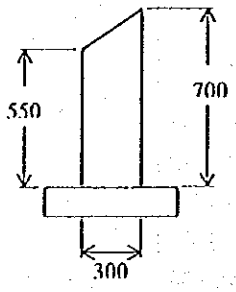
Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	CONCRETE K 225 REVETMENT	Page	4 / 17

III. CONCRETE K 225 FOR REVETMENT

- Top Concrete

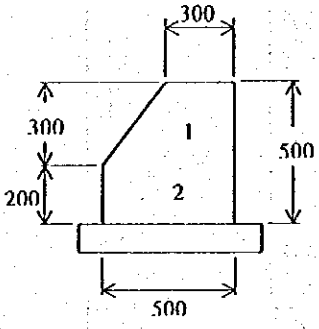


A = $\frac{0.55 + 0.70}{2} \times 0.30$ = 0.188 m²

L = 7.5 x 2 = 15 m

Volume = 0.188 x 15 = 2.813 m³

- Base Concrete



A1 = $\frac{0.55 + 0.30}{2} \times 0.30$ = 0.12 m²

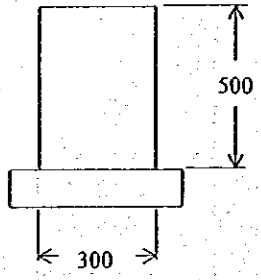
A2 = 0.2 x 0.50 = 0.10 m²

Total = 0.12 + 0.10 = 0.22 m²

L = 10 x 2 = 20 m

Volume = 0.22 x 20 = 4.40 m³

- Partition Wall



A = 0.50 x 0.30 = 0.15 m²

L = 6.5 x 2 = 13 m

Volume = 0.15 x 13 = 1.95 m³

Total Concrete K 225 for Revetment

2.813 + 4.40 + 1.95 = 9.163 m³

Total Concrete K 225

46.462 + 9.163 = 55.625 m³

3. Reinforcing Bar

a. Box Culvert Reinforcing Bar

BAR WEIGTH

TYPE	DIA	LENGTH	NUMBER	WEIGHT PER m (kgf/m)	WEIGHT PER BAR (kgf/m)	WEIGHT (kgf)	SHAPE
S 1	D 13	5380	39	1.040	5.595	218.213	
S 2	D 13	2520	77	1.040	2.621	201.812	
S 3	D 13	970	78	1.040	1.009	78.686	
S 4	D 13	2300	78	1.040	2.392	186.576	
S 5	D 13	8820	22	1.040	9.173	201.806	
S 6	D 13	870	54	1.040	0.905	48.859	
W 1	D 13	2550	78	1.040	2.652	206.856	
W 2	D 13	8820	22	1.040	9.173	201.802	
W 3	D 13	400	108	1.040	0.416	44.928	
F 1	D 13	5430	39	1.040	5.647	220.241	
F 2	D 13	2520	77	1.040	2.621	201.802	
F 3	D 13	1010	78	1.040	1.050	81.931	
F 4	D 13	2240	78	1.040	2.330	181.709	
F 5	D 13	8820	22	1.040	9.173	201.802	
F 6	D 13	920	54	1.040	0.957	51.667	
					Total =	2,328.690	

b. Wing Wall Reinforcing Bar

BAR WEIGTH

TYPE	DIA	LENGTH	NUMBER	WEIGHT PER m (kgf/m)	WEIGHT PER BAR (kgf/m)	WEIGHT (kgf)	SHAPE
WW 1	D 13	2,040	21	1.040	2.122	44.562	
WW 2	D 13	2,040	21	1.040	2.122	44.562	
WW 3	D 13	2,990	42	1.040	3.110	130.603	
WW 4	D 13	2,990	42	1.040	3.110	130.603	
WW 5	D 13	4,670	16	1.040	4.857	77.712	
WW 5a	D 13	4,200	20	1.040	4.368	87.360	
WW 6	D 13	840	21	1.040	0.874	18.354	
WW 7	D 13	840	21	1.040	0.874	18.354	
WW 8	D 13	903	21	1.040	0.939	19.740	
WW 9	D 13	1,003	63	1.040	1.043	65.709	
WW 10	D 13	7,820	12	1.040	8.133	97.596	
WW 10a	D 13	500	4	1.040	0.520	2.080	
WW 11	D 13	5,415	2	1.040	5.632	11.264	
					Total =	748.499	

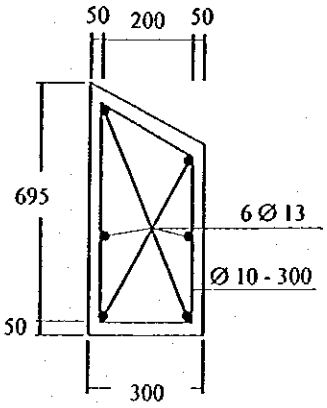
Total Reinforcing Bar a + b =

2,328.69 + 748.499 = 3,077.189 kg

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	REINFORCING BAR VOLUME	Page	6 / 17

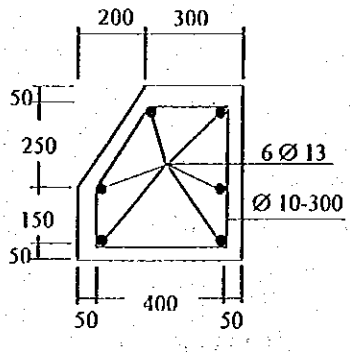
c. Concrete For Revetment Baru Retarding Pond

1. Top Concrete



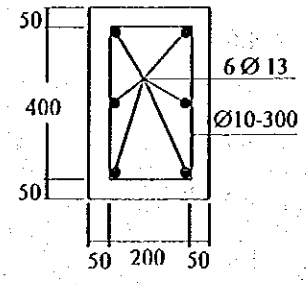
Type	Dia (mm)	Length (m)	No.	Weight Per m	Weight Per Bar	Total (kg)
1	13	7.5	6 x 2	1.040	7.80	187.2
2	10	1.56	26x2	0.617	0.963	50.05
					Total	237.25

2. Base Concrete



Type	Dia (mm)	Length (m)	No.	Weight Per m	Weight Per Bar	Total (kg)
1	13	10	6 x 2	1.040	10.40	124.80
2	10	1.51	34x2	0.617	0.932	63.35
					Total	188.154

3. Partition Wall



Type	Dia (mm)	Length (m)	No.	Weight Per m	Weight Per Bar	Total (kg)
1	13	6.5	6 x 2	1.040	6.76	81.12
2	10	1.26	22x2	0.617	0.777	34.21
					Total	115.33

Total 1 + 2 + 3

237.25 + 188.154 + 115.33 = 540.73 kg

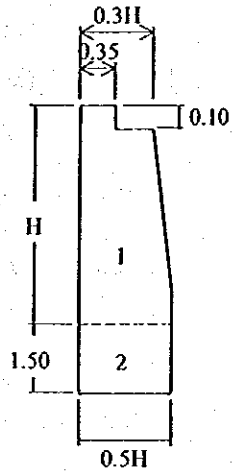
Total Reinforcing Bar

3,077.189 + 540.73 = 3,617.92 kg

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	STONE MASONRY CALCULATION	Page	7 / 17

4. Stone Masonry

- Wall



Note:

H_{1-1} = 1.50 m

H_{2-2} = 2.00 m

H_{3-3} = 3.50 m

For Left Side

a. H_{1-1} = 1.50 m

Top = 0.3 x 1.50 = 0.50 m

Bottom = 0.5 x 1.50 = 0.75 m

Area 1 = $\frac{0.5+0.75}{2}$ x (1.50 – 0.10) = 0.875 m²

0.1 x 0.35 = 0.035 m²

Area 2 = 1.50 x 0.75 = 1.125 m²

Total Area = 2.035 m²

Length = 2.00 m

Volume = 2.00 x 2.035 = 4.07 m³

b. H_{2-2} = 2.00

Top = 0.3 x 2.00 = 0.60 m

Bottom = 0.5 x 2.00 = 1.00 m

Area 1 = $\frac{0.6+1.00}{2}$ x 1.90 = 1.52 m²

0.1 x 0.35 = 0.035 m²

Area 2 = 1.50 x 0.75 = 1.50 m²

Total Area = 3.055 m²

Length = 1.50 m

Volume = 3.055 x 1.50 = 4.583 m³

c. H_{3-3} = 3.50 m

Top = 0.3 x 3.50 = 1.050 m

Bottom = 0.5 x 3.50 = 1.75 m

Area 1 = $\frac{1.05+1.75}{2}$ x 3.40 + 0.10 x 0.35 = 4.795 m²

Area 2 = 1.50 x 3.50 = 5.250 m²

Total Area = 10.045 m²

Length = 1.20 m

Volume = 1.20 x 10.045 = 12.054 m³

Volume Total for Left Side = 20.709 m³

For Right Side

a. H_{1-1} = 1.50 m

Top = 0.3 x 1.50 = 0.50 m

Bottom = 0.5 x 1.50 = 0.75 m

Area 1 = $\frac{0.5+0.75}{2}$ x 1.4 + 0.1 x 0.35 = 0.91 m²

Area 2 = 1.50 x 0.75 = 1.125 m²

Total Area = 2.035 m²

Length = 3.00 m

Volume = 3.00 x 2.035 = 6.105 m³

b. H_{2-2} = 2.00

Total Area 1 + Area 2 = 3.055 m²

Length = 1.50 m

Volume = 3.055 x 1.50 = 4.583 m³

c. H_{3-3} = 3.50 m

Top = 0.3 x 3.50 = 1.050 m

Bottom = 0.5 x 3.50 = 1.75 m

Total Area 1 + Area 2 = 10.045 m²

Length = 2.00 m

Volume = 2.00 x 10.045 = 20.09 m³

Volume Total for Left Side = 30.778 m³

Total Volume of Stone Masonry Wing Wall:

For Left Side = 20.709 m³

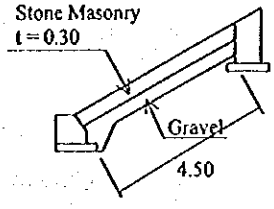
For Right Side = 30.788 m³

Total = 51.487 m³

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	STONE MASONRY CALCULATION	Page	9 / 17

- Stone Masonry for Revetment

- Revetment 1



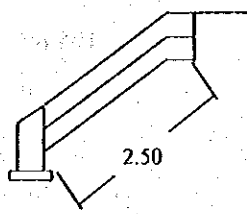
Area 1 = 4.5 x 0.30 = 1.35 m²

Length = 1.2 m

Number = 2

Volume = 2 x 12 x 1.35 = 32.4 m³

- Revetment 2



Area 2 = 2.5 x 0.30 = 0.75 m²

Length = 6.0 m

Number = 2

Volume = 2 x 0.75 x 6 = 9.00 m³

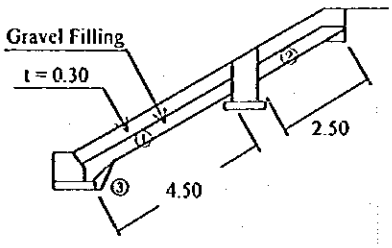
Total = 32.40 + 9.00 = 41.40 m³

Total Volume of Stone Masonry:

51.48 + 41.40 = 92.50 m³

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	GRAVEL BACK FILLING	Page	10 / 17

5. Back Filling Gravel



(1) A = 0.30 x 4.50 = 1.35 m²

(3) A = $\frac{0.10 \times 0.60}{2}$ = 0.03 m²

Total A = 1.380 m²

Number = 2

Length = 12 m

Volume = 1.380 x 12 x 2 = 33.12 m³

(2) A = 0.30 x 2.50 = 0.750 m²

Number = 2

Length = 6 m

Volume = 0.75 x 2 x 6 = 9.00 m³

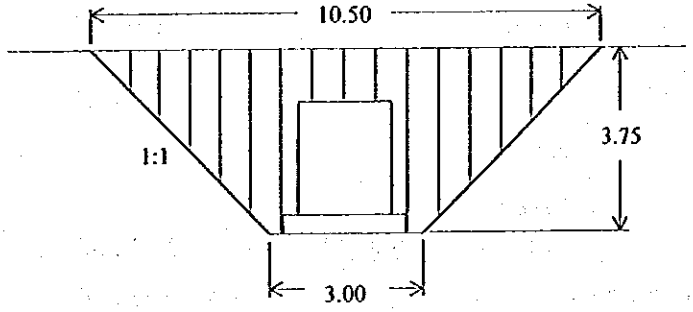
Total Volume Gravel Filling

= 33.12 + 9.00 = 42.13 m³

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	EXCAVATION	Page	11 / 17

6. Excavation

- Excavation for Box

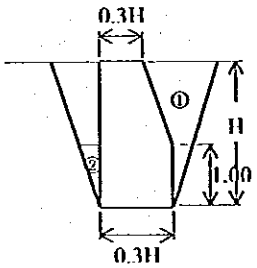


$$A = \frac{10.5 + 3.00}{2} \times 3.75 = 25.313 \text{ m}^2$$

Length = 9.0 m

Volume = 25.313 x 9.0 = 227.82 m³

- Excavation for Wing Wall



(a) H = 1.50 m, L = 2 + 3 = 5 m

0.5H = 0.75 m

$$A1 = \frac{0.75 + 2.25}{2} \times 1.5 = 2.25 \text{ m}^2$$

A2 = 0.5 x 1 x 1 = 0.50 m²

Total A = 2.750 m²

Volume = 2.75 x 5 = 13.75 m³

(b) H = 2.00 m, L = 1.5 + 1.5 = 3.00 m

$$A1 = \frac{1+3}{2} \times 2 = 4.00 \text{ m}^2$$

A2 = 0.5 x 1 x 1 = 0.50 m²

Total A = 4.50 m²

Vol. = 4.5 x 3 = 13.50 m³

(c) H = 3.00 m, L = 5.40 m

$$A1 = \frac{1.5 + 4.5}{2} \times 3 = 9.00 \text{ m}^2$$

A2 = 0.5 x 1 x 1 = 0.50 m²

Total A = 9.50 m²

Vol. = 9.50 x 5.40 = 48.60 m³

(c) H = 3.50 m, L = 1 + 1 = 2.00 m

$$A1 = \frac{1.75 + 5.25}{2} \times 3.5 = 12.25 \text{ m}^2$$

A2 = 0.5 x 1 x 1 = 0.50 m²

Total A = 12.75 m²

Vol. = 12.75 x 2 = 24.50 m³

Total Excavation for Wing Wall:

Vol. = 13.75 + 13.50 + 48.60 + 24.50 = 100.350 m³

Total Volume Excavation:

Vol. = 227.82 + 100.35 = 328.17 m³

7. Back Filling

- For Box Culvert

= 227.82 – (2.85 x 2.70 x 9) = 158.565 m³

- For Wing Wall

= 100.35 – (0.9 x 5) – (1.6 x 3) – (3.6 x 5.4)

- (4.9 x 2) = 61.81 m³

Total Back Filling

= 158.565 + 61.81 = 220.375 m³

8. PVC Weep Hole: Ø 50 mm

Number of Hole/ m length	= 7 holes		
Length of Revetment	= 13 m		
Total hole	= 10 x 2 x 7	=	140 holes

9. Log Pile Ø 150, L = 3,000

Length of Str.	= 6.5 + 2.0 x 2 + 5.0	=	15.50 m
Log Pile	= 15 x 2 x 3.0	=	90 m³

10. Cobble Stone

Section 1 – 1	= (3.0 + 2.0) x 1.70 x 0.15	=	1.275 m³
Section 2 – 2	= (1.5 + 1.5) x 2.20 x 0.15	=	0.990 m³
Section 3 – 3	= (3.0 + 2.2) x 3.20 x 0.15	=	2.496 m³
Section 4 – 4	= (1.0 + 1.0) x 3.70 x 0.15	=	1.100 m³
Total		=	5.871 m³

11. Pointing

$= \sqrt{3.4^2 + 6.8^2} \times (8.5 + 11) = 148.25 \text{ m}^2$

Name of Structure	BARU CONVEYANCE CHANNEL INLET	Category Calculation	FORM WORK	Page	14 / 17

FORM WORK

1. Wall:	2.75 m x 2 x 8.6 m	=	47.30 m²
	1.70 m x 2 x 8.6 m	=	29.24 m²
	0.45 m x 4 x 9.00 m	=	16.20 m²
	Sub Total	=	92.74 m²
2. Top Slab:	1.70 m x 9.00 m	=	15.30 m²
3. Wing Wall:			
	(5) 2.5 m x 4.10 m x 4	=	41.00 m²
	(6) $\frac{2.5\text{ m} + 1.5\text{ m}}{2}$ x 0.75 m x 4	=	6.00 m²
	(7) 0.75 m x 2.00 m x 2	=	3.00 m²
	(8) 1.30 m x 2.00 m x 2	=	7.20 m²
	Sub Total	=	57.20 m²
Total	= 92.74 + 15.30 + 57.20	=	164.94 m²
4. Concrete for Revetment			
Top Concrete			
	(0.55 m + 0.70 m) x 7.5 x 2	=	18.75 m²
	0.1 m x 2 x 7.5 m x 2	=	3.00 m²
Base Concrete			
	(0.5 + 0.55) x 10 x 2	=	21.00 m²
	0.1 m x 2 x 10 x 2	=	4.00 m²
Partition Wall			
	0.5 x 2 x 6.5 x 2	=	13.10 m²
	0.1 m x 2 x 6.5 x 2	=	2.60 m²
Total		=	61.775 m²
Grand Total	= 164.94 + 61.775	=	226.675

SUMMARY OF SCAFOLDING AND FORM SUPPORT VOLUME, FOR BANDARHARJO DRAINAGE SYSTEM

No.	VOLUME / STRUCTURE	SCAFOLDING (m^2)	FORM SUPPORT (m^3)
1	BARU PUMPING STATION	1,049	549
2	BARU PUMPING STATION GATE	350	120
3	BARU CONVEYANCE CHANNEL	6,574	2,768
4	BARU CONVEYANCE CHANNEL INLET STRUCTURE	150	35
5	BARU CONVEYANCE CHANNEL OUTLET STRUCTURE	106	20
6	BANDARHARJO EAST SECONDARY CHANNEL	1,166	491
7	BANDARHARJO EAST SECONDARY CHANNEL OUTLET STRUCTURE	90	31
8	BARU RETARDING POND INLET STRUCTURE No. 1	-	77
9	BARU RETARDING POND INLET STRUCTURE No. 2	-	42
10	FUEL TANK BOX FOR BARU PUMPING STATION	133	62
TOTAL		9,618	4,195

Name of Structure	BARU CONVEYANCE CH. INLET STR.; FOR SCAFFOLDING AND FORM SUPPORT	Category of calculation	VOLUME CALCULATION	Page	16 / 17

1. SCAFFOLDING AREA

   A. Box Culvert

   $\{(2 \times 2.75) + (2 \times 2.0)\} \times 8.65 = 82.175\ m^2$

   B. Wing Wall

   $(8 \times 4.85 - 2 \times 2.0) + (2 \times 2.5 \times 4.85)$

   $+ (3.0 \times 1.55) + (2 \times 0.35 \times 4.85) = 67.06\ m^2$

   Total $= 149.235\ m^2$

2. FORM SUPPORT

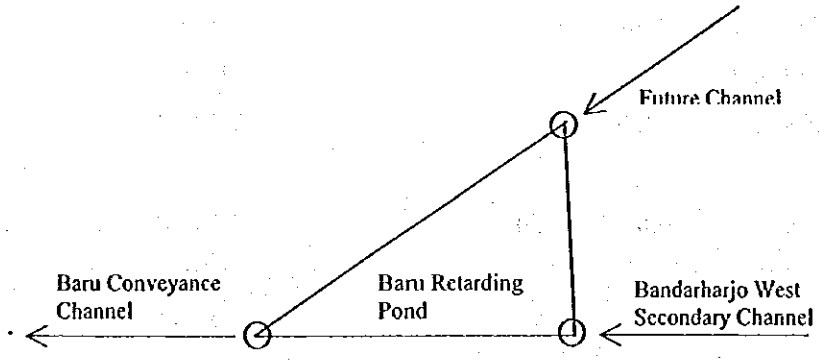
   $2.0 \times 2.0 \times 8.65 = 36.60\ m^3$

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	CONCRETE VOLUME	Page	1 / 11

OUTLET WORK OF FUTURE SECONDARY CHANNEL

1.	CONCRETE K 225	=	15.07 m^3
2.	LEVELING CONCRETE	=	1.28 m^3
	FORM WORK FOR LEVELING CONCRETE	=	4.4 m^2
3.	REINFORCING BAR	=	837 Kg
4.	STONE MASONRY	=	137 m^3
5.	BACK FILL GRAVEL	=	17.5 m^3
6.	STRUCTURE EXCAVATION	=	378 m^3
7.	BACK FILLING	=	208.63 m^3
8.	LOG PILE Ø 15 cm, L=3.0 m	=	156 m'
9.	WEEP HOLE PVC Ø 50 cm	=	42 nos.
10.	FORM WORK	=	95.91 m^2
11.	COBBLE STONE	=	5.57 m^3

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	CONCRETE VOLUME	Page	2 / 11



Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	CONCRETE VOLUME	Page	3 / 11

CONCRETE K 225

Slab

- Area of Slab = 2.60 x 9.0 = 23.40 m²
- Thickness of Slab = 0.40 m
- Volume of Slab = 23.40 x 0.40 = 9.40 m³

Parapet Wall

- Area of Parapet = 0.8 x 2 x 2.60 = 4.16 m²
- Thickness of Parapet = 0.30 m
- Volume of Parapet = 0.3 x 4.16 = 1.25 m³

Concrete K 225 for Revetment

- Top Concrete:

A = $\frac{0.55 + 0.70}{2} \times 0.30$ = 0.188 m²

L = 6.50 x 2 = 13.00 m

Volume = 13.00 x 0.188 = 2.44 m³

- Base Concrete:

A = $\frac{0.50 + 0.30}{2} \times 0.30$ = 0.12 m²

0.20 x 0.50 = 0.10 m²

Total A = 0.12 + 0.10 = 0.22 m²

L = 4.50 x 2 = 9.00 m

Volume = 9.00 x 0.22 = 1.98 m³

Total Volume = 2.44 + 1.98 = 4.42 m³

Total Volume Concrete K 225

= 9.4 + 1.25 + 4.42 = 15.07 m³

2. PLAIN CONCRETE

0.1 x 0.5 x 13 + 0.1 x 0.7 x 9 = 1.28 m³

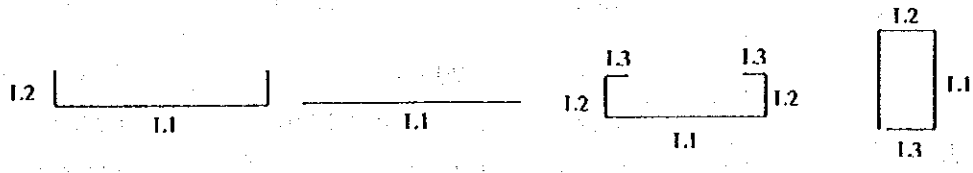
Form work for Leveling Concrete

= 0.1 x 2 x (13 + 9) = 4.4 m²

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	REINFORCING BAR VOLUME	Page	4 / 11

3. REINFORCING BAR

Slab Reinforcing

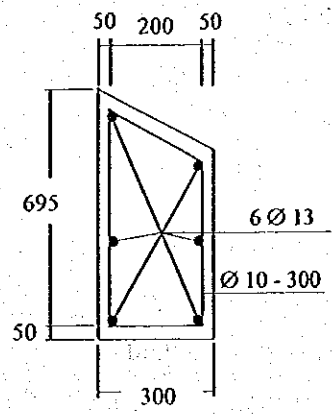


Shape 1 Shape 2 Shape 3 Shape 4

Type	Dia	Length (mm)	Number	Weight/m kg/m	Weight/bar (kg)	Weight (kg)	Shape
S1	13	3,060	71	1.040	3.182	225.95	1
S2	13	2,620	37	1.040	2.725	100.817	2
S3	13	8,820	20	1.040	9.173	183.46	2
S4	13	400	12	1.040	0.416	4.99	3
S5	13	2,040	20	1.040	2.121	42.432	4
						TOTAL = 557.65 kg	

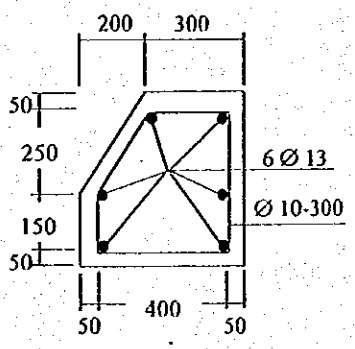
C. Concrete for Revetment Baru Retarding Pond

1. Top Concrete



Type	Dia (mm)	Length (m)	No.	Weight Per m	Weight Per Bar	Total (kg)
1	13	13	6 x 2	1.040	13.52	27.04
2	10	1.56	44x2	0.617	0.963	83.5
					Total =	110.54

2. Base Concrete



Type	Dia (mm)	Length (m)	No.	Weight Per m	Weight Per Bar	Total (kg)
1	13	9	6 x 2	1.040	9.36	112.32
2	10	1.56	31x2	0.617	0.932	55.92
					Total =	168.24

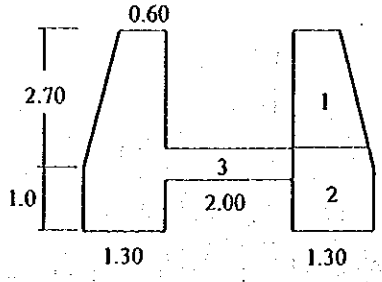
Total Reinforcing Bar

557.65 + 110.54 + 168.24 = 836.43 kg

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	STONE MASONRY VOLUME	Page	5 / 11

4. STONE MASONRY

- For Culvert



Area 1 = $\frac{0.60 + 1.30}{2} \times 2.70$ = 2.565 m²

Area 2 = 1.00 x 1.3 = 1.30m²

A1.2 = 2 x (2.565 + 1.30) = 7.73 m²

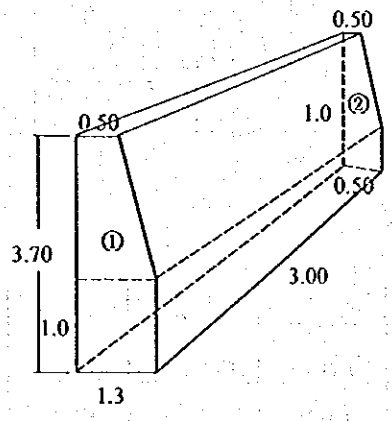
Area 3 = 0.3 x 2 = 0.60 m²

Total A = 7.73 + 0.60 = 8.33 m²

Length of Structure = 9.00 m

Volume = 9 x 8.33 = 74.97 m³

- For Wing Wall



Area 1 = $\frac{0.50 + 1.30}{2} \times 2.70$ = 2.43 m²

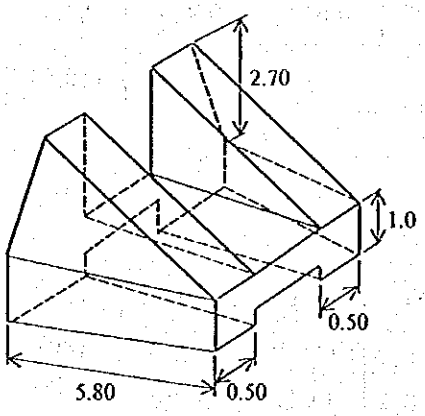
1 x 1.30 = 1.30 m²

Total Area 1 = 3.73 m²

Area 2 = 0.5 x 1.0 = 0.50 m²

Volume = $\frac{3.73 + 0.50}{2} \times 3.00 \times 2$ = 12.690 m³

Transition Outlet



Area 1 = 8.06 m²

Area 2 = 0.5 x 1 x 2 = 1.00 m²

0.3 x 2.00 = 0.60 m²

Total Area 2 = 1.60 m²

Volume = $\frac{8.06 + 1.60}{2} \times 5.80$ = 28.01 m³

- Revetment:

1. $\frac{3 + 6.5}{2} \times 2 \times 0.3$ = 5.85 m³

2. $\frac{2.46 + 7.17}{2} \times 2.5 \times 2 \times 0.30$ = 7.221 m³

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	STONE MASONRY VOLUME	Page	6 / 11

3. $\frac{2.8+4.2}{2} \times 5.04 \times 0.3 \times 2$ = 7.56 m³

Sub Total = 20.631 m³

Total Volume Stone Masonry

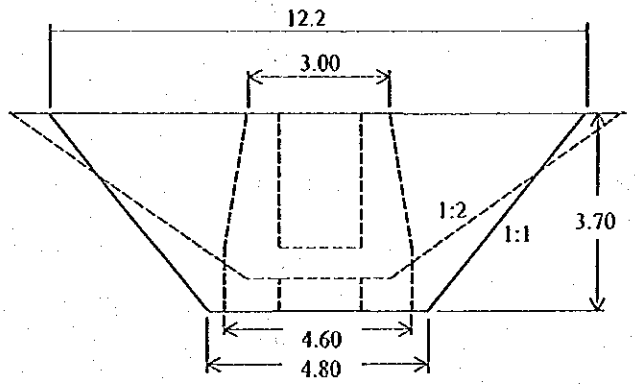
= 74.97 + 12.69 + 28.8 + 20.631 = 137.091 m³

5. BACK FILLING GRAVEL:

$\frac{20.631}{2} \times 0.25$ = 17.193 m³

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	EXCAVATION VOLUME	Page	7 / 11

6. EXCAVATION



Area = (4.8 + 12.2) / 2 x 3.70 = 31.45 m²

Length of Excavation = 12.00 m

Volume = 15.75 x 27.39 = 377.40 m³

7. BACK FILLING

Area Structure = $\frac{3+4.6}{2} \times 3.70$ = 14.06

Length = 12 m

Vol. of Structure = 14.06 x 9 = 126.54 m³

Vol. Back Filling = 31.45 x 12 – 168.70 = 208.63 m³

8. PVC WEEP HOLE, Ø 50 mm, n = 6 x 7 = 42 holes

Length = 42 x 0.7 m = 30 m

9. LOG PILE Ø 150, L = 3,000

2 x 2 x (9 / 1.0 + 1) x 3.0 = 120 m

2 x (5.5 x 1.0 + 1) x 0.3 = 36 m

Total = 120 + 36 = 156 m

10. COBBLE STONE

- Length of Str. = 9 + 5.5 = 14.5 m
- Cobble Stone = 2 x 1.5 x 9 x 0.15 = 4.05 m³

$2 \times \left(\frac{1.5+0.35}{2}\right) \times 5.5 \times 0.15$ = 1.53 m³

Total = 4.05 + 1.53 = 5.57 m³

Name of Structure	OUTLET OF FUTURE SECONDARY CHANNEL	Category Calculation	FORM WORK VOLUME	Page	8 / 11

11. Form Work

a. Slab Concrete

2.00 m x 9.00 m	=	18.00 m²
1.20 m x 2.60 x 2	=	6.24 m²
0.30 m x 2.60 x 2	=	4.16 m²
Sub Total	=	28.40 m²

b. Concrete for Revetment

- Top Concrete

(0.695 + 0.95) x 13 x 2	=	32.37 m²
0.10 x 2 x 13 x 2	=	5.20 m²
Sub Total	=	37.57 m²

- Base Concrete

(0.55 + 0.5) x 13 x 2	=	27.3 m²
0.10 x 2 x 6.6 x 2	=	2.64 m²
Sub Total	=	29.94 m²

Total Form Work

28.40 + 37.57 + 29.94	=	95.91 m²

SUMMARY OF SCAFOLDING AND FORM SUPPORT VOLUME, FOR BANDARHARJO DRAINAGE SYSTEM

No.	VOLUME / STRUCTURE	SCAFOLDING (m^2)	FORM SUPPORT (m^3)
1	BARU PUMPING STATION	1,049	549
2	BARU PUMPING STATION GATE	350	120
3	BARU CONVEYANCE CHANNEL	6,574	2,768
4	BARU CONVEYANCE CHANNEL INLET STRUCTURE	150	35
5	BARU CONVEYANCE CHANNEL OUTLET STRUCTURE	106	20
6	BANDARHARJO EAST SECONDARY CHANNEL	1,166	491
7	BANDARHARJO EAST SECONDARY CHANNEL OUTLET STRUCTURE	90	31
8	BARU RETARDING POND INLET STRUCTURE No. 1	-	77
9	BARU RETARDING POND INLET STRUCTURE No. 2	-	42
10	FUEL TANK BOX FOR BARU PUMPING STATION	133	62
TOTAL		9,618	4,195

Name of Structure	BARU RETARDING POND INLET STRUCTURE NO.2 FOR SCAFFOLDING AND FORM SUPPORT	Category Calculation	WORK VOLUME	Page	10 / 11

1. SCAFFOLDING AREA

---

2. FORM SUPPORT AREA

9.0 x 2.0 x 2.30 = 41.40 m³

Name of Structure	BARU CONVEYANCE CHANNEL (BOX CULVERT)	Category of calculation	SUMMARY	Page	1 / 1

SUMMARY OF CHANNEL WORK AND INSPECTION ROAD VOLUME CALCULATION

I. CHANNEL WORKS

1.	Dewatering	=	LS	
2.	Structure Excavation	=	14,030	m^3
3.	Structure Excavation with Shoring	=	8,544	m^3
4.	Bock Fill with Sandy Soil	=	16,110	m^3
5.	Concrete Structure (Type C1)	=	2981.5	m^3
6.	Leveling concrete (Type E)	=	240.63	m^3
7.	Water Stop with Rubber Filler	=	381.50	m'
8.	Form Work for Concrete Type C1	=	10,989.43	m^2
9.	Form work for Concrete Type E	=	166	m^2

II. REINFORCING BAR

1.	Box Culvert = 79650 + 54450	=	134,100	kg
2.	Man Hole Block Type A	=	25,710	kg
3.	Man Hole Block Type B	=	65,410	kg
		=	225,220	kg

III. INSPECTION ROAD

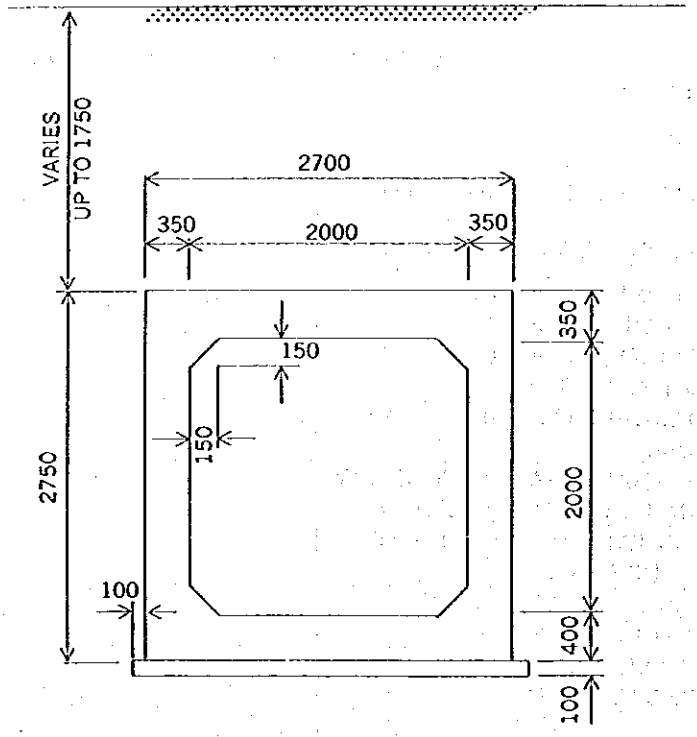
1.	Embankment	=	1,944	m^3
2.	Sand Bedding	=	79	m^3
3.	Concrete Conbloc	=	1,315	m^2
4.	Cement Mortar	=	3	m^3
5.	Concrete Kerb	=	32	m^3
6.	Aggregate Class A	=	225	m^3

Name of Structure	SCAFFOLDING AND FORM SUPPORT, FOR BANDAR-HARJO DRAINAGE SYSTEM	Category of calculation	WORK VOLUME	Page	1 / 1

SUMMARY SCAFFOLDING AND FORM SUPPORT VOLUME, FOR BANDARHARJO DRAINAGE SYSTEM

No.	VOLUME / STRUCTURE	SCAFFOLDING (m^2)	FORM SUPPORT (m^3)
1	BARU PUMPING STATION	1,049	549
2	BARU PUMPING STATION GATE	350	120
3	BARU CONVEYANCE CHANNEL	6,574	2,768
4	BARU CONVEYANCE CHANNEL INLET STRUCTURE	150	35
5	BARU CONVEYANCE CHANNEL OUTLET STRUCTURE	106	20
6	BANDARHARJO EAT SECONDARY CHANNEL	1,166	491
7	BANDARHARJO EAST SECONDARY CHANNEL OUTLET STRUCTURE	90	31
8	BARU RETARDING POND INLET STRUCTURE No. 1	-	77
9	BARU RETARDING POND INLET STRUCTURE No. 2	-	42
10	FUEL TANK BOX FOR BARU PUMPING STATION	133	62
TOTAL		9,618	4,195

Name of Structure	BARU CONVEYANCE CHANNEL SCAFFOLDING AND FORM SUPPORT	Category of calculation	WORK VOLUME	Page	1 / 1



GENERAL CROSS SECTION
SCALE A

Length of Box Culvert = 692 m

1. Scaffolding area = (2 x 2.75 + 2 x 2.0) x 692 = 6,574 Sq.m
2. Support area = 2.0 x 2.0 x 692 = 2,768 Sq.m

Package 3: I Bandarharjo East Secondary Channel

(25)

Name of Structure	BANDARHARJO EAST SECONDARY CHANNEL	Category of calculation	WORKS VOLUME	Page	1/7

BANDARHARJO EAST SECONDARY CHANNEL
SUMMARY OF CHANNEL WORK VOLUME CALCULATION

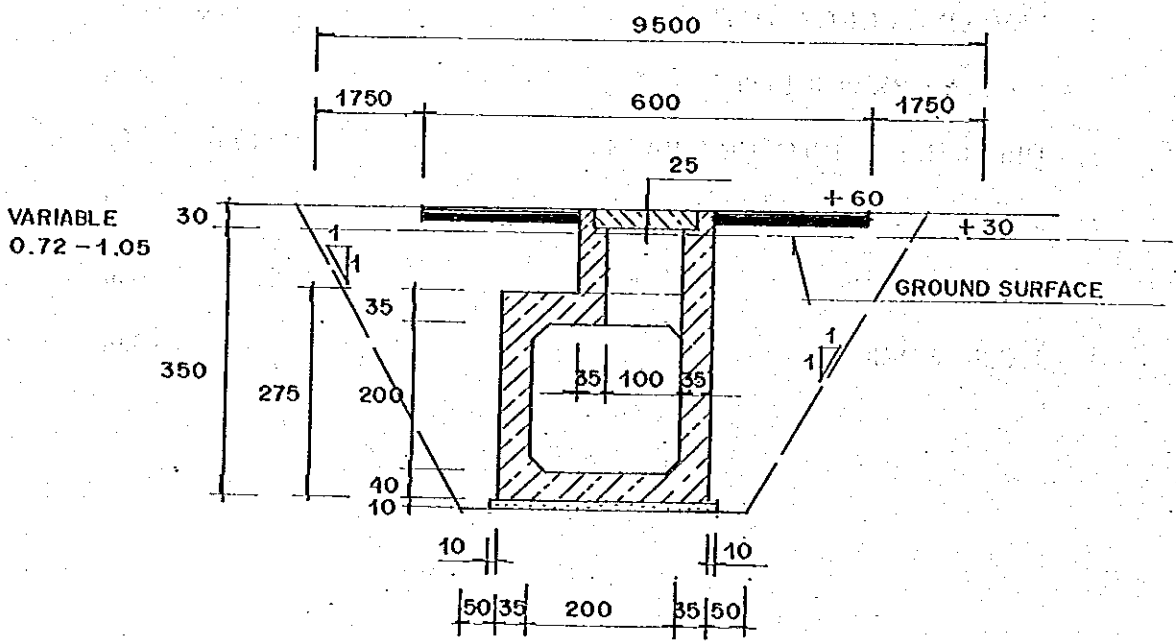
1.	STRUCTURAL EXCAVATION	=	3,136.21	cu.m	✓
2.	BACK FILL WITH SANDY SOIL	=	2,954.70	cu.m	
3.	CONCRETE TYPE C1	=	439.45	cu.m	✓
	FORM WORK FOR TYPE C1	=	1,554.49	sq.m	
4.	LEVELING CONCRETE TYPE E	=	35.64	cu.m	✓
	FORM WORK FOR TYPE E	=	24.54	sq.m	
5.	DEFORMED REINFORCING BARS	=	32,875	Kg	✓
6.	WATER STOP, W = 200	=	65	m'	✓
7.	SCAFFOLDING	=	1,166	sq.m	
8.	FALSE WORK	=	491	cu.m	

I2/P3

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	CHANNEL WORK VOLUME	Page	2/12

I. CHANNEL WORKS

1. Dewatering = LS
2. Channel Excavation
3. Structure Excavation



Length of Channel = 122.70 m

$$\text{Volume} = \left(\frac{3.70+10.70}{2}\times 3.50\times 122.7\right)+\left(\frac{3.70+3.50}{2}\times 0.10\times 122.7\right)$$

$$V = 3092.04 + 44.17 = 3136.21 \text{ m}^3 \checkmark$$

4. Back Fill with Sandy Soil

$$\text{Volume} = V_{EXC} - V_{STRUCTURE}$$

$$= 3136.21 - [(2.70 \times 2.75 \times 122.70) + (1.70 \times 0.885 \times 1.70) \times 11] + (0.30 \times 7.00 \times 122.70)$$

$$= 3136.212 - (911.048 + 28.134) + 257.67$$

$$= 3136.212 - 939.182 + 257.67$$

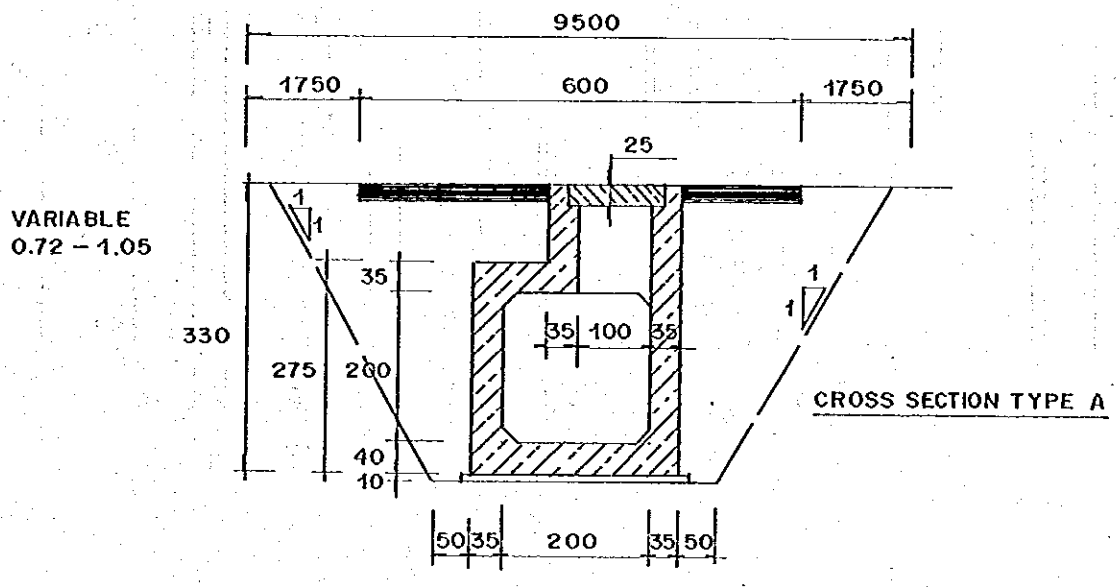
$$V = 2454.700 \text{ m}^3$$

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	CHANNEL WORK VOLUME	Page	3/7

5a. Wet Masonry

5b. Concrete Structure

- Cross Section = Type A
- Length of Channel = 122.70 m



Wide = A_1 = 2.70 x 2.75 = 7.425 m^2

A_2 = 2.00 x 200 = 4.00 m^2

Volume = (7.425 – 4.00) x 122.70 + [(1.70 x 1.70) – (1.00 x 1.00)] x 0.885 x 11 + (1.30 x 1.30 x 0.25) x 11 – (1.00 x 1.00 x 0.35) x 11

= 420.248 + 18.399 + 4.648 – 3.850

V = 439.445 m^3

5b. ~~Concrete Structure~~ leveling concrete

Volume = (2.70 + 0.20) x 0.10 x 122.90

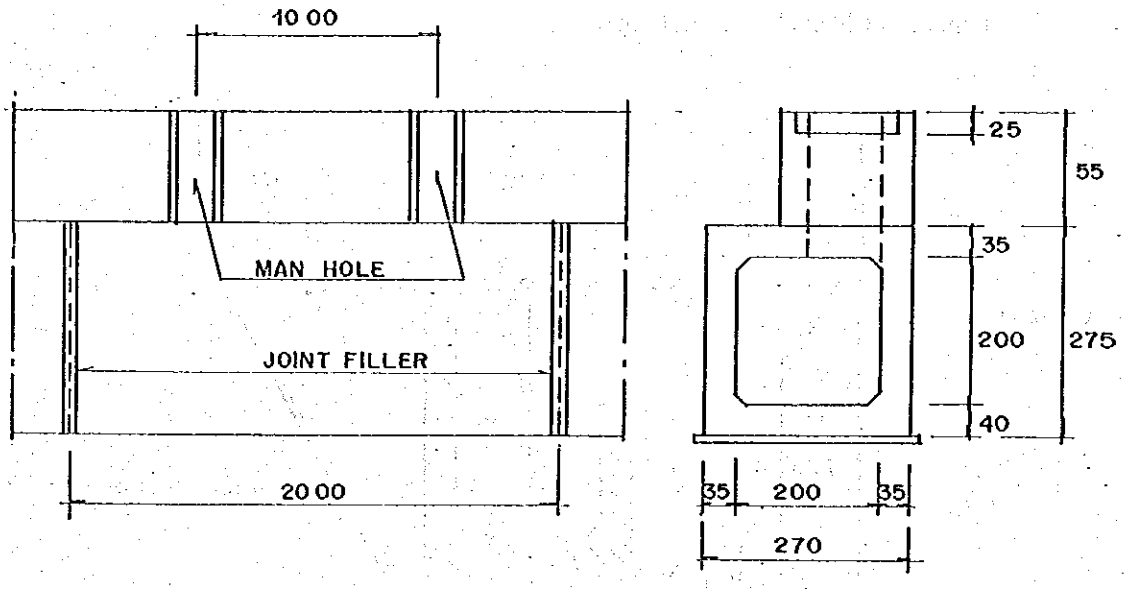
= 35.641 m^3

6. Mortar = _____

7. Pointing = _____

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	CHANNEL WORK VOLUME	Page	4/7

8. Water Stop with Rubber Filler :



Length of Joint Filler = (2.75 x 2) + (2.70 x 2) = 10.90 m'

Number = 6

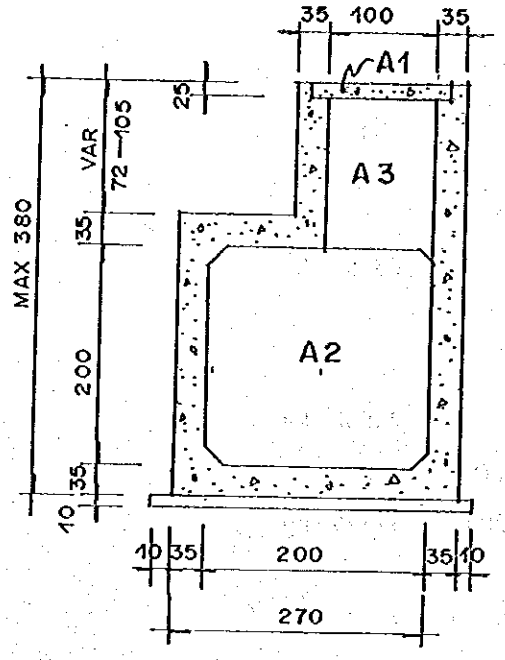
Total Length = 10.90 x 6 = 65.40 m

9. Weep Hole = ___

10. Palm Fiber = ___

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	FORM VOLUME	Page	7.1.

- CONCRETE STRUCTURE FORM WORK.



for bending concrete

Wide :

A_1 = (0.10 x 122.70) x 2 = 24.54 m² ✓

A_2 = [(2.75 x 2) + (2.00 x 3)] x 122.70 – (1.00 x 1.00) x 11 ✓

A_2 = 1411.05 – 11 = 1400.05 m² ✓

A_3 = [(1.70 x 1.05)x 4 + (1.00 x 1.40) x 4] x 11

= (7.14 + 5.60) x 11 = 140.14 m²

A_4 = (1.30 x 0.25) x 4 x 11

A_4 = 14.30 m²

Length of concrete L = 122.70 m

Total for volume A = ~~24.54~~ + 1400.05 + 140.14 + 14.30

= ~~1579.03~~ m²

1554.49

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING MAN HOLE VOLUME	Page	1 / 12

SUMMARY REINFORCING BAR MAN HOLE TYPE A AND BOX CULVERT (STANDARD)

- Number man hole (Type A) = 11 pieces
- Length of Box Culvert = 104 m'

- Total Bar Weight of Man Hole Type A (Block) :

  = 11 x 625 = 6875 kg

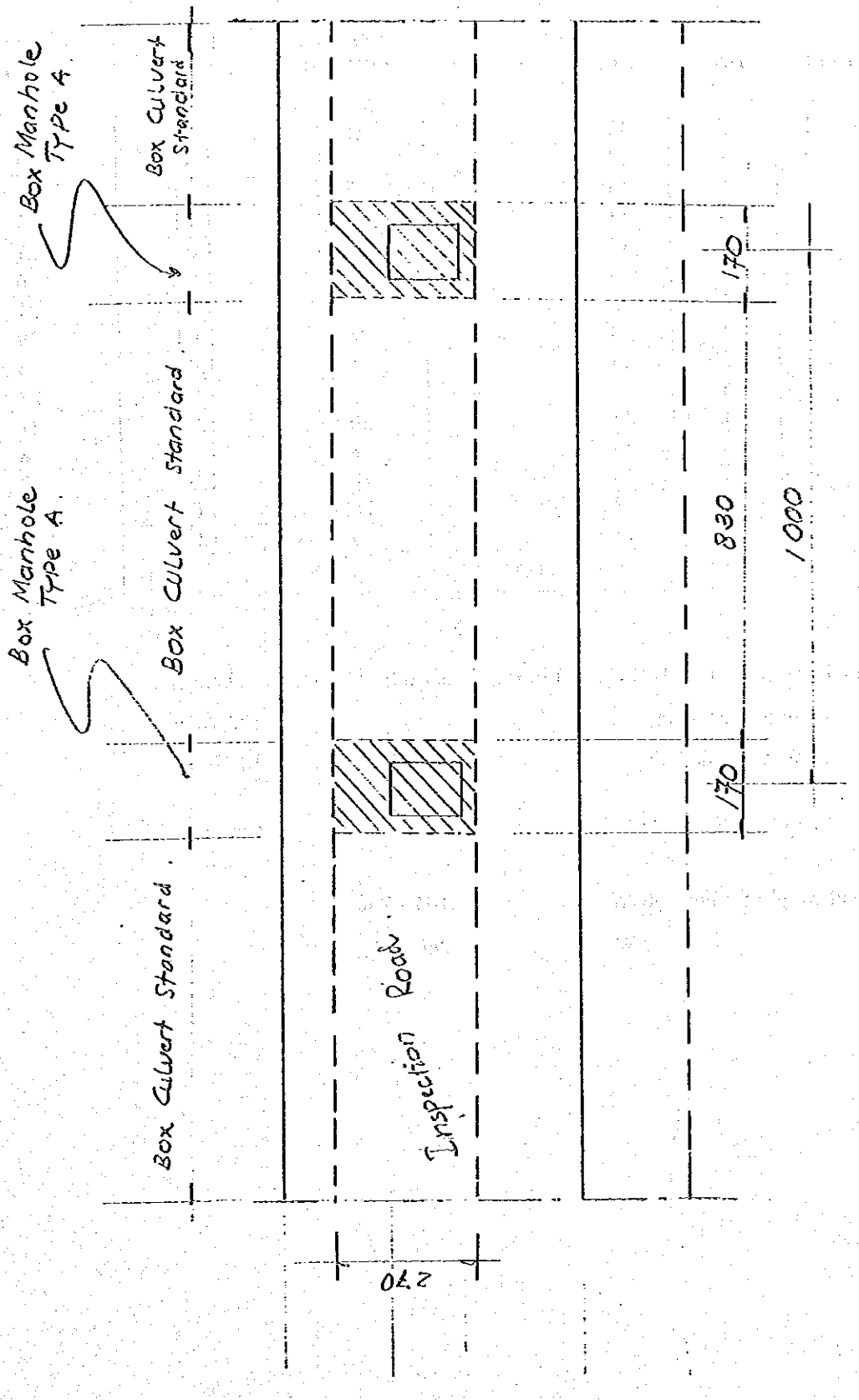
- Total Bar Weight of Box Culvert (Standard) :

  = 104 x 250 = 26000 kg

- Total Bar Weight of Man Hole Type A and Box Culvert (Standard) :

  = 6875 + 26000 = 32875 kg

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	PLAN MAN HOLE TYPE A	Page	1./ 12.



Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING BOX CULVERT VOLUME	Page	3 / 12

BAR WEIGHT FOR STANDARD BOX CULVERT / m'

TYPE	SHAPE	DIA	NUMBER	TOTAL LENGTH (m)	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
S 1	5	13	4	21.52	1.04	22
2	1	13	8	20.16	1.04	21
3	6	13	8	7.76	1.04	8
4	4	13	8	18.40	1.04	19
5	1	13	20	20.00	1.04	21
6	3	13	6	5.22	1.04	6
W 1	1	13	8	20.40	1.04	21
2	1	13	28	28.00	1.04	29
3	2	13	12	4.80	1.04	5
F 1	5	13	4	21.72	1.04	23
2	1	13	8	20.16	1.04	21
3	6	13	8	8.08	1.04	8
4	4	13	8	18.00	1.04	19
5	1	13	20	20.00	1.04	21
6	3	13	6	5.52	1.04	6
TOTAL						250 kg

- Total Bar Weight for Box Culvert in Bandarharjo East Secondary channel :
  - Length of channel = _____ = 122.70 m
  - Length of man hole = 11 x 1.70 = 18.70 m
  - Length of standard box culvert = 104.00 m

- Total weight for box culvert = 104 x 250

  ΣW = 26000 kg

BAR WEIGHT FOR ONE BLOCK MAN HOLE TYPE A

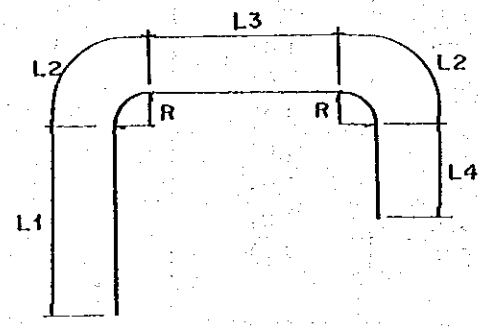
TYPE	SHAPE	DIA	NUMBER	TOTAL LENGTH (m)	UNIT WEIGHT (Kg/m)	TOTAL WEIGHT (Kg)
S 1	5	13	4	28.424	1.04	30
2	1	13	8	17.952	1.04	19
3	6	13	8	6.596	1.04	7
4	4	13	8	15.640	1.04	16
5	1	13	20	22.000	1.04	23
6	3	13	6	3.654	1.04	4
W 1	1	13	8	34.680	1.04	36
2	1	13	28	47.600	1.04	50
3	2	13	12	8.160	1.04	9
F 1	5	13	4	36.924	1.04	38
2	1	13	8	34.272	1.04	36
3	6	13	8	13.736	1.04	14
4	4	13	8	30.600	1.04	32
5	1	13	20	34.000	1.04	35
6	3	13	6	9.384	1.04	10
M 1	3	13	4	30.080	1.04	31
2	3	13	3	16.200	1.04	17
3	5	13	33	86.790	1.40	91
4	4	13	15	22.750	1.04	24
5	7	13	13	25.090	1.04	26
6	7	13	13	21.710	1.04	23
7	1	13	4	3.500	1.04	4
8	1	13	4	4.800	1.04	5
C 1	2	19	7	12.460	2.23	28
2	1	13	4	5.120	1.04	5
3	1	13	5	3.050	1.04	3
4	2	13	5	5.550	1.04	6
5	6	19	2	1.540	2.23	3
TOTAL						625 kg

- Bar Shorted Consequent for One Man Hole
  - S_1 = (1.00 + 2 x 0.10) x 4 = 4.8 m
  - S_2 = 1.20 x 8 = 9.60 m
  - S_3 = 0.970 x 4 = 3.88 m
  - S_4 = 2.30 x 4 = 9.20 m
  - S_5 = (1.20 x 10) = 12.00 m
  - S_6 = 0.870 x 6 = 5.22 m

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING MAN HOLE VOLUME	Page	5/12

- Reinforcing Bar for One Block Man Hole
  - S_1 = (5.380 x 4) – 4.80 = 16.72 x 1.70 = 28.424 m
  - S_2 = (2.52 x 8) – 9.60 = 10.56 x 1.70 = 17.952 m
  - S_3 = (0.970 x 8) – 3.88 = 3.88 x 1.70 = 6.596 m
  - S_4 = (2.30 x 8) – 9.20 = 9.20 x 1.70 = 15.640 m
  - S_5 = (1.70 x 20) – 12.00 = 22.000 m
  - S_6 = (0.870 x 6) x 1.70 – 5.22 = 3.654 m
  - W_1 = 2.55 x 8 x 1.70 = 34.680 m
  - W_2 = 1.00 x 28 x 1.70 = 47.600 m
  - W_3 = 0.40 x 12 x 1.70 = 8.160 m
  - F_1 = 5.43 x 4 x 1.70 = 36.924 m
  - F_2 = 2.52 x 8 x 1.70 = 34.272 m
  - F_3 = 1.01 x 8 x 1.70 = 13.736 m
  - F_4 = 2.25 x 8 x 1.70 = 30.600 m
  - F_5 = 1.70 x 20 = 34.000 m
  - F_6 = 0.920 x 6 x 1.70 = 9.384 m

- S_1 (Shape : 5) : D.13



Length of Bar :

L_1 = ½ (275 – 10) + 30 ϕ – R

= 132.50 + 39 – 14 = 157.5 cm

L_1 = 1.575 m

$L_2 = \frac{2\pi R}{4}$ = ½ x 3.14 x 14

L_2 = 21.98 cm = 0.220 m'

L_3 = (270 – 18) – 2R

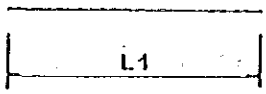
L_3 = 252 – 28 = 224 cm = 2.240 m

L_4 = ½ (275 – 23) – R = 126 – 14 = 112 cm = 1.120 m

Total length = ΣL = 1.575 + 0.22 x 2 + 2.24 + 1.12

L = 5.375 m ~ 5.380 m

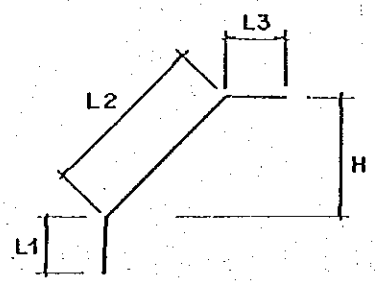
- S_2 (Shape : 1) : D.13



Length of Bar :

$L_1 = 270 - 18 = 252$ cm $= 2.52$ m

- S_3 (Shape : 6) : D.13



Length of Bar :

$L_1 = 10$ cm $= 0.10$ m

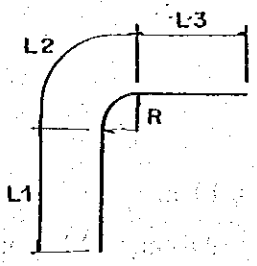
$L_2 = \sqrt{2H^2} = \sqrt{2 \times (54.3)^2} = 76.80$ cm

$L_2 = 0.768$ m

$L_3 = 10$ cm $= 0.10$ m

Total length $= \Sigma L = 0.10 + 0.768 + 0.10 = 0.968$ m ~ 0.970 m

- S_4 (Shape : 5) : D.13



Length of Bar :

$L_1 = \frac{1}{2}(275 - 24) - R = 125.5 - 14$

$= 111.5$ cm $= 1.115$ m

$L_2 = \frac{2\pi R}{4} = \frac{1}{2} \times 3.14 \times 14 = 21.98$ cm

$L_2 = 22.0$ cm $= 0.220$ m

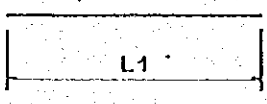
$L_3 = \frac{1}{2}(270 - 23) - 2R = 123.5 - 28$

$L_3 = 95.5$ cm $= 0.955$ m

Total length of bar $= \Sigma L = 1.115 + 0.22 + 0.955$

$= 2.29$ m ~ 2.30 m

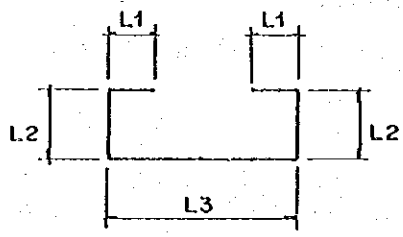
- S_5 (Shape : 1) : D.13



Length of Bar :

$L_1 = 100$ cm $= 1.00$ m/m'

- S_6 (Shape : 3) : D.13



Length of Bar :

L_1 = 10 cm = 0.10 m

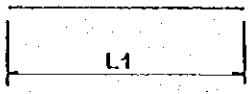
L_2 = $17 + 2\phi$ = 19.6 cm = 0.196 m

L_3 = $(35 - 10) + 2\phi$ = 27.6 cm = 0.276 m

Total length = $\Sigma L = 2 \times (0.10 + 0.196) + 0.276$

= 0.868 m ~ 0.870 m

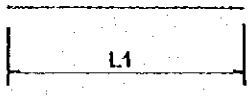
- W_1 (Shape : 1) : D.13



Length of Bar :

L_1 = 275 – 20 = 255 cm = 2.55 m

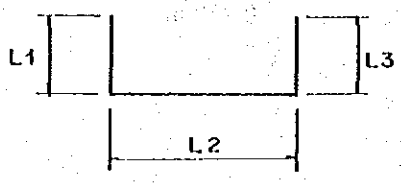
- W_2 (Shape : 1) : D.13



Length of Bar :

L_1 = 100 cm = 1.0 m

- W_3 (Shape : 2) : D.13



Length of Bar :

L_1 = 10 cm = 0.10 m

L_2 = $17 + 2\phi$ = 19.6 cm = 0.196 m

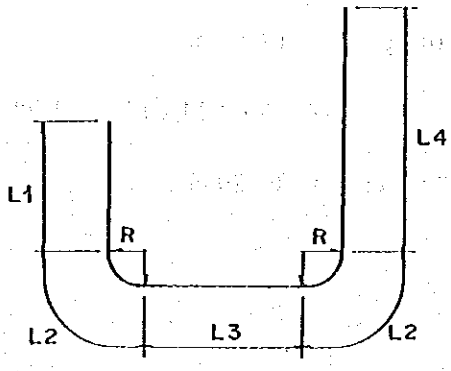
L_3 = 10 cm = 0.10 m

Total length = ΣL = 0.10 + 0.196 + 0.10

L = 0.396 m ~ 0.40 m

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING BOX CULVERT VOLUME	Page	8/12

- F_1 (Shape : 5) : D.13



Length of Bar :

$L_4 = \frac{1}{2}(275 - 10) + 30\phi - R$

$= 132.50 + 39 - 14 = 157.5$ cm

$L_4 = 1.575$ m ~ 1.600 m

$L_2 = \frac{2\pi R}{4} = \frac{1}{2} \times 3.14 \times 14$

$L_2 = 21.98$ cm $= 0.220$ m'

$L_3 = (270 - 18) - 2R$

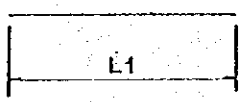
$L_3 = 252 - 28 = 224$ cm $= 2.240$ m

$L_1 = \frac{1}{2}(275 - 18) - R = 128.50 - 14 = 114.50$ cm $= 1.145$ m

Total length $= \Sigma L = 1.600 + 0.22 \times 2 + 2.24 + 1.145$

$L = 5.425$ m ~ 5.430 m

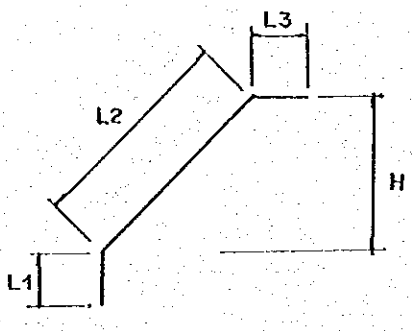
- F_2 (Shape : 1) : D.13



Length of Bar :

$L_1 = 270 - 18 = 252$ cm $= 2.52$ m

- F_3 (Shape : 6) : D.13



Length of Bar :

$L_1 = 10$ cm $= 0.10$ m

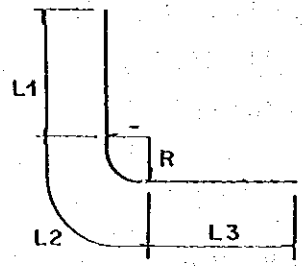
$L_2 = \sqrt{2H^2} = \sqrt{2 \times (56.8)^2} = 80.5$ cm

$L_2 = 0.803$ m

$L_3 = 10$ cm $= 0.10$ m

Total length $= \Sigma L = 0.10 + 0.803 + 0.10 = 1.003$ m ~ 1.010 m

- F_4 (Shape : 5) : D.13



Length of Bar :

$L_1 = \frac{1}{2}(275 - 18) - 1\frac{1}{2}R = 128.5 - 21$

$L_1 = 107.5 \text{ cm} = 1.075 \text{ m}$

$L_2 = \frac{2\pi R}{4} = \frac{1}{2} \times 3.14 \times 14 = 21.98 \text{ cm}$

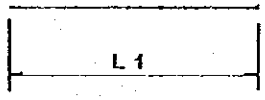
$L_2 = 22.0 \text{ cm} = 0.220 \text{ m}$

$L_3 = \frac{1}{2}(270 - 23) - 2R = 123.5 - 28 = 95.5 \text{ cm}$

$L_3 = 0.955 \text{ m}$

Total length of beam= $\Sigma L = 1.075 + 0.22 + 0.955 = 2.25 \text{ m}$

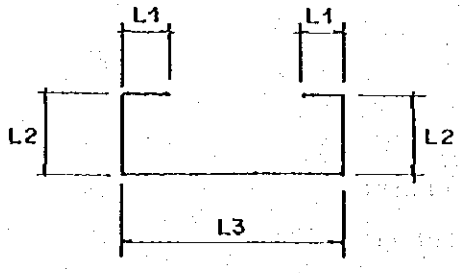
- F_5 (Shape : 1) : D.13



Length of Bar :

$L_1 = 100 \text{ cm} = 1.00 \text{ m/m'}$

- F_6 (Shape : 3) : D.13



Length of Bar :

$L_1 = 10 \text{ cm} = 0.10 \text{ m}$

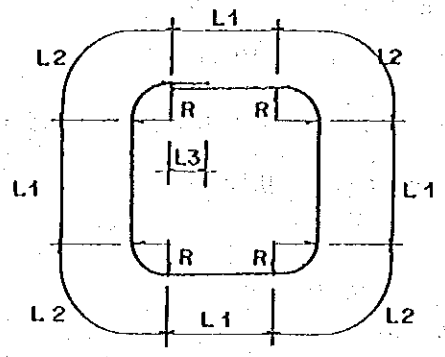
$L_2 = 19.5 + 2\phi = 22.1 \text{ cm} = 0.221 \text{ m}$

$L_3 = (35 - 10) + 2\phi = 27.6 \text{ cm} = 0.276 \text{ m}$

Total length $= \Sigma L = 2 \times (0.10 + 0.221) + 0.276$

$= 0.918 \text{ m} \sim 0.920 \text{ m}$

- M_1 (Shape : 3) : D.13



Length of Bar :

$L_1 = 170 - 2 \times 7 = 156 \text{ cm} = 1.56 \text{ m}$

$L_2 = \frac{2\pi R}{4} = \frac{1}{2} \times 3.14 \times 14 = 21.98 \text{ cm}$

$L_2 = 22 \text{ cm} = 0.220 \text{ m}$

$L_3 = 30\,\phi = 39 \text{ cm} \sim 0.40 \text{ m}$

Total length $= 4L_1 + 4L_2 + L_3 = 4 \times 1.56 + 4 \times 0.22 + 0.40$

$L = 7.520 \text{ m}$

- M_2 (Shape : 3) : D.13

Length of Bar :

$L_1 = 100 + 2 \times 7 = 114 \text{ cm} = 1.14 \text{ m}$

$L_2 = \frac{2\pi R}{4} = \frac{1}{2} \times 3.14 \times 7 = 10.99 \text{ cm}$

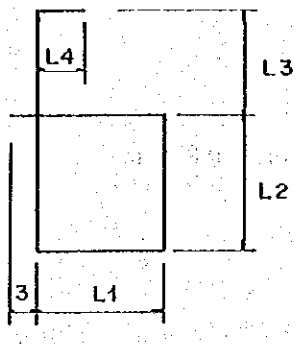
$L_2 = 11 \text{ cm} = 0.110 \text{ m}$

$L_3 = 30\,\phi = 39 \text{ cm} \sim 0.40 \text{ m}$

Total length $= 4L_1 + 4L_2 + L_3 = 4 \times 1.14 + 4 \times 0.11 + 0.40$

$L = 5.40 \text{ m}$

- M_3 (Shape : 5) : D.13



Length of Bar :

$L_1 = 35 - 14 = 21 \text{ cm} = 0.210 \text{ m}$

$L_2 = (35 + 90) - (25 + 7) = 93 \text{ cm}$

$= 0.93 \text{ m}$

$L_3 = (25 + 7 - 7) = 25 \text{ cm}$

$L_3 = 0.25 \text{ m}$

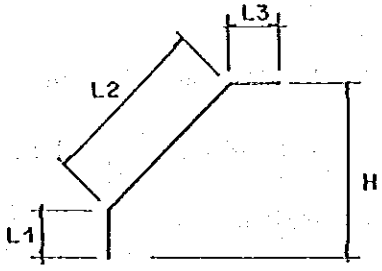
$L_4 = 10 \text{ cm} = 0.10 \text{ m}$

Total length $= 2 \times L_1 + 0.03 + 2L_2 + L_3 + 0.10$

$\Sigma L = 0.42 + 1.86 + 0.25 + 0.10 = 2.63 \text{ m}$

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING MAN HOLE VOLUME	Page	11/12

- M_4 (Shape : 4) : D.13



Length of Bar :

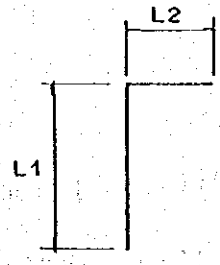
L_1 = 10 cm = 0.10 m

$L_2 = \sqrt{2H_1^2} = \sqrt{2\times(0.93)^2}$ = 1.315 m'

L_3 = 10 cm = 0.10 m

Total length $\Sigma L = 0.10 + 1.315 + 0.10$ = 1.515 m

- M_5 (Shape : 7) : D.13



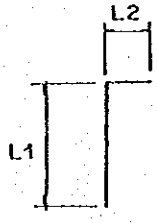
Length of Bar :

L_1 = 130 + 30 ϕ = 169 cm = 1.69 m

L_2 = 21 + 3 = 24 cm = 0.24 m

Total length $\Sigma L = 1.69 + 0.24$ = 1.93 m

- M_6 (Shape : 7) : D.13



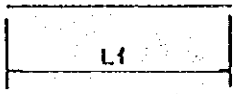
Length of Bar :

L_1 = (93 + 25) + 30 ϕ = 157 cm = 1.57 m

L_2 = 10 cm = 0.10 m

Total length $\Sigma L = 1.59 + 0.10$ = 1.67 m

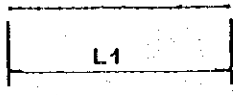
- M_7 (Shape : 1) : D.13



Length of Bar :

L_1 = 87.5 cm = 0.875 m

- M_8 (Shape : 1) : D.13

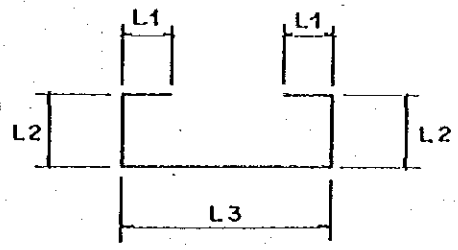


Length of Bar :

L_1 = 120 cm = 0.12 m

Name of Structure	BANDARHARJO EAST SECOND CHANNEL	Category of calculation	REINFORCING MAN HOLE VOLUME	Page	12/12

- C_1 (Shape : 2) : D.19



Length of Bar :

L_1 = 10 cm = 0.10 m

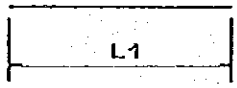
L_2 = 25 – 10 = 15 cm = 0.15 m

L_3 = 138 – 10 = 128 cm = 1.28 m

Total length = $\Sigma L = 2L_1 + 2L_2 + L_3$ = (2 x 0.10) + (2 x 0.15) + 1.28

L = 1.78 m

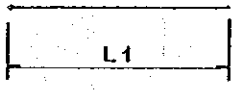
- C_2 (Shape : 1) : D.13



Length of Bar :

L_1 = 138 – 10 = 128 cm = 1.28 m

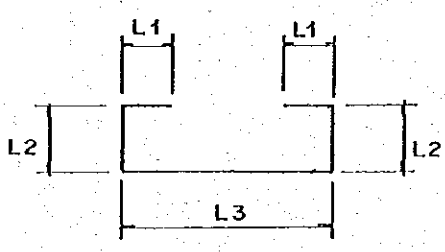
- C_3 (Shape : 1) : D.13



Length of Beam :

L_1 = 69 – 8 = 61 cm = 0.61 m

- C_4 (Shape : 2) : D.13



Length of Bar :

L_1 = 10 cm = 0.10 m

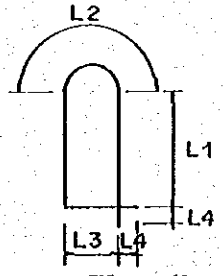
L_2 = 25 – 10 = 15 cm = 0.15 m

L_3 = 69 – 8 = 61 cm = 0.61 m

Total length = $2L_1 + 2L_2 + L_3$ = 0.20 + 0.30 + 0.61

L = 1.11 m

- C_5 (Shape : 6) : D.13



Length of Bar :

L_1 = 0.20 m

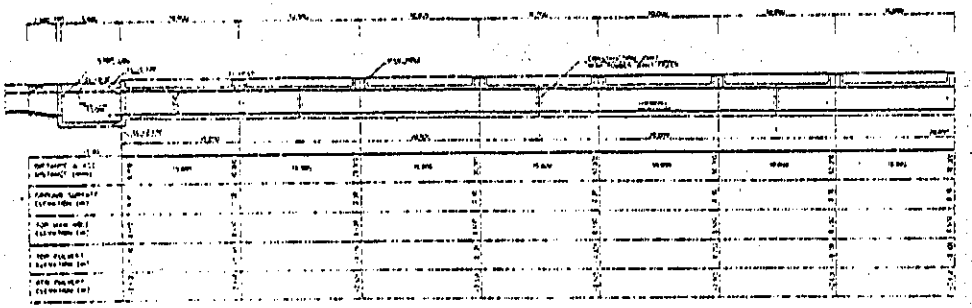
L_2 = 10 ϕ = 19 cm = 0.19 m

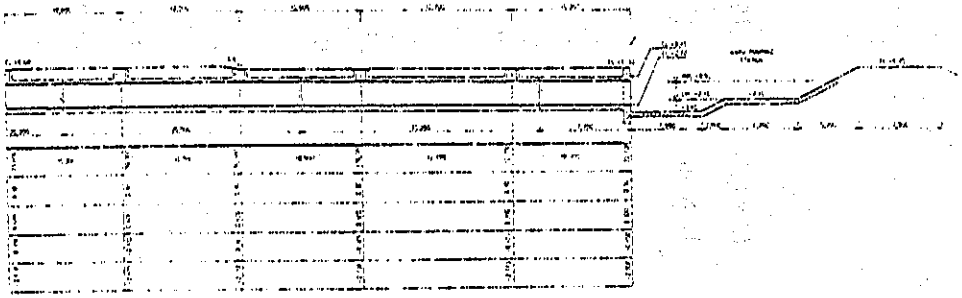
L_3 = 12 cm = 0.12 m

L_4 = 3 cm = 0.03 m

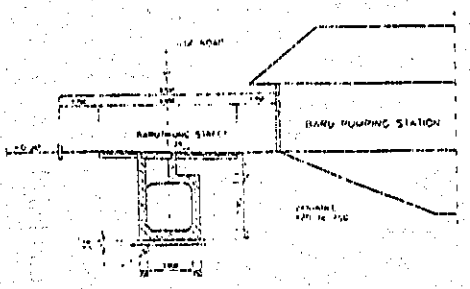
Total length ΣL = (2 x 0.20) + 0.19 + 0.12 + (2 x 0.03)

= 0.77 m

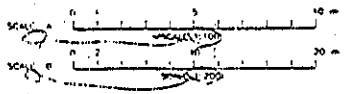




LONGITUDINAL SECTION
OF PANDARHARJO EAST SECONDARY CHANNEL



TYPICAL CROSS SECTION
OF PANDARHARJO EAST SECONDARY CHANNEL



THE REPUBLIC OF INDONESIA

LONGITUDINAL SECTION
OF PANDARHARJO EAST SECONDARY CHANNEL

September 28, 1999

Name of Structure	SCAFOLDING AND FORM SUPPORT, FOR BANDARHARJO DRAINAGE SYST.	Category of calculation	WORK VOLUME	Page	

SUMMARY OF SCAFOLDING AND FORM SUPPORT VOLUME, FOR BANDARHARJO DRAINAGE SYSTEM.

Nº	VOLUME / STRUCTURE	SCAFOLDING (m^2)	FORM SUPPORT (m^3)
1	BARU PUMPING STATION	1049	549
2	BARU PUMPING STA. GATE	350	120
3	BARU CONVEYANCE CH.	6574	2768
4	BARU CONVEYANCE CH INLET STRUCTURE	150	35
5	BARU CONVEYANCE CH OUTLET STRUCTURE	106	20
6	BANDARHARJO EAST SECONDARY CHANNEL	1166	491
7	BANDARHARJO EAST SECONDARY CHANNEL OUTLET STRUCT.	90	31
8	BARU RETARDING POND INLET STRUCTURE Nº 1	—	77
9	BARU RETARDING POND INLET STRUCTURE Nº 2	—	42
10	FUEL TANK 80% FOR BARU PUMPING STATION	133	62
	TOTAL	9618	4195

OUTLET

Name of Structure	BANDARHARJO EAST SC: SCAFOLDING AND FORM SUPPORT	Category of calculation	WORK VOLUME	Page	1/1

1. SCAFOLDING AREA.

Ⓐ walls of box culvert (L = 7.7 - 0.4 = 7.3 m).

(2 × 2.75 + 2 × 2.0) × 7.3 = 69.35 Sq. m.

Ⓑ Wing wall.

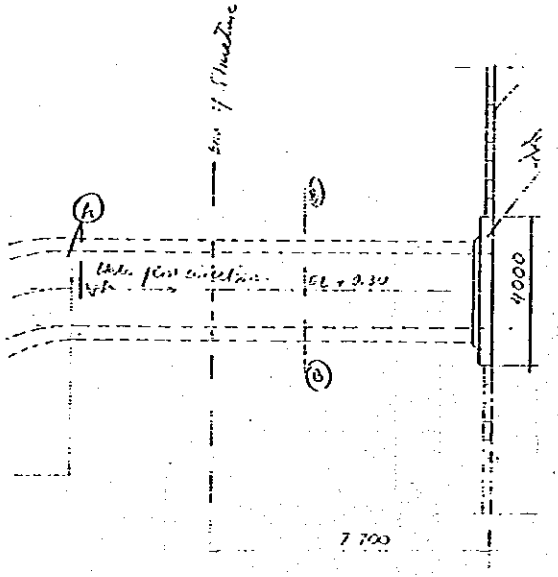
(4.1 × 4.0 − 2.0 × 2.0) + (2 × 0.5 × 4.1) + (2 × 0.4 × 4.10) = 19.78

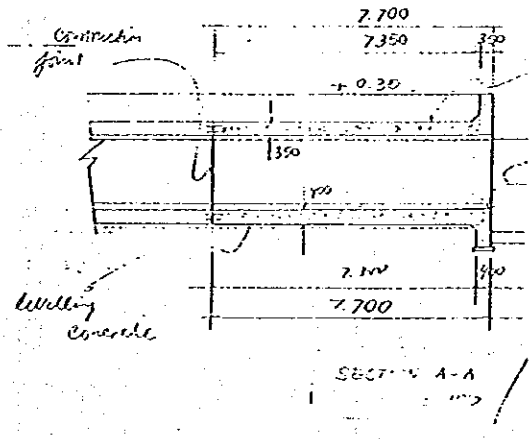
Ⓐ + Ⓑ = 89.13 Sq m.

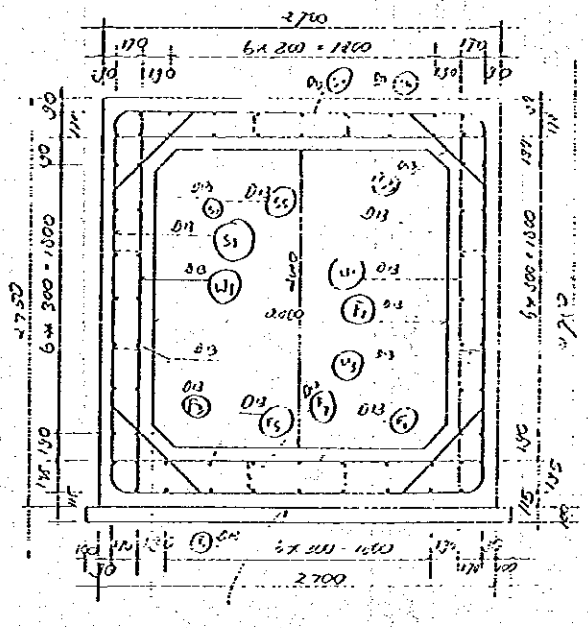
2. FORM SUPPORT AREA.

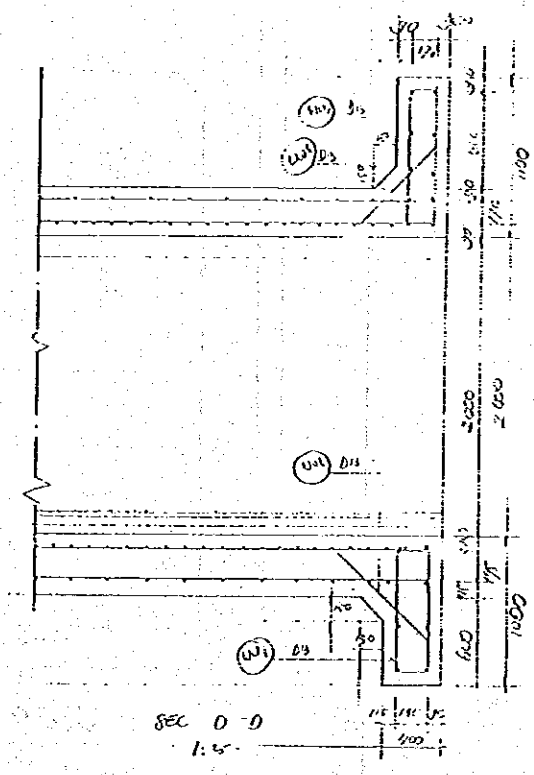
2.0 × 2.0 × 7.70 ——— = 30.80 Sq m.

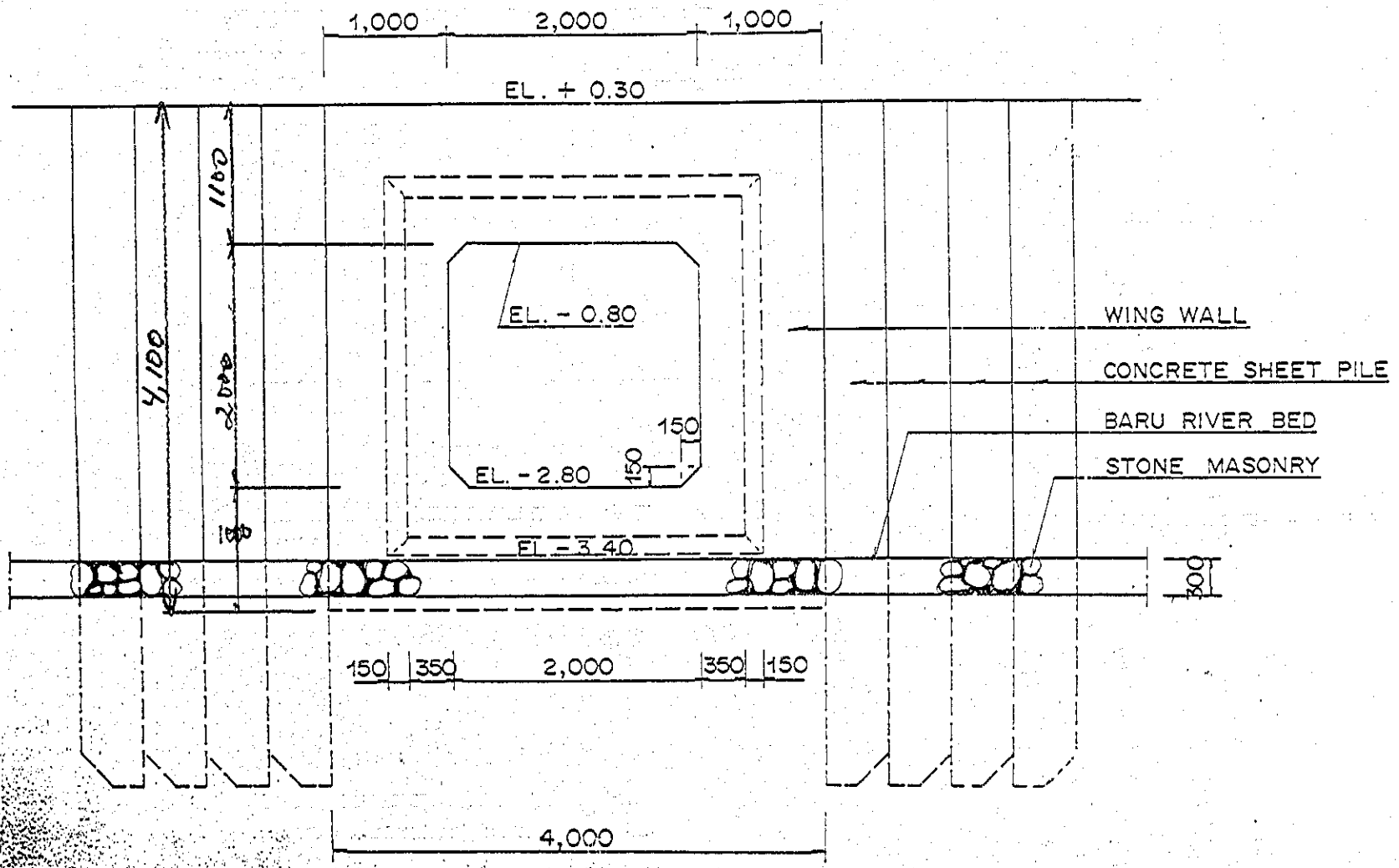
Name of Structure	Bandarbarjo East scondary channel outlet.	Category of calculation	Volume Calculation.	Page	1a.

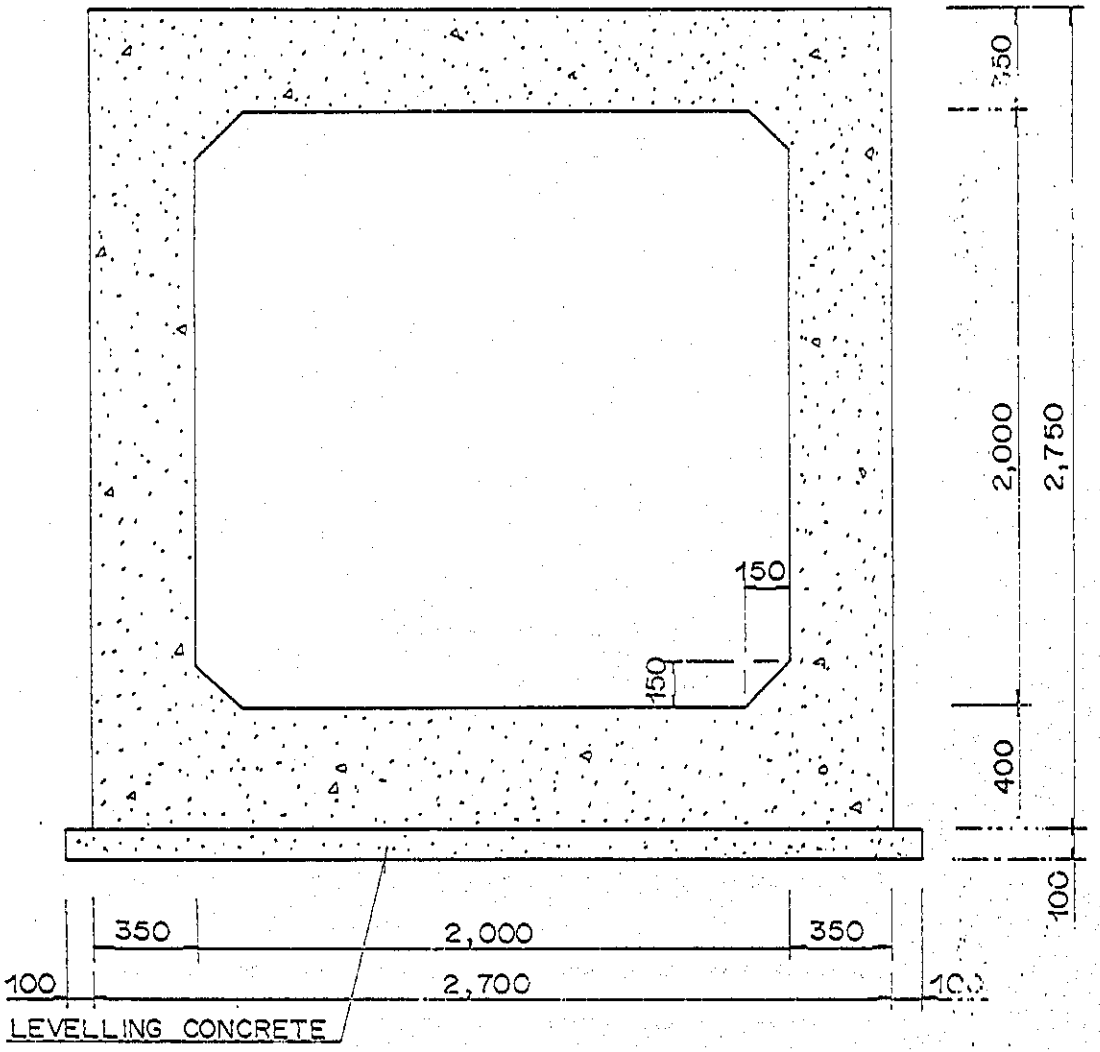









1,000
2,000
1,000
EL. + 0.30
1162
4,100
2,000
EL. - 0.80
150
150
EL. - 2.80
EL. - 3.40
WING WALL
CONCRETE SHEET PILE
BARU RIVER BED
STONE MASONRY
300
150
350
2,000
350
150
4,000



SECTION B - B
SCALE C

SCALE C
1:25

0 0.25 1.25 2.50 m

0 0.50 2.50 5.00 m