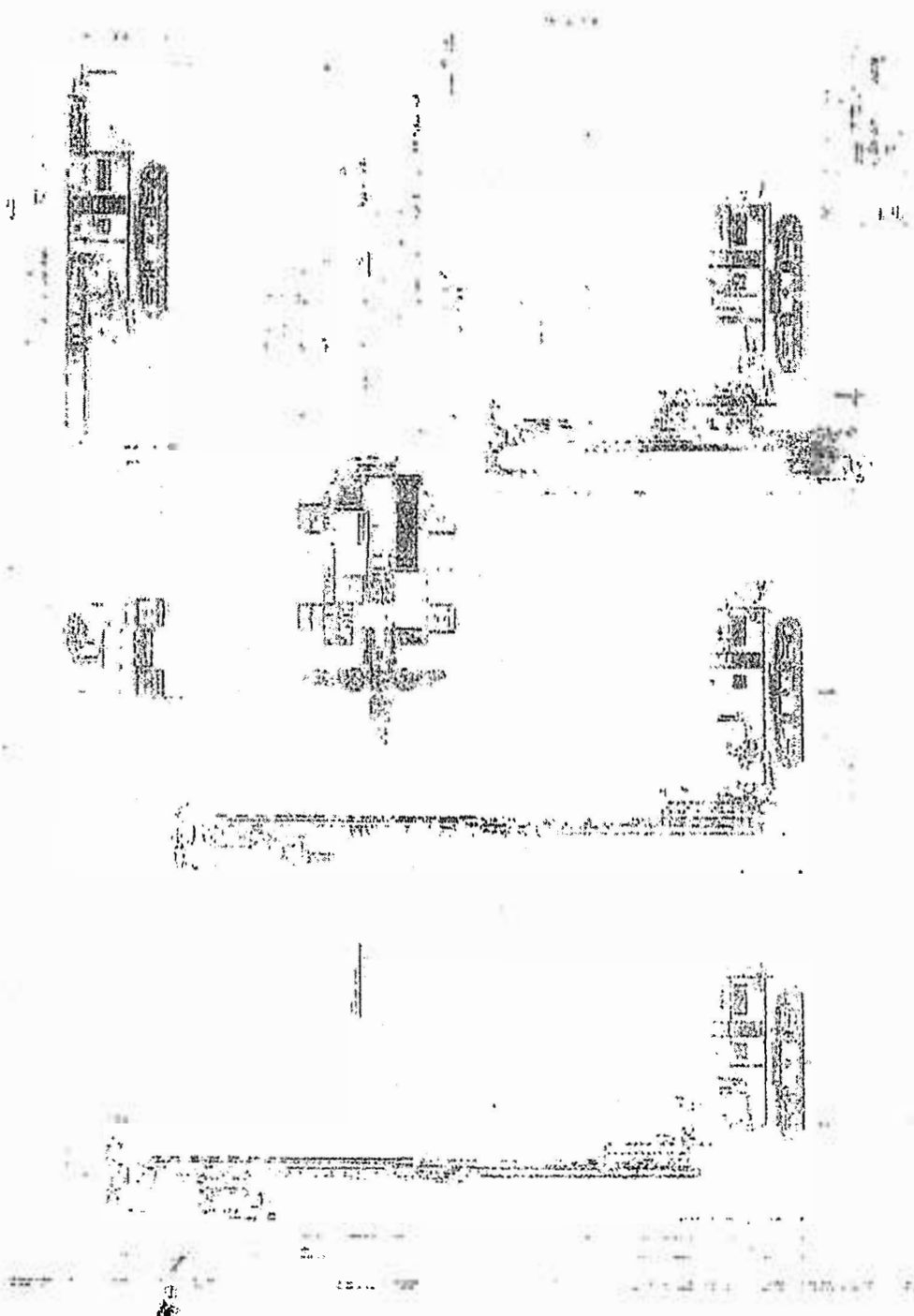
SUITABLE APPLICATIONS

- Driving/Extracting Sheet Piles up to 17m in length (as singles or in pairs)
- Pre-Augering.
- Impact Driving
- Driving Steel Bearing/Tubular Piles/H Piles

FOR FURTHER INFORMATION OR TO HIRE ANY OF THIS EQUIPMENT CALL
0845 450 7475

http://www.spil.co.uk

7.2 Transport and operating dimensions



000041

Colin McKeever

From: Gareth Scott
Sent: 17 December 2010 12:27
To: Colin McKeever
Subject: FW: Water tankers
Attachments: Picture 018.jpg

Colin,

See below quote from Truck plant services to provide water for ETN.

Regards

Gareth

From: Kenny [mailto:kenny@truckplantservices.co.uk]
Sent: 17 December 2010 12:23
To: Gareth Scott
Subject: Water tankers

As per telephone call.

Quotation for supplying 25000 litre water tanker delivered to Murrayfield area of Edinburgh

Delivery £420.00+vat

Refill or Exchange £420.00+vat

Final uplift of empty tank £280.00+vat

This quote is subject to suitable access for artic,suitable hard standing for tanker when uncoupled and working area for changeover if required.

Regards

Kenneth Blair

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BILFINGER BERGER UK Limited	Technical Query	Form: F64-3 Rev: B Page: 1 of 2

Project: Edinburgh Tram Network	**Date: 19.05.2010**
Section / Work Section 5	**Ref. Number: TQ 1809**
From: Bilfinger Berger Siemens Consortium	
To: PB	**Answer required by: 25.05.2010**

Murrayfeild S21B to S21D

Following site tests bore hole to rock level and Dtp's carried out along Section 05, Murrayfeild S21B to S21D, please find attached our site sketch ref BSC-SK-05-118v1 showing the postions and results of the tests.

Please advise if any the results verify the design intent as indicate and advise of any replacement measures that may be required to satisfy the designer prior to construction.

Signed: W. Hume Name: Wallace Hume

for and on behalf of Bilfinger Berger Civil UK Limited

External Distribution:	Internal Distribution:

000044

RAEBURN DRILLING AND GEOTECHNICAL LTD

Site: SECTION 5A - RETAINING WALLS S21B & S21D

Client: Bilfinger Berger UK Ltd

Engineer: Bilfinger Berger UK Ltd

Contract No: 21703

Borehole No: DP02

Inspection Pit to 1.20
Cable Percussion to 5.00

Location:

Orientation: Vertical

Equipment: Dando 2000

Progress	Sample Depth	Samples and Tests Type	Result	Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
30/3/2010						0.20	# MADE GROUND (compact clay)				
	0.50	B					# MADE GROUND (ash, wire netting, stones, sand and wood)		▼		
	1.00	B				1.20	# DYNAMIC PROBE TEST				
30/3						5.00	END OF BOREHOLE				5.00

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 0.60m.
Test undertaken in accordance with BS EN ISO 22476-2:2005; Dyanmic Probe Super Heavy, Method B.

Diam	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Ground-water Rose To	Time(mins)	Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Time(hr)	Flush Returns	Flush Type	Flush To Depth
HM		0.60											
Chk & App	Status Prelim												

RAEBURN

Fig No: B
Sheet 1 of 1
Scale 1:50

Style: BOREHOLE File: \\2003SBS\PROJECTS\GINTW\PROJECTS\21703.GPJ Printed: 14/04/2010 10:53:33 Raeburn Drilling and Geotechnical, Whitelieberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

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000045

RAEBURN DRILLING AND GEOTECHNICAL LTD

Site: SECTION 5A - RETAINING WALLS S21B & S21D

Client: Bilfinger Berger UK Ltd

Engineer: Bilfinger Berger UK Ltd

Contract No: 21703

Borehole No: DP03

Inspection Pit to 1.20
Cable Percussion to 5.00

Location:

Orientation: Vertical

Equipment: Dando 2000

Progress	Sample Depth	Samples and Tests Type	Result	Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
30/3/2010						0.20	# MADE GROUND (compact clay)				
	0.50	B					# MADE GROUND (ash, wire netting, stones, sand and wood)		▼		
	1.00	B				1.20	# DYNAMIC PROBE TEST				
30/3						5.00	END OF BOREHOLE				5.00

Remarks:
Description based on Driller's log.
An inspection pit was excavated by Hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 0.60m.
Test undertaken in accordance with BS EN ISO 22476-2:2005; Dyanmic Probe Super Heavy, Method B.

Diam	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Ground-water Rose To	Ground-water Time(mins)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling Time(hr)	Flush Returns	Flush Type	Flush To Depth
HM		0.60											
Chk & App	Status Prelim												

Fig No: B
Sheet 1 of 1
Scale 1:50

Style: BOREHOLE File: \\2003SBS\PROJECTS\GINTWP\PROJECTS\21703.GPJ Printed: 14/04/2010 10:53:35 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

000046

RAEBURN DRILLING AND GEOTECHNICAL LTD

Site: SECTION 5A - RETAINING WALLS S21B & S21D

Client: Bilfinger Berger UK Ltd

Engineer: Bilfinger Berger UK Ltd

Contract No: 21703

Borehole No: DP04

Inspection Pit to 1.20
Cable Percussion to 5.00

Location:

Orientation: Vertical

Equipment: Dando 2000

Progress	Sample Depth	Samples and Tests Type	Result	Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
30/3/2010						0.20	# MADE GROUND (compact clay)				
							# MADE GROUND (ash, wire netting, stones, sand and wood)				
	0.50	B									
	1.00	B				1.20	# DYNAMIC PROBE TEST				
30/3						5.00	END OF BOREHOLE				5.00

Remarks:
Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 0.60m.
Test undertaken in accordance with BS EN ISO 22476-2:2005; Dyanmic Probe Super Heavy, Method B.

Diam	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Rose To	Time(mins)	Cut Off	Water Added From	To	Chiselling From	To	Time(hr)	Flush Returns	Type	To Depth
HM		0.60											
Chk & App	Status Prelim												

Fig No: B
Sheet 1 of 1
Scale 1:50

Style: BOREHOLE File: \\2003\BSIPROJECTS\GINTW\PROJECTS\21703.GPJ Printed: 14/04/2010 10:53:36 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com