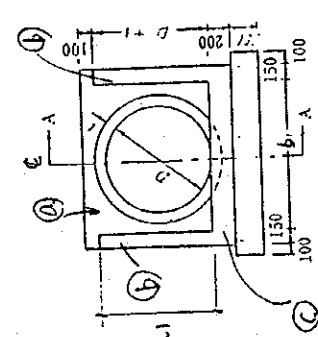
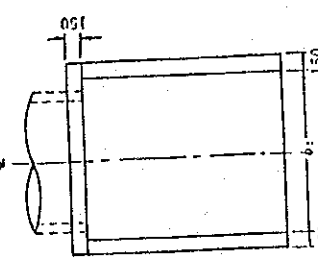
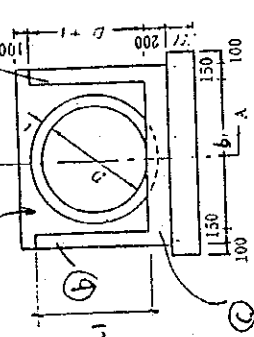
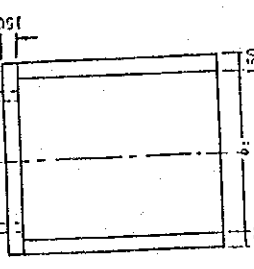
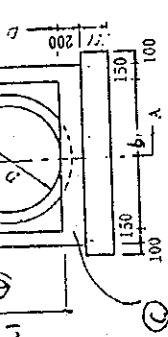
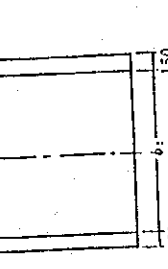
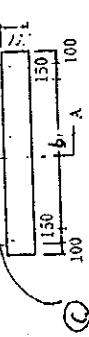
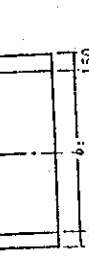


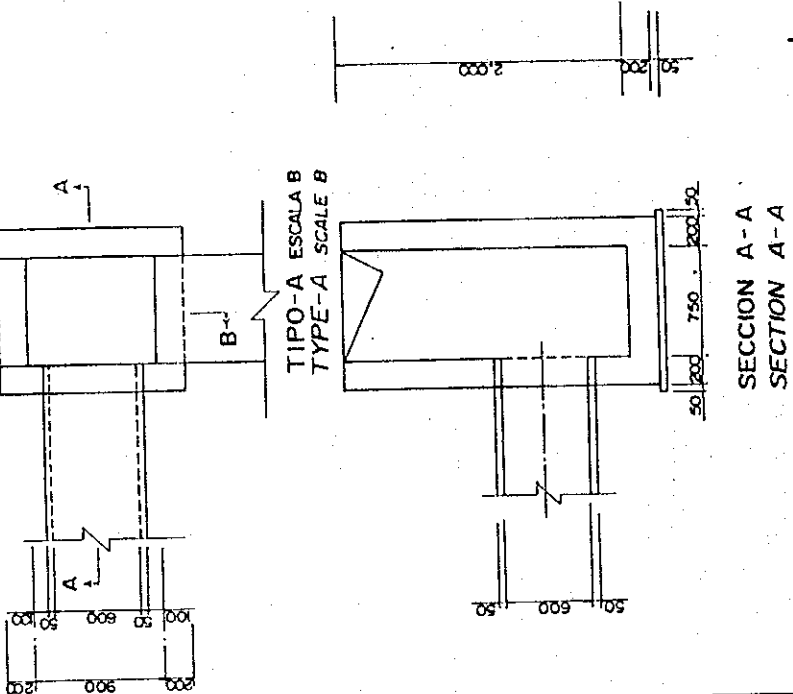


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 09 Concrete class E for				 
(using wall)				 
1. $\phi$ 600	$(h_1 = 650 \text{ mm}, b = 800 \text{ mm})$ $(L_1 = 975 \text{ mm}, h_2 = 700 \text{ mm}) \quad L_2 = 1.5 \text{ m} = 1500 \text{ mm}$			 
①	$1.1 \times 0.95 \times 0.15 \text{ m} = 0.157 \text{ m}^3$			 
②	$0.975 \times 0.65 \times 0.15 \times \frac{1}{2} \times 2 = 0.095 \text{ m}^3$			 
③	$1.7 \times 0.975 \times 0.2 = 0.3315 \text{ m}^3$			
④	$1.1 \times 1.0 \times 0.15 \text{ m} = 0.165 \text{ m}^3$			
⑤	$1.05 \times 0.7 \times \frac{1}{2} \times 0.15 \times 2 = 0.110 \text{ m}^3$			
⑥	$1.1 \times 1.05 \times 0.2 \text{ m} = 0.231 \text{ m}^3$			
⑦	$0.3 \times 0.4 \times 1.1 \text{ m} \times 2 = 0.264 \text{ m}^3$			
	$1.237 \text{ m}^3$			
	$1.237 \times 3 = 3.711$	$\text{m}^3$	6.021	
	$0.77 \times 3 = 2.310$			

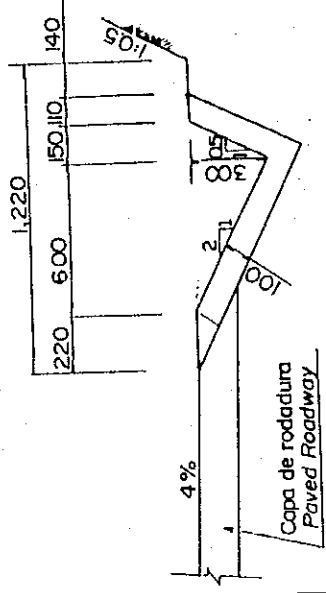
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 1/10. Concrete, class F for side ditch and catch basin				
	(catch basin) per lino			
	$1.15 \times 1.30 \times 2.2$			
	$- 0.75 \times 0.9 \times 2.0 = 1.35 \text{ m}^3$			
	$1.35 - 0.357 = 0.993 \text{ m}^3$			
	$1.862 \times 3 = 5.586$	$\text{m}^3$	5.586	

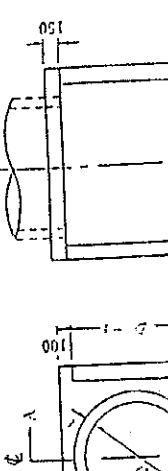
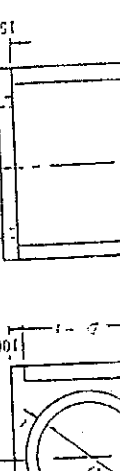
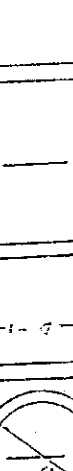
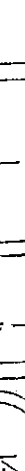


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 1/0 Concrete class F for side ditch and catch basin	(Side ditch) per / m $1.08 \times 0.432 \times \frac{1}{2}$ $- 0.75 \times 0.3 \times \frac{1}{3} = 0.12 / m^3$			
	$0.61 \times 244 m = 90.024$	$m^3$	90.024	

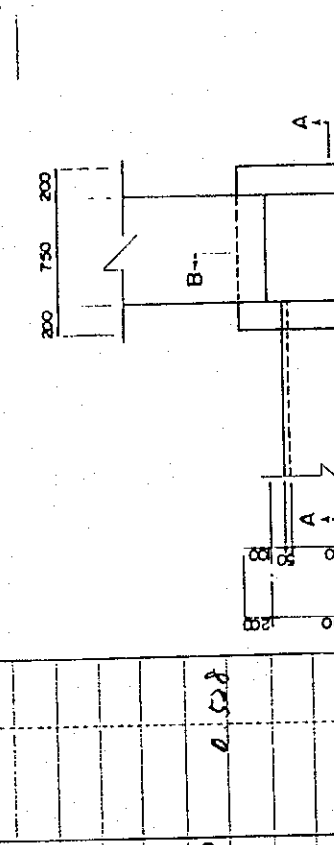
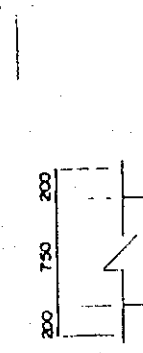
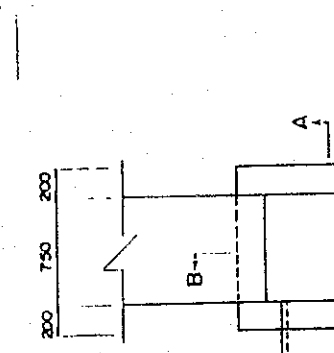
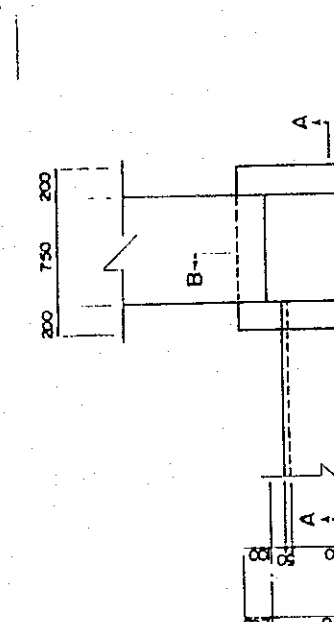
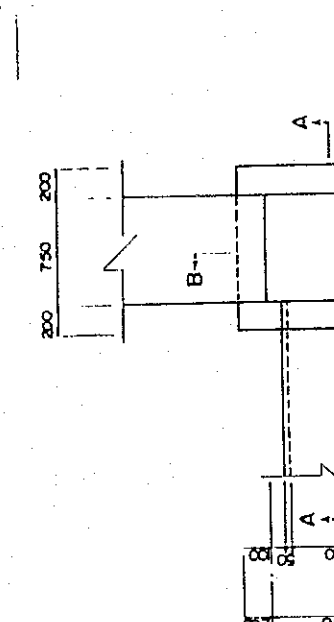
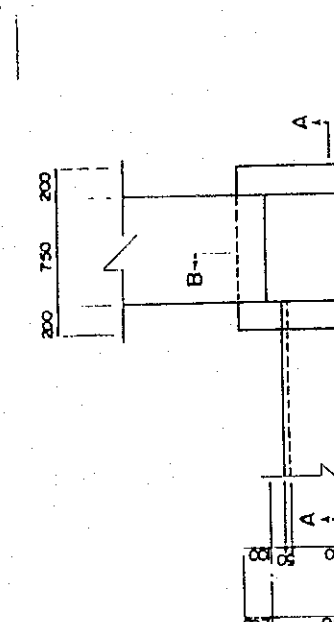
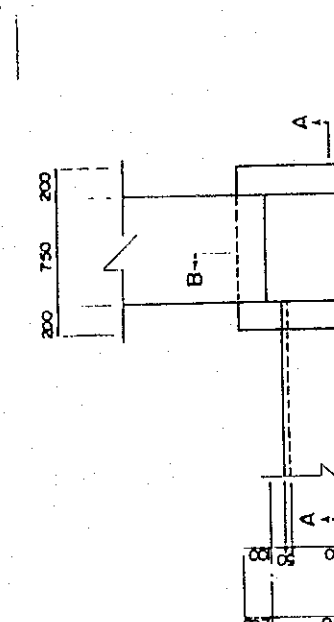
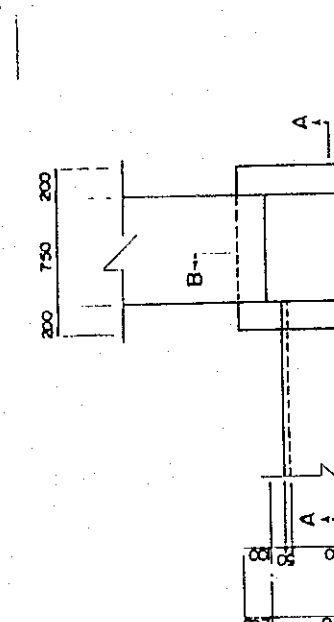
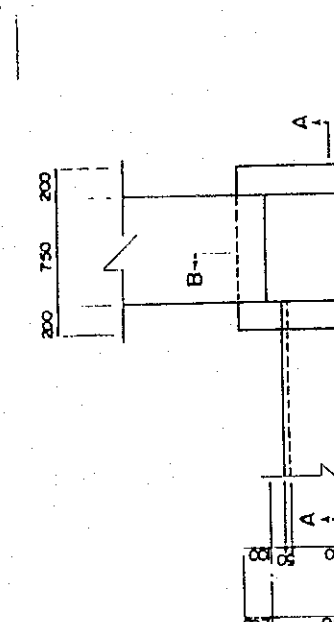
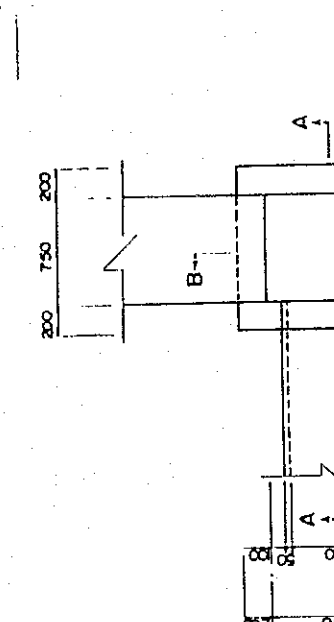
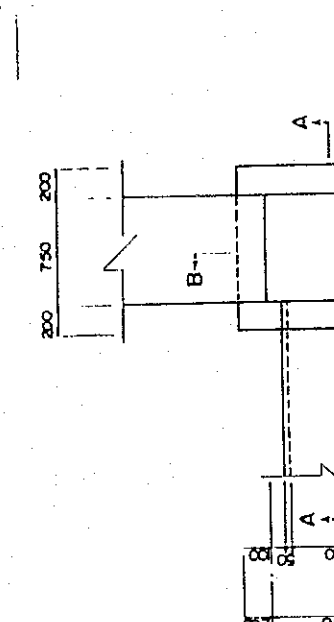
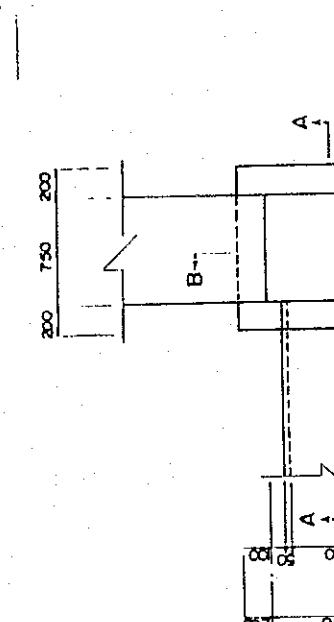
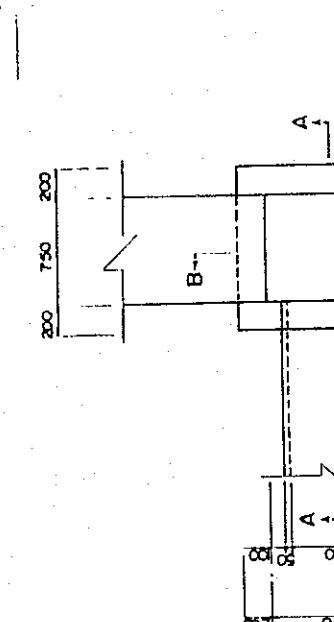
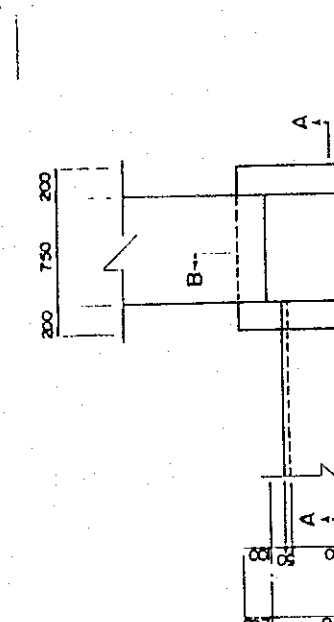
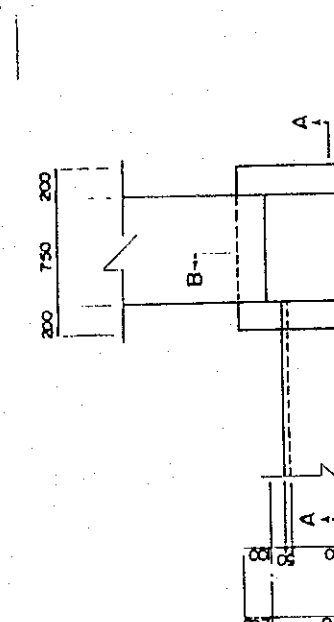
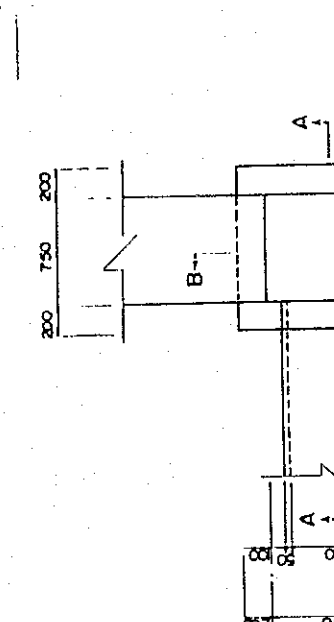
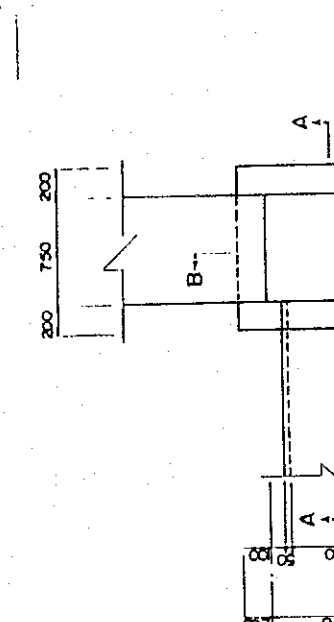
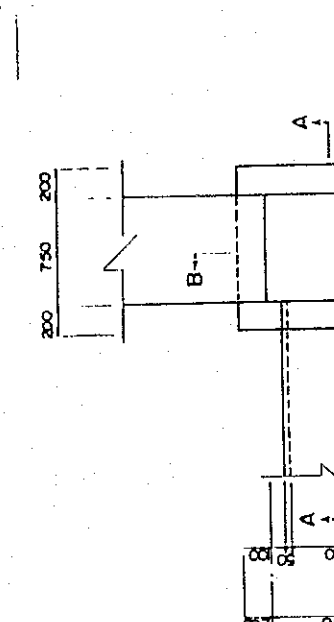
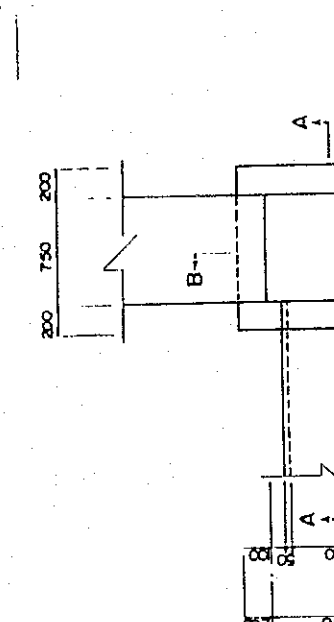
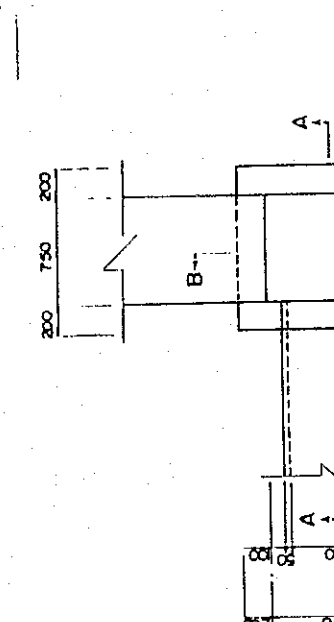
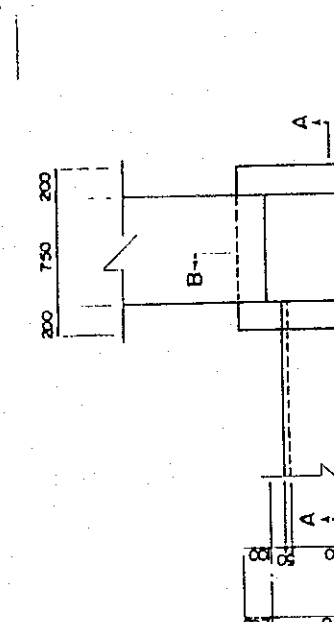
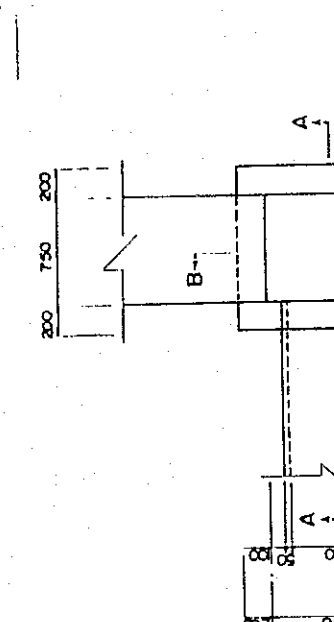


Working Division:

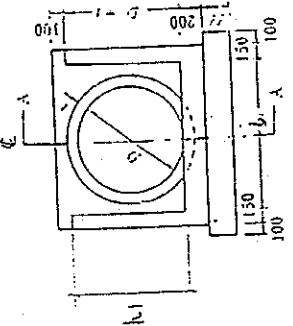
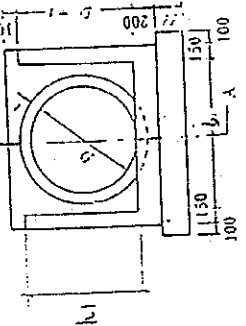
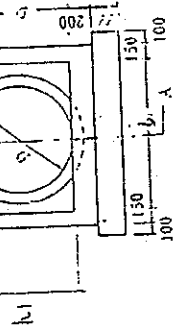
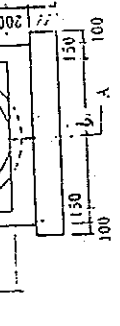

Description	Calculation Details	Unit	Quantity	Remarks
3. 1.1	Concrete class H for levelling concrete			
1. $\phi$ 600 pipe (using wall)	$1.1 \text{ m} \times 1.125 \times 0.1 = 0.124 \text{ m}^3$			
1.1 $\times$ 1.20 $\times$ 0.1 = 0.132 $\text{m}^3$	$0.256 \text{ m}^3$	$\text{m}^3$	1.164	
2. $\phi$ 800 pipe	$0.256 \times 3 = 0.768$ $0.132 \times 3 = 0.396$			
1.3 $\times$ 1.449 $\times$ 0.1 = 0.189 $\text{m}^3$	$1.3 \times 1.598 \times 0.1 = 0.207 \text{ m}^3$			
1.3 $\times$ 1.598 $\times$ 0.1 = 0.207 $\text{m}^3$	$0.390 \text{ m}^3$			
3. $\phi$ 1000 pipe	$1.5 \times 1.775 \times 0.1 = 0.266 \text{ m}^3$			
1.5 $\times$ 1.896 $\times$ 0.1 = 0.284 $\text{m}^3$	$0.550 \text{ m}^3$			

D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	900
D 700	900
D 800	1,000
D 900	1,100

Working Division:

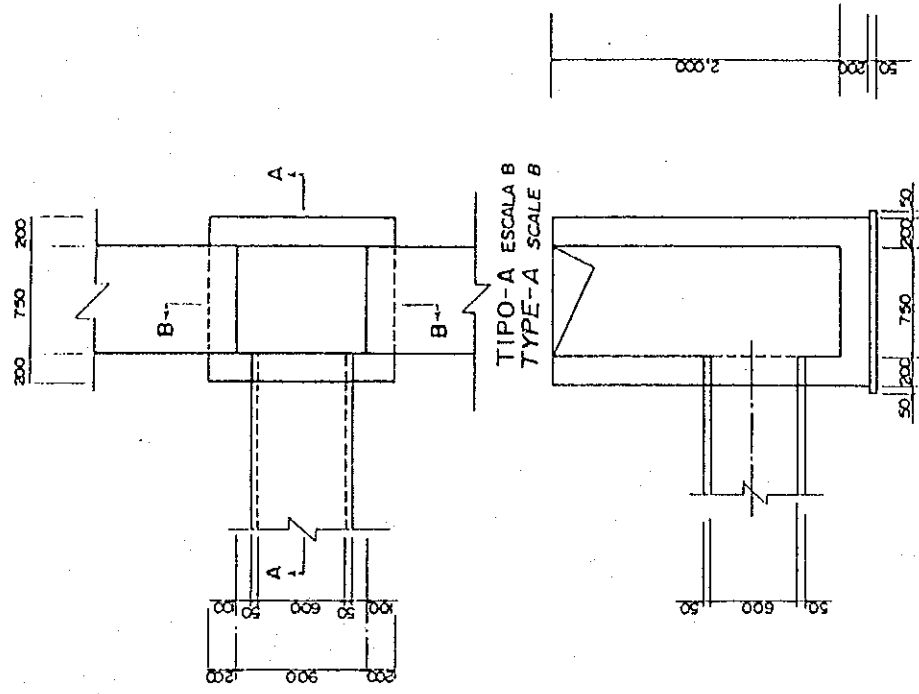
Description	Calculation Details	Unit	Quantity	Remarks
3	(Catch basin) per line $1.25 \times 1.4 \times 0.10 = 0.176 \text{ m}^3$ $0.176 \times 3 = 0.528$	m <sup>3</sup>	0.528	
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				
				

Working Division:

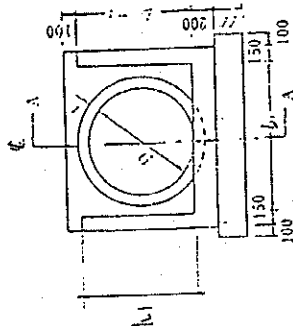
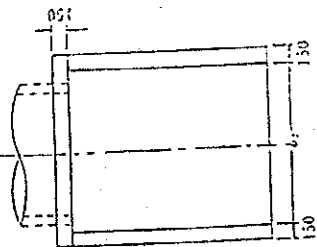
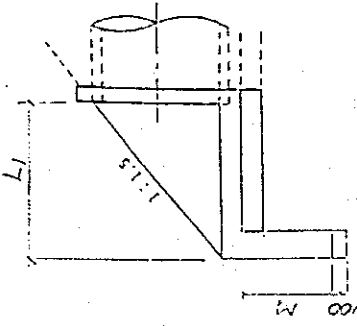
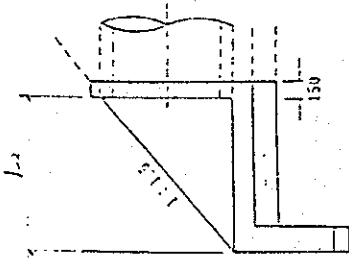
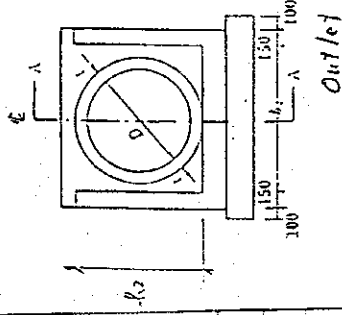
Description	Calculation Details	Unit	Quantity	Remarks
13 / 12	Formwork, Fl finish for concrete of item 109, 110 and 111			
	Casing wall			
	1. $\phi$ 600			
	a) $1.1 \times 0.95 \times 2 = 1.085 \text{ m}^2$			
	b) $1.095 - (0.3 + 0.05) \times 2 = 0.660 \text{ m}^2$			
	c) $(0.15 + 1.125) \times 0.15 / 2 \times 2 = 0.829 \text{ m}^2$			
	d) $0.15 \times 0.1 \times 2 = 0.03 \text{ m}^2$			
	e) $0.2 \times (1.1 + 1.125 \times 2) + 1.1 \times (0.4 + 0.2) = 1.33$			
	f) $1.1 \times 1.0 \times 1.0 \text{ m} = 1.100 \text{ m}^2$			
	g) $1.100 - (0.3 + 0.05) \times 2 = 0.715$			
	h) $(0.15 + 1.20) \times 0.7 \times 1/2 \times 2 = 0.945$			
	i) $0.15 \times 0.1 \times 2 = 0.03 \text{ m}^2$			
	j) $0.2 \times (1.1 + 1.20 \times 2) + 1.1 \times (0.4 + 0.2) = 1.36$			
	<u>5.899 m<sup>2</sup></u>			
	$5.899 \times 3 = 17.697$	m <sup>2</sup>	17.697	
	$3.05 \times 3 = 9.150$		9.150	
			26.847	

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. <i>1/2 Formwork EI finish</i>				
	<i>(Catch drain)</i>			
	<i>1.15 x 2.2 x 2 = 5.06</i>			
	<i>1.30 x 2.2 x 2 - 0.35π = 5.335</i>			
	<i>10.395 m<sup>2</sup></i>			
	<i>10.395 x 3 = 31.185</i>	m <sup>2</sup>	<i>31.185</i>	



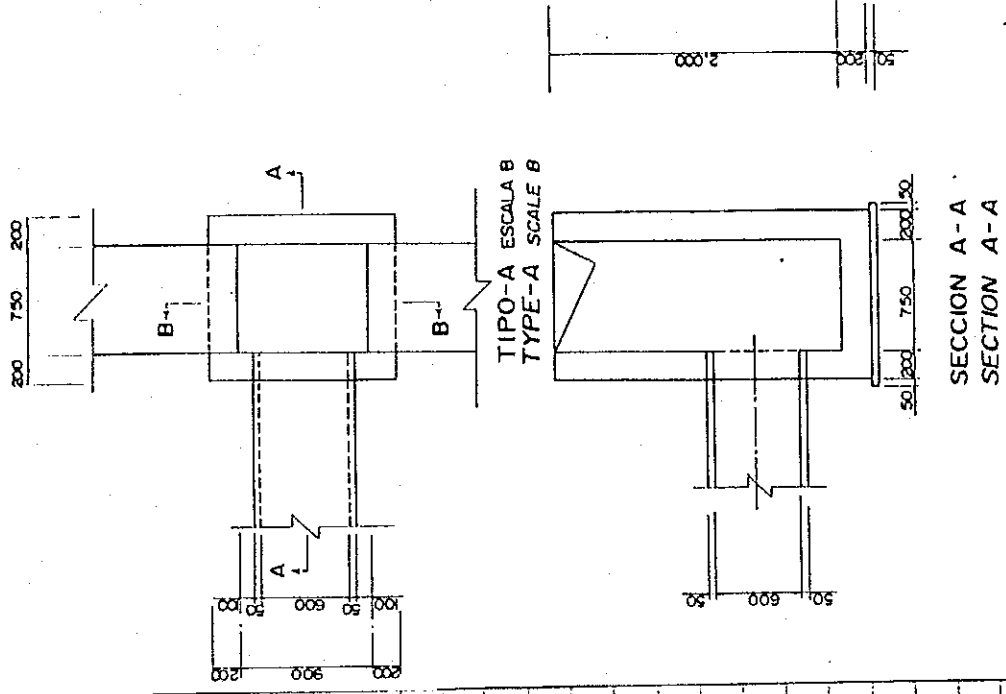
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks																
3 / 13	Formwork F3 finish																			
	(Working wall)																			
	1. $\phi 600$			<table border="1"> <tr> <th>D</th> <th>b' (mm)</th> </tr> <tr> <td>D 400</td> <td>600</td> </tr> <tr> <td>D 450</td> <td>650</td> </tr> <tr> <td>D 500</td> <td>700</td> </tr> <tr> <td>D 600</td> <td>800</td> </tr> <tr> <td>D 700</td> <td>900</td> </tr> <tr> <td>D 800</td> <td>1,000</td> </tr> <tr> <td>D 900</td> <td>1,100</td> </tr> </table>	D	b' (mm)	D 400	600	D 450	650	D 500	700	D 600	800	D 700	900	D 800	1,000	D 900	1,100
D	b' (mm)																			
D 400	600																			
D 450	650																			
D 500	700																			
D 600	800																			
D 700	900																			
D 800	1,000																			
D 900	1,100																			
	② $0.1 \times 1.1 + 0.8 \times 0.65$ $- 0.3^2 \pi = 0.347 \text{ m}^2$																			
	③ $0.975 \times 0.65 \times 2 \times 2 = 0.634 \text{ m}^2$																			
	④ $0.1 \times 1.1 + 0.8 \times 0.70$ $- 0.3^2 \pi = 0.387 \text{ m}^2$																			
	⑤ $1.05 \times 0.70 \times 2 \times 2 = 0.735 \text{ m}^2$ $2.103 \text{ m}^2$	$\text{m}^2$	9.675																	
	$2.103 \times 3 = 6.309$																			
	$1.122 \times 3 = 3.366$																			
																				
																				
				Outlet																



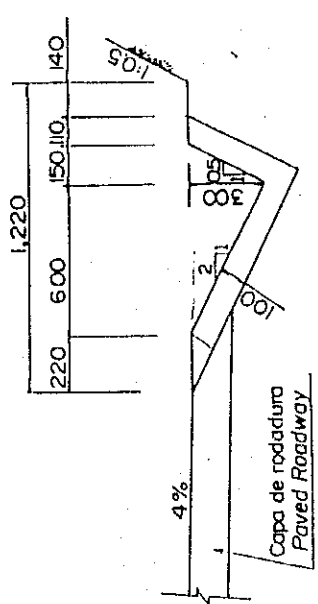
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 /s3 Formwork F3 finish				
	(Catch Basin)			
	$0.75 \times 2.0 \times 2 = 3.0$			
	$0.90 \times 2.0 \times 2 = 3.6$			
	$6.317 \text{ m}^2$			
	$6.317 \times 3 = 18.951$	$\text{m}^2$	18.951	



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 113 Formwork, F3 finish for concrete slab 109 and 110.	(Side ditch) per 1m $0.671 + 0.335 = 1.006 \text{ m}^2$			
	$1.006 \times 744 \text{ m} = 748.464$	$\text{m}^2$	748.464	



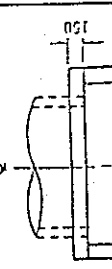
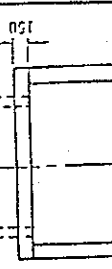
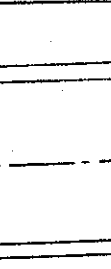
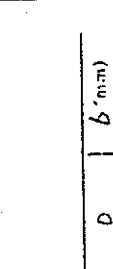
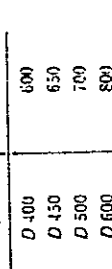
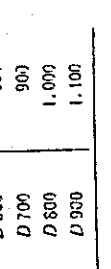

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
1. 3/14	Reinforcing bars for concrete work (wing wall).			
	80 kg / 1 m <sup>3</sup> of concrete volume			
	1. $\phi 600$			
	$1.237 \text{ m}^3 \times 80 = 98.96 \text{ kg}$			
	$98.96 \times 3 = 296.88$			
	$0.77 \times 80 \times 3 = 184.8$			
	2. $\phi 800$			
	$2.000 \text{ m}^3 \times 80 = 160 \text{ kg}$			
	3. $\phi 1000$			
	$2.939 \text{ m}^3 \times 80 = 235.12 \text{ kg}$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 114	Reinforcing bars for concrete works			
	(Catch basin)			
	80 kg / 1m <sup>3</sup> of concrete volume			
	$1.862 \text{ m}^3 \times 80 \text{ kg/m}^3 = 148.96 \text{ m}^3$			
	$148.96 \times 3 = 446.88 \text{ kg}$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. /15	Gabion mattress, $z = 500 \text{ mm}$			
	Swing (spill part)			
	1. $\phi 600$	$m^3$	18.150	
	$(0.8 + 0.3) \times 5.0 \times 0.5 = 2.75 \text{ m}^3$			
	$2.75 \times 2 \times 3 = 16.50$			
	$5.75 \times 0.2 \times 3 = 1.65$			
	2. $\phi 800$			
	$(1.5 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$			
	3. $\phi 1000$			
	$(1.7 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$			
	A. $1.2 \times 1.2 \text{ m}$			
	$(2.434 \times 2 + 3.3) \times 5.0 \times 0.5 = 20.42 \text{ m}^3$			
	5. $1.5 \times 1.5 \text{ m}$			
	$(3.154 \times 2 + 3.45) \times 5.0 \times 0.5 = 24.395 \text{ m}^3$			



Working Division: 14. 1A SECA ACCESS ROAD

Description	Calculation Details	Unit	Quantity	Remarks
M.3	CULVERT AND DRAINAGE WORKS			
101	Open-cut excavation all classes	m <sup>3</sup>	829.788	
	1. Pipe culvert		104.37	
	2. Box culvert			
	3. Drain pipe		488.490	
	4. Catch basin		236.928	
	Total		829.788	
102	Backfill with selected material	m <sup>3</sup>	258.41	
	1. Pipe culvert		48.49	
	2. Box culvert			
	3. Catch basin		209.920	
	Total		258.41	
103	Crushed stone bedding	m <sup>3</sup>	15.80	→ 16
	1. Pipe culvert			

6-24-1

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	CULVERT AND DRAINAGE WORKS			
104	Reinforced concrete pipe, P. 600 mm Culvert: 0 m, For ditch 51.5 m	m	51.500	→ 52
105	Reinforced concrete pipe, P. 800 mm	m	45.90	→ 46
106	Reinforced concrete pipe, D. 1000 mm	m	0.0	
107	P.V.C. perforated drain pipe, P. 200 mm	m	2035.376	→ 2036
108	Free drainage material for subdrain	m <sup>3</sup>	424.579	→ 425
109	Concrete, class E, for pipe culvert and wing walls	m <sup>3</sup>	83.482	
	1. Pipe culvert 22.83			
	2. Box culvert			
	3. Wing wall for pipe culvert 14.16			
	4. Wing wall for box culvert 46.492			
	Total 83.482			
110	Concrete, class F, for side ditch and catch basin	m <sup>3</sup>	522.063	→ 522
	1. Side ditch 14.896			
	2. Catch basin 507.167			
	Total 522.063			

5-270



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	CULVERT AND DRAINAGE WORKS			
/11	Concrete, class H, for levelling concrete	m <sup>3</sup>	8.648	
	1. Culvert			
	2. Wing wall		7.944	
	3. Catch basin		0.704	
	Total		8.648	
/12	Formwork, F1 finish, for concrete of Items 109 and 110.	m <sup>2</sup>	327.758	
	1. culvert		67.66	
	2. Wing wall		176.938	
	3. Catch basin		83.160	
	Total		327.758	
/13	Formwork, F3 finish, for concrete of Items 109 and 110.	m <sup>2</sup>	4373.275	
	1. Culvert			
	2. Wing wall		106.130	
	3. Catch basin		50.536	
	4. Drain ditch		4216.609	
	Total		4373.275	

6-273

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3.	CULVERT AND DRAINAGE WORKS			
1/14	Reinforcing bars for concrete works	Ton	6	14
	1. Culvert			
	2. Wing wall 4420.36			
	3. Catch basin 1191.00			
	Total 5612.04			
1/15	Gabion mattress, t = 500 mm	m <sup>3</sup>	153.130	154
A	Joint filler, t = 10 mm	m <sup>2</sup>	6.585	6
1/10	Bituminous coating for contraction joint	m <sup>2</sup>	13.170	14
A				
1/12				

6-244

Working Division: A

Description	Calculation Details	Unit	Quantity	Remarks
11.4	CONCRETE WORKS			
103	Concrete class E for box culverts	m <sup>3</sup>	122.304	
104	Concrete class H for levelling concrete	m <sup>3</sup>	11.230	
106	Formwork F1 finish for concrete item 103, 104	m <sup>2</sup>	220.480	
108	Formwork F3 finish for concrete item 103	m <sup>2</sup>	247.95	
109	Reinforcing bars for concrete works	Ton	10	
110	Joint filler for culvert	m <sup>2</sup>	6.585	
112	Bituminous coating for contraction joint	m <sup>2</sup>	13.170	

525

變更(1)

Sr. No	St. No.	Q m <sup>3</sup> /s	I	Entrance El m	Exit El m	Road El m	Culvert Length m	Type	Soil Thickness m
D-1	0+414.50	2.00	5.0%	192.600	191.875	196.660	14.500	D=800mm / 80°	3.622
D-2	0+879.50	23.22	3.0%	188.850	188.388	194.785	15.400	2000mm x 2000mm I	4.166
D-3	2+014.00	28.65	6.5%	180.110	178.407	191.100	26.200	2000mm x 2000mm II	9.841
D-4	2+700.00	1.70	4.0%	185.850	185.454	188.125	9.900	D=800mm 90°	1.673
D-5	3+100.00	2.22	10.0%	190.500	189.360	193.200	11.400	D=800mm 90°	2.470
D-6	3+450.00	1.70	10.0%	191.400	190.390	193.200	10.100	D=800mm 90°	1.505

87.500 (m)  
 2 6800 90° 3.  
 0 180° 14.5 /  
 / 2.0x2.0 I. 15.4 /  
 / III 26.2 /

6-258

7. La Seca

	Length	Pipe Length		Open Cut Excavation		Backfill		Crushed Stone Bedding		Pipe D=600		Pipe D=800		Pipe D=1000		Concrete Class E		Form Work F1		Reinforced Bar			
		Unit (m)	Unit (m)	Unit (m3)	Total	Unit (m3)	Total	Unit (m3)	Total	Unit (m)	Unit (m)	Unit (m)	Unit (m)	Unit (m3)	Total	Unit (m2)	Total	Unit (kg)	Total	Unit (m2)	Total	Unit (kg)	Total
D=600mm	90	51.5	51.5	0.83	42.68	0.43	22.18	0.14	7.34					0.16	8.05	0.52	26.78	0.00	0.00	0.00	0.00	0.00	0.00
	180	0.0		0.93	0.00	0.42	0.00	0.17	0.00					0.26	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fix	0.0		1.09	0.00	0.45	0.00	0.24	0.00					0.62	0.00	2.00	0.00	0.00	0.00	0.00	0.00	42.98	0.00
D=800mm	90	31.4	45.9	1.28	40.17	0.58	18.15	0.17	5.42					0.26	8.12	0.68	21.35	0.00	0.00	0.00	0.00	0.00	0.00
	180	14.5		1.48	21.52	0.56	8.16	0.21	3.05					0.46	6.66	1.34	19.43	0.00	0.00	0.00	0.00	0.00	0.00
	Fix	0.0		1.72	0.00	0.60	0.00	0.31	0.00					1.11	0.00	2.68	0.00	0.00	0.00	0.00	0.00	73.53	0.00
D=1000mm	90	0.0	0.0	1.90	0.00	0.73	0.00	0.28	0.00					0.35	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	180	0.0		2.12	0.00	0.72	0.00	0.33	0.00					0.60	0.00	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fix	0.0		2.22	0.00	0.71	0.00	0.36	0.00					1.43	0.00	3.16	0.00	0.00	0.00	0.00	0.00	84.55	0.00
Total		97.4			104.37		48.49		15.80		51.50	45.90	0.00		22.83		67.56						0.00

	Length	Open Cut Excavation		Backfill		Concrete Class E		Concrete Class H		Form Work F1		Form Work F3		Form Work F1		Reinforced Bar	
		Unit (m)	Unit (m3)	Total	Unit (m3)	Total	Unit (m3)	Total	Unit (m2)	Total	Unit (m2)	Total	Unit (m2)	Total	Unit (m2)	Total	Unit (kg)
1200mm x 1200mm	-9.25	0.0	2.42	0.00	0.77	0.00	1.63	0.00	0.19	0.00	3.60	0.00	3.70	0.00	0.00	162.91	0.00
1500mm x 1500mm	-9.5	0.0	3.36	0.00	0.96	0.00	2.31	0.00	0.22	0.00	4.30	0.00	4.45	0.00	0.00	193.31	0.00
2000mm x 2000mm	-5.75	41.6	4.97	206.60	1.25	51.82	2.94	220.48	0.27	11.23	5.30	220.48	5.95	247.45	232.36	9,666.34	0.00
2000mm x 2000mm	-7.75	0.0	5.18	0.00	1.31	0.00	3.20	0.00	0.27	0.00	5.50	0.00	5.95	0.00	236.02	0.00	
2000mm x 2000mm	7.751~	0.0	5.54	0.00	1.37	0.00	3.74	0.00	0.28	0.00	5.70	0.00	5.95	0.00	270.47	0.00	
2500mm x 2000mm	3.75-5.75	0.0	5.93	0.00	1.31	0.00	3.61	0.00	0.32	0.00	5.50	0.00	6.43	0.00	317.29	0.00	
2500mm x 2000mm	5.751~	0.0	6.32	0.00	1.37	0.00	4.20	0.00	0.32	0.00	5.70	0.00	6.43	0.00	331.62	0.00	
Total		41.6		206.60		51.82		220.48	11.23		247.45		9,666.34				

122.304

0.12.13

## LONGITUD DE CUNETAS

CAMINO DE ACCESO: LA SECA

0+000 a 3+284.03 Km

	ABSCISAS	IZQUIERDA	DERECHA	LONGITUD
	0+000.00 - 0+038.18	0.00	38.18	38.18
5.5	0+080.00 - 0+100.00	0.00	240.00	240.00
8.0	0+300.00 - 0+500.00	0.00	240.00	240.00
6.5	0+540.00 - 0+800.00	0.00	270.00	270.00
3.5	0+800.00 - 1+100.00	0.00	210.00	210.00
6.0	1+100.00 - 1+350.00	0.00	230.00	230.00
8.0	1+300.00 - 1+400.00	0.00	70.00	70.00
	1+400.00 - 1+440.41	40.41	40.41	80.82
	1+440.41 - 1+490.00	0.00	49.59	49.59
1.5	1+400.00 - 1+720.00	0.00	230.00	230.00
	1+720.00 - 1+780.00	60.00	60.00	120.00
5.5	1+780.00 - 1+900.00	0.00	120.00	120.00
	1+900.00 - 2+000.00	0.00	100.00	100.00
	2+084.10 - 2+115.13	VV 51.03	51.03	102.06
	2+115.13 - 2+240.00	0.00	124.87	124.87
	2+240.00 - 2+274.38	34.38	34.38	68.76
	2+274.38 - 2+340.00	0.00	65.62	65.62
	2+440.00 - 2+490.00	VV 50.00	50.00	100.00
	2+580.00 - 2+694.67	V 0.00	114.67	114.67
	2+740.00 - 2+760.00	VV 20.00	0.00	20.00
	2+760.00 - 2+837.58	77.58	77.58	155.16
	2+880.00 - 2+920.00	0.00	40.00	40.00
	2+920.00 - 3+080.00	160.00	160.00	320.00
	3+080.00 - 3+163.53	0.00	83.53	83.53
	3+163.53 - 3+200.00	VV 36.47	36.47	72.94
	3+220.00 - 3+240.00	0.00	20.00	20.00
	3+240.00 - 3+350.00	110.00	110.00	220.00
	3+350.00 - 3+514.48	0.00	164.48	164.48
	3+514.48 - 3+600.00	85.52	85.52	171.04
	3+600.00 - 3+714.29	0.00	114.29	114.29
	3+714.29 - 3+720.00	5.71	5.71	11.42
	3+720.00 - 3+740.00	0.00	20.00	20.00
	3+740.00 - 3+750.00	10.00	10.00	20.00
	3+750.00 - 3+760.00	10.00	10.00	20.00
	3+760.00 - 3+824.03	0.00	64.03	64.03

LONG. TOTAL: 4091.46 m

Total length 4091.46

addition 10x10=100 4191.46m

Catch basin 8 nos

Ø 600

51.5 m

6-2/10

### Drain Pipe Quantities

Access Road Name	Length (m)	Excavation (m3)		P. V. C Pipe D=200mm (m)		Drainage Material (m3)	
		Per meter	Total	Total	Per meter	Total	
Conguillo	5,823.120	0.240	1,397.549	5,823.120	0.209	1,214.703	
Severno Tramo1	1,535.870	0.240	368.609	1,535.870	0.209	320.382	
Severno Tramo2	2,472.920	0.240	593.501	2,472.920	0.209	515.851	
Los Cuyuyes	7,324.030	0.240	1,757.767	7,324.030	0.209	1,527.793	
Poza Honda	266.710	0.240	64.010	266.710	0.209	55.636	
La Seca	2,035.376	0.240	488.490	2,035.376	0.209	424.579	
El Guasmo	786.460	0.240	188.750	786.460	0.209	164.056	
Cana Dulce	1,200.560	0.240	288.134	1,200.560	0.209	250.437	
Membrillo Outlet	30.000	0.240	7.200	30.000	0.209	6.258	
<b>Grand Total</b>			<b>5,154.011</b>	<b>21,475.046</b>		<b>4,479.695</b>	

Excavation  $V=(0.8+0.4)*0.4/2 =0.24$

Free Drainage Material  $V=0.24*3.14*0.1^2 =0.21$

6259

Working Division:

Remarks

Unit Quantity

Calculation Details

Description

3 121. Open-cut excavation, all classes (Catch basin)

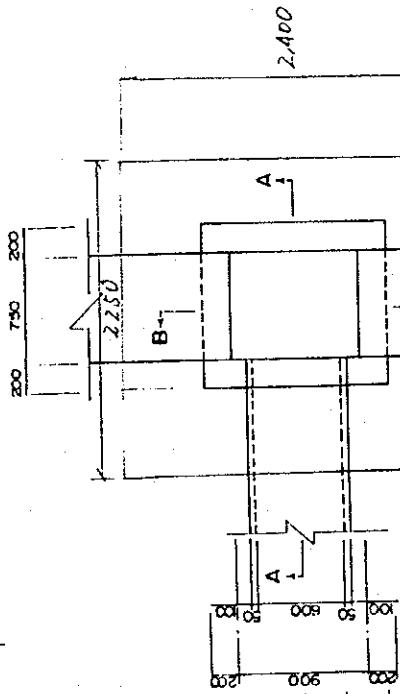
$2.25 \times 2.4 \text{ m} = 5.4 \text{ m}^2$

$4.5 \times 4.65 \text{ m} = 20.925 \text{ m}^2$

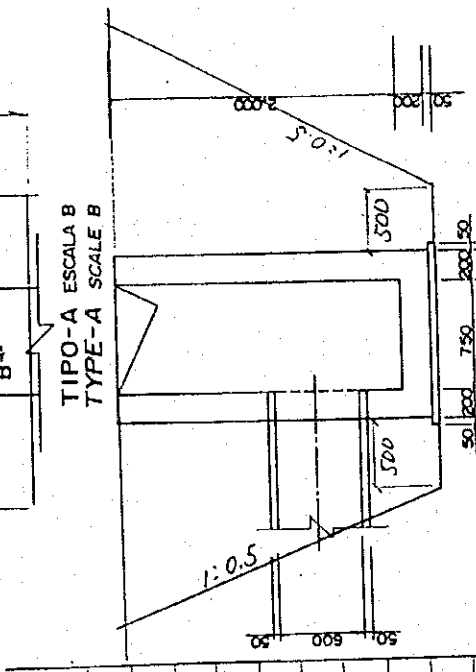
$(5.4 + 20.925) \times \frac{1}{2} \times 2.25 = 29.616 \text{ m}^3$

$29.616 \times 8 \text{ units} = 236.928$

m<sup>3</sup> 236.928



TIPO-A ESCALA B  
TYPE-A SCALE B



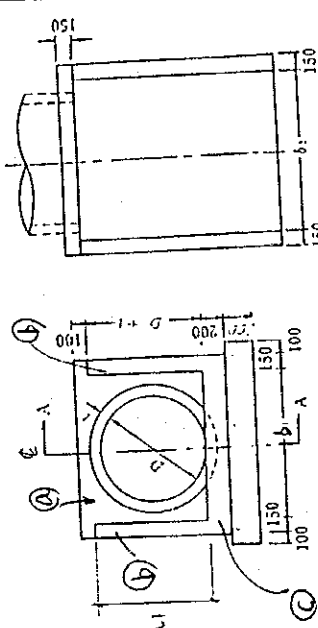
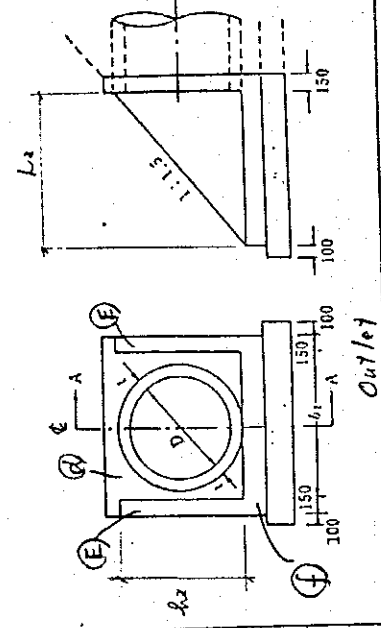
SECCION A-A  
SECTION A-A



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 102	Backfill with selected material			
	< catch basin >			
	$29.616 = 1.15 \times 1.3 \times 2.2 - 1.25 \times 1.4 \times 0.05$			
	= 26.240			
	$26.24 \times 8 = 209.92$	$m^3$	209.920	

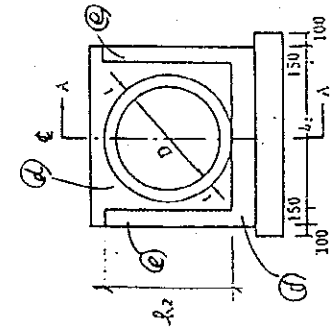
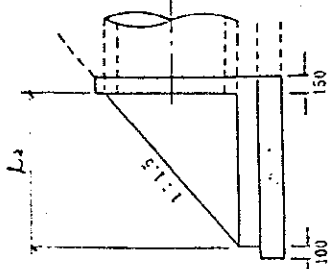
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 109	Concrete down E for			
	(curbing wall)			
	pipe type			
	$L_1 = 600$ $(h_1 = 650 \text{ mm}, b = 800 \text{ mm})$ $(L_2 = 975 \text{ mm}, h_2 = 700 \text{ mm})$ $L_2 = 1.5 M = 1.5 \times 650$			
	① $1.1 \times 0.95 \times 0.15 \text{ m} = 0.157 \text{ m}^3$			
	② $0.975 \times 0.65 \times 0.15 \text{ m} \times \frac{1}{2} \times 2 = 0.095 \text{ m}^3$			
	③ $1.7 \times 0.975 \times 0.2 = 0.331 \text{ m}^3$			
	④ $1.1 \times 1.0 \times 0.15 \text{ m} = 0.165 \text{ m}^3$			
	⑤ $1.05 \times 0.7 \times \frac{1}{2} \times 0.15 \times 2 = 0.110 \text{ m}^3$			
	⑥ $1.1 \times 1.05 \times 0.2 \text{ m} = 0.231 \text{ m}^3$			
	⑦ $0.3 \times 0.4 \times 1.1 \text{ m} \times 2 = 0.264 \text{ m}^3$			
	1.237 $\text{m}^3$			
	0.77 $\times 8 \text{ nos} = 6.16$	$\text{m}^2$	6.16	

Working Division:

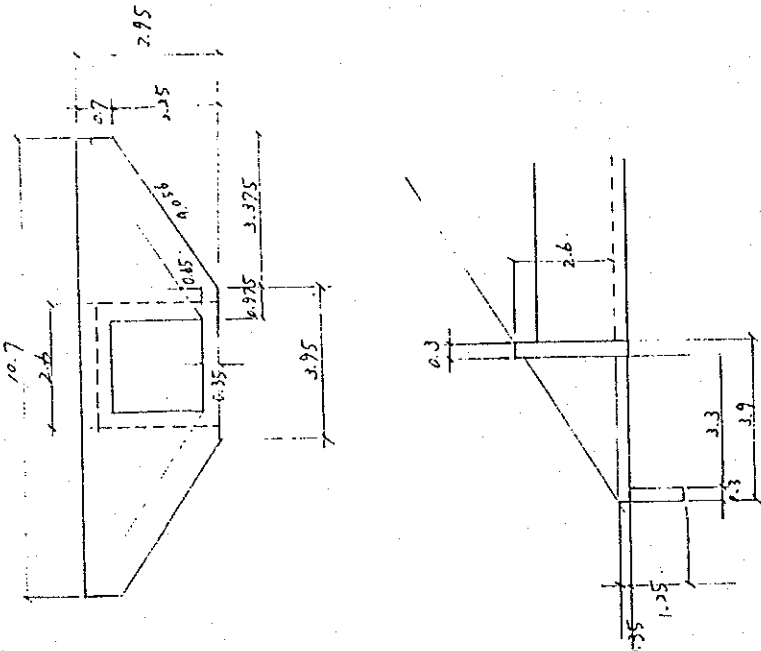
Description	Calculation Details	Unit	Quantity	Remarks
3 109	$2 \phi 800$ $h_1 = 0.866 \text{ m}$ $L_1 = 1.299 \text{ m}$ $b = 1.0 \text{ m}$ $h_2 = 0.932$ $L_2 = 1.398 \text{ m}$ $M = e.b.m.$			
	①: $1.3 \times 1.166 \times 0.15 = 0.227 \text{ m}^3$			
	②: $0.866 \times 1.299 \times \frac{1}{2} \times 0.15 \times 2 = 0.169 \text{ m}^3$			
	③: $1.3 \times 1.299 \times 0.2 = 0.338 \text{ m}^3$			
	④: $1.3 \times 1.232 \times 0.15 = 0.240 \text{ m}^3$			
	⑤: $0.932 \times 1.398 \times \frac{1}{2} \times 0.15 \times 2 = 0.195 \text{ m}^3$			
	⑥: $1.3 \times 1.398 \times 0.2 = 0.363 \text{ m}^3$			
	⑦: $0.3 \times 0.6 \times 1.3 \times 2 = 0.468 \text{ m}^3$			
	<p style="text-align: center;"><u>2.0 m<sup>3</sup></u></p>			
	$2.0 \times 4 = 8.0$	m <sup>3</sup>	8.0	

D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100



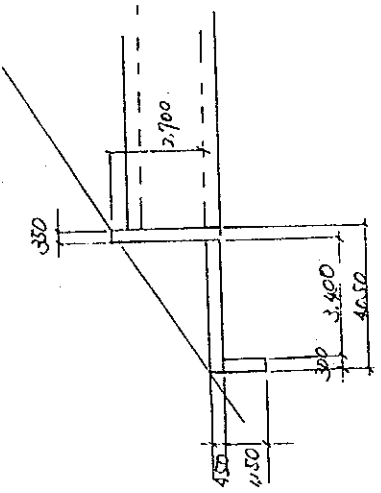
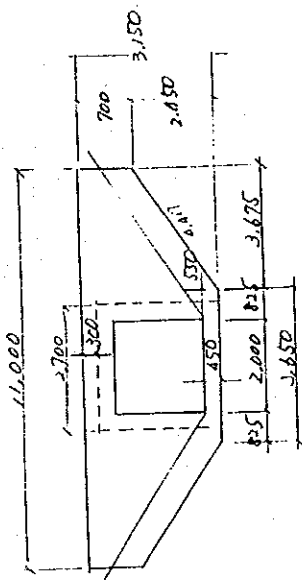
6-263

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 1.09 Concrete class E (wing wall)	3. 2.0 x 2.0 m (I)  Wing } $(10.7 + 3.95) \times 2.25/2 + 0.7 \times 10.7$ $- 2.0^2 \times 0.3 = 5.991$  Slab } $3.6 \times 2.6 \times 0.35 = 3.276$ $0.3 \times 1.35 \times 2.6 = 0.995$  $10.242 m^3$			
		m <sup>3</sup>	20.484	

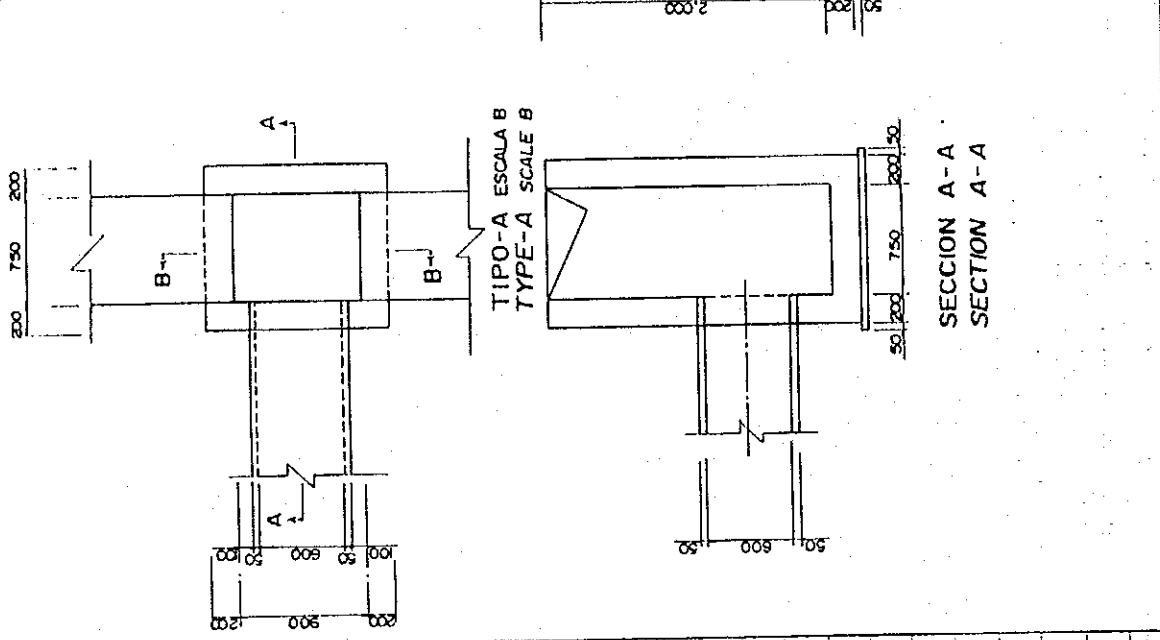
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 109 Concrete class F (Wing wall)				
	$5.2.0 \times 2.0 \text{ (M)}$			
	$\text{Wing } \left\{ \begin{aligned} &(11.0 + 3.65) \times 2.45 \times \frac{1}{2} + 0.7 \times 11.0 \\ &- 2.0^2 \end{aligned} \right\} \times 0.35$			
	$= 7.576 \text{ m}^3$			
	$\text{Slab}$			
	$2.7 \times 3.70 \times 0.45 = 4.476$			
	$0.3 \times 1.15 \times 2.70 = 0.932$			
	$13.004 \text{ m}^3$			
	$13.004 \times 2 \times 1 = 26.008$	$\text{m}^3$	$26.008$	

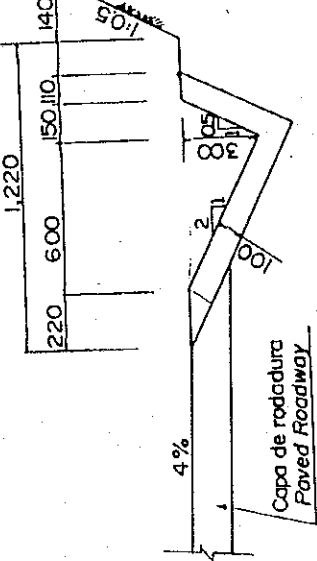


Working Division:

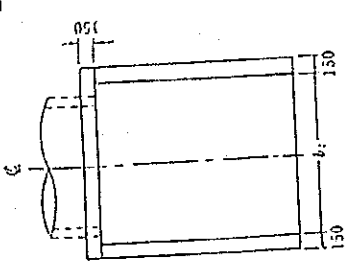
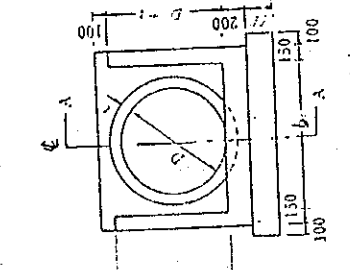
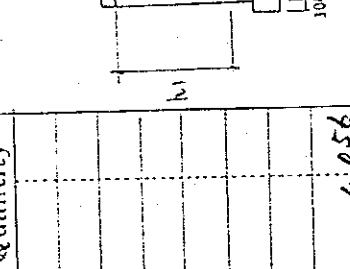
Description	Calculation Details	Unit	Quantity	Remarks
3 10	Concrete, class F for side ditch and catch basin			
	(Catch basins) per no.			
	1.15 x 1.30 x 2.2			
	- 0.75 x 0.9 x 2.0 = 1.359 m <sup>3</sup>			
	1.939 - 0.357 = 1.582 m <sup>3</sup>			
	1.582 x 9 = 14.896	m <sup>3</sup>	14.896	



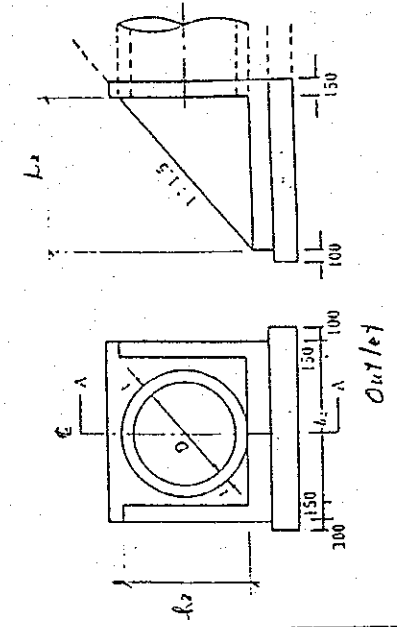
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 100 Concrete class F. for side ditch and catch basin	(Side ditch) per 1 m $1.08 \times 0.432 \times \frac{1}{2}$ $- 0.75 \times 0.3 \times \frac{1}{2} = 0.121 \text{ m}^3$	$\text{m}^3$	507.167	

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 1.1	Concrete class H for levelling concrete			
	1. $\phi$ 600 pipe (wing wall)			
	$1.1 \text{ m} \times 1.125 \times 0.1 = 0.124 \text{ m}^3$			
	$1.1 \times 1.20 \times 0.1 = 0.132 \text{ m}^3$			
	<u><math>0.256 \text{ m}^3</math></u>			
	2. $\phi$ 800 pipe	$\text{m}^3$	1.056	
	$0.132 \times 8 = 1.056$			
	3. $\phi$ 1,000 pipe			
	$1.3 \times 1.449 \times 0.1 = 0.189 \text{ m}^3$			
	$1.3 \times 1.598 \times 0.1 = 0.201 \text{ m}^3$			
	<u><math>0.390 \text{ m}^3</math></u>			
	$0.390 \times 4 = 1.56$	$\text{m}^3$	1.560	

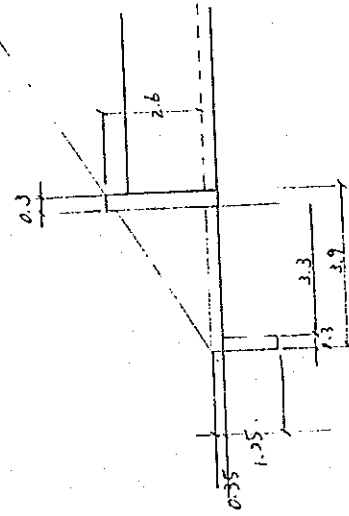
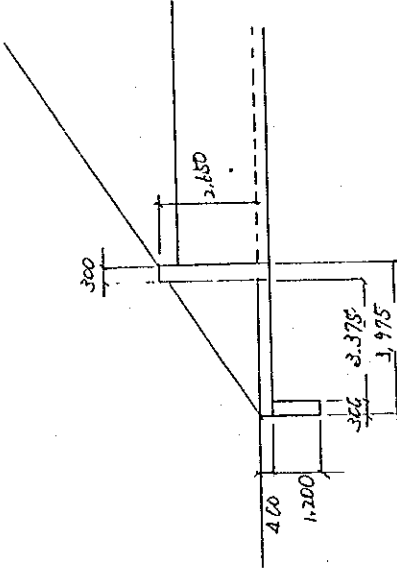
D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100



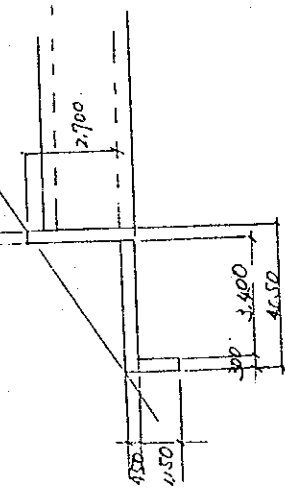
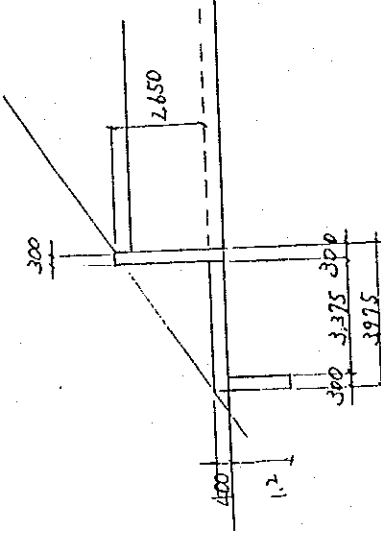
0-260



Working Division:

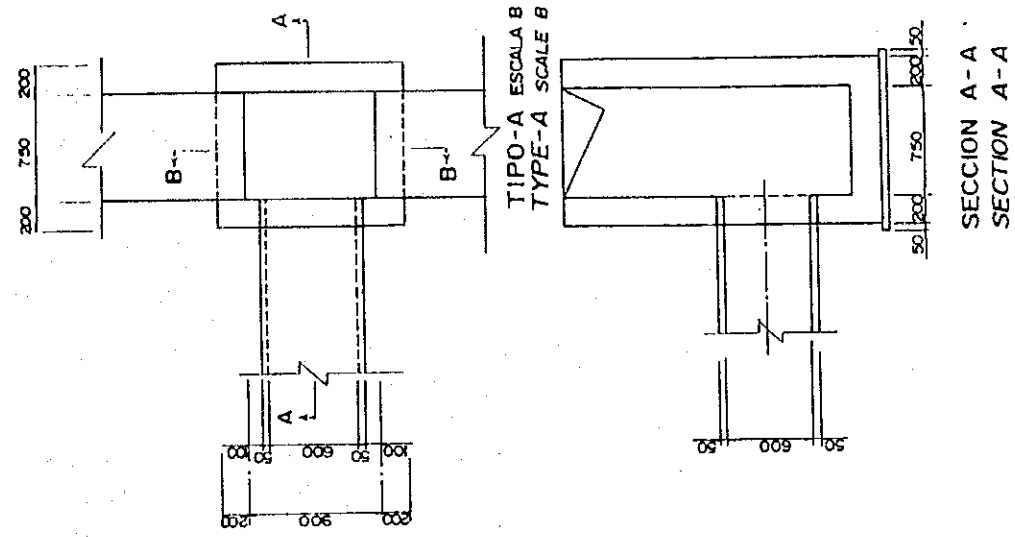
Description	Calculation Details	Unit	Quantity	Remarks
3 1/11	Concrete class H for leveling concrete (wing wall)			
3	$2.0 \times 2.0$ (I)			
	(wing) $0.3 \times (4.056 \times 2 + 3.95) \times 0.1 = 0.362$ m <sup>3</sup>			
	(slab) $2.6 \times 3.33 \times 0.1 = 0.866$			
	$1.228$ m <sup>3</sup>			
	$1.228 \times 2 \times 1 = 2.456$	m <sup>3</sup>	2.456	
4	$2.0 \times 2.0$ (II)			
	(wing) $0.3 \times (4.237 \times 2 + 3.80) \times 0.1 = 0.368$			
	(slab) $2.6 \times 3.675 \times 0.1 = 0.956$			
	$1.324$ m <sup>3</sup>			
				

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	<p>Concrete class H for leveling concrete (curb wall)</p> <p>5. <math>2.0 \times 2.0 \text{ m (III)}</math>  <math>(\text{wing}) \quad 0.35 \times (4.417 \times 2 + 3.65) \times 0.1 = 0.437</math>  <math>(\text{slab}) \quad 2.7 \times 3.7 \times 0.1 = 0.999</math>  <math>1.436 \times 2 \times 1 = 2.872</math>  <math>1.436 \text{ m}^3</math></p>	$\text{m}^3$	2.872	
6.	<p><math>2.5 \times 2.0 \text{ m (I)}</math>  <math>(\text{wing}) \quad 0.30 \times (4.237 \times 2 + 4.3) \times 0.1 = 0.383</math>  <math>(\text{slab}) \quad 3.1 \times 3.675 \times 0.1 = 1.139</math>  <math>1.522 \text{ m}^3</math></p>	$\text{m}^3$		

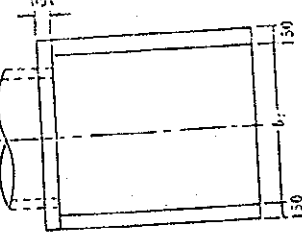
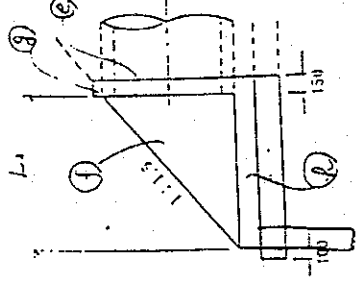
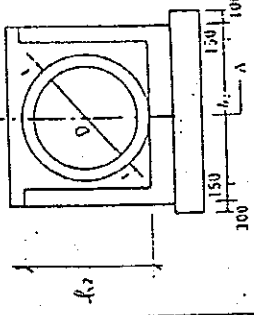
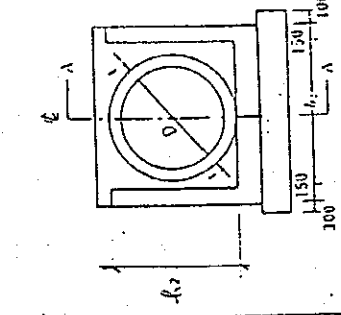
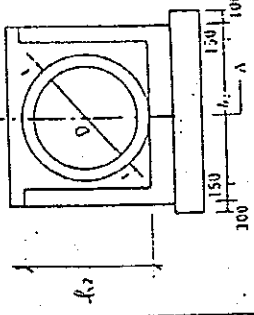
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	Concrete class H for levelling concrete (Catch Basin) per 1 no.			
	$1.25 \times 1.4 \times 0.10 = 0.175$	$m^3$		
	$0.175 \times 8 = 1.400$	$m^3$	1.400	



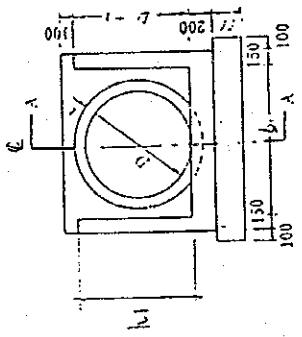
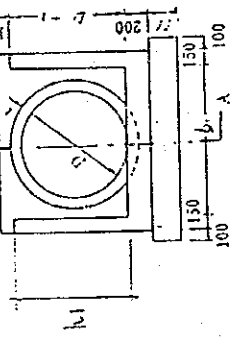
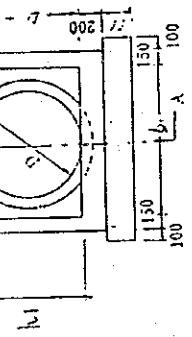
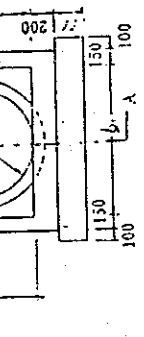
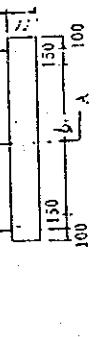

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Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
13 / 12	Formwork, EI finish for concrete of item 109, 110 and 111			
	(Curing wall)			
	1. $\phi$ 600			
	a) $1.1m \times 0.95m = 1.045 m^2$			
	b) $1.045 - (0.3 + 0.05)^2 \pi = 0.660 m^2$			
	c) $(0.15 + 1.125) \times 0.15 / 2 \times 2 = 0.829 m^2$			
	d) $0.15 \times 0.1 \times 2 = 0.03 m^2$			
	e) $0.2 \times (1.1 + 1.125 \times 2) + 1.1 \times (0.4 + 0.2) = 1.33$			
	f) $1.1m \times 1.0m = 1.100 m^2$			
	g) $1.100 - (0.3 + 0.05)^2 \pi = 0.715$			
	h) $(0.15 + 1.20) \times 0.7 \times \frac{1}{2} \times 2 = 0.945$			
	i) $0.15 \times 0.1 \times 2 = 0.03 m^2$			
	j) $0.2 \times (1.1 + 1.20 \times 2) + 1.1 \times (0.4 + 0.2) = 1.36$			
	3.899 m <sup>2</sup>			
	$3.05 \times 8 m = 24.4 m^2$	m <sup>2</sup>	24.400	
				
				
				

D	b (mm)
D 400	500
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100

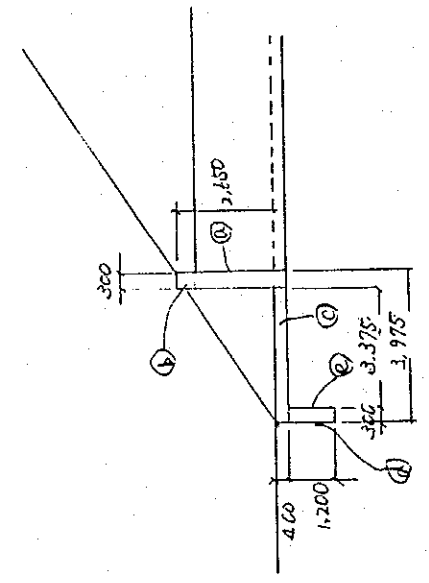
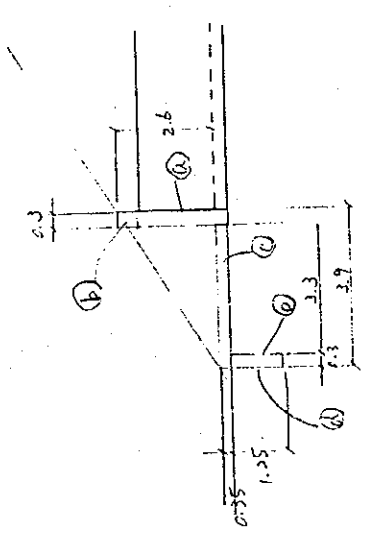
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / P	Framework EI finish			
	(carving wall)			
	2. 8700			
	① 1.3 m x 1.166 m = 1.516			
	1.516 - (0.466) * 2 = 0.584 m <sup>2</sup>			
	② (0.15 + 1.449) x 0.866 * 1/2 x 2 = 1.385 m <sup>2</sup>			
	③ 0.15 x 0.1 x 2 = 0.03			
	④ 0.2 x (1.3 + 1.449 x 2) + 1.3 (0.6 + 0.4) = 2.140			
	⑤ 1.3 x 1.332 = 1.602			
	1.602 - 0.466 * 2 = 0.920 m <sup>2</sup>			
	⑥ (0.15 + 1.548) x 0.932 * 1/2 x 2 = 1.583 m <sup>2</sup>			
	⑦ 0.15 x 0.1 x 2 = 0.03			
	⑧ 0.2 x (1.3 + 1.548 x 2) + 1.3 (0.6 + 0.4) = 2.199			
	9.101 m <sup>2</sup>			
	9.101 x 4 = 36.404	m <sup>2</sup>	36.404	

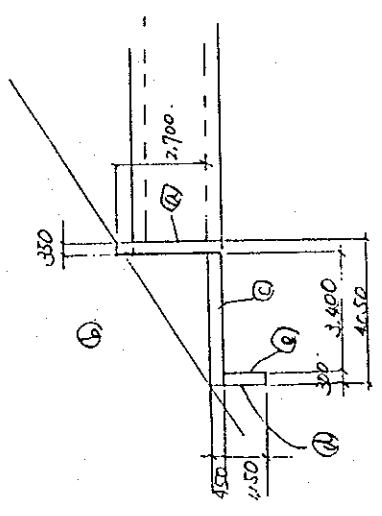
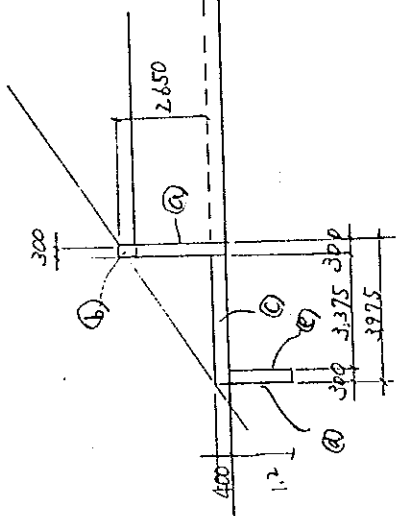
6291

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 1/2 Formwork Fl finish				
3. 20 x 20 m (I)				
a) (10.7 + 3.95) x 2.25 x 1/2 + 0.7 x 10.7				
- 2.6 x 2.65 = 17.081 m <sup>2</sup>				
b) 0.7 x 0.3 x 2 = 0.42 m <sup>2</sup>				
c) (3.6 x 1.60 - 3.3 x 1.25) x 2 = 3.270 m <sup>2</sup>				
d) 1.60 x 2.6 = 4.16 m <sup>2</sup>				
e) 1.25 x 2.6 = 3.25 m <sup>2</sup>				
4. 2.0 x 2.0 m (II)				
a) (10.85 + 3.8) x 2.35 x 1/2 + 0.7 x 10.85				
- 2.6 x 2.75 = 17.659 m <sup>2</sup>				
b) (0.7 x 0.3 x 2 = 0.42 m <sup>2</sup>				
c) (3.675 x 1.6 - 3.375 x 1.2) x 2 = 3.660 m <sup>2</sup>				
d) 1.6 x 2.6 = 4.16 m <sup>2</sup>				
e) 1.2 x 2.6 = 3.12 m <sup>2</sup>				

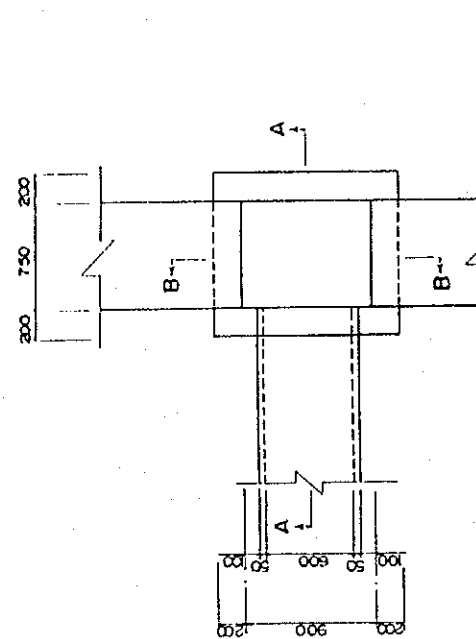


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 12 Formwork Fl finish				
	5. $2.0 \times 2.0$ (III)			
	① $(11.0 + 3.65) \times 2.45 \times \frac{1}{2} + 0.7 \times 11.0$ $- 2.7 \times 2.85 = 17.951 \text{ m}^2$			
	② $0.7 \times 0.35 \times 2 = 0.49$			
	③ $(3.70 \times 1.6 - 3.4 \times 1.15) \times 2 = 4.02$			
	④ $1.6 \times 2.7 = 4.32$			
	⑤ $1.15 \times 2.7 = 3.105$			
	<u>29.886 m<sup>2</sup></u>			
	$29.886 \times 2 \times 1 = 59.772$	m <sup>2</sup>	59.772	
	6. $2.5 \times 2.0$ (I)			
	① $(11.35 + 4.3) \times 2.35 \times \frac{1}{2} + 0.7 \times 11.35$ $- 3.1 \times 2.75 = 17.809$			
	② $0.7 \times 0.3 \times 2 = 0.42$			
	③ $(3.675 \times 1.6 - 3.375 \times 1.2) \times 2 = 3.660$			
	④ $1.6 \times 3.1 = 4.96$			
	⑤ $1.2 \times 3.1 = 3.72$			
	<u>30.569 m<sup>2</sup></u>			

Working Division:

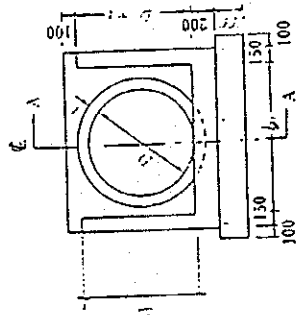
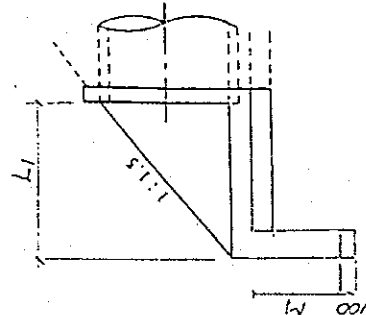
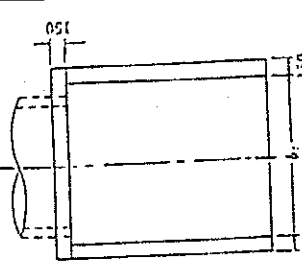
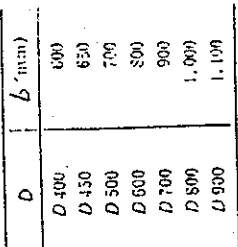
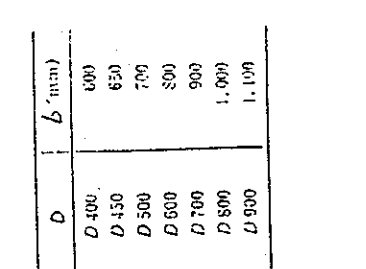
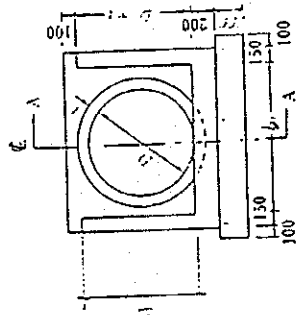
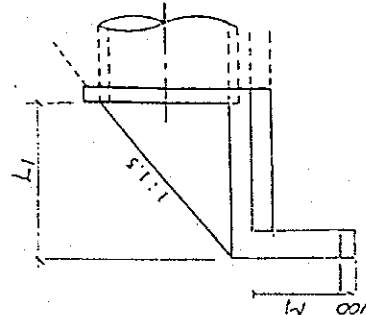
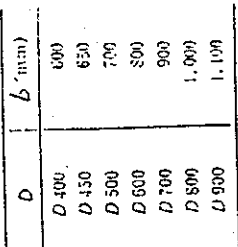
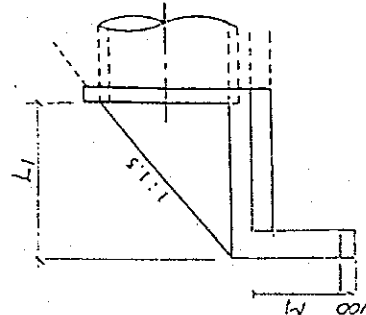
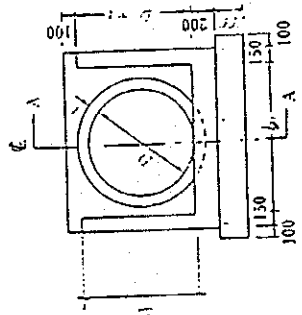
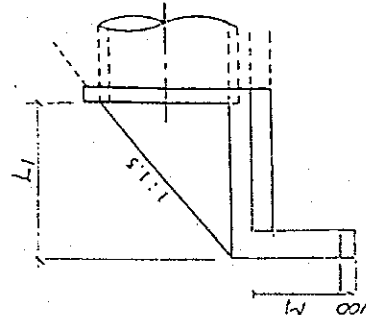
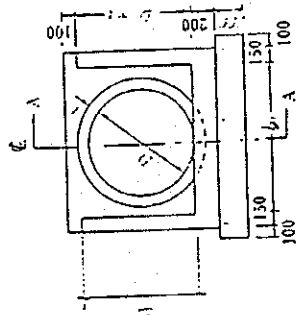
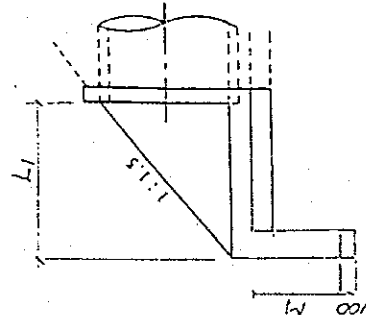
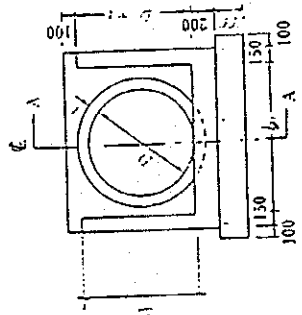
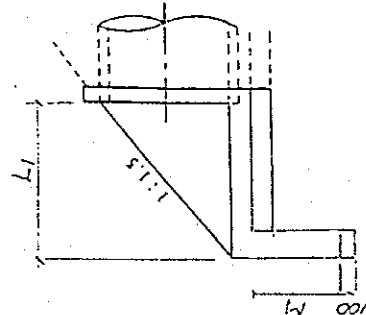
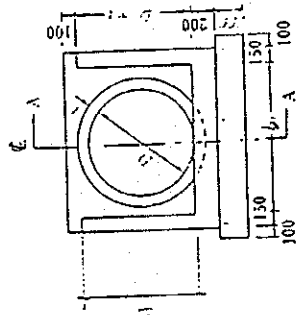
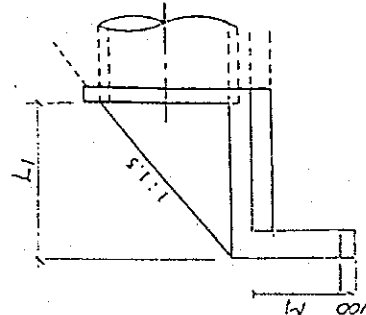
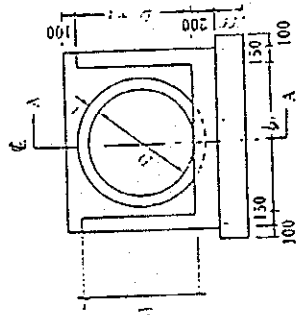
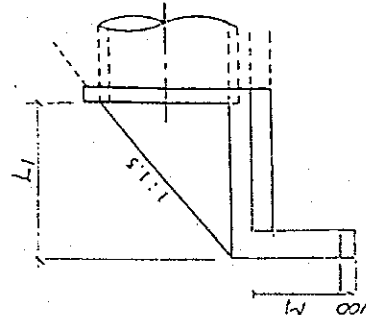
Remarks

Description	Calculation Details	Unit	Quantity	Remarks
3	1/2 Formwork Fl finish (Catch basin)			
	$1.15 \times 2.2 \times 2 = 5.06$			
	$1.30 \times 2.2 \times 2 = 5.72$ $5.72 - 0.357 = 5.363$ $5.06 + 5.363 = 10.423 \text{ m}^2$			
	$10.395 \times 8 = 83.16$	$\text{m}^2$	83.160	

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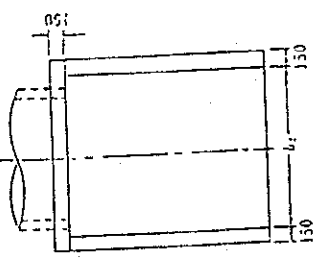
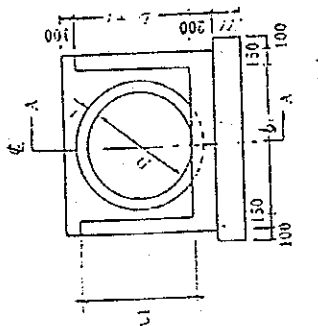
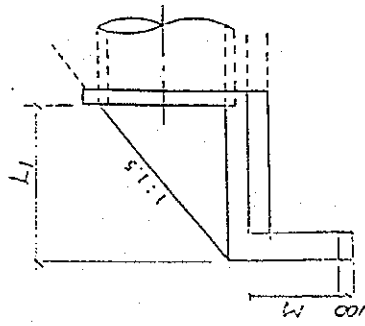
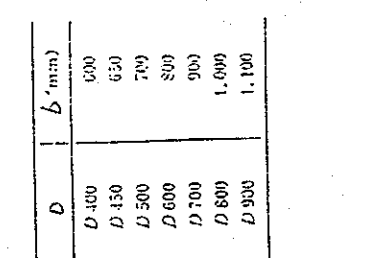
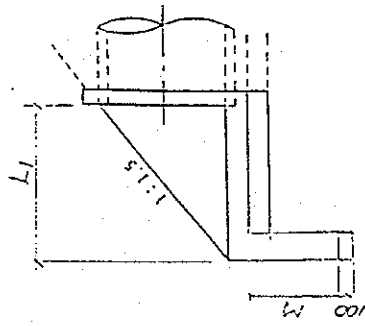
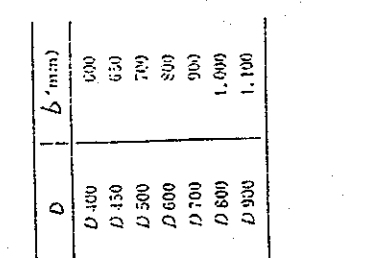
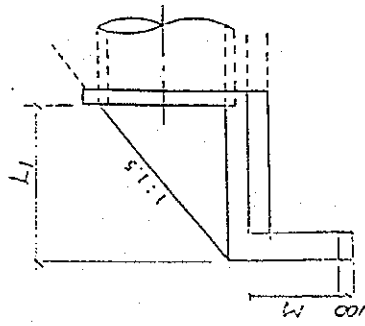
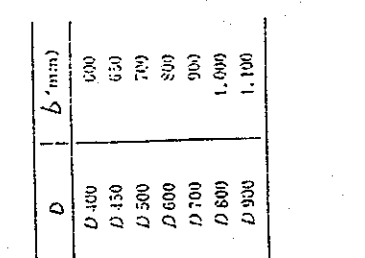
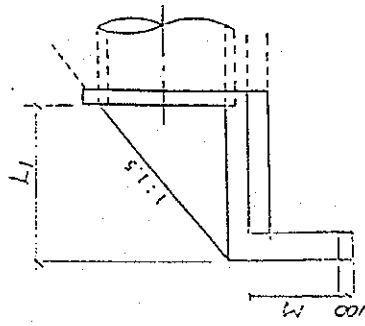
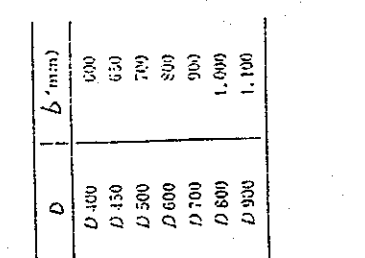
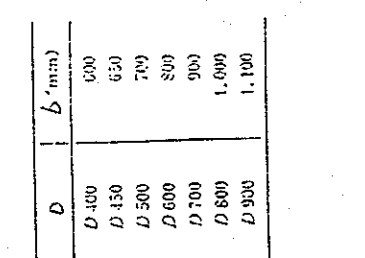
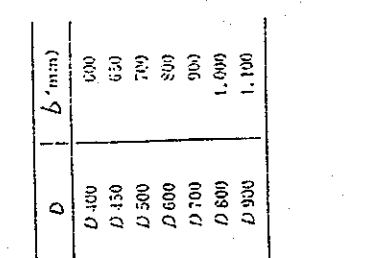
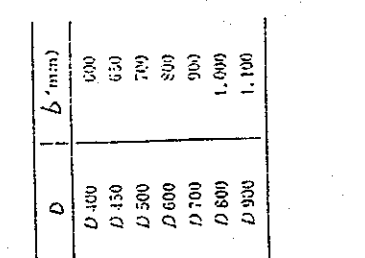
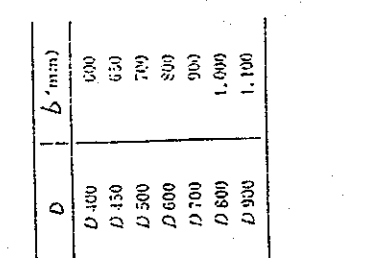
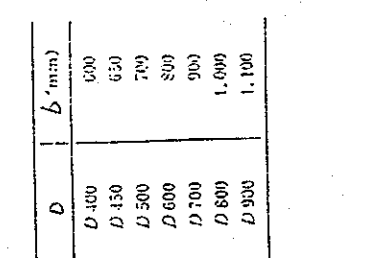
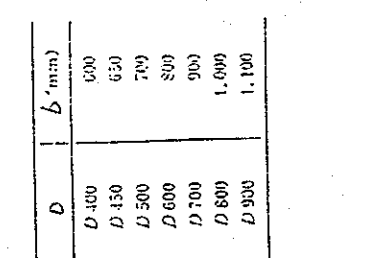
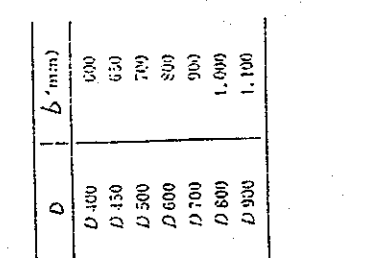
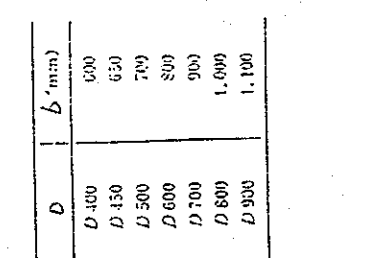


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 13 Formwork F3 finish				
(Working wall)				
1. Ø 600.				
① $0.1 \times 1.1 + 0.8 \times 0.65$				
② $0.3^2 \pi = 0.347 \text{ m}^2$				
③ $0.975 \times 0.65 \times 2 \times 2 = 0.634 \text{ m}^2$				
④ $0.1 \times 1.1 + 0.8 \times 0.70$				
⑤ $0.3^2 \pi = 0.307 \text{ m}^2$				
⑥ $1.05 \times 0.70 \times 2 \times 2 = 0.735 \text{ m}^2$				
			2.103 m <sup>2</sup>	
		m <sup>2</sup>	8.976	
				
				
				
				
				
				
				
				

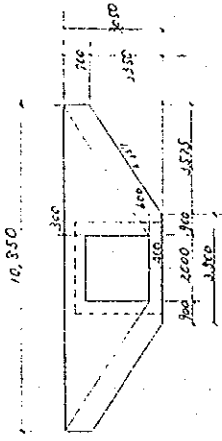
6-25

Working Division:

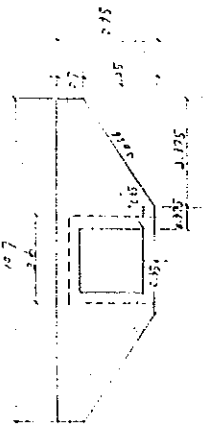
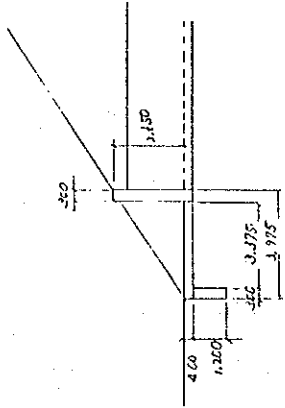
Description	Calculation Details	Unit	Quantity	Remarks
3 / 13 Formwork, F3 finish (curving wall)				
	2.0800			
	$0.1 \times 1.3 + 1.0 \times 0.866$ $- 0.4^2 \eta = 0.493 \text{ m}^2$			
	$1.299 \times 0.866 \times 2 \times 2 = 1.125 \text{ m}^2$			
	$0.1 \times 1.3 + 1.0 \times 0.932$ $- 0.4^2 \eta = 0.559 \text{ m}^2$			
	$1.298 \times 0.932 \times 2 \times 2 = 1.303 \text{ m}^2$			
	3.480 m <sup>2</sup>			
	3.480 m <sup>2</sup>	m <sup>2</sup>	13.920	
	3.480 x 4 = 13.920			
				
				
				
				
				
				
				
				
				

Working Division:

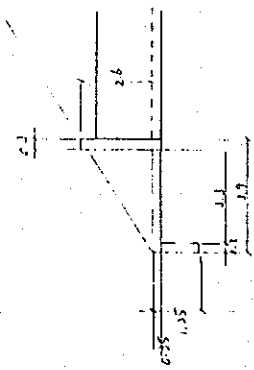
Description	Calculation Details	Unit	Quantity	Remarks
3 / 13 Formwork, F3 finish (Wing wall)				
	$1. 1.2 \times 1.2 \text{ m}$ $(3.3 + 7.35) \times 1.35 / 2 + 0.7 \times 7.35$ $- 1.2 \times 1.2 = 10.894 \text{ m}^2$			
	$2. 1.5 \times 1.5 \text{ m}$ $(3.45 + 8.72) \times 1.75 / 2 + 0.7 \times 8.7$ $- 1.5^2 = 14.471 \text{ m}^2$			
	$3. 2.0 \times 2.0 \text{ m (I)}$ $(10.7 + 3.95) \times 2.25 / 2 + 0.7 \times 10.7$ $- 2.0^2 = 19.971 \text{ m}^2$ $19.971 \times 2 \times / = 39.942$	m <sup>2</sup>	39.942	
	$4. 2.0 \text{ m} \times 2.0 \text{ m (II)}$ $(10.85 + 3.80) \times 2.35 / 2 + 0.7 \times 10.85$ $- 2.0^2 = 19.869 \text{ m}^2$			



4

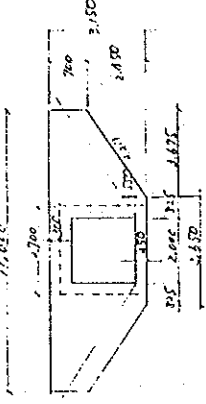
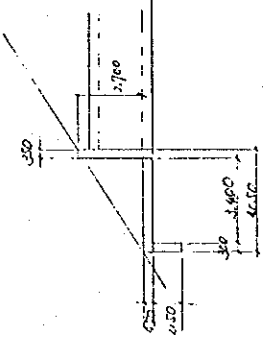
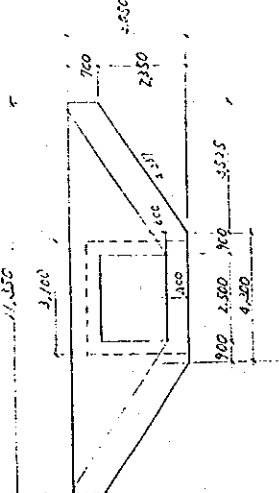
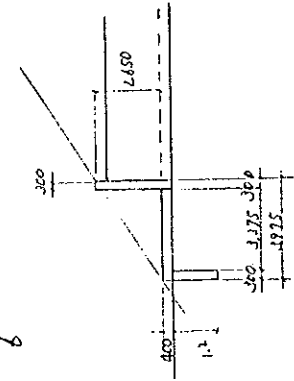


3



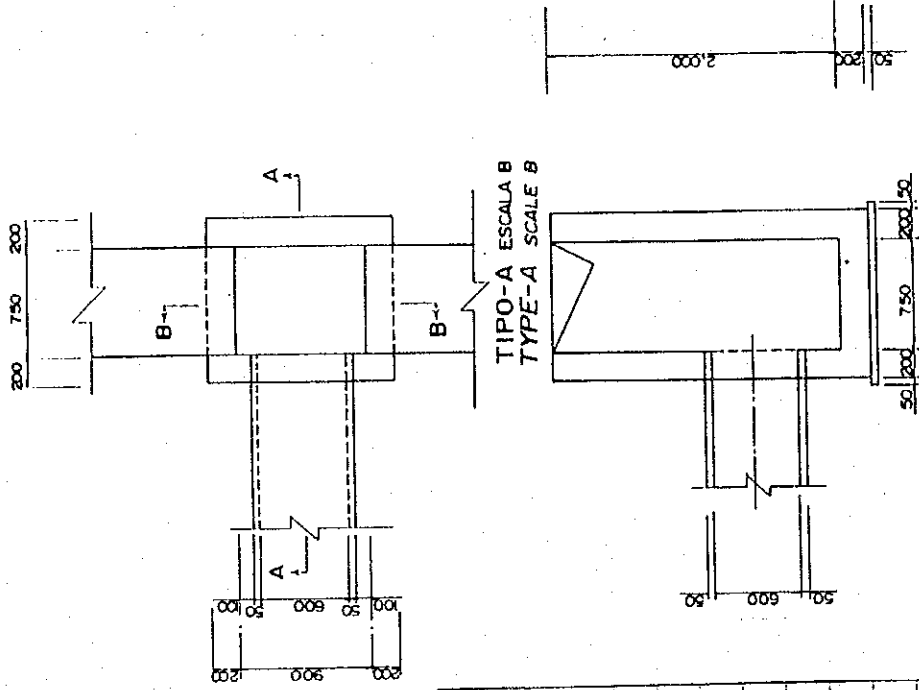
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Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 Formwork F3. finish Casing wall				
5	$20 \times 2.0 \text{ m (III)}$ $(11 + 3.65) \times 2.95 \times \frac{1}{2} + 0.7 \times 11$ $- 2.0^2 = 21.646 \text{ m}^2$	$\text{m}^2$	43.292	
6	$2.5 \times 2.0 \text{ (I)}$ $(11.35 + 4.3) \times 2.35 \times \frac{1}{2} + 0.7 \times 11.35$ $- 2.5 \times 2.0 = 21.334 \text{ m}^2$	$\text{m}^2$		
7	$2.5 \times 2.0 \text{ (II)}$ $(11.5 + 4.15) \times 2.4 \times \frac{1}{2} + 0.7 \times 11.5$ $- 2.5 \times 2.0 = 21.830 \text{ m}^2$	$\text{m}^2$		
8				

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 13	Formwork F3 finish (Catch basin)			
	$0.75 \times 2.0 \times 2 = 3.0$			
	$0.90 \times 2.0 \times 2 - 0.317 = 3.317$			
	$6.317 \text{ m}^2$			
	$6.317 \times 8 = 50.536$	$\text{m}^2$	50.536	



SECTION A-A  
SECTION A-A

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 /13 Formwork F3 finish for concrete slab 109 and 110.	(Side ditch) Per 1m. $0.671 + 0.335 = 1.006 \text{ m}^2$			
	$1.006 \times 4191.96 = 4216.609$	$\text{m}^2$	4,216.609	

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
1. 3. 14	Reinforcing bars for concrete works (wing wall)			
	80 kg / 1 m <sup>3</sup> of concrete volume			
	1. $\phi 600$			
	$1.257 \text{ m}^3 \times 80 = 100.56 \text{ kg}$			
	$0.77 \times 80 = 61.6 \text{ kg}$			
	2. $\phi 800$			
	$2.000 \text{ m}^3 \times 80 = 160 \text{ kg}$			
	$1.60 \times 4 = 640 \text{ kg}$			
	3. $\phi 1000$			
	$2.939 \text{ m}^3 \times 80 = 235.12 \text{ kg}$			



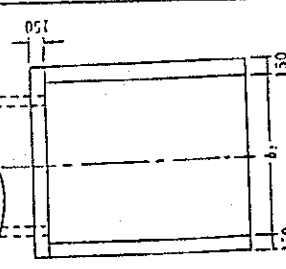
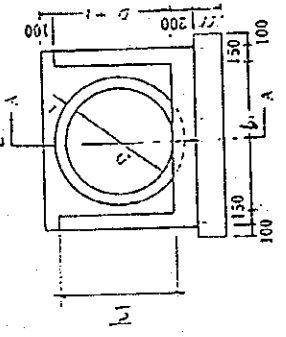
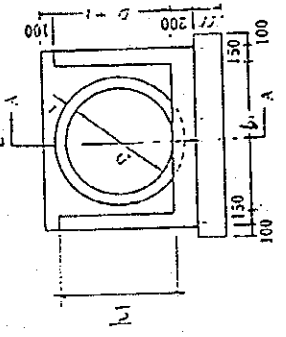
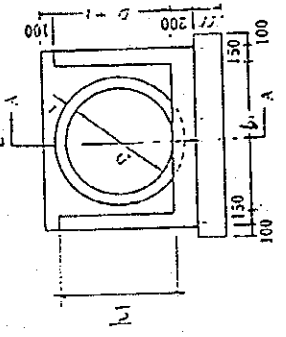
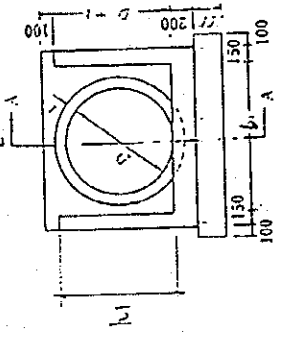
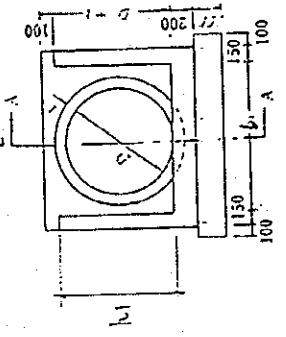
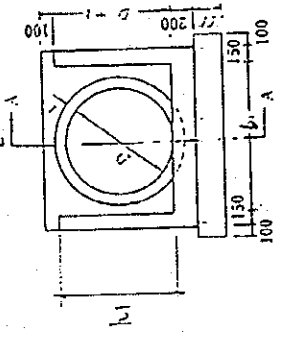
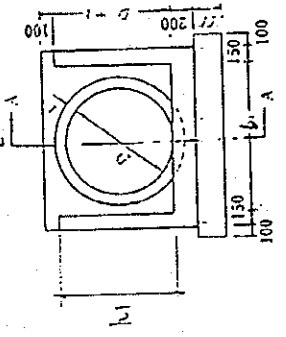
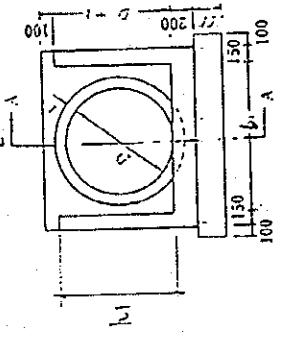
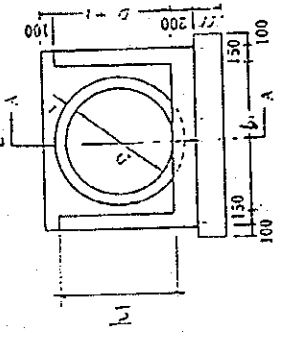
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 114	Reinforcing bars for concrete works (casing wall)			
	80 kg / m <sup>3</sup> of concrete volume			
	1. 1.2 x 1.2 m			
	4.312 x 80 = 344.96 kg			
	2. 1.5 x 1.5 m			
	6.704 x 80 = 536.32 kg			
	3. 2.0 x 2.0 m (I)			
	10.242 x 80 = 819.36 kg			
	819.36 x 2 x 1 = 1638.72			
	4. 2.0 x 2.0 m. (II)			
	11.001 x 80 = 880.08 kg			
	5. 2.0 x 2.0 m (III)			
	13.004 x 80 = 1040.32 kg			
	1040.32 x 2 x 1 = 2080.64			

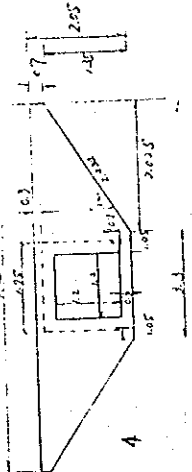
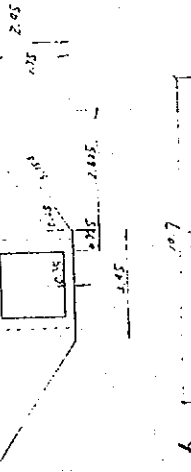
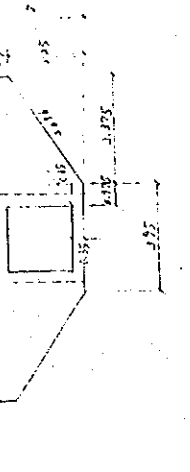
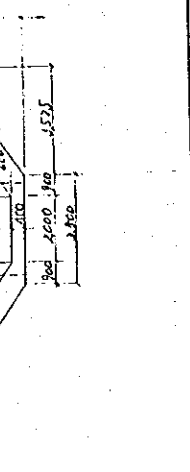
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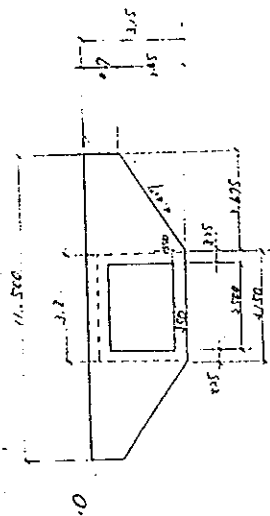
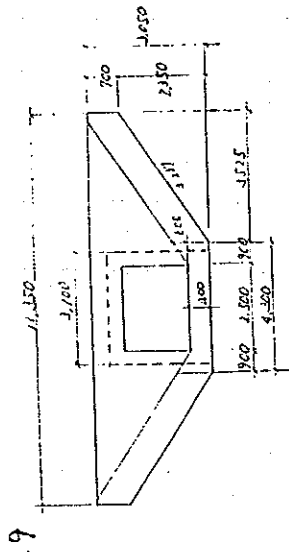
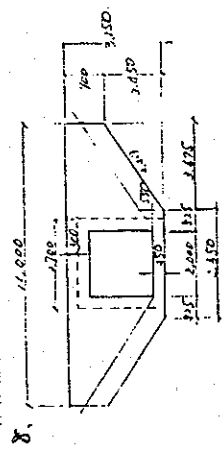
Description	Calculation Details	Unit	Quantity	Remarks
3. 114	Reinforcing bars for concrete works			
	(Catch basin)			
	80 kg / 1 m <sup>3</sup> of concrete volume	Ton	1.7	
	1.862 m <sup>3</sup> x 80 kg/m <sup>3</sup> = 148.96 m <sup>3</sup>			
	148.96 x 8 = 1191.68			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 15 Gabion mattress, $t = 500 \text{ mm}$				
	(swing spill post)			
1. $\phi 600$	$(0.8 + 0.3) \times 5.0 \times 0.5 = 2.75 \text{ m}^3$	$\text{m}^3$	4.4	
2. $\phi 800$	$2.75 \times \frac{1}{5} \times 8 = 4.4$	$\text{m}^3$		
	$(1.5 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$	$\text{m}^3$	26.0	
3. $\phi 1000$	$3.75 \times 2 \times 4 = 26.0$			
	$(1.2 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$			
4. $1.2 \times 1.2 \text{ m}$	$(2.434 \times 2 + 3.3) \times 5.0 \times 0.5 = 20.42 \text{ m}^3$			
	$5.15 \times 1.5 \text{ m}$			
	$(3.154 \times 2 + 3.46) \times 5.0 \times 0.5 = 24.395 \text{ m}^3$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	115 Gabion mattress, $l = 500\text{mm}$ (Waling Wall)			
	8. $2.0 \times 2.0$ (I)			
	$(4.156 \times 2 + 3.95) \times 5.0 \times 0.5 = 30.155\text{ m}^3$			
	$30.155 \times 2 \times 1 = 60.31$	$\text{m}^3$	60.31	
	7. $2.0 \times 2.0$ (II)			
	$(4.237 + 2 + 3.8) \times 5.0 \times 0.5 = 30.685\text{ m}^3$			
	8. $2.0 \times 2.0$ (III)			
	$(4.417 + 2 + 3.65) \times 5.0 \times 0.5 = 31.21\text{ m}^3$			
	$31.21 \times 2 \times 1 = 62.42$	$\text{m}^3$	62.42	
	9. $2.5 \times 2.0$ (I)			
	$(4.237 + 2 + 4.3) \times 5.0 \times 0.5 = 31.935\text{ m}^3$			
	10. $2.5 \times 2.0$ (II)			
	$(4.417 + 2 + 4.15) \times 5.0 \times 0.5 = 32.46\text{ m}^3$			



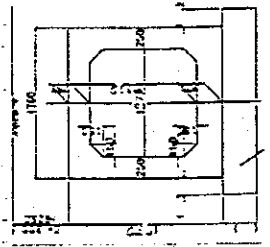
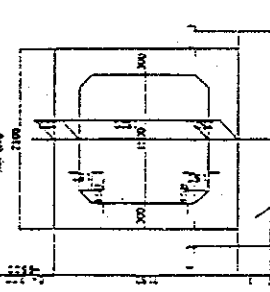
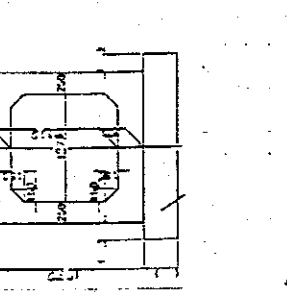
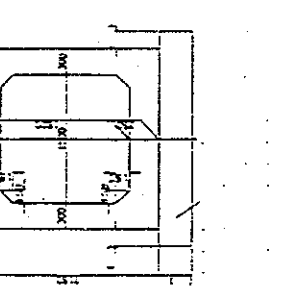
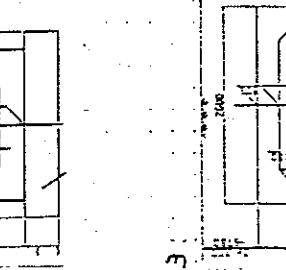
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Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
B 4	Joint Filler, t = 10 mm < Culvert >			1. 1.2 x 1.2 m 1.25 x 1.70 = 1.22 / 1.2 = 1.535 m <sup>2</sup>
				2. 1.5 x 1.5 m 2.1 x 2.15 = 1.1 / 1.5 = 2.265 m <sup>2</sup>
				3. 2.0 x 2.0 m (I) 2.6 x 2.65 = 2 x 2 = 2.890 m <sup>2</sup> 2.890 x 1 = 2.890
				4. 2.0 x 2.0 m (II) 2.6 x 2.75 = 2 x 2 = 3.15 m <sup>2</sup>
				5. 2.0 x 2.0 m (III) 2.7 x 2.85 = 2 x 2 = 3.695 m <sup>2</sup> 3.695 x 1 = 3.695

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Working Division:

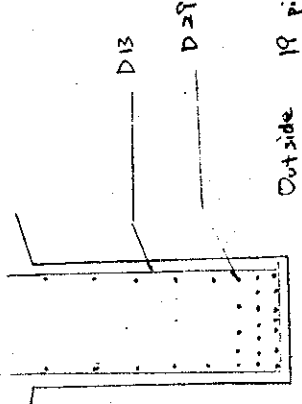
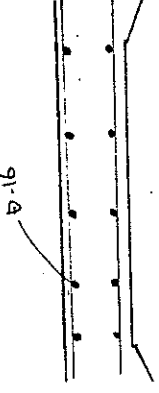
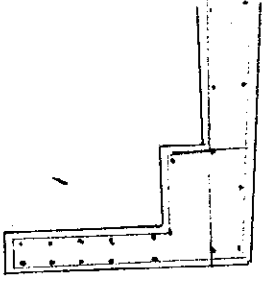
Description	Calculation Details	Unit	Quantity	Remarks
3. 1/12	Bituminous coating for contraction joint			
4	<p>&lt; Culvert &gt;</p> <p>1. <math>1.2 \times 1.2 \text{ m}</math></p> <p><math>1.75 \times 1.70 - 1.2 \times 1.2 = 1.535 \text{ m}^2</math></p>			1. 
	2. $1.5 \times 1.5 \text{ m}$			2. 
	3. $2.0 \times 2.0 \text{ m (I)}$	$\text{m}^2$	5.780	3. 
	$2.6 \times 2.65 - 2 \times 2 = 2.89 \text{ m}^2$			4. 
	$2.89 \times 2 = 5.78$			
	4. $2.0 \times 2.0 \text{ m (II)}$			5. 
	$2.6 \times 2.75 - 2 \times 2 = 3.15 \text{ m}^2$			
	$3.15 \times 2 = 6.30$			
	5. $2.0 \times 2.0 \text{ m (III)}$			
	$2.7 \times 2.85 - 2 \times 2 = 3.695 \text{ m}^2$			
	$3.695 \times 2 = 7.390$	$\text{m}^2$	7.390	

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
Concrete Works	01) Concrete class A Length = 240 m			
	$0.6 \times 1.8 \times 4 \text{ nos} = 4.32$			
	$0.8 \times 0.1 \times 1/2 \times 2 \text{ nos} = 0.08$			
	$0.3 \times 0.1 \times 1/2 \times 6 \text{ nos} = 0.09$			
	$70 \times 0.2 = 1.4$			
	$0.25 \times 1.0 \times 2 \text{ nos} = 0.50$			
	$0.18 \times 0.25 \times 2 \text{ nos} = 0.09$			
	Total 648 m <sup>3</sup> per meter			
	$648 \times 240 = 155.52 \text{ m}^3$			
	07) Formwork F = Finish			
	① Superstructure			
	$1.8 \times 240 \times 8 \text{ nos} = 345.6$			
	$0.81 \times 240 \times 2 \text{ nos} = 38.88$			
	$0.32 \times 240 \times 6 \text{ nos} = 46.08$			
	$0.40 \times 240 \times 3 \text{ nos} = 28.80$			
	$1.20 \times 240 \times 2 \text{ nos} = 57.60$			
	$0.82 \times 240 \times 2 \text{ nos} = 39.36$			
	$0.18 \times 240 \times 2 \text{ nos} = 8.64$			
	Total 564.96 m <sup>2</sup>			



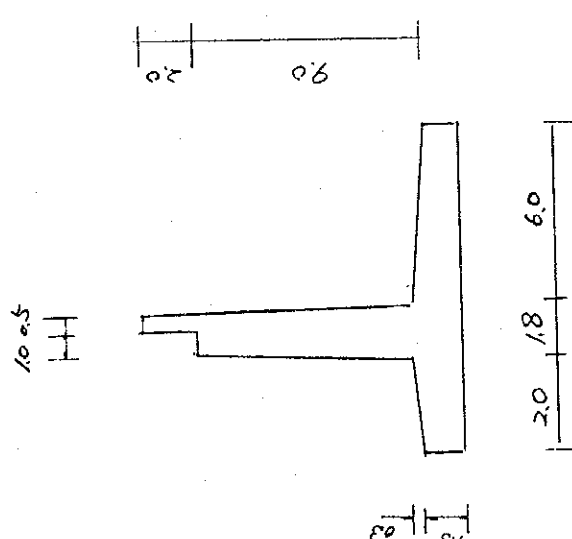
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
09) Reinforcing Bar	per meter			
D-29	$(19 + 5 \times 2) \times 1.0 \text{ m} \times 2 \text{ nos} = 58 \times 5.04 = 292.32$ $(18 + 5 \times 2) \times 1.0 \text{ m} \times 2 \text{ nos} = 56 \times 5.04 = 282.24$			
D-13	$(1.8 \times 2 + 0.5) \times 4 \text{ nos} \times 3 \text{ nos} = 49.2 \times 0.995 = 48.95$			Outside 19 pieces Inside 18 pieces
D-16	$5 \text{ piece} \times 1.0 \text{ m} \times 3 \text{ nos} \times 2 \text{ nos} = 30 \times 1.56 = 46.80$ $5.4 \text{ m} \times 5 \times 2 \text{ nos} = 54 \times 1.56 = 84.24$ $3 \text{ piece} \times 1.0 \text{ m} \times 4 \text{ nos} = 12.0 \times 1.56 = 18.72$ $2 \text{ piece} \times 1.0 \text{ m} \times 2 \text{ side} \times 2 \text{ nos} = 8.0 \times 1.56 = 12.48$			
D-13	$5 \text{ piece} \times 0.8 \text{ m} \times 2 \text{ side} \times 2 \text{ nos} = 16 \times 0.995 = 15.92$			
	$5 \text{ piece} \times 1.0 \times 2 \times 2 \text{ nos} = 20 \times 0.995 = 19.9$ $2 \text{ piece} \times 1.0 \times 2 \text{ nos} = 4 \times 0.995 = 3.98$			
	$(1.2 + 0.25 + 0.85 + 0.38) \times 3 \times 2 \text{ nos} = 17.58 \times 0.995 = 17.49$			
	Total 843.04 x 24 m = 20232.96			

Working Division:

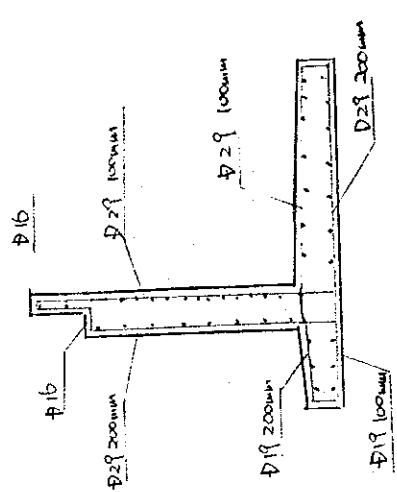
Description	Calculation Details	Unit	Quantity	Remarks
ii) JOINT FILLER	t = 20 mm			
A1	$7.0 \times 0.2 = 1.4$			
A2	$0.5 \times 0.18 \times 2_{nos} = 0.18$			
A3	$0.8 \times 0.1 \times 1/2 \times 2_{nos} = 0.08$			
A4	$0.3 \times 0.1 \times 1/2 \times 6_{nos} = 0.09$			
A5	$0.6 \times 0.1 \times 4_{nos} = 0.24$			
Total	$1.99 \text{ m}^2 \times 2_{nos} = 3.98 \text{ m}^2$			
MISCELLANEOUS				
03) Bearing	Fixed Type		4.0 nos	
04) Bearing	Movable Type		4.0 nos	
05) Steel Handrail	D80			
	$39.5 \text{ kg/cm} \times 24.0 \text{ m} \times 2_{nos} = 1876.0 \text{ kg}$			
06) PVC Drain Pipe	D100 mm			
	$0.4 \text{ m} \times 4_{nos} \times 2 \text{ side} = 3.2 \text{ m}$			
09) Anchor Bolt	D			
	$D32 \text{ } 0.8 \text{ m} \times 8_{nos} = 39.87 \text{ kg}$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
02) Concrete class E	$9.8 \times 1.5 = 14.7$ $2.0 \times 0.3 \times 1/2 = 0.3$ $6.0 \times 0.3 \times 1/2 = 0.9$ $(1.80 + 1.5) \times 0.0 \times 1/2 = 14.85$ $0.5 \times 2.0 = 1.0$ $1.8 \times 0.3 = 0.54$			
	Total $32.29 \times 7.0m = 226.03$			
04) Concrete class H	$226.03 \times 2_{nos} = 452.1 m^3$			
06) Formwork E1 Finish	$9.8 \times 7.0 \times 0.3 = 13.72 m^3$ $9.8 \times 1.5 = 14.7$ $(9.8 + 1.8) \times 0.3 \times 1/2 = 1.74$ $(14.7 + 1.74) \times 2_{nos} = 32.88$ $1.5 \times 7.0 \times 2_{nos} = 21.00$ $11.0 \times 7.0 = 77.0$			
	Total $130.88 \times 2 = 261.76$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
07) Formwork F2 Finish				
	$9.0 \times 7.0 = 63.0$			
	$(1.8+1.5) \times 9.0 \times \frac{1}{2} \times 2 nos = 29.70$			
	$2.0 \times 7.0 = 14.0$			
	Total $106.7 \times 2 nos = 213.4 \text{ m}^2$			
09) Reinforcing Bar				
	Size Nos m			
	D29 5 10.8 = 272.16			
	D22 45 1.0 = 136.80			
	D19 5 2.0 = 22.50			
	D19 10 1.0 = 22.50			
	D19 5 1.5 = 16.88			
	D16 2 1.0 = 3.12			
	D19 10 3.8 = 85.50			
	D19 49 1.0 = 110.25			
	D29 5 60 = 151.20			
	D29 5 1.5 = 37.80			
	D16 2 1.0 = 3.12			
	D29 10 7.8 = 88.12			
	D19 30 1.0 = 67.50			
	D29 10 10.8 = 54.32			
	D22 90 1.0 = 213.60			



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
	ϕ16 10 20 = 31.20			
	ϕ13 10 10 = 9.95			
	ϕ13 5 05 = 2.49			
	ϕ16 5 20 = 15.60			
	ϕ13 10 10 = 9.95			
	ϕ16 5 10 = 7.80			
	ϕ13 5 10 = 4.98			
	Total 222.34 kg/m			
	222.34 x 70 m x 2 nos = 3112.76 kg			
MISCELLANEOUS				
	07) P.V.C Pipe D=75 mm Neephole			
	1.85 m x 30 nos x 2 side = 111 m			

Working Division: J. Z. MEMBRILLO

Description	Calculation Details	Unit	Quantity	Remarks
#12	Box culverts			
105	Open-cut excavation	m <sup>3</sup>	0	
106	Backfill with selected material	m <sup>3</sup>	0	
107	Free draining backfill	m <sup>3</sup>	0	
108	Gravel bedding	m <sup>3</sup>	0	

Working Division: 8 MEMBRILLO OUTLET ACCESS ROAD

Description	Calculation Details	Unit	Quantity	Remarks
8.3	CULVERT AND DRAINAGE WORKS			
1.01	Open-cut excavation all classes	m <sup>3</sup>	74.722	
	1. Pipe culvert			
	2. Box culvert			
	3. Drain pipe			
	4. Catch basin			
	Total		74.722	
1.02	Backfill with selected material	m <sup>3</sup>	56.790	
	1. Pipe culvert			
	2. Box culvert			
	3. Catch basin			
	Total		56.790	
1.03	Crushed stone bedding	m <sup>3</sup>	1.43	
	1. Pipe culvert			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	CULVERT AND DRAINAGE WORKS.			
104	Reinforced concrete pipe, D. 600 mm Culvert: 0 m, For ditch 10.0 m	m	10.0	
105	Reinforced concrete pipe, D. 800 mm	m	0.0	
106	Reinforced concrete pipe, D. 1000 mm	m	0.0	
107	P.V.C. perforated drain pipe, D. 200 mm	m	30.0	
108	Free drainage material for subdrain	m <sup>3</sup>	6.258	
109	Concrete, class E, for pipe culvert and wing walls	m <sup>3</sup>	3.10	
	1. Pipe culvert 1.56			
	2. Box culvert 0			
	3. Wing wall for pipe culvert 1.54			
	4. Wing wall for box culvert 0			
	Total 3.10			
110	Concrete, class F, for side ditch and catch basin	m <sup>3</sup>	58.654	
	1. Side ditch 54.930			
	2. Catch basin 3.724			
	Total			



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3	CULVERT AND DRAINAGE WORKS			
/11	Concrete, class H, for levelling concrete	m <sup>3</sup>	0.616	
	1. Culvert 0			
	2. Wing wall 0.264			
	3. Catch basin 0.352			
	Total 0.616			
/12	Formwork, F1 finish for concrete of Items 109 and 110	m <sup>2</sup>	32.090	
	1. culvert 5.20			
	2. Wing wall 6.10			
	3. Catch basin 20.790			
	Total 32.090			
/13	Formwork, F3 finish for concrete of Items 109 and 110	m <sup>2</sup>	471.572	
	1. Culvert 0			
	2. Wing wall 2.294			
	3. Catch basin 12.834			
	4. Drain ditch 456.694			
	Total 471.572			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3.	CULVERT AND DRAINAGE WORKS			
1/14	Reinforcing bars for concrete works	Tonn	0.4	
	1. Culvert 0			
	2 wing wall 23.2			
	3 Catch basin 297.92			
	Total 421.12			
1/15	Gabion mattress, t = 500 mm	m <sup>3</sup>	1.10	
1/16	Joint filler, t = 10 mm	m <sup>2</sup>	0.0	
1/17	Bituminous coating for contraction joint	m <sup>2</sup>	0.0	

Working Division: 4

Description	Calculation Details	Unit	Quantity	Remarks
41.4	CONCRETE WORKS			
/03	Concrete class E for box culverts	m <sup>3</sup>	0	
/04	Concrete class H for levelling concrete	m <sup>3</sup>	0	
/06	Formwork F1 finish for concrete item /03, /04	m <sup>2</sup>	0	
/08	Formwork F3 finish for concrete item /03	m <sup>2</sup>	0	
/09	Reinforcing bars for concrete works	Ton	0	
/10	Jard fillen for culvert	m <sup>3</sup>	0	
/12	Bituminous coating for contraction joint	m <sup>2</sup>	0	

61021

Membrillo outlet

	Length Unit (m)	Pipe Length Unit (m)	Open Cut Excavation (12.3/01)		Backfill (12.3/02)		Crushed Stone Bedding (12.3/03)		Pipe D=600 (12.3/04)		Pipe D=800 (12.3/05)		Pipe D=1000 (12.3/06)		Concrete Class E (12.3/09)		Form Work F1 (12.3/12)		Reinforced Bar (12.3/14)	
			Unit (m3)	Total	Unit (m3)	Total	Unit (m3)	Total	Unit (m)	Total	Unit (m)	Total	Unit (m3)	Total	Unit (m2)	Total	Unit (m2)	Total	Unit (kg)	Total
D=600mm	90	10.0	0.83	8.29	0.43	4.31	0.14	1.43					0.16	1.56	0.52	5.20	0.00	0.00		
	180	0.0	0.93	0.00	0.42	0.00	0.17	0.00					0.26	0.00	1.00	0.00	0.00	0.00		
	Fix	0.0	1.09	0.00	0.45	0.00	0.24	0.00					0.62	0.00	2.00	0.00	42.98	0.00		
D=800mm	90	0.0	1.28	0.00	0.58	0.00	0.17	0.00					0.26	0.00	0.68	0.00	0.00	0.00		
	180	0.0	1.48	0.00	0.56	0.00	0.21	0.00					0.46	0.00	1.34	0.00	0.00	0.00		
	Fix	0.0	1.72	0.00	0.60	0.00	0.31	0.00					1.11	0.00	2.68	0.00	73.53	0.00		
D=1000mm	90	0.0	1.90	0.00	0.73	0.00	0.28	0.00					0.35	0.00	0.76	0.00	0.00	0.00		
	180	0.0	2.12	0.00	0.72	0.00	0.33	0.00					0.60	0.00	1.58	0.00	0.00	0.00		
	Fix	0.0	2.22	0.00	0.71	0.00	0.36	0.00					1.43	0.00	3.16	0.00	84.55	0.00		
Total	10.0		8.29	4.31	1.43	10.00	0.00	0.00	1.56	5.20	0.00	0.00	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00

	Length Unit (m)	Open Cut Excavation (12.2/07)		Backfill (12.2/06)		Concrete Class E (Item 12.4/03)		Concrete Class H (Item 12.4/04)		Form Work F1 (Item 12.4/06)		Form Work F3 (Item 12.4/08)		Reinforced Bar (12.4/09)	
		Unit (m3)	Total	Unit (m3)	Total	Unit (m3)	Total	Unit (m3)	Total	Unit (m2)	Total	Unit (m2)	Total	Unit (kg)	Total
1200mm x 1200mm	~9.25	0.0	2.42	0.00	0.77	0.00	1.63	0.00	0.19	0.00	3.60	0.00	3.70	0.00	162.91
1500mm x 1500mm	~9.5	0.0	3.36	0.00	0.96	0.00	2.31	0.00	0.22	0.00	4.30	0.00	4.45	0.00	193.31
2000mm x 2000mm	~5.75	0.0	4.97	0.00	1.25	0.00	2.94	0.00	0.27	0.00	5.30	0.00	5.95	0.00	232.36
2000mm x 2000mm	~7.75	0.0	5.18	0.00	1.31	0.00	3.20	0.00	0.27	0.00	5.50	0.00	5.95	0.00	236.02
2000mm x 2000mm	7.75~	0.0	5.54	0.00	1.37	0.00	3.74	0.00	0.28	0.00	5.70	0.00	5.95	0.00	270.47
2500mm x 2000mm	3.75~5.75	0.0	5.93	0.00	1.31	0.00	3.61	0.00	0.32	0.00	5.50	0.00	6.43	0.00	317.29
2500mm x 2000mm	5.75~	0.0	6.32	0.00	1.37	0.00	4.20	0.00	0.32	0.00	5.70	0.00	6.43	0.00	331.62
Total	0.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.122

### Drain Pipe Quantities

Access Road Name	Length (m)	Excavation (m3)		P.V.C Pipe D=200mm (m)		Drainage Material (m3)	
		Per meter	Total	Total	Per meter	Total	
Conguillo	5,823.120	0.240	1,397.549	5,823.120	0.209	1,214.703	
Severno Tramo1	1,535.870	0.240	368.609	1,535.870	0.209	320.382	
Severno Tramo2	2,472.920	0.240	593.501	2,472.920	0.209	515.851	
Los Cuyuyes	7,324.030	0.240	1,757.767	7,324.030	0.209	1,527.793	
Poza Honda	266.710	0.240	64.010	266.710	0.209	55.636	
La Seca	2,035.376	0.240	488.490	2,035.376	0.209	424.579	
El Guasmo	786.460	0.240	188.750	786.460	0.209	164.056	
Cana Dulce	1,200.560	0.240	288.134	1,200.560	0.209	250.437	
Membrillo Outlet	30.000	0.240	7.200	30.000	0.209	6.258	
<b>Grand Total</b>			<b>5,154.011</b>	<b>21,475.046</b>		<b>4,479.695</b>	

Excavation  $V=(0.8+0.4)*0.4/2 =0.24$

Free Drainage Material  $V=0.24*3.14*0.1^2 =0.21$

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## LONGITUD DE CUNETAS

CAMINO DE ACCESO: MEMBRILLO OUT

0+000 a 3+353.97 Km

ABRILAS	IZQUIERDA	DERECHA	LONGITUD
0+000.00 - 0+050.00	50.00	50.00	100.00
0+050.00 - 0+070.00	0.00	10.00	10.00
0+070.00 - 0+130.00	80.00	80.00	120.00
S.O 0+130.00 - 0+240.00	110.00	0.00	110.00
S.O 0+240.00 - 0+353.97	113.97	0.00	113.97
<b>LONG. TOTAL:</b>			<b>453.97 m</b>

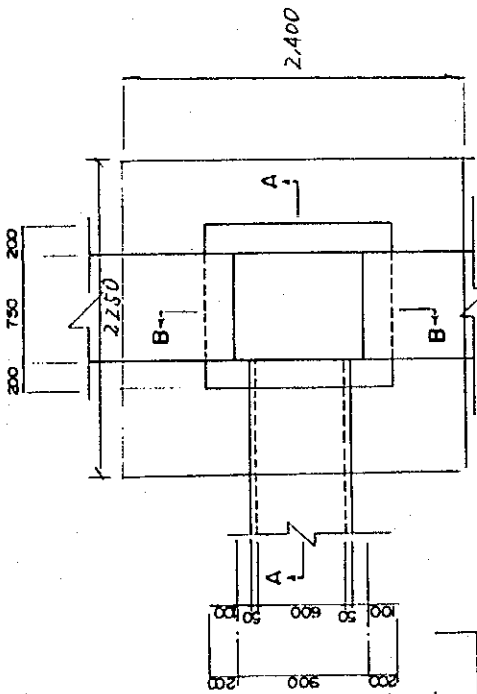
Total Length      453.97

Catch basin          2 nos

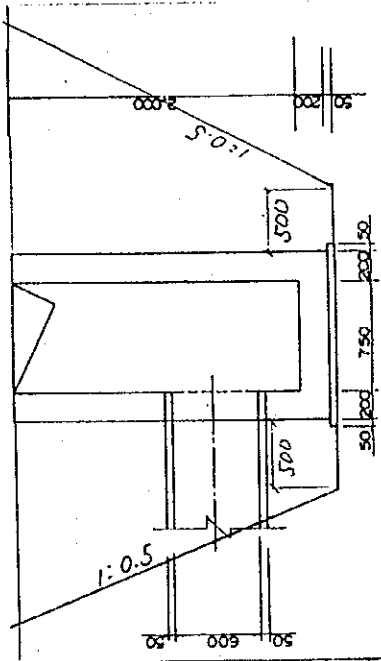
$\phi$  600              10.0 m

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
.3 1el Open-cut excavation, all classes (Catch Basin)				
	$2.25 \times 2.4 \text{ m} = 5.4 \text{ m}^2$			
	$4.5 \times 4.65 \text{ m} = 20.925 \text{ m}^2$			
	$(5.4 + 20.925) \times \frac{1}{2} \times 2.25 = 29.416 \text{ m}^3$			
	$29.416 \times 2 = 59.232$	$\text{m}^3$	59.232	



TIPO-A ESCALA B  
TYPE-A SCALE B



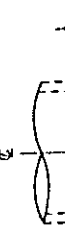
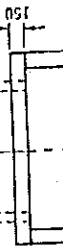
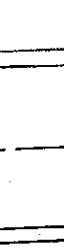
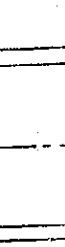
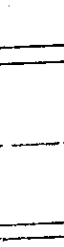
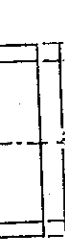
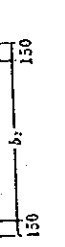

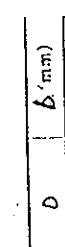
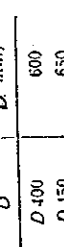
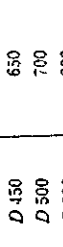
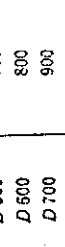
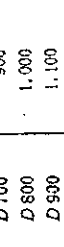
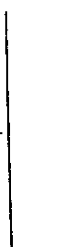






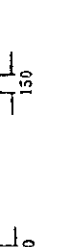

SECCION A-A  
SECTION A-A

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 102	Backfill with selected material			
	< catch basin >			
	$29.616 - 1.15 \times 1.3 \times 2.2 - 1.25 \times 1.4 \times 0.5$			
	$= 26.240$			
	$26.240 \times 2 = 52.480$	$m^3$	52.480	



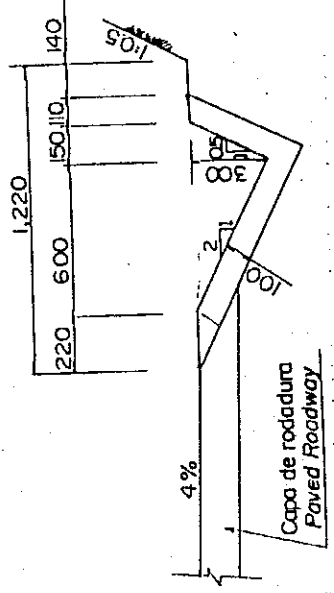
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 109	Concrete class E for			
	Curing wall			
	Pipe type			
	1. Ø 600			
	$(h_1 = 650 \text{ mm}, b = 800 \text{ mm})$ $(L_1 = 975 \text{ mm}, h_2 = 700 \text{ mm}) L_2 = 1.05 \text{ m} = 1.05 \text{ m}$			
	① $1.1 \times 0.95 \times 0.15 \text{ m} = 0.157 \text{ m}^3$			
	② $0.975 \times 0.65 \times 0.15 \text{ m} \times \frac{1}{2} \times 2 = 0.095 \text{ m}^3$			
	③ $1.7 \times 0.975 \times 0.2 = 0.331 \text{ m}^3$			
	④ $1.1 \times 1.0 \times 0.15 \text{ m} = 0.165 \text{ m}^3$			
	⑤ $1.05 \times 0.7 \times \frac{1}{2} \times 0.15 \times 2 = 0.110 \text{ m}^3$			
	⑥ $1.1 \times 1.05 \times 0.2 \text{ m} = 0.231 \text{ m}^3$			
	⑦ $0.3 \times 0.4 \times 1.1 \text{ m} \times 2 = 0.264 \text{ m}^3$			
	$0.77 \times 2 = 1.54$	$\text{m}^3$	1.54	
				
				
				
				
				
				
				
				
				





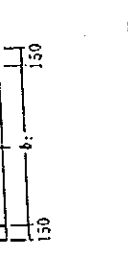
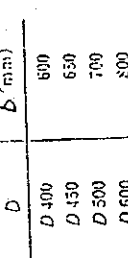
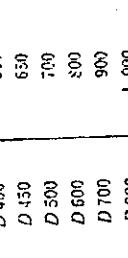
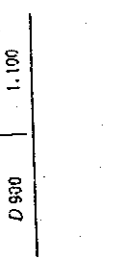
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 1/10	Concrete class F. for side ditch and catch basin			
	(Side ditch) per 1m			
	$1.08 \times 0.432 \times \frac{1}{2}$			
	$- 0.75 \times 0.3 \times \frac{1}{2} = 0.121 \text{ m}^3$			
	$0.121 \times 453.97 = 54.930$	m <sup>3</sup>	54.930	



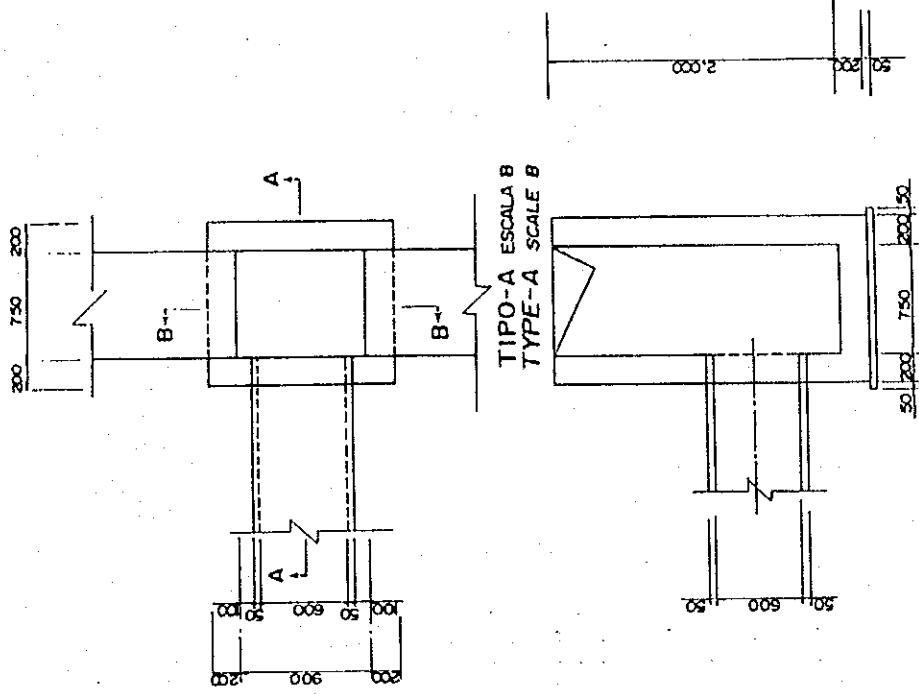
6-329

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3. 1.11	Concrete class H for levelling concrete			
	1. $\phi$ 600 pipe (using wall)			
	$1.1 \text{ m} \times 1.125 \times 0.1 = 0.124 \text{ m}^3$			
	$1.1 \times 1.20 \times 0.1 = 0.132 \text{ m}^3$			
	$0.133 \times 2 = 0.266$	$\text{m}^3$	0.264	
	2. $\phi$ 800 pipe			
	$1.3 \times 1.449 \times 0.1 = 0.189 \text{ m}^3$			
	$1.3 \times 1.598 \times 0.1 = 0.201 \text{ m}^3$			
	<del><math>0.390 \text{ m}^3</math></del>			
	3. $\phi$ 1000 pipe			
	$1.5 \times 1.773 \times 0.1 = 0.266 \text{ m}^3$			
	$1.5 \times 1.896 \times 0.1 = 0.284 \text{ m}^3$			
	$0.550 \text{ m}^3$			

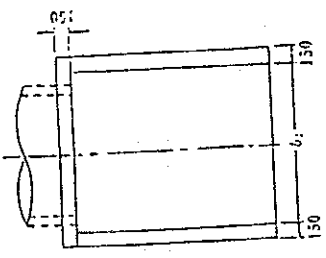
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 11	Concrete class H for levelling concrete			
	(catch basin) per no.			
	$1.25 \times 1.4 \times 4.5 = 4.088 \text{ m}^3$			
	0.10 0.176			
	$0.176 \times 2 = 0.352$	$\text{m}^3$	0.352	

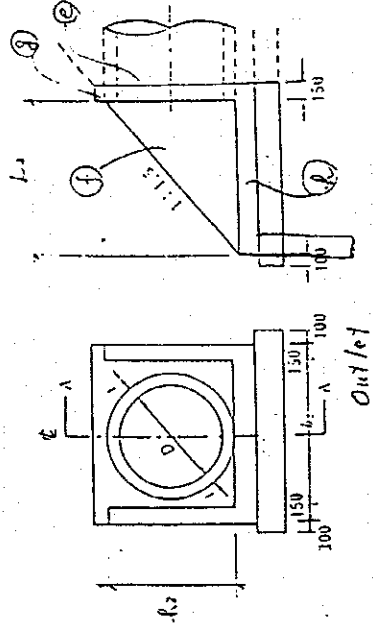


SECTION A-A  
SECTION A-A

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
13 / 12	Formwork, Fl finish for concrete of Item 109, 110 and 111			
	(Curing well)			
	1. $\phi$ 600			
	a) $1.1m \times 0.95m = 1.045 m^2$			
	b) $1.045 - (0.3 + 0.05)^2 \pi = 0.660 m^2$			
	c) $(0.15 + 1.125) \times 0.65 / 2 \times 2 = 0.829 m^2$			
	d) $0.15 \times 0.1 \times 2 = 0.03 m^2$			
	e) $0.2 \times (1.1 + 1.125 \times 2) + 1.1 \times (0.4 + 0.2) = 1.33$			
	f) $1.1m \times 1.0m = 1.100 m^2$			
	g) $1.100 - (0.3 + 0.05)^2 \pi = 0.715$			
	h) $(0.15 + 1.20) \times 0.7 \times \frac{1}{2} \times 2 = 0.945$			
	i) $0.15 \times 0.1 \times 2 = 0.03 m^2$			
	j) $0.2 \times (1.1 + 1.20 \times 2) + 1.1 \times (0.4 + 0.2) = 1.36$			
	$5.899 m^2$	$m^2$	6.10	
	$3.05 \times 2 = 6.10$			

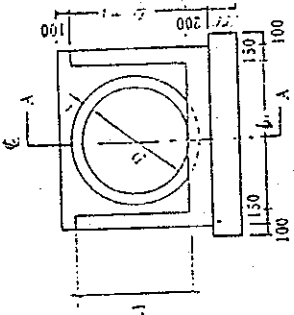
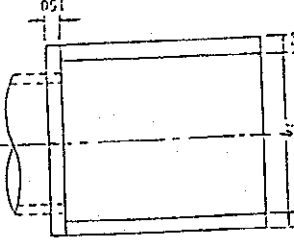
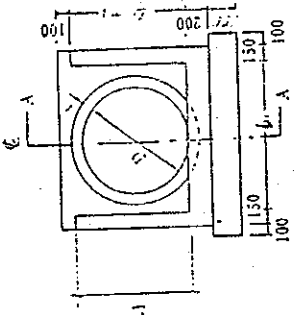
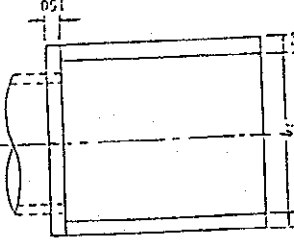
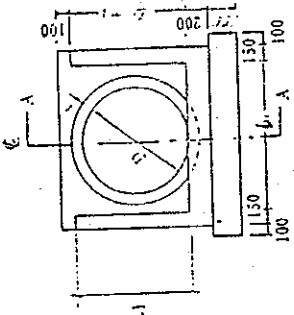
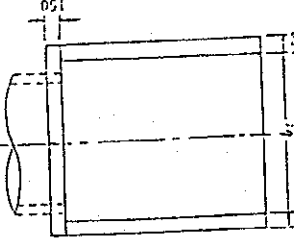
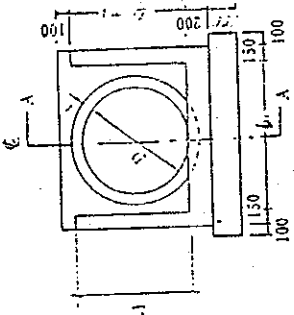
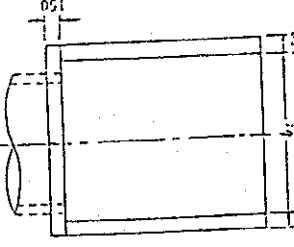
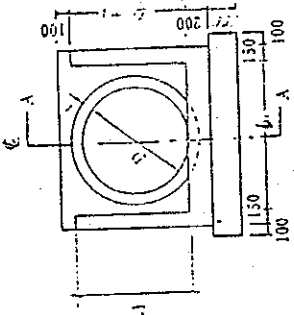
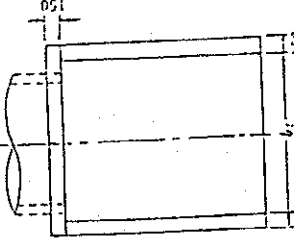
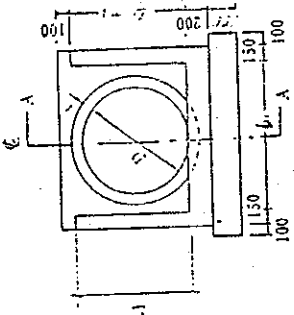
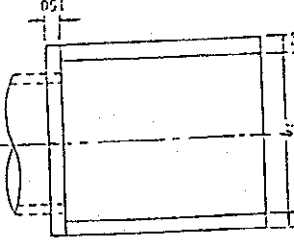
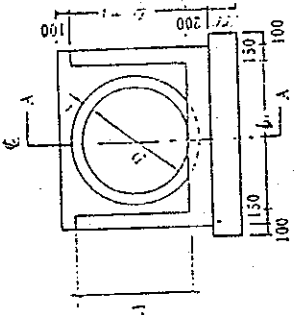
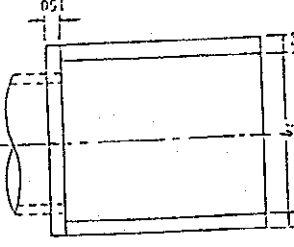
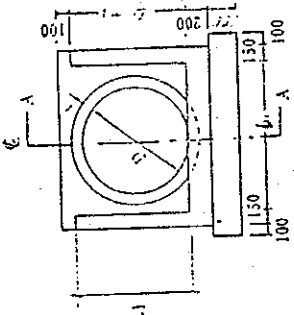
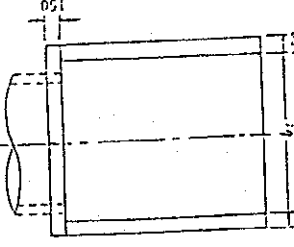
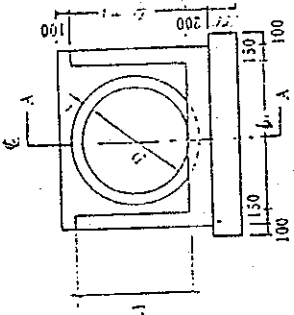
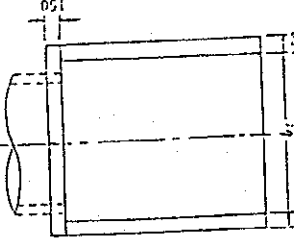
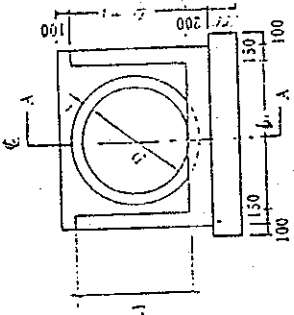
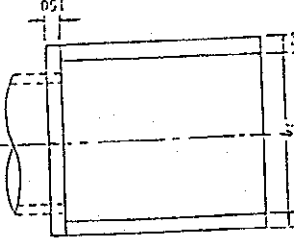
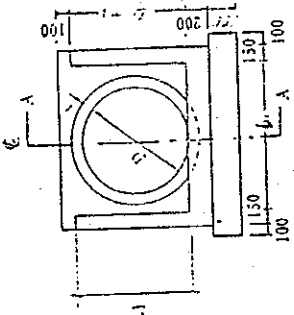
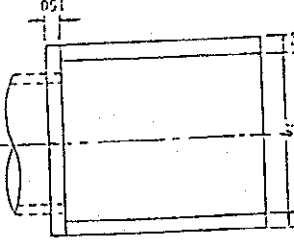
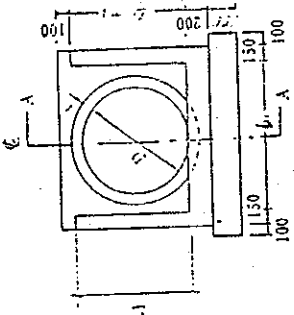
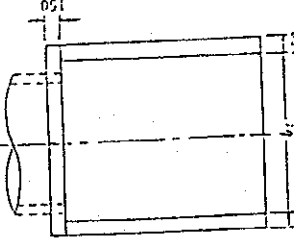
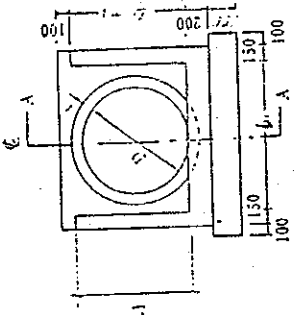
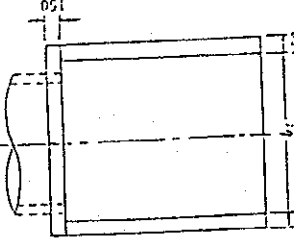
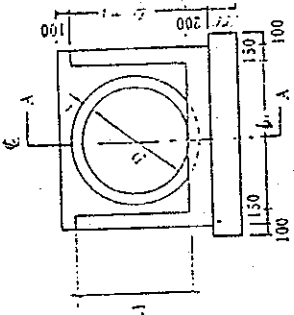
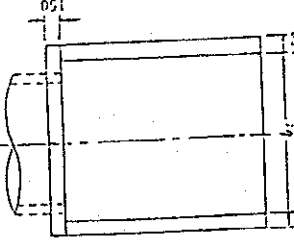
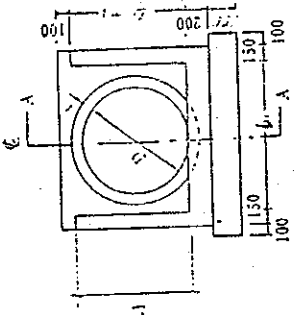
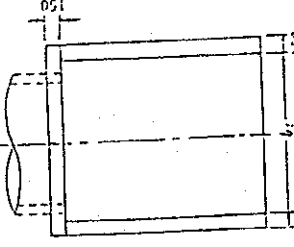
D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100



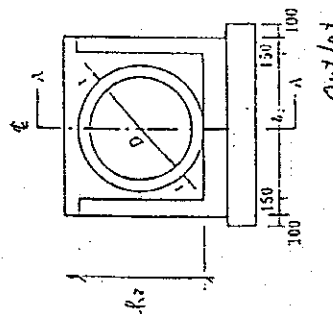
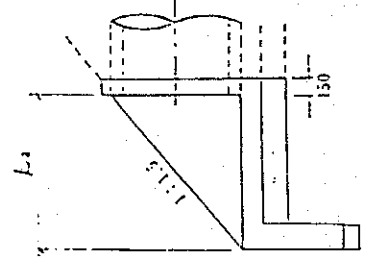
2/10/20



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 13 Formwork F3 finish				 
	<p>(Working wall)</p> <p>1. <math>\phi</math> 600.</p>			 
	$\textcircled{a}$ $0.1 \times 1.1 + 0.8 \times 0.65$ $- 0.3^2 \pi = 0.347 \text{ m}^2$			 
	$\textcircled{b}$ $0.975 \times 0.65 \times 2 \times 2 = 0.634 \text{ m}^2$			 
	$\textcircled{c}$ $0.1 \times 1.1 + 0.8 \times 0.70$ $- 0.3^2 \pi = 0.387 \text{ m}^2$			 
	$\textcircled{d}$ $1.05 \times 0.70 \times 2 \times 2 = 0.735 \text{ m}^2$			 
	$2.103 \text{ m}^2$	$\text{m}^2$	2.244	 
	$1.122 \times 2 = 2.244$			 
				 
				 
				 
				 
				 
				 
				 

D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100

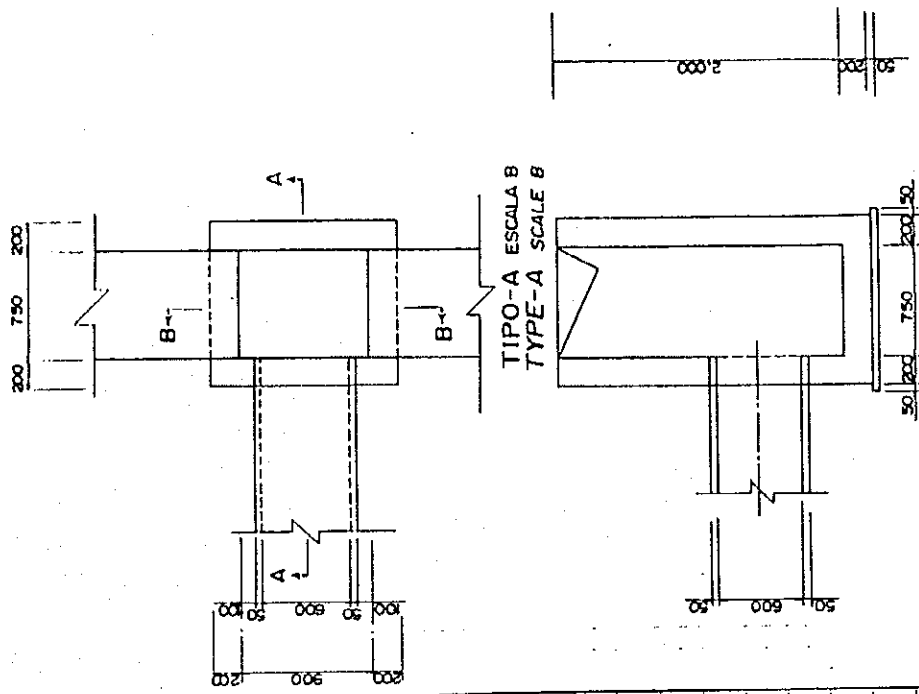


6-234



Working Division:

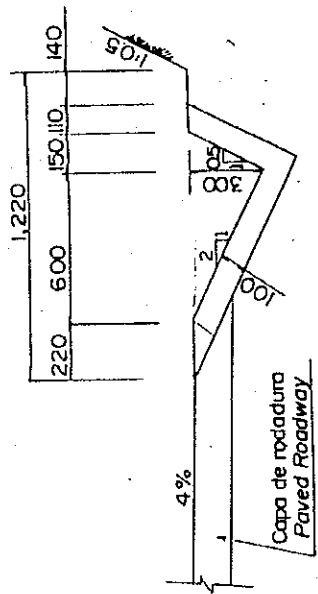
Description	Calculation Details	Unit	Quantity	Remarks
3 /s Formwork F3 finish	(Catch basis)			
	$0.75 \times 2.0 \times 2 = 3.0$			
	$0.90 \times 2.0 \times 2 = 3.6$			
	$6.317 \text{ m}^2$			
	$6.317 \times 2.0 = 12.634$	$\text{m}^2$	12.634	



6-335

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 / 13 Formwork for concrete slab 109 and 110.	(Side ditch) Per 1m. $0.671 + 0.335 = 1.006 \text{ m}^2$			
	$1.006 \times 453.97 \text{ m} = 456.694$	$\text{m}^2$	456.694	



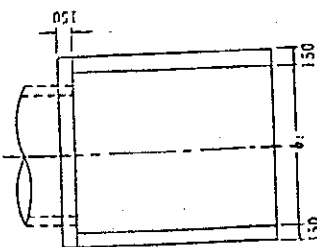
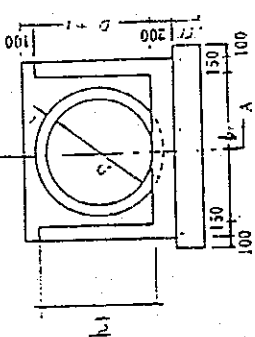
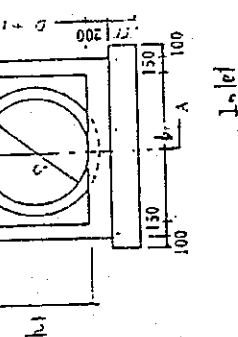
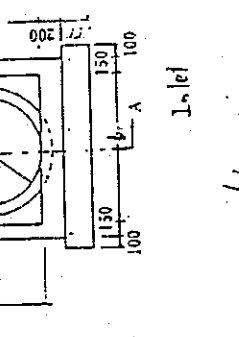
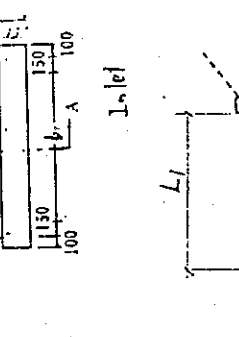
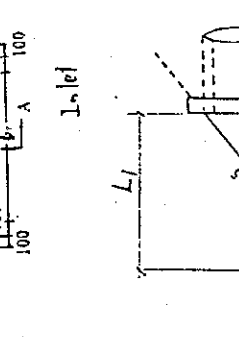
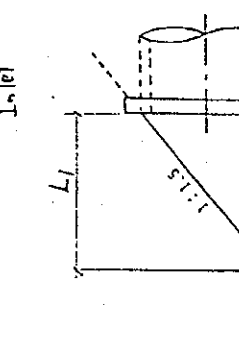
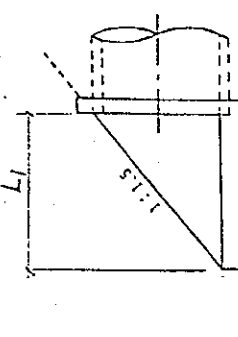
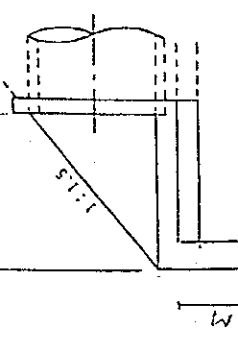
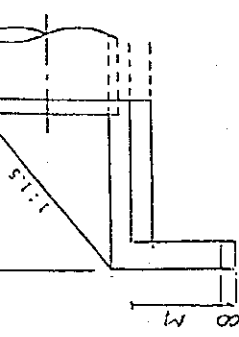
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
1. 3 14	Reinforcing bars for concrete works (wing wall)			
	80 kg / 1 m <sup>3</sup> of concrete volume			
	1. 0.600 $7.257 \text{ m}^3 \times 80 = 580.56 \text{ kg}$ $0.77 \times 80 \times 2 = 123.2$			
	2. 0.800 $2.000 \text{ m}^3 \times 80 = 160 \text{ kg}$			
	3. 0.000 $2.939 \text{ m}^3 \times 80 = 235.12 \text{ kg}$			

6/30/27



Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
3 1.15 Gabion mattress, L = 500 mm				
Sinking (spill part)				
1 phi 600	$(0.8 + 0.3) \times 5.0 \times 0.5 = 2.75 \text{ m}^3$	$\text{m}^3$	1.10	
2 phi 800	$2.75 \times 0.2 \times 2 = 1.10$			
	$(1.5 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$			
3 phi 1000	$(1.2 + 0.3) \times 5.0 \times 0.5 = 3.75 \text{ m}^3$			
	$(2.934 \times 2 + 3.3) \times 5.0 \times 0.5 = 20.42 \text{ m}^3$			
4 1.2 x 1.2 m				
	$5 1.5 \times 1.5 \text{ m}$			
	$(3.154 \times 2 + 3.45) \times 5.0 \times 0.5 = 24.395 \text{ m}^3$			

D	b (mm)
D 400	600
D 450	650
D 500	700
D 600	800
D 700	900
D 800	1,000
D 900	1,100

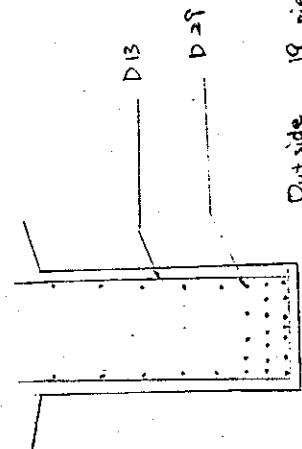
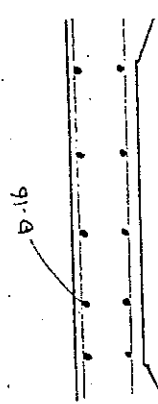
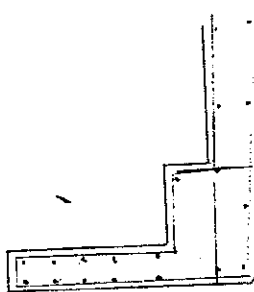
0.7339

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
Concrete Works	01) Concrete class A length = 240 m.			
	$0.6 \times 18 \times 4 \text{ nos} = 4.32$			
	$0.8 \times 0.1 \times 1/2 \times 2 \text{ nos} = 0.08$			
	$0.3 \times 0.1 \times 1/2 \times 6 \text{ nos} = 0.09$			
	$70 \times 0.2 = 1.4$			
	$0.25 \times 1.0 \times 2 \text{ nos} = 0.50$			
	$0.18 \times 0.25 \times 2 \text{ nos} = 0.09$			
	Total $6.48 \text{ m}^3$ per meter			
	$6.48 \times 24.0 = 155.52 \text{ m}^3$			
	07) Formwork F2 Finish			
	① Superstructure			
	$1.8 \times 24.0 \times 8 \text{ nos} = 345.6$			
	$0.81 \times 24.0 \times 2 \text{ nos} = 38.88$			
	$0.32 \times 24.0 \times 6 \text{ nos} = 46.08$			
	$0.40 \times 24.0 \times 3 \text{ nos} = 28.80$			
	$1.20 \times 24.0 \times 2 \text{ nos} = 57.60$			
	$0.82 \times 24.0 \times 2 \text{ nos} = 39.36$			
	$0.18 \times 24.0 \times 2 \text{ nos} = 8.64$			
	Total $564.96 \text{ m}^2$			

0281-0

Working Division:

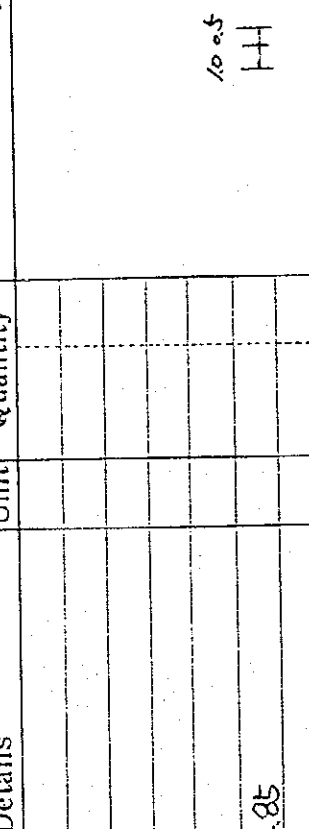
Description	Calculation Details	Unit	Quantity	Remarks
09) Reinforcing Bar	per meter			
D-29	$(19 + 5 \times 2) \times 10m \times 2nos = 58 \times 5.04 = 292.32$ $(18 + 5 \times 2) \times 10m \times 2nos = 56 \times 5.04 = 282.24$			
D13	$(1.8 \times 2 + 0.5) \times 4nos \times 3nos = 49.2 \times 0.995 = 48.95$			Outside 19 pieces Inside 18 pieces
D16	$5 \text{ piece} \times 10m \times 3nos \times 2nos = 30 \times 1.56 = 46.80$ $54m \times 5 \times 2nos = 54 \times 1.56 = 84.24$ $3 \text{ piece} \times 10m \times 4nos = 120 \times 1.56 = 18.72$ $2 \text{ piece} \times 10m \times 2 \text{ side} \times 2nos = 80 \times 1.56 = 12.48$			
D13	$5 \text{ piece} \times 0.8m \times 2 \text{ side} \times 2nos = 16 \times 0.995 = 15.92$ $5 \text{ piece} \times 10 \times 2 \times 2nos = 20 \times 0.995 = 19.9$ $2 \text{ piece} \times 10 \times 2nos = 4 \times 0.995 = 3.98$ $(1.2 + 0.25 + 0.85 + 0.15 + 0.38) \times 3 \times 2nos = 17.58 \times 0.995 = 17.49$			
Total	$843.04 \times 24m = 20232.96$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
II) JOINT FILLER	$t = 20 \text{ mm}$ A1. $7.0 \times 0.2 = 1.4$ A2. $0.5 \times 0.18 \times 2 \text{ nos} = 0.18$ A3. $0.8 \times 0.1 \times 1/2 \times 2 \text{ nos} = 0.08$ A4. $0.3 \times 0.1 \times 1/2 \times 6 \text{ nos} = 0.09$ A5. $0.6 \times 0.1 \times 4 \text{ nos} = 0.24$ Total $1.99 \text{ m}^2 \times 2 \text{ nos} = 3.98 \text{ m}^2$			
MISCELLANEOUS				
03) Bearing	Fixed Type		40 nos	
04) Bearing	Movable Type		40 nos	
05) Steel Handrail	D80			
	$39.5 \text{ kg/cm} \times 24.0 \text{ m} \times 2 \text{ nos} = 1896.0 \text{ kg}$			
06) Pvc Drain Pipe	D100 mm			
	$0.4 \text{ m} \times 4 \text{ nos} \times 2 \text{ side} = 3.2 \text{ m}$			
09) Anchor Bar	D			
	D32 $0.8 \text{ m} \times 8 \text{ nos} = 39.87 \text{ kg}$			

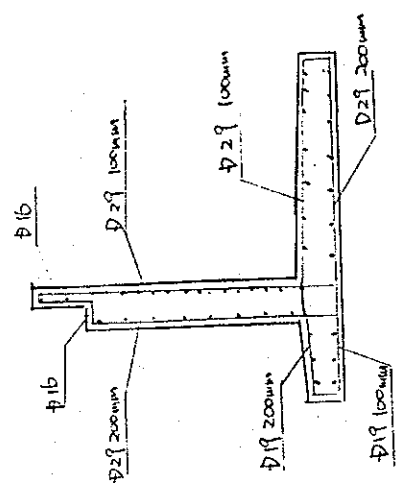


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
02) Concrete class E	$9.8 \times 1.5 = 14.7$ $2.0 \times 0.3 \times 1/2 = 0.3$ $6.0 \times 0.3 \times 1/2 = 0.9$ $(1.80 + 1.5) \times 9.0 \times 1/2 = 14.85$ $0.5 \times 2.0 = 1.0$ $1.8 \times 0.3 = 0.54$			
Total	$32.29 \times 7.0 \text{ m} = 226.03$			
04) Concrete class H	$226.03 \times 2 \text{ nos} = 452.1 \text{ m}^3$			
06) Formwork E1 Finish	$9.8 \times 7.0 \times 0.2 = 13.72 \text{ m}^2$			
	$9.8 \times 1.5 = 14.7$ $(9.8 + 1.8) \times 0.3 \times 1/2 = 1.74$ $(14.7 + 1.74) \times 2 \text{ nos} = 32.88$ $1.5 \times 7.0 \times 2 \text{ nos} = 21.00$ $11.0 \times 7.0 = 77.0$			
Total	$130.88 \times 2 = 261.76$			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
07) Formwork F2 Finish				
	$9.0 \times 7.0 = 63.0$			
	$(1.8 + 1.5) \times 9.0 \times \frac{1}{2} \times 2nos = 29.70$			
	$2.0 \times 7.0 = 14.0$			
	Total $106.7 \times 2nos = 213.4 \text{ m}^2$			
09) Reinforcing Bar				





Working Division: 6 Conguille Access Road

Description	Calculation Details	Unit	Quantity	Remarks
6.1	<u>Earthwork</u>			
	<u>101 Clearing</u>			
	$A = 246.703 + 275.658 = 522.361$	$m^2$	<u>522.361</u>	
	<u>106 Compaction of original ground</u>			
	$A = 6.0 \times 15.769 \cdot 2 \times 0.1 = 9.458 \cdot 5$	$m^2$	<u>9.459</u>	

# Quantity Calculation 6.1 / 01 Clearing

Access Road Name : Congullo Access Road (Membrillo-Buenaventura)

Station	Distance (m)	Cut Volume										Embankment Volume			Clearing			Total Area (m <sup>2</sup> )	Station					
		Common (C=0.90)					Washed Rock (C=1.10)					Total Embankment Volume (m <sup>3</sup> )	Balance A-B (m <sup>3</sup> )	Accumulated Volume (m <sup>3</sup> )	Lateral Volume (m <sup>3</sup> )	Length (m)	Area (m <sup>2</sup> )							
		Sectional Area (m <sup>2</sup> )	Ground Volume (m <sup>3</sup> )	Corrected Volume (m <sup>3</sup> )	Sectional Area (m <sup>2</sup> )	Ground Volume (m <sup>3</sup> )	Corrected Volume (m <sup>3</sup> )	Sectional Area (m <sup>2</sup> )	Ground Volume (m <sup>3</sup> )	Corrected Volume (m <sup>3</sup> )	Total Corrected Volume A (m <sup>3</sup> )									Volume (m <sup>3</sup> )	Volume (m <sup>3</sup> )	Volume (m <sup>3</sup> )	Length (m)	Area (m <sup>2</sup> )
0 + 0.000		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 + 0.000					
0 + 50.000	50.000	16.8	420	378	378	378	378	378	378	378	0	0	0	378	0	0	0	378	0 + 50.000					
0 + 100.000	100.000	36.4	1,340	1,296	300	300	300	300	2,086	2,086	0	0	0	2,086	0	0	0	2,086	0 + 100.000					
0 + 150.000	150.000	29.4	1,603	1,443	1,443	1,443	1,443	1,443	2,599	2,599	0	0	0	2,599	0	0	0	2,599	0 + 150.000					
0 + 200.000	200.000	29.2	1,413	1,274	1,274	1,274	1,274	1,274	1,989	1,989	0	0	0	1,989	0	0	0	1,989	0 + 200.000					
0 + 250.000	250.000	33.6	1,370	1,413	616	616	616	616	2,605	2,605	0	0	0	2,605	0	0	0	2,605	0 + 250.000					
0 + 300.000	300.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 300.000					
0 + 350.000	350.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 350.000					
0 + 400.000	400.000	1.6	40	36	0	0	0	0	36	36	0	0	0	36	0	0	0	36	0 + 400.000					
0 + 450.000	450.000	33.0	1,290	1,251	30	30	30	30	1,384	1,384	0	0	0	1,384	0	0	0	1,384	0 + 450.000					
0 + 500.000	500.000	34.6	1,440	1,296	30	30	30	30	1,339	1,339	0	0	0	1,339	0	0	0	1,339	0 + 500.000					
0 + 550.000	550.000	28.0	1,565	1,409	20	20	20	20	1,620	1,620	0	0	0	1,620	0	0	0	1,620	0 + 550.000					
0 + 600.000	600.000	19.2	1,180	1,062	5.9	5.9	5.9	5.9	1,430	1,430	0	0	0	1,430	0	0	0	1,430	0 + 600.000					
0 + 650.000	650.000	48.3	1,760	1,540	24.8	24.8	24.8	24.8	2,072	2,072	0	0	0	2,072	0	0	0	2,072	0 + 650.000					
0 + 700.000	700.000	46.0	1,870	1,683	6.8	6.8	6.8	6.8	2,072	2,072	0	0	0	2,072	0	0	0	2,072	0 + 700.000					
0 + 750.000	750.000	42.8	2,220	1,998	29.8	29.8	29.8	29.8	2,000	2,000	0	0	0	2,000	0	0	0	2,000	0 + 750.000					
0 + 800.000	800.000	10.0	1,700	1,888	0.0	0.0	0.0	0.0	1,888	1,888	0	0	0	1,888	0	0	0	1,888	0 + 800.000					
0 + 850.000	850.000	0.0	250	235	0.0	0.0	0.0	0.0	225	225	0	0	0	225	0	0	0	225	0 + 850.000					
0 + 900.000	900.000	8.0	200	180	0.0	0.0	0.0	0.0	180	180	0	0	0	180	0	0	0	180	0 + 900.000					
0 + 950.000	950.000	31.6	990	897	16.8	16.8	16.8	16.8	1,553	1,553	0	0	0	1,553	0	0	0	1,553	0 + 950.000					
0 + 1000.000	1000.000	50.8	2,160	1,854	44.8	44.8	44.8	44.8	2,044	2,044	0	0	0	2,044	0	0	0	2,044	0 + 1000.000					
0 + 1050.000	1050.000	43.2	2,300	2,115	57.6	57.6	57.6	57.6	2,028	2,028	0	0	0	2,028	0	0	0	2,028	0 + 1050.000					
0 + 1100.000	1100.000	13.6	1,470	1,278	6.4	6.4	6.4	6.4	1,620	1,620	0	0	0	1,620	0	0	0	1,620	0 + 1100.000					
0 + 1150.000	1150.000	0.0	340	306	0.0	0.0	0.0	0.0	306	306	0	0	0	306	0	0	0	306	0 + 1150.000					
0 + 1200.000	1200.000	52.0	2,420	2,420	69.2	69.2	69.2	69.2	2,512	2,512	0	0	0	2,512	0	0	0	2,512	0 + 1200.000					
0 + 1250.000	1250.000	43.2	2,340	2,102	48.4	48.4	48.4	48.4	2,028	2,028	0	0	0	2,028	0	0	0	2,028	0 + 1250.000					
0 + 1300.000	1300.000	36.0	1,990	1,782	42.8	42.8	42.8	42.8	1,644	1,644	0	0	0	1,644	0	0	0	1,644	0 + 1300.000					
0 + 1350.000	1350.000	14.4	940	810	9.6	9.6	9.6	9.6	1,176	1,176	0	0	0	1,176	0	0	0	1,176	0 + 1350.000					
0 + 1400.000	1400.000	7.2	340	294	2.4	2.4	2.4	2.4	486	486	0	0	0	486	0	0	0	486	0 + 1400.000					
0 + 1450.000	1450.000	30.8	1,700	1,516	40.0	40.0	40.0	40.0	1,700	1,700	0	0	0	1,700	0	0	0	1,700	0 + 1450.000					
0 + 1500.000	1500.000	10.8	790	707	11.1	11.1	11.1	11.1	821	821	0	0	0	821	0	0	0	821	0 + 1500.000					
0 + 1550.000	1550.000	21.6	1,810	1,573	18.4	18.4	18.4	18.4	1,703	1,703	0	0	0	1,703	0	0	0	1,703	0 + 1550.000					
0 + 1600.000	1600.000	62.0	2,970	2,778	47.30	47.30	47.30	47.30	2,823	2,823	0	0	0	2,823	0	0	0	2,823	0 + 1600.000					
0 + 1650.000	1650.000	88.4	3,170	3,330	37.6	37.6	37.6	37.6	18,044	18,044	0	0	0	18,044	0	0	0	18,044	0 + 1650.000					
0 + 1700.000	1700.000	34.3	2,360	2,300	21.6	21.6	21.6	21.6	13,323	13,323	0	0	0	13,323	0	0	0	13,323	0 + 1700.000					
0 + 1750.000	1750.000	0.0	850	765	0.0	0.0	0.0	0.0	1,350	1,350	0	0	0	1,350	0	0	0	1,350	0 + 1750.000					
0 + 1800.000	1800.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 1800.000					
0 + 1850.000	1850.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 1850.000					
0 + 1900.000	1900.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 1900.000					
0 + 1950.000	1950.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 1950.000					
0 + 2000.000	2000.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 2000.000					
0 + 2050.000	2050.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 2050.000					
0 + 2100.000	2100.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 2100.000					
0 + 2150.000	2150.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 2150.000					
0 + 2200.000	2200.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0.000	0	0	0	0.000	0 + 2200.000					
0 + 2250.000	2250.000	30.8	500	450	3.0	3.0	3.0	3.0	505	505	0	0	0	505	0	0	0	505	0 + 2250.000					
0 + 2300.000	2300.000	14	545	491	0.0	0.0	0.0	0.0	546	546	0	0	0	546	0	0	0	546	0 + 2300.000					
0 + 2350.000	2350.000	1.6	80	72	0.0	0.0	0.0	0.0	72	72	0	0	0	72	0	0	0	72	0 + 2350.000					
0 + 2400.000	2400.000	1.6	35	26	0.0	0.0	0.0	0.0	68	68	0	0	0	68	0	0	0	68	0 + 2400.000					
0 + 2450.000	2450.000	0.0	230	207	0.0	0.0	0.0	0.0	207	207	0	0	0	207	0	0	0	207	0 + 2450.000					
0 + 2500.000	2500.000	0.0	190	171	0.0	0.0	0.0	0.0	171	171	0	0	0	171	0	0	0	171	0 + 2500.000					
0 + 2550.000	2550.000	1.1	28	25	0.0	0.0	0.0	0.0	25	25	0	0	0	25	0	0	0	25	0 + 2550.000					
0 + 2600.000	2600.000	68.8	1,748	1,573	145.6	145.6	145.6	145.6	3,640	3,640	4,934	4,934	40	40	40	40	5,377	0 + 2600.000						
0 + 2650.000	2650.000	37.6	3,160	2,844	138.8	138.8	138.8	138.8	1,821	1,821	10,665	10,665	0.0	0.0	0.0	0.0	12,486	0 + 2650.000						
0 + 2700.000	2700.000	36.0	3,090	1,881	34.4	34.4	34.4	34.4	4,330	4,330	6,644	6,644	0.0	0.0	0.0	0.0	11,014	0 + 2700.000						
0 + 2800.000	2800.000	45.2	1,780	1,602	33.6	33.6	33.6	33.6	2,900	2,900	4,022	4,022	0.0	0.0	0.0	0.0	6,922	0 + 2800.000						
Total	3000.000		65,865	59,279					78,880	86,768	146,040		78,810					67,237	59,405					

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