2.4. Box culvert at station 9+326

BOX CULVERT

9+326

BOX CULVERT STAT		QUANTITIE
L	= 21.878 + 15.930 + 0.02 = 37.848	
CULVERT		1
CONCRETE (M3)		
S1=S2	$= 2.950 \times 2.550 - 2.500 \times 2.000 + 2 \times 0.100 \times 0.100 =$	
5	= S1 + S2 =	5.085
VOLUME	$= 5 \times (21.878 + 15.950) + 5.900 \times 0.200 \times 0.300 \times 2 =$	<u>193.06</u>
	DOUBLE BOX CULVERT	l
	<u>5900</u> 2950 . 2950	ł
i	300 2500 300 2500 J00 S2	
		i
		1
· · ·		
	SÍ	
FORM (M2)		706.09
INSIDE FORM (M2)		492.951
BOX BULWARK	- (2000 + 2 + 0.100 - (1.51).15 ⁰ - 1)) - 25.200	
	$= (2.000 + 2 \times 0.100 \times (1:SIN45^{\circ} - 1)) \times 37.828 \times 4 =$	315.159
BOTTOM OF THE BOX	$= (2.950 - 0.300 \times 2) \times 37.828 \times 2 =$	177.792
OUTSIDE FORM (M2)		213.138
BOX BULWARK	$= 2.550 \times 2 \times 37.828 + 4 \times 0.300 \times 0.200 =$	193.163
THE END OF CULVERT	$= S \times 2 + 5.900 \times 0.200 \times 4 =$	14.890
CENTER	= S =	5.085
SCAFFOLDING (M2)	= 2.550 x 2.000 x 37.828 + 4.000 x 0.300 x 0.200 =	<u>193.16</u>
SUPPORT		175.10
AREÁ (M2)	= 5.900 x 2.000 - 5 =	6.715
VOLUME (M3)	$= AREA \times L =$	<u>254.15</u>
()		204.15
* . 		
· · · · ·		

GT 9+326

BOXCULVERT STATION 9+326 QUANTITIES TABLE OF REINFORCEMENT SEGMENT 1

				SEGME	NII		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	<u>(</u> រាហា)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	4160	125	14	350	- 1.208	1456	1759.449
2	2850	250	12	176	0.888	501.6	445.327
3	6270	250	14	176	1.208	1103.52	1333.507
4	1500	250	14	348	1.208	522	630.791
5	1550	125	18	350	1.998	542.5	1083.687
6	1970	250	12	352	0.888	693.44	615.645
7	2850	125	12	350	0.888	997.5	885.594
8	1049	250	12	352	0.888	369.248	327.823
9	1120	250	12	352	0.888	394.24	350.012
10	22383	250	12	52	0.888	1163.916	1033.340
11	22483	250	12	100	0.888	2248.3	1996.071
12	5780	250	12	- 2	0.888	11.56	10.263
13	1-1-10	250	12	26	0.888	37.44	33.240
14	1180	250	12	525.072	0.888	619.58496	550.076
15	1280	250	12	525.072	0.888	672.09216	596.692
REINFORG	CEMENT : I)<=14		10567.8	TOTAL FOR SEC	GMENT 1 :	
REINFORG	CEMENT : 16=	=D<=25		1083.7	REINFORCEME	NT (KG):	11651.5
REINFORG	CEMENT : 25	<d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>111.60</td></d=32<>			CONCRETE (M ³):	111.60

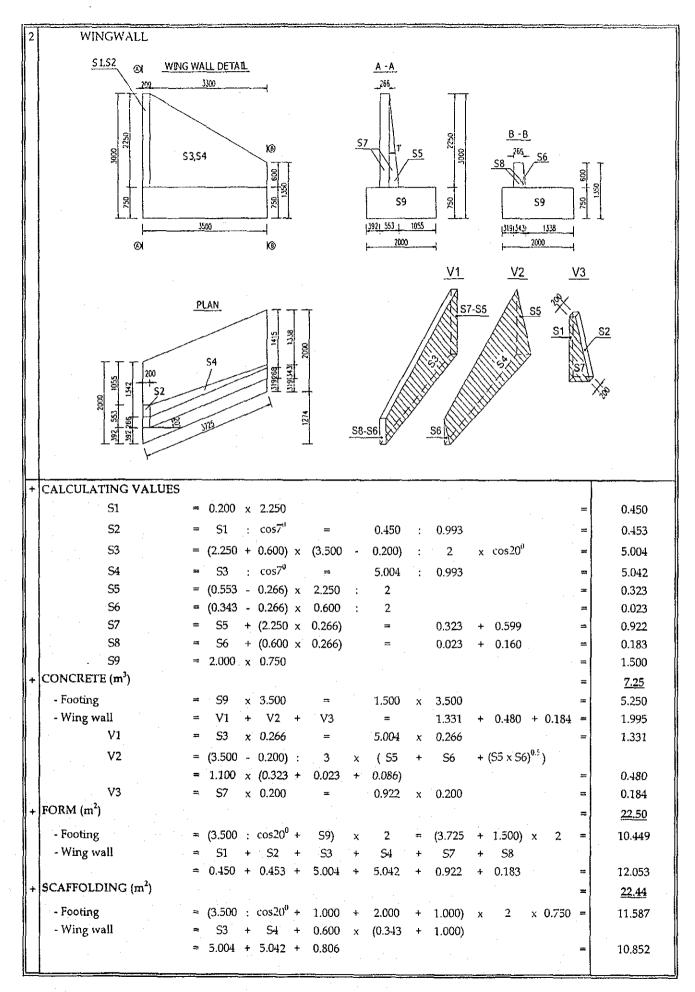
SEGMENT 2

SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER		TOTIC	
L 1			BRINELLI	NOWIDEK	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(ՠու)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	4160	125	14	254	1.208	1056.64	1276.86
2	2850	250	12	128	0.888	364.8	323.87
3	6270	250	14	128	1.208	802.56	969.82
4	1500	250	14	252	1.208	378	456.78
5	1550	125	18	254	1.998	393.7	786.45
6	1970	250	12	256	0.888	504.32	+17.74
7	2850	125	12	254	0.888	723.9	642.69
8	1049	250	12	256	0.888	268.544	238.42
9	1120	250	12	256	0.888	286.72	254.55
10	16455	250	12	52	0.888 -	855.66	759.67
11	16555	250	12	100	0.888	1655.5	1469.77
12	5780	250	12	• 2	0.888	11.56	10.26
13	1440	250	12	26	0.888	37.44	33,24
14	1180	250	12	382.8	0.888	451.704	401.03
15	1280	250	12	382.8	0.888	489.984	435.01
REINFORC	EMENT : I	D<=14		7719.7	TOTAL FOR SEC	<u>GMENT 2 :</u>	
REINFORC	EMENT : 16=	=D<≃25		786.4	REINFORCEME	NT (KG):	8506.2
REINFORC	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>);</td><td>81.46</td></d=32<>			CONCRETE (M ³);	81.46
			TOTAL	FOR SEC	GMENT 1 & 2		
		D<=14		18287.6	REINFORCEME	NT (KG)	20157.7
		=D<=25		1870.1			
REINFORC	EMENT: 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>193.06</td></d=32<>			CONCRETE (M ³):	193.06

2 - 4 - 2

BOX CULVERT

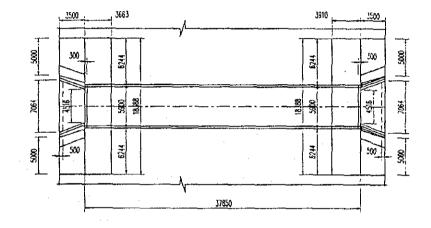
9+326

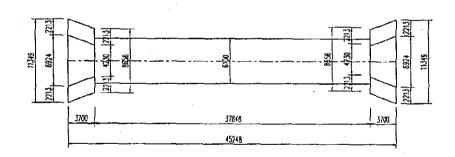


2 - 4 - 3

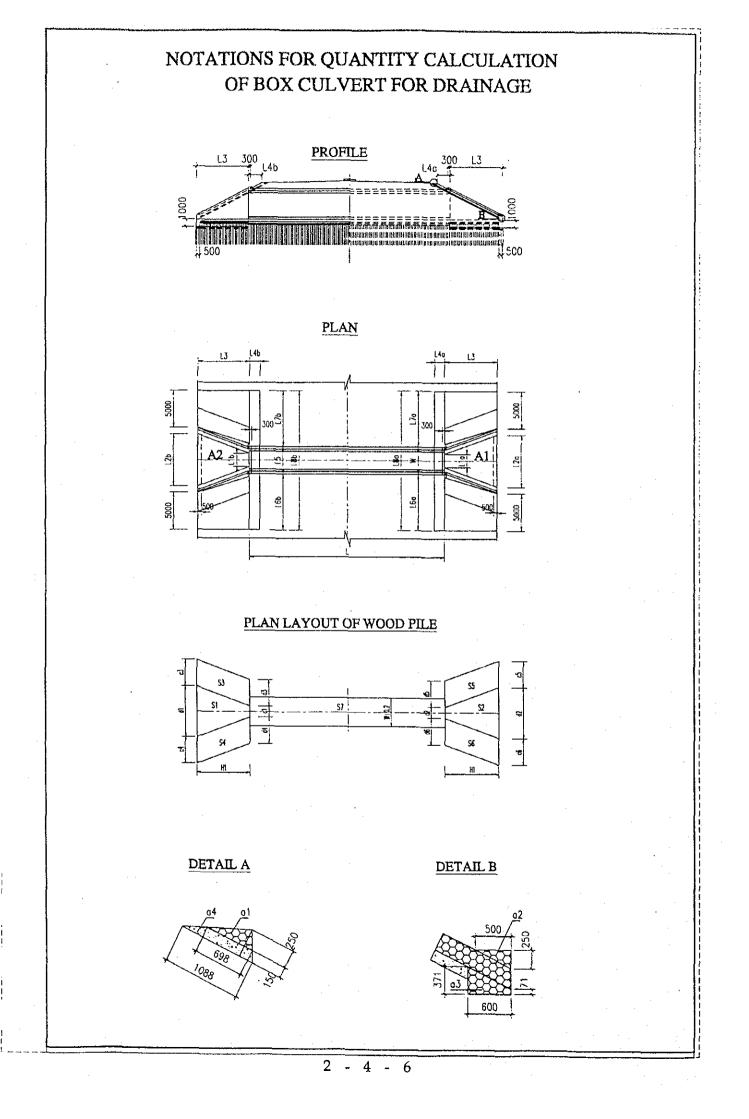
AUVINAN	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAIN MANA	(WW)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2258	12	20	0.888	45.2	40.1
1b	2310	14	20	1.208	46.2	55.8
2a	3723	12	6	0.888	22.3	19.8
2b	2100	12	16	0.888	33.6	29.8
2c	582	12	20	0.888	11.6	10.3
3	4254	12	2	0.888	8.5	7.6
4	4429	12	20	0.888	88.6	78.6
Sa	3043	12	15	0.888	45.6	40.5
Sb	2150	12	6	0.888	12.9	11.5
50	2467	20	15	2.466	37.0	91.3
Sd	1574	20	6	2.466	9.4	23.3
9	2444	14	16	1.208	39.1	47.3
7	2301	12	4	0.888	9.2	8.2
8	2301	12	4	0.888	9.2	8.2
6	3605	12	4	0.888	14.4	12.8
10	1304	14	8	1.208	10.4	12.6
11	744	12	11	0.888	8.2	7.3
12	2143	12	1	0.888	2.1	6 1
		REINFORCEMENT :		D<=14	392.2 KG	KG
		REINFORCEMENT:		14< D<=25	114.6 KG	KG
		TOTAL REINFORCEMENT:	CEMENT :		506.8 KG	KG

BOX CULVERT FOR DRAINAGE (STATION 9+326)





2 - 4 - 5



							5	ILVEI	RT KN	CULVERT KM9+326		
) = US	C1	+	lp		×	HI	••	2	И		
	u	4.230	. +	6.924		×	3.700	••	5	ų	20.635	(m2)
	S2= (62	+	d2		×	Η1	••	3	n	·	
		4.230	+	6.924		×	3.700	•••	7	Ņ	20.635	(m2)
	S3= (ß	+	Сþ		×	1H1	••	6	n		
) =	2.213	+	2.213	-	×	3.700	••	2	11	8.188	(m2)
	S4= (C4	+	d4		×	Η	••	2	N		
) 	2.213	.+	2.213	-	×	3.700		2	¥	8.188	(m2)
•	55= (ťC	+	d5		×	Η1		1	11		
) =	2.213	+	2.213		×	3.700	•,•	2	11	8.188	(m2)
	S6= (ę,	÷	d6		×	Η1		2	R		
)	2.213	÷	2.213	, c	×	3.700		2	ų	8.188	(m2)
	S7=	Ч	×	(W + 0.2)	ŧ							
	IJ	37.850	×	6.100	n		230.885	35	(m2)		·	
	÷.											
1. APRO	N CON	APRON CONCRETE:										·
	A1= (Lla	÷	L2a		×	EJ	.,	Ņ	ű		
) =	4.516	+	7.064		×	3.500		2	11	20.265	(m2)
	A2= (4L1	÷	L2b	~	×	ញ	••	2	a		
	<u></u> ۱۱	4.516	+	7.064		×	3.500	••	2	łł	20.265	(m2)
)	IA	+	A2	· ~	x 0.3		L 2	q	÷	L2b) × 0.45 × 0.5
) =	20.265	+	20.265		x 0.3	+	7.064	64	÷	7.064) × 0.45 × 0.5
2. CONC	RETE F	2. CONCRETE FOUNDATION OF CULVERT:	IO NC	CULVER	÷							

TABLE OF EXPLAINING QUANTITIES OF CULVERT

2 -4 _

7

2. LUINLAFTE FUUNIVITUIN OF CULVERLE

II 0.2 × 6.100 × **= 37.850** 0.2 x (W + 0.2) x Ц

46.18 (m3)

(En3)

15.34

	<u>7.40</u> (m3)	<u>329.55</u> (100m)		+ $(0.8 \times 4.5 \times 4)$ $) \times 0.15 =$ + $(0.8 \times 4.5 \times 4)$ $) \times 0.15 =$			(AD WALL)
	x 0.1 = x 0.1 = x	::100 = = (100m)		+ 230.885			(b1 IS AREA OF HEAD WALL)
	S6) 8.188)) × 25 × 5:100) × 25 × 5:100		56 + 8.188			(m2) (b1
	S5 + 8.188 +	+ S7 + 230.885 × 25 × 3 : 100 = × 25 × 3 : 100 =		S5 + 8.188 +		(m2) (m2) 0.133 (m2) 0.134 (m2)	1.770
	S4 + 8.188 +	S6 + 8.188 +) × 2?		+ +		0.087 0.063 #	5.900 =
	S3 + 8.188 +	55 + 8.188 + (0.8 × 4.5 × 4) 14.400	ц Ц	+ 54 3 + 8.188		0.5 = 0.5 = 0.5 × 0.6 0.5 × 0.15	×
	∔ +	+ + + +	000 PILE T	+ 53 ; + 8.188		× ×	= 0.300
	+ S2 + 20.6349	+ 54 + 8.188 + 52 + 20.6349	4 IS AREA W	+ 52 + 20.635	• •	x 0.25 x 0.25 + 0.371 + 1.088	× کا
JCRETE :	(S1 (20.635 <u>E:</u>	<u>M</u> (S3 (S1188 (S1188 (S1188 (S1188 (S1188) (S1188	NOTE: S=0.8 × 4.5 × 4 IS AREA WOOD PILE TO <u>D BEDDING:</u>	S1 20.635	SONRY	0.695 0.5 (0.071 (0.698	0.300
3. LEAN CONCRETE:	= (+ WOOD PILE:	$\frac{*L=5M}{W3=}$	NOTE: S=0.6 <u>5. SAND BEDDING:</u>) 1)	6. STONE MASONRY	a1≓ a2= a4≝	an Ld

<u>47.90</u> (m3)

2 -

4

h IJ . . 11 II \sim (I lj COS(26.56) 0.894 COS(26.56) 0.894 V3b 29.345 0.133 ÷ (m2) (m2) (m2) (m2) 71.897 (m2) 67.355 (m2) i. • • t 0.063 × 0.25 × 0.25 19.677 18.388 × 0.25 × 0.25 19.677 19.677 19.677 18.388 V3a 30.616 II (m2) 11 ų IÌ t 11 Ш n 5 × × ų 3.910 6.000 3.663 x 0.5 0.087 b3a 19.677 0.087 b3b 19.677 × 4 V2 3.902 L3 3.500 L3 3.500 L3 3.500 L3 3.500 × × Ņ Ņ N ŝ 18.388 18.388 b2a 19.677 b2b 19.677 V1b 1.597 x x × × хx × × 2 × H 11 + × 5.000 5.000 5.000 5.000 5.000 5.000 5.000 b1 1.770 V1a 1.597 L4a L4b b1 1.770 L8a L8b e3 ŋ × × × × × L6a 6.244 b4a 71.897 L6b 6.244 L7a 6.244 b4b 67.355 L.7b 6.244 L8b L8a 0.6 a2 al a1 TOTAL = b2a= { = (b3a= (= (V2= (b2b≕ (= ____ b3b= (= (b4b= V3a= = V3b= = b4a= Vla= V1b= b5≝

3.902 (m3)

IJ

x 5 x 4

(m3)

1.597

(m3)

1.597

(Em3)

30.616

(m3)

29.345

(m3)

67.058

2 - 4 -

				17.363 (m3)		16.601	(m3)			
			H	U	łł	ដ				
	(m3)	(m3)	COS(26.56)	0.894	COS(26.56)	0.894				
	2.463	2.463	0.15 :	0.15 :	0.15 :	0.15 :		(m3)		
	n	N	×	*	×	×		38.89		
			-	•	<u> </u>	~	1	=(
	18.388	18.388	b 5	6.000	b 5	6.000	V5b	16,601		
	×	×	1	•	1		+	+	(m2)	
	0.134	0.134	b3a	19.677	b 3b	19.677	V5a	17.363	21.192 (m ²)	
· .	H	u	+	+	÷	÷	+	+	11 11	
			b2a	19.677	b2b	19.677	V4b	2.463	N N	·
			+	+	+	+	, +	+	××	
	L8a	L8b	p1	1.770	Iq.	1.770	V4a	2.463	X 0.75 X 0.75	
	×	×	١	ı	,	•	$\overline{}$	_	\sim	
الانر	a4	a 4	b4a	71.897	b4b	67.355			L2b) 7.064	
7. BASE BEDDING:	V4a≂	V4b≈	V5a= (V5b= (TOTAL =		<u>8. FORM :</u> = (L2a + (7.064 +	9. SCAFFOLDING :

21.192 (m2) II 11 2 2 × × X 0.75 X 0.75 L2b) 7.064 (L2a + (7.064 + ű

2 4 -

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2.5. Box culvert at station 9+760

BOX CULVERT

9+760

1	CULVERT															-	
+	CONCRETE (M3)																
	S1=S2	=	2.950	x	2.050	-	2.500	x	1,500	+	2	х	0,100	x	0.100) =	2.318
	s	=	S1	+	S2											Ħ	4.635
	VOLUME	=	S	x	(14.154 -	+ 2	1.940)	+	5.900	x	0.200	x	0.300	x	2	11	168.00
	· · ·									4							
							DOU	BLE	BOX CL	JLV	<u>ERT</u>						
							 -		5900							:	
							2	950		2950							ĺ
					250	_	3002	2500	300	<u>2500</u>		Ş	2				
					*		\ [1	<u> </u>		=1/	/					
					2050 1500		100 5	3									
							IT										
					<u>%</u>		L	/	<u></u>		J					:	
							S	L									
	FORM (M2)																561.4
	INSIDE FORM (M2)																394.55
	BOX BULWARK		1.1						(1/SIN45 ⁰		1))	x	36.094	x	+	Ħ	228.52
	BOTTOM OF THE BOX	=	(2,500	-	0.100 2	X	2)	X	36.094	x	2					=	
*	OUTSIDE FORM (M2)		3.050		~ ·												166.85
	BOX BULWARK THE END OF CULVERT	=	2.050 S	x x			36.094			x		х	0.200			=	
	CENTER	=		X	2 -	t	5.900	x	0.200	x	4					н	
		[=	4.033
4	SCAFFOLDING (M2)	=	2.050	x	2.000	x 3	36.094	+	4.000	x	0.300	x	0.200			=	148.2
	SUPPORT																
	AREA (M2)	=	5.900	x	1.500	-	S									=	4.215
	VOLUME (M3)	=	AREA	x	L											=	<u>152.22</u>
	· · ·	ļ															
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	· · · ·															-	
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GT 9+760

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BOXCULVERT STATION 9+760 QUANTITIES TABLE OF REINFORCEMENT SEGMENT 1

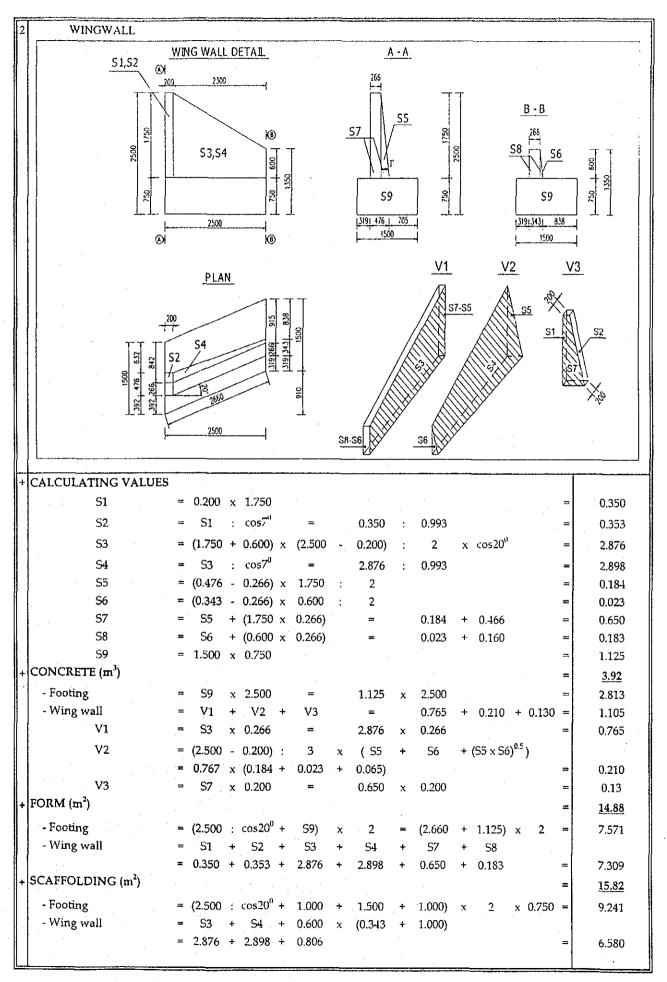
				JEGIVIE.	AT T		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	3660	125	14	226	1.208	827.2	999.ó
2	2350	250	12	114	0.888	267.9	237.8
3	6270	250	14	114	1.208	714.8	863.7
4	1500	250	14	224	1.208	336.0	406.0
5	1550	125	18	226	1.998	350.3	699.8
6	1970	250	12	228	0.888	449.2	398.8
7	2350	125	12	226	0.888	531.1	471.5
8	1049	250	12	228	0.888	239.2	212.3
9	1120	250	12	228	0.888	255.4	226.7
10	14659	250	12	52	0.888	762.3	676.8
11	14759	250	12	88	0.888	1298.8	1153.1
12	5780	250	12	2	0.888	11.6	10.3
13	1440	250	12	26	0.888	37.4	33.2
14	1180	250	12	339.6%	0.888	400.8	355.9
REINFORG	CEMENT : 1	D<≓14		6045.7	TOTAL FOR SEC	GMENT 1 :	· · · · · · · · · · · · · · · · · · ·
REINFORG	CEMENT : 16	=D<=25		699.8	REINFORCEME	NT (KG):	6745.5
REINFORG	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>·):</td><td>65.96</td></d=32<>			CONCRETE (M ³	·):	65.96

SEGMENT 2

	· · · · · · · · · · · · · · · · · · ·					
UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg) -
3660	125	14	350	1.208	1281.0	1548.0
2350	250	12	176	0.888	413.6	367.2
6270	250	14	176	1.208	1103.5	1333.5
1500	250	14	348	1.208	522.0	630.8
1550	125	18	350	1.998	542.5	1083.7
1970	250	12	352	0.888	693.4	615.6
2350	125	12	350	0.888	822.5	730.2
1049	250	12	352	0.888	369.2	327.8
1120	250	- 12	352	0.888	394.2	350.0
22445	250	12	52	0.888	1167.1	1036.2
22545	250	12	88	0.888	1984.0	1761.4
5780	250	12	2	0.888	11.6	10.3
1440	250	12	26	0.888	37.4	33.2
1180	250	12	526.56	0.888	621.3	551.6
CEMENT :	D<=14		9295.9	TOTAL FOR SEC	GMENT 2 :	
EMENT: 16	=D<=25		1083.7	REINFORCEME	10379.6	
CEMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>102.05</td></d=32<>			CONCRETE (M ³	102.05	
		TOTAL	FOR SEC	·····	••••••••••••••••••••••••••••••••••••••	
EMENT :	D<=14		15341.6	REINFORCEME	NT (KG) :	17125.1
EMENT: 16	=D<=25		1783.4			{
EMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>168.00</td></d=32<>			CONCRETE (M ³):	168.00
	3660 2350 6270 1500 1550 1970 2350 1049 1120 22445 22545 3780 1440 1180 EMENT : EMENT : EMENT : 2 EMENT : 2 E EMENT : 2 E EMENT : 2 E EMENT : 2 E E EMENT : 2 E EMENT : 2 E EMEM	(mm) (mm) 3660 125 2350 250 6270 250 1500 250 1550 125 1970 250 2350 125 1970 250 2350 125 1049 250 22445 250 22545 250 5780 250 1180 250 1180 250 EMENT : D<=14	(mm) (mm) (mm) 3660 125 14 2350 250 12 6270 250 14 1500 250 14 1500 250 14 1550 125 18 1970 250 12 2350 125 12 1049 250 12 22445 250 12 22545 250 12 250 12 12 1440 250 12 1180 250 12 1180 250 12 1180 250 12 250 12 1440 250 12 12 1180 250 12 250 12 12 250 12 12 250 12 1440 250 12 12 250 12 12 </td <td>(mm)(mm)(mm)OF BAR$3660$12514350$2350$25012176$6270$25014176$1500$25014348$1550$12518350$1970$25012352$2350$12512350$1049$25012352$22445$25012352$22445$25012352$22445$25012250$1120$25012252$22445$25012252$22545$2501226$1180$2501226$1180$25012526.56EMENT :$D <= 14$9295.9EMENT :$16 = D <= 25$1083.7TOTAL FOR SECEMENT :$D <= 14$15341.6EMENT :$D <= 14$15341.6EMENT :$16 = D <= 25$1783.4</td> <td>(mm)(mm)(mm)OF BAR(kg/m)$3660$125143501.208$2350$250121760.888$6270$250141761.208$1500$250143481.208$1500$250143481.208$1550$125183501.998$1970$250123520.888$2350$125123500.888$1049$250123520.888$1120$250123520.888$22445$250123520.888$22445$25012880.888$2545$2501220.888$1180$25012260.888$1180$25012260.888$1180$25012526.560.888$1180$25012526.560.888$1180$25012526.560.888$1180$25012526.560.888$2EMENT: D<=14$9295.9TOTAL FOR SEG<math>EMENT: 251083.7REINFORCEME$EMENT: 25<$</math></td> 1783.4REINFORCEME $EMENT: 16=D<=25$ 1783.41783.4	(mm)(mm)(mm)OF BAR 3660 12514350 2350 25012176 6270 25014176 1500 25014348 1550 12518350 1970 25012352 2350 12512350 1049 25012352 22445 25012352 22445 25012352 22445 25012250 1120 25012252 22445 25012252 22545 2501226 1180 2501226 1180 25012526.56EMENT : $D <= 14$ 9295.9EMENT : $16 = D <= 25$ 1083.7TOTAL FOR SECEMENT : $D <= 14$ 15341.6EMENT : $D <= 14$ 15341.6EMENT : $16 = D <= 25$ 1783.4	(mm)(mm)(mm)OF BAR(kg/m) 3660 125143501.208 2350 250121760.888 6270 250141761.208 1500 250143481.208 1500 250143481.208 1550 125183501.998 1970 250123520.888 2350 125123500.888 1049 250123520.888 1120 250123520.888 22445 250123520.888 22445 25012880.888 2545 2501220.888 1180 25012260.888 1180 25012260.888 1180 25012526.560.888 1180 25012526.560.888 1180 25012526.560.888 1180 25012526.560.888 $2EMENT: D<=14$ 9295.9TOTAL FOR SEG $EMENT: 251083.7REINFORCEMEEMENT: 25<$	(mm)(mm)OF BAR(kg/m)(m) 3660 125143501.2081281.0 2350 250121760.888413.6 6270 250141761.2081103.5 1500 250143481.208522.0 1550 125183501.996542.5 1970 250123520.888693.4 2350 125123500.888822.5 1970 250123520.888369.2 2350 125123520.888369.2 1120 250123520.888394.2 22445 250122520.8881167.1 22545 2501220.8881167.1 2545 25012260.88811.6 1440 25012260.888621.3EMENT : $D<=14$ 9295.9TOTAL FOR SEGMENT 2.:EMENT : $16=D<=25$ 1083.7REINFORCEMENT (KG):EMENT : $16=D<=25$ 1083.7REINFORCEMENT (KG) :TOTAL FOR SEGMENT 1 & 2EMENT : $D<=14$ TOTAL FOR SEGMENT 1 & 2EMENT : $16=D<=25$ TOTAL FOR SEGMENT 1 & 2EMENT : $16=D<=25$ TOTAL FOR SEGMENT 1 & 2EMENT : $16=D<=25$ TOTAL FOR SEGMENT 1 & 2

2 - 5 - 2

9+760



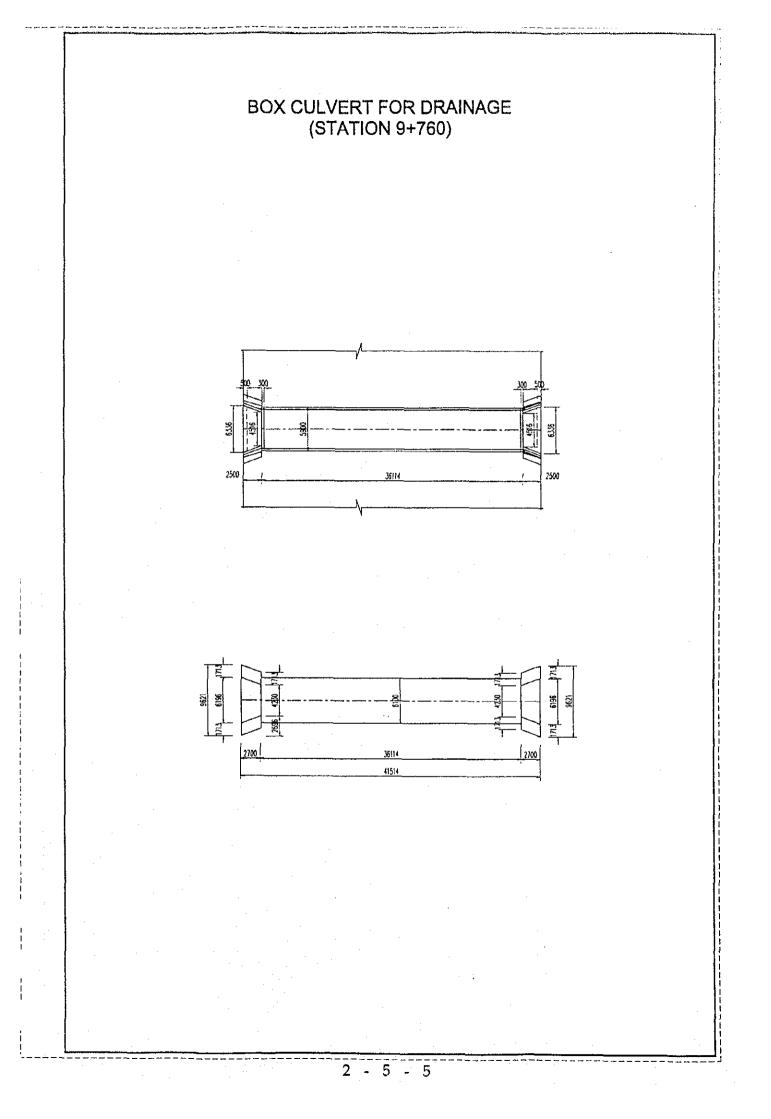
FION 9+760	WINGWAL
BOX CULVERT STATI	REINFORCEMENT OF

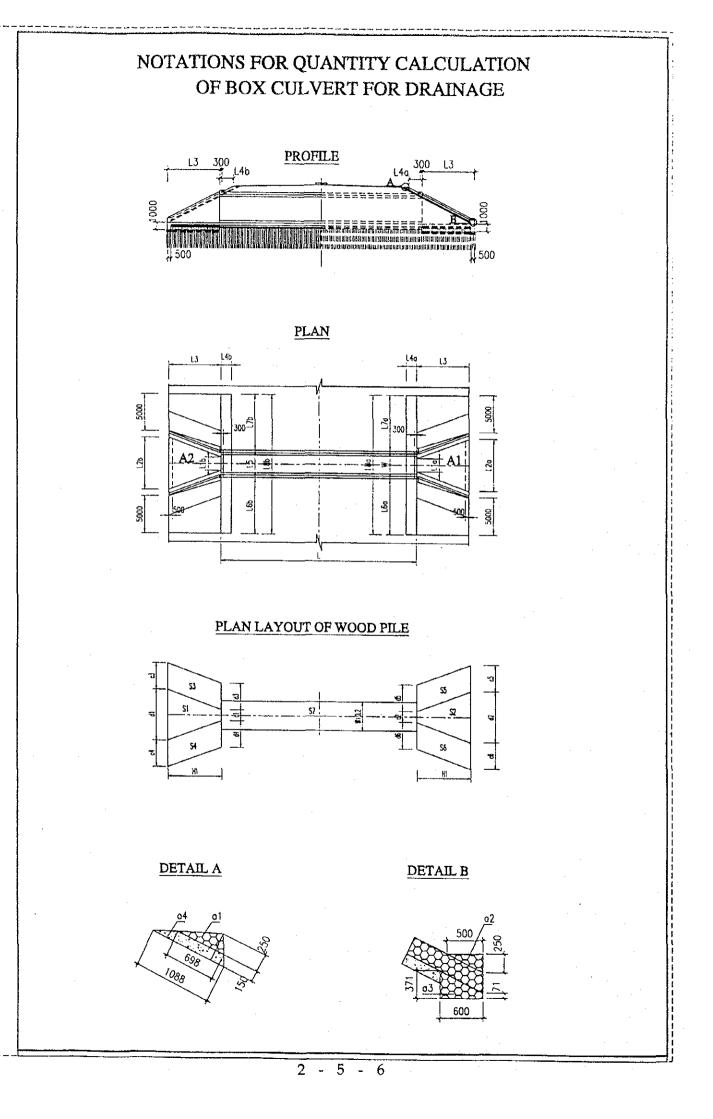
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Λάλλα άλ ξ	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAK WAKA	(WW)	(MM)	OF BAR	(KG/M)	(M)	(KG)
Ìa	2011	12	15	0.888	30.2	26.8
1b	2060	14	15	1.208	30.9	37.3
2a	2651	12	6	0.888	15.9	14.1
2b	1552	12	12	0.888	18.6	16.5
2c	582	12	15	0.888	8.7	7.8
3	3005	12	2	0.888	6.0	5.3
4	3378	12	16	0.888	54.0	48.0
5a	2574	12	11	0.888	28.3	25.1
5b	1868	12	4	0.888	7.5	9.9
5c	1998	20	11	2.466	22.0	54.2
5d	1292	20	4	2.466	5.2	12.7
6	2444	14	8	1.208	19.6	23.6
7	1814	12	4	0.888	7.3	6.4
8	1814	12	4	0.888	7.3	6.4
6	2554	12	4	0.888	10.2	9.1
10	1304	14	5	1.208	6.5	7.9
11	724	12	6	0.888	6.5	5.8
12	1791	12	-	0.888	1.8	1.6
	а Х	REINFORCEMENT:		D=<14	248.5 KG	KG
-	X	REINFORCEMENT:		14<1)<=25	66.9 KG	KG

2 - 5 -

5 - 4





) × 0.45 × 0.5) × 0.45 × 0.5 (m2) (m2) (m2) (m2) (m2) (m2) (m2) (m2) 14.075 14.075 4.625 13.565 13.565 4.625 4.625 L2b 6.336 4.625 CULVERT KM9+760 II (m2) L2a 6.336 220.295 H1 2.700 H1 2700 22700 H1 H1 L3 2.500 L3 2.500 x 0.3 x 0.3 6.196 d2 6.196 d3 1.713 d4 1.713 d5 d6 (W + 0.2) 6.100 A2 13.565 6.336 L2a · L2b 6.336 d1 A1 13.565 36.114 c6 1.713 L1a 4.516 c1 4.230 c2 4.230 c3 1.713 c4 1.713 1.713 L1b 4.516 ß 1 **1. APRON CONCRETE:** A1= (1 A2= S2= :=ß IJ 2; 1= 2; SS=

2. CONCRETE FOUNDATION OF CULVERT:

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44.06 (m3) 0.2 × 6.100 36.114 H 0.2 x (W + 0.2) x

(m3)

10.99

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5 2

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TABLE OF EXPLAINING QUANTITIES OF CULVERT

ONCRETE:
EANC
3.1

		10/0.41	14.0/3 7 14.0/31 -
\$ *	• •	+	• •
+ 4.625	+ 4.625 +	+ 4.625 +	+ 4.625 +
S S	0 + +	+ +	+ S2 + 0 + 14.0751 + 0.000

5. SAND BEDDING:

- 8

5

S7	220.295						
÷	÷						
8	4.625						
+	+						
S5	4.625				÷		
÷	+			(m2)			(m2)
S	4.625			19.008			19.008 (m2)
+	+		lt	IJ		11	IJ
S3	4.625		6	7		3	7
+	÷		×	×		×	×
	14.075			X 0.75		X 0.75	X 0.75
+	+				÷ .		
Si	14.075		L2b)	6.336		L2b)	6.336
) =		6.FORM	= (L2a +	(6.336 + 6.336	7 SCAFFOLDING	= (L2a + L2b)	(6.336 +

<u>40.04</u> (m3)

) × 0.15 =) × 0.15 =

2 -

2.6. Box culvert at station 10+310

BOX CULVERT

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10+310

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L	= 16.472 + 14.750 + 0.02 = 31.242	······
CONCRETE (M3)		
S1	$= 2.950 \times 2.550 - 2.500 \times 2.000 + 2 \times 0.100 \times 0.100 =$	2.543
S	= S1 + S2 =	5.085
VOLUME	$= S \times (16.472 + 14.750) + 5.900 \times 0.200 \times 0.300 \times 2 =$	159.47
	DOUBLE BOX CULVERT	
	5900	
	2950 2950 300 2500 300 2500 300 S2 300 2500 300 S2 300 2500 100 S2	
	S1	
FORM		<u>586.31</u>
INSIDE FORM (M2)		406.865
BOX BULWARK	= $(2.000 + 2 \times 0.100 \times (1:SIN45^{0} - 1)) \times 31.222 \times 4 =$	260.122
BOTTOM OF THE BOX	= (2.950 - 0.300 x 2) x 31.222 x 2 =	146.743
OUTSIDE FORM (M2)		179.447
BOX BULWARK	$= 2.550 \times 2 \times 31.222 + 4 \times 0.300 \times 0.200 =$	159.472
THE END OF CULVERT	= 5 x 2 + 3.900 x 0.200 x 4 =	14.890
CENTER	= S =	5.085
SCAFFOLDING (M2)	= 2.550 x 2.000 x 31.222 + 4.000 x 0.300 x 0.200 =	<u>159.47</u>
SUPPORT		
	= 5.900 x 2.000 - S =	6.715
VOLUME (M3)	= AREA x L =	<u>209.79</u>
1		
		· .
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GT 10+310

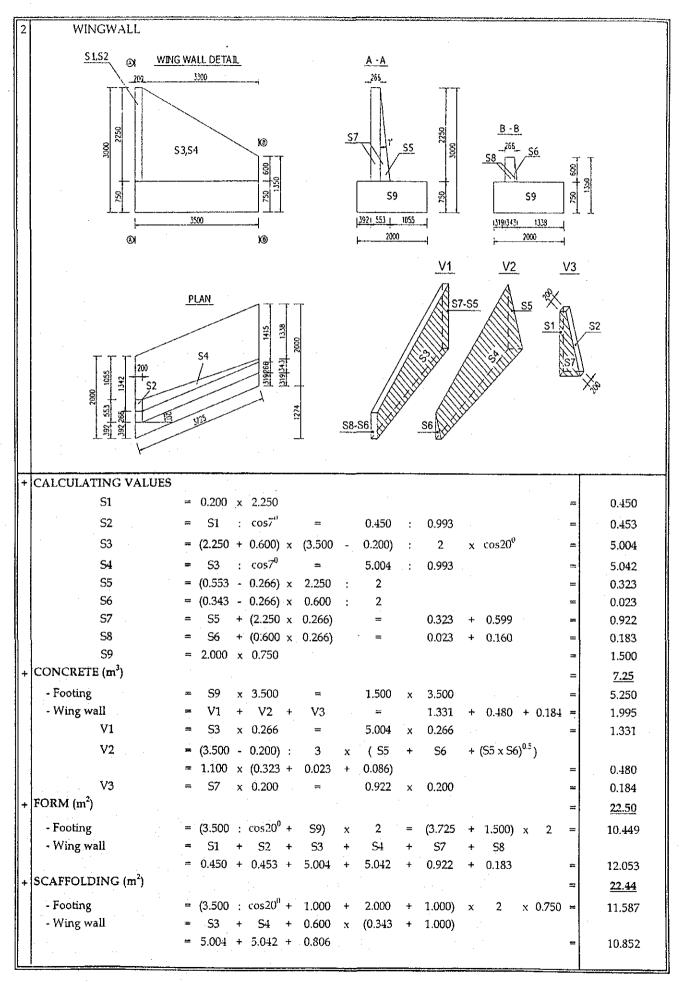
				SEGME	INI L		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(៣៣)	OF BAR	(kg/m)	(m)	(kg)
1	4160	125	14	262	1.208	1089.92	1317,073
2	2850	250	12	132	0.888	376.2	333.995
3	6270	250	14	132	1.208	827.64	1000.131
4	1500	250	14	260	1.208	390	471.281
5,	1550	125	18	262	1.998	406.1	811.217
6	1970	250	1,2	264	0.888	520.08	461.734
7	2850	125	12	262	0.888	746.7	662.930
8	1049	250	12	264	0.888	276.936	245.867
9	1120	250	12	264	0.888	295.68	262.509
10	16977	250	12	52	0.888	882.804	783.765
11	17077	250	12	100	0.888	1707.7	1516.119
12	5780	250	12 ·	2	0.888	11.56	10.263
13	1440	250	12	26	0.888	37.44	33.240
14	1180	250	12	395.328	0.888	466.48704	414.153
15	1280	250	· 12	395.328	0.888	506.01984	449.251
REINFORG	CEMENT : I	D<=14		7962.3	TOTAL FOR SEC	<u>GMENT 1 :</u>	
REINFORG	CEMENT : 16=	=D<=25		811.2	REINFORCEME	NT (KG):	8773.5
REINFORG	CEMENT : 25	5 <d=32< td=""><td></td><td>·</td><td>CONCRETE (M³</td><td>):</td><td>84.11</td></d=32<>		·	CONCRETE (M ³):	84.11

BOXCULVERT STATION 10+310 QUANTITIES TABLE OF REINFORCEMENT SEGMENT 1

SEGMENT 2

,							
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	4160	125	14	238	1.208	990.08	1196.43
2	2850	250	12	120	0.888	342	303.63
3	6270	250	14	120	1.208	752.4	909.21
4	1500	250	14	236	1.208	354	427.78
5	1550	125	18	238	1.998	368.9	736.91
6	1970	250	12	240	0.888	472.8	419.76
7	2850	125	12	238	0.888	, 678.3	602.20
8	1049	250	12	240	0.888	251.76	223.52
9	1120	250	12	240	0.888	268.8	238.64
10	15255	250	12	52	0.888	793.26	704.27
11	15355	250	12	100	0.888	1535.5	1363.24
12	5780	250	12	2	0.888	11.36	10.26
13	1440	250	12	26	0.888	37.44	33.24
14	1180	250	12	354	0.888	417.72	370.86
15	1280	250	12	354	0.838	453.12	402.29
REINFORG	CEMENT :	D<=14		7205.3	TOTAL FOR SEC	GMENT 2 :	· · · · · · · · · · · · · · · · · · ·
REINFORG	CEMENT: 16	=D<=25	· ·	736.9	REINFORCEME	NT (KG):	7942.2
REINFORG	CEMENT : 2	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>): •</td><td>75.36</td></d=32<>			CONCRETE (M ³): •	75.36
			TOTAL	FOR SEC	GMENT 1 & 2		
REINFORG	CEMENT :	D<=14		15167.6	REINFORCEME	NT (KG) :	16715.8
REINFORG	CEMENT : 16	5=D<=25		1548.1	· · ·	i	
REINFORG	CEMENT : 2	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>159.47</td></d=32<>			CONCRETE (M ³):	159.47

10+310

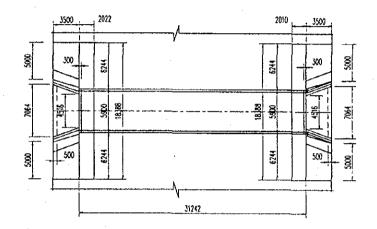


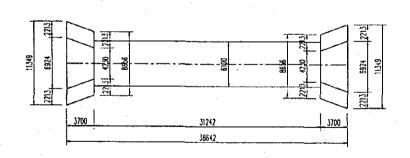
	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
ANE WARD	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2258	12	20	0.888	45.2	40.1
16	2310	14	20	1.208	46.2	55.8
- 2a	3723	12	6	0.888	22.3	19.8
2b	2100	12	16	0.888	33.6	29.8
2c	582	12	20	0.888	11.6	10.3
3	4254	12	2	0.888	8.5	7.6
4	4429	12	20	0.888	88.6	78.6
Sa	3043	12	15	0.888	45.6	40.5
5b	2150	12	9	0.888	12.9	11.5
5c	2467	20	15	2.466	37.0	91.3
5d	1574	20	6	2.466	9.4	23.3
9	2444	14	. 16	1.208	39.1	47.3
7	2301	12	4	0.888	9.2	8.2
8	2301	12	4	0.888	9.2	8.2
6	3605	12	4	0.888	14.4	12.8
10	1304	14	8	1.208	10.4	12.6
11	744	12	11	0.888	. 8.2	7.3
12	2143	12	1	0.888	2.1	1.9
		REINFORCEMENT:		D<=14	392.2 KG	KG
		REINFORCEMENT:		14< D<=25	114.6 KG	KG
-		TOTAL REINFORCEMENT	CEMENT :		506.8 KG	KG

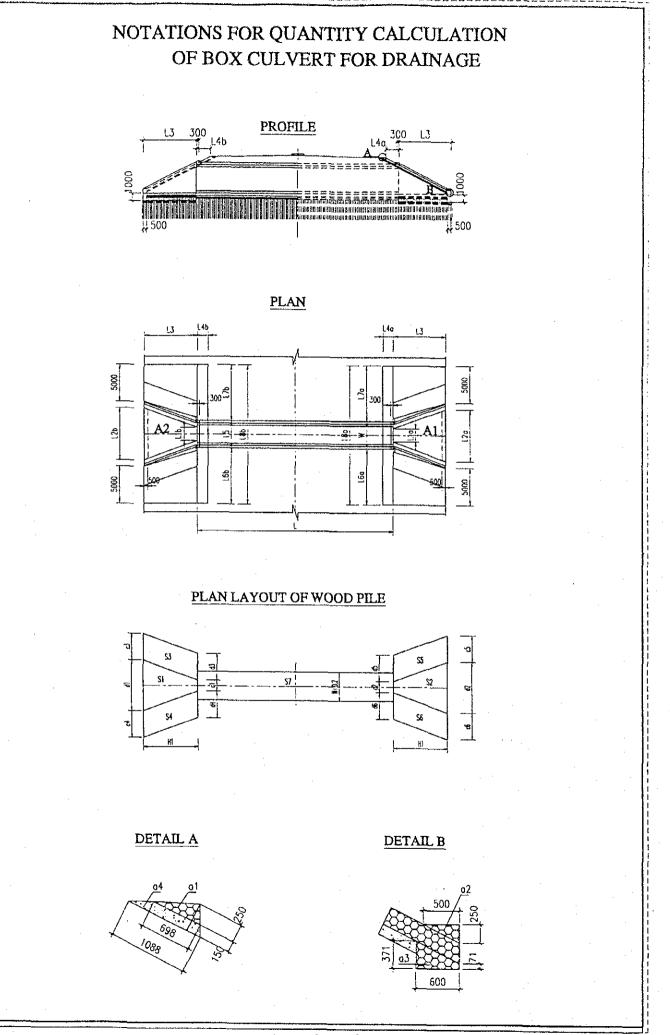
BOX CULVERT STATION 10+310 REINFORCEMENT OF WINGWALL

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BOX CULVERT FOR DRAINAGE (STATION 10+310)







$\begin{array}{cccccccccccccccccccccccccccccccccccc$	·	•		•			S	LVE)	CULVERT KM10+310	[10+31	Oi	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	SI= (C	+	d1		×	Η	••	7	. 11		
c_2 + d_2 × $H1$: 2 = 20635 d_3 + d_3 × 3700 : 2 = 20635 c_3 + d_3 × 3700 : 2 = 20635 c_4 + d_4 × 3700 : 2 = 8.188 c_4 + d_4 × 3700 : 2 = 8.188 c_5 + d_5 × 111 : 2 = 8.188 2213 + 2213 × 3.700 : 2 = 8.188 c_6 + d_6 × 111 : 2 8.188 1 × 111 : 2213 : 3.700 : 2 8.188 1 . 111 : 2213 : 3.3700 : 2 8.188 1 . 111 : 22133 </td <td></td> <td>4.230</td> <td>+</td> <td>6.924</td> <td></td> <td>×</td> <td>3.700</td> <td>••</td> <td>ы</td> <td>ß</td> <td>20.635</td> <td>(m2)</td>		4.230	+	6.924		×	3.700	••	ы	ß	20.635	(m2)
4.230 $+$ 6.924) \times $H1$: 2 20.635 $c3$ $+$ $d3$) \times $H1$: 2 = 2.0635 $c4$ $+$ $d4$) \times $H1$: 2 = 8.188 $c4$ $+$ $d4$) \times 3.700 : 2 = 8.188 $c5$ $+$ $d5$) \times 111 : 2 = 8.188 0 $c5$ $+$ $d6$) \times $H1$: 2 = 8.188 0 $c5$ $+$ $d6$) \times $H1$: 2 = 8.188 0 $c6$ $+$ $d6$) \times $H1$: 2 8.188 0 1 1 2.213) \times 3.700 : 2 8.188 0 1 1 \times 2.213)	S2= (5	+	d2		×	Ш	••	7	II		
c_3 + d_3) × H1 : 2 = 8.188 c_4 + d_4) × H1 : 2 = 8.188 c_4 + d_4) × 3.700 : 2 = 8.188 c_5 + d_5) × 111 : 2 = 8.188 c_5 + d_5) × 111 : 2 = 8.188 c_6 + d_6) × H1 : 2 = 8.188 c_5 + d_6 × H1 : 2 = 8.188 c_6 + d_6 × H1 : 2 = 8.188 L × $(W+0.2)$ = 190.576 $(m2)$ = 8.188 L × $(W+0.2)$ = 190.576 $(m2)$ = 2.0265 (L + L_2a) 	4.230	+	6.924		×	3.700	••	2	11 .	20.635	(m2)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	S3= (ß	ŧ	d3		×	ΗI		2			
c_4 + d_4) × H1 : 2 = 8.188 c_5 + d_5) × 3.700 : 2 = 8.188 c_5 + d_5) × 111 : 2 = 8.188 c_6 + d_6) × H1 : 2 = 8.188 c_6 + d_6 × H1 : 2 = 8.188 c_5 + d_6 × 11 : 2 = 8.188 1 × (W+0.2) = 190.576 (m2) = 8.188 1 × (W+0.2) = 190.576 (m2) = 20.265 (31.242 × 6.100 = $1.30.576$ (m2) = 20.265 ($1.1a$ + $1.2a$) × $1.30.576$ (m2) = 20.265 (4.516 + 7.0) 	2.213	+	2.213		×	3.700		ы	11	8.188	(m2)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	S4= (C4	+	d4	·	×	Ш	••	5	n		
c5 + $d5$) × 111 : 2 = 8.188 (6) × 111 : 2 = 8.188 (6) × 111 : 2 = 8.188 (7) (7) : 2 = 8.188 (7) (7) : 2 = 8.138 (7) (7) : 2 = 8.138 (7) (7) : 2 = 8.138 (7) (7) : 2 : 8.138 (7) (7) : 2 : 8.138 (7) : : 19.576 (m2) : 2 : 8.138 : <td< td=""><td>u</td><td>2.213</td><td>+</td><td>2.213</td><td></td><td>×</td><td>3.700</td><td>••</td><td>5</td><td>11</td><td>8.188</td><td>(m2)</td></td<>	u	2.213	+	2.213		×	3.700	••	5	11	8.188	(m2)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	S5= (£	+	đ5		×	Π	••	2	II		
c6 + $d6$) × $H1$: 2 = 8188 1 L × $(W+0.2)$ = 3700 : 2 = 8188 1 L × $(W+0.2)$ = 190.576 $(m2)$ = 8188 1 31.242 × (6.100) = 190.576 $(m2)$ = 8.188 1 31.242 × (6.100) = 190.576 $(m2)$ = 8.188 1 31.242 × (6.100) = 190.576 $(m2)$ = 20.265 1 $21.1b$ + $L2a$) × $L3$: 2 = 20.265 1 4.516 + 7.064) × 3.500 : 2 = 20.265 1 $A1$ + $A2$) × 3.500 : 2 = 20.265 1 $A1$ + $A2$) × 0.3)	2.213	÷	2.213		×	3.700	••	2	ß	8.188	(m2)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	S6= (cę	+	d6		×	ΗI	••	7	II		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$) .	2.213	ł	2.213		×	3.700	•,	2	11	8.188	(m2)
31.242 x 6.100 = 190.576 (m2) $CRETE$:	S7=	<u>-</u>	×	(W + 0.2)	. 11	-						
CRETE: $11a + 12a + 12a + 7.064 $) x $1350 + 7.064 $) x $3500 + 22 = 20.265 $ $4.516 + 7.064 $) x $3.500 + 22 = 20.265 $ = 20.265 $11b + 12b + 7.064 $) x $1.3 + 22 = 2 = 20.265 $ $4.516 + 7.064 $) x $3.500 + 2 = 20.265 $ $A1 + A2 + 7.064 $) x $3.500 + 2 = 20.265 $ $A1 + A2 + 7.064 $) x $3.03 + (-12a + 12b + 7.064)$ $A1 + 22 + 20.265 $) x 0.3 + (-7.064) + 7.064) $20.265 + 20.265 $) x 0.3 + (-7.064) + 7.064) $20.000 \times 0.2 = 31.242 \times 6100 \times 0.2 = 31.242 $ $0.2 = 31.242 \times 6100 $	II	31.242	×	6.100	II	·	190.5	26	(m2)			
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$												
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ALKUN CUNC											
4.516 + 7.064) × 3.500 : 2 = 20.265 ($1.1b$ + $1.2b$) × 1.3 : 2 = 20.265 (4.516 + 7.064) × 3.500 : 2 = 20.265 ($A1$ + $A2$) × 0.3 + ($1.2b$ + 7.064 + 7.064 $A1$ + $A2$) × 0.3 + (7.064 + 7.064 20.265 + 20.265) × 0.3 + (7.064 + 7.064 $20.VNDATION OF CULLVENT: (W + 0.2) × 0.2 = 31.242 × 6.100 × 0.2 = 31.242 × 0.2 = 31.242 4.100 x 0.2 = 31.242 x 6.100 x 0.2 = 31.242 5.100 x 0.2$	A1= (L1a	+	L2a		×	13		5	11		
I.1b + $I.2b$) × $I.3$: 2 = 20.265 ($A.1$ + 7.064) × 3.500 : 2 = 20.265 ((12a + $I.2b$ ((12a + $I.2b$ ((12a + $I.2b$ (((((12a + $I.2b$ ((((12a + $I.2b$ (((12a + $I.2b$ (((12a + $I.2b$ (((10a ((10a 10a 10a 10a 10a 10a 10) =	4.516	+	7.064		×	3.500		7	11	20.265	(m2)
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	A2= (L1b	+	L2b		×	13	••	2	11		
A1 + A2) × 0.3 + (L2a + L2b 20.265 + 20.265) × 0.3 + (7.064 + 7.064 DUNDATION OF CULVERT: (W + 0.2) × 0.2 = 31.242 × 6.100 × 0.2 =) =	4.516	+	7.064		×	3.500		2	II	20.265	(m2)
20.265 + 20.265) × 0.3 + (7.064 + 7.064 DUNDATION OF CULVERT: (W + 0.2) × 0.2 = 31.242 × 6.100 × 0.2 =		A1	+	A2		x 0.3) +	ت	2a	+	L2b) × 0.45 × 0.5
$\frac{DUNDATION OF CULVERT}{(W + 0.2) \times 0.2} = 31.242 \times 6.100 \times 0.2 = 31.242$	=	20.265	+	20.265		x 0.3	, +	7.() 64	÷	7.064) × 0.45 × 0.5
$(W + 0.2) \times 0.2 = 31.242 \times 6.100 \times 0.2 =$	CONCRETE FC	OINDATIO	NOF	CULVER	Ë							
	L ×	(W + 0.2)	×	0.2	Ш	31.242		100	, ×	0.2	11	<u>38.12</u> (m3)

(m3)

15.34

II (f

TABLE OF EXPLAINING QUANTITIES OF CULVERT

	$0.1 = 0.1 = \frac{7.40}{2.40}$ (m3)) = <u>279.16</u> (100m)	(100m)			S7 + $(0.8 \times 4.5 \times 4) \times 0.15 =$ 190.576 + $(0.8 \times 4.5 \times 4) \times 0.15 =$					(b1 IS AREA OF HEAD WALL)		
	S6) × 8.188) ×		x 25 x 5 :100 x 25 x 5 :100	41.75			56 + 8.188 +							
	+ +		S7) 190.576)		·		×+ +	·		(Cm)	(m2)	1.770 (m2)	(m2)	
	+ 55 + 8.188		+ S7 + 190.5	x 25 x 3 : 100 x 25 x 3 : 100			55 8.188			(m2) 0.133	0.134	" 1.7	19.677	
	54 8.188		56 8.188	<u> </u>			+ +	·	0.087	0.063		5.900	Ω ∦ ∦	
	+ +		+ +	(0.8 × 4.5 × 4) 14.400	OF SLOPE		+ 54 + 8.188		0.5 =	0.5 = 0.5 × 0.6	- ×	×	L3 × 0.5 3.500 × 0.5	
	S3 8.188		S5 8.188	(0.8	FILE TOE		53 8.188			>	< ×	0.300	× ×	
	S2 + 20.6349 +		S4 + 8.188 +	S2 + 20.6349 +	sea wood		S2 + 20.635 +	·	0.25 ×	0.25 ×	1.088)	- F - F - F - F - F - F - F - F - F - F	5.000)	
	+ +		+ +	+ +	4 IS AI		+ +		×	× +	· +	×	+ +	
RETE:	(S1 (20.635		f (S3 (8.188	S1 20.635	NOTE: S=0.8 x 4.5 x 4 IS AREA WOOD PILE TOE OF SLOPE	<u>ING</u>	51 20.635	<u>NRY</u>	0.695	0.5	0.698	0.300	L6a 6.244	
3. LEAN CONCRETE:	" "	4. WOOD PILE:	* L=3M = 3 * L=3M	W3= (NOTE	5. SAND BEDDING		6. STONE MASONRY	a]=	a2= 		ابا	h2a≈ (= (

<u>41.85</u> (m3)

2

						(m3)	(m3)	Ħ	(m3)	(Em3)	<u>48.850</u>
						1.597	1.597	х5х4	20.846	20.907	34
				÷					11 11	11 11	
						H	N	+ 0.133	CO5(26.56) 0.894	COS(26.56) 0.894	V3b 20.907
(m2)	(m2)	(m2)	(m2)	(m2)				Ē	·• ··		+ +
19.677	19.677	19.677	= 36.960 (m2)	= 37.181 (m2)	(m2)	18.388	18.388	(0.063	× 0.25 × 0.25	x 0.25 x 0.25	V3a 20.846
14 N	II 18	N H	0	52	0	×	×	11	\sim	\sim	4 +
x 0.5 x 0.5	x 0.5 x 0.5	x 0.5 x 0.5	2.010	2.022	6,000	0.087	0.087	4	b3a 19.677	b3b 19.677	V2 3.902
L3 3.500	L3 3.500	1L3 3.500	×	×	IL	ч	"	5 ×	+ +	+ +	+ +
× ×	× ×	××	18.388	18.388	7			×	b2a 19.677	b2b 19.677	V1b 1.597
\sim	\sim	\sim	H	Ш	×				+ +	+ +	+ +
5.000	5.000	5.000	L4a	L4b	ц	L8a	L8b	a3	b1 1.770	b1 1.770	V1a 1.597
+ +	+ +	+ +	• ×	×	×	×	×	÷	a 3	i i .	~ ~
L6b 6.244	L7a 6.244	L7b 6.244	L8a	L8b	0.6	al	La I	a2	b4a 36.960	b4b 37.181	
ly2b= (= (b3a= (h∂b= (= (lı∔a=	b4b=	b5=	V1a=	V1b=	V2= (V3a= (= {	V3b= (= (TOTAL =

3.902 (m3)

(Em3)

2 6 -

- 9

				11.501	(m3)	11.538	(Em3)								
			ļI	II	Ħ	11									
	(m3)	(m3)	COS(26.56)	0.894	COS(26.56)	0.894									
	2.463	2.463	0.15 :	0.15 :	0.15 :	0.15 :			(m3)						
	II		×	×	×	×			<u>27.96</u>						•
			(<u> </u>		-	Ļ	=	<u>"</u>						
	18.388	18.388	b5	6.000	þ5	6.000		V5b	11.538	·					
	×	×	ı	1		ł		ŧ	+			(m2)			(m2) ⁻
	0.134	0.134	b3a	19.677	b3b	19.677	1	V5a	11.501			21.192 (m2)			21.192 (m2)
	II	. 11	+	+	+	+		ŧ	+		11	11		Ħ	38
	,		b2a	19.677	b2b	19.677		V4b	2.463		2	5		7	7
			+	+	+	+		t	+		×	×		×	×
	L8a	L8b	19	1.770	19	1.770		V4a	2.463		X 0.75	X 0.75		X 0.75	X 0.75
	×	×	ľ	ı	ŀ	ı		-	<u> </u>						
e'si	a4	a4	b4a	36.960	b4b	37.181					L2b)				7.064
Z. BASE BEDDING	V4a=	V4b=	V5a= () =	V5b= (ji i		TOTAL =		8. FORM :	= (L2a +	(7.064 +	9. SCAFFOLDING :	= (1.2a +	(7.064 +

2.7. Box culvert at station 10+690

BOX CULVERT

10+690

	BOX CULVERT STAT				10+690		4										QUANTITI
4	L	<u></u> =	13,860	+	17.650 -	+ ()	.02	=	31.530	. <u>-</u>					<u> </u>		
	CULVERT																
	CONCRETE (M3) 51=S2		3 050		2.054	•	500		1 744		~				A		
1	S1=52 S	1			2,050 - S2		200	X	1.500	+		х	0.100	х	0,100	=	
	VOLUME	=			3∠ +13.860 -	. 177	650.		5.000		0.200		0.200		2	=	4.635
	VOLOME.	-	5	^	(13.009 7	г I <i>т</i> .	0501	Ŧ	3.900	X	000	X	0.500	х	-	=	<u>146.76</u>
						_	DOUB	LΕ	BOX CL	JLV	ERT						
ĺ									5900								
						ľ	295			2950							
						[]0	2 25	00	300	2500	300	Sž	2				
l					1 1 ²⁵⁰							/	-				
											$\neg V$						
					2050	-	<u>11</u> 00 -				1						
					L ar		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	/									
	· .						SÍ										
	FORM (M2)																<u>492.50</u>
	INSIDE FORM (M2)																344.447
I	BOX BULWARK	=	(1.500	+	2 2	ς Ο.	100	х (I/SIN45 ⁰	-	1))	x	31.510	x	4	I	199.501
1	BOTTOM OF THE BOX				0.100						2					=	144.946
	OUTSIDE FORM (M2)									•							148.056
1	BOX BULWARK		2.050						4	1	0.300	x	0.200			Ħ	129.431
	THE END OF CULVERT		S	x	2 +	F 5.	900	х	0.200	X	4					=	13.990
ľ	CENTER	=	S													=	4.635
	SCAFFOLDING (M2)		2 050	~	2 000 -	, 21	510	÷	1000		0.300		0.200			_	140.44
	SUPPORT		2.000	^	2.000 2	× 51	.JIU .	r.	4.000	X	0.000	х	0.2.00			N	<u>129.43</u>
		. =	5.900	x	1.500	_	s									-	4.215
	VOLUME (M3)		AREA				-									I	132.90
	· .																
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GT 10+690

				SEGME	NT 1		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	3660	125	14	222	1.208	812.5	981.9
2	2350	250	12	112	0.888	263.2	233.7
3	6270	250	14	112	1.208	702.2	848.6
4	1500	250	14	220	1.208	330.0	398.8
5	1550	125	18	222	1.998	344.1	687.4
6	1970	250	12	224	0.888	441.3	391.8
7	2350	125	12	222	0.888	521.7	463.2
8	1049	250	12	224	0.888	235.0	208.6
9	1120	250	12	224	0.888	250.9	222.7
10	14365	250	12	52	0.888	747.0	663.2
11	14465	250	12	88	0.888	1272.9	1130.1
12	5780	250	12	2	0.888	11.6	10.3
13	1440	250	12	26	0.888	37.4	33.2
14	1180	250	12	332.64	0.888	392.5	348.5
REINFORG	CEMENT : I)<≂14		5934.5	TOTAL FOR SEC	<u>GMENT 1 :</u>	
REINFOR	EMENT : 16=	=D<=25		687.4	REINFORCEME	NT (KG):	6621.8
REINFORG	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>64.60</td></d=32<>			CONCRETE (M ³):	64.60

BOXCULVERT STATION 10+690 QUANTITIES TABLE OF REINFORCEMENT

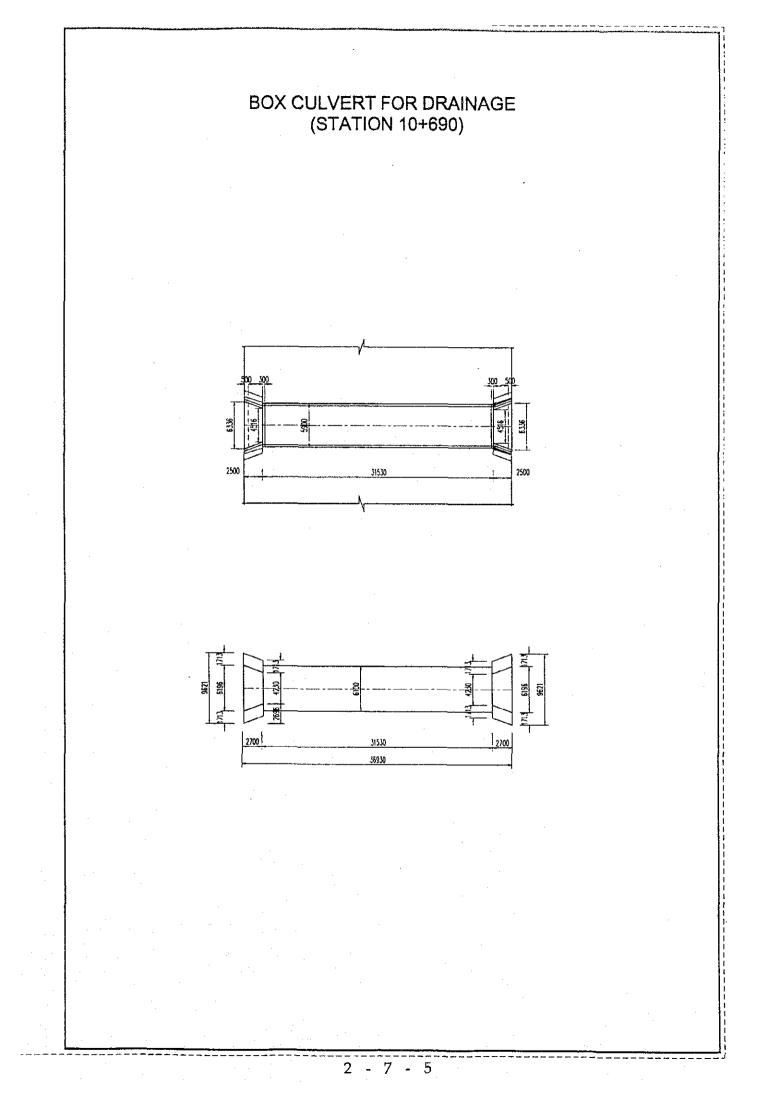
SEGMENT 2

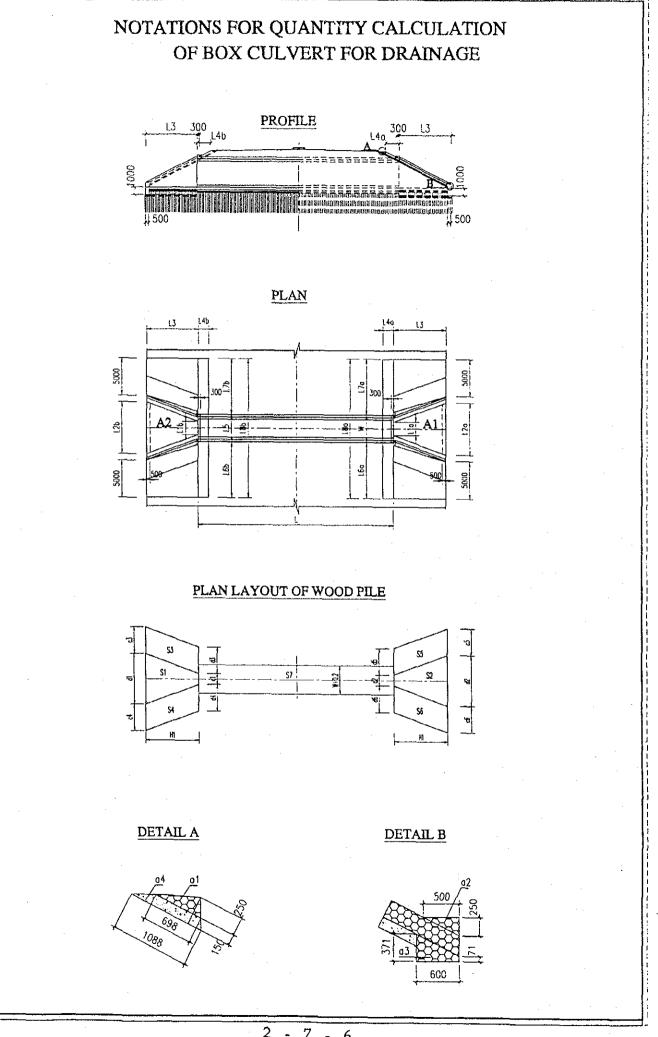
r			· · · · · · · · · · · · · · · · · · ·	·····			· · · · · ·
SYMBOL	UNIT LENGTH	I SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	3660	125	14	282	1.208	1032.1	1247.2
2	2350	250	12	142	0.888	333.7	296.3
3	6270	250	14	142	1.208	890.3	1075.9
4	1500	250	14	280	1.208	420.0	507.5
5	1550	125	18	282	1.998	437.1	873.1
6	1970	250	12	284	0.888	559.5	496.7
7	2350	125	12	282	0.888	662.7	588.4
8	1049	250	12	284	0.888	297.9	264.5
9	1120	250	12	284	0.888	318.1	282.4
10	18155	250	12	52	0.888	944.1	838.1
11	18255	250	12	88	0.888	1606.4	1426,2
12	5780	250	12	2	0.888	11.6	10.3
13	1440	250	12	26	0.888	37.4	33.2
14	1180	250	12	423.6	0.838	499.8	443.8
REINFORG	CEMENT :	D<=14	_	7510.5	TOTAL FOR SEC	GMENT 2 :	
REINFOR	CEMENT : 1	6=D<=25		873.1	REINFORCEME	NT (KG):	8383.7
REINFORG	CEMENT :	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>^b):</td><td>82.16</td></d=32<>			CONCRETE (M ³	^b):	82.16
			TOTAL	FOR SEG	MENT 1 & 2	<u> </u>	
REINFOR	CEMENT :	D<=14		13445.0	REINFORCEME	NT (KG) :	15005.5
REINFOR	CEMENT : 1	6=D<=25		1560.5			
REINFOR	CEMENT :	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M²</td><td>·):</td><td>146.76</td></d=32<>			CONCRETE (M ²	·):	146.76

	WINGWALL		
		NG WALL DETAL	<u>A-A</u>
	<u>31,52</u> Ø	2300	ίδ.
i		······································	
			S5 <u>B-B</u>
	05/1	KG <u>57</u>	
	2500	\$3,\$4	
	┃		
	220	13	S9 원 S9 원
	· · · ·		176 705 131917431 333 1 1500 1500
	K0	K®	<u>1500</u>
			<u>V1</u> <u>V2</u> <u>V3</u>
ĺ		PLAN	<u>V1</u> <u>V2</u> <u>V3</u>
			A A
	101	819	57-55 S5 X
	,200	818 1200 1200	S1 S1 S2
		S4 @ 2 ²	
	종 _ଛ 52	S4 Salar	
		10.100	
		2500	
	· · · ⊨	sn-sel	S6 S6
	L		
+	CALCULATING VALUES		
	S1	= 0.200 x 1.750	= 0.350
		.1	
	S2	· · · · · · · · · · · · · · · · · · ·	350 : 0.993 = 0.353
	53	= (1.750 + 0.600) x (2.500 - 0.1)	$200)$: 2 x $\cos 20^{6}$ = 2.876
		(E00) . E X 000,E0 2.070
	S4	٥	
		= S3 : cos7 ⁰ = 2.	876 : 0.993 = 2.898
•	S5	$= S3 : cos7^0 = 2.$ = (0.476 - 0.266) x 1.750 :	876 0.993 = 2.898 2 = 0.184
	S5 S6	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 :	$\begin{array}{rcrcrcrcrcrc} 876 & : & 0.993 & = & 2.898 \\ 2 & & = & 0.184 \\ 2 & & = & 0.023 \end{array}$
	55 56 57	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266)	$\begin{array}{rcrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
	55 56 57 58	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266) = S6 + (0.600 x 0.266)	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
	55 56 57 58 59	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266)	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	55 56 57 58 59 CONCRETE (m ³)	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266) = S6 + (0.600 x 0.266) = 1.500 x 0.750	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcrcrcrcrcrcrcrc$
+	55 56 57 58 59	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266) = S6 + (0.600 x 0.266) = 1.500 x 0.750	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	55 56 57 58 59 CONCRETE (m ³)	$= S3 : \cos^{70} = 2.$ = (0.476 - 0.266) x 1.750 : = (0.343 - 0.266) x 0.600 : = S5 + (1.750 x 0.266) = S6 + (0.600 x 0.266) = 1.500 x 0.750 = S9 x 2.500 = 1.	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 \\ 2 & = & 0.023 \\ = & 0.184 + & 0.466 & = & 0.650 \\ = & 0.023 + & 0.160 & = & 0.183 \\ & & & & & & \\ & & & & & & \\ & & & & $
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall	$= S3 : cos7^{0} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.50)$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 & = & 0.023 \\ = & 0.184 & + & 0.466 & = & 0.650 \\ = & 0.023 & + & 0.160 & = & 0.183 \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & & & \\ & & & & & \\ & & &$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V1 V2	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500 + 0.500)$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 \\ 2 & = & 0.023 \\ = & 0.184 + & 0.466 & = & 0.650 \\ = & 0.023 + & 0.160 & = & 0.183 \\ & = & 1.125$
	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V2 V3	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500 + 0.500)$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & & 0.184 \\ 2 & = & & & 0.023 \\ = & & 0.184 & + & 0.466 & = & 0.650 \\ = & & 0.023 & + & 0.160 & = & 0.183 \\ & & & & & & 1.125 \\ & & & & & & & 1.125 \\ & & & & & & & & & \\ & & & & & & & & $
	55 56 57 58 59 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²)	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500 + 0.500)$ $= S7 \times 0.200 = 0.500$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 \\ 2 & = & 0.023 \\ = & 0.184 + & 0.466 & = & 0.650 \\ = & 0.023 + & 0.160 & = & 0.183 \\ & = & 1.125$
	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V2 V3	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500 + 0.500)$ $= S7 \times 0.200 = 0.500$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 \\ 2 & = & 0.023 \\ = & 0.184 + & 0.466 \\ = & 0.023 + & 0.160 \\ = & 0.23 + & 0.160 \\ = & 1.125 \\ = & 1.125 \\ = & 3.92 \\ 125 & x & 2.500 \\ = & 0.765 + & 0.210 + & 0.130 \\ = & 1.105 \\ 876 & x & 0.266 \\ = & 0.765 \\ 855 & + & 56 & + & (55 \times 56)^{0.5} \\ 0.650 & x & 0.200 \\ = & 0.13 \\ = & 14.88 \end{array}$
	55 56 57 58 59 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²)	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (0.200) $	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & 0.184 \\ 2 & = & 0.023 \\ = & 0.184 + & 0.466 \\ = & 0.023 + & 0.160 \\ = & 0.23 + & 0.160 \\ = & 1.125 \\ & = & 1.125 \\ & = & 3.92 \\ 125 & x & 2.500 \\ = & 0.765 + & 0.210 + & 0.130 \\ = & 0.765 \\ = & 0.765 \\ 876 & x & 0.266 \\ & = & 0.765 \\ 876 & x & 0.266 \\ & = & 0.765 \\ 876 & x & 0.266 \\ & = & 0.765 \\ 876 & x & 0.200 \\ & = & 0.210 \\ 650 & x & 0.200 \\ & = & 0.13 \\ & = & 14.88 \\ \end{array}$
	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500) = 0.$ $= S7 \times 0.200 = 0.$ $= (2.500 : \cos^{2}0^{0} + S9) \times $ $= S1 + S2 + S3 + 3.$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & & 0.184 \\ 2 & = & & & 0.023 \\ = & & 0.184 & + & 0.466 & = & 0.650 \\ = & & 0.023 & + & 0.160 & = & 0.183 \\ = & & & & & & & & & & \\ & & & & & & &$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing - Wing wall	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times (2.500) = 0.$ $= S7 \times 0.200 = 0.$ $= (2.500 : \cos^{2}0^{0} + S9) \times $ $= S1 + S2 + S3 + 3.$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing - Wing wall SCAFFOLDING (m ²)	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times ($ $= 0.767 \times (0.184 + 0.023 + 0.23)$ $= S7 \times 0.200 = 0.$ $= (2.500 : \cos^{20^{0}} + S9) \times $ $= S1 + S2 + S3 + 32$ $= 0.350 + 0.353 + 2.876 + 2.$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & & & = & 0.184 \\ 2 & = & & & & 0.023 \\ = & & 0.184 & + & 0.466 & = & 0.650 \\ = & & 0.023 & + & 0.160 & = & 0.183 \\ = & & & & & & & & & \\ & & & & & & & &$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing - Wing wall SCAFFOLDING (m ²) - Footing	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times ($ $= 0.767 \times (0.184 + 0.023 + 0.23)$ $= S7 \times 0.200 = 0.200$ $= (2.500 : \cos^{2}0^{0} + S9) \times $ $= S1 + S2 + S3 + 32$ $= 0.350 + 0.353 + 2.876 + 2.23$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing - Wing wall SCAFFOLDING (m ²)	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times ($ $= 0.767 \times (0.184 + 0.023 + 0.)$ $= S7 \times 0.200 = 0.$ $= (2.500 : \cos^{2}0^{0} + S9) \times $ $= S1 + S2 + S3 + 3$ $= 0.350 + 0.353 + 2.876 + 2.$ $= (2.500 : \cos^{2}0^{0} + 1.000 + 1.$ $= S3 + S4 + 0.600 \times (0.100)$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
+	S5 S6 S7 S8 S9 CONCRETE (m ³) - Footing - Wing wall V1 V2 V3 FORM (m ²) - Footing - Wing wall SCAFFOLDING (m ²) - Footing	$= S3 : \cos^{70} = 2.$ $= (0.476 - 0.266) \times 1.750 :$ $= (0.343 - 0.266) \times 0.600 :$ $= S5 + (1.750 \times 0.266)$ $= S6 + (0.600 \times 0.266)$ $= 1.500 \times 0.750$ $= S9 \times 2.500 = 1.$ $= V1 + V2 + V3$ $= S3 \times 0.266 = 2.$ $= (2.500 - 0.200) : 3 \times ($ $= 0.767 \times (0.184 + 0.023 + 0.23)$ $= S7 \times 0.200 = 0.200$ $= (2.500 : \cos^{2}0^{0} + S9) \times $ $= S1 + S2 + S3 + 32$ $= 0.350 + 0.353 + 2.876 + 2.23$	$\begin{array}{rcrcrcrcrcrcrcrcrcrcrcrcrcrcrcl} 876 & : & 0.993 & = & 2.898 \\ 2 & = & & & = & 0.184 \\ 2 & = & & & & = & 0.023 \\ = & & 0.023 & + & 0.160 & = & 0.183 \\ = & & 0.023 & + & 0.160 & = & 0.183 \\ = & & & & & & & & & & & \\ & & & & & &$

(ON 10+69	WINGWA
BOX CULVERT STATION	REINFORCEMENT OF WINGW

AG MADY	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAK WAKA	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2011	12	15	0.888	30.2	26.8
16	2060	14	15	1.208	30.9	37.3
2a	2651	12	6	0.888	15.9	14.1
2b	1552	12	12	0.888	18.6	16.5
2c	582	12	15	0.888	8.7	7.8
3	3005	12	2	0.888	6.0	5.3
4	3378	12	16	0.888	54.0	48.0
Śа	2574	12	11	0.888	28.3	25.1
5b.	1868	12	4	0.888	7.5	6.6
5c	1998	20	11	2.466	22.0	54.2
Sd	1292	20	4	2.466	5.2	12.7
6	2444	† 1	8	1.208	19.6	23.6
· 1	1814	12	4	0.888	7.3	6.4
8	1814	12	4	0.888	7.3	6.4
6	2554	12	4	0.888	10.2	9.1
10	1304	14	5	1.208	6.5	7.9
	724	12	6	0.888	6.5	5.8
12	1791	12		0.888	1.8	1.6
		REINFORCEMENT:		D=<14	248.5 KG	KG
		REINFORCEMENT:		14< D<=25	66.9 KG	KG
		TOTAL REINFORCEMENT:	EMENT :		315.4 KG	KG
						<u> </u>





CULVERT KM10+690	+ d1) x	4.230 + 6.196) x 2.700 : 2 = 14.075	+ d2) × H1 : 2 =	+ 6.196) ×	+ d3) × H1 : 2 =	+ 1.713) ×	+ d4) × H1 : 2 =	+ 1.713) x 2.700 : 2 =	+ d5) x H1 : 2 =	+ 1.713) ×	+ d6) × H1 : 2 =	+ 1.713) x	×	×		+ L2a) x	4.516 + 6.336) x 2.500 ; 2 = 13.565	L1b + L2b) x L3 : 2 =
	1H × () × 2.70	th × () × 2.70	n x () × 2.70(TH × () × 2.70(1H × () × 2,70(th × () × 2.70(15) × × 13) x 2.50() x [J
	+ d1	+ 6.196	+ d2	+ 6.196	+ d3	+ 1.713	+ d4	+ 1.713	+ d5	+ 1.713	+ d6	+ 1.713	× (W + 0.2)	× 6.100		+ L2a	+ 6.336	+ L2b
	S1= (c1	<u> </u>	S2= (c2	_	S3= (3	_	S4= (c4	= (1.713	S5≈ (c5	= (1.713	S6≈ (c6	~	S7≈ L	= 31.530	APRON CONCRETE:	A1= (L1a		A2= (L1b

TARLE OF EXPLAINING OUANTITIES OF CULVERT

2 7 --

7

2. CONCRETE FOUNDATION OF CULVERT:

II 0.2 × 6.100 × = 31.530 0.2 × (W + 0.2) ×

<u>38.47</u> (m3)

(m3)

10.99

0 0

) × 0.45 × 0.5) × 0.45 × 0.5

1.2b 6.336

+ ÷

L2a 6.336

+

x 0.3 x 0.3

+ A2) + 13.565)

A1 13.565

_ "

								·	
	<u>4.67</u> (m3)		<u>263.54</u> (100m)			·) x 0.15 =) x 0.15 =		
	0.1 = 0.1 =		\$1 IJ	(100m)			57 192.333		
	S6) × (4.625) × (× 25 × 5 :100 × 25 × 5 :100	21.11			5 + 25 +		
	4		~~				S6 4.625		
	+ +		S7 192.333				+ +		
	S5 4.625		192	× 25 × 3 : 100 × 25 × 3 : 100			55 4.625	·	
	. + +		+ +	x 25 ; x 25 ;			ক		
•	54 4.625		S6 4.625	\sim			+ +	(m2)	(m2)
	+ + 4		+ +		OPE		S4 4.625	19.008	19.008 (m2)
	3 25		52	0.000	TOE OF SLOPE		+ +	11 N	11 31
	S3 4.625		55 4.625				53 4.625	2 2	2 2
	+ +		+ +	+ +	OD P		. + +	××	××
	S2 14.0751		S4 4.625	S2 14.0751	EA WC		S2 14.075	X 0.75 X 0.75	X 0.75 X 0.75
	+ +		+ +	+ +	IS AF		+ +	\sim	\sim
31'E:	S1 14.075		53 4.625	S1 14.075).8 x 4.5 x 4	Ö	S1 14.075	L2b) 6.336	L2b) 6.336
3. LEAN CONCRETE:	— II В	4. WOOD PILE	W5= ($W_{3} = ($	NOTE: S=0.8 x 4.5 x 4 IS AREA WOOD PILE	5. SAND BEDDING:	 II 11	<u>6.FORM</u> = (L2a + (6.336 +	<u>7.SCAFFOLDING</u> = (L2a + (6.336 +

•

<u>35.85</u> (m3)

2.8. Box culvert at station 10+950

BOX CULVERT

.

10+950

I					10+950	0.05		36 700								QUANTITIE
	L CULVERT	<u>_</u>	15.540	+	13.340 +	0.02	2	20.700					<u> </u>			
	CONCRETE (M3)															
	S1=S2		2950	Ň	2.050 -	2.500	x	1.500	+	2	Y	0.100	Y	<u>a na</u>	_	2.318
	S1-52	=	S1	+		2.,700	^	1		~	A	9.100	^	W. 100		4.635
	VOLUME	_	S		(13.340+	13.340	-1-	5 900	v	0.200	v	0.300	v	n	=	124.36
	1020ML	-	5	^	110.070 r	19,9403	г	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	^	0.200	~	0.500		~	-	1.24.20
		.·				DOU	BLE	BOX C	ULV	ERT						
						<u>⊧</u>		5900								
					1220	[950 2500	300 1	2950 2500		s:	2				
				·	2050											
					1	S	1									
ł	FORM (M2)															<u>419.90</u>
*	INSIDE FORM (M2)	Í														291.649
	BOX BULWARK	=	(1.500	+	2 x	0.100	x((1/SIN45) _	1))	х	26.680	x	4	=	168.921
	BOTTOM OF THE BOX	1			0.100 x			26.680		2					=	122.728
k	OUTSIDE FORM (M2)					,										128.253
	BOX BULWARK	=	2.050	x	2 x	26.680	+	- 4	х	0.300	x	0.200				109.628
	THE END OF CULVERT	=	S	x		5.900			x	4	••				=	13.990
	CENTER	=	S		- •					,					=	4.635
			. –												-	1.000
ŀ	SCAFFOLDING (M2)	=	2.050	x	2.000 x	26.680	÷	4.000	X	0.300	x	0.200			=	109.63
	SUPPORT			~	^	_2,000			~	0.000	л	0.200				107.00
	AREA (M2)	=	5,900	x	1.500 -	S -									=	4.215
	VOLUME (M3)	1	AREA												=	<u>112.54</u>
				.,												
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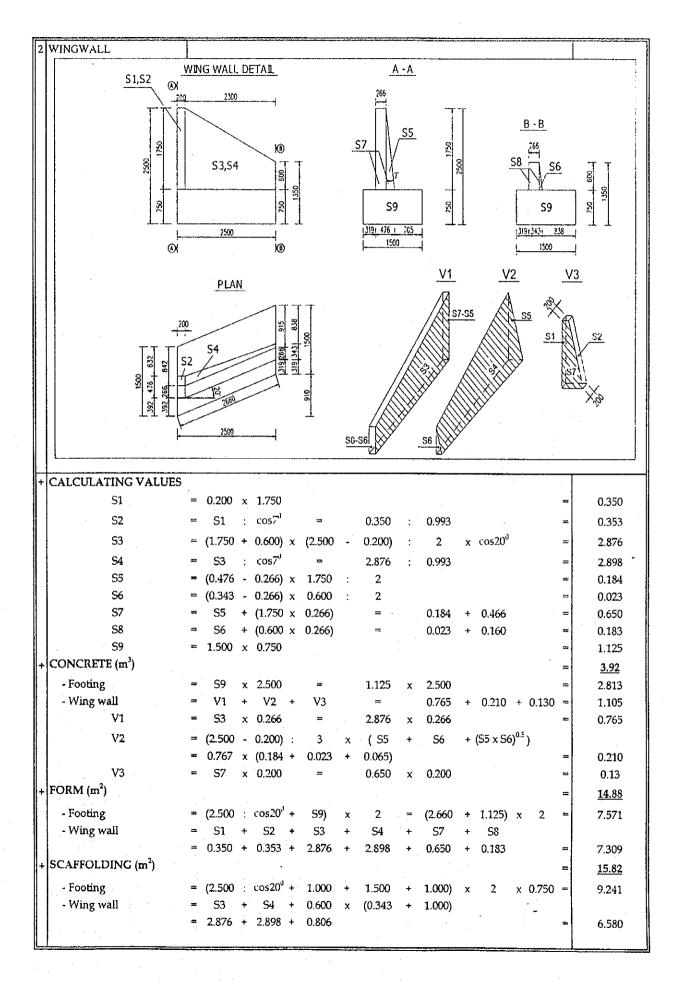
GT 10+950

BOXCULVERT STATION 10+950 QUANTITIES TABLE OF REINFORCEMENT

OF BAR (mm) (mm) (mm) OF BAR (kg/m) (m) (kg) 1 3660 125 14 214 1.208 783.24 946.5 2 2350 250 12 108 0.888 233.8 225.3 3 6270 250 14 108 1.208 677.16 818.3 4 1500 250 14 212 1.208 318 384.3 5 1350 125 18 214 1.998 331.7 662.6 6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 302.9 446.5 8 1049 250 12 216 0.888 241.92 214.8 10 13845 250 12 32 0.888 11.94 639.2 11 13945 250 12 26					1. OITLINI	1104		
1 3660 125 14 214 1.208 783.24 946.5 2 2350 250 12 108 0.888 253.8 225.3 3 6270 250 14 108 1.208 677.16 818.3 4 1500 250 14 212 1.208 318 384.3 5 1550 125 18 214 1.998 331.7 662.6 6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 502.9 446.5 8 1049 250 12 216 0.888 226.384 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 32 0.888 11.56 10.3 13 1440 250 12 26 0.888	SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
2 2350 250 12 108 0.888 253.8 225.3 3 6270 250 14 108 1.208 677.16 818.3 4 1500 250 14 212 1.208 318 384.3 5 1530 125 18 214 1.998 331.7 662.6 6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 302.9 446.5 8 1049 250 12 216 0.888 226.584 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 52 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 127.16 1089.5 13 1440 250 12 26 0	OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
- $ -$ <td>1</td> <td>3660</td> <td>125</td> <td>14</td> <td>214</td> <td>1.208</td> <td>783.24</td> <td>946.5</td>	1	3660	125	14	214	1.208	783.24	946.5
4 1500 250 14 212 1.208 318 384.3 5 1550 125 18 214 1.998 331.7 662.6 6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 502.9 446.5 8 1049 250 12 216 0.888 226.584 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 52 0.888 122.7.16 1089.5 12 5780 250 12 2 0.888 122.7.16 1089.5 12 5780 250 12 2 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.788 335.4 REINFORCEMENT : 16=D<=25	2	2350	250	12	108	0.888	253.8	225.3
5 1350 125 18 214 1.998 331.7 662.6 6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 502.9 446.5 8 1049 250 12 216 0.888 226.584 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 216 0.888 241.92 214.8 10 13845 250 12 32 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 1227.16 1089.5 13 1440 250 12 26 0.888 377.48 332.4 14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : 16=D<=25	3	6270	250	14	108	1.208	677.16	818.3
6 1970 250 12 216 0.888 425.52 377.8 7 2350 125 12 214 0.888 502.9 446.5 8 1049 250 12 214 0.888 502.9 446.5 9 1120 250 12 216 0.888 226.384 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 52 0.888 719.94 639.2 11 13945 250 12 88 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 17.94 639.2 11 13945 250 12 2 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 37.44 33.2 14 1180 250 12 320.16	4	1500	250	14	212	1.208	318	384.3
7 2350 125 12 214 0.888 502.9 446.5 8 1049 250 12 216 0.888 226.584 201.2 9 1120 250 12 216 0.888 241.92 214.8 10 13845 250 12 52 0.888 109.4 639.2 11 13945 250 12 32 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 11.56 10.3 13 1440 250 12 26 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.788 335.4 REINFORCEMENT : D<=14	5	1550	125	18	214	1.998	331.7	662.6
1 1	6	1970	250	12	216	0.888	425.52	377.8
91120250122160.000120,011100,12101384525012520.888241,92214,8101384525012520.883719,94639,211139452501220.8881227,161089,51257802501220.88811,5610,313144025012260.88837,4433,214118025012320,160.888377,7888335,4REINFORCEMENT :D<=14	7	2350	125	12	214	0.888	502.9	446.5
10 13845 250 12 52 0.805 241.92 214.3 10 13845 250 12 52 0.888 719.94 639.2 11 13945 250 12 88 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 11.56 10.3 13 1440 250 12 26 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : $D<=14$ 5722.1 $TOTAL FOR SEGMENT 1$: 638 REINFORCEMENT : $16=D<=25$ 662.6 REINFORCEMENT (KG): 638 TOTAL FOR SEGMENT 1 & 2 TOTAL FOR SEGMENT 1 & 2 REINFORCEMENT : $D <= 14$ 11444.29 REINFORCEMENT (KG) : 1276 REINFORCEMENT : $D <= 14$ 11444.29 REINFORCEMENT (KG) : 1276	8	1049	250	12	216	0.888	226.584	201.2
11 13945 250 12 88 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 1227.16 1089.5 12 5780 250 12 2 0.888 11.56 10.3 13 1440 250 12 26 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : D<=14	9	1120	250	12	216	0.888	241.92	214.8
12 5780 250 12 2 0.888 11.56 100//5 13 1440 250 12 26 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : D<=14	10	13845	250	12	52	0.888	719.94	639.2
13 140 250 12 26 0.888 37.44 33.2 14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : D<=14	11	13945	250	12	88	0.888	1227.16	1089.5
14 1180 250 12 320.16 0.888 377.7888 335.4 REINFORCEMENT : D<=14	12	5780	250	12	2	0.888	11.56	10.3
REINFORCEMENT : D<=14	13	1440	250	12	26	0.888	37.44	33.2
REINFORCEMENT : 16=D<=25	. 14	1180	250	. 12	320.16	0.888	377.7888	335.4
REINFORCEMENT : 25 <d=32< td=""> CONCRETE (M³): 62 TOTAL FOR SEGMENT 1 & 2 TOTAL FOR SEGMENT 1 & 2 62 REINFORCEMENT : D<=14</d=32<>	REINFORG	CEMENT :	D<=14		5722.1	TOTAL FOR SEC	<u>GMENT 1 :</u>	
TOTAL FOR SEGMENT 1 & 2 REINFORCEMENT : D<=14	REINFORG	CEMENT : 16	=D<=25		662.6	REINFORCEME	NT (KG):	6384.7
REINFORCEMENT : D<=14 11444.29 REINFORCEMENT (KG) : 1276 REINFORCEMENT : 16=D<=25	REINFOR	CEMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>·):</td><td>62.18</td></d=32<>			CONCRETE (M ³	·):	62.18
REINFORCEMENT: 16=D<=25 1325.195				TOTAL	FOR SEG	MENT 1 & 2		
	REINFORG	CEMENT :	D<=14		11444.29	REINFORCEME	NT (KG) :	12769.5
REINFORCEMENT 25 <d=32 (a(3),="" 12="" <="" concrete="" td=""><td>REINFORG</td><td>CEMENT : 16</td><td>=D<=25</td><td></td><td>1325.195</td><td></td><td></td><td></td></d=32>	REINFORG	CEMENT : 16	=D<=25		1325.195			
	REINFORG	CEMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>·):</td><td>124.36</td></d=32<>			CONCRETE (M ³	·):	124.36

SEGMENT 1 & 2

2 - 8 - 2



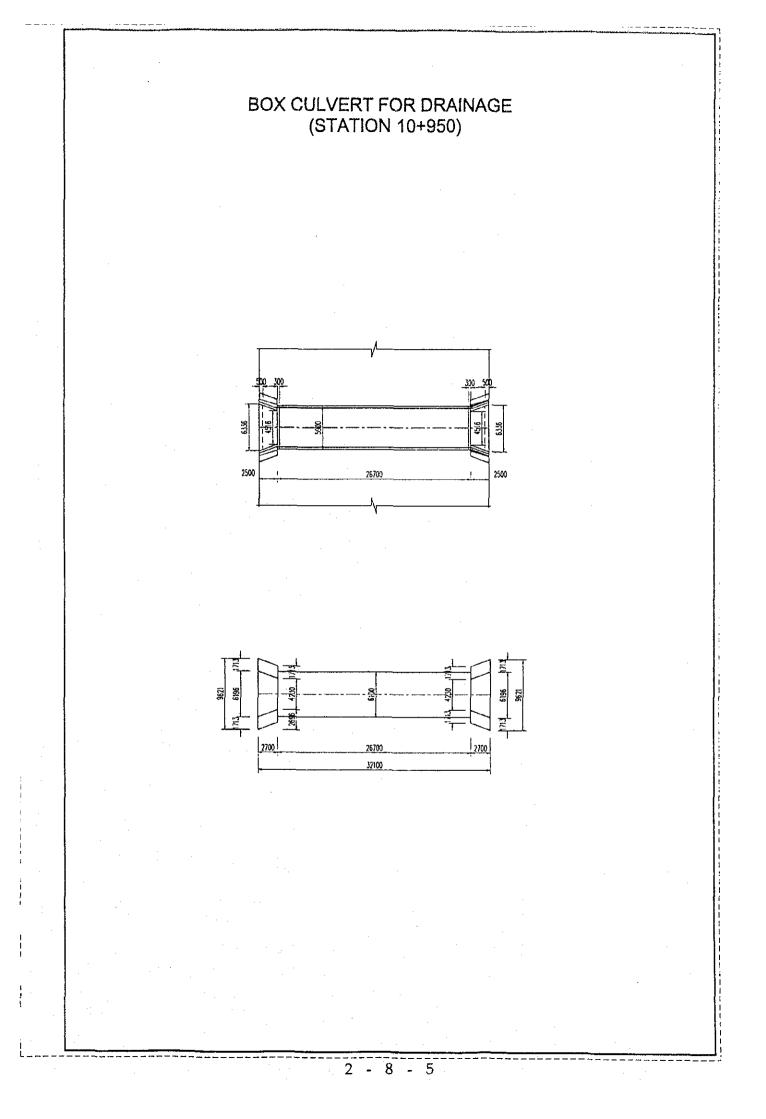
2 - 8 - 3

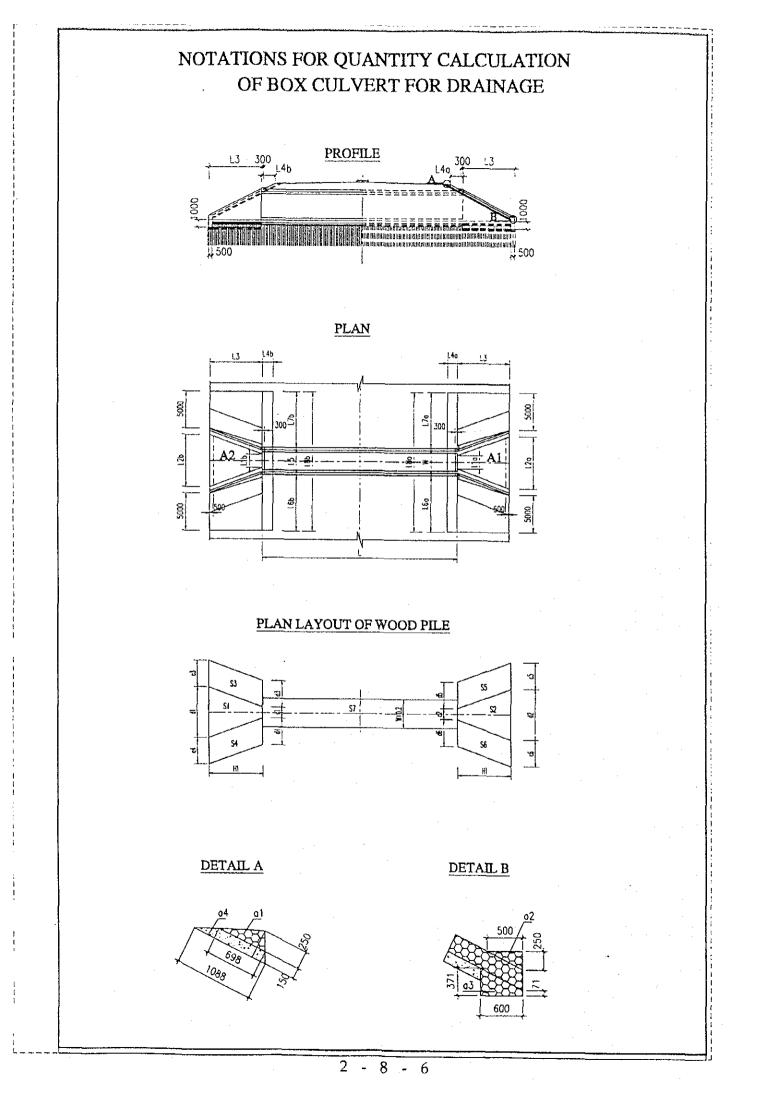
BOX CULVERT STATION 10+950	REINFORCEMENT OF WINGWAL	
BOX	REINF	

	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAIX MAIXIN	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2011	12	15	0.888	30.2	26.8
1b	2060	14	15	1.208	30.9	37.3
2a	2651	12	6	0.888	15.9	14.1
2b	1552	12	12	0.888	18.6	16.5
2c	582	12	15	0.888	8.7	7.8
ĸ	3005	12	2	0.888	6.0	5.3
4	3378	12	16	0.888	54.0	48.0
бa	2574	12	11	0.888	28.3	25.1
5b	1868	12	4	0.888	7.5	6.6
5c	1998	20	11	2.466	22.0	54.2
5d	1292	20	4	2.466	5.2	12.7
6	2444	14	8	1.208	19.6	23.6
7	1814	12	4	0.888	7.3	6.4
8	1814	12	4	0.888	7.3	6.4
6	2554	12	4	0.888	10.2	9.1
10	1304	14	5	1.208	6.5	7.9
-	724	12	6	0.888	6.5	5.8
12	1791	12	1	0.888	1.8	1.6
		REINFORCEMENT:		D=<14	248.5 KG	KG
		REINFORCEMENT:		14< I)<=25	66.9 KG	KG
		TOTAL REINFORCEMENT:	EMENT :		315.4 KG	KG

2 - 8

8 - 4





$Sl = \{ cl + dl \} \times Sl = \{ cl + dl \} \times Sl = \{ cl + dl \} \times Sl = \{ cl + d2 \} \times Sl = \{ cl + d3 \} \times Sl = \{ cl + d4 \} \times Sl = \{ cl +$	H1 2.700 H1 2.700 H1 2.700 H1 2.700 H1 2.700 H1 2.700			14.075 14.075 4.625 4.625 4.625	(m2) (m2) (m2) (m2)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	2.700 H1 2.700 H1 2.700 H1 2.700 H1 2.700 H1 2.700		# # # # # # # # # # # #	14.075 14.075 4.625 4.625 4.625	(m2) (m2) (m2) (m2)
$\begin{pmatrix} c_2 & + & d_2 \\ (& 4.230 & + & 6.196 \\ (& c_3 & + & d_3 \\ (& 1.713 & + & 1.713 \\ (& c_4 & + & d_4 \\ (& 1.713 & + & 1.713 \end{pmatrix}$	H 2.700 H 2.700 H H 2.700 H1 H1 2.700 2.700		n 9 h n n n n n n	14.075 4.625 4.625 4.625 4.625	(m2) (m2) (m2) (m2)
$\begin{pmatrix} 4.230 + 6.196 \\ c3 + d3 \end{pmatrix}$ $\begin{pmatrix} 1.713 + 1.713 \\ c4 + d4 \end{pmatrix}$ $\begin{pmatrix} c4 + d4 \\ 1.713 + 1.713 \end{pmatrix}$	2.700 HI 2.700 HI 2.700 H1 H1 2.700 2.700			14.075 4.625 4.625 4.625 4.625	(m2) (m2) (m2)
$\begin{pmatrix} c3 & + d3 \\ 1.713 & + 1.713 \end{pmatrix}$ $\begin{pmatrix} c4 & + d4 \\ c4 & + d4 \end{pmatrix}$ $\begin{pmatrix} 1.713 & + 1.713 \end{pmatrix}$	H1 2.700 2.700 H1 2.700 H1 2.700			4.625 4.625 4.625 4.625	(m2) (m2) (m2)
$\begin{pmatrix} 1.713 + 1.713 \\ c^4 + d4 \end{pmatrix}$	2.700 H1 2.700 H1 2.700 H1 2.700		N N N N N N U	4.625 4.625 4.625 4.625	(m2) (m2) (m2)
(c4 + d4) (1.713 + 1.713)	H1 2.700 H1 2.700 H1 2.700			4.625 4.625 4.625	(m2) (m2)
(1.713 + 1.713)	2.700 H1 2.700 H1 2.700			4.625 4.625 4.625	(m2) (m2)
•	H1 2.700 H1 2.700		n n n u	4.625 4.625	(m2)
+	2.700 H1 2.700	N N N 	n n u	4.625 4.625	(m2) (m2)
+	H1 2.700	л л 	n u	4.625	(m2)
÷	2.700		u	4.625	(m2)
+			1		
×					
×	162.870	(m2)			
1. APRON CONCRETE:		÷			
÷	13	۲ ۱	l		
	3	•			Ĩ
+	2.500		11	13.565	(m2)
+ L2b)	L 3	5	lf		
= (4.516 + 6.336) x	2:500	. 2	H	13.565	(m2)
(A1 + A2) × 0.3) +	L2a	+	1.2b) × 0.45 × 0.5
= (13.565 + 13.565) × 0.3) +	6.336	+	6.336) ~ 0.45 ~ 0.5

TABLE OF EXPLAINING QUANTITIES OF CULVERT

2 - 8 - 7

II 0.2 × 6.100 × 26.700 11 0.2 L x (W + 0.2) x

<u>32.57</u> (m3)

(m3)

10.99

11 11

	<u>4.67</u> (m3)		<u>226.71</u> (100m)) x 0.15 =) x 0.15 =		
	H H		11 11	(100m)			57 162.870		
	L.0 × (× (x 25 x 5 :100 x 25 x 5 :100	21.11			++		·
	S6 4.625) × 2 × 2				S6 4.625		
	÷ +		20	11 12			+ +		÷
·	S5 4.625		S7 162.870	x 25 x 3 : 100 x 25 x 3 : 100			55 4.625		
	+ +		+ +	× × 8 8					
	S4 4.625		S6 4.625				+ +	19.008 (m2)	19.008 (m2)
	+ +		+ +		OPE		S4 4.625	19.00	19.00
				0.000	TOE OF SLOPE		+ +	1 3 11	11 11
	53 4.625		S5 4.625			·	53 4.625	5 5	7 7
	+ +		+ +	÷ +		:	+ +	××	××
	S2 14.0751		54 4.625	S2 14.0751	rea wo		52 14.075	X 0.75 X 0.75	X 0.75 X .0.75
	+ +		+ +	+ +	4 IS A	÷	+ +		
<u> 1 E.</u>	51 14.075		53 4.625	S1 14.075).8 x 4.5 x .	ö	S1 14.075	L2b) 6.336	L2b) 6.336
3. LEAN CONCRETE	 H N	4. WOOD PILE:	$\frac{*L=5M}{*}$		NOTE: S=0.8 × 4.5 × 4 IS AREA WOOD PILE	5. SAND BEDDING	U II	<u>6.FORM</u> = (L2a + (6.336 +	<u>7.SCAFFOLDING</u> = (L2a + (6.336 +

2 - 8 - 8

<u>31.43</u> (m3)

2.9. Box culvert at station 11+451

BOX CULVERT

11+451

	BOX CULVERT STAT				11+451											Ĭ	QUANTITIES
	L	, =	13.340	+	13,340	+	0.02	=	26.700		····						
	CULVERT																
ł	CONCRETE (M3)		3.050		2.050		- - -				•						
	S1=S2 S	=	2.930 S1		2.050 S2	•	2.500	х	1.500	+	2	X	4), [(8)	х	0,100	1	
	VOLUME	=					13.3 (0)		5,900	•	0.200		6.200	U	2	~	4.635 <u>124.36</u>
	1 OLOME	-	3		112	Υ	13.340)	Ŧ	7.3001	л	0(8)	Y	11.0011	х	4	-	144.20
							DOU	BLI	E BOX C	JLV	ERT						
									5900								
							2	950		2950							
							300 2	500	300	2500	300	S	2				
					- ²							Ĩ	-				
					2050			<u>;</u>									
						1	S	7 I									
		ĺ						•									
	FORM (M2) INSIDE FORM (M2)														-		<u>419.90</u>
	BOX BULWARK		1. 500		2		 		(1/SIN45')			26 600				291.649
	BOTTOM OF THE BOX								26.680		1)) 2	X	20.080	X	+		168.921 122.728
•	OUTSIDE FORM (M2)	-	(=.300		0.100	л)	х	20.000	7	÷		÷		-	=	122.728
	BOX BULWARK	=	2.050	x	2	x	26.680	÷	4	x	0.300	x	0.200			=	109.628
	THE END OF CULVERT		S						0.200							=	13.990
	CENTER	=	S													=	4.635
		=	2.050	x	2.000	х	26.680	+	4.000	х	0.300	x	0.200			=	109.63
+	SUPPORT						· .										
	AREA (M2)	ŧ	1.1			-	S								÷	=	4.215
	VOLUME (M3)	-	AREA	X	L											=	112.54
									•								
																	i.
		1															
									,								
													•				
													-				
					÷												
		<u> </u>							<u> </u>								

2 - 9 - 1

GT 11+451

BOXCULVERT STATION 11+451 QUANTITIES TABLE OF REINFORCEMENT

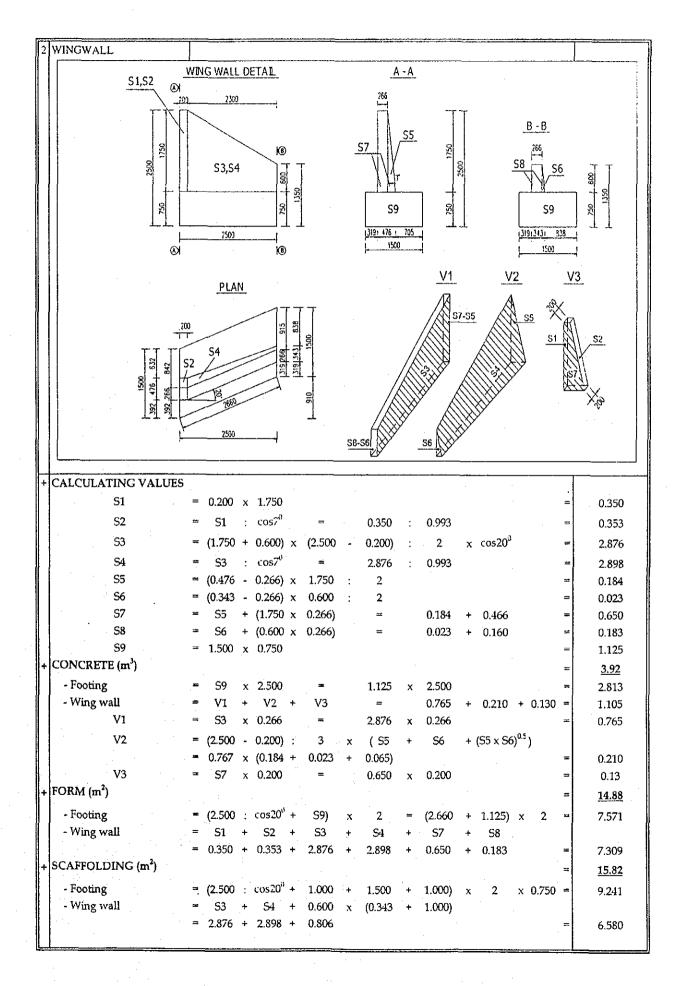
TT TOTAL LENGTH TOTAL WEIGHT (m) (kg) 783.24 946.5
783.24 946.5
253.8 225.3
677.16 818.3
318 384.3
331.7 662.6
425.52 377.8
502.9 446.5
226.584 201.2
241.92 214.8
719.94 639.2
1227.16 1089.5
11.56 10.3
37.44 33.2
377.7888 335.4
SEGMENT 1 :
MENT (KG): 6384.3
(M ³): 62.18
MENT (KG) : 12769.
(M ³): 124.36

SEGMENT 1 & 2

9

2

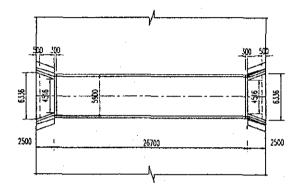
- 2

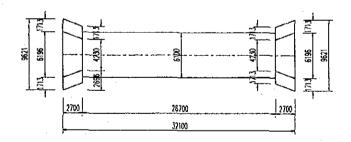


[+45]	WAL
	DNIN
BOX CULVERT STATION 1	OF V
RT ST	IENT
JLVE	CEV
X CL	LFOI
BO	REIN

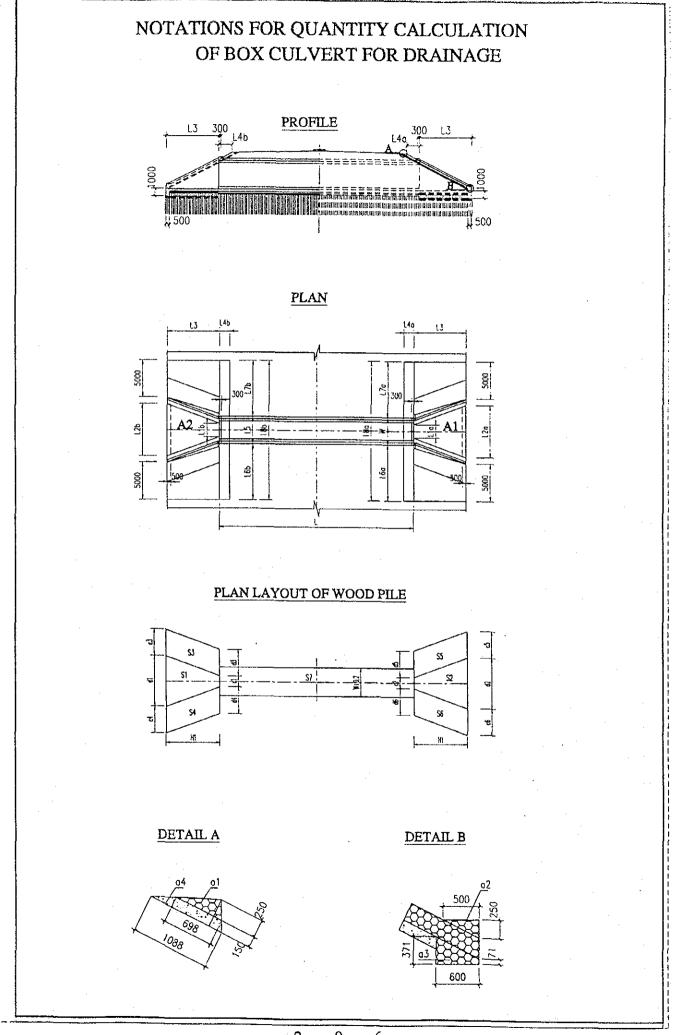
ARMAK AND	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAN MANA	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2011	12	15	0.888	30.2	26.8
lb	2060	14	15	1.208	30.9	37.3
2a	2651	12	6	0.888	15.9	14.1
2b	1552	12	12	0.888	18.6	16.5
2c	582	12	15	0.888	8.7	7.8
£	3005	12	2	0.888	6.0	5.3
4	3378	12	16	0.888	54.0	48.0
Sa	2574	12	11	0.888	28.3	25.1
5b	1868	12	4	0.888	7.5	6.6
5c	1998	20	11	2.466	22.0	54.2
Sd	1292	20	4	2.466	5.2	12.7
. 9	2444	14	8	1.208	19.6	23.6
7	1814	12	4	0.888	7.3	6.4
8	1814	12	4	0.888	7.3	6.4
6	2554	12	4	0.888	10.2	9.1
10	1304	14	5	1.208	6.5	7.9
	724	12	6	0.888	6.5	5.8
12	1791	12	1	0.888	1.8	1.6
		REINFORCEMENT:		D=<14	248.5 KG	KG
		REINFORCEMENT:		14< [)<=25	66.9 KG	KG
		TOTAL REINFORCEMENT:	EMENT :		315.4 KG	KG







.



		(m2)		(m2)		(m2)		(m2)		(m2)		(m2)						(m2)		(m2)) x 0.45 x 0.5) × 0.45 × 0.5
		14.075		14.075		4.625		4.625		4.625		4.625		-				13.565		13.565	L2b	6.336
11+45	H	R	IJ	IJ	IJ	ij	IJ	n	33	n	5	n				I	u	H	ŧ	u	÷	÷
CULVERT KM11+451	7	ы	2	7	2	7	7	.61	2	2	5	7		(m2)			N	5	N	7		36
LVER			••		•••	•••		• •		•••		••		02			••			••	Ľ2	6.336
CO	IH	2.700	Н	2.700	ΗI	2.700	H1	2.700	Η1	2.700	Η	2.700		162.870		÷	3	2.500	ទា	2.500	+	, +
	×	×	×	×	×	×	×	×	×	×	×	×				i	×	×	×	×	× 0.3	x 0.3
						Ŷ								H		,	-		~		~	
	lp	6.196	d2	6.196	d3	1.713	d4	1.713	d5	1.713	d6	1.713	(W + 0.2)	6.100		c -	171	6.336	L2b	6.336	A2	13.565
	+	+	÷	÷	+	+	+	+	+	+	+	+	×	×		4	۲	+	+	+	+	+
	cl	4.230	6	4.230	ფ	1.713	43	1.713	<u>9</u>	1.713	c6	1.713	-1	26.700	RETE	с г г	L13	4.516	LIb	4.516	AI	13.565
	S]= () ==	S2= () 11	S3= () #	S4= () 11	S5= () =	S6= () 1	S?=	Ħ	APRON CONCRETE:	A1- 1		 ₩	A2= _(1		"
															1. AI							

2. CONCRETE FOUNDATION OF CULVERT

L x (W + 0.2) x 0.2 = 26.700 x 6.100 x 0.2 = 32

2 - 9

7

TABLE OF EXPLAINING QUANTITIES OF CULVERT

<u>32.57</u> (m3)

(Em3)

10.99

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0 Z
EA1
3

, B	SI	+	S2	÷	83 1	÷	<u>8</u>	+	SS	Ŧ	() 86	x 0.1	11			
) =	14.075	+	14.0751	+	4.625	÷	4.625	+	4.625	Ŧ	4.625)	x 0.1	11	4.67	(m3)	
4. WOOD PILE																
* <u>I</u> ,=5M	_											÷				
W5= (+	\$	+	S5	+	S6	+	S7		× 25 × 5 :100	5:100	h			
"	4.625	+	4.625	+	4.625	÷	4.625	÷	162.870	$\widehat{}$	× 25 × 5 :100	5:100	11	226.71		(100m)
* L=3M																
W3= (SI	+	S 2	+		0		x 25 x	× 25 × 3 : 100 =	11						
	14.075	÷	14.0751	+.	0.	0.000		x 25 x	x 25 x 3 : 100 =	и	21.11		(100m)			
			·			·										
NOTE: 5	NOTE: S=0.8 x 4.5 x 4 IS AREA WOOD PILE TOE OF SLOPE	4 IS A	REA WO		LE TOE O	F SLOPE										
5. SAND BEDDING	ÖN															
) =	S	Ŧ	22	+	S.	¥	+	сл С	S5		+ %	0,	S7	× () × 0.15 =	
1	14.075	+	+ 14.075 +	4	1.625 ⊣	+ 4.62	+ +	4.6	25 +	4	.625	+ 162	162.870	× () × 0.15 =	
6.FORM				·				•			-					

2

8

9

<u>31.43</u> (m3)

19.008 (m2)

11 11

2 2

× ×

X 0.75

X 0.75

L2b) 6.336

= (L2a + (6.336 +

19.008 (m2)

8 H

2 2

X 0.75

×

X 0.75

 \sim

7.SCAFFOLDING = (L2a + (6.336 +

L2b) 6.336

2.10. Box culvert at station 11+690

BOX CULVERT

11+690

Ĭ	BOX CULVERT STAT				11+690												QUANTI
	L,		15.590	+	15.590	+	0.02	#	31.200				-				<u> </u>
lt –	CULVERT																
+	CONCRETE (M3)																
	S1=S2	=	2.950	х	2.550	-	2,500	x	2,000	+	2	х	0.100	x	0.100		2.543
	s	=	S1	+	S2											=	5.085
	VOLUME	=	S	x	(15.590	+	15.590)	÷	5.900	x	0.200	x	0.300	x	2	=	159.2
II.							DC	DUB	LE BOX C	UL	VERT						
									5900								
							[295	0	295	<u> </u>						
		l				_	 300	250	10 J00	2500	i 1300	S	2				
	e de la companya de l				т	250			1		<u> </u>	/					
						-		8									
					2550	2000) -			1						
					· L	_ 01	•]						
								S1									
+	FORM (M2)																606.2
11	INSIDE FORM (M2)						,										426.98
	BOX BULWARK	_	(2 000	Ŧ	· •	v	0 300	~	(1:SIN45 ⁰	•	1\\		21 100		.1	=	280.43
	BOTTOM OF THE BOX								31.180		2	х	51.100	х	4		i
11	OUTSIDE FORM (M2)	-	(4.900	-	0.500	х	2)	х	51.100	x	4					=	146.54
	BOX BULWARK	_	2.550	~	2		31.180	L	4		0.300		0.200			_	179.23
	THE END OF CULVERT								4 0.200		0.300 4	x	0.200			=	159.25
	CENTER	=	S	х	· 2	T	5.900	х	0.200	x	4						14.89
	CENTER	~	5													п	5.085
 _	SCAFFOLDING (M2)	_	2 550	~	2 000	~	31 180	ъ	1 000		0.300	.,	0.200			=	150.0
81	SUPPORT		2.000	Ŷ	2.000	Ŷ	51.100	•	4.000	~	0.000	×.	0.200			-	<u>159.2</u>
		_	5 000	~	2.000		S										6.715
			AREA			-	3									_	
			* 11/1	Ŷ	L											-	<u>209.5</u>
		1							•							ĺ	
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1																	
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GT 11+690

BOXCULVERT STATION 11+690 QUANTITIES TABLE OF REINFORCEMENT

SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	-4160	125	1-1	250	1.208	1040.0	1256.7
2	2850	250	12.	126	0.888	359.1	318.8
3	6270	250	14	126	1.208	790.0	954.7
4	1500	250	14	248	1.208	372.0	449.5
5	1550	125	18	250	1.998	387.5	774.1
6	1970	250	12	252	0.888	496.4	440.7
7	2850	125	12	250	0.888	712.5	632.6
8	1049	250	12	252	0.888	264.3	234.7
-9	1120	250	12	252	0.888	282.2	250.6
10	16095	250	12	52	0.888	836.9	743.0
11	16195	250	12	100	0.888	1619.5	1437.8
12	5780	250	12	2	0.888	11.6	10.3
13	1440	250	12	26	0.888	37.4	33.2
14	1180	250	12	374.16	0.888	441.5	392.0
15	1280	250	12	374.16	0.888	478.9	425.2
REINFORC	CEMENT :	D<=14		7579.9	TOTAL FOR SEC	<u>GMENT 1 :</u>	
REINFORC	CEMENT: 16	5≠D<=25		774.1	REINFORCEME	NT (KG):	8353.9
REINFORC	EMENT : 2	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>79.63</td></d=32<>			CONCRETE (M ³):	79.63
			TOTAL	FOR SEC	MENT 1 & 2		
REINFORC	CEMENT :	D<=14		15159.76	REINFORCEME	NT (KG) :	16707.9
REINFORG	CEMENT : 16	5≃D<=25		1548.125		· · · · · · · · · · · · · · · · · · ·	
REINFORC	CEMENT : 2	25 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>159.26</td></d=32<>			CONCRETE (M ³):	159.26

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SEGMENT 1 & 2

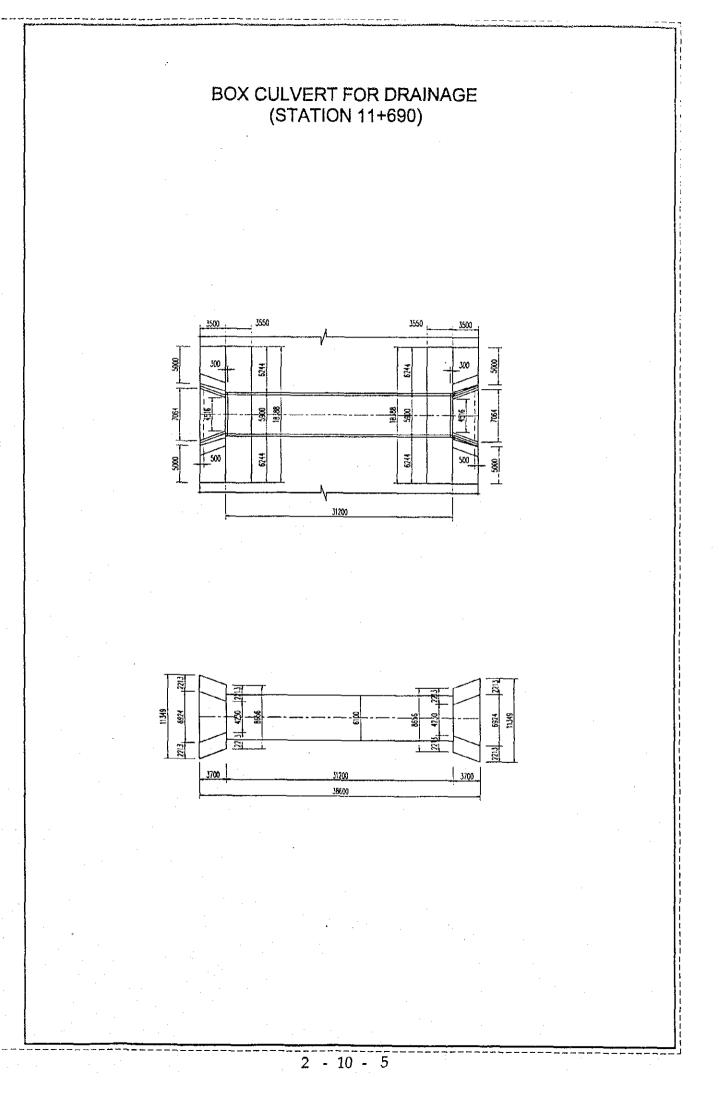
2 - 10 - 2

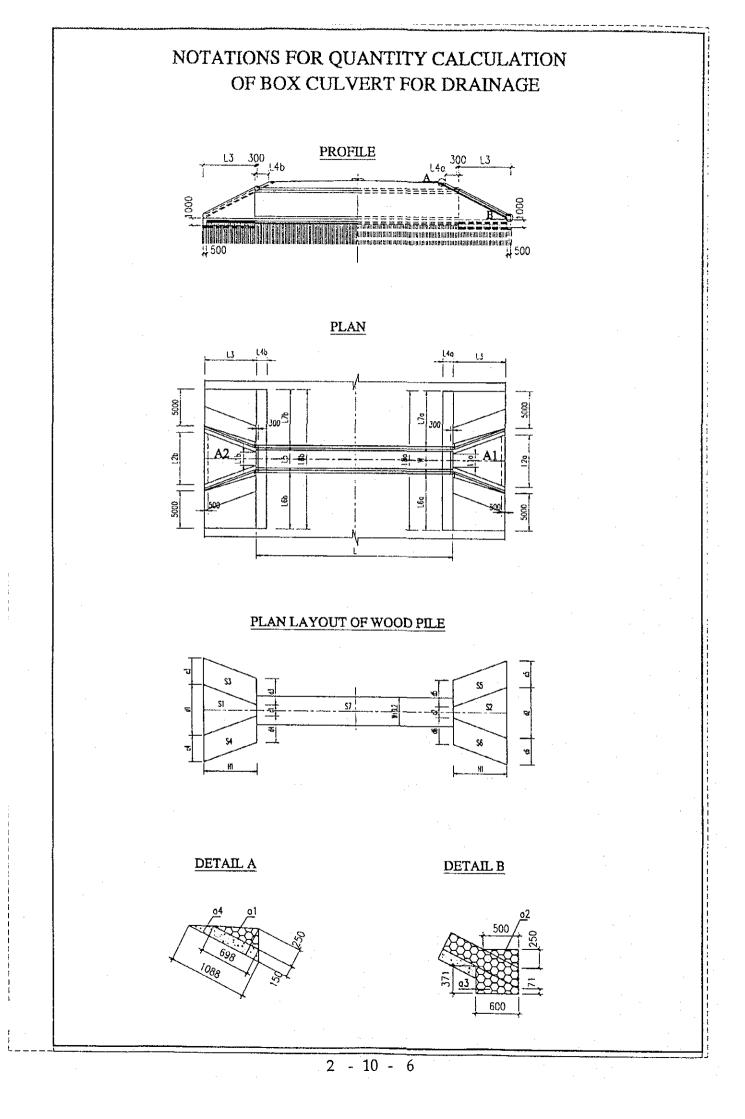
11+690

2	WINGWALL	<u></u>	<u></u>	<u> </u>							
	<u>\$1,52</u> @ <u>WIN</u>	G WALL DETAIL			<u>A - A</u>						
		3300			255						
	2350 2250 2250	\$3,54		<u>\$</u> ;	59	1055	L L [] 	<u></u>	B - B 2 ⁶⁴ <u>56</u> 59 91343 133 2000		1350
							<u>V1</u>	-	<u>V2</u>	<u>V3</u>	
	5000 5200 132 5200 52 132 5200	PLAN S4	4 <u>52000</u>				S H	7-55 6	55	ST CHART	<u>52</u> X.39
	102 253 102 253	1125	127	<u></u>	<u>56</u>	,	56 🕅	Y			
		-	ى ا يە.		20						
	CALCULATING VALUES						;				
	S1	= 0.200 x 2.250)							=	0.450
	S2	= S1 : cos7			0.450	:	0.993			-	0.450
	S3	= (2.250 + 0.600		-			•	x cos.	20 ⁰		5.004
	54	= S3 : cos7	• •		5.004	•			-	=	5.042
	S5	= (0.553 ~ 0.266		:	2	•	0.000			=	0.323
	S6	= (0.343 - 0.266		:						=	0.023
	S7		0 x 0.266)		-		0.323	+ 0.5	99		0.922
	S 8	= S6 + (0.60	0 x 0.266)		=		0.023	+ 0.1		#	0.183
	S9	$= 2.000 \times 0.750$)							=	1.500
+	CONCRETE (m ³)						· .			=	7.25
	- Footing	= S9 x 3.500) _ =		1.500	x	3.500			=	5.250
	- Wing wall	= V1 + V2			=		1.331	+ 0.4	80 + 0	.184 =	1.995
	V1	= S3 x 0.266			5.004	x	0.266			=	1.331
	V2	= (3.500 - 0.200	·	x	(S5	÷	S6	+ (S5 >	(S6) ^{0.5})		ļ
		= 1.100 x (0.32		+	,					.5	0.480
	V3	= S7 x 0.200) =		0.922	х	0.200			=	0.184
+	FORM (m ²)	·								=	<u>22.50</u>
	- Footing	= (3.500 : cos20	,	x	2	=	(3.725	+ 1.50	00) x	2 =	10.449
	- Wing wall	= S1 + S2		+	S4	+	5 7	+ S			
	201 PPOT P 110 2	= 0.450 + 0.453	+ 5.004	+	5.042	+	0.922	+ 0.1	83 .	=	12.053
+	SCAFFOLDING (m ²)	· · · · ·								. =	<u>22.44</u>
	- Footing	= (3.500 : cos20						x 2	x 0.	750 =	11.587
	- Wing wall		+ 0.600	x	(0.343	+	1.000)				
	· · ·	= 5.004 + 5.042	2 + 0.806				· .	•		=	10.852
Ľ											

CERT STATION 11+69 CEMENT OF WINGWA	
30X CULVERT STAT EINFORCEMENT OF	

				NUMPER	UNIT WEIGHT		TOTAL WEIGHT
		(WW)	(WW)	OF BAR	(KG/M)	(M)	(KG)
	la	2258	12	20	0.888	45.2	40.1
	٩I	2310	14	20	1.208	46.2	55.8
	2a	3723	12	6	0.888	22.3	19.8
	2b	2100	12	16	0.888	33.6	29.8
	2c	582	12	20	0.888	11.6	10.3
·	3	4254	12	2	0.888	8.5	7.6
2	4	4429	12	20	0.888	88.6	78.6
-	5a ·	3043	12	15	0.888	45.6	40.5
10	5b	2150	12	6	0.888	12.9	11.5
	5c	2467	20	15	2.466	37.0	91.3
4	5d	1574	20	6	2.466	9.4	23.3
	6	2444	14	16	1.208	39.1	47.3
	7	2301	12	4	0.888	9.2	8.2
•.	8	2301	12	4	0.888	9.2	8.2
	6	3605	12	4	0.888	14.4	12.8
	10	1304	14	8	1.208	10.4	12.6
	-	744	12	11	0.888	8.2	7.3
	12	2143	12	,	0.888	2.1	1.9
			REINFORCEMENT :		D<=14	392.2 KG	KG
			REINFORCEMENT:		14< D<=25	114.6 KG	KG
			TOTAL REINFORC	ORCEMENT:		506.8 KG	KG





(m3)

15.34

11 11

TABLE OF EXPLAINING QUANTITIES OF CULVERT

	<u>7.40</u> (m3)	<u>278.84</u> (100m)	+ $(0.8 \times 4.5 \times 4)$) × 0.15 = + $(0.8 \times 4.5 \times 4)$) × 0.15 =	(TIT MAIT)
	0.1	5:100 = 5:100 = 5:100m)	57 + 190.320	(bI IS AREA OF HEAD WALL)
	S6) 8.188)	$\frac{41.75}{100}$	S6 + 8.188	(m2) (b1
	8.15 8.12	+ 57 + 190.320 x 25 x 3 : 100 = x 25 x 3 : 100 =	S5 + 8.188 + (m2) (m2) 0.133 (m2) 0.134 (m2)	1.770 19.677 (m2)
• · · · · · · · · · · · · · · · · · · ·	~	56 + 56 + 188 + 18	34 + 188 + 0.087 0.063 0.15 =	11 H1 000
	φ.	55 + 8.188 + (0.8 × 4.5 × 4) 14.400 : TOE OF SLOPE	++ 70.00 0.00 1 × ×) × 5. L3 × 0.5 3.500 × 0.5
	+ +	$W5= (53 + 54 + 55 + 4)$ $= (8.188 + 8.188 + 8.188 + 8.188 + 8.188 + 1)$ $W3= (51 + 52 + (0.8 \times 4.5 \times 4))$ $= (20.635 + 20.6349 + 14.400)$ $= (20.635 + 20.6349 + 14.400)$ NOTE: $S=0.8 \times 4.5 \times 4$ IS AREA WOOD PILE TOE OF SLOPE	S2 + S3 20.635 + 8.188 0.25 × 0.25 × 0.371) × 1.088) ×	$ \begin{array}{rcrcccccccccccccccccccccccccccccccccc$
	+ + 10	53 + 8 8.188 + 8. 51 + 6 20.635 + 20 8 × 4.5 × 4 IS AREA	+ + × × + +	× + +
3. LEAN CONCRETE:		W5= (8.1) = (8.1) = (8.1) W3= (5.1) NOTE: S=0.8 × NOTE: S=0.8 ×	 (S1 = (20.635 = (20.635 6. STONE MASONRY a1= 0.695 a2= 0.5 a3= (0.071 a4= (0.698 	hi= 0.300 h2a= (L6a a (6.244

<u>41.81</u> (m3)

2 - 10 - 8

								3.902			(m3)
						(m3)	(m3)	li 	(m3)	(m3)	<u>64.626</u>
						1.597	1.597	x5x4	28.764	28.764	Q
									11 11	SI II	= =
						H	II	+ 0.133	COS(26.56) 0.894	COS(26.56) 0.894	V3b 28.764
(m2)	(m2)	(m2)	(m2)	(m2)		•		m	•• ••	•• •• .	+ +
19.677	19.677	19.677	= 65.277 (m2)	= 65.277 (m2)	(m2)	18.388	18.388	(0.063	× 0.25 × 0.25	× 0.25 × 0.25	V3a 28.764
11 18	H LL	11 ±1	20	20	8	×	×	31	\sim		+ +
x 0.5 x 0.5	× 0.5 × 0.5	x 0.5 x 0.5	3.550	3.550	6.000	0.087	0.087	4	b3a 19.677	b3b 19.677	V2 3.902
L3 3.500	L3 3.500	L3 3.500	×	×	11	H	II	к У	+ +	+ +	+ +
× × .	××	××	18.388	18.388	5			×	b2a 19.677	b2b 19.677	V1b 1.597
\sim	$\sim \sim$	\sim	u	II	×				` + +	+ +	+ +
5.000	5.000	5.000	L4a	L4b	ъ	L8a	L8b	a3	b1 1.770	b1 1.770	V1a 1.597
+ +	+ +	+ +	×	×	×	×	×	+	• •	E I	\sim
L6b 6.244	L7a 6.244	L7b 6.244	L8a	L8b	0.6	al	aï	a2	b4a 65.277	b4b 65.277	•
h2b= (= (lɔ3a= (= (b3b= (= (b4a=	⊳4b=	lb5 ≖	Vla=	V1b=	V2= (V3a= (= (V3b= (TOTAL =
		••••	· ·								

3.902 (m3)

2 - 10 - 9

			11 11	II	Æ								
	(Em)	(m3)	COS(26.56) 0.894	COS(26.56)	0.894								
	2.463	2.463	•• ••	•••	••		(m3)						
	с і	2	0.15 0.15	0.15	0.15		Ē						
	ti	H	× ×	×	×		37.43						
			~~~	` -		=	=(					·	
·	18.388	18.388	b5 6.000	<b>5</b> 5	6.000	V5b	16.252			·			
	×	×	<b>н</b> н	1		÷	+			(m2)			(m2)
	0.134	0.134	b3a 19.677	46d	19.677	V5a	16.252			21.192			21.192 (m2)
	11	11	+ +	+	+	+	+		II	H		Ħ	11
		·	b2a 19.677		19.677	V4b	2.463		7	ы		ы	6
			+ +	+	+	+	+		×	×		×	×
	L8a	L8b	b1 1.770	PI Iq	1.770	V4a	2.463		X 0.75	X 0.75		X 0.75	X 0.75
	×	×	ı ı	ı	ŀ	<u> </u>	<u> </u>						
	a4	a4	b4a 65 277	b4b	65.277				L2b)	7.064	·	(12b)	7.064
6. BASE BEDDING:	V4a=	V4b=	V5a= (	V5b= (		TOTAL =		8. FORM :	= (L2a +	(7.064 +	9. SCAFFOLDING :	= (L2a +	(7.064 +

2 - 10 - 10

.

16.252 (m3) 16.252 (m3)

## 2.11. Box culvert at station 11+976.5

BOX CULVERT

11+976.5

1	BOX CULVERT STATI				11+976	=====	<u></u>		<u></u>				<u></u>	<u></u>	******	****	QUANTITIES
	L			+		-	0.02		27.143								QUANTITES
	CULVERT	Γ	1		1	<u> </u>	0.01		27.140				<u></u>				
	CONCRETE (M3)																
ľ	S1	=	5,800	x	4.750		5.000	x	4,000	+	2	x	0,300	x	0.300	ų	7,730
	52	i i					0.200		0.200	:	2					u	0.410
	S	Ŧ	<b>S</b> 1	÷												ţt	8,140
	VOLUME	=	S	x	(13.562	÷	13.562)	+	5.800	x	0.200	х	0.300	x	2	Ħ	221.48
							,										
							SINC	SLE	BOX C	UL\	(ERT						
							⊢		5800								
									500								
	·					1	8      8				 	1					
							l Th	Loo B	†		$\mathbb{N}$						
	· .					9			S2		11						
						4750	ŝ	1200	1//		11						
											川						
	i					]			· · · · · · · · · · · · · · · · · · ·		_]						
	FORM (M2)	1					•										<u>674.345</u>
	INSIDE FORM (M2)				· .												<u>874.345</u> 387.314
	BOX BULWARK	_	<i>u</i> a <i>00</i> 0		ว		0.200		(1:SIN45⁰	I	1))		27122		-		
ł	BOTTOM OF THE BOX				∡ 0.300		0.300 2)		27.123		1))	х	27.123	х	-	#	230.466
			(0.000	-	000	x	•				1						119.341
	RETAINING WALL OUTSIDE FORM (M2)	=					(1.500	+ 1	(1:SIN45 ⁰	-	1)	х	0.200)	х	27.12	=	37.507
	BOX BULWARK	_	4.750		2		27.123	Ŧ	4	<b>x</b> .	0.300	x	0.200				287.032
ļ			-1.7.30 S			· · .	SIN85 ⁰					-					257.909
	THE END OF CULVERT CENTER	H	S	x	2	•	SINOD	+	5.800	x	0.200	х	4			=	20.983
	SCAFFOLDING (M2)		-		WARK											=	8.140
	SUPPORT		DOND													=	<u>257.909</u>
	AREA (M2)	±	4,750	¥	2,000	v	27.123	÷	1 000	x	0.300	v	0.200			_	1.360
	VOLUME (M3)	1	AREA			Ŷ	dal . 1 dad	•	4.000	Ŷ	0.500	^	0.200			_	<u>36.914</u>
				^												_	30.714
		ĺ															
	н. Н																
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	· · · ·																

BOXCULVERT STATION 11+976.5
QUANTITIES TABLE OF REINFORCEMENT
SEGMENT 1 & 2

				SEGMEN	11&2		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1a	7770	250	20	108	2.466	839.2	2069.5
1b	7782	250	20	3	2.466	23.3	57.6
2	4610	250	20	106	2.466	488.7	1205.1
3a	6604	250	22	53	2.984	350.0	1044.4
3b	6627	250	22	2	2.984	13.3	39.5
4a	6360	250	20	108	2.466	686.9	1693.9
4b	6382	250	20	3	2.466	19.1	47.2
5a	3220	250	12	108	0.888	347.8	308.7
5b	3232	250	12	6	0.888	19.4	17.2
6a	6575	250	20	53	2.466	348.5	859.4
6b	6598	250	20	2	2.466	13.2	32.5
7	5170	250	16	111	1.578	573.9	905.8
8a	1567	250	12	108	0.888	169.2	150.2
8b	1571	250	12	3	0.888	4.7	4.2
9a	1638	250	12	108	0.888	176.9	157.0
9Ь	1642	250	12	3	0.888	4.9	4.4
10	1560	250	12	24	0.888	37.4	33.2
11	5682	250	12	2	0.888	11.4	10.1
12	3700	250	12	54	0.888	199.8	177.4
13	1355	250	12	54	0.888	73.2	65.0
14	14207	250	12	48	0.888	681.9	605.4
15	14068	250	12	32	0.888	450.2	399.7
16	14546	250	12	32	0.888	465.5	413.2
17	14006	250	12	10	0.888	140.1	124.3
18	14307	250	12	48	0.888	686.7	609.7
19	1410	250	14	228	1.208	321.5	388.5
20	1440	250	12	228	0.888	328.3	291.5
REINFORG		D<=14		3759.7	TOTAL FOR SEG	MENT 1 :	······································
REINFOR		=D< <b>=</b> 25		7955.1	REINFORCEMEN	IT (KG):	11714.8
REINFOR	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³):</td><td></td><td>110.74</td></d=32<>			CONCRETE (M ³ ):		110.74
			TOTA	and the second se	GMENT 1 & 2	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
REINFOR		D<=14			REINFORCEMEN	IT (KG) :	23429.7
REINFOR		=D<=25		15910.16			······································
REINFOR	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³)</td><td>:</td><td>221.48</td></d=32<>			CONCRETE (M ³ )	:	221.48

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2 WINGWALL TY		
<u>51,52</u>	WING WALL TYPE I A - A	
051.6	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	- 1600 -
	$\frac{\sqrt{1}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{3}}$	
3700	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2
+ CALCULATING VA	ALUES	
S1	= 0.200 x 4.350 =	0.870
S2	= S1 : cos ⁻⁰ = 0.870 : 0.993 =	0.877
S3	$= (4.350 + 0.600) \times (7.700 - 0.200) : 2 \times \cos^{50} =$	18.633
54	$= 53 : \cos^{-0} = 18.633 : 0.993 =$	18.773
S5	= (0.784 - 0.251) x 4.350 : 2 =	1.159
S6	= (0.323 - 0.251) x 0.600 : 2 ×	0.022
S7	= 55 + (4.350 x 0.251) = 1.159 + 1.092 =	2.251
- S8	= 56 + (0.600 x 0.251) $=$ 0.022 + 0.151 =	0.173
59	= 3.700 x 1.000 =	3.700
+ CONCRETE (m ³ )	<b>2</b>	<u>36.97</u>
- Footing	$= 59 \times 7.700 = 3.700 \times 7.700 =$	28.490
- Wing wall	= V1 + V2 + V3 = 4.677 + 3.350 + 0.450 =	8.477
V1	$= 53 \times 0.251 = 18.633 \times 0.251 =$	4.677
V2	$= (7.700 - 0.200) : 3 \times (55 + 56 + (55 \times 56)^{0.5})$ = 2.500 × (1.159 + 0.032 + 0.160)	0.000
V3	$= 2.500 \times (1.159 + 0.022 + 0.160) =$ = S7 x 0.200 = 2.251 x 0.200 =	3.350
+ FORM (m ² )		0.45
	= (7.700 · ································	<u>64.44</u>
- Footing	$= (7.700 : \cos^{-1} + 59) \times 2 = (7.729 + 3.700) \times 2 =$	22.859
- Wing wall	= 51 + 52 + 53 + 54 + 57 + 58 = 0.870 + 0.877 + 18.633 + 18.773 + 2.251 + 0.173 =	19
+ SCAFFOLDING (m ²	2,	41.576
		<u>65.06</u>
- Footing - Wing wall	$= (7.700 : \cos^{50} + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 =$	26.859
- ming wan	$= 53 + 54 + 0.600 \times (0.323 + 1.000)$ = 18.633 + 18.773 + 0.794 =	20.000
	= 18.633 + 18.773 + 0.794	38.200

	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
BAK WAKA	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	3571	12	39	0.888	139.2	123.6
1b	3701	18	39	1.998	144.3	288.3
2a	7870	12	6	0.888	47.2	41.9
2b	4396	12	36	0.888	158.3	140.5
2c	552	12	39	0.888	21.5	19.1
e	8696	12	2	0.888	17.4	15.4
4	8691	12	38	0.888	330.3	293.2
Sa	5350	12	37	0.888	198.0	175.7
5b	3660	12	2	0.888	7.3	6.5
5c	4344	22	37	2.984	160.7	479.6
Sd	2654	22	2	2.984	5.3	15.8
6	2944	14	81	1.208	238.5	288.2
7	4008	12	4	0.888	16.0	14.2
8	4008	12	6	0.888	24.0	21.4
6	7617	12	6.	0.888	45.7	40.6
10	1304	14	14	1.208	18.3	22.1
11	847	12	21	0.888	17.8	15.8
12	3241	12	2	0.888	6.5	5.8
		<b>REINFORCEMENT:</b>		D=<14	1224.0 KG	KG
-		<b>REINFORCEMENT:</b>		14< D<=25	783.8 KG	KG
		TOTAL REINFORC	NFORCEMENT :		2007.8 KG	KG

BOX CULVERT STATION 11+976.5 REINFORCEMENT OF WINGWALL TYPE I

- 11	3 WINGWALL TYPE II	
	WING WALL TYPE II	
	A-A	
ĺ	S7 S7 Br cr St S	
	\$3,\$4 KB \$5 \$	
	1700         [589] 799]         2317         2849         f [512]           (A)         (6)         1700         133	
ļ	(b)         (b)         (c)         (c) <th(c)< th=""> <th(c)< th=""> <th(c)< th=""></th(c)<></th(c)<></th(c)<>	
	$\frac{\sqrt{1}}{\sqrt{2}}$	
		•
1	53-56 SG SG	
		•
ľ	+ CALCULATING VALUES	
		0.82
	$52 = 51 : \cos^{-0} = 0.870 : 0.993 =$	0.82
		19.7
		19.9
		1.1
		0.02
		0.1
IJ		3.70
	+ CONCRETE (m ³ ) =	<u>37.</u>
		28.4
		8.97
		5.17
	V2 = $(7.700 - 0.200)$ : 3 x $(55 + 56 + (55 \times 56)^{0.5})$ = $2.500 \times (1.175 + 0.022 + 0.161)$ =	3.4(
Į		0.4
		<u>67.</u>
		23.7
	-Wing wall = $S1 + S2 + S3 + S4 + S7 + S8$	
		43.8
		<u>68.2</u>
		27.7
	- Wing wall = $53 + 54 + 0.600 \times (0.333 + 1.000)$ = $19.754 + 19.902 + 0.800$ =	
I	= 19.754 + 19.902 + 0.800 =	40.4

,

	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	HUTAL LENGTH	TOTAL WEIGHT
DAIN MEMININ	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	3573	12	41	0.888	146.5	130.1
lb	3704	18	41	1.998	151.8	303.3
2a	8065	12	6	0.888	48.4	43.0
2b	4525	12	36	0.888	162.9	144.6
2c	552	12	41	0.888	22.6	20.1
3	8907	12	2	0.888	17.8	15.8
4	8930	12	36	0.888	321.5	285.4
5a'	5238	12	35	0.888	183.3	162.8
5h	3611	12	8	0.888	28.9	25.6
5c	4232	22	35	2.984	148.1	442.0
5d	2605	22	8	2.984	20.8	62.2
6	2944	14	72	1.208	212.0	256.1
7	4004	12	4	0.888	16.0	14.2
8	4004	12	. 6	0.888	24.0	21.3
6	7856	12	6	0.888	47.1	41.8
10	1304	14	-14	1.208	18.3	22.1
11	858	- 12	21	0.888	18.0	16.0
12	3291	12	2	0.888	6.6	5.8
		REINFORCEMENT		D=<14	1204.8 KG	KG
		<b>REINFORCEMENT</b> :		14< D<=25	807.5 KG	KG
		TOTAL REINFORG	FORCEMENT :		2012.3 KG	KG

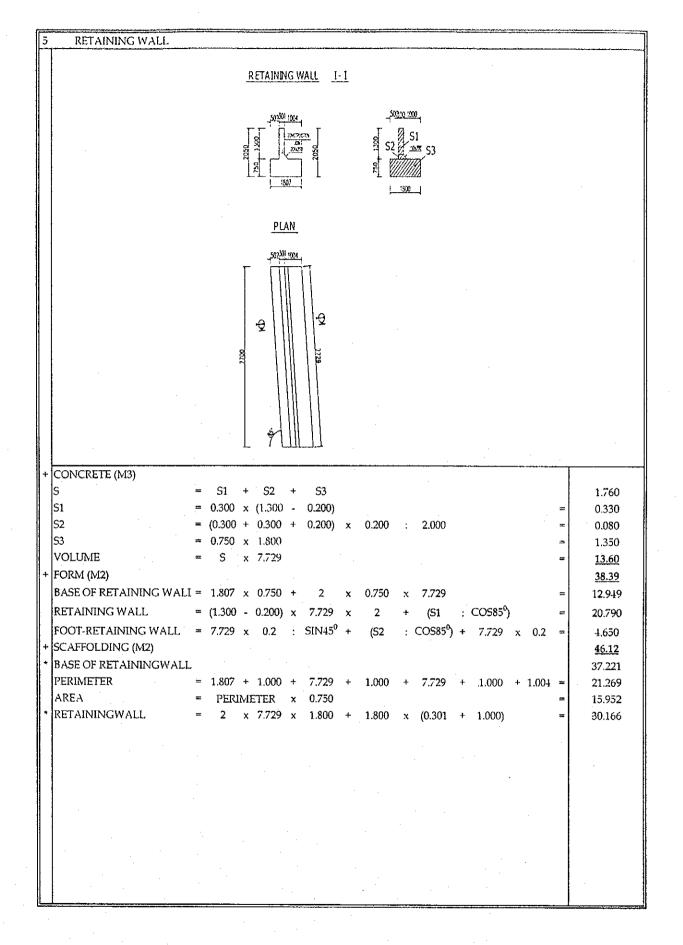
BOX CULVERT

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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	4 WINGWALL TYPE		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	WI		
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
+ CALCULATING VALUES S1 = 0.200 x 4.350 S2 = S1 : $\cos 5^{-1}$ = 0.870 : 0.993 = 0.877 S3 = (4.350 + 0.600) x (7.700 - 0.200) : 2 x $\cos 25^{-1}$ = 20.481 S4 = S3 : $\cos 5^{-1}$ = 20.481 : 0.993 = 20.633 S5 = (0.852 - 0.276) x 4.350 : 2 = 1.253 S6 = (0.355 - 0.276) x 0.600 : 2 = 0.024 S7 = S5 + (4.350 x 0.276) = 1.253 + 1.201 = 2.454 S8 = S6 + (0.600 x 0.276) = 0.024 + 0.166 = 0.190 S9 = 4.000 x 1.000 = 4.000 x 7.700 = 4.000 S9 = 4.000 x 1.000 = 4.000 x 7.700 = 30.800 - Footing = S9 x 7.700 = -4.000 x 7.700 = 30.800 - Wing wall = V1 + V2 + V3 = 5.653 + 3.630 + 0.491 = 9.774 V1 = S3 x 0.276 = 20.481 x 0.276 = 5.653 + 3.630 + 0.491 = 9.774 V1 = S3 x 0.276 = 20.481 x 0.276 = 5.653 + 3.630 + 0.491 = 9.774 V1 = S3 x 0.276 = 20.481 x 0.276 = 5.653 + 3.630 + 0.491 = 9.774 V1 = S3 x 0.276 = 20.481 x 0.276 = 5.653 + 3.630 + 0.491 = 9.774 V1 = S3 x 0.276 = 20.481 x 0.276 = 0.491 = 9.774 V1 = S3 x 0.276 = 2.454 x 0.200 = 0.491 = 2.500 x (1.253 + 0.024 + 0.173) = 3.630 V3 = 57 x 0.200 = 2.454 x 0.200 = 0.491 = 70.50 V3 = 57 x 0.200 = 2.454 x 0.200 = 0.491 = 70.50 V3 = S1 + S2 + S3 + S4 + S7 + S8 = 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506 = 70.92			
$\begin{cases} 51 = 0.200 \times 4.350 \\ 52 = 51 : \cos^{-1} = 0.870 : 0.993 \\ 53 = (4.350 + 0.600) \times (7.700 - 0.200) : 2 \times \cos^{25^{0}} = 20.481 \\ 54 = 53 : \cos^{-1} = 20.481 : 0.993 \\ 55 = (0.852 - 0.276) \times 4.350 : 2 \\ 56 = (0.355 - 0.276) \times 0.600 : 2 \\ 57 = 55 + (4.350 \times 0.276) = 1.253 + 1.201 = 2.454 \\ 58 = 56 + (0.600 \times 0.276) = 0.024 + 0.166 \\ 59 = 4.000 \times 1.000 \\ + CONCRETE (m^{3}) \\ -Footing = 59 \times 7.700 = -4.000 \times 7.700 \\ -Wing wall = V1 + V2 + V3 = 5.653 + 3.630 + 0.491 \\ V1 = 53 \times 0.276 = 20.481 \times 0.276 \\ V2 = (7.700 - 0.200) : 3 \times (55 + 56 + (55 \times 56)^{05}) \\ = 2.500 \times (1.253 + 0.024 + 0.173) \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 51 + 52 + 53 + 54 + 57 + 58 \\ = 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 \\ V3 = 70.92 \\ V3 = 51 + 52 + 53 + 54 + 57 + 58 \\ = 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 \\ = 70.92 \\ \hline$		<u>511-56</u>	
$\begin{cases} 51 = 0.200 \times 4.350 \\ 52 = 51 : \cos^{-1} = 0.870 : 0.993 \\ 53 = (4.350 + 0.600) \times (7.700 - 0.200) : 2 \times \cos^{25^{0}} = 20.481 \\ 54 = 53 : \cos^{-1} = 20.481 : 0.993 \\ 55 = (0.852 - 0.276) \times 4.350 : 2 \\ 56 = (0.355 - 0.276) \times 0.600 : 2 \\ 57 = 55 + (4.350 \times 0.276) = 1.253 + 1.201 = 2.454 \\ 58 = 56 + (0.600 \times 0.276) = 0.024 + 0.166 \\ 59 = 4.000 \times 1.000 \\ + CONCRETE (m^{3}) \\ -Footing = 59 \times 7.700 = -4.000 \times 7.700 \\ -Wing wall = V1 + V2 + V3 = 5.653 + 3.630 + 0.491 \\ V1 = 53 \times 0.276 = 20.481 \times 0.276 \\ V2 = (7.700 - 0.200) : 3 \times (55 + 56 + (55 \times 56)^{05}) \\ = 2.500 \times (1.253 + 0.024 + 0.173) \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 57 \times 0.200 = 2.454 \times 0.200 \\ V3 = 51 + 52 + 53 + 54 + 57 + 58 \\ = 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 \\ V3 = 70.92 \\ V3 = 51 + 52 + 53 + 54 + 57 + 58 \\ = 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 \\ = 70.92 \\ \hline$	+ CALCIU ATINC VAL	TIEC	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	[ [		0.870
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- Wing wall = V1 + V2 + V3 = $5.653 + 3.630 + 0.491 = 9.774$ V1 = $53 \times 0.276 = 20.481 \times 0.276 = 5.653$ V2 = $(7.700 - 0.200) : 3 \times (55 + 56 + (55 \times 56)^{0.5})$ = $2.500 \times (1.253 + 0.024 + 0.173)$ = $3.630$ V3 = $57 \times 0.200 = 2.454 \times 0.200$ = $0.491$ + FORM (m ² ) = $70.50$ - Footing = $(7.700 : \cos 25^0 + 59) \times 2 = (8.496 + 4.000) \times 2 = 24.992$ - Wing wall = $51 + 52 + 53 + 54 + 57 + 58$ = $0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506$			
$V1 = 53 \times 0.276 = 20.481 \times 0.276 = 5.653$ $V2 = (7.700 - 0.200) : 3 \times (55 + 56 + (53 \times 56)^{0.5})$ $= 2.500 \times (1.253 + 0.024 + 0.173) = 3.630$ $V3 = 57 \times 0.200 = 2.454 \times 0.200 = 0.491$ $+ FORM (m^2) = (7.700 : \cos 25^0 + 59) \times 2 = (8.496 + 4.000) \times 2 = 24.992$ $- Wing wall = 51 + 52 + 53 + 54 + 57 + 58$ $= 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506$ $+ SCAFFOLDING (m^2) = 70.92$	· · · · ·		
$V2 = (7.700 - 0.200) : 3 \times (55 + 56 + (53 \times 56)^{0.5})$ $= 2.500 \times (1.253 + 0.024 + 0.173) = 3.630$ $V3 = 57 \times 0.200 = 2.454 \times 0.200 = 0.491$ $+ FORM (m^2) = (7.700 : \cos 25^0 + 59) \times 2 = (8.496 + 4.000) \times 2 = 24.992$ $- Wing wall = 51 + 52 + 53 + 54 + 57 + 58$ $= 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506$ $+ SCAFFOLDING (m^2) = 70.92$	-		1
$= 2.500 \times (1.253 + 0.024 + 0.173) = 3.630$ $V3 = 57 \times 0.200 = 2.454 \times 0.200 = 0.491$ $= 70.50$ $= 70.50$ $= 77.700 : \cos 25^{0} + 59) \times 2 = (8.496 + 4.000) \times 2 = 24.992$ $= 51 + 52 + 53 + 54 + 57 + 58$ $= 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506$ $= 70.92$			
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$			3.630
+ FORM (m ² ) = $70.50$ - Footing = $(7.700 : \cos 25^{10} + 59) \times 2 = (8.496 + 4.000) \times 2 = 24.992$ - Wing wall = $51 + 52 + 53 + 54 + 57 + 58$ = $0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506$ + SCAFFOLDING (m ² ) = $70.92$	V3		
-Footing = $(7.700 : \cos 25^{0} + 59) \times 2 = (8.496 + 4.000) \times 2 =$ -Wing wall = $51 + 52 + 53 + 54 + 57 + 58$ = $0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 =$ + SCAFFOLDING (m ² ) = $70.92$	+ FORM $(m^2)$		
- Wing wall = $S1 + S2 + S3 + S4 + S7 + S8$ = $0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190$ = $45.506$ + SCAFFOLDING (m ² ) = $70.92$	- Footing		
= 0.870 + 0.877 + 20.481 + 20.635 + 2.454 + 0.190 = 45.506 + SCAFFOLDING (m ² ) = $70.92$			
+ SCAFFOLDING $(m^2)$ = $\underline{70.92}$			5.506
	+ SCAFFOLDING (m ² )		
-Footing = $(7.700 : \cos 25^{\circ} + 1.000 + 4.000 + 1.000) \times 2 \times 1.000 = 28.992$			
- Footing= $(7.700 : \cos 25^{\circ} + 1.000 + 4.000 + 1.000) \times 2 \times 1.000 =$ 28.992- Wing wall= $53 + 54 + 0.600 \times (0.355 + 1.000)$	-		0.772
= 20.481 + 20.635 + 0.813 = 41.929			1.929

RAP MARK	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
1a	3575	12	43	0.888	153.7	136.5
1b	3709	18	43	1.998	159.5	318.6
2a.	8609	12	6 .	0.888	51.7	45.9
2b	4806	12	36	0.888	173.0	153.6
2c	552	12	43	0.888	23.7	21.1
3	9505	12	2	0.888	19.0	16.9
4	9446	12	38	0.888	358.9	318.7
5a	5289	12	34	0.888	179.8	159.7
5b	3636	12	15	0.888	54.5	48.4
5c	4283	22	34	2.984	145.6	434.5
5d	2630	22	15	2.984	39.5	117.7
6	2944	14	88	1.208	259.1	313.1
7	4296	12	4	0.888	17.2	15.3
8	4296	12	6	0.888	25.8	22.9
6	8372	12	6	0.888	50.2	44.6
10	1304	14	14	1.208	18.3	22.1
11	891	12	21	0.888	18.7	16.6
12	2742	12	3	0.888	8.2	7.3
		REINFORCEMENT :		D=<14	1342.4 KG	KG
		<b>REINFORCEMENT:</b>		14< D<=25	870.9 KG	KG
		TOTAL REINFOR	FORCEMENT :		2213.2 KG	KG

BOX CULVERT STATION 11+976.5 REINFORCEMENT OF WINGWALL TYPE 111

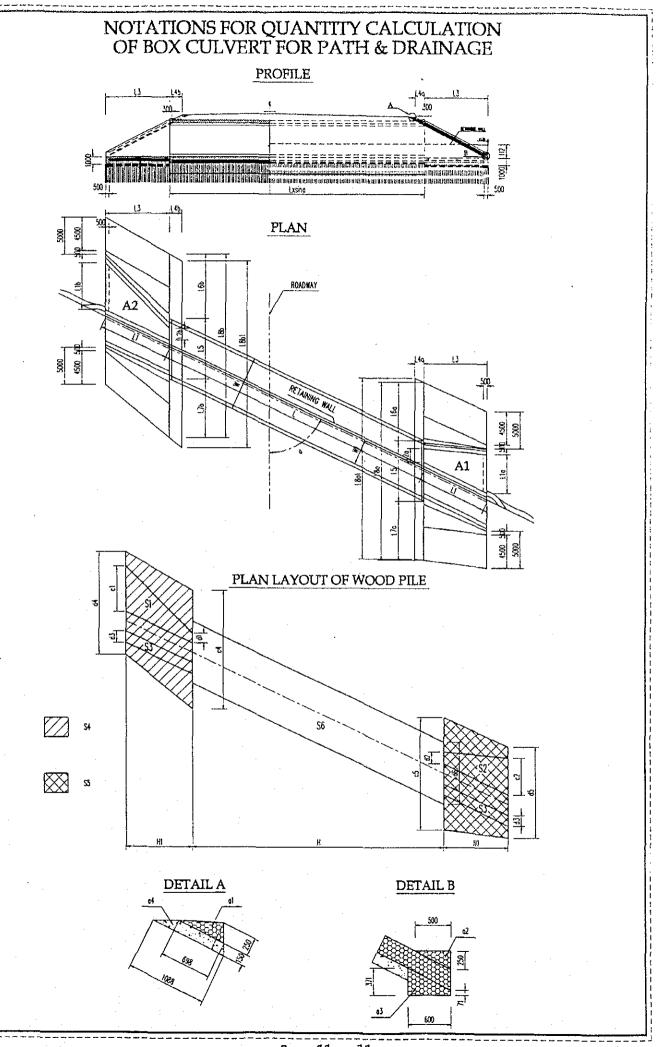
BOX CULVERT

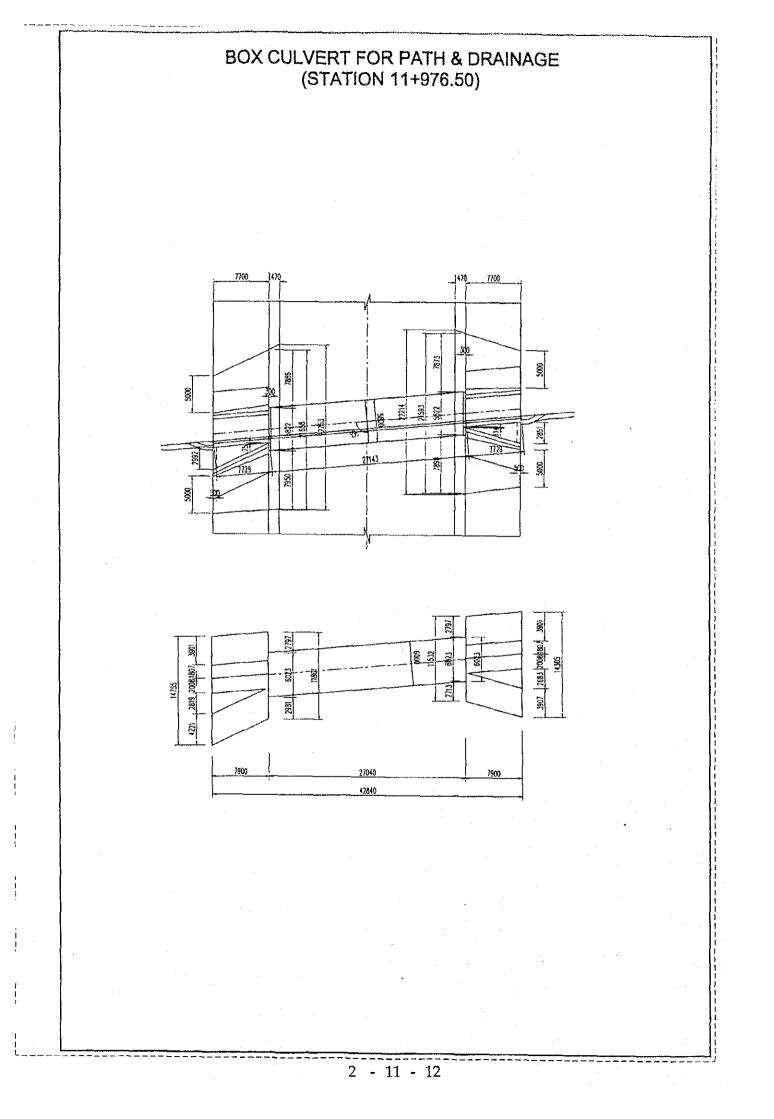


BOX CULVERT STATION 11+976.5 REINFORCEMENT OF RETAINING WALL

.

BAR MARK	UNIT LENGTII	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
1	4496	12	40	0.888	179.8	159.7
2	7830	12	10	0.888	78.3	69.5
3	1410	12	40	0.888	56.4	50.1
4	2572	12	74	0.888	190.3	169.0
5	8501	12	16	0.888	136.0	120.8
9	2444	14	27	1.208	66.0	7.9.7
7	2150	12	8	0.888	17.2	15.3
8	8073	12	4	0.888	32.3	28.7
		REIFORCEMENT	NT	D<=14	692.7 KG	KG
		REIFORCEMENT	NT	14< D<=25	0.0	0.0 KG
		<b>TOTAL REINFORCEMENT:</b>	FORCEMENT	••	692.7 KG	KG





(100m)399.413 (m3) 9.012 (m3) (2×S3))×(25×5:100) 28.551)×1.250 L1b 2.992 17.840 TABLE OF EXPLAINING QUANTITIES OF CULVERT L1a 2.851 8 (m3) 32.572 0.100 × **CULVERT KM 11+976.5** S2 10.598 (m2) (m2) (m2) (m2) 0.500 0.500 (m2) (m2) (m2) (m2) (m2) (m2) (m2) II 104.896 102.056 11.135 10.598 11.415 11.808 ×× 0.2 0.700 11 11 ä × S3 14.275 11.135 S 6.000 (m2) (m2) (m2) 2.00 2.00 2.00 3 2 **N N N N N** × 162.862 14.275  $(w+0.2) \times 0.2 = 27.143$ 1H 7900 1H 1H 1H 7.900 7.900 7.900 L3 7.700 L3 7.700 t 0.300 2.900 Η 102.056 162.862 ß S6 2. CONCRETE FOUNDATION OF CULVERT: × di 0.000 d2 0.000 d4 d5 14.755 d5 14.755 d6 0.023 S3 14.275 L2a 0.114 L2b 0.075 A2 11.808 102.056 SS S6= 27.040 x L. APRON CONCRETE: **3. LEAN CONRETE:** c2 2.683 c4 11.801 c5 d3 d3 d3 H 11.415 104.896 104.896 L1a 2.851 L1b 2.992 2.819 Al 5 ×  $\mathfrak{A}$ 4. WOOD PILE: 2 ₽ # # W5= A1= A1= # U W5≖ S1= S2= S2= S4= S5= S5= S3= S3= <u>S6</u> A2= A2= = Y = V = О L=5M S5=

<u>L=3M</u>	Ū	+	Ĵ	+	ŝ	() < C3.)	+	(U 8 ~ 7 E ~ 7)	5 × 2	2 2 2	1001 - 5 - 2	şi		
~ _	11.135	• +	10.598	• +	79 78 78	(4 X 33 ) 28.551	· +	14.400	(# <b>4</b>	) × (22 × 1 ) × 0.75	5 ×	: II	48.513	(100
PROTECTION	NO													
) =1EM	S	×	25.000	×	3.000	×	2.0		••	100.000	·	11		1001)
~	1.920	×	25.000	×	3.000	×	2.0		••	100.000		ł	2.880	1001)
= 'IOTAI'	11	$\overline{}$	W3	+	W31		ł	51.393	(100m)					
NOTE: S=0.8 x		: 4 IS	4.5 × 4 IS AREA WOOD FILE TOE OF SLOPE	100/	O PILE 1	OE OF (	SLOP	뙤						
														·
5. SAND BEDI	DDING:	ଞା												
K = (	2	+	SS	+	ß	6	÷	(0.8 × 4.5 × 4)	5 x 4)	× (	0.150	11	·	
1 =	104.896	+	102.056	+	162.	162.862	<b>+</b> _	14.400	8	× (	0.150	Π	57.632	(m3)
PROTECTION	NO													
K1= (	S7	×	0.150	×	2.000		ű		(m3)		·			
Ċ	1.920	×	0.150	×	2.000		ű		(m3)					
TOTAL =	11	$\overline{}$	ч	+	КI К	-	ŧ	58.208	(m3)					
6. STONE MASONRY	IASON	RY												
a1=	0.698	×	0.250		×	0.500			II	0.087	(m2)			
a2=	0.500	×	0.250		×	0.500			11	0.063	(m2)			
a3= (	0.071	+	0.371		×	0.500	×	0.600	u	0.133	(m2)			
a4= (	0.698	÷	1.088		×	0.500	×	0.150	11	0.134	(m2)			
b1=	0.300	×	51	II		(m2)					·			
b]=	0.300	×	5.822	H	1.747	(շու)								
h2a= (	Léa	+	5.000	-	×	51	×	0.500	11		(m2)			
س	7.873	+	5.000	$\sim$	×	7.700	×	0.500	Ű	49.561	(m2)			
b2b= (	L6b	+	5.000		×	13	×	0.500	ij	•	(m2)			
) 	7.886	+	5.000		×	7.700	×	0.500	║.	49.611	(m2)			
b3a= (	L7a	+	5.000		×	L3	×	0.500	h		(m2)		•	
)    	7.898	+	5.000		×	7.700	×	0.500	11	49.657	(m2)			
b3b= (	L7b	+	5.000	$\widehat{}$	×	L3	×	0.500	II	۰.	(m2)	•		
 	7.950	÷	5.000		×	7.700	×	0.500	11	49.858	(m2)		·	

(100m) (100m) (100m)

2 - 11 - 14

																•								-							
																								20.741		20.795					
											(m3)	(Em3)	(Em3)	(Em3)			(m3)	(m3)	(m3)		(11)3)	(cm)	1	11	II	IJ					
												36.245		36.336			3.326	-	83.689		2076	0/477	COS(76 565)		COS(26.565)					(m3)	(m3)
											II	H	Ħ	n		Ħ	11	IL	ß		I		č	0.894	S	0.894					48.089
											COS(26.565)	0.894	COS(26.565)	0.894		0.25 )		V3c )	3.326 )				0.150	0.150 :	0.150 :	0.150 :				II	11
											COS	-	COS	-		2.00 × 0.25	0.50	+	+				-	-	_	-				-	$\sim$
											••	••	••			×	×	V3b	36.336				×	: ×	×	×				V5c	0.596
	(m2)	(m2)	(m2)	(m2)	(m2)		(En3)	(m3)	(Em)	(Em3)	0.250	0.250	0.250	0.250	·	S8	66'1	+	+				~	~ ~	$\sim$					+	+
		32.198		32.275	6.000		1.938	1.942		3.902	×	×	×	×		_	)	V3a	36.245		110 00	417.77 77 752	h5	6.000	b5	6.000				V5b	20.795
·	11	lt .	II	11	11		11		II	II		-				+	÷	+	+		>	< >	 د	ŧ	ı	,		(m3)	(m3)	÷	+
	x0.500	× 0.500	× 0.500	x 0.500			× 22.214	× 22.253	x 4.000	× 4.000	b1	1.747	P1	1.747		2.0 )	2.0 )	V2	3.902		YOL U	401.U	-0.10	1.747	19	1.747		18	= 0.596	V5a	20.741
	L4a	1.470	L4b	1.470	2.000		0.087	0.087	5.000	5.000	,	•	ì		÷	×	×	+	+		I			ı	,	١				+	+
	×(	.×.	×	×			tt	II I	×	×	+ bła	+ 32.198	+ b4b	+ 32.275		× 0.600	× 0.600	+ V1b	+ 1.942				+ hda	+ 32.198	+ b4b	+ 32.275	·	x 2.000	x 2.000	+ V4b	+ 2.981
	l.8a1	22.214	1.851	22.253	5.000		L&a1	1,8b1	a3	0.133	b3a	49.657	b3b	49.858			0.600	Vla	1.938		1 8-1	L041 1 851	haa	49.657	b3b	49.858		0.150	0.150	V4a	2.976
	+	+	+	+	×		×	×	+	+	+	+	+	+		×	×	_	J		, , ,	< >	< +	+	+	+		×	×		_
	L8a	21.593	L8b	21.658	0.600		al	al	a2	0.063	b2a	49.561	b2b	49.611	NOL	61	3.240	.L =		EDDING	Ve		En h7a	49.561	b2b	49.611	NOI	88 88	1.99	L =	
	b4a= (	-	b4b= (	Ĭ	b5= (	• .	V1a=	V1b=	V2= (	<b>)</b> =	V3a= (	) =	V3b= (	) =	PROTECTION	V3c= (		TOTAL =	·	7. BASE BEDDING:		-64V	$V_{Sa=}$	. 11	V5b= (	) 	PROTECTION	V5c= (	)	TOTAL =	

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(m3) (m3)

				(m3)	<u>134.193</u> (m3)		-						
-	÷			Ħ	II								
		(E113)		0.400	0.400					(m2)			(m2)
		59.641		ł	ı					11.686			11.686
	ļ	11		H2	1.300			1	t	11		II	N
		0.400		Ļ	<u> </u>			ć	1	7		7	3
	×	×		×	×			;	×	×		×	×
	W1	3.500		Ш	3.500			٣	Ŧ	<b>,</b> ,		<b>, 14</b>	-
	×	×		×	×	÷		;	×	×		×	×
								-	-				
	2 x L1	15.458		2 × L1	15.458			11	111	2.992		qrı	2.992
	+	+		+	÷			4	F	+		+	+
E	L	( 27.143	ILI.	7	27.143			-	L19	2.851	DIDING	L1a	2.851 +
<u>8. PATH</u> a. LATERITE	M = (	<b>`</b>	b. SAND FILL	) = Z	)			9.FORM :	-	<u>`</u>	10.SCAFFOLDING :	-) =	•

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### 2.12. Box culvert at station 12+180

BOX CULVERT

12+180

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Ī	BOX CULVERT STATI				12+180						<u></u>		<u></u>				QUANTITIES
1	L CULVERT	<u> </u>	19.210	+	19.210	+	0.02	=	58.440			~~~~~				<b></b>	
	CONCRETE (M3)																
	S1 = S2		2.050	v	2 550	_	2 500	v	2.000	Ŧ	2	v	0.100	v	0.100	· -	2,543
	S	=	S1	+		-	2.500	^	2.000	•	2	^	0,100	^	0.100	1	5.085
	VOLUME	_	S			<b>1</b> +	19.210	+	5.900	v	ຄວດຄ	J	0.300	J	'n		
	VOLONIE		5	^	(1).210		19.210)		5.770	^	0.200	~	000	~	£	-	170.00
							DO	UВ	LE BOX C	ULV	VERT						
									5900								
								295		295	0						
						_		250	)0 <u>300</u>	2500	) <u>300</u>	S	2				
					Т	250		i	11			/					
						_	3	ğ			$\neg$						
					2550	2000											
1						3											
					-		1	51									
	FORM (M2)																<u>716.82</u>
	INSIDE FORM (M2)		/a = -		_				(a								500.665
	BOX BULWARK								(1:SIN45 ⁰			х	38.420	х	4	. #	320.091
	BOTTOM OF THE BOX	=	(2.950	-	0.300	x	2)	х	38.420	х	2					=	180.574
	OUTSIDE FORM (M2)		0 550		0		00.000				0.700		0.000				216.157
- 1	BOX BULWARK THE END OF CULVERT		2.550 S				38.420		4	x		х	0.200			n	196.182
	CENTER		5 S	×	2	Ŧ	5.900	x	0.200	x	4					=	14.890
		-	5												. •	-	5.085
+	SCAFFOLDING (M2)		2 550	Ŷ	2 000	v	38 130	+	4.000	×	0 300	¥	0.200			Ħ	<u>196.18</u>
	SUPPORT		2.000		2.000	~			1.000	^ .	0.000	^	0.200		÷		170.10
	AREA (M2)	=	5.900	x	2.000	-	S									ä	6.715
	VOLUME (M3)	1	AREA													=	258.12
												,					
1																	
									÷								
									•		•						

			3	DEGIVIEIN I	1024		
SYMBOL	UNIT LENGTH	SPACE	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1	4160	125	14	306	1.208	1273.0	1538.3
2	2850	250	12	154	0.888	438.9	389.7
3	6270	250	14	154	1.208	965.6	1166.8
4	1500	250	14	304	1.208	456.0	551.0
5	1550	125	18	306	1.998	474.3	947.5
6	1970	250	12	308	0.888	606.8	538.7
7	2850	125	12	306	0.888	872.1	774.3
8	1049	250	12	308	0.888	323.1	286.8
9	1120	250	12	308	0.888	345.0	306.3
10	19715	250	12	52	0.888-	1025.2	910.2
11	19815	250	12	100	0.888	1981.5	1759.2
12	5780	250	12	2	0.888	11.6	10.3
13	1440	250	12	26	0.888	37.4	33.2
14	1180	250	12	461.04	0.888	544.0	483.0
15	1280	250	12	461.04	0.888	590.1	523.9
REINFORG	CEMENT :	D<=14		9271.6	TOTAL FOR 1 SE	E <u>GMENT :</u>	
REINFORG	CEMENT : 16	=D<=25		947.5	REINFORCEME	NT (KG):	10219.1
REINFOR	CEMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>98.04</td></d=32<>			CONCRETE (M ³	):	98.04
			TOTAL	, FOR SEG	MENT 1 & 2		
REINFORG	CEMENT :	D<=14	· · · · · · · · · · · · · · · · · · ·	18543.26	REINFORCEME	NT (KG) :	20438.2
REINFORG	CEMENT : 16	≂D<=25		1894.904			
REINFORG	CEMENT : 2	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³</td><td>):</td><td>196.08</td></d=32<>			CONCRETE (M ³	):	196.08

#### QUANTITIES TABLE OF BOXCULVERT STATION 12+180 SEGMENT 1 & 2

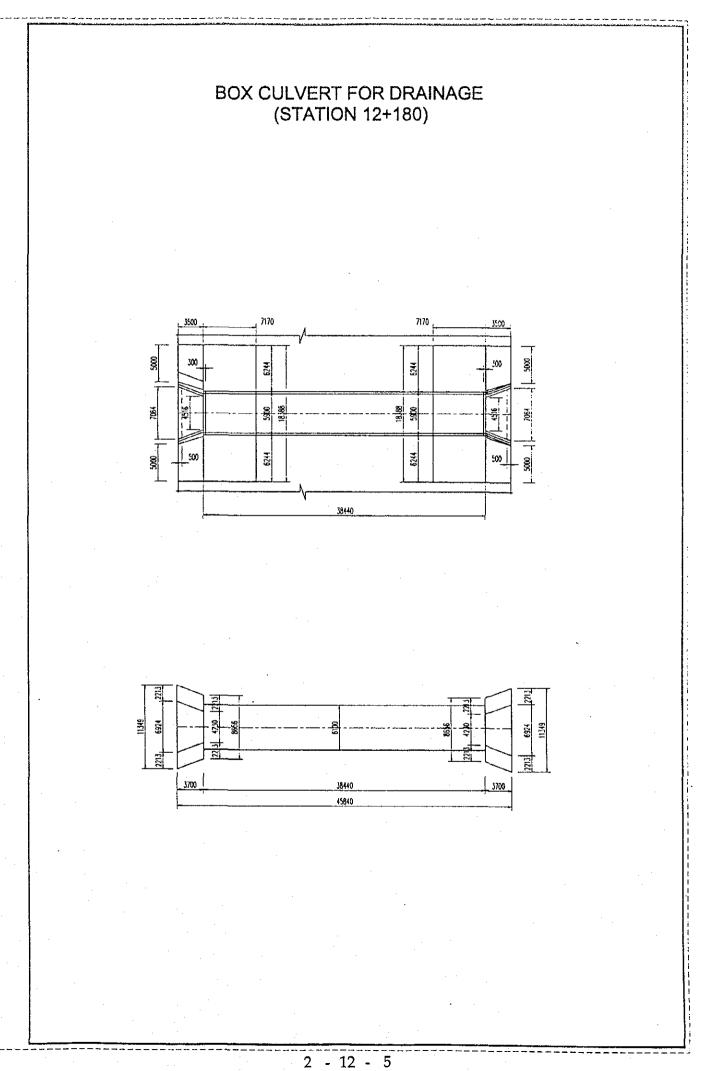
### BOX CULVERT

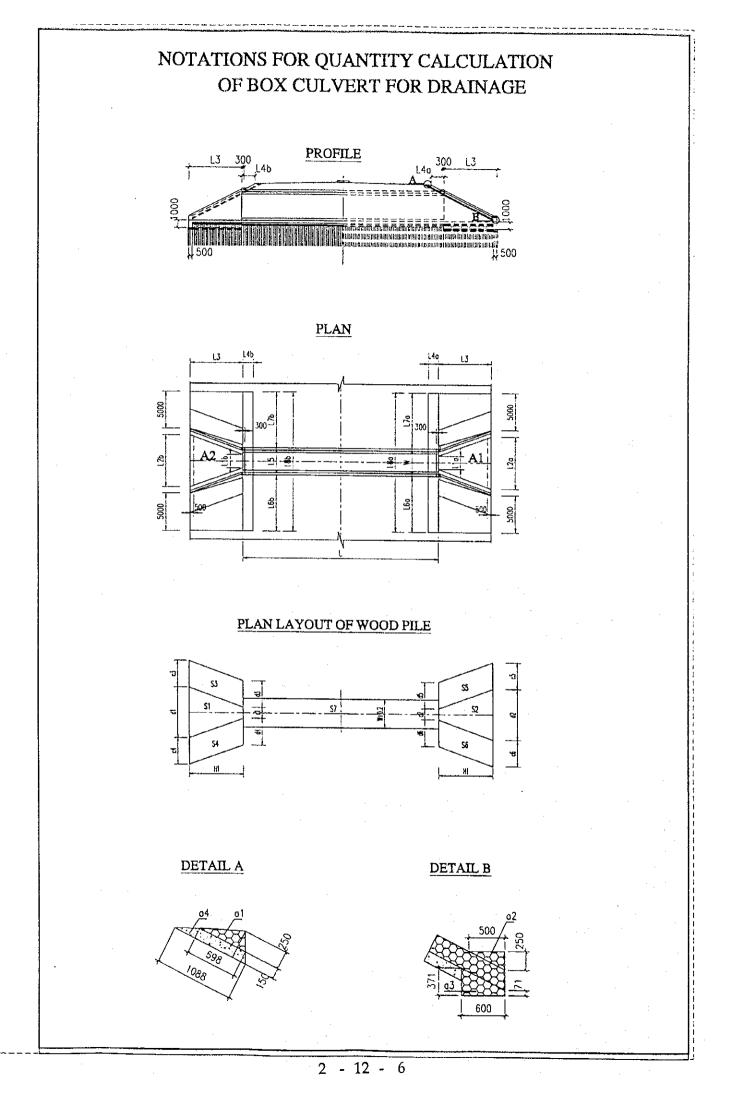
#### 12+180

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<u>S1,52</u>	WING WALL	በሮፕለ ሽ		,	- 0					
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						. 1/4	. 1/2	L.	0	
						<u>V1</u>	_ <u>V2</u> _		<u>'3</u>	
	PLAN	ł				A 57.	s5 Å	×\$*		
	· ·					$\langle \langle \rangle \rangle$	#ID ===	<u>55</u> X	1	
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	S4		200				All's H		<u>Il</u>	
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2000 2551			1274				y -	÷		
392 566	13 115		12	S8-S6		S6				
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CALCULATING VA				<u>i</u>	<u></u>		<u></u>			
CALCULATING VA S1		).200 x 2.25							=	0.450
ł .		0.200 x 2.25 S1 : cos7			).450 :	0.993	<u></u>		=	0.450 0.453
S1	= (		• =		).450 : .200) :	0.993	x cos20 ⁰		=	
S1 S2	= (: = = (:	S1 : cos7	" = )) x (3.50	0 - 0		2	x cos20 ⁰		=	0.453
51 52 53	= ( = = (;	S1 : cos7 2.250 + 0.600	" = )) x (3.50 [®] ≖	0 - 0. 5	.200) :	2	x cos20 ⁰		=	0.453 5.004
51 52 53 54	= () = () = ()	S1 : cos7 2.250 + 0.600 S3 : cos7	" = 0) x (3.50 ⁰ = 6) x 2.250	0 - 0. 5 0 :	.200) : 5.004 :	2	x cos20 ⁰	•		0.453 5.004 5.042 0.323
51 52 53 54 55	= () = () = ()	S1 : cos7 2.250 + 0.600 S3 : cos7 0.553 - 0.266 0.343 - 0.266	" = 0) x (3.50 ⁰ = 6) x 2.250	0 - 0. 5 0 : 0 :	.200) : 5.004 : 2	2	x cos20 ⁶ + 0.599		-	0.453 5.004 5.042
51 52 53 54 55 55 56	= () = () = ()	S1       :       cos7         2.250       +       0.600         S3       :       cos7         0.553       -       0.266         0.343       -       0.266         S5       +       (2.256)	" = 0) x (3.50 ⁰ = 5) x 2.25( 5) x 0.600	0 ~ 0. 5 0 : 0 :	.200) : 5.004 : 2 2	2 0.993				0.453 5.004 5.042 0.323 0.023
51 52 53 54 55 56 57	= () = (; = () = () = ()	S1       :       cos7         2.250       +       0.600         S3       :       cos7         0.553       -       0.266         0.343       -       0.266         S5       +       (2.256)	$\begin{array}{c} = \\ 0 \\ 0 \\ x \\$	0 ~ 0. 5 0 : 0 :	.200) : 5.004 : 2 2 =	2 0.993 0.323	+ 0.599	•		0.453 5.004 5.042 0.323 0.023 0.922
51 52 53 54 55 56 57 58	= () = (; = () = () = ()	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{c} = \\ 0 \\ 0 \\ x \\$	0 ~ 0. 5 0 : 0 :	.200) : 5.004 : 2 2 =	2 0.993 0.323	+ 0.599	•		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500
51 52 53 54 55 56 57 58 58 59	= () = (; = () = () = ()	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	= ) x (3.50 * 5) x 2.25( 5) x 0.60( 0 x 0.266 0 x 0.266 0 x 0.266	0 - 0 5 ) : ) : )	.200) : 5.004 : 2 2 =	2 0.993 0.323 0.023	+ 0.599			0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u>
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ )	= () = (: = (! = 2	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{c} = \\ 0 \\ 0 \\ x \\ 5 \\ x \\ 2.250 \\ 0 \\ x \\ 0.266 \\ 0 \\ x \\ 0.266 \\ 0 \\ 0 \\ x \\ 0.266 \\ 0 \\ 0 \\ 0 \\ = \end{array}$	0 - 0 5 ) : ) : )	.200) : 5.004 : 2 2 =	2 0.993 0.323 0.023	+ 0.599 + 0.160	+ 0.184		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing	= () = (; = (( = 2	S1       :       cos7         2.250       +       0.600         S3       :       cos7         0.553       -       0.266         0.343       -       0.266         S5       +       (2.25         S6       +       (0.60         2.000       x       0.755         S9       x       3.50	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 - 0. 5 0 : )) ))	.200) : 5.004 : 2 = = =	2 0.993 0.323 0.023 3.500 1.331	+ 0.599 + 0.160	•		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing - Wing wall	= () = () = (( = (( = 2 = 2	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 - 0 5 ) : )) )) 1 5	.200) : 5.004 : 2 2 = = 	2 0.993 0.323 0.023 3.500 1.331 0.266	+ 0.599 + 0.160 + 0.480	+ 0.184		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing - Wing wall V1	= () = (( = (( = 2 = 2 = 2 = ((	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 ~ 0. 5 5 : 5) : 6) 7) 7) 71 75 75 70 75 75 75 75 75 75 75 75 75 75 75 75 75	.200) : 5.004 : 2 2 = = .500 x = 5.004 x (S5 +	2 0.993 0.323 0.023 3.500 1.331	+ 0.599 + 0.160	+ 0.184		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing - Wing wall V1	= () = (( = (( = 2 = 2 = 2 = ((	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 - 0. 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : .004 : 2 2 = = .500 x = .004 x ( 55 + .086)	2 0.993 0.323 0.023 3.500 1.331 0.266	+ 0.599 + 0.160 + 0.480	+ 0.184		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2	= () = (( = (( = ( = 2 = 2 = 2 = ( = ( = 1	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 - 0. 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : 5.004 : 2 2 = = 5.004 x (S5 + .086)	2 0.993 0.323 0.023 3.500 1.331 0.266 S6	+ 0.599 + 0.160 + 0.480	+ 0.184		0.453 5.004 5.042 0.323 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480 0.184
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² )	= (( = (( = (( = 2 = 2 = 2 = (( = 1 = 1 = 1	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0 - 0. 5 5 : 5) : 6) 7) 7) 7) 7) 71 75 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : 5.004 : 2 2 = = 5.004 x (55 + .086) 0.922 x	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200	+ 0.599 + 0.160 + 0.480 + (S5 x Se	+ 0.184 5) ^{0.5} )		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480 0.184 22.50
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² ) - Footing	= (( = (( = (( = 2 = 2 = 2 = (( = 1 = 1 = 1	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{rcl} & = \\ 0 & \times & (3.50) \\ 0 & = \\ 5) & \times & 2.25( \\ 5) & \times & 0.266( \\ 0) & = \\ 0 & + & \sqrt{3} \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & = \\ 0 & =$	0 - 0 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : 5.004 : 2 2 = = .500 x = 5.004 x (S5 + .086) 0.922 x 2 =	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725	+ 0.599 + 0.160 + 0.480 + (S5 x So + 1.500)	+ 0.184 5) ^{0.5} )		0.453 5.004 5.042 0.323 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480 0.184
51 52 53 54 55 56 57 58 59 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² )	= (( = (( = (( = 2 = 2 = 2 = (( = 1 = ( = 1 = (( = 1 = (( = 1))))))))))))))))))))))))))))))))))))	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{rcl} & = \\ & & \\ & & \\ & & \\ & & \\ & \\ & \\ &$	0 - 0. 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : 5.004 : 2 2 = = .500 x = 5.004 x (S5 + .086) 0.922 x 2 = S4 +	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725 S7	+ 0.599 + 0.160 + 0.480 + (S5 × Se + 1.500) + S8	+ 0.184 5) ^{0.5} )		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 7.25 5.250 1.995 1.331 0.480 0.184 22.50 10.449
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² ) - Footing - Footing	= (( = (( = (( = ( = 2 = 2 = 2 = ( = 1 = () = () = ()	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{rcl} & = \\ & & \\ & & \\ & & \\ & & \\ & \\ & \\ &$	0 - 0. 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	.200) : 5.004 : 2 2 = = .500 x = 5.004 x (S5 + .086) 0.922 x 2 =	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725	+ 0.599 + 0.160 + 0.480 + (S5 x So + 1.500)	+ 0.184 5) ^{0.5} )		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480 0.184 <u>22.50</u> 10.449 12.053
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² ) - Footing - Wing wall SCAFFOLDING (m ²	= (( = (( = (( = ( = ( = ( = ( = ( = ( =	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{rcl} & = \\ & & \\ & & \\ & & \\ & & \\ & \\ & \\ &$	0 - 0, 5 $     5 - 5 $ $     5 - 5 $ $     5 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5 $ $     7 - 5$	$\begin{array}{c} .200) & : \\ 5.004 & : \\ 2 \\ 2 \\ = \\ = \\ \end{array}$ $\begin{array}{c} .500 & x \\ ( 55 & + \\ .086) \\ 0.922 & x \\ 2 \\ 2 \\ 54 & + \\ .042 & + \end{array}$	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725 S7 0.922	+ 0.599 + 0.160 + 0.480 + (S5 × Se + 1.500) + S8 + 0.183	+ 0.184 5) ^{0.5} ) x 2		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 7.25 5.250 1.995 1.331 0.480 0.184 22.50 10.449 12.053 22.44
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² ) - Footing - Wing wall SCAFFOLDING (m ² - Footing	= (( = (( = (( = ( = ( = ( = ( = ( = ( =	S1       : $\cos 7$ 2.250       +       0.600         S3       : $\cos 7$ 0.553       -       0.266         0.343       -       0.266         S5       +       (2.25         S6       +       (0.60         2.000       x       0.750         S9       x       3.500         V1       +       V2         S3       x       0.266         3.500       -       0.200         X       0.751         S9       x       3.500         L100       x       (0.32         S7       x       0.200         3.500       : $\cos 2(0, 32, 32)$	$\begin{array}{rcl} & = \\ 0 & \times & (3.50) \\ 0 & = \\ (5) & \times & 2.25( \\ (5) & \times & 0.266 \\ (5) & \times $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} .200) & : \\ 3.004 & : \\ 2 \\ 2 \\ = \\ = \\ \end{array}$ $\begin{array}{c} .500 \\ x \\ ( 55 \\ + \\ .086) \\ 0.922 \\ x \\ 2 \\ 54 \\ + \\ .042 \\ + \\ .000 \\ + \\ \end{array}$	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725 S7 0.922 1.000)	+ 0.599 + 0.160 + 0.480 + (S5 × Se + 1.500) + S8 + 0.183	+ 0.184 5) ^{0.5} )		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 <u>7.25</u> 5.250 1.995 1.331 0.480 0.184 <u>22.50</u> 10.449 12.053
S1 S2 S3 S4 S5 S6 S7 S8 S9 CONCRETE (m ³ ) - Footing - Wing wall V1 V2 V3 FORM (m ² ) - Footing - Wing wall SCAFFOLDING (m ²	= (( = (( = (( = (( = 2 = 2 = 2 = (( = 1) = (( = 1) = (( = () = () = () = () = () = ()	S1       : $\cos 7$ 2.250       +       0.600         S3       : $\cos 7$ 0.553       -       0.266         0.343       -       0.266         S5       +       (2.25         S6       +       (0.60         2.000       x       0.750         S9       x       3.500         V1       +       V2         S3       x       0.266         3.500       -       0.200         X       0.751         S9       x       3.500         L100       x       (0.32         S7       x       0.200         3.500       : $\cos 2(0, 32, 32)$	$\begin{array}{rcl} & = \\ 0 & \times & (3.50) \\ 0 & = \\ 5 & \times & 2.25( \\ 5 & \times & 0.60( \\ 0 & \times & 0.266 \\ 0 & = \\ + & \sqrt{3} \\ 3 & + & 0.02( \\ 0 & = \\ 0 & = \\ 0 & = \\ 1 & + & \sqrt{3} \\ 3 & + & 0.02( \\ 0 & = \\ 0 & = \\ 1 & + & \sqrt{3} \\ 3 & + & 5.004 \\ 0 & = \\ 1 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & + & 0.60( \\ 0 & +$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} .200) & : \\ 3.004 & : \\ 2 \\ 2 \\ = \\ = \\ \end{array}$ $\begin{array}{c} .500 \\ x \\ (55 \\ + \\ .086) \\ 0.922 \\ x \\ 2 \\ 54 \\ + \\ .042 \\ + \\ .000 \\ + \\ \end{array}$	2 0.993 0.323 0.023 3.500 1.331 0.266 S6 0.200 (3.725 S7 0.922	+ 0.599 + 0.160 + 0.480 + (S5 × Se + 1.500) + S8 + 0.183	+ 0.184 5) ^{0.5} ) x 2		0.453 5.004 5.042 0.323 0.023 0.922 0.183 1.500 7.25 5.250 1.995 1.331 0.480 0.184 22.50 10.449 12.053 22.44

<b>ATION 12+180</b>	WINGWALL
<b>OX CULVERT STAT</b>	EINFORCEMENT OF
BO	REI

NANA UAU	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
NAIMI MAG	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	2258	12	20	0.888	45.2	40.1
41	2310	14	20	1.208	46.2	55.8
2a	3723	12	6	0.888	22.3	19.8
2b	2100	12	16	0.888	33.6	29.8
- 2c	582	12	20	0.888	11.6	10.3
3	4254	12	2	0.888	8.5	7.6
4	4429	12	20	0.888	88.6	78.6
5a	3043	12	15	0.888	45.6	40.5
Sb	2150	12	6	0.888	12.9	11.5
Sc	2467	20	15	2.466	37.0	91.3
Sd	1574	20	6	2.466	9.4	23.3
9	2444	14	16	1.208	39.1	47.3
7	2301	12	4	0.888	9.2	8.2
8	2301	12	4	0.888	9.2	8.2
6	3605	12	4	0.888	14.4	12.8
10	1304	14	8	1.208	10.4	12.6
	744	12	11	0.888	8.2	7.3
12	2143	12	_	0.888	2.1	6.1
		<b>REINFORCEMENT</b> :		D<=14	392.2 KG	KG
		<b>REINFORCEMENT</b> :		14< D<=25	114.6 KG	KG
		TOTAL REINFORCEMENT:	CEMENT:		506.8 KG	KG





R 	: 2 = 20.635 (m2)		$2^{-1} = 20.635$ (m2)		: 2 = 8.188 (m2)		: 2 = 8.188 (m2)		: 2 = 8.188 (m ² )		: 2 = 8.188  (m2)					: 2 = 20.265 (m2)	
10	3.700	Η1	3.700	HI	3.700	IHI	3.700	ιH	3.700	H1	3.700		234.484		L3	3.500	13
×	×	×	× (	× (	× (	× (	х [.] (	×	× (	× (	×	IJ	II		×	×	×
d1	6.924	d2	6.924	cp	2.213	d4 -	2.213	d5	2.213	d6	2.213	(W + 0.2)	6.100		L2a	7.064	L2b
+	+	÷	+	+	+	÷	+	+	+	+	+	×	×		+	÷	+
C	4.230	с <b>7</b>	4.230	ß	2.213	, c4	2.213	ŋ	2.213	c6	2.213	Ľ	38.440	RETE:	Lla	4.516	LIb
) =IS		S2= (	) 	S3= (	) #	S4= (	=	S5= (	) =	) =9S	) 	S7=	11	APRON CONCRETE:	A1= (	) =	A2= (

**TABLE OF EXPLAINING QUANTITIES OF CULVERT** 

2. CONCRETE FOUNDATION OF CULVERT:

11 0.2 × 6.100 × 38.440 ħ 0.2  $L \times (W + 0.2) \times$ 

<u>46.90</u> (m3)

(m3)

15.34

I U

) × 0.45 × 0.5 ) × 0.45 × 0.5

1.2b 7.064

L2a 7.064

+

x 0.3 x 0.3

+ A2 ) + 20.265 )

A1 20.265

"

(m2)

20.265

Ħ

2

••

3.500

×

7.064

+

4.516

H

			e U											
			(100m)				) × 0.15 ) × 0.15							
	(Em3)		<u> 334.05</u>				+ (0.8 × 4.5 × 4) ) × 0.15 = + (0.8 × 4.5 × 4) ) × 0.15 =				()			
	7.40		334				+ (0.8 > + (0.8 >			·	D WAL			
	(i ti		11 11	(100m)			S7 234.484				JF HEA			
	6 0.1 6 0.1		88	0			S7 234.4				(FI IS AREA OF HEAD WALL)			
	× ×		× 25 × 5 :100 × 25 × 5 :100	41.75			+ +				SI (q)			
	56 8.188		* *				S6 8.188				(m2)	·		
	+ +		( 84 )	11 11			+ +			(m2) (m2)		(m2)	÷	
	S5 8.188		57 234.484	x 25 x 3 : 100 x 25 x 3 : 100			S5 8.188		(m2) (m2)	0.133 0.134	1.770	19.677		
	+ +		+ +	× 25 × × 25 ×			° ¢ò	·	0.087 (	ÛŲ	11	19.		
	S4 8.188		56 8.188	$\sim$			+ +		0.0	4 11	5.900	11 11		
	+ +		∞ + +	4)	)PE		54 8.188		in II	0.6 0.15	Ŋ	x 0.5 x 0.5		
				(0.8 × 4.5 × 4) 14.400	OF SLC		+ +		0.5 0.5 1	0.5 x 0.5 x	×	L3 3.500		
	53 8.188		55 8.188	0)	IOL 371		S3 8.188			××	0.300	× ×		
	+ +		+ }	+ +	OD F		+ +	. •	××		Đ	$\sim$		
	S2 20.6349		54 8.188	S2 20.6349	REA WC		S2 20.635		0.25	0.371	L5	5.000		
	+ +		+ +	+ +	4 IS AI	•	+ +		х×	+ +	×	+ +		
TE	S1 20.635		53 8.188	51 20.635	NOTE: S=0.8 x 4.5 x 4 IS AREA WOOD FILE TOE OF SLOPE	Ö	S1 20.635	IRY	0.695	0.071 0.698	0.300	L6a 6.244		
3. I.ŁAN CONCRETE:		4. WOOD PILE:	$\frac{1}{MS=}$		NOTE: S=I	5. SAND BEDDING:		6. STONE MASONRY	a1= a2=	a3= ( a4= (	=   q	h2a= ( = (		
<u>3. LEAN</u>		<u>4. WOO</u>				5. SANE	II II	6. STON			•			

<u>48.44</u> (m3)

						(m3)	(m3)	ß	(m3)	(m3)	101.854
						1.597	1.597	x 5 x 4	47.379	47.379	10.
									11 11	H H	= =
						ł	11	+ 0.133	COS(26.56) 0.894	COS(26.56) 0.894	V3b 47.379
(m2)	(m2)	(m2)	(m2)	(m2)						· ·· ··	+ +
19.677	19.677	19.677	= 131.842 (m2)	= 131.842 (m2)	(m2)	18.388	18.388	(0.063	x 0.25 x 0.25	× 0.25 × 0.25	V3a 47.379
<b>B</b> II	11 11	li 11 -	20	02	8	×	×	R	$\sim$	$\sim$	+ +
x 0.5 x 0.5	x 0.5 x 0.5	x 0.5 x 0.5	7.170	7.170	6.000	0.087	0.087	4	b3a 19.677	b3b 19.677	V2 3.902
L3 3.500	L3 3.500	L3 3.500	×	×	ff	łł	it	5 ×	+ +	+ +	+ +
× ×	* *	×'×	18.388	18.388	2			×	b2a 19.677	b2b 19.677	V1b 1.597
	$\sim$		Ш	H	×			$\sim$	+ +	+ +	+ +
5.000	5.000	5.000 5.000	L4à	L4b	ŝ	L8a	L8b	a3	b1 1.770	b1 1.770	V1a 1.597
+ +	+ +	+ +	×	×	×	×	×	+	k I	1 1	
L6b 6.244	L7a 6.244	L7b 6.244	L.8a	L8b	0.6	al	al	a2	b4a 131.842	b4b 131.842	
b2b= ( = (	b3a= ( = (	b3b= ( = (	bika=	[b4]b=	<b>b</b> 5=	V1a=	V1b=	V2= (	V3a= ( = (	V3b= ( = (	TOTAL =

3.902 (m3)

(m3)

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2 - 12 - 9

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			÷	27.420 (m3)		27.420	(Em3)							-	
			a	11	ŧŧ	II									
	(m3)	(m3)	COS(26.56)	0.894	COS(26.56)	0.894									
	2.463	2.463	0.15 :	0.15 :	0.15 :	0.15 :			(m3)						
	11	II .	×	*	×	×			59.77				·		
				2 (				<u> </u>	=						
	18.388	18.388	<b>b5</b>	6.000	b5	6.000		V5b	27.420						
	×	×	8	I	۱	ŧ		+	÷			(m2)			(m2)
	0.134	0.134	b3a	19.677	b3b	19.677		V5a	27.420			<b>21.192</b> (m2)			<b>21.192</b> (m2)
	II	II	+	+	÷	÷		t	+		IJ	n	-	11	ŧ
			b2a	19.677	b2b	19.677		V4b	2.463		4	0		2	7
			+	+ .	÷	+		+	+		×	×		×	×
	L8a	L8b	b1	1.770	14	1.770		V4a	2.463		X 0.75	X 0.75	·	X 0.75	X 0.75
	×	×	ı	۰ ¹	١	1		-	<u> </u>					· (	
:1	a4	a4	b4a	131.842	b4b	131.842					L2b)	7.064		L2b) .	7.064
	V4a=	V4b≕	V5a= (	1	V5b= (	 =		TOTAL =		8. FORM :	= (Ľ2a +	( 7.064 +	9. SCAFFOLDING	= (L2a +	( 7.064 +

6. BASE BEDDING:

2 - 12 - 10

# 2.13. Box culvert at station 12+592.5

12 + 592.5

	BOX CULVERT STAT				12+592.5 14.329 +	0.02		28.678								QUANTITIE
1	CULVERT	1														
	CONCRETE (M3)															
	S1	=	5.800	x	4.750 ~	5.000	x	4.000	+	2	x	0.300	x	0.300	=	7.730
	52	=	1.300	x	0.300 +	0.200	x	0.200	;	2					=	0.410
	S	=	S1	÷	S2										H	8.140
ļ	VOLUME	=	S	x	(14.329 +	14.329)	+	5.800	x	0.200	x	0.300	x	2	=	<u>233.97</u>
						<u>SI</u>	NGL	E BOX (	CUL	/ERT						
								5800		{						
						400		5000		400						
					- <del></del> -	st										
						TI	<u>300 §</u>	 			S1					
							<u>1300</u> -	ີ S2	2	X						
					4750	0007	1200	100	3500							
					]											
							<u>.</u>									
					-	ş ¹		<u>8</u>		<u>·</u>						
- 1	FORM (M2)															<u>711.38</u>
	INSIDE FORM (M2)								_							409.253
_ [	BOX BULWARK				2 x					.,	x	28.658	x	<u> </u>	a	243.528
	BOTTOM OF THE BOX	=	(5.000	-	0.300 x			28.658		1					=	126.095
	RETAINING WALL	=				(1.300	+	(1:SIN45	o -	1)	х	0.200)	x	28.66	=	39.630
	OUTSIDE FORM (M2)															302.128
	BOX BULWARK	=			2 x							0.200		÷	=	272.491
	THE END OF CULVERT	=		x	2 :	SIN75 ⁰	+	5.800	x	0.200	x	4			=	21.497
	CENTER	=	-												-	8.140
	SCAFFOLDING (M2) SUPPORT	]=	4.750	х	2.000 x	28.658	+	4.000	х	0.300	x	0.200			=	272.49
	AREA (M2)		5 800	v	4.750 -	S									=	19.410
1	VOLUME (M3)				4.750 - L	5									_	19.410 556.64
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## BOXCULVERT STATION 12+592.5 QUANTITIES TABLE OF REINFORCEMENT

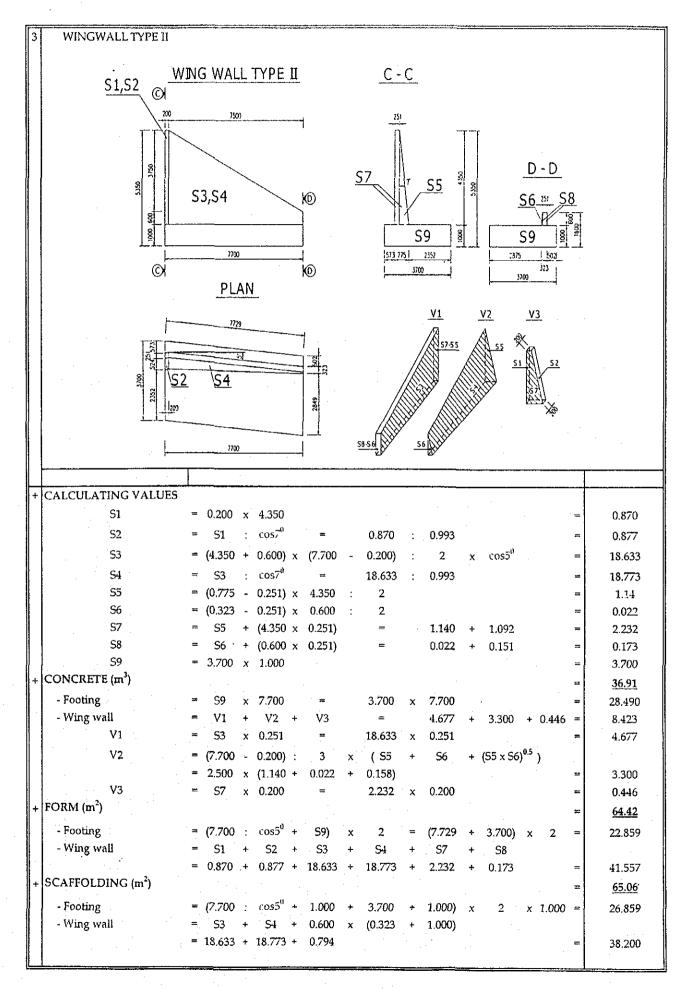
## SEGMENT 1 & 2

Carpor						1	1
SYMBOL	UNIT LENGTH	SPACE	DIAMETER		······	TOTAL LENGTH	TOTAL WEIGHT
OF BAR	(mm)	(mm)	(mm)	OF BAR	(kg/m)	(m)	(kg)
1a	7770	250	20	110	2.466	854.7	2107.8
1b	7881	250	20	7	2.466	55.2	136.1
2	4610	250	20	108	2.466	497.9	1227.8
3a	6604	250	22	54	2.984	356.6	1064.2
3b	6808	250	22	6	2.984	40.8	121.9
4a	6360	250	20	110	2.466	699.6	1725.3
4b	6560	250	20	7	2.466	45.9	113.2
5a	3220	250	12	110	0.888	354.2	314.5
5b	3334	250	12	14	0.888	46.7	41.4
6a	6575	250	20	54	2.466	355.1	875.7
6b	6783	250	20	6	2.466	40.7	100.4
. 7	5170	250	16	117	1.578	604.9	954.7
8a	1567	250	12	110	0.888	172.4	153.0
8b	1608	250	12	7	0.888	11.3	10.0
9a	1638	250	12	110	0.888	180.1	159.9
9b	1680	250	12	7	0.888	11.8	10.4
10	1560	250	12	24	0.888	37.4	33.2
11	5860	250	12	2	0.888	11.7	10.4
12	3700	250	12	57	0.888	210.9	187.2
13	1355	250	12	57	0.888	77.2	68.6
14	14613	250	12	<u>4</u> 8	0.888	701.4	622.7
15	13980	250	12	32	0.888	447.3	397.2
16	15446	250	12	32	0.888	494.3	438.8
17	14204	250	12	10	0.888	142.0	126.1
18	14713	250	12	48	0.888	706.2	627.0
19	1410	250	14	248	1.208	349.7	422.6
20	1440	250	12	248	0.888	357.1	317.1
REINFORG	CEMENT : I	)<=14		3940.1	TOTAL FOR SEGN	MENT 1 :	
REINFORG	CEMENT: 16=	=D<=25		8427.1	REINFORCEMEN		12367.2
REINFORG	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³):</td><td>· · · · · · · · · · · · · · · · · · ·</td><td>116.99</td></d=32<>			CONCRETE (M ³ ):	· · · · · · · · · · · · · · · · · · ·	116.99
			TOTA	L FOR SE	GMENT 1 & 2		
REINFORG	CEMENT : I	)<=14			REINFORCEMEN	T (KG) :	24734.4
REINFORG	CEMENT: 16=	=D<=25		16854.13		<u>v - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - </u>	
REINFORG	CEMENT : 25	5 <d=32< td=""><td></td><td></td><td>CONCRETE (M³)</td><td>· · · · · · · · · · · · · · · · · · ·</td><td>233.97</td></d=32<>			CONCRETE (M ³ )	· · · · · · · · · · · · · · · · · · ·	233.97
						· · · · · · · · · · · · · · · · · · ·	

$\begin{array}{c c} \hline WING WALL TYPE I \\ S1_{52} @^{3} \\ \hline & & & \\ \hline & & $	2 WINGWALL TYPE I		
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		<u>V1</u> <u>V2</u> <u>V3</u>	
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$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	+ CALCULATING VALUES	β	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	S1	$= 0.200 \times 4.350 = 0.000$	.870
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	S2	= S1 : cos7" = 0.870 : 0.993 = 0.	.877
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	53	$= (4.350 + 0.600) \times (7.700 - 0.200) : 2 \times \cos 15^{0} = 19$	.217
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$		$=$ S3 : $\cos 7^{0}$ = 19.217 : 0.993 = 19	.361
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	S5		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$			
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$			
CONCRETE (m ³ ) = $S9 \times 7.700 = 3.700 \times 7.700 = 4.977$ Footing = $V1 + V2 + V3 = 4.977 + 3.400 + 0.460 = 8.837$ V1 = $S3 \times 0.259 = 19.217 \times 0.259 = 4.977$ V2 = $(7.700 - 0.200) : 3 \times (S5 + S6 + (S5 \times S6)^{0.5}) = 2.500 \times (1.175 + 0.022 + 0.161) = 3.400$ V3 = $S7 \times 0.200 = 2.302 \times 0.200 = 0.46$ FORM (m ² ) = $(7.700 : \cos 15^{0} + S9) \times 2 = (7.972 + 3.700) \times 2 = 23.343$ Wing wall = $S1 + S2 + S3 + S4 + S7 + S8$ = $0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ SCAFFOLDING (m ² ) = $(7.700 : \cos 15^{0} + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 = 27.343$			
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$			
- Wing wall = V1 + V2 + V3 = $4.977$ + $3.400$ + $0.460$ = $8.837$ V1 = S3 x $0.259$ = $19.217$ x $0.259$ = $4.977$ V2 = $(7.700 - 0.200)$ : 3 x $(S5 + S6 + (S5 x S6)^{0.5})$ = $2.500$ x $(1.175 + 0.022 + 0.161)$ = $3.400$ V3 = $S7$ x $0.200$ = $2.302$ x $0.200$ = $0.46$ FORM (m ² ) = $66.15$ - Footing = $(7.700 : cos15^{0} + S9)$ x 2 = $(7.972 + 3.700)$ x 2 = $23.343$ - Wing wall = S1 + S2 + S3 + S4 + S7 + S8 = $0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177$ = $42.804$ SCAFFOLDING (m ² ) = $(7.700 : cos15^{0} + 1.000 + 3.700 + 1.000)$ x 2 x $1.000$ = $27.343$			
$V1 = S3 \times 0.259 = 19.217 \times 0.259 = 4.977$ $V2 = (7.700 - 0.200) : 3 \times (S5 + S6 + (S5 \times S6)^{0.5})$ $= 2.500 \times (1.175 + 0.022 + 0.161) = 3.400$ $V3 = S7 \times 0.200 = 2.302 \times 0.200 = 0.46$ $FORM (m^{2}) = (7.700 : \cos 15^{0} + S9) \times 2 = (7.972 + 3.700) \times 2 = 23.343$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 1.000 \times 2 \times 1.000 = 27.343$	-		
$= 2.500 \times (1.175 + 0.022 + 0.161) = 3.400$ $V3 = 57 \times 0.200 = 2.302 \times 0.200 = 0.46$ FORM (m ² ) $= (7.700 : \cos 15^{0} + 59) \times 2 = (7.972 + 3.700) \times 2 = 23.343$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 7.700 : \cos 15^{0} + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 = 27.343$			
$= 2.500 \times (1.175 + 0.022 + 0.161) = 3.400$ $V3 = S7 \times 0.200 = 2.302 \times 0.200 = 0.46$ $= 66.15$ $= 7.700 : \cos 15^{0} + S9 \times 2 = (7.972 + 3.700) \times 2 = 23.343$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 66.72$ $= 7.700 : \cos 15^{0} + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 = 27.343$	V2	$= (7.700 - 0.200) : 3 \times (S5 + S6 + (S5 \times S6)^{0.5})$	•
FORM (m ² ) = $\frac{66.15}{23.343}$ - Footing = (7.700 : cos15 ⁰ + S9) x 2 = (7.972 + 3.700) x 2 = 23.343 - Wing wall = S1 + S2 + S3 + S4 + S7 + S8 = 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804 - SCAFFOLDING (m ² ) = (7.700 : cos15 ¹¹ + 1.000 + 3.700 + 1.000) x 2 x 1.000 = $\frac{66.72}{27.343}$ - Wing wall = S3 + S4 + 0.600 x (0.333 + 1.000)		$= 2.500 \times (1.175 + 0.022 + 0.161) = 3.$	400
$\begin{array}{rcl} -Footing &=& (7.700 : \cos 15^{0} + S9) & x & 2 &=& (7.972 + 3.700) & x & 2 &=\\ -Wing wall &=& S1 &+ S2 &+ S3 &+ S4 &+ S7 &+ S8 &\\ &=& 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 &=& 42.804 \\ -SCAFFOLDING (m^{2}) &=& & & & & & \\ -Footing &=& (7.700 : \cos 15^{''} + 1.000 + 3.700 + 1.000) & x & 2 & x 1.000 &=& 27.343 \\ -Wing wall &=& S3 &+ S4 &+ 0.600 & x & (0.333 &+ 1.000) \end{array}$		$= S7 \times 0.200 = 2.302 \times 0.200 = 0$	.46
-Wing wall = $S1 + S2 + S3 + S4 + S7 + S8$ = $0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177$ = 42.804 + SCAFFOLDING (m ² ) = (7.700 : $\cos 15^{11} + 1.000 + 3.700 + 1.000$ ) x 2 x 1.000 = 27.343 -Wing wall = $S3 + S4 + 0.600$ x (0.333 + 1.000)			<u>6.15</u>
= 0.870 + 0.877 + 19.217 + 19.361 + 2.302 + 0.177 = 42.804 = $66.72$ - Footing - Wing wall = S3 + S4 + 0.600 x (0.333 + 1.000) x 2 x 1.000 = 27.343	l l		.343
$= \frac{66.72}{27.343}$ $= (7.700 : \cos 15'' + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 = 27.343$ $= S3 + S4 + 0.600 \times (0.333 + 1.000)$	- Wing wall		
-Footing = $(7.700 : \cos 15'' + 1.000 + 3.700 + 1.000) \times 2 \times 1.000 = 27.343$ -Wing wall = S3 + S4 + 0.600 x (0.333 + 1.000)	SCAFFOLDING (m ² )		
-Wing wall = $S3 + S4 + 0.600 \times (0.333 + 1.000)$	<ul> <li>A second sec second second sec</li></ul>		
	-		.343
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BOX CULVERT STATION 12+592.5 REINFORCEMENT OF WINGWALL TYPE
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	HILDNEIT INNI	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
BAK MAKK	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
la	3555	12	41	0.888	145.8	129.4
1b	3686	18	41	1.998	151.1	301.8
2a	1977	12	9	0.888	47.9	42.5
2b	4192	12	38	0.888	159.3	141.4
20	584	12	41	0.888	23.9	21.3
3	9022	12	. 2	0.888	18.0	16.0
4	8930	12	36	0.888	321.5	285.4
Śа	5238	12	35	0.888	183.3	162.8
Sb	3611	12	8	0.888	28.9	25.6
5c	4232	22	35	2.984	148.1	442.0
Sd	2605	22	8	2.984	20.8	62.2
9	2944	14	72	1.208	212.0	256.1
7	4004	12	4	0.888	16.0	14.2
8	4004	12	9	0.888	24.0	21.3
6	7856	12	6	0.888	47.1	41.8
10	1304	14	14	1.208	18.3	22.1
Π	857	12	22	0.888	18.8	16.7
12	3317	12	2	0.888	6.6	5.9
	I	<b>REINFORCEMENT:</b>	•	D<=14	1202.6 KG	KG
		<b>REINFORCEMENT:</b>		14< D<=25	806.0 KG	KG
		TOTAL REINFOR	<b>ORCEMENT</b> :		2008.7 KG	KG



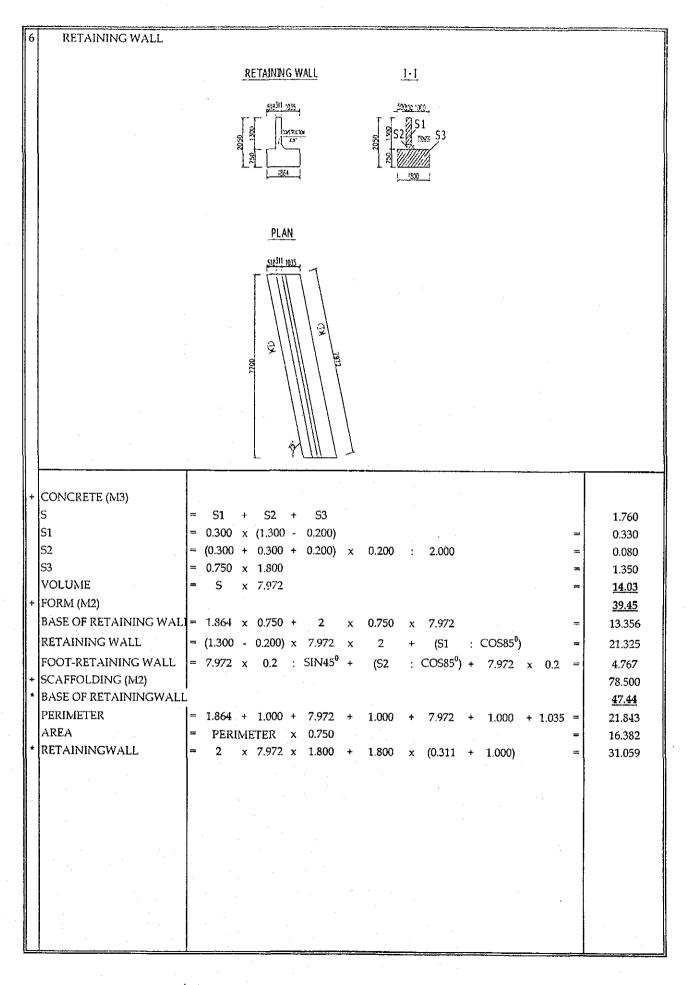
<b>BOX CULVERT STATION 12+592.5</b>	<b>REINFORCEMENT OF WINGWALL TYPE II</b>	

$ \begin{array}{l lllllllllllllllllllllllllllllllllll$		UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
$ \  \  \  \  \  \  \  \  \  \  \  \  \ $	BAK MAKK	(WW)	(MM)	OF BAR	(KG/M)	(M)	(KG)
$ \  \  \  \  \  \  \  \  \  \  \  \  \ $	la	3555	12	40	0.888	142.2	126.2
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	91	3685	18	40 -	1.998	147.4	294.4
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	2a	7749	12	. 9	0.888	46.5	41.3
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	- 2b	4354	12	38	0.888	165.5	146.9
8749       12       2       0.888       17.5       1         8691       12       38       0.888       330.3       1         8691       12       38       0.888       330.3       1         5350       12       37       0.888       198.0       1         9353       12       27       0.888       7.9       1         944       234       22       37       2.944       160.7       1         92944       12       22       37       2.984       160.7       1         92944       14       72       12.08       212.0       1       1         92944       12       22       2.984       160.7       1       1         92944       12       22       2.984       160.7       1       1         94008       12       22       0.888       16.0       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	2c	584	12	40	0.888	23.4	20.7
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	E	8749	12	2	0.888	17.5	15.5
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	4	8691	12	38	0.888	330.3	293.2
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	5a	5350	12	37	0.888	198.0	175.7
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	5b	3953	12	2	0.888	9.7	7.0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	50	4344	22	37	2.984	160.7	479.6
72       14       72       1.208       212.0       10         108       12       4       0.888       16.0       10       10         108       12       6       0.888       24.0       10       10         109       12       6       0.888       24.0       10       10         101       12       6       0.888       45.7       10       10         1304       14       14       1.208       18.3       18.3       10         1304       11       14       1.208       18.3       18.3       10       10         1304       12       22       0.888       18.5       18.5       10       10         1304       12       22       0.888       18.5       18.5       10       10         13270       12       2       2       0.888       6.5       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10	5d	2947	22	2	2.984	5.9	17.6
4008       12       4       0.888       16.0       16.0         4008       12       6       0.888       24.0       1         7617       12       6       0.888       45.7       1         1304       14       14       1.208       18.3       1         840       12       22       0.888       18.5       1         3270       12       22       0.888       18.5       1         KEINFORCEMENT       0.888       0.888       6.5       1         ADDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD	6	2944	14	72	1.208	212.0	256.1
4008       12       6       0.888       24.0       24.0         7617       12       6       0.888       45.7       1         1304       14       14       1.208       18.3       1         840       12       22       0.888       18.5       1         3270       12       22       0.888       6.5       1         ABINFORCEMENT:       12       2       0.888       6.5       1         ABINFORCEMENT:       12       2       0.888       6.5       1	7	4008	12	4	0.888	16.0	14.2
7617       12       6       0.888       45.7          1304       14       14       18.3           840       12       22       0.888       18.5           3270       12       22       0.888       18.5            1       3270       12       2       0.888       6.5            1       3270       12       2       0.888       6.5 <td>8</td> <td>4008</td> <td>12</td> <td>6</td> <td>0.888</td> <td>24.0</td> <td>21.4</td>	8	4008	12	6	0.888	24.0	21.4
1304     14     14     1.208     18.3       840     12     22     0.888     18.5     8.6       3270     12     2     0.888     6.5     1.503       KEINFORCEMENT:     D<=14	6	7617	12	. 6	0.888	45.7	40.6
840     12     22     0.888     18.5       3270     12     2     0.888     6.5       REINFORCEMENT:     D<=14	10	1304	14	14	1.208	18.3	22.1
3270     12     2     0.888     6.5       REINFORCEMENT:     D<=14	11	840	12	22	0.888	18.5	16.4
D<=[4 [] [4<])<=25		3270	12	2	0.888	6.5	5.8
14< I)<==25			<b>REINFORCEMENT:</b>		D<=14	1203.2	KG
	-		<b>REINFORCEMENT:</b>		14<1)<=25	9.167	KG
	-		TOTAL REINFORCE	CMENT :		1994.8	KG

4 WINGWALL TYPE III	
1	ING WALL TYPE III E-E
<u> </u>	ING WALL TYPE III <u>E-E</u> ^{K®} S1,S2
	<u></u>
	ST IT
	$\frac{F-F}{F}$
E CI	S3,S4 55 7 3 3 56 56
C C	
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	$52\left \frac{1}{2}\right ^{4}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
	<u>will</u> <u>5255</u> <u>55</u>
	S4
8	
	58-56 (1)11 56 (1)111
	້
+ CALCULATING VALUES	
S1	$= 0.200 \times 4.350 = 0.870$
S2	$= S1 : \cos^{-0} = 0.870 : 0.993 = 0.877$
53	$= (4.350 + 0.600) \times (7.700 - 0.200) : 2 \times \cos 35^{\circ} = 22.661$ $= S3 : \cos 7^{\circ} = 22.661 : 0.993 = 22.831$
S4 S5	$= 53 : \cos^{-4} = 22.661 : 0.993 = 22.831$ = (0.942 - 0.305) x 4.350 : 2 = 1.385
55 56	$= (0.393 - 0.305) \times 0.600 : 2 = 0.026$
S7	$= 55 + (4.350 \times 0.305) = 1.385 + 1.327 = 2.712$
S8	$= S6 + (0.600 \times 0.305) = 0.026 + 0.183 = 0.209$
59	$= 4.200 \times 1.000 = 4.200$
+ CONCRETE (m ³ )	= <u>43.79</u>
- Footing - Wing wall	$ = S9 \times 7.700 = 4.200 \times 7.700 = 32.340 $ $ = V1 + V2 + V3 = 6.912 + 4.000 + 0.542 = 11.454 $
V1	$= S3 \times 0.305 = 22.661 \times 0.305 = 6.912$
V2	= $(7.700 - 0.200)$ : 3 x $(55 + 56 + (55 \times 56)^{0.5})$
	$= 2.500 \times (1.385 + 0.026 + 0.190) = 4.000$
V3	$= S7 \times 0.200 = 2.712 \times 0.200 = 0.542$
+ FORM $(m^2)$	= <u>77.36</u>
- Footing	$= (7.700 : \cos 35^{0} + 59) \times 2 = (9.400 + 4.200) \times 2 = 27.200$
- Wing wall	= S1 + S2 + S3 + S4 + S7 + S8 = 0.870 + 0.877 + 32.661 + 32.821 + 3.712 + 0.200 = -1.50.160
+ SCAFFOLDING (m ² )	= 0.870 + 0.877 + 22.661 + 22.831 + 2.712 + 0.209 = 50.160
- Footing	$= (7.700 : \cos 33^{\circ} + 1.000 + 4.200 + 1.000) \times 2 \times 1.000 = 31.200$
- Footing - Wing wall	$= (7.700 : \cos 35'' + 1.000 + 4.200 + 1.000) \times 2 \times 1.000 = 31.200$ $= S3 + S4 + 0.600 \times (0.393 + 1.000)$
B	= 22.661 + 22.831 + 0.836 = 46.328

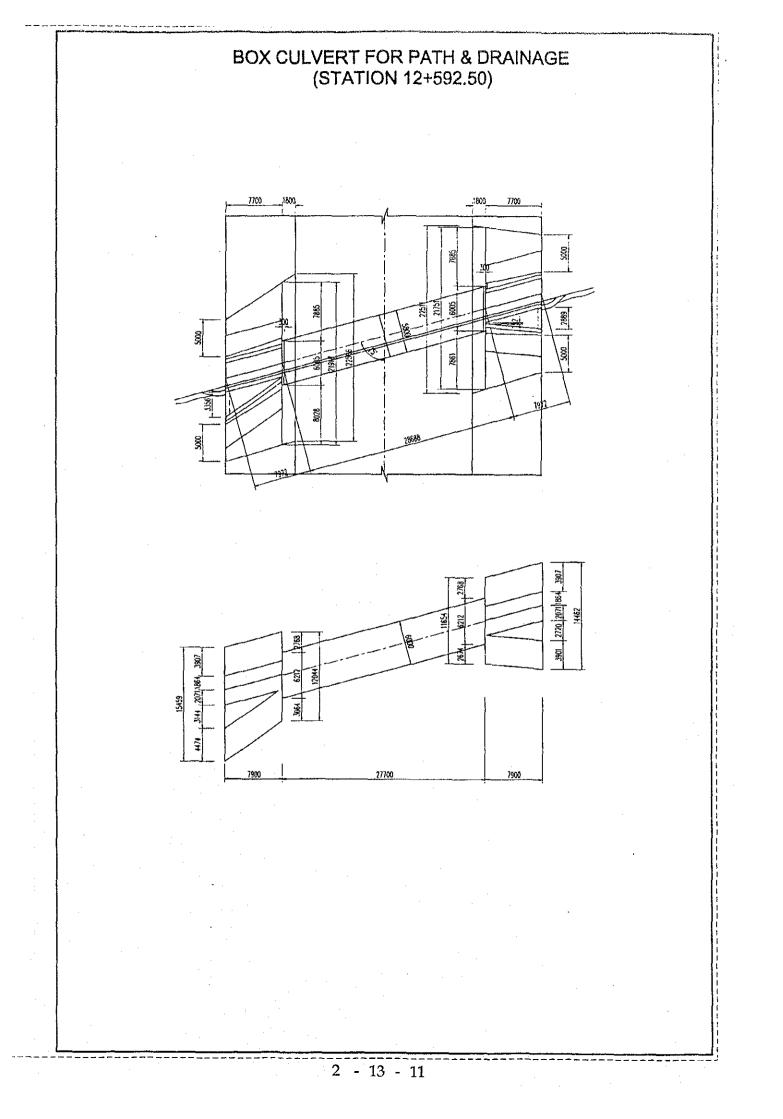
	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
DAN MAIN	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
1a	3561	12	48	0.888	170.9	151.8
<b>q</b> 1	3704	18	48	1.998	177.8	355.1
2a	9466	12	6	0.888	56.8	50.4
2b	5295	12	38	0.888	201.2	178.6
2c	597	12	48	0.888	28.7	25.4
3	10544	12	2	0.888	21.1	18.7
4	10337	12	34	0.888	351.5	312.0
5a	5104	12	35	0.888	178.6	158.6
5b	3533	12	20	0.888	70.7	62.7
50	4098	22	35	2.984	143.4	428.0
5d	2527	22	20	2.984	50.5	150.8
9	2944	14	80	1.208	235.5	284.6
7.	4483	12	4	0.888	6.71	15.9
~	4483	12	6	0.888	26.9	23.9
6	9263	12	6	0.888	55.6	49.3
10	1304	14	14	1.208	18.3	22.1
11	975	12	22	0.888	21.5	19.0
12	3233	12	3	0.888	9.7	8.6
		REIFORCEMENT		D<=14	1381.8 KG	KG
_	•	REIFORCEMENT		14<1)<=25	933.9 KG	KG
	- - -	<b>TOTAL REINFORCEMENT:</b>	CEMENT :		2315.7 KG	KG
						J

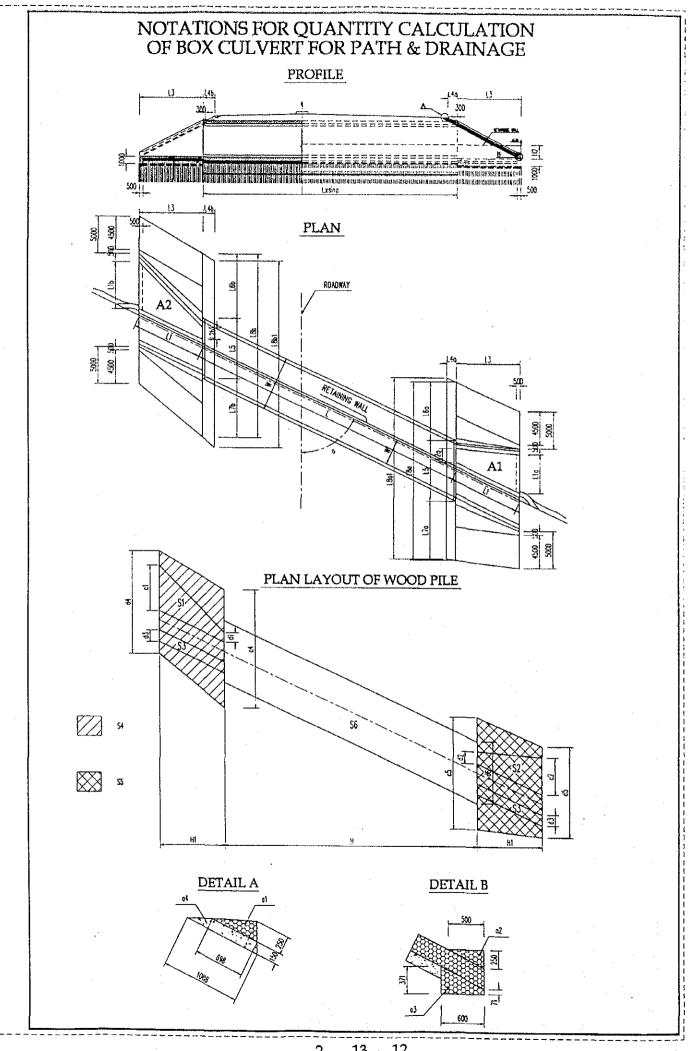
12+592.5



BOX CULVERT STATION 12+592.5 REINFORCEMENT OF RETAINING WALL

BAR MARK	UNIT LENGTH	DIAMETER	NUMBER	UNIT WEIGHT	TOTAL LENGTH	TOTAL WEIGHT
	(MM)	(MM)	OF BAR	(KG/M)	(M)	(KG)
1	4496	12	40	0.888	1 79.8	159.7
2	8075	12	10	0.888	80.8	71.7
3	1410	12	40	0.888	56.4	50.1
4a	2572	12	74	0.888	190.3	169.0
4b	1884	12	8	0.888	15.1	13.4
5	8741	12	16	0.888	139.9	124.2
6	2444	14	27	1.208	66.0	79.7
7	2205	12	8	0.888	17.6	15.7
8	8313	12	4	0.888	33.3	29.5
		REIFORCEMENT	NT	D<=14	712.9 KG	KG
		REIFORCEMENT	NT	14< D<=25	0.0 KG	KG
		TOTAL REINFORCEMENT	FORCEMEN	Γ:	712.9 KG	KG





																						(m3)							<u>414.067</u> (100m)
																						Ľ)							414.
																						9.57							# #
																					"	=				(m3)			100)
																		<b>-</b> .			LIb	3.356				18.234			(25×5:100) 1.250
	EKI												÷								е +	+ 68							53) ) x 51 ) x
																· .					Lla	2.889		(Em3)		11 H			( 2 x 53) 29.451
	ES OF (	<u> 92.5</u>																			) × (	) × (		34.426		0.100 0.100			ιι.
	<b>TABLE OF EXPLAINING QUANTITIES OF CULVERT</b>	<b>CULVERT KM 12+592.5</b>	(m2)	(m2)	(m2)	(m2)	(m2)	(m2)	(m2)	(m2)	·					(1)	(C111)	(mz)	(m2)	(m2)	0.500	0.500		II		× ×			52 10.744
	NING O	LVERT		12.419		10.744		108.637		103.158							11 700	11./00		12.921	×	×		0.2					1 1
	<b>L</b> AI	CC	)		U	ł		1	II	11						I	I I	I	11	u	0.700	0.700		×		2		-	<u>م</u>
	JF EX		7	5	2	7	7	7	7	7	(m2)	(m2)	(m2)	(m2)		S c	3 8	B 2	2.00	2.00	_	<u> </u>		6.000		53 14.726			51 12.419
ų ž			••			••	••		••	••							•		••		+	+		×					<b>1 1</b>
F	IAI	·	IHI	7.900	ш	7.900	HI	7.900	ΗI	7.900		14.726		172.072		-		N0/./	E.1	7.700	ч	0.300	Ë	28.688		S5 103.158	·		56 172.072
			×	×	×	×	×	×	×	×	ł,	11	11	II		;	< ;	×	×	×	×	×	JLVER	0.2 =		0[ 0[		·	172
							-	<u> </u>								~	~ ~	~ -	-				OF CI	×		.++			+ +
	•		Γp	0.000	d2	0.000	d4	15.459	d5 J	14.462	Η	7.900	d6	6.212		с г г	0 1 E J	701.0	L2b	0.000	A2	12.921	NOITA	w +0.2 )		S3 14.726		1	55 103.158
· .			+	+	` <b>+</b>	+	÷	÷	+	<b>+</b>	×	×	×	×	RETE	<b>4</b>	• •	<b>⊦</b> ••	÷	+	+	+	OND	<u> </u>	إنتر	• •			+ +
			c]	3.144	C2	2.720	c4	12.044	ß	11.654	Ep .	1.864	H	27.700	CONC		1 000	100.7	LIP	3.356	A1	11.708	LETE FO	×	ONRET	S4 108.637	PILE:	č	54 108.637
	·		S1= (	S1= (	S2= (	S2= (	S4= (	S4= (	S5= (	S5= (	S3=	S3 <del>=</del>	56=	S6=	<b>1. APRON CONCRETE</b>	/ ۲. ۸	I V	-14	A2= (	A2= (	) = A	) = V	2. CONCRETE FOUNDATION OF CULVERT:	Г Ч	<b>3. LEAN CONRETE:</b>	ייייייייייייייייייייייייייייייייייייי	4 WOOD PILE:	<u>L=5M</u>	W5= (
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) x (25 x 3 : 100) + x 0.75			0.150 0.150			(m2)	(m2) (m2)	(m2)		(m2) (m2)	(m2)	(m2)	(m2) .	(m2)	(m2)	(m2)
) × (25 ) × 0.75	100.000 100.000		× ×			0.087	0.133 0.133	0.134		49.607		49.607		49.515		50.158
(0.8 × 4.5 × 4) 14.400	: : [100m]		(0.8 × 4.5 × 4) 14.400	(m3) 5 (n13) <u>6</u> (m3)		U		11		11 11		11	<b>II</b>	u	11	11
(0.8 ) 1	53.141	34	(0.8) 14	0.576 60.316			0.600	0.150		0.500	0.500	0.500	0.500	0.500	0.500	0.500
+ +	2.0 2.0	if SLO	+ +	II & II			×	×		××		×	×	×	×	×
(2 × S3 ) 29.451	× × ~	e toe o	S6 172.072			0.500	0.500	0.500 (m2)	(m2)	L3 7.700	13	7.700	<b>L</b> 3	7.700	EJ	7.700
0.4	3.000 3.000 W31		1	2.000 2.000 K1		×	××	×	1.802	× ×	×	×	×	×	×	×
+ +	× × +	MOO	+ +	× × +		·		<b>~</b> "	11		$\sim$	, <b>^</b>	<u> </u>			
S2 10.744	25.000 25.000 W3	AREA	55 103.158	0.150 0.150 K		0.250	0.371	1.088 L5	6.005	5.000	5.000	5.000	5.000	5.000	5.000	5.000
+ +	× × ~	x 4 IS	`+ +	× × 🔾	VIRY	. ×	× +	+ ,×	. ×	+ +	+	+	+	+	+	÷
S1 12.419	<u>1.920</u> AL =	0.8 × 4.5 BEDDIN	54 108.637 TION	1.920 AL =	MASON	0.698	0.500	0.300	0.300	L6a 7.885	L6b	7.885	L7a	7.861	L7b	8.028
<u>L=3M</u> W3= ( W3= (	PROTECTION W31= ( 55 ( 1.9 TOTAL =	NOTE: S=0.8 x 4.5 x 4 IS AREA WOOD PILE TOE OF SLOPE 5. SAND BEDDING:	$K = \begin{pmatrix} 5 \\ -5 \end{pmatrix}$ $= \begin{pmatrix} 108 \\ -108 \end{pmatrix}$	$\begin{array}{c} K1 = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \\ ( 1 \end{pmatrix} \\ TOTAL = \end{array}$	6. STONE MASONR	a1= ,	a2= a3= (	a4= ( b1=	b]=	b2a≖ ( = (	b2b= (	<b>)</b> #	b3a= (	 	b3b= (	<b>)</b> =

		21.996 22.138	
	(m3) (m3) (m3) (m3) (m3) (m3)	(m3) (m3)	
	38.338 38.573 3.326 3.326	= 3.015 = 3.023 COS(26.565) 0.894 COS(26.565) 0.894	(m3) (m3)
		= COS( 0.894 0.894 0.894	50.768
	COS(26.565) 0.894 COS(26.565) 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.894 0.900 0.894 0.00000000000000000000000000000000000	0.150 0.150 0.150 0.150 0.150	41 A
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	38.573	* * * *	V5c 0.596
(m2) (m2) (m2) (m3) (m3) (m3)	0.250 0.250 0.250 0.250 0.250 1.99 +		+ +
39.836 40.036 6.000 1.964 1.969 3.907		22.511 22.566 b5 b5 6.000 6.000	V5b 22.138
	+ + + +	× × 1 + 1 1	(m3) (m3) +
<ul> <li>× 0.500</li> <li>× 0.500</li> <li>× 0.500</li> <li>× 0.500</li> <li>× 22.511</li> <li>× 4.000</li> <li>× 4.000</li> </ul>		0.134 0.134 b1 1.802 1.802 1.802	= 0.596 V5a 21.996
L4a 1.800 L4b 1.800 1.800 0.087 5.000 5.000	, , , , , , , , , , , , , , , , , , , ,	11 11 1 1 1 1 1	~~ <b>+</b> +
× × = = = = = = = = = = = = = = = = = =	<ul> <li>+ b4a</li> <li>+ 39.836</li> <li>+ b4b</li> <li>+ 40.036</li> <li>+ 40.036</li> <li>× 0.600</li> <li>× 0.600</li> <li>+ 1.969</li> </ul>	+ b4a + 39.836 + b4b + 40.036	x 2.000 x 2.000 + V4b + 3.023
L8a1 22.511 1.8b1 1.8b1 2.2566 5.000 5.000 1.8a1 1.8b1 a3 a3	b3a b3a b3b 50.158 50.158 0.600 0.600 V1a 1.964	L8a1 L8b1 b3a 49.515 b3b b3b 50.158	0.150 0.150 V4a 3.015
+ + + + × × × + +	++++ ××~~		×× – –
b4a= ( L8a ( 21.751 b4b= ( 21.918 ( 21.918 b4b= ( 21.918 ( 21.918 b5= ( 21.918 v1a= a1 v1a= a1 v2= ( a2 * 0.063	$V3a = \begin{cases} b2a \\ b2a \\ c 49.607 \\ c 3.240 \\$	7. BASE BEDDING         V4a=       a4         V4a=       a4         V5a=       ( b2a         =       ( 49.607         >       ( b2b)         =       ( 49.607	$\frac{PROTECTION}{V5c=} ( 88 ( 1.99 ) ( 1.99 ) TOTAL =$

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(m3) (m3)

		R	11							
	(m3)	0.400	0.400				(m2)			(m2)
	62.485	ı	ı	·			12.490			12.490
1	ų	H2	1.300			II	LI		II	n
0.400	0.400	<u> </u>	_			7	2		2	N
×	×	×	×			×	×		×	× .
IM	3.500	١M	3.500			<b></b> 1	1		,i	in the second se
×	×	×	×			×	×		×	×
2 × L1	15.944	2 × L1	15.944			LJb	3.356		LIb	3.356
. +	+	÷	+			+	÷	••1	+	+
 µ	28.688 FILL		28.688	•		Lla	2.889	<b>LDING</b>	( Lla	2.889
<u>8. PATH</u> a. LATERITE M = ( L	b. SAND FILL	) = N	}		9.FORM :	) #	<b>-</b>	<b>10.SCAFFOLDING</b>	) =	<u> </u>

(m3) <u>140.591</u> (m3)