INLET STRUCTURE FOR C. ROUTE

No. 201

KINDS	UNIT	NO25	NO26	NO27	NO28	NO29	NO30	NO31	TOTAL	REMARKS
(1) EARTH WORK										
EXCAVATION	m³	161.6	108.7	85.9	80.0	175.4	140.1	95.0	866.7	
EMBANKMENT	m³		429.9	501.6	564.0	45.7		337.5	1884.7	
BACKFILLING	m³									
(2) OTHERS										
WET MASONRY	m²	101.40	99.11	91.17	91.54	64.72	72.92	79.76	600.62	
DRY STONE PITCHING			71.40	65.40	65.40	19.40		59.40	321.00	

INLET STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m')	
① EARTH WORK	No.24 INLET SPILLWAY	15	CALCULADED		IN No 1
1. EXCAVATION					

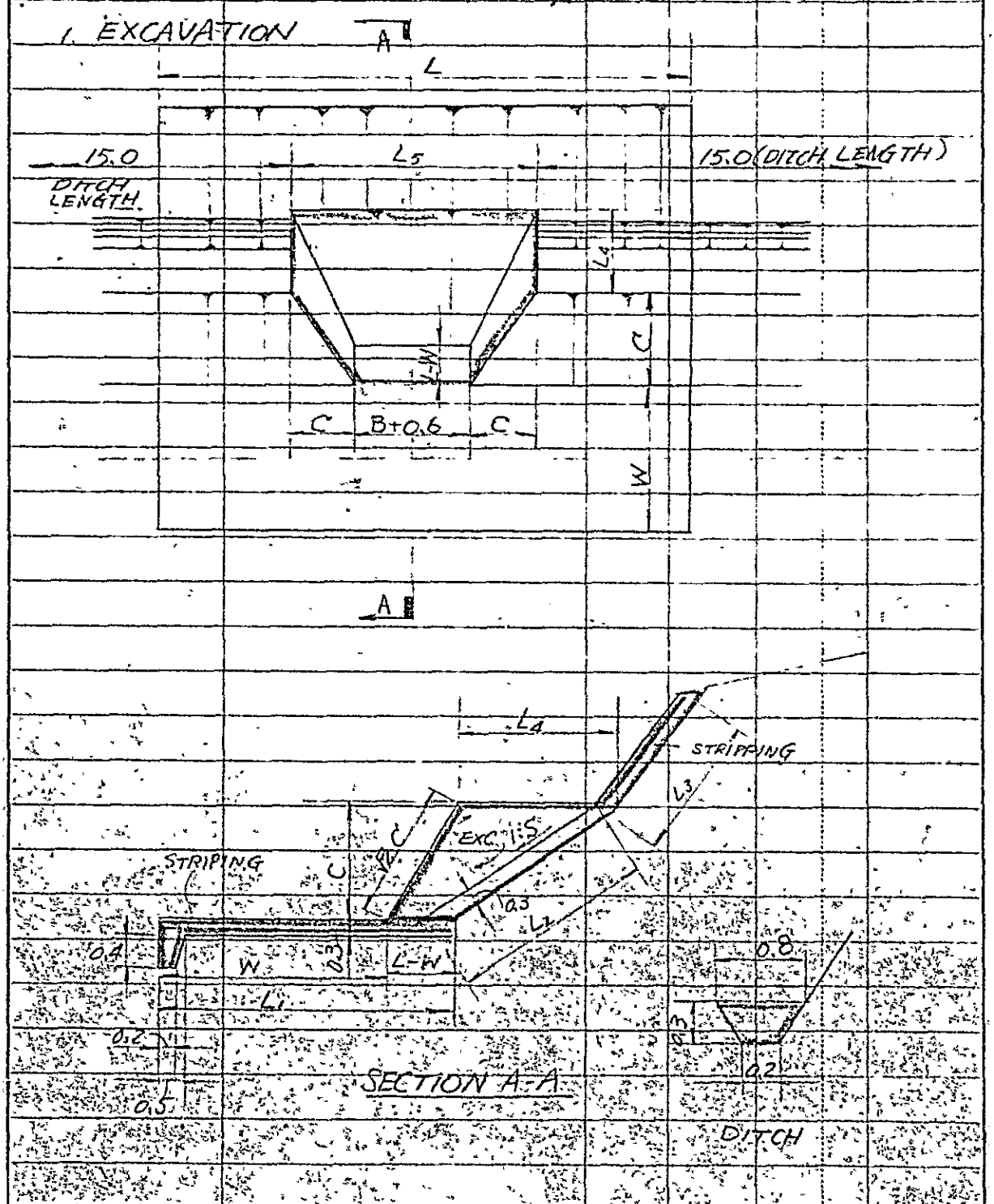


Table 2 Concrete, form & Others:

Kinds	Calculated Process	Unit	Numbers	Total (m²) : (m³)	Remarks
1. EXCAVATION					
INLET OPENING PORTION					
V_1	$=[L_5 \times L_4 + (L-W)\times(B+0.6)] \times \frac{1}{2} \times C$				
DITCH PORTION					
V_2	$=(0.2+0.8)\times\frac{1}{2}\times 0.3\times 15.0\times 2 = 4.5\ m^3$				
STRIPPING FOR MASONRY LINING					
V_3	$=(L_1+L_3)\times L\times 0.3 + (L-L_5+C)\times\sqrt{2}\times C\times 0.3$				
	$+(0.2+0.5)\times\frac{1}{2}\times 0.4\times L$				
					W: CANAL BED WIDTH
	$L_4 = L-W+C\times S = C$				C: CANAL DEPTH
	$L_5 = B+2C+0.6$				B: INLET OPENING WIDTH

TABLE OF DIMENSION AND CALCULATION

No	W	C	L	L_1	L_2	L_3	L_4	L_5	B	S	V_1	V_2	V_3	TOTAL
1	10.0	1.8	20.0	11.5	5.8	1.0	10.9	6.2	2.0	1.5	84.2	4.5	89.7	178.4 m³
2	10.0	1.8	20.0	11.5	5.9	1.0	10.9	6.2	2.0	1.5	84.2	4.5	89.7	178.4
3	10.0	1.8	20.0	11.5	4.0	2.0	11.8	6.2	2.0	2	89.2	4.5	95.7	189.4
4	10.0	1.8	20.0	11.0	3.2	1.3	10.9	7.2	3.0	1.5	103.0	4.5	81.7	189.2
7	10.0	1.8	20.0	11.5	6.7	2.0	15.4	7.2	3.0	4	132.2	4.5	94.9	231.6
8	10.0	1.8	25.0	11.1	5.5	0.5	16.8	10.2	6.0	2	243.3	4.5	103.2	351.0
9	10.0	1.8	25.0	11.0	3.2	0.8	15.9	10.2	6.0	1.5	235.1	4.5	104.6	344.2
11	10.0	1.8	25.0	11.0	4.8	1.0	16.8	8.2	4.0	2	186.1	4.5	107.7	298.3
12	10.0	1.8	20.0	11.0	3.2	4.3	10.9	6.2	2.0	1.5	84.2	4.5	106.5	195.2
13	10.0	1.8	20.0	11.0	3.2	2.8	10.9	7.2	3.0	1.5	103.0	4.5	76.7	204.2
14	10.0	1.8	20.0	11.0	3.2	0.8	10.9	9.2	3.0	1.5	113.0	4.5	84.7	192.2
15	10.0	1.8	25.0	11.2	3.2	4.8	15.7	10.2	6.0	1.5	235.1	4.5	136.2	375.8
16	10.0	1.8	25.0	11.0	3.2	1.4	15.7	8.2	4.0	1.5	177.4	4.5	112.7	294.6

Table 2 Concrete, form & Others.

Kinds			Calculated Process						Unit	Numbers	Total (m³)			Remarks
No.	W	C.	L	L_1	L_2	L_3	L_4	L_5	B	S	V_1	V_2	V_3	TOTAL
17	10.0	1.8	25.0	11.0	5.0	0	15.9	8.2	4.0	1.5	179.4	4.5	100.2	284.1
18	10.0	1.8	25.0	11.4	5.1	0	16.8	8.2	4.0	2	186.1	4.5	103.2	293.8
19	10.0	1.8	25.0	11.2	5.4	0	16.8	8.2	4.0	2	186.1	4.5	101.7	292.3
20	10.0	1.8	25.0	11.5	3.4	1.7	15.9	8.2	4.0	1.5	179.4	4.5	116.7	300.6
25	3.0	1.7	16.0	7.1	4.3	1.8	4.7	6.0	2.0	2	103.7	4.5	53.4	161.6
30	3.0	1.7	16.0	2.0	4.6	0.6	18.4	6.0	2.0	3	112.4	4.5	23.2	140.1

(2) WET MASONRY LINING

1. CANAL BED

$V_1 = L_1 \times L \times 0.3$

2. CUT-OFF

$V_2 = (0.2+0.5) \times \frac{1}{2} \times 0.4 \times L$

3. OPENING PORTION

$V_3 = L_2 \times L_5 \times 0.3$

$+ (L_0 + L - W) \times \frac{1}{2} \times \sqrt{2}\, C \times 0.3 \times 2$

$+ (B + 0.6) \times (L - W) \times 0.3 \times 2$

4. SLOPE LINING

$V_4 = L_3 \times L \times 0.3$

$+ \sqrt{2}\, C \times (L - L_5 + C) \times 0.3$

Table 2 Concrete, form & Others.

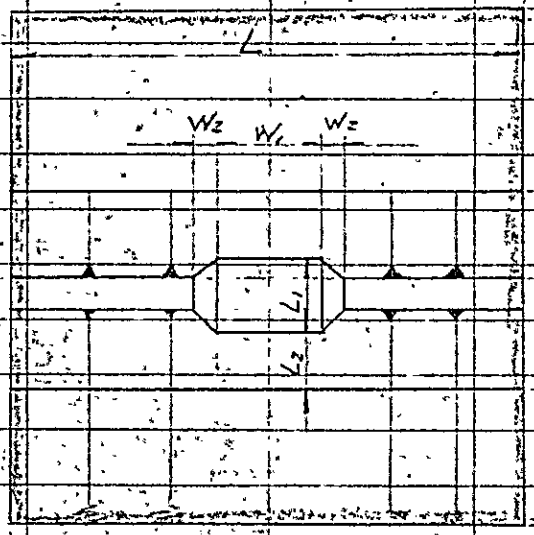
Kinda	Calculated Process				Unit	Numbers	Total	Remarks
							(m') (m²)	
	V_1	V_2	V_3	V_4				
No. 1	69.00	2.80	42.35	17.91			132.06	
2	69.00	2.80	42.53	17.91			132.24	
3	69.00	2.80	39.69	23.91			135.35	
4	66.00	2.80	44.47	12.95			126.22	
7	69.00	2.80	55.47	23.15			150.42	
8	83.25	3.50	100.51	16.43			203.69	
9	82.50	3.50	92.79	18.68			197.47	
11	82.50	3.50	77.49	21.70			185.19	
12	66.00	2.80	37.51	37.71			144.02	
13	66.00	2.80	44.41	27.95			141.16	
14	66.00	2.80	44.41	15.95			129.16	
15	84.00	3.50	92.79	48.68			228.97	
16	82.50	3.50	72.87	24.70			183.57	
17	82.50	3.50	77.30	16.20			177.50	
18	85.50	3.50	78.23	16.20			181.43	
19	84.00	3.50	78.97	14.20			180.67	
20	86.25	3.50	73.36	26.95			190.06	
25	34.08	2.24	48.00	17.08			101.40	
30	9.60	2.24	49.76	11.32			72.92	

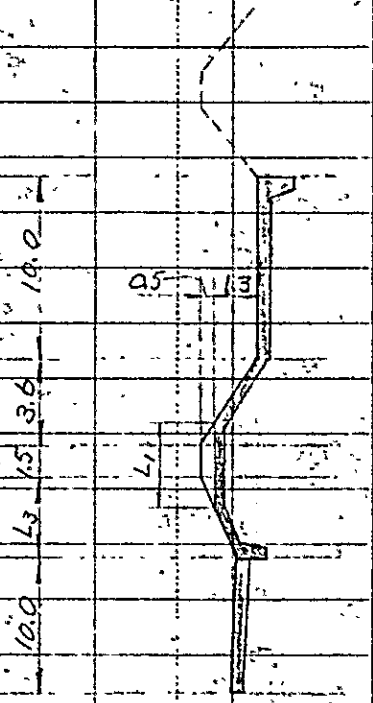
INLET STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	

No.5 No.6 No.10 No.21 INLET IN A ROUTE





① EARTH WORK

1. EXCAVATION OF INLET OPENING

$V_1 = (L_1+1.5)\times\frac{1}{2}\times 0.5\times(W_1+W_2)$

2. STRIPPING FOR MASONRY LINING

V_2 = EQUAL TO MASONRY VOLUME

TOTAL $V_1+V_2=V_E$

② WET MASONRY LINING

1. MAIN CANAL BED

$V_3 = 10.0\times L\times 0.3$

2. MAIN CANAL SLOPE

$V_4 = [l_1\times(L-W_1-2W_2)$ $l_1=\sqrt{1.8^2+3.6^2}=4.02$

$+l_2\times W_1+(l_1+l_2)\times W_2]\times 0.3$ $l_2=\sqrt{1.3^2+2.6^2}=2.91$

Table 2 Concrete, form & Others.

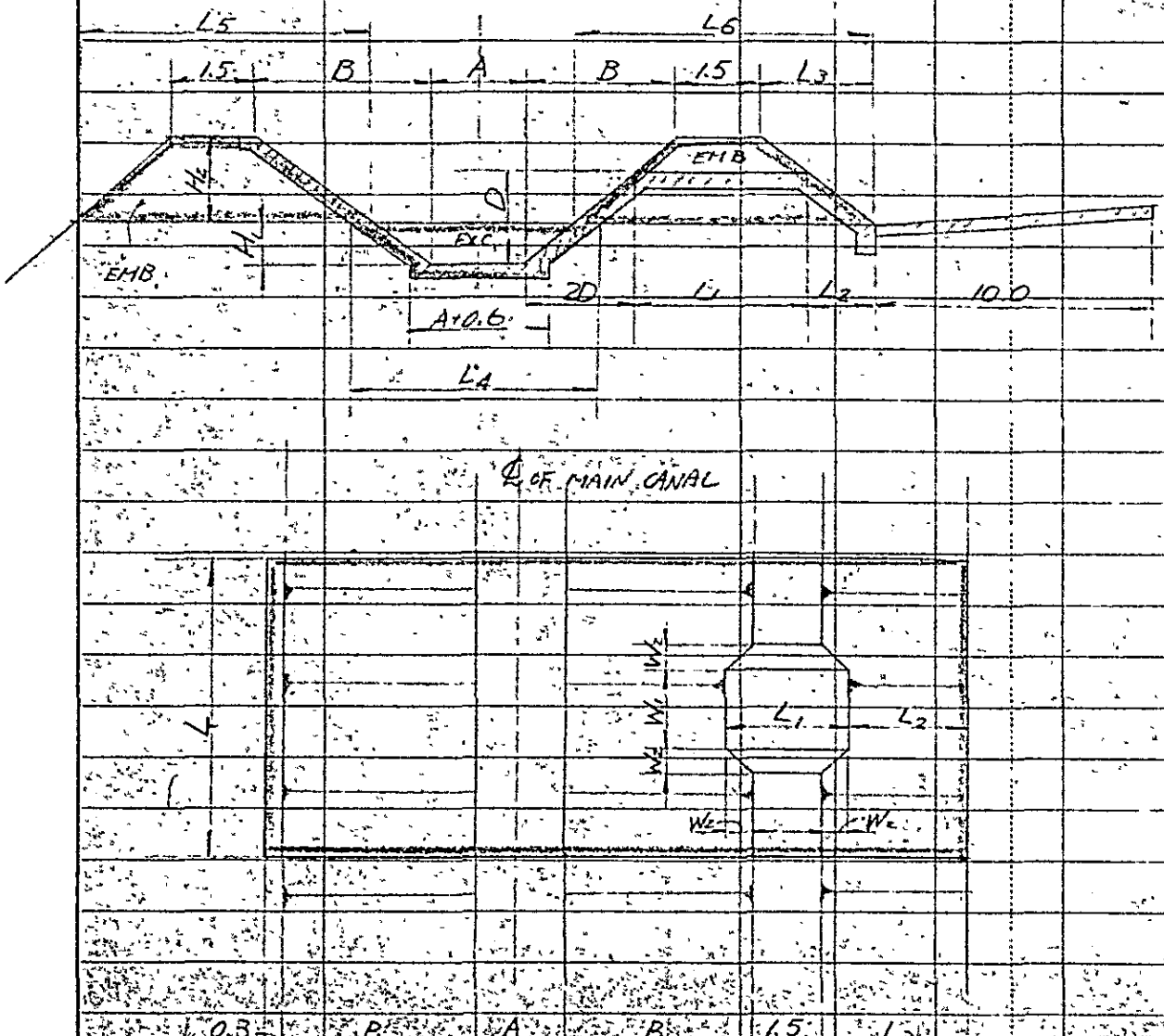
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
3 CANAL BANK PORTION					
V_5 =	$W_1 \times L_1 \times 0.3$				
	$+\sqrt{W_2^2+0.5^2} \times (1.5+L_1) \times \frac{1}{2} \times 2 \times 0.3$				
V_6 =	$\ell_3 \times (L - W_1 - 2W_2) \times 0.3$				$\ell_3 = \sqrt{L_3^2 + (\frac{L_3}{2})^2}$
	$+\ell_4 \times W_1 \times 0.3 + (\ell_3 + \ell_4) \times \frac{1}{2} \times 2W_2 \times 0.3$				$\ell_4 = \sqrt{L_2^2 + (\frac{L_2}{2})^2}$
4 CUT-OFF					
V_7 =	$(0.3+0.5) \times 0.4 \times \frac{1}{2} \times L + 0.5 \times 0.3 \times L$				
	$= 0.16 \times L + 0.15 \times L = 0.31 \times L$				
TOTAL	$V_H = V_3 + V_4 + V_5 + V_6 + V_7$				
③ DRY STONE PITCHING					
V_D	$= 10.0 \times L \times 0.3 = 3.0 \times L$				
			$L = W_1 + 2W_2 + 14.0$		
	REMARK		$V_2 = V_M + V_D$		
No.5 No.6 INLET					
	$W_1 = 3.0$ $W_2 = 1.0$ $L_1 = 5.8$ $L_2 = 1.8$ $L_3 = 2.8$				
No.10					
	$W_1 = 15.0$ $W_2 = 1.0$ $L_1 = 5.3$ $L_2 = 0.4$ $L_3 = 0.9$				
No.21					
	$W_1 = 15.0$ $W_2 = 1.0$ $L_1 = 3.0$ $L_2 = 1.9$ $L_3 = 2.9$				
			EXC.	WET MAS.	DRY STONE

	V_1	V_2		V_3	V_4	V_5	V_6	V_7	V_E	V_H	V_D
No.5 No.6	7.3	165	6	57.00	21.58	7.67	16.50	5.89	172.9	108.64	57.00
No.10	27.2	260	5	93.00	32.06	26.13	6.71	9.61	287.7	167.51	93.00
No.21	18.0	269	4	93.00	32.06	5.01	24.96	9.61	285.4	172.44	93.00

INLET STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
No.22, No.23, No.24, No.27, No.28, No.29, No.31					



where; $L_4 = A + 0.6 + 4H_1$

$L_5 = 1.5 + (B - 2H_1) \times 4$

$L_6 = 1.5 + 2(B - 2H_1) + 2L_3$

$H_2 = \frac{1}{2}B - H_1$

Table 2 Concrete, form & Others

Kinds			Calculated Process					Unit		Numbers	Total		Remarks	
											(m²) (m³)			
	A	B	D	H_1	H_2	W_1	W_2	L	L_1	L_3	L_4		L_5	L_6
22	3.0	5.0	1.89	0.22	2.28	7.0	1.22	23.44	3.94	7.22	4.48	1	9.74	25.06
23	3.0	5.0	1.89	1.17	—	15.0	1.22	31.44	3.94	7.22	—		—	—
26	1.0	3.4	1.00	0.37	1.33	7.0	1.40	23.8	4.3	2.6	3.08	1	2.14	12.02
27	1.0	3.4	1.00	0.18	1.52	5.0	1.40	21.8	4.3	3.2	2.32	1	3.66	13.98
28	1.0	3.4	1.00	0.08	1.62	5.0	1.40	21.8	4.3	3.25	1.92	1	4.46	14.48
29	1.0	3.4	1.30	1.32	0.38	3.0	1.40	19.8	2.0	0.8	6.88		4.54	2.62
31	1.0	3.4	1.00	0.43	1.27	3.0	1.40	19.8	4.3	2.8	3.32	1	1.66	12.18

$L_2 = L_3 - W_2$

$L = W_1 + 2W_2 + 14.00$

① EARTH WORK

1 EXCAVATION

$V_1 = (A + 0.6 + L_4) \times \frac{1}{2} \times (H_1 + 0.3) \times L$ FOR No 23 $V_1 = 0$

$V_2 = 10.0 \times L \times 0.3$ (SURFACE STRIPPING)

$V_E = V_1 + V_2$

2 EMBANKMENT

$V_8 = [(1.5 + L_5) + (1.5 + L_6)] \times \frac{1}{2} \times H_2 \times L$

$= (1.5 + L_6 + 3.0) \times H_2 \times L \times \frac{1}{2}$

② WET MASONRY

$V_3 = (\sqrt{B^2 + (\frac{B}{2})^2} + 0.3) \times L \times 0.3$ CANAL SLOPE

$V_4 = (A + 0.6) \times L \times 0.3$ CANAL BED

$V_5 = \sqrt{B^2 + (\frac{B}{2})^2} \times L \times 0.3$ CANAL SLOPE

$= \sqrt{W_2^2 + (\frac{W_2}{2})^2} \times (W_1 + W_2) \times 2 \times \frac{L}{2} \times 0.3$

$V_6 = L_1 \times W_1 \times 0.3$ CREST OPENING

$V_7 = \sqrt{L_3^2 + (\frac{L_1}{2})^2} \times L \times 0.3$ CANAL SLOPE

$= \sqrt{W_2^2 + (\frac{W_2}{2})^2} \times (W_1 + W_2) \times 2 \times \frac{1}{2} \times 0.3$

$V_8 = (1.5 + L) \times \frac{1}{2} \times \sqrt{W_2^2 + (\frac{W_2}{2})^2} \times 0.3 \times 2$ CREST SLOPE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
V_9 =	$(0.3+0.5)\times\frac{1}{2}\times 0.4\times(A+0.6)\times 2$				CUT-OFF
	$+0.3^2\times L$				
=	$0.32\times(A+0.6)+0.3^2\times L$				
TOTAL					
V_M =	$V_3+V_4+V_5+V_6+V_7+V_2+V_9$				
③ DRY STONE PITCHING					
V_D =	$10.0\times L\times 0.3 = 3\times L$				

	EARTH WORK V_E	EARTH WORK V_B	V_M	V_D
No. 22	119.6	1277.3	169.85	70.32
23	94.3	2064.3	229.05	94.32
26	108.7	429.9	99.11	71.40
27	85.9	527.6	91.17	65.40
28	80.0	584.0	91.54	65.40
29	195.4	45.7	64.72	58.40
31	95.0	337.5	79.78	58.40

FOR No. 23 EARTH WORK

$V_1 = 0$

$V_B = (1.5+B)\times 2\times\frac{1}{2}\times\frac{B}{2}\times 2\times L$

$+(3.0+4B+A+2H_1)\times 2\times\frac{1}{2}\times H_1\times L$

$=$

DRAINAGE CULVERT FOR A ROUTE

No. 211

KINDS	UNIT	NO 1	NO 2	NO 3	NO 4	NO 5	NO 6	NO 7	TOTAL	REMARKS
(1) EARTH WORK										
EXCAVATION	m^3	927.0	1219.4	1710.0	1243.0	1633.6	1445.3	1234.9	9673.2	
BACKFILLING	m^3	413.0	542.6	629.2	417.3	666.0	560.4	470.5	3625.0	
(2) CONCRETE WORK										
REINFORCED CONCRETE	m^3	24.30	64.08	78.90	59.40	88.26	59.40	59.40	433.74	
FORM	m^2	88.60	206.40	247.10	189.60	280.70	189.60	189.60	1391.60	
REINFORCEMENT	kg	3010.18	5895.04	7701.96	5826.72	10371.92	5826.72	5826.72	44459.26	
(3) OTHERS										
WET MASONRY	m^3	388.14	501.38	660.38	498.60	677.40	530.21	488.04	3746.15	
DRY STONE PITCHING	m^3	58.50	73.80	91.50	72.00	92.10	72.00	72.00	531.90	

KINDS	UNIT	NO 8	NO 9	NO 10	NO 11	NO 12	NO 13	NO 14	NO 15	NO 16	SUB-TOTAL
(1) EARTH WORK											
EXCAVATION	m³	1330.3	1808.6	1014.6	1631.1	1589.4	1445.7	1356.6	2169.5	1225.2	13768.7
BACKFILLING	m³	645.7	792.1	524.7	726.2	708.3	676.3	724.2	1232.0	595.7	6776.2
(2) CONCRETE WORK											
REINFORCED CONCRETE	m³	38.40	67.90	19.47	65.66	65.66	56.72	32.25	66.48	38.57	470.81
FORM	m²	125.20	219.60	70.70	211.62	211.62	179.70	163.74	211.38	125.20	1518.76
REINFORCEMENT	kg	3844.59	9152.37	2259.01	7386.27	7386.27	5655.84	3591.28	9552.26	3728.49	54556.38
(3) OTHERS											
WET MASONRY	m³	432.12	568.85	355.75	529.72	528.51	476.60	712.30	413.12	407.62	4426.66
DRY STONE PITCHING	m³	64.50	82.50	57.00	81.60	81.60	72.00	70.20	60.00	64.50	633.90

KINDS	UNIT	No 17	No 18	NO 19	SUB-TOTAL	TOTAL	REMARK
(1) EARTH WORK							
EXCAVATION	m³	1292.4	990.8	2043.1	4326.3	18095.0	
BACKFILLING	m³	479.3	592.0	1336.6	2207.9	8910.1	
(2) CONCRETE WORK							
REINFORCED CONCRETE	m³	58.56	30.58	60.82	150.04	620.85	
FORM	m²	110.42	96.30	187.60	476.12	1994.83	
REINFORCEMENT	kg	7431.70	3448.00	8579.89	19459.59	74015.91	
(3) OTHERS							
WET MASONRY	m³	460.43	368.66	358.78	1187.87	5614.53	
DRY STONE PITCHING	m³	83.30	67.50	60.00	211.80	845.70	

DRAINAGE CULVERT FOR C ROUTE

No. 213

KINDS	UNIT	NO 20	NO 21	NO 22	TOTAL	
(1) EARTH WORK						
EXCAVATION	m^3	626.0	531.5	531.5	1687.0	
BACKFILLING	m	414.2	211.8	211.8	837.8	
(2) CONCRETE WORK						
REINFORCED CONCRETE	m^3	10.13	9.08	9.08	28.29	
FORM	m	37.97	34.04	34.04	106.05	
REINFORCEMENT	Kg	1154.13	990.70	990.70	3135.53	
(3) OTHERS						
WET MASONRY	m^3	147.78	241.91	241.91	631.60	
DRY STONE PITCHING	m^2	30.00	54.60	54.60	139.20	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 1										
①	Φ19	2.98	0.36		3.34	2.226	7.43	168	1248.24	
②	Φ13	2.98	0.24		3.22	1.042	3.36	168	564.48	
③	Φ13	24.88	1.20	2.08	28.16	1.042	29.34	22	645.48	
④	Φ19	1.00	0.36		1.36	2.226	3.03	168	509.04	
⑤	Φ13	1.247	0.24		1.487	1.042	1.55	14	21.70	
⑥	Φ9	3.38	0.16		3.54	0.499	1.77	12	21.24	
TOTAL									3010.18	
No. 2										
①	Φ19	8.08	0.72	0.76	9.56	2.226	21.28	126	2681.28	
②	Φ13	8.08	0.48	0.52	9.08	1.042	9.46	126	1,191.96	
③	Φ13	24.88	1.20	2.08	28.16	1.042	29.34	48	1408.32	
④	Φ19	1.00	0.36		1.36	2.226	3.03	168	509.04	
⑤	Φ13	1.247	0.24		1.487	1.042	1.55	32	49.60	
⑥	Φ9	8.48	0.32	0.36	9.16	0.499	4.57	12	54.84	
TOTAL									5,895.04	
No. 3										
①	Φ19	9.98	0.72	0.76	11.46	2.226	25.51	126	3214.26	
②	Φ13	9.98	0.48	0.52	10.98	1.042	11.44	126	1441.44	
③	Φ13	24.88	1.20	2.08	28.16	1.042	29.34	82	2405.88	
④	Φ19	1.00	0.36		1.36	2.226	3.03	168	509.04	
⑤	Φ13	1.247	0.24		1.487	1.042	1.55	42	65.10	
⑥	Φ9	10.38	0.32	0.36	11.06	0.499	5.52	12	66.24	
TOTAL									7,701.96	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 4										
①	Φ19	7.48	0.72	0.76	8 96	2.226	19 94	126	2512 44	
②	Φ13	7.48	0.48	0.52	8 48	1.042	8 84	126	1113 84	
③	Φ13	24.88	1.20	2.08	28 16	1.042	29 34	54	1584 36	
④	Φ19	1.00	0.36		1 36	2.226	3 03	168	509 04	
⑤	Φ13	1.247	0.24		1 487	1.042	1 55	36	55 80	
⑥	Φ9	7.88	0.32	0.36	8 56	0.499	4 27	12	51 24	
TOTAL									5,826 72	
No. 5										
①	Φ19	11.18	1.08	1.52	13 78	2.226	30 67	168	5152 56	
②	Φ13	11.18	0.72	1.04	12 94	1.042	13 48	168	2264 64	
③	Φ13	24.88	1.20	2.08	28 16	1.042	29 34	78	2288 52	
④	Φ19	1.00	0.36		1 36	2.226	3 03	168	509 04	
⑤	Φ13	1.247	0.24		1 487	1.042	1 55	52	80 60	
⑥	Φ9	11.58	0.48	0.72	12 78	0.499	6 38	12	76 56	
TOTAL									10371 92	
No. 6										
①	Φ19	7.48	0.72	0.76	8 96	2.226	19 94	126	2512 44	
②	Φ13	7.48	0.48	0.52	8 48	1.042	8 84	126	1113 84	
③	Φ13	24.88	1.20	2.08	28 16	1.042	29 34	54	1584 36	
④	Φ19	1.00	0.36		1 36	2.226	3 03	168	509 04	
⑤	Φ13	1.247	0.24		1 487	1.042	1 55	36	55 80	
⑥	Φ9	7.88	0.32	0.36	8 56	0.499	4 27	12	51 24	
TOTAL									5826 72	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 7										
①	Φ19	7.48	0.72	0.76	8.96	2.226	19.94	126	2,512.44	
②	Φ13	7.48	0.48	0.52	8.48	1.042	8.84	126	1,113.84	
③	Φ13	24.88	1.20	2.08	28.16	1.042	29.34	54	1584.36	
④	Φ19	1.00	0.36		1.36	2.226	3.03	168	509.04	
⑤	Φ13	1.247	0.24		1.487	1.042	1.55	36	55.80	
⑥	Φ9	7.88	0.32	0.36	8.56	0.499	4.27	12	51.24	
TOTAL									5,826.72	
No. 8										
①	Φ19	4.98	0.36		5.34	2.226	11.89	121	1438.69	
②	Φ13	4.98	0.24		5.22	1.042	5.44	121	658.24	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	42	1188.60	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	28	40.60	
⑥	Φ9	5.38	0.16		5.54	0.499	2.76	10	27.60	
TOTAL									3844.59	
No. 9										
①	Φ22	8.98	0.80	0.88	10.66	2.984	31.81	161	5121.41	
②	Φ13	8.98	0.48	0.52	9.98	1.042	10.40	161	1674.40	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	62	1754.60	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	42	60.90	
⑥	Φ9	9.38	0.32	0.36	10.06	0.499	5.02	10	50.20	
TOTAL									9152.37	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remark
No. 10										
①	Φ19	2.48	0.36		2.84	2.226	6.32	121	764.72	
②	Φ13	2.48	0.24		2.72	1.042	2.83	121	342.43	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	22	622.60	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	16	23.20	
⑥	Φ9	2.88	0.16		3.04	0.499	1.52	10	15.20	
TOTAL									2259.01	
No. 11										
①	Φ19	8.68	0.72	0.76	10.16	2.226	22.62	161	3641.82	
②	Φ13	8.68	0.48	0.52	9.68	1.042	10.09	161	1624.49	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	54	1528.20	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24	-	1.388	1.042	1.45	36	52.20	
⑥	Φ9	9.08	0.32	0.36	9.76	0.499	4.87	10	48.70	
TOTAL									7386.27	
No. 12										
①	Φ19	8.68	0.72	0.76	10.16	2.226	22.62	161	3641.82	
②	Φ13	8.68	0.48	0.52	9.68	1.042	10.09	161	1624.49	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	54	1528.20	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	36	52.20	
⑥	Φ9	9.08	0.32	0.36	9.76	0.499	4.87	10	48.70	
TOTAL									7386.27	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 13										
①	Φ19	7.48	0.72	0.76	8.96	2.226	19.94	121	2412.74	
②	Φ13	7.48	0.48	0.52	8.48	1.042	8.84	121	1069.64	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	56	1584.80	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	38	55.10	
⑥	Φ9	7.88	0.32	0.36	8.56	0.499	4.27	10	42.70	
TOTAL									5655.84	
No. 14										
①	Φ19	6.88	0.72	0.76	8.36	2.226	18.61	121	2251.81	
②	Φ13	6.88	0.48	0.52	7.88	1.042	8.21	121	993.41	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	62	1754.60	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	42	60.90	
⑥	Φ9	7.28	0.32	0.36	7.96	0.499	3.97	10	39.70	
TOTAL									5591.28	
No. 15										
①	Φ22	7.48	0.80	0.88	9.16	2.984	27.33	188	5138.04	
②	Φ13	7.48	0.48	0.52	8.48	1.042	8.84	188	1661.92	
③	Φ13	27.88	1.44	2.60	31.92	1.042	33.26	62	2062.12	
④	Φ19	1.00	0.36		1.36	2.226	3.03	188	569.64	
⑤	Φ13	1.346	0.24		1.586	1.042	1.65	42	69.30	
⑥	Φ9	7.88	0.32	0.36	8.56	0.499	4.27	12	51.24	
TOTAL									9552.26	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 16										
①	Φ19	4.98	0.36		5.34	2.226	11.89	121	1438.69	
②	Φ13	4.98	0.24		5.22	1.042	5.44	121	658.24	
③	Φ13	23.88	1.20	2.08	27.16	1.042	28.30	38	1075.40	
④	Φ19	1.00	0.36		1.36	2.226	3.03	162	490.86	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	26	37.70	
⑥	Φ9	5.38	0.16		5.54	0.499	2.76	10	27.60	
TOTAL									3,728.47	
No. 17										
①	Φ19	11.58	1.08	1.52	14.18	2.226	31.56	107	3376.92	
②	Φ13	11.58	0.72	1.04	13.34	1.042	13.90	107	1487.30	
③	Φ13	15.88	0.72	1.04	17.64	1.042	18.38	118	2168.84	
④	Φ19	1.00	0.36		1.36	2.226	3.03	108	327.24	
⑤	Φ13	1.05	0.24		1.29	1.042	1.34	14	18.76	
⑥	Φ9	11.98	0.48	0.72	13.18	0.499	6.58	8	52.64	
TOTAL									7431.70	
No. 18										
①	Φ19	5.98	0.72	0.76	7.46	2.226	16.61	81	1345.41	
②	Φ13	5.98	0.48	0.52	6.98	1.042	7.27	81	588.87	
③	Φ13	15.88	0.72	1.04	17.64	1.042	18.38	62	1139.56	
④	Φ19	1.00	1.36		1.36	2.226	3.03	108	327.24	
⑤	Φ13	1.05	0.24		1.29	1.042	1.34	14	18.76	
⑥	Φ9	6.38	0.32	0.36	7.06	0.499	3.52	8	28.16	
TOTAL									3448.00	

DRAINAGE CULVERT

Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
No. 19										
①	Φ22	7.48	0.80	0.88	9.16	2.984	27.33	175	4782.75	
②	Φ13	7.48	0.48	0.52	8.48	1.042	8.84	175	1547.00	
③	Φ13	25.88	1.20	2.08	29.16	1.042	30.38	54	1640.52	
④	Φ19	1.00	0.36		1.36	2.226	3.03	174	527.22	
⑤	Φ13	1.05	0.24		1.29	1.042	1.34	36	48.24	
⑥	Φ9	7.88	0.32	0.36	8.56	0.499	4.27	8	34.16	
TOTAL									8577.89	
No. 20										
①	Φ19	1.48	0.36		1.84	2.226	4.10	51	209.10	
②	Φ13	1.48	0.24		1.72	1.042	1.79	51	91.29	
③	Φ13	19.88	0.96	1.56	22.40	1.042	23.34	18	420.12	
④	Φ19	1.00	0.36		1.36	2.226	3.03	134	406.02	
⑤	Φ13	1.148	0.24		1.388	1.042	1.45	12	17.40	
⑥	Φ9	1.88	0.16		2.04	0.499	1.02	10	10.20	
TOTAL									1154.13	
No. 21.22										
①	Φ19	1.68	0.36		2.04	2.226	4.54	41	186.14	
②	Φ13	1.68	0.24		1.92	1.042	2.00	41	82.00	
③	Φ13	15.88	0.72	1.04	17.64	1.042	18.38	20	367.60	
④	Φ19	1.00	0.36		1.36	2.226	3.03	108	327.24	
⑤	Φ13	1.05	0.24		1.29	1.042	1.34	14	18.76	
⑥	Φ9	2.08	0.16		2.24	0.499	1.12	8	8.96	
TOTAL									990.70	

No 1 DRAINAGE CULVERT

Table 2 Concrete, form & Others.

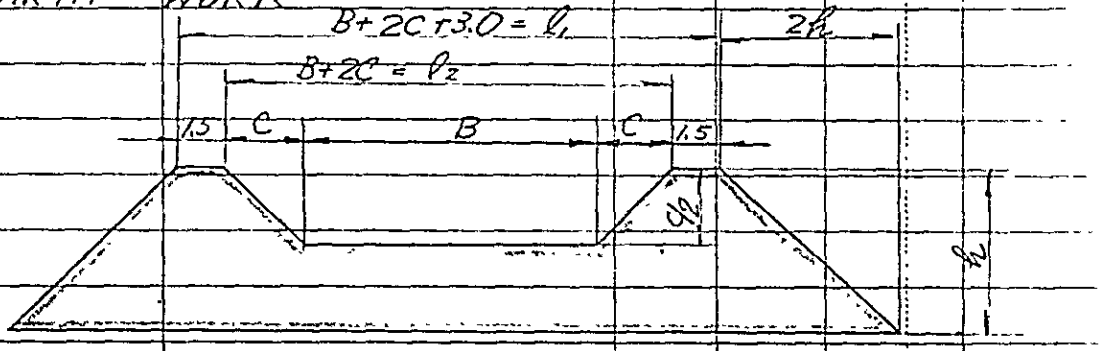
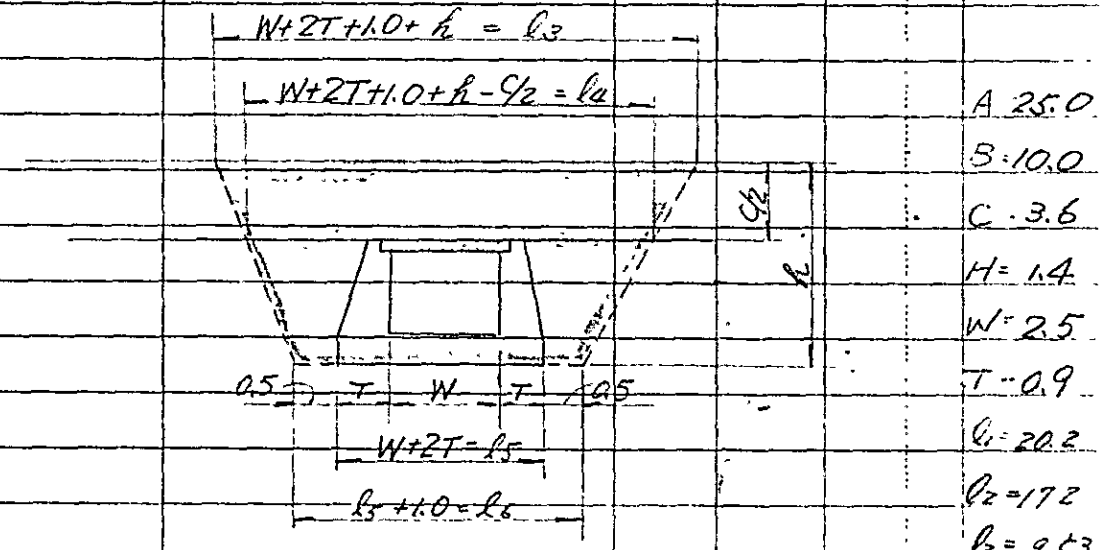
Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
① EARTH WORK					
					
					A 25.0 B 10.0 C 3.6 H 1.4 W 2.5 T 0.9 ℓ1 = 20.2 ℓ2 = 17.2 ℓ3 = 9.53 ℓ4 = 7.73 ℓ5 = 4.3 ℓ6 = 5.3 S = 1/100
	$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{5} \times A \times S$ = 4.23				
1. EXCAVATION FOR CANAL BANK PORTION					
	$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$				
	$= (9.53 + 5.3) \times \frac{1}{2} \times 4.23$ = a = 31.37				
	$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$				
	$= (9.53 + 7.73) \times \frac{1}{2} \times 3.6/2$ = b = 15.63				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2l_2 \times \frac{1}{2} \times 2)$				
	$= 31.37 \times (20.2 + 2 \times 4.23) =$	899.1			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 15.53 \times (10.0 + 3.6) \quad = (-)$	211.2			
		687.9	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 9.75$
	$(L_3 \times 10.0) \times 0.3 \times 2$				
	$= (9.75 \times 10.0) \times 0.6 =$	58.5			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 9.75 \times 15.0 \times 0.6 =$	87.8			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{E}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{3.6^2 + (\frac{3.6}{2})^2} \times 8.0 \times 1.2 =$	38.6			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 5.2$
	$= \sqrt{(5.2+0.2)^2 + (\frac{5.2}{2}+0.1)^2} \times 8.0 \times 0.6 =$	29.6			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.5$
	$= \sqrt{(4.5+0.2)^2 + (\frac{4.5}{2}+0.1)^2} \times 8.0 \times 0.6 =$	25.2			
		239.1	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			927.0	m³

Table 2 Concrete, form & Others.

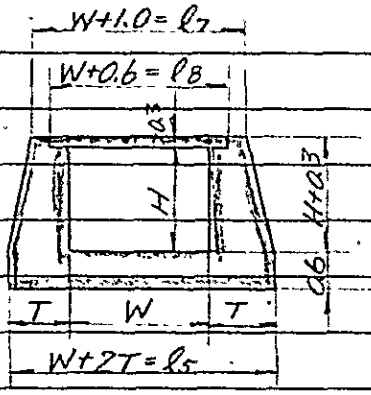
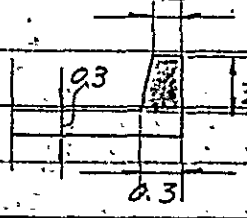
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
2 BACKFILL AND COMPACTION					H=1.4 W=2.5 T=0.9 ℓ7=3.5 ℓ8=3.1 ℓ5=4.3
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(3.5+4.3)\times\frac{1}{2}\times(1.4+0.3)+4.3\times0.6$				
	$=$ 9.21 $=d$				A=25.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E=4.5
	$=9.21\times25.0+9.21\times(4.5+5.2)\times\frac{1}{2}$				F=5.2
	$=$ ③	274.9			
	①-③			413.0	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=3.1\times0.3\times25.0$ =	23.25	m³		
END WALL					C=3.6 D=2.4 L1=3.1
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times(3.6-2.4)\times(3.1+0.4)=$	1.05	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
CONCRETE TOTAL				24.30 m³	
③ FORM					
	(n·W+0.3×2)×A				n NUMBER OF BC.
	=(1×2.5+0.6)×25.0 =	77.50 m²			n=1
	(0.2+0.3)×½×½(C−D)×4				
	= 0.25×½(3.6−2.4)×4 =	0.60 m²			L=3.1
	[½(C−D)×2+0.3)×(L+0.4)×2				
	= (3.6−2.4+0.3)×(3.1+0.4)×2 =	10.50 m²			
TOTAL				88.60 m²	
④ WET MASONRY					
A. 1. FLOOR	ℓ_s×0.6×(A+5.0)				ℓ_s=4.3
	= 4.3×0.6×(25.0+5.0) =	77.40 m³			A=25.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.9
	=(0.5+0.9)×½×(1.4+0.3)−0.09				H=1.4
	= e = 1.10				E=4.5
	e×(A+2×$\sqrt{E^2+(\frac{E}{2})^2}$×½)×2				
	= 1.10×(25.0+$\sqrt{4.5^2+(\frac{4.5}{2})^2}$)×2				
	=	66.07 m³			
3. INSIDE WALL					
	H×0.3×A×(n−1)				
	= 1.4×0.3×25.0×(1−1) =	0 m³			
4. CUT-OFF WALL					
	0.5, 0.2, 0.3				

Table 2 Concrete, form & Others.

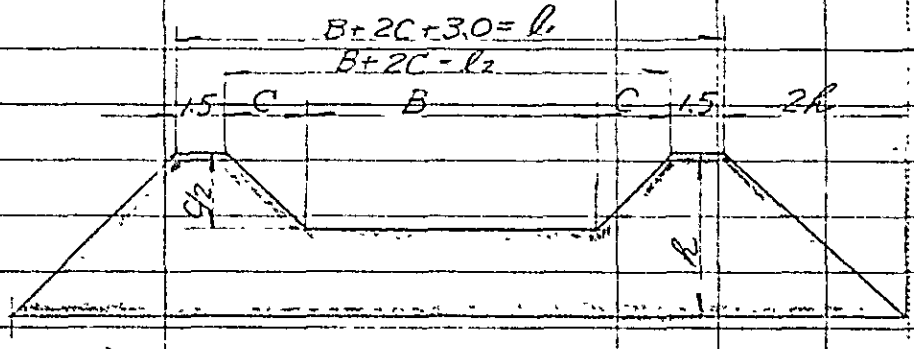
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=4.3$
	$=0.20\times(4.3+4.5\times\frac{1}{2})$ = 1.31	m³			$E=4.5$
SUB-TOTAL	1.+2.+3.+4.	144.78	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ = 5.850	m³			$L_3=9.75$
2 OUTLET APRON					$C=3.6$
	$L_3\times5.0\times0.3\times2$ = 2.925	m³			$L_1=3.1$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(C/2)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.5$
	$=\sqrt{3.6^2+(3.6/2)^2}\times(8.0+\frac{3.1}{2}+0.2)\times1.2=$ 47.09	m³			$F=5.2$
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				$B=10.0$
	$=\sqrt{(5.2+0.2)^2+(5.2/2+0.1)^2}\times8.0\times0.6=$ 28.98	m³			
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.5+0.2)^2+(4.5/2+0.1)^2}\times8.0\times0.6=$ 25.22	m³			
4. CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=10.0\times8.0\times0.6$ = 48.00	m³			
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$		-		
	$=0.16\times(2\times10.0+2\times9.75)$ = 1.32	m³			
SUB-TOTAL	= 243.36	m³ ⑤			
WET MASONRY TOTAL ④+⑤	=			388.14	m³
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ =			58.50	m³

No. 2
DRAINAGE
CULVERT

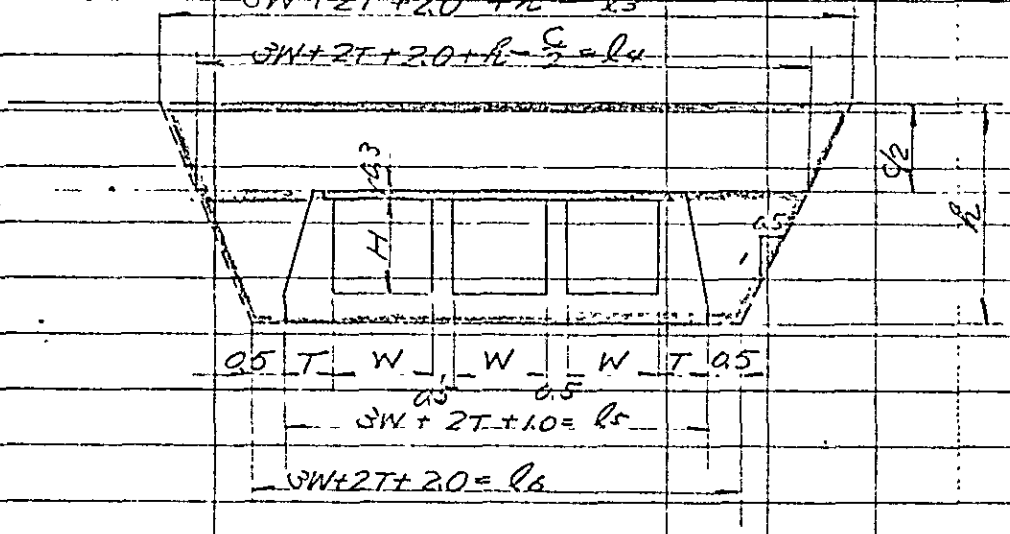
Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m')	

① EARTH WORK



A = 25.0
B = 10.0
C = 3.6
W = 2.2
H = 1.0
T = 0.8'
S = 1/50



ℓ1 = 20.2
ℓ2 = 17.2
ℓ3 = 13.98
ℓ4 = 12.18
ℓ5 = 9.2
ℓ6 = 10.2

$$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S = 3.78$$

I. EXCAVATION

FOR CANAL BANK

$$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$$

$$= (13.98 + 10.2) \times \frac{1}{2} \times 3.78 = a = 45.70$$

$$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$$

$$= (13.98 + 12.18) \times \frac{1}{2} \times 3.6/2 = b = 23.54$$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a\times(l_1+2R\times\frac{1}{2}\times2)$				
	$=45.70\times(20.2+2\times3.78)-$	1268.6			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=23.54\times(10.0+3.6)\quad=(-)$	320.1			
		948.5	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=12.3$
	$L_3\times10.0\times0.3\times2$				
	$=(12.3\times10.0)\times0.6\quad=$	73.8			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=12.3\times15.0\times0.6\quad=$	110.7			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{E}{2})^2}\times L_2\times0.3\times4$				$L_2=8.0$
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times8.0\times1.2\quad=$	38.6			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=4.1$
	$=\sqrt{(4.1+0.2)^2+(\frac{4.1}{2}+0.1)^2}\times8.0\times0.6=$	23.1			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.4$
	$=\sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2}\times8.0\times0.6=$	24.7			
		270.9	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1219.4	m³

Table 2 Concrete, form & Others.

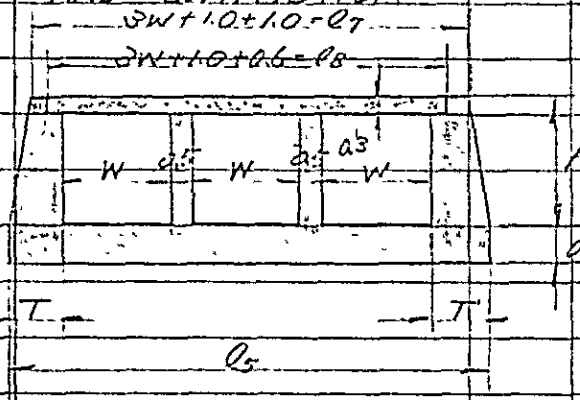
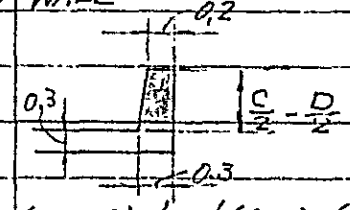
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2 BACKFILL AND COMPACTION					H= 10
			H+0.3		W= 2.2
					T= 0.8
					ℓ_7= 8.6
			0.6		ℓ_8= 8.2
					ℓ_5= 9.2
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(8.6+9.2)\times\frac{1}{2}\times(10+0.3)-0.6\times9.2$				
	$=d=17.09$				A= 25.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.4
	$=17.09\times25.0+17.09\times(4.1+4.4)\times\frac{1}{3}$				F= 4.1
	=③	= 499.9			
		①−③ =		448.6	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=8.2\times0.3\times25.0$	= 61.50			m³
END WALL					C= 3.6
					D= 2.4
					L_1= 8.2
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{2}(3.6-2.4)\times(8.2+0.4)\times2=$	2.58			
TOTAL				64.08	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
③ FORM					
	$(3W+0.3\times2)\times A$				
	$=(3\times2.2+0.6)\times25.0$ =	180.00	m²		
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times4$				
	$=0.25\times\frac{1}{2}(3.6-2.4)\times4$ =	0.60	m²		
	$(\frac{1}{2}(C-D)\times2+0.3)\times(L_1+0.4)\times2$				
	$=(3.6-2.4+0.3)\times(8.2+0.4)\times2$ =	25.80	m²		
TOTAL				206.40	m²

Table 2 Concrete, form & Others.

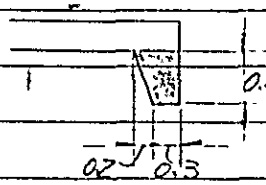
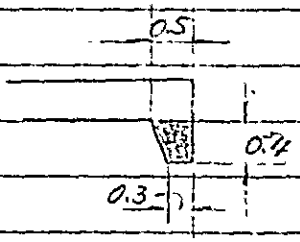
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
(1) WET MASONRY					
A 1 FLOOR					L= 9.2
	9.5 × 0.6 × (A + 5.0)				A = 25.0
	= 9.2 × 0.6 × (25.0 + 5.0) =	165.60	m³		
2. SIDE WALL					
	$(0.5+T)\times\frac{1}{2}\times(H+0.3)-0.3^2$				T = 0.8
	$=(0.5+0.8)\times\frac{1}{2}\times(1.0+0.3)-0.09$				H = 1.0
	= e = 0.76				E = 4.4
	$e\times(A+2\times\sqrt{E^2+(\frac{E}{2})^2}\times\frac{1}{2})\times 2$				
	$=0.76\times(25.0+\sqrt{4.4^2+(\frac{4.4}{2})^2})\times 2$				
	=	45.48	m³		
3. INSIDE WALL					
	H × 0.3 × A × 2 =	15.00	m³		
4 CUT-OFF WALL					
					
	$(0.3+0.5)\times\frac{1}{2}\times 0.5\times(9.5+E\times\frac{1}{2}\times 2)$				
	$=0.20\times(9.2+4.4\times\frac{1}{2})$ =	2.28	m³		
SUB-TOTAL 1+2+3+4 =		228.36	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	73.80	m³		L_3 = 12.3
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	36.90	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
3. CANAL SLOPE SURFACE					C = 3.6
	$\sqrt{C^2+(\frac{F}{2})^2} \times (L_2 + \frac{L_4}{2} + 0.2) \times 0.3 \times 2$				L_4 = 8.2
	$= \sqrt{3.6^2+(\frac{3.6}{2})^2} \times (80 + \frac{8.2}{2} + 0.2) \times 1.2 =$	57.41	m³		L_2 = 8.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				F = 4.4
	$= \sqrt{(4.1+0.2)^2+(\frac{4.1}{2}+0.1)^2} \times 8.0 \times 0.6 =$	23.08	m³		F = 4.1
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.6 =$	24.69	m³		
4. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 10.0
	$= 10.0 \times 8.0 \times 0.6 =$	48.00	m³		
5. CUT-OFF					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2B+2L_3)$				L_3 = 12.3
	$= 0.16 \times (2 \times 10.0 + 2 \times 12.3) =$	7.14	m³		
SUB-TOTAL		273.02	⑤		
WET MASONRY TOTAL ④+⑤ =				601.38	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_5 \times 0.3 \times 2 =$			73.80	m³

No. 3 DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	$B+2C+3.0=l_1$		$2l_1$		
	$B+2C=l_2$				
	1.5 C B C 1.5				
	$l_6+h=l_3$				
	$l_6+h-C/2=l_4$				
	0.5 T W W W W T 0.5				
	$4W+2T+1.5=l_5$				
	$l_5+1.0=l_6$				
	$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{5}\times A\times S=4.33$				
1. EXCAVATION					
FOR CANAL BANK PORTION					
	$(l_3+l_6)\times\frac{1}{2}\times h$				
	$=(16.63+12.3)\times\frac{1}{2}\times 4.33=a=$		62.63		
	$(l_3+l_4)\times\frac{1}{2}\times C/2$				
	$=(16.63+14.83)\times\frac{1}{5}\times 3.6/5=b=$		28.31		

A = 25.0
B = 10.0
C = 3.6
H = 1.5
W = 2.0
T = 0.9
l_1 = 20.2
l_2 = 17.2
l_3 = 16.63
l_4 = 14.83
l_5 = 11.3
l_6 = 12.3
S = 1/100

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
	$a\times(l_1+2h\times\frac{1}{2}\times2)$				
	$=67.63\times(20.2+2\times4.33)$ =	1807.5			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=28.31\times(10.0+3.6)$ = (-)	385.0			
		1422.5	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3=15.25$
	$(L_3\times10.0)\times0.3\times2$				
	$=(15.25\times10.0)\times0.6$ =	91.5			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=15.25\times15.0\times0.6$ =	137.3			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times0.3\times4$				$L_2=10.0$
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times10.0\times1.2$ =	48.3			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=5.3$
	$=\sqrt{(5.3+0.2)^2+(\frac{5.3}{2}+0.1)^2}\times10.0\times0.6$=	36.9			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.8$
	$=\sqrt{(4.8+0.2)^2+(\frac{4.8}{2}+0.1)^2}\times10.0\times0.6$=	33.5			
		347.5	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1770.0	m^3

Table 2 Concrete, form & Others.

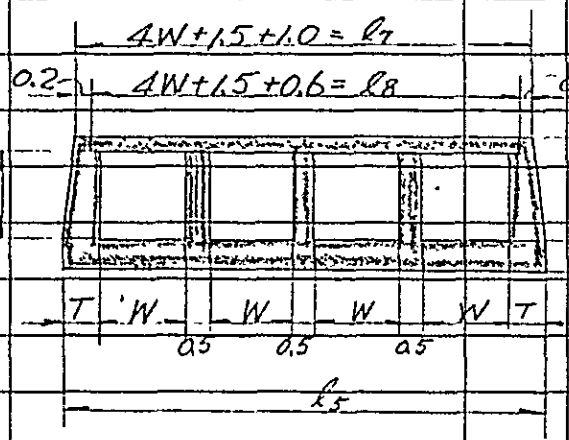
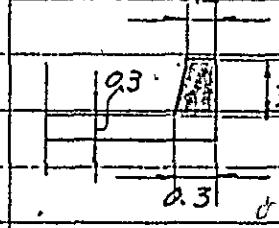
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
2 BACKFILL AND COMPACTION					
					H = 1.5
					W = 2.0
					T = 0.9
					ℓ_7 = 10.5
					ℓ_8 = 10.1
					ℓ_5 = 11.3
	$4W+1.5+1.0=\ell_7$				
	$4W+1.5+0.6=\ell_8$				
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_5\times0.6$				
	$=(10.5+11.3)\times\frac{1}{2}\times(1.5+0.3)+11.3\times0.6$				
	$=$ 26.40 $=d$				A = 25.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E = 4.8
	$=26.40\times25.0+26.40\times(4.8+5.3)\times\frac{1}{2}$				F = 5.3
	$=$ ③	793.3			
	① − ③			629.2	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=10.1\times0.3\times25.0=$	75.75	m³		
END WALL					C = 3.6
					D = 2.4
					L_1 = 10.1
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times(3.6-2.4)\times(10.1+0.4)=$	3.15	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
CONCRETE TOTAL				78.90	m³
③ FORM					
	(n·W+0.3×2)×A				n: NUMBER OF BO.
	=(4×2.0+0.6)×25.0 =	215.00			n=4
	(0.2+0.3)×½×½(C−D)×4				
	= 0.25×½(3.6−2.4)×4 =	0.60			L₁=10.1
	[½(C−D)×2+0.3)×(L₁+0.4)×2				
	=(3.6−2.4+0.3)×(10.1+0.4)×2=	31.50			
TOTAL				247.10	m²
④ WET MASONRY					
A. 1. FLOOR	ℓ₅×0.6×(A+5.0)				ℓ₅=11.3
	=11.3×0.6×(25.0+5.0) =	203.40			A=25.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.9
	=(0.5+0.9)×½×(1.5+0.3)−0.09				H=1.5
	= e = 1.17				E 4.8
	e×(A+2×$\sqrt{E^2+(\frac{E}{2})^2}$×½)×2				
	= 1.17×(25.0+$\sqrt{4.8^2+(\frac{4.8}{2})^2}$)×2				
	=	71.06			m³
3. INSIDE WALL					
	H×0.3×A×(n−1)				
	= 1.5×0.3×25.0×(4−1) =	33.75			m³
4. CUT-OFF WALL					

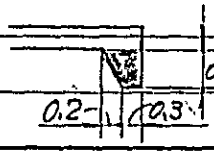
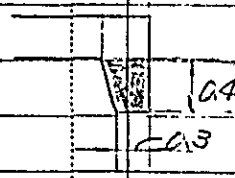


Table 8 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(l_5+E\times\frac{1}{4}\times2)$				$l_5=11.3$
	$=0.20\times(11.3+4.8\times\frac{1}{3})$ =	2.74 m^3			$E=4.8$
SUB-TOTAL	1.+2.+3.+4.	31.095 m^3 ④			
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	9.150 m^3			L_3 15.25
2 OUTLET APRON					$C=3.6$
	$L_3\times5.0\times0.3\times2$ =	4.575 m^3			$L_1=10.1$
3. CANAL SLOPE SURFACE					$l_2=10.0$
	$\sqrt{C^2+(C/2)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.8$
	$=\sqrt{3.6^2+(3.6/2)^2}\times(10.0+\frac{10.1}{2}+0.2)\times1.2=$	73.66 m^3			$F=5.3$
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(5.3+0.2)^2+(5.3/2+0.1)^2}\times10.0\times0.6=$	36.90 m^3			
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.8+0.2)^2+(4.8/2+0.1)^2}\times10.0\times0.6=$	33.54 m^3			
4. CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=10.0\times10.0\times0.6$ =	60.00 m^3			
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
=	$0.16\times(2\times10.0+2\times15.25)=$	8.08 m^3			
SUB-TOTAL	=	34.43 m^3 ⑤			
WET MASONRY TOTAL ④+⑤	=			660.38 m^3	
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.5\times2$ =			91.50 m^3	

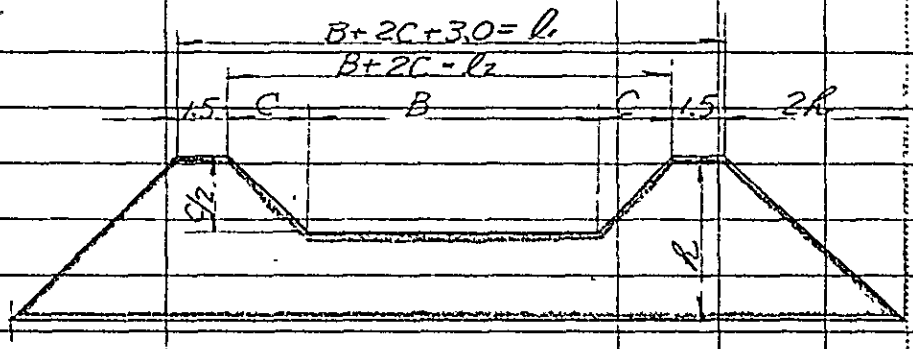


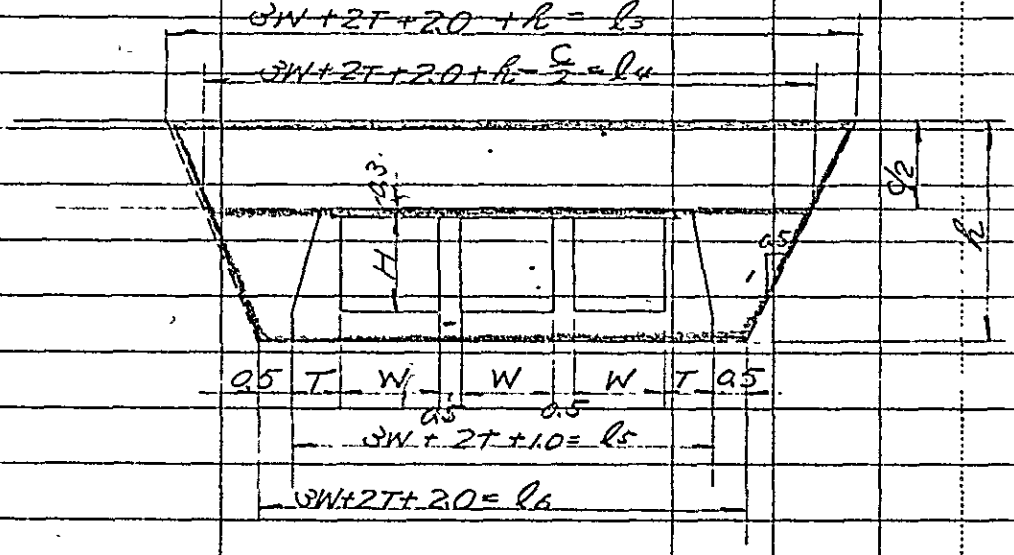
No. 4
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m²)	

① EARTH WORK





A=25.0
B=10.0
C=3.6
W=2.0
H=1.2
T=0.8
S=1/250
ℓ1=20.2
ℓ2=17.2
ℓ3=13.55
ℓ4=11.75
ℓ5=8.6
ℓ6=9.6

$R = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S = 3.95$

1. EXCAVATION

FOR CANAL BANK

$(\ell_3 + \ell_6) \times \frac{1}{2} \times R$

$= (13.55 + 9.6) \times \frac{1}{2} \times 3.95 = a = 45.72$

$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$

$= (13.55 + 11.75) \times \frac{1}{2} \times 3.6/2 = b = 22.77$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 45.72 \times (20.2 + 2 \times 3.95) -$	1284.7			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 22.77 \times (10.0 + 3.6) \quad = (-)$	309.7			
		975.0	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 12.0$
	$(L_3 \times 10.0) \times 0.3 \times 2$				
	$= (12.0 \times 10.0) \times 0.6 \quad -$	72.0			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 12.0 \times 15.0 \times 0.6 \quad =$	108.0			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{E}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{3.6^2 + (\frac{3.6}{2})^2} \times 8.0 \times 1.2 \quad =$	38.6			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 4.4$
	$= \sqrt{(4.4+0.2)^2 + (\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.6 =$	24.7			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.4$
	$= \sqrt{(4.4+0.2)^2 + (\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.6 =$	24.7			
		268.0	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1243.0	m^3

Table 2 Concrete, form & Others.

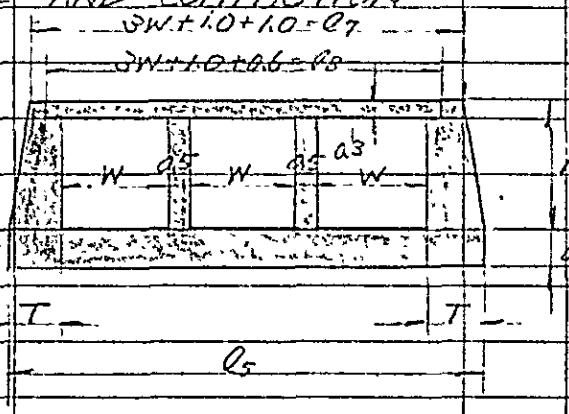
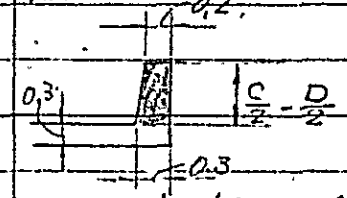
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
2 BACKFILL AND COMPACTION					H= 1.2
			H+0.3		W= 2.0
					T= 0.8
					ℓ_7= 8.0
			0.6		ℓ_6= 7.6
					ℓ_5= 8.6
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(8.0+8.6)\times\frac{1}{2}\times(1.2+0.3)+0.6\times8.6$				
	$=$ ① $= 17.61$				A= 25.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4A
	$=17.61\times25.0+17.61\times(4.4+4.4)\times\frac{1}{3}$				F= 4.4
	$=$ ③ $= 517.7$				
	① − ③ =			457.3	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=7.6\times0.3\times25.0$ $=$	57.00	m³		
END WALL					C= 3.6
					D= 2.4
					L_1= 7.6
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{2}(3.6-2.4)\times(7.6+0.4)\times2=$	2.40			
TOTAL				59.40	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
③ FORM					
	(3W+0.3×2)×A				
	= (3×2.0+0.6)×25.0 =	165.00	m²		
	(0.2+0.3)×½×½(C-D)×4				
	= 0.25×⅓(3.6-2.4)×4 =	0.60	m²		
	(½(C-D)×2+0.3)×(4+0.4)×2				
	= (3.6-2.4+0.3)×(7.6+0.4)×2=	24.00	m²		
TOTAL				189.60	m²

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m')	Remarks
④ WET MASONRY					
A 1. FLOOR					L = 8.6
	L × 0.6 × (A + 5.0)				A = 25.0
	= 8.6 × 0.6 × (25.0 + 5.0) =	154.80	m³		
2. SIDE WALL					
	$(0.5+T)\times\frac{1}{2}\times(H+0.3)-0.3^2$				T = 0.8
	$=(0.5+0.8)\times\frac{1}{2}\times(1.2+0.3)-0.09$				H = 1.2
	= e = 0.89				E = 4.4
	$e\times(A+2\times\sqrt{E^2+(\frac{E}{2})^2}\times\frac{1}{2})\times 2$				
	$=0.89\times(25.0+\sqrt{4.4^2+(\frac{4.4}{2})^2})\times 2$				
	=	53.26	m³		
3. INSIDE WALL					
	H × 0.3 × A × 2 =	18.00	m³		
4. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times 0.5\times(L+E\times\frac{1}{4}\times 2)$				
	$=0.20\times(8.6+4.4\times\frac{1}{2})$ =	2.16	m³		
SUB-TOTAL	1+2+3+4 =	228.22	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times 10.0\times 0.3\times 2$ =	72.00	m³		L_3 = 12.0
2. OUTLET APRON					
	$L_3\times 5.0\times 0.3\times 2$ =	36.00	m³		

Table 2 Concrete, form & Others.

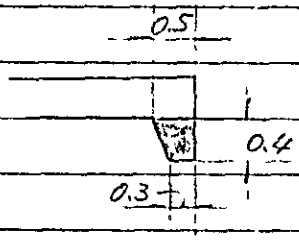
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
3. CANAL SLOPE SURFACE					C = 3.6
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2 + \frac{L_1}{2} + 0.2) \times 0.3 \times 4$				L_1 = 7.6
	$= \sqrt{3.6^2+(\frac{3.6}{2})^2} \times (8.0 + \frac{7.6}{2} + 0.2) \times 1.2 =$	57.96	m³		L_2 = 8.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				E = 4.4
	$= \sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.6 =$	24.69	m³		F = 4.4
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.6 =$	24.69	m³		
1. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 10.0
	$= 10.0 \times 8.0 \times 0.6 =$	48.00	m³		
5. CUT-OFF					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2B+2L_3)$				L_3 = 12.0
	$= 0.16 \times (2 \times 10.0 + 2 \times 12.0) =$	7.04	m³		
SUB-TOTAL		270.38	⑤		
WET MASONRY TOTAL ④+⑤ =				198.60	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_3 \times 0.3 \times 2 =$			72.00	m³

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Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	$B+2C+3.0=\ell_1$		$2h$		
	$B+2C=\ell_2$				
	1.5 C B C 1.5				
	$\ell_6+h=\ell_3$				
	$\ell_6+h-C/2=\ell_4$				
	0.5 T W W W W T 0.5				
	0.5 0.5 0.5				
	$AW+2T+1.5=\ell_5$				
	$\ell_5+1.0=\ell_6$				
	$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S=4.23$				
1. EXCAVATION					
FOR CANAL BANK PORTION					
	$(\ell_3+\ell_6)\times\frac{1}{2}\times h$				
	$=(17.73+13.5)\times\frac{1}{2}\times 4.23=a=$		66.05		
	$(\ell_3+\ell_4)\times\frac{1}{2}\times C/2$				
	$=(17.73+15.93)\times\frac{1}{2}\times 3.6/2=b=$		30.29		

A = 25.0
B = 10.0
C = 3.6
H = 1.4
W = 2.3
T = 0.9
ℓ_1 = 20.2
ℓ_2 = 17.2
ℓ_3 = 17.73
ℓ_4 = 15.93
ℓ_5 = 12.5
ℓ_6 = 13.5
S = 1/100

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³)	Remarks
	$a\times(l_1+2h\times\frac{1}{2}\times2)$				
	$=660^{5}\times(20.2+2\times4.23)$	1893.0			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=30.29\times(10.0+3.6)$ = (-)	411.9			
		1481.1	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=15.85$
	$(L_3\times100)\times0.3\times2$				
	$=(15.85\times10.0)\times0.6$ =	951			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=15.85\times15.0\times0.6$ =	142.7			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times0.3\times4$				$L_2=10.0$
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times10.0\times1.2$ =	48.3			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=5.0$
	$=\sqrt{(5.0+0.2)^2+(\frac{5.0}{2}+0.1)^2}\times10.0\times0.6=$	34.9			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.5$
	$=\sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2}\times10.0\times0.6=$	31.5			
		352.5	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1833.6	m³

Table 2 Concrete, form & Others.

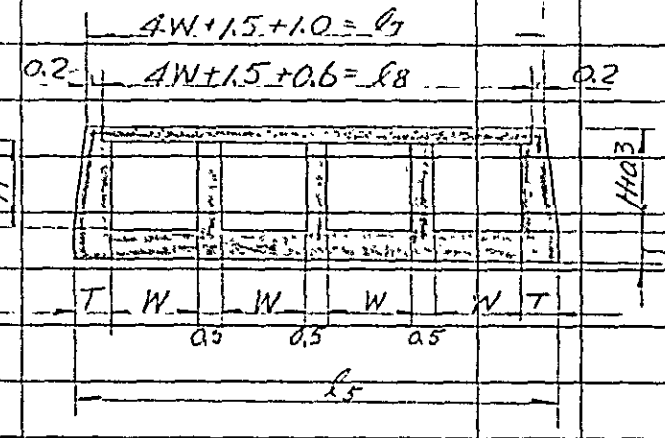
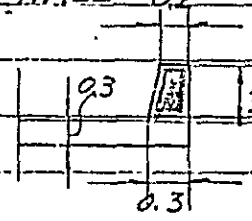
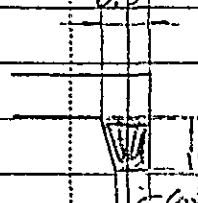
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m')	Remarks
2. BACKFILL AND COMPACTION					
					H=1.4 W=2.3 T=0.9 ℓ7=11.7 ℓ8=11.3 ℓ5=12.5
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(11.7+12.5)\times\frac{1}{2}\times(1.4+0.3)+12.5\times0.6$				
	$=$ 28.07 $=d$				A=25.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E=4.5
	$=28.07\times25.0+28.07\times(4.5+5.0)\times\frac{1}{2}$				F=5.0
	$=$ ③	835.1			
	① − ③			646.0	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=11.3\times0.3\times25.0$ =	84.75	m³		
END WALL					C=3.6 D=2.4 L1=11.3
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times(3.6-2.4)\times(11.3+0.4)$ =	3.51	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				88.26	m^3
③ FORM					
	$(n \cdot W + 0.3 \times 2) \times A$				n: NUMBER OF BO
	$= (4 \times 2.3 + 0.6) \times 25.0$ =	245.00	m^2		n = 4
	$(0.2+0.3) \times \frac{1}{2} \times \frac{1}{2}(C-D) \times 4$				
	$= 0.25 \times \frac{1}{2}(3.6-2.4) \times 4$ =	0.60	m^2		$L_1 = 11.3$
	$[\frac{1}{2}(C-D) \times 2 + 0.3) \times (L_1 + 0.4) \times 2$				
	$= (3.6-2.4+0.3) \times (11.3+0.4) \times 2$ =	35.10	m^2		
TOTAL				280.70	m^2
④ WET MASONRY					
A. 1. FLOOR	$\ell_5 \times 0.6 \times (A+5.0)$				$\ell_5 = 12.5$
	$= 12.5 \times 0.6 \times (25.0+5.0)$ =	225.00	m^3		A = 25.0
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
	$= (0.5+0.9) \times \frac{1}{2} \times (1.4+0.3) - 0.09$				H = 1.4
	$= e = 1.10$				E = 4.5
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 1.10 \times (25.0 + \sqrt{4.5^2 + (\frac{4.5}{2})^2}) \times 2$				
	=	66.07	m^3		
3. INSIDE WALL					
	$H \times 0.3 \times A \times (n-1)$				
	$= 1.4 \times 0.3 \times 25.0 \times (4-1)$ =	31.50	m^3		
4. CUT-OFF WALL					
	0.2 0.3 0.5				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m')	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(l_5+E\times\frac{1}{4}\times2)$				$l_5=12.5$
	$=0.20\times(12.5+4.5\times\frac{1}{3})$ =	2.95 m³			$E=4.5$
SUB-TOTAL	1.+2.+3.+4.	325.52 m³	④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	95.10 m³			$L_3=15.85$
2 OUTLET APRON					$C=3.6$
	$L_3\times5.0\times0.3\times2$ =	17.55 m³			$L_1=11.3$
3. CANAL SLOPE SURFACE					$L_2=10.0$
	$\sqrt{C^2+(\frac{C}{2})^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.5$
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times(10.0+\frac{11.3}{2}+0.2)\times1.2=$	76.55 m³			$F=5.0$
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(5.0+0.2)^2+(\frac{5.0}{2}+0.1)^2}\times10.0\times0.6=$	34.88 m³			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2}\times10.0\times0.6=$	31.53 m³			
4 CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=10.0\times10.0\times0.6$ =	60.00 m³			
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=0.16\times(2\times10.0+2\times15.85)=$	8.27 m³			
SUB-TOTAL	=	353.88 m³	⑤		
WET MASONRY TOTAL: ④+⑤	=			679.40 m³	
⑤ DRY STONE PITCHING					
	$10.0\times L_2\times0.3\times2$ =			95.10 m³	



No. 6
DRAINAGE
CULVERT

Table 2 . Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
① EARTH WORK					
	$B+2C+3.0=l_1$				A=25.0
	$B+2C=l_2$				B=10.0
	1.5 C B C 1.5 2R				C=3.6
					W=2.0
					H=1.5
					T=0.9
					S=1/100
	$2W+2T+2.0+R=l_3$				l_1=20.2
	$2W+2T+2.0+R-\frac{C}{2}=l_4$				l_2=17.2
					l_3=14.13
					l_4=12.33
					l_5=8.8
					l_6=9.8
	0.5 T W W W T 0.5				
	0.5 0.5				
	$2W+2T+1.0=l_5$				
	$2W+2T+2.0=l_6$				
	$R=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$	$=4.33$			
I. EXCAVATION					
FOR CANAL BANK					
	$(l_3+l_6)\times\frac{1}{2}\times R$				
	$=(14.13+9.8)\times\frac{1}{2}\times 4.33$	$=a=57.87$			
	$(l_3+l_4)\times\frac{1}{2}\times C/2$				
	$=(14.13+12.33)\times\frac{1}{2}\times 3.6/2$	$=b=23.81$			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 51.81 \times (20.2 + 2 \times 4.33) -$	1495.2			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 23.81 \times (10.0 + 3.6) =$ (-)	323.8			
		1171.4	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 12.0$
	$L_3 \times 10.0 \times 0.3 \times 2$				
	$= (12.0 \times 10.0) \times 0.6 =$	72.0			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 12.0 \times 15.0 \times 0.6 =$	108.0			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{C}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{3.6^2 + (\frac{3.6}{2})^2} \times 8.0 \times 1.2 =$	38.6			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 5.2$
	$= \sqrt{(5.2+0.2)^2 + (\frac{5.2}{2}+0.1)^2} \times 8.0 \times 0.6 =$	29.0			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.7$
	$= \sqrt{(4.7+0.2)^2 + (\frac{4.7}{2}+0.1)^2} \times 8.0 \times 0.6 =$	26.3			
		273.9	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =	-		1445.3	m³

Table 2 Concrete, form & Others.

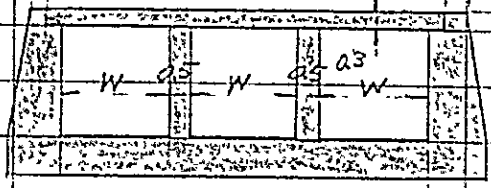
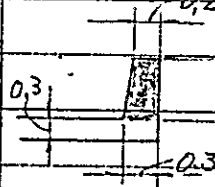
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2 BACKFILL AND COMPACTION					H= 1.5
	ℓ7 = 2W+1.0+1.0				W= 2.0
	ℓ8 = 2W+1.0+0.6				T= 0.9
			H+0.3		ℓ7= 8.0
			0.6		ℓ8= 7.6
					ℓ5= 8.8
	(ℓ7+ℓ5)×½×(H+0.3)+0.6×ℓ5				
	= (8.0+8.8)×½×1.8+0.6×8.8				
	= ① = 20.40				A= 25.0
	①×A + ①×(F+E)×½				E= 4.7
	= 20.40×25.0+20.40×9.9×½				F= 5.2
	= ③	= 611.0			
	①−③ =			560.4	m³
② REINFORCED CONCRETE					
SLAB					
	ℓ8×0.3×A				
	= 7.6×0.3×25.0	= 57.00			m³
END WALL					C= 3.6
					D= 2.4
					L1= 7.6
	(0.2+0.3)×½×½(C−D)×(L1+0.4)×2				
	= 0.25×½×1.2×8.0×2	= 2.40			
TOTAL				562.40	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
③ FORM					
	(3W+0.3×2)×L				
	=(3×2.0+0.6)×25.0	= 165.00	m²		
	(0.2+0.3)×½×½(C-D)×4				
	=0.25×½×1.2×4	= 0.60	m²		
	(½(C-D)×2+0.3)×(L₁+0.4)×2				
	=(1.2+0.3)×8.0×2	= 24.00	m²		
TOTAL				189.60	m²

Table 2 Concrete, form & Others.

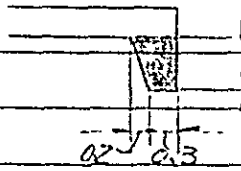
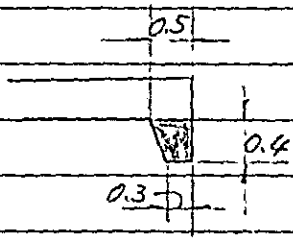
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
④ WET MASONRY					
A 1. FLOOR					ℓ_5 = 8.8
	$\ell_5 \times 0.6 \times (A + 5.0)$				A = 25.0
	= 8.8 × 0.6 × (25.0 + 5.0) =	158.40 m³			
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
=	$(0.5+0.9) \times \frac{1}{2} \times (1.5+0.3) - 0.09$				H = 1.5
=	e = 1.17				E = 4.7
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
=	$1.17 \times (25.0 + \sqrt{4.7^2 + (\frac{4.7}{2})^2}) \times 2$				
=		70.80 m³			
3. INSIDE WALL					
	H × 0.3 × A × 2 =	22.50 m³			
4 CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (\ell_5 + E \times \frac{1}{3} \times 2)$				
=	$0.20 \times (8.8 + 4.7 \times \frac{1}{3})$ =	2.23 m³			
SUB-TOTAL	1+2+3+4 =	253.93 m³ ④			
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	72.00 m³			L_3 = 12.0
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	36.00 m³			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
3. CANAL SLOPE SURFACE					C = 3.6
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2+\frac{L_1}{2}+0.2)\times 0.3\times 4$				L_1 = 7.6
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times(8.0+\frac{7.6}{2}+0.2)\times 1.2 =$	57.96	m³		L_2 = 8.0
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				E = 4.7
	$=\sqrt{(5.2+0.2)^2+(\frac{5.2}{2}+0.1)^2}\times 8.0\times 0.6 =$	28.98	m³		F = 5.2
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				
	$=\sqrt{(4.7+0.2)^2+(\frac{4.7}{2}+0.1)^2}\times 8.0\times 0.6 =$	26.30	m³		
4. CANAL BED					
	$B\times L_2\times 0.3\times 2$				B = 10.0
	$=10.0\times 8.0\times 0.6 =$	48.00	m³		
5. CUT-OFF					
					
	$(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2B+2L_3)$				L_3 = 12.0
	$=0.16\times(2\times 10.0+2\times 12.0) =$	7.04	m³		
SUB-TOTAL		276.28	⑤		
WET MASONRY TOTAL ④+⑤ =				530.21	m³
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times 0.3\times 2 =$			72.00	m³

No. 7
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

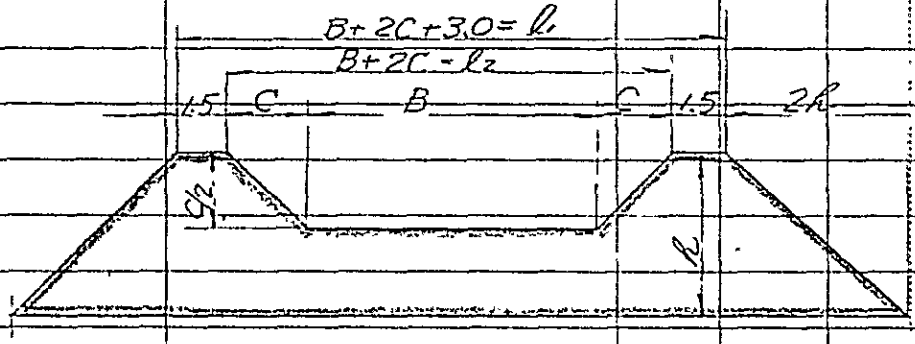
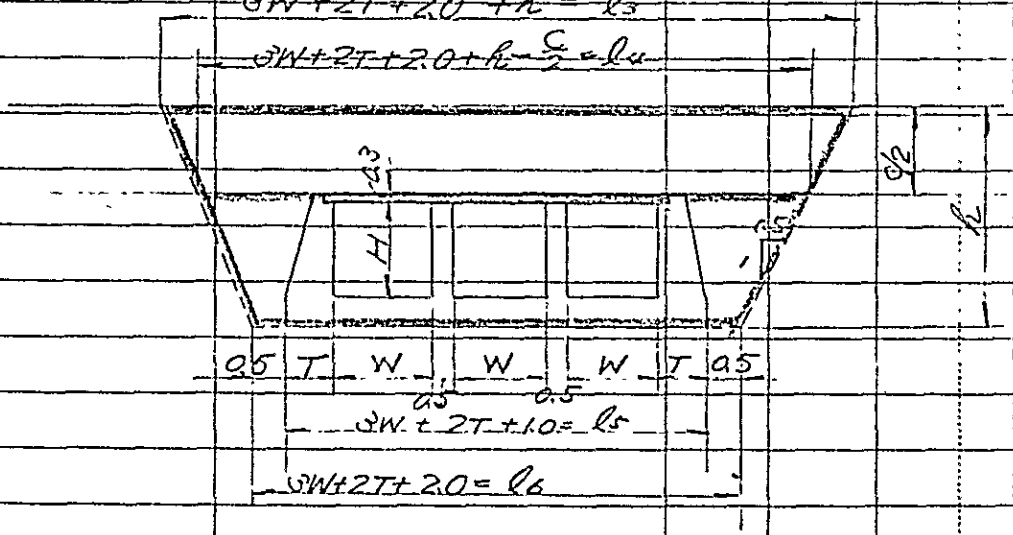
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
					A=25.0 B=10.0 C=3.6 W=2.0 H=1.2 T=0.8 S=1/250 ℓ1=20.2 ℓ2=17.2
					ℓ3=13.55 ℓ4=11.75 ℓ5=8.6 ℓ6=9.6
	$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S$	=3.95			
i. EXCAVATION FOR CANAL BANK					
	$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$				
	$= (13.55 + 9.6) \times \frac{1}{2} \times 3.95$	$= a =$		45.77	
	$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$				
	$= (13.55 + 11.75) \times \frac{1}{2} \times 3.6/2$	$= b =$		22.77	

Table 2 Concrete, form & Others.

Kinds -	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a\times(l_1+2R\times\frac{1}{2}\times2)$				
	$=15.77\times(20.2+2\times3.95)$	= 1281.7			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=22.77\times(10.0+3.6)$	= ㋑ 309.7			
		975.0	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=12.0$
	$(L_3\times100)\times0.3\times2$				
	$=(12.0\times10.0)\times0.6$	= 72.0			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=12.0\times15.0\times0.6$	= 108.0			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times0.3\times4$				$L_2=8.0$
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times8.0\times1.2$	= 39.6			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=4.1$
	$=\sqrt{(4.1+0.2)^2+(\frac{4.1}{2}+0.1)^2}\times8.0\times0.6=$	23.1			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=3.2$
	$=\sqrt{(3.2+0.2)^2+(\frac{3.2}{2}+0.1)^2}\times8.0\times0.6=$	18.2			
		259.9	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1234.9	m³

Table 2 Concrete, form & Others.

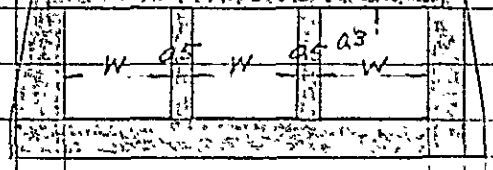
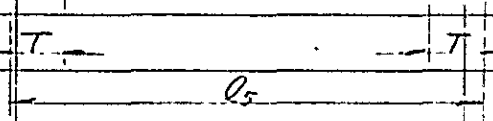
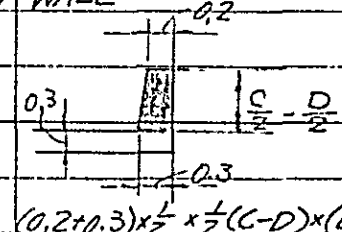
Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
2 BACKFILL	AND COMPACTION				H= 1.2
	$\ell_7 = SW + 1.0 + 1.0$				W= 2.0
	$\ell_8 = SW + 1.0 + 0.6$				T= 0.8
			H+0.3		ℓ_7= 8.0
					ℓ_8= 7.6
			0.6		ℓ_5= 8.6
					
	$(\ell_7 + \ell_5) \times \frac{1}{2} \times (H+0.3) + 0.6 \times \ell_5$				
	$= (8.0+8.6) \times \frac{1}{2} \times (1.2+0.3) + 0.6 \times 8.6$				
	$= d = 17.61$				A= 25.0
	$d \times A + d \times (F+E) \times \frac{1}{2}$				E= 3.2
	$= 17.61 \times 25.0 - 17.61 \times (4.1+3.2) \times \frac{1}{2}$				F= 4.1
	$= ③ =$	301.5			
	$① - ③ =$			470.5	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8 \times 0.3 \times A$				
	$= 7.6 \times 0.3 \times 25.0 =$	57.00	m³		
END WALL					
					C= 3.6
					D= 2.4
					L_1= 7.6
	$(0.2+0.3) \times \frac{1}{2} \times \frac{1}{2} (C-D) \times (L_1+0.4) \times 2$				
	$= 0.25 \times \frac{1}{2} (3.6-2.4) \times (7.6+0.4) \times 2 =$	2.40			
TOTAL				59.40	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
③ FORM					
	(3W+0.3×2)×A				
	=(3×2.0+0.6)×25.0 =	165.00	m^2		
	(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$(C-D)×4				
	=0.25×$\frac{1}{2}$(3.6-2.4)×4 =	0.60	m^2		
	($\frac{1}{2}$(C-D)×2+0.3)×(L+0.4)×2				
	=(3.6-2.4+0.3)×(7.6+0.4)×2=	24.00	m^2		
TOTAL				189.60	m^2

Table 2 Concrete, form & Others.

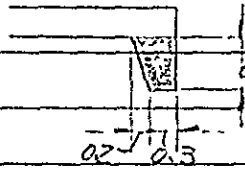
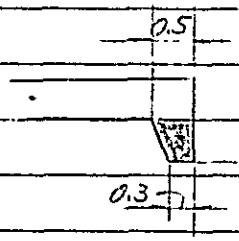
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
④ WET MASONRY					
A 1. FLOOR					L_5 = 8.6
	$L_5 \times 0.6 \times (A + 5.0)$				A = 25.0
	= 8.6 × 0.6 × (25.0 + 5.0) =	151.80	m³		
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.8
	$= (0.5+0.8) \times \frac{1}{2} \times (1.2+0.3) - 0.3^2$				H = 1.2
	= e = 0.89				E = 3.2
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{T}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 0.89 \times (25.0 + \sqrt{3.2^2 + (\frac{3.2}{2})^2}) \times 2$				
	=	50.87	m³		
3. INSIDE WALL					
	H × 0.3 × A × 2 =	18.00	m³		
4. CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (0.5 + E \times \frac{1}{2} \times 2)$				
	$= 0.2 \times (8.6 + 3.2 \times \frac{1}{3})$ =	2.04	m³		
SUB-TOTAL 1+2+3+4 =		225.71	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	11.00	m³		L_3 = 12.0
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	36.00	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
3. CANAL SLOPE SURFACE					C = 3.6
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2+\frac{L_1}{2}+0.2)\times 0.3\times 4$				L_1 = 7.6
	$=\sqrt{3.6^2+(\frac{3.6}{2})^2}\times(8.0+\frac{7.6}{2}+0.2)\times 1.2=$	57.96	m³		L_2 = 8.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times 0.3\times 2$				E = 3.2
	$=\sqrt{(4.1+0.2)^2+(\frac{4.1}{2}+0.1)^2}\times 8.0\times 0.6=$	23.08	m³		F = 4.1
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				
	$=\sqrt{(3.2+0.2)^2+(\frac{3.2}{2}+0.1)^2}\times 8.0\times 0.6=$	18.75	m³		
4. CANAL BED					
	$B\times L_2\times 0.3\times 2$				B = 10.0
	$=10.0\times 8.0\times 0.6 =$	48.00	m³		
5. CUT-OFF					
					
	$(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2B+2L_3)$				L_3 = 12.0
	$=0.16\times(2\times 10.0+2\times 12.0) =$	7.01	m³		
SUB-TOTAL		262.33	⑤		
WET MASONRY TOTAL ④+⑤ =				488.04	m³
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times 0.3\times 2 =$			72.00	m³

No 8
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	$B+2C+3.0=\ell_1$		$2h$		
	$B+2C=\ell_2$				
	1.5 C B C 1.5				
	$C/2$				
	h				
	$\ell_6+h=\ell_3$				
	$\ell_6+h-C/2=\ell_4$				A = 24.0
	0.3				B = 3.0
	$C/2$				C = 5.0
	H		h		H = 1.5
					W = 2.0
	0.5 T W 0.5 W T 0.5				T = 0.9
	$2W+2T+0.5=\ell_5$				ℓ_1 = 16.0
	$\ell_5+1.0=\ell_6$				ℓ_2 = 13.0
					ℓ_3 = 12.32
$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$	$=5.02$				ℓ_4 = 9.82
					ℓ_5 = 6.3
1. EXCAVATION					ℓ_6 = 7.3
FOR CANAL BANK PORTION					S = 1/100
$(\ell_3+\ell_6)\times\frac{1}{2}\times h$					
$=(12.32+7.3)\times\frac{1}{2}\times 5.02$	$=a=49.25$				
$(\ell_3+\ell_4)\times\frac{1}{2}\times C/2$					
$=(12.32+9.82)\times\frac{1}{2}\times 5.0/2$	$=b=27.68$				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 49.25 \times (16.0 + 2 \times 5.02) =$	1282.5			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 27.68 \times (3.0 + 5.0) \quad = (-)$	221.4			
		1061.1	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 10.75$
	$(L_3 \times 100) \times 0.3 \times 2$				
	$= (10.75 \times 10.0) \times 0.6 =$	64.5			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 10.75 \times 15.0 \times 0.6 =$	96.8			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{C}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{5.0^2 + (\frac{5.9}{2})^2} \times 8.0 \times 1.2 =$	53.7			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 5.1$
	$= \sqrt{(5.1+0.2)^2 + (\frac{5.1}{2}+0.1)^2} \times 8.0 \times 0.6 =$	28.4			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.6$
	$= \sqrt{(4.6+0.2)^2 + (\frac{4.6}{2}+0.1)^2} \times 8.0 \times 0.6 =$	25.8			
		269.2	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1330.3	m^3

Table 2 Concrete, form & Others.

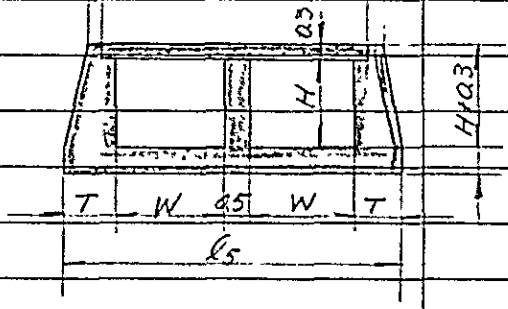
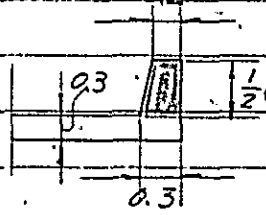
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
2. BACKFILL AND COMPACTION					
	$2W+0.5+1.0=\ell_7$				H = 1.5
	$2W+0.5+0.6=\ell_8$				W = 2.0
					T = 0.9
					ℓ_7 = 5.5
					ℓ_8 = 5.1
					ℓ_5 = 6.3
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_5\times0.6$				
	$=(5.5+6.3)\times\frac{1}{2}\times(1.5+0.3)+6.3\times0.6$				
	$=$ 14.40 $=d$				A = 24.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E = 4.6
	$=14.40\times24.0+14.40\times(4.6+5.1)\times\frac{1}{2}$				F = 5.1
	$=$ ③	415.4			
	① − ③			645.7	m²
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=5.1\times0.3\times24.0$ =	36.72	m³		
END WALL					C = 5.0
					D = 4.0
					L_1 = 5.1
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times(5.0-4.0)\times(5.1+0.4)$ =	1.38	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				38.10 m³	
③ FORM					
	$(n \cdot W + 0.3 \times 2) \times A$				n: NUMBER OF SIDE
	$= (2 \times 2.0 + 0.6) \times 24.0 =$	110.40 m²			n = 2
	$(0.2+0.3) \times \frac{1}{2} \times \frac{1}{2}(C-D) \times 4$				
	$= 0.25 \times \frac{1}{2}(5.0-4.0) \times 4 =$	0.50 m²			$L_1 = 5.1$
	$[\frac{1}{2}(C-D) \times 2 + 0.3) \times (L_1 + 0.4) \times 2$				
	$= (5.0-4.0+0.3) \times (5.1+0.4) \times 2 =$	14.30 m²			
TOTAL				125.20 m²	
④ WET MASONRY					
A. 1. FLOOR	$\ell_s \times 0.6 \times (A+5.0)$				$\ell_s = 6.3$
	$= 6.3 \times 0.6 \times (24.0+5.0) =$	109.62 m³			A = 24.0
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
	$= (0.5+0.9) \times \frac{1}{2} \times (1.5+0.3) - 0.09$				H = 1.5
	$= e = 1.17$				E = 4.6
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 1.17 \times (24.0 + \sqrt{4.6^2 + (\frac{4.6}{2})^2}) \times 2$				
	=	68.19 m³			
3. INSIDE WALL					
	$H \times 0.3 \times A \times (n-1)$				
	$= 1.5 \times 0.3 \times 24.0 \times (2-1) =$	10.80 m³			
4. CUT-OFF WALL					
	0.2 0.3 0.5				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remark.
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=6.3$
	$=0.70\times(6.3+4.6\times\frac{1}{2})$ =	1.72	m^3		$E=4.6$
SUB-TOTAL	1.+2.+3.+4.	190.33	m^3 ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	64.50	m^3		$L_3=10.75$
2. OUTLET APRON					$C=5.0$
	$L_3\times5.0\times0.3\times2$ =	32.25	m^3		$L_1=5.1$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(C/2)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.6$
	$=\sqrt{5.0^2+(5.0/2)^2}\times(8.0+\frac{5.1}{2}+0.2)\times1.2=$	72.11	m^3		$F=5.1$
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(5.1+0.2)^2+(5.1/2+0.1)^2}\times8.0\times0.6=$	28.44	m^3		
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.6+0.2)^2+(4.6/2+0.1)^2}\times8.0\times0.6=$	25.76	m^3		
4 CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=3.0\times8.0\times0.6$ =	14.40	m^3		
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=0.16\times(2\times3.0+2\times10.75)$ =	4.40	m^3		
SUB-TOTAL	=	241.86	m^3 ⑤		
WET MASONRY TOTAL ④+⑤	=			432.19	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.5\times2$ =			64.50	m^3

No. 9
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	B+2C+3.0=ℓ1				A=24.0
	B+2C=ℓ2				B=3.0
	1.5 C B C 1.5 2h				C=5.0
	h/2				W=2.5
	h				H=1.5
					T=0.9
					S=1/150
	3W+2T+2.0+R=ℓ3				ℓ1=16.0
	3W+2T+2.0+R-C/2=ℓ4				ℓ2=13.0
					ℓ3=16.28
	0.3 H 0.5 h/2 h				ℓ4=13.78
	0.5 T W W W T 0.5				ℓ5=10.3
	0.5 0.5				ℓ6=11.3
	3W+2T+1.0=ℓ5				
	3W+2T+2.0=ℓ6				
	$R=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$			=4.98	
I. EXCAVATION					
FOR CANAL BANK					
	$(\ell_3+\ell_6)\times\frac{1}{2}\times h$				
	$=(16.28+11.3)\times\frac{1}{2}\times 4.98$			=a=68.67	
	$(\ell_3+\ell_4)\times\frac{1}{2}\times h/2$				
	$=(16.28+13.78)\times\frac{1}{2}\times 5.0/2$			=b=37.58	

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (mt)	Remarks
	$a\times(\ell_1+2\ell\times\frac{1}{2}\times2)$				
	$=68.67\times(16.0+2\times4.98\times\frac{1}{2}\times2)=$	17827			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=37.58\times(3.0+5.0\times\frac{1}{2}\times2)=$ (-)	3006			
		14821	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=13.75$
	$(L_3\times10.0)\times0.3\times2$				
	$=(13.75\times10.0)\times1.3\times2=$	825			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=13.75\times(10.0+5.0)\times0.3\times2=$	123.8			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times0.3\times4$				$L_2=9.0$
	$=\sqrt{5.0^2+(\frac{5.0}{2})^2}\times9.0\times0.3\times4=$	60.4			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=4.9$
	$=\sqrt{(4.9+0.2)^2+(\frac{4.9}{2}+0.1)^2}\times9.0\times0.3\times2=$	30.8			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.6$
	$=\sqrt{(4.6+0.2)^2+(\frac{4.6}{2}+0.1)^2}\times9.0\times0.3\times2=$	29.0			
		326.5	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1808.6	m³

Table 2 Concrete, form & Others.

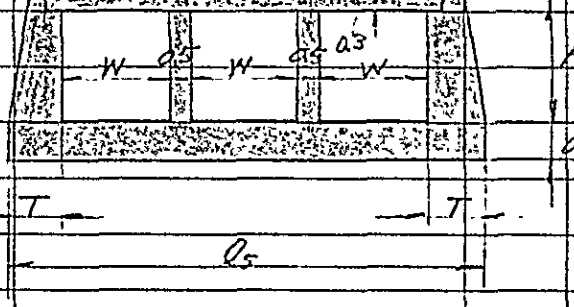
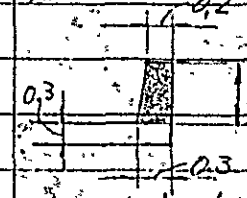
Kinds	Calculated Process	Unit	Numbers	Total (m) (m²)	Remarks
2 BACKFILL	AND COMPACTION				H= 1.5
	~~$\ell_W+1.0+1.0=\ell_7$~~				W= 2.5
	~~$2W+1.0+0.6=\ell_8$~~				T= 0.9
					ℓ_7= 9.5
					ℓ_8 = 9.1
					ℓ_5 = 10.3
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(9.5+10.3)\times\frac{1}{2}\times(1.5+0.3)+0.6\times10.3$				
	$=d=$ 24.0				A= 24.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.6
	$=$ 24.0 $\times$ 24.0 + 24.0 $\times(4.9+4.6)\times\frac{1}{2}$				F= 4.9
	$=$ ③	690.0			
	① − ③ =			792.1	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=9.1\times0.3\times24.0$ =	65.52 m³			
END WALL					C= 5.0
					D= 4.0
					L_2= 9.1
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_2+0.4)\times2$				
	$=0.25\times\frac{1}{2}(5.0-4.0)\times(9.1+0.4)\times2$ =	2.38			
TOTAL				67.90	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
③ FORM					
	(3W+0.3×2)×A				
	=(3×2.5+0.6)×24.0 =	194.40	m²		
	(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$(C-D)×4				
	=0.25×$\frac{1}{2}$(5.0-4.0)×4 =	0.50	m²		
	($\frac{1}{2}$(C-D)×2+0.3)×(L₁+0.4)×2				
	=((5.0-4.0)+0.3)×(9.1+0.4)×2=	24.70	m²		
TOTAL				219.60	m²

Table 2 Concrete, form & Others.

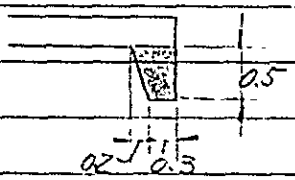
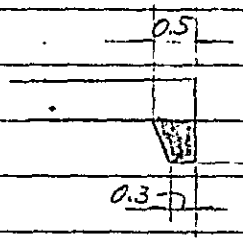
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
④ WET MASONRY					
A 1. FLOOR					ℓ_5=10.3
	$\ell_5 \times 0.6 \times (A+5.0)$				A=24.0
	$=10.3 \times 0.6 \times (24.0+5.0)$ =	179.22	m³		
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T=0.9
	$=(0.5+0.9) \times \frac{1}{2} \times (1.5+0.3) - 0.3^2$				H=1.5
	$= e = 1.17$				E=4.6
	$e \times (A + 2 \times \sqrt{E^2+(\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 1.17 \times (24.0 + \sqrt{4.6^2+(\frac{4.6}{2})^2}) \times 2$				
	=	68.19	m³		
3. INSIDE WALL					
	$H \times 0.3 \times A \times 2$ =	21.60	m³		
4 CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (\ell_5 + E \times \frac{1}{4} \times 2)$				
	$= 0.2 \times (10.3+4.6 \times \frac{1}{2})$ =	2.52	m³		
SUB-TOTAL 1+2.+3.+4	=	271.53	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	82.50	m³		L_3=13.75
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	41.25	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
3. CANAL SLOPE SURFACE					C = 5.0
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2 + \frac{L_1}{2} + 0.2) \times 0.3 \times 4$				$L_1 = 9.1$
	$= \sqrt{5.8^2+(\frac{5.8}{2})^2} \times (9.0 + \frac{9.1}{2} + 0.2) \times 1.2 =$	92.24	m³		$L_2 = 9.0$
	$\sqrt{(E+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				E = 4.6
	$= \sqrt{(4.9+0.2)^2+(\frac{4.9}{2}+0.1)^2} \times 9.0 \times 0.6 =$	30.79	m³		F = 4.9
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.6+0.2)^2+(\frac{4.6}{2}+0.1)^2} \times 9.0 \times 0.6 =$	28.98	m³		
4. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 3.0
	$= 3.0 \times 9.0 \times 0.6 =$	16.20	m³		
5. CUT-OFF					
					
	$(0.3 \times 0.5) \times \frac{1}{2} \times 0.4 \times (2B + 2L_3)$				$L_3 = 13.75$
	$= 0.16 \times (2 \times 3.0 + 2 \times 13.75) =$	5.36	m³		
SUB-TOTAL		29.32	⑤		
WET MASONRY TOTAL ④+⑤ =				568.85	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_5 \times 0.3 \times 2 =$			82.50	m³

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DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

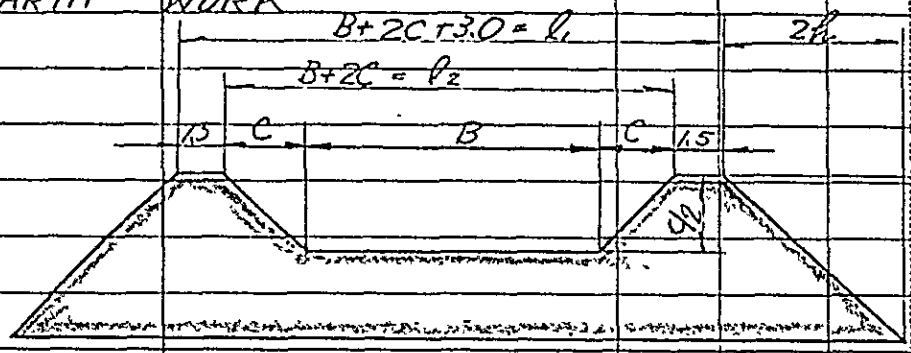
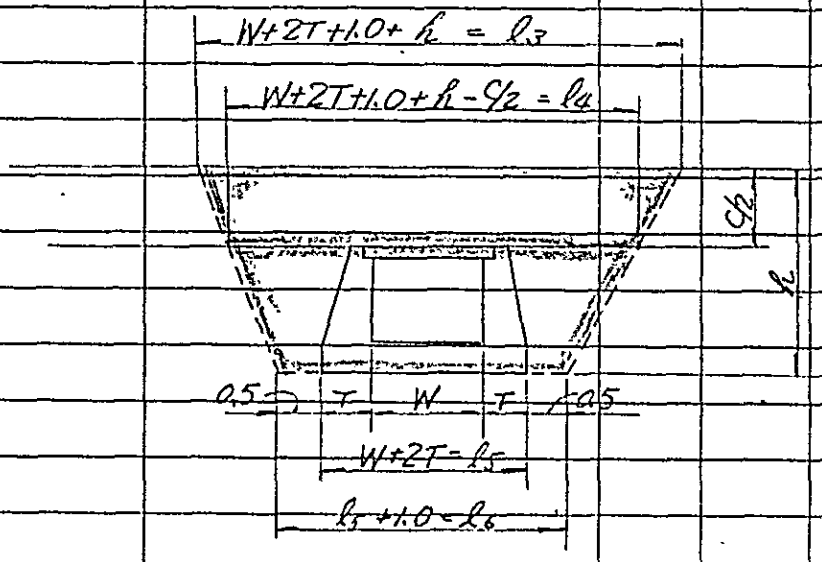
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
					
					A = 24.0 B = 3.0 C = 5.0 H = 1.5 W = 2.0 T = 0.9 l1 = 16.0 l2 = 13.0 l3 = 9.76 l4 = 7.26 l5 = 3.8 l6 = 4.8 S = 1/200
	$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S$	= 4.96			
1. EXCAVATION FOR CANAL BANK PORTION					
	$(l_3 + l_6) \times \frac{1}{2} \times h$				
	$= (9.76 + 4.8) \times \frac{1}{2} \times 4.96$	= a = 36.11			
	$(l_3 + l_4) \times \frac{1}{2} \times C/2$				
	$= (9.76 + 7.26) \times \frac{1}{2} \times 5.0/2$	= b = 21.28			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 36.11 \times (16.0 + 2 \times 4.96)$ =	936.0			
	$b \times (B + (\times \frac{1}{2} \times 2)$				
	$= 21.28 \times (3.0 + 5.0)$ = (-)	170.2			
		765.8	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 9.5$
	$(L_3 \times 10.0) \times 0.3 \times 2$				
	$= (9.5 \times 10.0) \times 0.6$ =	57.0			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 9.5 \times 15.0 \times 0.6$ =	85.5			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{C}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{5.0^2 + (\frac{5.0}{2})^2} \times 8.0 \times 1.2$ =	53.7			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 4.8$
	$= \sqrt{(4.8+0.2)^2 + (\frac{4.8}{2}+0.1)^2} \times 8.0 \times 0.6$ =	26.8			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.6$
	$= \sqrt{(4.6+0.2)^2 + (\frac{4.6}{2}+0.1)^2} \times 8.0 \times 0.6$ =	25.8			
		248.8	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1014.6	m³

Table 2 Concrete, form & Others.

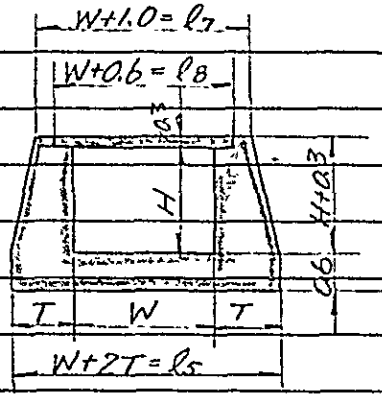
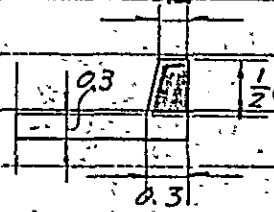
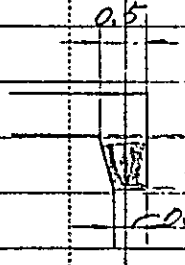
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
2. BACKFILL AND COMPACTION					
					H = 1.5 W = 2.0 T = 0.9 ℓ7 = 3.0 ℓ8 = 2.6 ℓ5 = 3.8
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(3.0+3.8)\times\frac{1}{2}\times(1.5+0.3)+3.8\times0.6$				
	$=$ 8.40 $=d$				A = 24.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E = 4.6
	$=8.40\times24.0+8.40\times(4.6+4.8)\times\frac{1}{2}$				F = 4.8
	$=$ ③	241.1			
	① − ③			524.7	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=2.6\times0.3\times24.0=$	18.72	m³		
END WALL 0.2					C = 5.0 D = 4.0 L1 = 2.6
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C+D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{3}(5.0+4.0)\times(2.6+0.4)\times2=$	0.75	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
CONCRETE TOTAL				19.47	m^3
③ FORM					
	$(n \cdot W + 0.3 \times 2) \times A$				n: NUMBER OF EC
	$= (1 \times 2.0 - 0.6) \times 24.0 =$	62.40	m^2		n=1
	$(0.2+0.3) \times \frac{1}{2} \times \frac{1}{2}(C-D) \times 4$				
	$= 0.25 \times \frac{1}{2}(5.0-4.0) \times 4 =$	0.50	m^2		$L_1 = 2.6$
	$\left(\frac{1}{2}(C-D) \times 2 + 0.3\right) \times (L_1 + 0.4) \times 2$				
	$= (5.0-4.0+0.3) \times (2.6+0.4) \times 2 =$	7.80	m^2		
TOTAL				70.70	m^2
④ WET MASONRY					
A. 1. FLOOR	$\ell_5 \times 0.6 \times (A + 5.0)$				$\ell_5 = 3.8$
	$= 3.8 \times 0.6 \times (24.0+5.0) =$	66.12	m^3		A = 24.0
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
	$= (0.5+0.9) \times \frac{1}{2} \times (1.5+0.3) - 0.09$				H = 1.5
	$= C = 1.17$				E = 4.6
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 1.17 \times (24.0 + \sqrt{4.6^2 + (\frac{4.6}{2})^2}) \times 2$				
	=	68.19	m^3		
3. INSIDE WALL		-			
	$H \times 0.3 \times A \times (n-1)$				
	$= 1.5 \times 0.3 \times 24.0 \times (1-1) =$	0	m^3		
4. CUT-OFF WALL					
	0.2 0.3 0.5				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=3.8$
	$=0.20\times(3.8+4.6\times\frac{1}{3})=$	1.22	m^3		$E=4.6$
SUB-TOTAL	1.+2.+3.+4.	135.53	m^3 ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2=$	57.00	m^3		$L_3=9.5$
2. OUTLET APRON					$C=5.0$
	$L_3\times5.0\times0.3\times2=$	28.50	m^3		$L_1=2.6$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(C/2)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.6$
	$=\sqrt{5.0^2+(5.0/2)^2}\times(8.0+\frac{2.6}{2}+0.2)\times1.2=$	63.73	m^3		$F=4.8$
	$\sqrt{(E+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.8+0.2)^2+(4.8/2+0.1)^2}\times8.0\times0.6=$	26.83	m^3		
	$\sqrt{(E+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.6+0.2)^2+(4.6/2+0.1)^2}\times8.0\times0.6=$	25.76	m^3		
4. CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=3.0\times8.0\times0.6=$	14.40	m^3		
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=0.16\times(2\times3.0+2\times9.5)=$	4.00	m^3		
SUB-TOTAL		220.22	m^3 ⑤		
WET MASONRY TOTAL ④+⑤				355.75	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2=$			57.00	m^3



No. 11
DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	$B+2C+3.0=l_1$				A = 24.0
	$B+2C=l_2$				B = 3.0
	1.5 C B C 1.5 2h				C = 5.0
	C/2 h				W = 2.4
					H = 1.2
					T = 0.8
					S = 1/100
	$3W+2T+2.0+h=l_3$				l_1 = 16.0
	$3W+2T+2.0+h-\frac{C}{2}=l_4$				l_2 = 13.0
					l_3 = 15.52
	C/2 h H 0.3 0.5				l_4 = 13.02
	0.5 T W W W T 0.5				l_5 = 9.8
	$3W+2T+1.0=l_5$				l_6 = 10.8
	$3W+2T+2.0=l_6$				
	$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$				$=4.72$
I. EXCAVATION					
FOR CANAL BANK					
	$(l_3+l_6)\times\frac{1}{2}\times h$				
	$=(15.52+10.8)\times\frac{1}{2}\times 4.72$				$=a=62.12$
	$(l_3+l_4)\times\frac{1}{2}\times C/2$				
	$=(15.52+13.02)\times\frac{1}{2}\times\frac{5.0}{2}$				$=b=35.68$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
	$a\times(l_1+2h\times\frac{1}{2}\times 2)$				
	$=62.12\times(16.0+2\times 4.72\times\frac{1}{2}\times 2)=$	1580.3			
	$b\times(B+C\times\frac{1}{2}\times 2)$				
	$=35.68\times(3.0+5.0\times\frac{1}{2}\times 2)=$ (-)	285.4			
		1294.9	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=13.6$
	$L_3\times 10.0\times 0.3\times 2$				
	$=(13.6\times 10.0)\times 0.3\times 2=$	81.6			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times 0.3\times 2$				
	$=13.6\times(10.0+5.0)\times 0.3\times 2=$	122.4			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times 0.3\times 4$				$L_2=9.0$
	$=\sqrt{5.0^2+(\frac{5.0}{2})^2}\times 9.0\times 0.3\times 4=$	60.4			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times 0.3\times 2$				$F=4.5$
	$=\sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2}\times 9.0\times 0.3\times 2=$	28.4			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				$E=4.0$
	$=\sqrt{(4.0+0.2)^2+(\frac{4.0}{2}+0.1)^2}\times 9.0\times 0.3\times 2=$	25.4			
		318.2	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =		-	1613.1	m³

Table 2 Concrete, form & Others.

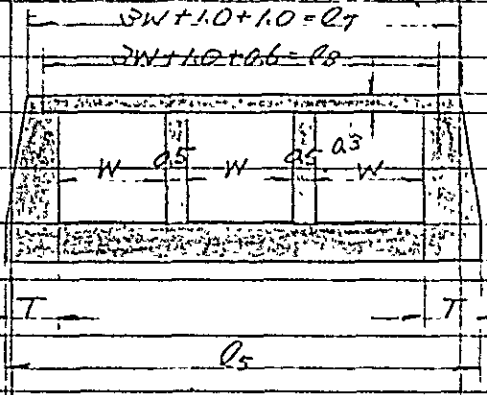
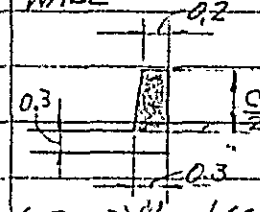
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
2 BACKFILL AND COMPACTION					H= 1.2
					W= 2.4
					T= 0.8
			11+0.3		ℓ_7= 9.2
					ℓ_8= 8.8
			0.6		ℓ_5= 9.8
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(9.2+9.8)\times\frac{1}{2}\times(1.2+0.3)+1.6\times9.8$				
	$=$ ① $=$ 2013				A= 24.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.0
	$=2013\times24.0+2013\times(4.5+4.0)\times\frac{1}{2}$				F= 4.5
	$=$ ③ $=$	568.7			
	① − ③ =			726.2	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=8.8\times0.3\times24.0$ =	63.36	m³		
END WALL					
					C= 5.0
					D= 4.0
					L_1= 8.8
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(5.0-4.0)\times(8.8+0.4)\times2$	7.30			
TOTAL				65.66	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m²)	Remarks
③ FORM					
	(3W+0.3×2)×A				
	=(3×2.4+0.3×2)×24.0 =	187.20	m²		
	(0.2+0.3)×½×½.(C−D)×4				
	=(0.2+0.3)×½×½(5.0−4.0)×4=	0.50	m²		
	($\frac{1}{2}$(C−D)×2+0.3)×(L₁+0.4)×2				
	=$\{\frac{1}{2}$(5.0−4.0)×2+0.3$\}$×(8.8+0.4)×2=	23.92	m²		
TOTAL				211.62	m²

Table 2 Concrete, form & Others.

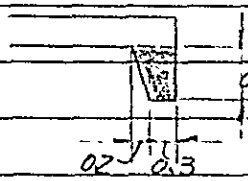
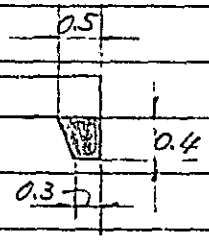
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
④ WET MASONRY					
A 1. FLOOR					L = 9.8
	L × 0.6 × (A + 5.0)				A = 24.0
	= 9.8 × 0.6 × (24.0 + 5.0) =	17052	m³		
2. SIDE WALL					
	$(0.5+T)\times\frac{1}{2}\times(H+0.3)-0.3^2$	03			T = 0.8
	$=(0.5+0.8)\times\frac{1}{2}\times(1.2+0.3)-0.3^2$				H 1.2
	= e = 0.89	H		03	4.0
	$e\times(A+2\times\sqrt{E^2+(\frac{E}{2})^2}\times\frac{1}{2})\times 2$				
	$= 0.89\times(24.0+2\times\sqrt{4.0^2+(\frac{4.0}{2})^2}\times\frac{1}{2})\times 2$				
	=	5068	m³		
3. INSIDE WALL					
	H × 0.3 × A × 2 =	17.28	m³		
4 CUT-OFF WALL					
					
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(L5+E\times\frac{1}{2}\times2)$				
	$=(0.3+0.5)\times\frac{1}{2}\times0.5\times(9.8+4.0\times\frac{1}{2}\times2)=$	2.36	m³		
SUB-TOTAL 1+2+3+4 =		24084	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	L3 × 10.0 × 0.3 × 2 =	81.60	m³		L3 = 13.6
2. OUTLET APRON					
	L3 × 5.0 × 0.3 × 2 =	40.80	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
3. CANAL SLOPE SURFACE					C = 5.0
	$\sqrt{C^2+(\frac{E}{2})^2} \times (L_2 + \frac{L_1}{2} + 0.2) \times 0.3 \times 4$				L_1 = 8.8
	$= \sqrt{5.0^2+(\frac{5.0}{2})^2} \times (9.0 + \frac{8.8}{2} + 0.2) \times 0.3 \times 4 =$	91.73	m³		L_2 = 9.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				E = 4.0
	$= \sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2} \times 9.0 \times 0.3 \times 2 =$	28.38	m³		F = 4.5
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.0+0.2)^2+(\frac{4.0}{2}+0.1)^2} \times 9.0 \times 0.3 \times 2 =$	25.36	m³		
4. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 3.0
	$= 3.0 \times 9.0 \times 0.3 \times 2 =$	16.20	m³		
5. CUT-OFF					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2B+2L_3)$				L_3 = 13.6
	$= (0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2 \times 3.0 + 2 \times 13.6) =$	5.31	m³		
SUB-TOTAL		288.88	⑤		
WET MASONRY TOTAL ④+⑤ =				529.72	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_2 \times 0.3 \times 2 =$			81.60	m³

No. 12 DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	B+2C+3.0=ℓ1				A=24.0
	B+2C=ℓ2				B=3.0
	1.5 C B C 1.5 2h				C=5.0
	G/2 h				W=2.4
					H=1.2
					T=0.8
					S=1/50
	3W+2T+2.0+h=ℓ3				ℓ1=16.0
	3W+2T+2.0+h-G/2=ℓ4				ℓ2=13.0
	G/2 H 0.5 0.5 G/2 h/2				ℓ3=15.48
	0.5 T W W W T 0.5				ℓ4=12.98
	3W+2T+1.0=ℓ5				ℓ5=9.8
	3W+2T+2.0=ℓ6				ℓ6=10.8
	h=G/2+0.3+H+0.6+1/2×A×S =4.68				
I. EXCAVATION					
FOR CANAL BANK					
	(ℓ3+ℓ6)×1/2×h				
	=(15.48+10.8)×1/2×4.68 = a=61.50				
	(ℓ3+ℓ4)×1/2×G/2				
	=(15.48+12.98)×1/2×5.0/2 = b=35.58				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 61.50 \times (16.0 + 2 \times 4.68 \times \frac{1}{2} \times 2) =$	1559.6			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 35.58 \times (30 + 5.0 \times \frac{1}{2} \times 2) = (-)$	2816			
		1275.0	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 13.6$
	$(L_3 \times 10.0) \times 0.3 \times 2$				
	$= (13.6 \times 10.0) \times 0.3 \times 2 =$	81.6			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 13.6 \times (10.0 + 5.0) \times 0.3 \times 2 =$	122.4			
CANAL BANK SURFACE					
	$\sqrt{c^2 + (\frac{E}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.8$
	$= \sqrt{5.0^2 + (\frac{5.0}{2})^2} \times 8.8 \times 0.3 \times 4 =$	59.0			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 4.3$
	$= \sqrt{(4.3+0.2)^2 + (\frac{4.3}{2}+0.1)^2} \times 8.8 \times 0.3 \times 2 =$	26.6			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.0$
	$= \sqrt{(4.0+0.2)^2 + (\frac{4.0}{2}+0.1)^2} \times 8.8 \times 0.3 \times 2 =$	21.8			
		314.4	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1589.4	m^3

Table 2 Concrete, form & Others.

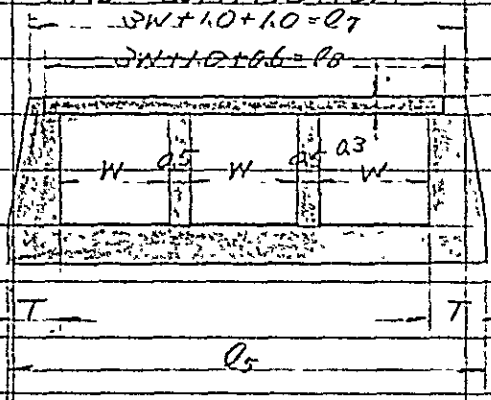
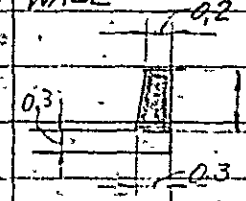
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m')	
2 BACKFILL AND COMPACTION			H+0.3		H= 1.2
					W= 2.4
					T= 0.8
					Q7= 9.2
					L= 8.8
			0.6		Q8= 9.8
	$(Q_7+Q_8)\times\frac{1}{2}\times(H+0.3)+0.6\times Q_8$				
	$=(9.2+9.8)\times\frac{1}{2}\times(1.2+0.3)+0.6\times9.8$				
	$=$ d = 20.13				A=24.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.0
	$=$ 20.13 × 24.0 + 20.13 × (4.3+4.0) × $\frac{1}{3}$				F= 4.3
	= ③ =	566.7			
	① − ③ =			708.3	m³
② REINFORCED CONCRETE					
SLAB					
	$Q_8\times0.3\times A$				
	= 8.8 × 0.3 × 24.0 =	63.36 m³			
END WALL					C= 5.0
					D= 4.0
					L1= 8.8
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(5.0-4.0)\times(8.8+0.4)\times2=$	2.30			
TOTAL				65.66	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
③ FORM					
	(3W'+0.3×2)×A				
	=(3×24+0.3×2)×24.0 =	187.20	m²		
	(0.2+0.3)×½×½(C-D)×4				
	=(0.2+0.3)×½×½(5.0-4.0)×4 =	0.50	m²		
	{½(C-D)×2+0.3}×(L₁+0.4)×2				
	={½(5.0-4.0)×2+0.3}×(8.8+0.4)×2 =	23.92	m²		
TOTAL				211.62	m²

Table 2 Concrete, form & Others.

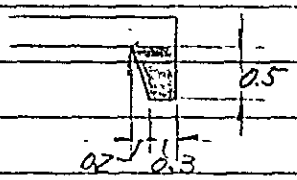
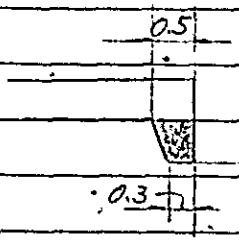
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
④ WET MASONRY					
A 1 FLOOR					ℓ = 9.8
	$\ell_5 \times 0.6 \times (A + 5.0)$				A = 24.0
	$= 9.8 \times 0.6 \times (24.0 + 5.0)$ =	170.52	m^3		
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.8
	$= (0.5+0.8) \times \frac{1}{2} \times (1.2+0.3) - 0.3^2$				H = 1.2
	$= e = 0.89$				E = 4.0
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 0.89 \times (24.0 + 2 \times \sqrt{4.0^2 + (\frac{4.0}{2})^2} \times \frac{1}{2}) \times 2$				
	=	50.68	m^3		
3. INSIDE WALL					
	$H \times 0.3 \times A \times 2$ =	17.28	m^3		
4. CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (0.5 + E \times \frac{1}{4} \times 2)$				
	$= (0.3+0.5) \times \frac{1}{2} \times 0.5 \times (9.8 + 4.0 \times \frac{1}{4} \times 2)$ =	2.36	m^3		
SUB-TOTAL 1+2.+3.+4	=	210.84	m^3 ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	81.60	m^3		L_3 = 13.6
2 OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	40.80	m^3		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
3. CANAL SLOPE SURFACE					C = 5.0
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2 + \frac{L}{2} + 0.2) \times 0.3 \times 4$				L = 8.8
	$= \sqrt{5.0^2+(\frac{5.0}{2})^2} \times (9.0 + \frac{8.8}{2} + 0.2) \times 0.3 \times 4 =$	91.23	m²		L_2 = 9.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				E = 4.0
	$= \sqrt{(4.3+0.2)^2+(\frac{4.3}{2}+0.1)^2} \times 9.0 \times 0.3 \times 2 =$	27.17	m²		F = 4.3
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.0+0.2)^2+(\frac{4.0}{2}+0.1)^2} \times 9.0 \times 0.3 \times 2 =$	25.36	m²		
4. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 3.0
	$= 3.0 \times 9.0 \times 0.3 \times 2 =$	16.20	m³		
5. CUT-OFF					
	$(0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2B+2L_3)$				L_3 = 13.6
	$= (0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2 \times 3.0 + 2 \times 13.6) =$	5.31	m³		
SUB-TOTAL		287.67	⑤		
WET MASONRY TOTAL ④+⑤ =				528.51	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_5 \times 0.3 \times 2 =$			81.60	m³

No. 13
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

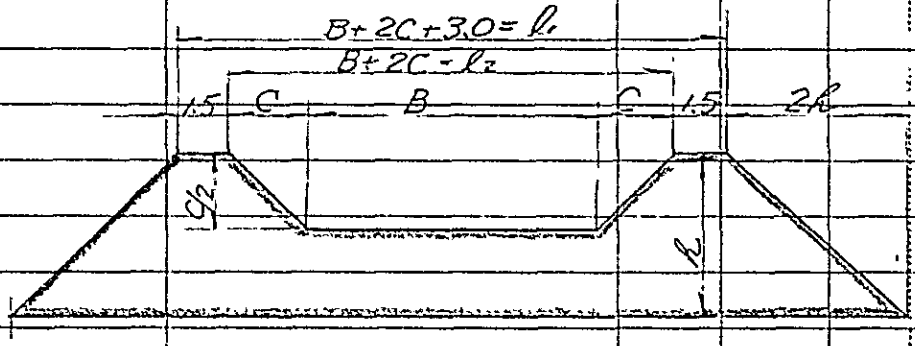
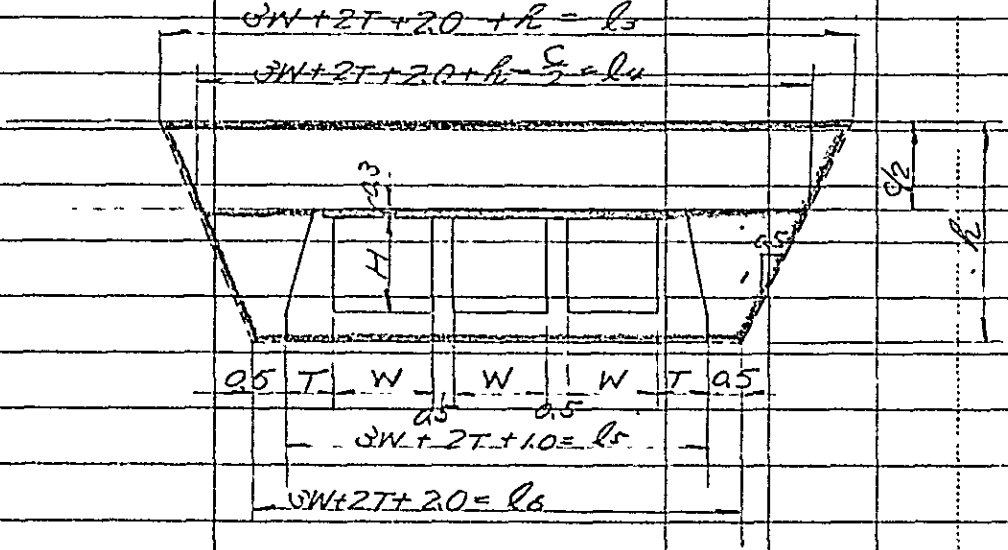
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
① EARTH WORK					
					A=24.0 B=3.0 C=5.0 W=2.0 H=1.3 T=0.8 S=1/100 ℓ1=16.0 ℓ2=13.0
					ℓ3=14.42 ℓ4=11.92 ℓ5=8.6 ℓ6=9.6
	$h = \frac{G}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S = 4.82$				
	I. EXCAVATION				
	FOR CANAL BANK				
	$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$				
	$= (14.42 + 9.6) \times \frac{1}{2} \times 4.82 = a = 57.99$				
	$(\ell_3 + \ell_4) \times \frac{1}{2} \times G/2$				
	$= (14.42 + 11.92) \times \frac{1}{2} \times \frac{5.0}{2} = b = 32.93$				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 57.89 \times (16.0 + 2 \times 4.82 \times \frac{1}{2} \times 2) =$	1484.3			
	$b \times (B + (\times \frac{1}{2} \times 2)$				
	$= 82.93 \times (3.0 + 5.0 \times \frac{1}{2} \times 2) = (-)$	263.4			
		1220.9	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 12.0$
	$(L_3 \times 10.0) \times 0.3 \times 2$				
	$= (12.0 \times 10.0) \times 0.3 \times 2 =$	13.2			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 12.0 \times (10.0 + 5.0) \times 0.3 \times 2 =$	108.0			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{C}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{5.0^2 + (\frac{5.0}{2})^2} \times 8.0 \times 0.3 \times 4 =$	53.7			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 4.7$
	$= \sqrt{(4.7+0.2)^2 + (\frac{4.7}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	26.3			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.2$
	$= \sqrt{(4.2+0.2)^2 + (\frac{4.2}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	23.6			
		224.8	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1445.7	m^3

Table 2 Concrete, form & Others.

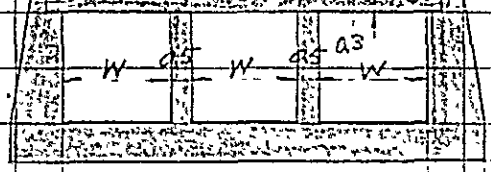
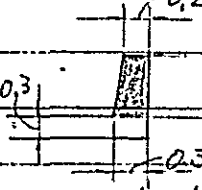
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m²)	
2 BACKFILL	AND COMPACTION				H= 1.3
	2W+1.0+1.0=ℓ_7				W= 2.0
	2W+1.0+0.6=ℓ_8				T= 0.8
			H+0.3		ℓ_7= 8.0
			0.6		ℓ_8= 7.6
	T T				ℓ_5= 8.6
	ℓ_5				
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(8.0+8.6)\times\frac{1}{2}\times(1.3+0.3)+0.6\times8.6$				
	$=$ ① $=$ 18.44				A= 24.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.2
	$=18.44\times24.0+18.44\times(4.7-4.2)\times\frac{1}{2}$				F= 4.7
	$=$ ③ $=$ 524.6				
	① − ③ =			696.3	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_5\times0.3\times A$				
	$=7.6\times0.3\times24.0$	=	54.72	m³	
END WALL					C= 5.0
					D= 4.0
					L_1= 7.6
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(5.0-4.0)\times(7.6+0.4)\times2$		2.00		
TOTAL				56.72	m³

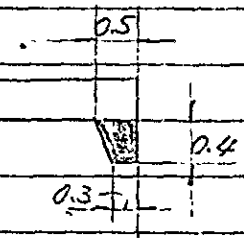
Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m²)	Remarks
③ FORM					
	(3W+0.3×2)×A				
	=(3×2.0+0.3×2)×24.0 =	158.40	m²		
	(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$(C−D)×4				
	=(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$(5.0−4.0)×4 =	0.50	m²		
	($\frac{1}{2}$(C−D)×2+0.3)×(L+0.4)×2				
	=[$\frac{1}{2}$(5.0−4.0)×2+0.3]×(7.6+0.4)×2=	20.80	m²		
TOTAL				179 70	m²

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m³)	Remarks
① WET MASONRY					
A 1. FLOOR					L = 8.6
	L × 0.6 × (A + 5.0)				A = 24.0
	= 8.6 × 0.6 × (24.0 + 5.0) =	14.964	m³		
2. SIDE WALL					
	(0.5 + T) × $\frac{1}{2}$ × (H + 0.3) − 0.3²				T = 0.8
	= (0.5 + 0.8) × $\frac{1}{2}$ × (1.3 + 0.3) − 0.3²				H = 1.3
	= e = 0.95				E = 4.2
	e × (A + 2 × $\sqrt{E^2 + (\frac{E}{2})^2}$ × $\frac{1}{2}$) × 2				
	= 0.95 × (24.0 + 2 × $\sqrt{4.2^2 + (\frac{4.2}{2})^2}$ × $\frac{1}{2}$) × 2				
	=	54.52	m³		
3. INSIDE WALL					
	H × 0.3 × A × 2 = 1.3 × 0.3 × 24 × 2 =	18.72	m³		
4. CUT-OFF WALL					
	(0.3 + 0.5) × $\frac{1}{2}$ × 0.5 × (L + E × $\frac{1}{2}$ × 2)				
	= (0.3 + 0.5) × $\frac{1}{2}$ × 0.5 × (8.6 + 4.2 × $\frac{1}{2}$ × 2) =	2.14	m³		
SUB-TOTAL 1 + 2 + 3 + 4	=	225.02	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	L3 × 10.0 × 0.3 × 2 =	72.00	m³		L3 = 12.0
2. OUTLET APRON					
	L3 × 5.0 × 0.3 × 2 =	36.00	m³		

Table 2 Concrete, form & Others.

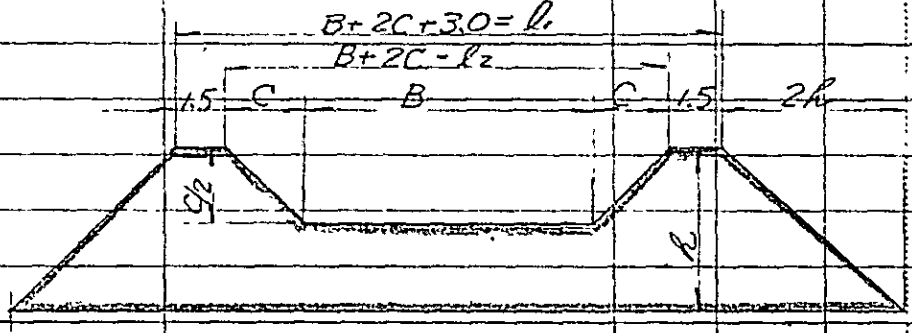
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m')	Remarks
3. CANAL SLOPE SURFACE					C=5.0
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2+\frac{L_1}{2}+0.2)\times 0.3\times 4$				$L_1=7.6$
	$=\sqrt{5.0^2+(\frac{5.0}{2})^2}\times(8.0+\frac{2.6}{2}+0.2)\times 0.3\times 4 = 76.47$	m^3			$L_2=8.0$
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times 0.3\times 2$				E=4.2
	$=\sqrt{(4.7+0.2)^2+(\frac{4.7}{2}+0.1)^2}\times 8.0\times 0.3\times 2 = 26.30$	m^3			F=4.7
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				
	$=\sqrt{(4.2+0.2)^2+(\frac{4.2}{2}+0.1)^2}\times 8.0\times 0.3\times 2 = 23.61$	m^3			
4. CANAL BED					
	$B\times L_2\times 0.3\times 2$				B=3.0
	$=3.0\times 8.0\times 0.3\times 2 = 14.40$	m^3			
5. CUT-OFF					
					
	$(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2B+2L_3)$				$L_3=12.0$
	$=(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2\times 3.0+2\times 12.0) = 4.80$	m^3			
SUB-TOTAL		253.58	⑤		
WET MASONRY TOTAL ④+⑤	=			478.60	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_5\times 0.3\times 2$ =			72.00	m^3

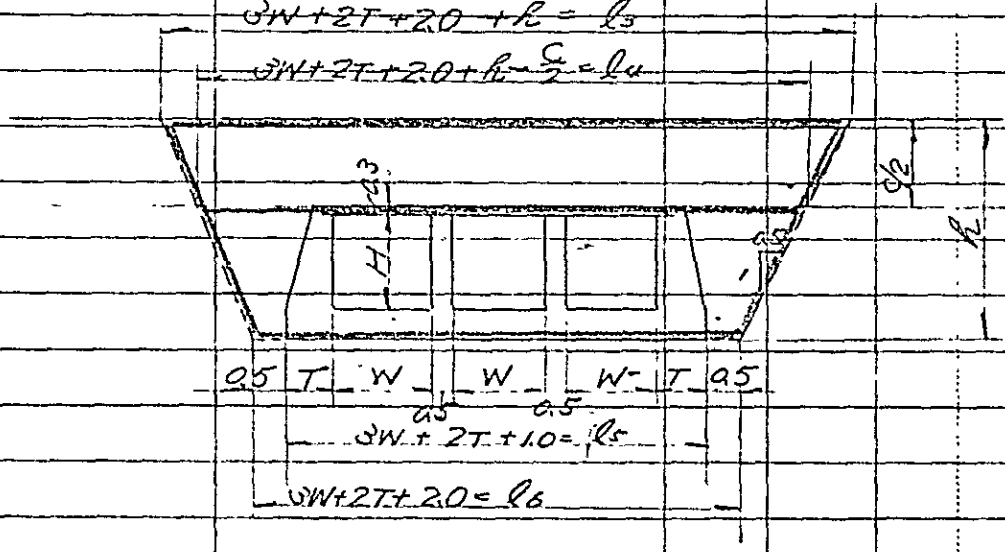
No. 14
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m')	

① EARTH WORK





A=24.0
B=3.0
C=5.0
W=1.8
H=1.5
T=0.9
S=1/100
ℓ1=16.0
ℓ2=13.0
ℓ3=14.22
ℓ4=11.72
ℓ5=8.2
ℓ6=9.2

$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S = 5.02$

1. EXCAVATION

FOR CANAL BANK

$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$

$= (14.22 + 9.2) \times \frac{1}{2} \times 5.02 = a = 58.78$

$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$

$= (14.22 + 11.72) \times \frac{1}{2} \times 5.0/2 = b = 32.43$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (L_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 3878 \times (16.0 + 2 \times 5.02 \times \frac{1}{2} \times 2) =$	1,530.6			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 3243 \times (3.0 + 5.0 \times \frac{1}{2} \times 2) = (-)$	259.4			
		1,271.2	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 11.7$
	$(L_3 \times 100) \times 0.3 \times 2$				
	$= (11.7 \times 10.0) \times 0.3 \times 2 =$	70.2			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 11.7 \times (10.0 + 5.0) \times 0.3 \times 2 =$	105.3			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{E}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{5.0^2 + (\frac{5.0}{2})^2} \times 8.0 \times 0.3 \times 4 =$	53.7			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 5.1$
	$= \sqrt{(5.1+0.2)^2 + (\frac{5.1}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	28.4			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 4.6$
	$= \sqrt{(4.6+0.2)^2 + (\frac{4.6}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	25.8			
		283.4	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1554.6	m³

Table 2 Concrete, form & Others.

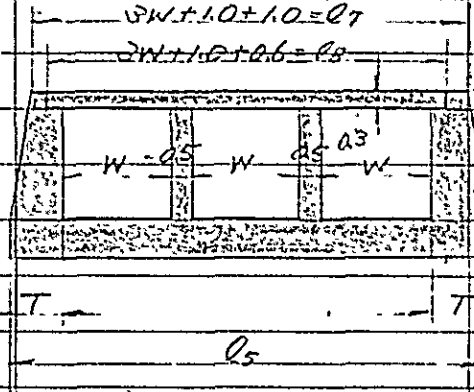
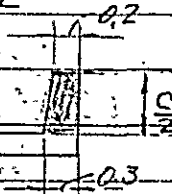
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2 BACKFILL AND COMPACTION					H= 1.5
					W= 1.8
					T= 0.9
			H+0.3		ℓ_7 7.4
					ℓ_6 7.0
			0.6		ℓ_5 = 8.2
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(7.4+8.2)\times\frac{1}{2}\times(1.5+0.3)+0.6\times8.2$				
	$=d=18.96$				A= 24.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.6
	$=18.96\times24.0+18.96(5.1+4.6)\times\frac{1}{2}$				F= 5.1
	$=③=547.0$				
	①−③=			724.2	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=7.0\times0.3\times24.0$ =	50.40 m³			
END WALL					C= 5.0
					D= 4.0
					L_1= 7.0
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(5.0-4.0)\times(7.0+0.4)\times2$ =	1.85			
TOTAL				52.25	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²)	Remarks
③ FORM					
	(3W+0.3×2)×A				
	=(3×1.8+0.3×2)×24.0 =	144.00	m²		
	(0.2+0.3)×½×½(C−D)×4				
	=(0.2+0.3)×½×½(5.0−4.0)×4 =	0.50	m²		
	(½(C−D)×2+0.3)×(L₁+0.4)×2				
	=½(5.0−4.0)×2+0.3}×(7.0+0.4)×2 =	19.24	m²		
TOTAL				163.74	m²

Table 2 Concrete, form & Others.

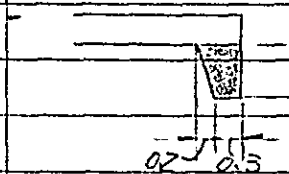
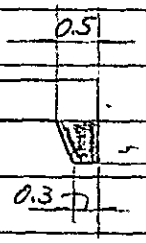
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m')	
④ WET MASONRY					
A 1. FLOOR					l_5 = 8.2
	$l_5 \times 0.6 \times (A + 5.0)$				A = 24.0
	$= 8.2 \times 0.6 \times (24.0 + 5.0)$ =	142.68 m³			
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
	$= (0.5+0.9) \times \frac{1}{2} \times (1.5+0.3) - 0.3^2$				H = 1.5
	$= e$ = 1.17				E = 4.6
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 1.17 \times (24.0 + 2 \times \sqrt{4.6^2 + (\frac{4.6}{2})^2} \times \frac{1}{2}) \times 2$				
	=	68.19 m³			
3. INSIDE WALL					
	$H \times 0.3 \times A \times 2 = 1.5 \times 0.3 \times 24 \times 2$ =	21.60 m³			
4 CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (8.5 + E \times \frac{1}{2} \times 2)$				
	$= (0.3+0.5) \times \frac{1}{2} \times 0.5 \times (8.2 + 4.6 \times \frac{1}{2} \times 2)$ =	2.10 m³			
SUB-TOTAL 1+2+3+4	=	234.57 m³ ④			
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	70.20 m³			L_3 = 11.7
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	35.10 m³			

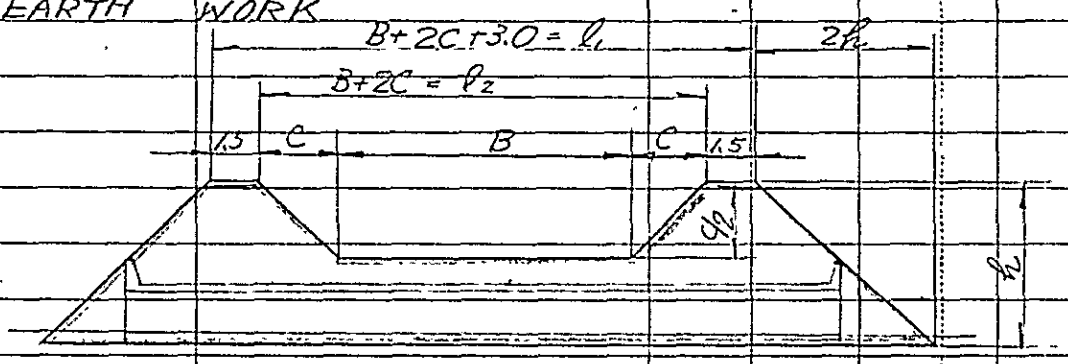
Table 2 Concrete, form & Others.

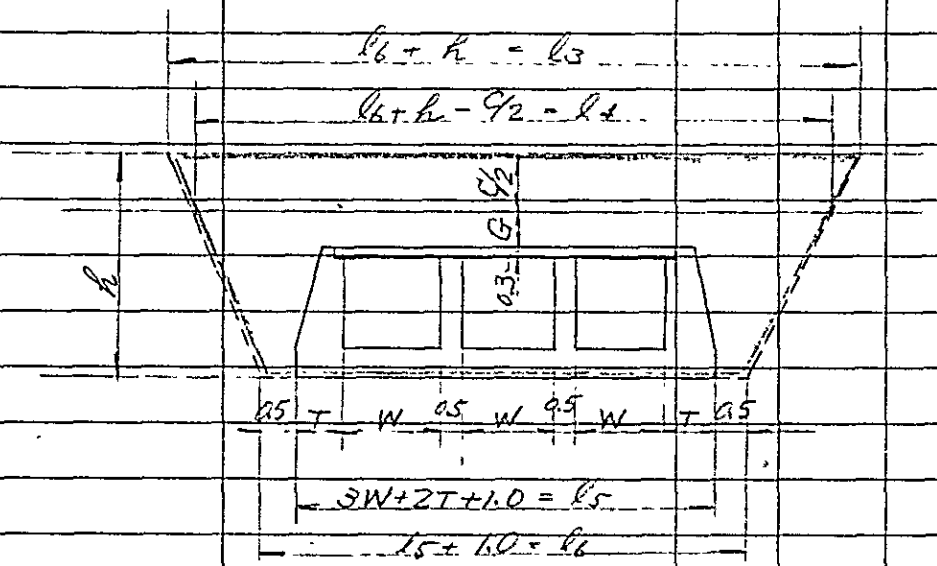
Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
3. CANAL SLOPE SURFACE					C = 5.0
	$\sqrt{C^2+(\frac{C}{2})^2} \times (L_2+\frac{L_1}{2}+0.2)\times 0.3\times 4$				L_1 = 7.0
	$=\sqrt{5.0^2+(\frac{5.0}{2})^2}\times(8.0+\frac{7.0}{2}+0.2)\times 0.3\times 4 =$	78.49 m³			L_2 = 8.0
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times 0.3\times 2$				E = 4.6
	$=\sqrt{(5.1+0.2)^2+(5.1/2+0.1)^2}\times 8.0\times 0.3\times 2 =$	28.44 m³			F = 5.1
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times 0.3\times 2$				
	$=\sqrt{(4.6+0.2)^2+(4.6/2+0.1)^2}\times 8.0\times 0.3\times 2 =$	25.76 m³			
4. CANAL BED					
	$B\times L_2\times 0.3\times 2$				B = 3.0
	$=3.0\times 8.0\times 0.3\times 2 =$	14.40 m³			
5. CUT-OFF					
					
	$(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2B+2L_3)$				L_3 = 11.7
	$=(0.3+0.5)\times\frac{1}{2}\times 0.4\times(2\times 3.0+2\times 11.7) =$	4.70 m³			
SUB-TOTAL		257.09 ⑤			
WET MASONRY TOTAL ④+⑤ =				712.30	m³
⑤ DRY STONE PITCHING					
	$10.0\times L_5\times 0.3\times 2 =$			70.20	m²

No 15 DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					





A = 28.0
B = 3.0
C = 5.0
H = 1.5
W = 2.0
T = 0.9
ℓ1 = 16.0
ℓ2 = 13.0
ℓ3 = 16.0
ℓ4 = 13.5
ℓ5 = 8.8
ℓ6 = 9.8
G = 1.16
S = 1/100

$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S + G$

$= 6.20$

1. EXCAVATION

FOR CANAL BANK PORTION

$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$

$= (16.0 + 9.8) \times \frac{1}{2} \times 6.20 = a = 79.98$

$(\ell_3 + \ell_4) \times \frac{1}{2} \times h_2$

$= (16.0 + 13.5) \times \frac{1}{2} \times 5.0/2 = b = 36.88$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 79.98 \times (16.0 + 2 \times 6.20)$ =	2271.4			B=3.0
	$b \times (B + C \times \frac{1}{2} \times 2)$				C=5.0
	$= 36.88 \times (3.0 + 5.0)$ =	295.0			
		1976.4	m² ①		
SURFACE STRIPPING					
INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	60.0			L_3=10.0
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$ =	90.0			E=5.0
CANAL BANK SURFACE					F=6.0
	$\sqrt{(E+0.2)^2 + (\frac{F}{2} + 0.1)^2} \times (L_3 - \frac{0.5}{2})$				
	$\times 0.3 \times 2$				
	$= \sqrt{(5.0+0.2)^2 + (\frac{5.0}{2} + 0.1)^2} \times (10.0 - \frac{8.8}{2})$				
	$\times 0.6$ =	19.5			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2} + 0.1)^2} \times (L_3 - \frac{0.5}{2})$				
	$\times 0.3 \times 2$				
	$= \sqrt{(6.0+0.2)^2 + (\frac{6.0}{2} + 0.1)^2} \times (10.0 - \frac{8.8}{2})$				
	$\times 0.6$ =	23.3			
		192.8	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			2169.2	m³

Table 2 Concrete, form & Others.

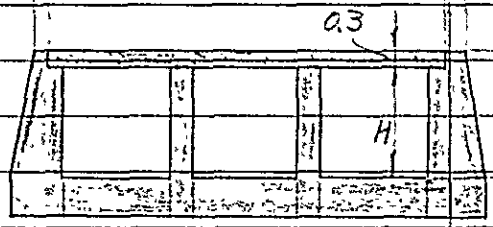
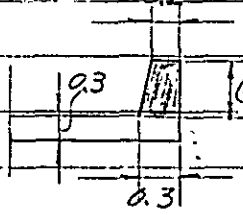
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
2 BACKFILL AND COMPACTION					
	$2W+1.0+1.0=\ell_7$				H=1.5
	$2W+1.0+0.6=\ell_8$				W=2.0
			H+0.3		T=0.9
					ℓ_7=8.0
					ℓ_8=7.6
			0.6		ℓ_5=8.8
	T W 0.5 W 0.5 W T				
	ℓ_5				
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(8.0+8.8)\times\frac{1}{2}\times(1.5+0.3)+8.8\times0.6$				
	$=$ 20.40 $=d$				A=28.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E=5.0
	$=20.40\times28.0+20.40\times(5.0+6.0)\times\frac{1}{3}$				F=6.0
	$=$ ③	683.4			
	①−③			1293.0	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=7.6\times0.3\times28.0$ $=$	63.8	m³		
END WALL					C=5.0
					D=6.0
					L_1=7.6
					G=1.16
	$(0.2+0.3)\times\frac{1}{2}\times\ell_9\times(L_1+0.4)\times2$				
	$=0.25\times0.66\times(7.6+0.4)\times2=$	7.6	m³		

Table 2 Concrete, form & Others.

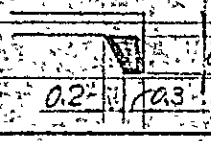
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				66.40	m³
③ FORM					
	(n·W+0.3×2)×A				n NUMBER OF BOX
	= (3×2.0−0.6)×28.0 =	134.40	m²		n=3
	(0.2+0.3)×½×l9×4				
	= 0.25×0.66×4 =	0.66	m²		L₁=7.6
	(2l9+0.3)×(L₁+0.4)×2				
	= (2×0.66−0.3)×(7.6+0.4)×2=	25.92	m²		
TOTAL				211.38	m²
④ WET MASONRY					
A. 1. FLOOR	l₂×0.6×(A+5.0)				l₂=8.8
	= 8.8×0.6×(28.0+5.0) =	172.24	m³		A=28.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.9
	=(0.5+0.9)×½×(1.5+0.3)−0.09				H=1.5
	= C = 1.17				E=5.0
	C×(A+2×√(E²+(E/2)²×½))×2				
	= 1.17×(28.0+√(5.0²+(5.0/2)²))×2				
	=	78.60	m³		
3. INSIDE WALL					
	H×0.3×A×(n−1)				
	= 1.5×0.3×28.0×(3−1) =	25.20	m³		
4. CUT-OFF WALL					
					

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(6.5+E\times\frac{1}{2}\times2)$				$E=5.0$
	$=0.20\times(8.8+5.0\times\frac{1}{2})$ =	2.26	m^3		
	SUB-TOTAL 1.+2.+3.+4. =	28.30	m^3 ④		
B. WET MASONRY LINING					
INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	6.00			$L_3=10.0$
OUTLET APRON					$E=5.0$
	$L_3\times5.0\times0.3\times2$ =	3.01			$F=6.0$
CANAL BANK SURFACE					$6.5=8.8$
	$\sqrt{(E+0.2)^2+(F/2+0.1)^2}\times(L_3-\frac{6.5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(5.0+0.2)^2+(5.0/2+0.1)^2}\times(10.0-\frac{8.8}{2})$				
	$\times0.6$ =	19.53			
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times(L_3-\frac{6.5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(6.0+0.2)^2+(6.0/2+0.1)^2}\times(10.0-\frac{8.8}{2})$				
	$\times0.6$ =	23.79			
	SUB-TOTAL	132.82	m^3 ⑤		
WET MASONRY TOTAL ④+⑤. =				413.12	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ =			60.00	m^3
					$L_3=10.0$

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DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
① EARTH WORK					
	$B+2C+3.0=l_1$		$2l_1$		
	$B+2C=l_2$				
	1.5 C B C 1.5				
	$l_6+h=l_3$				
	$l_6+h-C/2=l_4$				
	0.5 T W 0.5 W T 0.5				
	$2W+2T+0.5=l_5$				
	$l_5+1.0=l_6$				
	$l=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$	$=4.82$			
					A = 24.0
					B = 3.0
					C = 5.0
					H = 1.3
					W = 2.0
					T = 0.8
					l_1 = 16.0
					l_2 = 13.0
					l_3 = 11.92
					l_4 = 9.42
					l_5 = 6.1
					l_6 = 7.1
					S = 1/100
1. EXCAVATION					
FOR CANAL BANK PORTION					
	$(l_3+l_6)\times\frac{1}{2}\times h$				
	$=(11.92+7.1)\times\frac{1}{2}\times 4.82$	$=a=45.81$			
	$(l_3+l_4)\times\frac{1}{2}\times C/2$				
	$=(11.92+9.42)\times\frac{1}{2}\times 5.0/2$	$=b=26.68$			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a\times(l_1+2R\times\frac{1}{2}\times2)$				
	$=45.84\times(16.0+2\times4.82)$	1175.3			
	$b\times(B-C\times\frac{1}{2}\times2)$				
	$=26.68\times(3.0+5.0)$ =(-)	213.4			
		961.9	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3=10.75$
	$(L_3\times10.0)\times0.3\times2$				
	$=(10.75\times10.0)\times0.6$ =	14.5			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=10.75\times15.0\times0.6$ =	96.8			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{C}{2})^2}\times L_2\times0.3\times4$				$L_2=8.0$
	$=\sqrt{5.0^2+(\frac{5.0}{2})^2}\times8.0\times1.2$ =	53.7			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.4$
	$=\sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2}\times8.0\times0.6=$	24.7			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.2$
	$=\sqrt{(4.2+0.2)^2+(\frac{4.2}{2}+0.1)^2}\times8.0\times0.6=$	23.6			
		263.3	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =		-	1225.2	m³

Table 2 Concrete, form & Others.

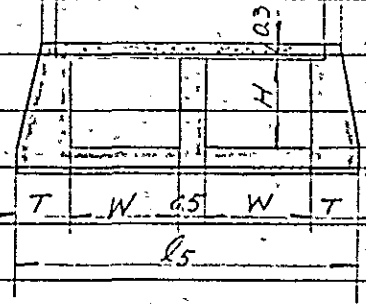
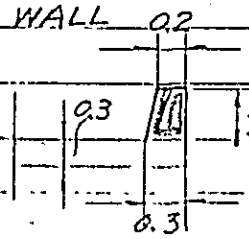
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
2. BACKFILL AND COMPACTION					
	$2W+0.5+1.0=\ell_7$				H=1.3
	$2W+0.5+0.6=\ell_8$				W=2.0
					T=0.8
					ℓ_7=5.5
					ℓ_8=5.1
					ℓ_5=6.1
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(5.5+6.1)\times\frac{1}{2}\times(1.3+0.3)+6.1\times0.6$				
	$=$ 17.94 $=d$				A=24.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E=4.2
	$=17.94\times24.0+17.94\times(4.2+4.4)\times\frac{1}{2}$				F=4.4
	$=$ ③	716.7			
	① − ③			515.7	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=5.1\times0.3\times24.0$	36.72	m³		
END WALL					C=5.0
					D=4.0
					L₁=7.0
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{2}(5.0-4.0)\times(7.0+0.4)\times2=$	1.85	m³		

Table 2 Concrete, form & Others.

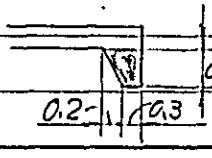
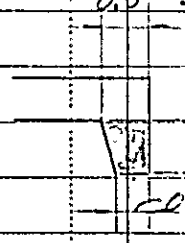
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				32.57 m³	
③ FORM					
	$(n \cdot W + 0.3 \times 2) \times A$				n: NUMBER OF BO.
	$= (2 \times 3.0 + 0.6) \times 24.0$ =	110.40 m²			n = 2
	$(0.2+0.3) \times \frac{1}{2} \times \frac{1}{2}(C-D) \times 4$				
	$= 0.25 \times \frac{1}{2}(5.0-4.0) \times 4$ =	0.50 m²			$L_1 = 5.1$
	$[\frac{1}{2}(C-D) \times 2 + 0.3) \times (L_1 + 0.4) \times 2$				
	$= ((10-1.0+0.3) \times (5.1+0.4) \times 2$ =	14.30 m²			
TOTAL				125.20 m²	
④ WET MASONRY					
A. 1. FLOOR	$\ell_5 \times 0.6 \times (A+5.0)$				$\ell_5 = 6.1$
	$= 6.1 \times 0.6 \times (24.0+5.0)$ =	116.14 m³			A = 24.0
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.8
	$= (0.5+0.8) \times \frac{1}{2} \times (1.3+0.3) - 0.09$				H = 1.3
	$= e = 0.95$				E = 4.2
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{E}{2})^2} \times \frac{1}{2}) \times 2$				
	$= 0.95 \times (24.0 + \sqrt{4.2^2 + (\frac{4.2}{2})^2}) \times 2$				
	=	54.52 m³			
3. INSIDE WALL					
	$H \times 0.3 \times A \times (n-1)$				
	$= 1.3 \times 0.3 \times 24.0 \times (2-1)$ =	9.36 m³			
4. CUT-OFF WALL					
					

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=6.1$
	$=0.20\times(6.1+4.2\times\frac{1}{5})$ =	1.64	m³		$E=4.2$
SUB-TOTAL	1.+2.+3.+4.	171.66	m³ ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	14.50	m³		$L_3=10.75$
2 OUTLET APRON					$C=5.0$
	$L_3\times5.0\times0.3\times2$ =	32.25	m³		$L_1=5.1$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(C\%)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=4.2$
	$=\sqrt{5.0^2+(5.0\%)^2}\times(8.0+\frac{5.1}{2}+0.2)\times1.2$ =	72.11	m³		$F=4.4$
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.4+0.2)^2+(4.4/2+0.1)^2}\times8.0\times0.6$ =	24.69	m³		
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.2+0.2)^2+(4.2/2+0.1)^2}\times8.0\times0.6$ =	23.61	m³		
4 CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=3.0\times8.0\times0.6$ =	14.40	m³		
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=0.16\times(2\times3.0+2\times10.75)$ =	4.40	m³		
SUB-TOTAL	=	235.90	m³ ⑤		
WET MASONRY TOTAL ④+⑤	=			407.62	m³
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ =			64.50	m³



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DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
① EARTH WORK					
	$B+2C+3.0=\ell_1$		$2k$		
	$B+2C=\ell_2$				
	1.5 C B C 1.5				
	$C/2$				
	k				
	$\ell_6+k=\ell_3$				
	$\ell_6+k-C/2=\ell_4$				
	$C/2$				
	k				
	0.5 T W W W W T 0.5				
	0.5 0.5 0.5				
	$4W+2T+1.5=\ell_5$				
	$\ell_5+1.0=\ell_6$				
	$k=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S=3.88$				
1. EXCAVATION					
FOR CANAL BANK PORTION				-	
	$(\ell_3+\ell_6)\times\frac{1}{2}\times k$				
	$=(17.58+13.7)\times\frac{1}{2}\times 3.88$	$=a=60.68$			
	$(\ell_3+\ell_4)\times\frac{1}{2}\times C/2$				
	$=(17.58+15.88)\times\frac{1}{2}\times 3.4/2$	$=b=28.44$			

A = 16.0
B = 1.0
C = 3.4
H = 1.2
W = 2.4
T = 0.8
ℓ_1 = 10.8
ℓ_2 = 7.8
ℓ_3 = 17.58
ℓ_4 = 15.88
ℓ_5 = 12.7
ℓ_6 = 13.7
S = 1/100

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a\times(l_1+2R\times\frac{1}{8}\times 2)$				
	$=60.68\times(10.8+2\times 3.88)$ =	1126.3			
	$b\times(B-C\times\frac{1}{2}\times 2)$				
	$=28.48\times(10+3.4)$ = (-)	125.1			
		1001.1	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3=14.05$
	$(L_3\times 10.0)\times 0.3\times 2$				
	$=(14.05\times 10.0)\times 0.6$ =	84.3			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times 0.3\times 2$				
	$=14.05\times 15.6\times 0.6$ =	136.5			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{E}{2})^2}\times L_2\times 0.3\times 4$				$L_2=8.0$
	$=\sqrt{3.4^2+(\frac{3.4}{2})^2}\times 8.0\times 12$ =	36.5			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times 0.3\times 2$				$F=4.0$
	$=\sqrt{(4.0+0.2)^2+(\frac{4.0}{2}+0.1)^2}\times 8.0\times 0.6$ =	22.5			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times 0.3\times 2$				$E=3.8$
	$=\sqrt{(3.8+0.2)^2+(\frac{3.8}{2}+0.1)^2}\times 8.0\times 0.6$ =	21.5			
		291.3	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			1292.4	m^3

Table 2 Concrete, form & Others.

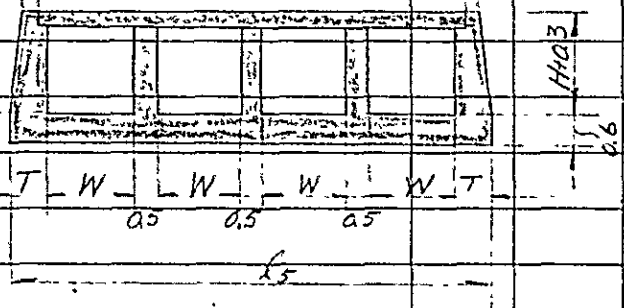
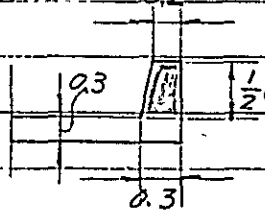
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2. BACKFILL	AND COMPACTION				
	ℓ_7 = 4W+1.5+1.0				H = 1.2
	ℓ_8 = 4W+1.5+0.6				W = 2.4
					T = 0.8
					ℓ_7 = 12.1
					ℓ_8 = 11.7
					ℓ_5 = 12.7
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(12.1+12.7)\times\frac{1}{2}\times(1.2+0.3)+12.7\times0.6$				
	$=$ 26.22 $=d$				A = 16.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E = 3.8
	$=26.22\times16.0+26.22\times(3.8+4.0)\times\frac{1}{2}$				F = 4.0
	$=$ ③	521.8			
	① − ③			479.3	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=11.7\times0.3\times16.0$	= 56.16	m³		
END WALL					C = 3.4
					D = 2.6
					L_1 = 11.7
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{2}(3.4-2.6)\times(11.7+0.4)\times2=$	2.42	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
CONCRETE TOTAL				58.58 m³	
③ FORM					
	(n·W+0.3×2)×A				n: NUMBER OF BS.
	=(1×2.4+0.6)×11.0 =	163.20 m²			n=4
	(0.2+0.3)×½×½(C−D)×4				
	= 0.25×½(3.4−2.6)×4 =	0.40 m²			L₁=11.7
	[½(C−D)×2+0.3]×(L₁+0.4)×2				
	=(3.4−2.6+0.3)×(11.7+0.4)×2 =	26.62 m²			
TOTAL				176.22 m²	
④ WET MASONRY					
A. 1. FLOOR	$\ell_s \times 0.6 \times (A+5.0)$				ℓ_s=12.7
	= 12.7×0.6×(16.0+5.0) =	160.02 m³			A=16.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.8
	=(0.5+0.8)×½×(1.2+0.3)−0.09				H=1.2
	= e = 0.89				E=3.8
	$e\times(A+2\times\sqrt{E^2+(\frac{E}{2})^2}\times\frac{1}{2})\times 2$				
	= 0.89×(16.0+$\sqrt{3.8^2+(\frac{3.8}{2})^2}$)×2				
	=	36.04 m³			
3. INSIDE WALL					
	H×0.3×A×(n−1)				
	= 1.2×0.3×16.0×(4−1) =	17.28 m³			
4. CUT-OFF WALL					
	0.2 0.3 0.5				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=12.7$
	$=0.20\times(12.7+3.8\times\frac{1}{2})=2.92$	m^3			$E=3.8$
SUB-TOTAL	1.+2.+3.+4.	214.16	m^3 ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2=$	84.30	m^3		$L_3=14.05$
2 OUTLET APRON					$C=3.4$
	$L_3\times5.0\times0.3\times2=$	42.15	m^3		$L_1=11.7$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(\frac{C}{2})^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=3.8$
	$=\sqrt{3.4^2+(\frac{3.4}{2})^2}\times(8.0+\frac{11.7}{2}+0.2)\times1.2=$	64.09	m^3		$F=4.0$
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.0+0.2)^2+(\frac{4.0}{2}+0.1)^2}\times8.0\times0.6=$	22.54	m^3		
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(3.8+0.2)^2+(\frac{3.8}{2}+0.1)^2}\times8.0\times0.6=$	21.47	m^3		
4 CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=1.0\times8.0\times0.6=$	4.80	m^3		
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=0.16\times(2\times10+2\times14.05)=$	4.82	m^3		
SUB-TOTAL		244.17	m^3 ⑤		
WET MASONRY TOTAL ④+⑤	=			460.43	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.5\times2=$			84.30	m^3

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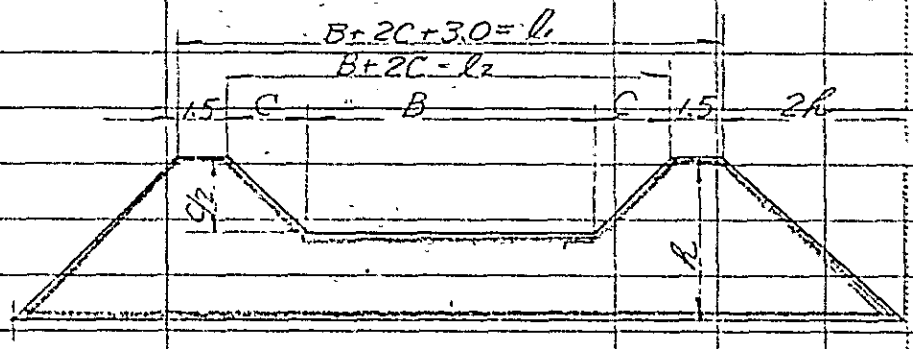
DRAINAGE
CULVERT

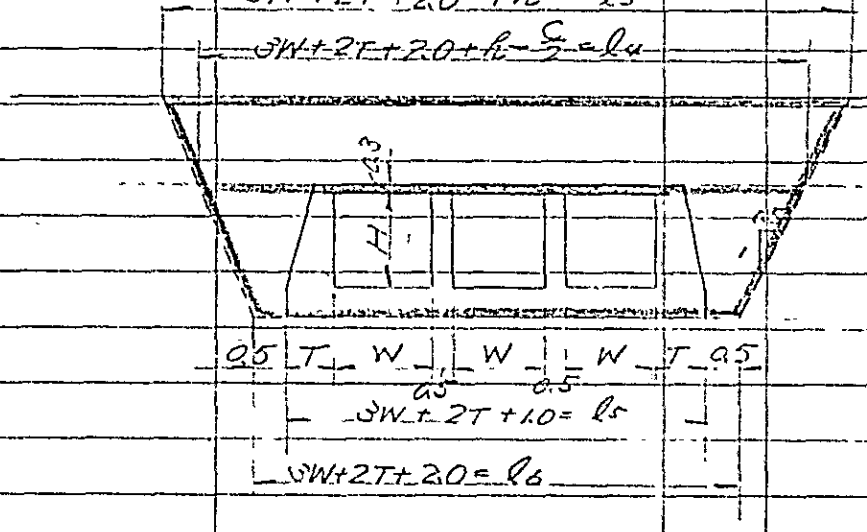
Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	

① EARTH WORK



A = 16.0
B = 1.0
C = 3.4
W = 1.5
H = 1.5
T = 0.9
S = 1/150



ℓ1 = 10.8
ℓ2 = 7.8
ℓ3 = 12.15
ℓ4 = 10.75
ℓ5 = 7.3
ℓ6 = 8.3

$\ell = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S = 4.15$

I. EXCAVATION

FOR CANAL BANK

$(\ell_3 + \ell_6) \times \frac{1}{2} \times \ell$

$= (12.15 + 8.30) \times \frac{1}{2} \times 4.15 = a = 13.06$

$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$

$= (12.15 + 10.75) \times \frac{1}{2} \times 3.4/2 = b = 19.72$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a\times(l_1+2h\times\frac{1}{2}\times2)$				
	$=43.06\times(10.80+2\times1.15\times\frac{1}{2}\times2)$ -	822.4			
	$b\times(B+C\times\frac{1}{2}\times2)$				
	$=19.72\times(1.0+3.4\times\frac{1}{2}\times2)=$ (-)	86.8			
		735.6	m^3 ①		
SURFACE STRIPPING					
INLET APRON					$L_3=11.25$
	$(L_3\times100)\times0.3\times2$				
	$=(11.25\times10.0)\times0.3\times2$ =	67.5			
OUTLET APRON					
	$L_3\times(10.0+5.0)\times0.3\times2$				
	$=11.25\times(10.0+5.0)\times0.3\times2$ =	101.3			
CANAL BANK SURFACE					
	$\sqrt{C^2+(\frac{E}{2})^2}\times L_2\times0.3\times4$				$L_2=8.0$
	$=\sqrt{3.4^2+(\frac{3.4}{2})^2}\times8.0\times0.3\times4$ =	36.5			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times L_2\times0.3\times2$				$F=4.5$
	$=\sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2}\times8.0\times0.3\times2=$	25.2			
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2}\times L_2\times0.3\times2$				$E=4.4$
	$=\sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2}\times8.0\times0.3\times2=$	24.7			
		255.2	m^3 ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			990.8	m^3

Table 2 Concrete, form & Others.

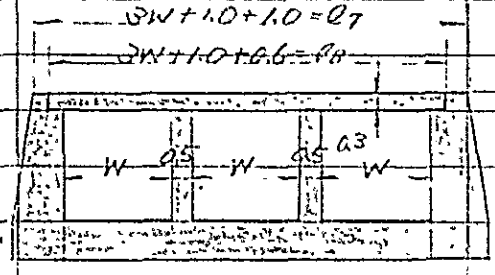
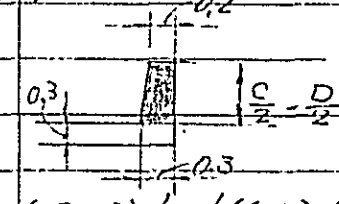
Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
2 BACKFILL AND COMPACTION			H+0.3		H= 1.5 W= 1.5 T= 0.9 ℓ_7= 6.5 ℓ_8= 6.1 ℓ_5= 7.3
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+0.6\times\ell_5$				
	$=(6.5+7.3)\times\frac{1}{2}\times(1.5-0.3)-0.6\times7.3$				
	$=d=16.80$				A= 16.0
	$d\times A+d\times(F+E)\times\frac{1}{2}$				E= 4.4
	$=16.80\times16.0+16.80\times(4.5+4.4)\times\frac{1}{2}$				F= 4.5
	$=③=343.6$				
	①−③=			392.0	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=6.1\times0.3\times16.0$	$=29.28$	m³		
END WALL					C= 3.4 D= 2.6 L_1= 6.1
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(3.4-2.6)\times(6.1+0.4)\times2=1.30$				
TOTAL				30.50	m³

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m²)	Remarks
③ FORM					
	(3W+0.3×2)×A				
	=(3×1.5+0.3×2)×16.0 =	81.60	m²		
	(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$.(C−D)×4				
	=(0.2+0.3)×$\frac{1}{2}$×$\frac{1}{2}$(3.4−2.6)×4=	0.40	m²		
	($\frac{1}{2}$(C−D)×2+0.3)×(L₁+0.4)×2				
	=[$\frac{1}{2}$(3.4−2.6)×2+1.3]×(6.1+0.4)×2=	14.30	m²		
TOTAL				96.30	m²

Table 2 Concrete, form & Others.

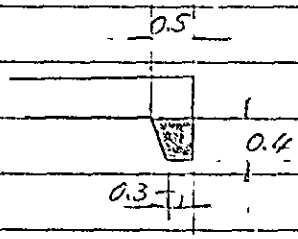
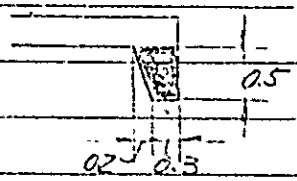
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
3. CANAL SLOPE SURFACE					C = 3.4
	$\sqrt{C^2+(\frac{E}{2})^2} \times (L_2 + \frac{L_1}{2} + 0.2) \times 0.3 \times 4$				L₁ = 6.1
	$= \sqrt{3.4^2+(\frac{3.4}{2})^2} \times (8.0 + \frac{6.1}{2} + 0.2) \times 0.3 \times 4 =$	51.55 m³			L₂ = 8.0
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				E = 4.4
	$= \sqrt{(4.5+0.2)^2+(\frac{4.5}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	25.22 m³			F = 4.5
	$\sqrt{(E+0.2)^2+(\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				
	$= \sqrt{(4.4+0.2)^2+(\frac{4.4}{2}+0.1)^2} \times 8.0 \times 0.3 \times 2 =$	24.69 m³			
4. CANAL BED					
	$B \times L_2 \times 0.3 \times 2$				B = 1.0
	$= 1.0 \times 8.0 \times 0.3 \times 2 =$	4.80 m³			
5. CUT-OFF					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2B+2L_3)$				L₃ = 11.25
	$= (0.3+0.5) \times \frac{1}{2} \times 0.4 \times (2+0+2 \times 11.25) =$	3.92 m³			
SUB-TOTAL		211.43	⑤		
WET MASONRY TOTAL ④+⑤	=			368.66	m³
⑤ DRY STONE PITCHING					
	$10.0 \times L_5 \times 0.3 \times 2$ =			67.50	m²

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m) (m²)	Remarks
④ WET MASONRY					
A 1. FLOOR					ℓ = 7.3
	$\ell \times 0.6 \times (A + 5.0)$				A = 16.0
	= 7.3 × 0.6 × (16.0 − 5.0) =	91.98	m^3		
2. SIDE WALL					
	$(0.5+T) \times \frac{1}{2} \times (H+0.3) - 0.3^2$				T = 0.9
	= (0.5+0.9) × ½ × (1.5+0.3) − 0.3²				H = 1.5
	= e 1.17				E = 4.4
	$e \times (A + 2 \times \sqrt{E^2 + (\frac{H}{2})^2} \times \frac{1}{2}) \times 2$				
	= $1.17 \times (16 + 2 \times \sqrt{4.4^2 + (\frac{4.4}{2})^2} \times \frac{1}{2}) \times 2$				
	=	48.95	m^3		
3. INSIDE WALL					
	H × 0.3 × A × 2 =	14.40	m^3		
4 CUT-OFF WALL					
					
	$(0.3+0.5) \times \frac{1}{2} \times 0.5 \times (\ell + E \times \frac{1}{4} \times 2)$				
	= (0.3+0.5) × ½ × 0.5 × (7.3 + 4.4 × ¼ × 2) =	1.9	m^3		
SUB-TOTAL 1+2+3+4 =		157.23	m^3 ④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2$ =	67.50	m^3		L_3 = 11.25
2. OUTLET APRON					
	$L_3 \times 5.0 \times 0.3 \times 2$ =	33.75	m^3		

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DRAINAGE CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
① EARTH WORK					
	$B+2C+3.0=\ell_1$		$2\ell_1$		
	$B+2C=\ell_2$				
	1.5 C B C 1.5				
	ℓ_2				
	h				
	$\ell_6+h=\ell_3$				
	$\ell_6+h-\ell_2=\ell_4$				A=26.0
					S=1.0
					C=3.4
					H=1.2
					W=2.0
	0.5 T W 0.5 W 0.5 W T 0.5				T=0.9
					ℓ_1=10.8
	$3W+2T+1.0=\ell_5$				ℓ_2=7.8
	$1.5+1.0=\ell_6$				ℓ_3=16.23
	$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S+G$				ℓ_4=14.53
	$=6.43$				ℓ_5=7.8
1. EXCAVATION					ℓ_6=9.8
FOR CANAL BANK PORTION					G=250
	$(\ell_3+\ell_6)\times\frac{1}{2}\times h$				S=1/100
	$=(16.23+9.8)\times\frac{1}{2}\times 6.43 = a=83.69$				
	$(\ell_3+\ell_4)\times\frac{1}{2}\times C/2$				
	$=(16.23+14.53)\times\frac{1}{2}\times 3.4/2 = b=26.15$				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 83.69 \times (10.8 + 2 \times 6.43) =$	1980.1			B = 1.0
	$b \times (B + C \times \frac{1}{2} \times 2)$				C = 3.4
	$= 26.15 \times (1.0 + 3.4) =$	115.1			
		1865.0	m³ ①		
SURFACE STRIPPING					
INLET APRON					
	$L_3 \times 10.0 \times 0.3 \times 2 =$	60.0			L_3 = 10.0
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2 =$	90.0			E = 2.9
CANAL BANK SURFACE					F = 4.2
	$\sqrt{(E+0.2)^2 + (\frac{F}{2}+0.1)^2} \times (L_3 - \frac{l_5}{2})$				
	$\times 0.3 \times 2$				
	$= \sqrt{(2.9+0.2)^2 + (\frac{2.9}{2}+0.1)^2} \times (10.0 - \frac{8.8}{2})$				
	$\times 0.6 =$	11.6			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times (L_3 - \frac{l_5}{2})$				
	$\times 0.3 \times 2$				
	$= \sqrt{(4.2+0.2)^2 + (\frac{4.2}{2}+0.1)^2} \times (10.0 - \frac{8.8}{2})$				
	$\times 0.6 =$	16.5			
		178.1	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =			2043.1	m³

Table 2 Concrete, form & Others.

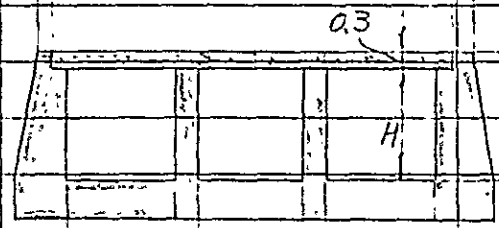
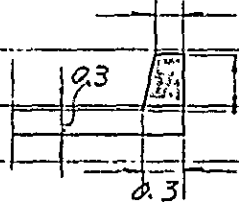
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2 BACKFILL AND COMPACTION					
	3W+1.0+1.0=ℓ_7				H= 1.2
	3W+1.0+0.6=ℓ_8				W= 2.0
			H+0.3		T= 0.9
					ℓ_7= 8.0
					ℓ_8= 7.6
			0.6		ℓ_5= 8.8
	T W 0.5 W 0.5 W T				
	ℓ_5				
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(8.0+8.8)\times\frac{1}{2}\times(1.2+0.3)+8.8\times0.6$				
	$=17.88 = d$				A=26.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E= 2.9
	$=17.88\times26.0+17.88\times(2.9+4.2)\times\frac{1}{3}$				F 4.2
	$=528.4 = ③$				
	①-③			1336.6	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=7.6\times0.3\times26.0$	59.28	m³		
END WALL	 $G-\frac{1}{2}(D-C)=\ell_9=0.40$				C= 3.4
					D= 7.6
					L_1= 7.6
	$(0.2+0.3)\times\frac{1}{2}\times\ell_9\times(L_1+0.4)\times2$				
	$=0.25\times0.40\times(7.6+0.4)\times2=$	1.60	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
CONCRETE TOTAL				60 88	m^3
③ FORM					
	$(n\,W+0.3\times2)\times A$				n: NUMBER OF BOX
	$=(3\times20+0.6)\times26.0$ =	171.60	m^2		n=3
	$(0.2+0.3)\times\frac{1}{2}\times l_9\times4$				
	$=0.25\times0.40\times4$ =	0.40	m^2		$L_1=7.6$
	$(2l_9+0.3)\times(L_1+0.4)\times2$				
	$=(2\times0.40+0.3)\times(7.6+0.4)\times2$ =	17.60	m^2		
TOTAL				189 60	m^2
④ WET MASONRY					
A. 1. FLOOR	$l_5\times0.6\times(A+5.0)$				$l_5=8.8$
	$=8.8\times0.6\times(26.0+5.0)$ =	163.68	m^3		A=26.0
2. SIDE WALL					
	$(0.5+T)\times\frac{1}{2}\times(H+0.3)-0.3^2$				T=0.9
	$=(0.5+0.9)\times\frac{1}{2}\times(1.2+0.3)-0.09$				H=1.2
	$=C=0.96$				E=2.9
	$C\times(A+2\times\sqrt{E^2+(\frac{E}{2})^2}\times\frac{L}{2})\times2$				
	$=0.96\times(26.0+\sqrt{2.9^2+(\frac{2.9}{2})^2})\times2$				
	=	56.15	m^3		
3. INSIDE WALL					
	$H\times0.3\times A\times(n-1)$				
	$=1.2\times0.3\times26.0\times(3-1)$ =	18.72	m^3		
4. CUT-OFF WALL					

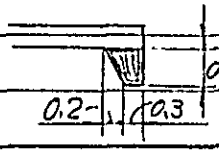


Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(B_5+E\times\frac{1}{3}\times2)$				E 2.9
	$=0.20\times(8.8+2.9\times\frac{1}{3})$ =	2.05	m^3		
SUB-TOTAL	1.+2.+3.+4. =	240.60	m^3 ④		
B. WET MASONRY LINING					
INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	60.0			$L_3=10.0$
OUTLET APRON					E=2.9
	$L_3\times5.0\times0.3\times2$ =	30.0			F=4.2
CANAL BANK SURFACE					$B_5=8.8$
	$\sqrt{(E+0.2)^2+(\frac{F}{2}+0.1)^2}\times(L_3-\frac{B_5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(2.9+0.2)^2+(\frac{2.9}{2}+0.1)^2}\times(10.0-\frac{8.8}{2})$				
	$\times0.6$ =	11.65			
	$\sqrt{(F+0.2)^2+(\frac{F}{2}+0.1)^2}\times(L_3-\frac{B_5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(4.2+0.2)^2+(\frac{4.2}{2}+0.1)^2}\times(10.0-\frac{8.8}{2})$				
	$\times0.6$ =	16.53			
	SUB-TOTAL	118.18	m^3 ⑤		
WET MASONRY TOTAL ④+⑤ =				358.78	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ =			60.00	m^3
					$L_3=10.0$

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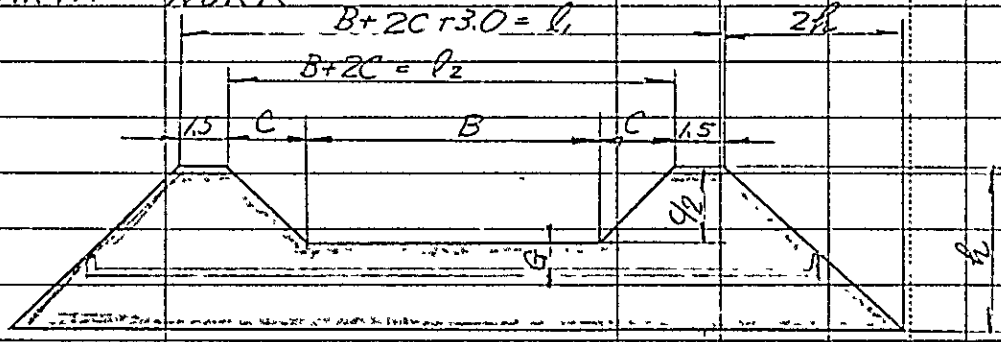
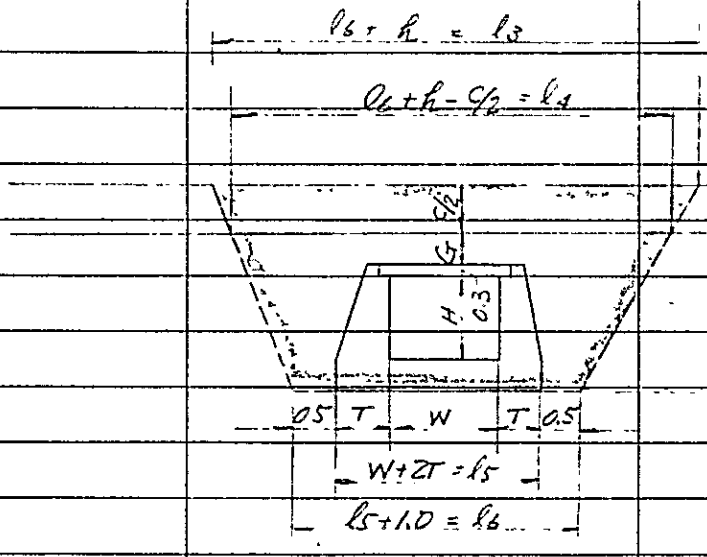
Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m) (m²)	Remarks
① EARTH WORK					





$h = \frac{C}{2} + 0.3 + H + 0.6 + \frac{1}{2} \times A \times S + G = 4.78$

A = 20.0
B = 1.0
C = 3.4
H = 1.0
W = 1.0
T = 0.8
ℓ1 = 10.8
ℓ2 = 7.8
ℓ3 = 8.38
ℓ4 = 6.68
ℓ5 = 2.6
ℓ6 = 3.6
S = 1/200
G = 1.13

1. EXCAVATION

FOR CANAL BANK PORTION

$(\ell_3 + \ell_6) \times \frac{1}{2} \times h$

$= (8.38 + 3.6) \times \frac{1}{2} \times 4.78 = a = 28.63$

$(\ell_3 + \ell_4) \times \frac{1}{2} \times C/2$

$= (8.38 + 6.68) \times \frac{1}{2} \times 3.4/2 = b = 12.80$

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
	$a \times (l_1 + 2h \times \frac{1}{3} \times 2)$				$h = 4.78$
	$= 28.63 \times (10.8 + 2 \times 4.78) =$	5829			$l_1 = 10.8$
	$b \times (B + C \times \frac{1}{3} \times 2)$				$B = 1.0$
	$= 1280 \times (10 + 3.4) \quad = (-)$	543			$C = 3.4$
		5286	m³ ①		
SURFACE STRIPPING					
INLET APRON					
	$(L_3 \times 10.0) \times 0.3 \times 2$				$L_3 = 50$
	$= (50 \times 10.0) \times 0.6 \quad =$	300			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 5.0 \times 15.0 \times 0.6 \quad =$	450			
CANAL BANK SURFACE					
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times (L_3 - \frac{\theta_5}{2})$				$E = 4.7$
	$\times 0.3 \times 2$				$F = 4.7$
	$= \sqrt{(4.7+0.2)^2 + (\frac{4.7}{2}+0.1)^2} \times (5.0 - \frac{2.6}{2}) \times 0.6$				
	$=$	12.2			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times (L_3 - \frac{\theta_5}{2})$				
	$\times 0.3 \times 2$				
	$= \sqrt{(4.7+0.2)^2 + (\frac{4.7}{2}+0.1)^2} \times (5.0 - \frac{2.6}{2}) \times 0.6$				
	$=$	12.2			
		99.4	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ②			626.0	m³

Table 2 Concrete, form & Others.

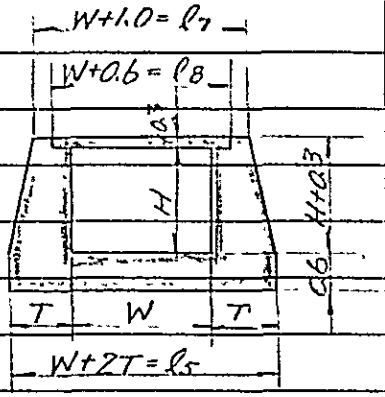
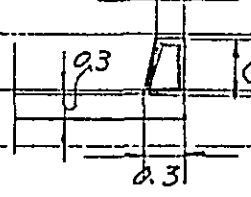
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
2. BACKFILL AND COMPACTION					H = 1.0 W = 1.0 T = 0.8 ℓ7 = 2.0 ℓ8 = 1.6 ℓ5 = 2.6
	(ℓ7 + ℓ5) × ½ × (H+0.3) + ℓ8 × 0.6				
	= (2.0+2.6) × ½ × (1.0+0.3) + 2.6 × 0.6				
	= 4.55 = d				A = 20.0
	d × A + d × (E+F) × ⅓				E = 4.7
	= 4.55 × 20.0 + 4.55 × (4.7+4.7) × ⅓				F = 4.7
	= ③	112.4			
	① − ③			414.2	m³
② REINFORCED CONCRETE					
SLAB					
	ℓ8 × 0.3 × A				
	= 1.6 × 0.3 × 20.0 =	960	m³		
END WALL 0.2					C = 3.4 D = 4.6 L1 = 1.6 G = 1.13
	(0.2+0.3) × ½ × ℓ9 × (L1+0.4) × 2				
	= 0.25 × 0.53 × (1.6+0.4) × 2 =	0.53	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				10.13 m³	
③ FORM					
	(n·W+0.3×2)×A				n: NUMBER OF BOX
	=(1×1.0+0.6)×20.0 =	32.0 m²			n=1
	(0.2+0.3)×½×l₂×4				
	= 0.25×0.53×4 =	0.53 m²			L₁=1.6
	(2×(l₂+0.3)×(L₁+0.4)×2				
	=(2×0.53+0.3)×(1.6+0.4)×2 =	5.44 m²			
TOTAL				37.97 m²	
④ WET MASONRY					
A. 1. FLOOR	Bs×0.6×(A+5.0)				Bs=2.6
	=2.6×0.6×(20.0+5.0) =	31.0 m³			A=20.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.8
	=(0.5+0.8)×½×(1.0+0.3)−0.09				H=1.0
	=e=0.76				E=4.7
	e×(A+2×√(E²+(E/2)²)×½)×2				
	=0.76×(20.0+14.7+(4.7/2)²)×2				
	=	38.39 m³			
3. CUT-OFF WALL					

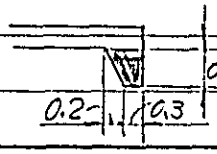


Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(l_5+E\times\frac{1}{4}\times2)$				$E=4.7$
	$=0.20\times(2.6+4.7\times\frac{1}{5})$ $=$	0.99	m^3		
	SUB-TOTAL 1.+2.+3. $=$	78.38	m^3 ④		
B. WET MASONRY LINING					
INLET APRON					
	$L_3\times10.0\times0.3\times2$ $=$	30.00			$L_3=5.0$
OUTLET APRON					$E=4.7$
	$L_3\times5.0\times0.3\times2$ $=$	15.00			$F=4.7$
CANAL BANK SURFACE					$l_5=2.6$
	$\sqrt{(E+0.2)^2+(F/2+0.1)^2}\times(L_3-\frac{l_5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(4.7+0.2)^2+(4.7/2+0.1)^2}\times(5.0-\frac{2.6}{2})$				
	$\times0.6$ $=$	12.2			
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times(L_3-\frac{l_5}{2})$				
	$\times0.3\times2$				
	$=\sqrt{(4.7+0.2)^2+(4.7/2+0.1)^2}\times(5.0-\frac{2.6}{2})$				
	$\times0.6$ $=$	12.2			
	SUB-TOTAL	69.4	m^3 ⑤		
WET MASONRY TOTAL ④+⑤ $=$				147.78	m^3
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ $=$			30.00	m^3
					$L_3=5.0$

No 21, 22
DRAINAGE
CULVERT

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m')	Remarks
① EARTH WORK	$B+2C+3.0=\ell_1$		$2h$		
	$B+2C=\ell_2$				
	1.5 C B C 1.5				
	$C/2$				
	h				
	$W+2T+1.0+h=\ell_3$				
	$W+2T+1.0+h-C/2=\ell_4$				A=16.0
					S=1.0
	$C/2$				C=3.4
	h				H=1.2
					W=1.2
	0.5 T W T 0.5				T=0.7
	$W+2T=\ell_5$				ℓ_1=10.8
	$\ell_5+1.0=\ell_6$				ℓ_2=7.8
					ℓ_3=6.44
$h=\frac{C}{2}+0.3+H+0.6+\frac{1}{2}\times A\times S$	=3.84				ℓ_4=4.74
					ℓ_5=2.6
1. EXCAVATION					ℓ_6=3.6
FOR CANAL BANK PORTION					S=1/200
$(\ell_3+\ell_6)\times\frac{1}{2}\times h$					
$=(6.44+3.6)\times\frac{1}{2}\times 3.84$	$=a=19.28$				
$(\ell_3+\ell_4)\times\frac{1}{2}\times C/2$					
$=(6.44+4.74)\times\frac{1}{2}\times 3.4/2$	$=b=9.50$				

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$a \times (l_1 + 2h \times \frac{1}{2} \times 2)$				
	$= 19.28 \times (10.5 + 2 \times 3.84) =$	356.3			
	$b \times (B + C \times \frac{1}{2} \times 2)$				
	$= 9.50 \times (1.0 + 3.4) \quad = (-)$	41.8			
		314.5	m³ ①		
SURFACE STRIPPING					
INLET APRON					$L_3 = 9.1$
	$L_3 \times 10.0 \times 0.3 \times 2$				
	$= (9.1 \times 10.0) \times 0.6 \quad =$	54.6			
OUTLET APRON					
	$L_3 \times (10.0 + 5.0) \times 0.3 \times 2$				
	$= 9.1 \times 15.0 \times 0.6 \quad =$	81.9			
CANAL BANK SURFACE					
	$\sqrt{C^2 + (\frac{C}{2})^2} \times L_2 \times 0.3 \times 4$				$L_2 = 8.0$
	$= \sqrt{3.4^2 + (\frac{3.4}{2})^2} \times 8.0 \times 1.2 \quad =$	36.5			
	$\sqrt{(F+0.2)^2 + (\frac{F}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$F = 4.0$
	$= \sqrt{(4.0-0.2)^2 + (\frac{4.0}{2}+0.1)^2} \times 8.0 \times 0.6 =$	22.5			
	$\sqrt{(E+0.2)^2 + (\frac{E}{2}+0.1)^2} \times L_2 \times 0.3 \times 2$				$E = 3.8$
	$= \sqrt{(3.8+0.2)^2 + (\frac{3.8}{2}+0.1)^2} \times 8.0 \times 0.6 =$	21.5			
		217.0	m³ ②		
TOTAL EXCAVATION VOLUME					
	① + ② =		-	531.5	m³

Table 2 Concrete, form & Others.

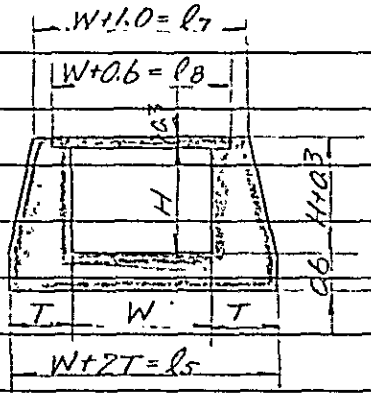
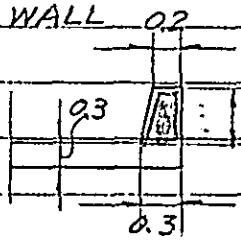
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
2. BACKFILL AND COMPACTION					
					H=11.2 W=1.2 T=0.7 ℓ7=2.2 ℓ8=1.8 ℓ5=2.6
	$(\ell_7+\ell_5)\times\frac{1}{2}\times(H+0.3)+\ell_8\times0.6$				
	$=(2.2+2.6)\times\frac{1}{2}\times(11.2+0.3)+2.6\times0.6$				
	$=$ 15.16 $=d$				A=16.0
	$d\times A+d\times(E+F)\times\frac{1}{2}$				E=3.8
	$=15.16\times16.0+15.16\times(3.8+4.0)\times\frac{1}{2}$				F=4.0
	$=$ ③	102.7			
	① − ③			211.8	m³
② REINFORCED CONCRETE					
SLAB					
	$\ell_8\times0.3\times A$				
	$=1.8\times0.3\times16.0$	8.64	m³		
END WALL					C=3.4 D=2.6 L1=1.8
	$(0.2+0.3)\times\frac{1}{2}\times\frac{1}{2}(C-D)\times(L_1+0.4)\times2$				
	$=0.25\times\frac{1}{2}(3.4-2.6)\times(1.8+0.4)\times2=$	0.44	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
CONCRETE TOTAL				908 m³	
③ FORM					
	(n·W+0.3×2)×A				n: NUMBER OF BC.
	=(1×1.2+0.6)×16.0 =	28.80 m²			n=1
	(0.2+0.3)×½×½(C−D)×4				
	=0.25×½(3.4−2.6)−4 =	0.40 m²			L₁=1.8
	[½(C−D)×2+0.3)×(L₁+0.4)×2				
	=(3.4−2.6+0.3)×(1.8+0.4)×2 =	14.4 m²			
TOTAL				31.04 m²	
④ WET MASONRY					
A. 1. FLOOR	ℓs×0.6×(A+5.0)				ℓs=2.6
	=2.6×0.6×(16.0+5.0) =	32.76 m³			A=16.0
2. SIDE WALL					
	(0.5+T)×½×(H+0.3)−0.3²				T=0.7
	=(0.5+0.7)×½×(1.2+0.3)−0.09				H=1.2
	=e=0.81				E=3.8
	e×(A+2×√(E²+(E/2)²)×½)×2				
	=0.81×(16.0+√(3.8²+(3.8/2)²))×2				
	=	32.80 m³			
3. INSIDE WALL					
	H×0.3×A×(n−1)				
	=1.2×0.3×16.0×(1−1) =	0.00 m³			
4. CUT-OFF WALL					

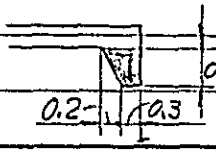
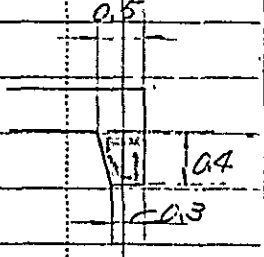


Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	$(0.3+0.5)\times\frac{1}{2}\times0.5\times(\ell_5+E\times\frac{1}{4}\times2)$				$\ell_5=2.6$
	$=0.20\times(2.6+3.8\times\frac{1}{2})$ =	1.90 m³			$E=3.8$
SUB-TOTAL	1.+2.+3.+4.	66.46 m³	④		
B. WET MASONRY LINING					
1. INLET APRON					
	$L_3\times10.0\times0.3\times2$ =	5.46 m³			$L_3=9.1$
2. OUTLET APRON					$C=3.4$
	$L_3\times5.0\times0.3\times2$ =	2.730 m³			$L_1=1.8$
3. CANAL SLOPE SURFACE					$L_2=8.0$
	$\sqrt{C^2+(C/2)^2}\times(L_2+\frac{L_1}{2}+0.2)\times0.3\times4$				$E=3.8$
	$=\sqrt{3.4^2+(3.4/2)^2}\times(8.0+\frac{1.8}{2}+0.2)\times1.2$ =	41.51 m³			$F=4.0$
	$\sqrt{(F+0.2)^2+(F/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(4.0+0.2)^2+(4.0/2+0.1)^2}\times8.0\times0.6$ =	22.54 m³			
	$\sqrt{(E+0.2)^2+(E/2+0.1)^2}\times L_2\times0.3\times2$				
	$=\sqrt{(3.8+0.2)^2+(3.8/2+0.1)^2}\times8.0\times0.6$ =	21.47 m³			
4. CANAL BED					
	$B\times L_2\times0.3\times2$				
	$=1.0\times8.0\times0.6$ =	4.80 m³			
5. CUT-OFF WALL					
	$(0.3+0.5)\times\frac{1}{2}\times0.4\times(2B+2L_3)$				
	$=1.16\times(2\times1.0+2\times9.1)$ =	3.23 m³			
SUB-TOTAL	=	125.45 m³	⑤		
WET MASONRY TOTAL ④+⑤	=			241.91 m³	
⑤ DRY STONE PITCHING					
	$10.0\times L_3\times0.3\times2$ =			54.60 m³	



ESCAPE STRUCTURE FOR A ROUTE

No. 336

KINDS	UNIT	NO.1	NO.2	NO.3	NO.4	TOTAL	REMARKS
(1) EARTH WORK							
EXCAVATION	m^3	192.9	210.0	210.0	210.0	822.9	
EMBANKMENT	m^3						
BACKFILLING	m^3	30.2	30.2	26.1	30.2	116.7	
(2) OTHERS							
WET MASONRY	m^3	133.66	141.76	144.70	141.76	561.88	
FLASH BOARD	m^3	4.16	4.76	4.96	4.76	19.04	
SAND	m^3	2.16	2.70	2.70	2.70	10.26	

ESCAPE STRUCTURE FOR B ROUTE

No. 337

KINDS	UNIT	NO S	TOTAL	REMARKS
(1) EARTH WORK				
EXCAVATION	m^3	281.8	281.8	
EMBANKMENT	m^3			
BACKFILLING	m^3	37.6	37.6	
(2) OTHERS				
WET MASONRY	m^3	169.27	169.27	
FLASH BOARD	m^3	5.60	5.60	
SAND	m^3	3.00	3.00	

ESCAPE STRUCTURE FOR C ROUTE

No. 338

KINDS	UNIT	NO.6	NO.7	TOTAL	REMARKS
(1) EARTH WORK					
EXCAVATION	m^3	149.7	149.7	299.4	
EMBANKMENT	m^3				
BACKFILLING	m^3	24.3	24.3	48.6	
(2) OTHERS					
WET MASONRY	m^3	115.34	115.34	230.68	
FLASH BOARD	m^3	1.98	1.98	3.96	
SAND	m^3	1.02	1.02	2.04	

No 1 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
EARTH WORK					
EXCAVATION				>100 ㎥	
BACK FILLING				38.2 ㎥	
OTHERS					
WET MASONRY				154.76 ㎥	
SAND				2.70 ㎥	
FLASH BOARD				4.96 ㎥	

NO 3 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
EARTH WORK					
EXCAVATION				210.0 ㎥	
BACKFILLING				261 ㎥	
OTHERS					
WET. MASONRY				14.70 ㎥	
SAND				3.70 ㎥	
FLUSH BOARD				4.96 ㎡	

NO. 2
ESCAPE STRUCTURE

Table 2. Concrete, form & Others.

Kinds	Calculated Prob...	Unit	Numbers	Total	Remarks
				(m³) (m²)	
EARTH WORK					
EXCAVATION				210.0 m³	
BACK-FILLING				52 m³	
OTHERS					
WET MASONRY				14.76 m³	
SAND				2.20 m³	
FLASH BOARD				4.96 m²	

NAS ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m)	
EARTH WORK					
EXCAVATION				281.8 m³	
BACKFILLING				97.6 m³	
OTHERS					
WET MASONRY				169.27 m³	
SAND				3.00 m³	
FLASH BOARD				5.60 m³	

NO.6. NO.7 Table 2 Concrete, form & Others.

ESCAPE STRUCTURE

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
EARTH WORK					
EXCAVATION				142.7 ㎥	
BACKFILLING				24.5 ㎥	
CITIZOS					
WEJ. MASONRY				115.34	
SAND				1.02 ㎥	
PLAIN BOARD				198 ㎡	

No.1 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

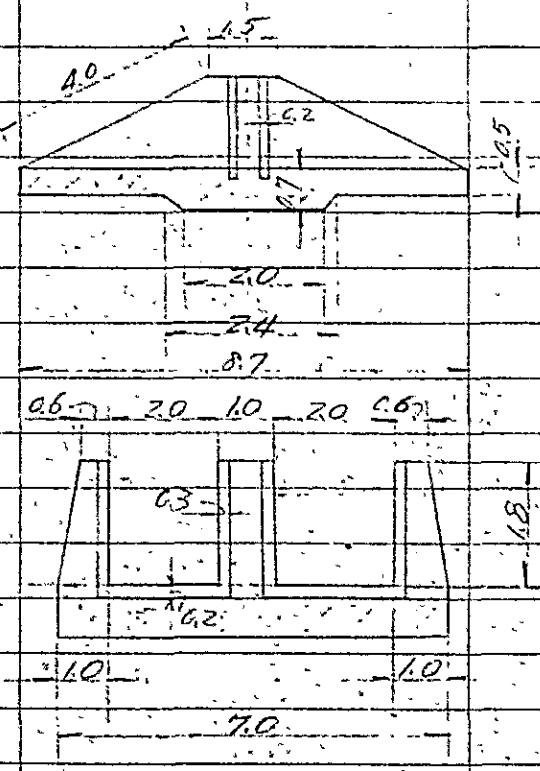
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³)	
① WET MASONRY					
1. FLOOR					
					
	0.5 × 8.7 × 7.0	= 30.45			
	(7.0+7.4) × ½ × 0.2 × 7.0	= 3.08			
	CHANNEL FOR FLASH BOARD		EXCLUDED		
	0.2×0.2×2.6×2×2 = (-) 0.42				
		33.11			

Table 2 Concrete, form & Others.

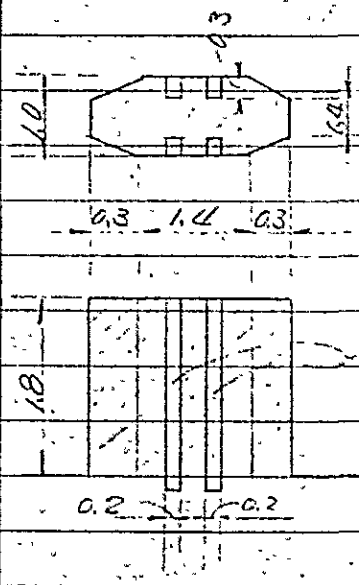
Kinds	Calculated Process	Unit	Numbers	Total (m³)	Remarks
2. WALL					
	(1.5×0.6+2.7×1.0)×½×1.8×2 =	17.28			
	CHANNEL FOR FLASH BOARD EXCLUDED				
	0.2×0.3×1.8×4 = (−)	0.43			
		16.85			
3. PIER					
					
	1.4×1.0×1.8 =	2.52			
	(0.4+1.0)×½×0.3×2×1.8 =	0.76			
	CHANNEL FOR FLASH BOARD EXCLUDED				
	0.3×0.2×1.8×4 = (−)	0.43			
		2.85			
4. WET MASONRY LINING					
OUTLET APRON	(LENGTH) (WIDTH) (THICKNESS) 19.0 × 4.5 × 0.3 =	25.65			
CANAL BED.	(LENGTH) WIDTH THICKNESS 12.0 × 10.0 × 0.3 =	36.00			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) Cont'd	
CANAL BANK SURFACE					
	(LENGTH) (4.0+1.5×4.0) × WIDTH 6.4 × 0.3 =	19.20			
		80.95			
WET MASONRY TOTAL VOLUME				133.66	m³
(2) FLASH BOARD					WOODEN BOARD
	WIDTH 2.6 × HEIGHT 2.0 × THICKNESS 0.2 =	1.04	4	4.16	m³
(3) SAND					
	2.0 × 1.8 × 0.3 =	1.08	2	2.16	m³
(4) EARTH WORK					
1. EXCAVATION					
CANAL BANK					
	(8.0+8.0+2.5×0.5×2) × 1/2 × 2.5				
	× (1.5+3.6×1/2×2) =	117.9	= A		
FOR MASONRY LINING					
	(4.0+1.5+4.0) × 4.65 × 0.3 =	13.9			
	(19.0×4.5+12.0×10.0) × 0.3 =	64.7		192.9	m³
2. BACKFILL AND COMPACTION					
	A − (6.2×1.5+7.0×8.7)				
	× 2.5 × 1/2 =			30.2	m³

No.2, No.4 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

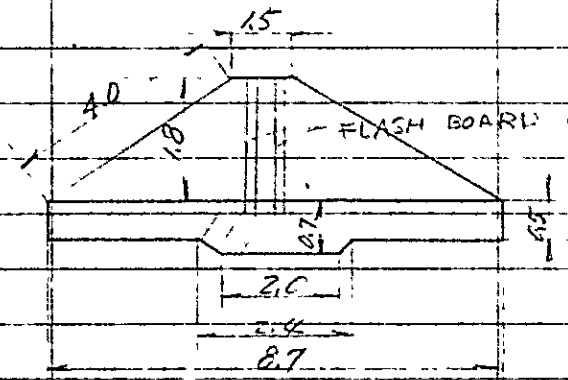
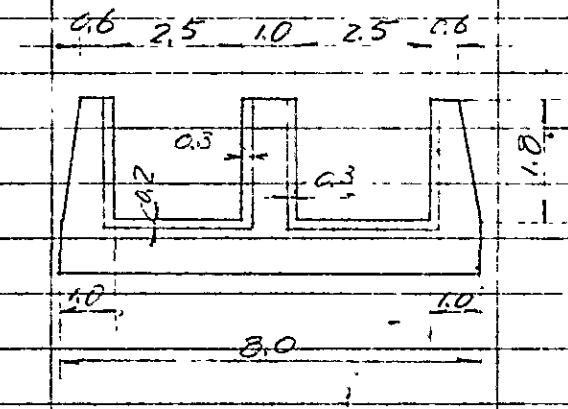
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) ~~(m²)~~	
① WET MASONRY					
1. FLOOR					
					
	0.5×8.7×8.0 =	34.80			
	(2.0+2.4)×½×0.2×8.0 =	3.52			
	CHANNEL FOR FLASH BOARD EXCLUDED				
	0.2×0.2×3.1×4 ∴ = (−)	0.50			
		37.82	m³		
2. WALL					
	(1.5×0.6+8.7×1.0)×½×1.8×2=	17.28			
	CHANNEL FOR FLASH BOARD EXCLUDED				
	(0.2×0.3×1.8)×4 = (−)	0.43			
		16.85	m³		

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) ~~(m²)~~	
3. PIER.	REFER TO No.1 ESCAPE STRUCTURE				
		285	m³		
4. WET MASONRY LINING					
OUTLET APRON	(LENGTH) (WIDTH) · (THICKNESS)				
	20.0 × 4.5 × 0.3 =	27.00			
CANAL BED	(LENGTH) (WIDTH) (THICKNESS)				
	13.0 × 10.0 × 0.3 =	39.00			
CANAL BANK SURFACE					
	(4.0+1.5+4.0) × 6.4 × 0.3 =	18.24	m²		
		84.24			
WET MASONRY TOTAL VOLUME				141.76	m³
② FLASH BOARD					WOODEN BOARD
	WIDTH HEIGHT 3.1 × 2.0 × 0.2 =	1.24	4	4.96	m³
③ SAND					
	2.5 × 1.8 × 0.3 =	1.35	2	2.70	m³
④ EARTH WORK					
1. EXCAVATION.					
CANAL BANK					
	(9.0+9.0+2.5×0.5×2) × ½				
	× 2.5 × (1.5+3.6 × ½ × 2). =	130.7	= A		
FOR MASONRY LINING					
	(4.0+1.5+4.0) × 4.6 × 0.3 =	13.3			
	(20.0 × 4.5 + 13.0 × 10.0) × 0.3 =	46.0		210.0	m³
2. BACKFILL AND COMPACTION					
	½ A − (7.2 × 1.5 + 8.0 × 8.7)				
	× ½ × 2.5 =			30.2	m³

No.3 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

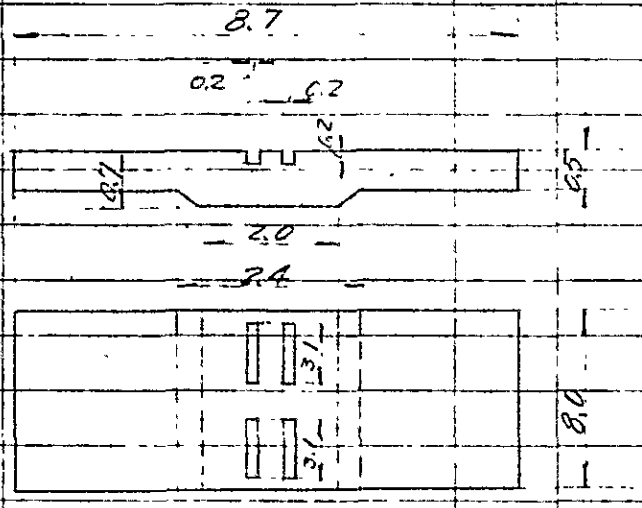
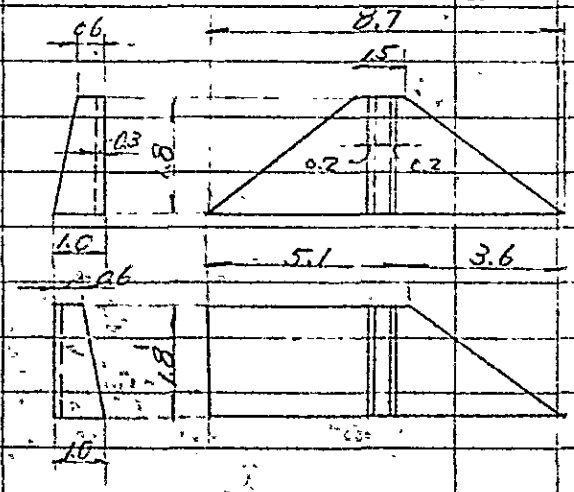
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
① WET MASONRY					
1 FLOOR					
	0.5×8.7×8.0 =	34.80			
	(2.0+2.4)×½×0.2×8.0 =	3.52			
	0.2×0.2×3.1×4 = (−)	0.50			
		38.82	11°		REFER TO No 2 No.4 ESCAPE
2. WALL					LEFT SIDE WALL
		3.6			RIGHT SIDE WALL
	(0.6×1.5+1.0×8.7)×½×1.8 =	8.64			
	(0.6×5.1+1.0×8.7)×½×1.8 =	10.50			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m) (m²)	
	CHANNEL FOR FLASH BOARD EXCLUDED				
	6.2×6.3×1.8×4 -(-)	0.43			
		18.79	m³		
3 PIER	REFER TO No.1 ESCAPE STRUCTURE				
		2.85	m³		
4. WET MASONRY LINING					
	REFER TO No.2 No.4 ESCAPE STRUCTURE				
		84.24	m³		
WET MASONRY TOTAL VOLUME				144.70	m³
(2) FLASH BOARD (WOODEN)					
	REFER TO No.2 No.4 ESCAPE STRUCTURE				
				4.96	m³
(3) SAND					
	REFER TO No.2 No.4 ESCAPE STRUCTURE				
				2.70	m³
(4) EARTH WORK					
1. EXCAVATION	REFER TO No.2 No.4 ESCAPE STRUCTURE				
CANAL BANK					
FOR MASONRY LINING					
				210.0	m³
2. BACKFILL AND COMPACTION					
	230.7 -(7.2×1.5+8.0×8.7)				
	×½×2.5+1.8×3.6×½×2.5×0.5=			226.1	m³

No. 5 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

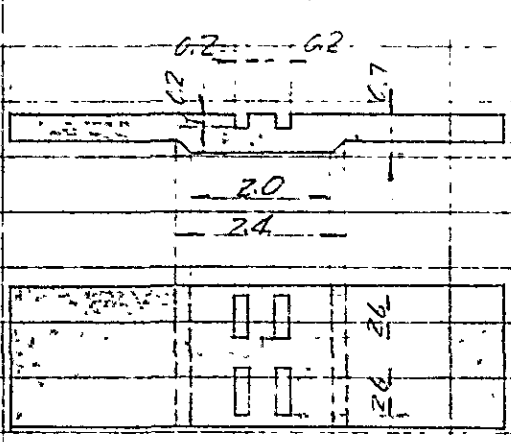
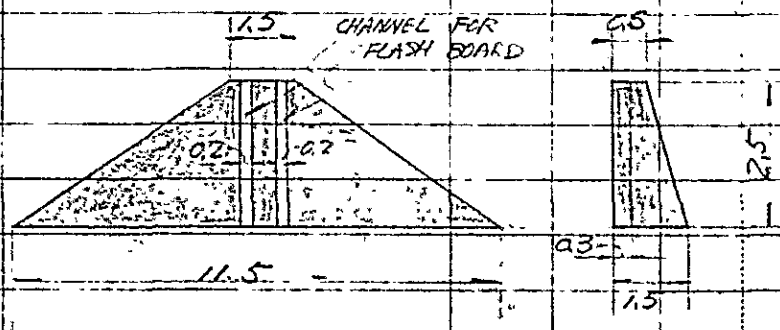
Kinds	Calculated Process	Unit	Numbers	Total (m³)	Remarks
① WET MASONRY					
1. FLOOR					
					
	11.5 × 8.0 × 6.5	= 16.20			
	(2.0+2.4) × ½ × 0.2 × 8.0	= 3.52			
	0.2 × 0.2 × 2.6 × 4	= (−) 0.42			
		49.10 m³			
2. WALL					
	(11.5×0.6+11.5+1.5) × ½ × 2.5 × 2 =	34.75			
	0.2×0.3×2.5×4	= (−) 0.60			
		34.15 m³			

Table 2 Concrete, form & Others.

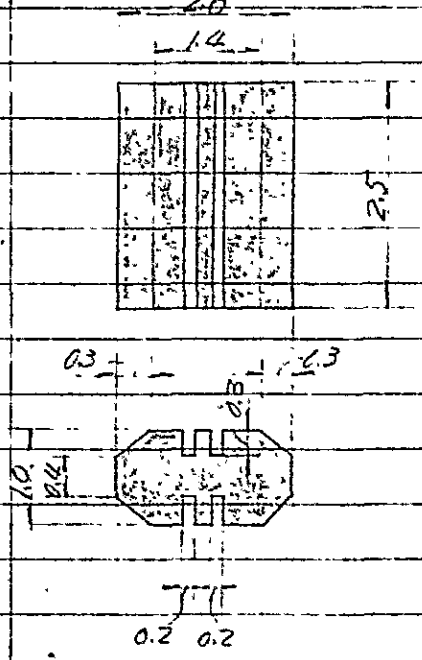
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
3 PIER					
	1.4×1.0×2.5 =	3.50			
	(0.4+1.0)×½×0.3×2×2.5 =	1.05			
	0.2×0.3×2.5×4 = (−)	0.60			CHANNEL FOR FLASH BOARD
		3.95	m³		
MASONRY STRUCTURE SUB-TOTAL					
	A =	67.20	m³		
4. WET MASONRY LINING					
OUTLET APRON	(LENGTH) (WIDTH) (THICKNESS)				
	19.0 × 4.5 × 0.3 =	25.65			
CANAL BED	(LENGTH) (WIDTH) (THICKNESS)				
	12.0 × 3.0 × 0.3 =	10.80			
LEFT CANAL BANK SURFACE	(WIDTH) (LENGTH) (THICKNESS)				
	(5.6×2+1.5)×6.4×0.3 =	24.38			
RIGHT CANAL BANK SURFACE					
	(5.6+0.3)×12.0×0.3 =	21.24			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m') (m²)	Remarks
	SUB-TOTAL B= 0207				
	WET MASONRY TOTAL VOLUME A+B=			69.27	m³
(2) FLASH BOARD (WOODEN)					
	2.6 x 2.7 x 0.2	140	4	5.60	m³
(3) SAND					
	0.3 x 2.0 x 2.5 =	150	2	3.00	m³
(4) EARTH WORK					
1. EXCAVATION					
CANAL BANK					
	(8.0+8.0+3.2x0.5x2)x$\frac{1}{2}$				
	x3.2x(1.5+5.0x$\frac{1}{2}$x2) =	199.65	=A		
FOR MASONRY LINING					
	(5.6x2+1.5)x6.4x0.3 =	21.38			
	(19.0x4.5+12.0x3.0)x0.3 =	36.45			
	(5.6+0.3)x12.0 x0.3 =	21.24		281.8	m³
2. BACKFILL AND COMPACTION					
	A - (6.2x1.5+8.0x1.15)				
	x3.2x$\frac{1}{2}$ =			27.6	m³

No.6, No.7 ESCAPE STRUCTURE

Table 2 Concrete, form & Others.

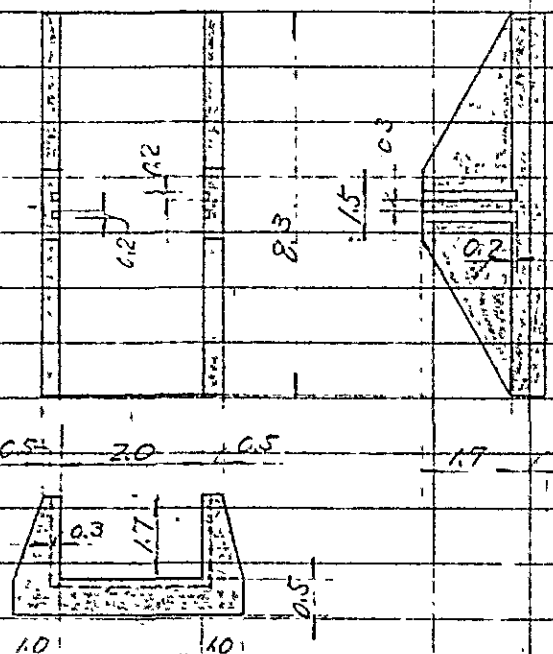
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m')	
① WET MASONRY					
					
	6.5 + 2.0 + 6.5	1.7	6.5		
	1.0 + 1.0 = 4.0				
1. FLOOR					
	4.0×8.3×0.5 =	16.60			
	0.2×0.2×2.6×2 = (−)	0.21	m³		
		16.39			
2. WALL					
	(0.5×1.5+1.0×8.3)×½				
	×1.7×2 =	15.39			
	0.2×0.3×1.7×4 = (−)	0.41	m³		
		14.98			
3. WET MASONRY LINING					
OUTLET APRON					
	16.0×4.5×0.3 =	21.60			
LEFT CANAL BANK					
	(3.80×2+1.5)×6.5×0.3×2 =	35.49			

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m) (m²)	Remarks
CANAL	BED AND RIGHT BANK				
	(1.5+3.80+0.3)×16.0×0.3 =	26.88			
		83.97 m³			
TOTAL VOLUME				115.34	m³
② FLASH BOARD					
	0.2×1.9×2.6 =	0.99	2	1.98	m³
③ SAND					
	0.3×1.7×2.0 =	1.02		1.02	m³
④ EARTH WORK					
1. EXCAVATION					
	(5.0×2+2.2×0.5×2)×½×2.2				
	×(1.5+3.4×½×2) =	65.76 =A			
	16.0×4.5×0.3 =	21.60			
	(3.80×2+1.5)×6.5×0.3×2 =	35.49			
	(1.5+3.8+0.3)×16.0×0.3 =	26.88		149.7	
					m³
2. BACKFILL AND COMPACTION					
	A −(1.5×3.0+4.0×8.3)				
	×½×2.2 =			24.3	m³

SPILLWAY STRUCTURE FOR B ROUTE

No. 356

KINDS	UNIT	No 1	No 2	TOTAL	REMARKS
(1) EARTH WORK					
EXCAVATION	m^3	190.5	89.6	280.1	
EMBANKMENT	m^3	2,447.5	1,627.0	4,074.5	
(2) CONCRETE WORK					
PLAIN CONCRETE	m^3	261.69	118.63	380.32	
FORM	m^2	915.74	415.38	1,331.12	
(3) OTHERS					
WET MASONRY	m^3	307.70	106.81	414.51	
DRY STONE PITCHING	m^3	121.50	46.00	167.50	

NO1 SPILLWAY

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
EARTH WORK					
EXCAVATION				1905 m³	
EMBANKMENT				2447 5 m³	
CONCRETE WORK					
PLAIN CONCRETE				6164 m³	
FORM				915 74 m²	
OTHER WORK					
WET MASONRY	235.48 + 72.22			307 70 m³	
DRY STONE				127.50 m³	

No2 SPILLWAY Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
EARTH WORK					
EXCAVATION				87 6 m³	
EMBANKMENT				16270 m³	
CONCRETE WORK					
PLAIN CONCRETE				118.68 m³	
FORM				415 33 m²	
OTHER WORK					
WET MASONRY				106 81 m³	
DRY STONE				4200 m³	

EARTH WORK No 1

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
Excavation	3.2 × 42.00			344 m³	
	1.7 × 33.00			56.1	
	Total			1905 m³	
Embankment	56.8 × 8.40			533.9 m³	
	55.3 × 6.50			357.5	
	53.2 × 7.70			414.3	
	55.3 × 9.40			519.8	
	57.7 × 1.10			63.4	
	57.2 × 9.70			556.4	
	Total			2447.5 m³	

EARTH WORK
No 2

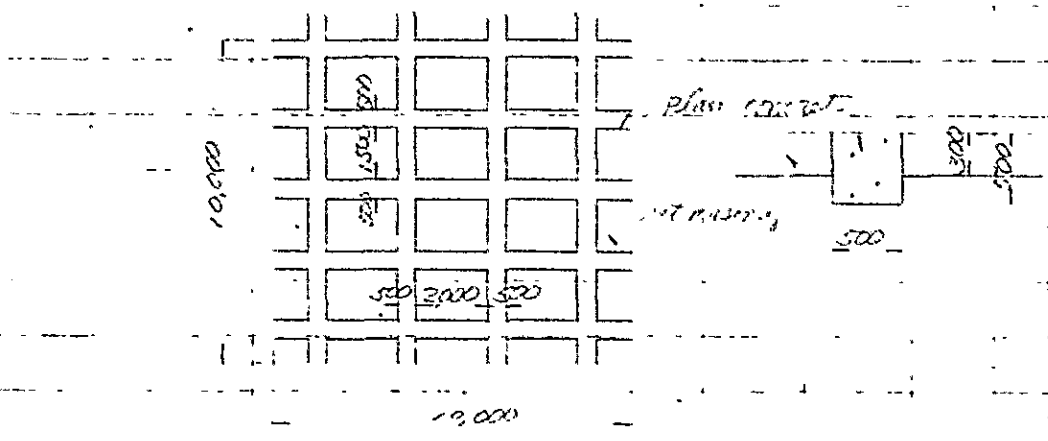
Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
Excavation	32 × 2.80			89.6 m³	
Embankment	59.1 × 14.4			851.0 m³	
	52.5 × 4.2			220.5	
	59.1 × 9.4			555.5	
	total			1627.0 m³	

MASONRY BLOCK LINING

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	



Plain Concrete	0.50×0.50×10.00×5			12.50 m³	
	0.50×0.50×(10.00−1.5×5)×2			7.50 m³	
				20.00	
Form	0.50×(2.00+0.50)×2×20			70.00 m²	
Wet Masonry	2.00×1.50×0.30×20			18.00 m³	

No.1 MASONRY BLOCK LINING

Table 2 Concrete, form & Others.

Kinds	Calculated Process		Unit	Numbers	Total	Remarks
					(㎡) (㎥)	
	15×2.37×1.82	=97.3				
	92.0×4.5	=189.0				
	15×2.50(14.4+9.4×5)	=343.2				
	1.50×(14.4−9.4×3)	=63.9				
	15×1.87×(18.2+14.2×2)	=196.9				
	3.94×(18.2+14.2)	=127.7				
	5.00×93.50	=130.5				
	15×3.00×(14.4+7.4)	=137.7				
		=1,302.2				
Plain Concrete	1,302.2×20.00×1/100				=61.64 ㎥	
Form	1,302.2×70.00×1/100				915.74 ㎡	
Lit Masonry	1,302.2×18.00×1/100				=234.40 ㎥	

NO 2
MASONRY BLOCK LINING AND DRY STONE PITCHING

Table 2 Concrete, form & Others.

Kinds	Calculated Process		Unit	Numbers	Total	Remarks
					(m²) (m³)	
	15 × 3.00 × (14.4 + 8.4)	= 159.7				
	4.50 × 25.00	= 126.0				
	15 × 2.50 × (14.4 + 8.4)	= 133.0				
	1.50 × (14.4 + 8.4)	= 35.7				
	5 × 4.2 × (10.3 + 15.3)	= 24.0				
	7.38 × 4.2	= 31.0				
	3.00 × 28.00	= 84.0				
	sub total	= 593.4				
Plain Concrete	593.4 × 20.00 × 1/100				118.68 m³	
Form	593.4 × 70.00 × 1/10				4153.8 m²	
Wet Masonry	593.4 × 18.00 × 1/100				106.81 m³	
Dry Stone	50 × 28.00 × 0.30				420 m³	

No 1
INLET APRON AND DRY STONE PITCHING

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	10.00				
	300 400 100 300				
Wet Masonry	10.00 × 6.30 × 23.00	m³		69.00	
"	$\frac{1}{3}$ × (1.30 + 2.40) × 0.40 × 23.00			3.72	
	total	m³		72.22	
Dry Stone	5.00 (23.00 + 10.00 × 2 + 42.00) × 0.30	m³		127.50	

BRIDGE FOR A ROUTE

No. 365

KINDS	UNIT	NO 4	TOTAL	REMARKS
(1) EARTH WORK				
EXCAVATION	m^3	43.2	43 2	
EMBANKMENT	m^3	1048.9	1048.9	
BACKFILLING	m^3	9.3	9.3	
(2). CONCRETE WORK				
REINFORCED CONCRETE	m^3	22.82	22.82	
PAVEMENT CONCRETE	m^3	1.64	1.64	
FORM	m^2	48.76	48 76	
REINFORCEMENT	Kg	2156.88	2156 68	
(3). OTHERS				
WET MASONRY	m^3	15 80	15. 80	

BRIDGE FOR B ROUTE

No. 366

KINDS	UNIT	NO 5	No 6	NO 7	No 8	NO 9	TOTAL	REMARKS
1) EARTH WORK								
EXCAVATION	m^3	157.4	157.4	157.4	157.4	13.9	723.5	
EMBANKMENT	m^3	791.5	791.5	791.5	791.5	411.1	3577.1	
BACKFILLING	m^3	86.5	86.5	86.5	86.5	55.7	401.7	
2) CONCRETE WORK								
REINFORCED CONCRETE	m^3	12.60	12.60	12.60	12.60	7.01	57.41	
PAVEMENT CONCRETE	m^3	1.08	1.08	1.08	1.08	0.66	4.98	
FORM	m^2	29.80	29.80	29.80	29.80	18.64	137.84	
REINFORCEMENT	kg	859.52	859.52	859.52	859.52	508.17	3946.25	
3) OTHERS								
NET MASONRY	m^3	87.74	87.74	87.74	87.74	47.13	400.09	

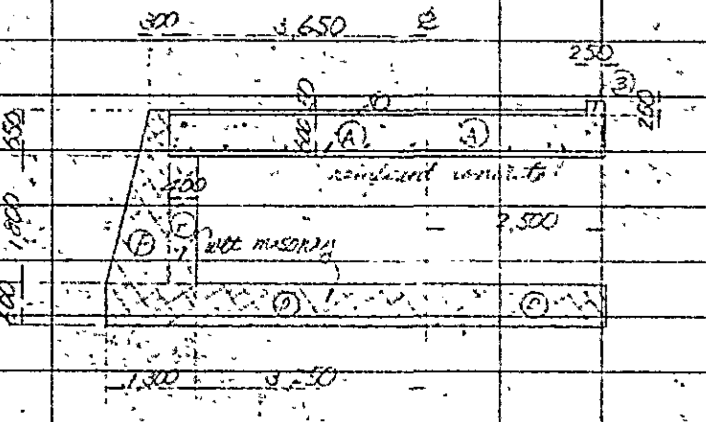
No 4 BRIDGE Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
Concrete Work					
R-inforced Concrete				32.82 ㎥	
Pavement Concrete				1.66 ㎥	
Form				48.76 ㎡	
Ochers					
Wet Masonry	49.20 - 2.660			46.80 ㎥	
Earth Work					
Excavation				43.2 ㎥	
Embankment				1048.9 ㎥	
Backfilling				9.3 ㎥	
REINFORCEMENT				7146.89 ㎏	

No 4 BRIDGE Table 2 Concrete, form & Others.

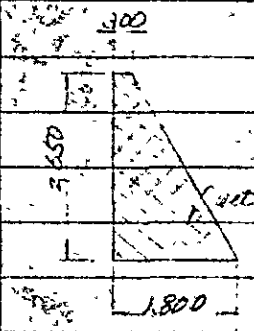
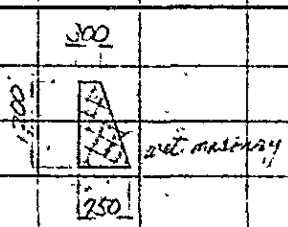
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
Earth Work					
Excavation	$\frac{1}{2}\frac{1}{3}(1.95+1.95)\times 0\times 0+\frac{1}{2}(2.80+3.00)\times 2.1\times 3.90$	1		74	
	$\frac{1}{2}(9.1+8.75)\times 0.60\times 5.00$			26.2	
	$\frac{1}{2}(1.50+2.30)\times 6.40\times 5.00\times 2$			76	
	total			176.2	
Embankment	$\frac{1}{2}(5.50+11.30)\times 1.70\times\frac{1}{2}\times 17.00$			121.4	
	$\frac{1}{2}\frac{1}{2}(5.0+11.30\times 1.70+5.00\times 2.10)\times 4.30$			52.0	
	$5.00\times 2.10\times 4.50$			47.3	
	$\frac{1}{2})5.00\times 2.10+\frac{1}{2}(5.00+2.00)\times 1.00)\times 2.00$			17.5	
	$\frac{1}{2}(5.50+9.10)\times 1.80\times\frac{1}{2}\times 1.20$			4.2	
	$\frac{1}{2}(3.0+10.60)\times 1.20\times\frac{1}{2}\times 2.40\times 2$			26.2	
	$\frac{1}{2}\frac{1}{2}(5.00+10.60)\times 1.40+2.20\times 2.10)\times 1.20\times 2$			33.8	
	$\frac{1}{2}(8.20\times 2.10+5.20\times 2.10)\times 1.10\times 2$			32.3	
	$\frac{1}{2}(5.00+14.00)\times 2.40\times\frac{1}{2}\times 2.40$			34.1	
	$\frac{1}{2}(5.00+14.60)\times 2.40\times\frac{1}{2}\times 23.50$			276.4	
	$\frac{1}{2}(13.5+4.50\times 2.10)\times 2.00\times 2$			75.6	
	$\frac{1}{2}(13.5+11.31\times 2.00\times 2$			49.6	
	$\frac{1}{2}\times 11.3\times 17.00\times 2$			192.1	
	total			1018.9	
Back filling	$\frac{1}{2}(4.21+4.39)\times 2.50\times 4$			54	
	$\frac{1}{2}(1.00+1.6)\times 0.6\times 5.00\times 2$			39	
	total			93	

Table 2 Concrete, form & Others.



Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
Reinforced Concrete	0.60× 7.30 × 5.00			m³ 21.90	A
	0.25 × 0.25 × 7.30 × 2			0.92	B
	total			m³ 22.92	
Form	0.60× 7.30 × 2			m² 8.76	A
	6.50 × 5.00			32.50	A
	0.25 × 7.30 × 2 × 2			7.30	B
	0.20 × 0.25 × 2 × 2			0.20	B
	total			m² 48.76	
Pavement Concrete	0.05 × 7.30 × 4.50			m³ 1.64	C
Wet Masonry	9.10 × 0.60 × 5.00			m³ 27.30	D
	0.40 × 1.80 × 5.00 × 2			7.20	E
	1/2 (0.30 + 0.90) × 2.45 × 5.00 × 2			14.70	F
	total			m³ 49.20	

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m^3) (m^2)	
					
	SECTION ①	SECTION ②			
Wet Masonry	SECTION ①				
	½(0.30+1.80)×2.65 = 2.78 m^2				
	SECTION ②				
	½(0.30+0.75)×1.20 = 0.63 m^2				
	½(①+②)×3.90×4 = ½(2.70+0.63)×3.90×4			26.60 m^3	

No.4 BRIDGE Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
1	φ19	7.12	0.72	0.76	8.60	2.226	19.14	40	880.44	
2	"	7.52	0.72	0.76	9.00	"	20.03	22	440.66	
3	φ16	4.81	0.30		5.11	1.578	8.06	56	451.36	
4	φ13	7.15	0.48	0.52	8.15	1.042	8.49	24	203.76	
5	"	1.55	0.24		1.79	"	1.87	48	89.76	
6	φ19	1.00	0.36		1.36	2.226	3.03	30	90.90	
									2156.88	

NO 5 6 7 8 BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (㎥) (㎡)	Remarks
Concrete Work					
Reinforced Concrete				12.60 ㎥	
Pavement Concrete				1.08 ㎥	
Form				29.80 ㎡	
Others					
Wet Masonry	㎡ 35 - 35.39			87.74 ㎡	
Earth Work					
Excavation				157.4 ㎥	
Embankment				29.15 ㎥	
Back filling				86.5 ㎥	
REINFORCEMENT		t		869.52 kg	

NO.5.6.7.9.
BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
Earthwork					
Excavation					
	$2.50 \times 4.90 \times \frac{1}{2} \times 5.00$		=	30.6 m³	
	$2.40 \times 3.70 \times \frac{1}{2} \times 5.00$		=	22.2	
	$0.90 \times \frac{1}{2}(4.10 + 0.55) \times 5.00$		=	10.5	
	$\frac{1}{2}\{\frac{1}{2}(4.50+3.20) \times 1.30 + \frac{1}{2}(4.60+3.10) \times$				
	$2.30\} \times 3.70 \times 4$		=	94.1	
	total			157.4 m³	
Embankment	$\frac{1}{2}(5.00+11.00) \times 1.50 \times 15.00 \times \frac{1}{2}$		=	900 m³	
	$\{\frac{1}{2}(5.00+11.00) \times 1.50 + 5.00 \times 1.90\} \times 3.40$				
	$\times \frac{1}{2}$		=	35.6	
	$5.00 \times 4.50 \times 1.50$		=		
	$\{5.00 \times 1.70 + \frac{1}{2}(5.00+8.60) \times 0.90\} \times$				
	$2.00 \times \frac{1}{2}$		=	14.6	
	$\{\frac{1}{2}(5.00+8.60) \times 0.70 + \frac{1}{2}(5.00+17.00) \times$				
	$0.50\} \times 1.00 \times \frac{1}{2}$		=	4.6	
	$\frac{1}{2}(5.00+7.00) \times 0.50 \times 1.50 \times 2$		=	9.0	
	$\{\frac{1}{2}(5.00+7.00) \times 0.50 + \frac{1}{2}(5.00+9.40) \times$				
	$1.10\} \times 1.20 \times \frac{1}{2} \times 2$		=	13.1	
	$\{\frac{1}{2}(5.00+9.40) \times 1.10 + 0.0\} \times 2.60 \times$				
	$\frac{1}{2} \times 2$		=	20.6	
	$\{\frac{1}{2}(5.00+7.00) \times 0.50 + \frac{1}{2}(5.00+17.00)$				
	$\times 3.00\} \times 6.00 \times \frac{1}{2}$		=	108.0	
	$\{\frac{1}{2}(5.00+17.00) \times 3.00 + \frac{1}{2}(5.00+14.20)$				
	$\times 2.30\} \times 6.50 \times \frac{1}{2}$		=	179.0	
	$\{\frac{1}{2}(5.00+14.20) \times 2.30 + \frac{1}{2}(5.00+7.60)$				
	$\times 0.90\} \times 9.00 \times \frac{1}{2}$		=	124.9	

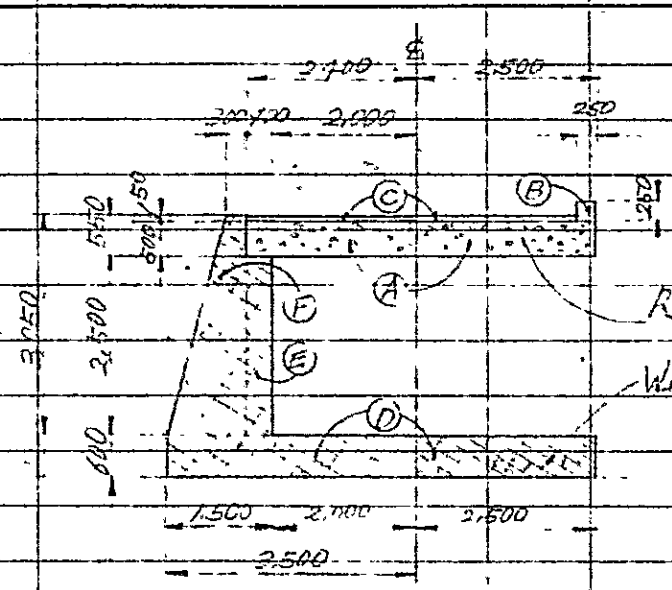
110.5.6.7.8 BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
Footing Apron	$\frac{1}{2}(5.00+7.60)\times 0.90 \times 8.70 \times \frac{1}{2} =$			21.7	
	$\{4.50\times 1.50 + \frac{1}{2}(4.50+8.00)\times$				
	$1.20\} \times 3.40 \times \frac{1}{2} \times 2$	=		42.5	
	$\frac{1}{2}(4.50+8.00)\times 1.20 \times 14.20$				
	$\times \frac{1}{2} \times 2$	=		106.5	
	$\frac{1}{2}\times 1.90\times 1.30\times 1.90\times \frac{1}{2}\times 2 =$			2.4	
	$\frac{1}{2}\times 1.90\times 1.30\times 7.30\times \frac{1}{2}\times 2 =$			9.0	
	total			291.5 m³	
Backfilling	$\frac{1}{2}(6.24+2.55)\times 3.70\times 4$	=		65.1 m³	
	$(1.00+0.75+0.37)\times 5.00\times 2$	=		21.4	
	total			86.5 m³	

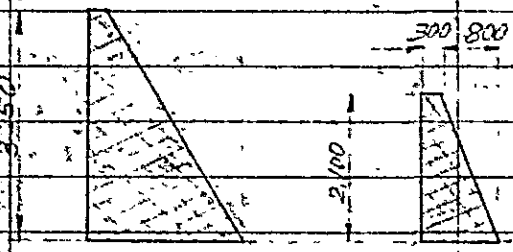
NO.5578. BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m^3) (m^2)	
					
Reinforced concrete	0.50×4.80×5.00		=	12.00	A
	0.25×0.25×4.80×2		=	0.60	B
	total			12.60	m^3
Form	3.50×4.80×2		=	48.80	A
	4.00×5.00		=	20.00	A
	0.25×4.80×2×2		=	4.80	B
	0.20×0.25×2×2		=	0.20	B
	total			73.80	m^2
Reinforced Concrete	0.05×4.80×4.50		=	1.08	C
Wet masonry	0.60×7.00×5.00		=	21.00	D
	2.50×0.40×5.00×2		=	10.00	E
	$3.05\times\frac{1}{2}(0.30+1.10)\times5.00\times2$		=	21.55	F
	total			52.35	m^3

NO. 5, 6, 7, 8 BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
	300 1900				
					
	Section ① Section ②				
	Section ①				
Outlet masonry	$3.25 \times \frac{1}{2}(0.30+2.20) =$	4.06 m²			1
	Section ②				
	$2.10 \times \frac{1}{2}(0.30+1.10) =$	1.47 m²			2
	$\frac{1}{2}(① + ②) \times 3.20 \times 4$				
	$= \frac{1}{2}(4.06+1.47) \times 3.20 \times 4$		=	35.39 m³	

No.5.6.7 8 BRIDGE Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
1	φ16	4.63	0.30		4.93	1.578	7.78	23	178.94	
2	"	4.96	"		5.26	"	8.30	22	182.60	
3	"	4.81	"		5.11	"	8.06	29	233.74	
4	φ13	4.65	0.24		4.89	1.042	5.10	12	61.20	
5	"	1.45	"		1.69		1.76	42	73.92	
6	"	0.65	"		0.89	"	0.91	"	38.22	
7	φ19	1.00	0.36		1.36	2.226	3.03	30	90.90	
									859.52	

NO.9 BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
Concrete Work					
Reinforced Concrete				7.01 ㎥	
Pavement Concrete				0.66 ㎥	
Form				18.64 ㎡	
Others					
Wet Masonry	35.66 + 13.47			49.13 ㎥	
Earth Work					
Excavation				93.9 ㎥	
Embankment				411.1 ㎥	
Backfilling				55.7 ㎥	
REINFORCEMENT				508.17 ㎏	

NO.9 BRIDGE

Table 2 Concrete, form & Others.

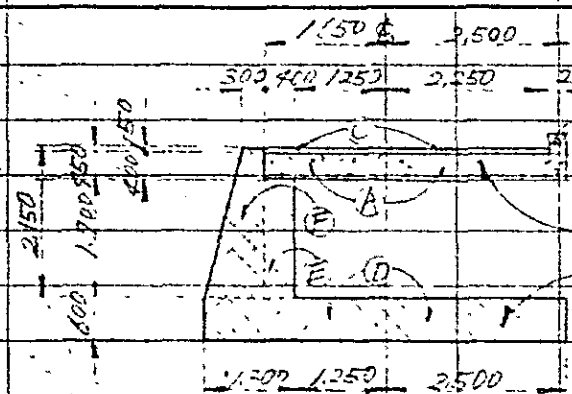
Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
Earth work					
Excavation	$\frac{1}{2}(0.20+3.50)\times 2.30\times 5.00$		=	21.3 m³	
	$\frac{1}{2}(4.90+2.50)\times 1.00\times 5.00$		=	18.5	
	$\frac{1}{2}(0.40+2.30)\times 1.20\times 5.00$		=	8.1	
	$\frac{1}{2}\left\{\frac{1}{2}(4.40+3.20)\times 1.20+\frac{1}{2}(1.10+2.30)\times 1.70\right\}\times 2.30\times 4$		=	46.0	
	Total			83.9 m³	
Embankment	$\frac{1}{2}(5.00+9.50)\times 1.10\times 6.40\times\frac{1}{2}$		=	25.5 m³	
	$\left\{\frac{1}{2}(5.00+9.50)\times 1.10+\frac{1}{2}(5.00+11.10)\times 1.50\right\}\times 5.80\times\frac{1}{2}$		=	58.2	
	$\left\{\frac{1}{2}(5.00+11.10)\times 1.50+5.00\times 1.70\right\}\times 3.00\times\frac{1}{2}$		=	30.9	
	$5.00\times 4.50\times 1.50$		=	33.8	
	$\left\{5.00\times 1.50+\frac{1}{2}(5.00+8.50)\times 0.90\right\}\times 1.60\times\frac{1}{2}$		=	10.9	
	$\left\{\frac{1}{2}(5.00+8.50)\times 0.90+\frac{1}{2}(5.00+5.90)\times 0.45\right\}\times 1.00\times\frac{1}{2}$		=	4.3	
	$\frac{1}{2}(5.00+5.90)\times 0.45\times 2$		=	4.9	
	$\left\{\frac{1}{2}(5.00+5.90)\times 0.45+\frac{1}{2}(5.00+7.70)\times 0.60\right\}\times 0.50\times\frac{1}{2}\times 2$		=	3.1	
	$\frac{1}{2}(5.00+7.70)\times 0.60\times 1.50\times\frac{1}{2}\times 2$		=	5.7	
	$\left\{\frac{1}{2}(5.00+7.00)\times 0.45+\frac{1}{2}(5.00+11.50)\times 1.60\right\}\times 3.00\times\frac{1}{2}$		=	23.9	
	$\frac{1}{2}(5.00+11.50)\times 1.60\times 0.60$		=	7.9	
	$\left\{\frac{1}{2}(5.00+11.50)\times 1.60+\frac{1}{2}(5.00+7.80)\times 0.70\right\}\times 4.80\times\frac{1}{2}$		=	42.4	

NO.9 BRIDGE

Table 2 Concrete, form & Others.

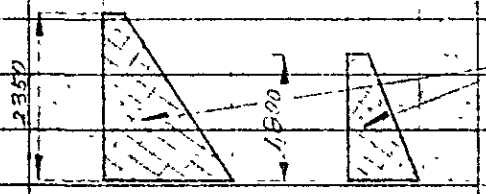
Kinds	Calculated Process	Unit	Numbers	Total (m²) (m³)	Remarks
Embankment	$\frac{1}{2}(5.00+7.80)\times 0.70\times 9.70$				
	$\times\frac{1}{2}$		$=$	21.7	
	$\{4.50\times 1.50+\frac{1}{2}(4.50+7.50)\times 1.20\}$				
	$\times 3.00\times\frac{1}{2}\times 2$		$=$	41.9	
	$\frac{1}{2}(4.50+7.50)\times 1.20\times 12.10\times\frac{1}{2}$				
	$\times 2$		$=$	87.1	
	$1.70\times 1.30\times\frac{1}{2}\times 1.80\times\frac{1}{2}\times 2$		$=$	2.0	
	$1.70\times 1.30\times\frac{1}{2}\times 6.20\times\frac{1}{2}\times 2$		$=$	6.9	
	total			411.1 m³	
Backfilling	$\frac{1}{2}(4.96+2.56)\times 2.30\times 4$		$=$	30.6	
	$(0.39+1.04+0.68)\times 5.00\times 2$		$=$	21.1	
	total			55.7 m³	

NO.9 BRIDGE Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total (m³) (m²)	Remarks
					
Reinforced concrete	2.40×3.30×5.00		=	6.60	A
	0.25×0.25×3.30×2		=	0.41	B
	total			7.01	m³
Form	0.40×3.30×2		=	2.64	A
	2.50×5.00		=	12.50	A
	0.25×3.30×2×2		=	3.30	B
	0.20×0.25×2×2		=	0.20	B
	total			18.64	m²
Pavement Concrete	0.05×3.30×4.00		=	0.66	C
Wet masonry	0.60×5.10×5.00		=	15.30	D
	1.70×0.40×5.00×2		=	6.80	E
	2.15×½(0.30+0.90)×5.00×2		=	12.90	F
	total			35.66	m³

NO.9.
BRIDGE

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m') (m')	
	300 1500 200 700				
		Wet masonry			
	Section ① Section ②				
Wet masonry	Section ①				
	$2.35 \times \frac{1}{2}(0.30+1.80) = 2.47$				
	Section ②				
	$1.80 \times \frac{1}{2}(0.30+1.00) = 1.17$				
	$\frac{1}{2}(① + ②) \times 1.85 \times 4$				
	$= \frac{1}{2}(2.47+1.17) \times 1.85 \times 4$		=	13.47 m³	

No 9 BRIDGE Table 3 Reinforcement.

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
1	φ16	3.13	0.30		3.43	1.578	5.41	15	81.15	
2	"	3.36	"		3.69	"	5.81	14	81.34	
3	"	4.91	"		5.11	"	8.06	19	153.14	
4	φ13	3.15	0.24		3.39	1.042	3.53	12	42.36	
5	"	1.15	"		1.39	"	1.45	26	37.70	
6	"	0.56	"		0.80	"	0.83	"	21.58	
7	φ19	1.00	0.36		1.36	2.226	3.03	30	90.90	
									508.17	

CHECK GATE FOR A ROUTE

No. 384

KINDS	UNIT	CHECK GATE	TOTAL	REMARKS
1) EARTH WORK				
EXCAVATION	m^3	51.9	51.9	
EMBANKMENT	m^3	35.8	35.8	
BACKFILLING	m^3	7.3	7.3	
2) CONCRETE WORK				
REINFORCED CONCRETE	m^3	41.86	41.86	
FORM	m^2	150.23	150.23	
REINFORCEMENT	kg	2307.90	2307.90	
(3) OTHERS				(HEIGHT) (WIDTH)
SLUICE GATE	SET	4 -	4 -	1.90 × 2.02

CHECK GATE Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
EARTH WORK					
EXCAVATION				51.9 m³	
BACKFILLING				7.3 m³	
EMBANKMENT				35.8 m³	
CONCRETE WORK					
REINFORCED CONCRETE				41.86 m³	
FORM				150.23 m²	
REINFORCEMENT				2307.90 kg	
OTHERS WORK					
GATE	1.90 × 2.00			1 set	

CHECK GATE

Table 2 Concrete, form & Others.

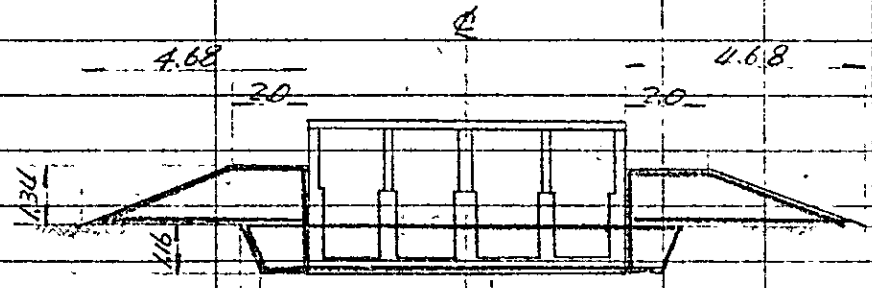
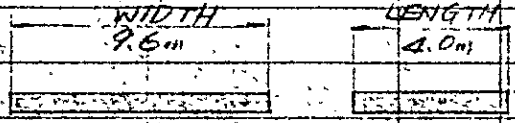
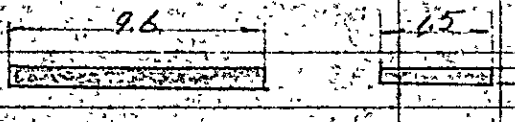
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
① EARTH WORK					
					STRUCTURE LENGTH 4.0m
1. EXCAVATION					
	$(10.6+11.76)\times\frac{1}{2}\times1.16\times4.0=$			51.9	m³
2. EMBANKMENT					
	$(4.68+2.0)\times\frac{1}{2}\times1.34\times2\times4.0=$			35.8	m³
3. BACKFILL					
	$(1.08+0.5)\times\frac{1}{2}\times1.16\times2\times4.0=$			7.3	m³
② CONCRETE	℄ OF MAIN CANAL				
1. FLOOR					
	$9.6\times4.0\times0.5=$			19.20	m³
2. UPPER SLAB (GATE OPERATION FLOOR)					
					
	$9.6\times1.5\times0.3=$			4.32	m³

Table 2 Concrete, form & Others.

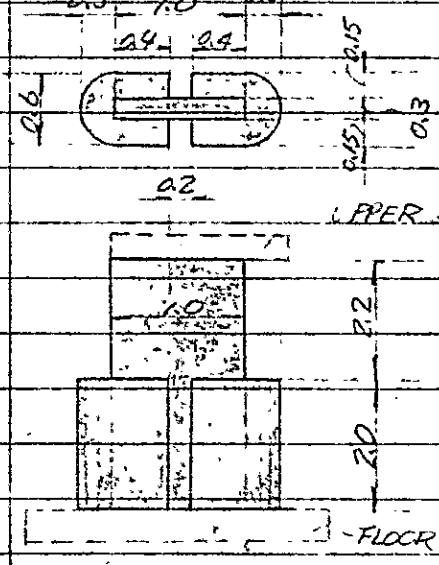
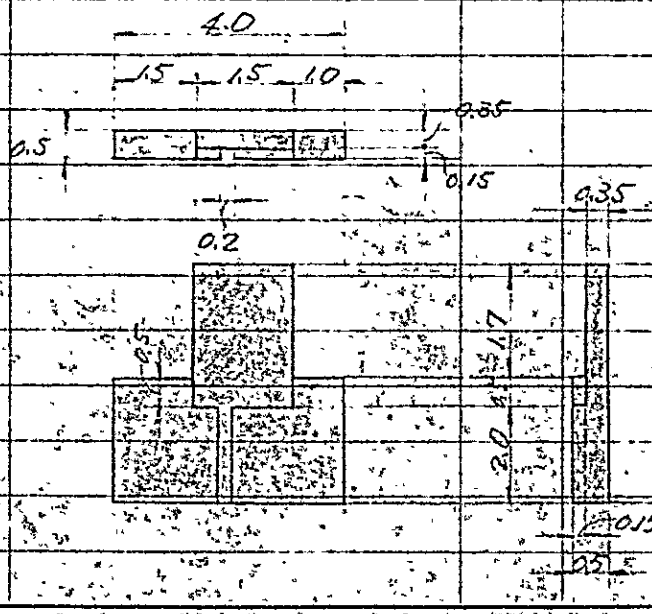
Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m) (m²)	
3. PIER	 NUMBER OF PIER IS 3.				
	$3.14 \times 0.3^2 \doteqdot 0.28$				
	$1.0 \times 0.6 = 0.60$				
	$0.2 \times 0.15 \times 2 \; (-) \; 0.06$				
	$A = 0.82$				
	$A \times 2.0 + 1.0 \times 0.3 \times 2.2 = 2.30$	3	6.90		m^3
4. SIDE WALL					

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³)	
	0.35×1.5×1.7 =	0.89			
	6.5×4.0×2.5 =	5.00			
	0.15×1.5×0.5 = (−)	0.11			
	0.2×0.15×2.0 = (−)	0.06			
		5.72	2	11.44	m³
TOTAL CONCRETE VOLUME				41.86	m³
③ FORM FOR CONCRETE (FIGURES ARE REFER TO THE ABOVE)					
1. FOR FLOOR					
	(9.6+4.0)×0.5×2 =			13.60	m²
2. FOR PIER					
	2×3.14×0.3+(0.4+0.15)×4+0.2×2 = 4.48 = A				
	(1.0+0.3)×2 = 2.6 = B				
	A×2.0+B×2.2 =	14.68	3	44.04	m²
3 FOR SIDE WALL					
	(4.0+0.5+0.15)×2×2.5 =	23.25			
	(1.5+0.35)×2×1.7 =	6.29			
		29.54	2	59.08	m²
4. FOR UPPER SLAB					
	9.6	9.6			
	(1.5+0.3)×2×9.6−1.5×0.3×2 =	35.46			
	0.3×1.0×3+0.35×1.5×2 = (−)	1.95		33.51	m²
TOTAL FORM				150.23	m²

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
④ REINFORCING STEEL RODS					
CALCULATION IS SHOWN IN SEPARATE SHEET					
⑤ OTHERS					
1. GATE AND RELATED MATERIALS					
SLUICE GATE	(HEIGHT) (WIDTH)				
	1.90 m. × 2.0 m.			4 SETS	

CHECK GATE Table 3 Reinforcement

Kinds	Dia (mm)	Actual length (m)	Hook length (m)	Joint length (m)	Total length (m)	Weight per meter (kg/m)	Weight of Unit (kg/unit)	Number	Total Weight (kg)	Remarks
1	φ16	9.48	0.60	0.64	10.72	1.578	16.92	28	473.76	
2	φ13	3.88	0.24		4.12	1.042	4.29	66	283.14	
3	φ16	4.88	0.30		5.18	1.578	8.17	24	196.08	
4	φ13	2.12	0.24		2.36	1.042	2.46	42	103.32	
5	φ16	4.88	0.30		5.18	1.578	8.17	24	196.08	
6	φ13	3.22	0.24		3.46	1.042	3.61	28	101.08	
7	φ16	2.38	0.30		2.68	1.578	4.23	36	152.28	
8	φ13	1.914	0.24		2.15	1.042	2.24	42	94.08	
9	φ16	2.38	0.30		2.68	1.578	4.23	10	42.30	
10	φ13	1.78	0.24		2.02	1.042	2.10	28	58.80	
11	φ16	2.88	0.30		3.18	1.578	5.02	40	200.80	
12	φ13	0.88	0.24		1.12	1.042	1.17	4	4.68	
13	φ13	1.38	0.24		1.62	"	1.69	4	6.76	
14	φ16	9.48	0.60	0.64	10.72	1.578	16.92	12	203.04	
15	φ16	1.38	0.30		1.68	"	2.65	66	174.90	
16	φ13	1.10	0.24		1.34	1.042	1.40	12	16.80	
									2307.90	

TAIL ESCAPE FOR C ROUTE

No. 391

KINDS	UNIT	TAIL ESCAPE	TOTAL	REMARKS
(1) EARTH WORK				
EXCAVATION	m^3	71.3	71.3	
EMBANKMENT	m^3	11.6	11.6	
BACKFILLING	m^3	16.4	16.4	
(2) OTHERS				
WET MASONRY	m^3	52.17	52.17	

TAIL ESCAPE Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(㎥) (㎡)	
EARTH WORK					
EXCAVATION				71.3 ㎥	
EMBANKMENT				11.6 ㎥	
BACKFILLING				16.4 ㎥	
OTHERS WORK					
WET MASONRY	1189 - 2165 - 1883			52.17 ㎥	

TAIL ESCAPE Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m²) (m³)	
Earth Work					
Excavation	$\frac{1}{2}\{(3.2+5.5)\times 1.4+\frac{1}{3}(5.5-7.2)\times 0.4\}$	2.00		17.3 m³	
	$\frac{1}{2}\{(3.2+5.5)\times 1.4+\frac{1}{3}(5.5+11.1)\times 1.9\}$	2.00		17.7	
	$\frac{1}{2}\{(4.2+4.95)\times 0.75-\frac{1}{2}(3.75+5.4)\times 1.3\}$	3.50		16.9	
	$\frac{1}{2}(10.0+16.3)\times 0.30\times 4.00$			19.4	
	total			71.3 m³	
Embankment	$\frac{1}{2}(0.80+2.7)\times 0.50\times 2.00\times 2$			3.6 m³	
	$\frac{1}{2}(2.5+4.0)\times 2.5\times 3.50\times 2$			8.6	
	total			11.6 m³	
Backfilling	$0.60\times 0.30\times(2.00+1.00+3.50)$			1.2 m³	
	$\frac{1}{2}\times 1.15\times 0.75\times 2\times(2.00+1.00)$			2.6	
	$\frac{1}{2}(1.15+0.55)\times 3.35\times 2\times(2.00+1.00+3.50)$			4.6	
	$\frac{1}{2}(0.65+0.50)\times 2.30\times 2\times(2.00+1.00+3.50)$			2.2	
	$\frac{1}{2}(1.15+1.00)\times 0.1\times 2\times 3.50$			0.8	
	$\frac{1}{2}(0.50+0.65)\times 0.30\times(14.0+15.0)$			5.0	
	total			16.4 m³	

Table 2 Concrete, form & Others.

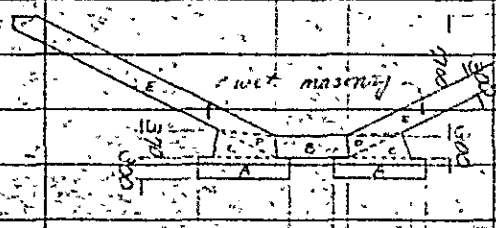
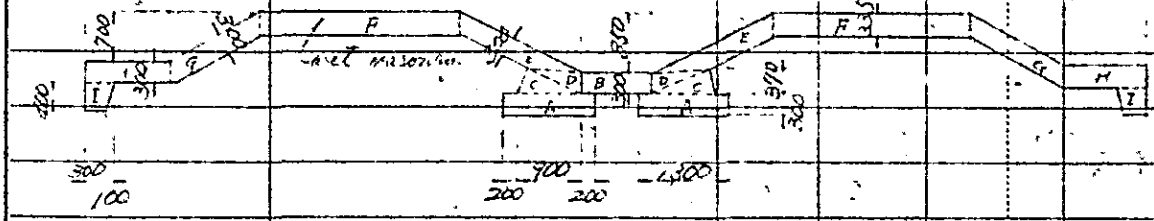
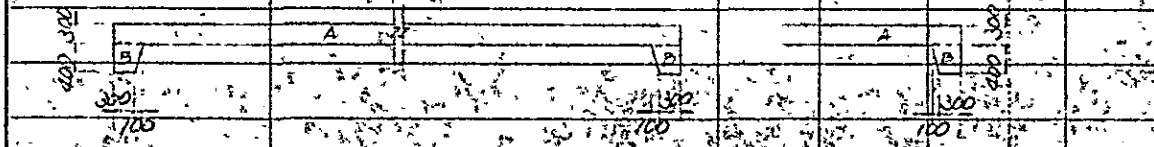
Kinds	Calculated Process.	Unit	Numbers	Total	Remarks
				(m') (m²)	
	300 3,400 1000 3,400 300				
					
	1,300 900 300 300		1300 100		
Wet Masonry	1.30 × 0.30 × 3.10 × 2			m³ 2.42	A
	1.00 × 0.30 × 3.10			0.93	B
	½ × 0.70 × 0.37 × 3.10 × 2			1.03	C
	½ × 0.30 × 0.79 × 3.10 × 2			1.73	D
	½ × √5 (1.70 + 1.43) × 0.30 × 3.10 × 2			6.51	E
	½ × 1.30 × 0.20 × 3.10 × 2			0.19	F
	½ (0.30 + 0.40) × 0.40 × 1.60			0.28	G
	total			m³ 11.89	

Table 2 Concrete, form & Others.

Kinds	Calculated Process	Unit	Numbers	Total	Remarks
				(m³) (m²)	
1,200 1,300	2,000 4,700 1,000 1,700		2,800	1,500	1,500
					
Wet Masonry	1.30×0.30×3.40×2			2.65	A
	1.00×0.30×3.40			1.02	B
	$\frac{1}{2}$×0.09×0.37×3.40×2			0.13	C
	$\frac{1}{2}$×0.30×0.79×3.40×2			0.81	D
	$\frac{1}{2}\sqrt{5}$(0.85+0.445)×0.30×3.40×2			2.95	E
	0.335×2.80×3.40×2			6.38	F
	$\frac{1}{2}\sqrt{5}$(0.70+0.665)×0.30×3.40×2			3.11	G
	1.20×0.30×3.40×2			2.45	H
	$\frac{1}{2}$(0.30+0.90)×0.40×3.40×2			0.85	I
	total			21.45 m³	
	15.00				
					
Wet Masonry	0.30×15.60×3.50			5.15 m³	A
	$\frac{1}{2}$(0.30+2.40)×0.40×(3.50×2+15.00)			3.28	B
	total			18.63 m³	

EARTH WORK FOR C-ROUTE

No. 316

KINDS	UNIT	TOTAL	REMARKS
(1) EARTH WORK			
EXCAVATION	m³	169,611.9	
EMBANKMENT	m³	17,725.3	
BACKFILLING	m³	45,705.8	

EARTHWORK FOR C-ROUTE

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Backfilling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
EC 1	—	46.0								
SP 1	20.24	54.4	51.2	364.5						
EC 1	40.24	57.7	56.3	2031						
NO. 2	35.23	58.0	52.0	2043						
NO 3										
+3.50	43.50	55.9	57.0	2479.5						
NO 3										
+3.50	—	61.6	58.9	—				2.0	1.0	—
NO 3										
+13.50	10.00	55.8	58.7	587.0				2.0	5.5	55.0
NO 3										
+13.50	—	56.3	56.1	—				8.5	8.7	—
NO 4										
+11.50	28.00	41.9	50.1	1402.8				8.3	8.3	232.4
NO 4										
+11.50	—	41.4	41.7	—				2.0	8.7	—
NO 4										
+11.50	10.00	48.0	44.7	447.0				2.0	5.5	55.0
NO 4										
+11.50	—	42.3	45.2	—					1.0	—
NO 5	28.50	35.7	39.0	1111.5						
NO 5	40.00	22.5	29.1	1163.0						
EC 2	14.47	15.2	16.9	141.2						
NO 6										
+2.00	16.53	16.8	16.1	266.1						
NO 7	16.00	15.3	16.1	257.6						
SP 2	19.80	29.7	22.5	445.5						
NO 8	20.20	34.2	34.5	696.9						
EC 2	32.13	26.7	33.0	1060.3						
NO 9	16.67	43.2	35.0	583.5						
NO 10	40.00	26.9	35.1	1404.0						
BC 3	7.84	27.9	27.4	214.8						
NO 11	32.16	33.1	30.5	980.9						
SP 3	18.19	29.5	31.3	569.4						
NO 12	21.81	33.7	31.6	689.2						
SUB TOTAL	524.71			20870						342.4

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Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Backfilling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
NO.1	—	33.7	31.6	—						
EC.1	29.54	29.0	35.4	1046.2						
NO.14	32.84	37.2	37.4	1228.2						
EC.4	16.84	37.8	37.8	636.3						
NO.15	23.02	37.7	37.3	858.7						
NO.16	40.00	36.9	35.4	1416.0						
NO.17	40.00	10.2	22.1	884.0						
EC.5	21.20	0.7	5.5	116.6	14.9	7.5	159.0			
NO.18	18.30	10.0	5.4	101.5		7.5	141.0			
SP.5	16.20	18.4	13.2	230.0						
NO.19	23.30	11.9	15.2	361.8						
EC.5	11.20	8.9	10.4	116.5						
NO.20	23.20	4.3	6.6	153.1	2.3	1.2	27.6			
NO.21	40.00	19.3	11.8	472.0		1.2	48.0			
NO.22	40.00	30.8	25.1	1004.0						
NO.23	40.00	32.9	31.9	1276.0						
EC.6	21.65	32.5	32.7	708.0						
SP.6	17.97	31.5	32.0	575.0						
EC.6	17.97	36.5	34.0	611.0						
NO.24	21.65	43.0	39.8	861.7						
NO.25 +3.50	43.50	51.6	47.3	2057.6						
NO.25 +3.50	—	57.3	54.5	—				2.0	1.0	—
NO.25 +13.50	10.00	47.7	52.5	525.0				7.0	5.5	55.0
NO.25 -13.50	—	48.2	48.0	—				8.3	8.7	—
NO.25 +33.50	20.00	46.2	47.2	944.0				8.3	8.3	166.0
NO.25 -33.50	—	45.7	46.0	—				2.0	8.7	—
SUB TOTAL	568.48			16151.3			375.9			221.0

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Back filling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
NO.25 +3.50	–	45.7	16.6	–				9.0	8.7	–
NO.26 +3.50	16.10	56.3	51.0	5100				2.0	5.5	55.0
NO.26 +3.50	–	50.6	53.5	–					1.0	–
NO.27	36.50	40.8	45.7	1489.1						
SP.7	19.34	30.0	35.4	684.3						
EC.7	15.63	20.6	25.3	396.7						
NO.28	5.46	16.8	18.7	102.1						
NO.29	40.00	9.1	13.0	520.0						
NO.30	40.00	11.1	10.1	404.0						
BC.8	19.65	12.9	12.0	235.8						
NO.31	20.35	15.3	14.1	286.9						
SP.8	24.77	11.6	13.5	334.4						
NO.32	15.23	11.6	11.6	176.7						
NO.33	22.14	11.1	11.4	309.4						
NO.34	40.00	10.5	10.8	432.0						
NO.35	40.00	9.1	9.8	392.0						
BC.9	8.23	9.1	9.1	74.9						
SP.9	7.18	9.4	9.3	66.8						
EC.9	7.18	8.8	9.1	65.3						
NO.36	17.13	7.0	7.9	135.3						
NO.37	40.00	1.6	4.3	172.0	7.2	3.6	144.0			
SP.10	14.48	1.0	1.3	18.8	11.6	9.4	136.1			
NO.38	25.52		0.5	12.8	43.3	27.5	701.8			
NO.39	20.25				76.4	59.4	1203.4			
EC.10	3.44				75.4	75.4	259.2			
NO.40	34.56				64.0	69.7	2408.8			
SUB TOTAL	533.10			4983.2			5704.3			55.0

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Back filling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
NO.40	—				6.40	6.97	—			
NO.41	40.00				3.37	4.89	195.60			
NO.42	40.00	6.3	6.2	8.0	13.5	23.6	944.0			
NO.43	40.00	1.3	9.8	32.0	8.2	10.9	436.0			
NO.44	40.00	1.7	1.5	60.0	7.0	7.6	304.0			
NO.45	40.00	2.5	2.1	84.0	5.0	6.0	240.0			
NO.46	40.00	1.7	2.1	84.0	7.0	6.0	240.0			
NO.47	40.00	6.9	4.3	172.0		3.5	140.0			
NO.48	40.00	6.9	6.9	276.0						
BC.11	19.20	0.5	3.7	71.0	6.4	3.2	61.4			
SP.11	20.28	0.9	0.7	14.2	6.0	6.2	125.7			
FC.11	20.28	1.7	2.8	56.8	1.8	3.9	79.1			
NO.49	19.20	3.5	4.1	78.7	3.3	2.6	49.9			
+30.00	30.00		1.8	54.0	16.5	10.5	315.0			
NO.50	10.10	6.5	6.3	30	12.1	14.5	146.0			
BC.12	9.44	1.0	0.8	7.6	9.4	10.8	102.0			
NO.51	34.56	6.0	3.5	107.0	6.8	5.1	155.9			
SP.12	26.21	5.3	4.9	127.5	2.9	1.9	49.4			
NO.52	13.99	6.1	5.3	74.2	6.3	1.6	22.4			
FC.12	42.58	19.3	13.0	553.5		0.2	8.5			
NO.53	9.44	21.3	20.3	191.6						
+25.00	25.00	28.8	25.1	627.5						
+25.00	—	31.5	31.7	—				2.0	1.0	—
+35.00	10.00	32.3	33.4	334.0				9.1	5.5	55.0
+35.00	—	32.8	32.6	—				8.4	8.8	—
NO.54 +10.00	15.00	28.2	30.5	457.5				8.1	8.3	124.5
SUB TOTAL	470.98			3474.1			537.43			179.5

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Ex. to filling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
No.54										
+16.68	—	252	265	—				81	33	—
No.54										
+10.00	—	277	280	—				88	35	—
+20.00	10.00	166	422	427.0				20	54	54
+20.00	—	509	538	—				10	—	
No.55	20.00	385	447	894.0						
BC.13	32.39	423	404	1308.8						
No.56	7.11	442	423	307.9						
No.57	40.00	378	410	1640.0						
SP.13	4.35	371	375	163.1						
No.58	35.65	220	597	2128.3						
EC.13	15.81	0.1	11.2	177.1	15.9	7.9	124.9			
No.60	40.00	19.2	16.6	664.0		7.9	316.0			
No.61	40.00	13.5	19.2	768.0						
No.62	40.00	27.3	22.9	916.0						
EC.14	20.75	30.2	28.8	597.6						
No.63	19.25	31.6	30.9	594.8						
SP.14	17.16	35.3	33.5	574.9						
No.64	22.84	27.3	31.3	714.9						
EC.14	13.57	22.5	24.9	337.9						
No.65	20.05	22.5	22.5	451.1						
No.66	40.00	7.5	15.0	600.0						
+10.00	10.00	2.1	4.8	48.0	5.8	2.9	29.0			
No.67	30.00		1.1	33.0	28.7	17.3	519.0			
No.68	40.00	18.1	9.1	364.0		14.4	576.0			
No.69	40.00	18.1	18.1	724.0						
No.70	40.00	11.4	14.8	592.0						
SUB TOTAL	599.43			14777.4			1564.9			54.0

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Sand filling?		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
No 70	—	11 41	14.6	—						
No 71	40.00	0 5	6 0	240.0	11 4	5 7	228 0			
+20 00	20.00		3	6.0	22 0	20 2	404.0			
No 72	20 00	0 2	0 1	2 0	14 9	22 0	4400			
No 73	40 00	18 0	9.1	364 0		7 5	307 5			
SP 15	26 93	32.5	25 3	681 3						
No 74	13 07	32 5	32 5	424 8						
EC 15	10 79	32 5	32 5	350 7						
No 75	27 47	39 2	35 9	986 2						
No 76	40 00	38 2	37 2	1488 0						
No 77	40 00	32 5	33 9	1356 0						
No 78	40 00	35 5	34.0	1360 0						
No 79	42 00	21 3	28 7	1148.0						
No 80	40 00	11 7	15 3	532.0	1 9	10	4 0			
No 81	40 00	6 4	5 6	224 0		1 0	4 0			
No 82	40 00	9 8	7 9	316.0						
BC 16	16 16	20 6	15 0	200 9						
SP 16	5 55	21 7	21 2	33 9						
No 83	8 26	20.0	20 9	172 6						
EC 16	7 42	13 9	17.0	126 1						
No 84	32 06	5 5	9 7	311.0						
No 85	40.00	13 3	9 4	376.0						
No 86	40.00	7 8	11 6	464.0						
No 87	40.00	5 0	7 4	296.0	1 5	0 8	32			
+12.00	12.00	0 7	2 9	34 8	10 7	6 1	73 2			
No 88	28.00	2 1	4 9	137 2		5 4	151 2			
SUB TOTAL	717 74			11970 0			1615 1			

Table 1 Excavation & Embankment

Station	Distance	Excavation Section (m²)	Excavation Average Section (m²)	Excavation Volume (m³)	Embankment Section (m²)	Embankment Average Section (m²)	Embankment Volume (m³)	Backfilling Section (m²)	Backfilling Average Section (m²)	Backfilling Volume (m³)
NO.0	—	9.1	4.9	—		5.4	—			
+35.00	35.00	5.3	7.2	252.0	0.9	0.5	17.5			
+35.00	—	11.2	9.3	—	0.6	0.5	—	2.0	1.0	—
NO.29										
15.00	16.00	5.5	8.4	84.0	6.5	3.6	36.0	2.2	2.1	21.0
NO.30										
+45.00	—	1.1	—	—	0.8	—	—	1.5	—	—
NO.31										
+35.00	10.00	2.2	4.2	42.0	9.7	6.3	63.0	1.7	1.6	16.0
NO.0/1										
+55.00	—	0.6	2.4	—	11.5	10.6	—		0.9	—
EC.17	12.26	6.0	0.6	7.4	11.3	11.4	139.8			
NO.90	9.70	0.7	0.7	6.8	10.8	11.1	107.7			
NO.91	10.10	6.1	2.4	24.0	40.0	25.4	252.0			
NO.92	40.00				21.2	30.6	1224.0			
NO.93	20.00	6.3	0.2	4.0	11.7	16.5	330.0			
13.00	30.00	2.2	1.3	39.0	5.5	8.6	258.0			
30.00	—	7.1	4.7	—	4.5	5.0	—	2.0	1.0	—
NO.94	10.10	9.8	8.5	85.0	3.9	4.2	42.0	4.0	3.0	30.0
NO.94	—	10.3	10.1	—	3.4	3.7	—	3.6	3.0	—
EC.16	22.07	25.5	17.9	395.1		1.7	37.5	16.2	9.9	218.5
NO.95	17.73	35.9	30.7	550.5				26.6	21.4	383.7
SP.18	25.66	46.7	41.3	1059.8				37.4	32.0	821.1
NO.96	14.34	52.2	49.5	709.8				42.9	40.2	576.5
EC.18	27.25	54.3	53.3	1451.9				45.0	44.0	1297.0
NO.98	40.27	33.5	43.9	1767.9				24.2	34.6	1393.3
NO.99	40.00	40.5	37.0	1480.0				31.2	27.7	1108.0
EC.19	28.00	30.3	35.4	991.2				21.0	26.1	730.8
NO.100	12.00	26.0	28.2	338.4				16.7	18.9	226.8
SP.19	26.27	46.7	36.4	956.2				37.4	27.1	711.9
SUB TOTAL	492.75			10352.1			3799.5			7524.6

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Surplus		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
SP.10	—	46.1	36.4	—				37.4	27.1	—
No.101	13.23	49.0	47.9	633.7				38.7	33.6	444.3
EC.10	24.34	54.5	52.5	1278.7				47.2	43.5	1059.5
No.102	38.00	58.9	62.7	2382.6				59.6	53.4	2029.2
No.103	40.00	76.2	72.9	2916.0				67.6	63.6	2544.0
No.104	40.00	71.8	77.4	3096.0				68.5	68.1	2724.0
No.105	40.00	79.4	78.6	3144.0				70.1	69.2	2768.0
No.106	40.00	73.7	76.6	3064.0				64.4	67.3	2692.0
No.107	40.00	68.1	70.9	2836.0				58.8	61.6	2464.0
No.108	40.00	57.3	62.7	2508.0				48.0	53.4	2136.0
No.109	40.00	47.8	52.6	2104.0				38.5	43.3	1732.0
No.110	40.00	37.2	42.5	1700.0				28.4	33.5	1340.0
No.110	—	36.7	37.0	—				27.1	28.8	—
No.110 +10.00	16.00	55.3	46.0	460.0				30.0	28.6	56.0
No.110 +10.00	—	49.6	52.5	—					1.0	—
No.111	30.00	49.9	34.8	1044.0						
No.112	40.00	11.9	15.9	636.0						
No.113	40.00	19.9	19.9	796.0						
No.113 +15.00	15.00	7.5	7.7	115.5						
No.113 +15.00	—	13.2	10.1	—				2.0	1.0	—
No.113 +25.00	10.00	13.8	13.5	135.0	2.1	1.1		5.9	4.0	40.0
No.113 +25.00	—	14.3	14.1	—	1.6	1.9		5.4	5.7	—
No.114	15.00	13.0	13.7	205.5	2.5	2.1		5.1	5.3	79.5
No.114 +15.00	15.00	16.7	14.9	223.5	2.6	1.6		6.9	6.0	90.0
No.114 +15.00	—	16.2	16.5	—	0.7	0.7		7.4	7.2	—
SUB TOTAL	571.27			23912.5		7.7				21896.2

Table 1 Excavation & Embankment

Station	Distance	Excavation Section (m²)	Excavation Average Section (m²)	Excavation Volume (m³)	Embankment Section (m²)	Embankment Average Section (m²)	Embankment Volume (m³)	Sand filling Section (m²)	Sand filling Average Section (m²)	Sand filling Volume (m³)
NO 114										
+15.00	—	162	165	—	07	57	—	74	72	—
NO 114										
+25.00	10.00	194	178	1780	04	4.5	20	2.0	1.7	170
NO 113										
+25.00	—	137	166	—					1.0	—
NO 115	15.00	193	165	2475						
NO 116	40.00	273	233	9320						
NO 117	40.00	149	211	8440						
NO 118	40.00	105	127	5080						
NO 119	40.00	312	209	8360						
NO 120	40.00	417	365	14600						
NO 120	15.00	376	397	5955						
+15.00 NO 120	—	649	513	—				12.1	6.1	—
+20.00 NO 120	5.00	634	642	3210				19.8	13.5	67.5
+20.00	—	486	560	—				10.6	10.4	—
NO 121	20.00	295	371	7420				19.5	16.0	3360
NO 121	10.00	335	295	2950				18.8	19.2	1920
+10.00 NO 121	—	375	355	—				17.4	18.1	—
+15.00 NO 121	5.00	364	370	1850				10.6	14.0	70.0
+15.00	—	300	332	—				6.5	8.6	—
BC 20	9.04	382	391	3083				28.9	17.7	160.0
NO 122	15.96	534	458	7310				44.1	36.5	5825
KP 20	5.19	534	534	2772				44.1	44.1	2289
EC 20	21.15	573	554	11717				46.0	46.1	9750
NO 123	11.93	604	589	7056				51.1	49.6	5942
NO 124	40.00	596	600	24000				50.3	50.7	20280
NO 125	40.00	578	587	23480				48.5	49.4	19760
NO 126	40.00	596	587	22680				46.3	47.4	18960
SUB TOTAL	463.32			177558			1.0			91531

Table 1 Excavation & Embankment

Station	Distance	Excavation Section (m²)	Excavation Average Section (m²)	Excavation Volume (m³)	Embankment Section (m²)	Embankment Average Section (m²)	Embankment Volume (m³)	Back fill Section (m²)	Back fill Average Section (m²)	Back fill Volume (m³)
NO126	—	556	567	—				16.5	17.4	—
NO127	40.00	503	530	21200				41.0	43.7	17480
EC21	16.62	482	493	8194				37	40.0	6648
NO128	23.38	459	471	11012				36.6	37.8	8836
SP21	11.53	434	447	5295				34.1	35.4	4188
NO129	22.17	410	422	11888				31.7	32.9	9260
FC21	7.01	402	406	2858				0.3	20.0	1408
EC21	—	397	400	—				9.0	8.7	—
NO130 +20.75	16.00	465	431	4310				2.0	5.5	550
NO130 +22.78	—	468	137	—					1.0	—
NO130	17.22	383	396	6819						
NO131	40.00	409	396	15840						
NO132	40.00	472	440	17600						
NO133	20.00	456	479	9210						
+20.00	20.00	456	471	9420						
+20.00	—	513	485	—				2.0	1.0	—
+30.00	16.00	412	463	4630				5.7	3.9	390
+30.00	—	417	415	—				5.0	5.4	—
NO134	10.00	336	377	3770				24.3	14.7	1470
+10.00	20.00	428	382	3820				8.4	16.4	1610
+10.00	—	423	426	—				9.1	8.8	—
+20.00	10.00	546	485	4850				2.0	5.6	560
+20.00	—	489	518	—					1.0	—
NO135	20.00	548	524	10480						
NO136	40.00	565	562	22480						
NO137	40.00	516	541	21640						
SUB TOTAL	434.26			265259						52440

Table 1 Excavation & Embankment

Station	Distance	Excavation			Embankment			Backfilling		
		Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)	Section (m²)	Average Section (m²)	Volume (m³)
No.137	—	516	541	—						
No.138	19.10	446	481	919.0						
-30.00	30.00	482	464	892.0						
+30.00	—	539	511	—				2.0	1.0	—
No.139	16.60	447	493	493.0				9.1	5.6	56.0
No.139	—	452	450	—				8.4	8.8	—
No.140	19.60	229	341	1264.0				13.6	11.2	111.0
No.141	40.60	361	295	1200.0				10.1	11.9	476.0
No.141	—	356	359	—				10.8	10.5	—
+10.00	10.00	580	468	468.0				2.0	5.4	64.0
+10.00	—	523	552	—					1.0	—
No.142	30.00	558	541	1623.0						
No.143	40.00	656	607	2428.0						
No.144	40.00	678	667	3668.0						
No.145	40.00	578	628	2512.0						
EP	60.10	145	362	2175.6						
SUB TOTAL	380.10			16227.6						1036.0
TOTAL	5706.41			169611.9			122453			45208.3