P1-P2 No.

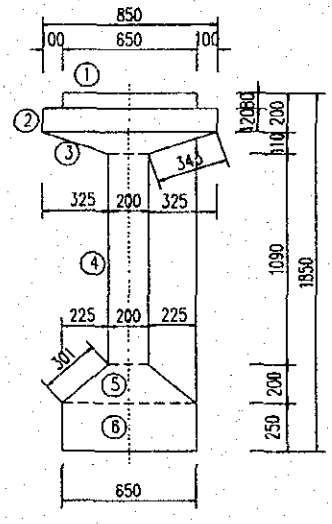
Item	Formula	Quantity
Form 1. Girder 1) Girder	(1) Calculation of Sectional Area	

[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	1.090	×	2	=	2.180
5	0.301	×	2	=	0.602
6	0.250	×	2 + 0.650	=	1.150

Total Length 5.018 m

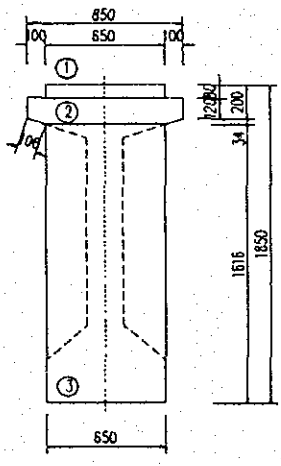


[2] End Section

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
3	1.616	×	2 + 0.650	=	3.882

Total Length 4.494 m



Item	Formula	Quantity

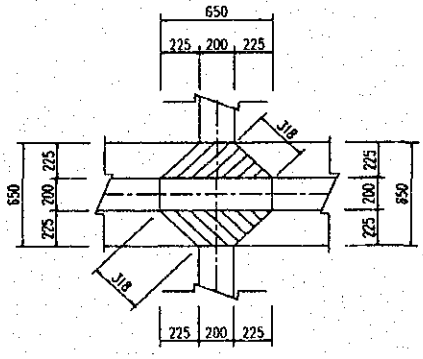
(2) Calculation of Form Area

[1] A1-A2 Girder Length 37.000 m

Section No.	Section Length (m)	Average of Section (m)	Length of Block (m)	Form Area (m2)	Remark
END	4.494				
END	4.494	4.494	0.500	2.247	
MIDDLE	5.018	4.756	5.300	25.207	
MIDDLE	5.018	5.018	25.400	127.457	
END	4.494	4.756	5.300	25.207	
END	4.494	4.494	0.500	2.247	
Total			37	182.365	

A1= 182.365 × No. of Girder 3 × 1 = 3 = 547.095 m2

2) Diaphragm



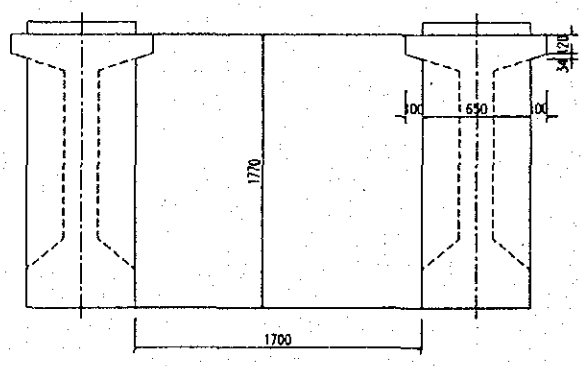
A2= { (0.200 × 1 + 0.318 × 2) × (0.890 + 1.200) × 1/2 - 0.650 × 0.890 } × 2 × 3 × 3 × 1 = 5.312 m2

Total A = 547.095 + 5.312 = 552.407 552.407 m2

P1-P2 No.

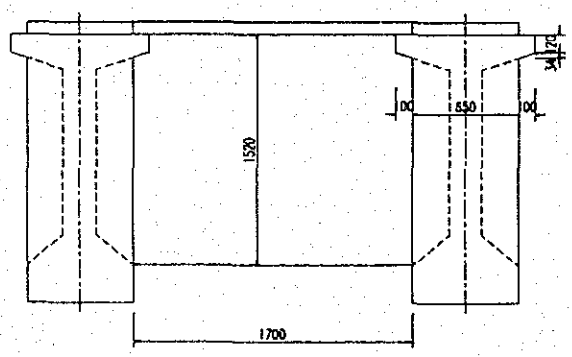
Item	Formula	Quantity
2. Diaphragm		

(1) End Cross Beam



A1= [{ 1.770 × 1.700 - (0.120 + 0.154) × 2/2 × 0.100 }
× 2 + 0.500 × 1.700] × 2 × 4 = 54.506 m2

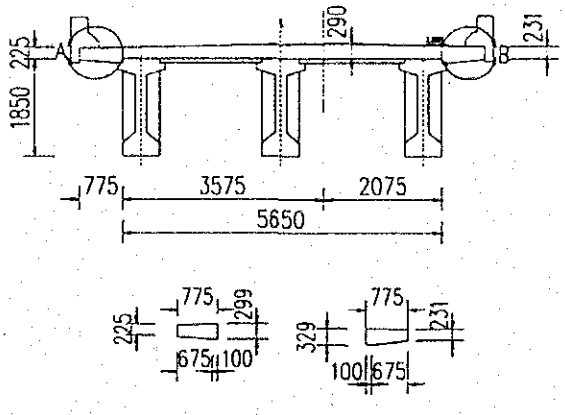
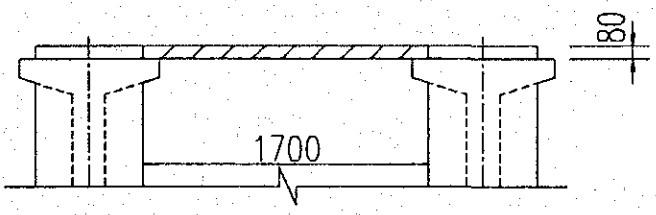
(2) Intermediate Cross Beam



A2= [{ 1.700 × 1.520 - (0.120 + 0.154) × 2/2 × 0.100 }
× 2 + 0.200 × 1.700] × 2 × 3 × 1
× = 32.719 m2

Sub-total A = 54.506 + 32.719 = 87.225 m2 87.225 m2

P1-P2

Item	Formula	Quantity
3. Deck Slab	 DETAIL "A & B" A-1 = (0.225 + 0.675) + (0.231 + 0.675) = 1.806 m A = 1.806 × 37.000 = 66.822 m2	66.822 m2
4. Clatform for construction	A = 9.500 × 35.00 × 1.000 = 332.500 m2	332.500 m2
5.Panel concrete	A = (1.700 + 1.000) × 0.080 × 2 + 1.700) × 2 × 37.00 × 1 = 157.768 m2 	157.768 m2

A1-P1 No.

Item	Formula	Quantity

PC CABLE

1) 12S12.7(B) 1.A1-P1 For ONE GIRDER

CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
1	27.702	C1	1	27.702	9.290	257.352
2	27.746	C2	1	27.746	9.290	257.760
3	27.848	C3	1	27.848	9.290	258.708
TOTAL			3	83.296		773.820

SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-A2) kg

Wp= 773.820 × 3 × 1 = 2,321.460

TENSION UNIT EACH

Ns= 3 × 2 × 3 × 1 = 18

2) 3S12.7

PC CABLE OF DIAPHRAGMS For A1-P1

LOCATION	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
Connection Or	5.650		8	45.2	2.320	104.864
TOTAL			8	45.200		104.864

TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P1) kg

Wp= 104.864 x 1 = 104.864

TENSION UNIT EACH

Ns= 8 * 2 = 16

SHEATING F 80/85MM 83.296 x 3 x 1 = 249.888 m

SHEATING F 50/55MM 45.200 x 1 x 1 = 45.200 m

STEEL SHEAR KEY 6 x 3 x 1 = 18 set

CEMENT GROUT IN SHEATING

3.14 x 0.08 x 0.080 / 4 x 249.888 = 1.255 m3

3.14 x 0.05 x 0.050 / 4 x 45.200 = 0.089 m3

ANCHOR CABLES 12S12.7 6 x 3 x 1 = 18 set

CABLES 3S12.7 8 x 2 x 1 = 16 set

P1-P2 No.

Item	Formula	Quantity

PC CABLE

1) 12S12.7(B)

1.P1-P2 For ONE GIRDER

CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
1	36.702	C1	1	36.702	9.290	340.962
2	36.714	C2	1	36.714	9.290	341.073
3	36.754	C3	1	36.754	9.290	341.445
4	36.784	C4	1	36.784	9.290	341.723
5	36.822	C5	1	36.822	9.290	342.076
TOTAL			5	183.776		1707.279

SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(P1-P2) kg

Wp= 1707.279 × 3 × 1 = 5,121.837

TENSION UNIT EACH

Ns= 5 × 2 × 3 × 1 = 30

2) 3S12.7

PC CABLE OF DIAPHRAGMS For P1-P2

LOCATION	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
Connection Or	5.650		10	56.50	2.320	131.080
TOTAL			10	56.500		131.080

TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P4) kg

Wp= 131.080 x 1 = 131.080

TENSION UNIT EACH

Ns= 10 x 2 = 20

SHEATING F 80/85MM 183.776 x 3 x 1 = 551.328 m

SHEATING F 50/55MM 56.500 x 2 x 1 = 113.000 m

STEEL SHEAR KEY 12 x 3 x 1 = 36 set

CEMENT GROUT IN SHEATING

3.14 x 0.08 x 0.080 / 4 x 551.328 = 2.770 m3

3.14 x 0.05 x 0.050 / 4 x 113.000 = 0.222 m3

ANCHOR CABLES 12S12.7 10 x 3 x 1 = 30 set

CABLES 3S12.7 10 x 2 x 1 = 20 set

P2-A2 No.

Item	Formula	Quantity

PC CABLE

1) 12S12.7(B) 1.P2-A2 For ONE GIRDER

CABLE VAR.	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
1	27.702	C1	1	27.702	9.290	257.352
2	27.746	C2	1	27.746	9.290	257.760
3	27.848	C3	1	27.848	9.290	258.708
TOTAL			3	83.296		773.820

SUB-TOTAL WEIGHT OF PC CABLES per BRIDGE(P2-A2) kg

Wp= 773.820 × 3 × 1 = 2,321.460

TENSION UNIT EACH

Ns= 3 × 2 × 3 × 1 = 18

2) 3S12.7

PC CABLE OF DIAPHRAGMS For P2-A2

LOCATION	EACH LENGTH	CABLE NO.	EACH	TOTAL LENGTH	UNIT WEIGHT	WEIGHT
Connection O	5.650		8	45.20	2.320	104.864
TOTAL			8	45.200		104.864

TOTAL WEIGHT OF PC CABLES per BRIDGE(A1-P1) kg

Wp= 104.864 x 1 = 104.864

TENSION UNIT EACH

Ns= 8 * 2 = 16

SHEATING F 80/85MM 83.296 x 3 x 1 = 249.888 m

SHEATING F 50/55MM 45.200 x 1 x 1 = 45.200 m

STEEL SHEAR KEY 6 x 3 x 1 = 18 set

CEMENT GROUT IN SHEATING

3.14 x 0.08 x 0.080 / 4 x 249.888 = 1.255 m3

3.14 x 0.05 x 0.050 / 4 x 45.200 = 0.089 m3

ANCHOR CABLES 12S12.7 6 x 3 x 1 = 18 set

CABLES 3S12.7 8 x 1 x 1 = 8 set

A1-A2 No.

Item	Formula	Quantity
ETC.	1. JOINT EACH LENGTH L = 6.500 EACH = 4 TOTAL LENGTH L = 6.500 × 4 =	26 m
	2. BEARING PAD ELASTOMERIC 600x300x57 EACH for One SPAN EACH = 3 TOTAL EACH EACH = 3 × 2 =	EACH 6
	ELASTOMERIC 500x250x50 EACH for One SPAN EACH = 3 TOTAL EACH EACH = 3 × 4 =	EACH 12
	3. ANCHOR BAR EACH for One SPAN EACH = 12 =	EACH 12
	TOTAL EACH (FIX) EACH = 2 × 4 = 8	
	TOTAL EACH (MOVE) EACH = 2 × 2 = 4	
	4. PAVEMENT a . WATER PROOFING 5MM 6.5 X 93.5 = 608 m2	608 m2
	b . WATER PROOFING 70MM 6.5 X 93.5 = 608 m2	608 m2

A1-P1

No.

For ONE GIRDER

SCHEDULE OF REINFORCEMENT (OF GIRDER)													
BAR MARK	SIZE (mm)	DIMENSIONS (mm) a	b	c	d	e	f	g	LENGTH (mm)	UNIT WEIGHT (kg/m)	NO. OF BARS	WEIGHT (kg)	REMARKS
G1	14	190	1757	117	1757	190			4011	1.208	138	668.9	
G2	14	190	1757	342	1757	190			4236	1.208	56	286.7	Average
G3	14	190	1757	567	1757	190			4461	1.208	6	32.3	
G4	14	190	1757	567	1757	190			4461	1.208	4	21.6	
G5	14	200	238	154	567	154	238	200	1751	1.208	148	313.2	
G6	14	200	42	759	42	200			1243	1.208	148	222.3	
G7	14	200	301	183	567	183	301	200	1935	1.208	86	201.1	
G8	14	200	151	183	567	183	151	200	1635	1.208	56	110.6	Average
G9	14	389	567	389					1345	1.208	6	9.8	
G10	22	8695	10450	8695					27840	2.984	6	498.5	
G11	14	8695	10450	8695					27840	1.208	20	672.8	
G12	14	8700	10450	8700					27850	1.208	10	336.5	
G13	14	100	338	151	302	100			991	1.208	20	24.0	
G14	14	200	800						1000	1.208	12	14.5	
G15	16	1600							1600	1.578	50	126.3	Interior
G16	16	1100							1100	1.578	50	86.8	Exterior
G17	10	570							570	0.617	12	4.2	
G18	10	150							150	0.617	40	3.7	
G19	14	361	364	567	364	361			2017	1.208	138	336.4	
Total	Span	Interior grider										3883.2	
		Exterior girder										3843.7	

3) Total Weight

Span	Int/Ext	Nos.	Weight/G	Total	Remark
A1-P1	Interior Beam	1	3883.21	3883.21	
	Exterior Beam	2	3843.75	7687.50	
Total				11570.70	

P1-P2

No.

For ONE GIRDER

SCHEDULE OF REINFORCEMENT (OF GIRDER)

BAR MARK	SIZE (mm)	DIMENSIONS (mm) a	b	c	d	e	f	g	LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
G1	14	190	1957	117	1957	190			4411	1.208	184	980.8	
G2	14	190	1957	342	1957	190			4636	1.208	74	414.6	Average
G3	14	190	1957	567	1957	190			4861	1.208	6	35.2	
G4	14	190	1957	567	1957	190			4861	1.208	6	35.2	
G5	14	200	238	154	567	154	238	200	1751	1.208	196	414.7	
G6	14	200	42	759	42	200			1243	1.208	196	294.4	
G7	14	200	301	183	567	183	301	200	1935	1.208	122	285.3	
G8	14	200	151	183	567	183	151	200	1635	1.208	74	146.2	Average
G9	14	389	567	389					1345	1.208	6	9.8	
G10	22	6945	7450	7950	7450	6945			36740	2.984	6	657.8	
G11	14	6945	7450	7950	7450	6945			36740	1.208	22	976.7	
G12	14	6950	7450	7950	7450	6950			36750	1.208	12	532.9	
G13	14	100	318	151	318	100			987	1.208	30	35.8	
G14	14	200	800						1000	1.208	12	14.5	
G15	16	1600							1600	1.578	74	186.9	Interior
G16	16	1100							1100	1.578	74	128.5	Exterior
G17	10	570							570	0.617	24	8.4	
G18	10	150							150	0.617	104	9.6	
G19	14	361	364	567	364	361			2017	1.208	184	448.5	
Total	Span		Interior grider									5487.3	
			Exterior girder									5428.9	

3) Total Weight

Span	Mid/Side	Int/Ext	Nos.	Weight/G	Total	Remark
P1-P2	Side Span	nterior Bean	1	5487.31	5487.31	
		Exterior Bean	2	5428.91	10857.82	
Total					16345.13	

P2-A2

No.

For ONE GIRDER

SCHEDULE OF REINFORCEMENT (OF GIRDER)													
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	14	190	1757	117	1757	190			4011	1.208	138	668.9	
G2	14	190	1757	342	1757	190			4236	1.208	56	286.7	Average
G3	14	190	1757	567	1757	190			4461	1.208	6	32.3	
G4	14	190	1757	567	1757	190			4461	1.208	4	21.6	
G5	14	200	238	154	567	154	238	200	1751	1.208	148	313.2	
G6	14	200	42	759	42	200			1243	1.208	148	222.3	
G7	14	200	301	183	567	183	301	200	1935	1.208	86	201.1	
G8	14	200	151	183	567	183	151	200	1635	1.208	56	110.6	Average
G9	14	389	567	389					1345	1.208	6	9.8	
G10	22	8695	10450	8695					27840	2.984	6	498.5	
G11	14	8695	10450	8695					27840	1.208	20	672.8	
G12	14	8700	10450	8700					27850	1.208	10	336.5	
G13	14	100	318	151	318	100			987	1.208	20	23.9	
G14	14	200	800						1000	1.208	12	14.5	
G15	16	1600							1600	1.578	50	126.3	Interior
G16	16	1100							1100	1.578	50	86.8	Exterior
G17	10	570							570	0.617	12	4.2	
G18	10	150							150	0.617	40	3.7	
G19	14	361	364	567	364	361			2017	1.208	138	336.4	
Total	Span		Interior grider									3883.1	
			Exterior girder									3843.7	

3) Total Weight

Span	Int/Ext	Nos.	Weight/C	Total	Remark
P2-A2	nterior Bean	1	3883.11	3883.11	
	Exterior Bean	2	3843.65	7687.30	
Total				11570.41	

A1-A2 No.

Par EACH

SCHEDULE OF REINFORCEMENT (OF DIAPHRAGM)													
(1) END DIAPHRAGM													
BAR MARK	SIZE (mm)	DIMENSIONS (mm) a	b	c	d	e	f	g	LENGTH (mm)	UNIT WEIGHT (kg/m)	NO. OF BARS	WEIGHT (kg)	REMARKS
G1	16	1850							1850	1.578	32	93.4	
G2	14	198	1759	410	1759	198			4324	1.208	14	73.1	
Sub-Total												166.6	
(2) INTERMEDIATE DIAPHRAGM													
BAR MARK	SIZE (mm)	DIMENSIONS (mm) a	b	c	d	e	f	g	LENGTH (mm)	UNIT WEIGHT (kgf/m)	NO. OF BARS	WEIGHT (kgf)	REMARKS
(+) INTERMEDIATE DIAPHRAGM (OF GIRDER L=28M)													
H1	16	1850							1850	1.578	28	81.7	
H2	14	198	1509	110	1509	198			3524	1.208	14	59.6	
												141.3	
(+) INTERMEDIATE DIAPHRAGM (OF GIRDER L=37M)													
K1	16	1850							1850	1.578	32	93.4	
K2	14	198	1709	110	1709	198			3924	1.208	14	66.4	
												159.8	
Sub-Total												301.1	

3) Total Weight

SECTION		Nos.	Weight/EACH	Weight
END DIAPHRAGM		4	166.6	666.2
(+) INTERMEDIATE DIAPHRAGM (OF GIRDER L=28M)		4	141.3	565.4
(+) INTERMEDIATE DIAPHRAGM (OF GIRDER L=37M)		3	159.8	479.4
Total				1711.0

No.

Par BRIDGE

SCHEDULE OF REINFORCEMENT (OF DECK SLAB)												
BAR MARK	SIZE (mm)	DIMENSIONS (mm)						LENGTH (mm)	UNIT WEIGHT (kg/m)	NO. OF BARS	WEIGHT (kg)	REMARKS
		a	b	c	d	e	f					
S1	20	7080						7080	2.466	592	10335.9	
S2	20	7080						7080	2.466	592	10335.9	
S3	22	7000	5000					12000	2.984	34	1217.5	
S3'	22	5000	7000					12000	2.984	32	1145.9	
S4	22	12000						12000	2.984	66	2363.3	
S5	14	27638						27638	1.208	66	2203.5	
S6	14	24812						24812	1.208	34	1019.1	
S6'	14	22364						22364	1.208	32	864.5	
S7	25	7080						7080	3.853	35	954.8	
S8	25	7080						7080	3.853	35	954.8	
S9	14	12000	6000	6606				24606	1.208	34	1010.6	
S9'	14	12000	10170					22170	1.208	32	857.0	
S10	12	210	155	210				575	0.888	4856	2479.5	
Total											35742.2	

QUANTITY TABLE OF ABUTMENTS

ITEMS			UNIT	ABUTMENT A1	ABUTMENT A2	TOTAL
A- ABUTMENT						
PILE	NUMBER OF PILES		PILE	24.0	24.0	48.0
	TOTAL LENGTH OF RC PILES □450MM		M	960.0	960.0	1920.0
	CONCRETE CLASS D		M3	195.2	195.2	390.4
	REINFORCEMENT	D32	KG	122.4	122.4	244.8
		D28	KG	1411.2	1411.2	2822.4
		D22	KG	26697.6	26697.6	53395.2
		D16	KG	1596.0	1596.0	3192.0
		ϕ6	KG	4413.6	4413.6	8827.2
		TOTAL	KG	34118.4	34118.4	68236.8
ABUTMENT	CONCRETE CLASS E		M3	146.3	146.3	292.6
	REINFORCEMENT	D25	KG	2724.8	2724.8	5449.6
		D22	KG	1711.2	1711.2	3422.4
		D20	KG	2786.1	2776.0	5562.1
		D16	KG	1892.3	1907.5	3799.8
		D14	KG	838.0	814.9	1652.9
		D10	KG	84.3	82.3	166.6
		TOTAL	KG	10036.7	10016.7	20053.4
	LEAN CONCRETE CLASS G		M3	3.9	3.9	7.7
	BLINDING STONE		M3	7.7	7.7	15.4
	EXCAVATION		M3	486.8	461.7	948.5
	FILLING		M3	392.9	367.8	760.6
B- APPROACH SLAB						
	CONCRETE CLASS E		M3	12.1	12.1	24.1
	LEAN CONCRETE CLASS G		M3	3.7	3.7	7.5
	ASPHANTIC JOINT FILLER T=20MM		M3	0.1	0.1	0.2
	REINFORCEMENT	D20	KG	938.1	938.1	1876.2
		D16	KG	975.5	965.3	1940.8
		D10	KG	69.4	69.4	138.8
		TOTAL	KG	1983.0	1972.8	3955.8
C- SLOPE PROTECTION						
	STONE MASONRY T=300MM		M3	231.3	139.9	371.2
	BLINDING AGGREGATE T=100MM		M3	77.1	46.6	123.7
	GEOTEXTILE		M2	268.0	176.0	444.0
	PVC PILE Φ60MM DIA., L=1000MM		M	40.0	27.5	67.5
	EXCAVATION		M3	756.0	519.0	1275.0
	FILLING		M3	582.0	400.0	982.0
FOOTING	WOODEN PILE L=3M		M	4763.0	3272.0	8035.0
	BLINDING STONE		M3	6.4	6.4	12.8
	STONE MASONRY T=300MM		M3	28.6	28.6	57.2

QUANTITY SURVEYING FOR ABUTMENT A1

No.

Item	Formula										Quantity
1) Concrete											
	* BackWall										
	v1 = (	7.50	x	2.05	+	7.50	x				
	x	0.05	/	2.00	) x	0.40	=	6.23	m3		
	* Frontwall										
	v2 =	7.50	x (	3.49	x	1.50	-	0.1	^2		
					/	2	) =	39.17	m3		
	* Corbel										
	v3 =	0.30	x(	0.30	+	0.60	) /	2			
					x	6.50	=	0.88	m3		
	* Haunch										
	v4 =	5.54	x	0.50	x	0.50	/ 2 x 2				
							=	1.38	m3		
	*Wingwall										
	v5 =(	2.40	x(	5.54	+	5.50	) /	2			
	+	1.80	x(	1.05	+	2.51	) /	2	)		
			x	0.50	x	2	=	16.45	m3		
	* Parapet										
	v7 =(	0.50	x	0.30	+	0.20	^2				
	-	0.15	^2/	2	)x	4.60	x	2			
						1.64	=	1.64	m3		
	*Footing										
	v6 =	7.50	x	5.40	x	2.00					
	-	4	x	pi	x	0.60	^2 x	0.1			
							=	80.55	m3		
							Total				**146.3 m3**
2) Form											
	* BackWall										
	a1 =	2.00 x		2.05	x	7.50	/	cos 8°			
	-	2.05 x (		0.50	+	0.50	) x	2			
							=	26.95	m2		
	* Frontwall										
	a2 =	7.5 /		cos 8°	x (	3.49	+	3.56	)		
	- (	0.5 +		0.5	) x	3.56	x	2			
	+	3.52 x		1.5	x	2	=	56.80	m2		
	* Corbel										
	a3 = (	0.3 + (		0.3	^2+	0.3	^2)^	0.5)			
		x		6.5	/	cos 8°	=	4.75	m2		
	* Haunch										
	a4 =	+ (		0.5	^2+	0.5	^2)^	0.5			
		x		5.54	x	2	=	7.83			
	*Wingwall										
	a5 =	2 x (		2.4	x (	5.535	+	5.50	)x1/2x2		
		+		1.8	x (	1.05	+	2.51	)x1/2x2		
	+	0.5 x (		1.05	+	2.31	+	3.00	)		
		-		0.5	x	5.54	)=	66.63	m2		
	* Parapet										
	a5 = (	4.6 x(		0.5	+	0.3	+	0.05			
		+		1.4142	x	0.15	+	0.05	)		
		+		2	x	0.17875	) x	2			
							=	10.95	m2		
	*Footing										
	a 6 =	2 x(		7.500	/	cos 8°	+	4.50	)		
					x	2	=	48.29	m2		
							Total				**222.2 m2**

QUANTITY SURVEYING FOR ABUTMENT A1

No.

Item	Formula	Quantity
3) Scaffolding:	* H<=4m	
	A2 = { 2 x(7.50 / cos 8° + 5.40) +	
	+ 8 } x 2 =	67.9 m2
	* 4m< H<=30m	
	A2 = [(7.5/cos8°+2) + (4.2+1.5+2) + (0.5+2) + (4.2+1-1)	
	+(7.5/cos8°-2 x 1.5) + (4.2-1+1) + (0.5+2) + (4.2+1.5+2)] x (2.05+3.485)	237.7 m2
4) Support	= (7.98 - 1.55 + 4.99) x 1.80 /2	
	x 0.50 x 2 =	10.3 m3
5) Lean Concrete	* Concrete class G	
	V = 0.1 x [(7.50 + 0.2)	
	x (5.40 + 0.2) - 4 x 1/4 x pi	
	x 1.20 ^2] =	3.86 m3
	* Form	
	A = 0.1 x [(7.50 + 0.2) / cos 8°	
	+ (5.40 + 0.20)] x 2 =	2.68 m2
6) Blinding Stone		
	V = 0.2 x [(7.50 + 0.2) x (5.40 +	
	+ 0.2) - 4 x 1/4 x pi x 1.20 ^2]	
	=	7.7 m3
7) Rc Pile		
	* Concrete D	
	N = 24 =	24 nos per 40.0m
	V1 = (0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4) x 10.000 x 4 =	8.068 m3
	V2 = (0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4 + 0.090 x 0.090)	
	x 1/2 x 0.62 =	0.065 m3
	Toral	8.133 m3
	V = 8.133 x 24 =	195.192 m3
	*Form	
	A1 = 0.020 x 1.414 x 4 x 10.000 =	1.131 m2
	A2 0.410 x 3 x 10.000 =	12.300 m2
	A3 = 0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4 =	0.202 m2
	A4 = (0.450 + 0.090) x 1/2 x 0.620	
	x 3 =	0.502 m2
	A = A1 x 4 + A2 x 4	
	+ A3 x 7 + A4 =	55.640 m2
8) Earthworks	* Excavation for foundation	
	= 3.40 / 6 x[(7.40 x 9.50)	
	+ (14.2 x 16.3) + (7.40 + 14.2)	
	x (9.50 + 16.3) =	486.8 m3
	* Excess Soil = Lean Concrete + Blinding Stone + Footing Volume + Pile Occupied Volume	
	Pile Occupied Volume = 4 x pi /4 x 1.20	
	x 1.20 x 0.400 =	1.81 m3
	Excess Soil =	93.94 m3
	* Back Fill =	392.9 m3

QUANTITY SURVEYING FOR ABUTMENT A1

No.

Item	Formula	Quantity
9) Approach Slab		
	* Concrete	
	= 6.46 x (6.00 x 0.30	
	+ (0.30 + 0.50) / 2 x 0.20)	
	- 0.50 x 0.50 / 2 x 0.3	
	x 2 =	12.1 m3
	* Lean Concrete	
	= (0.30 + 0.28 + 5.20)	
	x 6.46 x 0.1 =	3.7 m3
	* Asphaltic Joint Filler	
	= { 0.30 x (0.02 + 0.06)/ 2	
	+ 0.30 x 0.02 } x 6.46 / cos 8° =	0.11
	* Form	
	A = { 0.30 x 0.50 + (0.50 + 0.30)	
	/ 2.00 x 0.20 + 1.05 x 0.30 } x	
	x 2.00 + 6.46 / cos 8° x 0.50 =	4.35 m2

QUANTITY SURVEYING FOR ABUTMENT A2

No.

Item	Formula									Quantity
1) Concrete										
	* BackWall									
	v1 = (	7.50	x	2.05	+	7.50	x			
	x	0.05	/	2.00	) x	0.40	=	6.23	m3	
	* Frontwall									
	v2 =	7.50	x (	3.49	x	1.50	-	0.1	^2	
					/	2	) =	39.17	m3	
	* Corbel									
	v3 =	0.30	x(	0.30	+	0.60	) /	2		
					x	6.50	=	0.88	m3	
	* Haunch									
	v4 =	5.54	x	0.50	x	0.50	/ 2 x 2			
							=	1.38	m3	
	*Wingwall									
	v5 =(	2.40	x(	5.54	+	5.50	) /	2		
	+	1.80	x(	1.05	+	2.51	) /	2	)	
			x	0.50	x	2	=	16.45	m3	
	* Parapet									
	v7 =(	0.50	x	0.30	+	0.20	^2			
	-	0.15	^2/	2	)x	4.60	x	2		
						1.64	=	1.64	m3	
	*Footing									
	v6 =	7.50	x	5.40	x	2.00				
	-	4	x	pi	x	0.60	^2 x	0.1		
							=	80.55	m3	
							Total			**146.3 m3**
2) Form										
	* BackWall									
	a1 =	2.00 x		2.05	x	7.50	-			
	-	2.05 x (		0.50	+	0.50	) x	2		
							=	26.65	m2	
	* Frontwall									
	a2 =	7.5 x(		3.49	+	3.56	)			
	- (	0.5 +		0.5	) x	3.56	x	2		
	+	3.52 x		1.5	x	2	=	56.29	m2	
	* Corbel									
	a3 = (	0.3 + (		0.3	^2+	0.3	^2)^ 0.5)			
					x	6.5	=	4.71	m2	
	* Haunch									
	a4 =	+ (		0.5	^2+	0.5	^2)^ 0.5			
		x		5.535	x	2	=	7.83		
	*Wingwall									
	a5 =	2 x (		2.4	x (	5.535	+	5.50	)x1/2x2	
		+		1.8	x (	1.05	+	2.51	)x1/2x2	
	+	0.5 x (		1.05	+	2.31	+	3.00	)	
		-		0.5	x	5.54	)=	66.63	m2	
	* Parapet									
	a5 = (	4.6 x(		0.5	+	0.3	+	0.05		
		+		1.4142	x	0.15	+	0.05	)	
		+		2	x	0.17875	) x	2		
							=	10.95	m2	
	*Footing									
	a 6 =	2 x(		7.500	+	5.400	)x	2.00		
								51.60	m2	
							Total			**224.7 m2**

QUANTITY SURVEYING FOR ABUTMENT A2

No.

Item	Formula	Quantity
3) Scaffolding:	* H<=4m	
	A1 ={ 2 x(7.50 + 5.40) + 8 }	
	x 2 =	67.6 m2
	* 4m< H<=30m	
	A2 = {(7.5+2) + (4.2+1.5+2) + (0.5+2) + (4.2+1-1)	
	+(7.5-2 x 1.5) + (4.2-1+1) + (0.5+2) + (4.2+1.5+2)} x (2.05+3.485)	236.9 m2
4) Support	= (7.98 - 1.55 + 4.99) x 1.80 /2	
	x 0.50 x 2 =	10.3 m3
5) Lean Concrete	* Concrete class G	
	V = 0.1 x { (7.50 + 0.2) x (5.40 +	
	+ 0.2) - 4 x 1/4 x pi x 1.20 ^2}	
	=	3.86 m3
	* Form	
	A = 0.1 x { (7.50 + 0.2) + (5.40	
	+ 0.20)}x 2 =	2.66 m2
6) Blinding Stone		
	V = 0.2 x { (7.50 + 0.2) x (5.40 +	
	+ 0.2)- 4 x 1/4 x pi x 1.20 ^2}	
	=	7.7 m3
7) Bored Pile		
	* Concrete D	
	N = 24 =	24 nos
		per 40.0m
	V1 = (0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4) x 10.000 x 4 =	8.068 m3
	V2 = (0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4 + 0.090 x 0.090)	
	x 1/2 x 0.62 =	0.065 m3
	Toral	8.133 m3
	V = 8.133 x 24 =	195.192 m3
	*Form	
	A1 = 0.020 x 1.414 x 4 x 10.000 =	1.131 m2
	A2 0.410 x 3 x 10.000 =	12.300 m2
	A3 = 0.450 x 0.450 - 0.020 x 0.020	
	x 1/2 x 4 =	0.202 m2
	A4 = (0.450 + 0.090) x 1/2 x 0.620	
	x 3 =	0.502 m2
	A = A1 x 4 + A2 x 4	
	+ A3 x 7 + A4 =	55.640 m2
8) Earthworks	* Excavation for foundation	
	= 3.29 / 6 x{ (7.40 x 9.50)	
	+ (13.98 x 16.08) + (7.40 + 13.98)	
	x (9.50 + 16.08) =	461.7 m3
	* Excess Soil = Lean Concrete + Blinding Stone + Footing Volume + Pile Occupied Volume	
	Pile Occupied Volume = 4 x pi /4 x 1.20	
	x 1.20 x 0.400 =	1.81 m3
	Excess Soil =	93.9 m3
	* Back Fill =	367.8 m3

QUANTITY SURVEYING FOR ABUTMENT A2

No.

Item	Formula	Quantity
9) Approach Slab		
	* Concrete	
	= 6.46 x { 6.00 x 0.30	
	+ (0.30 + 0.50) / 2 x 0.20 }	
	- 0.50 x 0.50 / 2 x 0.3	
	x 2 =	12.1 m3
	* Lean Concrete	
	= (0.30 + 0.28 + 5.20)	
	x 6.46 x 0.1 =	3.7 m3
	* Asphaltic Joint Filler	
	= { 0.30 x (0.02 + 0.06)/ 2	
	+ 0.30 x 0.02 } x 6.46 =	0.11
	* Form	
	A = { 0.30 x 0.50 + (0.50 + 0.30)	
	/ 2.00 x 0.20 + 1.05 x 0.30 } x	
	x 2.00 + 6.46 x 0.50 =	4.32 m2

LIST OF REINFORCEMENT pil-1

SIGN	DIACETER	LENGTH	NOS.	UNIT WEIGHT	PIECE WEIGHT	TOTAL WEIGHT	NOTE
1	D22	9,900	12	2.984	29.500	354.0	
2	D6	1,614	95	0.222	0.358	34.0	
3	D6	490	120	0.222	0.109	13.1	
4	D25	1,911	2	3.854	7.360	14.7	
5	D22	350	8	2.984	1.040	8.3	
8	D16	1,508	8	1.579	2.380	19.0	
					TOTAL	443.1	
					D32	0.0	
					D25	14.7	
					D22	362.3	
					D16	19.0	
					ϕ6	47.1	
						443.1	

LIST OF REINFORCEMENT pile-2

SIGN	DIACETER	LENGTH	NOS.	UNIT WEIGHT	PIECE WEIGHT	TOTAL WEIGHT	NOTE
1	D22	9,900	8	2.984	29.500	236.0	
2	D6	1,614	95	0.222	0.358	34.0	
3	D6	490	120	0.222	0.109	13.1	
4	D25	1,911	2	3.854	7.360	14.7	
5	D22	350	8	2.984	1.040	8.3	
8	D25	0	0	3.854	0.000	0.0	
9	D16	1,508	8	1.579	2.380	19.0	
					TOTAL	325.1	
					D32	0.0	
					D25	14.7	
					D22	244.3	
					D16	19.0	
					ϕ6	47.1	
						325.1	

LIST OF REINFORCEMENT pile-3

SIGN	DIACETER	LENGTH	NOS.	UNIT WEIGHT	PIECE WEIGHT	TOTAL WEIGHT	NOTE
1a	D22	10,589	4	2.984	31.600	126.4	
1b	D22	10,612	4	2.984	31.700	126.8	(AVE)
2	D6	1,614	95	0.222	0.358	34.0	
3	D6	490	60	0.222	0.109	6.5	
4	D25	1,911	2	3.854	7.360	14.7	
5	D22	350	8	2.984	1.040	8.3	
6	D6	9,460	1	0.222	2.100	2.1	
7	D32	810	1	6.313	5.110	5.1	(AVE)
8	D25	0	0	3.854	0.000	0.0	
9	D16	1,508	4	1.579	2.380	9.5	
					TOTAL	333.4	
					D32	5.1	
					D25	14.7	
					D22	261.5	
					D16	9.5	
					ϕ6	42.6	
						333.4	

TOTAL

	Pile-1	Pile-2	Pile-3	Total
nos	1	2	1	
D32	0.0	0.0	5.1	5.1
D25	14.7	29.4	14.7	58.8
D22	362.3	488.6	261.5	1112.4
D16	19.0	38.0	9.5	66.5
ϕ6	47.1	94.2	42.6	183.9
	443.100	650.200	333.400	1426.7

QUANTITY TABLE OF PIER

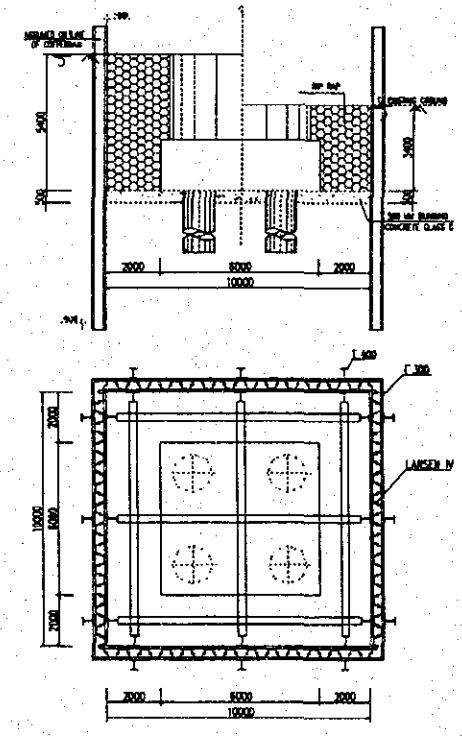
Items			Unit	Pier 1	Pier 2	Total
Pile	Number of piles		Pile	25	25	25
	Total length Rc piles 150mm		m	208.0	208	208
	Concrete piles class D		m^3	203.3	203	203
					0	0
	Renforcement	ϕ 6	kg	4597.5	4598	4598
		D16	kg	1662.5	1663	1663
		D22	kg	33710.0	33710	33710
		D25	kg	1470.0	1470	1470
		D32	kg	127.5	128	128
		Total	kg	41567.5	41568	41568
Pier	Concrete class E		m^3	123.4	123.4	246.8
	Reinforcement	D10	kg	20.7	20.7	41.4
		D14	kg	1048.8	1048.8	2097.6
		D16	kg	619.2	619.2	1238.4
		D20	kg	485.3	485.3	970.6
		D22	kg	1905.7	1905.7	3811.4
		D28	kg	4040.9	4040.9	8081.8
		D32	kg	2289.7	2289.7	4579.4
		Total	kg	10410.3	10410.3	20820.6
	Form	Curve	m^2	51.0	51.0	102.0
		Flat	m^2	81.6	81.6	163.3
	Scaffolingding work	H < 4m	m^2	116.0	116.0	232.0
		4m ≤ H < 30m	m^2	140.4	140.4	280.8
	Support		m^3	7.0	7.0	14.0
	Earth work	Excavation for foundation	m^3	563.3	372.4	935.7
		Blinding Concrete class G	m^3	47.7	47.7	95.5
		Rip rap	m^3	446.7	257.9	704.6
	Cofferdams	Sheet pile Larsen IV	m	1248.0	1248.0	2496.0
		Steel pile I 400	m	288.0	288.0	576.0
		Brace C 300	m	651.0	651.0	1302.1

QUANTITY SURVEYING FOR PIER P1 & P2

No.

Item	Formula											Quantity
1) Concrete												
	* Headstock											
	v1 = { (	7.00	x	1.40	-	1.15	x	0.70	)			
					x	1.00						
	+ (	7.00	x	1.60	-	1.15	x	0.70	)			
					x	1.00	}			=		19.39 m3
	* Wall											
	v2 =	5.80	x (	1/4 x pi	x	1.40	^2					
			+	2.90	x	1.40	)			=		32.48 m3
	* Footing											
	v3 = (	6.00	x	6.00	x	2.00						
	-	4	x	pi	x	0.60	^2 x	0.1	)			
										=		71.55 m3
								Total				123.41 m3
2) Form												
	* Wall (Curve form)											
	a1-1 =	2 x pi	x	1.40	x	5.80				=		51.02 m2
	* Wall (Flat form)											
	a1-2 =	2	x	2.90	x	5.80				=		33.64 m2
	* Footing											
	a2 =	2	x (	6.000	+	6.000	) x	2.00				
										=		48.00 m2
						Total		**Curve**		=		51.02 m2
								Flat		=		81.64 m2
3) Scaffolding:	* (H<=4m)											
	A1 =	2	x (	8.00	+	8.00	) x	2.00				
	+ (	2	x (	4.00	+	9.00	) x	2.00				
										=		116.00 m2
	* (4m< H<=30m)											
	A2 =	2	x (	4.00	+	9.00	) x	5.40				
										=		140.40 m2
4) Support	= { (	7.00	-	2.90	-	1.40	) x	2.00				
	+	1.15	x	0.70	x	2.00	}			=		7.01 m3
5) Lean Concrete	* Concrete class G											
	v =	0.50	x { (	6.00	+	4	) x (	6.00	+			
	+	4) -		4	x	1/4 x pi	x	1.20	^2}			
										=		47.74 m3
6) Rc Pile												
	* Concrete D											
	N =	25								=		25 nos per 40.0m
	V1 = (	0.450	x	0.450	-	0.020	x	0.020				
	x	1/2	x	4	) x	10.000	x	4		=		8.068 m3
	V2 = (	0.450	x	0.450	-	0.020	x	0.020				
	x	1/2	x	4	+	0.090	x	0.090	)			
	x	1/2	x	0.62						=		0.065 m3
								Toral				8.133 m3
	V =	8.133	x	25						=		203.325 m3
	*Form											
	A1 =	0.020	x	1.414	x	4	x	10.000		=		1.131 m2
	A2	0.410	x	3	x	10.000				=		12.300 m2
	A3 =	0.450	x	0.450	-	0.020	x	0.020				
	x	1/2	x	4						=		0.202 m2
	A4 = (	0.450	+	0.090	) x	1/2	x	0.620				
	x	3								=		0.502 m2
	A =	A1	x	4	+	A2	x	4				
	+	A3	x	7	+	A4				=		55.640 m2

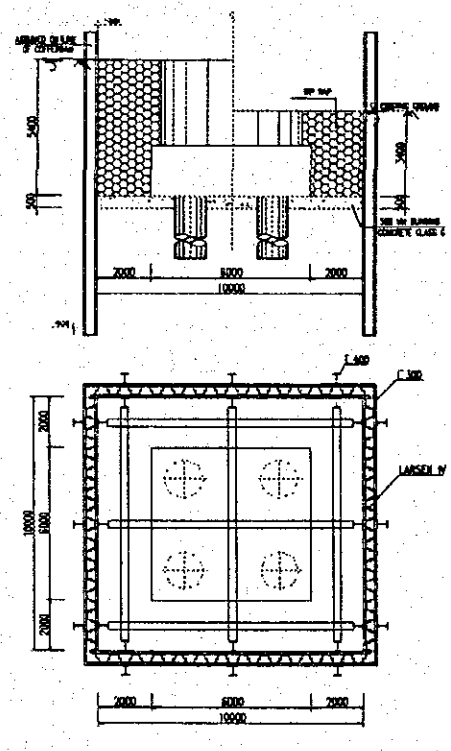
Item	Formula	Quantity
7) Earthwork	* Excavation for footing	
	= 5.90 x (10.00 x 10.00)	
	- 4 x pi /4 x 1.20 ^2 x 5.90	
	=	**563.31 m3**
	* Excess Soil	
	v1 = Lean Concrete =	47.74 m3
	v2 = Footing Volume =	71.55 m3
	v3 = Occupied volume of piles	
	= 4 x pi/4 x 1.200 ^2 x	
	x 0.60 =	2.71 m3
	v4 = Occupied volume of wall	
	= (pi/4 x 1.400 ^2 + 2.90 x 1.40)	
	x 3.400 =	19.04 m3
	Total =	**141.04 m3**
	* Riprap = Excavation for footing - Excess Soil	
	= 563.31 - 141.04	
	+ 4 x pi/4 x 1.200 ^2 x 5.40	
	=	**446.70 m3**
8)Cofferdams	* Sheet pile larsen IV	
	104.00 nos L= 12 m =	**1248.00 m**
	* Steel pile I 400	
	24.00 nos L= 12 m =	**288.00 m**
	* Brace C 300	
	L1 = (10.2 + 11.08) x 7.00 x 4	
	= 595.84 m	
	L3 = 9.2 x 6 = 55.2 m	
	Total	**651.04 m**



QUANTITY SURVEYING FOR PIER P1 & P2 No.

Item	Formula											Quantity	
1) Concrete													
	* Headstock												
	v1 = { (	7.00	x	1.40	-	1.15	x	0.70	)				
					x	1.00							
	+ (	7.00	x	1.60	-	1.15	x	0.70	)				
					x	1.00	}			=		**19.39**	m3
	* Wall												
	v2 =	5.80	x (	1/4 x pi	x	1.40	^2						
			+	2.90	x	1.40	)			=		**32.48**	m3
	* Footing												
	v3 = (	6.00	x	6.00	x	2.00							
	-	4	x	pi	x	0.60	^2 x	0.1	)				
										=		71.55	m3
								Total				123.41	m3
2) Form													
	* Wall (Curve form)												
	a1-1 =	2 x pi	x	1.40	x	5.80				=		**51.02**	m2
	* Wall (Flat form)												
	a1-2 =	2	x	2.90	x	5.80				=		**33.64**	m2
	* Footing												
	a2 =	2	x (	6.000	+	6.000	) x	2.00					
										=		**48.00**	m2
						Total		Curve		=		**51.02**	m2
								Flat		=		**81.64**	m2
3) Scaffolding:	* (H<=4m)												
	A1 =	2	x (	8.00	+	8.00	) x	2.00					
	+ (	2	x (	4.00	+	9.00	) x	2.00					
										=		**116.00**	m2
	* (4m< H<=30m)												
	A2 =	2	x (	4.00	+	9.00	) x	5.40					
										=		**140.40**	m2
4) Support	= { (	7.00	-	2.90	-	1.40	) x	2.00					
	+	1.15	x	0.70	x	2.00	}			=		**7.01**	m3
5) Lean Concrete	* Concrete class G												
	v =	0.50	x { (	6.00	+	4	) x (	6.00	+				
	+	4) -		4	x	1/4 x pi	x	1.20	^2 }				
										=		**47.74**	m3
6) Rc Pile													
	* Concrete D												
	N =	25								=		25	nos
												per 40.0m	
	V1 = (	0.450	x	0.450	-	0.020	x	0.020					
	x	1/2	x	4	) x	10.000	x	4	=			8.068	m3
	V2 = (	0.450	x	0.450	-	0.020	x	0.020					
	x	1/2	x	4	+	0.090	x	0.090	)				
	x	1/2	x	0.62						=		0.065	m3
								Toral				8.133	m3
	V =	8.133	x	25						=		203.325	m3
	*Form												
	A1 =	0.020	x	1.414	x	4	x	10.000		=		1.131	m2
	A2	0.410	x	3	x	10.000				=		12.300	m2
	A3 =	0.450	x	0.450	-	0.020	x	0.020					
	x	1/2	x	4						=		0.202	m2
	A4 = (	0.450	+	0.090	) x	1/2	x	0.620					
	x	3								=		0.502	m2
	A =	A1	x	4	+	A2	x	4					
	+	A3	x	7	+	A4				=		55.640	m2

Item	Formula	Quantity
7) Earthwork	* Excavation for footing	
	= 3.90 x (10.00 x 10.00)	
	- 4 x pi /4 x 1.20 ^2 x 3.90	
	=	**372.36 m3**
	* Excess Soil	
	v1 = Lean Concrete =	47.74 m3
	v2 = Footing Volume =	71.55 m3
	v3 = Occupied volume of piles	
	= 4 x pi/4 x 1.200 ^2 x	
	x 0.60 =	2.71 m3
	v4 = Occupied volume of wall	
	= (pi/4 x 1.400 ^2 + 2.90 x 1.40)	
	x 1.400 =	7.84 m3
	Total =	129.84 m3
	* Riprap = Excavation for footing - Excess Soil	
	= 372.36 - 129.84	
	+ 4 x pi/4 x 1.200 ^2 x 3.40	
	=	**257.90 m3**
8)Cofferdams	* Sheet pile larsen IV	
	104.00 nos L= 12 m =	**1248.00 m**
	* Steel pile I 400	
	24.00 nos L= 12 m =	**288.00 m**
	* Brace C 300	
	L1 = (10.2 + 11.08) x 7.00 x 4	
	= 595.84 m	
	L3 = 9.2 x 6 = 55.2 m	
	Total	**651.04 m**



STEEL OF PIERS P1 & P2

(FOR ONE PIER)

DETAIL	No	D (mm)	LENGTH (m)	QUANTITY (nos.)	UNIT WEIGH (kg/m)	TOTAL STEEL (kg)
PIER CAP	R1	10	5600	6	0.617	20.7
	B1	28	7868	14	4.834	532.5
	B2	28	8790	6	4.834	254.9
	B2a	28	8390	7	4.834	283.9
	B3	16	6800	5	1.578	53.7
	B3a	16	6054	6	1.578	57.3
	B4	14	4907	23	1.208	136.3
	B4a	14	4257	23	1.208	118.3
	B4b	14	1979	23	1.208	55.0
	B4c	14	3557	23	1.208	98.8
	B4d	14	2329	23	1.208	64.7
	B5	14	4280	12	1.208	62.0
	B5a	14	3558	12	1.208	51.6
	B5b	14	1630	12	1.208	23.6
	B5c	14	2858	12	1.208	41.4
	B5d	14	2329	16	1.208	45.0
COLUMN	C1	28	9034	68	4.834	2969.6
	C2	14	10794	27	1.208	352.1
	C3	16	3708	18	1.578	105.3
	C3a	16	3658	12	1.578	69.3
FOOTING	F1	22	6570	21	2.984	411.7
	F2	22	9300	39	2.984	1082.3
	F3	22	6570	21	2.984	411.7
	F4	32	9300	39	6.313	2289.7
	F5	20	5800	16	2.466	228.8
	F6	20	6500	16	2.466	256.5
	F7	16	4698	45	1.578	333.6

TOTAL			
	D = 10	20.7	(kg)
	D = 14	1048.8	(kg)
	D = 16	619.2	(kg)
	D = 20	485.3	(kg)
	D = 22	1905.7	(kg)
	D = 28	4040.9	(kg)
	D = 32	2289.7	(kg)
	TOTAL	10410.3	(kg)

LIST OF REINFORCEMENT

pile-1

SIGN	DIACETER	LENGTH	NOS.	UNIT WEIGHT	PIECE WEIGHT	TOTAL WEIGHT	NOTE
1	D22	9,900	12	2.984	29.500	354.0	
2	D6	1,614	95	0.222	0.358	34.0	
3	D6	490	120	0.222	0.109	13.1	
4	D25	1,911	2	3.854	7.360	14.7	
5	D22	350	8	2.984	1.040	8.3	
8	D25	0	0	3.854	0.000	0.0	
9	D16	1,508	8	1.579	2.380	19.0	
					TOTAL	443.1	

D32	0.0	
D25	14.7	
D22	362.3	
D16	19.0	
ϕ6	47.1	
	443.1	

LIST OF REINFORCEMENT

pile-2

SIGN	DIACETER	LENGTH	NOS.	UNIT WEIGHT	PIECE WEIGHT	TOTAL WEIGHT	NOTE
1a	D22	10,589	4	2.984	31.600	126.4	
1b	D22	10,612	4	2.984	31.700	126.8	(AVE)
2	D6	1,614	95	0.222	0.358	34.0	
3	D6	490	60	0.222	0.109	6.5	
4	D25	1,911	2	3.854	7.360	14.7	
5	D22	350	8	2.984	1.040	8.3	
6	D6	9,460	1	0.222	2.100	2.1	
7	D32	810	1	6.313	5.110	5.1	(AVE)
8	D25	0	0	3.854	0.000	0.0	
9	D16	1,508	4	1.579	2.380	9.5	
					TOTAL	333.4	

D32	5.1	
D25	14.7	
D22	261.5	
D16	9.5	
ϕ6	42.6	
	333.4	

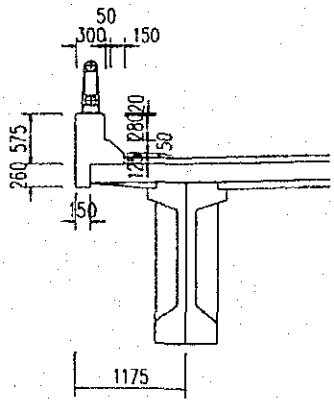
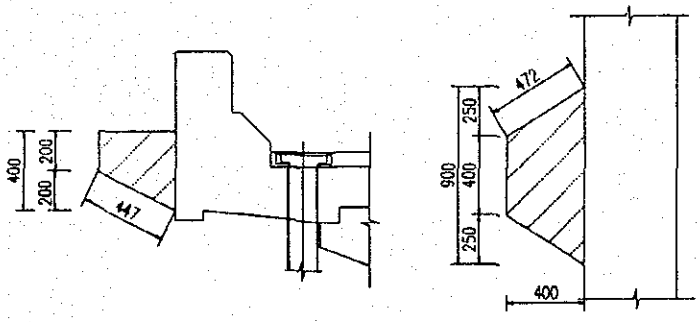
TOTAL

	Pile-2	Pile-3	Total
nos	3	1	
D32	0.0	5.1	5.1
D25	44.1	14.7	58.8
D22	1086.9	261.5	1348.4
D16	57.0	9.5	66.5
ϕ6	141.3	42.6	183.9
	1329.300	333.400	1662.7

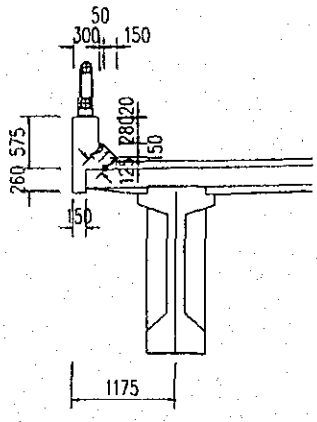
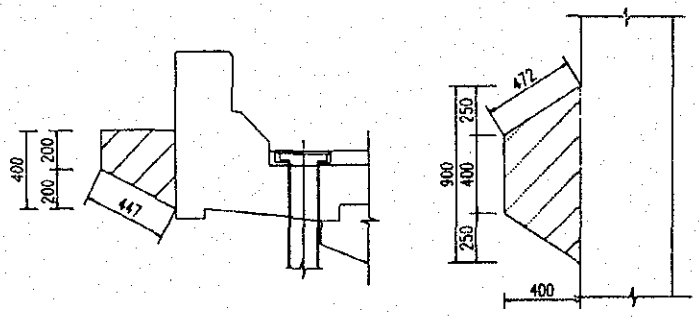
QUANTITY FOR MISCELLANEOUS

ITEMS			UNIT	TOTAL
PARAPET	CONCRETE CLASS E		m^3	48
	REINFORCEMENT	D14	kg	7408
RAILING			m	205
LIGHTING	LIGHTING POLES		poles	3
	CONCRETE CLASS E		m^3	0.3
	REINFORCEMENT	D16	kg	32.6
		D20	kg	62.0
	PVC PILE Ø 100MM		m	187
DRAINAGE	DRAINAGE		set	14
	PIPE Ø 180MM		m	24

A1-A2 No.

Item	Formula	Quantity
1. Railing CLASS "E"		
	A = {(0.300 × 0.575 + 0.260 × 0.150 + (0.125 + 0.275) × 0.150 × 1/2 + 0.275 × 0.050} × 2 = 0.511 m2	
	V = 0.511 × (28.000 × 2 + 37.000) = 47.523 m3	47.523 m3
2.Lighting CLASS "E"		
	V = (0.200 x 0.400 + 0.400 × 0.900) × 1/2 x 0.4 × 3 = 0.264 m3	0.264 m3

A1-A2 No.

Item	Formula	Quantity
1. Railing CLASS "E"		
	A = (0.575 + 0.260 + 0.15 + 0.125 + 0.212 + 0.280) × 2 × (28.000 × 2 + 37.000) = 297.972 m2	297.972 m2
2.Lighting CLASS "E"		
	A = {(0.900 + 0.400) × 0.447 × 1/2 + (0.400 + 0.200) × 0.472 × 2/2 + 0.400 × 0.200 } x 3 = 1.961 m2	1.961 m2

No.

Item	Formula						Quantity
	1. DRAIN						
	TOTAL EACH						
							EACH
	EACH =	7 ×	2			=	14
							m
	PIPE =	1.74 ×	14			=	24
	2. RAILING						
	EACH LENGTH for SPAN						
	L =	28.150 +	37.200 + 28.150	=	93.500		
	EACH =	3 SPAN					
	TOTAL LENGTH						
	L =	93.500 ×	2 +	4.6 x	2 x	2	= 205.400 m
	3. LIGHTING						
	EACH for One SPAN						
	EACH =	3				=	3
	PVC Φ	100 MM				=	187.00 m

No.

A1-A2

Par BRIDGE

SCHEDULE OF REINFORCEMENT (OF RAILING)													
BAR MARK	SIZE (mm)	DIMENSIONS (mm)							LENGTH (mm)	UNIT WEIGHT (kg/m)	NO. OF BARS	WEIGHT (kg)	REMARKS
		a	b	c	d	e	f	g					
P1	14	250	701	212	747	70			1980	1.208	68	162.7	
P2	14	230	297	176	275	245			1223	1.208	68	100.5	
P3	14	10000							10000	1.208	11	132.9	
Total												396.1	

Total Weight

Total = 396.13 / 10 × 93.5 × 2 = 7,407.63 (kg)

No.

A1-A2

Par BRIDGE

SCHEDULE OF REINFORCEMENT (OF LIGHTING)

BAR MARK	SIZE (mm)	DIMENSIONS (mm) a	b	c	d	e	f	g	LENGTH (mm)	UNIT WEIGHT (kg/m)	NO. OF BARS	WEIGHT (kg)	REMARKS
P1	20	113	825	320					1258	2.466	3	9.31	
P2	16	113	380	488	280				1261	1.578	3	5.97	
P3	20	1000	300	1000					2300	2.466	2	11.34	
P4	16	282	285	282					849	1.578	2	2.68	
P5	16	208	285	208					701	1.578	2	2.21	
Total												31.51	

Total Weight

Total = 31.51 × 3 = 94.53 (kg)

QUANTITY OF RAMPWAY "D" BRIDGE - INTERCHANGE 3

ITEMS		UNIT	ABUTMENTS	PIERS	SUPERSTRUCTURE	MISCELLANEOUS	TOTAL
CONCRETE	CLASS B	M3			210.6		210.6
	CLASS D	M3	390.4	203.3	229.4		823.1
	CLASS E	M3	316.7	246.8		47.5	611.1
	CLASS G	M3	15.2	95.5			110.7
PC - STEEL	12 S 12.7	ton			9.8		9.8
	3 S 12.7	ton			6.3		6.3
SHEATHING	CABLES Ø 80/85	M			1051.1		1051.1
	CABLES Ø 50/55	M			203.2		203.2
CEMENT GROUT IN SHEATHING		M3			5.7		5.7
ANCHORAGE	CABLES 12S12.7	SET			66.0		66.0
	CABLES 3S12.7	SET			44.0		44.0
STEEL SHEAR KEY		SET			72.0		72.0
REINFORCEMENT	RE-BAR	TON	92.2	62.4	80.9	7.5	243.0
EXPANSION JOINT	50MM	M			26.0		26.0
BEARING	600x300x57	SET			6.0		6.0
	500x250x50	SET			12.0		12.0
ANCHORAGE BAR		SET			12.0		12.0
PVC PIPE	Ø 50 MM	M	67.5				67.5
	Ø 100 MM	M					0.0
RAILING		M				205.4	205.4
LIGHTING POLE		SET				3.0	3.0
DRAINAGE	POT	SET				14.0	14.0
	PIPE Ø 180 MM	M				24.4	24.4
PAVEMENT	WATER PROOFING 5 MM	M2			607.8		607.8
	ALPHALT CONCRETE 70 M	M2			607.8		607.8
Rc Pile 450mm		M	1920.0	208.0			2128.0
GEOTEXTILE		M2	444.0				444.0
STONE MANSORY		M3	428.4				428.4
BLINGDING AGGREGATE		M3	123.7				123.7
RIP RAP		M3		704.6			704.6
BLINDING STONE		M3	28.2				28.2
WOODEN PIPE L = 3M		M	8035.0				8035.0
EXCAVATION		M3	2123.5	935.7			3059.2
FILLING		M3	1742.6				1742.6
FORM WORK	CURVE	M2		102.0			102.0
	FLAT	M2	446.9	163.3	5054.0		5664.2
SCAFFOLDING WORK	H < 4M	M2	135.8	232.0			367.8
	4 M < H < 30M	M2	474.6	280.8			755.4
SUPPORT		M3	20.5	14.0			34.6
COFFERDAMS	SHEET PILE LARSEN IV	M		2496.0			2496.0
	STEEL PILE I 400	M		576.0			576.0
	BRACE C 300	M		1302.1			1302.1

JICA