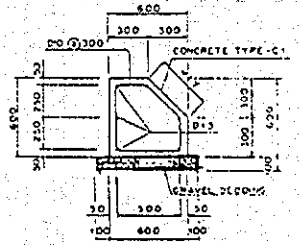
TYPE OF WORK : REVETMENT FOR SLOPE OF 1:1.5 (WET STONE MASONRY TYPE)
LOCATION : WF.104R + 32.0 ~ WF.110R + 10.0 m
:

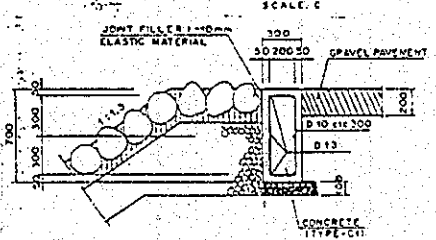
CALCULATION		RESULT
STRUCTURAL EXCAVATION		
V = 176.850 m^3 / 15.0 m x 270.00	= 3183.300	3183.300 m^3
BACKFILL WITH SELECTED SOIL		
V = 17.445 m^3 / 15.0 m x 270.00	= 314.010	314.010 m^3
WET STONE MASONRY		
V = 50.789 m^3 / 15.0 m x 270.0	= 914.202	914.202 m^3
CEMENT MORTAR POINTING		
A = 142.796 m^2 / 15.0 m x 270.0	= 2570.328	2570.328 m^2
DEFORMED REINFORCING BAR		
1. BASE CONCRETE		
W = 0.151 tf / 15.0 m x 270.0	= 2.718	2.718 tf
2. TOP CONCRETE		
W = 0.143 tf / 15.0 m x 270.0	= 2.574	2.574 tf
3. PARTITION WALL		
W = 0.103 tf / 15.0 m x 270.0	= 1.854	1.854 tf
GABION MATTRESS		
V = 33.750 m^3 / 15.0 m x 270.0	= 607.500	607.500 m^3
WEEP HOLE		
PVC PIPE ø 50, n = 162		
L = 6.750 m/ 15.0 m x 270.0	= 121.500	121.500 m
FILTER CLOTH		
A = 5.760 m^2 / 15.0 m x 270.0	= 103.680	103.680 m^2
RUBBLE STONE FILLING		
V = 5.625 m^3 / 15.0 m x 270.0	= 101.250	101.250 m^3

REVETMENT FOR SLOPE OF 1:1.5 (WET STONE MASONRY TYPE)

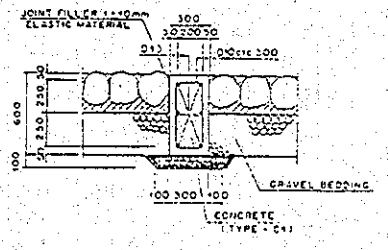
TYPE OF WORK :	GRAVEL BEDDING
LOCATION :	NF.104R+32.0 ~ NF.110R+10.0



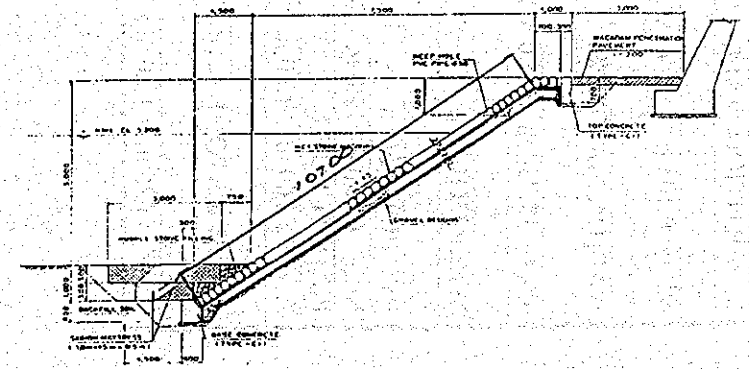
BASE CONCRETE
SCALE: C



TOP CONCRETE (1)
SCALE: B



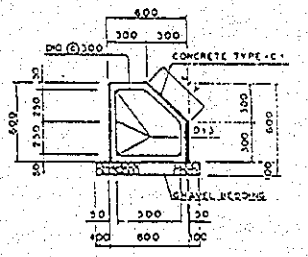
PARTITION WALL
SCALE: B



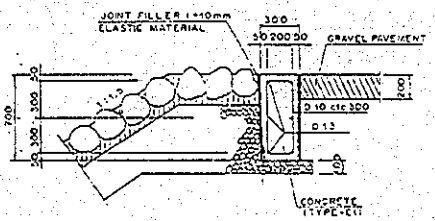
CALCULATION	RESULT
① REVETMENT	
V = 49.409 m²/15.0m x 270.0m = 889.362	889.362 m³
② BASE CONCRETE	
V = 1.200 m²/15.0m x 270.0 m = 21.6	21.600 m³
③ TOP CONCRETE	
V = 0.600 m²/15.0m x 270.0m = 10.8	10.800 m³
④ PARTITION WALL	
V = 0.422 m²/15.0m x 270.0m = 7.596	7.596 m³

REVETMENT FOR SLOPE OF 1: 1.5 (WET STONE MASONRY TYPE)

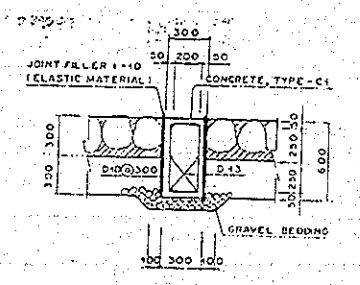
TYPE OF WORK :	CONCRETE , FORM
LOCATION :	WF. 104R +32.0 ~ WF. 110R +100



BASE CONCRETE
SCALE. C



TOP CONCRETE (1)
SCALE B

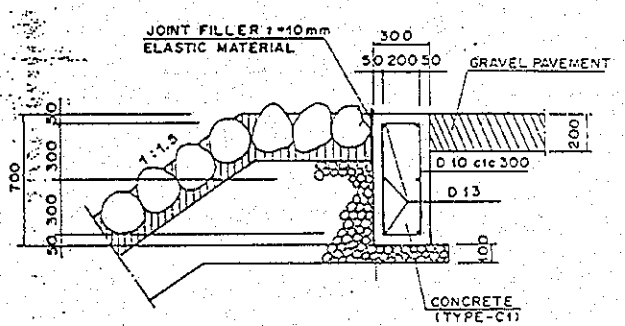


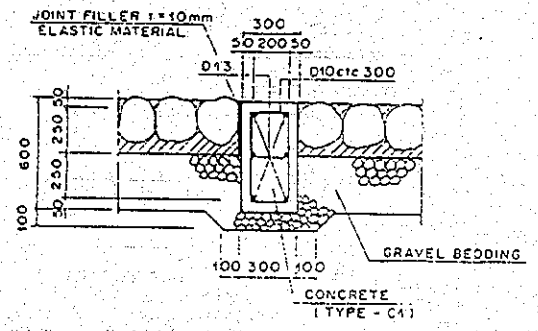
PARTITION WALL
SCALE.C

CALCULATION	RESULT
· CONCRETE	
① BASE CONCRETE	
3.150 m^2 / 15.0m x 270 m = 56.700	56.700 m^3
② TOP CONCRETE	
4.725 m^2 / 15.0m x 270 m = 85.050	85.050 m^3
③ PARTITION WALL	
2.073 m^2 / 15.0m x 270 m = 37.314	37.314 m^3
· FORM	
① BASE CONCRETE	
21.210 m^2 / 15.0m x 270.0m = 381.78	381.780 m^2
② TOP CONCRETE	
20.175 m^2 / 15.0m x 270.0m = 363.15	363.150 m^2
③ PARTITION WALL	
13.820 m^2 / 15.0m x 270.0m = 248.76	248.760 m^2

REVETMENT FOR SLOPE OF 1 : 1.5 (WET STONE MASONRY TYPE)

TYPE OF WORK :	JOINT FILLER
LOCATION :	WF. 10YR + 32.0 ~ WF. 11OR + 10.0m





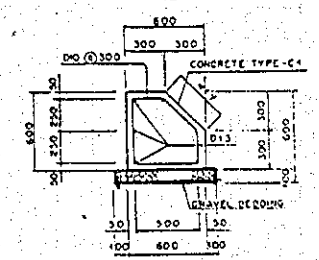
CALCULATION	RESULT
① TOP CONCRETE	
A = 4.620 m² / 15.0m x 270.0m = 83.160	83.160m²
② PARTITION WALL	
A = 3.455 m² / 15.0m x 270.0M = 62.19	62.190m²
③ BASE CONCRETE	
a = (0.3+0.6) x 0.3 ÷ 2 + 0.3 x 0.6	
= 0.315 m² / place	
A = 0.315 x 270.0 ÷ 15 = 5.670	5.670m²

TYPE OF WORK : REVETMENT FOR SLOPE OF 1:1.5
LOCATION : WF.176R ~ WF.180R (LOWER CHANNEL)

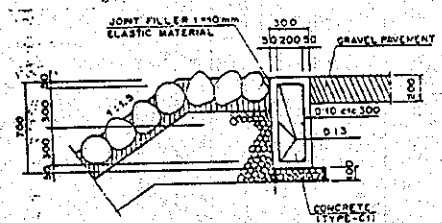
CALCULATION		RESULT
STRUCTURAL EXCAVATION		
V = 153.450 m^3 / 15.0 m x 175.00 m	= 1790.250	1790.250 m^3
BACKFILL WITH SELECTED SOIL		
V = 21.690 m^3 / 15.0 m x 175.00 m	= 253.050	253.050 m^3
WET STONE MASONRY		
V = 43.027 m^3 / 15.0 m x 175.00 m	= 501.982	501.982 m^3
CEMENT MORTAR POINTING		
A = 102.900 m^2 / 15.0 m x 175.00 m	= 1200.500	1200.500 m^2
GABION MATTRESS		
V = 33.750 m^3 / 15.0 m x 175.00 m	= 393.750	393.750 m^3
RUBBLE STONE FILLING		
V = 5.625 m^3 / 15.0 m x 175.00 m	= 65.625	65.625 m^3

REVETMENT FOR SLOPE OF 1:1.5

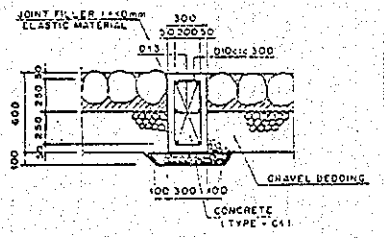
TYPE OF WORK :	GRAVEL BEDDING
LOCATION :	W.F. 176 F ~ W.F. 180 R (LOWER CHANNEL)



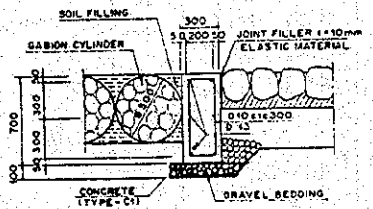
① BASE CONCRETE
SCALE: C



③ TOP CONCRETE (1)
SCALE: B



② PARTITION WALL
SCALE: B

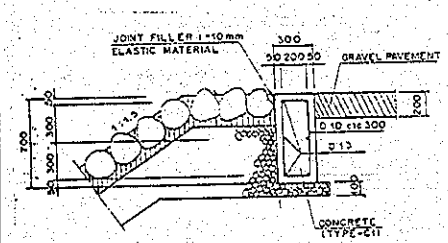


END WALL
SCALE: B

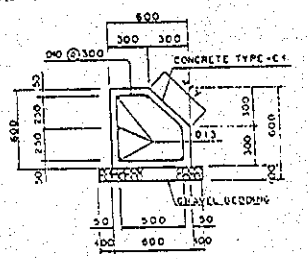
CALCULATION	RESULT
① REVETMENT	
37.716 m³/15.0m × 175.0 = 440.02	440.020m³
② BASE CONCRETE	
1.200 m³/15.0m × 175.0 = 14.000	14.000m³
③ TOP CONCRETE	
0.600 m³/15.0m × 175.0 = 7.000	7.000 m³
④ PARTITION WALL	
0.422 m³/15.0m × 175.0 = 4.923	4.923m³
⑤ END WALL	
1) UPSTREAM	
0.319 m³/place × 1 place = 0.319	
2) DOWN STREAM	
0.393 m³/place × 1 place = 0.393	
TOTAL	0.712 m³

REVETMENT FOR SLOPE OF 1:1.5

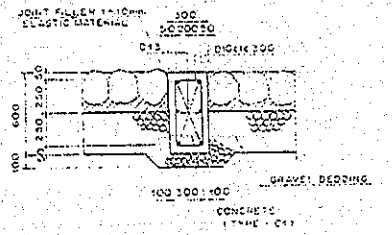
TYPE OF WORK :	DEFORMED REINFORCING BARS
LOCATION :	WF.176F ~ WF.176R (LOWER CHANNEL)



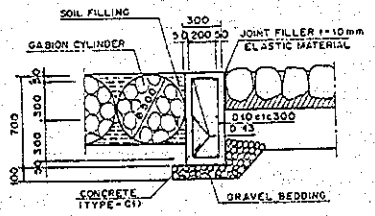
① TOP CONCRETE (1)
SCALE C



BASE CONCRETE
SCALE C



PARTITION WALL
SCALE B

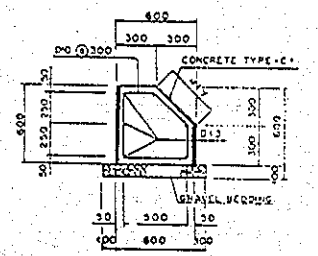


END WALL
SCALE B

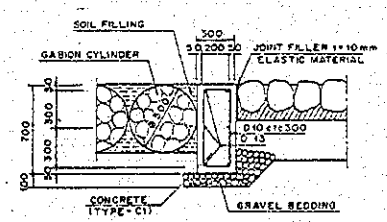
CALCULATION	RESULT
① BASE CONCRETE	
N = 0.151 tf / 15.0m x 175.0m = 1.762	1.762 tf
② TOP CONCRETE	
N = 0.143 tf / 15.0m x 175.0m = 1.668	1.668 tf
③ PARTITION WALL	
N = 0.079 tf / 15.0m x 175.0m = 0.922	0.922 tf
④ END WALL	
W = 0.080 tf + 0.035 tf = 0.115	0.115 tf

REVETMENT FOR SLOPE OF 1:1.5

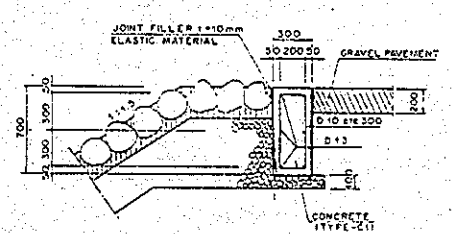
TYPE OF WORK :	CONCRETE , FORM
LOCATION :	WF.176F ~ WF.180R (LOWER CHANNEL)



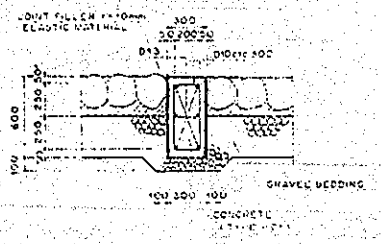
BASE CONCRETE
SCALE: C



END WALL
SCALE: B



TOP CONCRETE (1)
SCALE: B

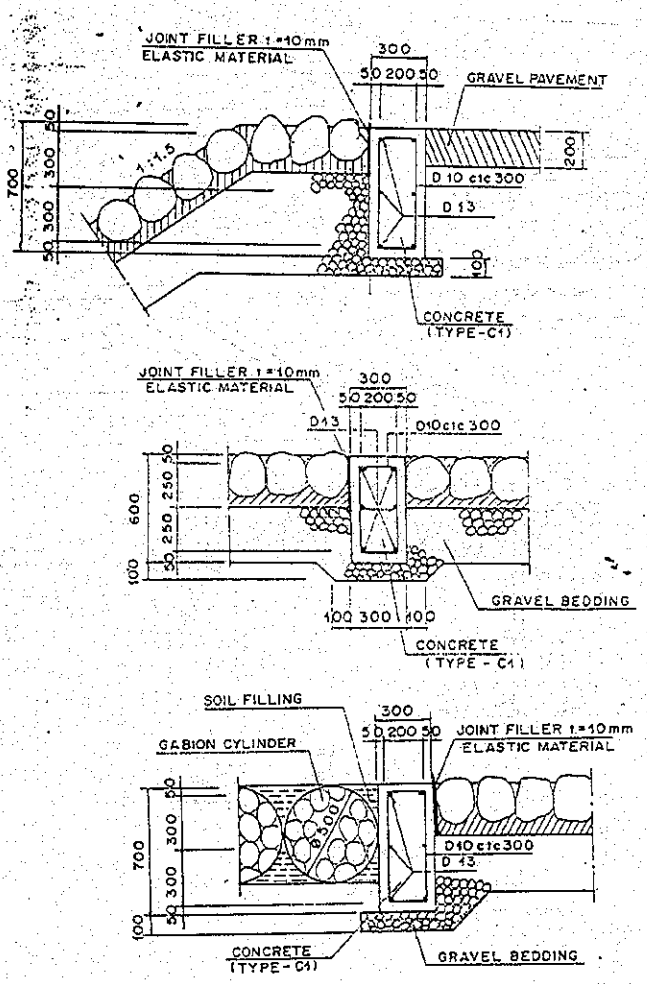


PARTITION WALL
SCALE: B

CALCULATION	RESULT
• CONCRETE	
① BASE CONCRETE	
$4.725\ m^3 / 15.0m \times 175.0 = 55.125$	$55.125\ m^3$
② TOP CONCRETE	
$3.150\ m^3 / 15.0m \times 175.0 = 36.750$	$36.750\ m^3$
③ PARTITION WALL	
$1.553\ m^2 / 15.0m \times 175.0 = 18.118$	$18.118\ m^3$
④ END WALL	
$1.762\ m^3 + 2.173\ m^3 = 3.935$	$3.935\ m^3$
• FORM	
① BASE CONCRETE	
$20.175\ m^2 / 15.0\ m \times 175.0 = 235.375$	$235.375\ m^2$
② TOP CONCRETE	
$21.120\ m^2 / 15.0m \times 175.0 = 246.4$	$246.400\ m^2$
③ PARTITION WALL	
$10.350\ m^2 / 15.0m \times 175.0 = 120.82$	$120.820\ m^2$
④ END WALL	
$10.060\ m^2 + 14.484\ m^2 = 24.544$	$24.544\ m^2$

REVETMENT FOR SLOPE OF 1:1.5

TYPE OF WORK :	JOINT FILLER
LOCATION :	WF. 176 F ~ WF. 180 R (LOWER CHANNEL)

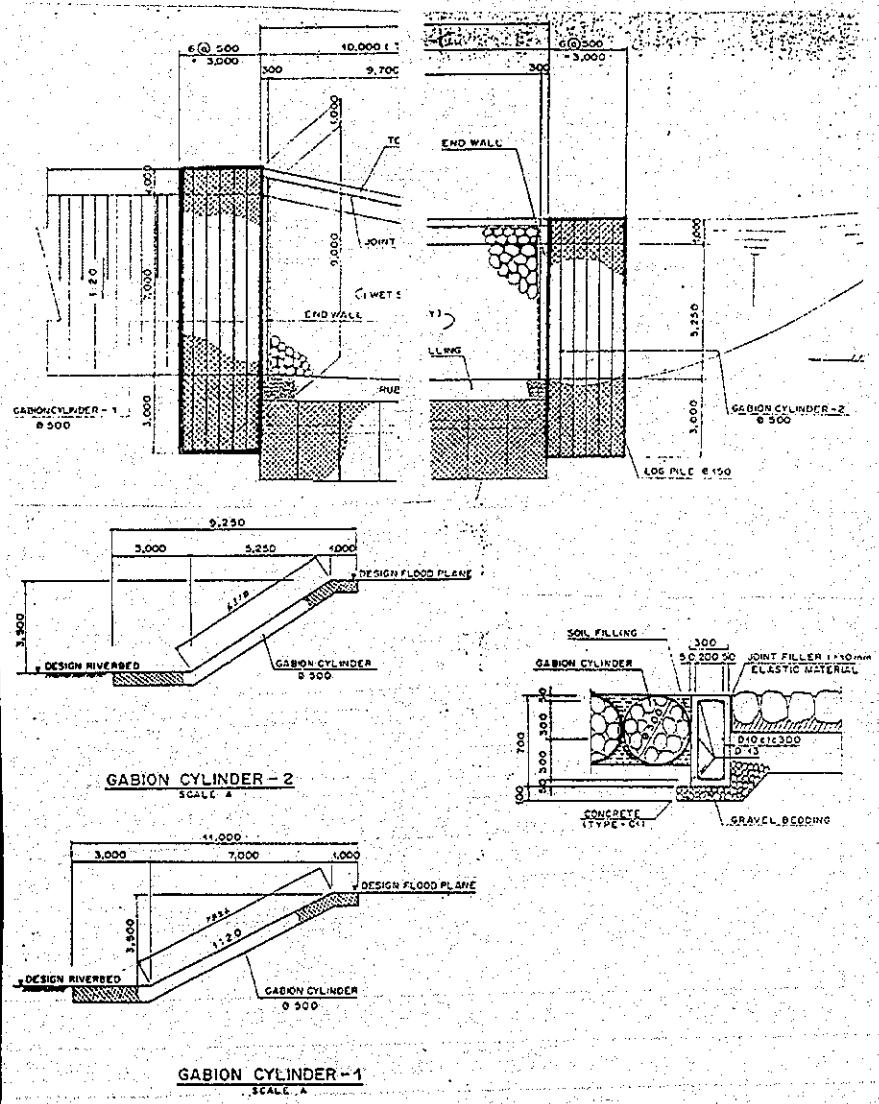


END WALL
SCALE B

CALCULATION	RESULT
① TOP CONCRETE	
A = 4.620 m² / 15.0m x 175.0m = 53.9	53.900 m²
② BASE CONCRETE	
A = 0.315 m² / 15.0m x 175.0m = 3.675	3.675 m²
③ PARTITION WALL	
A = 2.644 m² / 15.0m x 175.0m = 30.847	30.847 m²
④ END WALL	
A = 2.517 m² + 3.160 m² = 5.677	5.677 m²

REVETMENT FOR SLOPE OF 1:1.5

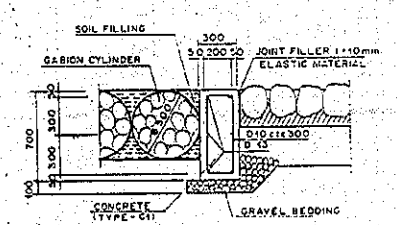
TYPE OF WORK :	Gabion Cylinder Dia. 500mm (Galvanized and Coated with PVC)
LOCATION :	WF.176F ~ WF.180R (LOWER CHANNEL)



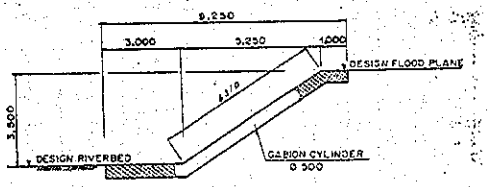
CALCULATION		RESULT
1) Gabion Cylinder - 1		
$l = 3.0 + 7.826 + 1.0$	$= 11.826$ m	
$n = 6$		
$L = 11.826 \times 6$	$= 70.956$ m	
$a = \pi \times 0.5^2 \div 4$	$= 0.196 m^2$	
$V = 70.956 \times 0.196$	$= 13.907 m^3$	$13.907 m^3$
2) Gabion Cylinder - 2		
$l = 3.0 + 6.310 + 1.0$	$= 10.310$ m	
$n = 6$		
$L = 10.310 \times 6$	$= 61.860$ m	
$a = \pi \times 0.5^2 \div 4$	$= 0.196 m^2$	
$V = 61.860 \times 0.196$	$= 12.125 m^3$	$12.125 m^3$
TOTAL		$26.032 m^3$

REVETMENT FOR SLOPE OF 1:1.5

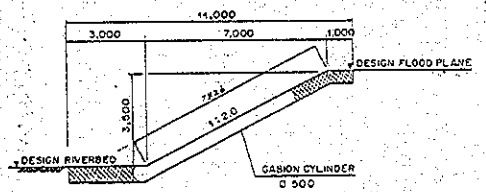
TYPE OF WORK :	Soil Filling
LOCATION :	WF.176F~WF.180R (LOWER CHANNEL)



END WALL
SCALE B



GABION CYLINDER - 2
SCALE A



GABION CYLINDER - 1
SCALE A

CALCULATION	RESULT
1) For Gabion Cylinder - 1	
$V_1 = (3.0+7.826+1.0) \times 0.5 \times 3.0 = 17.739\ m^3$	
$V_2 = 13.907\ m^3$	
※ V_2 is volume of cylinder	
$V = V_1 - V_2 = 17.739 - 13.907 = 3.832\ m^3$	$3.832\ m^3$
2) For Gabin Cylinder - 2	
$V_1 = (3.0+6.310+1.0) \times 0.5 \times 3.0 = 15.465\ m^3$	
$V_2 = 12.125\ m^3$	
$V = V_1 - V_2 = 15.465 - 12.125 = 3.340\ m^3$	$3.340\ m^3$
TOTAL	$7.172\ m^3$

2.3 Stone Facing Type

TYPE OF WORK : REVETMENT FOR SIDE SLOP OF 1:2 (STONE FACING)
LOCATION : WF.OR – 65.0 ~ WF.OR + 32.0

CALCULATION			RESULT
LOCATION : WF.0R – 65.0 ~ WF.0R + 32.0			
STRUCTURAL EXCAVATION			
V = 514.147 (BEDDING) + 1029.17 (FACING)	=	1543.32	1543.32 m^3
RUBBLE STONE BEDDING			
A_1 = (7.379 + 2.50 + 3.019) x 0.40	=	5.159 m^2	
A_2 = (1.00 + 5.814) x 0.40 x 2	=	5.451 m^2	
V_1 = 5.159 x 50.00	=	257.950	
V_2 = 5.451 x 47.00	=	514.147	
TOTAL	=	514.147	514.147 m^3
STONE FACING			
A_1 = (2.00 + 7.379 + 2.50 + 3.019 + 2.00) x 0.60	=	10.139 m^2	
A_2 = {(1.60 + 5.159) x 2 + 5.00} x 0.60	=	11.111 m^2	
V_1 = 10.139 x 50.00	=	506.950	
V_2 = 11.111 x 47.00	=	522.217	
TOTAL	=	1029.17	1029.17 m^3
LOCATION : WF.4R + 16.0 ~ WF.5R + 51.0			
STRUCTURAL EXCAVATION			
V = 268.30 (BEDDING) + 618.50 (FACING)	=	886.80	886.80 m^3
RUBBLE STONE BEDDING			
A = 1.118 x 6.00 x 0.40	=	2.683 m^2	
V = 2.683 x 100.00	=	268.30	268.30 m^3
STONE FACING			
A = (2.00 + 6.708 + 1.00 + 0.60) x 0.60	=	6.185 m^2	
V = 6.185 x 100.00	=	618.50	618.50 m^3

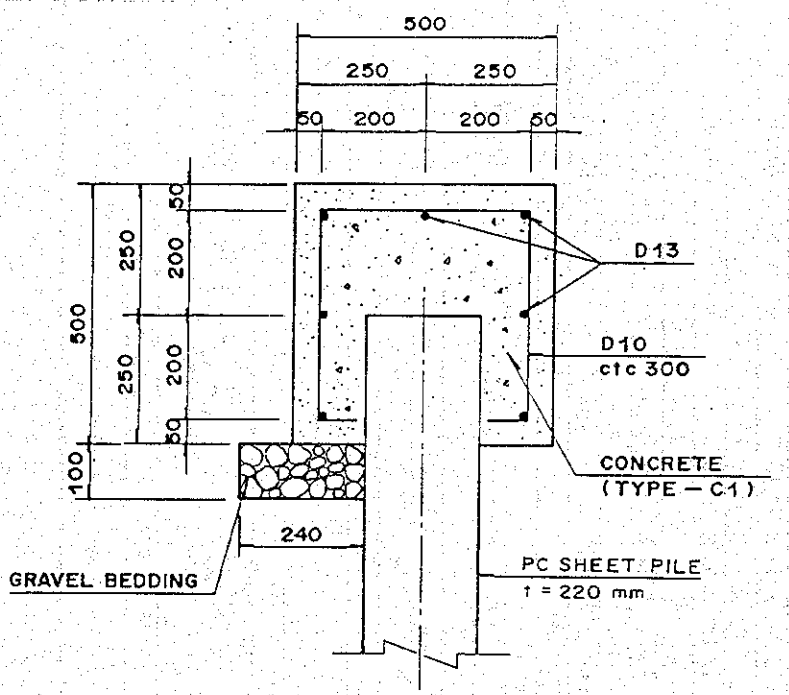
2.4 PC Sheet Pile Wall Type

TYPE OF WORK : PC SHEET PILE WALL TYPE REVETMENT
LOCATION : WF.31L + 32.8 ~ WF.38L + 25.1

CALCULATION			RESULT
STRUCTURAL EXCAVATION			
V_1 = ½ x 0.31 x 19.964	=	3.09	
V_2 = 0.31 x 53.47 x ½	=	8.29	
TOTAL	=	11.38	11.4 m^3
BACKFILL WITH SELECTED SOIL			
V_1 = ½ x 0.34 m^2 x 19.964	=	3.39	
V_2 = (0.34 + 11.56) x ½ x 53.47	=	318.15	
V_3 = (11.56 + 15.00) x ½ x 54.30	=	721.15	
V_4 = (15.00 + 17.86) x ½ x 34.97	=	722.43	
V_5 = (17.86 + 13.98) x ½ x 44.13	=	702.55	
V_6 = (13.98 + 12.13) x ½ x 49.15	=	641.65	
V_7 = (12.13 + 3.83) x ½ x 48.96	=	390.70	
V_8 = ½ x 3.83 m^2 x 24.942	=	47.76	
TOTAL	=	3547.73	3547.73 m^3

PC SHEET PILE WALL TYPE REVETMENT

TYPE OF WORK :	COPING CONCRETE
LOCATION :	W.F. 312+32.8 ~ W.F. 382+25.1



CALCULATION	RESULT
·CONCRETE (TYPE-C1)	
$V = 2.50^{m^3}/10.00m \times (96.0 + 8.50 \times 2 + 223.50) = 84.125$	$84.125\ m^3$
·GRAVEL BEDDING	
$V = 0.24^{m^3}/10.00m \times 336.50 = 8.076$	$8.076\ m^3$
·FORM ($H < 4.0m$)	
$A = 11.65^{m^2}/10.00m \times 336.50 = 392.023$	$392.023\ m^2$
·REINFORCING BAR	
$W = 0.10^{tf}/10.00m \times 336.50 = 3.365$	3.365^{tf}
·JOINT FILLER	
$A = 0.25^{m^2}/10.00m \times 336.50 = 8.413$	$8.413\ m^2$

TYPE OF WORK : PC SHEET PILE WALL TYPE REVETMENT
LOCATION : WF.31L + 32.8 ~ WF.38L + 25.1

CALCULATION				RESULT
STRUCTURAL EXCAVATION				
V_1 = ½ x 0.31 x 19.964		=	3.09	
V_2 = 0.31 x 53.47 x ½		=	8.29	24.620 m^2
	TOTAL	=	11.38	11.4 m^3
PC SHEET PILE				
• PC SHEET PILE				
Length if pile	L = 9.00 m / pile			
L = 9.00 m / pile x (4.47 + 192 + 17 x 2)		=	6057.00	6057.00 m
• DRIVING				
Driving Length if pile	L = 5.00 m (Average)			
L = 5.00 m / pile x (447 + 192 + 17 x 2)		=	3365.00	3365.00 m
GABION MATTRESS				
t = 300 with Soil Covering				
V_1 = 1.75 x 0.30 x 203.50		=	106.838	
V_2 = 1.75 x 0.30 x 71.00		=	37.275	
	TOTAL	=	114.113	114.113 m^3

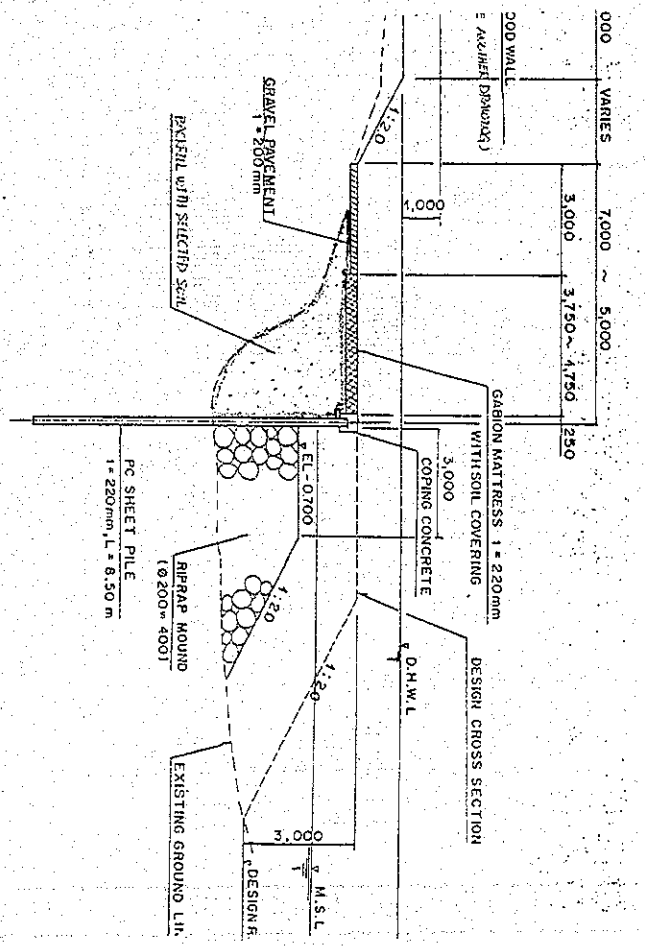
PC SHEET PILE WALL TYPE REVETMENT

TYPE OF WORK :	RIPRAP MOUND
LOCATION :	WF. 312 + 32.8 ~ WF. 381+25.1

CALCULATION	RESULT
$V_1 = 1/2 \times 7.10\,m^2 \times 19.964 = 70.87$	
$V_2 = (7.10 + 10.59) \times 1/2 \times 53.47 = 472.94$	
$V_3 = (10.59 + 10.00) \times 1/2 \times 54.30 = 559.02$	
$V_4 = (10.00 + 10.74) \times 1/2 \times 43.97 = 455.97$	
$V_5 = (10.74 + 10.74) \times 1/2 \times 44.13 = 473.96$	
$V_6 = (10.74 + 8.51) \times 1/2 \times 49.15 = 473.07$	
$V_7 = (8.5) + 4.69) \times 1/2 \times 48.96 = 323.14$	
$V_8 = 1/2 \times 4.69\,m^2 \times 24.942 = 58.49$	
TOTAL = 2887.46	$2887.46\,m^3$

PC SHEET PILE WALL TYPE REVETMENT

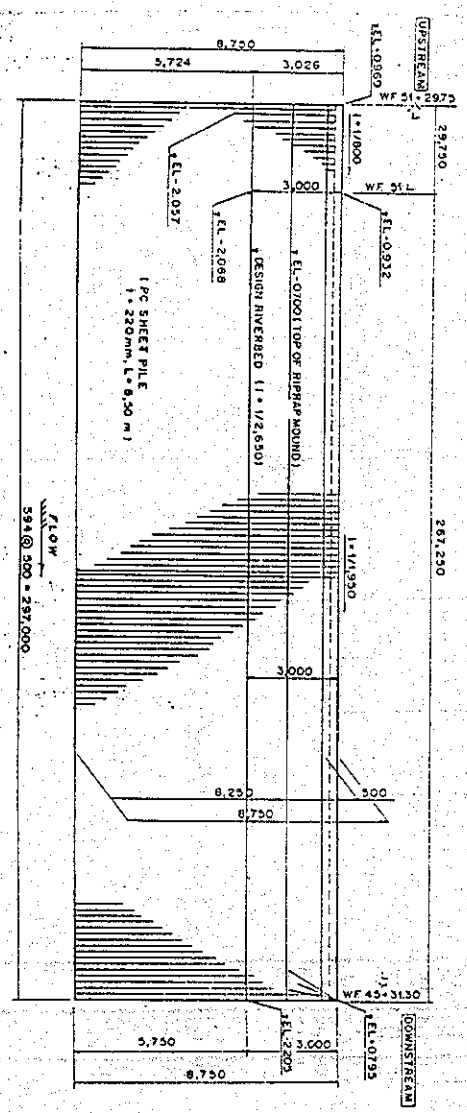
TYPE OF WORK :	BACKFILL WITH SELECTED SOIL
LOCATION :	WF. 452+31.30 ~ WF. 511+29.75



CALCULATION	RESULT
$V_1 = 1/2 \times 2.30\,m^2 \times 20.00 = 23.00$	
$V_2 = (2.3 + 8.1) \times 1/2 \times 47.14 = 245.13$	
$V_3 = (8.1 + 12.19) \times 1/2 \times 51.54 = 522.87$	
$V_4 = (12.19 + 8.38) \times 1/2 \times 51.74 = 532.15$	
$V_5 = (8.38 + 10.99) \times 1/2 \times 48.62 = 470.88$	
$V_6 = (10.99 + 3.66) \times 1/2 \times 48.21 = 353.14$	
$V_7 = 1/2 \times 3.66\,m^2 \times 29.75 = 54.44$	
TOTAL = 2201.61	$2201.6\,m^3$

PC SHEET PILE WALL TYPE REVETMENT

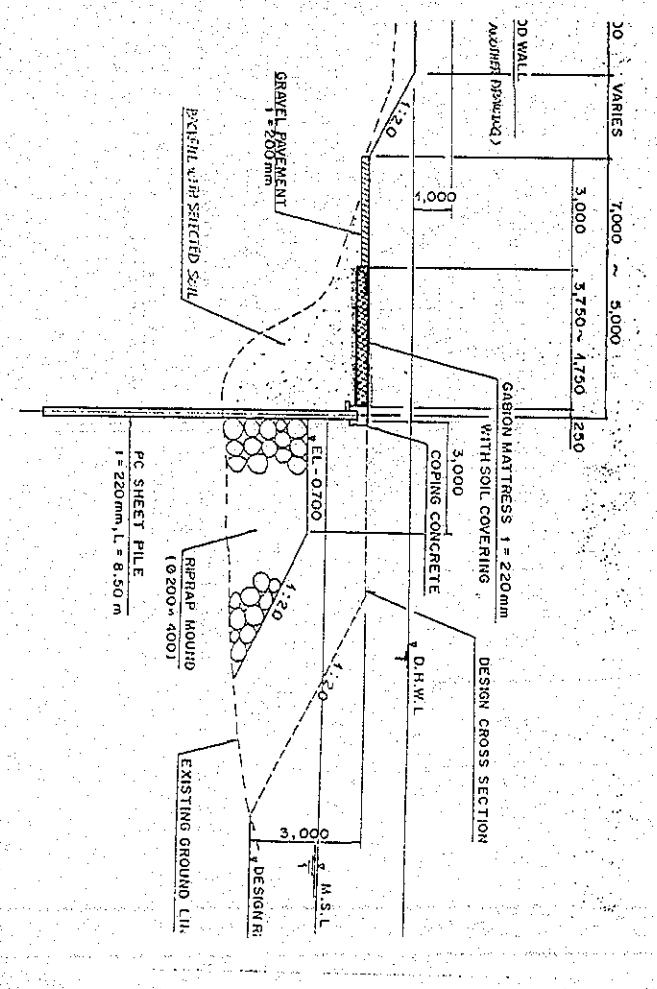
TYPE OF WORK :	PC SHEET PILE
LOCATION :	WF. 452 +31.30 ~ WF. 511 L +29.75



CALCULATION	RESULT
· PC SHEET PILE	
Length of pile : L = 8.50m / pile	
L = 8.50 m/pile x 594 piles = 5049.00	5049.00m
· DRIVING	
Driving length of pile : L = 5.00 m (Average)	
L = 5.00 m/pile x 594 piles = 2970.00	2970.00m

PC SHEET PILE WALL TYPE REVETMENT

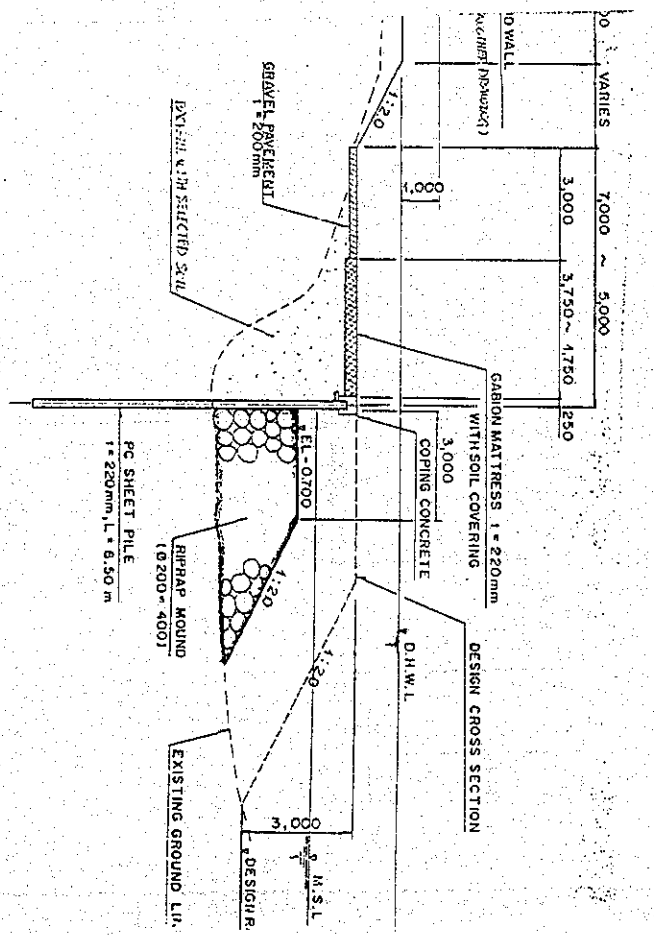
TYPE OF WORK :	GABION MATTRESS
LOCATION :	WF. 452 + 31.30 ~ WF. 511 + 29.75



CALCULATION	RESULT
t=300 with Soil Covering	
$V_1 = 3.75 \times 0.30 \times 240.00 = 270.000$	
$V_2 = 1.75 \times 0.30 \times 57.00 = 29.070$	
TOTAL = 299.070	299.070 m³

PC SHEET PILE WALL TYPE REVETMENT

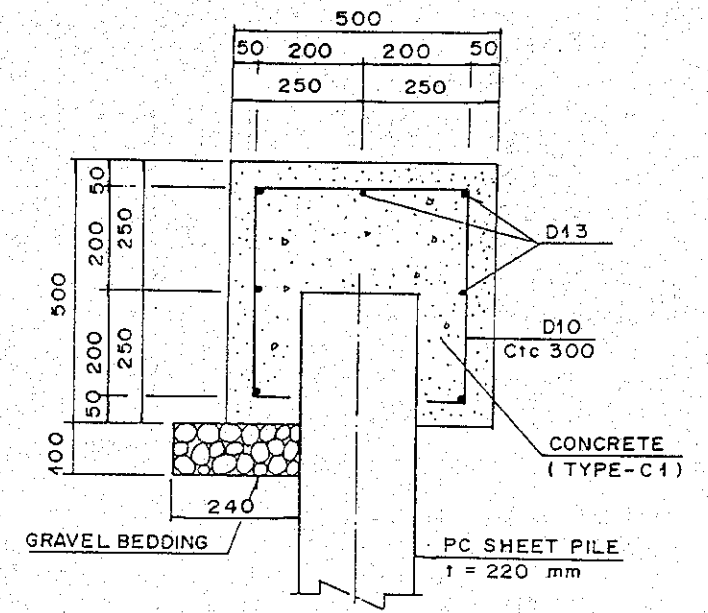
TYPE OF WORK :	RIPRAP MOUND
LOCATION :	WF. 452+31.30 ~ WF. 512+29.75



CALCULATION	RESULT
$V_1 = 1/2 \times 4.43\,m^2 \times 20.00 = 44.30$	
$V_2 = (4.43 + 9.59) \times 1/2 \times 47.14 = 330.45$	
$V_3 = (9.59 + 6.56) \times 1/2 \times 51.54 = 416.19$	
$V_4 = (6.56 + 7.21) \times 1/2 \times 51.74 = 356.23$	
$V_5 = (7.21 + 6.65) \times 1/2 \times 48.62 = 336.94$	
$V_6 = (6.65 + 4.80) \times 1/2 \times 48.21 = 276.00$	
$V_7 = 1/2 \times 4.80\,m^2 \times 29.75 = 71.40$	
TOTAL = 1831.51	1831.51 m^3

PC SHEET PILE WALL TYPE REVETMENT (1/2)

TYPE OF WORK :	COPING CONCRETE
LOCATION :	WF. 45L+3).30 ~ WF.5)L+29.75



CALCULATION	RESULT
・CONCRETE (TYPE-C1)	
$V = 0.50 \times 0.50 \times 10.00 = 2.500\ m^3/10.00m$	
$V' = 2.50\ m^3/10.00m \times 297.00 = 74.250$	$74.250\ m^3$
・GRAVEL BEDDING	
$V = 0.24 \times 0.10 \times 10.00 = 0.24\ m^3/10.00m$	
$V' = 0.24\ m^3/10.00m \times 297.00 = 7.128$	$7.128\ m^3$
・FORM (H<4.0m)	
$A = (0.50 \times 2 + 0.14) \times 10.00 + 0.50 \times 0.50$	
$= 11.650\ m^2/10.00m$	
$A' = 11.65\ m^2/10.00m \times 297.00 = 346.005$	346.005m

TYPE OF WORK : PC SHEET PILE WALL TYPE REVETMENT
LOCATION : COPING CONCRETE
: WF. 45l + 31.30 ~ WF. 51L + 29.75

(2/2)

CALCULATION	RESULT
· REINFORCING BAR	
Φ13 (W = 1.04 kgf/m)	
n_1 = 7 Bars	
W_1 = (10.00 − 0.05×2) × 7 Bars × 1.04 = 72.072	
Φ10 (W = 0.617 kgf/m)	
n_2 = (10.00 − 0.05 × 2) ÷ 0.30 + 1) = 34 Bars	
L = 0.07×2 + 0.40×3 = 1.340 m/Bar	
W_2 = 1.34 m/Bar × 34 × 0.617 = 28.111	
W = 100.183 kgf = 0.100 tf/10.00m	
w' = 0.100 tf/10.00m × 297.00 = 2.970	2.970 tf
· JOINT FILLER	
A = 0.50 × 0.50 = 0.250 m²/10.00m	
A' = 0.25 m²/10.00m × 297.00 = 7.425	7.425 m³

TYPE OF WORK : PC SHEET PILE WALL TYPE REVETMENT
LOCATION : WF.115L + 15.0 ~ WF.117L + 32.0

CALCULATION				RESULT
STRUCTURAL EXCAVATION				
A_1 = (0.50 + 0.90) x ½ x 0.40		=	0.260 m^2	
A_2 = (1.70 + 2.85) x ½ x 1.30		=	2.958 m^2	
	A	=	3.218 m^2	
V = 3.218 x 119.50		=	384.55	384.55 m^3
BACKFILL WITH SELECTED SOIL				
A_1 = (0.50 + 0.90) x ½ x 0.40		=	0.280 m^2	
A_2 = (1.70 + 2.85) x ½ x 1.30 - (0.90 x 0.70 + 0.90 x 0.10)				
		=	2.238 m^2	
	A	=	2.518 m^2	
V = 2.518 x 119.50		=	300.90	300.90 m^3
PC SHEET PILE				
• PC SHEET PILE				
Length of pile in riverside	L_1 = 8.50 m			
Length of pile in land side	L_2 = 5.00 m			
L = (8.50 + 5.00) x 239 sets		=	3226.50	3226.50 m
• DRIVING				
Driving length of pile in riverside L_3 = 4.20 m (Average)				
Driving length of pile in land side L_4 = 5.00 m				
L = (4.20 + 5.00) x 239 sets		=	2198.80	2198.80 m
FIXING STEEL TIE ROD AND OTHERS				
• STEEL TIE ROD (Ø 32 , w = 6.31 kgf / m)				
n = 119.50 : 2.0		≅	60 place	
L = 6.00 + 0.75 x		=	7.50 m / place	
W_1 = 7.50 x 60 x 6.3		=	2839.50	
• STEEL CHANNEL (I – 150 x 75 , W = 18.6 kgf / m)				
L = 119.50 x 2 x 2		=	478.00 m	
W_2 = 487.00 x 18.6		=	8890.80	
• OTHERS				
W_3 = 20 kgf / place x 60 place		=	1200.00	
TOTAL ($W_1 + W_2 + W_3$)		=	12930.30 kgf	
		=	12.930 tf	12.930 tf
RIPRAP MOUND				
A = 10.50 m^2				
V = 10.50 x (119.50 + 3.00 x 2)		=	1317.75	1317.8 m^3

TYPE OF WORK : PC SHEET PILE WALL TYPE REVETMENT
LOCATION : WF.45L + 31.30 ~ WF.51L + 29.75

CALCULATION			RESULT
COPING CONCRETE			
• CONCRETE (TYPE – C1)			
V = 0.90 x 0.70 x 10.00	=	6.300 m^3/10.00 m	
V^1 = 6.300 m^3/10.00 m x 297.00 x 2	=	150.570	150.570 m^3
• GRAVEL BEDDING			
V = {(0.24 x 0.10) x 2 + (10.00 x 0.45)} x 10.00	=	0.930 m^3/10.00 m	
V^1 = 0.93 m^3/10.00 m x 119.50	=	11.114	11.114 m^3
• FORM (H < 4.0 m)			
A = (0.90 x 2 x 2 + 0.35) x 10.00 + (0.90 x 0.70)	=	40.130m^2/10.00 m	
A^1 = 40.13 m^2/10.00 m x 119.50	=	479.554	479.554 m
• REINFORCING BAR			
D 13 (W = 1.04 kgf / m)			
n_1 = 10 Bars			
W_1 = (10.00 - 0.05 x 2) x 10 Bars x 1.04	=	102.960	
D 10 (W = 0.617 kgf / m)			
n_1 = (10.00 - 0.05 x 2) : 0.30 + 1	=	34 Bars	
L = 0.25 + 0.80 x 2 + 0.60 + 0.05	=	2.500 m / Bar	
W_2 = 2.50 m / Bar x 34 Bars x 0.617	=	52.445	
W = 155.405 kgf	=	0.155 tf / 10.00 m	
W^1 = 0.155 tf / 10.00 m x 119.50 x 2	=	3.705	3.705 tf
• JOINT FILTER			
A = (0.90 x 0.70) x 2 - 0.65 x 0.22 x 2	=	0.974 m^2/10.00 m	
A^1 = 0.974 m^2/10.00 m x 119.50	=	11.639	11.639 m^3

2.5 Leaning Wall (Concrete Type)

TYPE OF WORK : LEANING WALL (CONRETE TYPE)
LOCATION : WF.110L - 45.0 m ~ WF.111L + 15.0 m
:

CALCULATION		RESULT
STRUCTURAL EXCAVATION		
See Attached Table		
V = 2115.224		2115.224 m^3
BACKFILL WITH SELECTED SOIL		
See Attached Table		
V = 462.726		462.726 m^3
BACKFILL WITH GRAVEL		
See Attached Table		
V = 481.888		481.888 m^3
CONCRETE TYPE D		
See Attached Table		
CONCRETE : V = 1015.096		1015.096 m^3
FORM : A = 9940.880		9940.880 m^2
RUBBLE STONE BEDDING		
V = 2.30 x 0.20 x 15.00 + 2.60 x 0.20 x 10.00		
+ 2.85 x 0.20 x 10.00 + 3.00 x 0.20 x 10.00		
x 2.00 + 3.15 x 0.20 x 10.00 x 4.00 + 2.85		
x 0.20 x 15.00	= 63.550	63.550 m^3
DEFORMED REINFORCING BARS		
D 13 (1.04 kg.f / m)		
n = {(110.00 – 0.05 x 2) / 0.5 + 1.00} x 6.00	= 1325	
L = 1325 x 0.80	= 1060.000 m	
W = 1060.00 x 1.04	= 1102.400 kg.f	1102.40 kgf
JOINT FILLER		
See Attached Table		
A = 87.293		87.293 m^2
WEEP HOLE		
PVC PIPE ø 50		
1. n_1 = 85.00 / 2.00	= 43	
L_1 = 0,80 x 43	= 34.400	

TYPE OF WORK : LEANING WALL (CONRETE TYPE)
LOCATION : WF.110L - 45.0 m ~ WF.111L + 15.0 m
:

CALCULATION		RESULT
2. n_2 = 110.00 / 2.00	= 55	
L_2 = 1.10 x 55	= 60.500	
3. n_3 = 110.00 / 2.00	= 55	
L_3 = 1.50 x 55	= 82.500	
4. n_4 = 110.00 / 2.00	= 55	
L_4 = 2.00 x 55	= 110.000	
TOTAL L	= 287.400	287.400 m
FILTER CLOTH		
N = $n_1 + n_2 + n_3 + n_4$	= 208 places	
A = 0.640 m^2 / place x 208	= 133.120	133.120 m^2
STEEL FENCE		
L = 110.117		110.117 m
See "Form"		

LEANING WALL (CONCRETE TYPE)

TYPE OF WORK : STRUCTURAL EXCAVATION

LOCATION : WF. 105R ~ WF. 110R + 22.0

CALCULATION

Table. Calculation for Structural Excavation

section	L1	L2	H1	A1	L3	L4	H2	A2	L5	L6	H3	A3	A1+A2+A3	ave	distance(m)	volume(m3)
1	1.500	2.700	5.450	11.445	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.014			
2	1.500	2.700	5.550	11.655	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.224	17.119	14.500	248.231
3	1.500	2.700	5.550	11.655	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.224	17.224	10.000	172.244
4	1.500	2.700	5.550	11.655	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.224	17.224	10.000	172.244
5	1.500	2.700	5.450	11.445	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.014	17.119	10.000	171.194
6	1.500	2.700	5.450	11.445	4.775	3.750	1.150	4.902	2.075	2.375	0.300	0.668	17.014	17.014	10.000	170.144
7	1.500	2.610	5.450	11.200	4.650	3.650	1.100	4.565	2.040	2.340	0.300	0.657	16.422	16.718	10.000	167.181
8	1.500	2.610	5.350	10.994	4.650	3.650	1.100	4.565	2.040	2.340	0.300	0.657	16.216	16.319	10.000	163.190
9	1.500	2.610	5.250	10.789	4.650	3.650	1.100	4.565	2.040	2.340	0.300	0.657	16.011	16.114	10.000	161.135
10	1.500	2.520	5.150	10.352	4.475	3.500	1.050	4.187	1.955	2.255	0.300	0.632	15.170	15.590	10.000	155.903
11	1.500	2.520	5.050	10.151	4.475	3.500	1.050	4.187	1.955	2.255	0.300	0.632	14.969	15.069	10.000	150.694
12	1.500	2.520	4.950	9.950	4.475	3.500	1.050	4.187	1.955	2.255	0.300	0.632	14.768	14.868	10.000	148.684
13	1.500	2.520	4.850	9.749	4.475	3.500	1.050	4.187	1.955	2.255	0.300	0.632	14.567	14.667	10.000	146.674
14	1.500	2.430	4.650	9.137	4.300	3.350	1.000	3.825	1.870	2.170	0.300	0.606	13.568	14.068	10.000	140.676
15	1.500	2.430	4.550	8.941	4.300	3.350	1.000	3.825	1.870	2.170	0.300	0.606	13.372	13.470	10.000	134.700
16	1.500	2.430	4.450	8.744	4.300	3.350	1.000	3.825	1.870	2.170	0.300	0.606	13.175	13.274	10.000	132.735
17	1.500	2.340	4.250	8.160	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	12.220	12.698	10.000	126.976
18	1.500	2.340	4.050	7.776	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	11.836	12.028	10.000	120.279
19	1.500	2.340	3.850	7.392	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	11.452	11.644	10.000	116.439
20	1.500	2.250	3.650	6.844	3.950	3.050	0.900	3.150	1.700	2.000	0.300	0.555	10.549	11.000	10.000	110.003
21	1.500	2.250	3.450	6.469	3.950	3.050	0.900	3.150	1.700	2.000	0.300	0.555	10.174	10.361	10.000	103.613
22	1.500	2.340	3.550	6.816	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	10.876	10.525	10.000	105.248
23	1.500	2.340	3.750	7.200	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	11.260	11.068	10.000	110.679
24	1.500	2.340	3.950	7.584	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	11.644	11.452	10.000	114.519
25	1.500	2.340	4.150	7.968	4.125	3.200	0.950	3.479	1.785	2.085	0.300	0.581	12.028	11.836	10.000	118.359
26	1.500	2.430	4.250	8.351	4.300	3.350	1.000	3.825	1.870	2.170	0.300	0.606	12.782	12.405	10.000	124.051
27	1.500	2.430	4.300	8.450	4.300	3.350	1.000	3.825	1.870	2.170	0.300	0.606	12.881	12.831	4.500	57.741
																3643.532

RESULT

3643.532 m³

TYPE OF WORK : LEANING WALL (CONCRETE TYPE)
: BACKFILL WITH SELECTED SOIL

LOCATION : WF. 105R ~ WF. 110R + 22.0

CALCULATION

Table. Calculation for Backfill with Selected Soil

section	L1	L2	H1	A1	L3	L4	H2	A2	L5	L6	H3	A3	L7	H4	A4	A1+A2+A3+A4	ave	distance(m)	volume(m3)
1	1.050	0.600	1.150	0.949	1.175	0.600	1.150	1.021	2.075	2.175	0.100	0.213	0.500	3.450	1.725	3.907			
																	3.957	3.932	14.500	57.012
2	1.050	0.600	1.150	0.949	1.175	0.600	1.150	1.021	2.075	2.175	0.100	0.213	0.500	3.550	1.775	3.957			
																	3.957	3.957	10.000	39.569
3	1.050	0.600	1.150	0.949	1.175	0.600	1.150	1.021	2.075	2.175	0.100	0.213	0.500	3.550	1.775	3.957			
																	3.907	3.932	10.000	39.319
4	1.050	0.600	1.150	0.949	1.175	0.600	1.150	1.021	2.075	2.175	0.100	0.213	0.500	3.450	1.725	3.907			
																	3.907	3.907	10.000	39.069
5	1.050	0.600	1.150	0.949	1.175	0.600	1.150	1.021	2.075	2.175	0.100	0.213	0.500	3.450	1.725	3.907			
																	3.779	3.843	10.000	38.429
6	1.050	0.600	1.100	0.908	1.150	0.600	1.100	0.963	2.040	2.140	0.100	0.209	0.500	3.400	1.700	3.779			
																	3.729	3.754	10.000	37.540
7	1.050	0.600	1.100	0.908	1.150	0.600	1.100	0.963	2.040	2.140	0.100	0.209	0.500	3.300	1.650	3.729			
																	3.679	3.704	10.000	37.040
8	1.050	0.600	1.100	0.908	1.150	0.600	1.100	0.963	2.040	2.140	0.100	0.209	0.500	3.200	1.600	3.679			
																	3.497	3.588	10.000	35.882
9	1.050	0.600	1.100	0.908	1.150	0.600	1.100	0.963	2.040	2.140	0.100	0.209	0.500	3.050	1.525	3.497			
																	3.447	3.472	10.000	34.724
10	1.050	0.600	1.050	0.866	1.125	0.600	1.050	0.906	1.955	2.055	0.100	0.201	0.500	2.950	1.475	3.447			
																	3.397	3.422	10.000	34.224
11	1.050	0.600	1.050	0.866	1.125	0.600	1.050	0.906	1.955	2.055	0.100	0.201	0.500	2.850	1.425	3.397			
																	3.347	3.372	10.000	33.724
12	1.050	0.600	1.050	0.866	1.125	0.600	1.050	0.906	1.955	2.055	0.100	0.201	0.500	2.750	1.375	3.347			
																	3.117	3.232	10.000	32.322
13	1.050	0.600	1.050	0.866	1.125	0.600	1.050	0.906	1.955	2.055	0.100	0.201	0.500	2.500	1.250	3.117			
																	3.067	3.092	10.000	30.920
14	1.050	0.600	1.000	0.825	1.100	0.600	1.000	0.850	1.870	1.970	0.100	0.192	0.500	2.400	1.200	3.067			
																	3.017	3.042	10.000	30.420
15	1.050	0.600	1.000	0.825	1.100	0.600	1.000	0.850	1.870	1.970	0.100	0.192	0.500	2.300	1.150	3.017			
																	2.788	2.902	10.000	29.024
16	1.050	0.600	1.000	0.825	1.100	0.600	1.000	0.850	1.870	1.970	0.100	0.192	0.500	2.050	1.025	2.788			
																	2.688	2.738	10.000	27.379
17	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.184	0.500	1.850	0.925	2.688			
																	2.588	2.638	10.000	26.379
18	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.184	0.500	1.650	0.825	2.588			
																	2.360	2.474	10.000	24.739
19	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.800	0.100	0.175	0.500	1.400	0.700	2.360			
																	2.260	2.310	10.000	23.100
20	1.050	0.600	0.900	0.743	1.050	0.600	0.900	0.743	1.700	1.800	0.100	0.175	0.500	1.200	0.600	2.260			
																	2.438	2.349	10.000	23.489
21	1.050	0.600	0.900	0.743	1.050	0.600	0.900	0.743	1.700	1.785	0.100	0.184	0.500	1.350	0.675	2.438			
																	2.538	2.488	10.000	24.879
22	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.184	0.500	1.550	0.775	2.538			
																	2.638	2.588	10.000	25.879
23	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.184	0.500	1.750	0.875	2.638			
																	2.738	2.688	10.000	26.879
24	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.184	0.500	1.950	0.975	2.738			
																	2.917	2.827	10.000	28.274
25	1.050	0.600	0.950	0.784	1.075	0.600	0.950	0.796	1.785	1.885	0.100	0.192	0.500	2.100	1.050	2.917			
																	2.942	2.930	4.500	13.183
26	1.050	0.600	1.000	0.825	1.100	0.600	1.000	0.850	1.870	1.970	0.100	0.192	0.500	2.150	1.075	2.942			
																			832.966
27	1.050	0.600	1.000	0.825	1.100	0.600	1.000	0.850	1.870	1.970	0.100	0.192	0.500						

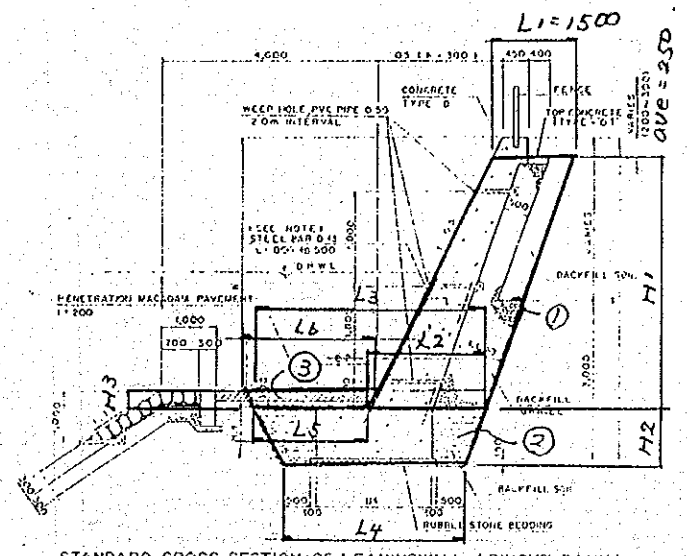
RESULT

832.966 m^3

TYPE OF WORK : LEANING WALL (CONCRETE TYPE)

LOCATION : WF. 105R ~ WF. 110R+220

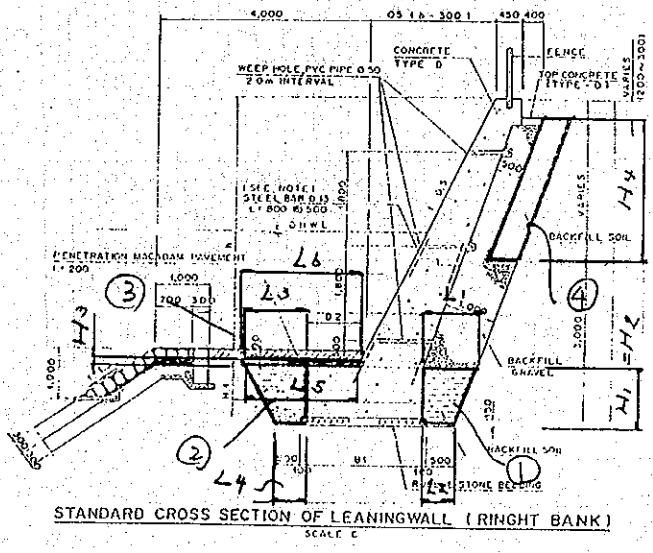
EXPLANATORY DRAWING



STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE C

FOR STRUCTURAL EXCAVATION



STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE C

FOR BACKFILL WITH SELECTED SOIL

TYPE OF WORK : LEANING WALL (CONCRETE TYPE)

: BACKFILL WITH GRAVEL

LOCATION : WF. 105R ~ WF. 110R + 220

CALCULATION	RESULT
	907.378 m³

Table. Calculation for Backfill with Gravel

section	L1	H1	A1	L2	H2	A2	A1+A2	ave	distance(m)	volume(m3)
1	0.500	3.450	1.725	1.050	2.000	2.100	3.825			
2	0.500	3.550	1.775	1.050	2.000	2.100	3.875	3.850	14.500	55.825
3	0.500	3.550	1.775	1.050	2.000	2.100	3.875	3.875	10.000	38.750
4	0.500	3.550	1.775	1.050	2.000	2.100	3.875	3.875	10.000	38.750
5	0.500	3.450	1.725	1.050	2.000	2.100	3.825	3.850	10.000	38.500
6	0.500	3.450	1.725	1.050	2.000	2.100	3.825	3.825	10.000	38.250
7	0.500	3.400	1.700	1.050	2.050	2.153	3.853	3.839	10.000	38.388
8	0.500	3.300	1.650	1.050	2.050	2.153	3.803	3.828	10.000	38.275
9	0.500	3.200	1.600	1.050	2.050	2.153	3.753	3.778	10.000	37.775
10	0.500	3.050	1.525	1.050	2.100	2.205	3.730	3.741	10.000	37.413
11	0.500	2.950	1.475	1.050	2.100	2.205	3.680	3.705	10.000	37.050
12	0.500	2.850	1.425	1.050	2.100	2.205	3.630	3.655	10.000	36.550
13	0.500	2.750	1.375	1.050	2.100	2.205	3.580	3.605	10.000	36.050
14	0.500	2.500	1.250	1.050	2.150	2.258	3.508	3.544	10.000	35.438
15	0.500	2.400	1.200	1.050	2.150	2.258	3.458	3.483	10.000	34.825
16	0.500	2.300	1.150	1.050	2.150	2.258	3.408	3.433	10.000	34.325
17	0.500	2.050	1.025	1.050	2.200	2.310	3.335	3.371	10.000	33.713
18	0.500	1.850	0.925	1.050	2.200	2.310	3.235	3.285	10.000	32.850
19	0.500	1.650	0.825	1.050	2.200	2.310	3.135	3.185	10.000	31.850
20	0.500	1.400	0.700	1.050	2.250	2.363	3.063	3.099	10.000	30.988
21	0.500	1.200	0.600	1.050	2.250	2.363	2.963	3.013	10.000	30.125
22	0.500	1.350	0.675	1.050	2.200	2.310	2.985	2.974	10.000	29.738
23	0.500	1.550	0.775	1.050	2.200	2.310	3.085	3.035	10.000	30.350
24	0.500	1.750	0.875	1.050	2.200	2.310	3.185	3.135	10.000	31.350
25	0.500	1.950	0.975	1.050	2.200	2.310	3.285	3.235	10.000	32.350
26	0.500	2.100	1.050	1.050	2.150	2.258	3.308	3.296	10.000	32.963
27	0.500	2.150	1.075	1.050	2.150	2.258	3.333	3.320	4.500	14.940
										907.378

TYPE OF WORK : LEANING WALL (CONCRETE TYPE)

LOCATION : CONCRETE (TYPE-D)

: WA. 105R ~ WA. 110R+22.0

CALCULATION	RESULT

Table. Calculation for Concrete (Wall) Volume

section	L1	L2	H1	A1	ave	distance(m)	V1(m3)	L3	H2	A2	distance(m)	V2(m3)	V1+V2(m3)
1	0.450	1.650	5.700	5.985				2.550	1.000	2.550	14.500	36.975	36.975
2	0.450	1.650	5.800	6.090	6.038	14.500	87.544	2.550	1.000	2.550	10.000	25.500	113.044
3	0.450	1.650	5.800	6.090	6.090	10.000	60.900	2.550	1.000	2.550	10.000	25.500	86.400
4	0.450	1.650	5.800	6.090	6.090	10.000	60.900	2.550	1.000	2.550	10.000	25.500	86.400
5	0.450	1.650	5.700	5.985	6.038	10.000	60.375	2.550	1.000	2.550	10.000	25.500	85.875
6	0.450	1.650	5.700	5.985	5.985	10.000	59.850	2.550	1.000	2.550	10.000	25.500	85.350
7	0.450	1.560	5.700	5.729	5.857	10.000	58.568	2.450	0.950	2.328	10.000	23.275	81.843
8	0.450	1.560	5.600	5.628	5.678	10.000	56.783	2.450	0.950	2.328	10.000	23.275	80.058
9	0.450	1.560	5.500	5.528	5.578	10.000	55.778	2.450	0.950	2.328	10.000	23.275	79.053
10	0.450	1.470	5.400	5.184	5.356	10.000	53.558	2.300	0.900	2.070	10.000	20.700	74.258
11	0.450	1.470	5.300	5.088	5.136	10.000	51.360	2.300	0.900	2.070	10.000	20.700	72.060
12	0.450	1.470	5.200	4.992	5.040	10.000	50.400	2.300	0.900	2.070	10.000	20.700	71.100
13	0.450	1.470	5.100	4.896	4.944	10.000	49.440	2.300	0.900	2.070	10.000	20.700	70.140
14	0.450	1.380	4.900	4.484	4.690	10.000	46.898	2.150	0.850	1.828	10.000	18.275	65.173
15	0.450	1.380	4.800	4.392	4.438	10.000	44.378	2.150	0.850	1.828	10.000	18.275	62.653
16	0.450	1.380	4.700	4.301	4.346	10.000	43.463	2.150	0.850	1.828	10.000	18.275	61.738
17	0.450	1.290	4.500	3.915	4.108	10.000	41.078	2.000	0.800	1.600	10.000	16.000	57.078
18	0.450	1.290	4.300	3.741	3.828	10.000	38.280	2.000	0.800	1.600	10.000	16.000	54.280
19	0.450	1.290	4.100	3.567	3.654	10.000	36.540	2.000	0.800	1.600	10.000	16.000	52.540
20	0.450	1.200	3.900	3.218	3.392	10.000	33.923	1.850	0.750	1.388	10.000	13.875	47.798
21	0.450	1.200	3.700	3.053	3.135	10.000	31.350	1.850	0.750	1.388	10.000	13.875	45.225
22	0.450	1.290	3.800	3.306	3.179	10.000	31.793	2.000	0.800	1.600	10.000	16.000	47.793
23	0.450	1.290	4.000	3.480	3.393	10.000	33.930	2.000	0.800	1.600	10.000	16.000	49.930
24	0.450	1.290	4.200	3.654	3.567	10.000	35.670	2.000	0.800	1.600	10.000	16.000	51.670
25	0.450	1.290	4.400	3.828	3.741	10.000	37.410	2.000	0.800	1.600	10.000	16.000	53.410
26	0.450	1.380	4.500	4.118	3.973	10.000	39.728	2.150	0.850	1.828	4.500	8.224	47.951
27	0.450	1.380	4.550	4.163	4.140	4.500	18.632	2.150	0.850	1.828			18.632
							1218.523				total	519.899	1738.422

1738.422

Calculation for Concrete(Top Cor

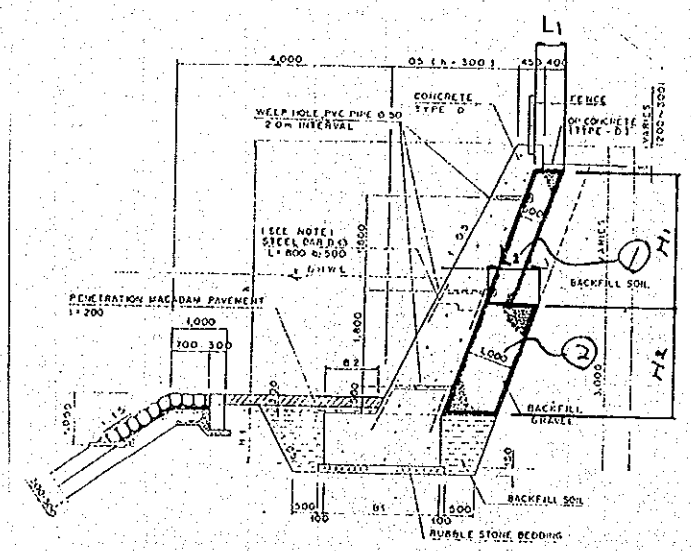
block	distance	L	t	w	V(m3)	
L1	14.500	14.500	0.150	0.400	0.870	
L2	10.000	10.000	0.150	0.400	0.600	
L3	10.000	10.000	0.150	0.400	0.600	
L4	10.000	10.000	0.150	0.400	0.600	
L5	10.000	10.000	0.150	0.400	0.600	
L6	10.000	10.000	0.150	0.400	0.600	
L7	10.000	10.000	0.150	0.400	0.600	
L8	10.000	10.000	0.150	0.400	0.600	
L9	10.000	10.000	0.150	0.400	0.600	
L10	10.000	10.000	0.150	0.400	0.600	
L11	10.000	10.000	0.150	0.400	0.600	
L12	10.000	10.000	0.150	0.400	0.600	
L 3	10.000	10.002	0.150	0.400	0.600	
L14	10.000	10.000	0.150	0.400	0.600	
L15	10.000	10.000	0.150	0.400	0.600	
L16	10.000	10.002	0.150	0.400	0.600	
L17	10.000	10.002	0.150	0.400	0.600	
L18	10.000	10.002	0.150	0.400	0.600	
L19	10.000	10.002	0.150	0.400	0.600	
L20	10.000	10.002	0.150	0.400	0.600	
L21	10.000	10.000	0.150	0.400	0.600	
L22	10.000	10.002	0.150	0.400	0.600	
L23	10.000	10.002	0.150	0.400	0.600	
L24	10.000	10.002	0.150	0.400	0.600	
L25	10.000	10.000	0.150	0.400	0.600	
L26	4.500	4.500	0.150	0.400	0.270	
					15.541	

TOTAL(m3)	
Wall	1738.422
Top Concrete	15.541
	1753.963

TYPE OF WORK : LEANING WALL (CONCRETE TYPE)

LOCATION : WF. 105R ~ WF. 110R+220

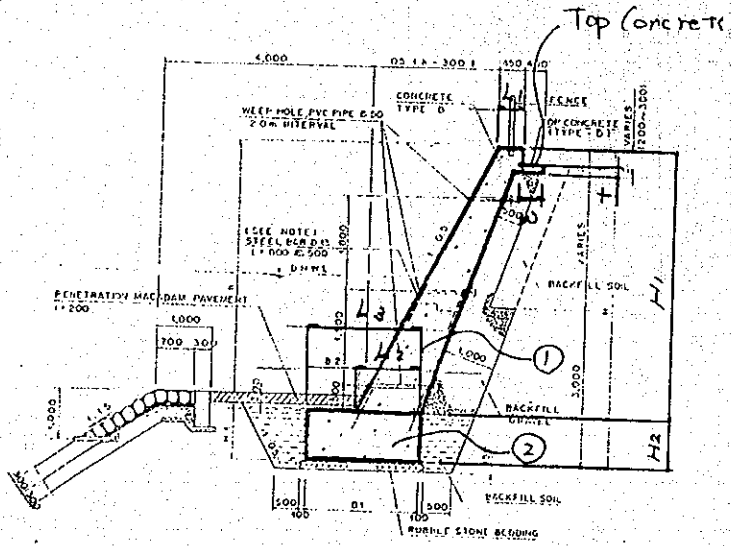
EXPLANATORY DRAWING



STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE C

FOR BACKFILL WITH GRAVEL

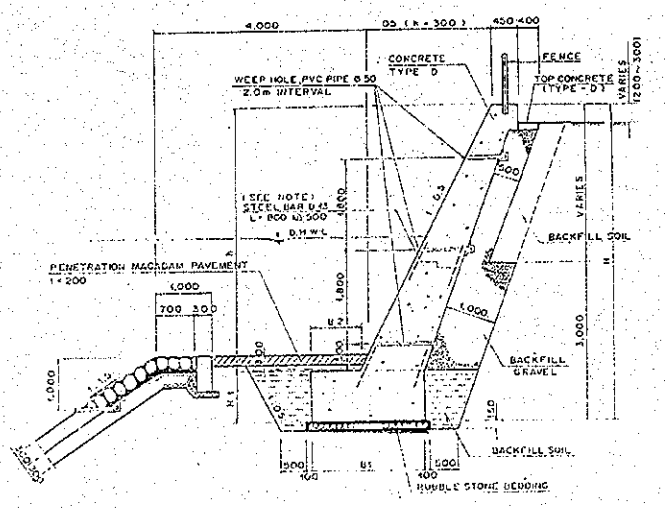


STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE C

FOR CONCRETE (TYPE - D)

TYPE OF WORK :	RUBBLE STONE BEDDING
LOCATION :	



STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE 0

CALCULATION

See Attached Table

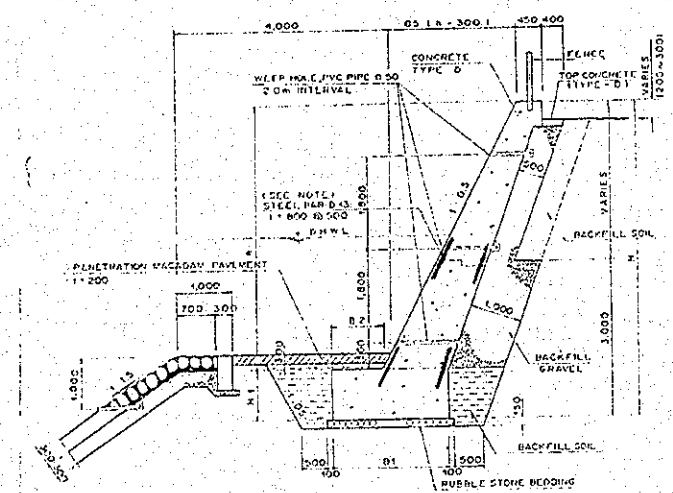
RESULT

94.943 m^3

Table. Calculation for Rubble Stone Bedding

block	t	distance	V(m3)
L1	0.15	14.500	5.981
L2	0.15	10.000	4.125
L3	0.15	10.000	4.125
L4	0.15	10.000	4.125
L5	0.15	10.000	4.125
L6	0.15	10.000	4.125
L7	0.15	10.000	3.975
L8	0.15	10.000	3.975
L9	0.15	10.000	3.975
L10	0.15	10.000	3.750
L11	0.15	10.000	3.750
L12	0.15	10.000	3.750
L13	0.15	10.000	3.750
L14	0.15	10.000	3.525
L15	0.15	10.000	3.525
L16	0.15	10.000	3.525
L17	0.15	10.000	3.300
L18	0.15	10.000	3.300
L19	0.15	10.000	3.300
L20	0.15	10.000	3.075
L21	0.15	10.000	3.075
L22	0.15	10.000	3.300
L23	0.15	10.000	3.300
L24	0.15	10.000	3.300
L25	0.15	10.000	3.300
L26	0.15	4.500	1.586
			94.943

TYPE OF WORK :	DEFORMED REINFORCING BARS
LOCATION :	



STANDARD CROSS SECTION OF LEANINGWALL (RINGHT BANK)

SCALE C

CALCULATION	RESULT
· D 13 (1.04 kg / m)	
L = 4.5 + 240.0 + 14.5 = 259.000	
n = {(259 - 0.05×2) ÷ 0.5 + 1} × 4 = 2075	
L = 2075 × 0.8 = 1660.0	
W = 1660.0 × 1.04 = 1726.4	1726.4 kgf