Item No.	Description	Unit	Quantity	Foregin Currency ( )		Local Currency (Rs)		Total	Ref.Clause
				Unit Price	Amount	Unit Price	Amount	Equivalent (Rs)	or Sub-clause
C	**DIVERSION TUNNEL**								
C1	INLET								
/01	Clearing and stripping	m2	9,800						T2.1
/02	Open-cut excavation, common	m3	14,200						T2.3
/03	Open-cut excavation, weatherd rock	m3	28,400						T2.3
/04	Open-cut excavation, rock	m3	28,400						T2.3
/05	Free draining backfill	m3	1,000						T2.5
/06	Concrete, class A for blockout	m3	30						T4.1
/07	Concrete, class C for inlet	m3	2,200						T4.1
/08	Shotcrete concrete	m2	3,100						T4.2
/09	Form, finish F1 or U1	m2	770						T4.1
/10	Form, finish F2 or U2	m2	370						T4.1
/11	Form, finish F4 or U4	m2	750						T4.1
/12	Reinforcing bar	ton	130						T4.1
/13	Embedded metal works	kg	620						T4.1

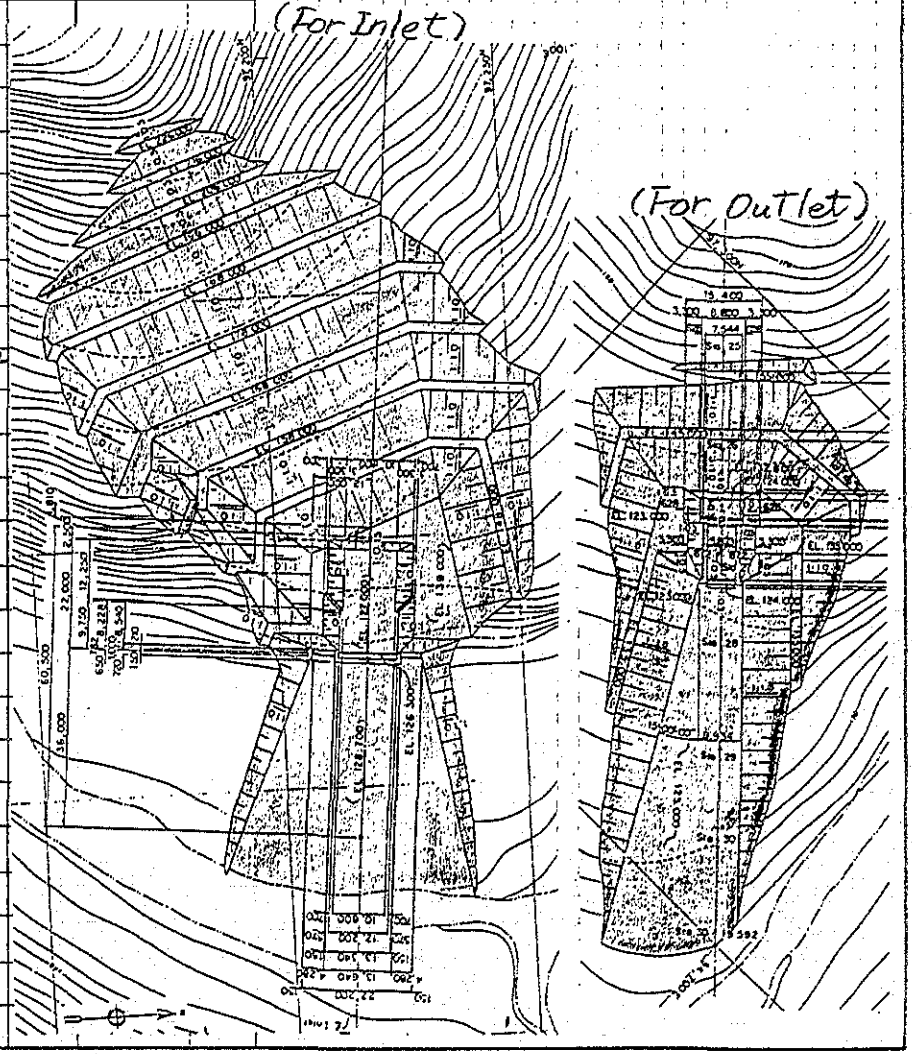
Item No.	Description	Unit	Quantity	Foregin Currency ( ) Unit Price	Foregin Currency ( ) Amount	Local Currency (Rs) Unit Price	Local Currency (Rs) Amount	Total Equivalent (Rs)	Ref.Clause or Sub-clause
/14	PVC weep holes 50 dia.	m	12						
	Subtotal of Item C1								
C2	TUNNEL								
/01	Excavation,tunnel	m3	27,600						T2.4
/02	Permanent steel support	ton	90						T2.4
/03	Drilling for consolidation grout hole	m	3,430						T3.5
/04	Drilling for curtain grout hole	m	480						T3.6
/05	Drilling for check hole	m	20						T3.8
/06	Backfill grout	m3	550						T3.4
/07	Consolidation grout	ton	70						T3.5
/08	Curtain grout	ton	10						T3.6
/09	Permeability test	time	100						T3.10
/10	Concrete, class C for lining	m3	10,650						T4.1
/11	PVC waterstop (b=300)	m	40						T4.1

Item No.	Description	Unit	Quantity	Foregin Currency ( )		Local Currency (Rs)		Total	Ref.Clause
				Unit Price	Amount	Unit Price	Amount	Equivalent (Rs)	or Sub-clause
/12	Grout stop	m	43						T4.1
/13	Form, finish F4 or U4	m2	9,700						T4.1
/14	Reinforcing bar	ton	535						T4.1
	Subtotal of Item C2								
C3	OUTLET								
/01	Clearing and stripping	m2	5,200						T2.1
/02	Open-cut excavation, common	m3	6,300						T2.3
/03	Open-cut excavation, weatherd rock	m3	12,600						T2.3
/04	Open-cut excavation, rock	m3	12,600						T2.3
/05	Free draining backfill	m3	230						T2.5
/06	Gabion mat	m3	420						T2.6
/07	Concrete, class C for outlet	m3	450						T4.1
/08	PVC waterstop (b=300)	m	70						T4.1

Item No.	Description	Unit	Quantity	Foregin Currency ( )		Local Currency (Rs)		Total	Ref.Clause
				Unit Price	Amount	Unit Price	Amount	Equivalent (Rs)	or Sub-clause
/09	Form, finish F1 or U1	m2	80						T4.1
/10	Form, finish F2 or U2	m2	370						T4.1
/11	Form, finish F4 or U4	m2	590						T4.1
/12	Reinforcing bar	ton	22						T4.1
/13	PVC weep holes 50 dia.	m	23						
	Subtotal of Item C3								
	Total of Item C								

Working Division: Diversion tunnel (Inlet)

Description	Calculation Details	Unit	Quantity	Remarks
C1 & C3				
1001	Clearing and stripping	m^2	15,298	
	Inlet = 9,735 m^2			
	Outlet = 5,143 m^2			
	Gabion = 2.00 × 1.00 × 70 × 3 = 420 m^2			
	Total = 15,298 m^2			



Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1 & C2				
1002	Excavation common	m^3	20,425	See Drawing No. D-005 and D-008
	Inlet = 70,786.5 × 20% = 14,157.3			
	Outlet = 31,336 × 20% = 6,267.2			
	total = 20,424.5 m^3			

Working Division: Diversion Tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1 x C3				
1003	Excavation weathered rock	m^3	40,849	
				See Drawing No. D-005 and D-008
	Inlet = 70,786.5 x 40% = 28,314.6			
	Outlet = 31,336 x 40% = 12,534.4			
	total = 40,849 m^3			

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1 & C4				
1004	Excavation rock	m^3	40,849	
				See Dwg No. D-005 and D-008
	Inlet = 70,786.5 × 40% = 28,314.6			
	Outlet = 31,336 × 40% = 12,534.4			
	Total = 40,849. m^3			

EXCAVATION OF INLET PORTION

Sec.No.	Dis.(m)	Area(m2)	Means(m2)	Volume(m3)
EL.129	0.000	1688.000	0.000	0.000
EL.134	5.000	268.000	978.000	4890.000
EL.138	4.000	150.000	209.000	836.000
EL.138	0.000	738.000	444.000	0.000
EL.148	10.000	1163.000	950.500	9505.000
EL.148	0.000	1370.000	1266.500	0.000
EL.158	10.000	1275.000	1322.500	13225.000
EL.158	0.000	1458.000	1366.500	0.000
EL.168	10.000	950.000	1204.000	12040.000
EL.168	0.000	1135.000	1042.500	0.000
EL.178	10.000	850.000	992.500	9925.000
EL.178	0.000	1005.000	927.500	0.000
EL.188	10.000	575.000	790.000	7900.000
EL.188	0.000	725.000	650.000	0.000
EL.195	7.000	598.000	661.500	4630.500
EL.195	0.000	730.000	664.000	0.000
EL.205	10.000	263.000	496.500	4965.000
EL.205	0.000	301.000	282.000	0.000
EL.215	10.000	100.000	200.500	2005.000
EL.215	0.000	124.000	112.000	0.000
EL.225	10.000	25.000	74.500	745.000
EL.225	0.000	40.000	32.500	0.000
EL.231	6.000	0.000	20.000	120.000

Total volume = 70786.500(m3)

Working Division: Excavation of outlet

Section No.	Distance	Sectional Area	Mean	Volume	Sectional Area	Mean	Volume	Remarks
	m	m²	m²	m³	m²	m²	m³	
EL. 125	0	1,873						
EL. 135	10	1,188	1,531	15,310				
EL. 135	0	1,530	1,359	-				
EL. 145	10	768	1,149	11,490				
EL. 145	0	880	824	-				
EL. 155	10	16	448	4,480				
EL. 155	0	40	28	-				
EL. 157.8	2.8	0	20	56				
				31,336 m³				

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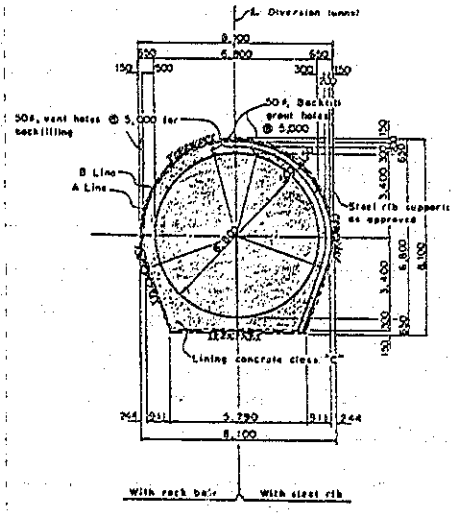
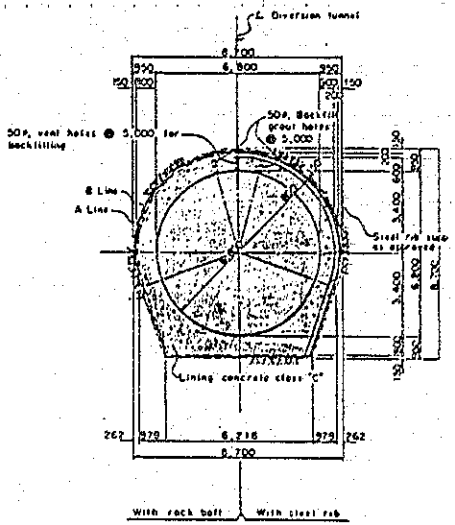
N.K. Form No. 2312

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/01	Excavation Tunnel	m^3		
	Type I A = 54.463 m^2			
	L = 205 m (See DWG. NO. G-019)			
	$V_1 = 54.463 \times 205 = 11,164.9$			
	Type II A = 62.829 m^2			
	L = 261.2m (See DWG. NO. G-019)			
	$V_2 = 62.829 \times 261.2 = 16,410.9$			
	$V_1 + V_2 = 27,575.8$ m^3			



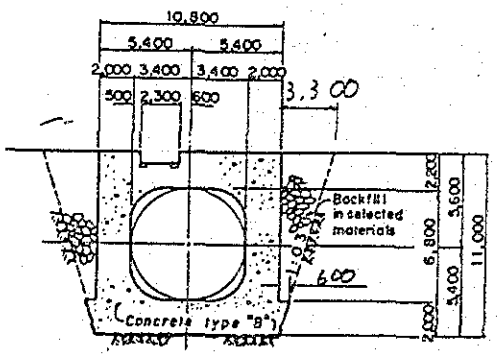
TYPE - I



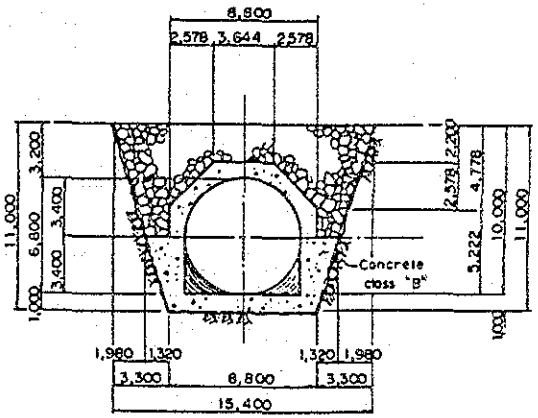
TYPE - II

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1 & C3				
1005.	Free drainage backfill			
	Inlet = $\frac{1}{2}$ x (0.60+3.3) x 9.0 x 2 x 27.8			
	= 975.78 m3			
	Outlet = 45.162 x 5.00 = 225.808 m3			
	Total = 1,201.59 m3			



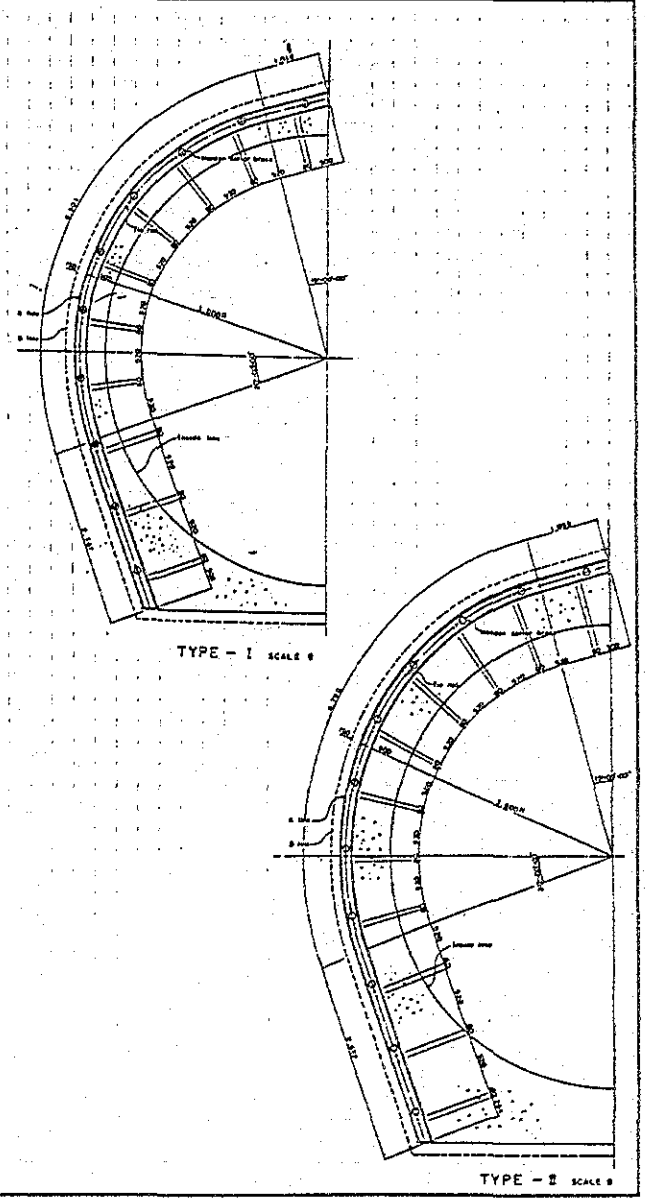
SECTION D-D
(Inlet)



SECTION B-B SCALE A
(Outlet)

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/02	Permanent steel support			
	H=150×150×7×10 w=31.5 kg/m			
Type-I	L=205.00 m			
	$\ell=\{2.836+2\times\pi\times3.625\times110/360\}\times2$			
	=20.359 m/sec			
	L=205.00×0.4=82 m			
	@=1,500 N=82/1.5=155 nos			
	w=55×20.359×31.5=35,272 kg			
Type-II	L=261.2 m			
	$\ell=\{3.046+2\times\pi\times4.125\times110/360\}\times2$			
	=21.931 m/sec			
	L=261.2×0.4=104.5 m			
	@=1,500 N=104.5/1.5=70 nos			
	w=70×21.931×31.5=48,358 kg			
	total=83,630 kg			

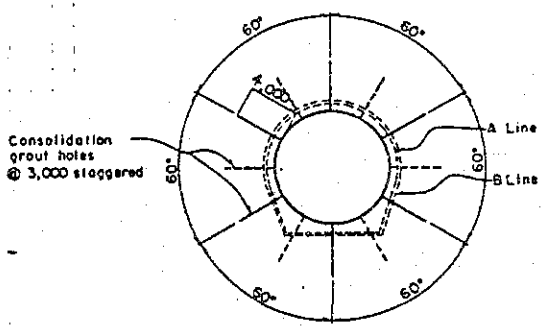


Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
C3/06	Gabion mat	m³	420	
	V = 2.00 × 1.00 × 70. × 3 = 420 m³			

Working Division: Diversion Tunnel

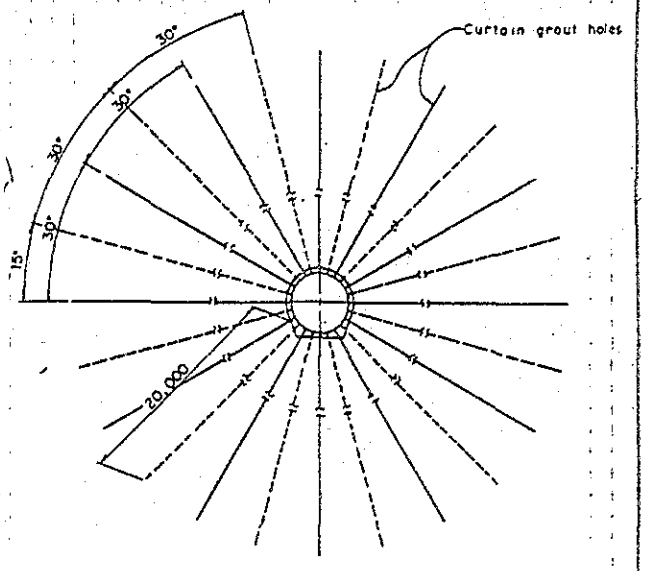
Description	Calculation Details	Unit	Quantity	Remarks
C2/03	Drilling for consolidation grout hole	m	3,360	
	8 Nos $\ell = 4$ m = 32 m/sec			
	$N_1 = 139.2/3 = 47$ sec			
	$N_2 = 262 \times \frac{2}{3} / 3 = 58$ sec			
	$32 \times (47+58) = 3,360$ m			



ARRANGEMENT OF CONSOLIDATION GROUT HOLES

Working Division: Diversion Tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/04	Drilling for curtain grout hole	m	480 m	
	N = 12本 x 2 Lane x 20 m			
	L = 12 x 2 x 20 = 480 m			



CURTAIN GROUT PATTERN

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/05	Drilling for check hole	m	200	

Working Division: Diversion Tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/06	Backfill grouting	m³	638.70	
	L = 466.20 m			
	Concrete Volume = 10,644.86 m³			
	V = 10,644.86 x 0.06 = 638.7			
	(Refer to C2/10)			

Working Division: Diversion Tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/07	consolidation grouting	ton	67 20	
	20 kg x 3,360 = 67,200			
	(Refer to C2/03)			

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Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/08	Curtain grouting	ton	9,6	
	480 x 20 m = 9,600			
	(Refer to C2/04)			

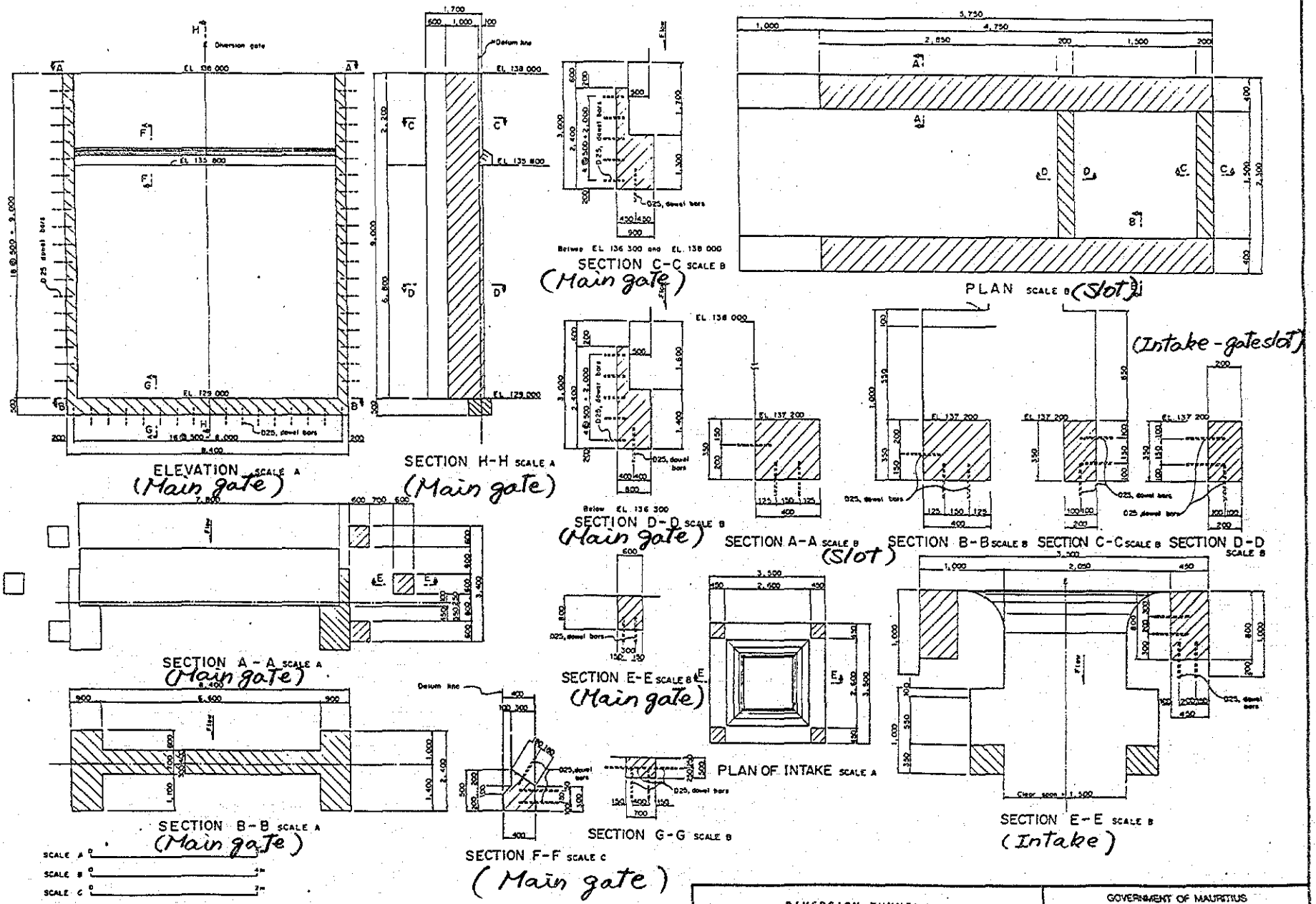
Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/09	Permeability tests	time	96	
	480 / 5 = 96			
	(Refer to C2/04)			

Working Division: Diversion Tunnel (Inlet)

Description	Calculation Details	Unit	Quantity	Remarks
C1/06	Concrete, type A for blockout	m^3	27.595	
Intake	$V_1 = 0.45 \times 0.45 \times 0.80 \times 4 = 0.648$			
Intake(Gate slot)	$V_2 = 0.20 \times 0.35 \times 1.70 \times 4 = 0.476$			
Intake(Slot)	$V_3 = 0.40 \times 0.35 \times 5.75 \times 2 = 16.10$			
Main Gate	$V_4 = 6.63 \times 0.50 = 3.315$			
	$V_5 = 0.80 \times 0.30 \times 9.00 \times 2 = 4.32$			
	$V_6 = \frac{1}{3} \times (0.30 + 0.50) \times 0.30 \times 8.40$ $= 1.008$			
Hoist	$V_7 = 0.60 \times 0.60 \times 0.80 \times 6 = 1.728$			
	Sub-total = 27.595 m^3			

DWG.NO.D – 010

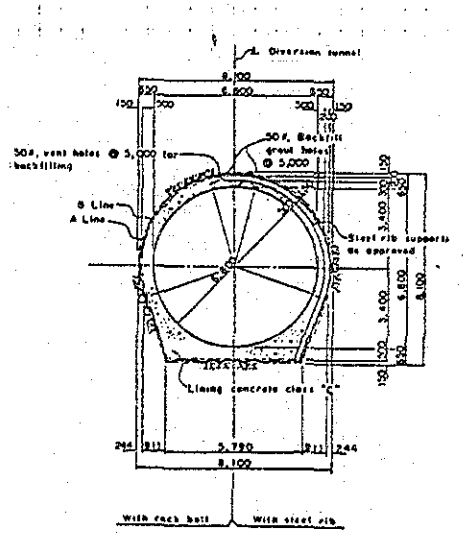


DIVERSION TUNNEL
BLOCKOUT DETAILS OF INTAKE

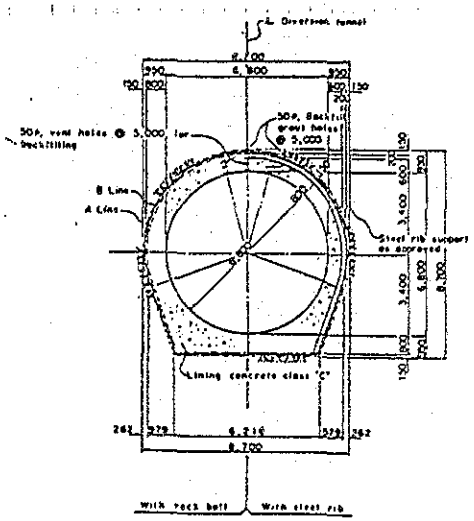
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C2/10	Concrete class C for Liming	m^3	10,644.86	
TYPE-I	1. $a_1 = \frac{1}{2} \times (5.672 + 7.612) \times 2.665 = 17.701$			
	2. $a_2 = 1.385 \times 3.806 = 5.271$			
	3. $a_3 = (\pi \times 4.05^2 \times 20/360) \times 2 = 5.726$			
	4. $a_4 = (\pi \times 4.05^2 \times 180/360) = 25.765$			
	Sub-total = 54.463			
	$A = 54.463 - \pi \times 3.40^2 = 18.146\ m^2$			
	$V_1 = 18.146 \times 205.0 = 3,719.93\ m^3$			
TYPE-II	1. $a_1 = \frac{1}{2} \times (6.092 + 8.176) \times 2.862 = 20.418$			
	2. $a_2 = 4.088 \times 1.488 = 6.083$			
	3. $a_3 = (\pi \times 4.35^2 \times 20/360) \times 2 = 6.605$			
	4. $a_4 = \pi \times 4.35^2 \times 180/360 = 29.723$			
	Sub total = 62.829			
	$A = 62.829 - \pi \times 3.40^2 = 26.512\ m^2$			
	$V_2 = 26.512 \times 261.20 = 6,924.93\ m^3$			
	$V_1 + V_2 = 10,644.86\ m^3$			



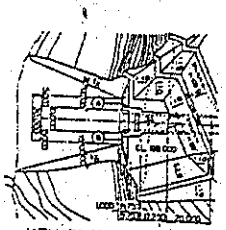
TYPE – I SCALE C



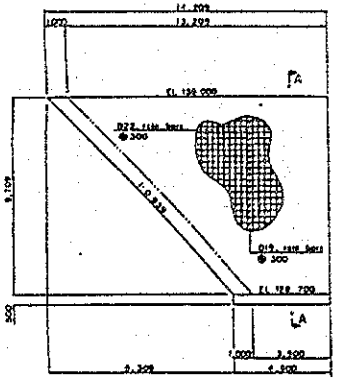
TYPE – II SCALE C

Working Division: Diversion tunnel (Inlet)

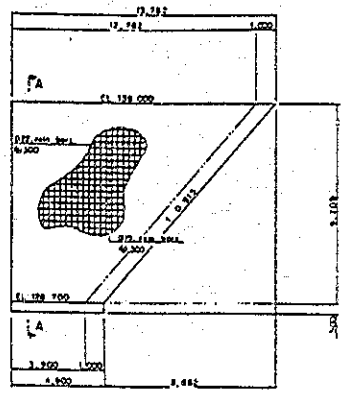
Description	Calculation Details	Unit	Quantity	Remarks
C1/07	Concrete class "C"	m^3		
(Protection wall)	Wall Type A	m^3	48.703	
	$A_1 = \frac{1}{2} \times (14.209 + 4.90) \times 9.709 = 92.765$			
	$V_1 = 92.765 \times 0.50 = 46.383\ m^3$			
	$V_2 = \frac{1}{2} \times (0.872 + 1.022) \times 0.50 \times 4.90$			
	$= 2.32\ m^3$			
	Wall Type B	m^3	47.885	
	$A_3 = \frac{1}{2} \times (13.872 + 4.90) \times 9.709 = 91.129$			
	$V_3 = 91.129 \times 0.50 = 45.565\ m^3$			
	$V_4 = \frac{1}{2} \times (0.872 + 1.022) \times 0.50 \times 4.90$			
	$= 2.32\ m^3$			
	$\sum V_1$ to $V_4 = 96.588$			



KEY PLAN OF INLET



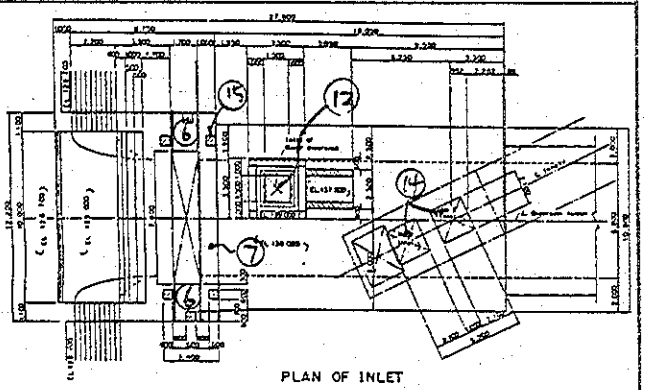
WALL TYPE A



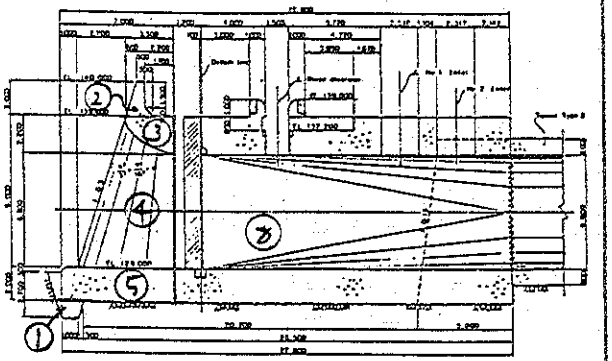
WALL TYPE B

Working Division:

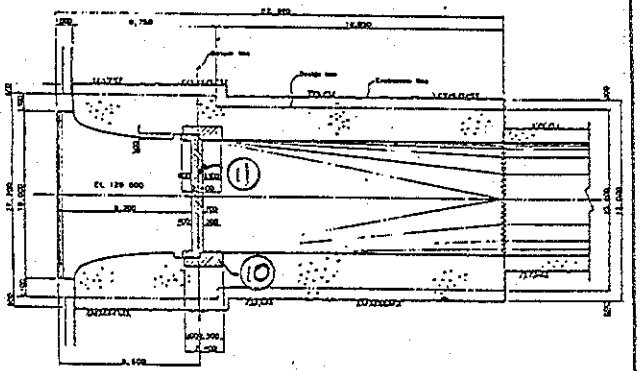
Description	Calculation Details	Unit	Quantity	Remarks
Inlet	Concrete class "C"	m^3	2,055.81	
①	$V_1 = \frac{1}{2} \times (1.00 + 1.60) \times 1.00 \times 12.20 = 15.86\ m^3$			
②	$V_2 = \{\frac{1}{2} \times (0.50 + 1.10) \times 1.50 + \frac{1}{2} \times (1.10 + 1.60) \times 0.50\} \times 12.20 = 22.875\ m^3$			
③	$V_3 = \frac{1}{2} \times 4.50 \times 2.20 \times 6.80 = 33.660\ m^3$			
④	$V_4 = \frac{1}{2} \times (3.30 + 7.00) \times 11.00 \times 2.70 \times 2 = 305.91\ m^3$			
⑤	$V_5 = 7.00 \times 2.00 \times 6.80 = 95.20\ m^3$			
⑥	$V_6 = 2.20 \times 1.70 \times 2 \times 9.00 + 2.00 \times 1.70 \times 12.20 = 108.8\ m^3$			
⑦	$V_7 = (12.20 \times 13.00 - 6.80 \times 6.80) \times 1.00 = 112.36\ m^3$			
⑧	$V_8 = \{11.00 \times 10.80 - \frac{1}{2} \times (6.8^2 + \pi \times 3.4^2)\} \times 18.10 = 1403.14\ m^3$			
⑨	$V_9 = (3.50 \times 3.50 - 1.50 \times 1.50) \times 1.00 = 10.00\ m^3$			
	Sub-total = 2,107.805			



PLAN OF INLET



PROFILE OF INLET



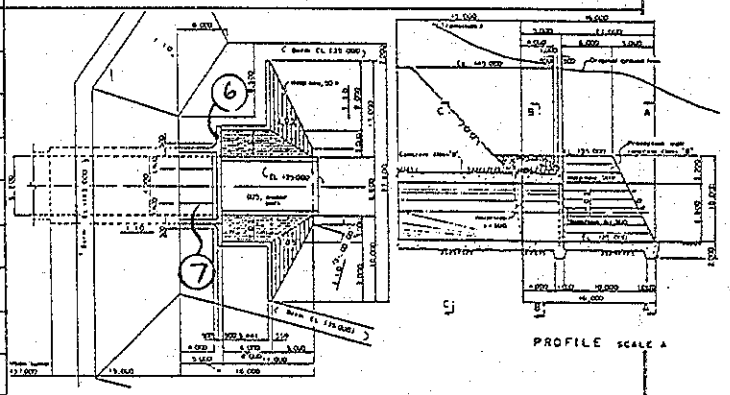
SECTIONAL PLAN OF INLET AT EL 129.000

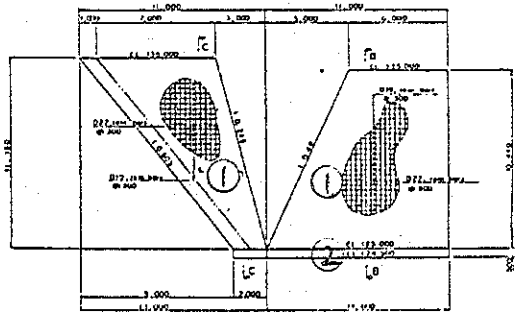
Working Division:

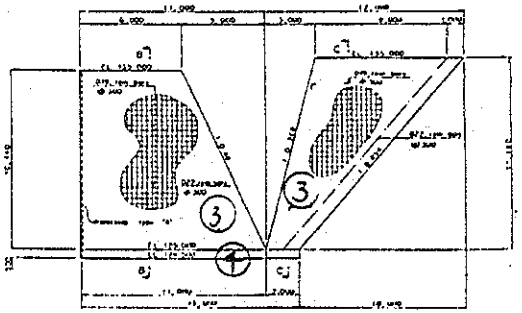
Description	Calculation Details	Unit	Quantity	Remarks
	Calculation of vacant volume.			
⑩	$V_{10} = 0.30 \times 2.40 \times 9.50 \times 2 = 13.68\ m^3$			
⑪	$V_{11} = 0.9 \times 2.40 \times 0.50 \times 2 + 6.60 \times 0.70 \times 0.50 = 4.47\ m^3$			
⑫	$V_{12} = 1.50 \times 1.50 \times 2.20 + 0.35 \times 0.20 \times 4.50 = 5.265\ m^3$			
⑬	$V_{13} = 4.05 \times 2.30 \times 0.80 = 7.452\ m^3$			
⑭	$V_{14} = 2.10 \times 2.10 \times 2.20 \times 2 = 19.404$			
⑮	$V_{15} = 0.60 \times 0.60 \times 0.80 \times 6 = 1.728$			
	Sub total = 51.999			
	Total = 2,107.805 − 51.999 = 2,055.81			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
C3/07				
Outlet	Concrete class "C" for Outlet	m^3	441.00	
Protection wall ①	$V_1 = \{\frac{1}{2}\times(8.00+2.00)\times 11.180 + \frac{1}{2}\times(6.00+11.00)\times 10.440\}\times 0.50 = 72.32\ m^3$			
" ②	$V_2 = \frac{1}{2}\times(1.059+0.809)\times 0.50\times 2.00 + \frac{1}{2}\times(1.022+0.872)\times 0.50\times 11.00 = 6.143\ m^3$			
" ③	$V_3 = \{\frac{1}{2}\times(6.00+11.00)\times 10.44 + \frac{1}{2}\times(9.00+2.00)\times 11.180\}\times 0.50 = 75.115\ m^3$			
" ④	$V_4 = \frac{1}{2}\times(1.059+0.809)\times 0.50\times 2.00 + \frac{1}{2}\times(1.022+0.872)\times 0.50\times 11.00 = 6.143\ m^3$			
Apron ⑤	$V_5 = 11.60\times 5.80\times 1.00 + \frac{1}{2}\times(1.00+1.60)\times 1.00\times 6.80 = 76.91\ m^3$			
Wing wall ⑥	$A = \frac{1}{2}\times(15.40+11.44)\times 6.6 - \frac{1}{2}\times(3.644+8.80)\times 2.578 - 1.822\times 8.80 = 56.498$			
	$V_6 = 56.498\times 0.50 = 28.249\ m^3$			
⑦	$A_1 = \frac{1}{2}\times(3.644+8.80)\times 2.578 + 1.822\times 8.80 + \frac{1}{2}\times(11.440+8.80)\times 4.40 = 76.602\ m^2$			
	$A_2 = 36.317/2 + 3.40\times 6.80 = 41.278\ m^2$			
	$A_3 = 76.602 - 41.278 = 35.324\ m^2$			
	$V_7 = 35.324\times 5.00 = 176.62\ m^3$			



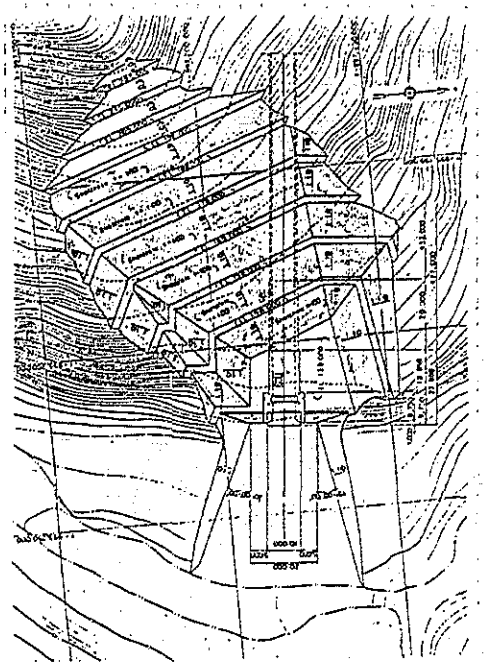




Working Division:

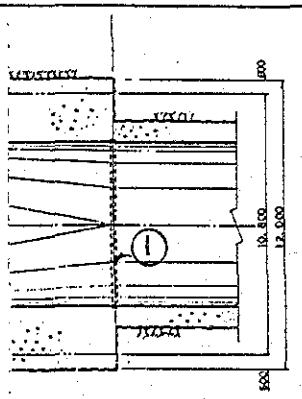
Description	Calculation Details	Unit	Quantity	Remarks
	$\Sigma V_1 \sim V_7 = 441.00\ m^3$			

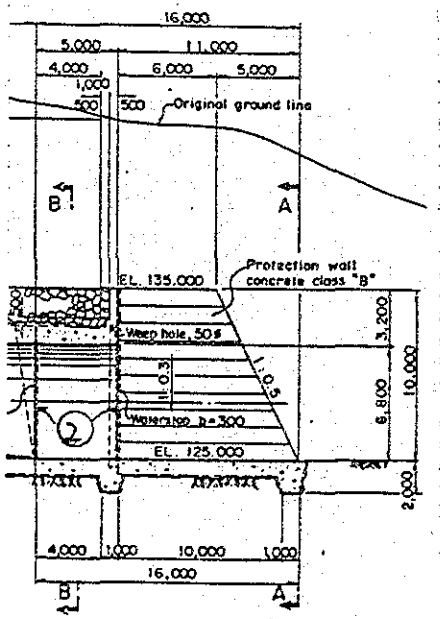
Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1/08	Shotcrete concrete	m^2	3,040	
	L = 215 m			
	H = 14.142			
	A = 14.142 × 215 = 3,040.53			

Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
	P.V.C Waterstop (b=200)			
		m	104.97	
C2/11 ①	$\ell = \pi \times 3.5^2 = 38.485$ M			
C3/08 ②	$\ell = \{\frac{1}{2} \times \pi \times 3.5^2 + 3.50 \times 2 + 7.00\} \times 2$			
	$= 66.485$ M			
	total = 104.97			





PROFILE SCALE A

Working Division: Diversion Tunnel

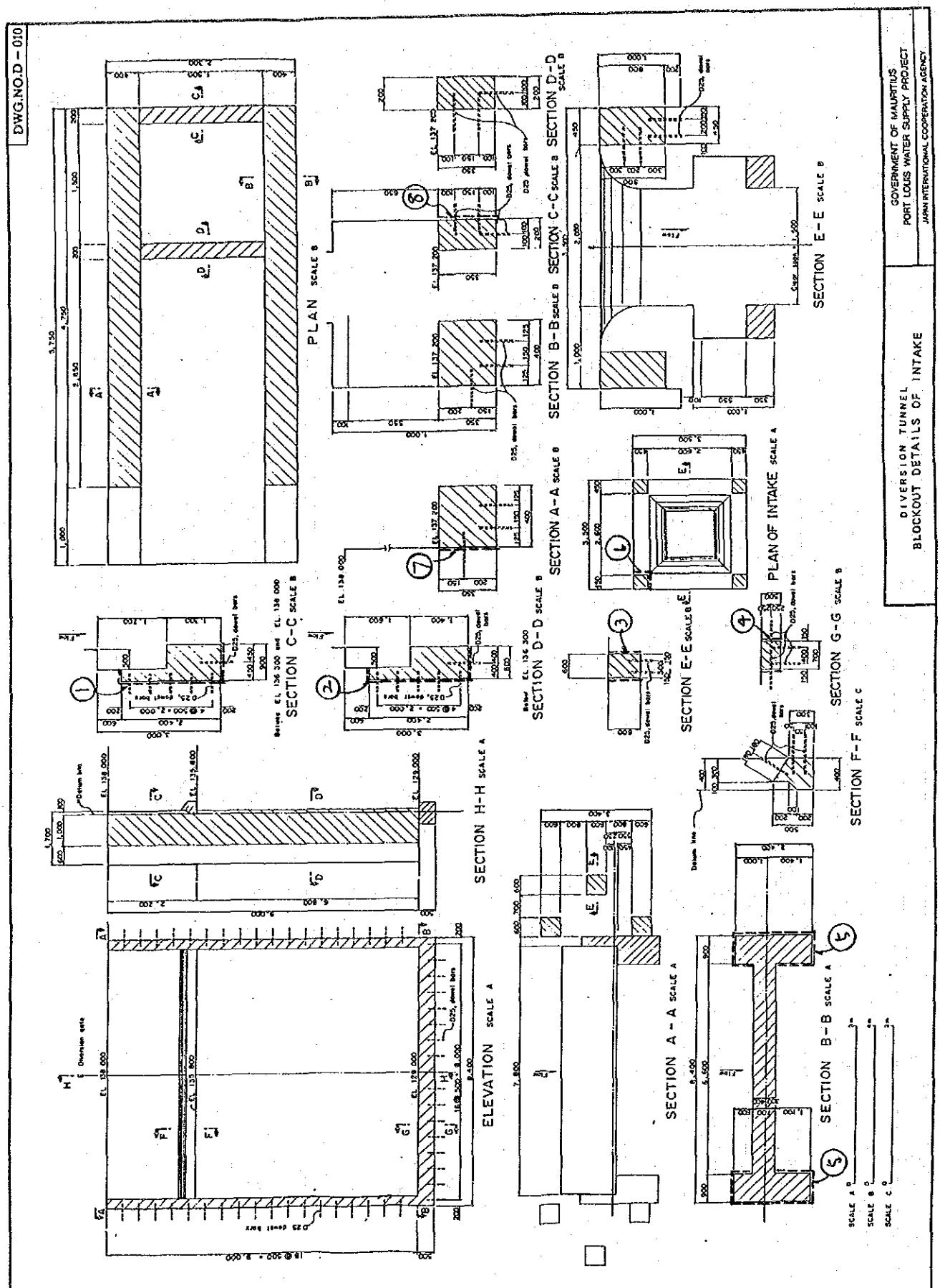
Description	Calculation Details	Unit	Quantity	Remarks
C2/12	Grout stop	m	43	
	2×π×3.4 × 2 = 42.725			

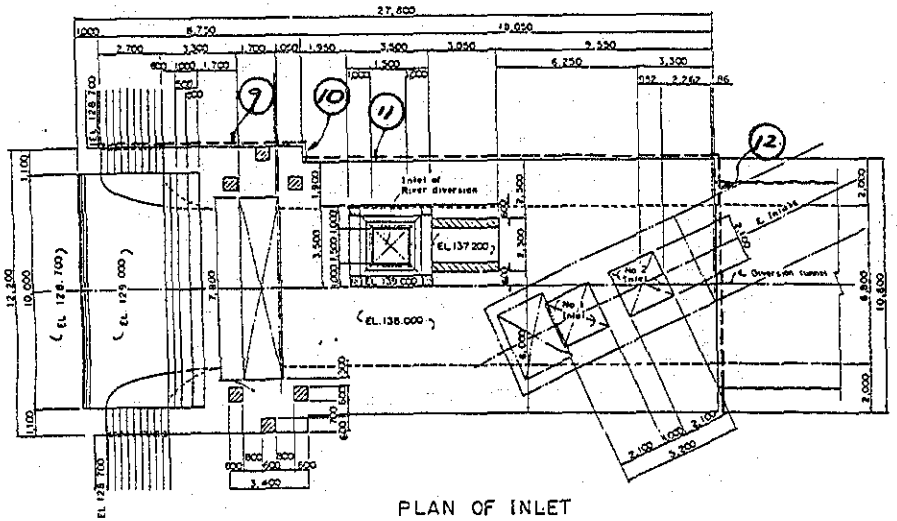
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
C1/09	Form work class F1	m^2	843.271	
(Inlet)		m^2	766.698	
1	$A_1 = (0.30 + 2.40 + 0.70) \times 2 \times 1.70$			
	$= 12.240\ m^2$			
2	$A_2 = (0.30 + 2.40 + 0.80) \times 2 \times 7.30$			
	$= 51.10\ m^2$			
3	$A_3 = 0.60 \times 0.80 \times 4 \times 6 = 11.52\ m^2$			
4	$A_4 = 0.50 \times 2 \times 6.60 = 6.60\ m^2$			
5	$A_5 = (0.90 \times 2 + 0.60 + 1.10 + 2.40) \times 2$			
	$\times 0.50 = 5.90\ m^2$			
6	$A_6 = 0.45 \times 0.80 \times 2 \times 4 = 2.88\ m^2$			
7	$A_7 = 0.35 \times 2 \times 4.75 = 3.325\ m^2$			
8	$A_8 = 0.35 \times 1.50 \times 2 = 1.05\ m^2$			
9	$A_9 = \{\frac{1}{2} \times (6.05 + 8.75) \times 9.00 + 7.75 \times 2.00$			
	$\times 2. = 172.20\ m^2$			
10	$A_{10} = 0.70 \times 2 \times 11.00 = 15.40\ m^2$			

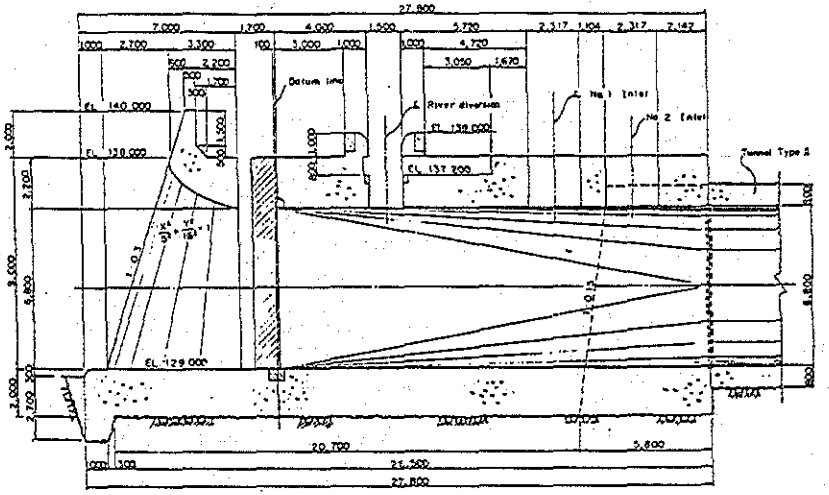
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
11	$A_{11} = 18.05 \times 11.00 \times 2 = 397.10\ m^2$			
12	$A_{12} = 11.00 \times 10.80 - \pi \times 3.4^2 = 82.483\ m^2$			
13	$A_{13} = 4.90 \times 2 \times 0.50 = 4.90\ m^2$			

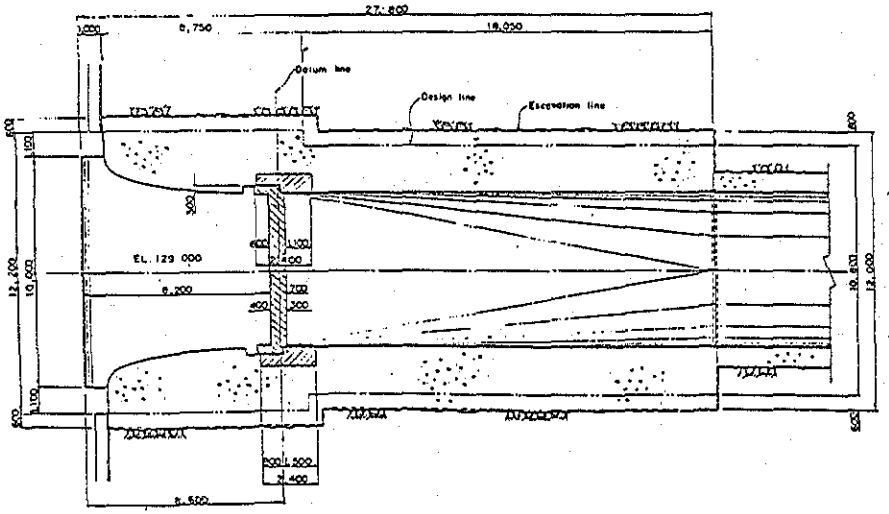

DWG.NO.D – 010
PLAN SCALE B
SECTION A-A SCALE B
SECTION B-B SCALE B
SECTION C-C SCALE B
SECTION D-D SCALE B
SECTION E-E SCALE B
PLAN OF INTAKE SCALE A
SECTION C-C SCALE B
SECTION D-D SCALE B
SECTION E-E SCALE B
SECTION G-G SCALE B
SECTION F-F SCALE C
SECTION H-H SCALE A
ELEVATION SCALE A
SECTION A – A SCALE A
SECTION B – B SCALE A
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY
DIVERSION TUNNEL
BLOCKOUT DETAILS OF INTAKE



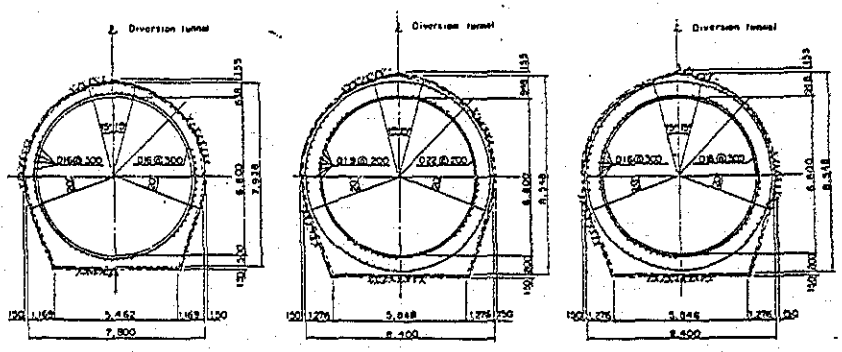
PLAN OF INLET



PROFILE OF INLET



SECTIONAL PLAN OF INLET AT EL. 129.000

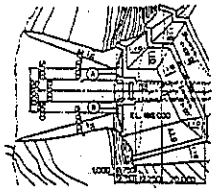


TYPE - I　　TYPE - II (U/s)　　TYPE - II (D/s)

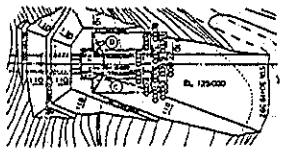
DIVERSION TUNNEL
(ARRANGEMENT OF REINFORCEMENT BARS)

SCALE 0 ——— 10m

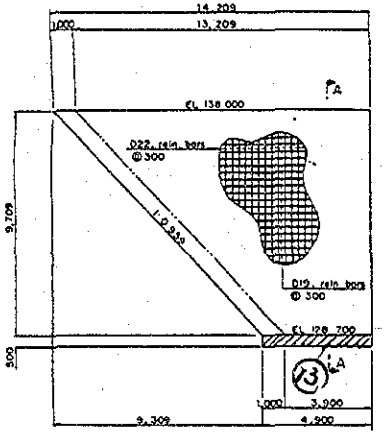
DIVERSION TUNNEL STRUCTURAL DETAILS	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY



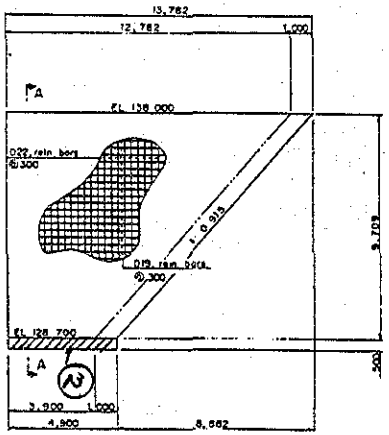
KEY PLAN OF INLET



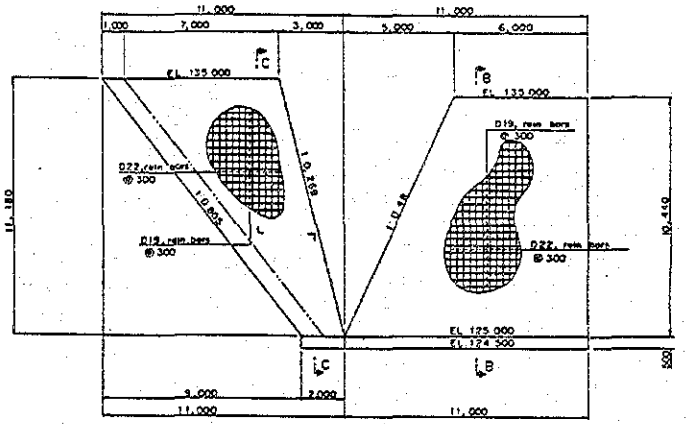
KEY PLAN OF OUTLET



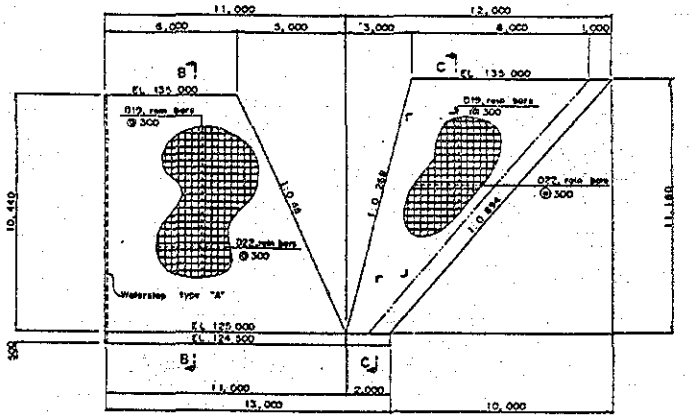
WALL TYPE A



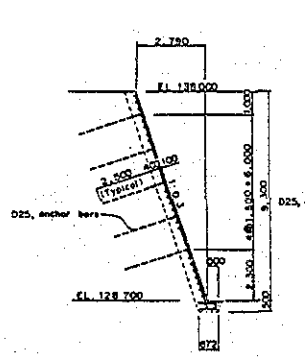
WALL TYPE B



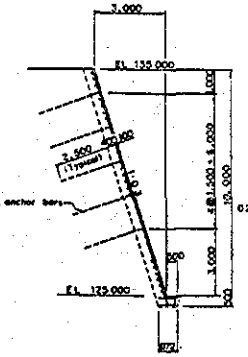
WALL TYPE – C



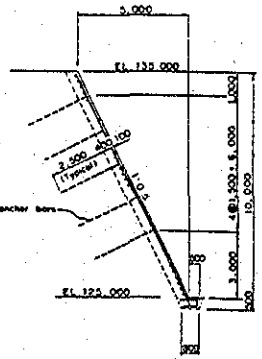
WALL TYPE – D



SECTION A-A



SECTION B-B



SECTION C-C

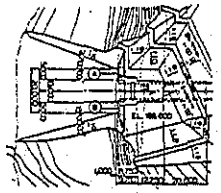
SCALE 0 10m

DIVERSION TUNNEL
DETAIL OF CONCRETE FACING

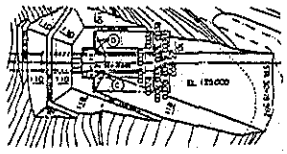
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Working Division:

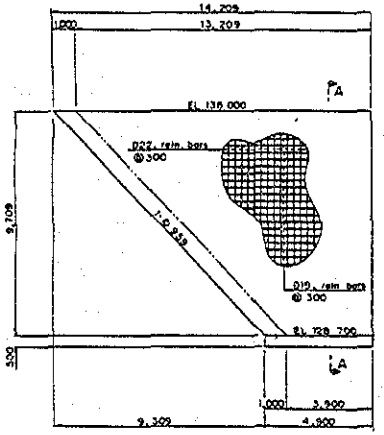
Description	Calculation Details	Unit	Quantity	Remarks
C3/09	Form work class F1			
(Outlet)		m^2	76.573	
(14)	$A_{14} = 35.324\ m^2$			
(15)	$A_{15} = 28.249\ m^2$			
(16)	$A_{16} = 0.50 \times 13.00 = 6.50 m^2$			
(17)	$A_{17} = 0.50 \times 13.00 = 6.50\ m^2$			



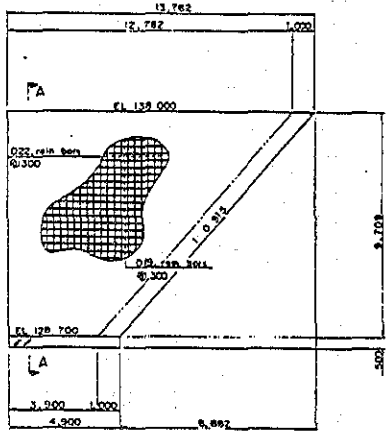
KEY PLAN OF INLET



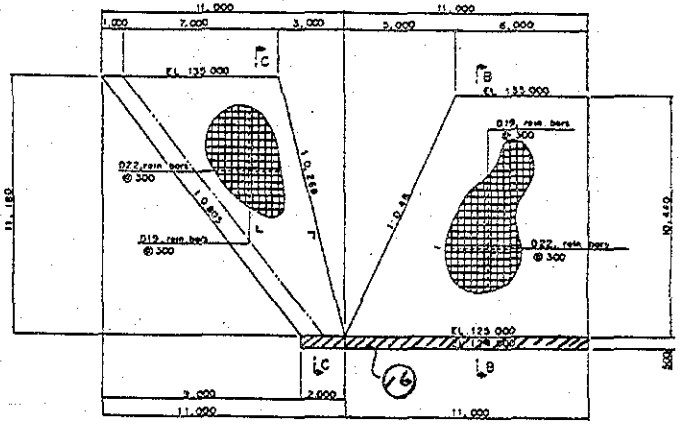
KEY PLAN OF OUTLET



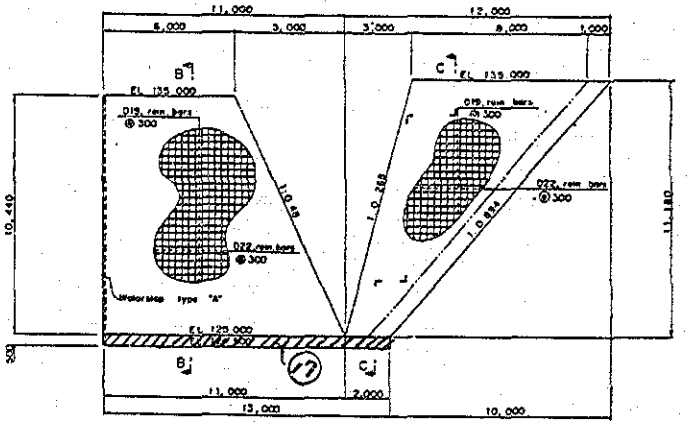
WALL TYPE A



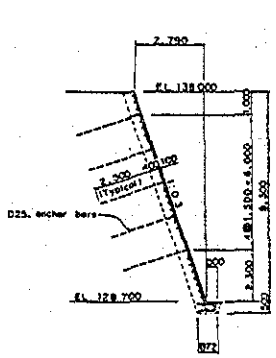
WALL TYPE B



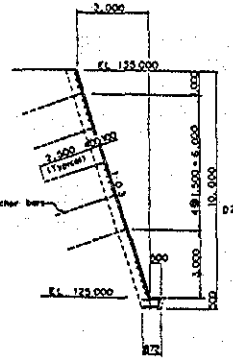
WALL TYPE - C



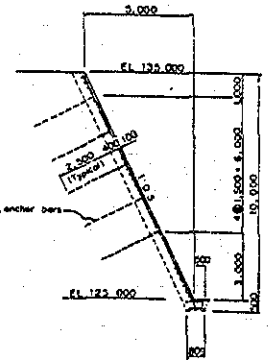
WALL TYPE - D



SECTION A-A



SECTION B-B



SECTION C-C

SCALE 0 10m

DIVERSION TUNNEL
DETAIL OF CONCRETE FACING

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

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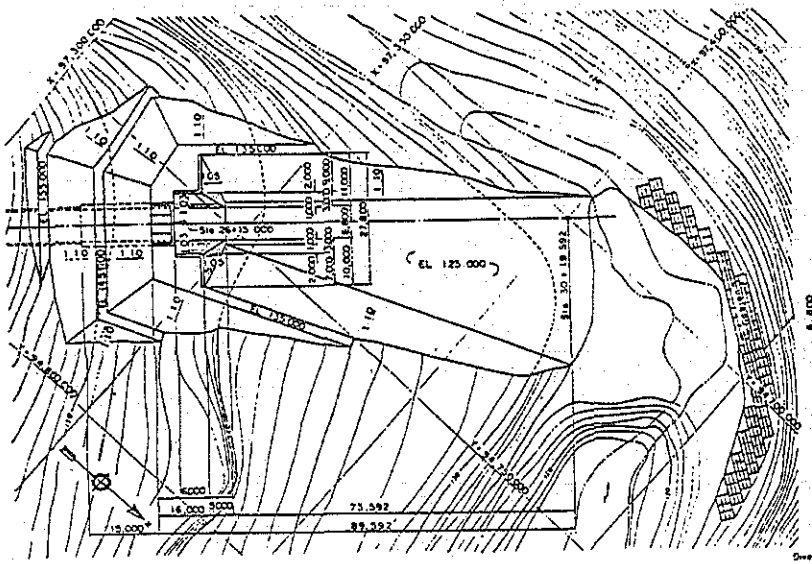
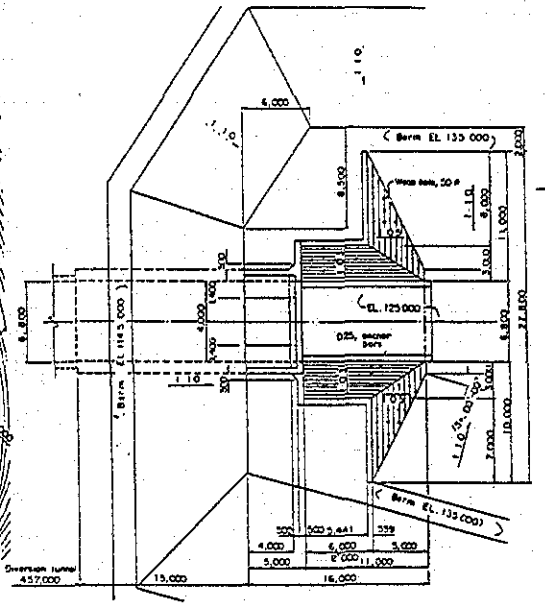
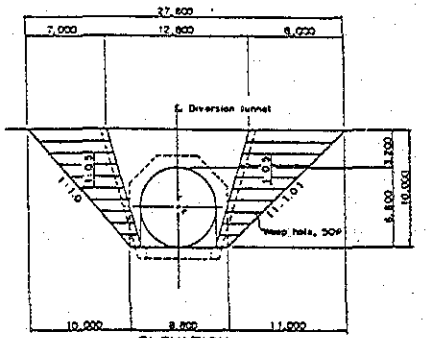


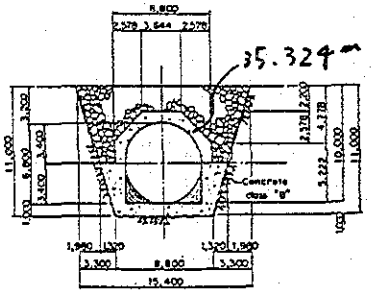
PLAN SCALE B



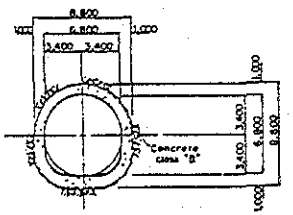
PLAN SCALE A



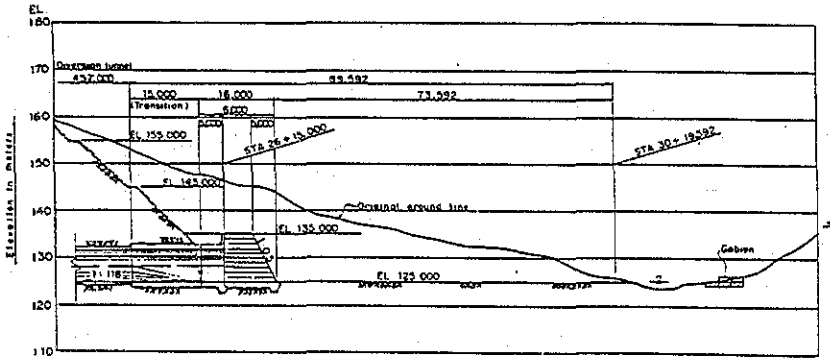
ELEVATION
SECTION A – A SCALE A



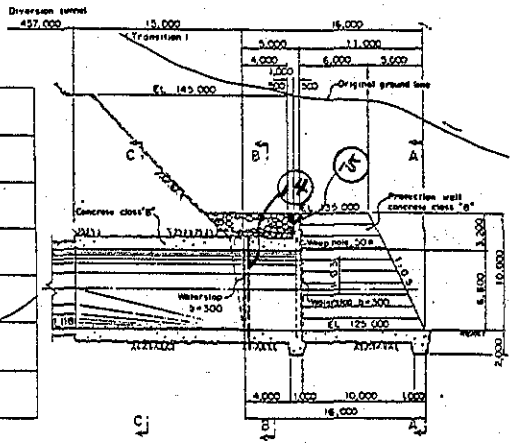
SECTION B – B SCALE A



SECTION C – C SCALE A



PROFILE SCALE B



PROFILE SCALE A

SCALE A 0 20
SCALE B 0 20

DIVERSION TUNNEL
OUTLET, PLAN AND SECTIONS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

III-190

Working Division:

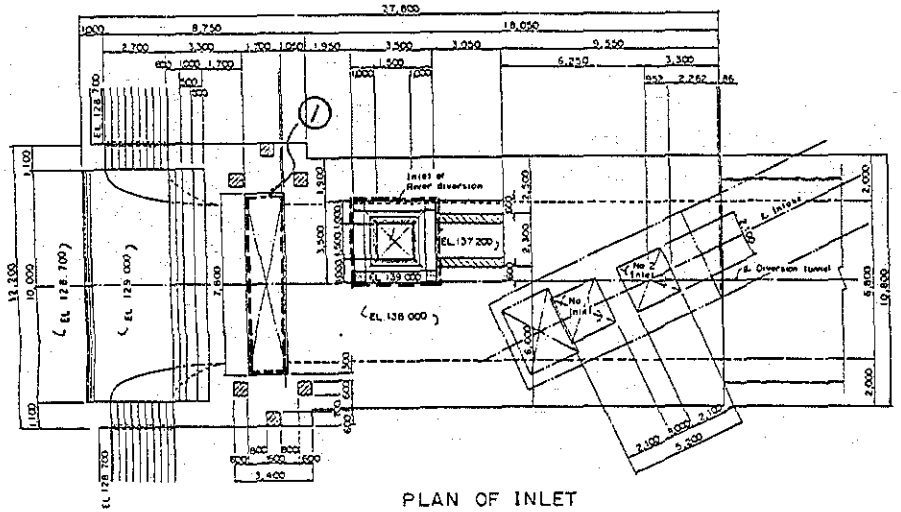
Description	Calculation Details	Unit	Quantity	Remarks
C1/10	Form work class F2	m^2	727.409	
(Inlet)		m^2	365.817	
①	$A_1 = (1.70 + 7.80) \times 2 \times 2.20 = 41.80$			
②	$A_2 = 1.50 \times 1.00 \times 4 = 6.00$			
③	$A_3 = (0.50 \times \sqrt{2} + 1.50) \times 12.20 = 26.927$			
④	$A_4 = \sqrt{0.50^2 + 2.00^2} \times 12.20 = 25.151$			
⑤	$A_5 = 2.70 \times 12.20 = 32.94$			
⑥	$A_6 = (0.50 + 1.70 + 0.60 + 1.30) \times 1.70 = 6.97$			
⑦	$A_7 = (0.50 + 1.60 + 0.60 + 1.40) \times 7.30 = 29.93$			
⑧	$A_8 = (0.36 + 0.30 + 0.40) \times 7.80 = 8.268$			
⑨	$A_9 = 0.35 \times 2 \times 4.75 = 3.325$			
⑩	$A_{10} = 0.35 \times 1.50 = 0.525$			
⑪	$A_{11} = 0.35 \times 1.50 = 0.525$			

Working Division:

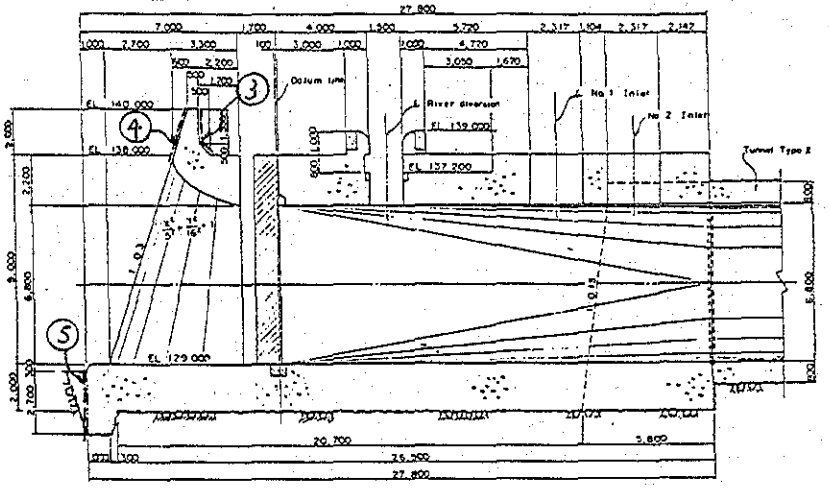
Description	Calculation Details	Unit	Quantity	Remarks
⑫	$A_{12} = \frac{1}{2} \times (14.209 + 4.90) \times 9.709 = 92.765$			
⑬	$A_{13} = \frac{1}{2} \times (13.782 + 4.90) \times 9.709 = 90.691$			

Working Division:

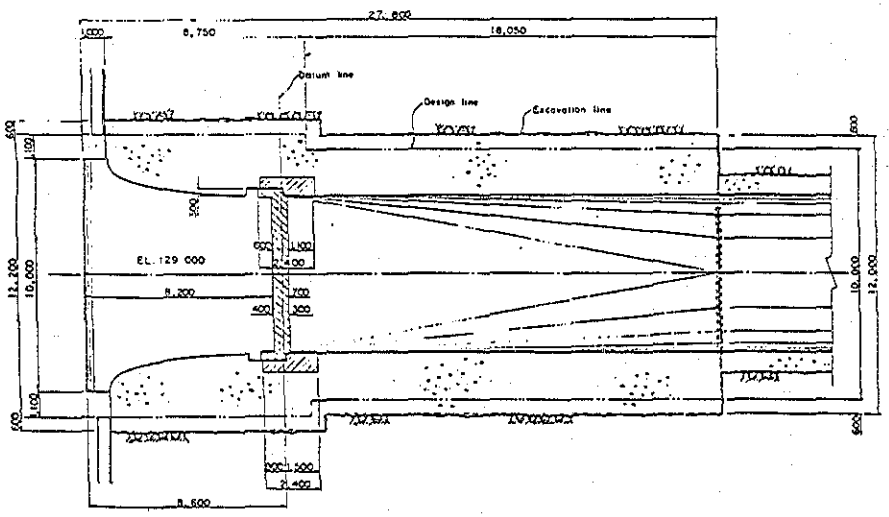
Description	Calculation Details	Unit	Quantity	Remarks
C3/10				
(outlet)		m^2	361.592	
(14)	$A_{14} = \frac{1}{2} \times (13.80 + 7.80) \times 10.00 - \frac{1}{2} \times \pi \times 3.40^2$			
	$- 6.80 \times 3.40 = 66.722$			
(15)	$A_{15} = \frac{1}{2} \times (8.00 + 2.00) \times 11.180 = 55.90$			
(16)	$A_{16} = \frac{1}{2} \times (9.00 + 2.00) \times 11.180 = 61.49$			
(17)	$A_{17} = \frac{1}{2} \times (6.00 + 11.00) \times 10.44 = 88.74$			
18	$A_{18} = \frac{1}{2} \times (6.00 + 11.00) \times 10.44 = 88.74$			



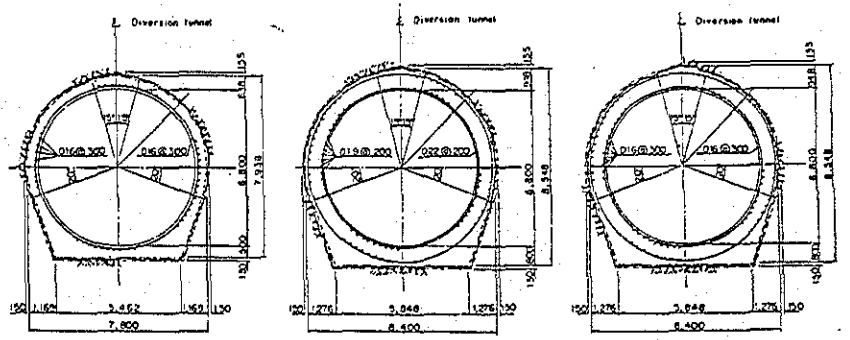
PLAN OF INLET



PROFILE OF INLET



SECTIONAL PLAN OF INLET AT EL. 129.000

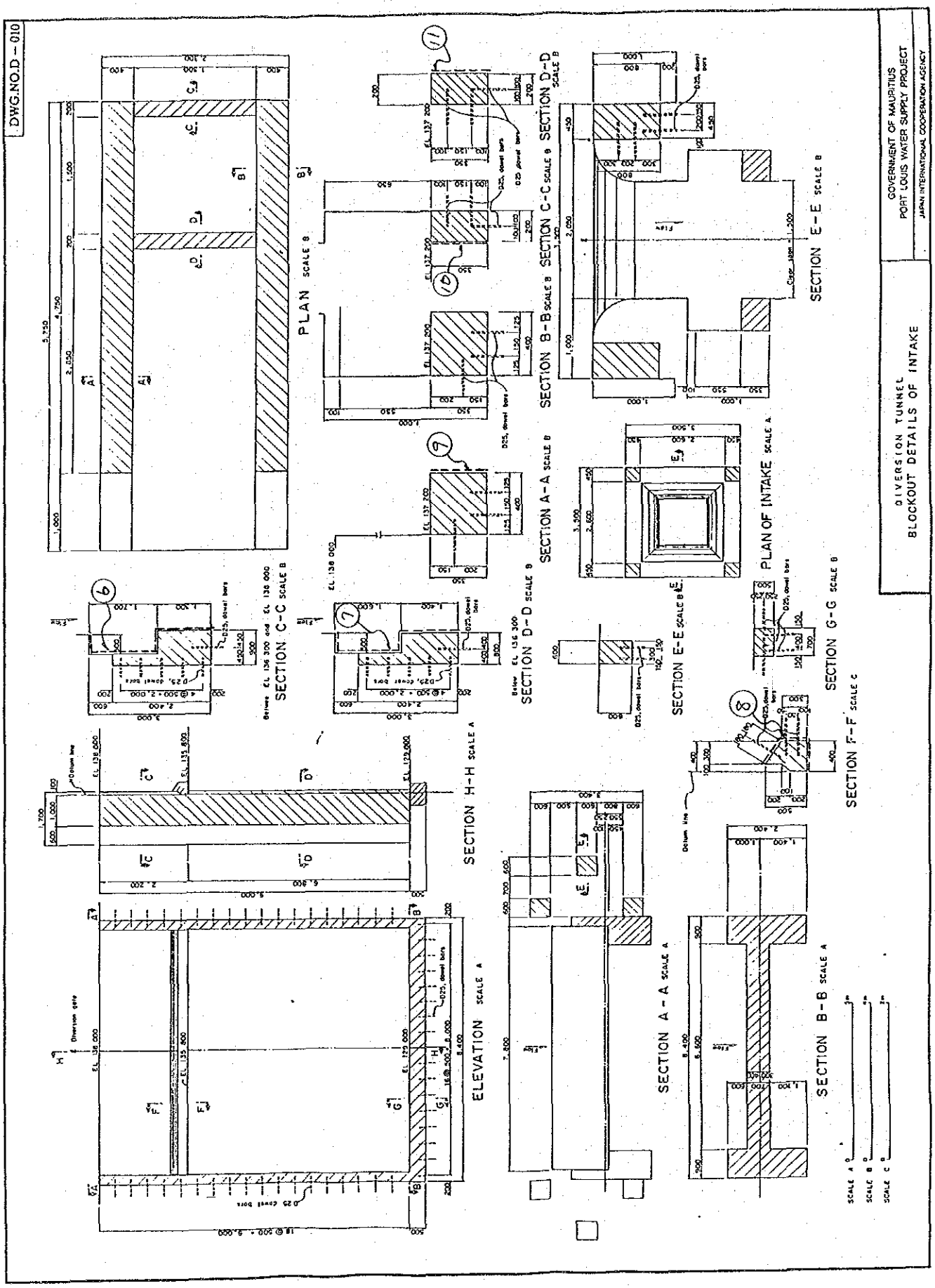


TYPE - I　　TYPE - II (U/s)　　TYPE - II (D/s)

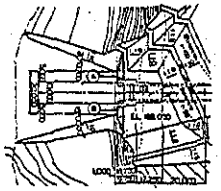
DIVERSION TUNNEL
(ARRANGEMENT OF REINFORCEMENT BARS)

SCALE 0 ——— 10m

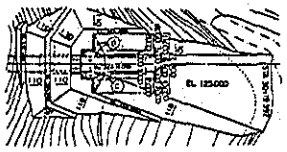
DIVERSION TUNNEL STRUCTURAL DETAILS	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY


DWG.NO.D – 010
PLAN SCALE B
SECTION A-A SCALE B
SECTION B-B SCALE B
SECTION C-C SCALE B
SECTION D-D SCALE B
SECTION E-E SCALE B
SECTION C-C SCALE B
SECTION D-D SCALE B
SECTION E-E SCALE B
PLAN OF INTAKE SCALE A
SECTION G-G SCALE B
SECTION F-F' SCALE C
SECTION H-H SCALE A
ELEVATION SCALE A
SECTION A-A SCALE A
SECTION B-B SCALE A
DIVERSION TUNNEL
BLOCKOUT DETAILS OF INTAKE
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

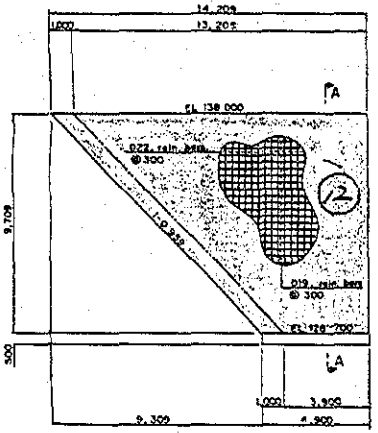
DWG.NO.D – 008



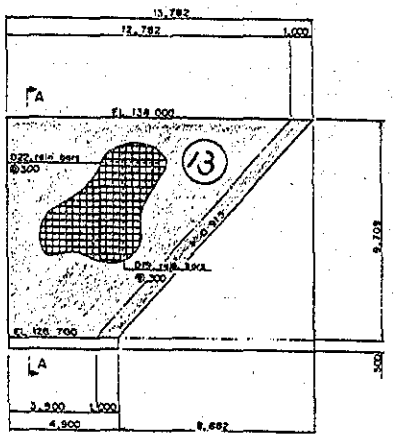
KEY PLAN OF INLET



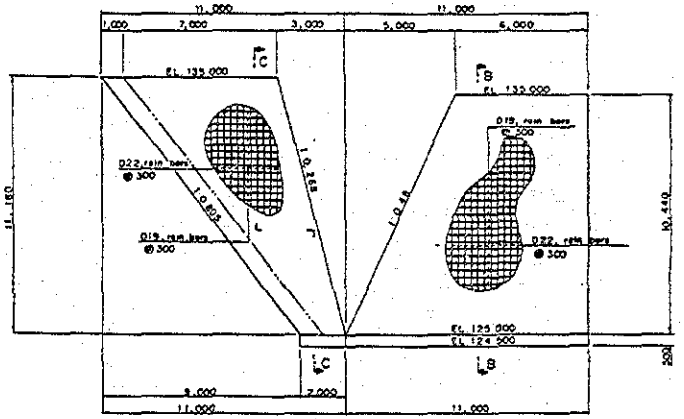
KEY PLAN OF OUTLET



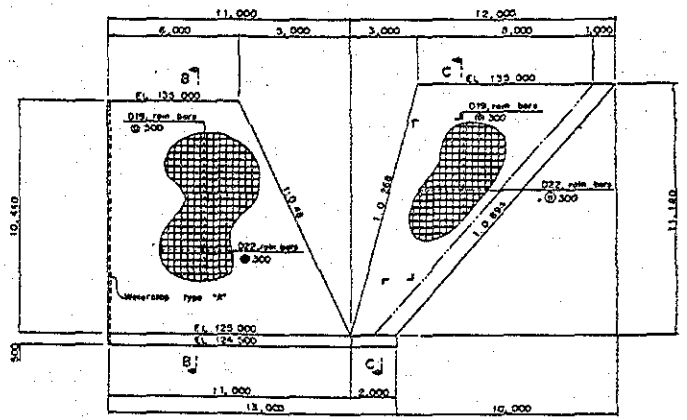
WALL TYPE A



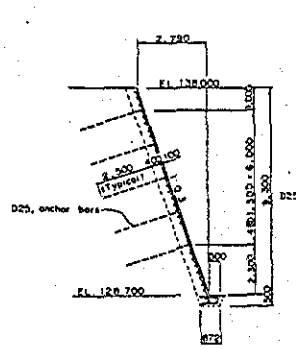
WALL TYPE B



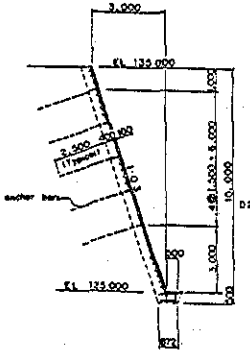
WALL TYPE – C



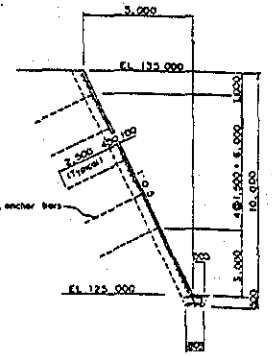
WALL TYPE – D



SECTION A-A



SECTION B-B



SECTION C-C

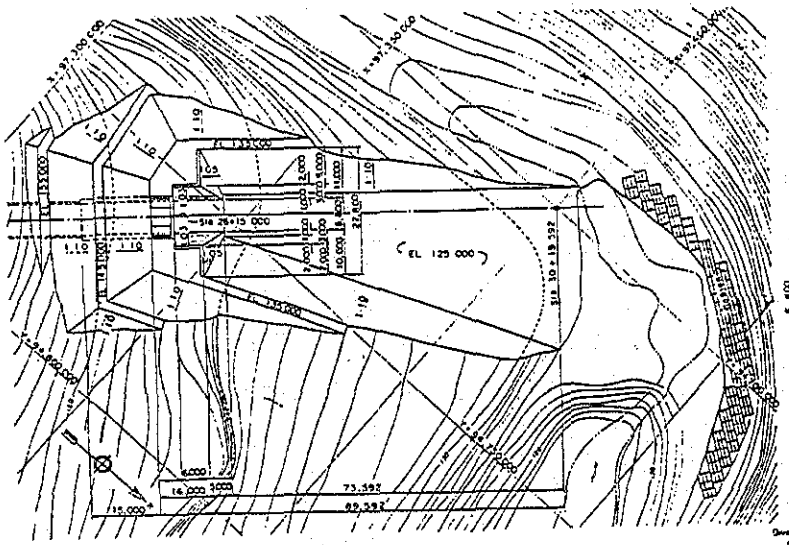
SCALE 0 10m

DIVERSION TUNNEL
DETAIL OF CONCRETE FACING

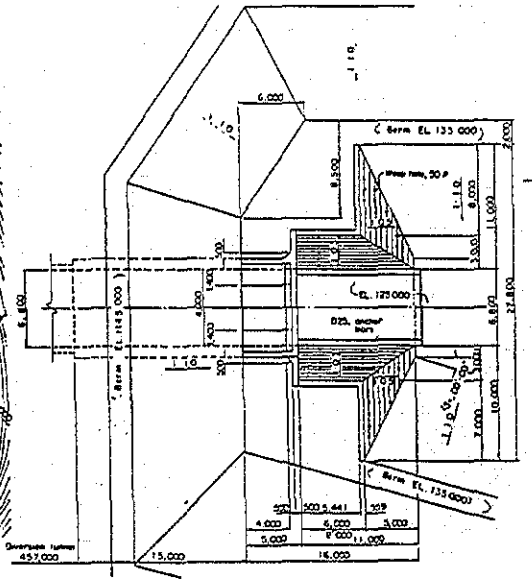
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

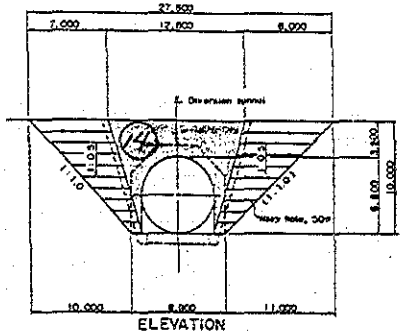
DWG.NO.D – 003



PLAN SCALE B

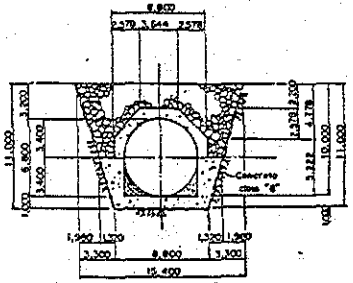


PLAN SCALE A

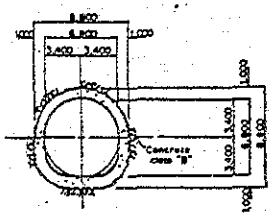


ELEVATION

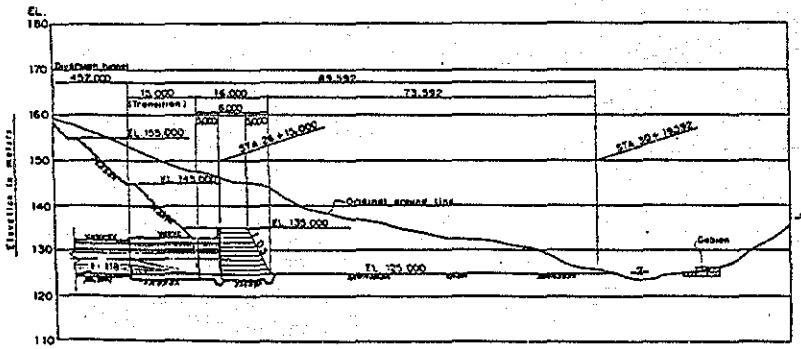
SECTION A – A SCALE A



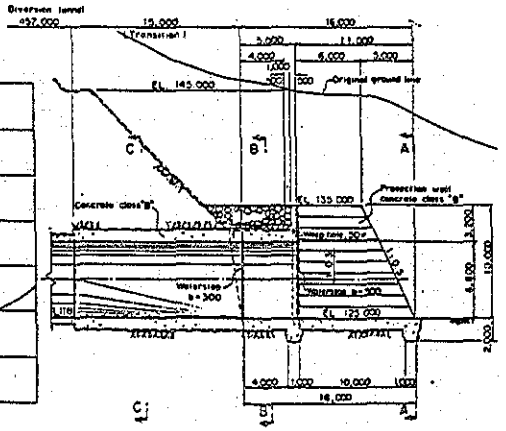
SECTION B – B SCALE A



SECTION C – C SCALE A



PROFILE SCALE B



PROFILE SCALE A

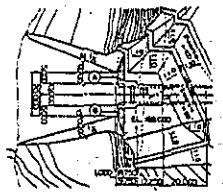
SCALE A 0 20

SCALE B 0 20

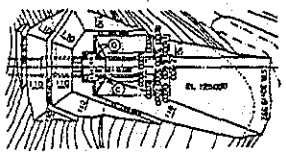
DIVERSION TUNNEL
OUTLET, PLAN AND SECTIONS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

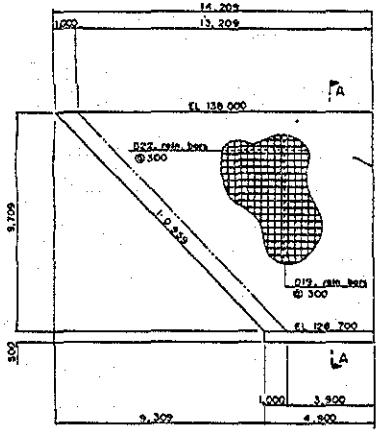
DWG.NO.D – 008



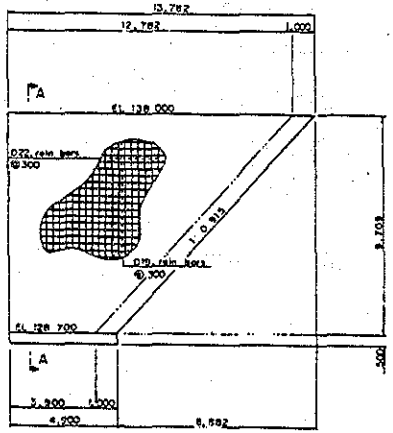
KEY PLAN OF INLET



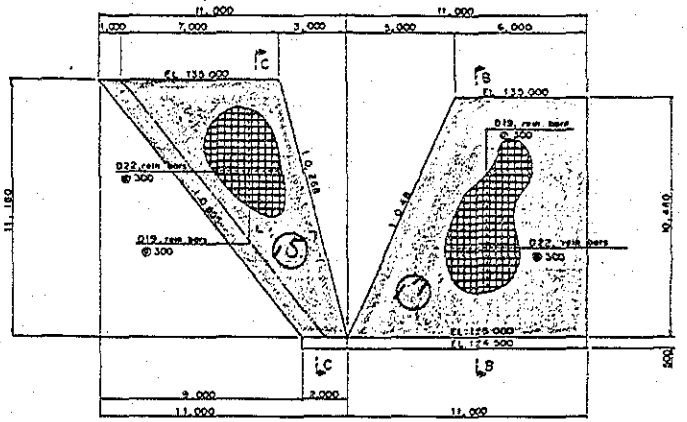
KEY PLAN OF OUTLET



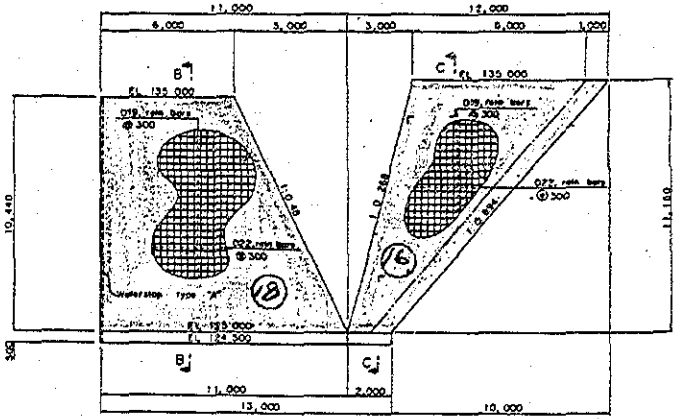
WALL TYPE A



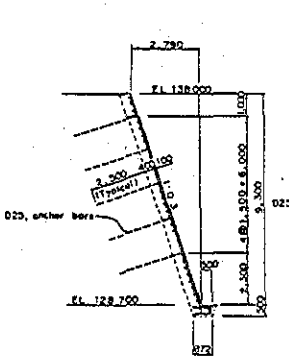
WALL TYPE B



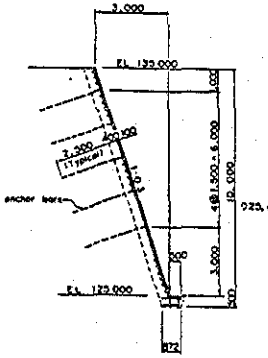
WALL TYPE – C



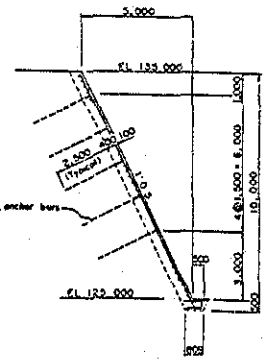
WALL TYPE – D



SECTION A–A



SECTION B–B



SECTION C–C

SCALE 0 10m

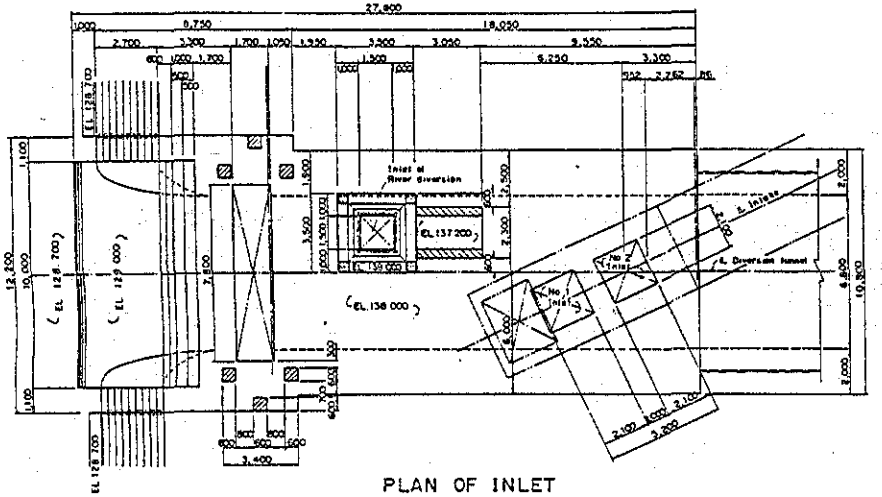
DIVERSION TUNNEL
DETAIL OF CONCRETE FACING

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

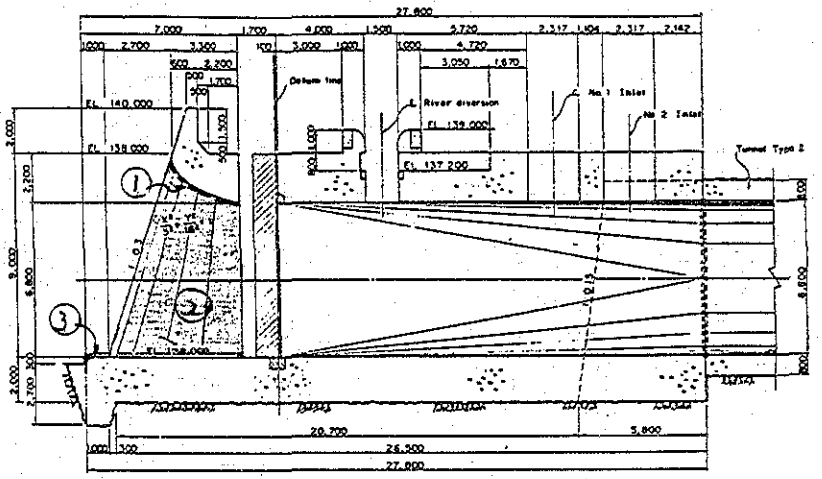
Working Division:

Description	Calculation Details	Unit	Quantity	Remarks
	Form work F4	m^2	10,962.844	
C1/11				
(Inlet)		m^2	741.196	
①	$A_1 = 5.70 \times (10.00 + 6.80) \times \frac{1}{2} = 47.88\ m^2$			
②	$A_2 = \frac{1}{2} \times 2.10 \times 5.70 \times 2 = 11.97\ m^2$			
③	$A_3 = \frac{1}{2} \times (10.00 + 6.80) \times 8.90 = 74.760\ m^2$			
④	$A_4 = (6.80 \times 4 + \pi \times 3.4^2) \times 0.5 \times 19.10 = 606.586\ m^2$			
C2/13				
(Tunnel)		m^2	9,638.909	
⑤	$A_5 = 2 \times \pi \times 3.40 \times 451.20 = 9,638.909\ m^2$			
C3/11				
(Outlet)		m^2	582.739	
⑥	$A_6 = (2 \times \pi \times 3.40 + \frac{1}{2} \times 2 \times \pi \times 3.4 + 3.40 \times 6.80) \times 0.5 \times 15.00 + (\frac{1}{2} \times 2 \times \pi \times 3.40 + 3.40 \times 6.80) \times 5.00 = 582.739\ m^2$			

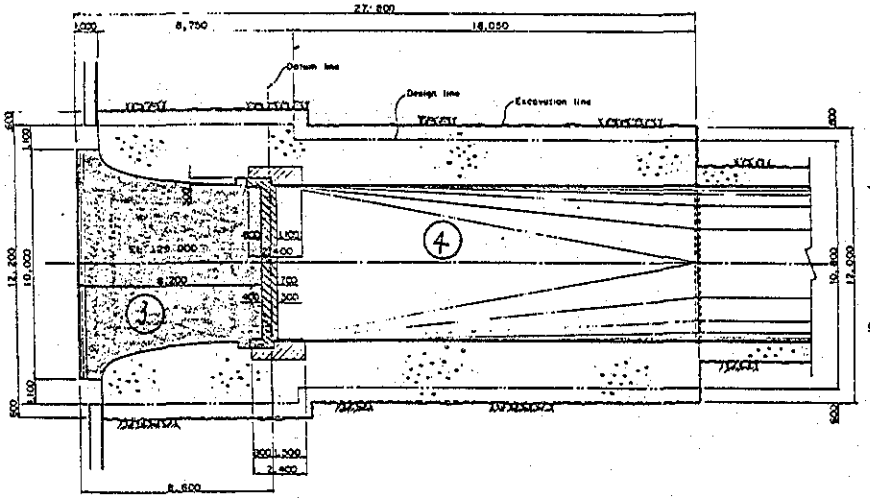
DWG.NO.D – 007



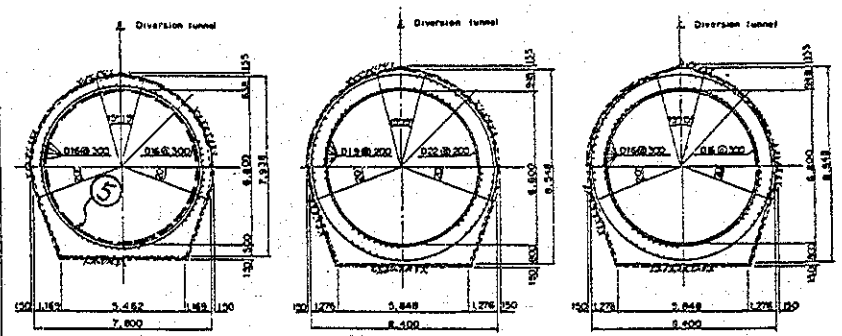
PLAN OF INLET



PROFILE OF INLET



SECTIONAL PLAN OF INLET AT EL 129.000



TYPE - I

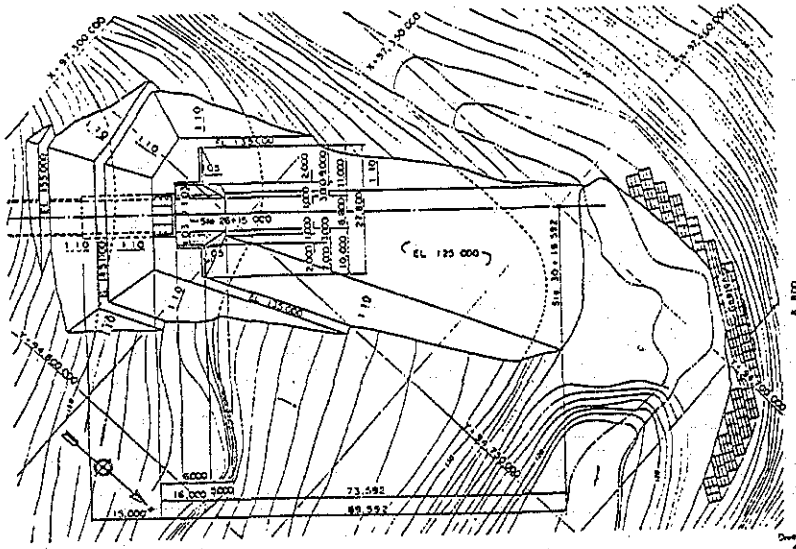
TYPE - II (U/s)

TYPE - II (D/s)

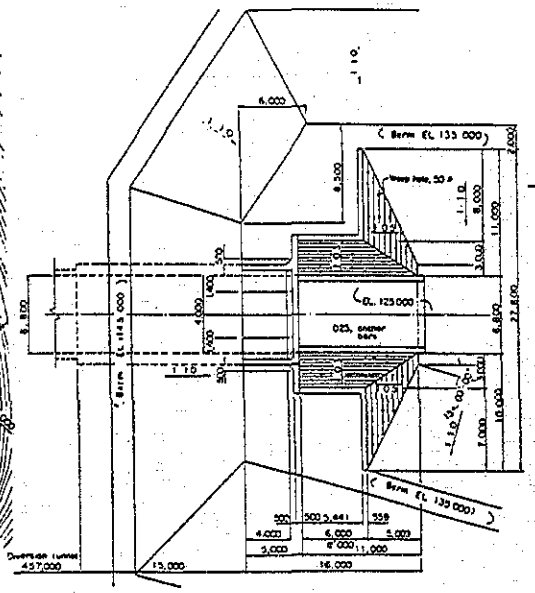
DIVERSION TUNNEL
(ARRANGEMENT OF REINFORCEMENT BARS)

SCALE 0 100

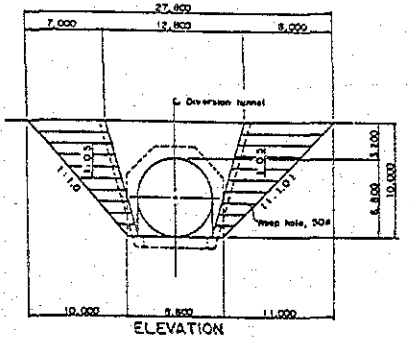
DIVERSION TUNNEL STRUCTURAL DETAILS	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT
	JAPAN INTERNATIONAL COOPERATION AGENCY



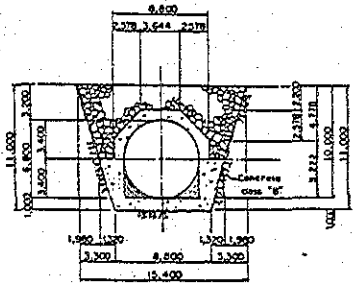
PLAN SCALE B



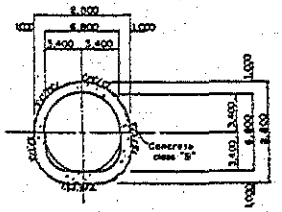
PLAN SCALE A



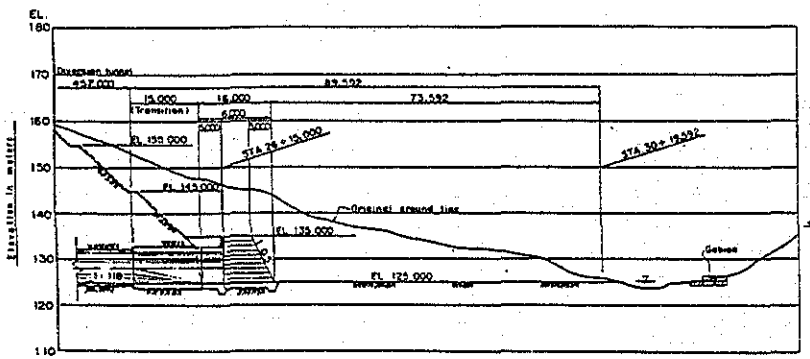
ELEVATION
SECTION A – A SCALE A



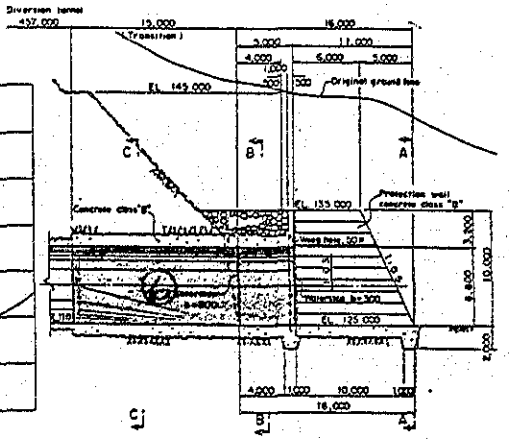
SECTION B – B SCALE A



SECTION C – C SCALE A



PROFILE SCALE B



PROFILE SCALE A

SCALE A 0 20
SCALE B 0 30

DIVERSION TUNNEL
OUTLET, PLAN AND SECTIONS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

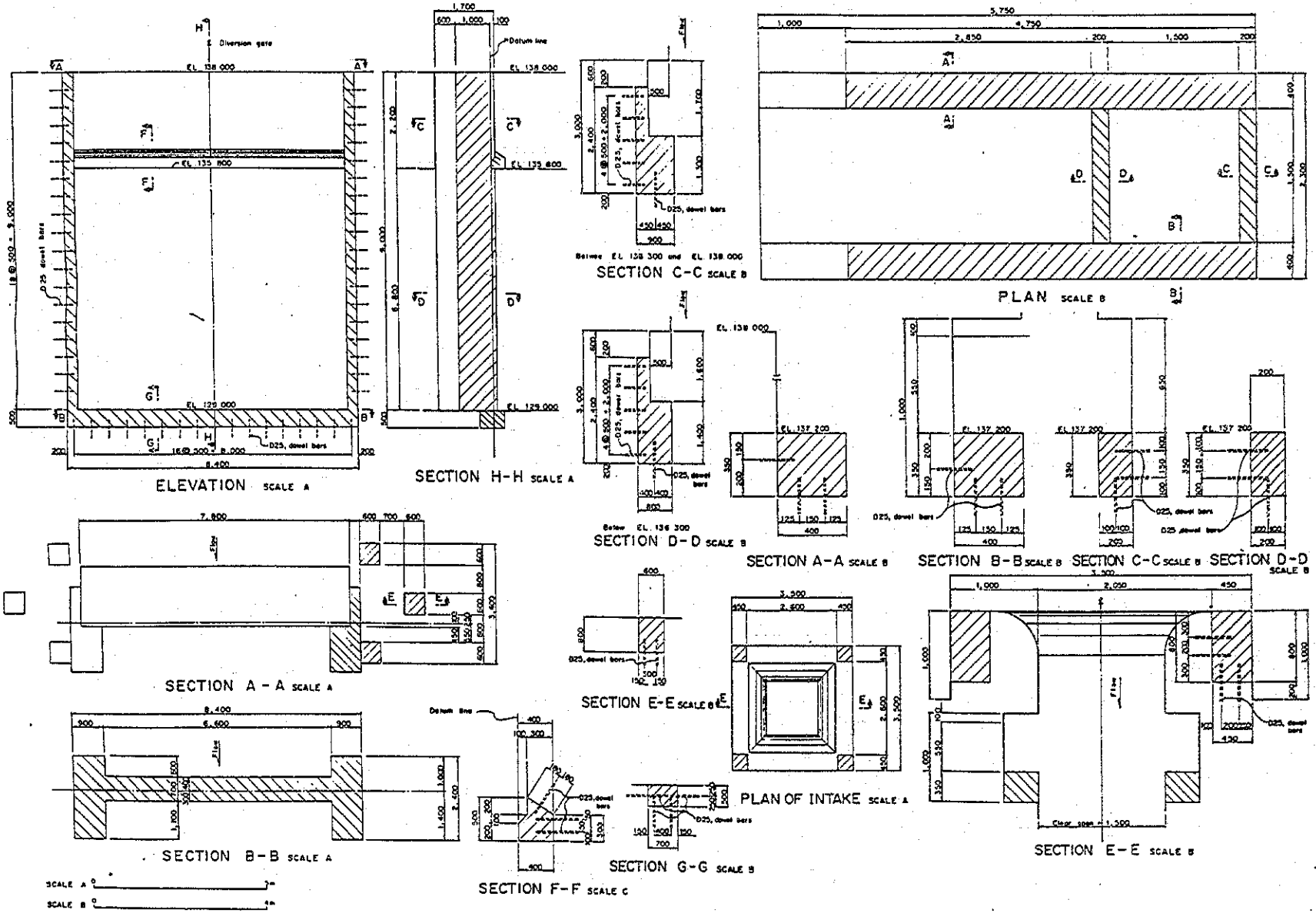
Working Division: Diversion tunnel (Inlet)

Description	Calculation Details	Unit	Quantity	Remarks
C1/12, C2/14 & C3/12				
	Reinforcement bar	Ton	680.154	
(Protection wall)	$w = 256.309 \times 0.03^{ton} = 7.689^{ton}$			
(Inlet)	$w = 2,055.81 \times 0.06^{ton} = 123.349^{ton}$			
(Outlet)	$w = 281.279 \times 0.06^{ton} = 16.876^{ton}$			
Tunnel	$w = 10,644.86 \times 0.05^{ton} = 532.24^{ton}$			
	Total = 680.154			

Working Division: Diversion Tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1/13	Anchor bar for Blockout	kg	619.00	
	D25, anchor bars			
	$w = 3.98$ kg/m $\quad l = 300$			
Gate slot	$n_1 = (6 \times 2 / 0.3) \times 3 = 120$			
	$n_2 = 7 \times 2 = 14$			
	$n_3 = 4 \times (7.2 / 0.3) = 96$			
	$n_4 = 3 \times (7.2 / 0.3) = 72$			
Hoist	$n_5 = 8 \times 6 = 48$			
Intake	$n_6 = 6 \times 4 = 24$			
	$n_7 = 5 \times 2 \times (2.25 / 0.3) = 75$			
	$n_8 = 2.7 / 0.3 = 9$			
	$n_9 = 3 \times 2 \times (3.05 / 0.3) = 61$			
	Sub-total n_1 to $n_9 = 519.00$ nos			
	$w = 519 \times 0.30 \times 3.98$ kg $= 619.00$			

DWG.NO.D – 010



DIVERSION TUNNEL
BLOCKOUT DETAILS OF INTAKE

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Working Division: Diversion tunnel

Description	Calculation Details	Unit	Quantity	Remarks
C1/14 & C3/13	50Φ, P.V.C weep holes	m	35	DWG is refered to Item No. /023
	1. $= \frac{1}{2} \times (1.00 + 8.00) \times 11.180 = 50.31$			
	2. $= \frac{1}{2} \times (1.00 + 7.00) \times 11.180 = 44.72$			
	3. $= \frac{1}{2} \times (6.00 + 11.00) \times 10.44 \times 2 = 177.48$			
	Sub-total $= 272.51\ m^2$			
	$N = 272.51\ m^2 / 4\ m^2 = 68.10 \doteq 69$			
	$\ell = 69 \times 0.50 = 35.4 \doteq 35\ m$			