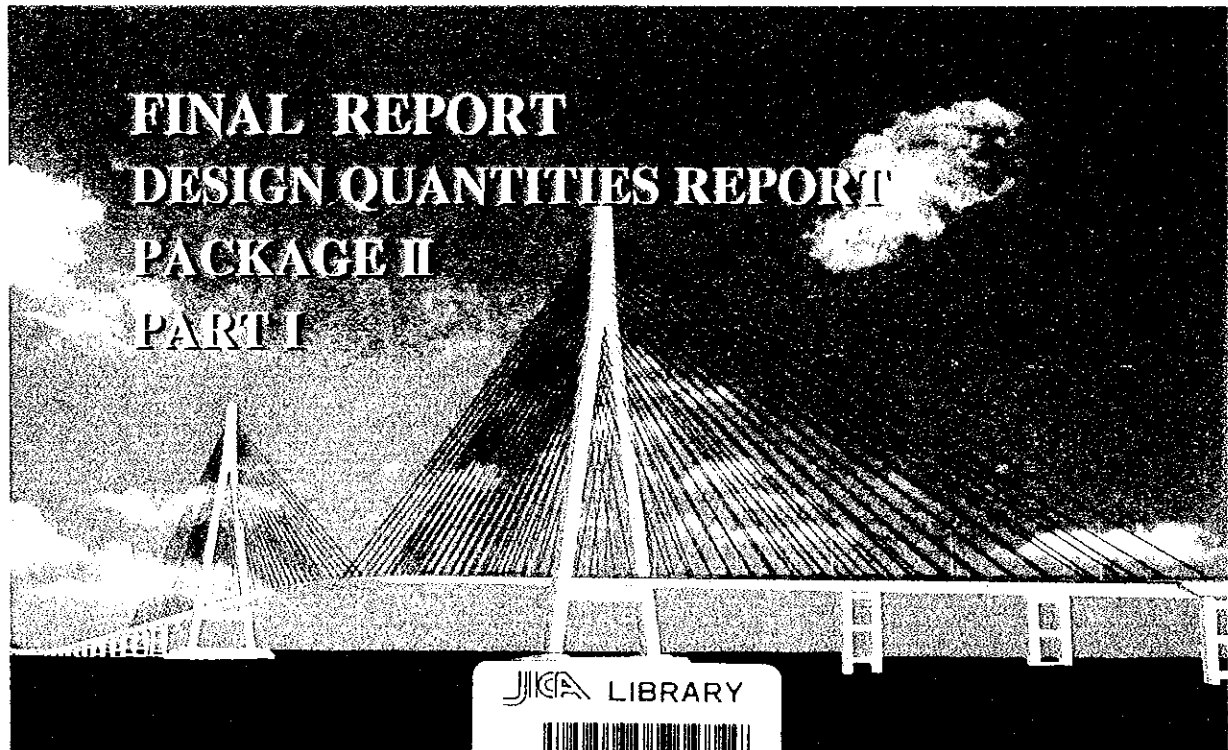


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF TRANSPORT
SOCIALIST REPUBLIC OF VIET NAM

THE DETAILED DESIGN
ON
THE CAN THO BRIDGE CONSTRUCTION
IN
SOCIALIST REPUBLIC OF VIET NAM



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OCTOBER 2000

NIPPON KOGI CO., LTD.

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF TRANSPORT

SOCIALIST REPUBLIC OF VIET NAM

**THE DETAILED DESIGN
ON
THE CAN THO BRIDGE CONSTRUCTION
IN
SOCIALIST REPUBLIC OF VIET NAM**

**FINAL REPORT
DESIGN QUANTITIES REPORT
PACKAGE II
PART I**

OCTOBER 2000

NIPPON KOEI CO., LTD.



1161254 [6]

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Notes

1. General

Unless otherwise noted these notes are applied to all design quantities.

2. Concrete

Concrete strengths are specified as followings base on 28 days cylinder strength.

Concrete class	Strength	Typical use
Concrete class A	50MPa	Precast PC box girder
Concrete class B	40MPa	Pylon, Cast in place PC box girder, Precast PC I girder
Concrete class C	35MPa	Hollow slab
Concrete class D	30MPa	Pile cap (Stay cable bridge), Cast in place bored concrete pile, Deck slab, Diaphragm, Precast RC panel
Concrete class E	24MPa	Abutment, Pier, Pile cap, Footing
Concrete class G	15MPa	Lean concrete, Plain concrete

3. Reinforcement

Reinforcements are specified as SD345.

4. Prestressing

Prestressed tendons are specified as SWPR7B.

5. Anchor Bar

Anchor bars are specified as SS400.

1. Superstructure

1.1. Approach Bridge (A1-P12)

I
1.Summary of Quantity

(Approach Bridge VIN LONG)
I-Gerder (A1-P12)

Item		Work Item		Unit	Quantity	Remarks
Concrete	CLASS B	Girder		cu.m	3,976.3	$\sigma_{ck}=40\text{Mpa}$
	CLASS D-1	Deck Slab		cu.m	2,559.0	$\sigma_{ck}=30\text{Mpa}$
		Diaphragm		cu.m	1,197.3	
		Total		cu.m	3,756.3	
	CLASS E	Barrier		cu.m	246.3	$\sigma_{ck}=24\text{Mpa}$
Form		Deck Slab		sq.m	1,030.2	
		Girder		sq.m	23,218.2	
		Diaphragm		sq.m	4,991.3	
		Barrier		sq.m	1,695.5	
		Total		sq.m	30,935.3	
Re-bar	Deck Slab	- D14		ton	154.3	
		D16 - D22		ton	303.2	
		D25 -		ton	84.1	
		Total		ton	541.6	211.6
	Girder	- D14		ton	312.3	
		D16 - D22		ton	350.9	
		D25 -		ton	-	
		Total		ton	663.2	166.8
	Diaphragm	- D14		ton	34.2	
		D16 - D22		ton	3.6	
		D25 -		ton	-	
		Total		ton	37.8	31.6
	Barrier	- D14		ton	38.9	
		D16 - D22		ton	0.6	
		D25 -		ton	-	
		Total		ton	39.5	160.4
	Total	- D14		ton	539.7	
		D16 - D22		ton	658.4	
		D25 -		ton	84.1	
		Total		ton	1,282.2	
PC Cable	12S12.7B			ton	237.9	SWPR7B
	4S12.7B	Transverse Tendons		ton	18.4	
		Total		ton	256.3	
Slab Plate				sq.m	7,450.6	
				cu.m	596.0	
		D10, D14		ton	154.6	
Shear Key				Nos.	2,592	
Expansion Joint		Type A		m	88.4	
		Concrete		cu.m	8.7	

(Approach Bridge VIN LONG)
I-Gerder (A1-P12)

Item	Work Item	Unit	Quantity	Remarks	
Bearing	Product layer rubber bearing	Nos.	216		
	Anchor Bar	Φ30 L=620	Nos.	96	
		Φ36 L=740	Nos.	48	
		Φ42 L=860	Nos.	96	
		Φ60 L=1220	Nos.	48	
	Anchor Cap	Φ50/65 L=350	Nos.	96	
		Φ50/56 L=410	Nos.	48	
		Φ50 L=470	Nos.	96	
		Φ65 L=650	Nos.	48	
Railing		m	1,085.8		
		ton	52.1		
Drainage	Pot	Nos.	72		
	Pipe	Φ150	m	47.0	
		Φ200	m	991.0	
	Hunger	Φ150	Nos.	48	
		Φ200	Nos.	696	
Pavement	t=75mm	Aspfalt concrete surface course	sq.m	10,236.1	
	t= 5mm	Water Proofing	sq.m	10,236.1	
		Road Marking	sq.m	412.4	
Concrete Central Reserve	precast L=2000	Nos.	232.8		
Erection		ton	92.1	per one girder	
		Nos.	108		
		ton	9,943.3	Total	

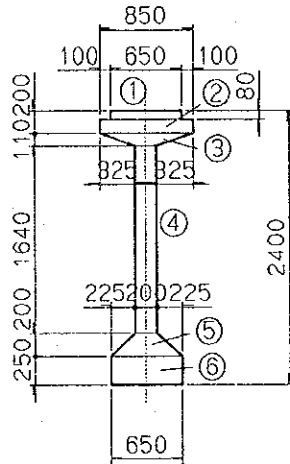
2. Concrete

1. Girder Concrete
 CLASS "B"
 1) Girder

(1) Calculation of Sectional Area

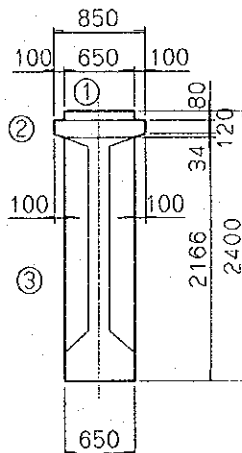
[1] Middle Section

Summary of Sectional Area		For ONE GIRDER	
No	Formula		(m ²)
1	0.650×0.080	=	0.052
2	0.850×0.120	=	0.102
3	$1/2 \times 0.325 \times 0.110 \times 2$	=	0.036
	0.200×0.110	=	0.022
4	1.640×0.200	=	0.328
5	$1/2 \times 0.225 \times 0.200 \times 2$	=	0.045
	0.200×0.200	=	0.040
6	0.650×0.250	=	0.163
Total Area			0.788 m ²



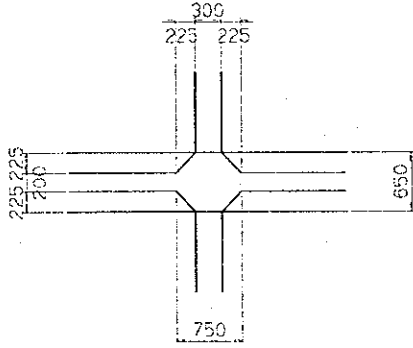
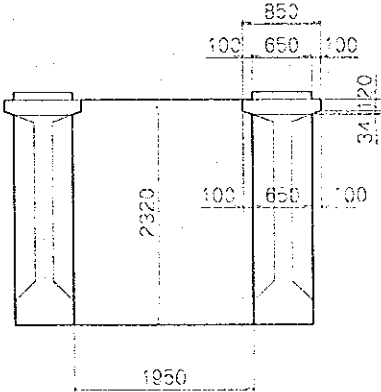
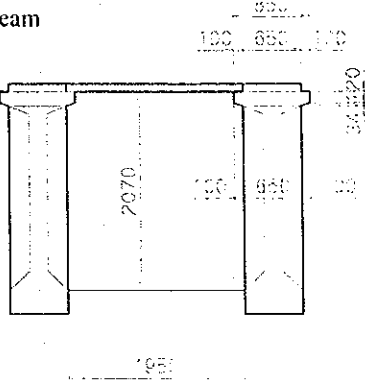
[2] End Section

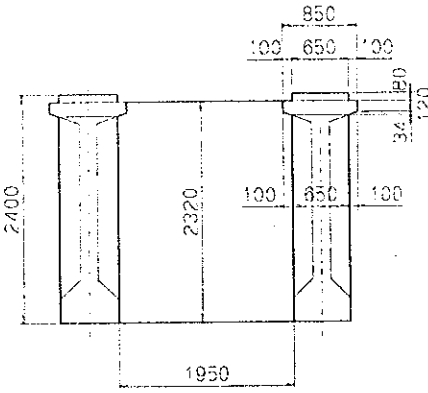
Summary of Sectional Area		For ONE GIRDER	
No	Formula		(m ²)
1	0.650×0.080	=	0.052
2	0.120×0.850	=	0.102
	$1/2 \times 0.100 \times 0.034 \times 2$	=	0.003
	0.650×0.034	=	0.022
3	0.650×2.166	=	1.408
Total Area			1.587 m ²

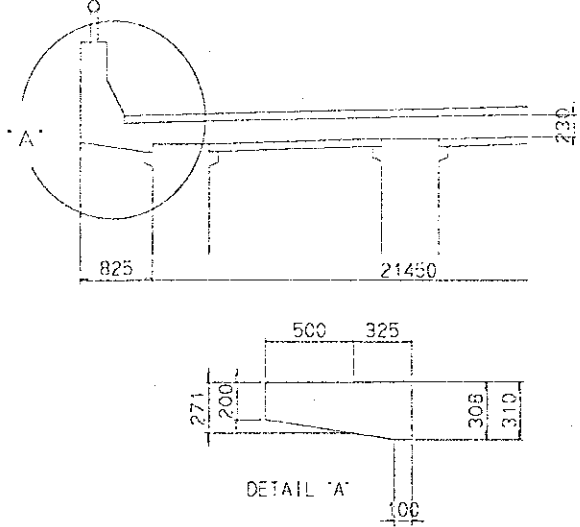
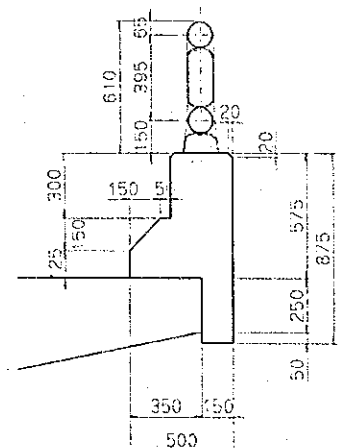


Item	Formula	Quantity																																																																																																																																																																																																
	(2) Calculation of Concrete Volume																																																																																																																																																																																																	
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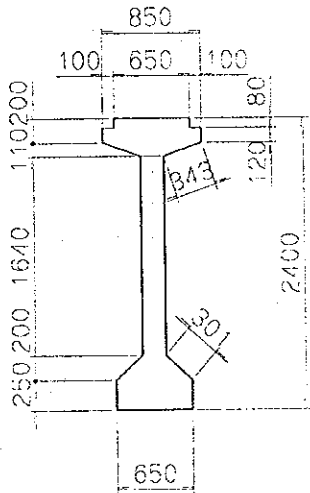
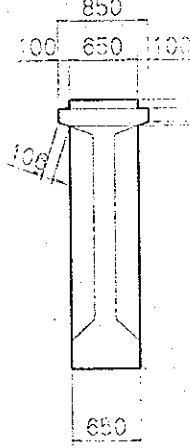
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Item	Formula	Quantity
2. Diaphragm Concrete CLASS "D-1" 1) Diaphragm	$V1 = \left(\frac{0.300 + 0.750}{2} \right) \times \frac{1}{2} \times 0.225 \times 2 = 0.424$ $V = 9 \times 3 \times 3 \times 0.424 \times 4 = 137.376 \text{ m}^3$ 	
2) Cross Beam	<p>(1) End Cross Beam</p>  $V2-1 = \left\{ \frac{2.320 \times 1.950 - (0.120 + 0.154) \times 0.100 \times 1/2}{2} \right\} \times 0.400 \times 8 \times 2 = 28.778 \text{ m}^3$ <p>(2) Intermediate Cross Beam</p>  $V2-2 = \left\{ \frac{2.070 \times 1.950 - (0.120 + 0.154) \times 0.100 \times 1/2}{2} \right\} \times 0.3 \times 8 \times 3 \times 3 = 86.597 \text{ m}^3$	

Item	Formula	Quantity
	<p>(3) Connection Cross Beam</p>  $V2-3 = \left\{ \begin{array}{l} 2.320 \times 1.950 - (0.120 + 0.154) \times 0.100 \times \frac{1}{2} \\ \times 2 \end{array} \right\} \times 2.000 \times 8 \times 2 + 1.587 \times 9$ <p style="text-align: right;">Girder end section area = 149.604 m²</p> $V2 = (28.778 + 86.597 + 149.604) \times 4 = 1059.916 \text{ m}^3$ <p>Total $V = V1 + V2 = 137.38 + 1059.9 = 1197.292 \text{ m}^3$</p>	<p>1197.292 m³</p>

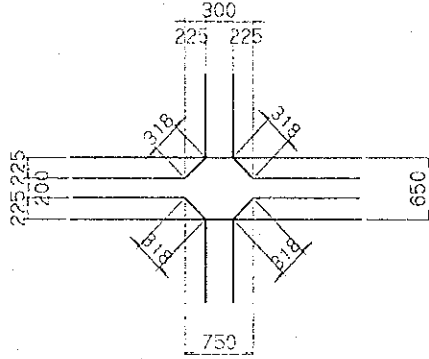
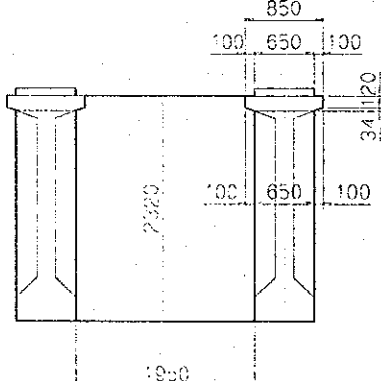
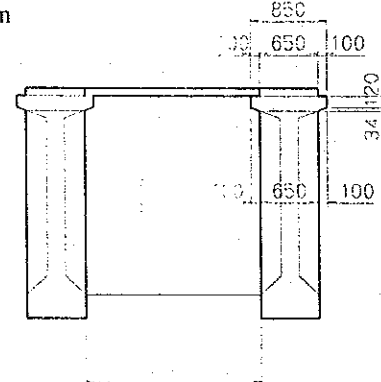
Item	Formula	Quantity
3. Deck Slab Concrete CLASS "D-1"	 $ \begin{aligned} A1 &= \{ 0.200 + 0.271 \} \times 1/2 \times 0.500 \times 2 = 0.236 \\ A2 &= \{ 0.271 + 0.308 \} \times 1/2 \times 0.225 \times 2 = 0.130 \\ A3 &= \{ 0.308 + 0.310 \} \times 1/2 \times 0.100 \times 2 = 0.062 \\ A4 &= 21.450 \times 0.230 = 4.934 \\ \Sigma A &= 5.362 \text{ m}^2 \\ \text{Exp} \\ V &= \frac{5.362 \times (120.000 - 0.200) \times 4 - 0.336 \times 0.070}{22.100 \times 7 - 0.635 \times 0.310 \times 22.100} = 2,558.981 \end{aligned} $	2,558.981 m ³
4. Barrier Concrete CLASS "E"	$ \begin{aligned} A1 &= 0.300 \times 0.300 = 0.090 \text{ m}^2 \\ A2 &= (0.300 + 0.500) \times 1/2 \times 0.150 = 0.060 \text{ m}^2 \\ A3 &= 0.500 \times 0.125 = 0.063 \text{ m}^2 \\ A4 &= 0.150 \times 0.300 = 0.045 \text{ m}^2 \\ A5 &= -0.020 \times 0.020 \times 1/2 \times 2 = -0.001 \text{ m}^2 \\ A &= 0.257 \text{ m}^2 \\ L &= 119.8 \times 4 = 479.200 \text{ m} \\ V &= 0.257 \times 479.200 \times 2 = 246.309 \text{ m}^3 \end{aligned} $ 	246.309 m ³

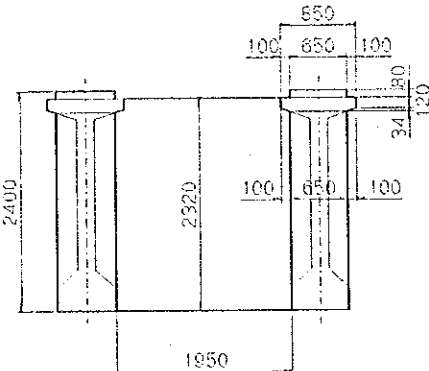
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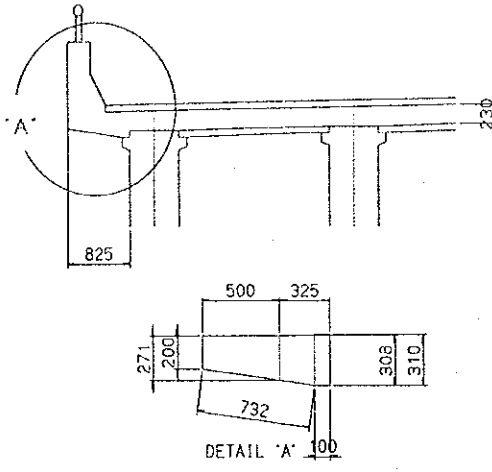
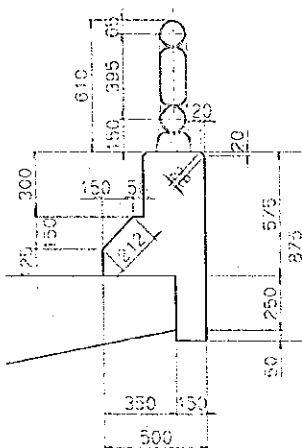
Item	Formula	Quantity
1. Girder		
1) Girder	(1) Calculation of Sectional Area	
	[1] Middle Section	
	Summary of Sectional Length	For ONE GIRDER
No	Formula	(m)
1	0.080×2	= 0.160
2	0.120×2	= 0.240
3	0.343×2	= 0.686
4	1.640×2	= 3.280
5	0.301×2	= 0.602
6	0.250×2	= 0.500
		Total Area 5.468 m
		
	[2] End Section	
	Summary of Sectional Length	For ONE GIRDER
No	Formula	(m)
1	0.080×2	= 0.160
2	0.120×2	= 0.240
2	0.106×2	= 0.212
6	2.166×2	= 4.332
		Total Area 4.944 m
		

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	<p>[3] P6-P9 Girder Length 39.832 m</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Section No.</th> <th>Section Length (m)</th> <th>Average of Section (m)</th> <th>Length of Block (m)</th> <th>Form Area (m²)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>END</td> <td>4.944</td> <td></td> <td></td> <td>1.149</td> <td>End-sec</td> </tr> <tr> <td>END</td> <td>4.944</td> <td>4.944</td> <td>0.400</td> <td>2</td> <td></td> </tr> <tr> <td>MIDDLE</td> <td>5.468</td> <td>5.206</td> <td>6.000</td> <td>31</td> <td></td> </tr> <tr> <td>MIDDLE</td> <td>5.468</td> <td>5.468</td> <td>27.032</td> <td>148</td> <td></td> </tr> <tr> <td>END</td> <td>4.944</td> <td>5.206</td> <td>6.000</td> <td>31</td> <td></td> </tr> <tr> <td>END</td> <td>4.944</td> <td>4.944</td> <td>0.400</td> <td>2</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 End-sec</td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td>39.832</td> <td>214.239</td> <td></td> </tr> </tbody> </table> <p style="text-align:center;">No. of Girder $9 \times 3 = 27$</p> <p>A3 = $214.239 \times 27 = 5784.45 \text{ m}^2$</p>	Section No.	Section Length (m)	Average of Section (m)	Length of Block (m)	Form Area (m ²)	Remark	END	4.944			1.149	End-sec	END	4.944	4.944	0.400	2		MIDDLE	5.468	5.206	6.000	31		MIDDLE	5.468	5.468	27.032	148		END	4.944	5.206	6.000	31		END	4.944	4.944	0.400	2							1 End-sec	Total			39.832	214.239		
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	<p>[4] P9-P12 Girder Length 39.832 m</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Section No.</th> <th>Section Length (m)</th> <th>Average of Section (m)</th> <th>Length of Block (m)</th> <th>Form Area (m²)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>END</td> <td>4.944</td> <td></td> <td></td> <td>1.149</td> <td>End-sec</td> </tr> <tr> <td>END</td> <td>4.944</td> <td>4.944</td> <td>0.400</td> <td>2</td> <td></td> </tr> <tr> <td>MIDDLE</td> <td>5.468</td> <td>5.206</td> <td>6.000</td> <td>31</td> <td></td> </tr> <tr> <td>MIDDLE</td> <td>5.468</td> <td>5.468</td> <td>27.032</td> <td>148</td> <td></td> </tr> <tr> <td>END</td> <td>4.944</td> <td>5.206</td> <td>6.000</td> <td>31</td> <td></td> </tr> <tr> <td>END</td> <td>4.944</td> <td>4.944</td> <td>0.400</td> <td>2</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 End-sec</td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td>39.832</td> <td>214.239</td> <td></td> </tr> </tbody> </table> <p style="text-align:center;">No. of Girder $9 \times 3 = 27$</p> <p>A4 = $214.239 \times 27 = 5784.45 \text{ m}^2$</p>	Section No.	Section Length (m)	Average of Section (m)	Length of Block (m)	Form Area (m ²)	Remark	END	4.944			1.149	End-sec	END	4.944	4.944	0.400	2		MIDDLE	5.468	5.206	6.000	31		MIDDLE	5.468	5.468	27.032	148		END	4.944	5.206	6.000	31		END	4.944	4.944	0.400	2							1 End-sec	Total			39.832	214.239		
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Total			39.832	214.239																																																				
	<p>$\Sigma A = A1 + A2 + A3 + A4$ $= 5844.29 + 5805 + 5784.45 + 5784.5$</p>	<p>23218.2 m^2 23218.227 m^2</p>																																																						

Item	Formula	Quantity
<p>2. Diaphragm</p> <p>1) Diaphragm</p>	$a1 = 0.318 \times 2 \times (1.640 + 1.950) \times \frac{1}{2} + 0.300 \times 1.950 = 1.727 \text{ m}^2$ $a2 = 0.318 \times 2 \times (1.640 + 1.950) \times \frac{1}{2} = 1.142 \text{ m}^2$ $A1 = \frac{(1.727 \times 2 + 1.142 \times 16) \times 3 \times 3}{4} = 782.136 \text{ m}^2$ 	
<p>2) Cross Beam</p>	<p>(1) End Cross Beam</p>  $A2-1 = [\{ 2.320 \times 1.950 - (0.120 + 0.154) \times 0.100 \} \times 2 + 1.950 \times 0.400] \times 8 \times 2 = 156.371 \text{ m}^2$ <p>(2) Intermediate Cross Beam</p>  $A2-2 = [\{ 2.320 \times 1.950 - (0.120 + 0.154) \times 0.100 \} \times 2 + 1.950 \times 0.300] \times 8 \times 3 \times 3 = 689.63 \text{ m}^2$	

Item	Formula	Quantity
	<p>(3) Connection Cross Beam</p>  $A2-3 = \left[\left\{ 2.320 \times 1.950 - (0.120 + 0.154) \times 0.100 \right\} \times 2 + 1.950 \times 2.000 \right] \times 8 \times 2 = 206.291 \text{ m}^2$ $A2 = (156.371 + 689.630 + 206.291) \times 4 = 4209.168 \text{ m}^2$ <p>Total A1 + A2 = 782.136 + 4,209.168 = 4,991.304 m²</p>	<p>4991.304 m²</p>

Item	Formula	Quantity
3. Deck Slab	 $A1 = (0.200 + 0.732 + 0.100) \times 2 \times (120.000 - 0.200) = 247.267 \text{ m}^2$ $A2 = (0.200 + 0.271) \times 1/2 \times 0.500 \times 2 = 0.236 \text{ m}^2$ $A3 = (0.271 + 0.308) \times 1/2 \times 0.225 \times 2 = 0.130 \text{ m}^2$ $A4 = (0.308 + 0.310) \times 1/2 \times 0.100 \times 2 = 0.062 \text{ m}^2$ $A5 = 21.450 \times 0.230 \times 2 = 9.867 \text{ m}^2$ <p style="text-align: right;">Sub-total 257.562 m²</p> $\text{Total } A = 257.562 \times 4 = 1030.248 \text{ m}^2$	1,030.248 m ²
4. Barrier	$A1 = (0.125 + 0.212 + 0.300 + 0.028 + 0.028 + 0.875 + 0.150 + 0.050) \times 479.200 \times 2 = 1,694.451 \text{ m}^2$ $A2 = 0.300 \times 0.300 = 0.090 \text{ m}^2$ $A3 = (0.300 + 0.500) \times 1/2 \times 0.150 = 0.060 \text{ m}^2$ $A4 = 0.500 \times 0.125 = 0.063 \text{ m}^2$ $A5 = 0.150 \times 0.300 = 0.045 \text{ m}^2$ $A6 = -0.020 \times 0.020 \times 1/2 \times 2 = -0.001 \text{ m}^2$ $A2 \sim A6 = 0.257 \text{ m}^2$ $A = 1,694.451 + 0.257 \times 4 = 1,695.479 \text{ m}^2$ 	1,695.479 m ²

4.Reinforcement Bar

1. SLAB

SCHEDULE OF REINFORCEMENT												
BAR MARK	SIZE (mm)	DIMENSIONS (mm)						LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f					
S1	25	6500					6500	3.853	370	9266		
S2	25	8250					8250	3.853	370	11761		
S3 - 1	18	10000					10000	1.998	966	19301		
S3 - 2	18	10000					10000	1.998	966	19301		
S4	18	3170					3170	1.998	966	6118		
S5	16	4790					4790	1.578	179	1353		
S6	16	3040					3040	1.578	179	859		
S7	16	10000					10000	1.578	358	5649		
S8	16	12000					12000	1.578	1074	20337		
S9	16	10210					10210	1.578	179	2884		
S10	14	12000					12000	1.208	558	8089		
S11	14	2610					2610	1.208	186	586		
S12	14	10000					10000	1.208	279	3370		
S13	14	6260					6260	1.208	93	703		
S14	14	3000					3000	1.208	68	246		
S15 - 1	14	10000					10000	1.208	525	6342		
S15 - 2	14	10000					10000	1.208	525	6342		
S16	14	3850					3850	1.208	525	2442		
S17	14	1417	199	420			2040	1.208	882	2174		
S18	14	420	199	650	199	420	1890	1.208	3087	7048		
S19	14	109	716	225			1050	1.208	966	1225		
							- D14			38,567		
							D16 - D22			75,802		
							D25 -			21,027		
Sub-Total										135,396		

						(kgf)	(ton)
- D14	38,567	×	4	=	154,268	154.3	
D14 - D25	75,802	×	4	=	303,208	303.2	
D25 -	21,027	×	4	=	84,108	84.1	
Total					541,584	541.6	

2. GIRDER

G1,G9

For ONE GIRDER

SCHEDULE OF REINFORCEMENT													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
G1	20	354	373	560	384	354			2030	2.466	6	30	
G2	20	300	474	373	560	384	474	300	2870	2.466	96	679	
G3	20	300	354	373	560	384	354	300	2630	2.466	74	480	
G4	16	7870							7870	1.578	12	149	
G5	16	7800							7800	1.578	12	148	
G6	16	7900							7900	1.578	12	150	
G7	16	240	2530	564	2541	240			6120	1.578	6	58	
G8	16	240	2532	342	2539	240			5900	1.578	96	894	
G9	16	240	2534	114	2536	240			5670	1.578	74	662	
G10	12	7870							7870	0.888	28	196	
G11	12	7800							7800	0.888	56	388	
G12	12	7900							7900	0.888	28	196	
G13	12	349	6005	1526					7880	0.888	28	196	
G14	12	180	2534	568	2545	180			6010	0.888	6	32	
G15	12	180	2538	118	2540	180			5560	0.888	158	780	
G16	12	300	362	379	568	390	362	300	2670	0.888	92	218	
G17	12	163	568	163					900	0.888	184	147	
G18	12	343	50	768	50	343			1560	0.888	184	255	
G19	12	180	145	191	568	191	145	180	1600	0.888	48	68	
G20	12	180	301	191	568	191	301	180	1920	0.888	126	215	
G21	12	1010							1010	0.888	66	59	
G22	12	515	197	257	197	55			1230	0.888	14	15	side
G22	12	515	197	257	197	55			1230	0.888	10	11	center
G23	12	100	318	253	318	100			1090	0.888	42	41	
G24	12	2000							2000	0.888	8	14	
G25	12	400							400	0.888	42	15	
G26	12	500							500	0.888	10	4	
G27	12	400							400	0.888	12	4	
G28	10	3840							3840	0.617	8	19	
G29	10	1260							1260	0.617	8	6	
Total	Side Span								- D14			2868	
									D16 - D22			3250	
									D25 - Total			6118	
	Center Span								- D14			2864	
									D16 - D22			3250	
									D25 - Total			6114	

G2,G3,G4,G6,G7,G8

For ONE GIRDER

SCHEDULE OF REINFORCEMENT														
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS	
		a	b	c	d	e	f	g						
G1	20	354	373	560	384	354			2030	2.466	6	30		
G2	20	300	474	373	560	384	474	300	2870	2.466	96	679		
G3	20	300	354	373	560	384	354	300	2630	2.466	74	480		
G4	16	7870							7870	1.578	12	149		
G5	16	7800							7800	1.578	12	148		
G6	16	7900							7900	1.578	12	150		
G7	16	240	2530	564	2541	240			6120	1.578	6	58		
G8	16	240	2532	342	2539	240			5900	1.578	96	894		
G9	16	240	2534	114	2536	240			5670	1.578	74	662		
G10	12	7870							7870	0.888	28	196		
G11	12	7800							7800	0.888	56	388		
G12	12	7900							7900	0.888	28	196		
G13	12	349	6005	1526					7880	0.888	28	196		
G14	12	180	2534	568	2545	180			6010	0.888	6	32		
G15	12	180	2538	118	2540	180			5560	0.888	158	780		
G16	12	300	362	379	568	390	362	300	2670	0.888	92	218		
G17	12	163	568	163					900	0.888	184	147		
G18	12	343	50	768	50	343			1560	0.888	184	255		
G19	12	180	145	191	568	191	145	180	1600	0.888	48	68		
G20	12	180	301	191	568	191	301	180	1920	0.888	126	215		
G21	12	1470							1470	0.888	66	86		
G22	12	515	197	257	197	515			1690	0.888	14	21	side	
G22	12	515	197	257	197	515			1690	0.888	10	15	center	
G23	12	100	318	253	318	100			1090	0.888	42	41		
G24	12	2000							2000	0.888	8	14		
G25	12	400							400	0.888	42	15		
G26	12	500							500	0.888	10	4		
G27	12	400							400	0.888	12	4		
G28	10	3840							3840	0.617	8	19		
G29	10	1260							1260	0.617	8	6		
Total	Side Span								- D14			2901		
									D16 - D22			3250		
									D25 -					
								Total				6151		
	Center Span									- D14			2895	
										D16 - D22			3250	
									D25 -					
								Total			6145			

G5

For ONE GIRDER

SCHEDULE OF REINFORCEMENT													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
G1	20	354	372	560	372	354			2020	2.466	6	30	
G2	20	300	474	372	560	372	474	300	2860	2.466	96	677	
G3	20	300	354	372	560	372	354	300	2620	2.466	74	478	
G4	16	7870							7870	1.578	12	149	
G5	16	7800							7800	1.578	12	148	
G6	16	7900							7900	1.578	12	150	
G7	16	240	2529	564	2529	240			6110	1.578	6	58	
G8	16	240	2529	342	2529	240			5880	1.578	96	891	
G9	16	240	2529	114	2529	240			5660	1.578	74	661	
G10	12	7870							7870	0.888	28	196	
G11	12	7800							7800	0.888	56	388	
G12	12	7900							7900	0.888	28	196	
G13	12	349	6005	1526					7880	0.888	28	196	
G14	12	180	2533	568	2533	180			6000	0.888	6	32	
G15	12	180	2533	118	2533	180			5550	0.888	158	779	
G16	12	300	362	378	568	378	362	300	2650	0.888	92	216	
G17	12	163	568	163					900	0.888	184	147	
G18	12	343	50	768	50	343			1560	0.888	184	255	
G19	12	180	145	191	568	191	145	180	1600	0.888	48	68	
G20	12	180	301	191	568	191	301	180	1920	0.888	126	215	
G21	12	1470							1470	0.888	66	86	
G22	12	515	197	257	197	515			1690	0.888	14	21	side
G22	12	515	197	257	197	515			1690	0.888	10	15	center
G23	12	100	318	253	318	100			1090	0.888	42	41	
G24	12	2000							2000	0.888	8	14	
G25	12	400							400	0.888	42	15	
G26	12	500							500	0.888	10	4	
G27	12	400							400	0.888	12	4	
G28	10	3840							3840	0.617	8	19	
G29	10	1260							1260	0.617	8	6	
Total	Side Span								- D14			2898	
									D16 - D22			3242	
									D25 - Total			6140	
	Center Span								- D14			2892	
									D16 - D22			3242	
									D25 - Total			6134	

3) Total Weight

Girder	Cent/Side	Nos.	Weight/G	Total	Remark	
G1,G9	Side Span	- D14	2,868	45,888		
		D16 - D22	3,250	52,000		
		D25 -				
	Center Span	- D14	2,864	22,912		
		D16 - D22	8	3,250	26,000	
		D25 -				
G2,G3,G4 G6,G7,G8	Side Span	- D14	2,901	139,248		
		D16 - D22	48	3,250	156,000	
		D25 -				
	Center Span	- D14	2,895	69,480		
		D16 - D22	24	3,250	78,000	
		D25 -				
G5	Side Span	- D14	2,898	23,184		
		D16 - D22	8	3,242	25,936	
		D25 -				
	Center Span	- D14	2,892	11,568		
		D16 - D22	4	3,242	12,968	
		D25 -				
Total			(kgf)	(ton)		
		- D14	312,280	312.3		
		D16 - D22	350,904	350.9		
		D25 -				
	Total	663,184	663.2			

3. DIAPHRAGM

Per EACH

SCHEDULE OF REINFORCEMENT													
(1) END DIAPHRAGM													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
C2	12	100	2530	424	2530	100			5690	0.888	56	283	
C3	12	1850							1850	0.888	144	237	
									- D14			520	
									D16 - D22				
									D25 -				
Sub-Total												520	
(2) INTERMEDIATE DIAPHRAGM													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
C4	12	100	2280	224	2280	100			4990	0.888	56	248	
C5	12	1850							1850	0.888	128	210	
									- D14			458	
									D16 - D22				
									D25 -				
Sub-Total												458	
(3) CONNECTION DIAPHRAGM													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
C1	16	240	1928	240					2410	1.578	120	456	
C6	12	100	2530	774	2530	100			6040	0.888	208	1116	
C7	12	100	2530	1424	2530	100			6690	0.888	104	618	
C8	12	1962	774	1962					4700	0.888	32	134	
C9	12	1962	1424	1962					5350	0.888	16	76	
C10	12	1850							1850	0.888	304	499	
C11	12	1900							1900	0.888	256	432	
C12	12	####							12000	0.888	10	107	
C13	12	9720							9720	0.888	10	86	
									- D14			3068	
									D16 - D22			456	
									D25 -				
Sub-Total												3524	

A1-P12

3) Total Weight

SECTION		Nos.	Weight/EACH	Weight	
				(kgf)	(ton)
END DIAPHRAGM	- D14	8	520	4,160	4.2
	D16 - D22				
	D25 -				
INTERMEDIATE DIAPHRAGM	- D14	12	458	5,496	5.5
	D16 - D22				
	D25 -				
CONNECTION DIAPHRAGM	- D14	8	3068	24,544	24.5
	D16 - D22		456	3,648	3.6
	D25 -				
Total	- D14			34,200	34.2
	D16 - D22			3,648	3.6
	D25 -				
	Total			37,848	37.8

4. BARRIER

SCHEDULE OF REINFORCEMENT													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
		a	b	c	d	e	f	g					
P1	A1-P3	14							2120	1.208	1608	4,118	
	P3-P6	14							2040	1.208	1608	3,963	
	P6-P9	14							2030	1.208	1608	3,943	
	P9-P12	14							2030	1.208	1608	3,943	
P2	A1-P3	14							1310	1.208	1608	2,545	
	P3-P6	14							1260	1.208	1608	2,448	
	P6-P9	14							1260	1.208	1608	2,448	
	P9-P12	14							1260	1.208	1608	2,448	
P3		14							9800	1.208	64	758	
P4		14							9900	1.208	192	2,296	
P5		14							9900	1.208	128	1,531	
P6		14							12000	1.208	560	8,118	
P7		14							4700	1.208	56	318	
P8		16							1380	1.578	288	627	
									- D14			38,877	
									D16 - D22			627	
									D25 -				
Total Weight												39,504	

I
A1-P12
5.P.C Cable

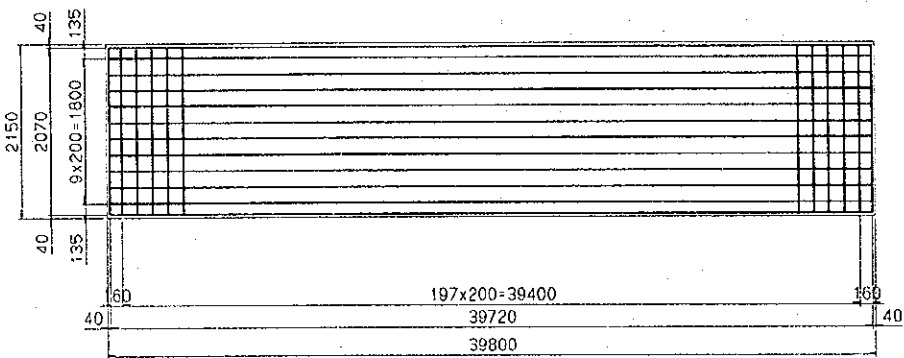
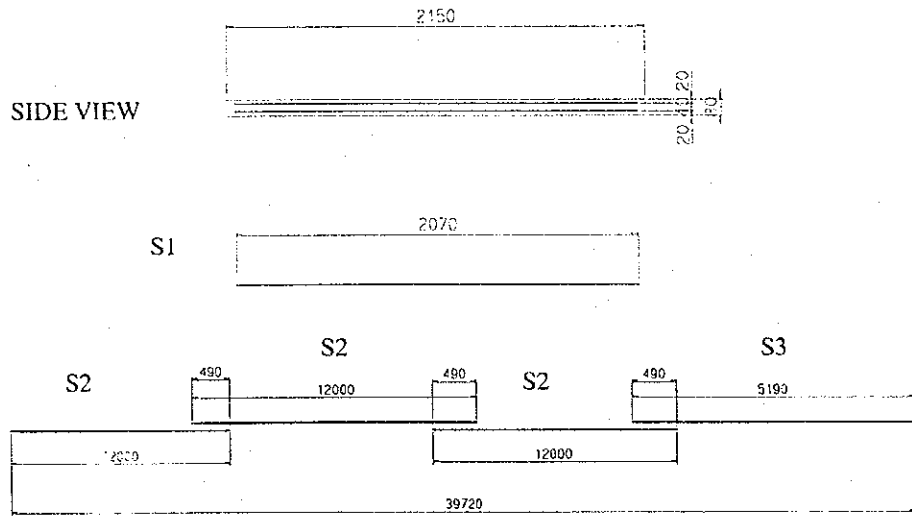
Item	Formula						Quantity		
1) 12S12.7(B)	1.A1-P3 For ONE GIRDER								
	CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT (kgf)		
	1	39.600	C1	1	39.600	9.290	368		
	2	39.568	C2	1	39.568	9.290	368		
	3	39.540	C3	1	39.540	9.290	367		
	4	39.514	C4	1	39.514	9.290	367		
	5	39.484	C5	1	39.484	9.290	367		
	6	39.460	C6	1	39.460	9.290	367		
	TOTAL			6	237.166		2204		
	SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P4)								
	Wp= 2204 × 9 × 3 =							59,508 kgf	
	TENSION UNIT								
	Ns= 6 × 2 × 9 × 3 =							324 Nos.	
		2.P3-P4 For ONE GIRDER							
		CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT (kgf)	
		1	39.592	C1	1	39.592	9.290	368	
		2	39.560	C2	1	39.560	9.290	368	
		3	39.532	C3	1	39.532	9.290	367	
		4	39.506	C4	1	39.506	9.290	367	
		5	39.476	C5	1	39.476	9.290	367	
		6	39.452	C6	1	39.452	9.290	367	
		TOTAL			6	237.118		2204	
		SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P4)							
		Wp= 2204 × 9 × 1 =							19,836 kgf
		TENSION UNIT							
Ns= 6 × 2 × 9 × 1 =							108 Nos.		
		3.P4-P5 For ONE GIRDER							
		CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT (kgf)	
		1	39.589	C1	1	39.589	9.290	368	
		2	39.557	C2	1	39.557	9.290	367	
		3	39.529	C3	1	39.529	9.290	367	
		4	39.503	C4	1	39.503	9.290	367	
		5	39.473	C5	1	39.473	9.290	367	
		6	39.449	C6	1	39.449	9.290	366	
		TOTAL			6	237.100		2202	
		SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P4)							
		Wp= 2202 × 9 × 1 =							19,818 kgf
		TENSION UNIT							
	Ns= 6 × 2 × 9 × 1 =							108 Nos.	

Item	Formula						Quantity																																																							
<p>4.P5-P6 For ONE GIRDER</p> <table border="1"> <thead> <tr> <th>CABLE VAR.</th> <th>EACH LENGTH</th> <th>CABLE NO.</th> <th>EACH</th> <th>TOTAL LENGTH</th> <th>UNIT WEIGHT</th> <th>WEIGHT (kgf)</th> </tr> </thead> <tbody> <tr><td>1</td><td>39.590</td><td>C1</td><td>1</td><td>39.590</td><td>9.290</td><td>368</td></tr> <tr><td>2</td><td>39.558</td><td>C2</td><td>1</td><td>39.558</td><td>9.290</td><td>367</td></tr> <tr><td>3</td><td>39.530</td><td>C3</td><td>1</td><td>39.530</td><td>9.290</td><td>367</td></tr> <tr><td>4</td><td>39.504</td><td>C4</td><td>1</td><td>39.504</td><td>9.290</td><td>367</td></tr> <tr><td>5</td><td>39.474</td><td>C5</td><td>1</td><td>39.474</td><td>9.290</td><td>367</td></tr> <tr><td>6</td><td>39.450</td><td>C6</td><td>1</td><td>39.450</td><td>9.290</td><td>366</td></tr> <tr> <td>TOTAL</td> <td></td> <td></td> <td>6</td> <td>237.106</td> <td></td> <td>2202</td> </tr> </tbody> </table> <p style="text-align: center;">SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P4)</p> <p style="text-align: center;">Wp= 2202 × 9 × 1 = 19,818 kgf</p> <p style="text-align: center;">TENSION UNIT</p> <p style="text-align: center;">Ns= 6 × 2 × 9 × 1 = 108 Nos.</p>							CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT (kgf)	1	39.590	C1	1	39.590	9.290	368	2	39.558	C2	1	39.558	9.290	367	3	39.530	C3	1	39.530	9.290	367	4	39.504	C4	1	39.504	9.290	367	5	39.474	C5	1	39.474	9.290	367	6	39.450	C6	1	39.450	9.290	366	TOTAL			6	237.106		2202
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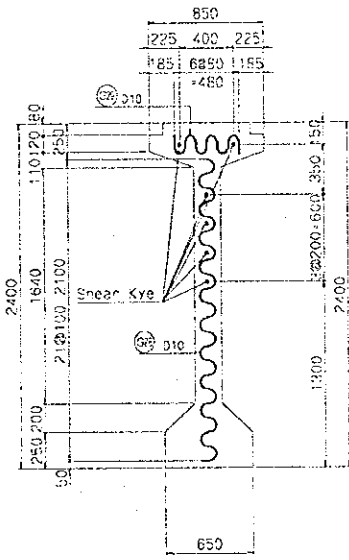
I A1-P12

Item	Formula						Quantity
2) 4S12.7B	TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P12) $\Sigma =$						237,888 kgf 238 ton
	TENSION UNIT Ns=						= 1,296 Nos.
	PC CABLE OF DIAPHRAGMS						
	LOCATION	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT (kgf)
End Diaphragm	21.366		16	341.9	3.096	1,058	
Intermediate One	21.366		72	1538.4	3.096	4,763	
Connection One	21.141		192	4059.1	3.096	12,567	
TOTAL			280	5939.3		18,388	
TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P12)							
Wp= 18,388						= 18,388 kgf 18 ton	
TENSION UNIT							
Ns= 280 × 2						= 560 Nos.	

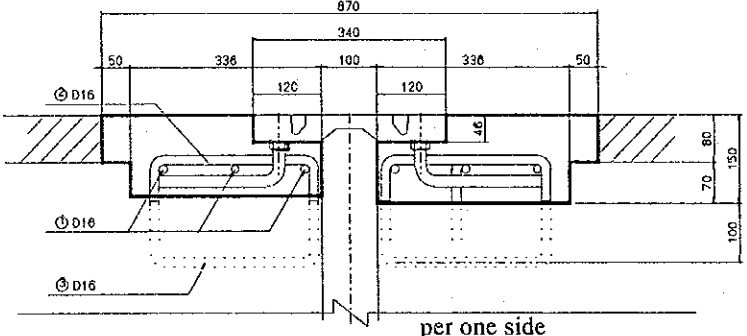
6. Slab plate

Item	Formula	Quantity																																			
	$A = 1.950 \times 8 \times 39.800 \times 3 \times 4 = 7450.560 \text{ m}^2$	7450.560 m ²																																			
	$V = 7450.56 \times 0.080 = 596.045 \text{ m}^3$	596.045 m ³																																			
	<p>Re-bar Per 39.8m</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>WEIGHT/M (kgf/m)</th> <th>WEIGHT /One (kgf)</th> <th>NO. of BARS</th> <th>WEIGHT (kgf)</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>D 14</td> <td>2070</td> <td>1.208</td> <td>2.501</td> <td>400</td> <td>1,000</td> </tr> <tr> <td>S2</td> <td>D 10</td> <td>12000</td> <td>0.617</td> <td>7.404</td> <td>72</td> <td>533</td> </tr> <tr> <td>S3</td> <td>D 10</td> <td>5190</td> <td>0.617</td> <td>3.202</td> <td>24</td> <td>77</td> </tr> <tr> <td colspan="6"></td> <td style="text-align: right;">1,610</td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	WEIGHT/M (kgf/m)	WEIGHT /One (kgf)	NO. of BARS	WEIGHT (kgf)	S1	D 14	2070	1.208	2.501	400	1,000	S2	D 10	12000	0.617	7.404	72	533	S3	D 10	5190	0.617	3.202	24	77							1,610	
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						1,610																															
	$W = 1,610 \times 8 \times 3 \times 4 = 154560 \text{ kgf}$	154560 kgf 154.6 ton																																			
	<p>BAR ARRANGEMENT</p> 																																				
	<p>SIDE VIEW</p> 																																				

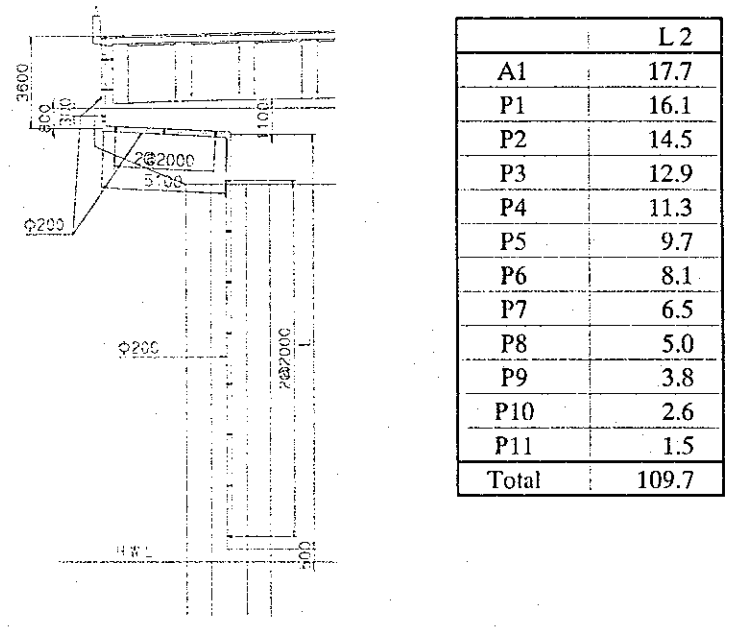
7. SHERA KEY

Item	Formula	Quantity
	$N = 6 \times 4 \times 9 \times 3 \times 4 =$ 	<p>Nos</p> <p>2,592</p>

8. ACCESSORY

Item	Formula	Quantity
<p>1. EXPANSION JOINT (TYPE A)</p>	<p>Each Length L = 22.100</p> <p>N = 4</p> <p>Total Length L = 22.100 × 4 = 88.400 m</p> <p>Concrete</p>  <p>A1 = 0.336 × 0.150 - 0.12 × 0.046 = 0.045 A2 = 0.080 × 0.050 = 0.004 Total = 0.049 m²</p> <p>V = 0.049 × 22.100 × 8 = 8.663 m³</p>	<p>88.400 m</p> <p>8.663 m³</p>
<p>2. BEARING PAD</p>	<p>ELASTOMERIC 460*660*108</p> <p>EACH for One SPAN</p> <p>N = 9</p> <p>TOTAL EACH</p> <p>N = 9 × 24 = 216</p>	<p>Nos. 216</p>
<p>3. ANCHOR BAR</p>	<p>Φ30 L=620 (MOVE) A1,P3,P6,P6,P9,P12 N = 8 × 2 × 6 = 96</p> <p>Φ36 L=740 (MOVE) P2,P5 N = 8 × 3 × 2 = 48</p> <p>Φ42 L=860 (FIX) P7,P8,P10,P11 N = 8 × 3 × 4 = 96</p> <p>Φ60 L=1220 (FIX) P1,P4 N = 8 × 3 × 2 = 48</p>	<p>Nos. 96</p> <p>Nos. 48</p> <p>Nos. 96</p> <p>Nos. 48</p>

Item	Formula						Quantity	
4. ANCHOR CAP (SGP)	$\Phi 50/65$	L=350	(MOVE)	A1,P3,P6,P6,P9,P12	=	Nos. 96		
	N =	8	x	2	x	6		
	$\Phi 50/56$	L=410	(MOVE)	P2,P5	=	Nos. 48		
	N =	8	x	3	x	2		
$\Phi 50$	L=470	(FIX)	P7,P8,P10,P11	=	Nos. 96			
N =	8	x	3	x	4			
$\Phi 65$	L=650	(FIX)	P1,P4	=	Nos. 48			
N =	8	x	3	x	2			
5. RAILING	$L = 120.000 \times 2 \times 4$						=	960.0 m
	per 10m							
	Item	Size	Material	Unit Weight	Quantity	Unit	WEIGHT (kgf)	
	Post	610*180*130	FCD-450	18.1	5	each	90.5	
	Upper Rail	114.3*3.5T	STK-400	19.5	10	m	195.0	
	Bottom Rail	76.392.5T	STK-400	5.77	10	m	57.7	
		90*300	STK-400	2.13	1.67	each	3.6	
	Connection	87.5*300	STK-400	1.4	1.67	each	2.3	
	Anchor Bolt	M22-650	SS-400	2.9	20	each	58.0	
	Vertical Member	FBB*32*300	SS-400	2.09	65	each	135.9	
Total						542.9		
$W = 542.9 \times 960.000 \times 0.1$						=	52,118.4	
						52,118.4 kgf		
						52.1 ton		

Item	Formula	Quantity																												
6. DRAINAGE FACILITIES																														
Pot	300*250 (Drain Box, Screen and Deck Drain)	each																												
N =	3 × 2 × 3 × 4 =	72																												
Pipe	. 150																													
L =	0.980 × 2 × 2 × 3 × 4 =	47 m																												
Pipe	. 200																													
L1 =	(3.60 × 2 + 26.000 × 2 + 5.10) × 3 × 4 = 771.6 m																													
L2 =	109.7 × 2 = 219.4 m																													
	Total 991.0 m	991.0 m																												
																														
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>L 2</th> </tr> </thead> <tbody> <tr><td>A1</td><td>17.7</td></tr> <tr><td>P1</td><td>16.1</td></tr> <tr><td>P2</td><td>14.5</td></tr> <tr><td>P3</td><td>12.9</td></tr> <tr><td>P4</td><td>11.3</td></tr> <tr><td>P5</td><td>9.7</td></tr> <tr><td>P6</td><td>8.1</td></tr> <tr><td>P7</td><td>6.5</td></tr> <tr><td>P8</td><td>5.0</td></tr> <tr><td>P9</td><td>3.8</td></tr> <tr><td>P10</td><td>2.6</td></tr> <tr><td>P11</td><td>1.5</td></tr> <tr><td>Total</td><td>109.7</td></tr> </tbody> </table>		L 2	A1	17.7	P1	16.1	P2	14.5	P3	12.9	P4	11.3	P5	9.7	P6	8.1	P7	6.5	P8	5.0	P9	3.8	P10	2.6	P11	1.5	Total	109.7	
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P8	5.0																													
P9	3.8																													
P10	2.6																													
P11	1.5																													
Total	109.7																													
Hunger	. 150																													
N =	2 × 2 × 3 × 4 =	48																												
		each																												
	per One																													
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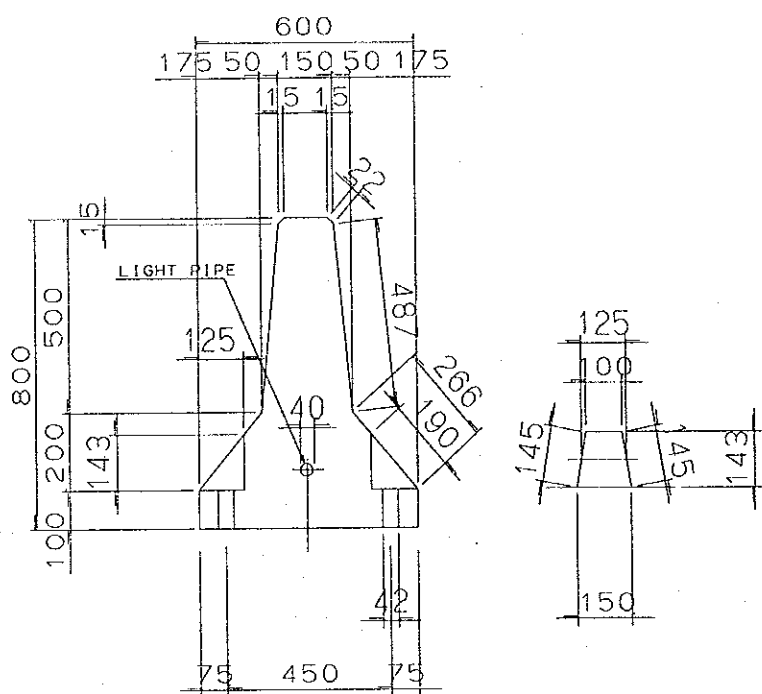
Item	Formula	Quantity																									
	Hunger . 200																										
	$N1 = (26.000 - 2.000) / 2.000 + 1) \times 2 = 26$ $N2 = (3 + 3) \times 2 = 12$ $N3 = (109.70 / 12 + 1) \times 2 = 20$																										
	Sub-Total	58																									
	$N = 58 \times 3 \times 4 = 696$	each 696																									
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PL	100*8*70	0.044	1	0.044																							
				0.669																							

9. PAVEMENT

	Formula	Quantity
1)	Asphalt concrete t=75mm	
	$A = 10.750 \times 2 \times (480.000 - 0.870 \times 3.5 - 1.715 \times 0.5)$	10,236.1 m ²
	$\text{Exp} = 10236.1 \text{ m}^2$	
2)	Water Proofing t=5mm	
	$A = 10.750 \times 2 \times (480.000 - 0.870 \times 3.5 - 1.715 \times 0.5)$	10,236.1 m ²
	$\text{Exp} = 10236.1 \text{ m}^2$	
3)	Road marking	
	<p>Bridge Length $L = 480.000 - 0.500 = 479.500 \text{ m}$</p> <p>Side Line</p> $A1 = 479.500 \times 0.200 \times 4 = 383.600 \text{ m}^2$ <p>Center Line</p> $A2 = 479.500 \times 0.100 \times \frac{3}{10} \times 2 = 28.770 \text{ m}^2$ <p>Total $383.600 + 28.770 = 412.4 \text{ m}^2$</p>	412.4 m ²

10. Precast central reverse

Item	Formula	Quantity
1. Concrete	$N = \frac{(120.000 - 0.800 \times 4 - 0.170 \times 2) \times 4}{2.000}$ <p style="text-align: right;">Exp</p> $= 232.8$ <p style="text-align: right;">Per 2.0m</p>	<p style="text-align: right;">each</p> <p style="text-align: right;">232.8</p>
	<div style="text-align: center;"> </div> $V1 = (0.150 + 0.250) \times \frac{1}{2} \times 0.500 \times 1.990 = 0.199$ $V2 = (0.250 + 0.600) \times \frac{1}{2} \times 0.200 \times 1.990 = 0.169$ $V3 = 0.100 \times 0.600 \times 1.990 = 0.119$ $V4 = - (0.100 + 0.150) \times \frac{1}{2} \times 0.125 \times 0.143 \times \frac{1}{2} \times 10 = -0.089$ $V5 = - 0.015 \times 0.015 \times \frac{1}{2} \times 2 \times 1.990 = -0.001$ $\Sigma V = 0.397 \text{ m}^3$	<p style="text-align: right;">0.397 m³</p>

Item	Formula	Quantity																																										
2).Form	<p style="text-align: right;">Per 2.0m</p>  $ \begin{aligned} A1 &= \{ 0.100 + 0.266 + 0.487 + 0.022 \} \times 2 \times 1.990 = 3.483 \\ A2 &= \{ 0.150 + 0.250 \} \times 1/2 \times 0.500 \times 2 = 0.200 \\ A3 &= \{ 0.250 + 0.600 \} \times 1/2 \times 0.200 \times 2 = 0.170 \\ A4 &= 0.100 \times 0.600 \times 2 = 0.120 \\ A5 &= - 0.015 \times 0.015 \times 1/2 \times 2 \times 2 = -0.001 \\ A6 &= 0.125 \times 0.143 \times 10 = 0.179 \\ A7 &= 0.143 \times 0.145 \times 1/2 \times 2 \times 10 = 0.208 \\ A8 &= - 0.266 \times 0.125 \times 10 = -0.333 \\ \Sigma A &= 4.026 \text{ m}^2 \end{aligned} $	4.026 m ²																																										
3) Re-Bar	<p style="text-align: right;">Per 2.0m</p> <table border="1" data-bbox="311 1568 1204 1848"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>WEIGHT/M (kgf/m)</th> <th>WEIGHT /One (kgf)</th> <th>NO. of BARS</th> <th>WEIGHT (kgf)</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>6</td> <td>1460</td> <td>0.222</td> <td>0.324</td> <td>20</td> <td>6</td> </tr> <tr> <td>B2</td> <td>6</td> <td>590</td> <td>0.222</td> <td>0.131</td> <td>20</td> <td>3</td> </tr> <tr> <td>B3</td> <td>6</td> <td>1540</td> <td>0.222</td> <td>0.342</td> <td>10</td> <td>3</td> </tr> <tr> <td>B4</td> <td>6</td> <td>1910</td> <td>0.222</td> <td>0.424</td> <td>14</td> <td>6</td> </tr> <tr> <td colspan="6"></td> <td>18</td> </tr> </tbody> </table> <p style="text-align: right;">18 kgf</p> <p style="text-align: right;">Per 2.0m</p> <p>10-STUD Φ22*180 10-PL 70*12*70</p>	BAR MARK	SIZE (mm)	LENGTH (mm)	WEIGHT/M (kgf/m)	WEIGHT /One (kgf)	NO. of BARS	WEIGHT (kgf)	B1	6	1460	0.222	0.324	20	6	B2	6	590	0.222	0.131	20	3	B3	6	1540	0.222	0.342	10	3	B4	6	1910	0.222	0.424	14	6							18	6 kgf 3 kgf
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Item	Formula	Quantity
5) MORTAR	$V = 0.600 \times 0.030 \times 2.000$	Per 2.0m = 0.036 m ³ 0.036 m ³
6) FILL MORTAR	$A2 = \{ 0.150 + 0.250 \} \times 1/2 \times 0.500 = 0.100$ $A3 = \{ 0.250 + 0.600 \} \times 1/2 \times 0.200 = 0.085$ $A4 = 0.100 \times 0.600 = 0.060$ $A5 = 0.015 \times 0.015 \times 1/2 \times 2 = -0.001$ $\Sigma A = 0.244 \text{ m}^2$ $V1 = 0.244 \times 0.010 = 0.002 \text{ m}^3$ $V2 = 0.125 \times 0.143 \times 1/2 \times 0.125 \times 10 = 0.011 \text{ m}^3$ $\Sigma V = 0.013 \text{ m}^3$	Per 2.0m 0.013 m ³

11. Erection of girder

Item	Formula	Quantity																														
1) ERECTION LOAD																																
	(1) Calculation of Sectional Area																															
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Total			39.832	36.827																																														
	<p>Erection Weight</p> <p style="text-align: right;">per one girder (kgf)</p> <p>W = 36.827 × 2500 = 92067.5 (ton)</p> <p style="text-align: right;">92.1 Nos.</p> <p>Nos. = 9 × 3 × 4 = 108</p> <p>W = 92067.5 × 108 = 9,943,290 (kgf)</p> <p style="text-align: right;">9,943.3 (ton)</p>																																																	

1.2. Stay Cable Bridge (P12-P18)

1-1. Summary of Quantity

Item		Work Item		Unit	Quantity	Remarks
Concrete	Class C	Pre-cast PC Box Girder		cu.m	20,520.9	σ _{ck} =50MPa
	Class D	Pylon		cu.m	9,278.0	σ _{ck} =40MPa
Form	External	Girder		sq.m	14,936.5	
		Pylon		sq.m	10,882.5	
		Total		sq.m	25,818.9	
	Internal	Girder		sq.m	44,307.5	
		Pylon		sq.m	7,552.6	
		Total		sq.m	51,860.1	
	Total			sq.m	77,679.0	
Re-bar	Girder	-D14		ton	1,154.3	
		D16-D22		ton	1,827.8	
		D25-		ton		
		Total		ton	2,982.1	
	Pylon	-D14		ton		
		D16-D32		ton	504.6	
		D35-		ton	1,152.5	
		Total		ton	1,657.2	
PC Tendon	Stay Cable			ton	1,587.0	
	12S15.2	Internal Longitudinal Prestressing Tendons		ton	497.9	
		Diaphragm		ton	143.2	
		Total		ton	641.1	
	4S15.2	Internal Transverse Tendons		ton	194.0	
f32	Longitudinal Prestressing Bar		ton	77.7		
Damper	80-10-40			Nos.	118	
	80-40-40			Nos.	10	
Structural steel		Pylon		ton	420.0	
Bearing	Product layer rubber bearing	1120*1120*424.5		Nos.	6	
		1120*1120*437		Nos.	6	
		1220*1220*459		Nos.	6	
		1470*1470*424.5		Nos.	6	
	Anchor Bar	f32		ton	0.1	
		f55		ton	0.6	
		f65		ton	0.9	
		f75		ton	1.5	
	Anchor Cap			ton	2.3	
	Expansion joint		Type A		m	44.2
Pavement	Asphalt concrete surface course t=75mm			sq.m	18,920.0	
	Guse Asphalt Concrete t=70mm			sq.m	4,515.0	
	Water Proofing t= 5mm			sq.m	18,920.0	
	Bound Layer			sq.m	4,515.0	
	Road Marking			sq.m	904.1	

Item		Work Item		Unit	Quantity	Remarks
Drainage Facilities	Drain Pot	300 x 300	For Concrete Girder	Nos.	148	
		300 x 250	For Steel Girder	Nos.	36	
	Drain Pipe	VP Φ200		m	243.2	
		VP Φ300		m	392.6	
		VP Φ400		m	402.6	
		SGP Φ200		m	93.4	
		SGP Φ300		m	209.0	
	Hunger & Support	Φ200		Nos.	220	
		Φ300		Nos.	197	
		Φ400		Nos.	202	
Pre-cast Barrier	Precast L=2000	For Concrete Girder		Nos.	431	
		For Steel Girder		Nos.	103	
Pre-cast Curb	Precast L=2000	For Concrete Girder		Nos.	431	
		For Steel Girder		Nos.	103	
Railing		Railing		m	2,180.0	
				ton	99.5	
Temporary Works	Pylon	Concert	Class B	cu.m	21.2	
		PC Tendon	12S15.2	ton	16.9	
		Scaffolding		ton	250.0	
	Pier	Scaffolding		ton	252.0	
	Temporary Prop	Concrete	Class E	cu.m	204.0	
		Re-Bar		ton	6.1	
		Pile	Driving H-Pile	ton	1,382.9	
		Bent and Scaffolding		ton	446.2	

2. Precast Concrete Box Girder

Item	Calculation				Quantity
1. Concrete					
1) Girder	9,118.925	×	2	=	18,237.850 m3
2) Diaphragm	695.100	×	2	=	1,390.200 m3
3) Anchorage (Stay Cable)					249.100 m3
4) Anchorage (PC Cable)					643.700 m3
Total					20,520.850 = 20,520.850 m3
2. Form					
External					
1) Girder	6,932.044	×	2	=	13,864.088 m2
3) Anchorage (Stay Cable)					1,072.400 m2
Total					14,936.488 = 14,936.488 m3
Internal					
1) Girder	19,231.307	×	2	=	38,462.614 m2
2) Diaphragm	3,101.500	×	2	=	6,203.000 m2
Exemption	-873.458	×	2	=	-1,746.916 m2
3) Anchorage (PC Cable)					3,976.500 m2
Exemption					-2,587.700 m2
					44,307.498 = 44,307.498 m3
3. Re-Bar					
1) Girder					
Re-Bar Weight of Each Segment					
		Diameter			
Girder Type	D12	D14	D20		
1	881	3202	5243		
2	848	3464	5225		
3	963	4075	6136		
4	963	4117	6106		
5	992	4075	6136		
6	1069	4056	6158		
7	1468	3551	6179		
8-1	340	2210	3854		
8-2	285	2123	3483		
9-1	410	2220	3901		
9-2	442	2160	3532		
10-1	327	1529	2887		
10-2	548	1502	2493		

Item	Calculation				Quantity
Re-Bar Weight of Girder					
Girder Type	Number of Segment	Diameter			
		D12	D14	D20	
1	2	1,762	6,404	10,486	
2	2	1,696	6,928	10,450	
3	2	1,926	8,150	12,272	
4	180	173,340	741,060	1,099,080	
5	8	7,936	32,600	49,088	
6	8	8,552	32,448	49,264	
7	8	11,744	28,408	49,432	
8-1	2	680	4,420	7,708	
8-2	2	570	4,246	6,966	
9-1	2	820	4,440	7,802	
9-2	2	884	4,320	7,064	
10-1	2	654	3,058	5,774	
10-2	2	1,096	3,004	4,986	
Total	222	211,660	879,486	1,320,372	
				1,091,146 kg	
				1,320,372 kg	
				2,411,518 kg	
2) Diaphragm	-D14	7,383	× 2 =	14,766 kg	
	D16-D22	91,236	× 2 =	182,472 kg	
	Total			197,238 kg	
3) Anchorage	-D14			0 kg	
(Stay Cable)	D16-D22			53,932 kg	
	Total			53,932 kg	
4) Anchorage	-D14			48,352 kg	
(PC Cable)	D16-D22			271,032 kg	
	Total			319,384 kg	
Total	-D14			1,154,264 kg	
	D16-D22			1,827,808 kg	
	Total			2,982,072 kg	

Item	Calculation				Quantity
4. PC Cable					
1) Internal Cable	PC-Tendon 12S15.2				
	Unit weight of Cable 13.212 kg/m				
	Upper Deck				
	Cable Name	Cable Length (m)	nos	Total Length (m)	Weight (kg)
	S1-L(R)	26.154	16	418.5	5,528.7
	S2-L(R)	123.146	16	1,970.3	26,032.1
	S3-L(R)	51.088	16	817.4	10,799.6
	S4-L(R)	39.079	16	625.3	8,261.0
	S5-L(R)	67.101	8	536.8	7,092.3
	S6-L(R)	55.091	16	881.5	11,645.8
	S7-L(R)	43.082	16	689.3	9,107.2
	S8-L(R)	31.072	8	248.6	3,284.2
	S9-L(R)	23.066	8	184.5	2,438.0
	S10-L(R)	67.101	16	1,073.6	14,184.6
	S11-L(R)	91.120	16	1,457.9	19,262.0
	S12-L(R)	95.123	8	761.0	10,054.1
	S13-L(R)	83.114	16	1,329.8	17,569.6
	S14-L(R)	75.107	16	1,201.7	15,877.0
	S15-L(R)	67.101	16	1,073.6	14,184.6
	S16-L(R)	55.091	16	881.5	11,645.8
	S17-L(R)	75.107	16	1,201.7	15,877.0
	S18-L(R)	83.114	16	1,329.8	17,569.6
	S19-L(R)	47.085	16	753.4	9,953.4
	S20-L(R)	23.084	16	369.3	4,879.8
	S21-L(R)	67.899	16	1,086.4	14,353.3
	S22-L(R)	84.915	16	1,358.6	17,950.4
	S23-L(R)	68.902	8	551.2	7,282.7
	S24-L(R)	60.896	16	974.3	12,872.9
	S25-L(R)	44.883	16	718.1	9,487.9
	S26-L(R)	28.870	16	461.9	6,102.9
	S27-L(R)	20.882	8	167.1	2,207.1
	S28-L(R)	35.075	16	561.2	7,414.6
	S29-L(R)	71.122	16	1,138.0	15,034.6
	S30-L(R)	76.173	16	1,218.8	16,102.4
	S31-L(R)	59.082	16	945.3	12,489.5
	S32-L(R)	64.163	16	1,026.6	13,563.5
	Total		464	28,013.0	370,108.2

Item	Calculation					Quantity																																																																						
2) PC-Bar	Bottom Deck																																																																											
	<table border="1"> <thead> <tr> <th>Cable Name</th> <th>Cable Length (m)</th> <th>nos</th> <th>Total Length (m)</th> <th>Weight (kg)</th> </tr> </thead> <tbody> <tr><td>S1b-L(R)</td><td>66.296</td><td>16</td><td>1,060.736</td><td>14,014.444</td></tr> <tr><td>Sb2-L(R)</td><td>54.491</td><td>16</td><td>871.856</td><td>11,518.961</td></tr> <tr><td>Sb3-L(R)</td><td>47.081</td><td>16</td><td>753.296</td><td>9,952.547</td></tr> <tr><td>Sb4-L(R)</td><td>23.061</td><td>16</td><td>368.976</td><td>4,874.911</td></tr> <tr><td>Sb5-L(R)</td><td>63.130</td><td>16</td><td>1,010.080</td><td>13,345.177</td></tr> <tr><td>Sb6-L(R)</td><td>43.077</td><td>16</td><td>689.232</td><td>9,106.133</td></tr> <tr><td>Sb7-L(R)</td><td>91.116</td><td>8</td><td>728.928</td><td>9,630.597</td></tr> <tr><td>Sb8-L(R)</td><td>83.111</td><td>8</td><td>664.888</td><td>8,784.500</td></tr> <tr><td>Sb9-L(R)</td><td>67.097</td><td>8</td><td>536.776</td><td>7,091.885</td></tr> <tr><td>Sb10-L(R)</td><td>55.087</td><td>8</td><td>440.696</td><td>5,822.476</td></tr> <tr><td>Sb11-L(R)</td><td>79.106</td><td>16</td><td>1,265.696</td><td>16,722.376</td></tr> <tr><td>Sb12-L(R)</td><td>80.143</td><td>16</td><td>1,282.288</td><td>16,941.589</td></tr> <tr> <td>Total</td> <td></td> <td>160</td> <td>9,673.448</td> <td>127,805.596</td> </tr> </tbody> </table>						Cable Name	Cable Length (m)	nos	Total Length (m)	Weight (kg)	S1b-L(R)	66.296	16	1,060.736	14,014.444	Sb2-L(R)	54.491	16	871.856	11,518.961	Sb3-L(R)	47.081	16	753.296	9,952.547	Sb4-L(R)	23.061	16	368.976	4,874.911	Sb5-L(R)	63.130	16	1,010.080	13,345.177	Sb6-L(R)	43.077	16	689.232	9,106.133	Sb7-L(R)	91.116	8	728.928	9,630.597	Sb8-L(R)	83.111	8	664.888	8,784.500	Sb9-L(R)	67.097	8	536.776	7,091.885	Sb10-L(R)	55.087	8	440.696	5,822.476	Sb11-L(R)	79.106	16	1,265.696	16,722.376	Sb12-L(R)	80.143	16	1,282.288	16,941.589	Total		160	9,673.448	127,805.596
	Cable Name	Cable Length (m)	nos	Total Length (m)	Weight (kg)																																																																							
	S1b-L(R)	66.296	16	1,060.736	14,014.444																																																																							
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	Sb10-L(R)	55.087	8	440.696	5,822.476																																																																							
	Sb11-L(R)	79.106	16	1,265.696	16,722.376																																																																							
	Sb12-L(R)	80.143	16	1,282.288	16,941.589																																																																							
Total		160	9,673.448	127,805.596																																																																								
Total 370.108 + 127.806 Anchorage					497.9 ton 1248 set																																																																							
SBPR/930/1180 Dia.32mm Unit Weight 6.310 kg/m 14nos./section $\Sigma L = 12319.244 \text{ m}$																																																																												
<table border="1"> <thead> <tr> <th>Segment</th> <th>Nos of Segment</th> <th>Nos. of PC-Bar</th> <th>Length (m/segment)</th> <th>Total Length (m)</th> <th>Weight (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>2</td><td>14</td><td>3.353</td><td>93.884</td><td>592.4</td></tr> <tr><td>2</td><td>2</td><td>14</td><td>3.403</td><td>95.284</td><td>601.2</td></tr> <tr><td>3~67</td><td>130</td><td>14</td><td>4.003</td><td>7,285.460</td><td>45,971.3</td></tr> <tr><td>68~69</td><td>4</td><td>14</td><td>2.903</td><td>162.568</td><td>1,025.8</td></tr> <tr><td>70~102</td><td>66</td><td>14</td><td>4.003</td><td>3,698.772</td><td>23,339.3</td></tr> <tr><td>103~110</td><td>16</td><td>14</td><td>4.002</td><td>896.448</td><td>5,656.6</td></tr> <tr><td>111</td><td>2</td><td>14</td><td>3.101</td><td>86.828</td><td>547.9</td></tr> <tr> <td></td> <td>222</td> <td>98</td> <td></td> <td>12,319.244</td> <td>77,734.5</td> </tr> </tbody> </table>						Segment	Nos of Segment	Nos. of PC-Bar	Length (m/segment)	Total Length (m)	Weight (kg)	1	2	14	3.353	93.884	592.4	2	2	14	3.403	95.284	601.2	3~67	130	14	4.003	7,285.460	45,971.3	68~69	4	14	2.903	162.568	1,025.8	70~102	66	14	4.003	3,698.772	23,339.3	103~110	16	14	4.002	896.448	5,656.6	111	2	14	3.101	86.828	547.9		222	98		12,319.244	77,734.5																	
Segment	Nos of Segment	Nos. of PC-Bar	Length (m/segment)	Total Length (m)	Weight (kg)																																																																							
1	2	14	3.353	93.884	592.4																																																																							
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111	2	14	3.101	86.828	547.9																																																																							
	222	98		12,319.244	77,734.5																																																																							
3) Deck Slab	Total Weight of Cable = 77.7 ton																																																																											
	Anchorage 112 × 14 × 2 = 224 set																																																																											
	Tendon Type 4S15.2																																																																											
	Unit Weight of Tendon 4.404 kg/m																																																																											
	Ave.PC-Cable Length = 24.992 m																																																																											
	Nos. of Cable = 1,762 nos																																																																											
Total Weight of Cable = 193,934 kg 193.9 ton																																																																												
Anchorage of Tendon = 1.762 × 2 = 3.524 nos (Both Side Pre-Stressing)																																																																												

Item	Calculation		Quantity																																								
4) Diaphragm	Tendon Type	12S15.2																																									
		Unit Weight of Tendon = 13.212 kg/m																																									
	Type-1	<table border="1" data-bbox="582 313 1157 683"> <thead> <tr> <th>Cable Legth m</th> <th>Nos.</th> <th>Total Lenfth m</th> <th>Remarks</th> </tr> </thead> <tbody> <tr><td>25.376</td><td>174</td><td>4,415.424</td><td></td></tr> <tr><td>25.727</td><td>174</td><td>4,476.498</td><td></td></tr> <tr><td>25.355</td><td>12</td><td>304.260</td><td></td></tr> <tr><td>25.719</td><td>12</td><td>308.628</td><td></td></tr> <tr><td>25.310</td><td>6</td><td>151.860</td><td></td></tr> <tr><td>25.682</td><td>6</td><td>154.092</td><td></td></tr> <tr><td>25.270</td><td>12</td><td>303.240</td><td></td></tr> <tr><td>25.649</td><td>12</td><td>307.788</td><td></td></tr> <tr><td>Total</td><td>408</td><td>10,421.790</td><td></td></tr> </tbody> </table>	Cable Legth m	Nos.	Total Lenfth m	Remarks	25.376	174	4,415.424		25.727	174	4,476.498		25.355	12	304.260		25.719	12	308.628		25.310	6	151.860		25.682	6	154.092		25.270	12	303.240		25.649	12	307.788		Total	408	10,421.790		
	Cable Legth m	Nos.	Total Lenfth m	Remarks																																							
	25.376	174	4,415.424																																								
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	25.682	6	154.092																																								
25.270	12	303.240																																									
25.649	12	307.788																																									
Total	408	10,421.790																																									
	Total Weight of Cable = 137,693 kg	137.7 ton																																									
Type-2 (at Pylon)	Ave.PC-Cable Length = 25.600 m																																										
	Nos. of Cable = 10 nos																																										
	Total Weight of Cable = 3,382 kg	3.382 ton																																									
Type-3 (at Pylon)	Ave.PC-Cable Length = 16.186 m																																										
	Nos. of Cable = 10 nos																																										
	Total Weight of Cable = 2,138 kg	2.138 ton																																									
		Total																																									
	Anchorage (Both side pre-stressing)	143.2 ton 856 set																																									

5. Concrete and Form of Segment

Segment Number	Section Type Number	Segment Length	Concrete		External Form		Internal Form		Remarks
			Sectional Area	Volume	Length	Area of Form	Length	Area of Form	
			m ²	m ³	m	m ²	m	m ²	
1	1	3.3530	22.226	74.524	15.856	53.165	42.446	142.321	
2	2	3.4030	21.254	72.327	15.856	53.958	43.314	147.398	
3	3	4.0030	20.288	81.213	15.856	63.472	44.180	176.853	
4	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
5	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
6	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
7	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
8	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
9	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
10	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
11	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
12	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
13	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
14	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
15	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
16	5	4.0030	20.938	83.815	15.856	63.472	43.432	173.858	
17	6	4.0030	22.642	90.636	15.856	63.472	41.700	166.925	
18	7	4.0030	24.390	97.633	15.856	63.472	40.296	161.305	
19	7	4.0030	24.390	97.633	15.856	63.472	40.296	161.305	
20	6	4.0030	22.642	90.636	15.856	63.472	41.700	166.925	
21	5	4.0030	20.938	83.815	15.856	63.472	43.432	173.858	
22	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
23	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
24	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
25	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
26	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
27	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
28	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
29	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
30	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
31	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
32	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
33	5	4.0030	20.938	83.815	15.856	63.472	43.432	173.858	
34	6	4.0030	22.642	90.636	15.856	63.472	41.700	166.925	
35	7	4.0030	24.390	97.633	15.856	63.472	40.296	161.305	
36	7	4.0030	24.390	97.633	15.856	63.472	40.296	161.305	
37	6	4.0030	22.642	90.636	15.856	63.472	41.700	166.925	
38	5	4.0030	20.938	83.815	15.856	63.472	43.432	173.858	
39	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
40	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
41	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
42	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
43	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
44	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
45	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
46	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
47	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
48	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
49	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
50	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
51	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
52	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	

5. Concrete and Form of Segment

Segment Number	Section Type Number	Segment Length	Concrete		External Form		Internal Form		Remarks
			Sectional Area	Volume	Length	Area of Form	Length	Area of Form	
			m ²	m ³	m	m ²	m	m ²	
53	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
54	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
55	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
56	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
57	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
58	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
59	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
60	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
61	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
62	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
63	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
64	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
65	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
66	8	4.0030	23.246	93.054	15.856	63.472	39.250	157.118	
67	9	4.0030	29.201	116.892	12.656	50.662	38.356	153.539	
68	10	2.9025	34.285	99.512	12.656	36.734	35.128	101.959	
69	10	2.9025	34.285	99.512	12.656	36.734	35.128	101.959	
70	9	4.0030	29.201	116.892	12.656	50.662	38.356	153.539	
71	8	4.0030	23.246	93.054	15.856	63.472	39.250	157.118	
72	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
73	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
74	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
75	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
76	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
77	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
78	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
79	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
80	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
81	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
82	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
83	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
84	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
85	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
86	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
87	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
88	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
89	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
90	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
91	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
92	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
93	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
94	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
95	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
96	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
97	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
98	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
99	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
100	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
101	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
102	4	4.0030	19.990	80.020	15.856	63.472	44.332	177.461	
103	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
104	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	

5. Concrete and Form of Segment

Segment Number	Section Type Number	Segment Length	Concrete		External Form		Internal Form		Remarks
			Sectional Area	Volume	Length	Area of Form	Length	Area of Form	
			m	m ²	m ³	m	m ²	m	
105	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
106	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
107	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
108	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
109	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
110	4	4.0020	19.990	80.000	15.856	63.456	44.332	177.417	
111	4	3.1010	19.990	61.989	15.856	49.169	44.332	137.474	
Total				9,118.925		6,932.044		19,231.307	

Item	Formula	Quantity																																																																																					
6. Diaphragm	1) Concrete																																																																																						
	<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">TYPE</th> <th rowspan="2">nos</th> <th colspan="2">Concrete V:(m3)</th> </tr> <tr> <th>Each</th> <th>Total</th> </tr> </thead> <tbody> <tr><td>Gieder End</td><td>1</td><td>19.766</td><td>19.766</td></tr> <tr><td>On Pier</td><td>2</td><td>26.416</td><td>52.832</td></tr> <tr><td>TYPE-A</td><td>2</td><td>12.206</td><td>24.412</td></tr> <tr><td>TYPE-B</td><td>28</td><td>12.326</td><td>345.128</td></tr> <tr><td>TYPE-C</td><td>1</td><td>11.947</td><td>11.947</td></tr> <tr><td>TYPE-D</td><td>1</td><td>11.947</td><td>11.947</td></tr> <tr><td>TYPE-E</td><td>1</td><td>11.947</td><td>11.947</td></tr> <tr><td>TYPE-1</td><td>60</td><td>3.254</td><td>195.24</td></tr> <tr><td>TYPE-2</td><td>3</td><td>3.208</td><td>9.624</td></tr> <tr><td>TYPE-3</td><td>2</td><td>3.006</td><td>6.012</td></tr> <tr><td>TYPE-4</td><td>2</td><td>3.119</td><td>6.238</td></tr> <tr><td>Total</td><td>103</td><td></td><td>695.093</td></tr> </tbody> </table>	TYPE	nos	Concrete V:(m3)		Each	Total	Gieder End	1	19.766	19.766	On Pier	2	26.416	52.832	TYPE-A	2	12.206	24.412	TYPE-B	28	12.326	345.128	TYPE-C	1	11.947	11.947	TYPE-D	1	11.947	11.947	TYPE-E	1	11.947	11.947	TYPE-1	60	3.254	195.24	TYPE-2	3	3.208	9.624	TYPE-3	2	3.006	6.012	TYPE-4	2	3.119	6.238	Total	103		695.093																																
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TYPE	nos			Internal Form A:(m2)																																																																																			
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Total	103		3101.534		873.458																																																																																		
	Total Form Area of Diaphragm =	3,101.5 m2																																																																																					
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Item	Formula	Quantity																																																																																																								
3) Re-Bar	<p data-bbox="352 259 724 293">1. Total of Unit Quantity of Re-Bar</p> <table border="1" data-bbox="470 327 1075 792"> <thead> <tr> <th rowspan="2">TYPE</th> <th colspan="3">Re-bar (kg/each)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr> <td>Gieder End</td> <td>44.0</td> <td>1,338.0</td> <td>0.0</td> </tr> <tr> <td>On Pier</td> <td>138.0</td> <td>1,491.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-A</td> <td>105.0</td> <td>1,288.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-B</td> <td>104.0</td> <td>1,288.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-C</td> <td>105.0</td> <td>1,288.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-D</td> <td>104.0</td> <td>1,288.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-E</td> <td>106.0</td> <td>1,235.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-1</td> <td>15.0</td> <td>363.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-2</td> <td>15.0</td> <td>369.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-3</td> <td>15.0</td> <td>382.0</td> <td>0.0</td> </tr> <tr> <td>TYPE-4</td> <td>15.0</td> <td>395.0</td> <td>0.0</td> </tr> </tbody> </table> <p data-bbox="352 835 756 869">2. Total of anchorage concrete volume</p> <table border="1" data-bbox="470 898 1177 1294"> <thead> <tr> <th rowspan="2">TYPE</th> <th rowspan="2">nos</th> <th colspan="3">Re-bar (kg)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr> <td>TYPE-1</td> <td>1</td> <td>44</td> <td>1,338</td> <td>0</td> </tr> <tr> <td>TYPE-2</td> <td>2</td> <td>276</td> <td>2,982</td> <td>0</td> </tr> <tr> <td>TYPE-3</td> <td>1</td> <td>105</td> <td>1,288</td> <td>0</td> </tr> <tr> <td>TYPE-4</td> <td>1</td> <td>104</td> <td>1,288</td> <td>0</td> </tr> <tr> <td>TYPE-5</td> <td>60</td> <td>6,300</td> <td>77,280</td> <td>0</td> </tr> <tr> <td>TYPE-6</td> <td>3</td> <td>312</td> <td>3,864</td> <td>0</td> </tr> <tr> <td>TYPE-7</td> <td>2</td> <td>212</td> <td>2,470</td> <td>0</td> </tr> <tr> <td>TYPE-8</td> <td>2</td> <td>30</td> <td>726</td> <td>0</td> </tr> <tr> <td>Total</td> <td>103</td> <td>7,383</td> <td>91,236</td> <td>0</td> </tr> </tbody> </table>	TYPE	Re-bar (kg/each)			-D14	D16-D22	D25	Gieder End	44.0	1,338.0	0.0	On Pier	138.0	1,491.0	0.0	TYPE-A	105.0	1,288.0	0.0	TYPE-B	104.0	1,288.0	0.0	TYPE-C	105.0	1,288.0	0.0	TYPE-D	104.0	1,288.0	0.0	TYPE-E	106.0	1,235.0	0.0	TYPE-1	15.0	363.0	0.0	TYPE-2	15.0	369.0	0.0	TYPE-3	15.0	382.0	0.0	TYPE-4	15.0	395.0	0.0	TYPE	nos	Re-bar (kg)			-D14	D16-D22	D25	TYPE-1	1	44	1,338	0	TYPE-2	2	276	2,982	0	TYPE-3	1	105	1,288	0	TYPE-4	1	104	1,288	0	TYPE-5	60	6,300	77,280	0	TYPE-6	3	312	3,864	0	TYPE-7	2	212	2,470	0	TYPE-8	2	30	726	0	Total	103	7,383	91,236	0	
TYPE	Re-bar (kg/each)																																																																																																									
	-D14	D16-D22	D25																																																																																																							
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TYPE-4	1	104	1,288	0																																																																																																						
TYPE-5	60	6,300	77,280	0																																																																																																						
TYPE-6	3	312	3,864	0																																																																																																						
TYPE-7	2	212	2,470	0																																																																																																						
TYPE-8	2	30	726	0																																																																																																						
Total	103	7,383	91,236	0																																																																																																						

SCHEDULE OF REINFORCEMENT

Gieder End

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	2	16	10002	600	1398	9004			21010	1.578	66	
	2	16	10000	10000	6253				26260	1.578	166	Average
	3	16	10000	10000	4179				24180	1.578	229	Average
	4	16	10000	7705					17710	1.578	168	Average
	5	16	240	2558	514	2558	240		6110	1.578	444	Average
	6	16	240	1834	514	1834	240		4670	1.578	265	Average
	7	12	102	518	102				730	0.888	44	
											44	
-D14											1,338	
D16-D22											0	
D25-											1,382	
Total Gieder End												

SCHEDULE OF REINFORCEMENT

On Pier

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	20	16	5120						5120	1.578	162	
	2	16	4172						4180	1.578	132	Average
	3	16	8000	10919					18920	1.578	60	
	4	16	4172						4180	1.578	132	Average
	5	16	240	1727	914	1727	240		4850	1.578	230	Average
	6	16	240	774	914	774	240		2950	1.578	37	Average
	7	16	240	2550	914	2550	240		6500	1.578	410	Average
	8	16	240	1057	914	1057	240		3510	1.578	44	
	9	16	240	914	240				1400	1.578	190	
	10	16	240	2581					2830	1.578	27	
	11	16	240	2158					2400	1.578	23	
	12	16	240	882	240				1370	1.578	26	
	13	16	1660						1660	1.578	10	
	14	16	1209						1210	1.578	8	
	15	12	102	918	102				1130	0.888	62	
M 1	8	12	1900						1900	0.888	13	
	2	12	1700						1700	0.888	12	
	3	12	1300						1300	0.888	9	
	4	12	1900						1900	0.888	13	
	5	12	3200						3200	0.888	23	
	6	12	800						800	0.888	6	
											138	
-D14											1,491	
D16-D22											0	
D25-											1,629	
Total On Pier												

SCHEDULE OF REINFORCEMENT TYPE-A

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	20	16	5120						5120	1.578	162	
2	4	16	8000	5032					13040	1.578	82	
3	2	16	8000	10919					18920	1.578	60	
4	2	16	8000	8895					16900	1.578	53	
5	20	16	4172						4180	1.578	132	Average
6	30	16	240	1727	314	1727	240		4250	1.578	201	Average
7	8	16	240	774	314	774	240		2350	1.578	30	Average
8	40	16	240	2550	2550	2550	240		8130	1.578	513	Average
9	8	16	240	1057	314	1057	240		2910	1.578	37	
10	4	16	1657						1660	1.578	10	
11	4	16	1209						1210	1.578	8	
12	62	12	102	318	102				530	0.888	29	
M 1	8	12	1900						1900	0.888	13	
2	8	12	1700						1700	0.888	12	
3	8	12	1300						1300	0.888	9	
4	8	12	1900						1900	0.888	13	
5	8	12	3200						3200	0.888	23	
6	8	12	800						800	0.888	6	
-D14											105	
D16-D22											1,288	
D25-											0	
Total of		TYPE-A									1,393	

SCHEDULE OF REINFORCEMENT

TYPE-B

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks	
			a	b	c	d	e	f					
D	1	20	16	5120						5120	1.578	162	
	2	4	16	8000	5032					13040	1.578	82	
	3	2	16	8000	10919					18920	1.578	60	
	4	2	16	8000	8895					16900	1.578	53	
	5	20	16	4172						4180	1.578	132	Average
	6	30	16	240	1727	314	1727	240		4250	1.578	201	Average
	7	8	16	240	774	314	774	240		2350	1.578	30	Average
	8	40	16	240	2550	2550	2550	240		8130	1.578	513	Average
	9	8	16	240	1057	314	1057	240		2910	1.578	37	
	10	4	16	1657						1660	1.578	10	
	11	4	16	1209						1210	1.578	8	
	12	62	12	102	318	102				530	0.888	29	
M	1	8	12	1900						1900	0.888	13	
	2	8	12	1700						1700	0.888	12	
	3	8	12	1300						1300	0.888	9	
	4	8	12	1900						1900	0.888	13	
	5	8	12	3100						3100	0.888	22	
	6	8	12	800						800	0.888	6	
												104	
												1,288	
												0	
												1,392	
Total of TYPE-B													

SCHEDULE OF REINFORCEMENT

TYPE-D

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	20	16	5120						5120	1.578	162	
2	4	16	8000	5032					13040	1.578	82	
3	2	16	8000	10919					18920	1.578	60	
4	2	16	8000	8895					16900	1.578	53	
5	20	16	4172						4180	1.578	132	Average
6	30	16	240	1727	314	1727	240		4250	1.578	201	Average
7	8	16	240	774	314	774	240		2350	1.578	30	Average
8	40	16	240	2550	2550	2550	240		8130	1.578	513	Average
9	8	16	240	1057	314	1057	240		2910	1.578	37	
10	4	16	1657						1660	1.578	10	
11	4	16	1209						1210	1.578	8	
12	62	12	102	318	102				530	0.888	29	
M 1	8	12	1900						1900	0.888	13	
2	8	12	1700						1700	0.888	12	
3	8	12	1300						1300	0.888	9	
4	8	12	1900						1900	0.888	13	
5	8	12	3100						3100	0.888	22	
6	8	12	800						800	0.888	6	
-D14											104	
D16-D22											1,288	
D25-											0	
Total of TYPE-D											1,392	

SCHEDULE OF REINFORCEMENT

TYPE-1

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	6	16	5309	1535	9000	2535	5309		23690	1.578	224	Average
2	23	16	240	714	214	714	240		2130	1.578	77	
3	18	16	240	735	214	735	240		2170	1.578	62	
4	38	12	102	217	102				430	0.888	15	
-D14											15	
D16-D22											363	
D25-											0	
Total of TYPE-1											378	

SCHEDULE OF REINFORCEMENT

TYPE-2

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	6	16	5309	1535	9000	2535	5309		23690	1.578	224	Average
2	23	16	240	764	214	764	240		2230	1.578	81	
3	18	16	240	785	214	785	240		2270	1.578	64	
4	38	12	102	217	102				430	0.888	15	
-D14											15	
D16-D22											369	
D25-											0	
Total of TYPE-2											384	

SCHEDULE OF REINFORCEMENT

TYPE-3

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	6	16	5309	1535	9000	2535	5309		23690	1.578	224	Average
2	23	16	240	864	214	864	240		2430	1.578	88	
3	18	16	240	885	214	885	240		2470	1.578	70	
4	38	12	102	217	102				430	0.888	15	
-D14											15	
D16-D22											382	
D25-											0	
Total of TYPE-3											397	

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
D 1	6	16	5309	1535	9000	2535	5309		23690	1.578	224	Average
2	23	16	240	964	214	964	240		2630	1.578	95	
3	18	16	240	985	214	985	240		2670	1.578	76	
4	38	12	102	217	102				430	0.888	15	
	-D14										15	
	D16-D22										395	
	D25-										0	
	Total of	TYPE-4									410	

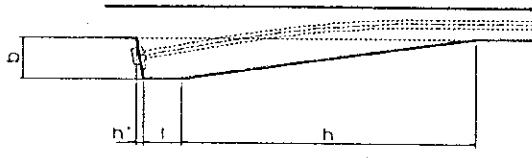
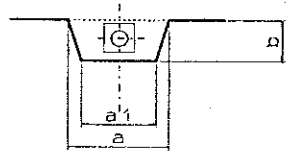
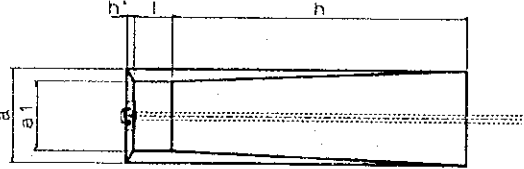
Item	Formula	Quantity
7. Anchorage of Stay Cable		
1) Concrete	1. Calculation of each anchorage concrete volume	
	TYPE-1	
	$V = \frac{1}{6} \times \left\{ \left(1.716 + 2.430 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.705 + 1.090 \right) \times \frac{1}{2} \right\} \times \left(1.560 + 1.000 \right) = 1.278 \text{ m}^3$	
	TYPE-2	
	$V = \frac{1}{6} \times \left\{ \left(2.334 + 3.300 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.955 + 1.350 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 2.273 \text{ m}^3$	
	TYPE-3	
	$V = \frac{1}{6} \times \left\{ \left(1.839 + 2.600 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.955 + 1.350 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 1.791 \text{ m}^3$	
	TYPE-4	
	$V = \frac{1}{6} \times \left\{ \left(2.024 + 2.750 \right) \times \frac{1}{2} \right. \\ \left. \times \left(1.005 + 1.400 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 2.009 \text{ m}^3$	
	TYPE-5	
	$V = \frac{1}{6} \times \left\{ \left(1.465 + 2.350 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.655 + 1.050 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 1.138 \text{ m}^3$	
	TYPE-6	
	$V = \frac{1}{6} \times \left\{ \left(1.372 + 2.200 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.655 + 1.050 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 1.066 \text{ m}^3$	
	TYPE-7	
	$V = \frac{1}{6} \times \left\{ \left(1.91 + 2.700 \right) \times \frac{1}{2} \right. \\ \left. \times \left(0.955 + 1.350 \right) \times \frac{1}{2} \right\} \times \left(1.600 + 1.000 \right) = 1.860 \text{ m}^3$	
	TYPE-8	
	$V = \frac{1}{6} \times \left\{ \left(2.394 + 3.250 \right) \times \frac{1}{2} \right. \\ \left. \times \left(1.105 + 1.500 \right) \times \frac{1}{2} \right\} \times \left(1.560 + 1.000 \right) = 2.524 \text{ m}^3$	

Item	Formula						Quantity																																																																																																																																																																																																																		
2. Total of anchorage concrete volume																																																																																																																																																																																																																									
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Item	Formula	Quantity
2) Form	<p>1. Calculation of each anchorage area of form</p> <p>TYPE-1</p> $A = (1.560 + 1.000) \times \frac{1}{2} \times 1.127$ $+ (1.598 + 2.118) \times \frac{1}{2} \times 1.000$ $+ 1.598 \times 0.220 \times \frac{1}{2} + 2.118$ $\times 0.340 \times \frac{1}{2} + 1.716 \times 0.738$ $\times \frac{1}{2} + 2.430 \times 1.142 \times \frac{1}{2}$ $= 5.857 \text{ m}^2$ <p>TYPE-2</p> $A = (1.145 + 14.230) \times \frac{1}{2} \times 1.000$ $+ 1.145 \times 0.250 \times \frac{1}{2} + 14.230$ $\times 0.350 \times \frac{1}{2} + (2.206 + 2.742)$ $\times \frac{1}{2} \times 1.000 + 2.206 \times 0.250$ $\times \frac{1}{2} + 2.742 \times 0.350 \times \frac{1}{2}$ $+ 2.334 \times 0.987 \times \frac{1}{2} + 3.300$ $\times 1.395 \times \frac{1}{2}$ $= 17.004 \text{ m}^2$ <p>TYPE-3</p> $A = (1.201 + 1.493) \times \frac{1}{2} \times 1.000$ $+ 1.201 \times 0.250 \times \frac{1}{2} + 1.493$ $\times 0.350 \times \frac{1}{2} + (1.664 + 2.069)$ $\times \frac{1}{2} \times 1.000 + 1.664 \times 0.250$ $\times \frac{1}{2} + 2.069 \times 0.350 \times \frac{1}{2}$ $+ 1.839 \times 0.987 \times \frac{1}{2} + 2.600$ $\times 1.395 \times \frac{1}{2}$ $= 6.916 \text{ m}^2$ <p>TYPE-4</p> $A = (1.572 + 1.869) \times \frac{1}{2} \times 1.000$ $+ 1.572 \times 0.250 \times \frac{1}{2} + 1.869$ $\times 0.350 \times \frac{1}{2} + (1.479 + 1.829)$ $\times \frac{1}{2} \times 1.000 + 1.479 \times 0.250$ $\times \frac{1}{2} + 1.829 \times 0.350 \times \frac{1}{2}$ $+ 2.024 \times 1.035 \times \frac{1}{2} + 2.750$ $\times 1.443 \times \frac{1}{2}$ $= 7.435 \text{ m}^2$ <p>TYPE-5</p> $A = (1.422 + 1.912) \times \frac{1}{2} \times 1.000$ $+ 1.422 \times 0.250 \times \frac{1}{2} + 1.912$ $\times 0.350 \times \frac{1}{2} + (0.809 + 1.088)$ $\times \frac{1}{2} \times 1.000 + 0.809 \times 0.250$ $\times \frac{1}{2} + 1.088 \times 0.350 \times \frac{1}{2}$ $+ 1.465 \times 0.701 \times \frac{1}{2} + 2.350$ $\times 1.107 \times \frac{1}{2}$ $= 5.234 \text{ m}^2$	

Item	Formula	Quantity																																										
	<p>TYPE-6</p> $A = (0.729 + 0.981) \times \frac{1}{2} \times 1.000$ $+ 0.729 \times 0.250 \times \frac{1}{2} + 0.981$ $\times 0.350 \times \frac{1}{2} + (1.541 + 2.073)$ $\times \frac{1}{2} \times 1.000 + 1.541 \times 0.250$ $\times \frac{1}{2} + 2.073 \times 0.350 \times \frac{1}{2}$ $+ 1.372 \times 0.701 \times \frac{1}{2} + 2.200$ $\times 1.107 \times \frac{1}{2} = 5.179 \text{ m}^2$																																											
	<p>TYPE-7</p> $A = (1.385 + 1.722) \times \frac{1}{2} \times 1.000$ $+ 1.385 \times 0.250 \times \frac{1}{2} + 1.722$ $\times 0.350 \times \frac{1}{2} + (1.492 + 1.854)$ $\times \frac{1}{2} \times 1.000 + 1.492 \times 0.250$ $\times \frac{1}{2} + 1.854 \times 0.350 \times \frac{1}{2}$ $+ 1.910 \times 0.987 \times \frac{1}{2} + 2.700$ $\times 1.395 \times \frac{1}{2} = 7.038 \text{ m}^2$																																											
	<p>TYPE-8</p> $A = (2.201 + 2.667) \times \frac{1}{2} \times 1.000$ $+ 2.201 \times 0.250 \times \frac{1}{2} + 2.667$ $\times 0.350 \times \frac{1}{2} + (1.341 + 1.625)$ $\times \frac{1}{2} \times 1.000 + 1.341 \times 0.250$ $\times \frac{1}{2} + 1.625 \times 0.350 \times \frac{1}{2}$ $+ 2.394 \times 1.133 \times \frac{1}{2} + 3.250$ $\times 1.540 \times \frac{1}{2} = 8.970 \text{ m}^2$																																											
	<p>2. Total of anchorage concrete volume</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">TYPE</th> <th rowspan="2">nos</th> <th colspan="2">Form A:(m2)</th> </tr> <tr> <th>Each</th> <th>Total</th> </tr> </thead> <tbody> <tr><td>TYPE-1</td><td>28</td><td>5.857</td><td>163.996</td></tr> <tr><td>TYPE-2</td><td>12</td><td>17.004</td><td>204.048</td></tr> <tr><td>TYPE-3</td><td>20</td><td>6.916</td><td>138.32</td></tr> <tr><td>TYPE-4</td><td>16</td><td>7.435</td><td>118.96</td></tr> <tr><td>TYPE-5</td><td>8</td><td>5.234</td><td>41.872</td></tr> <tr><td>TYPE-6</td><td>8</td><td>5.179</td><td>41.432</td></tr> <tr><td>TYPE-7</td><td>16</td><td>7.038</td><td>112.608</td></tr> <tr><td>TYPE-8</td><td>28</td><td>8.970</td><td>251.16</td></tr> <tr><td>Total</td><td>136</td><td></td><td>1072.396</td></tr> </tbody> </table>	TYPE	nos	Form A:(m2)		Each	Total	TYPE-1	28	5.857	163.996	TYPE-2	12	17.004	204.048	TYPE-3	20	6.916	138.32	TYPE-4	16	7.435	118.96	TYPE-5	8	5.234	41.872	TYPE-6	8	5.179	41.432	TYPE-7	16	7.038	112.608	TYPE-8	28	8.970	251.16	Total	136		1072.396	
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Item	Formula	Quantity																																																																																												
<p>3) Re-Bar</p>	<p>1. Total of Unit Quantiy of Re-Bar</p> <table border="1" data-bbox="470 302 1077 660"> <thead> <tr> <th rowspan="2">TYPE</th> <th colspan="3">Re-bar (kg/each)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr><td>TYPE-1</td><td>0</td><td>277</td><td>0</td></tr> <tr><td>TYPE-2</td><td>0</td><td>492</td><td>0</td></tr> <tr><td>TYPE-3</td><td>0</td><td>388</td><td>0</td></tr> <tr><td>TYPE-4</td><td>0</td><td>435</td><td>0</td></tr> <tr><td>TYPE-5</td><td>0</td><td>246</td><td>0</td></tr> <tr><td>TYPE-6</td><td>0</td><td>231</td><td>0</td></tr> <tr><td>TYPE-7</td><td>0</td><td>403</td><td>0</td></tr> <tr><td>TYPE-8</td><td>0</td><td>546</td><td>0</td></tr> </tbody> </table> <p>2. Total of anchorage Re-Bar Weight</p> <table border="1" data-bbox="470 795 1181 1198"> <thead> <tr> <th rowspan="2">TYPE</th> <th rowspan="2">nos</th> <th colspan="3">Re-bar (kg)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr><td>TYPE-1</td><td>28</td><td>0.0</td><td>7,756</td><td>0.0</td></tr> <tr><td>TYPE-2</td><td>12</td><td>0.0</td><td>5,904</td><td>0.0</td></tr> <tr><td>TYPE-3</td><td>20</td><td>0.0</td><td>7,760</td><td>0.0</td></tr> <tr><td>TYPE-4</td><td>16</td><td>0.0</td><td>6,960</td><td>0.0</td></tr> <tr><td>TYPE-5</td><td>8</td><td>0.0</td><td>1,968</td><td>0.0</td></tr> <tr><td>TYPE-6</td><td>8</td><td>0.0</td><td>1,848</td><td>0.0</td></tr> <tr><td>TYPE-7</td><td>16</td><td>0.0</td><td>6,448</td><td>0.0</td></tr> <tr><td>TYPE-8</td><td>28</td><td>0.0</td><td>15,288</td><td>0.0</td></tr> <tr><td>Total</td><td>136</td><td>0.0</td><td>53,932</td><td>0.0</td></tr> </tbody> </table> <p style="text-align: right;">Total Exemption Area of Form = 53,932 kg 53.9 ton</p>	TYPE	Re-bar (kg/each)			-D14	D16-D22	D25	TYPE-1	0	277	0	TYPE-2	0	492	0	TYPE-3	0	388	0	TYPE-4	0	435	0	TYPE-5	0	246	0	TYPE-6	0	231	0	TYPE-7	0	403	0	TYPE-8	0	546	0	TYPE	nos	Re-bar (kg)			-D14	D16-D22	D25	TYPE-1	28	0.0	7,756	0.0	TYPE-2	12	0.0	5,904	0.0	TYPE-3	20	0.0	7,760	0.0	TYPE-4	16	0.0	6,960	0.0	TYPE-5	8	0.0	1,968	0.0	TYPE-6	8	0.0	1,848	0.0	TYPE-7	16	0.0	6,448	0.0	TYPE-8	28	0.0	15,288	0.0	Total	136	0.0	53,932	0.0	
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<p>8. Anchorage of Internal Cable</p> <p>1) Concrete</p>	<p>1. Calculation of each anchorage concrete volume</p> <div style="text-align: center;"> <p>PROFILE</p>  <p>SECTION</p>  <p>PLAN</p>  </div> <p>Dimensions for Anchorage of Internal Cable</p> <table border="1" data-bbox="359 940 1348 1198"> <thead> <tr> <th>Type</th> <th>a</th> <th>a1</th> <th>b</th> <th>h</th> <th>h'</th> <th>l</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.900</td> <td>0.660</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> <tr> <td>2</td> <td>1.300</td> <td>1.060</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> <tr> <td>3</td> <td>1.700</td> <td>1.460</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> <tr> <td>4</td> <td>1.900</td> <td>1.660</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> <tr> <td>5</td> <td>0.900</td> <td>0.660</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> <tr> <td>6</td> <td>1.300</td> <td>1.060</td> <td>0.390</td> <td>2.650</td> <td>0.069</td> <td>0.350</td> </tr> </tbody> </table> $V = \frac{1}{6} \times b \times (2 \times a + a1) \times (h + h') + \frac{1}{2} \times (a + a1) \times b \times l$ <table border="1" data-bbox="630 1366 1029 1624" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Type</th> <th>Concrete Volume</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.541 m3</td> </tr> <tr> <td>2</td> <td>0.808 m3</td> </tr> <tr> <td>3</td> <td>1.075 m3</td> </tr> <tr> <td>4</td> <td>1.208 m3</td> </tr> <tr> <td>5</td> <td>0.541 m3</td> </tr> <tr> <td>6</td> <td>0.808 m3</td> </tr> </tbody> </table>	Type	a	a1	b	h	h'	l	1	0.900	0.660	0.390	2.650	0.069	0.350	2	1.300	1.060	0.390	2.650	0.069	0.350	3	1.700	1.460	0.390	2.650	0.069	0.350	4	1.900	1.660	0.390	2.650	0.069	0.350	5	0.900	0.660	0.390	2.650	0.069	0.350	6	1.300	1.060	0.390	2.650	0.069	0.350	Type	Concrete Volume	1	0.541 m3	2	0.808 m3	3	1.075 m3	4	1.208 m3	5	0.541 m3	6	0.808 m3	
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Item	Formula				Quantity
2. Total of anchorage					
	Type-1	Type-2	Type-3	Type-4	
S1-L	16	0	0	0	
S2-L	32	0	0	0	
S3-L	32	0	0	0	
S4-L	32	0	0	0	
S5-L	16	0	0	0	
S6-L	32	0	0	0	
S7-L	32	0	0	0	
S8-L	0	0	16	0	
S9-L	0	16	0	0	
S10-L	0	0	0	16	
S11-L	32	0	0	0	
S12-L	0	16	0	0	
S13-L	16	16	0	0	
S14-L	16	16	0	0	
S15-L	16	16	0	0	
S16-L	16	16	0	0	
S17-L	32	0	0	0	
S18-L	32	0	0	0	
S19-L	32	0	0	0	
S20-L	32	0	0	0	
S21-L	32	0	0	0	
S22-L	32	0	0	0	
S23-L	16	0	0	0	
S24-L	32	0	0	0	
S25-L	32	0	0	0	
S26-L	0	0	0	0	
S27-L	16	0	16	0	
S28-L	32	0	0	0	
S29-L	32	0	0	0	
S30-L	16	0	0	0	
S31-L	32	0	0	0	
S32-L	16	0	0	0	
計	704	96	32	16	
	Type-5	Type-6			
Sd1-L	0	8			
Sd2-L	0	16			
Sd3-L	0	16			
Sd4-L	0	16			
Sd5-L	0	16			
Sd6-L	0	16			
Sd7-L	16	0			
Sd8-L	16	0			
Sd9-L	16	0			
Sd10-L	16	0			
Sd11-L	0	16			
Sd12-L	0	16			
計	64	120			

Item	Formula			Quantity																																				
	3. Total of anchorage concrete volume																																							
	<table border="1"> <thead> <tr> <th data-bbox="472 264 619 295">TYPE</th> <th data-bbox="619 264 724 295">nos</th> <th colspan="2" data-bbox="724 264 1023 295">Concrete V: (m3)</th> </tr> <tr> <td></td> <td></td> <th data-bbox="724 295 871 327">Each</th> <th data-bbox="871 295 1023 327">Total</th> </tr> </thead> <tbody> <tr> <td data-bbox="472 327 619 358">TYPE-1</td> <td data-bbox="619 327 724 358">704</td> <td data-bbox="724 327 871 358">0.541</td> <td data-bbox="871 327 1023 358">380.864</td> </tr> <tr> <td data-bbox="472 358 619 389">TYPE-2</td> <td data-bbox="619 358 724 389">96</td> <td data-bbox="724 358 871 389">0.808</td> <td data-bbox="871 358 1023 389">77.568</td> </tr> <tr> <td data-bbox="472 389 619 421">TYPE-3</td> <td data-bbox="619 389 724 421">32</td> <td data-bbox="724 389 871 421">1.075</td> <td data-bbox="871 389 1023 421">34.400</td> </tr> <tr> <td data-bbox="472 421 619 452">TYPE-4</td> <td data-bbox="619 421 724 452">16</td> <td data-bbox="724 421 871 452">1.208</td> <td data-bbox="871 421 1023 452">19.328</td> </tr> <tr> <td data-bbox="472 452 619 483">TYPE-5</td> <td data-bbox="619 452 724 483">64</td> <td data-bbox="724 452 871 483">0.541</td> <td data-bbox="871 452 1023 483">34.624</td> </tr> <tr> <td data-bbox="472 483 619 515">TYPE-6</td> <td data-bbox="619 483 724 515">120</td> <td data-bbox="724 483 871 515">0.808</td> <td data-bbox="871 483 1023 515">96.960</td> </tr> <tr> <td data-bbox="472 515 619 546">Total</td> <td data-bbox="619 515 724 546">1032</td> <td></td> <td data-bbox="871 515 1023 546">643.744</td> </tr> </tbody> </table>				TYPE	nos	Concrete V: (m3)				Each	Total	TYPE-1	704	0.541	380.864	TYPE-2	96	0.808	77.568	TYPE-3	32	1.075	34.400	TYPE-4	16	1.208	19.328	TYPE-5	64	0.541	34.624	TYPE-6	120	0.808	96.960	Total	1032		643.744
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Total Volume of Concrete =	643.7 m3																																							

Item	Formula	Quantity																																																																																														
2) Form	<p>1. Calculation of Each Anchorage Form Area</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>PROFILE</p> </div> <div style="text-align: center;"> <p>SECTION</p> </div> </div> <div style="text-align: center; margin-top: 10px;"> <p>PLAN</p> </div> <p style="text-align: center; margin-top: 10px;">Dimensions for Anchorage of Internal Cable</p> <table border="1" style="width:100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th>Type</th> <th>a</th> <th>a1</th> <th>bs</th> <th>h</th> <th>hs</th> <th>h'</th> <th>l</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.900</td><td>0.660</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.069</td><td>0.350</td></tr> <tr><td>2</td><td>1.300</td><td>1.060</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.069</td><td>0.350</td></tr> <tr><td>3</td><td>1.700</td><td>1.460</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.069</td><td>0.350</td></tr> <tr><td>4</td><td>1.900</td><td>1.660</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.069</td><td>0.350</td></tr> <tr><td>5</td><td>0.900</td><td>0.660</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.039</td><td>0.350</td></tr> <tr><td>6</td><td>1.300</td><td>1.060</td><td>0.396</td><td>2.650</td><td>2.679</td><td>0.069</td><td>0.350</td></tr> </tbody> </table> <div style="margin-bottom: 10px;"> $A1 = \frac{1}{2} \times bs \times (a + a1) + bs \times (2 \times l + h + hs)$ $A2 = \frac{1}{2} \times hs \times (a + a1) + l \times a1$ $A3 = -a \times (l + h + hs)$ </div> <table border="1" style="width:100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="3">Area of Form (m2)</th> <th rowspan="2">Exemption of Girder</th> </tr> <tr> <th>A1</th> <th>A2</th> <th>Total</th> </tr> </thead> <tbody> <tr><td>1</td><td>1.663</td><td>2.321</td><td>3.984</td><td>-2.762</td></tr> <tr><td>2</td><td>1.821</td><td>3.532</td><td>5.353</td><td>-3.990</td></tr> <tr><td>3</td><td>1.980</td><td>4.744</td><td>6.724</td><td>-5.217</td></tr> <tr><td>4</td><td>2.059</td><td>5.350</td><td>7.409</td><td>-5.831</td></tr> <tr><td>5</td><td>1.651</td><td>0.000</td><td>1.651</td><td>0.000</td></tr> <tr><td>6</td><td>1.821</td><td>0.000</td><td>1.821</td><td>0.000</td></tr> </tbody> </table>	Type	a	a1	bs	h	hs	h'	l	1	0.900	0.660	0.396	2.650	2.679	0.069	0.350	2	1.300	1.060	0.396	2.650	2.679	0.069	0.350	3	1.700	1.460	0.396	2.650	2.679	0.069	0.350	4	1.900	1.660	0.396	2.650	2.679	0.069	0.350	5	0.900	0.660	0.396	2.650	2.679	0.039	0.350	6	1.300	1.060	0.396	2.650	2.679	0.069	0.350	Type	Area of Form (m2)			Exemption of Girder	A1	A2	Total	1	1.663	2.321	3.984	-2.762	2	1.821	3.532	5.353	-3.990	3	1.980	4.744	6.724	-5.217	4	2.059	5.350	7.409	-5.831	5	1.651	0.000	1.651	0.000	6	1.821	0.000	1.821	0.000	
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3) Re-Bar	<p>1. Table of Unit Quantiy of Re-Bar</p> <table border="1" data-bbox="485 293 1086 589"> <thead> <tr> <th rowspan="2">TYPE</th> <th colspan="3">Re-bar (kg/each)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr> <td>TYPE-1</td> <td>43</td> <td>237</td> <td>0</td> </tr> <tr> <td>TYPE-2</td> <td>67</td> <td>334</td> <td>0</td> </tr> <tr> <td>TYPE-3</td> <td>72</td> <td>386</td> <td>0</td> </tr> <tr> <td>TYPE-4</td> <td>75</td> <td>434</td> <td>0</td> </tr> <tr> <td>TYPE-5</td> <td>41</td> <td>231</td> <td>0</td> </tr> <tr> <td>TYPE-6</td> <td>46</td> <td>317</td> <td>0</td> </tr> </tbody> </table> <p>2. Total of anchorage Re-Bar Weight</p> <table border="1" data-bbox="488 725 1193 1055"> <thead> <tr> <th rowspan="2">TYPE</th> <th rowspan="2">nos</th> <th colspan="3">Re-bar (kg)</th> </tr> <tr> <th>-D14</th> <th>D16-D22</th> <th>D25</th> </tr> </thead> <tbody> <tr> <td>TYPE-1</td> <td>704</td> <td>30,272</td> <td>166,848</td> <td>0</td> </tr> <tr> <td>TYPE-2</td> <td>96</td> <td>6,432</td> <td>32,064</td> <td>0</td> </tr> <tr> <td>TYPE-3</td> <td>32</td> <td>2,304</td> <td>12,352</td> <td>0</td> </tr> <tr> <td>TYPE-4</td> <td>16</td> <td>1,200</td> <td>6,944</td> <td>0</td> </tr> <tr> <td>TYPE-5</td> <td>64</td> <td>2,624</td> <td>14,784</td> <td>0</td> </tr> <tr> <td>TYPE-6</td> <td>120</td> <td>5,520</td> <td>38,040</td> <td>0</td> </tr> <tr> <td>Total</td> <td>1032</td> <td>48,352</td> <td>271,032</td> <td>0</td> </tr> </tbody> </table> <p style="text-align: right; margin-right: 100px;">Total Exemption Area of Form = 319,384 kg 319.4 ton</p>	TYPE	Re-bar (kg/each)			-D14	D16-D22	D25	TYPE-1	43	237	0	TYPE-2	67	334	0	TYPE-3	72	386	0	TYPE-4	75	434	0	TYPE-5	41	231	0	TYPE-6	46	317	0	TYPE	nos	Re-bar (kg)			-D14	D16-D22	D25	TYPE-1	704	30,272	166,848	0	TYPE-2	96	6,432	32,064	0	TYPE-3	32	2,304	12,352	0	TYPE-4	16	1,200	6,944	0	TYPE-5	64	2,624	14,784	0	TYPE-6	120	5,520	38,040	0	Total	1032	48,352	271,032	0	
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TYPE-3	72	386	0																																																																									
TYPE-4	75	434	0																																																																									
TYPE-5	41	231	0																																																																									
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SCHEDULE OF REINFORCEMENT

Type-1

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	8	20	5000						5000	2.466	99	
2	4	16	240	579	317	3900			5040	1.578	32	
3	1	16	240	642	596	642	240		2360	1.578	4	
4	4	16	240	632	596	632	240		2340	1.578	15	
5	1	16	240	613	200	613	240		1910	1.578	3	
6	4	16	240	604	200	604	240		1890	1.578	12	Average
7	24	16	1900						1900	1.578	72	
8	15	12	180	409	728	409	180		1910	0.888	25	Average
9	15	12	180	391	200	391	180		1350	0.888	18	Average
-D14											43	
D16-D22											237	
D25-											0	
Total of Type-1											280	

SCHEDULE OF REINFORCEMENT

Type-2

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	12	20	5000						5000	2.466	148	
2	6	16	240	579	317	3900			5040	1.578	48	
3	1	16	240	642	996	642	240		2760	1.578	4	
4	4	16	240	632	996	632	240		2740	1.578	17	
5	2	16	240	613	200	613	240		1910	1.578	6	
6	8	16	240	604	200	604	240		1890	1.578	24	Average
7	24	16	2300						2300	1.578	87	
8	15	12	180	409	1128	409	180		2310	0.888	31	Average
9	30	12	180	391	200	391	180		1350	0.888	36	Average
-D14											67	
D16-D22											334	
D25-											0	
Total of Type-2											401	

SCHEDULE OF REINFORCEMENT

Type-3

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	14	20	5000						5000	2.466	173	
2	7	16	240	579	317	3900			5040	1.578	56	
3	1	16	240	642	1396	642	240		3160	1.578	5	
4	4	16	240	632	1396	632	240		3140	1.578	20	
5	2	16	240	613	200	613	240		1910	1.578	6	
6	8	16	240	604	200	604	240		1890	1.578	24	Average
7	24	16	2700						2700	1.578	102	
8	15	12	180	409	1528	409	180		2710	0.888	36	Average
9	30	12	180	391	200	391	180		1350	0.888	36	Average
-D14											72	
D16-D22											386	
D25-											0	
Total of Type-3											458	

SCHEDULE OF REINFORCEMENT

Type-4

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	16	20	5000						5000	2.466	197	
2	8	16	240	579	317	3900			5040	1.578	64	
3	1	16	240	642	1596	642	240		3360	1.578	5	
4	4	16	240	632	1596	632	240		3340	1.578	21	
5	2	16	240	613	200	613	240		1910	1.578	6	
6	8	16	240	604	200	604	240		1890	1.578	24	Average
7	24	16	3100						3100	1.578	117	
8	15	12	180	409	1728	409	180		2910	0.888	39	Average
9	30	12	180	391	200	391	180		1350	0.888	36	Average
-D14											75	
D16-D22											434	
D25-											0	
Total of Type-4											509	

SCHEDULE OF REINFORCEMENT

Type-5

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	8	20	5000						5000	2.466	99	
2	4	16	240	579	317	3500			4640	1.578	29	
3	1	16	240	589	596	289	240		1960	1.578	3	
4	4	16	240	580	596	580	240		2240	1.578	14	
5	1	16	240	563	200	563	240		1810	1.578	3	
6	4	16	240	554	200	554	240		1790	1.578	11	Average
7	24	16	1900						1900	1.578	72	
8	15	12	180	357	728	357	180		1810	0.888	24	Average
9	15	12	180	341	200	341	180		1250	0.888	17	Average
-D14											41	
D16-D22											231	
D25-											0	
Total of Type-5											272	

SCHEDULE OF REINFORCEMENT

Type-6

Symbol of Bar	Number of Bar	Size (mm)	Dimensions (mm)						Length of Bar mm	Unit Weight kg/m	Weight of Bar kg	Remarks
			a	b	c	d	e	f				
T 1	12	20	5000						5000	2.466	148	
2	6	16	240	579	317	3500			4640	1.578	44	
3	1	16	240	589	996	289	240		2360	1.578	4	
4	4	16	240	580	996	580	240		2640	1.578	17	
5	2	16	240	563	200	563	240		1810	1.578	6	
6	4	16	240	554	200	554	240		1790	1.578	11	Average
7	24	16	2300						2300	1.578	87	
8	15	12	180	357	1128	357	180		2210	0.888	29	Average
9	15	12	180	341	200	341	180		1250	0.888	17	Average
-D14											46	
D16-D22											317	
D25-											0	
Total of Type-6											363	

3. Steel Girder

Unit : kg

1. Summary Quantity Table of Steel Girder

Designation	Grade	Size	Main Structure	Inspection Way ※1	Fender	Drain	Erection Pieces	Total	Remark	
Steel Plate	SPA	3.2	156					156		
		2.3	152					152		
	Sub-total		308					308		
	SMA490BW	32	57,060						57,060	
		28	5,700				6.317		12,017	
		27	4,292						4,292	
		26	14,716						14,716	
		25	45,320						45,320	
		24	4,884						4,884	
		22	44,771						44,771	
		20	4,072						4,072	
		19	3,428					14.102	17,530	
		18	8,236						8,236	
		17	222,692				228		222,920	
	Sub-total		415,171			6.545	14.102	435,818		
	SMA490AW	16	48,867						48,867	
		15	9,164						9,164	
		14	471,352				377		471,729	
		13	326,426						326,426	
		12	349,250					3,289	352,539	
		11	28,328						28,328	
		10	202,474						202,474	
		9	34,941						34,941	
	8	7,904						7,904		
	Sub-total		1,478,706			377	3,289	1,482,372		
	SMA400CW	50	2,368						2,368	
	SMA400BW	28	1,240						1,240	
	SMA400AW	12	15,678			160			15,838	
		11	135,990						135,990	
		10	11,118						11,118	
		9	21,239	1819 ※2	1,480	345			24,883	
		8	34,304			34			34,338	
		6	2,114			47,280	17		49,411	
	Sub-total		220,443	1,819	48,920	396		271,578		
	SM400A	8					153		153	
	SS400	12	1,222						1,222	
		10					67		67	
		9			856				856	
		8			856				856	
		6					392		392	
		5					67		67	
	Sub-total		1,222	1,712			526	3,460		
	Total		2,119,458	3,531	48,920	7,997	17,391	2,197,297		
	Channel	SS400	125x65x6		5,136				5,136	
	Angle	SMA400AW	90x90x10			1,960			1,960	
SS400		75x75x6		856				856		
		65x65x6		4,815				4,815		
Sub-total			5,671	1,960			7,631			
U-Type Rib Plate	SM490AW	320x240x6	469,211					469,211		
Round Pipe	STK400	34x2.3		642				642		
		21.7x1.9		749				749		
	Sub-total			1,391				1,391		
Drain Pipe	SGP	300A				20,558		20,558		
		200A				3,226		3,226		
Sub-total						23,784		23,784		
Flat Bar	SS400	50x6		321				321		
Round Bar	SUS304	16			40			40		
	SS400	16				63		63		
		6				80		80		
	Sub-total				40	143		183		
Checkered Steel	SS400	3.2		2,889			2,889			
U-Type Bolt	SS400	M16				332		332		
		M10		214			214			
	Sub-total			214		332		546		
Bolt & Nut	SS400	M16		535		44		579		
		M10		107			107			
	Sub-total			642		44		686		
Nut	SS400	M22	209					209		
		M16				12		12		
	Sub-total		209			12		221		
STUD	SS400	22 x 280(180)	3,214					3,214		
		22 x 80	1,972					1,972		
	Sub-total		5,186					5,186		
Catch Basin	FC250	Drain				835		835		
HTB	F10TW	M22	2,102					2,102		
		M16			80			80		
	Sub-total		2,102		80			2,182		
TCB	S10TW	M24	3,082					3,082		
		M22	55,170					55,170		
		M16			792			792		
	Sub-total		58,252		792			59,044		
Ground-Total		2,654,418	19,795	51,792	33,147	17,391	2,776,543			

Note ※1 All Materials Shall be Galvanized without ※2.

(STUD CASE)

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Item		Unit	Main Structure	Inspection Way ※1	Fender	Drain	Erection Pieces	Total
Large Piece	Number of Piece	n	536					536
	Weight of Piece	kg	1,272,252					1,272,252
Small Piece	Number of Piece	n	40,413		3,296			43,709
	Weight of Piece	kg	1,316,417		50,920	31,924		1,399,261
Processing Weight	Total	kg	2,588,669	18,939	50,920	31,924	17,391	2,707,843
	Weight of SM570 in the total	kg						0
Length of Plate Joint Welding		m	1,613					1,613
Length of T-type Joint Welding		m	3,723					3,723
Number of Members		n	327					327

Note ※1 All Materials Shall be Galvanized without ※2.