

**DISPUTE RESOLUTION PROCEDURE**

**Russell Road Retaining Wall**

**TIE LIMITED**

**POSITION PAPER PURSUANT TO PARAGRAPH 9.2  
OF SCHEDULE PART 9 (DISPUTE RESOLUTION PROCEDURE)**

relating to

the agreement between **tie Limited**

and

Bilfinger Berger (UK) Limited / Siemens plc / Construcciones y Auxiliar de Ferrocarriles consortium

in connection with the works authorised by the

*Edinburgh Tram (Line One) Act 2006 and the Edinburgh Tram (Line Two) Act 2006*

9 September 2009



## 1. INTRODUCTION

- 1.1 By way of letter dated 4 September 2009 (reference 25.1.201/WIM/3431) the Bilfinger Berger (UK) Limited / Siemens plc / Construcciones y Auxiliar de Ferrocarriles delivery consortium (hereinafter collectively referred to as "**Infraco**") gave notice to **tie** Limited (hereinafter referred to as "**tie**") that it wished to initiate the Internal Resolution Procedure in respect of a dispute, difference and/or unresolved claim ("**Dispute**") between **tie** and the Infraco in connection with or arising from the agreement between **tie** and the Infraco in connection with the works authorised by the *Edinburgh Tram (Line One) Act 2006* and the *Edinburgh Tram (Line Two) Act 2006* (hereinafter referred to as the "**Infraco Contract**").
- 1.2 This Position Paper has been prepared by **tie** pursuant to *paragraph 9.2 of Schedule Part 9 (Dispute Resolution Procedure)* to the Infraco Contract.

## 2. THE DISPUTE

- 2.1 **tie** understands that the matters referred to the Dispute Resolution Procedure by Infraco in its letter dated 4 September 2009 (reference 25.1.201/WIM/3431) are:
- 2.1.1 whether the value of the increase in sums due to be paid to Infraco under the Infraco Contract arising from the Mandatory **tie** Change are equal to that detailed in the Infraco's estimate dated 14 May 2009 in relation to Russell Road retaining wall (the "**Estimate**"); and
- 2.1.2 if not, what is the true and proper valuation of the impacts arising from the Mandatory **tie** Change.
- 2.2 **tie's** position is that:
- 2.2.1 only certain matters (not all those relied upon by Infraco) notified in the Infraco notification of **tie** Change number 146 dated 14 October 2008 issued under cover of letter dated 14 October 2008 (the "**Infraco Notification of tie Change**") constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change;
- 2.2.2 the value of the increase in sums due to be paid to Infraco under the Infraco Contract arising from those matters which constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change are not equal to that detailed in the Estimate;
- 2.2.3 there are only certain items and quantities of work and rates which should be contained in the Estimate representing the true and proper valuation of those matters which constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change, as follows:
- 2.2.3.1 items of work, quantities and rates in respect of the change to the foundation design of retaining units section 3 to 11 and 15 to 18 from an "L" shaped footing foundation to cast in-situ concrete piles with pile cap (the "**Foundations**") amount to SEVEN HUNDRED AND ONE THOUSAND FOUR HUNDRED AND SIXTY SEVEN POUNDS AND NINETY FIVE PENCE (£701,467.95) STERLING EXCLUDING VAT; and



2.2.3.2 items of work in respect of dealing with contaminated material (the "**Contamination**") which are to be valued on the basis of Actual Cost.

2.3 For the avoidance of doubt the matters set out in this Position Paper are without prejudice to and under reservation of tie's whole rights and remedies in connection with any delay to the completion of the Infraco Works as a consequence of or in any way connected with the matters notified in the Infraco Notification of tie Change and/or the occurrence of a Notified Departure and/or the date of issue by Infraco of the Infraco Notification of tie Change and/or the date of delivery to tie by Infraco of the Estimate in respect of Infraco Notification of tie Change and/or the absence of a tie Change Order in response to the Estimate.

2.4 There follows tie's position on the Dispute, together with its comments (where appropriate) on tie's understanding of the Infraco's position on the Dispute.

### 3. TIE'S POSITION ON THE DISPUTE

3.1 Applying the whole terms of the Infraco Contract it is tie's position that:

3.1.1 the only items of work which could be said to flow from the Infraco Notification of tie Change and which could be said to constitute a Notified Departure and therefore are deemed to be a Mandatory tie Change and which are to be the subject of a tie Change Order, are those which relate to:

3.1.1.1 the Foundations; and

3.1.1.2 the Contamination.

3.1.2 the only items of work which should be contained in the Estimate are those which relate to the Foundations and the Contamination;

3.1.3 the design changes to the Foundations came about as a consequence of the requirements of an Approval Body and on that basis constitute a Notified Departure in terms of *Pricing Assumption 3.4.1.1.3 of Schedule Part 4 (Pricing)*;

3.1.4 Contamination is a Specified Exclusion and on that basis constitutes a Notified Departure in terms of *Clause 3.3 (c) of Schedule Part 4 (Pricing)*;

3.1.5 those items of work which are said by Infraco to flow from the Infraco Notification of tie Change and are particularised in the Estimate but are not related to the Foundations or the Contamination arise from the Infraco's obligation to complete the design of the Edinburgh Tram Network including, but not limited to, the achievement of full compliance with the Employer's Requirements for the deliverables to enable the Edinburgh Tram Network to be procured, constructed and commissioned;

3.1.6 those items of work which flow from the Infraco Notification of tie Change and Estimate but are not related to the Foundations or the Contamination come about through:

3.1.6.1 the evolution of the design through normal development and completion of the design; and/or



3.1.6.2 an unauthorised change to the limits of deviation for the Edinburgh Tram Network ("**LOD**"), which **LOD** has not changed from that set down by the *Edinburgh Tram (Line One) Act 2006* and the *Edinburgh Tram (Line Two) Act 2006* and depicted on the Base Date Design Information;

3.1.7 the Estimate delivered by Infraco is deficient, lacking in detail and does not comply with the whole requirements of the Infraco Contract and **tie** reserves its entitlement not to consider it as a valid Estimate for the purposes of the Infraco contract;

3.1.8 the Infraco have failed to demonstrate and/or substantiate that those items of work which they say flow from the Infraco Notification of **tie** Change and are contained in the Estimate but are not related to the Foundations or the Contamination constitute a Notified Departure; and

3.1.9 notwithstanding the deficiencies noted at *paragraphs 3.1.9* and *3.1.10* above, **tie** does have sufficient information to know that the only items of work which could be said to flow from the Infraco Notification of **tie** Change and are contained in the Estimate which constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change are those which relate to the Foundations and the Contamination

(each of which matters are considered in more detail below)

3.2 Furthermore, it is **tie's** position that in order for it to be said that a Notified Departure has occurred under the Infraco Contract, it is for the Infraco to:

3.2.1 demonstrate and prove that the evolution and completion of the design to Issued For Construction stage exceeds normal development and completion of the design;

3.2.2 demonstrate and prove that a Notified Departure has occurred; and

3.2.3 provide a sufficient, adequate and competent Estimate of value

(each of which matters are considered in more detail below)

3.3 It is **tie's** position that the foregoing is the logical sequence of steps which occur in the event of a Notified Departure. However, it is the case that the Infraco have failed to fully comply with each of these steps.

#### Contents of the Estimate

3.4 The items of work contained in the Estimate delivered by the Infraco are included by the Infraco on the basis of the Infraco's opinion that the Issued For Construction drawings for the Russell Road retaining walls differed to a greater extent and complexity than design development and therefore a Notified Departure had occurred.



- 3.5 In fact the Estimate contains several disparate items such as:
- 3.5.1 LOD access (temporary works) in the sum of £1,156,016.74 - this matter is not connected in any way with design development, but is instead a principal access issue;
  - 3.5.2 alleged works to a greater extent than design development (permanent works) in the sum of £1,565,107.35 - this matter includes the Foundations and changes to piling; and
  - 3.5.3 dealing with contamination (provisional) in the sum of £1,876,722.98

all of which is claimed by Infraco as a re-measurement by comparison to alleged allowances in the Base Date Design Information.

- 3.6 With the exception of the Foundations (*paragraph 3.5.2* above) and the Contamination (*paragraph 3.5.3* above), which **tie** acknowledges constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change, applying the test set out at *Pricing Assumption 3.4.1*:
- 3.6.1 in terms of the design principle between the Base Date Design Information and the Issued For Construction drawings for the construction of Russell Road retaining wall there is no change;
  - 3.6.2 in terms of the shape and/or form of Russell Road retaining wall between Base Date Design Information and Issued For Construction drawings there is no change; and
  - 3.6.3 in terms of outline specification of Russell Road retaining wall between Base Date Design Information and Issued For Construction drawings there is no change.

#### 4. **REQUIRED OBJECTIVES OF REFERRAL OF THE DISPUTE TO THE INTERNAL RESOLUTION PROCEDURE AND REDRESS**

- 4.1 A declaration that:
- 4.1.1 the value of the increase in sums due to be paid to Infraco under the Infraco Contract arising from the facts or circumstances notified in the Infraco Notification of **tie** Change which constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change (which only relate to the Foundations pursuant to *Pricing Assumption 3.4.1.1.3* and the Contamination pursuant to *Clause 3.3 (c) of Schedule Part 4 (Pricing)* are not equal to that detailed in the Estimate; and
  - 4.1.2 the true and proper valuation of the impacts arising from the facts or circumstances notified in the Infraco Notification of **tie** Change which constitute a Notified Departure and therefore are deemed to be a Mandatory **tie** Change (which only relate to the Foundations pursuant to *Pricing Assumption 3.4.1.1.3* and the Contamination pursuant to *Clause 3.3 (c) of Schedule Part 4 (Pricing)*) are:
    - 4.1.2.1 £701,467.95 excluding VAT in connection with the works associated with the Foundations; and



4.1.2.2 Actual Cost in connection with the items of work associated with Contamination.

**5. TIE'S FURTHER COMMENTS ON AND UNDERSTANDING OF INFRACO'S POSITION ON THE DISPUTE**

- 5.1 Without prejudice to and under reservation of **tie's** position set out above in this Position Paper, set out at Annex 1 to this Position Paper is **tie's** detailed valuation of the items of work associated with the Foundations.
- 5.2 This Position Paper is served under reservation of a right by **tie**, both in its sole discretion and in any event in response to new information coming to light, at any time to add, omit, alter or otherwise amend in whole or in part its position as set out in this Position Paper.



## ANNEX 1 TO THE POSITION PAPER

## IN THE MATTER OF A DISPUTE

BETWEEN

tie LIMITED

and

BILFINGER BERGER UK LIMITED; SIEMENS PLC; and

CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S,A

There follows tie's valuation of the items of work associated with the Foundations.

ITEM	DESCRIPTION OF WORK	UNIT	QUANT	RATE	AMOUNT
	<b>Russell Road Retaining Wall</b>				
	Valuation of Retaining Wall Foundations from BDDI to IFC				
	Drawing Refer RWT 0030 and 45 Rev 1 to Rev 3				
	Rates pro-rata to Schedule Part 4, page 244				
B6(4)					
001	Establish Piling Rig - included in Contract Sum				0.00
002	Moving piles for 1050mm diameter bore piles				
	Drwg 30		81		
	Drwg 45		36.00		
	Rate as BQ no change in plant	Nr	117	34.69	4,058.73
003a	Cast in place reinforced 1050 pile				
	117 nr x 12m	M	1404	406.21	570,318.84
	(Rate £232.12 / 0.6 x 1.05)				
4	Reinforcement - included in rate	t			0.00
5	Proof loading - no further loading requirements	nr			0.00
6	Earthworks - not significantly changed but BDDI to Infracore betterment				0.00
10	Drainage - would have been required whether the foundation design changed or not				0.00
12	Structural Concrete				
	BDDI		226.08		
	IFC		233.41		
		cm	7.33	141.77	1,039.11
13	Blinding				
	BDDI		27.82		
	IFC		0		
		cm	-27.82	142.95	-3,977.39
14	Formwork - fl				
	BDDI		115.59		
	IFC		145.88		
		sm	30.29	55.51	1,681.67



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15	Water proofing				
		BDDI		2609	
		IFC		2667	
			sm	58	6.89
					399.62
18	Reinforcement in slabs and pile caps				
		BDDI		75.65	
		IFC		64.27	
			t	-11.38	1,045.19
					-11,896.92
					561,623.66
	Consortium Preliminaries			7.40%	41,560.15
	Other Preliminaries			17.50%	98,284.14
	<b>Total</b>				<b>£701,467.95</b>

**Re-measurement of concrete, blinding and formwork**

<b>L' Shaped Footing - BDDI</b>						
BDDI				Concrete	50mm Blinding	Formwork
Units	length	Width	Depth	Cm	CM	sm
3	11.88	2.35	0.35	9.77	1.40	8.31
4	11.88	2.35	0.35	9.77	1.40	8.31
5	11.88	2.75	0.35	11.43	1.63	8.31
6	11.88	3.05	0.35	12.68	1.81	8.31
7	11.88	3.35	0.35	13.93	1.99	8.31
8	11.88	3.35	0.35	13.93	1.99	8.31
9	10.40	4.10	0.35	14.93	2.13	7.28
10	10.40	5.40	0.35	19.66	2.81	7.28
11	8.92	5.00	0.35	15.60	2.23	6.24
15	11.23	4.80	0.50	26.94	2.69	11.23
16	11.23	4.60	0.50	25.82	2.58	11.23
17	11.23	4.40	0.50	24.70	2.47	11.23
18	11.23	4.80	0.50	26.94	2.69	11.23
	145.88			226.08	27.82	115.59
<b>Pile Cap / Beam - IFC</b>						
IFC				Concrete	50mm Blinding	Formwork
Units	length	Width	Depth	Cm	CM	sm
3	11.88	1.60	1.00	19.00		11.88
4	11.88	1.60	1.00	19.00		11.88
5	11.88	1.60	1.00	19.00		11.88
6	11.88	1.60	1.00	19.00		11.88
7	11.88	1.60	1.00	19.00		11.88
8	11.88	1.60	1.00	19.00		11.88
9	10.40	1.60	1.00	16.64		10.40
10	10.40	1.60	1.00	16.64		10.40
11	8.92	1.60	1.00	14.26		8.92
15	11.23	1.60	1.00	17.96		11.23
16	11.23	1.60	1.00	17.96		11.23
17	11.23	1.60	1.00	17.96		11.23
18	11.23	1.60	1.00	17.96		11.23
	145.88			233.41	0.00	145.88





**Re-measurement of BDDI Reinforcement**

Summary		T
Unit Base	3	2.30
	4	2.39
	5	2.82
	6	2.74
	7	2.98
	8	2.98
	11	8.70
	9	5.42
	10	11.16
	15	8.81
	16	8.65
	17	8.23
	18	8.45
	Tonnes	75.65

Unit by Unit

<b>Base 3</b>					
Nr	Dia	Bar Mark	length	kg /m	KG
2	16	316	1650	1.579	5.21
18	16	303	3125	1.579	88.82
2	16	333	3025	1.579	9.55
18	16	304	5325	1.579	151.35
18	16	304	5325	1.579	151.35
2	16	305	5000	1.579	15.79
47	16	332	2275	1.579	168.83
47	16	331	1450	1.579	107.61
47	16	332	2275	1.579	168.83
2	16	305	5000	1.579	15.79
18	16	304	5325	1.579	151.35
18	16	304	5325	1.579	151.35
18	16	303	5325	1.579	151.35
2	16	333	3025	1.579	9.55
2	16	316	1650	1.579	5.21
94	16	330	3025	1.579	448.99
94	16	330	3025	1.579	448.99
2	16	333	3650	1.579	11.53
2	16	305	5060	1.579	15.98
2	16	305	5000	1.579	15.79
2	16	333	3025	1.579	9.55
				<b>Tonnes</b>	<b>2.30</b>



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<b>Base 4</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
11	16	363	2075	1.579	36.04
11	16	364	4075	1.579	70.78
3	16	314	2875	1.579	13.62
24	16	335a	1525	1.579	57.79
24	16	355a	1525	1.579	57.79
24	16	375a	1525	1.579	57.79
22	16	304	5325	1.579	184.98
3	16	315	5175	1.579	24.51
22	16	304	5325	1.579	184.98
24	20	359a	2550	2.467	150.98
94	16	311	1625	1.579	241.19
94	16	361	2000	1.579	296.85
23	16	358	1950	1.579	70.82
3	16	315	5175	1.579	24.51
23	20	360a	2750	2.467	156.04
23	16	304	5325	1.579	193.39
23	16	304	5325	1.579	193.39
23	20	356a	1725	2.467	97.88
1	20	362	3025	2.467	7.46
1	20	362	3025	2.467	7.46
3	16	314	2875	1.579	13.62
12	16	364	4075	1.579	77.21
12	16	363	2035	1.579	38.56
2	20	368	2400	2.467	11.84
23	16	354a	2750	1.579	99.87
1	20	365	1850	2.467	4.56
2	20	367	2200	2.467	10.85
1	20	365	1850	2.467	4.56
				<b>Tonnes</b>	<b>2.39</b>

<b>Base 5</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
21	16	304	5325	1.579	176.57
2	16	305	5000	1.579	15.79
2	16	305	5000	1.579	15.79
21	16	304	5325	1.579	176.57
21	16	366	3125	1.579	103.62
94	16	349	1975	1.579	293.14
2	16	372	3850	1.579	12.16
94	20	371	2600	2.467	602.93
47	20	351	2600	2.467	301.47
47	20	352	1575	2.467	182.62
94	16	349	1975	1.579	293.14
2	20	365	1850	2.467	9.13
2	16	372	3850	1.579	12.16
2	16	305	5000	1.579	15.79
2	16	305	5000	1.579	15.79
21	16	304	5325	1.579	176.57



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2	16	372	3850	1.579	12.16
2	20	365	1850	2.467	9.13
47	16	332	2275	1.579	168.83
47	16	331	1450	1.579	107.61
21	16	366	3125	1.579	103.62
2	16	125	5175	1.579	16.34
				<b>Tonnes</b>	<b>2.82</b>

<b>Base 6</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
23	16	8	2000	1.579	72.63
19	16	7	5800	1.579	174.01
23	16	7	5800	1.579	210.64
23	16	7	5800	1.579	210.64
19	16	7	5800	1.579	174.01
23	16	8	2000	1.579	72.63
95	20	2	3825	2.467	896.45
95	20	2	3825	2.467	896.45
2	16	7	5800	1.579	18.32
2	16	7	5800	1.579	18.32
				<b>Tonnes</b>	<b>2.74</b>

<b>Base 7</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
26	16	8	2000	1.579	82.11
21	16	7	5800	1.579	192.32
26	16	7	5800	1.579	238.11
26	16	7	5800	1.579	238.11
21	16	7	5800	1.579	192.32
26	16	8	2000	1.579	82.11
95	20	12	4100	2.467	960.90
95	20	12	4100	2.467	960.90
2	16	7	5800	1.579	18.32
2	16	7	5800	1.579	18.32
				<b>Tonnes</b>	<b>2.98</b>

<b>Base 8</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
26	16	8	2000	1.579	82.11
21	16	7	5800	1.579	192.32
26	16	7	5800	1.579	238.11
26	16	7	5800	1.579	238.11
21	16	7	5800	1.579	192.32
26	16	8	2000	1.579	82.11
95	20	12	4100	2.467	960.90
95	20	12	4100	2.467	960.90
2	16	7	5800	1.579	18.32
2	16	7	5800	1.579	18.32
				<b>Tonnes</b>	<b>2.98</b>



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<b>Base 9</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
31	20	17	2200	2.467	168.25
3	20	47	1875	2.467	13.88
3	20	55	10175	2.467	75.31
26	20	55	10175	2.467	652.64
31	20	55	10175	2.467	778.15
3	20	47	1875	2.467	13.88
31	20	17	2200	2.467	168.25
82	25	52	4975	2.467	1,006.41
3	20	56	3900	2.467	28.86
82	20	52	4975	2.467	1,006.41
3	20	47	1875	2.467	13.88
41	20	53	3875	2.467	391.94
41	20	54	3050	2.467	308.50
3	20	55	10175	2.467	75.31
41	20	59	3325	2.467	336.31
41	20	60	2625	2.467	265.51
3	20	55	10175	2.467	75.31
3	20	47	1875	2.467	13.88
3	20	56	3900	2.467	28.86
				<b>Tonnes</b>	<b>5.42</b>

<b>Base 10</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
3	20	18	3400	2.467	25.16
41	20	17	2200	2.467	222.52
21	20	9	3800	2.467	196.87
20	20	10	2450	2.467	120.88
21	20	11	2325	2.467	120.45
20	20	12	3050	2.467	150.49
3	20	19	2050	2.467	15.17
3	20	20	5400	2.467	39.97
21	20	14	8050	2.467	417.05
20	20	13	8700	2.467	429.26
19	20	13	8700	2.467	407.80
19	20	14	8050	2.467	377.33
3	20	20	5400	2.467	39.97
41	20	17	2200	2.467	222.52
3	20	21	2050	2.467	15.17
61	32	1	6425	6.316	2,475.40
3	20	26	5150	2.467	38.12
61	32	1	6425	6.316	2,475.40
3	20	21	2050	2.467	15.17
3	20	22	8750	2.467	64.76
1	20	14	8050	2.467	19.86
42	20	4	3900	2.467	404.09
42	20	5	3200	2.467	331.56
3	20	24	2450	2.467	18.13
3	20	23	2350	2.467	17.39
19	32	15	6525	6.316	783.03
3	20	25	5150	2.467	38.12



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36	32	16	3950	6.316	898.14
19	32	15	6525	6.316	783.03
				<b>Tonnes</b>	<b>11.16</b>

<b>Base 11</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg/m</b>	<b>KG</b>
37	20	17	2200	2.467	200.81
3	20	47	1875	2.467	13.88
3	20	47	1875	2.467	13.88
33	20	48	8700	2.467	708.28
3	20	48	8700	2.467	64.39
3	20	17	2200	2.467	16.28
70	32	46	6000	6.316	2,652.72
3	20	49	4800	2.467	35.52
70	32	46	6000	6.316	2,652.72
3	20	47	1875	2.467	13.88
35	32	42	3925	6.316	867.66
35	32	3	3100	6.316	685.29
2	20	48	8700	2.467	42.93
35	20	43	4000	2.467	345.38
35	20	5	3200	2.467	276.30
3	20	48	8700	2.467	64.39
3	20	47	1870	2.467	13.84
3	20	49	4800	2.467	35.52
				<b>Tonnes</b>	<b>8.70</b>

<b>Unit 1 (15)</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg /m</b>	<b>KG</b>
3	16	18	1850	1.579	8.76
2	20	17	4300	2.467	21.22
36	20	5	4925	2.467	437.40
36	20	5	4925	2.467	437.40
2	20	17	4300	2.467	21.22
36	20	5	4925	2.467	437.40
36	20	5	4925	2.467	437.40
2	20	17	4300	2.467	21.22
36	20	4	2800	2.467	248.67
3	16	18	1850	1.579	8.76
45	16	8	1600	1.579	113.69
44	16	9	2425	1.579	168.48
45	32	6	2775	6.316	788.71
44	32	7	1750	6.316	486.33
2	20	16	4050	2.467	19.98
45	20	3	4525	2.467	502.34
44	20	2	3450	2.467	374.49
2	20	16	4050	2.467	19.98
89	32	1	5225	6.316	2,937.10
45	20	2	3450	2.467	383.00
44	20	3	4525	2.467	491.18
2	20	17	4300	2.467	21.22
2	20	17	4300	2.467	21.22



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2	20	17	4300	2.467	21.22
36	20	4	3800	2.467	337.49
2	20	16	4050	2.467	19.98
2	20	16	4050	2.467	19.98
				<b>Tonnes</b>	<b>8.81</b>

<b>Unit 2 (16)</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg /m</b>	<b>KG</b>
3	16	18	1850	1.579	8.76
35	20	39	4150	2.467	358.33
2	20	17	4300	2.467	21.22
35	20	40	4625	2.467	399.35
35	20	40	4625	2.467	399.35
2	20	17	4300	2.467	21.22
45	32	6	2775	6.316	788.71
44	32	7	1750	6.316	486.33
35	20	40	4625	2.467	399.35
35	20	40	4625	2.467	399.35
2	20	17	4300	2.467	21.22
45	16	8	1600	1.579	113.69
44	16	9	2425	1.579	168.48
35	20	39	4150	2.467	358.33
3	16	18	1850	1.579	8.76
3	20	30	3950	2.467	29.23
45	20	29	4400	2.467	488.47
44	20	28	3350	2.467	363.64
89	32	27	5025	6.316	2,824.67
2	20	30	3950	2.467	19.49
2	20	31	4075	2.467	20.11
2	20	17	4300	2.467	21.22
2	20	31	4075	2.467	20.11
44	20	29	4400	2.467	477.61
45	20	28	3550	2.467	394.10
2	20	30	3950	2.467	19.49
2	20	30	3950	2.467	19.49
				<b>Tonnes</b>	<b>8.65</b>



FOISA Exempt

<b>Unit 3 (17)</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg /m</b>	<b>KG</b>
3	16	18	1850	1.579	8.76
33	20	39	4150	2.467	337.86
2	20	17	4300	2.467	21.22
45	20	38	4300	2.467	477.36
44	20	37	3250	2.467	352.78
33	20	40	4625	2.467	376.53
33	20	40	4625	2.467	376.53
2	20	17	4300	2.467	21.22
45	32	6	2775	6.316	788.71
44	32	7	1750	6.316	486.33
33	20	40	4625	2.467	376.53
33	20	40	4625	2.467	376.53
2	20	17	4300	2.467	21.22
45	16	9	2425	1.579	172.31
33	20	39	4150	2.467	337.86
3	16	18	1850	1.579	8.76
2	20	41	3850	2.467	19.00
89	32	36	4825	6.316	2,712.25
2	20	41	3850	2.467	19.00
45	20	37	3250	2.467	360.80
44	20	38	4300	2.467	466.76
2	20	31	4075	2.467	20.11
2	20	17	4300	2.467	21.22
2	20	31	6075	2.467	29.97
2	20	41	3850	2.467	19.00
2	20	41	3850	2.467	19.00
				<b>Tonnes</b>	<b>8.23</b>

<b>Unit 4 (18)</b>					
<b>Nr</b>	<b>Dia</b>	<b>Bar Mark</b>	<b>length</b>	<b>kg /m</b>	<b>KG</b>
3	16	18	1850	1.579	8.76
36	20	39	4150	2.467	368.57
2	20	17	4300	2.467	21.22
45	20	3	4525	2.467	502.34
44	20	2	3450	2.467	374.49
36	20	40	4625	2.467	410.76
36	20	40	4625	2.467	410.76
2	20	17	4300	2.467	21.22
45	32	6	2775	6.316	788.71
44	32	7	1750	6.316	486.33
36	20	40	4625	2.467	410.76
36	20	40	4625	2.467	410.76
2	20	17	4300	2.467	21.22
45	16	8	1600	1.579	113.69
44	16	9	2425	1.579	168.48
36	20	39	4150	2.467	368.57
3	16	18	1850	1.579	8.76
2	20	16	4050	2.467	19.98
89	32	1	5225	6.316	2,937.10



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2	20	16	4050	2.467	19.98
44	20	3	4525	2.467	491.18
2	20	31	4075	2.467	20.11
2	20	17	1750	2.467	8.63
2	20	31	4075	2.467	20.11
2	20	16	4050	2.467	19.98
2	20	16	4050	2.467	19.98
				<b>Tonnes</b>	<b>8.45</b>

**Re-measurement of IFC Reinforcement**

Summary		Tonnes
Unit Base	3	4.60
	4	4.86
	5	5.10
	6	3.86
	7	3.86
	8	3.86
	9	5.16
	11	4.25
	10	6.14
	15	5.67
	16	5.71
	17	5.60
	18	5.59
		64.27

<b>Base 3</b>					
Nr	Dia	Bar Mark	length	kg /m	KG
2	16	338	1500	1.579	4.74
11	20	347	4500	2.467	122.12
11	20	348	5150	2.467	139.76
11	20	348	5150	2.467	139.76
47	16	332	2875	1.579	213.36
47	16	331	2050	1.579	152.14
47	16	331	2050	1.579	152.14
47	16	332	2875	1.579	213.36
11	20	348	5150	2.467	139.76
11	20	348	5150	2.467	139.76
11	20	347	4500	2.467	122.12
2	16	339	2425	1.579	7.66
94	32	333	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>4.60</b>



FOISA Exempt

Base 4					
Nr	Dia	Bar Mark	length	kg /m	KG
2	20	365	2450	2.467	12.09
11	20	347	4500	2.467	122.12
11	20	347	4500	2.467	122.12
11	20	348	5150	2.467	139.76
47	16	331	2050	1.579	152.14
47	16	332	2875	1.579	213.36
11	20	348	5150	2.467	139.76
11	20	348	5150	2.467	139.76
11	20	347	4500	2.467	122.12
2	20	345	2450	2.467	12.09
47	20	351	3200	2.467	371.04
47	20	352	2175	2.467	252.19
94	32	333	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>4.86</b>

Base 5					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	32	4500	2.467	122.12
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	32	4500	2.467	122.12
47	20	36	3200	2.467	371.04
47	20	37	2175	2.467	252.19
2	20	41	2450	2.467	12.09
2	20	41	2450	2.467	12.09
47	16	30	2875	1.579	213.36
47	16	31	5150	1.579	382.20
94	32	31	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>5.10</b>

Base 6					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	32	4500	2.467	122.12
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	32	4500	2.467	122.12
94	32	31	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>3.86</b>



FOISA Exempt

Base 7					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	32	4500	2.467	122.12
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	32	4500	2.467	122.12
94	32	31	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>3.86</b>

Base 8					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	32	4500	2.467	122.12
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	33	5150	2.467	139.76
11	20	32	4500	2.467	122.12
94	32	31	5150	6.316	3,057.58
				<b>Tonnes</b>	<b>3.86</b>

Base 9					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	66	4750	2.467	128.90
11	20	66	4525	2.467	122.79
11	20	66	4525	2.467	122.79
11	20	66	4525	2.467	122.79
11	20	66	4525	2.467	122.79
11	20	66	4275	2.467	116.01
92	32	64	5150	6.316	2,992.52
41	20	71	4000	2.467	404.59
41	20	72	3175	2.467	321.14
41	20	69	3850	2.467	389.42
41	20	70	3150	2.467	318.61
				<b>Tonnes</b>	<b>5.16</b>

Base 11					
Nr	Dia	Bar Mark	length	kg /m	KG
11	20	65	4275	2.467	116.01
11	20	67	6750	2.467	183.17
11	20	67	6750	2.467	183.17
11	20	66	4275	2.467	116.01
70	32	64	5150	6.316	2,276.92
35	20	75	3950	2.467	341.06
35	20	74	3700	2.467	319.48
35	20	73	4525	2.467	390.71
35	20	74	3700	2.467	319.48
				<b>Tonnes</b>	<b>4.25</b>



FOISA Exempt

Base 10					
Nr	Dia	Bar Mark	length	kg /m	KG
6	20	20	2600	2.467	38.49
1	30	11	3725	2.467	9.19
6	20	21	3400	2.467	50.33
1	30	11	3725	6.316	23.53
1	30	12	3425	6.316	21.63
11	20	15	3175	2.467	86.16
11	20	15	3175	2.467	86.16
6	20	17	6000	2.467	88.81
11	20	14	6500	2.467	176.39
11	20	14	6500	2.467	176.39
6	20	15	3175	2.467	47.00
11	20	13	5175	2.467	140.43
71	32	22	5150	6.316	2,309.45
71	32	22	5150	6.316	2,309.45
4	20	16	3600	2.467	35.52
6	20	11	3725	2.467	55.14
1	32	9	4625	6.316	29.21
6	20	11	3725	2.467	55.14
6	20	11	3725	2.467	55.14
11	32	5	3700	6.316	257.06
11	20	1	3175	2.467	86.16
				<b>Tonnes</b>	<b>6.14</b>

Base 15					
Nr	Dia	Bar Mark	length	kg /m	KG
3	16	10	3650	1.579	17.29
11	20	5	4925	2.467	133.65
11	20	5	4925	2.467	133.65
11	20	5	4925	2.467	133.65
11	20	5	4925	2.467	133.65
11	20	4	4275	2.467	116.01
3	16	18	2350	1.579	11.13
89	32	1	5150	6.316	2,894.94
45	16	8	2025	1.579	143.89
44	16	9	2850	1.579	198.01
45	32	6	3150	6.316	895.29
45	32	7	2125	6.316	603.97
11	20	4	4275	5.467	257.09
				<b>Tonnes</b>	<b>5.67</b>

Base 16					
Nr	Dia	Bar Mark	length	kg /m	KG
3	16	18	2350	1.579	11.13
11	20	39	4625	2.467	125.51
11	20	40	4625	2.467	125.51
11	20	41	4625	2.467	125.51
45	32	6	3150	6.316	895.29



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45	32	7	2125	6.316	603.97
11	20	40	4625	2.467	125.51
11	20	40	4625	6.316	321.33
45	16	8	2025	1.579	143.89
45	16	9	2850	1.579	202.51
11	20	39	4625	2.467	125.51
3	16	18	2350	1.579	11.13
89	32	1	5150	6.316	2,894.94
				<b>Tonnes</b>	<b>5.71</b>

Base 17					
Nr	Dia	Bar Mark	length	kg /m	KG
3	16	18	2350	1.579	11.13
11	20	39	4625	2.467	125.51
11	20	40	4625	2.467	125.51
11	20	40	4625	2.467	125.51
45	32	6	3275	6.316	930.82
45	32	7	2250	6.316	639.50
11	20	40	4625	2.467	125.51
11	20	40	4625	2.467	125.51
45	16	8	2100	1.579	149.22
45	16	9	2925	1.579	207.84
11	20	39	4625	2.467	125.51
3	16	11	3250	1.579	15.40
89	32	1	5150	6.316	2,894.94
				<b>Tonnes</b>	<b>5.60</b>

Base 18					
Nr	Dia	Bar Mark	length	kg /m	KG
3	16	11	2380	1.579	11.27
11	20	39	4625	2.467	125.51
11	20	40	4625	2.467	125.51
11	20	40	4625	2.467	125.51
45	32	6	3275	6.316	930.82
44	32	7	2250	6.316	625.28
11	20	40	4625	2.467	125.51
11	20	40	4625	2.467	125.51
45	16	8	2100	1.579	149.22
45	16	9	2925	1.579	207.84
11	20	39	4625	2.467	125.51
3	16	11	3275	1.579	15.51
89	32	1	5150	6.316	2,894.94
				<b>Tonnes</b>	<b>5.59</b>