

**ROAD DESIGN
(PACKAGE 2)**

1. SUMMARY OF QUANTITY

Grand Summary of Quantity Calculation Sheet for Package 2

Item	Description	Unit	Qty						
			Package2		Total				
			Main Road	Relocation Road					
Road Structures									
1. Earthworks	Excavation & Backfilling	Filling for Surcharge W>=4m	m3	48,516.300	-	48,516			
		Sand Mat for Surcharge W>=4m	m3	61,308.000	-	61,308			
		Filling W>=4m	Bulldozer	m3	37,398.800	-	37,399		
		Filling W<4m		m3	1,014.800	213.106	1,228		
		Cutting W>=4m	Bulldozer	m3	24,887.300	256.883	25,144		
		Back Fill of Wall W>=4m		m3	5,171.300	-	5,171		
	Trimming of Slope	Slope of Embankment		m2	2,527.354	-	2,527		
		Cut Slope		m2	-	-	-		
	Slope Protection	Sodding		m2	2,527.354	-	2,527		
	2. Pavement	Main Road, On-ramp & Relocation Road to Existing Thanlyin Bridge	Subgrade course	t=1000mm	m2	-	-		
Subbase course			Aggregate, t=500mm	m2	-	-			
			t=350mm	m2	14,194.670	-	14,195		
			t=300mm	m2	-	-			
			t=250mm	m2	-	-			
			t=150mm	m2	-	1,208.849	1,209		
Base course			Aggregate, t=250mm	m2	9,291.960	-	9,292		
			t=150mm	m2	-	1,153.091	1,153		
Prime Coat				m2	9,498.770	1,153.091	10,652		
Surface Base			Coarse asphalt concrete, t=50mm	m2	9,498.770	1,115.919	10,615		
Binder course			Coarse asphalt concrete, t=50mm	m2	-	-	-		
Tack Coat				m2	9,739.690	1,115.919	10,856		
Surface course			Fine asphalt concrete, t=50mm	m2	9,739.690	1,115.919	10,856		
Toll Plaza			Subgrade course	Aggregate, t=350mm	m2	4,127.200	-	4,127	
		Subbase course	Aggregate, t=250mm	m2	-	-			
		Base course	Aggregate, t=100mm	m2	4,127.200	-	4,127		
		Concrete	t=250mm σck=24N/mm	m2	3,581.350	-	3,581		
			t=250mm σck=18N/mm	m2	38.320	-	38		
			Attainment section σck=24N/mm	m3	90.280	-	90		
		Metal Lath	D6,15000x15000 (3.11kg/m2)	kg	10,400.180	-	10,400		
		Steel Bar	SS400 Φ28 (round bar)	kg	3,274.600	-	3,275		
			SD345 D22	kg	2,364.410	-	2,364		
			SD345 D13	kg	21,262.170	-	21,262		
		Joint Filleer(bituminous material) t=25mm	m2	43.040	-	43			
		Asphalt Emulsion	t	0.804	-	1			
Star City Access Main Road		Sand Compacted	t=200mm	m2	-	-			
		Hard Core with Sand	t=500mm	m2	-	-			
		Plastic Sheet		m2	-	-			
		Lean concrete 1:3:6	t=80mm	m2	-	-			
		Concrete	t=200mm	m2	-	-			
		STEEL MESH	Φ10 @ 150mm/c	kg	-	-			
		TRANSVERSE JOINT	PLAIN DOWEL BAR, φ28	kg	-	-			
		LONGITUDINAL JOINT	DEFORMED TIE BAR, D22	kg	-	-			
		Star City Access Side Walk	Sand Compacted	t=300mm	m2	-	-		
			Hard Core with compacted sand	t=200mm	m2	-	-		
Expose Aggregate Finished Footpath			t=75mm	m2	-	-			
Soil Aggregate:C-30			t=100mm	m2	-	362.674	363		
Sand			t=30mm	m2	-	362.674	363		
Precast Concrete Paving Block			t=60mm	m2	-	362.674	363		
3. Soft Soil Treatment		Deep Mixing Method	Soil Cement Columns (Working Pile) including Field Test	lm	24,968.000	-	24,968		
	Soil Cement Columns (Preliminary Test Columns; Non-working Pile) including Field Test		lm	46.250	-	46			
	Solidifying material addition		unit addition(330kg/m3)	t	19,667.540	-	19,668		
	Shallow Improvement		depth=2.0m (L=42.522m, W=3.708m)	m3	315.300	-	315		
			depth=1.3m	m3	11,270.170	-	11,270		
		Solidifying material addition	unit addition(230kg/m3)	t	2,592.140	-	2,592		
		Solidifying material addition	unit addition(290kg/m3)	t	91.437	-	91		
		4. Wall Structures	Mechanically Stabilised Earth Wall	Wall Area	Prefabricated Concrete Block	m2	1,036.560	1,037	
				Strip	W=80mm, t=3mm	m	9,462.000	-	9,462
				Crushed Stone of Back Wall	C-40	m3	2,151.670	-	2,152
Rising Concrete (Include Curb)	Concrete σck=24N/mm			m3	548.060	-	548		
	Form			m2	2,289.920	-	2,290		
	Steel Bar(SD345 D16)			kg	15,450.500	-	15,451		
	Steel Bar(SD345 D13)			kg	32,512.100	-	32,512		
	Steel Bar(SD345 D10)			kg	9,762.695	-	9,763		
	Joint Filleer(bituminous material) t=20mm			m2	9.250	-	9		
	Joint Filleer(bituminous material) t=10mm			m2	67.620	-	68		
	Leveling Concrete	m3		-	-	-			
	Crushed Stone (C-40)	m3		-	-	-			
	Rubber Plate	t=10mm (10x300x600)		m2	106.800	-	107		
Base Concrete of Wall	Concrete σck=18N/mm	m3		95.970	-	96			
	Form	m2	258.380	-	258				
Geotextile		m2	1,319.530	-	1,320				
Gravity Wall	Concrete		m3	288.700	-	289			
	Form		m2	803.970	-	804			
	Steel Bar	SD345 D16	kg	12,498.200	-	12,498			
		SD345 D13	kg	7,040.600	-	7,041			
	Joint	t=10mm	m2	24.673	-	25			
	Lighting Foundation	Concrete σck=24N/mm	m3	3.680	-	4			
		Form	m2	16.112	-	16			
	Steel Bar(SD345 D13)	kg	0.320	-	-				
5. Miscellaneous	Concrete Kerb and Concrete Block	Concrete Kerb(typeA-1)	m	328.397	278.980	607			
		Concrete Kerb(typeA-2)	m	-	-	-			
		Concrete Kerb(typeA-3)	m	-	-	-			
		Concrete Kerb(typeA-4)	m	-	-	-			
		Concrete Kerb(typeA-5)	m	-	-	-			
		Concrete Kerb(typeB-1)	m	-	-	-			
		Concrete Kerb(typeB-2)	m	-	-	-			
		Concrete Kerb(typeB-3)	m	-	-	-			
		Concrete Kerb(typeC)	m	-	-	-			
		Concrete Kerb(typeD)	m	-	-	-			
		Concrete Kerb(typeE)	m	95.347	-	95			
		Guard-rail	Bridge type	m	-	-	-		
			Metal type(GR-A)	m	634.202	-	634		
			Metal type(GR-Am)	m	-	-	-		
	Metal type(GR-B)		m	-	-	-			
	Guard-pipe	Metal type(GP-A)	m	-	-	-			
	Road Marking	unbroken ,white W=15cm	m	17.427	-	17			
		unbroken ,white W=8cm	m	-	-	-			
		unbroken ,white W=10cm	m	5,507.497	482.440	5,990			
		unbroken ,white W=30cm	m	10.500	3.522	14			
		unbroken ,white W=45cm	m	24.984	-	25			
		broken ,white W=8cm	m	-	-	-			
		broken ,white W=10cm	m	-	-	-			
		Speed Limit Marks	Nos	0	0	0			
		Toll Ahead Marks	Nos	4	0	4			
		Arrow Mark ,white	Nos	9	0	9			
	Concrete Seal	Median Strip	W=1.5m	m	-	-			
			W=0.75m	m	81.560	-	82		
		Side Strip (Toll Plaza Section)	W=1.20m	m2	44.961	-	45		
		Side Strip next to "Wall"	W=0.50m	m	165.277	-	165		
		Under Flyover Section (Thaketa Side)	W=Varied	m2	1,241.797	-	1,242		
	Signboard	Informatory Signboard Type A	Nos	-	-	-			
		Informatory Signboard Type B	Nos	-	-	-			
		Informatory Signboard Type C	Nos	-	-	-			
		Regulatory Signs	Nos	-	-	-			
		Warning Signs	Nos	-	-	-			
	Approach Slab for Flyover Section (AF-1)	Concrete	σ ck = 24 N/mm ²	m3	18.900	-	19		
		Form		m2	7.300	-	7		
		Reinforcement Bar	SD345	t	2.715	-	3		
		Rubber Bearing	t=20mm	m2	2.200	-	2		
Joint Material		t=20mm	m2	9.000	-	9			
Gas Pipe		Sgp4oa	kg	17.000	-	17			
Cap		φ 60 x 3.2	kg	2.000	-	2			

Grand Summary of Quantity Calculation Sheet for Package 2

Item	Description	Unit	Qty			
			Package2		Total	
			Main Road	Relocation Road		
6. Drainage Structures	Open Ditches	Side Ditch Type U-300x300	m	26.207	-	26
		Side Ditch Type U-500x500	m	-	-	-
		Side Ditch Type U-800x800	m	-	-	-
		Side Ditch Type U-1000x1000	m	-	-	-
		Side Ditch Type U-1500x1500	m	-	-	-
		Side Ditch Type U-500x500 with Concrete Cover	m	-	-	-
		Side Ditch Type U-500x850 with Concrete Cover	m	-	-	-
		Side Ditch Type U-800x800 with Concrete Cover	m	-	-	-
		Side Ditch Type U-800x1000 with Concrete Cover	m	-	-	-
		Side Ditch Type U-1000x1000 with Concrete Cover	m	-	-	-
		Side Ditch Type U-1000x1500 with Concrete Cover	m	-	-	-
		Side Ditch Type U-1500x1500 with Concrete Cover	m	-	-	-
		Side Ditch Type U-1500x2500 with Concrete Cover	m	1,111.563	-	1,112
		Catch Basins/Pits, Inlets, Outlets, Manholes	Catch Pit (C=DITCH) Type A	Nos	32.000	-
	Catch Pit (C=DITCH) Type C		Nos	17.000	-	17
	Catch Pit (C=DITCH) Type D		Nos	2.000	-	2
	Catch Pit (C=DITCH) Type B		Nos	4.000	-	4
	Catch Pit 700 x 700 x 1050		Nos	-	-	-
	Catch Pit 700 x 700 x 1850		Nos	-	-	-
	Catch Pit 700 x 700 x 2250		Nos	-	-	-
	Catch Pit 1000 x 1000 x 1350		Nos	-	-	-
	Catch Pit 1200 x 1200 x 1600		Nos	-	-	-
	Catch Pit 600 x 600 x 1100		Nos	4.000	-	-
	Concrete Pipe Culverts	Concrete Pipe Culvert ϕ 300 (CON. 360°) TYPE B	m	358.097	-	358
		Concrete Pipe Culvert ϕ 300 (CON. 360°) TYPE A	m	102.064	-	102
		Concrete Pipe Culvert ϕ 900 (CON. 360°)	m	-	-	-
	Concrete Box Culverts	Box Culvert Type 1000 x 1000	m	-	-	-
	Vertical Drain	Vertical Drain Type A UPVC Pipe ϕ 200mm	m	66.151	-	66
		Vertical Drain Type A Joint (90°) ϕ 200mm	Nos	17.000	-	17
		Vertical Drain Type B U-Ditch Section A-A	m	2.550	-	3
		Vertical Drain Type B U-Ditch Section B-B	m	13.858	-	14
		Vertical Drain Type B U-Ditch Section C-C	m	1.132	-	1
		Vertical Drain Type C UPVC Pipe ϕ 150mm	m	-	-	-
	Drainage Outlet	Drainage Outlet Type A Left Side	L.S	-	-	-
		Drainage Outlet Type A Right Side	L.S	-	-	-
		Drainage Outlet Type A Flap Gate 1000 x 1000	Nos	-	-	-
		Drainage Outlet Type B Left Side	L.S	1.000	-	1
		Drainage Outlet Type B Right Side	L.S	1.000	-	1
		Drainage Outlet Type B Flap Gate 2000 x 1500	Nos	2.000	-	2

ROAD DESIGN (PACKAGE 2)

2. MAIN ROAD

BILL OF QUANTITIES
CUTTING AND FILLING VOLUME
PACKAGE 2

After Settlement

Cut:	24,885.30	+	1.97	=	24,887.27 m3	W > 4m				
	Sur-cut, Cut		Intersection							
Back-Fill	5,171.30			=	5,171.3 m3	W >= 4m				
	Mechanically									
Fill	35,651.50	+	1,236.56	+	304.34	+	176.09	=		
	FILL		Sur_Fill		Abutment A2		Abutment AO1			
		+	30.33					=	37,398.8 m3	W >= 4m
			Intersection							
Cut & Caver	248.40	+	324.60	+	426.50	+	15.25	=	1,014.8 m3	W < 4m
	Mechanically		Shoulder L		Shoulder R		Intersection			

Left Shoulder Fill

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	0.00			
STA	2.0 +	400.000	0.00	0.00	7.5	0.00
STA	2.0 +	420.000	0.00	0.00	20.0	0.00
STA	2.0 +	440.000	0.00	0.00	20.0	0.00
STA	2.0 +	460.000	0.00	0.00	20.0	0.00
STA	2.0 +	480.000	0.57	0.29	20.0	5.80
STA	2.0 +	500.000	1.52	1.05	20.0	21.00
STA	2.0 +	520.000	0.58	1.05	20.0	21.00
STA	2.0 +	540.000	0.58	0.58	20.0	11.60
STA	2.0 +	560.000	0.00	0.29	20.0	5.80
STA	2.0 +	580.000	0.00	0.00	20.0	0.00
STA	2.0 +	600.000	0.18	0.09	20.0	1.80
STA	2.0 +	620.000	2.25	1.22	20.0	24.40
STA	2.0 +	627.420	2.53	2.39	7.4	17.70
STA	2.0 +	640.000	6.88	4.71	12.6	59.30
STA	2.0 +	660.000	1.31	4.10	20.0	82.00
STA	2.0 +	680.000	0.50	0.91	20.0	18.20
STA	2.0 +	680.992	0.50	0.5	1.0	0.50
STA	2.0 +	700.000	0.50	0.5	19.0	9.50
STA	2.0 +	720.000	0.50	0.5	20.0	10.00
STA	2.0 +	724.080	0.50	0.5	4.1	2.00
STA	2.0 +	740.000	0.50	0.5	15.9	8.00
STA	2.0 +	760.000	0.50	0.5	20.0	10.00
STA	2.0 +	777.651	0.86	0.7	17.7	12.00
STA	2.0 +	780.000	0.82	0.8	2.3	2.00
STA	2.0 +	782.486	0.77	0.8	2.5	2.00
合計						324.60

Right Shoulder Fill

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	0.65			
STA	2.0 +	400.000	0.65	0.65	7.5	4.90
STA	2.0 +	420.000	0.65	0.65	20.0	13.00
STA	2.0 +	440.000	0.65	0.65	20.0	13.00
STA	2.0 +	460.000	0.65	0.65	20.0	13.00
STA	2.0 +	480.000	0.95	0.80	20.0	16.00
STA	2.0 +	500.000	0.95	0.95	20.0	19.00
STA	2.0 +	520.000	0.95	0.95	20.0	19.00
STA	2.0 +	540.000	0.95	0.95	20.0	19.00
STA	2.0 +	560.000	0.65	0.80	20.0	16.00
STA	2.0 +	580.000	0.65	0.65	20.0	13.00
STA	2.0 +	600.000	0.28	0.47	20.0	9.40
STA	2.0 +	620.000	2.85	1.57	20.0	31.40
STA	2.0 +	627.420	3.13	2.99	7.4	22.20
STA	2.0 +	640.000	3.61	3.37	12.6	42.40
STA	2.0 +	660.000	1.66	2.64	20.0	52.80
STA	2.0 +	680.000	1.00	1.33	20.0	26.60
STA	2.0 +	680.992	1.00	1.0	1.0	1.00
STA	2.0 +	700.000	1.01	1.0	19.0	19.20
STA	2.0 +	720.000	1.00	1.0	20.0	20.20
STA	2.0 +	724.080	1.00	1.0	4.1	4.10
STA	2.0 +	740.000	1.00	1.0	15.9	15.90
STA	2.0 +	760.000	0.93	1.0	20.0	19.40
STA	2.0 +	777.651	0.93	0.9	17.7	16.40
STA	2.0 +	780.000	0.93	0.9	2.3	2.20
STA	2.0 +	782.486	0.93	0.9	2.5	2.30
合計						426.50

Enbankment (Thaketa)

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	89.90			
STA	2.0 +	400.000	89.90	89.90	7.5	674.30
STA	2.0 +	420.000	110.60	100.25	20.0	2,005.00
STA	2.0 +	440.000	128.24	119.42	20.0	2,388.40
STA	2.0 +	460.000	142.77	135.51	20.0	2,710.20
STA	2.0 +	480.000	140.84	141.81	20.0	2,836.20
STA	2.0 +	500.000	135.09	137.97	20.0	2,759.40
STA	2.0 +	520.000	138.99	137.04	20.0	2,740.80
STA	2.0 +	540.000	142.04	140.52	20.0	2,810.40
STA	2.0 +	560.000	133.75	137.90	20.0	2,758.00
STA	2.0 +	580.000	121.34	127.55	20.0	2,551.00
STA	2.0 +	600.000	116.76	119.05	20.0	2,381.00
STA	2.0 +	620.000	117.95	117.36	20.0	2,347.20
STA	2.0 +	627.420	118.12	118.04	7.4	875.90
STA	2.0 +	640.000	104.72	111.42	12.6	1,401.70
STA	2.0 +	660.000	84.18	94.45	20.0	1,889.00
STA	2.0 +	680.000	54.22	69.20	20.0	1,384.00
STA	2.0 +	680.992	53.32	53.8	1.0	53.30
STA	2.0 +	700.000	35.37	44.3	19.0	842.80
STA	2.0 +	720.000	18.36	26.9	20.0	537.40
STA	2.0 +	724.080	15.19	16.8	4.1	68.50
STA	2.0 +	740.000	6.32	10.8	15.9	171.30
STA	2.0 +	760.000	2.37	4.4	20.0	87.00
STA	2.0 +	777.651	2.34	2.4	17.7	41.70
STA	2.0 +	780.000	2.34	2.3	2.3	5.50
STA	2.0 +	782.486	2.34	2.3	2.5	5.80
合計						35,651.50

Back – Fill for Mechanically Stabilised Earth Work (Thaketa)

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	19.20			
STA	2.0 +	400.000	19.20	19.20	7.5	144.00
STA	2.0 +	420.000	16.99	18.10	20.0	362.00
STA	2.0 +	440.000	15.14	16.07	20.0	321.40
STA	2.0 +	460.000	13.72	14.43	20.0	288.60
STA	2.0 +	480.000	10.68	12.20	20.0	244.00
STA	2.0 +	500.000	9.22	9.95	20.0	199.00
STA	2.0 +	520.000	10.49	9.86	20.0	197.20
STA	2.0 +	540.000	13.35	11.92	20.0	238.40
STA	2.0 +	560.000	14.32	13.84	20.0	276.80
STA	2.0 +	580.000	16.04	15.18	20.0	303.60
STA	2.0 +	600.000	21.70	18.87	20.0	377.40
STA	2.0 +	620.000	22.57	22.14	20.0	442.80
STA	2.0 +	627.420	22.36	22.47	7.4	166.70
STA	2.0 +	640.000	28.50	25.43	12.6	319.90
STA	2.0 +	660.000	35.97	32.24	20.0	644.80
STA	2.0 +	680.000	13.45	24.71	20.0	494.20
STA	2.0 +	680.992	13.23	13.3	1.0	13.20
STA	2.0 +	700.000	7.97	10.6	19.0	201.50
STA	2.0 +	720.000	0.00	4.0	20.0	79.80
STA	2.0 +	724.080	0.00	0.0	4.1	0.00
STA	2.0 +	740.000	0.00	0.0	15.9	0.00
STA	2.0 +	760.000	0.00	0.0	20.0	0.00
STA	2.0 +	777.651	0.00	0.0	17.7	0.00
STA	2.0 +	780.000	0.00	0.0	2.3	0.00
STA	2.0 +	782.486	0.00	0.0	2.5	0.00
合計						5,171.30

Cut and Cover for Mechanically Stabilised Earth Work (Thaketa)

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	0.53			
STA	2.0 +	400.000	0.53	0.53	7.5	4.00
STA	2.0 +	420.000	0.53	0.53	20.0	10.60
STA	2.0 +	440.000	0.53	0.53	20.0	10.60
STA	2.0 +	460.000	0.53	0.53	20.0	10.60
STA	2.0 +	480.000	0.53	0.53	20.0	10.60
STA	2.0 +	500.000	0.53	0.53	20.0	10.60
STA	2.0 +	520.000	0.53	0.53	20.0	10.60
STA	2.0 +	540.000	0.53	0.53	20.0	10.60
STA	2.0 +	560.000	0.53	0.53	20.0	10.60
STA	2.0 +	580.000	0.53	0.53	20.0	10.60
STA	2.0 +	600.000	1.23	0.88	20.0	17.60
STA	2.0 +	620.000	1.23	1.23	20.0	24.60
STA	2.0 +	627.420	1.23	1.23	7.4	9.10
STA	2.0 +	640.000	1.23	1.23	12.6	15.50
STA	2.0 +	660.000	1.23	1.23	20.0	24.60
STA	2.0 +	680.000	1.23	1.23	20.0	24.60
STA	2.0 +	680.992	1.23	1.23	0.99	1.20
STA	2.0 +	700.000	1.23	1.23	19.01	23.40
STA	2.0 +	720.000	0.00	0.62	20.00	12.40
STA	2.0 +	724.080	0.00	0.00	4.08	0.00
STA	2.0 +	740.000	0.00	0.00	15.92	0.00
STA	2.0 +	760.000	0.00	0.00	20.00	0.00
STA	2.0 +	777.651	0.00	0.00	17.65	0.00
STA	2.0 +	780.000	0.00	0.00	2.35	0.00
STA	2.0 +	782.486	0.00	0.00	2.49	0.00
合計						248.40

FILL

			Area	Ave.	Distance	Volume
STA	2.0 +	420.000	5.31			
STA	2.0 +	440.000	4.77	5.04	20.0	100.80
STA	2.0 +	460.000	4.39	4.58	20.0	91.60
STA	2.0 +	480.000	3.53	3.96	20.0	79.20
STA	2.0 +	500.000	2.35	2.94	20.0	58.80
STA	2.0 +	520.000	3.51	2.93	20.0	58.60
STA	2.0 +	540.000	4.25	3.88	20.0	77.60
STA	2.0 +	560.000	4.16	4.21	20.0	84.20
STA	2.0 +	580.000	5.05	4.61	20.0	92.20
STA	2.0 +	600.000	6.30	5.68	20.0	113.60
STA	2.0 +	620.000	6.60	6.45	20.0	129.00
STA	2.0 +	627.420	6.53	6.57	7.4	48.75
STA	2.0 +	640.000	6.18	6.36	12.6	80.01
STA	2.0 +	660.000	16.04	11.11	20.0	222.20
STA	2.0 +	680.000		8.02	20.0	160.40
STA	2.0 +	680.992		0.00	1.0	0.00
STA	2.0 +	700.000		0.00	19.0	0.00
STA	2.0 +	720.000		0.00	20.0	0.00
STA	2.0 +	724.080		0.00	4.1	0.00
STA	2.0 +	740.000		0.00	15.9	0.00
STA	2.0 +	760.000		0.00	20.0	0.00
STA	2.0 +	777.651		0.00	17.7	0.00
STA	2.0 +	780.000		0.00	2.3	0.00
STA	2.0 +	782.486		0.00	2.5	0.00
合計						1,236.56

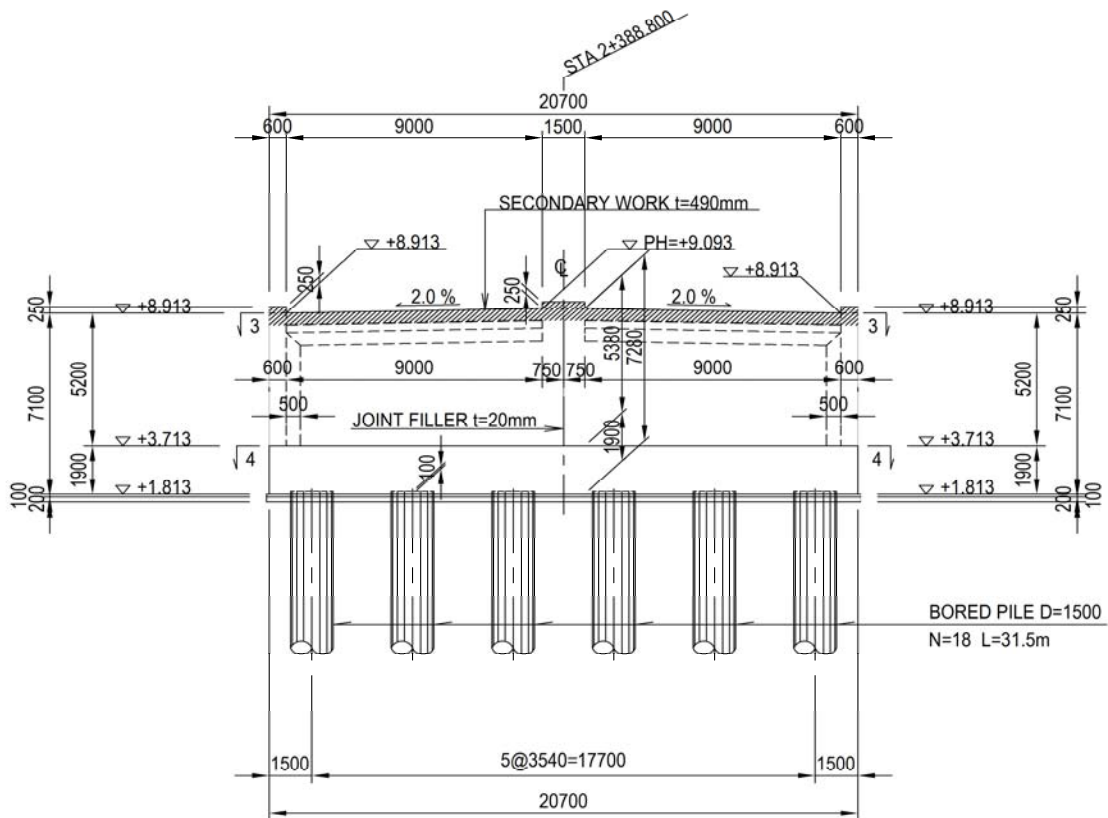
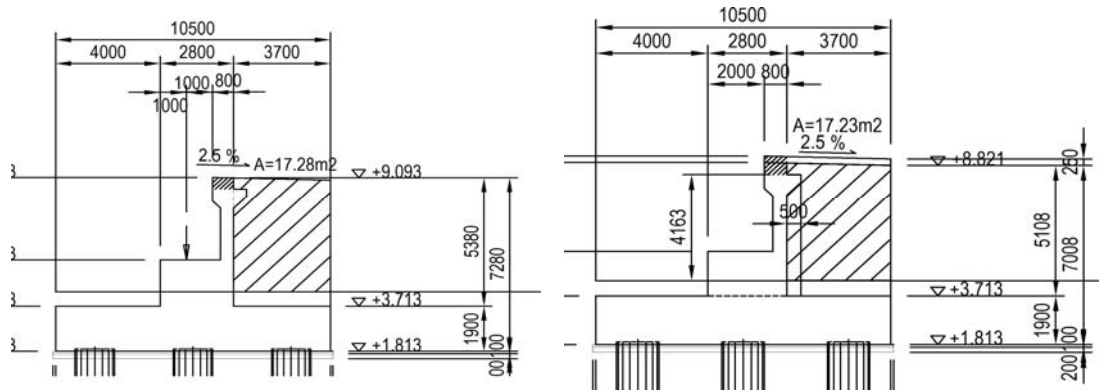
Cut

			Area	Ave.	Distance	Volume
STA	2.0 +	392.500	6.68			
STA	2.0 +	400.000	6.68	6.68	7.5	50.10
STA	2.0 +	420.000	80.08	43.38	20.0	867.60
STA	2.0 +	440.000	94.41	87.25	20.0	1,745.00
STA	2.0 +	460.000	109.71	102.06	20.0	2,041.20
STA	2.0 +	480.000	103.87	106.79	20.0	2,135.80
STA	2.0 +	500.000	108.78	106.33	20.0	2,126.60
STA	2.0 +	520.000	106.08	107.43	20.0	2,148.60
STA	2.0 +	540.000	109.41	107.75	20.0	2,155.00
STA	2.0 +	560.000	100.18	104.80	20.0	2,096.00
STA	2.0 +	580.000	89.17	94.68	20.0	1,893.60
STA	2.0 +	600.000	76.28	82.73	20.0	1,654.60
STA	2.0 +	620.000	72.63	74.46	20.0	1,489.20
STA	2.0 +	627.420	72.21	72.42	7.4	537.40
STA	2.0 +	640.000	79.19	75.70	12.6	952.30
STA	2.0 +	660.000	80.94	80.07	20.0	1,601.40
STA	2.0 +	680.000	11.70	46.32	20.0	926.40
STA	2.0 +	680.992	11.70	11.70	1.0	11.60
STA	2.0 +	700.000	11.21	11.46	19.0	217.80
STA	2.0 +	720.000	2.84	7.03	20.0	140.60
STA	2.0 +	724.080	2.84	2.84	4.1	11.60
STA	2.0 +	740.000	2.68	2.76	15.9	43.90
STA	2.0 +	760.000	2.84	2.76	20.0	55.20
STA	2.0 +	777.651	0.48	1.66	17.7	29.30
STA	2.0 +	780.000	0.91	0.70	2.3	1.60
STA	2.0 +	782.486	1.48	1.20	2.5	3.00
合計						24,885.30

Back Fill of Abutmentt

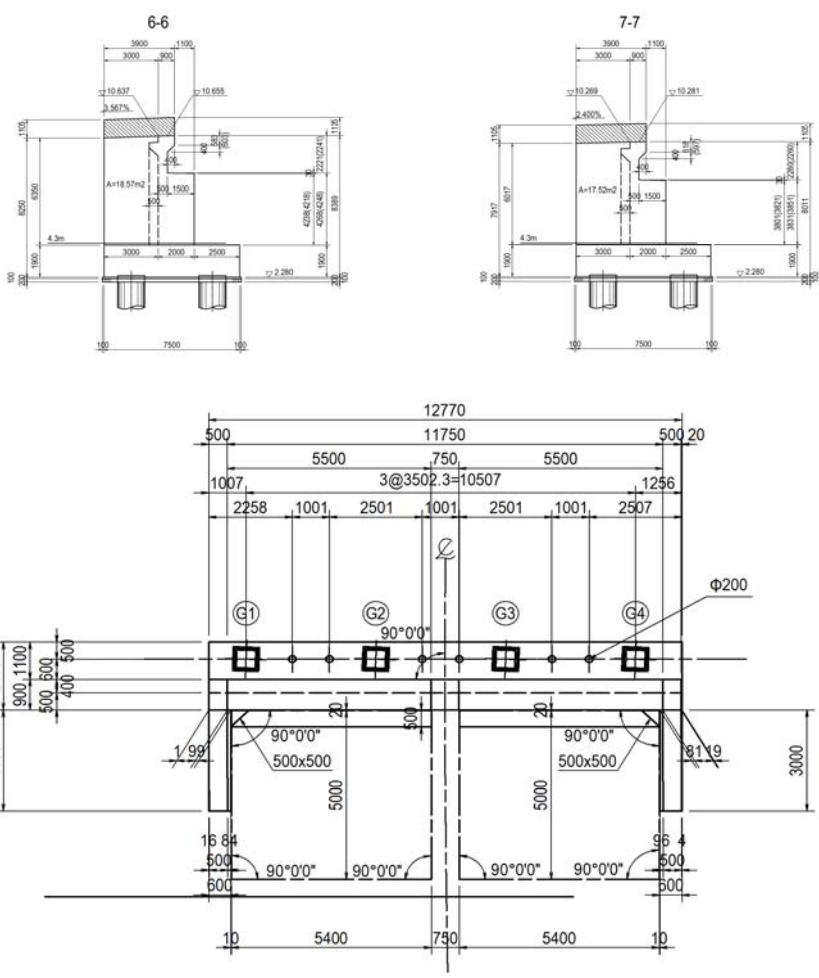
1) A2

$$\begin{aligned}
 & (17.28 + 17.23) / 2 * 9.75 * 2 = 336.47 \text{ m}^3 \\
 & 0.50 * 0.5 / 2 * 2 * 4.16 = 1.04 \text{ m}^3 \quad \text{Corner} \\
 & (0.3 + 0.8) / 2 * 0.5 * 1.5 = 0.41 \text{ m}^3 \quad \text{Chair} \\
 & 0.35 * 18.0 * 5.0 = 31.50 \text{ m}^3 \quad \text{Plate} \\
 & 336.47 - 1.04 + 0.41 - 31.5 = 304.34 \text{ m}^3
 \end{aligned}$$



2) AO1 (Over Bridge)

(18.57 + 17.52) / 2 * 5.78 * 2 =	208.42 m3	
0.50 * 0.5 / 2 * 2 * 4.16 =	1.04 m3	Corner
(0.3 + 0.8) / 2 * 0.5 * 0.75 =	0.21 m3	Chair
0.35 * 18.0 * 5.0 =	31.50 m3	Plate
208.42 - 1.04 + 0.21 - 31.5 =	176.09 m3	



SHUKHINTHAR INTERSECTION

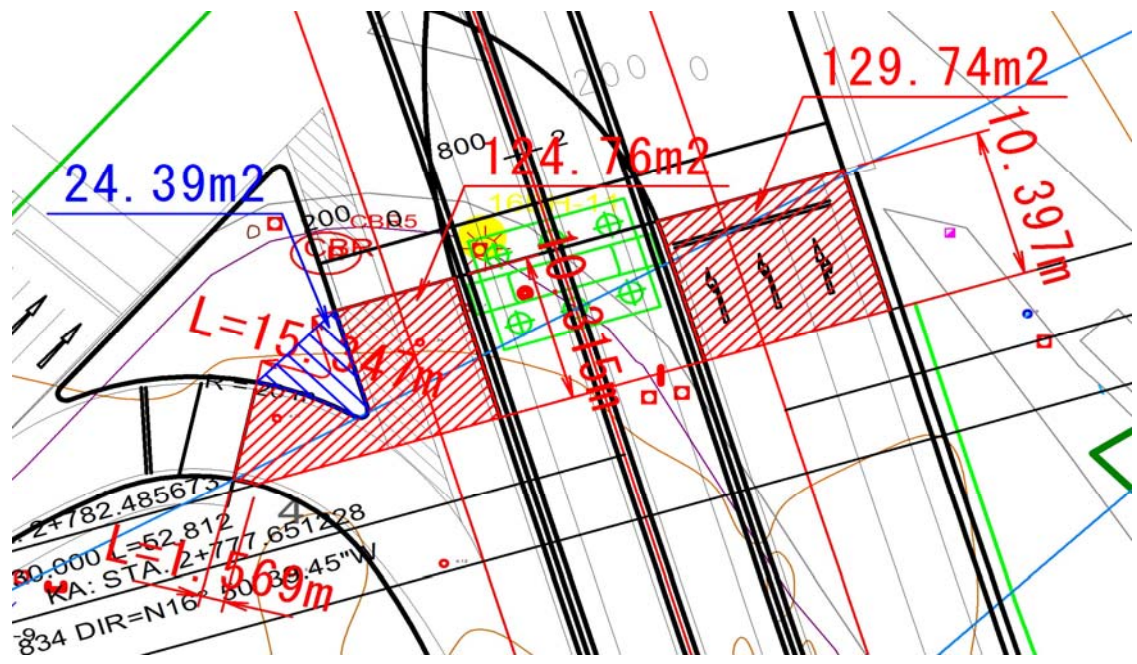
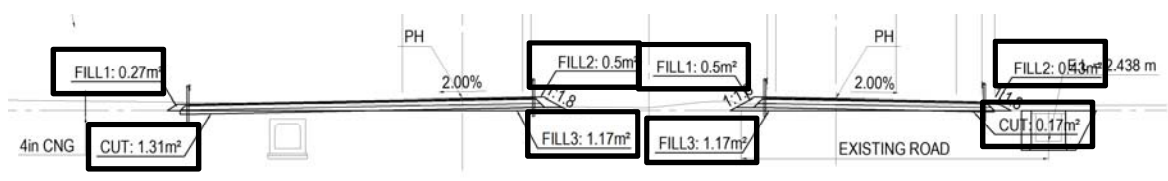
Cut

0.17 *	10.40	=	1.77
0.13 *	1.57	=	0.20
		<hr/>	1.97 >=4m

Fill

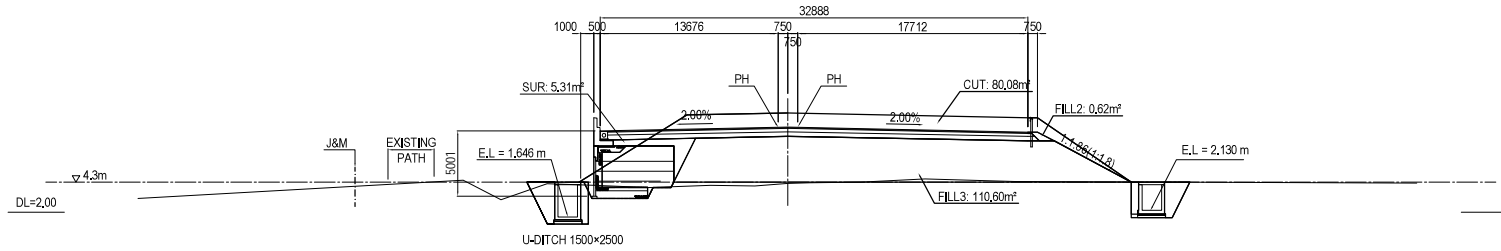
1.17 *	10.40	=	12.16
1.17 *	10.32	=	12.07
24.39 *	0.25	=	6.10
		<hr/>	30.33 >=4m

(0.50 +	0.43)*	10.4	=	9.67
0.50 *	10.32		=	5.16
0.27 *	1.57		=	0.42
			<hr/>	15.25 <4m

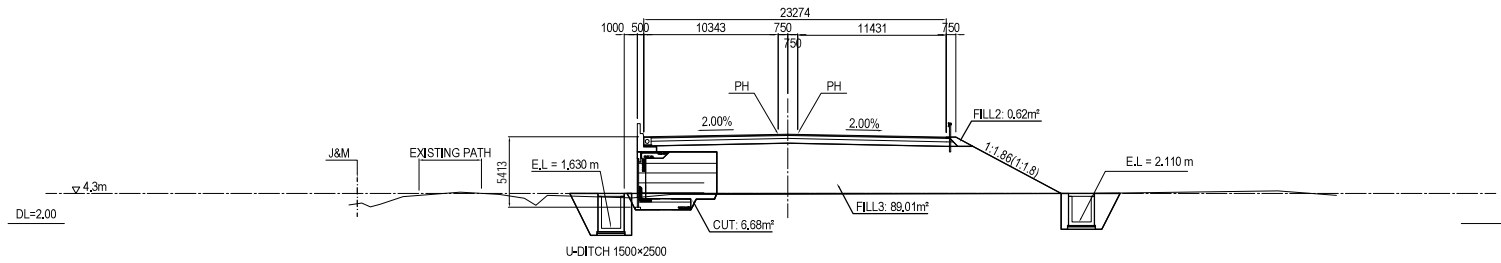


CROSS SECTION(1) S=1:400

STA.2+420
GH=4.20
PH=8.525



STA.2+400
GH=4.25
PH=8.870

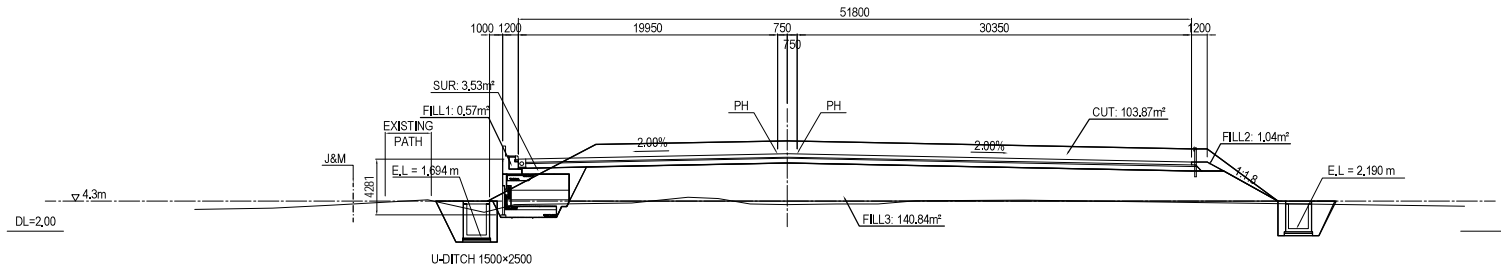


Note: Elevation is based on MSL(Mean Sea Level)

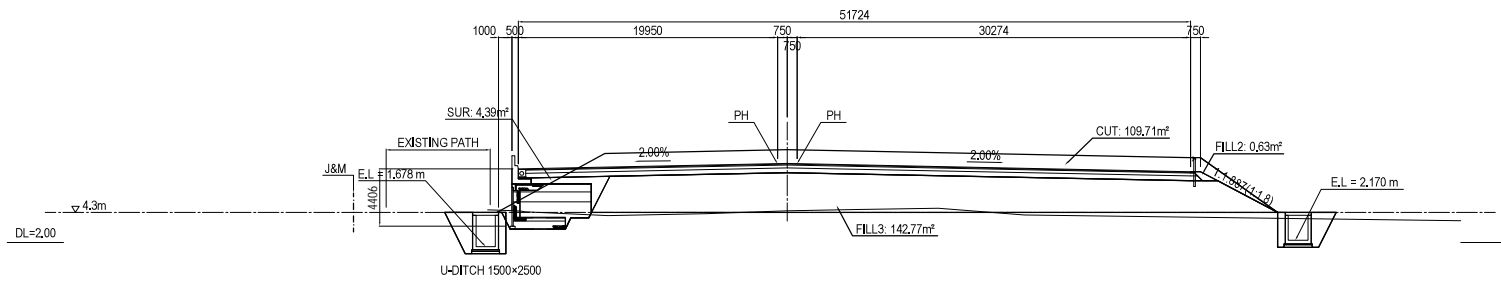
PROJECT NAME	FINANCER	COUNTRY	CONSULTANT	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO. LTD	PREPARED BY CHECKED BY APPROVED BY	E.YOKOTA T. HAYAKAWA Y. SANO		CROSS SECTION(3)	2 DWG No. P2-RD-001

CROSS SECTION(2) S=1:400

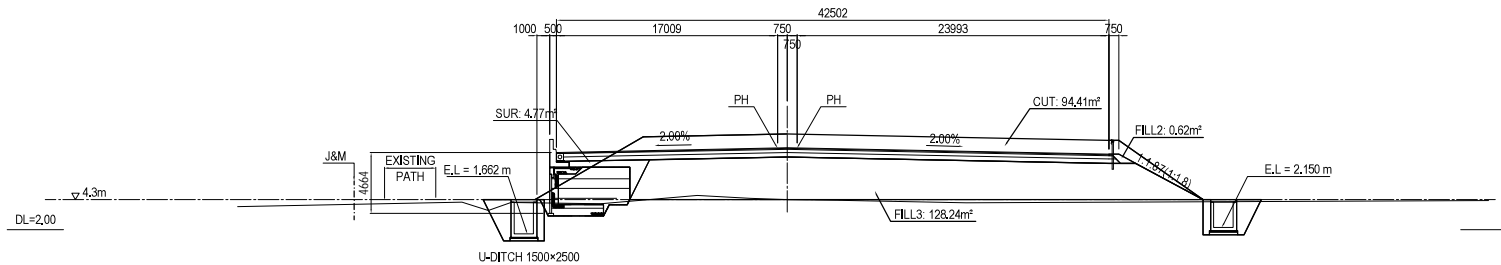
STA.2+480
GH=4.04
PH=7.930



STA.2+460
GH=4.42
PH=8.055



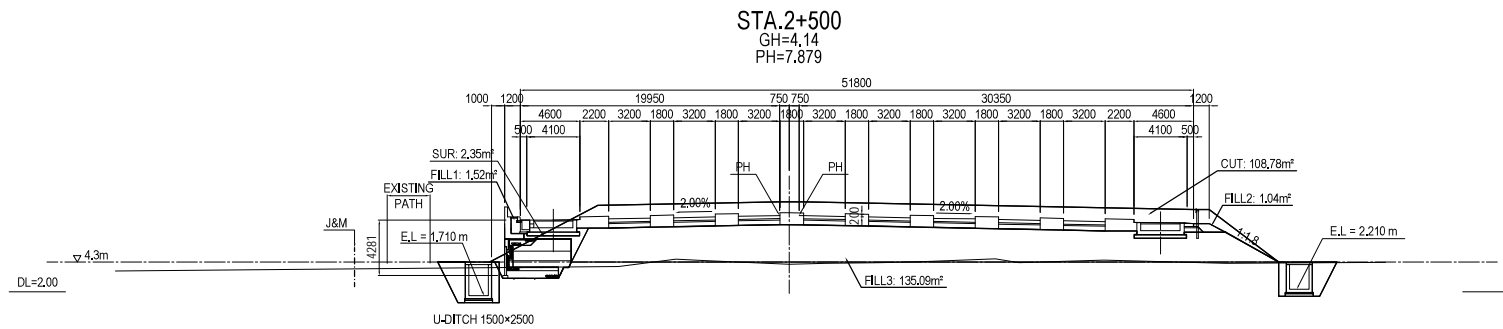
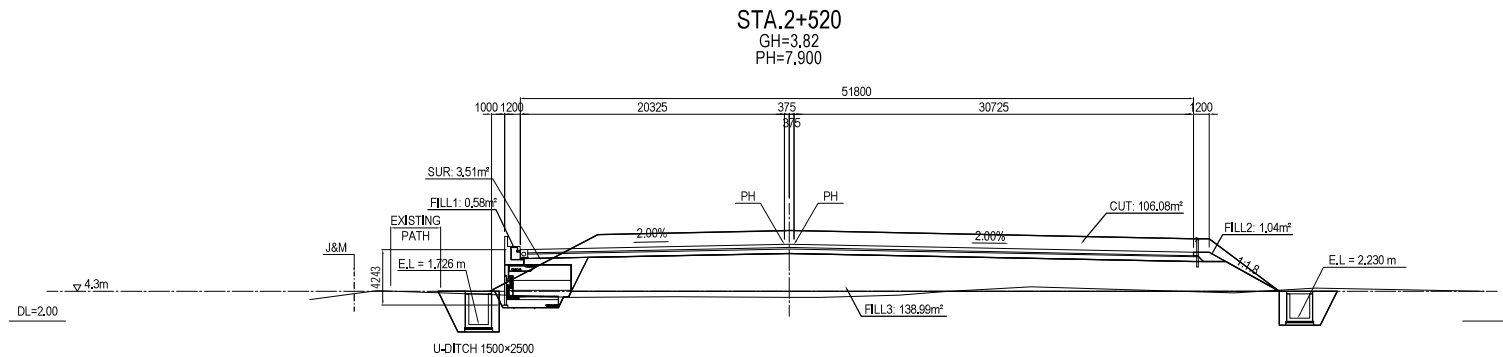
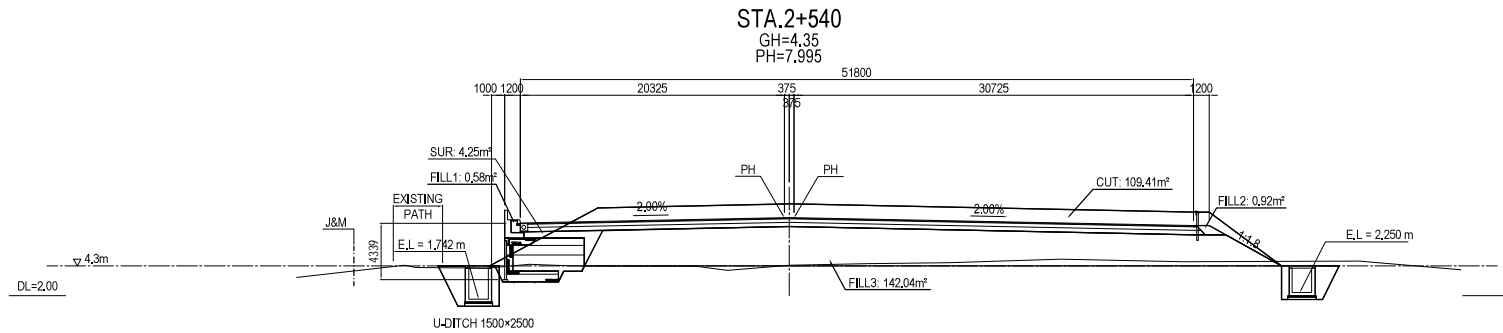
STA.2+440
GH=4.30
PH=8.254



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO. LTD	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE			
				PREPARED BY	E. YOKOTA				CROSS SECTION(4)	2	
				CHECKED BY	T. HAYAKAWA						DWG No.
				APPROVED BY	Y. SANO						P2-RD-002

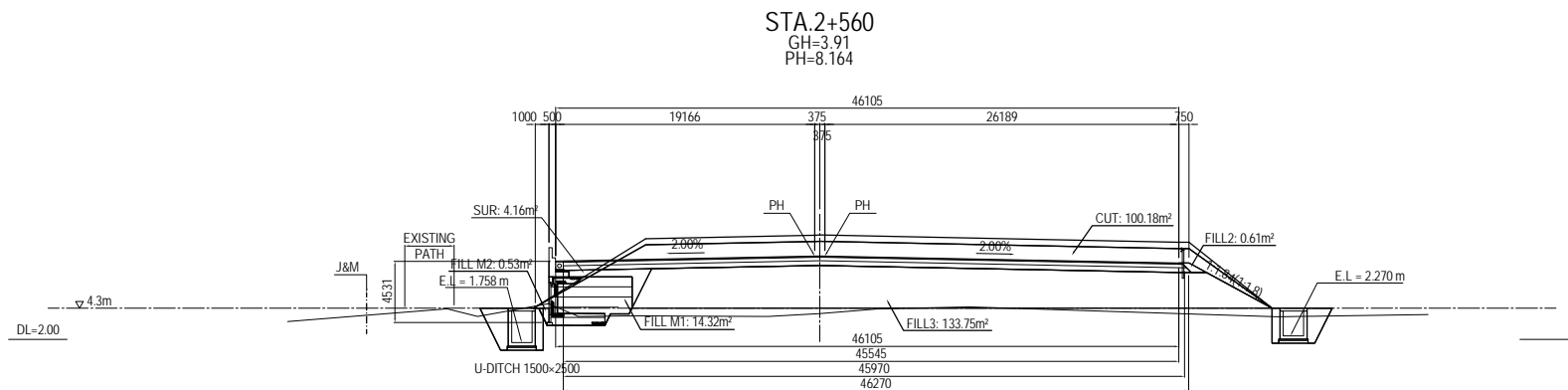
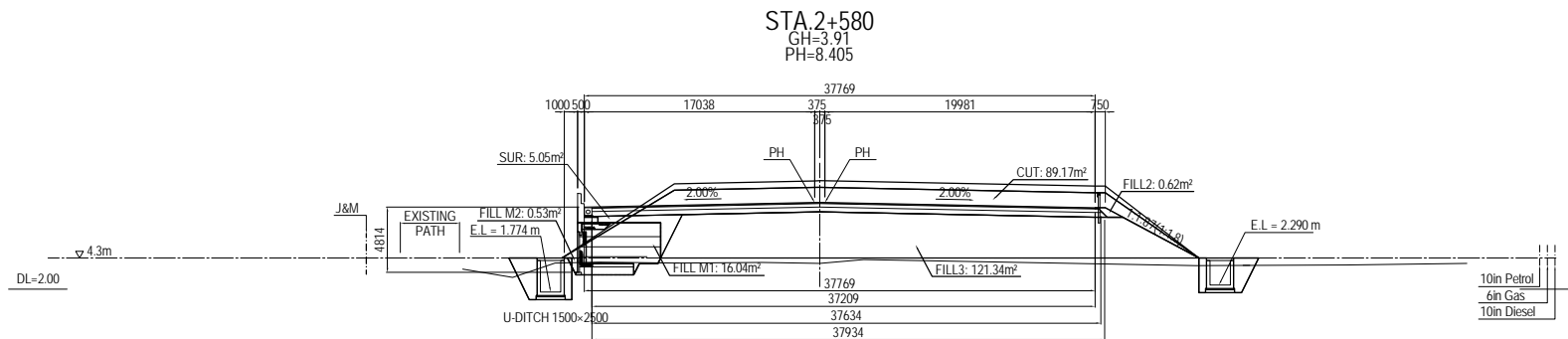
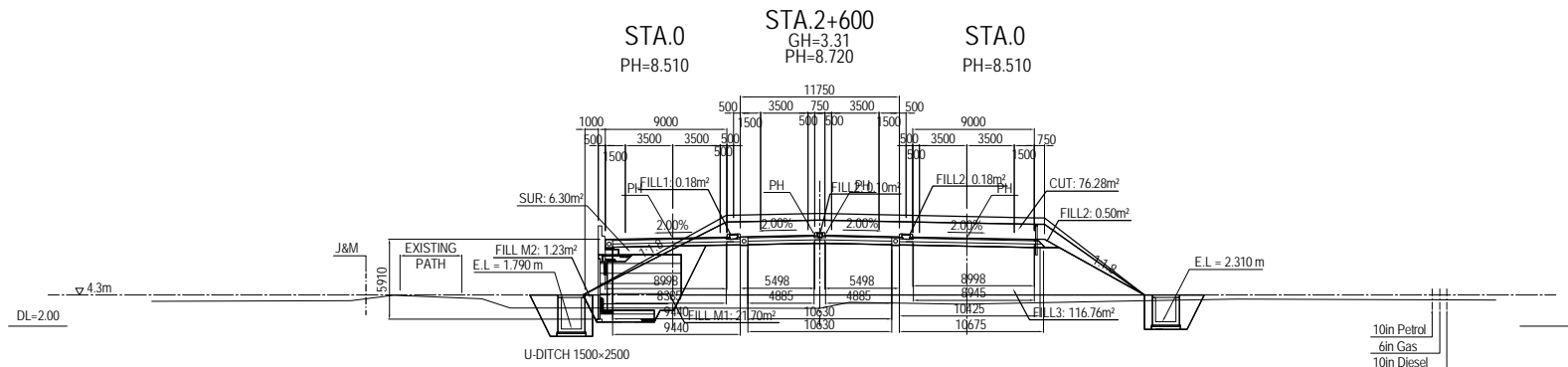
CROSS SECTION(3) S=1:400



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COOPERATION REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	E. YOKOTA			CROSS SECTION(5)	2
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P2-RD-002

CROSS SECTION(4)



PROJECT NAME
DETAILED DESIGN ON
BAGO RIVER BRIDGE
CONSTRUCTION PROJECT

FINANCED BY
JICA
JAPAN INTERNATIONAL
COOPERATION AGENCY

COUNTERPART
REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

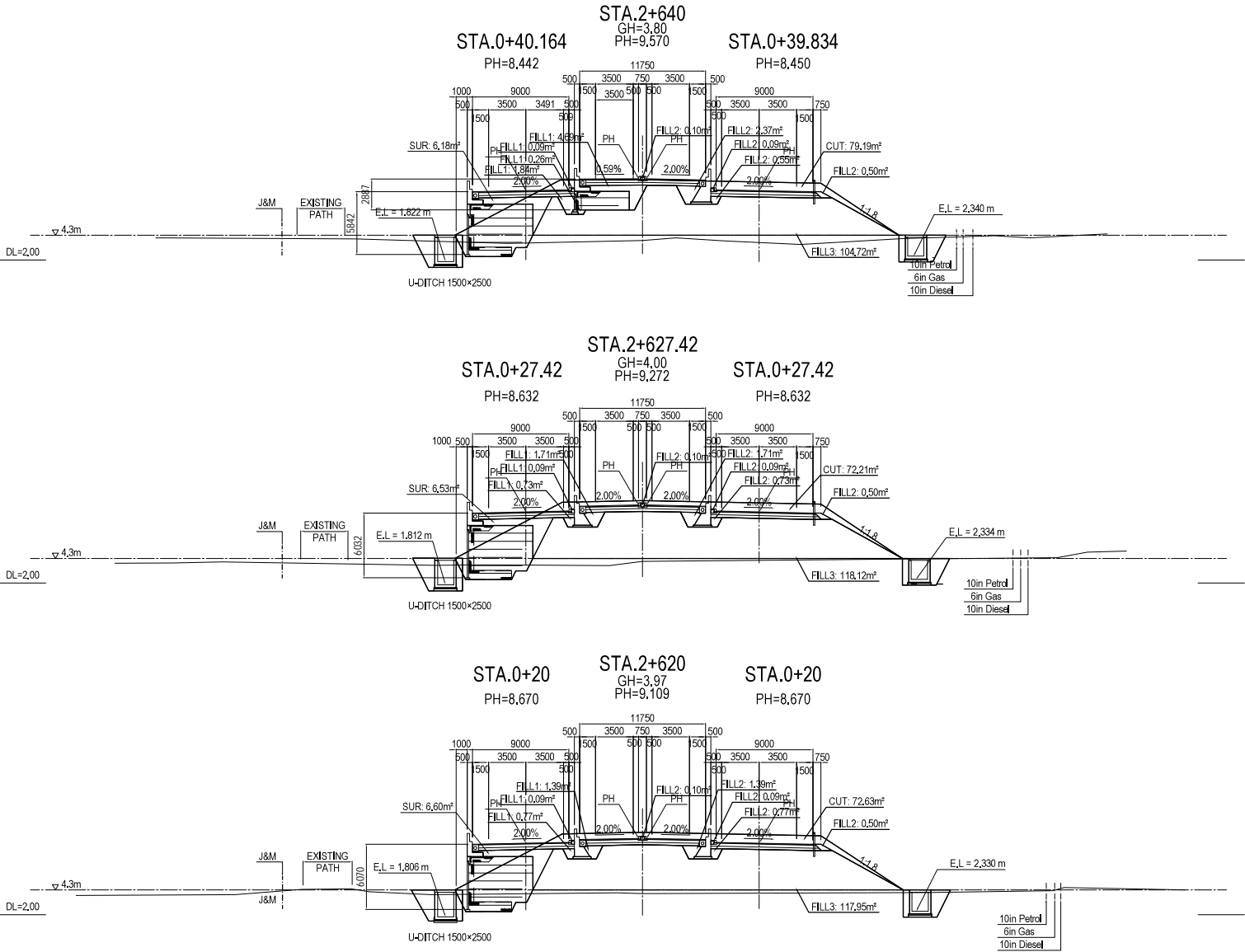
JICA STUDY TEAM
NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED
CHODAI CO., LTD.
NIPPON ENGINEERING CONSULTANTS CO., LTD.

	NAME	SIGNATURE	DATE
PREPARED BY	E. YOKOTA		
CHECKED BY	T. HAYAKAWA		
APPROVED BY	Y. SANO		

DRAWING TITLE	
CROSS SECTION(6)	

PACK/	DWG No.
2	
P2-RD-002	

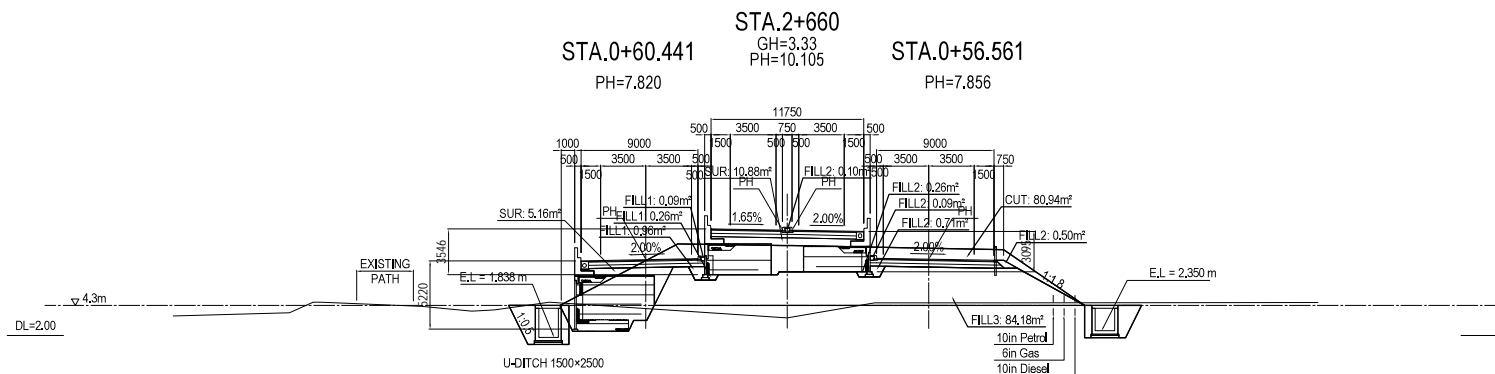
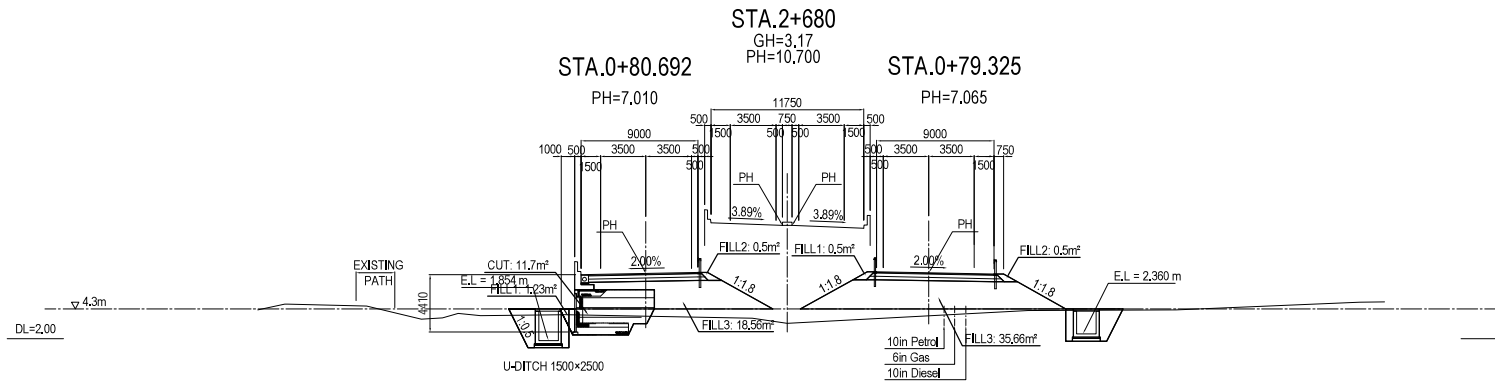
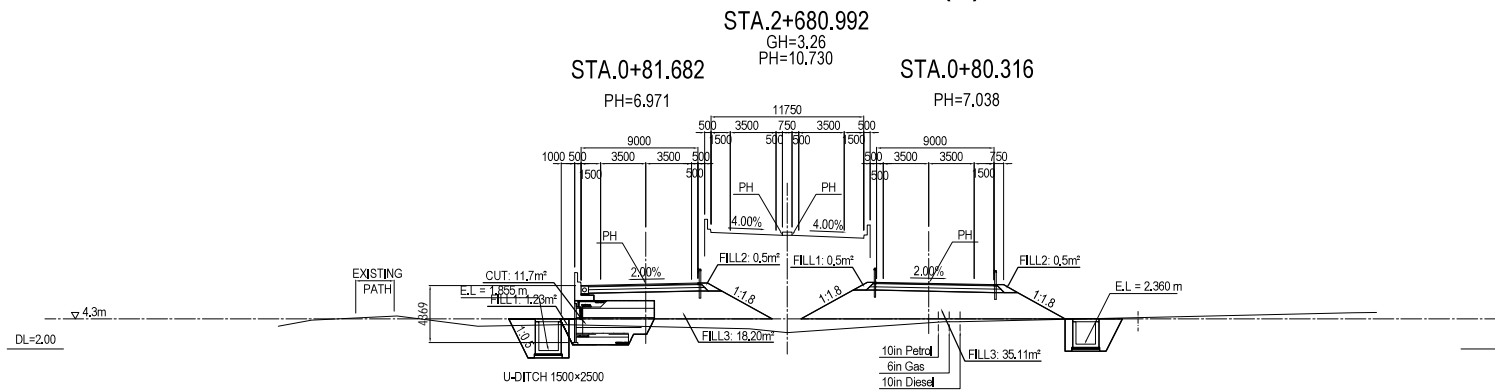
CROSS SECTION(5)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	E. YOKOTA			CROSS SECTION(7)	2
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P2-RD-002

CROSS SECTION(6)



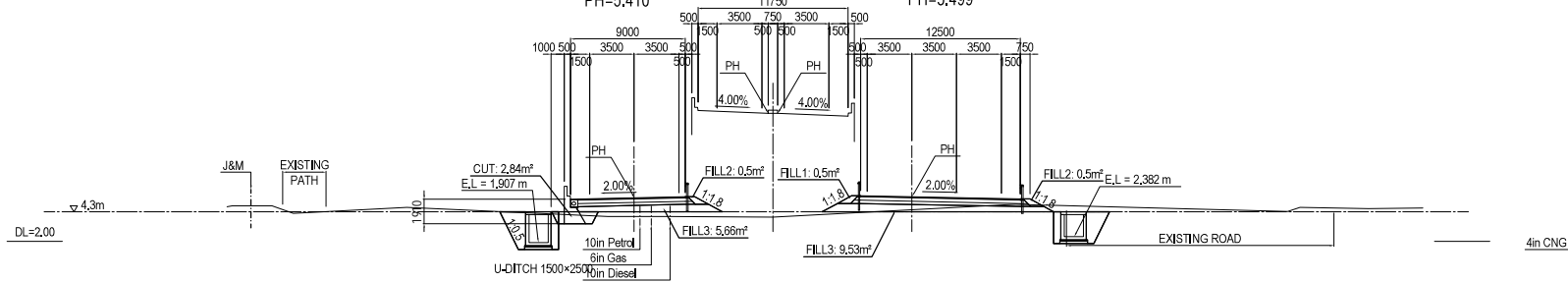
Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRIES REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JOINT STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE			
				PREPARED BY	E.YOKOTA				CROSS SECTION(8)	2	
				CHECKED BY	T. HAYAKAWA						DWG No.
				APPROVED BY	Y. SANO						P2-RD-002

CROSS SECTION(7)

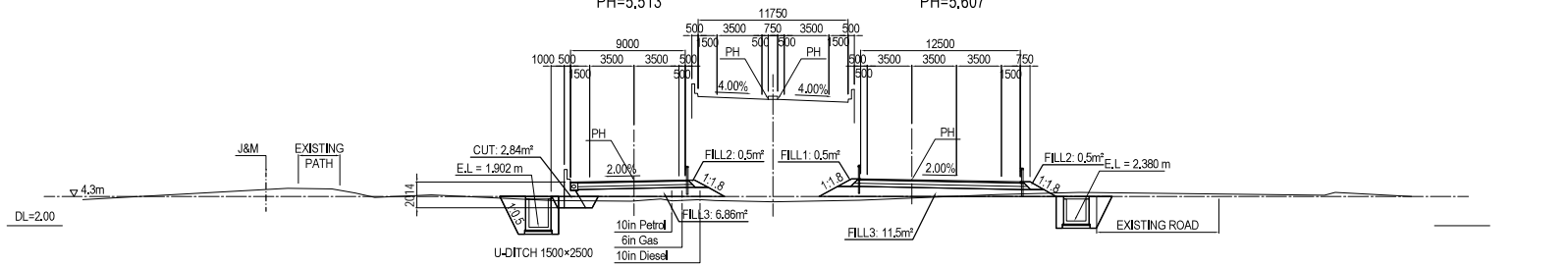
STA.2+724.08

STA.0+125.889 GH=3.90
PH=5,410 PH=12,022 STA.0+122.270 PH=5,499



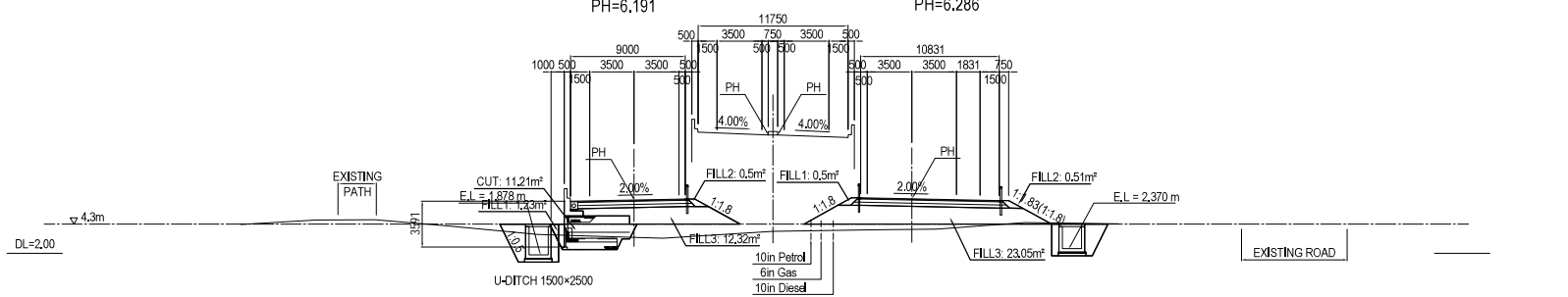
STA.2+720

STA.0+121.704 GH=3.87
PH=5,513 PH=11,900 STA.0+118.296 PH=5,607



STA.2+700

STA.0+101.186 GH=3.74
PH=6,191 PH=11,300 STA.0+98.814 PH=6,286



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME
DETAILED DESIGN ON
BAGO RIVER BRIDGE
CONSTRUCTION PROJECT

FINANCED BY
JICA
JAPAN INTERNATIONAL
COOPERATION AGENCY

COUNTERPART
REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

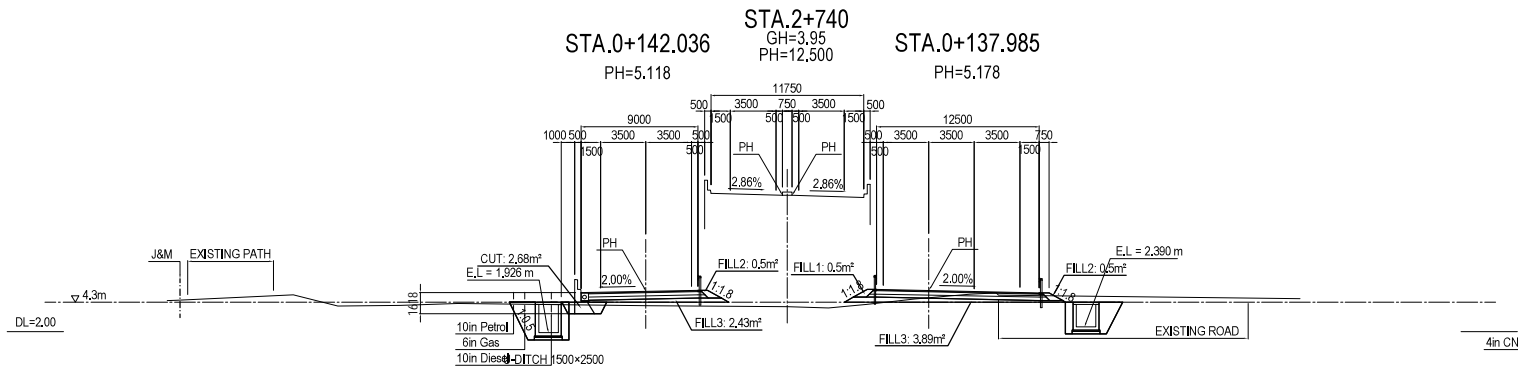
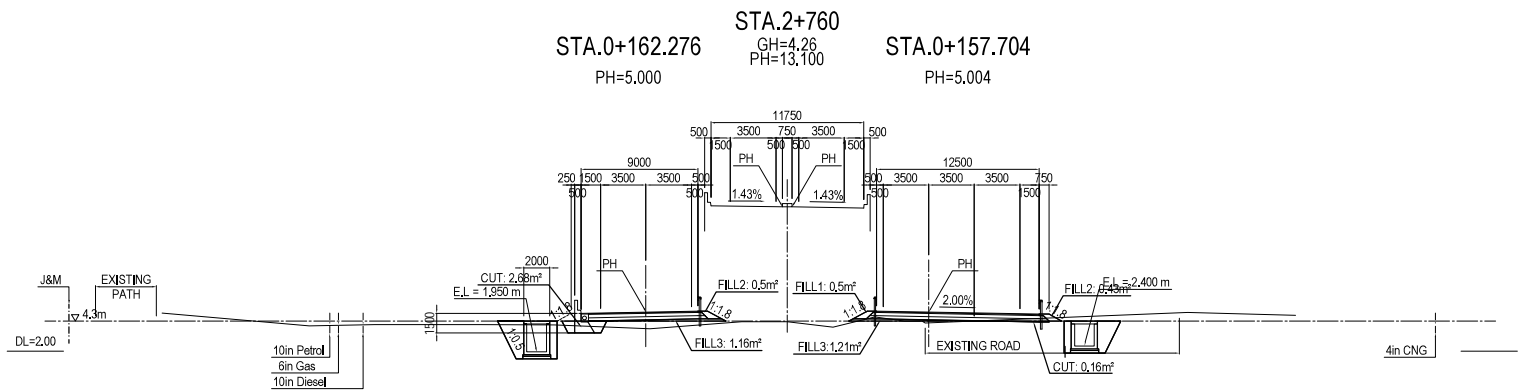
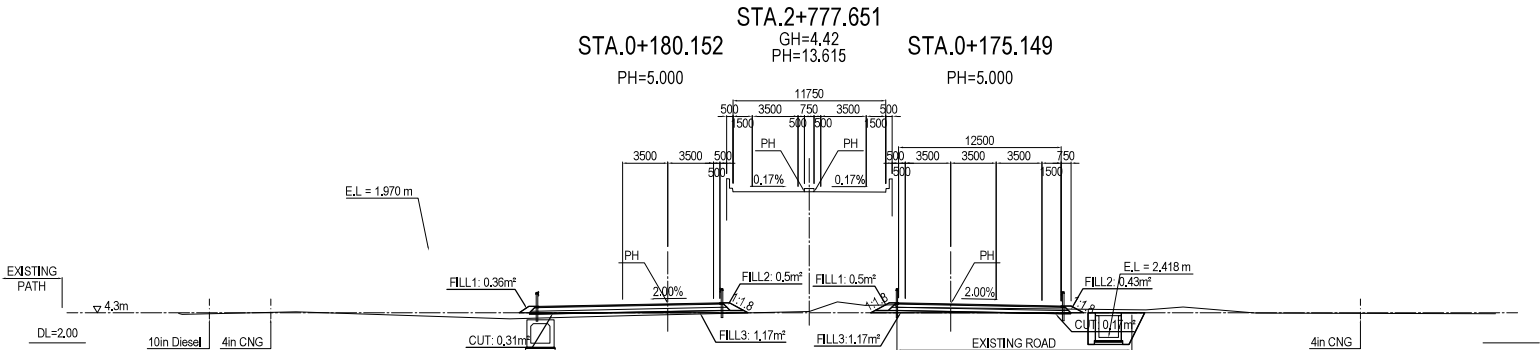
DESIGNED BY
NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED
CHODAI CO., LTD.
NIPPON ENGINEERING CONSULTANTS CO., LTD.

	NAME	SIGNATURE	DATE
PREPARED BY	E.YOKOTA		
CHECKED BY	T. HAYAKAWA		
APPROVED BY	Y. SANO		

DRAWING TITLE
CROSS SECTION(9)

PACKAGE
2
DWG No.
P2-RD-002

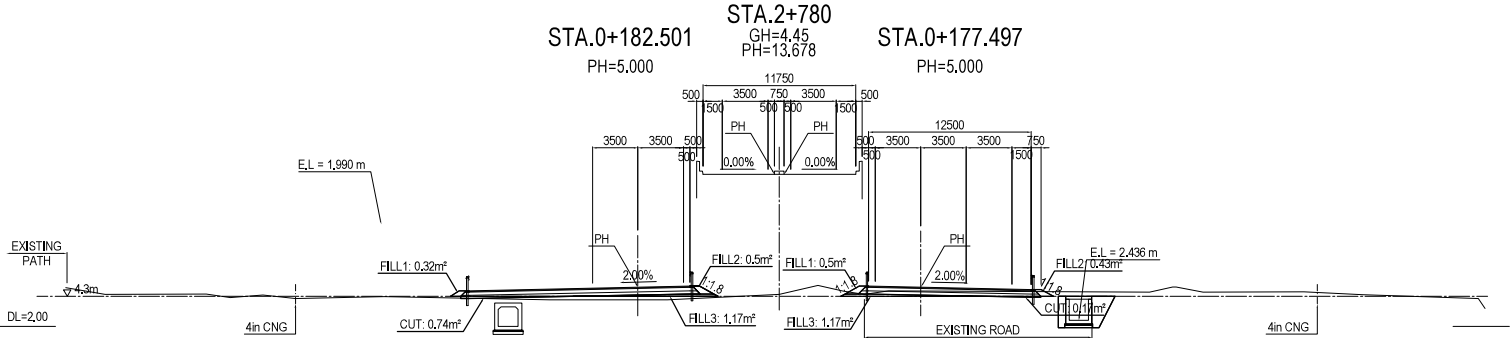
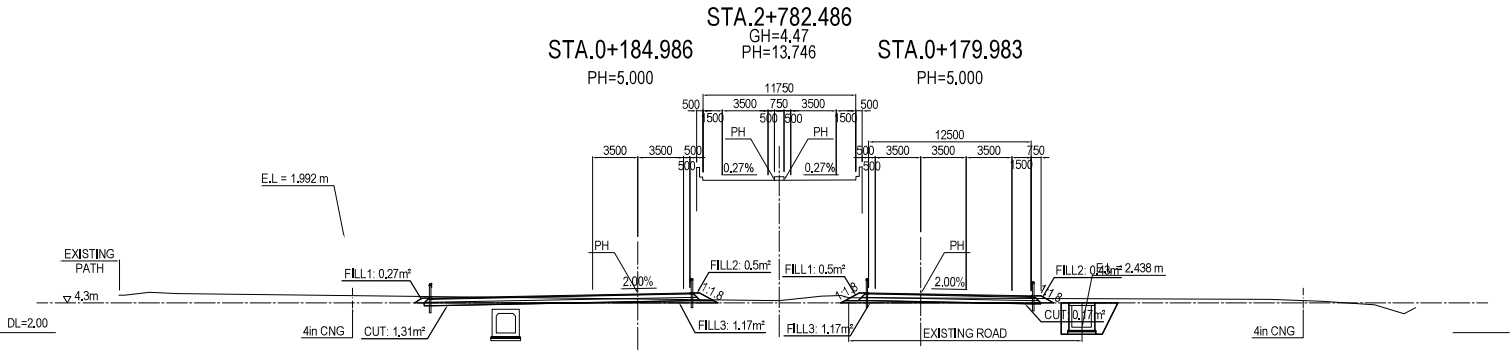
CROSS SECTION(8)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	HONORARY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE			
				PREPARED BY	E.YOKOTA				CROSS SECTION(10)	2	
				CHECKED BY	T. HAYAKAWA						DWG No.
				APPROVED BY	Y. SANO						P2-RD-002

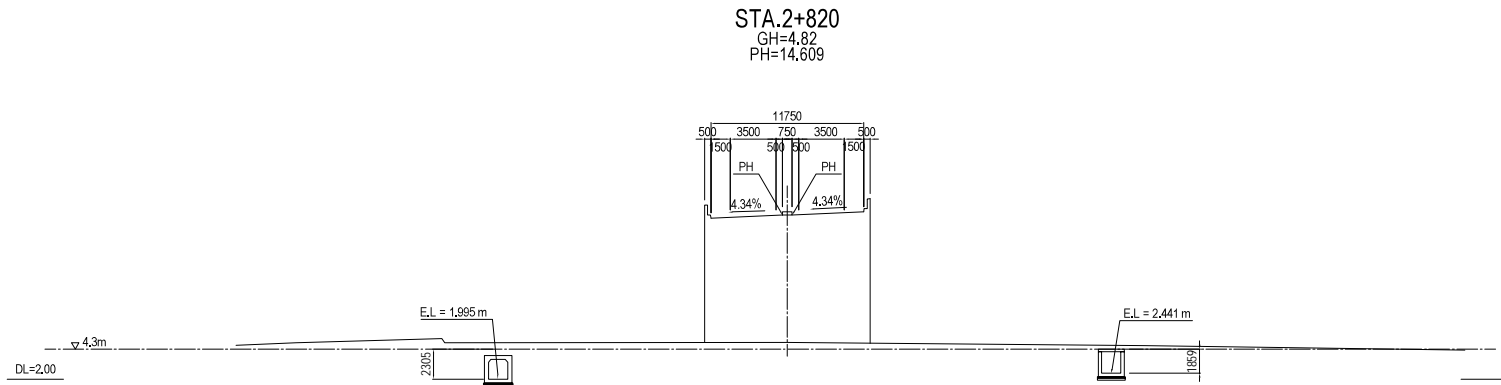
CROSS SECTION(9)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	E.YOKOTA			CROSS SECTION(11)	2
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P2-RD-002

CROSS SECTION(10)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME	FINANCED BY	COUNTERPART	CLIENT	DESIGNER	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	E.YOKOTA				CROSS SECTION(12)	2
				T. HAYAKAWA					DWG No.
				Y. SANO					P2-RD-002

2.1.2 Sodding for Main Road

Sodding was designed for the fill slope protection. Quantity unit of sodding is square meter (m²).

(a) Main Road

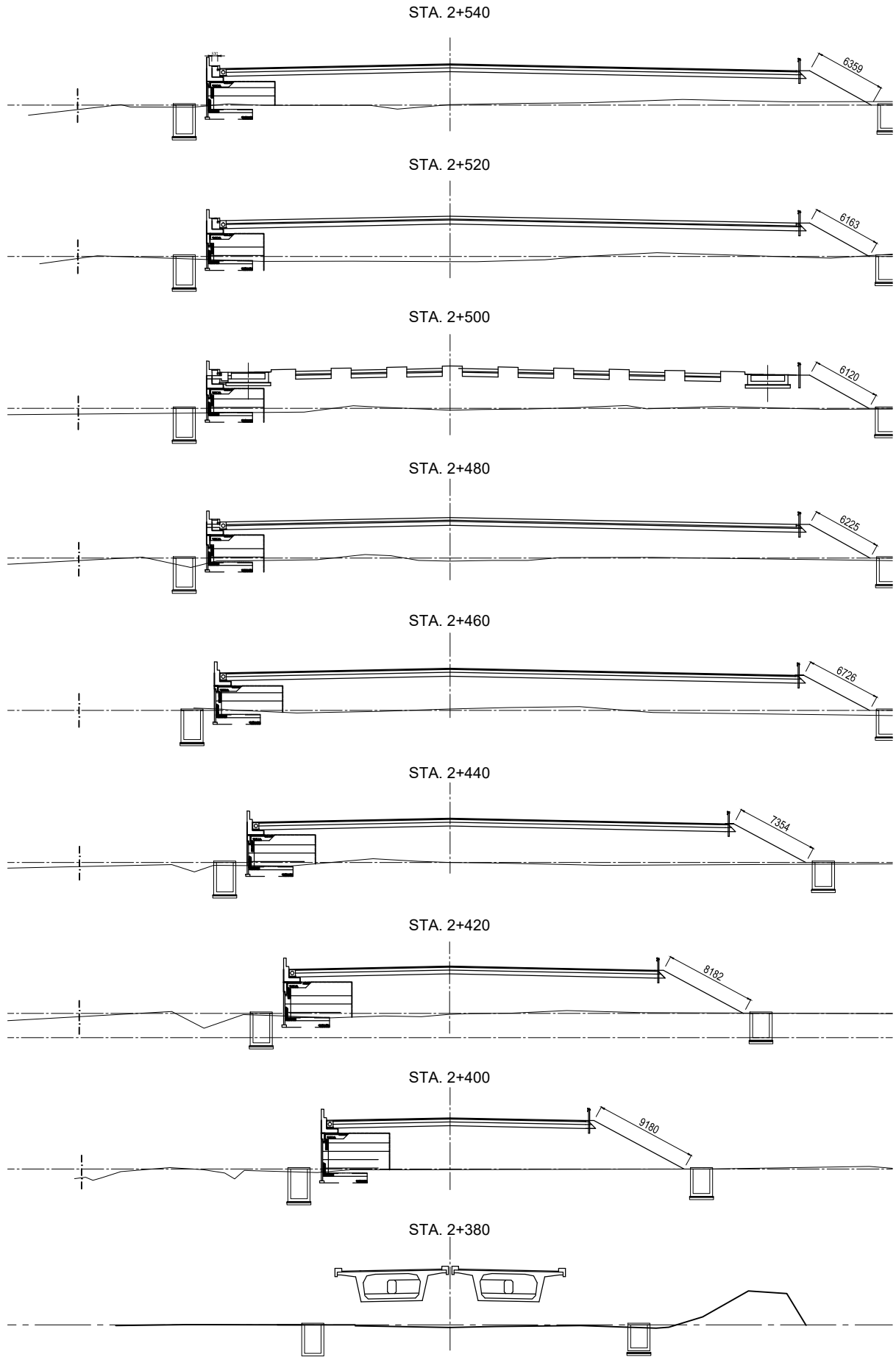
Package 2 starts from STA. 1+312 and ends at STA. 2+676. It is noted that the section from STA. 1+312 to STA. 2+388 is a bridge section. Further, the ending station, STA. 2+626, is located at the parapet face of flyover abutment which belongs to Package 3.

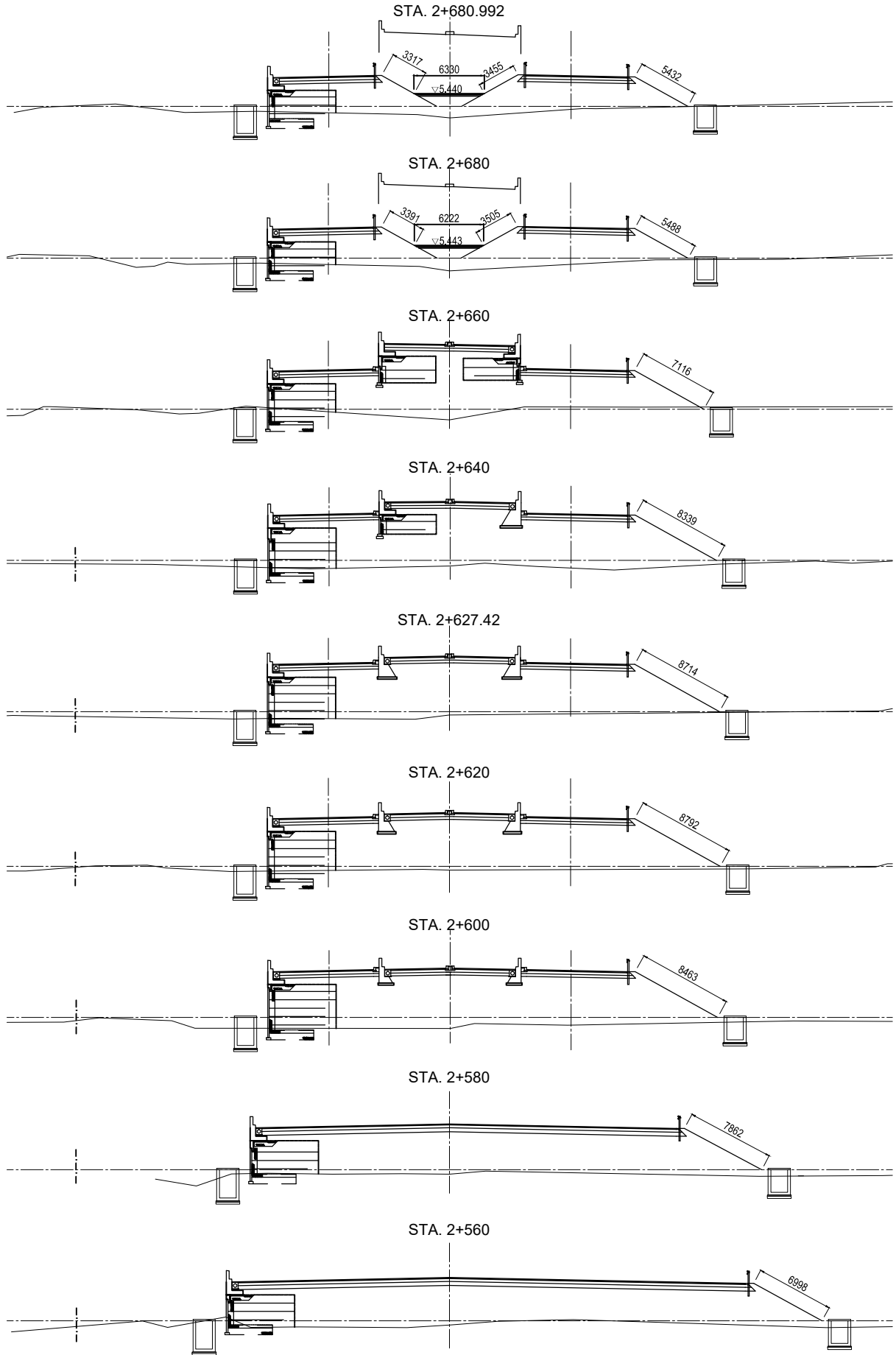
Package 2 has approach roads between Toll Plaza and Shukhinthar Mayopat Road/Thanlyin Chin Kat Road Intersection. These approach roads belong to Package 2. Sodding area was counted for main road /approach road fill slope and approach roads' inside fill slope under the flyover, up to the existing intersection.

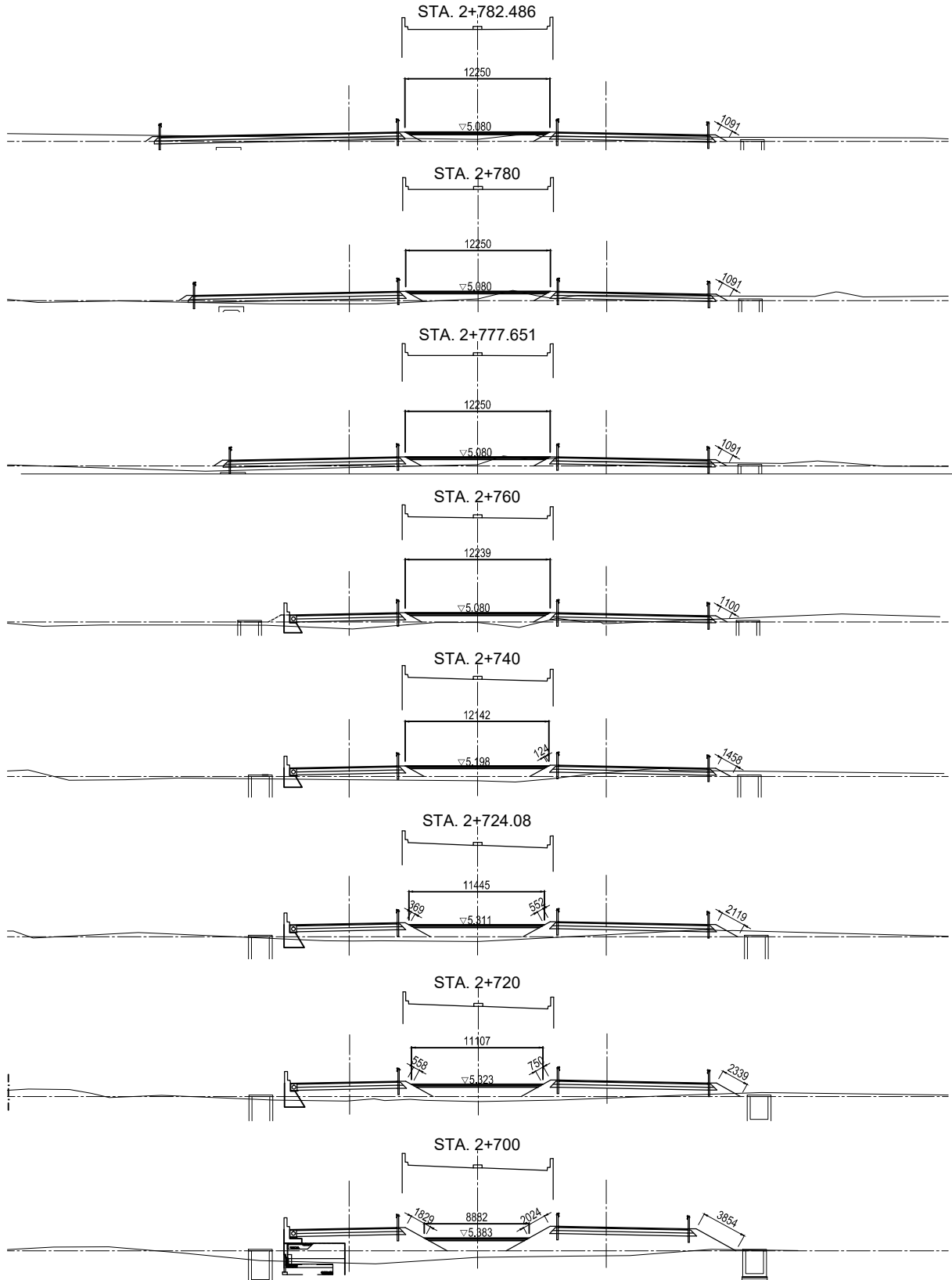
The measured fill slope length is given in the 3 (three) page cross section illustrations attached hereinafter.

Station	Distance	Main Road/Approach Road Fill Slope				Fill Slope under the Flyover			
		Left Slope		Right Slope		Left		Right	
		Length	Area	Length	Area	Length	Area	Length	Area
2+400.000	-			9.180	-				
2+420.000	20.000			8.182	173.620				
2+440.000	20.000			7.354	155.360				
2+460.000	20.000			6.726	140.800				
2+480.000	20.000			6.225	129.510				
2+500.000	20.000			6.120	123.450				
2+520.000	20.000			6.163	122.830				
2+540.000	20.000			6.359	125.220				
2+560.000	20.000			6.998	133.570				
2+580.000	20.000			7.862	148.600				
2+600.000	20.000			8.463	163.250				
2+620.000	20.000			8.792	172.550				
2+627.420	7.420			8.714	64.951				
2+640.000	12.580			8.339	107.260				
2+660.000	20.000			7.116	154.550	0.000	-	0.000	-
2+680.000	20.000			5.488	126.040	3.391	33.910	3.505	35.050
2+680.992	0.992			5.432	5.415	3.317	3.327	3.455	3.451
2+700.000	19.008			3.854	88.255	1.829	48.908	2.024	52.073
2+720.000	20.000			2.339	61.930	0.558	23.870	0.750	27.740
2+724.080	4.080			2.119	9.094	0.369	1.891	0.552	2.656
2+740.000	15.920			1.458	28.473	0.000	2.937	0.124	5.381
2+760.000	20.000			1.100	25.580			0.000	1.240
2+777.651	17.651			1.091	19.337				
2+780.000	2.349			1.091	2.563				
2+782.486	2.486			1.091	2.712				
		Subtotal	0.000	Subtotal	2284.919	Subtotal	114.843	Subtotal	127.591

Total = 2527.354 m²







BILL OF QUANTITIES

PAVEMENT

PACKAGE 2

Pavement Thanlyin Main Road

$$\text{Surface Course } t = 5\text{cm} \quad A = 9,485.19 + 254.50 = 9,739.69 \text{ cm}^2$$

$$\text{Surface Base } t = 5\text{cm} \quad A = 9,244.27 + 254.50 = 9,498.77 \text{ cm}^2$$

$$\text{Upper Subbase } t = 25\text{cm} \quad A = 9,017.05 + 274.91 = 9,291.96 \text{ cm}^2$$

$$\text{Lower Subbase } t = 35\text{cm} \quad A = 13,905.35 + 289.32 = 14,194.67 \text{ cm}^2$$

Under Concrete Pavement

$$\text{Upper Subbase } t = 10\text{cm} \quad A = 4,111.70 \text{ cm}^2$$

Surface

STA2+392.5~STA2+600

t=5cm

			Width	Ave.	Distance	Area
STA	2.0 +	388.800	19.500			
STA	2.0 +	392.500	19.500	19.500	3.70	72.100
STA	2.0 +	400.000	23.274	21.390	7.50	160.400
STA	2.0 +	420.000	32.888	28.080	20.00	561.600
STA	2.0 +	440.000	42.502	37.700	20.00	754.000
STA	2.0 +	460.000	51.724	47.110	20.00	942.200
STA	2.0 +	462.500	51.800	51.760	2.50	129.400
STA	2.0 +	542.200	51.800			
STA	2.0 +	560.000	46.105	48.950	17.80	871.300
STA	2.0 +	580.000	37.769	41.940	20.00	838.800
STA	2.0 +	600.000	31.750	34.760	20.00	695.200
Total						5,025.000

STA2+600~STA2+782.486

t=5cm

Left			Width	Ave.	Distance	Area
STA	0.0 +	0.000	8.998			
STA	0.0 +	20.000	8.998	8.998	20.00	179.960
STA	0.0 +	27.420	8.998	8.998	7.42	66.765
STA	0.0 +	40.164	8.998	8.998	12.74	114.671
STA	0.0 +	60.441	8.998	8.998	20.28	182.452
STA	0.0 +	80.692	9.000	8.999	20.25	182.239
STA	0.0 +	81.682	9.000	9.000	0.99	8.910
STA	0.0 +	101.186	9.000	9.000	19.50	175.536
STA	0.0 +	121.704	9.000	9.000	20.52	184.662
STA	0.0 +	125.889	9.000	9.000	4.19	37.665
STA	0.0 +	142.036	9.000	9.000	16.15	145.323
STA	0.0 +	162.276	9.000	9.000	20.24	182.160
STA	0.0 +	180.152	13.943	11.472	17.88	205.073
STA	0.0 +	182.501	17.002	15.473	2.35	36.346
STA	0.0 +	184.986	19.851	18.427	2.48	45.791
Total						1,747.553

STA 2+600.000

t=5cm

Right			Width	Ave.	Distance	Area
STA	0.0 +	0.000	8.998			
STA	0.0 +	20.000	8.998	8.998	20.00	179.960
STA	0.0 +	27.420	8.998	8.998	7.42	66.765
STA	0.0 +	39.834	8.998	8.998	12.41	111.701
STA	0.0 +	56.561	8.998	8.998	16.73	150.510
STA	0.0 +	79.325	9.000	8.999	22.76	204.853
STA	0.0 +	80.316	9.000	9.000	0.99	8.919
STA	0.0 +	98.814	10.831	9.916	18.50	183.426
STA	0.0 +	118.296	12.500	11.666	19.48	227.277
STA	0.0 +	122.270	12.500	12.500	3.97	49.675
STA	0.0 +	137.985	12.500	12.500	15.72	196.438
STA	0.0 +	157.704	12.500	12.500	19.72	246.488
STA	0.0 +	175.149	12.500	12.500	17.45	218.063
STA	0.0 +	177.497	12.500	12.500	2.35	29.350
STA	0.0 +	179.983	12.500	12.500	2.49	31.075
Total						1,904.500

STA 2+600.000

					t=5cm			
Center			Width	Ave.	Distance	Area		
STA	2.0	+	600.000	10.996				
STA	2.0	+	620.000	10.996	10.996	20.00	219.920	
STA	2.0	+	627.420	10.996	10.996	7.42	81.590	
STA	2.0	+	640.000	10.996	10.996	12.58	138.330	
STA	2.0	+	660.000	10.996	10.996	20.00	219.920	
STA	2.0	+	672.500	9.000	9.998	12.50	124.975	
合計	2.0	+	675.100	9.000	9.000	2.60	23.400	
Total							808.135	

Total= 9,485.19 m2

Surface Base

STA2+392.5~STA2+600

t=5cm

			Width	Ave.	Distance	Area
STA	2.0 +	388.800	19.500			
STA	2.0 +	392.500	19.500	19.500	3.70	72.100
STA	2.0 +	400.000	22.714	21.110	7.5	158.300
STA	2.0 +	420.000	32.328	27.520	20.0	550.400
STA	2.0 +	440.000	41.887	37.110	20.0	742.200
STA	2.0 +	460.000	51.109	46.500	20.0	930.000
STA	2.0 +	462.500	51.240	51.170	2.5	127.900
STA	2.0 +	542.200	51.240			
STA	2.0 +	560.000	45.545	48.390	17.8	861.300
STA	2.0 +	580.000	37.209	41.380	20.0	827.600
STA	2.0 +	600.000	31.750	34.480	20.0	689.600
Total						4,959.400

STA2+600~STA2+782.486

t=5cm

Left			Width	Ave.	Distance	Area
STA	0.0 +	0.000	8.385			
STA	0.0 +	20.000	8.385	8.385	20.00	167.700
STA	0.0 +	27.420	8.385	8.385	7.42	62.217
STA	0.0 +	40.164	8.385	8.385	12.74	106.858
STA	0.0 +	60.441	8.385	8.385	20.28	170.023
STA	0.0 +	80.692	8.440	8.413	20.25	170.372
STA	0.0 +	81.682	8.440	8.440	0.99	8.356
STA	0.0 +	101.186	8.440	8.440	19.50	164.614
STA	0.0 +	121.704	8.440	8.440	20.52	173.172
STA	0.0 +	125.889	8.440	8.440	4.19	35.321
STA	0.0 +	142.036	8.440	8.440	16.15	136.281
STA	0.0 +	162.276	8.440	8.440	20.24	170.826
STA	0.0 +	180.152	13.943	11.192	17.88	200.068
STA	0.0 +	182.501	17.002	15.473	2.35	36.346
STA	0.0 +	184.986	19.851	18.427	2.48	45.791
Total						1,647.945

STA2+600~STA2+782.486

t=5cm

Right			Width	Ave.	Distance	Area
STA	0.0 +	0.000	8.945			
STA	0.0 +	20.000	8.945	8.945	20.00	178.900
STA	0.0 +	27.420	8.945	8.945	7.42	66.372
STA	0.0 +	39.834	8.945	8.945	12.41	111.043
STA	0.0 +	56.561	8.945	8.945	16.73	149.623
STA	0.0 +	79.325	9.000	8.973	22.76	204.261
STA	0.0 +	80.316	9.000	9.000	0.99	8.919
STA	0.0 +	98.814	10.831	9.916	18.50	183.426
STA	0.0 +	118.296	12.500	11.666	19.48	227.277
STA	0.0 +	122.270	12.500	12.500	3.97	49.675
STA	0.0 +	137.985	12.500	12.500	15.72	196.438
STA	0.0 +	157.704	12.500	12.500	19.72	246.488
STA	0.0 +	175.149	12.500	12.500	17.45	218.063
STA	0.0 +	177.497	12.500	12.500	2.35	29.350
STA	0.0 +	179.983	12.500	12.500	2.49	31.075
Total						1,900.910

				t=5cm			
Center				Width	Ave.	Distance	Area
STA	2.0	+	600.000	9.770			
STA	2.0	+	620.000	9.770	9.770	20.00	195.400
STA	2.0	+	627.420	9.770	9.770	7.42	72.493
STA	2.0	+	640.000	9.770	9.770	12.58	122.907
STA	2.0	+	660.000	10.330	10.050	20.00	201.000
STA	2.0	+	672.500	9.000	9.665	12.50	120.813
STA	2.0	+	675.100	9.000	9.000	2.60	23.400
Total							736.013

Total= 9,244.27 m2

Upper Subbase

STA2+392.5~STA2+600

t=25cm

			Width	Ave.	Distance	Area
STA	2.0 +	392.500				
STA	2.0 +	392.500	19.500	19.500	0.00	0.00
STA	2.0 +	400.000	23.139	21.320	7.5	159.90
STA	2.0 +	420.000	32.753	27.950	20.0	559.00
STA	2.0 +	440.000	42.367	37.560	20.0	751.20
STA	(2 +	460.000)	51.589	0.000	0.0	0.00
STA	2.0 +	457.500	51.665	47.020	17.5	822.90
STA	2.0 +	547.200	51.665			
STA	2.0 +	560.000	45.970	48.820	12.8	624.90
STA	2.0 +	580.000	37.634	41.800	20.0	836.00
STA	2.0 +	600.000	31.615	34.620	20.0	692.40
Total						4,446.30

Edge of Footinh

STA2+600~STA2+782.486

t=25cm

Right			Width	Ave.	Distance	Area
STA	0.0 +	0.000	9.440			
STA	0.0 +	20.000	9.925	9.683	20.00	193.66
STA	0.0 +	27.420	9.925	9.925	7.42	73.64
STA	0.0 +	39.834	9.925	9.925	12.41	123.21
STA	0.0 +	56.561	9.925	9.925	16.73	166.02
STA	0.0 +	79.325	9.850	9.888	22.76	225.09
STA	0.0 +	80.316	9.850	9.850	0.99	9.76
STA	0.0 +	98.814	11.681	10.766	18.50	199.15
STA	0.0 +	118.296	13.350	12.516	19.48	243.84
STA	0.0 +	122.270	13.350	13.350	3.97	53.05
STA	0.0 +	137.985	13.350	13.350	15.72	209.80
STA	0.0 +	157.704	13.350	13.350	19.72	263.25
STA	0.0 +	175.149	13.350	13.350	17.45	232.89
STA	0.0 +	177.497	13.350	13.350	2.35	31.35
STA	0.0 +	179.983	13.350	13.350	2.49	33.19
Total						2,057.89

t=25cm

Left			Width	Ave.	Distance	Area
STA	0.0 +	0.000	10.425			
STA	0.0 +	20.000	8.940	9.683	20.00	193.66
STA	0.0 +	27.420	8.940	8.940	7.42	66.34
STA	0.0 +	40.164	8.940	8.940	12.74	113.93
STA	0.0 +	60.441	8.940	8.940	20.28	181.28
STA	0.0 +	80.692	8.865	8.903	20.25	180.30
STA	0.0 +	81.682	8.865	8.865	0.99	8.78
STA	0.0 +	101.186	8.865	8.865	19.50	172.90
STA	0.0 +	121.704	8.865	8.865	20.52	181.89
STA	0.0 +	125.889	8.865	8.865	4.19	37.10
STA	0.0 +	142.036	8.865	8.865	16.15	143.14
STA	0.0 +	162.276	8.865	8.865	20.24	179.43
STA	0.0 +	180.152	14.793	11.829	17.88	211.46
STA	0.0 +	182.501	17.852	16.323	2.35	38.34
STA	0.0 +	184.986	20.701	19.277	2.48	47.90
Total						1,756.44

t=25cm

Center	Width	Ave.	Distance	Area
STA 2.0 + 600.000	10.630			
STA 2.0 + 620.000	10.630	10.630	20.00	212.60
STA 2.0 + 627.420	10.630	10.630	7.42	78.88
STA 2.0 + 640.000	10.630	10.630	12.58	133.73
STA 2.0 + 660.000	11.190	10.910	20.00	218.20
STA 2.0 + 670.100	11.190	11.190	10.10	113.02
Total				756.42

Total= 9,017.05 m2

STA2+462.55~STA2+542.200 t=10cm

	Width	Ave.	Distance	Area
STA 2.0 + 462.500	51.590			
STA 2.0 + 480.000	51.590	51.590	17.5	902.80
STA 2.0 + 500.000	51.590	51.590	20.0	1,031.80
STA 2.0 + 520.000	51.590	51.590	20.0	1,031.80
STA 2.0 + 540.000	51.590	51.590	20.0	1,031.80
STA 2.0 + 542.200	51.590	51.590	2.2	113.50
合計				4,111.70

Lower Subbase

STA2+392.5~STA2+600

t=35cm

			Width	Ave.	Distance	Area
STA	2.0 +	388.800	19.500			
STA	2.0 +	392.500	19.500	19.500	3.70	72.10
STA	2.0 +	400.000	23.389	21.440	7.5	160.80
STA	2.0 +	420.000	33.053	28.220	20.0	564.40
STA	2.0 +	440.000	42.667	37.860	20.0	757.20
STA	2.0 +	460.000	51.889	47.280	20.0	945.60
STA	2.0 +	462.500	51.965	51.930	2.5	129.80
STA	2.0 +	462.500	51.815	51.890	0.0	0.00
STA	2.0 +	480.000	51.815	51.820	17.5	906.90
STA	2.0 +	500.000	51.815	51.820	20.0	1,036.40
STA	2.0 +	520.000	51.815	51.820	20.0	1,036.40
STA	2.0 +	540.000	51.815	51.820	20.0	1,036.40
STA	2.0 +	542.200	51.965	51.890	2.2	114.20
STA	2.0 +	542.200	51.965			
STA	2.0 +	560.000	46.270	49.120	17.8	874.30
STA	2.0 +	580.000	37.934	42.100	20.0	842.00
STA	2.0 +	600.000	31.915	34.920	20.0	698.40
合計						9,174.90

Edge of Footinh

t=35cm

Left			Width	Ave.	Distance	Area
STA	0.0 +	0.000	9.440			
STA	0.0 +	20.000	8.940	9.190	20.00	183.80
STA	0.0 +	27.420	8.940	8.940	7.42	66.34
STA	0.0 +	40.164	8.940	8.940	12.74	113.93
STA	0.0 +	60.441	8.940	8.940	20.28	181.28
STA	0.0 +	80.692	9.115	9.028	20.25	182.83
STA	0.0 +	81.682	9.115	9.115	0.99	9.02
STA	0.0 +	101.186	9.115	9.115	19.50	177.78
STA	0.0 +	121.704	9.115	9.115	20.52	187.02
STA	0.0 +	125.889	9.115	9.115	4.19	38.15
STA	0.0 +	142.036	9.115	9.115	16.15	147.18
STA	0.0 +	162.276	9.115	9.115	20.24	184.49
STA	0.0 +	180.152	15.293	12.204	17.88	218.16
STA	0.0 +	182.501	18.317	16.805	2.35	39.48
STA	0.0 +	184.986	21.109	19.713	2.48	48.99
合計						1,778.43

t=35cm

Right	Width	Ave.	Distance	Area
STA 0.0 + 0.000	10.675			
STA 0.0 + 20.000	10.175	10.425	20.00	208.50
STA 0.0 + 27.420	10.175	10.175	7.42	75.50
STA 0.0 + 39.834	10.175	10.175	12.41	126.31
STA 0.0 + 56.561	10.175	10.175	16.73	170.20
STA 0.0 + 79.325	10.350	10.263	22.76	233.63
STA 0.0 + 80.316	10.350	10.350	0.99	10.26
STA 0.0 + 98.814	12.181	11.266	18.50	208.40
STA 0.0 + 118.296	13.850	13.016	19.48	253.58
STA 0.0 + 122.270	13.850	13.850	3.97	55.04
STA 0.0 + 137.985	13.850	13.850	15.72	217.65
STA 0.0 + 157.704	13.817	13.834	19.72	272.79
STA 0.0 + 175.149	13.815	13.816	17.45	241.02
STA 0.0 + 177.497	13.815	13.815	2.35	32.44
STA 0.0 + 179.983	13.815	13.815	2.49	34.34
合計				2,139.66

t=35cm

Center	Width	Ave.	Distance	Area
STA 2.0 + 600.000	10.630			
STA 2.0 + 620.000	10.630	10.630	20.00	212.60
STA 2.0 + 627.420	10.630	10.630	7.42	78.88
STA 2.0 + 640.000	10.630	10.630	12.58	133.73
STA 2.0 + 660.000	11.190	10.910	20.00	218.20
合計 2.0 + 675.100	11.190	11.190	15.10	168.97
				812.37

Total= 13,905.35 m2

SHUKHINTHAR INTERSECTION

Surface Course

A	129.74	=	129.74
B	124.76	=	124.76
		=	<u>254.50</u> m2

Surface Base

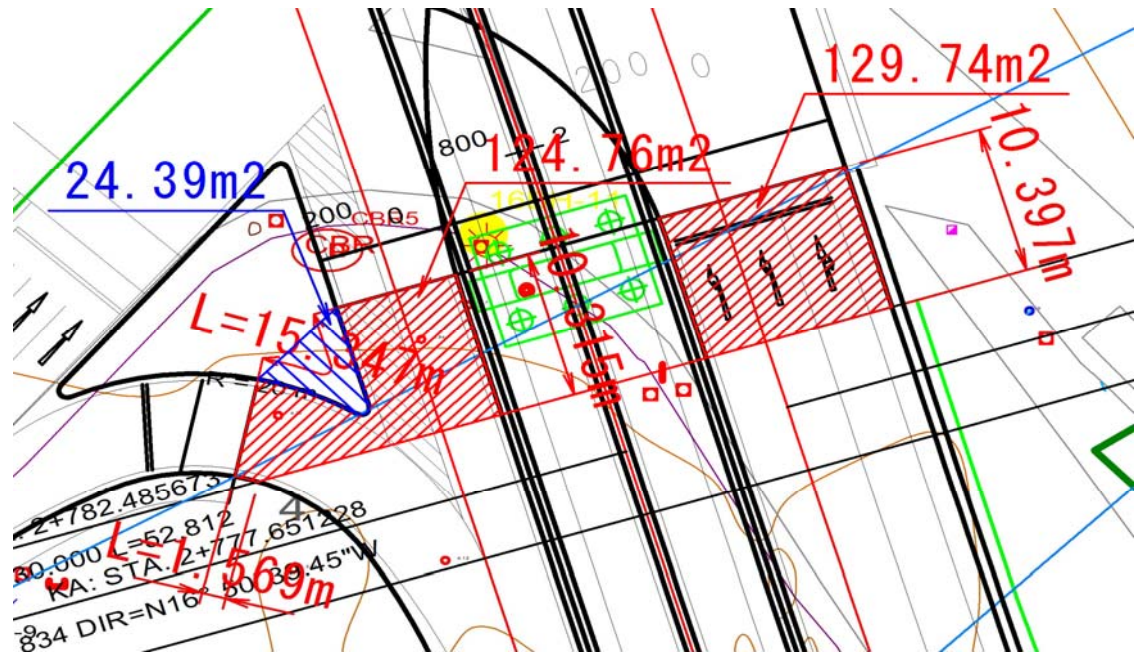
A	129.74	=	129.74
B	124.76	=	124.76
		=	<u>254.50</u> m2

Upper Subbase

A	129.74	=	129.74
B	124.76	=	124.76
10.397 * (0.30 + 0.25 / 2) * 2		=	8.84
10.315 * (0.30 + 0.25 / 2)		=	4.38
15.347 * (0.30 + 0.25 / 2)		=	6.52
1.569 * (0.30 + 0.25 / 2)		=	0.67
		=	<u>274.91</u> m2

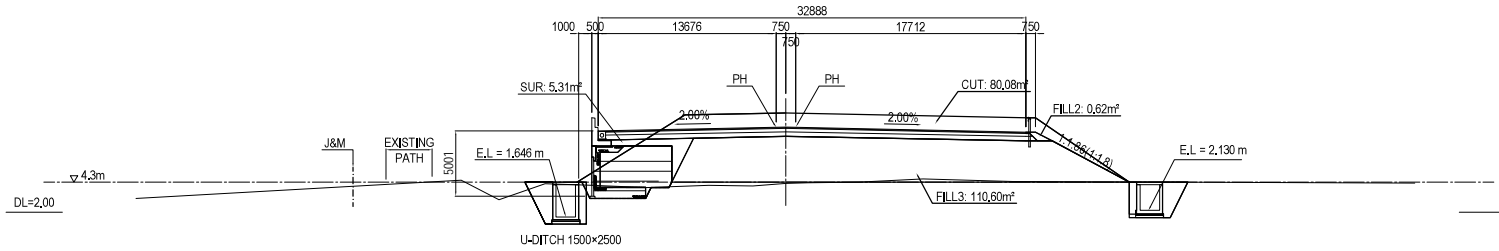
Lower Subbase

A	129.74	=	129.74
B	124.76	=	124.76
10.397 * (0.30 + 0.25 + 0.35 / 2) * 2		=	15.08
10.315 * (0.30 + 0.25 + 0.35 / 2)		=	7.48
15.347 * (0.30 + 0.25 + 0.35 / 2)		=	11.13
1.569 * (0.30 + 0.25 + 0.35 / 2)		=	1.14
		=	<u>289.32</u> m2

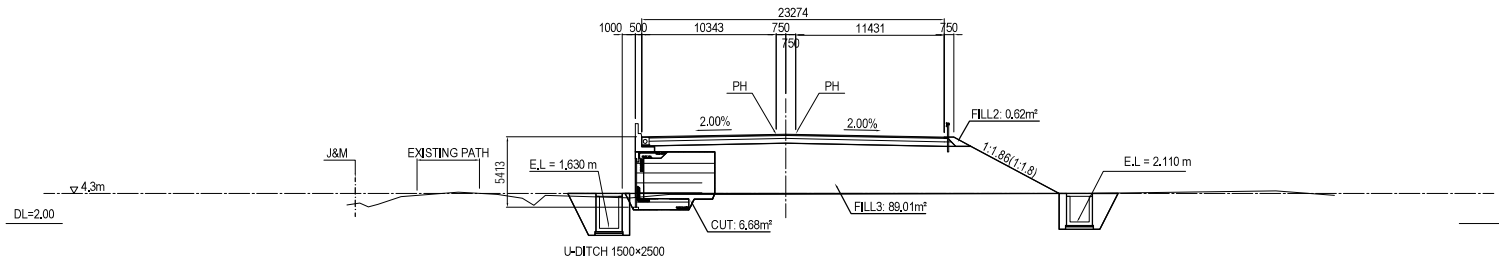


CROSS SECTION(1) S=1:400

STA.2+420
GH=4.20
PH=8.525



STA.2+400
GH=4.25
PH=8.870



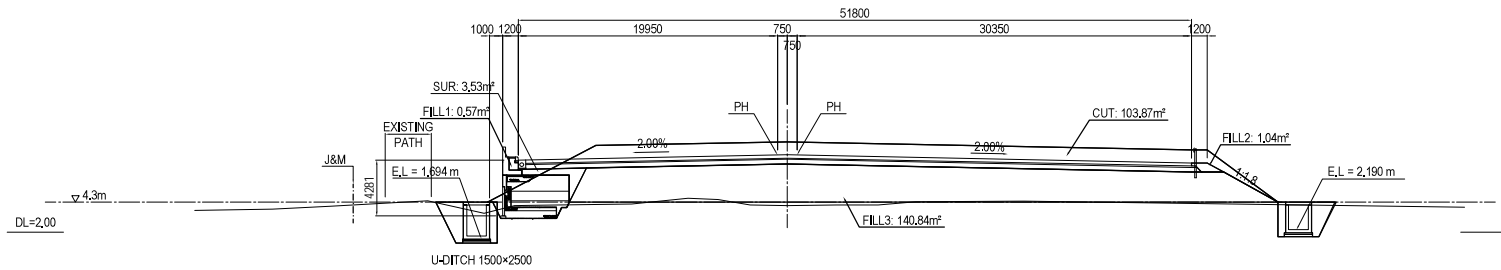
Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME	FINANCING	COUNTRY	CONSULTANT	PREPARED BY	CHECKED BY	APPROVED BY	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO. LTD	E. YOKOTA	T. HAYAKAWA	Y. SANO				CROSS SECTION(3)	2 DWG No. P2-RD-001

CROSS SECTION(2) S=1:400

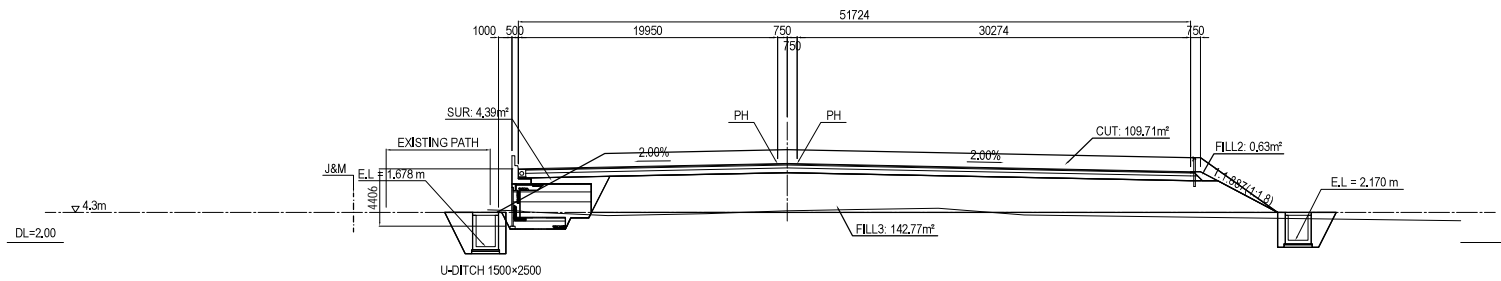
STA.2+480

GH=4.04
PH=7.930



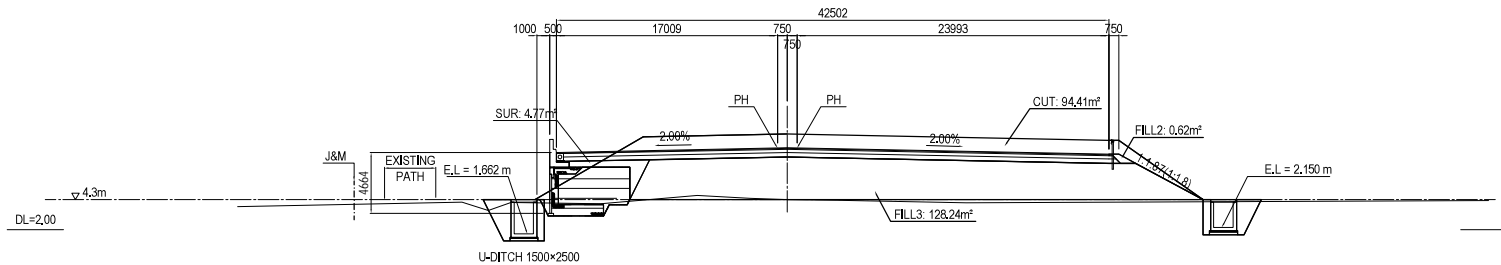
STA.2+460

GH=4.42
PH=8.055



STA.2+440

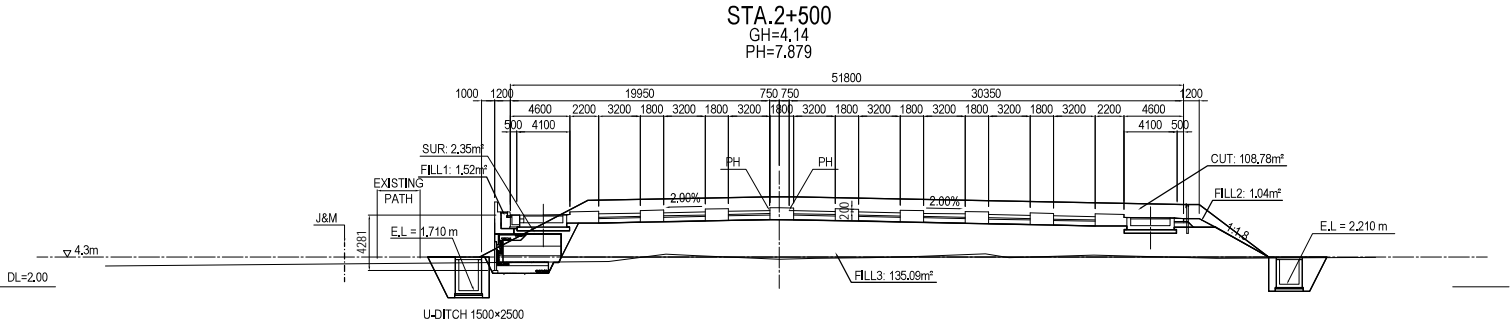
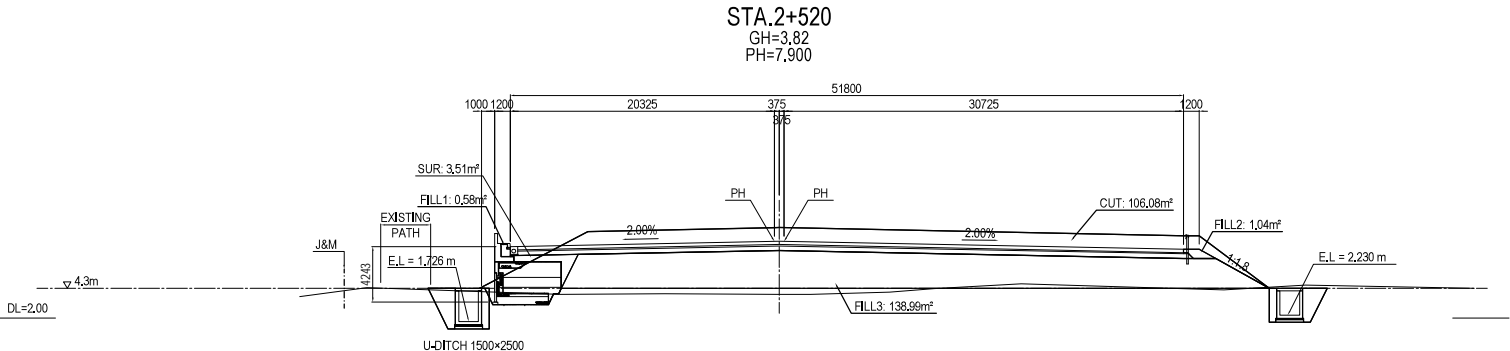
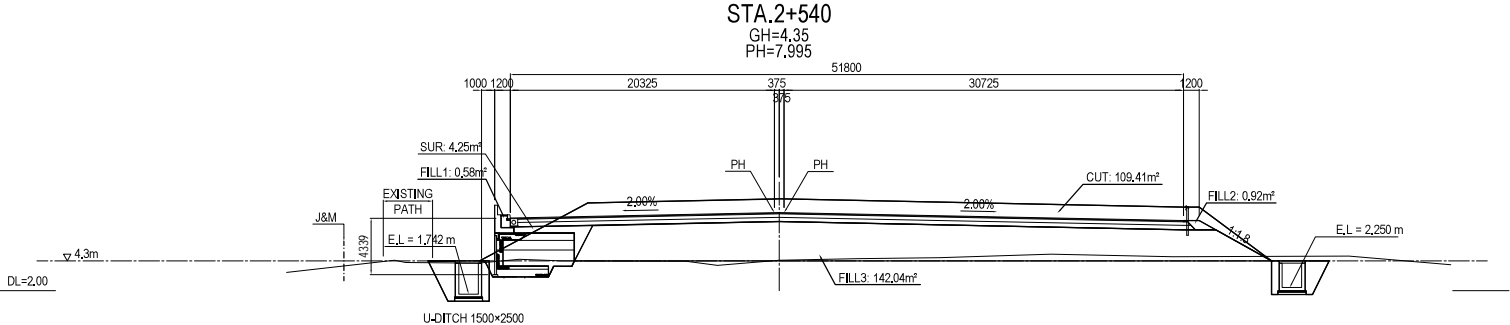
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Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCING JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO. LTD	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	E. YOKOTA			CROSS SECTION(4)	2
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P2-RD-002

CROSS SECTION(3) S=1:400



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME
DETAILED DESIGN ON
BAGO RIVER BRIDGE
CONSTRUCTION PROJECT

FINANCING
JICA
JAPAN INTERNATIONAL
COOPERATION AGENCY

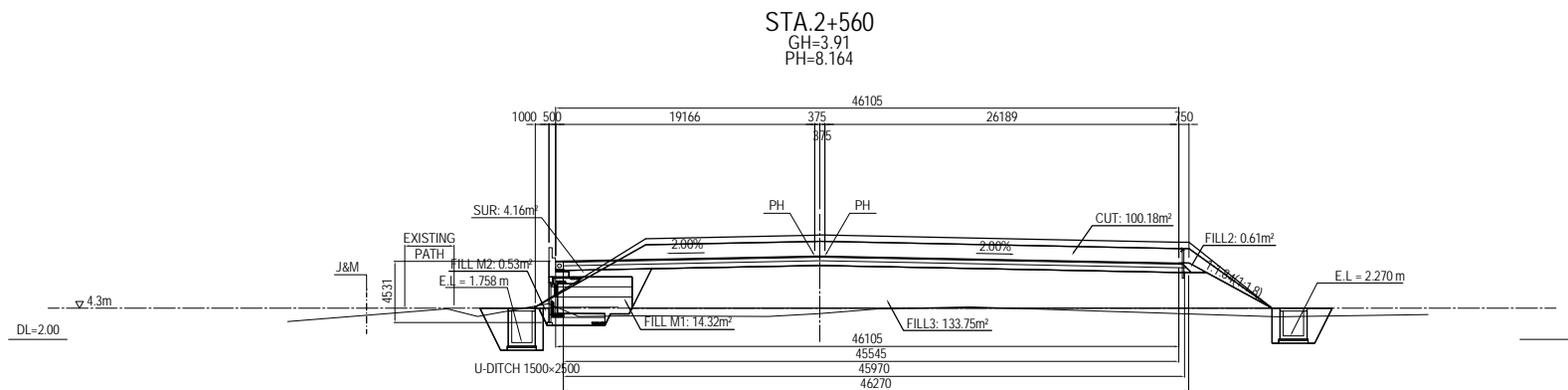
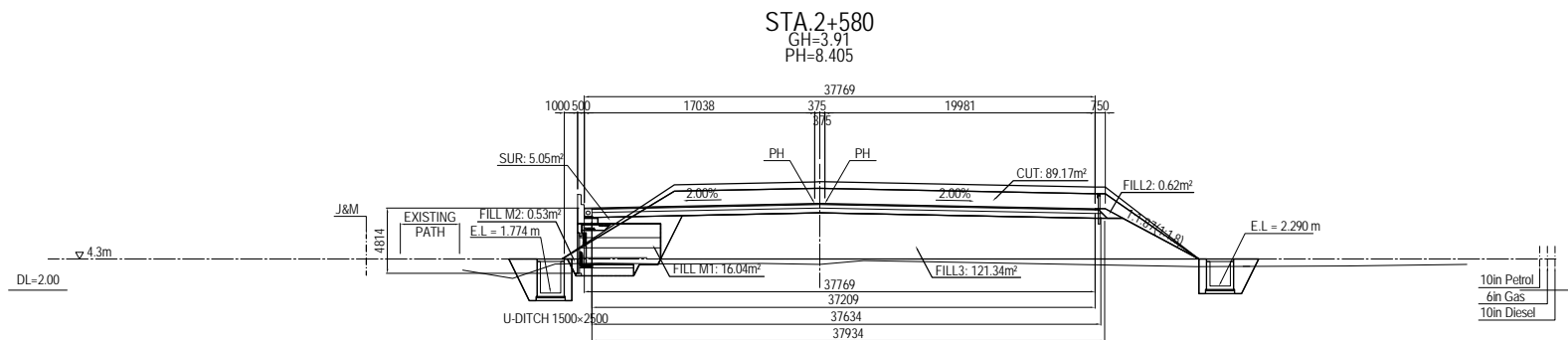
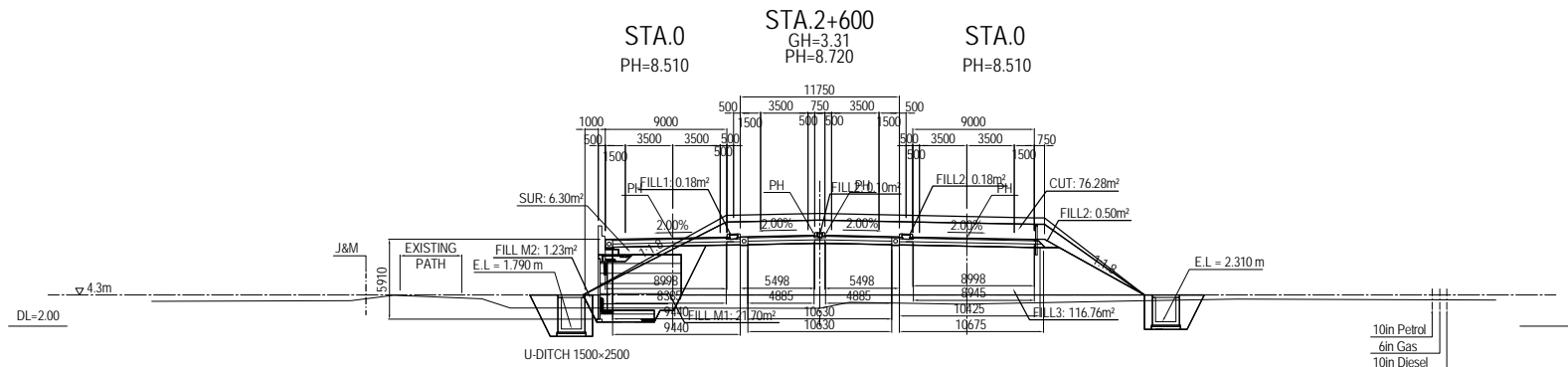
COUNTERPART
REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION
DEPARTMENT OF BRIDGE

DESIGN TEAM
NIPPON KOEI CO., LTD.
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
METROPOLITAN EXPRESSWAY COMPANY LIMITED
CHODAI CO., LTD.
NIPPON ENGINEERING CONSULTANTS CO., LTD.

	NAME	SIGNATURE	DATE
PREPARED BY	E.YOKOTA		
CHECKED BY	T. HAYAKAWA		
APPROVED BY	Y. SANO		

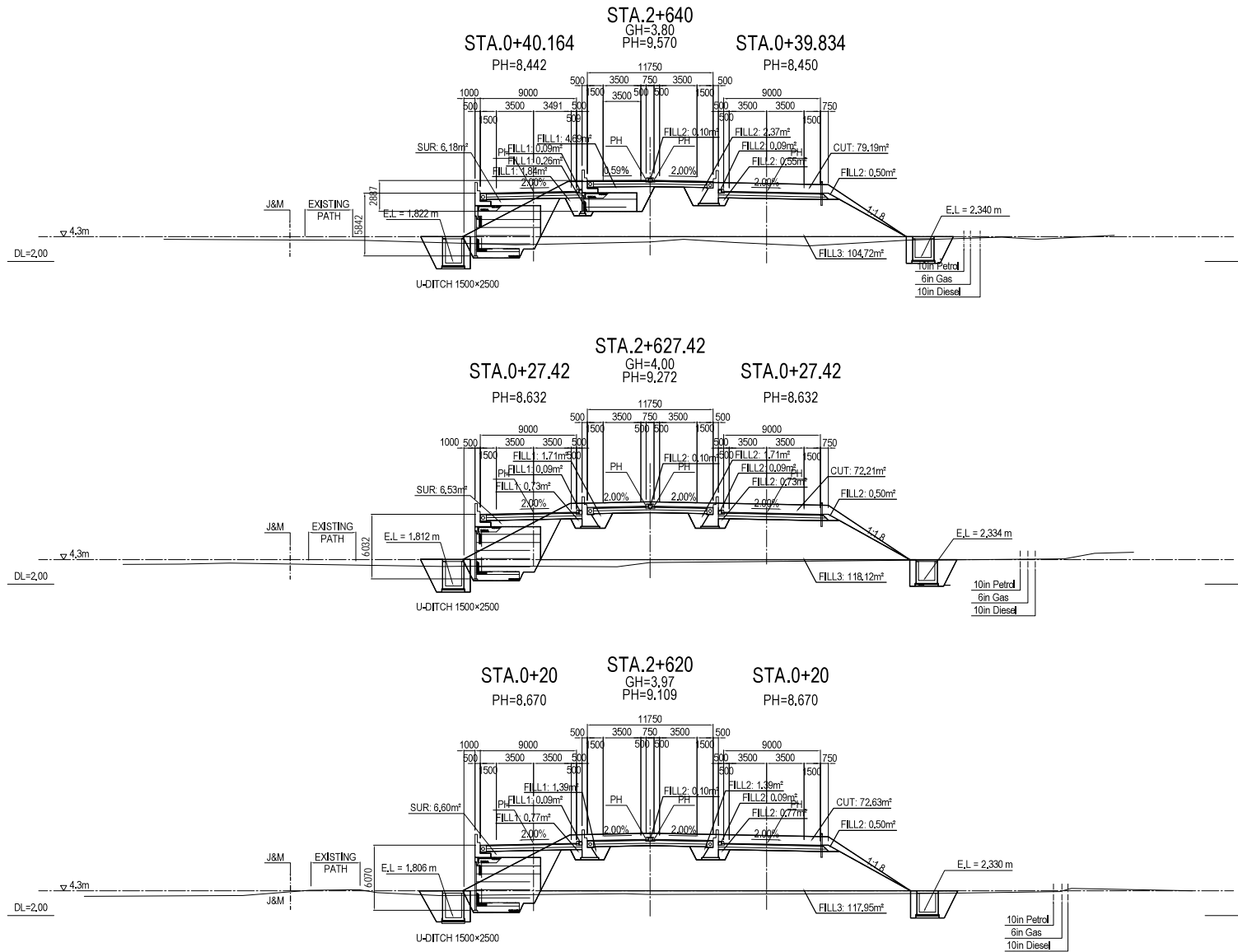
DRAWING TITLE		PACKAGE
CROSS SECTION(5)		2
		DWG No.
		P2-RD-002

CROSS SECTION(4)



PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(6)	PACK/
				PREPARED BY	E. YOKOTA			2
				CHECKED BY	T. HAYAKAWA			1
				APPROVED BY	Y. SANO			P2-RD-002

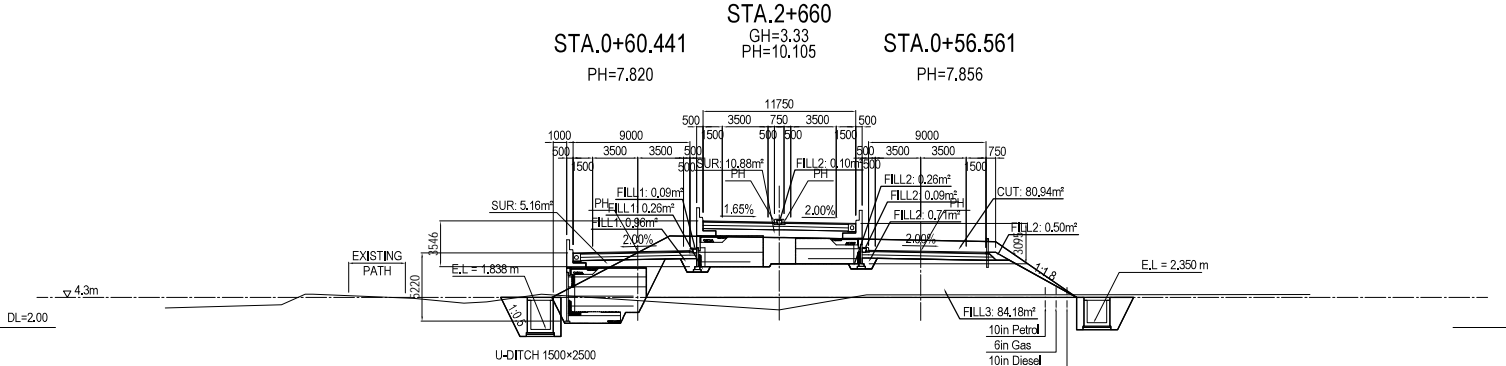
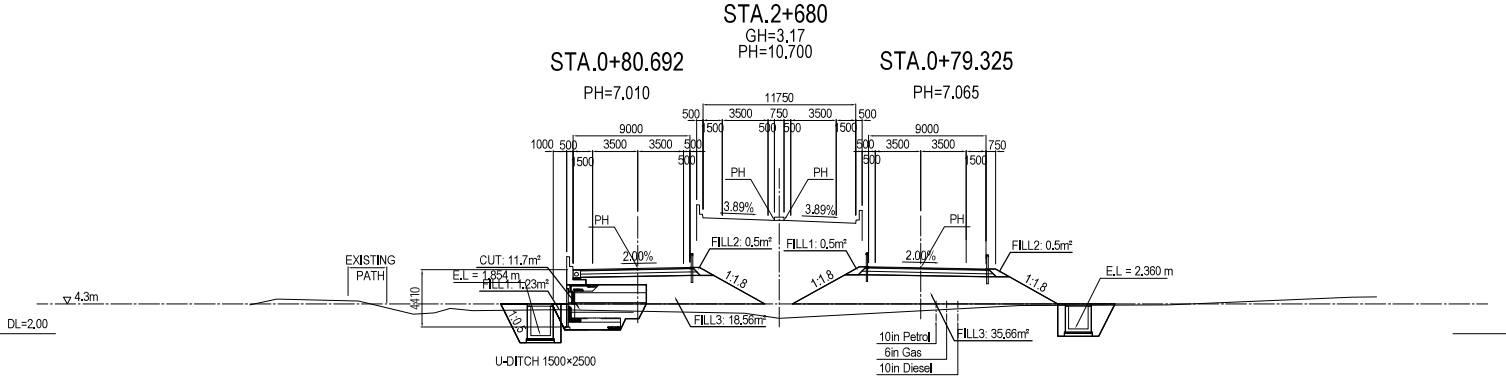
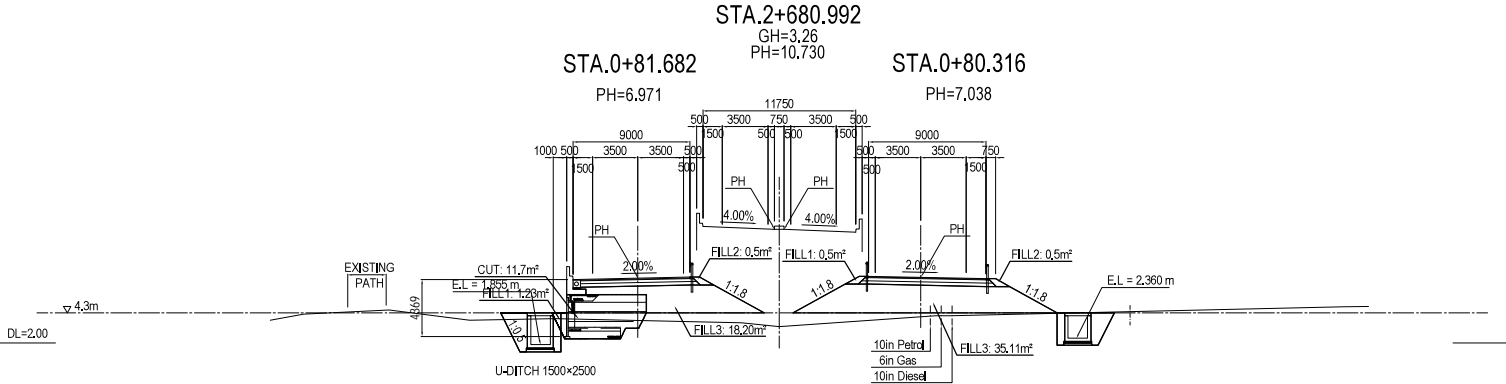
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Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME	FINANCING	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY CHECKED BY APPROVED BY	E.YOKOTA T. HAYAKAWA Y. SANO		CROSS SECTION(7)	2 DWG No. P2-RD-002

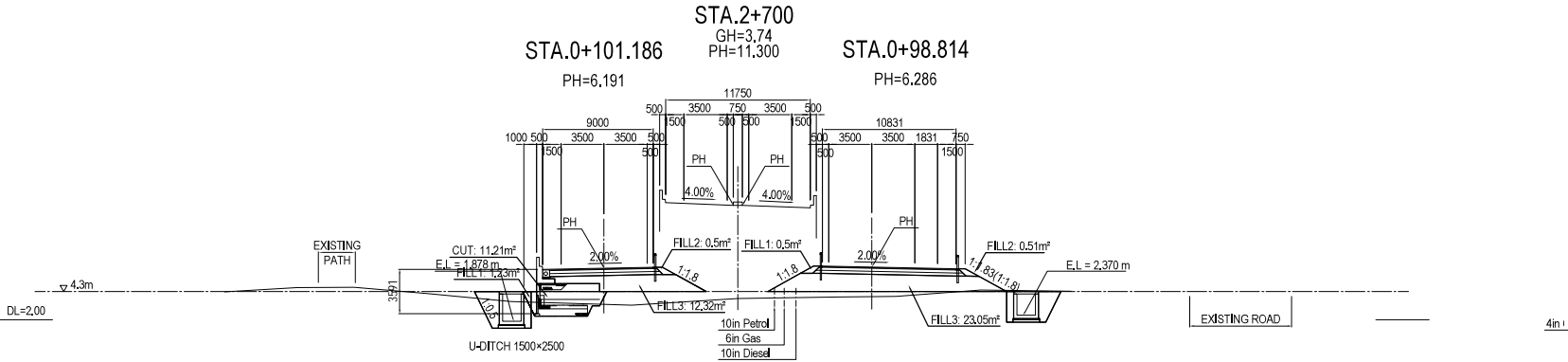
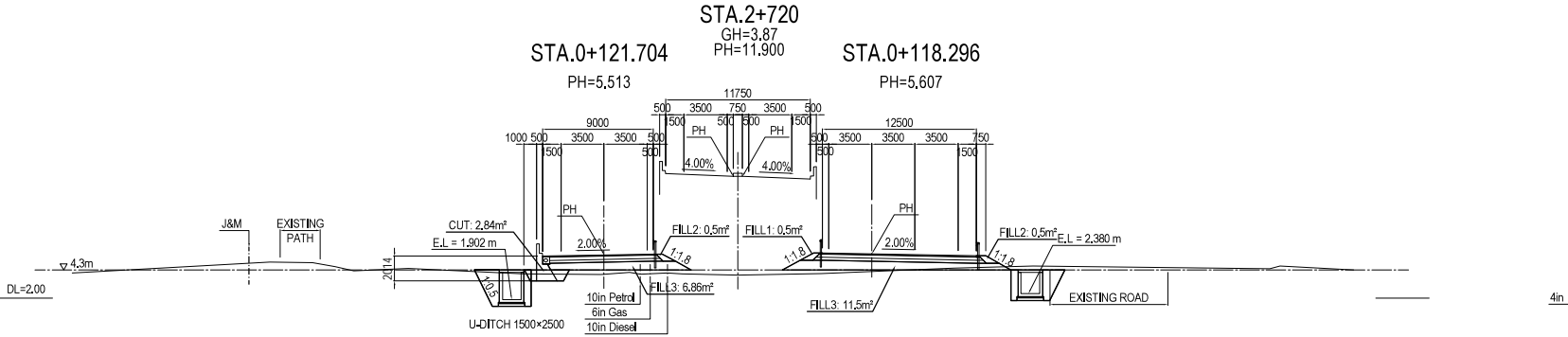
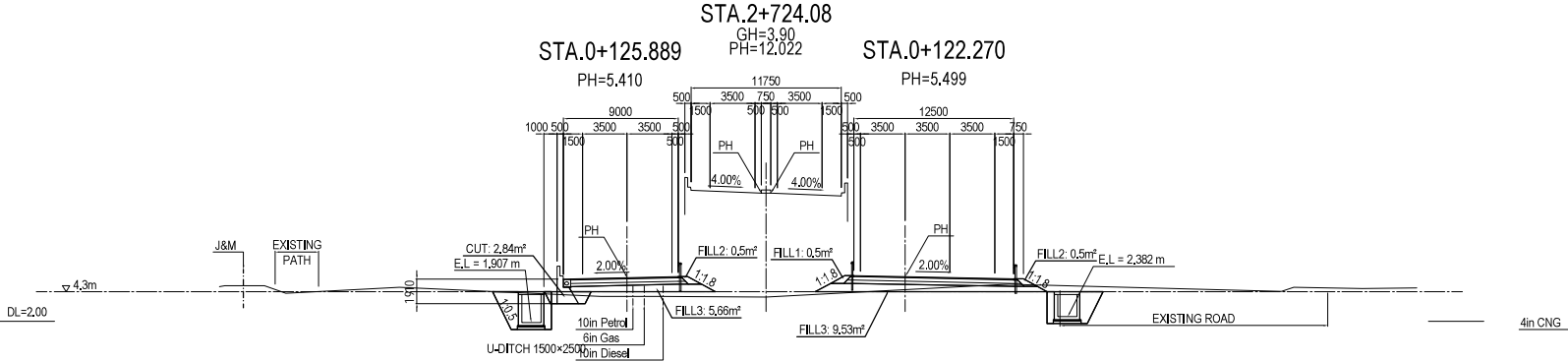
CROSS SECTION(6)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	HINWISORY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JOINT STUDY TEAM NIPPON KOEI CO. LTD. ORIENTAL CONSULTANTS GLOBAL CO. LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO. LTD. NIPPON ENGINEERING CONSULTANTS CO. LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE			
				PREPARED BY	E.YOKOTA				CROSS SECTION(8)	2	
				CHECKED BY	T. HAYAKAWA						DWG No.
				APPROVED BY	Y. SANO						P2-RD-002

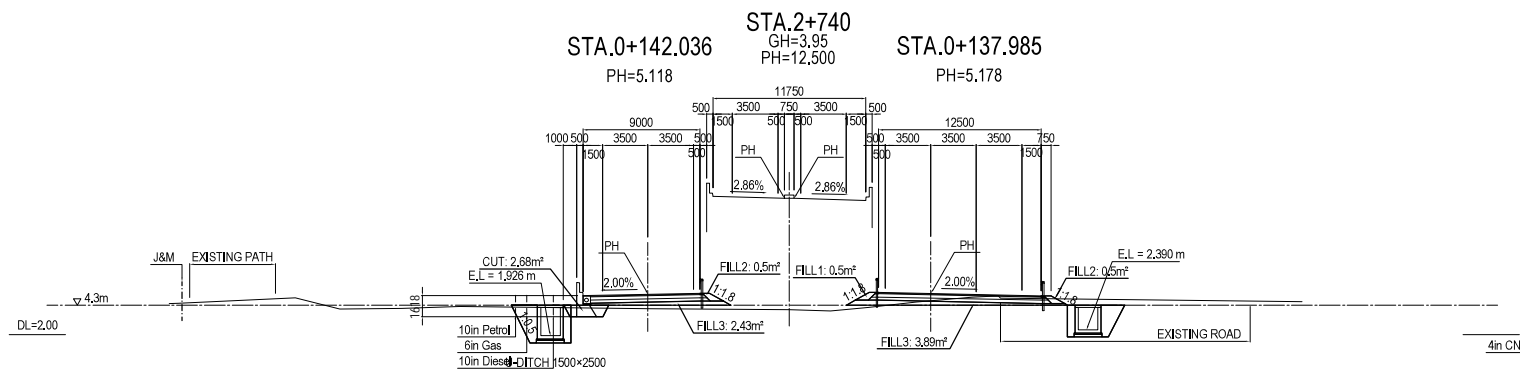
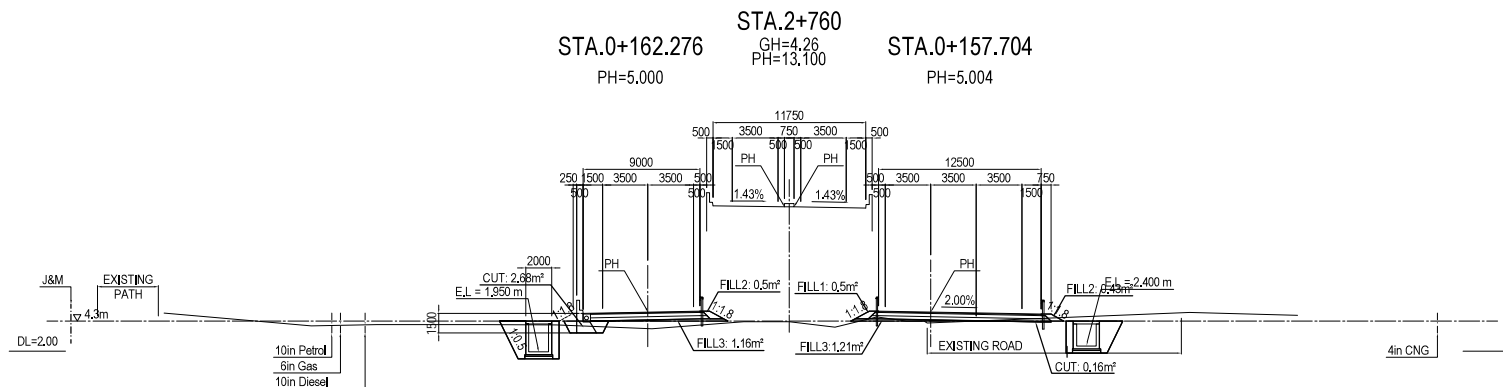
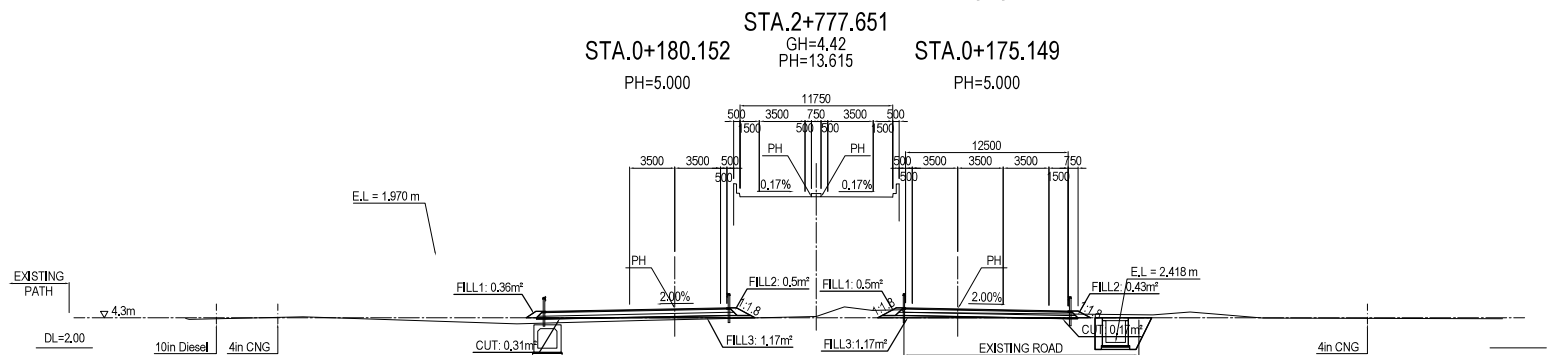
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Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE		
				PREPARED BY	E.YOKOTA				CROSS SECTION(9)	2
				CHECKED BY	T. HAYAKAWA					DWG No.
				APPROVED BY	Y. SANO					P2-RD-002

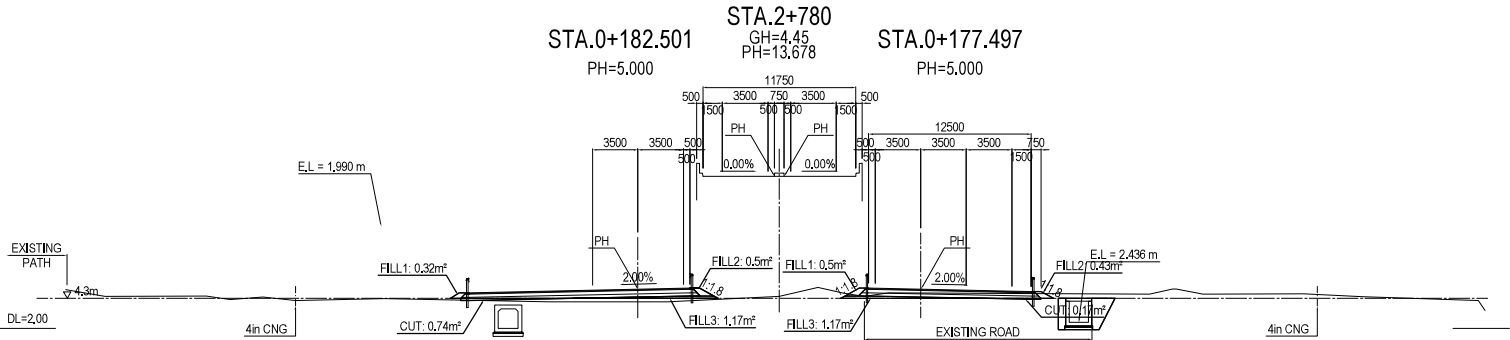
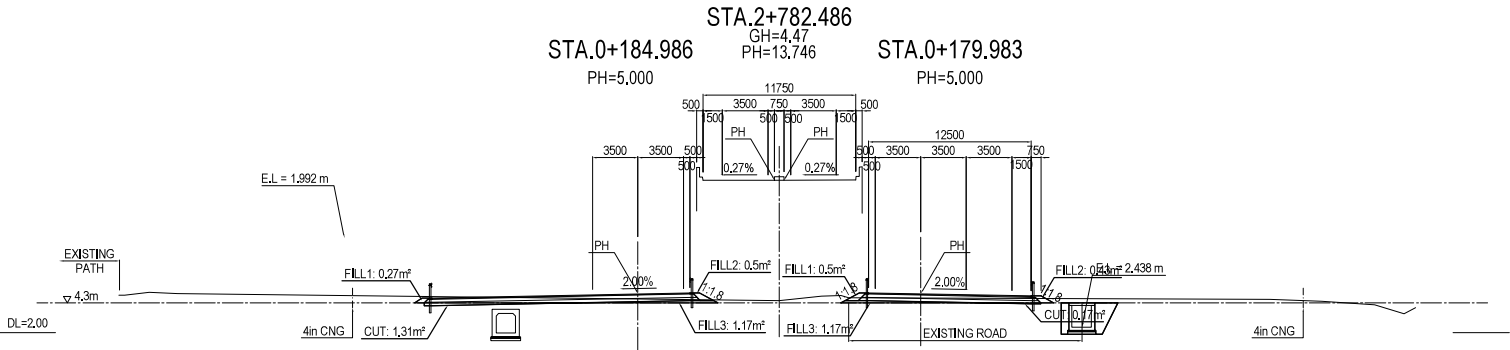
CROSS SECTION(8)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	HONORARY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE		
				PREPARED BY	E.YOKOTA				CROSS SECTION(10)	2
				CHECKED BY	T. HAYAKAWA					DWG No.
				APPROVED BY	Y. SANO					P2-RD-002

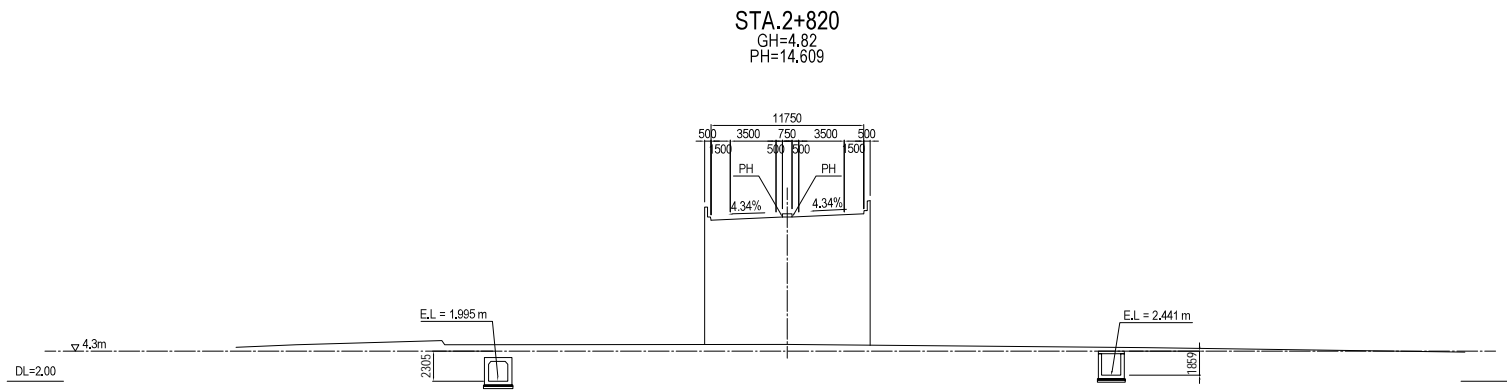
CROSS SECTION(9)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COOPERATION REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	E.YOKOTA			CROSS SECTION(11)	2
				CHECKED BY	T. HAYAKAWA				DWG No.
				APPROVED BY	Y. SANO				P2-RD-002

CROSS SECTION(10)



Note: Elevation is based on MSL(Mean Sea Level)

PROJECT NAME	FINANCED BY	COUNTERPART	CLIENT	DESIGNER	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	E.YOKOTA T. HAYAKAWA Y. SANO				CROSS SECTION(12)	2 DWG No. P2-RD-002

Soft Soil Improvement

Deep Mixing Method & Shallow Improvement

for Main Road

Total BoQ of improvement

	Items	Unit	Quantity	Note
Deep soil mixing	sets	set	1,723	
	Total improvement long	m	24,325.50	
	Total improvement area	m ³	52,786.34	
	Solidifying material addition	t	19,161.44	cement-based(330kg/m ³)
Shallow improvement	Improvement depth	m	1.30	
	Total improvement area	m ²	8,669.36	
	Total improvement volume	m ³	11,270.17	
	Solidifying material addition	t	2,592.14	cement-based(230kg/m ³)

• DEEP MIXING METHOD

PKG2												
Quck (kN/m2)	AREA	Improved radial	Section(m2)	Excavation length(m)	Dry excavation length(m)	Improve long(m)	sets	Total excavation long(m)	Total dry excavation length(m)	Total improve long(m)	Total improve volume (m3)	Note
700	A(L=17500)	1200mm@1000 2-axis	2.17	17.50	2.00	15.50	167	2922.50	334.00	2588.50	5617.05	
	B(L=17500)	1200mm@1000 2-axis	2.17	17.50	0.00	17.50	220	3850.00	0.00	3850.00	8354.50	
	C(L=16500)	1200mm@1000 2-axis	2.17	16.50	2.00	14.50	66	1089.00	132.00	957.00	2076.69	
	D(L=16500)	1200mm@1000 2-axis	2.17	16.50	0.00	16.50	44	726.00	0.00	726.00	1575.42	
	E(L=13000)	1200mm@1000 2-axis	2.17	13.00	0.00	13.00	156	2028.00	0.00	2028.00	4400.76	
	E(L=15500)	1200mm@1000 2-axis	2.17	15.50	0.00	15.50	396	6138.00	0.00	6138.00	13319.46	
	E(L=14500)	1200mm@1000 2-axis	2.17	14.50	0.00	14.50	123	1783.50	0.00	1783.50	3870.20	
	E(L=16500)	1200mm@1000 2-axis	2.17	16.50	0.00	16.50	75	1237.50	0.00	1237.50	2685.38	
	E(L=18500)	1200mm@1000 2-axis	2.17	18.50	0.00	18.50	60	1110.00	0.00	1110.00	2408.70	
	D(L=5000)	1200mm@1000 2-axis	2.17	5.00	0.00	5.00	117	585.00	0.00	585.00	1269.45	
	E(L=6500)	1200mm@1000 2-axis	2.17	6.50	0.00	6.50	150	975.00	0.00	975.00	2115.75	
	E(L=8000)	1200mm@1000 2-axis	2.17	8.00	0.00	8.00	39	312.00	0.00	312.00	677.04	
E(L=18500)	1200mm@1000 2-axis	2.17	18.50	0.00	18.50	110	2035.00	0.00	2035.00	4415.95		
Total							1723	24791.50	466.00	24325.50	52786.34	

• SHALLOW IMPROVEMENT

PKG2									
Quck (kN/m ²)	AREA	Model used	Work place	Improve depth(m)	Total improve area (m ²)	Total improve volume (m ³)	unit addition (kg/m ³)	Solidifying material addition (t)	Note
420	A(L=1300)	Backhoe	Structure foundation	1.30	8669.36	11270.17	230	2592.14	ap=100%
Total					8669.36	11270.17	-	2592.14	

Soft Soil Improvement

Surcharge

FILL	Area	Ave.	Distance	Volume
STA 2.0 + 420.000	174.9			
STA 2.0 + 440.000	207.0	191.0	20.0	3,819.0
STA 2.0 + 460.000	235.7	221.4	20.0	4,427.0
STA 2.0 + 480.000	230.3	233.0	20.0	4,660.0
STA 2.0 + 500.000	230.1	230.2	20.0	4,604.0
STA 2.0 + 520.000	230.0	230.1	20.0	4,601.0
STA 2.0 + 540.000	235.7	232.9	20.0	4,657.0
STA 2.0 + 560.000	217.9	226.8	20.0	4,536.0
STA 2.0 + 580.000	193.8	205.9	20.0	4,117.0
STA 2.0 + 600.000	170.0	181.9	20.0	3,638.0
STA 2.0 + 620.000	162.0	166.0	20.0	3,320.0
STA 2.0 + 627.420	161.9	162.0	7.4	1,201.7
STA 2.0 + 640.000	156.0	159.0	12.6	1,999.6
STA 2.0 + 660.000	137.6	146.8	20.0	2,936.0
Total amount				48,516.3

SAND MAT	Area	Ave.	Distance	Volume
STA 2.0 + 420.000	20.9			
STA 2.0 + 440.000	25.4	23.2	20.0	463.0
STA 2.0 + 460.000	29.5	27.5	20.0	549.0
STA 2.0 + 480.000	30.1	29.8	20.0	596.0
STA 2.0 + 500.000	30.0	30.1	20.0	601.0
STA 2.0 + 520.000	30.0	30.0	20.0	600.0
STA 2.0 + 540.000	30.1	30.1	20.0	601.0
STA 2.0 + 560.000	27.0	28.6	20.0	571.0
STA 2.0 + 580.000	23.2	25.1	20.0	502.0
STA 2.0 + 600.000	20.3	21.8	20.0	435.0
STA 2.0 + 620.000	20.4	20.4	20.0	407.0
STA 2.0 + 627.420	20.4	20.4	7.4	151.4
STA 2.0 + 640.000	20.2	20.3	12.6	255.4
STA 2.0 + 660.000	19.7	20.0	20.0	399.0
Total amount				6,130.8

Wall Structures

SUMMARY OF QUANTITIES FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Toll Plaza~ Approach road(STA.2+390~2+760)LEFT SIDE】

ITEM	DISCREPTION	UNIT	QUANTITY	REMARKS	
AREA		m2	989.72		
LENGTH		m	329.882		
MAXIMUM HEIGHT		m	4.480		
TOTAL LENGTH		m	9,068.000		
COVER CONCRETE	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	69.80	
	FORM		m2	459.83	
	BAR	D13,SD345	kg	4,418.3	
	JOINT	$t=10\text{mm}$	m2	24.55	
	SCAFFOLDING	CATWALK	m	329.86	
BASE CONCRETE	CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	26.48	
	FORM		m2	132.76	
	ANCHOR BAR	D13,SD345	kg	175.1	
CONCRETE BARRIER (TYPE1)	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	385.81	
	FORM OF CONCRETE		m2	1,293.18	
	BASE CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	37.44	
	FORM OF BASE CONCRETE		m2	30.45	
	AGGREGATE		m3	247.12	
	BAR	D16,SD345	kg	13,000.1	
	BAR	D13,SD345	kg	22,705.3	
	JOINT FILLER	$t=10\text{mm}$	m2	39.93	
	JOINT FILLER	$t=20\text{mm}$	m2	2.58	
	RUBBER PL	$t=10\text{mm}$	m2	89.86	SIZE:10×300×600 500 SHEETS
CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	7.49		
CONCRETE BARRIER (TYPE2)	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	29.56	
	FORM OF CONCRETE		m2	100.96	
	BASE CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	2.70	
	FORM OF BASE CONCRETE		m2	2.27	
	AGGREGATE		m3	17.30	
	BAR	D16,SD345	kg	868.0	
	BAR	D13,SD345	kg	1,684.0	
	JOINT FILLER	$t=10\text{mm}$	m2	1.48	
	RUBBER PL	$t=10\text{mm}$	m2	6.00	SIZE:10×300×600 34 SHEETS
CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	0.50		
CONCRETE BARRIER (TYPE3)	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	15.78	
	FORM OF CONCRETE		m2	56.16	
	BASE CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	1.35	
	FORM OF BASE CONCRETE		m2	1.27	
	AGGREGATE		m3	8.65	
	BAR	D16,SD345	kg	434.0	
	BAR	D13,SD345	kg	877.0	
	RUBBER PL	$t=10\text{mm}$	m2	3.00	SIZE:10×300×600 17 SHEETS
CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	0.25		
REINFORCEMENT	BAR	D13,SD345	kg	285.0	
EARTH WORKS	AGGREGATE OF BACK WALL	C-40	m3	699.4	
DRAINAGE	AGGREGATE	C-40	m3	1,108.4	
	EVACUATION PROTECTOR	NONWOVENFABRI C $t=2.0\text{mm}$	m2	1,319.53	
JOINT	$t=20\text{mm}$	m2	0.46		

TABLE OF MATERIALS FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Toll Plaza~ Approach road(STA.2+390~2+760)LEFT SIDE】

(THIN TYPE : t=140 mm)

ITEM	SYMBOL	SIZE	UNIT	QUANTITY	REMARKS
CONCRETE SKIN	A 4	1.50 × 1.50 = 2.2500 m ²	SHEET	212	
	AL 4	1.35 × 1.50 = 2.0250 "	"	6	
	AR 4	1.35 × 1.50 = 2.0250 "	"	5	
	BP 4	1.50 × 1.48 = 2.2200 "	"	105	BAR b=300
	BLP 4	1.35 × 1.48 = 1.9980 "	"	1	BAR b=300
	BRP 4	1.35 × 1.48 = 1.9980 "	"	3	BAR b=300
	C 2	1.50 × 0.75 = 1.1250 "	"	105	
	CL 2	1.35 × 0.75 = 1.0125 "	"	3	
	CR 2	1.35 × 0.75 = 1.0125 "	"	4	
	DP 2	1.50 × 0.73 = 1.0950 "	"	102	BAR b=300
	DLP 2	1.35 × 0.73 = 0.9855 "	"	6	BAR b=300
	DRP 2	1.35 × 0.73 = 0.9855 "	"	3	BAR b=300
VARIANT SKIN	ALE 2	0.60 × 1.50 = 0.9000 m ²	SHEET	1	
	ARE 2	0.60 × 1.50 = 0.9000 "	"	1	
	BLEP 2	0.60 × 1.48 = 0.8880 "	"	1	BAR b=300
	BREP 2	0.60 × 1.48 = 0.8880 "	"	1	BAR b=300
STRIP	PL (SS400)	80 × 4.0 × 6,000	NUMBER	600	
		" 5,000	"	740	
		" 4,000	"	442	
	TOTAL LENGTH			m	9,068.00
BOLT & NUT		M12 × 40	NUMBER	1,782	
HORIZONTAL JOINT		85 × 20 × 600	SHEET	668	
PREMEABLE SAND		420 × 4	m	666.1	
INSTALLATION METAL OF EDG	L	125 × 210 × 3.2×1500	NUMBER	2	θ= 99 °
	L	125 × 210 × 3.2× 750	"	1	θ= 99 °
CONCRETE ANCHOR		M12 × 90	"	6	
STEEL PLATE		ZINC PLATING (100×1.6×750)	SHEET	21	
WALL AREA				989.72 m ²	
WALL HEIGHT				4.480 m	
CONSTRUCTION LENGTH				329.882 m	

SUMMARY OF QUANTITIES FOR GRAVITY WALL

【Toll Plaza~Approach road(STA.2+720~2+760)】

ITEM	DISCREPTION	UNIT	QUANTITY	REMARKS	
BODY	CONCRETE	m3	80.94		
	FORM	m2	252.89		
	BER	D16,SD345	kg	4,390.9	
		D13,SD345	kg	2,473.4	
	JOINT	t=10mm	m2	9.10	
	SCAFFOLDING	FRAM SCAFFOLDING	m2	36.09	
REINFORCEMENT	BAR	SD345	kg	16.0	

TABLE OF MATERIAL FOR GRAVITY WALL

ITEM	DISCREPTION	UNIT	QUANTITY					TOTAL
			①	②	③	④	⑤	
CONCRETE		m3	19.69	17.26	15.56	14.58	13.85	80.94
FORM		m2	57.73	51.88	49.27	47.70	46.31	252.89
BAR	D16,SD345	kg	879.8	879.8	879.8	Material	871.7	4,390.9
	D13,SD345	kg	495.6	495.6	495.6	495.6	491.0	2,473.4
JOINT	t=10mm	m2	2.14	1.91	1.75	1.68	1.62	9.10
SCAFFOLDING		m2	36.09	-	-	-	-	36.09
Shallow Improvement	Depth	m	2.00					2.00
	Area	m2	157.67					157.67
	Volume	m3	315.34					315.34
	Solidifying Material Addition	t	34.69 (110kg/m3)					34.69

SUMMARY OF QUANTITIES FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Main Load(STA.2+659.058~2+672.314)RIGHT SIDE】

ITEM	DISCREPTION	UNIT	QUANTITY	REMARKS	
AREA		m2	19.54		
LENGTH		m	13.250		
MAXIMUM HEIGHT		m	1.480		
TOTAL LENGTH		m	162.000		
COVER CONCRETE	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	2.89	
	FORM		m2	19.05	
	BAR	D13,SD345	kg	177.4	
	JOINT	t=10mm	m2	0.87	
	SCAFFOLDING	CATWALK	m	13.23	
BASE CONCRETE	CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	1.06	
	FORM		m2	5.38	
	BASE AGGREGATE	RC-40	m3	1.59	
	ANCHOR BAR	D13,SD345	kg	7.0	
CONCRETE BARRIER (TYPE1)	CONCRETE	$\sigma_{ck}=24\text{N/mm}^2$	m3	17.04	
	FORM OF CONCRETE		m2	59.47	
	BASE CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	1.65	
	FORM OF BASE CONCRETE		m2	1.57	
	AGGREGATE		m3	10.91	
	BAR	D16,SD345	kg	574.2	
		D13,SD345	kg	1,002.8	
	JOINT FILLER	t=20mm	m2	2.58	
	RUBBER PL	t=10mm	m2	3.97	SIZE:10×300×600 23 SHEETS
	CONCRETE	$\sigma_{ck}=18\text{N/mm}^2$	m3	0.33	
EARTH WORKS	AGGREGATE OF BACK WALL	C-40	m3	19.0	
JOINT		t=20mm	m2	0.61	

TABLE OF MATERIALS FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Main Load(STA.2+659.058~2+672.314)RIGHT SIDE】

(THIN TYPE : t=140 mm)

ITEM	SYMBOL	SIZE	UNIT	QUANTIT	REMARKS
CONCRETE SKIN	BP 4	1.50 × 1.48 = 2.2200 m ²	SHEET	4	BAR b=300
	C 2	1.50 × 0.75 = 1.1250 "	"	3	
	CL 2	1.35 × 0.75 = 1.0125 "	"	1	
	CR 2	1.35 × 0.75 = 1.0125 "	"	1	
	DP 2	1.50 × 0.73 = 1.0950 "	"	3	BAR b=300
	DLP 2	1.35 × 0.73 = 0.9855 "	"	1	BAR b=300
	DRP 2	1.35 × 0.73 = 0.9855 "	"	1	BAR b=300
STRIP	PL (SS400)	80 × 4.0 × 5,000	NUMBER	18	
		" 4,000	"	18	
	TOTAL LENGTH		m	162.00	
BOLT & NUT		M12 × 40	NUMBER	36	
HORIZONTAL JOINT		85 × 20 × 600	SHEET	10	
PREMEABLE SAND		420 × 4	m	14.8	
INSTALLATION METAL OF EDGE	L	125 × 210 × 3.2× 750	NUMBER	2	θ= 90 °
CONCRETE ANCHOR		M12 × 90	"	4	
WALL AREA				19.54 m ²	
WALL HEIGHT				1.480 m	
CONSTRUCTION LENGTH				13.250 m	

SUMMARY OF QUANTITIES FOR GRAVITY WALL

【Main road RIGHT SIDE(STA.2+620~2+659.058)】

ITEM	DISCREPTION	UNIT	QUANTITY	REMARKS	
BODY	CONCRETE	m3	101.74		
	FORM	m2	266.37		
	BER	D16,SD345	kg	4,019.3	
		D13,SD345	kg	2,264.0	
	JOINT	t=20mm	m2	7.72	
	SCAFFOLDING	FRAM SCAFFOLDING	m2	44.64	

TABLE OF MATERIAL FOR GRAVITY WALL

ITEM	DISCREPTION	UNIT	QUANTITY				TOTAL
			①	②	③	④	
CONCRETE		m3	16.83	23.09	28.62	33.20	101.74
FORM		m2	52.14	64.66	71.99	77.58	266.37
BER	D16,SD345	kg	914.3	1,035.0	1,035.0	1,035.0	4,019.30
	D13,SD345	kg	515.0	583.0	583.0	583.0	2,264.00
JOINT	t=20mm	m2	2.06	2.55	3.15	-	7.76
SCAFFOLDING		m2	-	-	49.13	54.26	103.39

SUMMARY OF QUANTITIES FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Main Load(STA.2+659.442~2+672.686)LEFT SIDE】

ITEM		DISCREPTION	UNIT	QUANTITY	REMARKS
AREA			m2	27.30	
LENGTH			m	13.250	
MAXIMUM HEIGHT			m	2.230	
TOTAL LENGTH			m	232.000	
COVER CONCRETE	CONCRETE	$\sigma_{ck}=24N/mm^2$	m3	2.63	
	FORM		m2	17.30	
	BAR	D13,SD345	kg	170.4	
	JOINT	t=10mm	m2	0.79	
	SCAFFOLDING	CATWALK	m	13.23	
BASE CONCRETE	CONCRETE	$\sigma_{ck}=18N/mm^2$	m3	1.06	
	FORM		m2	5.38	
	BASE AGGREGATE	RC-40	m3	1.59	
	ANCHOR BAR	D13,SD345	kg	7.0	
CONCRETE BARRIER (TYPE1)	CONCRETE	$\sigma_{ck}=24N/mm^2$	m3	17.04	
	FORM OF CONCRETE		m2	59.47	
	BASE CONCRETE	$\sigma_{ck}=18N/mm^2$	m3	1.65	
	FORM OF BASE CONCRETE		m2	1.57	
	AGGREGATE		m3	10.91	
	BAR	D16,SD345	kg	574.2	
		D13,SD345	kg	1,002.8	
	JOINT FILLER	t=20mm	m2	2.58	
	RUBBER PL	t=10mm	m2	3.97	SIZE:10×300×600 23 SHEETS
CONCRETE	$\sigma_{ck}=18N/mm^2$	m3	0.33		
EARTH WORKS	AGGREGATE OF BACK WALL	C-40	m3	26.8	
JOINT		t=20mm	m2	0.63	

TABLE OF MATERIALS FOR MECHANICALLY STABILISED EARTH WALL

【Thaketa : Main Load(STA.2+600~2+672.686)LEFT SIDE】

(THIN TYPE : t=140 mm)

ITEM	SYMBOL	SIZE	UNIT	QUANTITY	REMARKS
CONCRETE SKIN	A 4	1.50 × 1.50 = 2.2500 m ²	SHEET	3	
	BP 4	1.50 × 1.48 = 2.2200 "	"	4	BAR b=300
	BLP 4	1.35 × 1.48 = 1.9980 "	"	1	BAR b=300
	C 2	1.50 × 0.75 = 1.1250 "	"	3	
	CL 2	1.35 × 0.75 = 1.0125 "	"	1	
	CR 2	1.35 × 0.75 = 1.0125 "	"	1	
	DP 2	1.50 × 0.73 = 1.0950 "	"	3	BAR b=300
	DRP 2	1.35 × 0.73 = 0.9855 "	"	1	BAR b=300
STRIP	PL (SS400)	80 × 4.0 × 5,000	NUMBER	32	
		" 4,000	"	18	
	TOTAL LENGTH		m	232.00	
BOLT & NUT		M12 × 40	NUMBER	50	
HORIZONTAL JOINT		85 × 20 × 600	SHEET	16	
PREMEABLE SAND		420 × 4	m	20.1	
INSTALLATION METAL OF EDGE	L	125 × 210 × 3.2×1500	NUMBER	1	θ= 90 °
	L	125 × 210 × 3.2× 750	"	1	θ= 90 °
CONCRETE ANCHOR		M12 × 90	"	4	
WALL AREA				27.30 m ²	
WALL HEIGHT				2.230 m	
CONSTRUCTION LENGTH				13.250 m	

SUMMARY OF QUANTITIES FOR GRAVITY WALL

【Main road LEFT SIDE(STA.2+620~2+659.442)】

ITEM		DISCREPTION	UNIT	QUANTITY	REMARKS
BODY	CONCRETE		m3	106.02	
	FORM		m2	284.71	
	BER	D16,SD345	kg	4,088.90	
		D13,SD345	kg	2,303.20	
	JOINT	t=20mm	m2	7.85	
	SCAFFOLDING	FRAM SCAFFOLDING	m2	106.12	

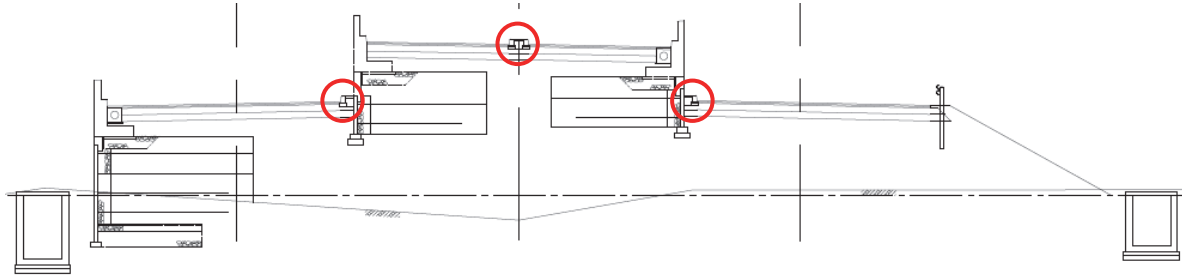
TABLE OF MATERIAL FOR GRAVITY WALL

ITEM	DISCREPTION	UNIT	QUANTITY				TOTAL
			①	②	③	④	
CONCRETE		m3	18.25	23.41	28.96	35.40	106.02
FORM		m2	56.19	72.42	72.42	83.68	284.71
BER	D16,SD345	kg	983.9	1,035.0	1,035.0	1,035.0	4,088.90
	D13,SD345	kg	554.2	583.0	583.0	583.0	2,303.20
JOINT	t=20mm	m2	2.09	2.58	3.18	-	7.85
SCAFFOLDING		m2	-	-	49.52	56.60	106.12

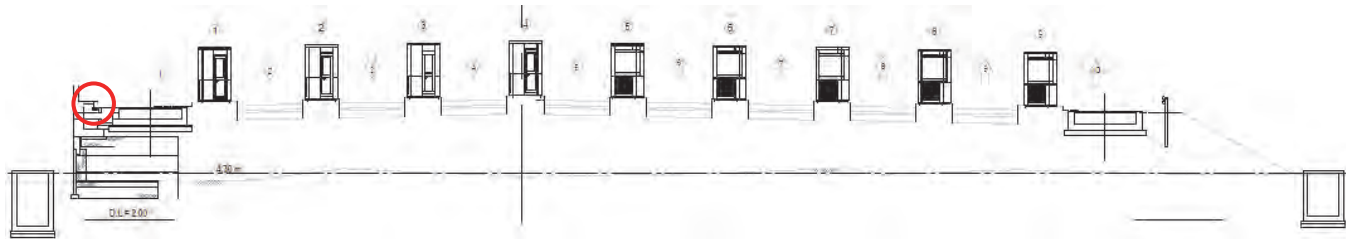
2.5.1 Kerb, Guard Rail and Guard Pipe

(a) Kerb

Kerb, Type A-1, is deployed in the median of main road, and in the inside raised protection shoulder of approach roads between Toll Plaza and Shukhinthar Mayopat Road/Thanlyin Chin Kat Road Intersection.



Further, Kerb, Type E, is designed to install in 1.20 m wide felloe guard section of toll plaza area.



Median of Main Road

Length = 81.560 m (from STA. 2+594.440 to STA. 2+676.000) \times 2 = 163.120 m

Approach Road

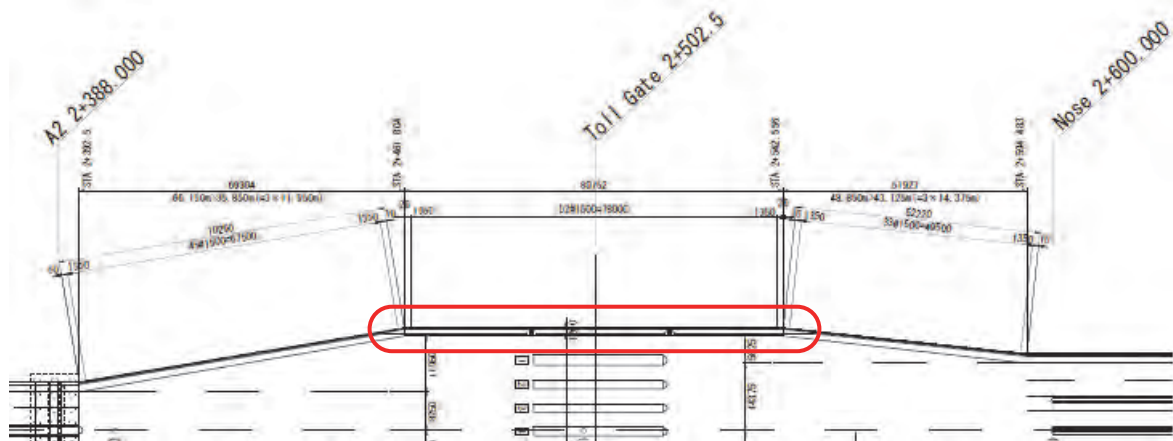
from Toll Plaza : Length = 82.660 m (from STA. 2+594.440 to STA. 2+677.100)

to Toll Plaza : Length = 82.617 m (from STA. 2+594.483 to STA. 2+677.100)

Total length of Kerb, Type A-1 = 163.120 + 82.660 + 82.617 = 328.397 m

Felloe Guard Section of Toll Plaza

Felloe guard section of Toll Plaza, enclosed by red line in a figure below, consists of a rectangular section and two triangular (taper) sections.



Length of Kerb, Type E = 80.752 (from STA. 2+461.804 to STA. 2+542.556) +
5.680 (taper section 1) + 8.915 (taper section 2) = 95.347 m

(b) Guardrail

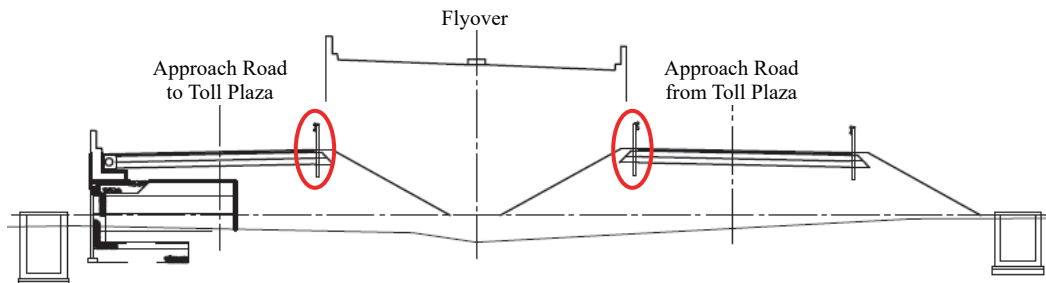
Main Road

The right side (upstream side) of the main road, after the Bago Bridge section, inclusive Toll Plaza area, is designed as the earthwork section with normal fill slope. Then, guardrail, Type GR-A, is deployed in the protection shoulder area. The installed guardrail continues to the end of approach road from Toll Plaza to the existing intersection.

Length = 71.809 (from STA. 2+392.500 to STA. 2+461.010: skewed length) +
83.619 (from STA. 2+461.010 to STA. 2+544.629) +
52.090 (from STA. 2+544.629 to STA. 2+594.440: skewed length) +
196.239 (from STA. 2+594.440 to STA. 2+790.679: Edge of Stop Line) = 403.757 m

Under the Flyover

Under the flyover, the section between approach roads is depressed with fill slopes as shown below. For the traffic safety, guardrail, Type GR-A, is designed at the shoulder of fill slope.



Length = 115.2224 (from STA. 2+677.100: Flyover Abutment Wall Face to STA. 2+792.322: before the pedestrian crosswalk) × 2 = 230.445 m

Grand Total of Guardrail, GR-A, Length = 403.757 + 230.445 = 634.202 m

2.5.2 Road Marking

(a) Main Road: Unbroken Line, White, Width = 10 cm

Bridge Section

Length = 1080.500 m (from STA. 1+312.000 to STA. 2+392.500) \times 4 = 4322.000 m

Main Road: Flyover Side

Length = 81.560 m (from STA. 2+594.440 to STA. 2+676.000: Thaketa bound) \times 2 +
81.517 m (from STA. 2+594.483 to STA. 2+676.000: Thanlyin bound) \times 2 = 326.154 m

Approach Road from Toll Plaza to the existing Intersection

Length = 198.364 (from STA. 2+594.440 to STA. 2+792.804: Edge of Pedestrian Crossing) \times 2
= 396.728 m

Approach Road from the existing Intersection to Toll Plaza

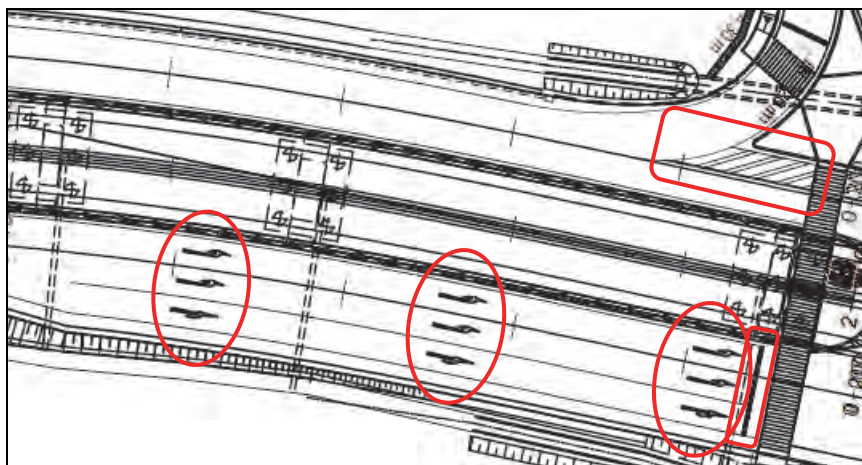
Length = 198.321 (from STA. 2+594.483 to STA. 2+792.804: Edge of Pedestrian Crossing) +
221.845 (outmost unbroken line measured from the drawing) +
42.449 (inside unbroken line of right-turn channel from Shukhinthar-Mayopat Road)
= 462.615 m

Total Length of Unbroken Line, White, Width = 10 cm

= 4322.000 + 326.154 + 396.728 + 462.615 = 5507.497 m

(b) Main Road: Unbroken Line, White, Width = 15 cm and 45 cm

Unbroken line, white, width = 15 cm and 45 cm are used in zebra marking indicated in the plan below.



The following lengths are measured from the drawing.

Length of Unbroken Line, White, Width = 15 cm = 17.427 m

Length of Unbroken Line, White, Width = 45 cm = 6.288 + 6.279 + 6.277 + 4.827 + 1.313
= 24.984 m

(c) Unbroken Line, White, Width = 30 cm: Stop Line

Length of Unbroken Line, White, Width = 30 cm = 10.500 m

(d) Main Road: Broken Line, White, Width = 10 cm

Bridge Section

Length = 1080.500 (from STA. 1+312.000 to STA. 2+392.500) × 2 = 2161.000 m

Approach Road from Toll Plaza to the existing Intersection

Length = 196.239 (from STA. 2+594.440 to STA. 2+790.679: Edge of Stop Line) +
80.810 (Broken Line along the auxiliary lane was measured from the drawing) = 277.049 m

Approach Road from the existing Intersection to Toll Plaza

Length = 198.321 m (from STA. 2+594.483 to STA. 2+792.804: Edge of Pedestrian Crossing)

(e) Toll Ahead Marks (PM-4)

Toll Ahead Marks are provided at STA. 1+902.500 and STA. 2+202.500 on the Thaketa bound lanes, inside lane and outside lane respectively. Therefore:

Number of Toll Ahead Marks is 4.

(f) Arrow Mark, White (PM-AR2 and PM-AR3)

On the approach road from Toll Plaza to the existing intersection, nine (9) arrow marks are designed before the stop line, with the following breakdown:

Arrow Marks, White, PM-AR2	3 numbers
Arrow Marks, White, PM-AR3	6 numbers
Total	9 numbers

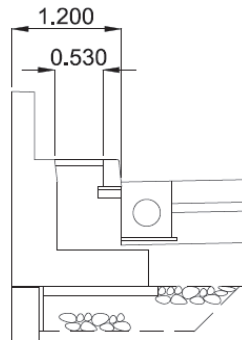
2.5.3 Concrete Seal for Median and Side Strip

(a) Median of Main Road, Width = 0.750 m

Length of Concrete Seal = 81.560 m (from STA. 2+594.440 to STA. 2+676.000)

(b) Side Strip (Toll Plaza Section), Width = 1.200 m

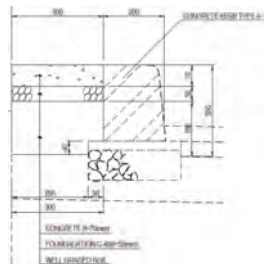
Left side (downstream side) of Toll Plaza has mechanically-stabilised earth wall with 1.200 m wide felloe guard. The section consists of a wall-type handrail above mechanically-stabilised earth wall, concrete seal section and concrete kerb of Type E. The actual width of concrete seal is 0.530 m. This quantity is estimated by sq.m.



Area = 80.752 (from STA. 2+461.804 to STA. 2+542.556) $\times 0.530$ +
 $(3.180$ (triangular section) + 4.981 (triangular section)) $\times 0.530/2 = 44.961 \text{ m}^2$

(c) Side Strip next to "Wall", Width = 0.500 m

Just before the flyover, the main road is supported by gravity wall and mechanically-stabilised earth wall at both, left and right, ends. Approach roads between Toll Plaza and the existing intersection run parallel to the main road, and have raised protection shoulder of 0.500 m width next to the wall, as shown in the illustration below.



Approach Road from Toll Plaza to the existing intersection

Length = 82,660 (from STA. 2+594.440 to STA. 2677.100 (Abutment AF.1 Wall Face))

Approach Road from the existing intersection to Toll Plaza

Length = 82.617 (from STA. 2+594.483 to STA. 2+677.100 (Abutment AF.1 Wall Face))

Total Length of Concrete Seal = $82,660 + 82,617 = 165.277 \text{ m}$

2.5.4 Concrete Seal under Flyover Section

The area between approach roads (to toll plaza and from toll plaza) under the flyover shall be covered with concrete seal.

Station	Distance (m)	Width (m)	Area (m ²)
2+677.100	-	5.906	-
2+680.000	2.900	6.222	17.586
2+680.992	0.992	6.330	6.225
2+700.000	19.008	8.882	144.576
2+720.000	20.000	11.107	199.890
2+724.080	4.080	11.455	46.024
2+740.000	15.920	12.142	187.834
2+760.000	20.000	12.239	243.810
2+777.651	17.651	12.250	216.130
2+780.000	2.349	12.250	28.772
2+782.486	2.486	12.250	30.449
2+792.322	9.837	12.250	120.499
Total Area			1241.797

Concrete Seal under Flyover Section

Concrete Seal

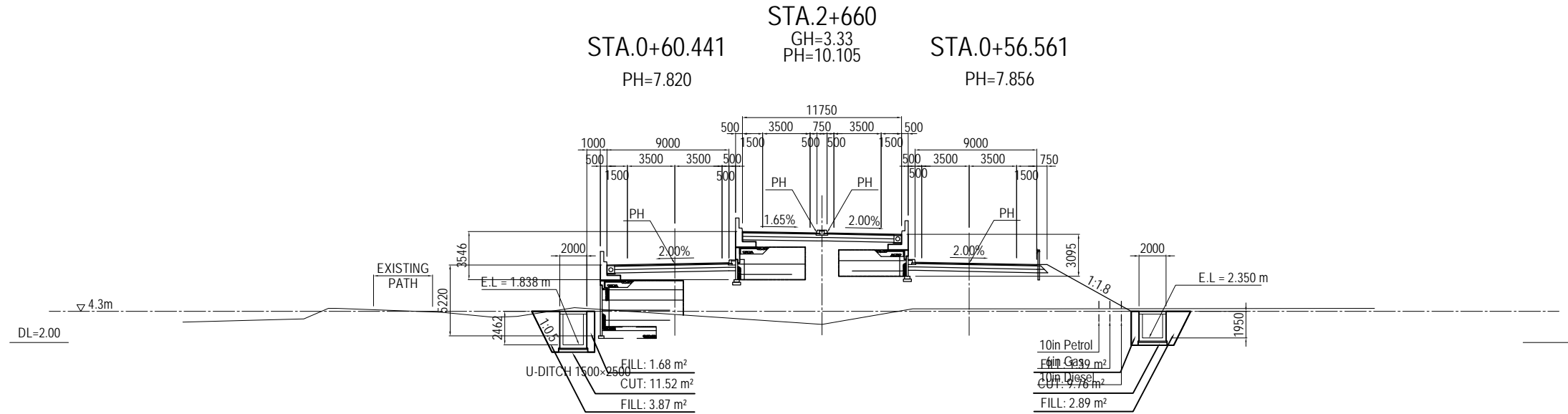
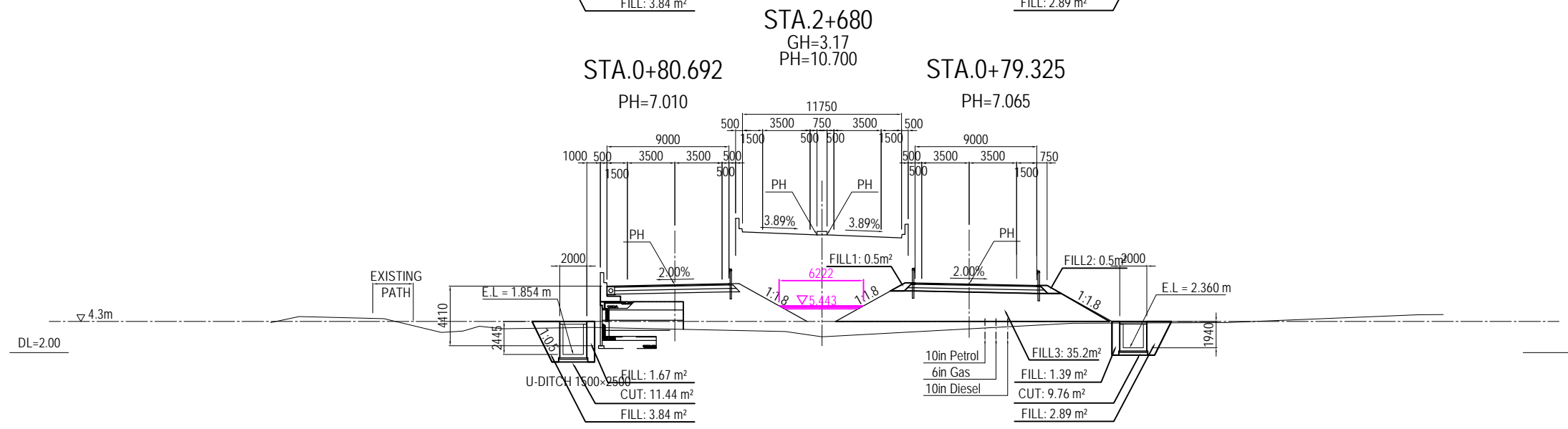
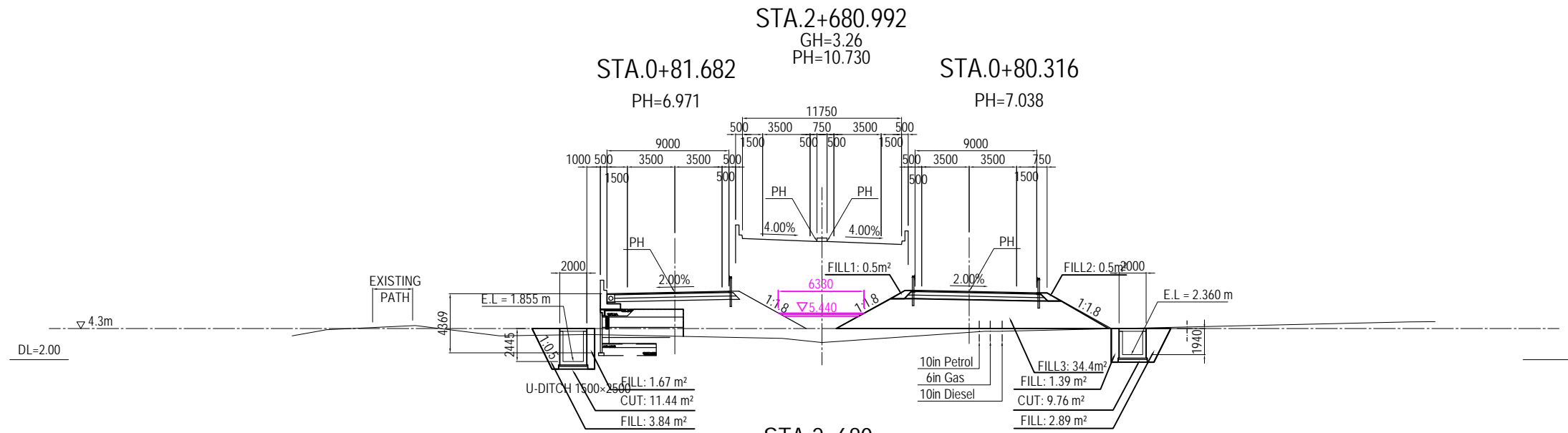
@ 1000.0 m

Station	Distance (m)	Cut						Remark
		Area (m2)	Average (m)	Area (m2)	Area (m2)	Average (m)	Volume (m3)	
STA. 2 +677.000		6.222						
STA. 2 +680.000	3.000	6.222	6.22	18.7				
STA. 2 +680.992	0.992	6.330	6.28	6.2				
STA. 2 +700.000	19.008	8.882	7.61	144.7				
STA. 2 +720.000	20.000	11.107	9.99	199.8				
STA. 2 +724.080	4.080	11.445	11.28	46.0				
STA. 2 +740.000	15.920	12.142	11.79	187.7				
STA. 2 +760.000	20.000	12.239	12.19	243.8				
STA. 2 +777.651	17.651	12.250	12.24	216.0				
STA. 2 +780.000	2.349	12.250	12.25	28.8				
STA. 2 +782.486	2.486	12.250	12.25	30.5				
STA. 2 +789.900	7.414	12.250	12.25	90.8				
Total	112.900			1,213.0			0.0	
Total Volume				1,213.0			0.0	

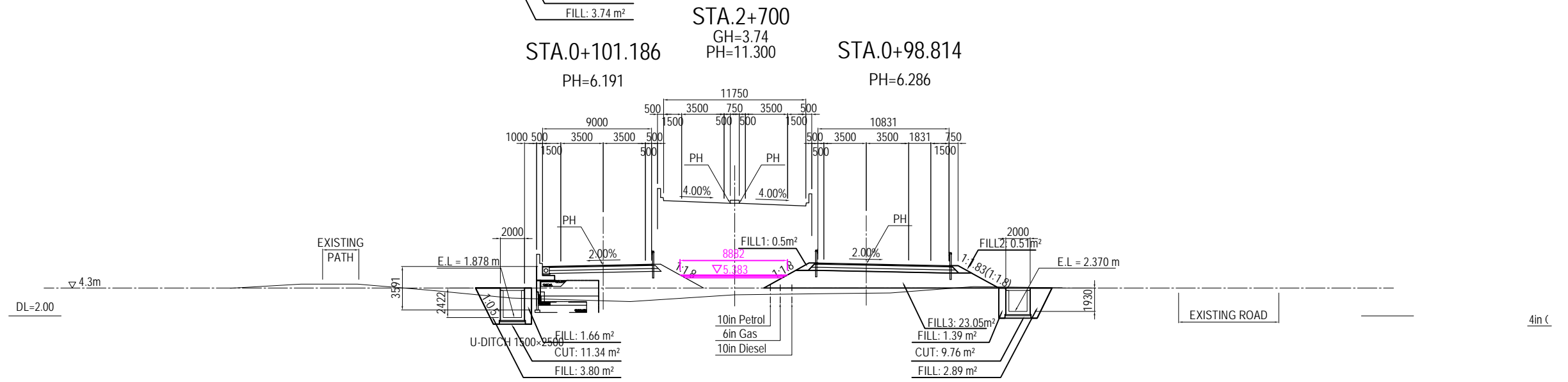
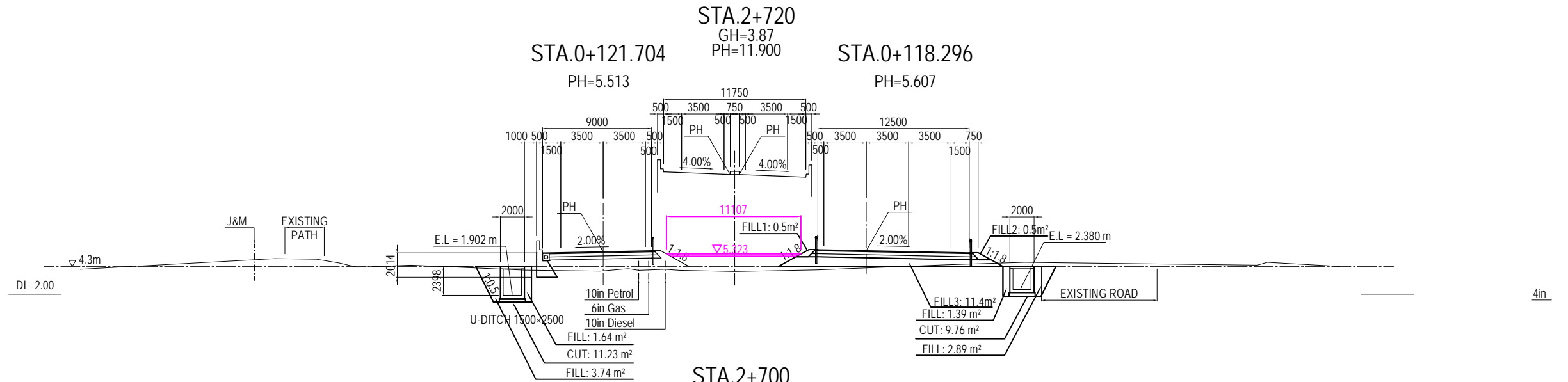
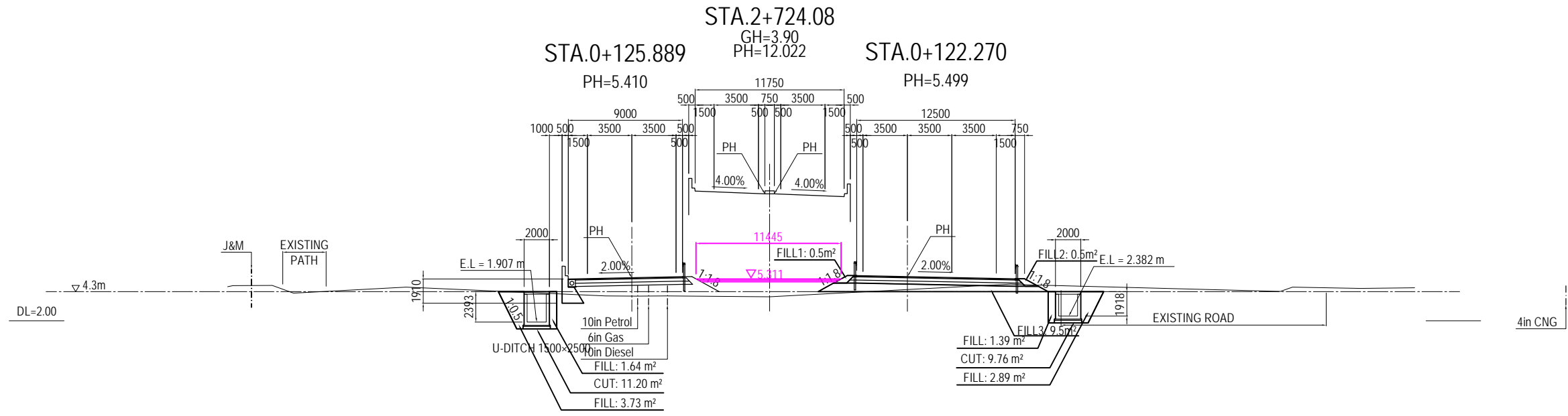
- 1. Deduction for PF1 $A=2.2m * 7m=15.4m^2$
- 2. Deduction for PF2 $A=3.0m * 7m=21m^2$

Deducted Total Volume (=Total Volume -(1.+2.)
 $A=1213m^2 - (15.4m^2 + 21m^2) = 1176.6m^2$

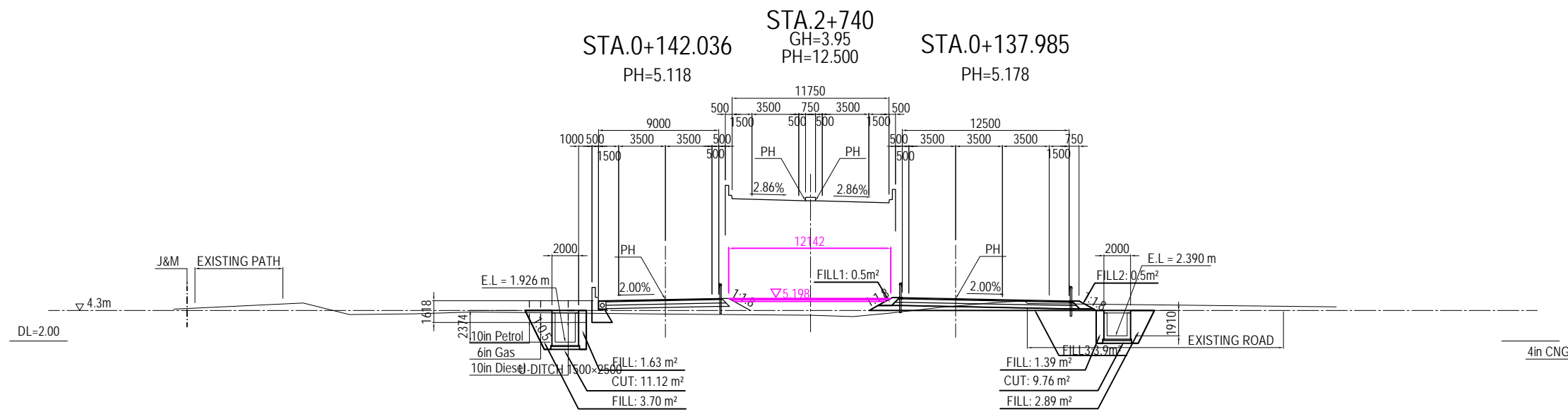
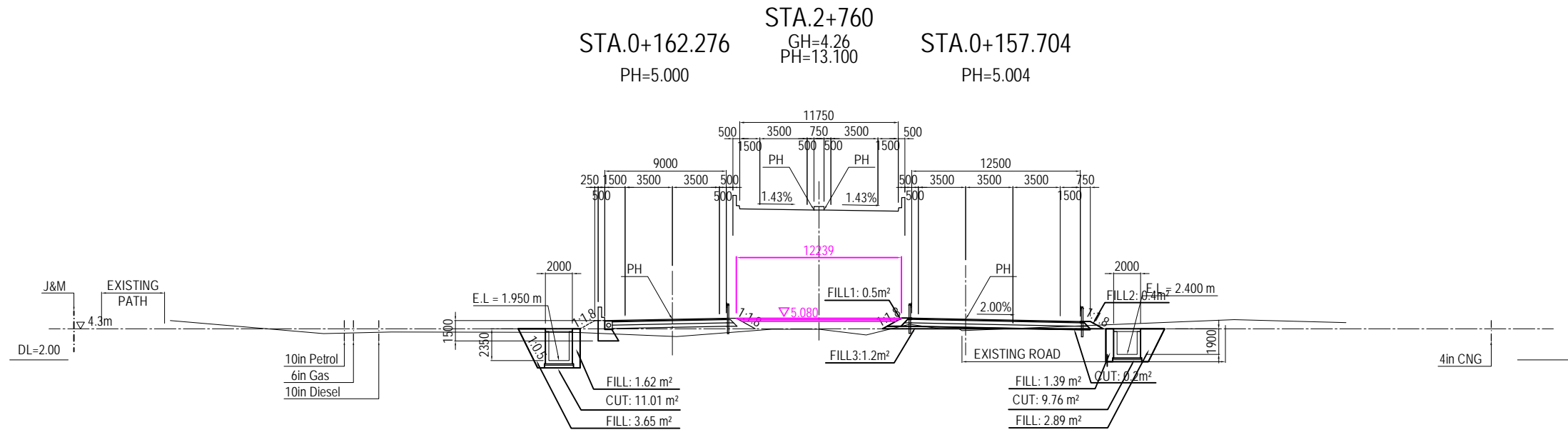
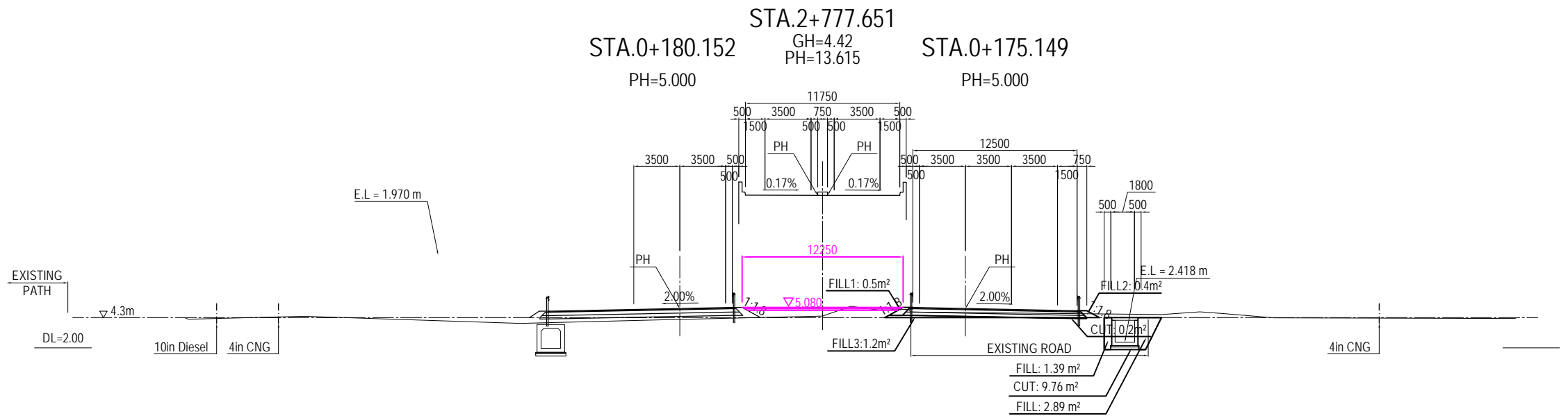
CROSS SECTION(6)



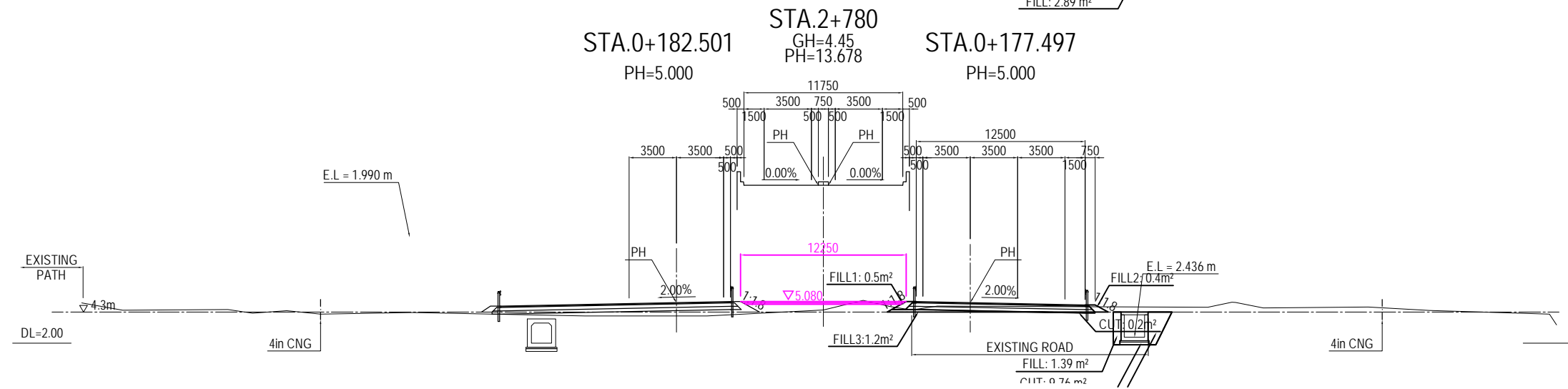
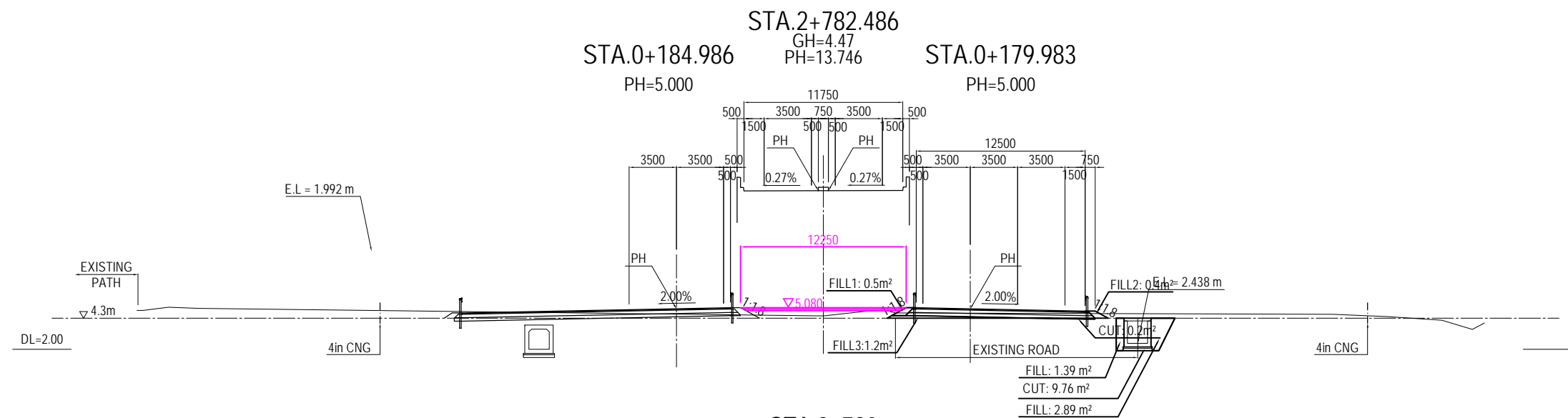
CROSS SECTION(7)



CROSS SECTION(8)



CROSS SECTION(9)



Approach Slab for Flyover Section (AF1)

1) Summary of quantity of approach slab

Item	Specification	Unit	AF1 Abutment	Total	Remarks	
Concrete	Reinforcement structure	m ³	18.9	18.9	$\sigma_{ck}=24\text{N/mm}^2$	
Form	Reinforcement structure	m ²	7.3	7.3		
Reinforcement bar	Weight	D10	t	0.008	0.008	SD345
		D13	t	0.705	0.705	SD345
		D16	t	-----	-----	SD345
		D22	t	-----	-----	SD345
		D25	t	0.589	0.589	SD345
		D29	t	1.413	1.413	SD345
		D32	t	-----	-----	SD345
		Total	t	2.715	2.715	SD345
Rubber bearing	t=20	m ²	2.2	2.2		
Joint material	t=20	m ²	9.0	9.0		
Gas pipe	Sgp4oa	kg	17	17		
Cap	$\phi 60 \times 3.2$	kg	2	2		

1. Quantity of approach slab (construction of package 2)

1) Concrete

$$V_2 = 10.80 \times 5.00 \times 0.35 = 18.9 \text{ m}^3$$

$$\Sigma V = 18.9 \text{ m}^3$$

2) Form

$$A_2 = (10.80 + 5.00 \times 2) \times 0.35 = 7.3 \text{ m}^2$$

$$\Sigma A = 7.3 \text{ m}^2$$

3) Rubber shoe

t=20mm

$$A_2 = 0.20 \times 10.80 = 2.2 \text{ m}^2$$

$$\Sigma A = 2.2 \text{ m}^2$$

4) Joint material

t=20mm

$$A_2 = (0.35 + 0.48) \times 10.80 = 9.0 \text{ m}^2$$

$$\Sigma A = 9.0 \text{ m}^2$$

5) Gas pipe (sgp50A)

$$W_2 = 0.23 \times \overset{\text{(kg/m)}}{5.31} \times 14 = 17 \text{ kg}$$

$$\Sigma W = 17 \text{ kg}$$

6) Anchor cap ($\phi 70 \times 3.2$)

$$W_2 = \pi/4 \times \overset{\text{(kg/m)}}{0.07^2} \times 0.003 \times 7.85 \times 10^3 \times 14 = 2 \text{ kg}$$

$$\Sigma W = 2 \text{ kg}$$

7) Reinforcement bar

(SD345)

Diameter	Unit	Quantity	Remarks
D10	kg	8	
D13	kg	705	
D16	kg	-----	
D19	kg	-----	
D22	kg	589	
D25	kg	1413	
D29	kg	-----	
D32	kg	-----	
Total	kg	2715	

**ROAD DESIGN
(PACKAGE 2)**

**3. RELOCATION ROAD
TO THANLYIN BRIDGE**

3 RELOCATION ROAD TO EXISTING YANGON-THANLYIN BRIDGE

The boundary line between Package 2 and Package 3 was defined at the edge of pedestrian crossing. The pedestrian crossing belongs to Package 3. Therefore, the relocation road to the existing Yangon-Thanlyin Bridge in Package 2 starts from STA. 0+26.880.

3.1 EARTHWORKS

(a) Two-Lane Section

Station	Distance	Cut		Fill	
		Area	Volume	Area	Volume
0+026.880	-	3.756	-	0.427	-
0+040.000	13.120	2.253	39.420	0.765	7.819
0+060.000	20.000	1.016	32.696	1.310	20.747
0+080.000	20.000	1.280	22.961	2.897	42.070
0+100.000	20.000	1.284	25.634	1.833	47.301
0+120.000	20.000	2.348	36.311	1.356	31.896
Subtotal		157.021		Subtotal	149.833

Note: for the calculation purpose, the cut area and fill area at STA. 0+120 is a summed area of one lane section of STA. 0+ 120.

(b) One Lane Section to Yangon-Thanlyin Bridge

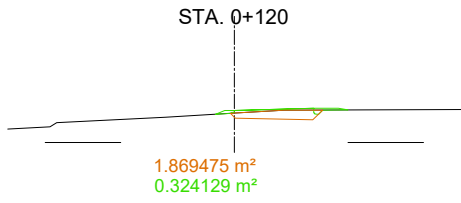
Station	Distance	Cut		Fill	
		Area	Volume	Area	Volume
0+120.000	-	1.869		0.324	
0+140.000	20.000	1.144	30.130	0.645	9.688
0+160.000	20.000	1.498	26.418	0.360	10.050
0+168.656	8.656	1.025	10.920	0.513	3.780
Subtotal		67.468		Subtotal	23.518

(c) One Lane Section from Yangon-Thanlyin Bridge

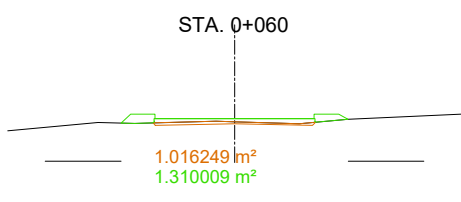
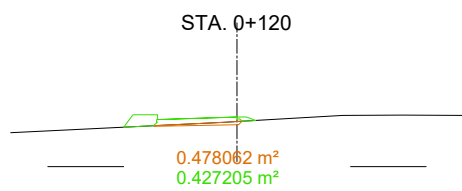
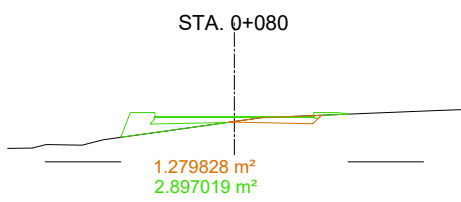
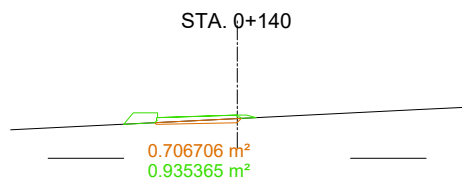
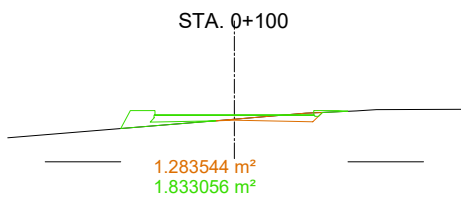
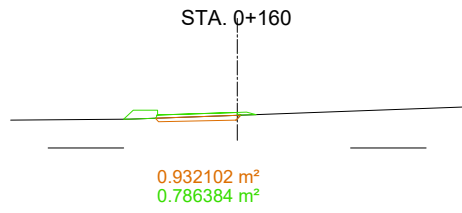
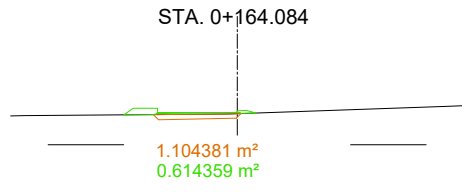
Station	Distance	Cut		Fill	
		Area	Volume	Area	Volume
0+120.000	-	0.478	-	1.032	-
0+140.000	20.000	0.707	11.848	0.935	19.677
0+160.000	20.000	0.932	16.388	0.786	17.217
0+164.084	4.084	1.104	4.158	0.614	2.860
Subtotal		32.394		Subtotal	39.755

Grand Total of Cut Volume = $157.021 + 67.468 + 32.394 = 256.883 \text{ m}^3$

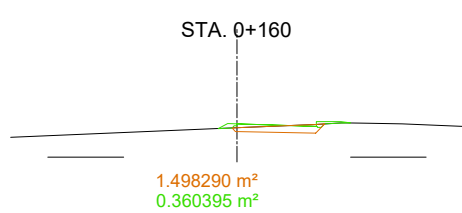
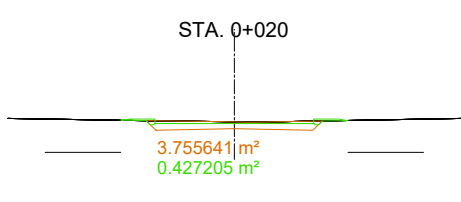
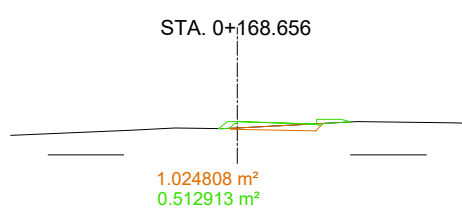
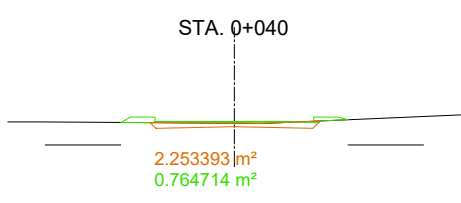
Grand Total of Fill Volume = $149.833 + 23.518 + 39.755 = 213.106 \text{ m}^3$



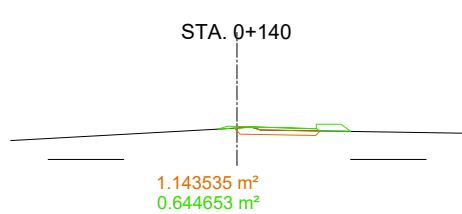
On the Right Side
From STA. 0+120 to the Right-Hand Side in Bridge



On the Left Side
From the Right-Hand Side in Bridge to STA. 0+120

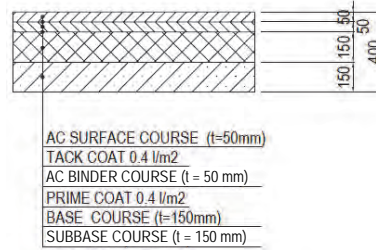


On the Left Side
From STA. 0+026.880 to STA. 0+100

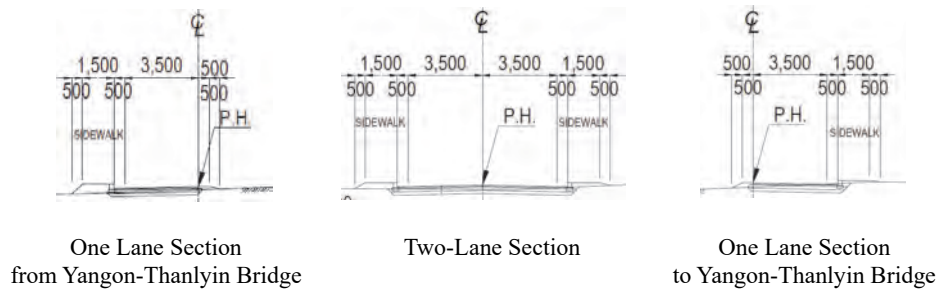


3.2 PAVEMENT

Type E6 pavement structure of the details below was applied to the relocation road to existing Yangon-Thanyin Bridge.



The paved surface width is 8.00 m at two-lane section, and 4.00 m at one lane section, as given in the cross section below.



For the quantity calculation purpose, the pavement layer width is defined as follows:

- ✓ Asphalt concrete surface course shall be constructed with the paved surface width.
- ✓ The width of asphalt concrete binder course is the same with asphalt concrete surface course.
- ✓ Tack coat shall be sprayed on the asphalt concrete binder course.
- ✓ The construction width of base course is 20 cm wider than the width of asphalt concrete binder course taking into consideration of construction allowance of 10 cm at left and right side.
- ✓ Prime coat shall be sprayed on the base course.
- ✓ The construction width of subbase course is 30 cm wider than the width of base course taking into consideration of construction allowance of 15 cm at left and right side.

(a) Two-Lane Section

Length = 93.120 m (from STA. 0+26.880 to STA. 0+120)

Pavement	Width (m)	Length (m)	Area (m ²)
Asphalt Concrete Surface Course (t = 50 mm)	8.000	93.120	744.961
Tack Coat 0.4 l/m ²	8.000	93.120	744.961
Asphalt Concrete Binder Course (t = 50 mm)	8.000	93.120	744.961
Prime Coat 0.4 l/m ²	8.200	93.120	763.585
Base Course (t = 150 mm)	8.200	93.120	763.585
Subbase Course (t = 150 mm)	8.500	93.120	791.521

(b) One Lane Section to Yangon-Thanlyin Bridge

Length = 48.656 m (from STA. 0+120.000 to STA. 0+168.656)

Pavement	Width (m)	Length (m)	Area (m ²)
Asphalt Concrete Surface Course (t = 50 mm)	4.000	48.656	194.623
Tack Coat 0.4 l/m ²	4.000	48.656	194.623
Asphalt Concrete Binder Course (t = 50 mm)	4.000	48.656	194.623
Prime Coat 0.4 l/m ²	4.200	48.656	204.355
Base Course (t = 150 mm)	4.200	48.656	204.355
Subbase Course (t = 150 mm)	4.500	48.656	218.951

(c) One Lane Section from Yangon-Thanlyin Bridge

Length = 44.084 m (from STA. 0+120.000 to STA. 0+164.084)

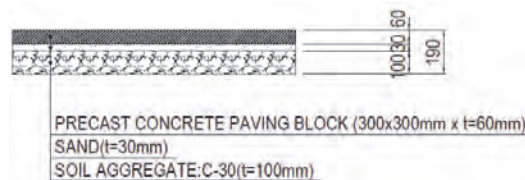
Pavement	Width (m)	Length (m)	Area (m ²)
Asphalt Concrete Surface Course (t = 50 mm)	4.000	44.084	176.335
Tack Coat 0.4 l/m ²	4.000	44.084	176.335
Asphalt Concrete Binder Course (t = 50 mm)	4.000	44.084	176.335
Prime Coat 0.4 l/m ²	4.200	44.084	185.152
Base Course (t = 150 mm)	4.200	44.084	185.152
Subbase Course (t = 150 mm)	4.500	44.084	198.377

(d) Total Quantity of Pavement Work

Pavement	(a)	(b)	(c)	Total
Asphalt Concrete Surface Course (t = 50 mm)	744.961	194.623	176.335	1115.919
Tack Coat 0.4 l/m ²	744.961	194.623	176.335	1115.919
Asphalt Concrete Binder Course (t = 50 mm)	744.961	194.623	176.335	1115.919
Prime Coat 0.4 l/m ²	763.585	204.355	185.152	1153.091
Base Course (t = 150 mm)	763.585	204.355	185.152	1153.091
Subbase Course (t = 150 mm)	791.521	218.951	198.377	1208.849

(e) Precast Concrete Paving Block

Sidewalk shall be furnished by the precast concrete paving block with the composition shown below.



The width of sidewalk is 1.500 m with concrete kerb, Type A-1, 20 cm wide, at one end. Therefore, the precast concrete paving block shall cover 1.30 m of sidewalk.

The area of Precast Concrete Paving Block is estimated as follows:

Location	Length (m)	Width (m)	Area (m ²)
Upstream	137.204 m (from STA. 0+26.880 to STA. 0+164.084)	1.300	178.365
Downstream	141.776 m (from STA. 0+26.880 to STA. 0+168.656)	1.300	184.309
Total Area =			362.674

3.3 MISCELLANEOUS

3.3.1 Kerb, Guard Rail and Guard Pipe

Relocation Road to existing Yangon-Thanlyin Bridge has Kerb, Type A-1, at the boundary between roadway and sidewalk.

Upstream side : L = 137.204 m (from STA. 0+26.880 to STA. 0+164.084)

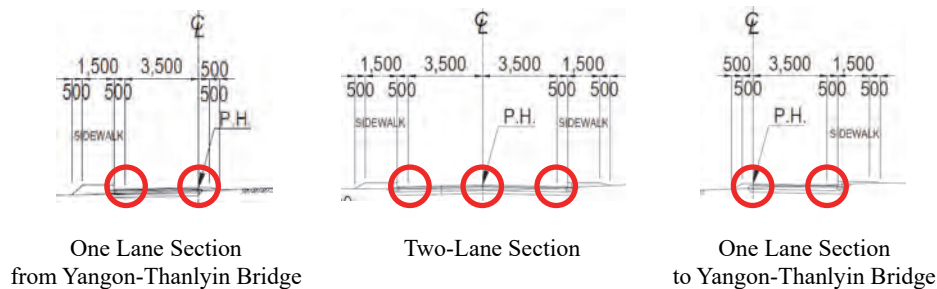
Downstream side : L = 141.776 m (from STA. 0+26.880 to STA. 0+168.656)

Total : L = 278.980 m

3.3.2 Road Markings

(a) Unbroken Line, White, Width = 10 cm

The relocation road will have unbroken line road markings on the centreline and carriageway edges. Circled points show the location where unbroken line will be provided in the illustration below.



Two-Lane Section: L = 75.519 m (from STA. 0+26.880 to STA. 0+102.399)

$$\text{Unbroken Line} = 75.519 \times 3 = 226.557 \text{ m}$$

One Lane Section: to Yangon-Thanlyin Bridge

$$L = 66.257 \text{ m (from STA. 0+102.399 to STA. 0+168.656)}$$

$$\text{Unbroken Line} = 66.257 \times 2 = 132.514 \text{ m}$$

One Lane Section: from Yangon-Thanlyin Bridge

$$L = 61.685 \text{ m (from STA. 0+102.399 to STA. 0+164.084)}$$

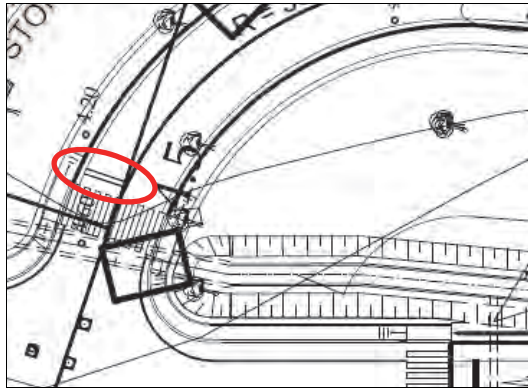
$$\text{Unbroken Line} = 61.685 \times 2 = 123.370 \text{ m}$$

Total Length of Unbroken Line = 226.557 + 132.514 + 123.270 = 482.440 m

(b) Unbroken Line, White, Width = 30 cm: Stop Line

Before the pedestrian crossing, the stop line shall be provided. The length was measured from the

drawing.



Unbroken Line, White, Width = 30 cm: Stop Line, Length = 3.522 m

**ROAD DESIGN
(PACKAGE 2)**

4. DRAINAGE STRUCTURES

Package 2 Drainage Structures

PAY ITEM:	Unit	Qty		
		Main Road	Total	
04100 Open Ditches	04100-12 Side Ditch Type U-300x300	m	26.207	26.207
	04100-13 Side Ditch Type U-500x500	m		0.000
	04100-14 Side Ditch Type U-800x800	m		0.000
	04100-15 Side Ditch Type U-1000x1000	m		0.000
	04100-05 Side Ditch Type U-1500x1500	m		0.000
	04100-01 Side Ditch Type U-500x500 with Concrete Cover	m		0.000
	04100-02 Side Ditch Type U-500x850 with Concrete Cover	m		0.000
	04100-03 Side Ditch Type U-800x800 with Concrete Cover	m		0.000
	04100-16 Side Ditch Type U-800x1000 with Concrete Cover	m		0.000
	04100-17 Side Ditch Type U-1000x1000 with Concrete Cover	m		0.000
	04100-18 Side Ditch Type U-1000x1500 with Concrete Cover	m		0.000
	04100-19 Side Ditch Type U-1500x1500 with Concrete Cover	m		0.000
	04100-20 Side Ditch Type U-1500x2500 with Concrete Cover	m	1111.563	1111.563
04330 Catch Basins/Pits, Inlets, Outlets, Manholes	04330-01 Catch Pit (C=DITCH) Type A	Nos	32.000	32.000
	04330-04 Catch Pit (C=DITCH) Type C	Nos	17.000	17.000
	04330-05 Catch Pit (C=DITCH) Type D	Nos	2.000	2.000
	04330-02 Catch Pit (C=DITCH) Type B	Nos	4.000	4.000
	04330-06 Catch Pit 700 x 700 x 1050	Nos		0.000
	04330-07 Catch Pit 700 x 700 x 1850	Nos		0.000
	04330-08 Catch Pit 700 x 700 x 2250	Nos		0.000
	04330-09 Catch Pit 1000 x 1000 x 1350	Nos		0.000
	04330-10 Catch Pit 1200 x 1200 x 1600	Nos		0.000
	04330-03 Catch Pit 600 x 600 x 1100	Nos	4.000	4.000
04310 Concrete Pipe Culverts	04310-02 Concrete Pipe Culvert φ300 (CON. 360°) TYPE B	m	358.097	358.097
	04310-01 Concrete Pipe Culvert φ300 (CON. 360°) TYPE A	m	102.064	102.064
	04310-03 Concrete Pipe Culvert φ900 (CON. 360°)	m	0.000	0.000
04320 Concrete Box Culverts	04320-03 Box Culvert Type 1000 x 1000	m		0.000
04400 Vertical Drain	04400-01 Vertical Drain Type A UPVC Pipe φ200mm	m	66.151	66.151
	04400-02 Vertical Drain Type A Joint (90°) φ200mm	Nos	17.000	17.000
	04400-03 Vertical Drain Type B U-Ditch Section A-A	m	2.550	2.550
	04400-04 Vertical Drain Type B U-Ditch Section B-B	m	13.858	13.858
	04400-05 Vertical Drain Type B U-Ditch Section C-C	m	1.132	1.132
	04400-06 Vertical Drain Type C UPVC Pipe φ150mm	m		0.000
04600 Drainage Outlet	04600-01 Drainage Outlet Type A Left Side	L.S		0.000
	04600-02 Drainage Outlet Type A Right Side	L.S		0.000
	04600-03 Drainage Outlet Type A Flap Gate 1000 x 1000	Nos		0.000
	04600-04 Drainage Outlet Type B Left Side	L.S	1.000	1.000
	04600-05 Drainage Outlet Type B Right Side	L.S	1.000	1.000
	04600-06 Drainage Outlet Type B Flap Gate 2000 x 1500	Nos	2.000	2.000

PAY ITEM: OPEN DITCHES
 LOCATION: MAIN ROAD

LOCATION	U-DITCH 300X300		U-DITCH 500X500		U-DITCH 800X800		U-DITCH 1000X1000		REMARKS
	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	
START SIDE	3.350	3.350							
	3.350	3.350							
	3.350	9.457							
END SIDE									
SUB TOTAL	10.050	16.157	0.000	0.000	0.000	0.000	0.000	0.000	
		26.207		0.000		0.000		0.000	

LOCATION	U-DITCH 1500X1500		U-DITCH 500X500C		U-DITCH 500X850C		U-DITCH 800X800C		REMARKS
	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	
START SIDE									
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		0.000		0.000		0.000		0.000	

LOCATION	U-DITCH 1000X1000C		U-DITCH 1000X1500C		U-DITCH 1500X1500C		U-DITCH 1500X2500C		REMARKS
	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	
START SIDE							540.562	571.001	
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	540.562	571.001	
		0.000		0.000		0.000		1111.563	

LOCATION									REMARKS
	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	L (m)	R (m)	
START SIDE									
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		0.000		0.000		0.000		0.000	

PAY ITEM: CATCH PIT
 LOCATION: MAIN ROAD

LOCATION	TYPE A		TYPE C		TYPE D		TYPE B		REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE	12.000	1.000	6.000		1.000	1.000	2.000	2.000	
	12.000		1.000						
	1.000		6.000						
	6.000		1.000						
			3.000						
END SIDE									
SUB TOTAL	31.000	1.000	17.000	0.000	1.000	1.000	2.000	2.000	
		32.000		17.000		2.000		4.000	

LOCATION	700x700x1050		1000x1000x1350		1200x1200x1600		600x600x1100		REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE								1.000	
								1.000	
								1.000	
								1.000	
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.000	
		0.000		0.000		0.000		4.000	

LOCATION									REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE									
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		0.000		0.000		0.000		0.000	

LOCATION									REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE									
END SIDE									
SUB TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		0.000		0.000		0.000		0.000	

PAY ITEM: PIPE CULVERT
 LOCATION: MAIN ROAD

LOCATION	Φ300 TYPE B		Φ300 TYPE A		Φ900				REMARKS
	L	R	L	R	L	R	L	R	
	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	
START SIDE	92.049	33.680	8.632	8.632					
	80.222			19.600					
	33.720			20.300					
	118.426			22.300					
				22.600					
END SIDE									
SUB TOTAL	324.417	33.680	8.632	93.432	0.000	0.000	0.000	0.000	
		358.097		102.064		0.000		0.000	

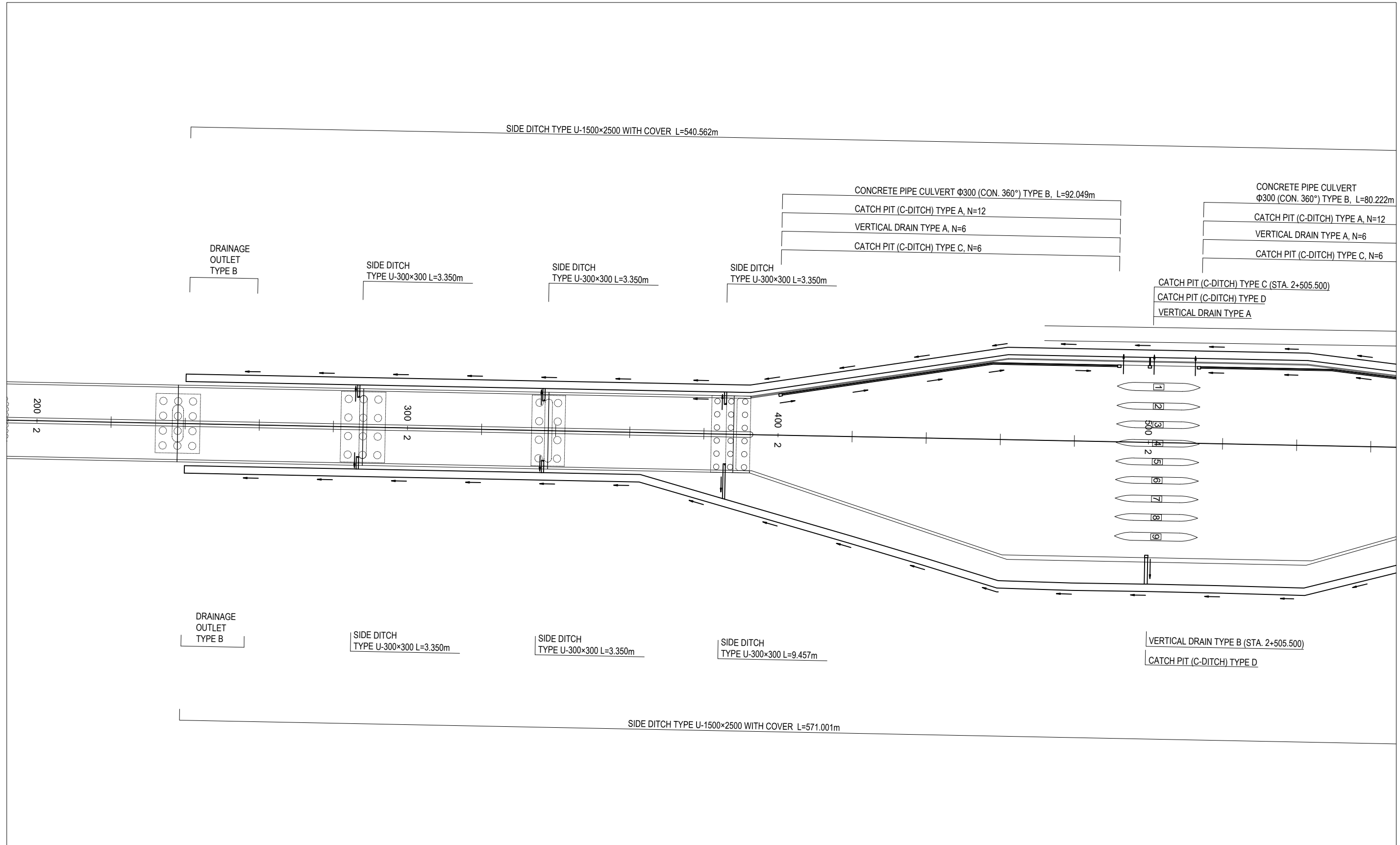
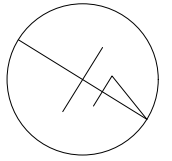
PAY ITEM: VERTICAL DRAIN
 LOCATION: MAIN ROAD

LOCATION	TYPE A		TYPE B						REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE	6.000			1.000					
	6.000			1.000					
	1.000								
	3.000								
	1.000								
END SIDE									
SUB TOTAL	17.000	0.000	0.000	2.000	0.000	0.000	0.000	0.000	
		17.000		2.000		0.000		0.000	

PAY ITEM: DRAINAGE OUTLET
 LOCATION: MAIN ROAD

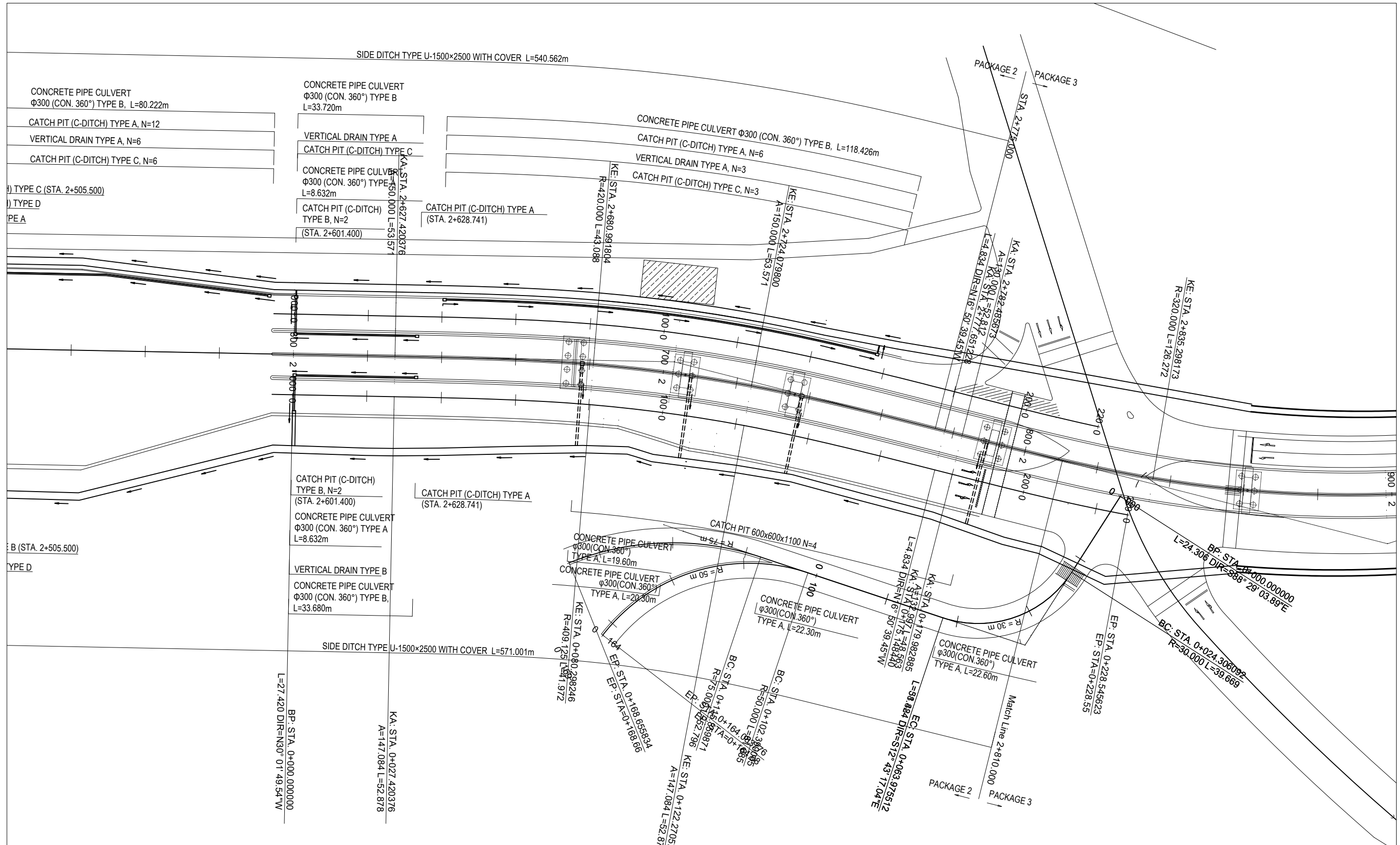
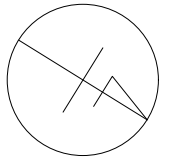
LOCATION	TYPE A		TYPE B						REMARKS
	L	R	L	R	L	R	L	R	
	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
START SIDE			1.000	1.000					
END SIDE									
SUB TOTAL	0.000	0.000	1.000	1.000	0.000	0.000	0.000	0.000	
		0.000		2.000		0.000		0.000	

DRAINAGE SYSTEM PLAN (1) S= 1:1000



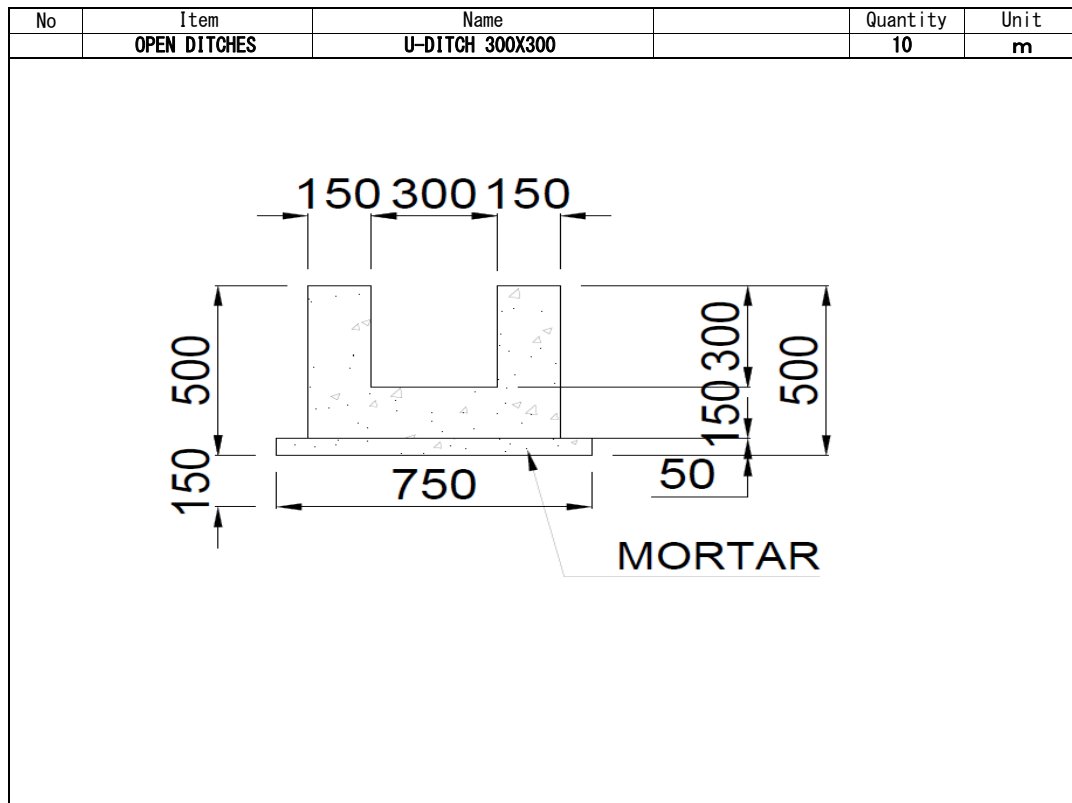
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DRAINAGE SYSTEM PLAN(1) S=1:1000	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-3010

DRAINAGE SYSTEM PLAN (2) S= 1:1000



PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">NAME</th> <th style="width: 15%;">SIGNATURE</th> <th style="width: 15%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td>21 Jun. 2017</td> </tr> </tbody> </table>	NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU	15 Jun. 2017	CHECKED BY	T. HAYAKAWA	20 Jun. 2017	APPROVED BY	Y. SANO	21 Jun. 2017	DRAWING TITLE DRAINAGE SYSTEM PLAN(1) S=1:1000	PACKAGE 2 DWG No. P2-RD-3011
NAME	SIGNATURE	DATE																
PREPARED BY	M. TORIU	15 Jun. 2017																
CHECKED BY	T. HAYAKAWA	20 Jun. 2017																
APPROVED BY	Y. SANO	21 Jun. 2017																

UNIT QUANTITY CALCULATION SHEET



Item	Formula	Quantity
U-300 x 300 Concrete	$V1 = 0.600 \times 0.150 \times 10.000 = 0.900 \text{ m}^3$	1.800 m ³
	$V2 = 0.300 \times 0.150 \times 10.000 \times 2 = 0.900 \text{ m}^3$	
Form	$A1 = (0.450 + 0.300) \times 2 \times 10.000 = 15.000 \text{ m}^2$	15.000 m ²
Mortar	$V = 0.750 \times 0.050 \times 10.000 = 0.375 \text{ m}^3$	0.375 m ³
Excavation	$V = \left(\frac{2.250 + 1.750}{2} \right) \times 0.500 \times 10.000 = 10.000 \text{ m}^3$	10.000 m ³
Backfill	$V1 = \left(\frac{0.750 + 0.500}{2} \right) \times 0.500 = 0.313 \text{ m}^2$	6.940 m ³
	$V2 = 0.450 \times 0.075 = 0.034 \text{ m}^2$	
	$V = (0.313 + 0.034) \times 2.000 \times 10.000 = 6.940 \text{ m}^3$	

No	Item	Name	Quantity	Unit			
	OPEN DITCHES	U-DITCH 500X500	10	m			
Item	Formula			Quantity			
U-500 x 500 Concrete	$V1 = 0.800 \times 0.150 \times 10.000 = 1.200 \text{ m}^3$ $V2 = 0.500 \times 0.150 \times 10.000 \times 2 = 1.500 \text{ m}^3$ $\underline{\hspace{1cm}} = 2.700 \text{ m}^3$			2.700 m ³			
Form	$A1 = (0.650 + 0.500) \times 2 \times 10.000 = 23.000 \text{ m}^2$			23.000 m ²			
Foundation	$V = 0.950 \times 0.150 \times 10.000 = 1.425 \text{ m}^3$			1.425 m ³			
Leveling Con:	$V = 0.950 \times 0.100 \times 10.000 = 0.950 \text{ m}^3$			0.950 m ³			
Excavation	$V = \frac{(2.850 + 1.950)}{2} \times 0.900 \times 10.000 = 21.600 \text{ m}^3$			21.600 m ³			
Backfill	$V1 = \frac{(0.950 + 0.500)}{2} \times 0.900 = 0.653 \text{ m}^2$ $V2 = 0.650 \times 0.075 = 0.049 \text{ m}^2$ $V = (0.653 + 0.049) \times 2.000 \times 10.000 = 14.040 \text{ m}^3$			14.040 m ³			
Reinforcing -bar D13	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS
	R1	D13	1,760	50	0.995	1.75	88
	R2	D13	10,000	11	0.995	9.95	109
	Total						197 kg
							197 kg

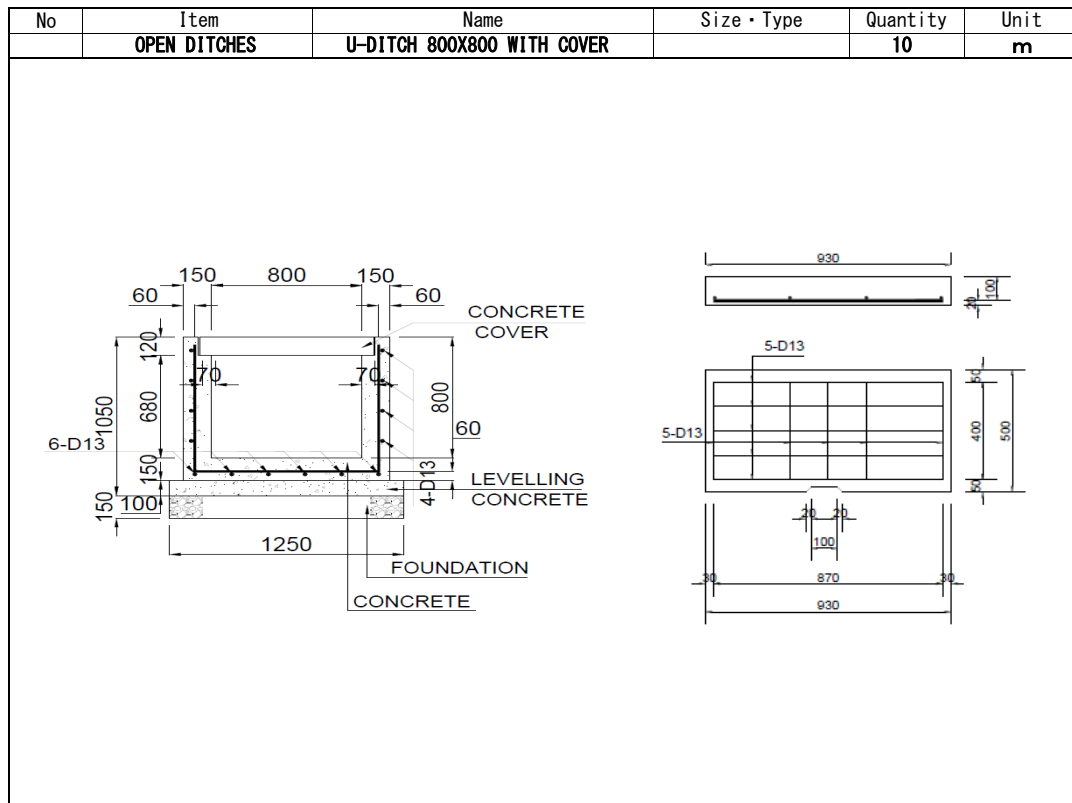
No	Item	Name	Size · Type	Quantity	Unit																												
	OPEN DITCHES	U-DITCH 800X800		10	m																												
Item	Formula				Quantity																												
U-800 x 800 Concrete	$V1 = 1.100 \times 0.150 \times 10.000 = 1.650 \text{ m}^3$				4.050 m ³																												
	$V2 = 0.800 \times 0.150 \times 10.000 \times 2 = 2.400 \text{ m}^3$																																
Form	$A1 = (0.950 + 0.800) \times 2 \times 10.000 = 35.000 \text{ m}^2$				35.000 m ²																												
Foundation	$V = 1.250 \times 0.150 \times 10.000 = 1.875 \text{ m}^3$				1.875 m ³																												
Leveling Con:	$V = 1.250 \times 0.100 \times 10.000 = 1.250 \text{ m}^3$				1.250 m ³																												
Excavation	$V = \frac{(3.450 + 2.250)}{2} \times 1.200 \times 10.000 = 34.200 \text{ m}^3$				34.200 m ³																												
Backfill	$V1 = \frac{(1.100 + 0.500)}{2} \times 1.200 \times H = 0.960 \text{ m}^2$				20.620 m ³																												
	$V2 = 0.950 \times 0.075 = 0.071 \text{ m}^2$																																
	$V = (0.960 + 0.071) \times 2.000 \times 10.000 = 20.620 \text{ m}^3$																																
Reinforcing -bar D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>2,660</td> <td>50</td> <td>0.995</td> <td>2.65</td> <td>133</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>10,000</td> <td>14</td> <td>0.995</td> <td>9.95</td> <td>139</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td>272 kg</td> <td></td> </tr> </tbody> </table>					BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	2,660	50	0.995	2.65	133	R2	D13	10,000	14	0.995	9.95	139	Total					272 kg	
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																										
	R1	D13	2,660	50	0.995	2.65	133																										
	R2	D13	10,000	14	0.995	9.95	139																										
Total					272 kg																												
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No	Item	Name	Size · Type	Quantity	Unit																													
	OPEN DITCHES	U-DITCH 1000X1000		10	m																													
Item	Formula				Quantity																													
U-1000 x 1000 Concrete	$V1 = 1.300 \times 0.150 \times 10.000 = 1.950 \text{ m}^3$				4.950 m ³																													
	$V2 = 1.000 \times 0.150 \times 10.000 \times 2 = 3.000 \text{ m}^3$																																	
Form	$A1 = (1.150 + 1.000) \times 2 \times 10.000 = 43.000 \text{ m}^2$				43.000 m ²																													
Foundation	$V = 1.450 \times 0.200 \times 10.000 = 2.900 \text{ m}^3$				2.900 m ³																													
Leveling Con:	$V = 1.450 \times 0.100 \times 10.000 = 1.450 \text{ m}^3$				1.450 m ³																													
Excavation	$V = \frac{3.900 + 2.450}{2} \times 1.450 \times 10.000 = 46.038 \text{ m}^3$				46.038 m ³																													
Backfill	$V1 = \left(\frac{1.225 + 0.500}{2} \right) \times 1.450 \times H = 1.251 \text{ m}^2$				26.740 m ³																													
	$V2 = 1.150 \times 0.075 = 0.086 \text{ m}^2$																																	
	$V = (1.251 + 0.086) \times 2.000 \times 10.000 = 26.740 \text{ m}^3$																																	
Reinforcing -bar D13	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>3,260</td> <td>50</td> <td>0.995</td> <td>3.24</td> <td>162</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>10,000</td> <td>20</td> <td>0.995</td> <td>9.95</td> <td>199</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td>361 kg</td> <td></td> </tr> </tbody> </table>						BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	3,260	50	0.995	3.24	162	R2	D13	10,000	20	0.995	9.95	199	Total					361 kg	
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																											
	R1	D13	3,260	50	0.995	3.24	162																											
	R2	D13	10,000	20	0.995	9.95	199																											
Total					361 kg																													
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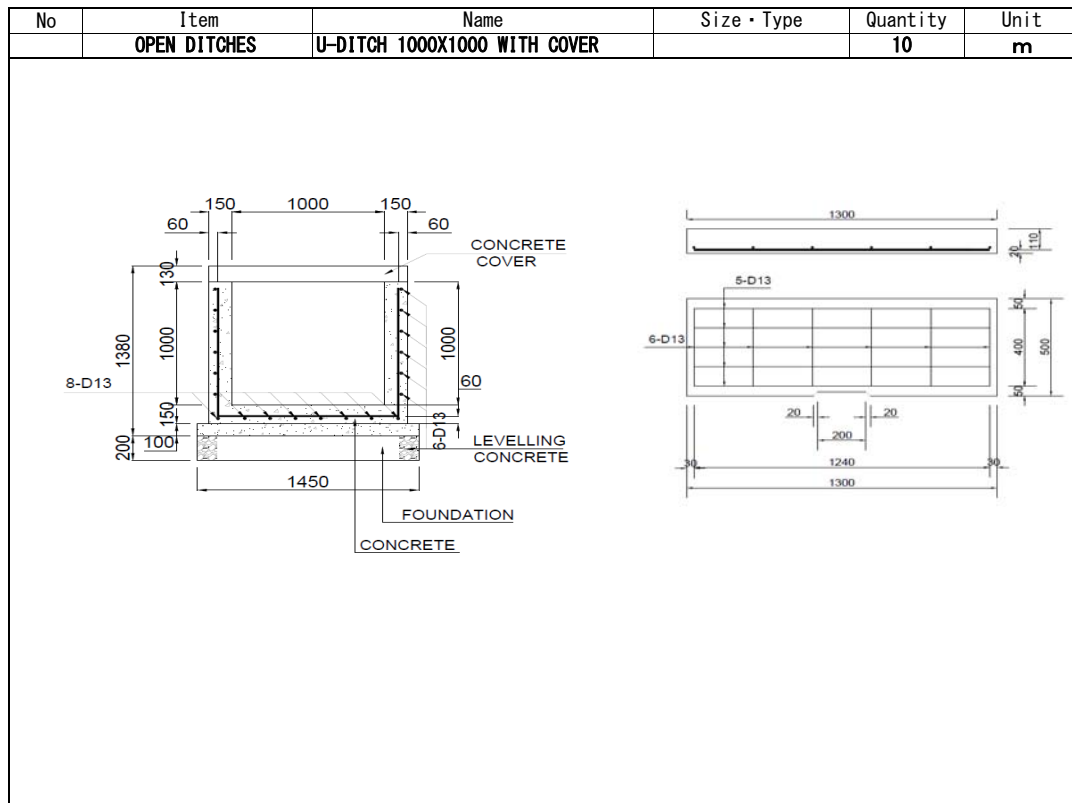
No	Item	Name	Size · Type	Quantity	Unit																												
	OPEN DITCHES	U-DITCH 1500X1500		10	m																												
Item	Formula				Quantity																												
U-1500 x 1500 Concrete	$V1 = 1.800 \times 0.150 \times 10.000 = 2.700 \text{ m}^3$				7.200 m ³																												
	$V2 = 1.500 \times 0.150 \times 10.000 \times 2 = 4.500 \text{ m}^3$																																
Form	$A1 = (1.650 + 1.500) \times 2 \times 10.000 = 63.000 \text{ m}^2$				63.000 m ²																												
Foundation	$V = 1.950 \times 0.200 \times 10.000 = 3.900 \text{ m}^3$				3.900 m ³																												
Leveling Con:	$V = 1.950 \times 0.100 \times 10.000 = 1.950 \text{ m}^3$				1.950 m ³																												
Excavation	$V = \left(\frac{4.900 + 2.950}{2} \right) \times 1.950 \times 10.000 = 76.538 \text{ m}^3$				76.538 m ³																												
Backfill	$V1 = \left(\frac{1.475 + 0.500}{2} \right) \times 1.950 \times H = 1.926 \text{ m}^2$				41.000 m ³																												
	$V2 = 1.650 \times 0.075 = 0.124 \text{ m}^2$																																
	$V = (1.926 + 0.124) \times 2.000 \times 10.000 = 41.000 \text{ m}^3$																																
Reinforcing -bar D13	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>4,760</td> <td>50</td> <td>0.995</td> <td>4.74</td> <td>237</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>10,000</td> <td>27</td> <td>0.995</td> <td>9.95</td> <td>269</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td>506 kg</td> <td></td> </tr> </tbody> </table>					BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	4,760	50	0.995	4.74	237	R2	D13	10,000	27	0.995	9.95	269	Total					506 kg	
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																										
	R1	D13	4,760	50	0.995	4.74	237																										
	R2	D13	10,000	27	0.995	9.95	269																										
Total					506 kg																												
					506 kg																												

No	Item	Name	Size · Type	Quantity	Unit
	OPEN DITCHES	U-DITCH 500X500 WITH COVER		10	m
Item	Formula				Quantity
U-500 x 500 with cover					
Concrete	$V1 = 0.800 \times 0.150 \times 10.000$	=	1.200	m^3	
	$V2 = 0.380 \times 0.150 \times 10.000 \times 2$	=	1.140		
	$V3 = 0.120 \times 0.080 \times 10.000 \times 2$	=	0.192	m^3	
	$V4(cover) = 0.630 \times 0.120 \times 10.000$	=	0.756	m^3	
			<u>3.288</u>	m^3	
3.288				m^3	
Form	$A1 = (0.650 + 0.380 + 0.12) \times 2 \times 10.000$	=	23.000	m^2	
	$A2-a(cover) = (0.500 + 0.630) \times 0.12 \times \frac{10.000}{0.500} \times 2$	=	5.424	m^2	
	$A2-b(cover) = 0.630 \times 10.000$	=	6.300	m^2	
	$A2(a+b) = 5.424 + 6.300$	=	11.724	m^2	
	Total A = A1 + A2 = 23.000 + 11.724 = 34.724	=	34.724	m^2	
34.724				m^2	
Foundation	$V = 0.950 \times 0.150 \times 10.000$	=	1.425	m^3	
1.425				m^3	
Leveling Con:	$V = 0.950 \times 0.100 \times 10.000$	=	0.950	m^3	
0.950				m^3	
Excavation	$V = \frac{(2.850 + 1.950)}{2} \times 0.900 \times 10.000$	=	21.600	m^3	
21.600				m^3	
Backfill	$V1 = \frac{(0.950 + 0.500)}{2} \times 0.900$	=	0.653	m^2	
	$V2 = 0.650 \times 0.075$	=	0.049	m^2	
	$V = (0.653 + 0.049) \times 2.000 \times 10.000$	=	14.040	m^3	
14.040				m^3	
Concrete Cover	$N = \frac{10.000}{0.500}$	=	20.000	Nos	
20.000				Nos	
Reinforcing -bar D13	NO. UNIT				
	BAR MARK	SIZE (mm)	LENGTH (mm)	OF BARS	WEIGHT (kgf/m)
	R1	D13	1,760	50	0.995
	R2	D13	10,000	11	0.995
	R3(cover)	D13	570	80	0.995
	R4(cover)	D13	400	60	0.995
					Total
					266 kg

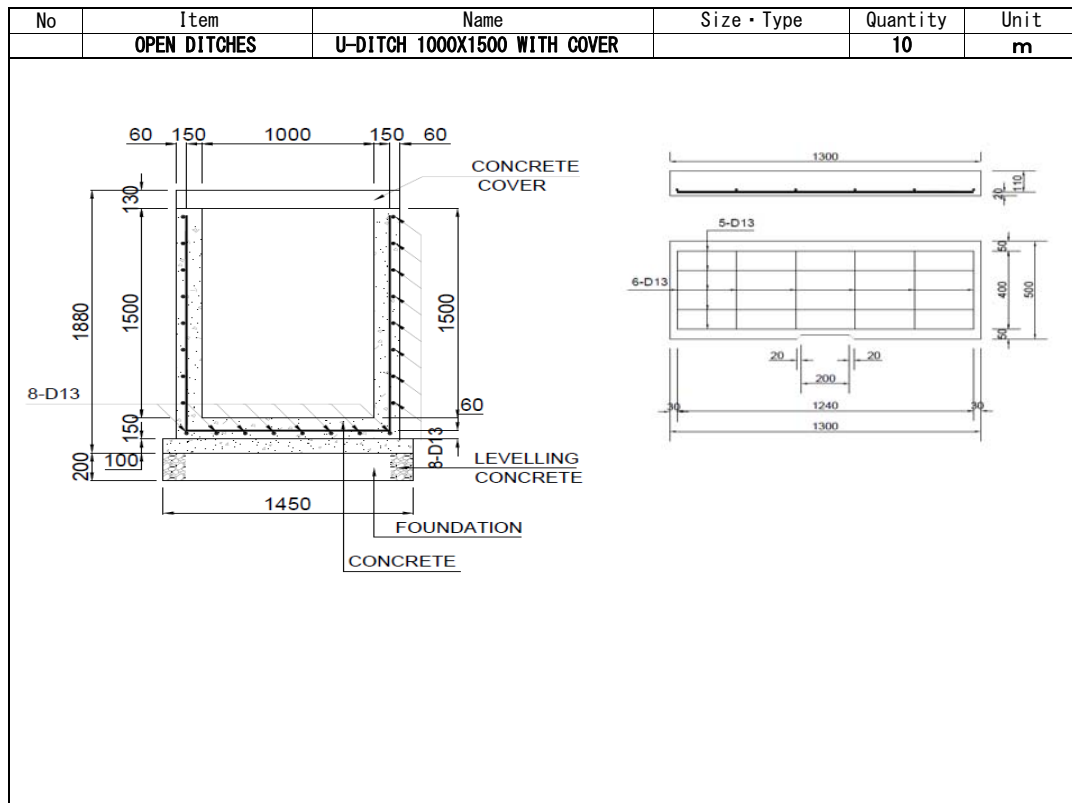
No	Item	Name	Size · Type	Quantity	Unit												
	OPEN DITCHES	U-DITCH 500X850 WITH COVER		10	m												
Item	Formula				Quantity												
U-500 x 850 with cover																	
Concrete	V1 =	0.800	x	0.150	x	10.000	=	1.200	m ³								
	V2 =	0.730	x	0.150	x	10.000	x	2	=	2.190	m ³						
	V3 =	0.120	x	0.080	x	10.000	x	2	=	0.192	m ³						
	V4 (cover) =	0.630	x	0.120	x	10.000	=	0.756	m ³								
								<u>4.338</u>	m ³	4.338	m ³						
Form	A1 =	(1.000	+	0.730	+	0.12)	x	2	x	10.000	=	37.000	m ²		
	A2-a (cover) =	(0.500	+	0.630)	x	0.12	x	($\frac{10.000}{0.500}$)	x	2	=	5.424	m ²
	A2-b (cover) =	0.630	x	10.000	=	6.300	m ²										
	A2 (a+b) =	5.424	+	6.300	=	11.724	m ²										
	Total A =	A1	+	A2	=	37.000	+	11.724	=	48.724	m ²	48.724	m ²				
Foundation	V =	0.950	x	0.150	x	10.000	=	1.425	m ³	1.425	m ³						
Leveling Con:	V =	0.950	x	0.100	x	10.000	=	0.950	m ³	0.950	m ³						
Excavation	V =	($\frac{3.200 \times 1.950}{2}$)	x	1.250	x	10.000	=	32.188	m ³	32.188	m ³				
Backfill	V1 =	($\frac{1.125 + 0.500}{2}$)	x	1.250	=	1.016	m ²								
	V2 =	1.000	x	0.075	=	0.075	m ²										
	V =	(1.016	+	0.075)	x	2.000	x	10.000	=	21.820	m ³	21.820	m ³		
Concrete Cover	N =	$\frac{10.000}{0.500}$	=	20.000	Nos	20.000	Nos										
Reinforcing -bar D13	NO. UNIT																
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS										
	R1	D13	2,460	50	0.995	2.45	123										
	R2	D13	10,000	15	0.995	9.95	149										
	R3 (cover)	D13	570	80	0.995	0.567	45										
	R4 (cover)	D13	400	60	0.995	0.398	24										
Total							341	kg	341	kg							



Item	Formula	Quantity																																										
U-800 x 800 with cover																																												
Concrete	$V1 = 1.100 \times 0.150 \times 10.000 = 1.650 \text{ m}^3$ $V2 = 0.680 \times 0.150 \times 10.000 \times 2 = 2.040$ $V3 = 0.120 \times 0.080 \times 10.000 \times 2 = 0.192 \text{ m}^3$ $V4(\text{cover}) = 0.930 \times 0.120 \times 10.000 = 1.116 \text{ m}^3$ 4.998 m³	4.998 m ³																																										
Form	$A1 = (0.950 + 0.680 + 0.12) \times 2 \times 10.000 = 35.000 \text{ m}^2$ $A2\text{-a}(\text{cover}) = (0.500 + 0.930) \times 0.12 \times \frac{10.000}{0.500} \times 2 = 6.864 \text{ m}^2$ $A2\text{-b}(\text{cover}) = 0.930 \times 10.000 = 9.300 \text{ m}^2$ $A2(a+b) = 6.864 + 9.300 = 16.164 \text{ m}^2$ Total A = 35.000 + 16.164 = 51.164 m²	51.164 m ²																																										
Foundation	$V = 1.250 \times 0.150 \times 10.000 = 1.875 \text{ m}^3$	1.875 m ³																																										
Leveling Con:	$V = 1.250 \times 0.100 \times 10.000 = 1.250 \text{ m}^3$	1.250 m ³																																										
Excavation	$V = \frac{(3.450 + 2.250)}{2} \times 1.200 \times 10.000 = 34.200 \text{ m}^3$	34.200 m ³																																										
Backfill	$V1 = \frac{(1.100 + 0.500)}{2} \times 1.200 \times 10.000 = 0.960 \text{ m}^3$ $V2 = 0.950 \times 0.075 = 0.071 \text{ m}^3$ $V = (0.960 + 0.071) \times 2.000 \times 10.000 = 20.620 \text{ m}^3$	20.620 m ³																																										
Concrete Cover	$N = \frac{10.000}{0.500} = 20.000 \text{ Nos}$	20.000 Nos																																										
Reinforcing -bar D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>2.660</td> <td>50</td> <td>0.995</td> <td>2.65</td> <td>133</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>10.000</td> <td>14</td> <td>0.995</td> <td>9.95</td> <td>139</td> </tr> <tr> <td>R3 (cover)</td> <td>D13</td> <td>870</td> <td>100</td> <td>0.995</td> <td>0.866</td> <td>87</td> </tr> <tr> <td>R4 (cover)</td> <td>D13</td> <td>400</td> <td>100</td> <td>0.995</td> <td>0.398</td> <td>40</td> </tr> <tr> <td colspan="6" style="text-align: center;">Total</td> <td>399 kg</td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	2.660	50	0.995	2.65	133	R2	D13	10.000	14	0.995	9.95	139	R3 (cover)	D13	870	100	0.995	0.866	87	R4 (cover)	D13	400	100	0.995	0.398	40	Total						399 kg	399 kg
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																																						
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R2	D13	10.000	14	0.995	9.95	139																																						
R3 (cover)	D13	870	100	0.995	0.866	87																																						
R4 (cover)	D13	400	100	0.995	0.398	40																																						
Total						399 kg																																						

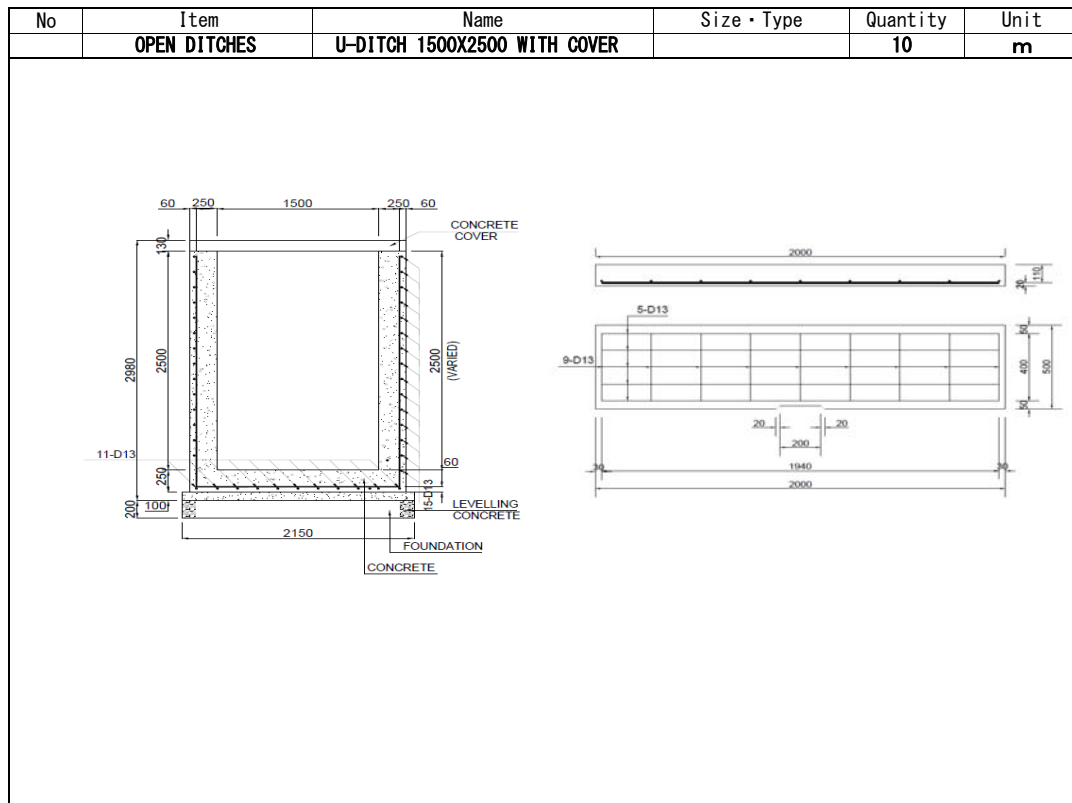


Item	Formula	Quantity					
U-1000 x 1000 with cover							
Concrete	$V1 = 1.300 \times 0.150 \times 10.000$	$= 1.950 \text{ m}^3$					
	$V2 = 1.000 \times 0.150 \times 10.000 \times 2$	$= 3.000 \text{ m}^3$					
	$V3(\text{cover}) = 1.300 \times 0.130 \times 10.000$	$= 1.690 \text{ m}^3$					
		6.640 m³					
Form	$A1 = (1.150 + 1.000) \times 2 \times 10.000$	$= 43.000 \text{ m}^2$					
	$A2\text{-a}(\text{cover}) = (0.500 + 1.300) \times 0.13 \times \frac{10.000}{0.500} \times 2$	$= 9.360 \text{ m}^2$					
	$A2\text{-b}(\text{cover}) = 1.300 \times 10.000$	$= 13.000 \text{ m}^2$					
	$A2(\text{a+b}) = 9.360 + 13.000$	$= 22.360 \text{ m}^2$					
	$\text{Total A} = A1 + A2$	$= 43.000 + 22.360$					
		65.360 m²					
Foundation	$V = 1.450 \times 0.200 \times 10.000$	$= 2.900 \text{ m}^3$					
Leveling Con:	$V = 1.450 \times 0.100 \times 10.000$	$= 1.450 \text{ m}^3$					
Excavation	$V = \frac{(3.900 + 2.450)}{2} \times 1.450 \times 10.000$	$= 46.038 \text{ m}^3$					
Backfill	$V1 = \frac{(1.230 + 0.500)}{2} \times 1.450 \times H$	$= 1.254 \text{ m}^2$					
	$V2 = 1.150 \times 0.075$	$= 0.086 \text{ m}^2$					
	$V = (1.254 + 0.086) \times 2.000 \times 10.000$	$= 26.800 \text{ m}^3$					
Concrete Cover	$N = \frac{10.000}{0.500}$	$= 20.000 \text{ Nos}$					
Reinforcing -bar D13							
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS
	R1	D13	3,260	50	0.995	3.24	162
	R2	D13	10,000	20	0.995	9.95	199
	R3(cover)	D13	1,240	100	0.995	1.23	123
	R4(cover)	D13	400	120	0.995	0.398	48
				Total		532 kg	

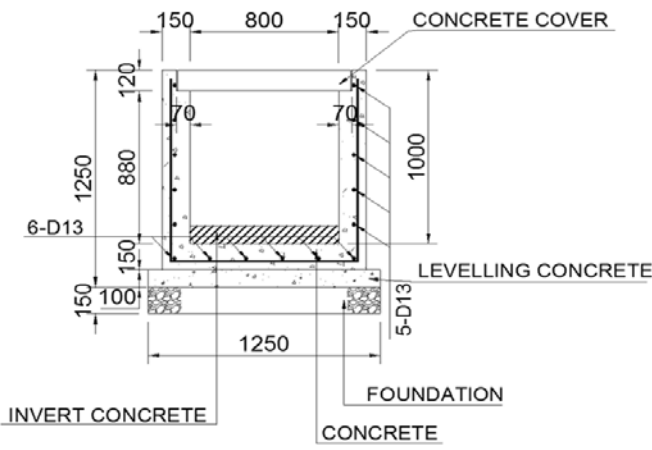


Item	Formula	Quantity	
U-1000 x 1500 with cover			
Concrete	$V1 = 1.300 \times 0.150 \times 10.000$	$= 1.950 \text{ m}^3$	
	$V2 = 1.500 \times 0.150 \times 10.000 \times 2$	$= 4.500 \text{ m}^3$	
	$V3(\text{cover}) = 1.300 \times 0.130 \times 10.000$	$= 1.690 \text{ m}^3$	
		8.140 m³	
Form	$A1 = (1.650 + 1.500) \times 2 \times 10.000$	$= 63.000 \text{ m}^2$	
	$A2\text{-a}(\text{cover}) = (0.500 + 1.300) \times 0.13 \times \frac{10.000}{0.500} \times 2$	$= 9.360 \text{ m}^2$	
	$A2\text{-b}(\text{cover}) = 1.300 \times 10.000$	$= 13.000 \text{ m}^2$	
	$A2(a+b) = 9.360 + 13.000$	$= 22.360 \text{ m}^2$	
	$\text{Total A} = A1 + A2$	$= 63.000 + 22.360$	
		= 85.360 m²	
Foundation	$V = 1.450 \times 0.200 \times 10.000$	$= 2.900 \text{ m}^3$	
Leveling Con:	$V = 1.450 \times 0.100 \times 10.000$	$= 1.450 \text{ m}^3$	
Excavation	$V = \frac{(4.400 + 2.450)}{2} \times 1.950 \times 10.000$	$= 66.788 \text{ m}^3$	
Backfill	$V1 = \frac{(1.475 + 0.500)}{2} \times 1.950$	$= 1.926 \text{ m}^2$	
	$V2 = 1.650 \times 0.075$	$= 0.124 \text{ m}^2$	
	$V = (1.926 + 0.124) \times 2.000 \times 10.000$	$= 41.000 \text{ m}^3$	
Concrete Cover	$N = \frac{10.000}{0.500}$	$= 20.000 \text{ Nos}$	
Reinforcing -bar D13	NO. UNIT		
	BAR MARK SIZE LENGTH	OF BARS	WEIGHT (kgf/m)
	R1 D13 4,260	50	0.995
	R2 D13 10,000	24	0.995
	R3(cover) D13 1,240	100	0.995
	R4(cover) D13 400	120	0.995
	Total	622 kg	

No	Item	Name	Size - Type	Quantity	Unit		
	OPEN DITCHES	U-DITCH 1500X1500 WITH COVER		10	m		
Item	Formula				Quantity		
U-1500 x 1500 with cover							
Concrete	$V1 = 1.800 \times 0.150 \times 10.000$				$= 2.700 \text{ m}^3$		
	$V2 = 1.500 \times 0.150 \times 10.000 \times 2$				$= 4.500 \text{ m}^3$		
	$V3(\text{cover}) = 1.800 \times 0.130 \times 10.000$				$= 2.340 \text{ m}^3$		
					9.540 m³		
Form	$A1 = (1.650 + 1.500) \times 2 \times 10.000$				$= 63.000 \text{ m}^2$		
	$A2\text{-a}(\text{cover}) = (0.500 + 1.800) \times 0.13 \times \frac{10.000}{0.500} \times 2$				$= 11.960 \text{ m}^2$		
	$A2\text{-b}(\text{cover}) = 1.800 \times 10.000$				$= 18.000 \text{ m}^2$		
	$A2(\text{a+b}) = 11.960 + 18.000$				$= 29.960 \text{ m}^2$		
	$\text{Total A} = A1 + A2$				$= 63.000 + 29.960$		
	$= 92.960$				$= 92.960 \text{ m}^2$		
Foundation	$V = 1.950 \times 0.200 \times 10.000$				$= 3.900 \text{ m}^3$		
Leveling Con:	$V = 1.950 \times 0.100 \times 10.000$				$= 1.950 \text{ m}^3$		
Excavation	$V = \frac{4.900 + 2.950}{2} \times 1.950 \times 10.000$				$= 76.538 \text{ m}^3$		
Backfill	$V1 = \frac{1.475 + 0.500}{2} \times 1.950$				$= 1.926 \text{ m}^2$		
	$V2 = 1.650 \times 0.075$				$= 0.124 \text{ m}^2$		
	$V = (1.926 + 0.124) \times 2.000 \times 10.000$				$= 41.000 \text{ m}^3$		
Concrete Cover	$N = \frac{10.000}{0.500}$				$= 20.000 \text{ Nos}$		
Reinforcing -bar D13	NO. UNIT						
	BAR MARK	SIZE (mm)	LENGTH (mm)	OF BARS	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS
	R1	D13	4,760	50	0.995	4.74	237
	R2	D13	10,000	27	0.995	9.95	269
	R3 (cover)	D13	1,740	100	0.995	1.73	173
	R4 (cover)	D13	400	160	0.995	0.398	64
Total					743 kg	743 kg	



Item	Formula	Quantity																																																
U-1500 x 2500 with cover																																																		
Concrete	$V1 = 2.000 \times 0.250 \times 10.000 = 5.000 \text{ m}^3$	20.100 m ³																																																
	$V2 = 2.500 \times 0.250 \times 10.000 \times 2 = 12.500 \text{ m}^3$																																																	
	$V3(\text{cover}) = 2.000 \times 0.130 \times 10.000 = 2.600 \text{ m}^3$																																																	
<hr/>		20.100 m ³																																																
Form	$A1 = (2.750 + 2.500) \times 2 \times 10.000 = 105.000 \text{ m}^2$	138.000 m ²																																																
	$A2\text{-a}(\text{cover}) = (0.500 + 2.000) \times 0.13 \times \frac{10.000}{0.500} \times 2 = 13.000 \text{ m}^2$																																																	
	$A2\text{-b}(\text{cover}) = 2.000 \times 10.000 = 20.000 \text{ m}^2$																																																	
	$A2(\text{a+b}) = 13.000 + 20.000 = 33.000 \text{ m}^2$																																																	
	$\text{Total A} = A1 + A2 = 105.000 + 33.000 = 138.000 \text{ m}^2$																																																	
Foundation	$V = 2.150 \times 0.200 \times 10.000 = 4.300 \text{ m}^3$	4.300 m ³																																																
Leveling Con:	$V = 2.150 \times 0.100 \times 10.000 = 2.150 \text{ m}^3$	2.150 m ³																																																
Excavation	$V = \frac{(6.200 + 3.150)}{2} \times 3.050 \times 10.000 = 142.588 \text{ m}^3$	142.588 m ³																																																
Backfill	$V1 = \frac{(2.025 + 0.500)}{2} \times 3.050 \times 10.000 = 3.851 \text{ m}^3$	81.140 m ³																																																
	$V2 = 2.750 \times 0.075 = 0.206 \text{ m}^3$																																																	
	$V = (3.851 + 0.206) \times 2.000 \times 10.000 = 81.140 \text{ m}^3$																																																	
Concrete Cover	$N = \frac{10.000}{0.500} = 20.000 \text{ Nos}$	20.000 Nos																																																
Reinforcing -bar D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT</th> <th>WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>7,160</td> <td>50</td> <td></td> <td>0.995</td> <td>7.12</td> <td>356</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>10,000</td> <td>41</td> <td></td> <td>0.995</td> <td>9.95</td> <td>408</td> </tr> <tr> <td>R3 (cover)</td> <td>D13</td> <td>1,940</td> <td>100</td> <td></td> <td>0.995</td> <td>1.93</td> <td>193</td> </tr> <tr> <td>R4 (cover)</td> <td>D13</td> <td>400</td> <td>180</td> <td></td> <td>0.995</td> <td>0.398</td> <td>72</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td></td> <td>1,029 kg</td> <td></td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	7,160	50		0.995	7.12	356	R2	D13	10,000	41		0.995	9.95	408	R3 (cover)	D13	1,940	100		0.995	1.93	193	R4 (cover)	D13	400	180		0.995	0.398	72	Total						1,029 kg		1,029 kg
	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																																										
	R1	D13	7,160	50		0.995	7.12	356																																										
	R2	D13	10,000	41		0.995	9.95	408																																										
	R3 (cover)	D13	1,940	100		0.995	1.93	193																																										
	R4 (cover)	D13	400	180		0.995	0.398	72																																										
Total						1,029 kg																																												

U-800x1000	CALCULATION	Par10m	
<p data-bbox="534 286 917 318">U-800x1000 WITH COVER</p> <p data-bbox="922 320 997 342">S=1:50</p> 			
ITEM	CALCULATION	UNIT	QUANTITY
CONCRETE	$V = (1.15 \times 1.10 - 0.94 \times 0.12 - 0.80 \times 0.88) \times 10 = 4.48$	m3	4.5
MOLD	$A = (1.15 + 1.00) \times 10.00 = 21.50$	m2	21.5
LEVELLING CONCRETE	$A = 1.25 \times 10.00 = 12.50$	m2	12.5
	$V = 1.25 \times 0.10 \times 10.00 = 1.25$	m3	1.3
LEVELLING CONCRETE	$A = (0.10 + 0.10) \times 10 \times 10 = 20.00$	m2	20.0
CONCRETE CAVER	$N = 10.00$	組	10.0
FOUNDATION	$V = 1.25 \times 0.15 \times 10.00 = 1.88$	m3	1.9
REINFORCEMENT BAR D13	$W1 = 6 \times 0.995 \times 10.00 = 59.70$		
	$W2 = 10 \times 0.995 \times 10.00 = 99.50$		
	$W3 = 4 \times 0.995 \times 3.10 \times 10.00 = 123.38$		
INVERT CONCRETE	$V1 = 1/2 \times (0.27 + 0.31) \times 16 = 4.64$	m3	4.6
	<p style="text-align: right;">total 4.64</p>		

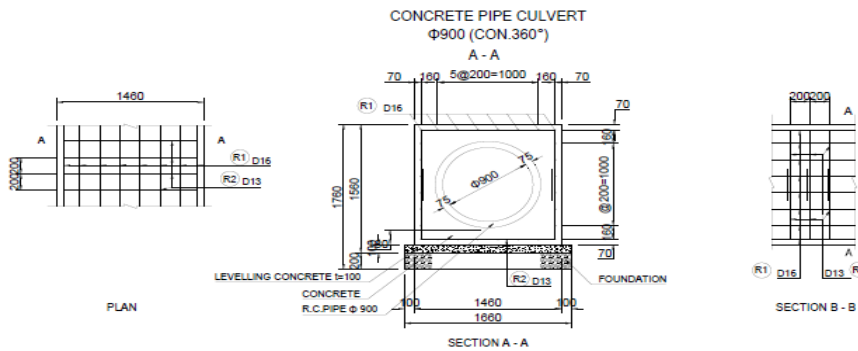
Excavation	$V = \left(\frac{3.600 + 2.200}{2} \right) \times 1.400 \times 10.000 = 40.600$	m^3	40.600 m^3
Backfill	$V1 = \left(\frac{1.200 + 0.500}{2} \right) \times 1.400 \times H = 1.190$	m^2	
	$V2 = 1.150 \times 0.050 = 0.058$	m^2	
	$V = \left(1.190 + 0.058 \right) \times 2.000 \times 10.000 = 24.960$	m^3	24.960 m^3

INVERT CONCRETE(U-800×1000) S=1:500



No	Item	Name	Quantity	Unit
	CONCRETE PIPE CULVERT	PC900	10	m

DETAIL OF CONCRETE PIPE CULVERT Φ900 (CON.360°) S= 1:30



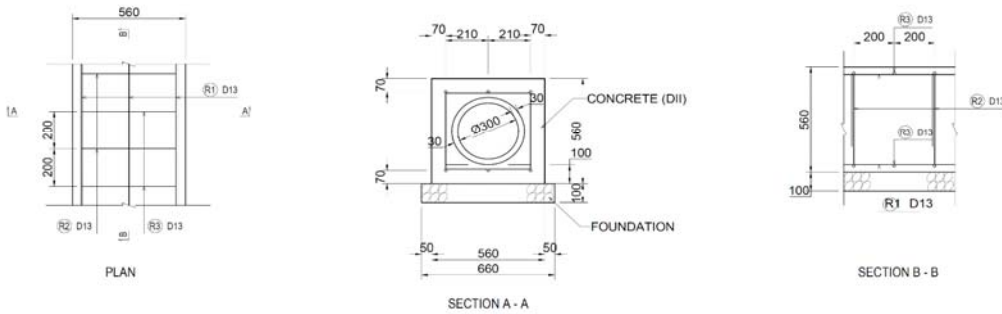
ITEM	UNIT	QUANTITY	REMARKS
R.C.PIPE Φ 900	m	10.000	JIS A5303 CLASS 1
CONCRETE	m ³	12.657	28 days = 180 kg/cm ²
FOUNDATION	m ²	16.600	GRAVEL / F200mm
FORM	m ²	29.200	
LEVELLING CONCRETE	m ³	1.660	H=100

Dia	Nos	Length (mm)	Unit Weight (kg/m)	Weight (kg)	Remarks
D16	10	3,110	0.995	30.945	R2 / SD345
D13	28	1,000	1.560	42.580	R1 / SD345
TOTAL				74.625	

Item	Formula	Quantity																												
R. C. pipe φ 0.900	by Japanese Standard Design φ 0.900 (con. 360°) Type P4-D900 L= 10.000 m	10.000 m																												
Concrete	$V = (1.460 \times 1.460 - 0.525^2 \times \pi) \times 10.000 = 12.657 \text{ m}^3$	12.657 m ³																												
Form	$A = 1.460 \times 2 \times 10.000 = 29.200 \text{ m}^2$	29.200 m ²																												
Reinforcing -ber D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D16</td> <td>1,000</td> <td>280</td> <td>1.56</td> <td>437</td> <td>SD345</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>3,110</td> <td>100</td> <td>0.995</td> <td>309</td> <td>SD345</td> </tr> <tr> <td colspan="4">Total</td> <td></td> <td>746 kg</td> <td></td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D16	1,000	280	1.56	437	SD345	R2	D13	3,110	100	0.995	309	SD345	Total					746 kg		746 kg
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																								
R1	D16	1,000	280	1.56	437	SD345																								
R2	D13	3,110	100	0.995	309	SD345																								
Total					746 kg																									
Foundation	$V = 1.660 \times 0.200 \times 10.000 = 3.320 \text{ m}^3$	3.320 m ³																												
Leveling Conc:	$V = 1.660 \times 0.100 \times 10.000 = 1.660 \text{ m}^3$	1.660 m ³																												
Excavation	$V = \frac{4.920 + 2.660}{2} \times (1.760 + 0.500) \times 10.000 = 85.654 \text{ m}^3$	85.654 m ³																												
Backfill	$V_1 = 85.654$ $V_2 = (1.460 \times 1.460) \times 3.320 + 1.660$ $V = V_1 - V_2 = 85.654 - 7.112 = 78.542 \text{ m}^3$	78.542 m ³																												

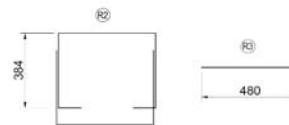
No	Item	Name	Quantity	Unit
	CONCRETE PIPE CULVERT	Type A	PC300	10
				m

CONCRETE PIPE CULVERT
Φ300 (CON.360°)TYPE A
A - A



WORK QUANTITIES PER UNIT (PER 10m)			
ITEM	UNIT	QUANTITY	REMARKS
R.C PIPE Φ 300	m	10.000	JIS A 5303 CLASS 1
CONCRETE (DII)	m ³	2.118	28 days = 240 kg/cm ²
FOUNDATION	m ²	6.600	GRAVEL / t=100mm
FORM	m ²	11.200	

DETAIL OF STEEL REINFORCEMENT

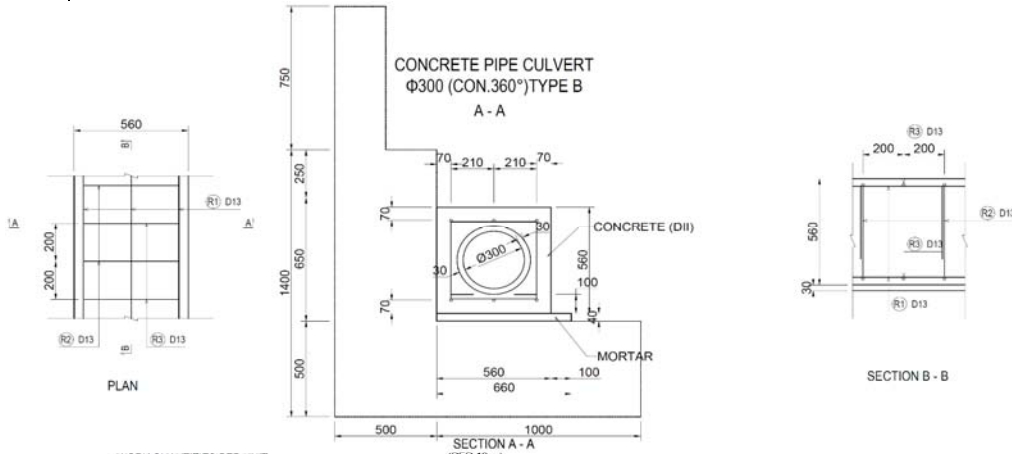


WORK QUANTITIES PER UNIT FOR REINFORCEMENT BAR (PER 1.0m)					
Dia	No.	Length (mm/ft)	Unit Weight (kg/m)	Weight (kg)	Remarks
D13	8	1,000	0.995	5.970	(R1) / SD345
D13	5	420	0.995	2.090	(R2) / SD345
D13	5	1,310	0.995	6.517	(R3) / SD345
TOTAL				14.557	

Note: Precast R.C. Pipe Φ300, Reinforced Spun and Centrifugal Reinforced Concrete Pipes shall be Selected.

Item	Formula	Quantity																																			
R. C. pipe φ 0.300	by Japanese Standard Design φ 0.300 (con. 360°) Type P3-D300 L= 10.000 m	10.000 m																																			
Concrete	$V = (0.560 \times 0.560 - 0.180^2 \times \pi) \times 10.000 = 2.118 \text{ m}^3$	2.118 m ³																																			
Form	$A = 0.560 \times 2 \times 10.000 = 11.200 \text{ m}^2$	11.200 m ²																																			
Reinforcing -ber D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>1,000</td> <td>60</td> <td>0.995</td> <td>0.995</td> <td>60 Grade 40</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>420</td> <td>50</td> <td>0.995</td> <td>0.418</td> <td>21 Grade 40</td> </tr> <tr> <td>R3</td> <td>D13</td> <td>1,310</td> <td>50</td> <td>0.995</td> <td>1.3</td> <td>65 Grade 40</td> </tr> <tr> <td colspan="6">Total</td> <td>146 kg</td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	1,000	60	0.995	0.995	60 Grade 40	R2	D13	420	50	0.995	0.418	21 Grade 40	R3	D13	1,310	50	0.995	1.3	65 Grade 40	Total						146 kg	146 kg
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																															
R1	D13	1,000	60	0.995	0.995	60 Grade 40																															
R2	D13	420	50	0.995	0.418	21 Grade 40																															
R3	D13	1,310	50	0.995	1.3	65 Grade 40																															
Total						146 kg																															
Foundation	$V = 0.660 \times 0.150 \times 10.000 = 0.990 \text{ m}^3$	0.990 m ³																																			

No	Item	Name	Quantity	Unit
	CONCRETE PIPE CULVERT	Type B	PC300	10
				m



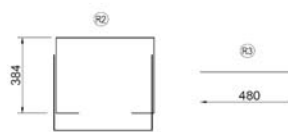
WORK QUANTITIES PER UNIT (PER 10m)

ITEM	UNIT	QUANTITY	REMARKS
R.C PIPE Φ 300	m	10.000	JIS A 5303 CLASS 1
CONCRETE (DII)	m ³	2.118	28 days = 240 kg/m ²
MORTAR	m ²	0.264	
FORM	m ²	11.200	

WORK QUANTITIES PER UNIT FOR REINFORCEMENT BAR (PER 1.0m)

Dia	Nos	Length (mm/nos)	Unit Weight (kg/m)	Weight (kg)	Remarks
D13	6	1,000	0.995	5.970	R1 / SD345
D13	5	420	0.995	2.090	R2 / SD345
D13	5	1,310	0.995	6.517	R3 / SD345
TOTAL				14.557	

DETAIL OF STEEL REINFORCEMENT



Note: Precast R.C. Pipe Φ300, Reinforced Spun and Centrifugal Reinforced Concrete Pipes shall be Selected.

Item	Formula	Quantity																																			
R. C. pipe φ 0.3	by Japanese Standard Design φ 0.300 (con. 360°) Type P3-D300 L= 10.000 m	10.000 m																																			
Concrete	$V = (0.560 \times 0.560 - 0.180^2 \times \pi) \times 10.000 = 2.118 \text{ m}^3$	2.118 m ³																																			
Form	A1= 0.560 x 2 x 10.000 = 11.200 m ² A2= 0.040 x 2 x 10.000 = 0.800 m ² A= 11.200 + 0.800 = 12.000 m ²	12.000 m ²																																			
Reinforcing -ber D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>1,000</td> <td>60</td> <td>0.995</td> <td>0.995</td> <td>Grade 40</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>420</td> <td>50</td> <td>0.995</td> <td>0.418</td> <td>Grade 40</td> </tr> <tr> <td>R3</td> <td>D13</td> <td>1,310</td> <td>50</td> <td>0.995</td> <td>1.3</td> <td>Grade 40</td> </tr> <tr> <td colspan="4">Total</td> <td></td> <td>146 kg</td> <td></td> </tr> </tbody> </table>	BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	1,000	60	0.995	0.995	Grade 40	R2	D13	420	50	0.995	0.418	Grade 40	R3	D13	1,310	50	0.995	1.3	Grade 40	Total					146 kg		146 kg
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																															
R1	D13	1,000	60	0.995	0.995	Grade 40																															
R2	D13	420	50	0.995	0.418	Grade 40																															
R3	D13	1,310	50	0.995	1.3	Grade 40																															
Total					146 kg																																
Mortar	$V = 0.660 \times 0.040 \times 10.000 = 0.264 \text{ m}^3$	0.264 m ³																																			

BOX CULVERT OF SCHEDULE

Item	Size/Type	Unit	BOX CULVERT		TOTAL	OTHERS
			BOX CULVERT	DITH OUTRET		
Concrete		m3	32.7	6.5	39.2	
Form		m2	123.1	10.2	133.3	
Foundation	t=200	m2	7.4		7.4	
Reinforcing	D13	kg	2600		2600	
Backfill Granular		m3	26		26.4	
Bip Rap		m3		1.7	1.7	
Excavation		m3	71.7	4.7	76.4	
Backfill		m3	34.5	2.1	36.5	

No	Item	Name	Quantity	Unit																													
	BOXCULVERT	1000 x 1000	1	m																													
<p>SIDE ELEVATION S = 1:150</p>																																	
<p>BACKFILL</p>																																	
<p>MATERIALS (PER 1m)</p> <table border="1"> <thead> <tr> <th>KIND</th> <th>UNIT</th> <th>QUANTITY</th> </tr> </thead> <tbody> <tr> <td rowspan="4">CONCRETE</td> <td>TOP</td> <td>m³ 0.480</td> </tr> <tr> <td>SIDE</td> <td>m³ 0.640</td> </tr> <tr> <td>BOTTOM</td> <td>m³ 0.480</td> </tr> <tr> <td>TOTAL</td> <td>m³ 1.600</td> </tr> <tr> <td>FORM</td> <td>m²</td> <td>5.966</td> </tr> <tr> <td rowspan="4">REINFORCING BAR</td> <td>D19</td> <td>kg 0</td> </tr> <tr> <td>D16</td> <td>kg 0</td> </tr> <tr> <td>D13</td> <td>kg 121.950</td> </tr> <tr> <td>TOTAL</td> <td>kg 121.950</td> </tr> <tr> <td rowspan="2">FOUNDATION</td> <td>LEVELING CONCRETE t=100</td> <td>m² 0</td> </tr> <tr> <td>CRUSHED STONE t=200</td> <td>m² 1.800</td> </tr> </tbody> </table>					KIND	UNIT	QUANTITY	CONCRETE	TOP	m ³ 0.480	SIDE	m ³ 0.640	BOTTOM	m ³ 0.480	TOTAL	m ³ 1.600	FORM	m ²	5.966	REINFORCING BAR	D19	kg 0	D16	kg 0	D13	kg 121.950	TOTAL	kg 121.950	FOUNDATION	LEVELING CONCRETE t=100	m ² 0	CRUSHED STONE t=200	m ² 1.800
KIND	UNIT	QUANTITY																															
CONCRETE	TOP	m ³ 0.480																															
	SIDE	m ³ 0.640																															
	BOTTOM	m ³ 0.480																															
	TOTAL	m ³ 1.600																															
FORM	m ²	5.966																															
REINFORCING BAR	D19	kg 0																															
	D16	kg 0																															
	D13	kg 121.950																															
	TOTAL	kg 121.950																															
FOUNDATION	LEVELING CONCRETE t=100	m ² 0																															
	CRUSHED STONE t=200	m ² 1.800																															
Item	Formula			Quantity																													
Concrete	V1 = 1.600 x 10.320 x 2 = 33.024 m ³			32.685 m ³																													
	-V2 = -0.300 x 0.300 x π x 0.300 x 4 = -0.339 m ³																																
Total				= 32.685																													
Form	A1= 5.966 x 10.320 x 2 = 123.138 m ²			123.138 m ²																													
	A2= 0.600 x 3.14 x 0.300 x 4 = 2.261 m ²																																
Total				= 125.399																													
Reinforcing -ber D13	W1= 121.950 x 10.320 x 2 = 2517.048 kg			2600 kg																													
	H1= 1.390 x 0.995 x 4 x 4 = 22.129 kg																																
	H2= 1.660 x 0.995 x 4 x 4 = 26.427 kg																																
	H3= 1.200 x 0.995 x 4 x 4 = 19.104 kg																																
	H4= 0.950 x 0.995 x 4 x 4 = 15.124 kg																																
Total				= 2599.832																													
Foundation	A= 0.360 x 10.330 x 2 = 7.438 m ²			7.438 m ²																													
Backfill Granular	V= 1.600 x 1.600 x 0.500 x 10.330 x 2 = 26.445 m ³			26.445 m ³																													
Excavation	V= (2.600 + 3.700) x 0.500 x 1.100 x 20.7 = 71.726 m ³			71.726 m ³																													
Backfill	V1 = 71.726 = 71.726 m ²			34.466 m ³																													
	V2 = [(1.600 x 0.900) + (1.800 x 0.200)] x 20.7 = 37.260 m ²																																
	V = V1 - V2 = 71.726 - 37.260 = 34.466 m ³																																

No	Item	Name	Quantity	Unit
	OUTLETS		1	each
<p style="text-align: center;">SIDE ELEVATION</p> <p style="text-align: center;">SECTION A-A</p>				
Item	Formula			Quantity
Concrete	$V1 = 2.900 \times 3.000 \times 0.500$	$= 4.350$	m^3	6.525 m^3
	$V2 = 2.900 \times 0.500 \times 1.500$	$= 2.175$	m^3	
	Total	= 6.525		
Form	$A1 = (3.000 + 2.900) \times 2 \times 0.500$	$= 8.700$	m^2	10.150 m^2
	$A1 = (2.900 + 0.500) \times 2 \times 0.500$	$= 1.450$	m^2	
	Total	= 10.150		
Rip Rap	$V = 2.000 \times 2.900 \times 0.300$	$= 1.740$	m^3	1.740 m^3
Excavation	$V = 3.900 \times 4.000 \times 0.300$	$= 4.680$	m^3	4.680 m^3
Backfill	$V = 4.680 - 2.900 \times 3.000 \times 0.300$	$= 2.070$	m^3	2.070 m^3

CATCH PIT 700×700×1850

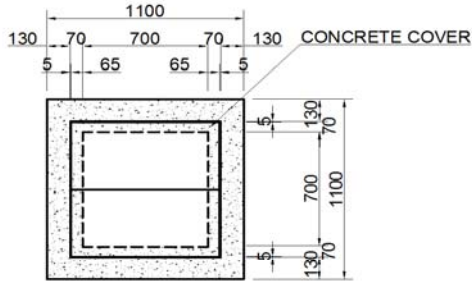
Item	Size/Type	Unit	Quantity	Remark
Concrete		m ³	1.468	
Form		m ²	14.355	
Leveling Con:		m ³	0.144	
Leveling Con: Form		m ²	0.480	
Foundation		m ²	1.440	
Reinforcing	D13	kg	99	
Excavation		m ³	29.358	
Backfill		m ³	26.264	
REMOVAL OFSURPLUS SOIL		m ³	0.176	

CATCH PIT 700 × 700 × 1850

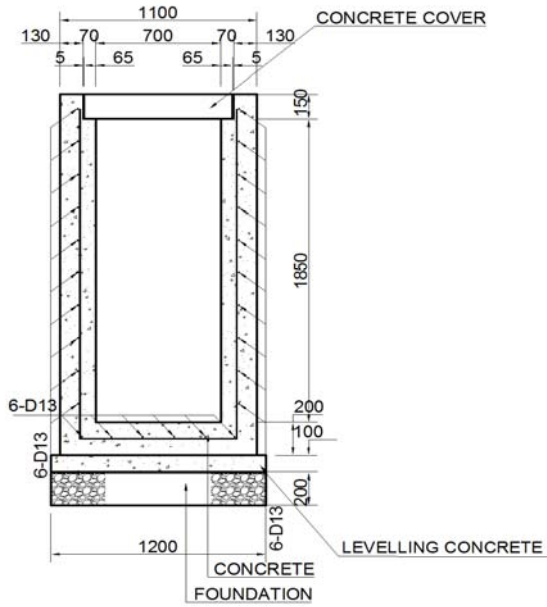
General View

CATCH PIT (700X700X1850)

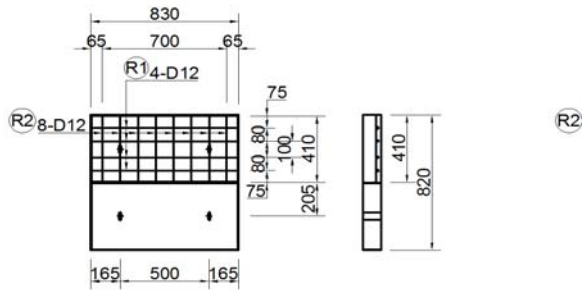
C



PLAN



SECTION



COVER

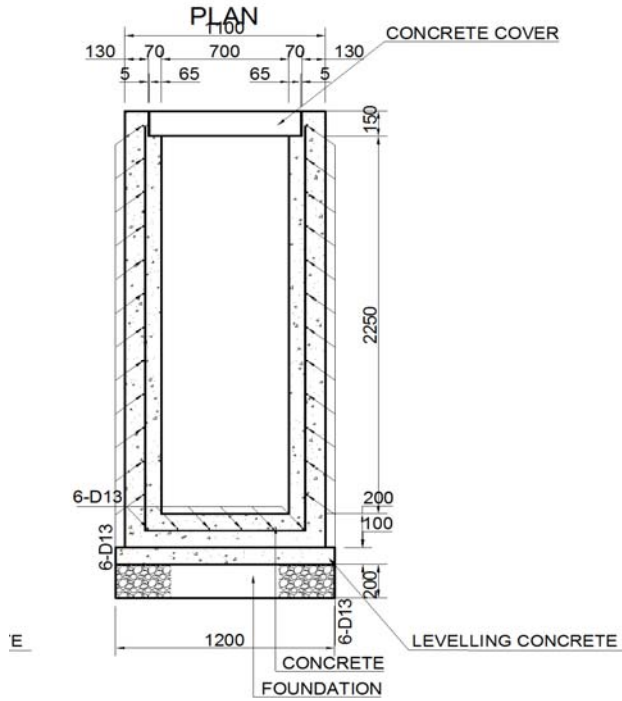
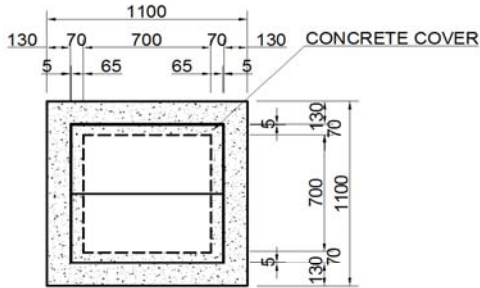
CATCH PIT 700×700×2250

Item	Size/Type	Unit	Quantity	Remark
Concrete		m ³	1.72	
Form		m ²	16.89	
Leveling Con:		m ³	0.14	
Leveling Con: Form		m ²	0.48	
Foundation		m ²	1.44	
Reinforcing	D13	kg	116	
Excavation		m ³	38.58	
Backfill		m ³	35.00	
REMOVAL OFSURPLUS SOIL		m ³	(0.31)	

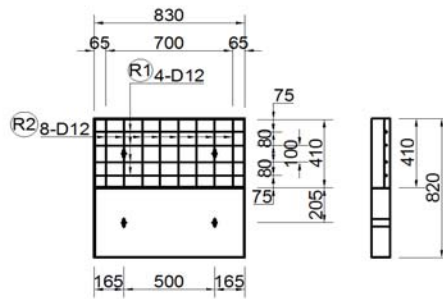
CATCH PIT 700 × 700 × 2250

General View

CATCH PIT (700X700X2250)



SECTION



COVER

No	Item	Name	Size · Type	Quantity	Unit									
	CATCH PIT	C-DITCH TYPE A	0.60x0.40x0.50	1	nos									
SECTION A-A														
Item	Formula				Quantity									
Concrete	Catch Pit (0.6 x 0.4 x 0.50)													
	V1 =	0.900	x	0.650	x	0.610	=	0.357						
	-V2 =	0.600	x	0.522	x	0.056	=	-0.018						
	-V3 =	0.600	x	0.400	x	0.454	=	-0.109						
	-V4 =	0.180	x	0.180	x	3.142	x	0.150	x	2	=	-0.031		
-V5 =	0.108	x	0.108	x	3.142	x	0.100	=	-0.004					
									0.195	m ³	0.195	m ³		
Form	A1 =	0.900	x	0.610	x	2	+	0.650	x	0.610	x	2	=	1.891
	A2 =	0.600	x	0.610	x	2	+	0.400	x	0.610	x	2	=	1.220
	-A3 =	0.180	x	0.180	x	3.142	x	4	=	-0.407				
	-A4 =	0.108	x	0.108	x	3.142	x	2	=	-0.073				
									2.631	m ²	2.631	m ²		
Mortar	V =	1.100	x	0.750	x	0.040	=	0.033	m ³	0.033	m ³			
Grating	N =	600 × 500 × 56			=	1	nos	1	Nos					

No	Item	Name	Size · Type	Quantity	Unit
	CATCH PIT	C-DITCH TYPE C	0.50x0.50x0.70	1	nos
Item	Formula				Quantity
Concrete	Catch Pit (0.5 x 0.5 x 0.70) $V1 = 0.800 \times 0.800 \times 0.900 + 0.600 \times 0.200 \times 0.900 = 0.684$ $-V2 = 0.500 \times 0.500 \times 0.700 = -0.175$ $-V3 = 0.500 \times (0.585 + 0.550) \times 0.350 \times 0.300 = -0.060$ 0.449 m³				0.449 m³
Form	$A1 = 0.800 \times 0.900 \times 3 + 0.500 \times 0.900 \times 4 + 0.100 \times 0.900 \times 2 = 4.140$ $= 0.360$ $A3 = 0.500 \times (0.585 + 0.550) \times 0.350 \times 2 = 0.397$ 4.897 m²				4.897 m²
Foundation	$V = 1.000 \times 1.000 \times 0.150 = 0.150 \text{ m}^3$				0.150 m³
Excavation	$V = 1.000 \times 1.000 \times 1.050 = 1.050 \text{ m}^3$				1.050 m³
Backfill	$V = 0.200 \times 0.900 \times 0.200 \times 2 + 0.800 \times 0.900 \times 0.100 \times 2 = 0.216 \text{ m}^3$				0.216 m³

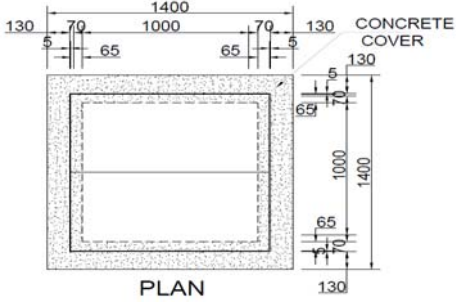
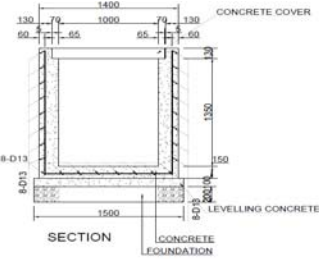
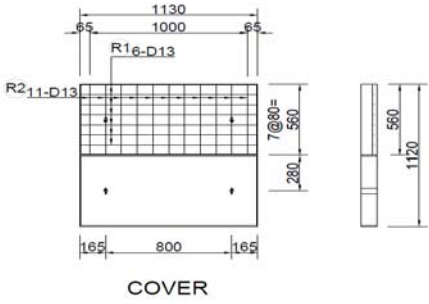
No	Item	Name	Size · Type	Quantity	Unit									
	CATCH PIT	C-DITCH TYPE D	0.435x0.60x0.75	1	nos									
Item	Formula				Quantity									
Concrete	Catch Pit (0.435 x 0.6 x 0.75)													
	V1 =	0.735	x	0.900	x	0.900	=	0.595						
	-V2 =	0.600	x	0.522	x	0.056	+	0.435	x	0.600	x	0.694	=	-0.199
	-V3 =	0.108	x	0.108	x	3.142	x	0.150	=	-0.005				
	-V4 =	0.300	x	0.300	x	0.150	=	-0.014						
								0.377	m ³	0.377	m ³			
Form	A1 =	0.735	x	0.900	x	2	+	0.435	x	0.900	x	2	=	2.106
	A2 =	0.900	x	0.900	x	2	+	0.600	x	0.900	x	2	=	2.700
	-A3 =	0.108	x	0.108	x	3.142	x	2	=	-0.073				
	-A4 =	0.300	x	0.300	x	2	=	-0.180						
									4.553	m ²	4.553	m ²		
Foundation	V =	1.100	x	0.835	x	0.150	=	0.138	m ³	0.138	m ³			
Grating	N =	600 x 500 x 56			=	1	nos	1	Nos					

No	Item	Name	Size · Type	Quantity	Unit
	CATCH PIT	C-DITCH TYPE B		10	Nos
Item	Formula			Quantity	
Excavation	$0.90/6 \times (2.0 \times 2.9 + 2.9 \times 2.0 + 2 \times (2.9 \times 2.9 + 2.0 \times 2.0)) \times 10$			= 54.630	= 54.600 m3
Backfilling	$54.60 - (1.0 \times 1.0 \times 0.8 + 1.2 \times 1.1 \times 0.10) \times 10$			= 45.280	= 45.300 m3
Surplus soil	$54.60 - 45.30 \times 1/0.9$			= 4.267	= 4.300 m3
Body					
Concrete (E1)	$(1.00 \times 1.00 \times 1.30 - 0.60 \times 0.60 \times 1.10) \times 10$			= 9.040	=
	[Deduction] $-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 0.20 \times 10$			= -0.203	=
	$-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 0.20 \times 10$			= -0.203	=
	$-0.07 \times 0.081 \times 0.60 \times 2 \times 10$			= -0.068	=
				8.565	8.570 m3
Reinforcing bar					kg
Form	$(1.00 \times 1.30 \times 4 + 0.60 \times 1.10 \times 4) \times 10$			= 78.400	= 78.400 m2
Foundation	$1.10 \times 1.20 \times 10$			= 13	= 13.200 m2
	$1.10 \times 1.20 \times 0.10 \times 10$			= 1.320	= 1.320 m3
Cover					
Grating Cover 600x720				=	= 10 each

No	Item	Name	Size · Type	Quantity	Unit									
	CATCH PIT	CATCH PIT 700X700X1050	700X700X1050	1	nos									
Item	Formula				Quantity									
Concrete	Catch Pit (0.7 x 0.7 x 1.05)													
	V1 =	1.000	x	0.150	x	1.000	x	1.000	=	0.150	m ³			
	V2 =	1.000	x	0.150	x	1.050	x	2.000	=	0.315	m ³			
	V3 =	0.700	x	0.150	x	1.050	x	2.000	=	0.221	m ³			
	V4 =	0.080	x	0.150	x	1.000	x	2.000	=	0.024	m ³			
	V5 =	0.080	x	0.150	x	0.840	x	2.000	=	0.020	m ³			
	V6(cover) =	0.830	x	0.410	x	0.150	x	2.000	=	0.102	m ³			
										0.832	m ³			
Form	A1 =	(1.000	+	1.000	+	1.000	+	1.000)x	1.350	=	5.400	m ²
	A2 =	(0.700	+	0.700	+	0.700	+	0.700)x	1.200	=	3.360	m ²
	A3(cover) =	(0.830	+	0.410)x	2.000	x	2.000	x	0.150	=	0.744	m ²
	Total =	A1	+	A2	+	A3	=	5.400	3.360	0.744	=	9.504	m ²	
													9.504	m ²
Foundation	V =	1.100	x	0.200	x	1.100	=	0.242	m ³	0.242	m ³			
Leveling Con:	V =	1.100	x	0.100	x	1.100	=	0.121	m ³	0.121	m ³			
Cover	N =						=	2	nos	2	Nos			
Reinforcing-bar														
	BAR	SIZE	LENGTH	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS							
	MARK	(mm)	(mm)		(kgf/m)	(kgf/NOS)	(kgf)							
	R1	D13	3,360	5	0.995	3.340	17							
	R2	D13	1,000	18	0.995	0.995	18							
	R3(cover)	D13	820	8	0.995	0.816	7							
	R4(cover)	D13	400	16	0.995	0.398	6							
				Total		D13	48	kg			48	kg		

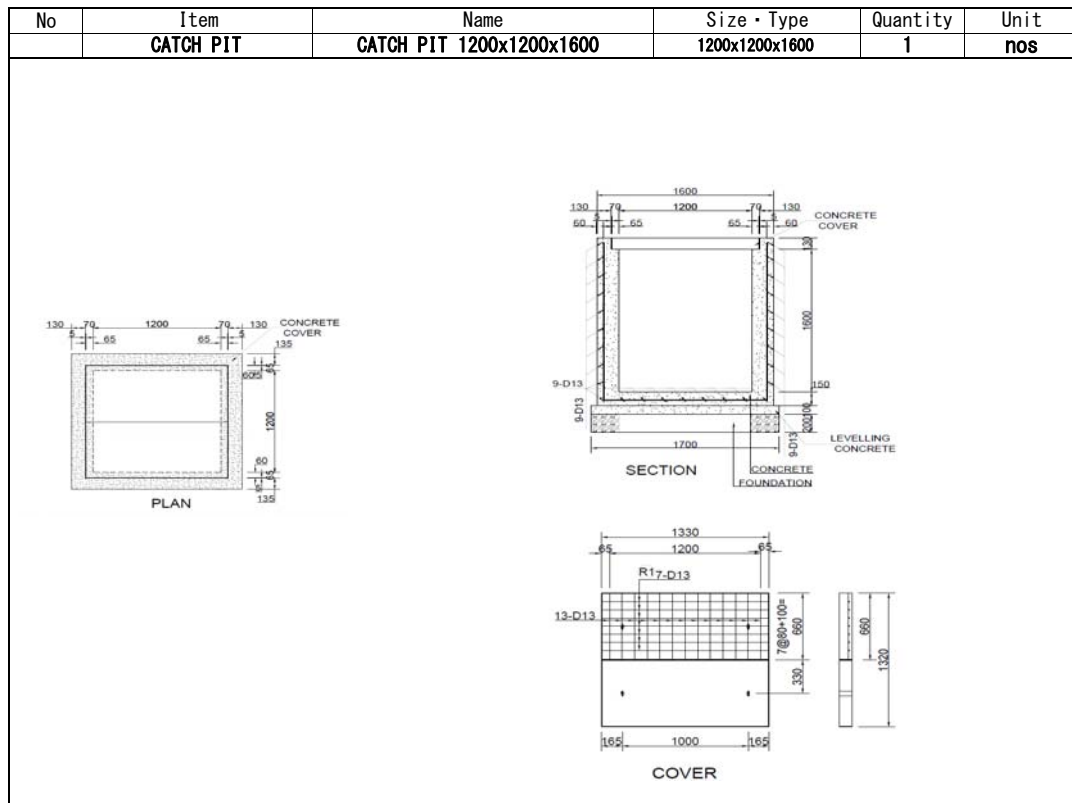
Excavation	$V = \left(\frac{3.750 + 2.100}{2} \right) \times 1.650 \times 2.100$	$= 10.135 \text{ m}^3$	10.135 m^3
Backfill	$V1 = \left(\frac{1.325 + 0.500}{2} \right) \times 1.650 \times H$	$= 1.506 \text{ m}^2$	
	$V2 = 1.350 \times 0.050$	$= 0.068 \text{ m}^2$	
	$V = (1.506 + 0.068) \times 2.000 \times 2.100$	$= 6.611 \text{ m}^3$	6.611 m^3

No	Item	Name	Size · Type	Quantity	Unit
	CATCH PIT	CATCH PIT 1000x1000x1350	1000x1000x1350	1	nos

Item	Formula	Quantity				
Concrete	Catch Pit (0.7 x 0.7 x 0.55)					
	V1 = 1.400 x 0.150 x 1.400 x 1.000 = 0.294 m ³					
	V2 = 1.400 x 0.200 x 1.350 x 2.000 = 0.756 m ³					
	V3 = 1.000 x 0.200 x 1.350 x 2.000 = 0.540 m ³					
	V4 = 0.130 x 0.150 x 1.400 x 2.000 = 0.055 m ³					
	V5 = 0.130 x 0.150 x 1.140 x 2.000 = 0.044 m ³					
V6 (cover) = 1.130 x 0.560 x 0.150 x 2.000 = 0.190 m ³						
	1.879 m³	1.879 m³				
Form	A1 = (1.400 + 1.400 + 1.400 + 1.400) x 1.650 = 9.240 m ²					
	A2 = (1.000 + 1.000 + 1.000 + 1.000) x 1.500 = 6.000 m ²					
	A3 (cover) = (1.130 + 0.560) x 2.000 x 2.000 x 0.150 = 1.014 m ²					
	Total = A1 + A2 + A3 = 9.240 + 6.000 + 1.014 = 16.254 m ²					
	16.254 m²	16.254 m²				
Foundation	V = 1.500 x 0.200 x 1.500 = 0.450 m ³	0.450 m³				
Leveling Con:	V = 1.500 x 0.100 x 1.500 = 0.225 m ³	0.225 m³				
Cover	N = 2 nos	2 Nos				
Reinforcing-bar						
BAR	SIZE	LENGTH	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS
R1	D13	4,360	7	0.995	4.34	30
R2	D13	1,400	24	0.995	1.39	33
R3 (cover)	D13	1,120	12	0.995	1.11	13
R4 (cover)	D13	550	22	0.995	0.547	12
				Total	D13	88 kg

Excavation	$V = \left(\frac{4.450 + 2.500}{2} \right) \times 1.950 \times 2.500$	$= 16.941 \text{ m}^3$	16.941 m^3
Backfill	$V1 = \left(\frac{1.475 + 0.500}{2} \right) \times 1.950$	$= 1.926 \text{ m}^2$	
	$V2 = 1.650 \times 0.050$	$= 0.083 \text{ m}^2$	
	$V = (1.926 + 0.083) \times 2.000 \times 2.500$	$= 10.045 \text{ m}^3$	10.045 m^3

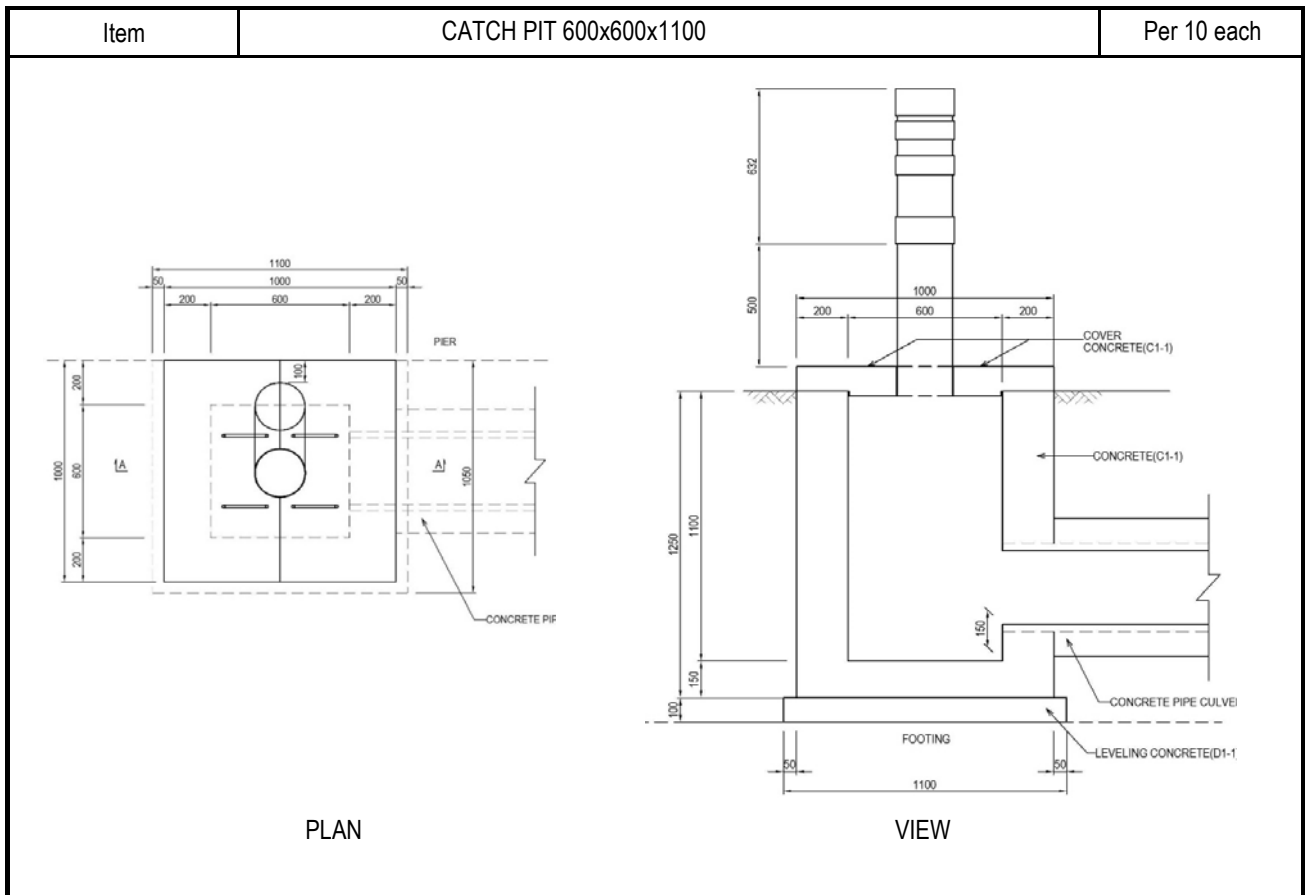


Item	Formula	Quantity				
Concrete	Catch Pit (1.2 x 1.2 x 1.60)					
	V1 = 1.600 x 0.150 x 1.600 x 1.000	= 0.384 m ³				
	V2 = 1.600 x 0.200 x 1.600 x 2.000	= 1.024 m ³				
	V3 = 1.200 x 0.200 x 1.600 x 2.000	= 0.768 m ³				
	V4 = 0.130 x 0.150 x 1.600 x 2.000	= 0.062 m ⁴				
	V5 = 0.130 x 0.150 x 1.340 x 2.000	= 0.052 m ⁵				
V6(cover) = 1.330 x 0.660 x 0.150 x 2.000	= 0.263 m ³					
	2.553 m³	2.553 m³				
Form	A1 = (1.600 + 1.600 + 1.600 + 1.600) x 1.900	= 12.160 m ²				
	A2 = (1.200 + 1.200 + 1.200 + 1.200) x 1.750	= 8.400 m ²				
	A3(cover) = (1.330 + 0.660) x 2.000 x 2.000 x 0.150	= 1.194 m ²				
	Total = A1 + A2 + A3 = 12.160 + 8.400 + 1.194 = 21.754	= 21.754 m ²	21.754 m²			
Foundation	V = 1.700 x 0.200 x 1.700	= 0.578 m ³	0.578 m³			
Leveling Con:	V = 1.700 x 0.100 x 1.700	= 0.289 m ³	0.289 m³			
Cover	N =	= 2 nos	2 Nos			
Reinforcing-bar						
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS
R1	D13	5,060	8	0.995	5.03	40
R2	D13	1,600	27	0.995	1.59	43
R3(cover)	D13	1,320	14	0.995	1.31	18
R4(cover)	D13	650	26	0.995	0.647	17
				Total	D13	118 kg

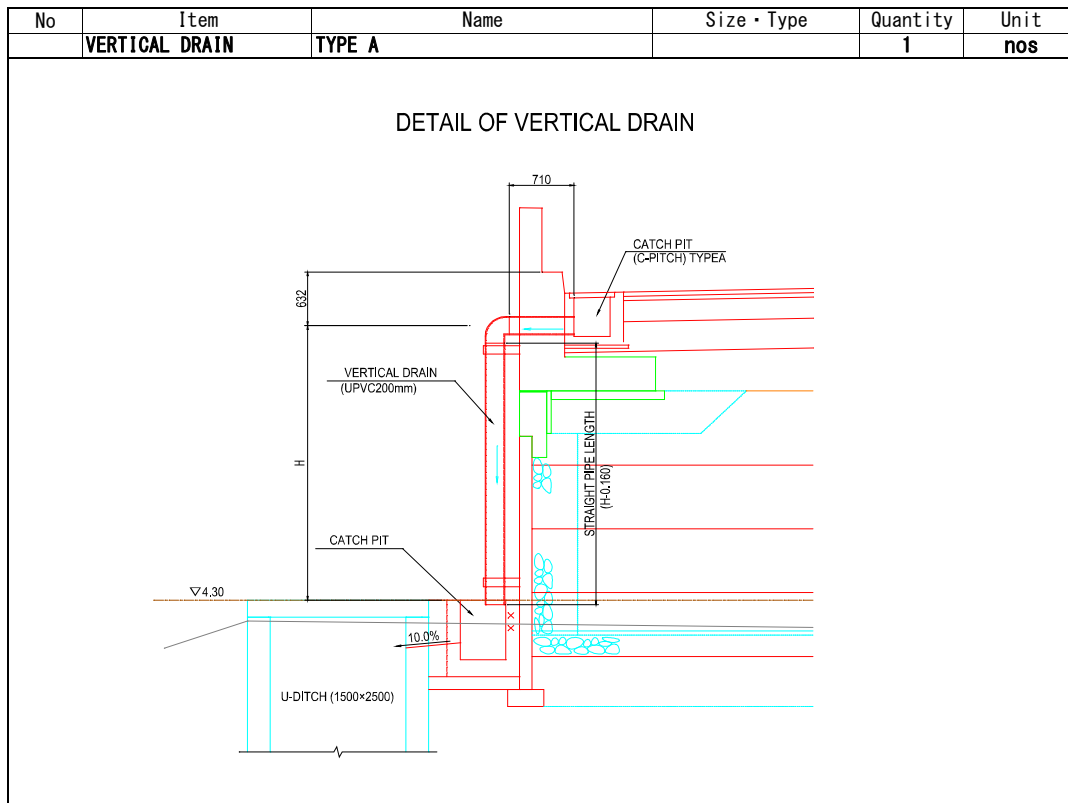
Excavation	$V = \left(\frac{4.900 + 2.700}{2} \right) \times 2.200 \times 2.700$	$= 22.572 \text{ m}^3$	22.572 m^3
Backfill	$V1 = \left(\frac{1.600 + 0.500}{2} \right) \times 2.200 \times H$	$= 2.310 \text{ m}^2$	
	$V2 = 1.900 \times 0.050$	$= 0.095 \text{ m}^2$	
	$V = \left(\frac{2.310 + 0.095}{2} \right) \times 2.000 \times 2.700$	$= 12.987 \text{ m}^3$	12.987 m^3

No	Item	Name	Size · Type	Quantity	Unit											
	CATCH PIT	CATCH PIT 1500x1500x1850	1500x1500x1850	1	nos											
Item	Formula				Quantity											
Concrete	Catch Pit (1.5 x 1.5 x 1.85)															
	V1 =	1.900	x	0.150	x	1.900	x	1.000	=	0.542	m ³					
	V2 =	1.900	x	0.200	x	1.850	x	2.000	=	1.406	m ³					
	V3 =	1.500	x	0.200	x	1.850	x	2.000	=	1.110	m ³					
	V4 =	0.130	x	0.150	x	1.900	x	2.000	=	0.074	m ⁴					
	V5 =	0.130	x	0.150	x	1.640	x	2.000	=	0.064	m ⁵					
	V6 (cover) =	1.630	x	0.810	x	0.150	x	2.000	=	0.396	m ⁵					
										3.592	m ³	3.592	m ³			
Form	A1 =	(1.900	+	1.900	+	1.900	+	1.900)x	2.150	=	16.340	m ²		
	A2 =	(1.500	+	1.500	+	1.500	+	1.500)x	2.000	=	12.000	m ²		
	A3 (cover) =	(1.630	+	0.810)x	2.000	x	2.000	x	0.150	=	1.464	m ²		
	Total =	A1	+	A2	+	A3	=	16.340	+	12.000	+	1.464	=	29.804	m ²	
													29.804	m ²	29.804	m ²
Foundation	V =	2.000	x	0.200	x	2.000	=	0.800	m ³	0.800	m ³					
Leveling Con:	V =	2.000	x	0.100	x	2.000	=	0.400	m ³	0.400	m ³					
Cover	N =						=	2	nos	2	Nos					
Reinforcing-bar																
	BAR	SIZE	LENGTH	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS									
	R1	D13	5,860	10	0.995	5.83	58									
	R2	D13	1,900	27	0.995	1.89	51									
	R3 (cover)	D13	1,620	14	0.995	1.61	23									
	R4 (cover)	D13	800	32	0.995	0.796	25									
				Total		D13	157	kg								

Excavation	$V = \left(\frac{5.450 + 3.000}{2} \right) \times 2.450 \times 3.000$	$= 31.054 \text{ m}^3$	31.054 m^3
Backfill	$V1 = \left(\frac{1.725 + 0.500}{2} \right) \times 2.450$	$= 2.726 \text{ m}^2$	
	$V2 = 2.150 \times 0.050$	$= 0.108 \text{ m}^2$	
	$V = \left(\frac{2.726 + 0.108}{2} \right) \times 2.000 \times 3.000$	$= 17.004 \text{ m}^3$	17.004 m^3



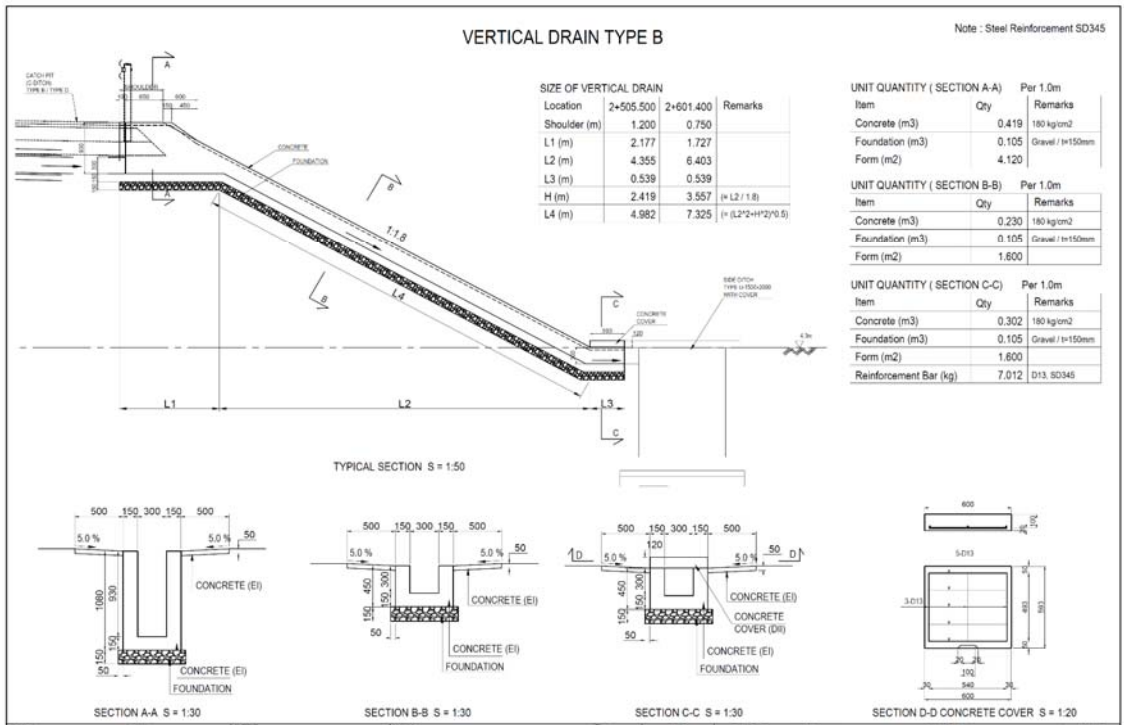
Title	Specification	Calculation Formula	Quantity
Body			
Concrete	18N/mm2	$(1.00 \times 1.00 \times 1.25 - 0.60 \times 0.60 \times 1.10) \times 10 = 8.54$	
		[Deduction] $-(1/4 \times 3.14 \times 0.30 \times 0.30) \times 0.20 \times 10 = -0.141$	
		8.399	8.40 m3
Form	Body	$(1.00 \times 1.25 \times 4 + 0.60 \times 1.10 \times 4) \times 10 = 76.400$	
	Leveling Concrete	$(1.10 \times 0.10 \times 2 + 1.00 \times 0.10 \times 2) \times 10 = 4.200$	
		80.600	80.60 m2
Leveling Concrete	t=100	$1.10 \times 1.05 \times 10 = 11.55$	11.55 m2
		$1.155 \times 0.10 \times 10 = 1.155$	1.16 m3
Cover			
Concrete	24N/mm2	$(0.50 \times 1.00 \times 0.10 \times 2 + 0.60 \times 0.60 \times 0.02) \times 10 = 1.072$	
		[Deduction] $-(1/4 \times 3.14 \times 0.22 \times 0.22) \times 0.12 \times 10 = -0.046$	
		1.026	1.03 m3
Reinforcing bar	D10	$(0.89 \times 7 + 0.40 \times 11) \times 2 \times 0.560 \times 10 = 119.056$	119.06 kg
	D13	$0.76 \times 2 \times 2 \times 1.042 \times 10 = 31.677$	31.68 kg
Form		$(1.00 \times 0.12 + 0.50 \times 0.12) \times 2 \times 2 \times 10 = 7.200$	7.20 m2
Pipe	VPφ200	2 Straight Pipes / each $(0.70 + 0.15) \times 10 = 8.50$	8.50 m
Pipe Elbow	45°	2 Elbows / each	20 each



Item	Formula	Quantity																																																																																																																																																																													
L1=Pipe Length	<table border="1"> <thead> <tr> <th rowspan="2">Vertical Drain Location</th> <th rowspan="2">Ground</th> <th rowspan="2">H</th> <th colspan="3">Pipe Length (m)</th> <th rowspan="2">Elbow (nos.)</th> <th rowspan="2">PK1: L1 = 10.538 m</th> <th rowspan="2">Nos = 3 nos</th> </tr> <tr> <th>Straight</th> <th>Cross</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td rowspan="3">PK1(Thakda side)</td> <td>0+280.000</td> <td>4.30</td> <td>1.684</td> <td>1.524</td> <td>0.710</td> <td>2.8570</td> <td>1</td> <td rowspan="3">PK2: L1 = 66.151 m Nos = 17 nos</td> </tr> <tr> <td>0+285.000</td> <td>4.30</td> <td>2.261</td> <td>2.101</td> <td>0.710</td> <td>3.434</td> <td>1</td> </tr> <tr> <td>0+325.000</td> <td>4.30</td> <td>3.074</td> <td>2.914</td> <td>0.710</td> <td>4.247</td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Total</td> <td>10.538</td> <td>3</td> </tr> <tr> <td rowspan="16">PK2(Thakda side)</td> <td>2+428.400</td> <td>4.30</td> <td>3.429</td> <td>3.268</td> <td>0.710</td> <td>4.601</td> <td>1</td> <td rowspan="16"></td> </tr> <tr> <td>2+448.400</td> <td>4.30</td> <td>3.125</td> <td>2.965</td> <td>0.710</td> <td>4.298</td> <td>1</td> </tr> <tr> <td>2+458.400</td> <td>4.30</td> <td>2.996</td> <td>2.836</td> <td>0.710</td> <td>4.169</td> <td>1</td> </tr> <tr> <td>2+468.400</td> <td>4.30</td> <td>2.920</td> <td>2.760</td> <td>0.973</td> <td>4.356</td> <td>1</td> </tr> <tr> <td>2+478.400</td> <td>4.30</td> <td>2.859</td> <td>2.699</td> <td>0.973</td> <td>4.295</td> <td>1</td> </tr> <tr> <td>2+488.400</td> <td>4.30</td> <td>2.849</td> <td>2.689</td> <td>0.973</td> <td>4.285</td> <td>1</td> </tr> <tr> <td>2+505.500</td> <td>4.30</td> <td>2.719</td> <td>2.559</td> <td>0.973</td> <td>4.155</td> <td>1</td> </tr> <tr> <td>2+518.700</td> <td>4.30</td> <td>2.614</td> <td>2.654</td> <td>0.973</td> <td>4.250</td> <td>1</td> </tr> <tr> <td>2+528.700</td> <td>4.30</td> <td>2.853</td> <td>2.693</td> <td>0.973</td> <td>4.289</td> <td>1</td> </tr> <tr> <td>2+538.700</td> <td>4.30</td> <td>2.901</td> <td>2.741</td> <td>0.973</td> <td>4.337</td> <td>1</td> </tr> <tr> <td>2+548.700</td> <td>4.30</td> <td>2.987</td> <td>2.827</td> <td>0.710</td> <td>4.160</td> <td>1</td> </tr> <tr> <td>2+558.700</td> <td>4.30</td> <td>3.086</td> <td>2.926</td> <td>0.710</td> <td>4.259</td> <td>1</td> </tr> <tr> <td>2+578.700</td> <td>4.30</td> <td>3.363</td> <td>3.203</td> <td>0.710</td> <td>4.536</td> <td>1</td> </tr> <tr> <td>2+600.000</td> <td>4.30</td> <td>3.728</td> <td>3.568</td> <td>0.710</td> <td>4.901</td> <td>1</td> </tr> <tr> <td>2+705.000</td> <td>4.30</td> <td>1.246</td> <td>1.086</td> <td>0.710</td> <td>2.419</td> <td>1</td> </tr> <tr> <td>2+750.000</td> <td>4.30</td> <td>0.277</td> <td>0.117</td> <td>0.710</td> <td>1.450</td> <td>1</td> </tr> <tr> <td>2+760.900</td> <td>4.30</td> <td>0.218</td> <td>0.058</td> <td>0.710</td> <td>1.391</td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Total</td> <td>66.151</td> <td>17</td> </tr> </tbody> </table>	Vertical Drain Location	Ground	H	Pipe Length (m)			Elbow (nos.)	PK1: L1 = 10.538 m	Nos = 3 nos	Straight	Cross	Total	PK1(Thakda side)	0+280.000	4.30	1.684	1.524	0.710	2.8570	1	PK2: L1 = 66.151 m Nos = 17 nos	0+285.000	4.30	2.261	2.101	0.710	3.434	1	0+325.000	4.30	3.074	2.914	0.710	4.247	1							Total	10.538	3	PK2(Thakda side)	2+428.400	4.30	3.429	3.268	0.710	4.601	1		2+448.400	4.30	3.125	2.965	0.710	4.298	1	2+458.400	4.30	2.996	2.836	0.710	4.169	1	2+468.400	4.30	2.920	2.760	0.973	4.356	1	2+478.400	4.30	2.859	2.699	0.973	4.295	1	2+488.400	4.30	2.849	2.689	0.973	4.285	1	2+505.500	4.30	2.719	2.559	0.973	4.155	1	2+518.700	4.30	2.614	2.654	0.973	4.250	1	2+528.700	4.30	2.853	2.693	0.973	4.289	1	2+538.700	4.30	2.901	2.741	0.973	4.337	1	2+548.700	4.30	2.987	2.827	0.710	4.160	1	2+558.700	4.30	3.086	2.926	0.710	4.259	1	2+578.700	4.30	3.363	3.203	0.710	4.536	1	2+600.000	4.30	3.728	3.568	0.710	4.901	1	2+705.000	4.30	1.246	1.086	0.710	2.419	1	2+750.000	4.30	0.277	0.117	0.710	1.450	1	2+760.900	4.30	0.218	0.058	0.710	1.391	1						Total	66.151	17	
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No. of Pipe Brace	PK1: 3 x 2 = 6 Nos Nos/1set PK2: 17 x 2 = 34 Nos Nos/1set																																																																																																																																																																														

No	Item	Name	Size · Type	Quantity	Unit
	PIPE BRACE	PIPE BRACE	200mm	1	nos
Item	ormula				Quantity
FB (Flat Bar)	Pipe Brace (200mm) N = 100 × 6 × 440				2 Nos
FB	N = 100 × 6 × 700				2 Nos
BN (Bolt and Nut)	N = M12 × 40				4 Nos
Anchor	N = M12				4 Nos

No	Item	Name	Quantity	Unit
	VERTICAL DRAIN	TYPE B	1	nos



Item	Formula	Quantity
A-A Section	CONCRETE (m3)	
	CONCRETE DITCH	
	V1= 0.600 X 1.080 X 1 X 1 = 0.648 m3	
	V2= 0.300 X 0.930 X 1 X 1 = 0.279 m3	
	V3= V1 - V2 = 0.369 m3	
	CONCRETE SIDE PROTECTION	
	V4= 0.500 X 0.050 X 2 X 1 = 0.050 m3	
	CONCRETE (SIDE+DITCH)	
	V5= V3 + V4 = 0.419 m3	0.419 m3 (Per 1m)
	FOUNDATION (m3)	
V6= 0.700 X 0.150 X 1 = 0.105 m3	0.105 m3 (Per 1m)	
FORM (m2)		
	A1= 1.080 X 2 X 1 = 2.160 m2	
	A2= 0.930 X 2 X 1 = 1.860 m2	
	A3= 0.050 X 2 X 1 = 0.100 m2	
A4= A1 + A2 + A3 = 4.120 m2	4.120 m2 (Per 1m)	
Excavation		
V= 2.600 X 1.230 X 1.000 = 3.198 m3	3.198 m3 (Per 1m)	
Back Filling		
V= 1.000 X 1.230 X 1.000 X 2 = 2.460 m3	2.460 m3 (Per 1m)	

B-B Section	CONCRETE (m3)							
	CONCRETE DITCH							
	V1=	0.600	X	0.450	X	1.000	X	= 0.270 m3
	V2=	0.300	X	0.300	X	1.000	X	= 0.090 m3
	V3=	V1	-	V2				= 0.180 m3
	CONCRETE SIDE PROTECTION							
	V4=	0.500	X	0.050	X	2.000	X 1	= 0.050 m3
	CONCRETE (SIDE+DITCH)							
	V5=	V3	+	V4				= 0.230 m3
	FOUNDATION (m3)							0.230 m3 (Per 1m)
	V6=	0.700	X	0.150	X	1		= 0.105 m3
	FORM (m2)							0.105 m3 (Per 1m)
	A1=	0.450	X	2	X	1		= 0.900 m2
	A2=	0.300	X	2	X	1		= 0.600 m2
	A3=	0.050	X	2	X	1		= 0.100 m2
A4=	A1	+	A2	+	A3		= 1.600 m2	
Excavation							1.600 m2 (Per 1m)	
V=	2.600	X	0.600	X	1.000		= 1.560 m3	
Back Filling							1.560 m3 (Per 1m)	
V=	1.000	X	0.600	X	1.000	X 2	= 1.200 m3	
							1.200 m3 (Per 1m)	
C-C Section	CONCRETE (m3)							
	CONCRETE DITCH							
	V1=	0.600	X	0.450	X	1.000		= 0.270 m3
	V2=	0.300	X	0.300	X	1.000		= 0.090 m3
	V3=	V1	-	V2				= 0.180 m3
	CONCRETE SIDE PROTECTION							
	V4=	0.500	X	0.050	X	2.000	X 1	= 0.050 m3
	COVER							
	V5=	0.600	X	0.120	X	1		= 0.072 m3
	CONCRETE (DITCH+SIDE+COVER)							
	V6=	V3	+	V4	+	V5		= 0.302 m3
	FOUNDATION (m3)							0.302 m3 (Per 1m)
	V6=	0.700	X	0.150	X	1		= 0.105 m3
	FORM (m2)							0.105 m3 (Per 1m)
	A1=	0.450	X	2	X	1		= 0.900 m2
A2=	0.300	X	2	X	1		= 0.600 m2	
A3=	0.050	X	2	X	1		= 0.100 m2	
A4=	A1	+	A2	+	A3		= 1.600 m2	
REINFORCING-BAR D13 (kg)							1.600 m2 (Per 1m)	
L1=	0.493	X	3	/	0.593		= 2.494 m	
L2=	0.540	X	5	/	0.593		= 4.553 m	
L3=	L1	+	L2				= 7.047 m	
W1=	L3	X	0.995				= 7.012 kg	
(kgf/m)							7.012 kg (Per 1m)	
Excavation								
V=	2.600	X	0.600	X	1.000		= 1.560 m3	
Back Filling							1.560 m3 (Per 1m)	
V=	1.000	X	0.600	X	1.000	X 2	= 1.200 m3	
							1.200 m3 (Per 1m)	

TOTAL QTY

SIZE OF VERTICAL DRAIN

Location	2+505.500	2+601.400	Remarks
Shoulder (m)	1.200	0.750	
L1 (m)	2.177	1.727	
L2 (m)	4.355	6.403	
L3 (m)	0.539	0.539	
H (m)	2.419	3.557	(= L2 - 1.8)
L4 (m)	4.982	7.325	(= (L2*2+H*2)/0.5)

Length for Section A-A = 2.177 + 1.727 = 3.904 m
 Length for Section B-B = 4.982 + 7.325 = 12.307 m
 Length for Section C-C = 0.539 + 0.593 = 1.132 m

CONCRETE (m3)

$$V = 0.419 \times 3.904 + 0.230 \times 12.307 + 0.302 \times 1.132 = 4.808 \text{ m}^3$$

(m3/m: A-A) (m) (m3/m: B-B) (m) (m3/m: C-C) (m)

4.808 m3

FOUNDATION (m3)

$$V = 0.105 \times 3.904 + 0.105 \times 12.307 + 0.105 \times 1.132 = 1.821 \text{ m}^3$$

(m3/m: A-A) (m) (m3/m: B-B) (m) (m3/m: C-C) (m)

1.821 m3

FORM (m2)

$$A = 4.120 \times 3.904 + 1.600 \times 12.307 + 1.600 \times 1.132 = 37.587 \text{ m}^2$$

(m2/m: A-A) (m) (m2/m: B-B) (m) (m2/m: C-C) (m)

37.587 m2

REINFORCING-BAR D13 (kg)

$$W = 7.012 \times 1.132 = 7.938 \text{ kg}$$

(kg/m: C-C) (m)

7.938 kg

Excavation

$$V = 3.198 \times 3.904 + 1.560 \times 12.307 + 1.560 \times 1.132 = 33.450 \text{ m}^3$$

(m3/m: A-A) (m) (m3/m: B-B) (m) (m3/m: C-C) (m)

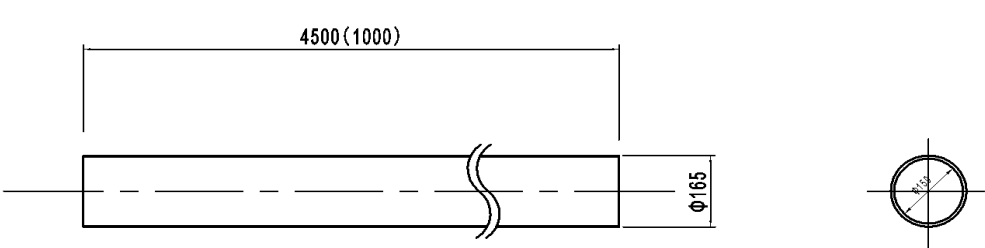
33.450 m3

Back Filling

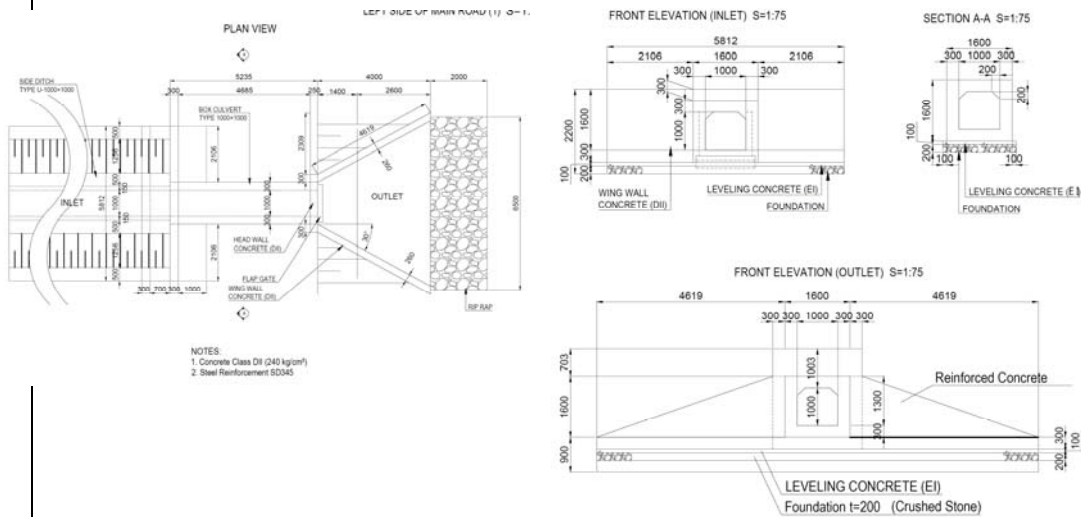
$$V = 2.460 \times 3.904 + 1.200 \times 12.307 + 1.200 \times 1.132 = 25.731 \text{ m}^3$$

(m3/m: A-A) (m) (m3/m: B-B) (m) (m3/m: C-C) (m)

25.731 m3

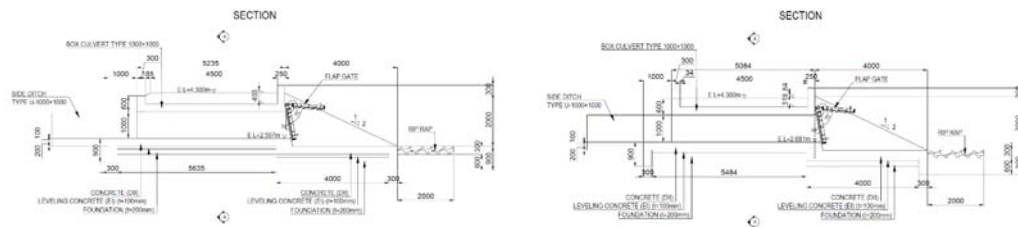
No	Item	Name	Quantity	Unit
	Vertical Drain Type C	φ 150mm uPVC Pipe(CI-8.5)	10	m
<p>φ150mm uPVC Pipe(CI-8.5) S=1:10</p> 				
Item	Formula			Quantity
φ 150mm uPVC Pipe (CI-8.5)	L=	10.000 m	10.000 m	

No	Item	Name	Size · Type	Quantity	Unit
	DRAINAGE OUTLET	TYPE A Left & Right SIDE		1	nos



Left Side

Right Side



Item	Formula	Quantity
------	---------	----------

Summary for Drainage Outlet Type A, Size of Left and Right Side are same.
 For each side

No.	Description	Width	Length	Thickness	Height	Number	Unit	Quantity
		W	L	T	H			
1	Box 1000x1000		5.235				m	5.235
2	Leveling concrete						m ³	2.794
	Outlet Slab1	2.200	4.000	0.100		1	m ³	0.880
	Outlet Slab2	2.309	3.950	0.100		1	m ³	0.912
	Inlet Slab	5.812	1.000	0.100		1	m ³	0.581
	Inlet Wall	2.106	1.000	0.100		2	m ³	0.421
3	Foundation						m ³	5.588
	Outlet Slab1	2.200	4.000	0.200		1	m ³	1.760
	Outlet Slab2	2.309	3.950	0.200		1	m ³	1.824
	Inlet Slab	5.812	1.000	0.200		1	m ³	1.162
	Inlet Wall	2.106	1.000	0.200		2	m ³	0.842
4	Reinforced Concrete (DII)						m ³	15.845
	Inlet Front Slab	5.812	0.700	0.300		1	m ³	1.221
	Inlet Back Slab	2.106	1.000	0.300		2	m ³	1.264
	Inlet Wall1	5.812		0.300	2.500	1	m ³	4.359
	Inlet Wall2	1.600		0.300	1.300	-1	m ³	-0.624
	Outlet Slab1	1.600	4.000	0.300		1	m ³	1.920
	Outlet Slab2	2.309	4.000	0.300		1	m ³	2.771
	Outlet Slab3	6.518		0.300	0.600	1	m ³	1.173
	Outlet Wing Wall1	4.619		0.300	1.600	1	m ³	2.217
	Outlet Wing Wall2	4.619		0.260	0.300	2	m ³	0.721
	Outlet Wing Wall3	0.300		0.300	1.900	2	m ³	0.342
	Outlet Head Wall1	1.600		0.300	0.703	1	m ³	0.337
	Outlet Head Wall2	1.600		0.300	0.300	1	m ³	0.144
5	Formwork of out-let						m ²	83.942
	Inlet Wall1	5.812			2.500	2	m ²	29.060
	Inlet Wall2	1.600			1.000	-2	m ²	-3.200
	Outlet Slab	6.518			0.900	2	m ²	11.732
	Outlet Wing Wall	4.619			1.600	2	m ²	14.781
	Outlet Head Wall1	2.200			2.603	2	m ²	11.453
	Outlet Head Wall2	1.600			1.000	-2	m ²	-3.200
	Leveling Concrete1	5.812			0.100	2	m ²	1.162
	Leveling Concrete2	10.768			0.100	2	m ²	2.154
6	Riprap for Bedding Stone	6.500	2.000	0.300		1	m ³	3.900

Reinforced Bar Left and Right Side are same amount

Inlet

LIST OF REINFORCEMENT(INLET)							
MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
A 1	D13	2 380	32	0.995	2.368	76	L
A 2	"	800	16	"	0.796	13	I
A 3	"	1 500	18	"	1.493	27	I
A 4	"	1 500	34	"	1.493	51	I
A 5	D10	2 256	52	0.560	1.263	66	—
A 6	D13	2 440	68	0.995	2.428	165	←
A 7	"	1 670	22	"	1.662	37	←
A 8	D10	5 712	16	0.560	3.199	51	—
C 1	"	2 300	49	"	1.288	63	0
D 1	D13	1 610	11	0.995	1.602	18	⊥
D 2	"	2 960	4	"	2.945	12	—
SUB TOTAL						579	kg
						D10	180 kg
						D13	399 kg
						Total	579 kg

Outlet

LIST OF REINFORCEMENT(INLET)							
MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
E 1	D16	2 300	44	1.560	3.588	158	L
E 2	"	1 859	12	"	2.900	35	L (AVE)
E 3	"	1 090	10	"	1.700	17	I
E 4	"	1 295	42	"	2.020	85	I (AVE)
E 5	D13	1 233	54	0.995	1.227	66	I (AVE)
E 6	D10	3 449	36	0.560	1.931	70	— (AVE)
E 7	"	5 715	4	"	3.200	13	—
E 8	D13	4 880	9	0.995	4.856	44	←
E 9	"	2 630	22	"	2.617	58	← (AVE)
E 10	D10	5 064	53	0.560	2.836	150	— (AVE)
E 11	"	6 430	4	"	3.601	14	—
E 12	"	7 117	4	"	3.986	20	—
E 13	D13	4 880	9	0.995	4.856	16	←
G 1	"	2 300	35	"	2.289	80	0
H 1	D13	2 318	15	0.995	2.306	35	⊥
H 2	"	2 100	10	"	2.090	21	—
SUB TOTAL						906	kg
						D10	263 kg
						D13	348 kg
						D16	295 kg
						Total	906 kg

Total

	Inlet	Outlet	Total
D16	= 0.000	+ 295.000	= 295.000 kg
D13	= 399.000	+ 348.000	= 747.000 kg
D10	= 180.000	+ 263.000	= 443.000 kg
Grand Total			= 1485.000 kg

For Each Side
1485.000 kg

Earthworks

For Left Side
Excavation

	Width	Height	Length	
Inlet V1	= 7.812	X 2.500	X 4.000	= 78.120 m3
Outlet V2	= 8.500	X 3.200	X 6.000	= 163.200 m3
V3	= 8.500	X -0.300	X 6.000	= -15.300 m3
Total				= 226.020 m3

226.020 m3

Backfill

	Width	Height	Length	nos	
Inlet V1	= 3.106	X 2.500	X 2.000	X 2	= 31.060 m3
V2	= 3.106	X 1.703	X 2.000	X 2	= 21.158 m3
Outlet V2	= 2.309	X 2.900	X 4.000	X 0.5 x 2	= 26.784 m3
Total					= 79.002 m3

79.002 m3

For Right Side
Excavation

	Width	Height	Length	
Inlet V1	= 7.812	X 2.500	X 4.000	= 78.120 m3
Outlet V2	= 8.500	X 3.200	X 6.000	= 163.200 m3
V3	= 8.500	X -0.384	X 6.000	= -19.584 m3
Total				= 221.736 m3

221.736 m3

Backfill

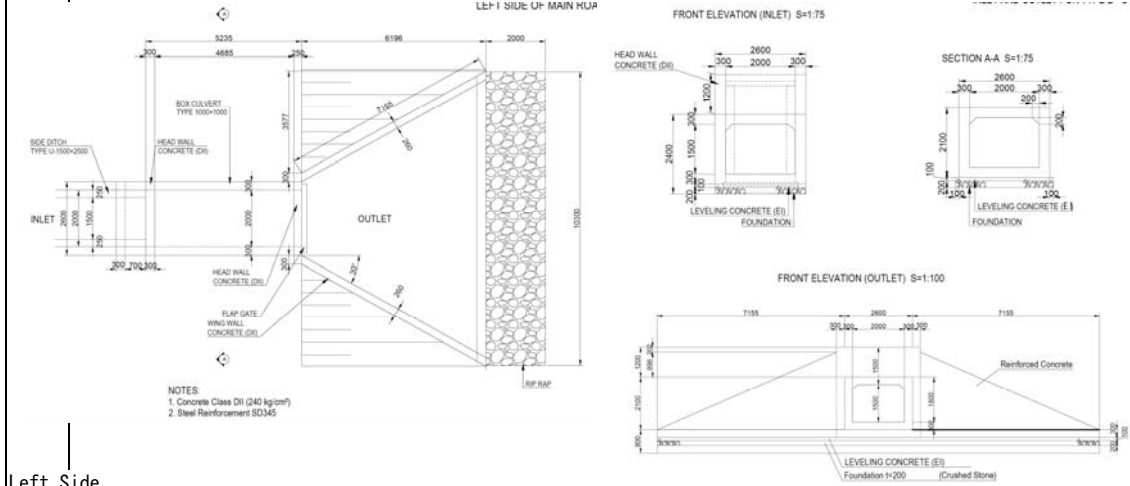
	Width	Height	Length	nos	
Inlet V1	= 3.106	X 2.500	X 2.000	X 2	= 31.060 m3
V2	= 3.106	X 1.703	X 2.000	X 2	= 21.158 m3
Outlet V2	= 2.309	X 2.816	X 4.000	X 0.5 x 2	= 26.009 m3
Total					= 78.227 m3

78.227 m3

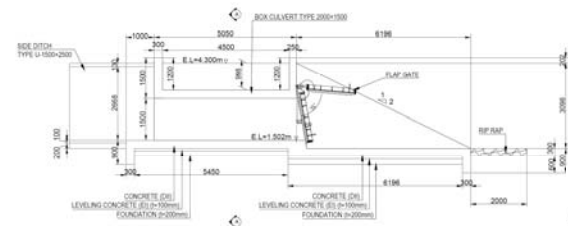
No	Item	Name	Size · Type	Quantity	Unit
	DRAINAGE OUTLET	TYPE A Flap Gate 1000x1000		1	nos
<p>DETAIL OF FLAP GATE S=1:30</p> <p>DRAINAGE OUTLET TYPE-A (9)</p>					
	Item	Formula			Quantity
	No. of Flap Gate	Left Side =			1 Nos
		Right Side =			1 Nos

No	Item	Name	Size · Type	Quantity	Unit																																																																																																																																																																																																																																																																										
	DRAINAGE OUTLET	TYPE A Box Culvert 1000x1000		1	m																																																																																																																																																																																																																																																																										
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>TOP SLAB</p> </div> <div style="width: 45%;"> <p>SIDE SLAB</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>SECTION S=1:50</p> </div> <div style="width: 45%;"> <p>(PER 1m)</p> </div> </div> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>MARK</th> <th>No.</th> <th>SEC.</th> <th>EACH</th> <th>LENGTH (mm)</th> <th>L 1 (mm)</th> <th>L 2 (mm)</th> <th>L 3 (mm)</th> <th>L 4 (mm)</th> <th>H (mm)</th> <th>R (mm)</th> </tr> </thead> <tbody> <tr><td>S 1</td><td>4</td><td>D13</td><td>4</td><td>3080</td><td>820</td><td>220</td><td>1120</td><td>820</td><td></td><td>140</td></tr> <tr><td>S 2</td><td>1</td><td>D13</td><td>4</td><td>1400</td><td>1400</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>S 3</td><td>1</td><td>D13</td><td>16</td><td>1000</td><td>1000</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>S 4</td><td>5</td><td>D13</td><td>8</td><td>1040</td><td>195</td><td>649</td><td></td><td></td><td>459</td><td></td></tr> <tr><td>S 5</td><td>3</td><td>D13</td><td>3</td><td>880</td><td></td><td>126</td><td></td><td></td><td></td><td></td></tr> <tr><td>W 1</td><td>1</td><td>D13</td><td>8</td><td>1390</td><td>1390</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>W 2</td><td>1</td><td>D13</td><td>20</td><td>1000</td><td>1000</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>W 3</td><td>2</td><td>D13</td><td>12</td><td>360</td><td></td><td>152</td><td></td><td></td><td></td><td></td></tr> <tr><td>F 1</td><td>4</td><td>D13</td><td>4</td><td>3080</td><td>800</td><td>220</td><td>1120</td><td>820</td><td></td><td>140</td></tr> <tr><td>F 2</td><td>1</td><td>D13</td><td>4</td><td>1400</td><td>1400</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>F 3</td><td>1</td><td>D13</td><td>16</td><td>1000</td><td>1000</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>F 4</td><td>5</td><td>D13</td><td>8</td><td>850</td><td>195</td><td>255</td><td></td><td></td><td>190</td><td></td></tr> <tr><td>F 5</td><td>3</td><td>D13</td><td>3</td><td>940</td><td></td><td>108</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>MARK</th> <th>SEC.</th> <th>LENGTH (mm)</th> <th>EACH</th> <th>WEIGHT (kg/m)</th> <th>WEIGHT(1one) (kg)</th> <th>WEIGHT (kg)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr><td>S 1</td><td>D13</td><td>3080</td><td>4</td><td>0.995</td><td>3.065</td><td>12.260</td><td></td></tr> <tr><td>S 2</td><td>D13</td><td>1400</td><td>4</td><td>0.995</td><td>1.393</td><td>5.572</td><td></td></tr> <tr><td>S 3</td><td>D13</td><td>1000</td><td>16</td><td>0.995</td><td>0.995</td><td>15.920</td><td></td></tr> <tr><td>S 4</td><td>D13</td><td>1040</td><td>8</td><td>0.995</td><td>1.035</td><td>8.280</td><td></td></tr> <tr><td>S 5</td><td>D13</td><td>880</td><td>3</td><td>0.995</td><td>0.975</td><td>2.925</td><td></td></tr> <tr><td>W 1</td><td>D13</td><td>1390</td><td>8</td><td>0.995</td><td>1.383</td><td>11.064</td><td></td></tr> <tr><td>W 2</td><td>D13</td><td>1000</td><td>20</td><td>0.995</td><td>0.995</td><td>19.900</td><td></td></tr> <tr><td>W 3</td><td>D13</td><td>360</td><td>12</td><td>0.995</td><td>0.358</td><td>4.296</td><td></td></tr> <tr><td>F 1</td><td>D13</td><td>3080</td><td>4</td><td>0.995</td><td>3.065</td><td>12.260</td><td></td></tr> <tr><td>F 2</td><td>D13</td><td>1400</td><td>4</td><td>0.995</td><td>1.393</td><td>5.572</td><td></td></tr> <tr><td>F 3</td><td>D13</td><td>1000</td><td>16</td><td>0.995</td><td>0.995</td><td>15.920</td><td></td></tr> <tr><td>F 4</td><td>D13</td><td>850</td><td>8</td><td>0.995</td><td>0.847</td><td>5.176</td><td></td></tr> <tr><td>F 5</td><td>D13</td><td>940</td><td>3</td><td>0.995</td><td>0.935</td><td>2.805</td><td></td></tr> </tbody> </table>						MARK	No.	SEC.	EACH	LENGTH (mm)	L 1 (mm)	L 2 (mm)	L 3 (mm)	L 4 (mm)	H (mm)	R (mm)	S 1	4	D13	4	3080	820	220	1120	820		140	S 2	1	D13	4	1400	1400						S 3	1	D13	16	1000	1000						S 4	5	D13	8	1040	195	649			459		S 5	3	D13	3	880		126					W 1	1	D13	8	1390	1390						W 2	1	D13	20	1000	1000						W 3	2	D13	12	360		152					F 1	4	D13	4	3080	800	220	1120	820		140	F 2	1	D13	4	1400	1400						F 3	1	D13	16	1000	1000						F 4	5	D13	8	850	195	255			190		F 5	3	D13	3	940		108					MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT(1one) (kg)	WEIGHT (kg)	REMARKS	S 1	D13	3080	4	0.995	3.065	12.260		S 2	D13	1400	4	0.995	1.393	5.572		S 3	D13	1000	16	0.995	0.995	15.920		S 4	D13	1040	8	0.995	1.035	8.280		S 5	D13	880	3	0.995	0.975	2.925		W 1	D13	1390	8	0.995	1.383	11.064		W 2	D13	1000	20	0.995	0.995	19.900		W 3	D13	360	12	0.995	0.358	4.296		F 1	D13	3080	4	0.995	3.065	12.260		F 2	D13	1400	4	0.995	1.393	5.572		F 3	D13	1000	16	0.995	0.995	15.920		F 4	D13	850	8	0.995	0.847	5.176		F 5	D13	940	3	0.995	0.935	2.805	
MARK	No.	SEC.	EACH	LENGTH (mm)	L 1 (mm)	L 2 (mm)	L 3 (mm)	L 4 (mm)	H (mm)	R (mm)																																																																																																																																																																																																																																																																					
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S 4	5	D13	8	1040	195	649			459																																																																																																																																																																																																																																																																						
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W 3	2	D13	12	360		152																																																																																																																																																																																																																																																																									
F 1	4	D13	4	3080	800	220	1120	820		140																																																																																																																																																																																																																																																																					
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F 4	5	D13	8	850	195	255			190																																																																																																																																																																																																																																																																						
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S 4	D13	1040	8	0.995	1.035	8.280																																																																																																																																																																																																																																																																									
S 5	D13	880	3	0.995	0.975	2.925																																																																																																																																																																																																																																																																									
W 1	D13	1390	8	0.995	1.383	11.064																																																																																																																																																																																																																																																																									
W 2	D13	1000	20	0.995	0.995	19.900																																																																																																																																																																																																																																																																									
W 3	D13	360	12	0.995	0.358	4.296																																																																																																																																																																																																																																																																									
F 1	D13	3080	4	0.995	3.065	12.260																																																																																																																																																																																																																																																																									
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F 4	D13	850	8	0.995	0.847	5.176																																																																																																																																																																																																																																																																									
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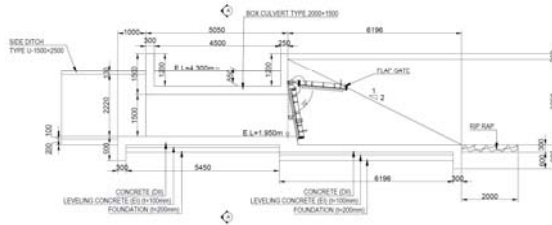
No	Item	Name	Size · Type	Quantity	Unit
	DRAINAGE OUTLET	TYPE B LEFT & Right SIDE		1	nos



Left Side



Right Side



Item	Formula	Quantity
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Summary for Drainage Outlet Type A, Size of Left and Right Side are same.
For each side

No.	Description	Width	Length	Thickness	Height	Number	Unit	Quantity
		W	L	T	H			
1	Box 2000x1500		5.050				m	5.050
2	Leveling concrete						m ³	4.258
	Outlet Slab1	3.200	6.146	0.100		1	m ³	1.967
	Outlet Slab2	3.577	5.896	0.100		1	m ³	2.109
	Inlet Slab	2.600	0.700	0.100		1	m ³	0.182
3	Foundation						m ³	8.515
	Outlet Slab1	3.200	6.146	0.200		1	m ³	3.933
	Outlet Slab2	3.577	5.896	0.200		1	m ³	4.218
	Inlet Slab	2.600	0.700	0.200		1	m ³	0.364
4	Reinforced Concrete (DII)						m ³	26.919
	Inlet Front Slab	2.600	0.700	0.300		1	m ³	0.546
	Inlet Head Wall1	2.600		0.300	3.900	1	m ³	3.042
	Inlet Head Wall2	2.600		0.300	1.500	-1	m ³	-1.170
	Outlet Slab1	3.200	6.446	0.300		1	m ³	6.188
	Outlet Slab2	3.577	6.196	0.300		1	m ³	6.649
	Outlet Slab3	3.200	0.500	0.300		1	m ³	0.480
	Outlet Wing Wall1	7.155		0.260	3.098	1	m ³	5.763
	Outlet Wing Wall2	10.300		0.300	0.900	1	m ³	2.781
	Outlet Wing Wall3	0.300		0.250	3.300	2	m ³	0.495
	Outlet Head Wall	2.600		0.250	3.300	1	m ³	2.145
5	Formwork of out-let						m ²	90.673
	Inlet Wall1	2.600			3.900	2	m ²	20.280
	Inlet Wall2	2.600			1.500	-2	m ²	-7.800
	Outlet Slab	10.300			0.900	2	m ²	18.540
	Outlet Wing Wall1	7.155			3.098	2	m ²	44.332
	Outlet Wing Wall2	0.300			3.400	4	m ²	4.080
	Outlet Head Wall	2.600			1.500	2	m ²	7.800
	Leveling Concrete1	3.300			0.100	2	m ²	0.660
	Leveling Concrete2	27.810			0.100	1	m ²	2.781
6	Riprap for Bedding Stone	10.300	2.000	0.300		1	m ³	6.180

Reinforced Bar Left and Right Side are same amount

Inlet

LIST OF REINFORCEMENT(INLET)

MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
A 1	D13	2 380	0	0.995	2.368	0	L
A 2	"	800	0	"	0.796	0	I
A 3	"	1 500	0	"	1.493	0	I
A 4	"	1 500	0	"	1.493	0	I
A 5	D10	2 256	0	0.560	1.263	0	—
A 6	D13	2 440	0	0.995	2.428	0	←
A 7	"	1 670	38	"	1.662	63	←
A 8	D10	2 500	16	0.560	1.400	22	—
C 1	"	2 300	23	"	1.288	30	0
D 1	D13	3 410	19	0.995	3.393	64	⌋
D 2	"	2 500	14	"	2.488	35	—
SUB TOTAL						214	kg
						D10	52 kg
						D13	162 kg
						Total	214 kg

Outlet

LIST OF REINFORCEMENT(INLET)

MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
E 1	D16	2 300	62	1.560	3.588	222	L
E 2	"	1 837	24	"	2.866	69	L (AVE)
E 3	"	1 672	18	"	2.608	47	I
E 4	"	1 370	68	"	2.137	145	I (AVE)
E 5	D13	1 462	90	0.995	1.455	131	I (AVE)
E 6	D10	4 069	60	0.560	2.279	137	— (AVE)
E 7	"	7 472	4	"	4.184	17	—
E 8	D13	4 880	16	0.995	4.856	78	←
E 9	"	3 363	68	"	3.346	228	← (AVE)
E 10	D10	6 282	89	0.560	3.518	313	— (AVE)
E 11	"	9 966	4	"	5.581	22	—
E 12	"	10 197	4	"	5.710	23	—
E 13	D13	7 319	16	0.995	7.282	117	←
G 1	"	2 300	50	"	2.289	114	0
H 1	D13	3 210	25	0.995	3.194	80	⌋
H 2	"	3 100	14	"	3.085	43	—
SUB TOTAL						1 786	kg
						D10	512 kg
						D13	791 kg
						D16	483 kg
						Total	1 786 kg

Total		Inlet	Outlet	Total
	D16	= 0.000	+ 483.000	= 483.000 kg
	D13	= 162.000	+ 791.000	= 953.000 kg
	D10	= 52.000	+ 512.000	= 564.000 kg
	Grand Total			= 2000.000 kg

For Each Side
2000.000 kg

Earthworks

For Left Side
Excavation

		Width	Height	Length	
Inlet	V1	= 4.600	X 3.698	X 3.300	= 56.136 m3
Outlet	V2	= 12.300	X 4.200	X 10.446	= 539.640 m3
	V3	= 12.300	X -0.202	X 10.446	= -25.954 m3
	Total				= 569.822 m3

569.822 m3

Backfill

		Width	Height	Length	nos	
Inlet	V1	= 2.000	X 3.698	X 3.300	X 2	= 48.814 m3
Outlet	V2	= 4.877	X 3.998	X 10.446	X 0.5 x 2	= 203.679 m3
	Total				= 252.493 m3	

252.493 m3

For Right Side
Excavation

		Width	Height	Length	
Inlet	V1	= 4.600	X 3.698	X 3.300	= 56.136 m3
Outlet	V2	= 12.300	X 4.200	X 10.446	= 539.640 m3
	V3	= 12.300	X -0.650	X 10.446	= -83.516 m3
	Total				= 512.260 m3

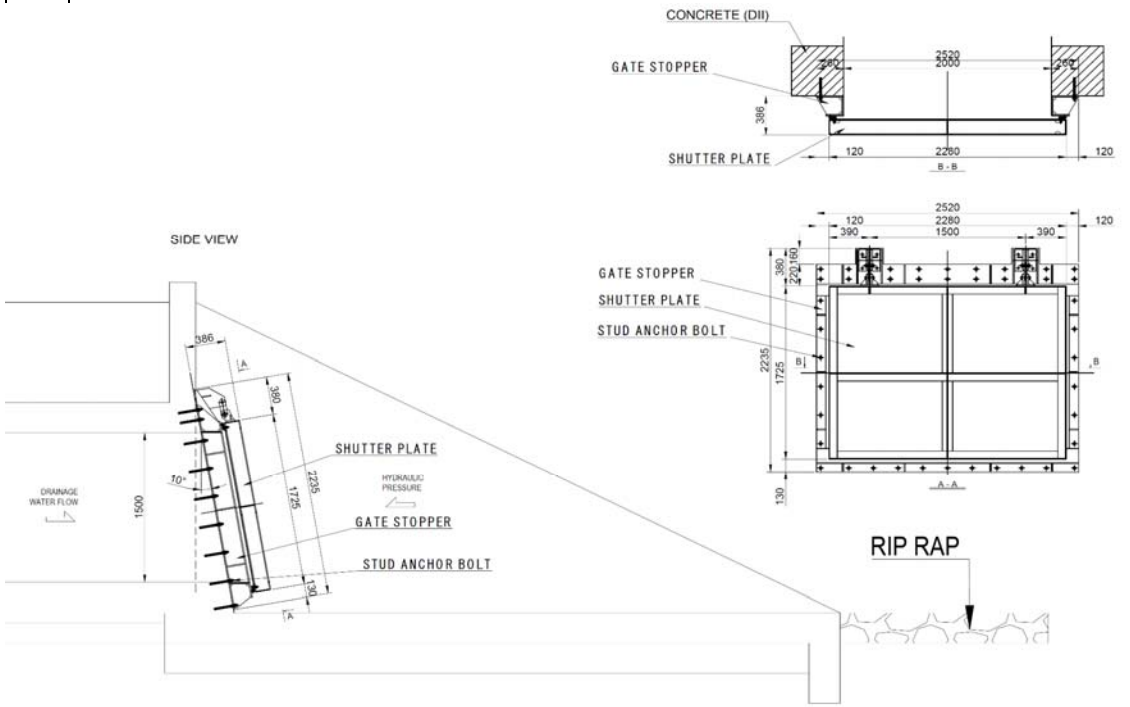
512.260 m3

Backfill

		Width	Height	Length	nos	
Inlet	V1	= 2.000	X 3.698	X 3.300	X 2	= 48.814 m3
Outlet	V2	= 4.877	X 3.550	X 10.446	X 0.5 x 2	= 180.855 m3
	Total				= 229.669 m3	

229.669 m3

No	Item	Name	Size · Type	Quantity	Unit
	DRAINAGE OUTLET	TYPE B Flap Gate 2000x1500		1	nos



Item	Formula	Quantity
No. of Flap Gate	Left Side =	1 Nos
	Right Side =	1 Nos

No	Item	Name	Size · Type	Quantity	Unit																																																																																																																																																																																																										
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	HEIGHT	1.50 m																																																																																																																																																																																																													
LIVE LOAD	REINFORCED CONCRETE	T-TYPE LIVE LOAD																																																																																																																																																																																																													
UNIT WEIGHT	SOIL	24.5 kN/m ³																																																																																																																																																																																																													
		18 kN/m ³																																																																																																																																																																																																													
CONCRETE DESIGN STRENGTH		24 N/mm ²																																																																																																																																																																																																													
ALLOWABLE STRESS																																																																																																																																																																																																															
COMPRESSIVE STRESS DUE TO BENDING		8 N/mm ²																																																																																																																																																																																																													
SHEARING STRESS		0.39 N/mm ²																																																																																																																																																																																																													
TENSILE STRESS (SD345)		160 N/mm ²																																																																																																																																																																																																													
COEFFICIENT OF EARTH PRESSURE		0.5																																																																																																																																																																																																													
IMPACT COEFFICIENT		-																																																																																																																																																																																																													
SEISMIC COEFFICIENT		-																																																																																																																																																																																																													
ANGLE OF SLOPE		90°/100°																																																																																																																																																																																																													
RADIUS OF CURVATURE		∞																																																																																																																																																																																																													
GRADIENT OF BOX CULVERT		-0.100%																																																																																																																																																																																																													
MARK	No.	SEC.	EACH	LENGTH (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	H (mm)	R (mm)																																																																																																																																																																																																					
S.1	4	D16	4	4500	300	267	2060	1006	—	170																																																																																																																																																																																																					
S.2	1	D19	4	2400	—	—	—	—	—	—																																																																																																																																																																																																					
S.3	1	D13	24	1000	1000	1000	—	—	—	—																																																																																																																																																																																																					
S.4	5	D13	8	1040	195	649	—	—	459	—																																																																																																																																																																																																					
S.5	3	D13	5	1000	—	131	—	—	—	—																																																																																																																																																																																																					
W.1	1	D13	8	1890	1890	—	—	—	—	—																																																																																																																																																																																																					
W.2	1	D13	28	1000	1000	—	—	—	—	—																																																																																																																																																																																																					
W.3	2	D13	12	360	—	154	—	—	—	—																																																																																																																																																																																																					
F.1	4	D16	4	5000	1150	267	2060	1256	—	170																																																																																																																																																																																																					
F.2	1	D19	4	2400	2400	—	—	—	—	—																																																																																																																																																																																																					
F.3	1	D13	24	1000	1000	—	—	—	—	—																																																																																																																																																																																																					
F.4	5	D13	8	650	195	255	—	—	—	180																																																																																																																																																																																																					
F.5	3	D13	5	960	—	111	—	—	—	—																																																																																																																																																																																																					

**ROAD DESIGN
(PACKAGE 3)**

01- ROAD AND ROAD STRUCTURES





**ROAD DESIGN
(PACKAGE 0)**

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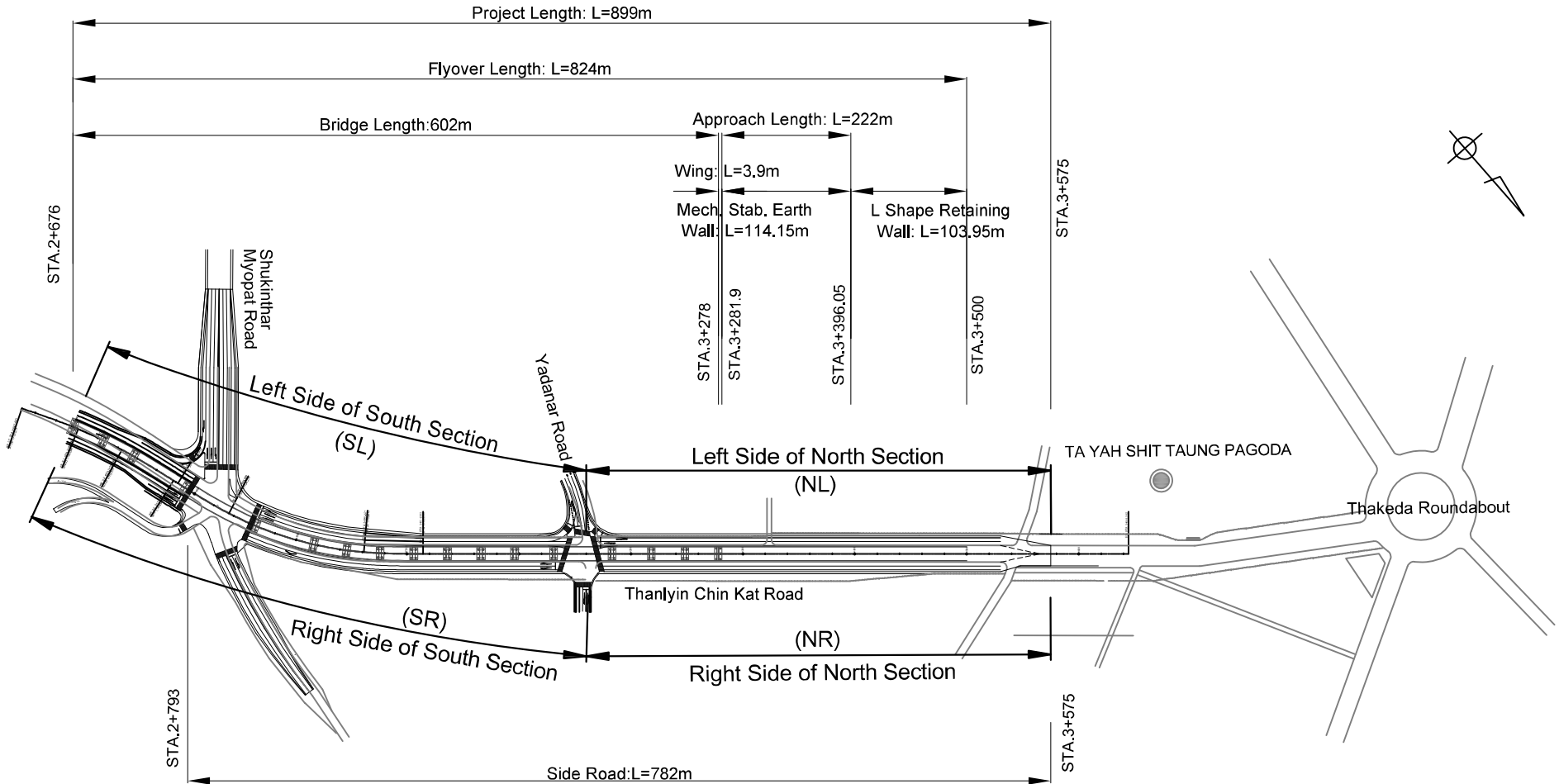
§1. Summary of Quantity

Construction type	Classification	standard	UNIT	Quantity	Remark
				MOC	
DIVISION 02 SITE WORKS					
	Demolition of Existing Concrete Structure (Unreinforced concrete)		m3	710	
	Demolition of Existing Concrete Structure (Reinforced concrete)		m3	306	
	Demolition of Existing Concrete Structure Asphalt Pavement		m3	933	
	Clearing and Grubbing		m2	14,204	
DIVISION 03 EARTH WORKS					
	ROAD EARTH WORK				
	Excavation - Type 1 (Open Cut for Road)		m3	11,019	
	Backfill for Filled-up ground		m3	1,177	
	Backfill for Sub-garde		m3	732	
	Gravel		m3	396	
	Trimming of Slope		m2	2,202	
	Excavation - Type 1 (Open Cut for Road Structure)		m3	14,850	
	Backfill		m3	8,780	
	Removal of surplus soil		m3	5,093	
DIVISION 04 WATERWAY WORKS					
	U-DITCH TYPE A		each	25	
	U-DITCH TYPE B		each	73	
	U-DITCH TYPE C		each	15	
	SIDE DITCH TYPE U-500x500 with Cover		m	34	
	SIDE DITCH TYPE U-800x800 with Cover		m	58	
	SIDE DITCH TYPE U-1000x1500		m	120	
	SIDE DITCH TYPE U-1500x1500		m	736	
	SIDE DITCH TYPE U-1500x1700		m	101	
	CONCRETE COVER TYPE A		each	240	
	CONCRETE COVER TYPE B		each	202	
	BOX CULVERT TYPE 1000x1000		m	52	
	BOX CULVERT TYPE 1500x1000		m	216	
	BOX CULVERT TYPE 1500x1500		m	249	
	CATCH PIT 500x500x1200		each	11	
	CATCH PIT (C-DITCH) TYPE B		each	2	
	CONCRETE PIPE CULVERT ϕ 300 (CON. 360°) TYPE A		m	229	
	CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)		m	10	
	TRENCH(W=1500)		m	37	
DIVISION 05 PAVEMENTS					
	Prime Coat		m2	16,565	
	Tack Coat		m2	16,565	
	Normal A/C Surface Course, thickness 5cm		m2	16,565	
	Normal A/C Subbase Course, thickness 5cm		m2	16,565	
	Aggregate Base thickness 15cm		m2	15,033	
	Aggregate Base thickness 25cm		m2	1,532	
	Aggregate Subbase thickness 15cm		m2	1,531	
	Aggregate Subbase thickness 25cm		m2	13,502	
	Aggregate Subbase thickness 30cm		m2	1,532	
	Concrete Plate for Sidewalk		m2	2,100	
	Sand(Side walk)		m2	2,100	
	Aggregate Base thickness 10cm(Sidewalk)		m2	2,100	

Construction type	Classification	standard	UNIT	Quantity	Remark
				MOC	
DMSION 08 MISCELLANEOUS					
	CONCRETE KERB TYPE A-1		m	1,256	
	CONCRETE KERB TYPE A-2		each	54	
	CONCRETE KERB TYPE A-3		m	122	
	CONCRETE KERB TYPE C		m	1,299	
	SIGN BOARD - TS-1 (Regulation Sign)		each	3	
	SIGN BOARD - TS-3 (Regulation Sign)		each	4	
	SIGN BOARD - TS-7 (Warning Sign)		each	7	
	SIGN BOARD - TS-10 (Warning Sign)		each	9	
	SIGN BOARD - TS-11 (Warning Sign)		each	2	
	Guard Fence		m	795	
	CONCRETE BARRIER		m	198	
	LANE LINE(w=100)		m	381	
	SIDE LINE(w=100)		m	2,473	
	BROKEN LINE(w=100)		m	414	
	STOP LINE(w=300)		m	101	
	CROSSWALK ARKING(w=450)		m	820	
	GIVE WAY LINE (w=600)		m	110	
	ZEBRA LINE(w=150)		m	79	
	ZEBRA LINE(w=450)		m	84	
			each	6	Converted value to w=10cm 1.248m2/each
			m2	8	
			each	19	Ditto 1.576m2/each
			m2	30	
			each	10	Ditto 1.418m2/each
			m2	14	
			each	6	Ditto 0.992m2/each
			m2	6	

§ 2 Detailed Statement

§ 2 - 1 Design Section



§ 2 - 2 Waterway Works

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR		Reference	Remarks
OPEN DITCHES													
	U-DITCH TYPE	(Inner Width, Inner Depth) U-DITCH TYPE A U-DITCH TYPE B U-DITCH TYPE C TRENCH(W=1500)	Nos	Nos	TOTAL	150	27	64	28	31	0		
						25			12	13			
						73	25	26	5	17			
						15	2	1	11	1			
						37		37					
	SIDE DITCH TYPE	(Inner Width, Inner Depth) SIDE DITCH TYPE U-500x500 with Cover SIDE DITCH TYPE U-800x800 with Cover SIDE DITCH TYPE U-1000x1500 SIDE DITCH TYPE U-1500x1500 SIDE DITCH TYPE U-1500x1700	m	m	TOTAL	1,048.6	311.8	288.8	181.0	267.0	0.0		
						33.8		33.8					
						58.3	58.3						
						120.0				120.0			
						735.5	253.5	255.0	80.0	147.0			
						101.0			101.0				
	CONCRETE COVER TYPE	(Inner Width, Inner Depth) CONCRETE COVER TYPE A CONCRETE COVER TYPE B	Nos	Nos	TOTAL	442	0	0	202	240	0		
						240				240			
						202			202				
CONCRETE BOX CULVERT													
	CONCRETE BOX CULVERT	(Inner Dia.) BOX CULVERT TYPE 1000x1000 BOX CULVERT TYPE 1500x1000 BOX CULVERT TYPE 1500x1500	m	m	TOTAL	516.5	79.5	132.0	239.0	66.0	0.0		
						52.0				52.0			
						216.0		132.0	70.0	14.0			
						248.5	79.5		169.0				
CONCRETE PIPE CULVERT													
	CONCRETE PIPE CULVERT	(Inner Dia.) CONCRETE PIPE CULVERT ϕ 300 (CON. 360°) TYPE A CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)	m	m	TOTAL	238.7	29.7	136.7	13.7	58.6	0.0		
						228.7	19.7	136.7	13.7	58.6			
						10.0	10.0						
CATCH PIT													
	CATCH PIT TYPE	(Inner Width, Inner Depth) CATCH PIT 500x500x1200 CATCH PIT (C-DITCH) TYPE B	Nos	Nos	TOTAL	13	1	7	1	4	0		
						11	1	7		3			
						2			1	1			

§ 2 - 3 Pavement

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR	NM	Reference	Remarks
ROADWAY													
	ROADWAY		m2	m2	TOTAL	16,565.0	5,560.0	3,981.0	3,584.0	3,450.0	0.0		
		PAVEMENT(TYPE E3)				1,532.0			748.0	784.0			
		PAVEMENT(TYPE E5)				13,502.0	5,550.0	2,450.0	2,836.0	2,666.0			
		PAVEMENT(TYPE E6)				1,531.0		1,531.0					
SIDEWALK													
	SIDEWALK		m2	m2	TOTAL	6,298.8	1,433.4	1,792.8	1,816.8	1,255.8	0.0		
		Concrete Plate for Sidewalk				2,099.6	477.8	597.6	605.6	418.6			
		Sand(Side walk)				2,099.6	477.8	597.6	605.6	418.6			
		Aggregate Base thickness 10cm(Sidewalk)				2,099.6	477.8	597.6	605.6	418.6			

§ 2 - 4 Miscellaneous

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR	NM	Reference	Remarks
CONCRETE KERB													
	CONCRETE KERB		m	m	TOTAL	2,676.9	729.0	675.2	611.1	661.6	0.0		
		CONCRETE KERB TYPE A-1				1,255.9	347.6	301.7	312.5	294.1			
		CONCRETE KERB TYPE A-3				122.3	20.1	35.9	28.7	37.6			
		CONCRETE KERB TYPE C				1,298.7	361.3	337.6	269.9	329.9			
			Nos	Nos	TOTAL	54	8	17	14	15	0		
		CONCRETE KERB TYPE A-2				54	8	17	14	15			
SIGN BOARD													
	SIGN BOARD		Nos	Nos	TOTAL	25	3	10	8	4	0		
		SIGN BOARD - TS-1				3		1	1	1			
		SIGN BOARD - TS-3				4	1	1	1	1			
		SIGN BOARD - TS-7				7	1	3	2	1			
		SIGN BOARD - TS-10				9	1	4	3	1			
		SIGN BOARD - TS-11				2		1	1				
FENCE & FENCE GATE													
	FENCE		m	m	TOTAL	992.6	449.6	294.6	79.9	168.5	0.0		
		Guard Fence				794.5	270.5	275.6	79.9	168.5			
		CONCRETE BARRIER				198.1	179.1	19.0					

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR	NM	Reference	Remarks		
LINE	LINE	LANE LINE(w=100) SIDE LINE(w=100) BROKEN LINE(w=100) GIVE WAY LINE STOP LINE(w=300) CROSSWALK MARKING(w=450) ZEBRA LINE(w=150) ZEBRA LINE(w=450)	m	m	TOTAL	4,542.4	1,415.5	1,393.2	776.7	957.0	0.0				
						381.0	223.3	99.9	30.0	27.8					
						2,472.7	594.2	712.7	599.7	566.1					
						414.2	97.8	103.5	102.5	110.4					
						109.8	59.4	50.4							
						100.7	33.9	45.2	11.0	10.6					
						819.5	305.0	268.9	17.5	228.1					
						78.5	39.6	38.9							
		ARROW	Nos	Nos	TOTAL	41	16	10	8	7	0				
						41	16	10	8	7					

§ 2 - 5 Removal of Existing Structures

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total						Reference	Remarks
SIGN REMOVAL	SIGN REMOVAL		Nos	Nos	TOTAL	0	0	0	0	0	0	3-6	
						0							
						0							
DEMOLITION OF STRUCTURES													
DEMOLITION OF CONCRETE STRUCTURES	[Structure Classification]	m3	m3	TOTAL	0.0	Median Curb Base	Pedestrian Curb Base	U-Ditch Type-4	U-Ditch Type-12356	Culvert			H: Height from construction base surface
				Plain Concrete Structures	403.2		397.1	6.1					
					0.0								
					0.0								
				RC Structures	305.8			224.3	81.5				
					0.0								
					0.0								
PAVEMENT DEMILOTION	[Classification and Thickness of Asphalt]	m2	m2	TOTAL	0.0	LR						3-7	t: Pavement plate thickness
				Machine Construction	t ≤ 10cm	9,327.0	9,327.0						
					10cm < t ≤ 15cm	0.0							
					15cm < t ≤ 35cm	0.0							
					35cm < t ≤ 40cm	0.0							
				Human-Powered Construction	t ≤ 4cm	0.0							
					4cm < t ≤ 10cm	0.0							
					10cm < t ≤ 15cm	0.0							
					15cm < t ≤ 30cm	0.0							
						0.0							
CONCRETE DEMILOTION & TRANSPORT	[Structure Classification & Transport distance]	m3	m3	TOTAL	0.0	Plain Concrete	RC	Flat Plate-Shaped Concrete	Curbs				
				Plain Concrete Structures	709.6	403.2		306.4					
				RC Structures	305.8		305.8						
BLOCK PAVING REMOVAL													
REMOVE INTERLOCKING PAVER BRICKS		m2	m2	TOTAL	0.0	0.0	0.0	0.0	0.0	0.0			
					0.0								
					0.0								
REMOVE FLAT PLATE-SHAPED CONCRETE		m2	m2	TOTAL	3,063.5	3,063.5	0.0	0.0	0.0	0.0			
				Flat Plate-Shaped Concrete	450x700-t100mm	3,063.5	3,063.5						
						0.0							
REMOVE NON SLIP ROAD PLATES		m	m	TOTAL	0.0	0.0	0.0	0.0	0.0	0.0			
					0.0								
					0.0								

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total						Reference	Remarks			
CURB REMOVAL	REMOVE PEDESTRIAN BOUNDARY BLOCKS		m	m	TOTAL	1,680.8	1,680.8	0.0	0.0	0.0	0.0					
					Median Curbs											
					Pedestrian Curbs			1,680.8	1,680.8							
	REMOVE SITE BOUNDARY BLOCKS		m	m	TOTAL	0.0	0.0	0.0	0.0	0.0	0.0					
								0.0								
						0.0										
SITE WORK	CLEANING AND GRUBBING		m2	m2	TOTAL	14,204.0	0.0	0.0	0.0	0.0	0.0					
			m	m	TOTAL	0.0	0.0	0.0	0.0	0.0	0.0					
								0.0								
						0.0										

§3 .Quantity breakdown sheet

§-1. Earth Works

Earth Works

Item	Shape/Size	Unit	main Line	Shukhint har	Yadanar Road	Demolition of Existing Concrete Structure Asphalt Pavement	Total	Remark
Earth Works								
	Drilling	m3	10,087.7	736.1	454.1	-259.0	11,018.9	
	Road Embankment	m3	1,176.8				1,176.8	
	Roadbed Embankment	m3	732.2				732.2	
	Gravel	m3	396.0				396.0	
Slope Works		m2	2,069.0	25.1	107.4		2,201.5	

Earth Works

@ 1000.0 m

Station	Distance (m)	Cut			Bank			Remark
		Area(m ²)	Average(m)	Volume(m ³)	Area(m ²)	Average(m)	Volume(m ³)	
STA.2 +800.000		0.0			0.0			
STA.2 +820.000	20.000	22.3	11.15	223.0	0.0	0.00	0.0	
STA.2 +835.298	15.298	30.1	26.20	400.8	0.0	0.00	0.0	
STA.2 +840.000	4.702	28.9	29.50	138.7	0.4	0.20	0.9	
STA.2 +860.000	20.000	13.4	21.15	423.0	0.1	0.25	5.0	
STA.2 +880.000	20.000	13.5	13.45	269.0	1.7	0.90	18.0	
STA.2 +900.000	20.000	15.9	14.70	294.0	1.3	1.50	30.0	
STA.2 +920.000	20.000	14.2	15.05	301.0	1.7	1.50	30.0	
STA.2 +940.000	20.000	16.4	15.30	306.0	0.7	1.20	24.0	
STA.2 +960.000	20.000	15.2	15.80	316.0	0.7	0.70	14.0	
STA.2 +961.571	1.571	16.1	15.65	24.6	0.7	0.70	1.1	
STA.2 +980.000	18.429	17.2	16.65	306.8	1.9	1.30	24.0	
STA.3 +0.000	20.000	14.6	15.90	318.0	2.7	2.30	46.0	
STA.3 +14.383	14.383	14.2	14.40	207.1	2.3	2.50	36.0	
STA.3 +20.000	5.617	16.3	15.25	85.7	1.9	2.10	11.8	
STA.3 +40.000	20.000	13.6	14.95	299.0	0.7	1.30	26.0	
STA.3 +60.000	20.000	16.2	14.90	298.0	1.7	1.20	24.0	
STA.3 +80.000	20.000	11.7	13.95	279.0	1.9	1.80	36.0	
STA.3 +100.000	20.000	8.8	10.25	205.0	2.1	2.00	40.0	
STA.3 +120.000	20.000	7.9	8.35	167.0	1.7	1.90	38.0	
STA.3 +140.000	20.000	9.8	8.85	177.0	1.0	1.35	27.0	
STA.3 +160.000	20.000	27.8	18.80	376.0	0.0	0.50	10.0	
STA.3 +180.000	20.000	14.7	21.25	425.0	1.3	0.65	13.0	
STA.3 +200.000	20.000	10.4	12.55	251.0	2.6	1.95	39.0	
STA.3 +220.000	20.000	10.1	10.25	205.0	3.7	3.15	63.0	
STA.3 +240.000	20.000	10.5	10.30	206.0	1.4	2.55	51.0	
STA.3 +260.000	20.000	14.5	12.50	250.0	2.7	2.05	41.0	
STA.3 +280.000	20.000	15.3	14.90	298.0	2.0	2.35	47.0	Abutment
STA.3 +280.000	0.000	15.3	15.30	0.0	2.0	2.00	0.0	
STA.3 +300.000	20.000	17.2	16.25	325.0	2.0	2.00	40.0	
STA.3 +320.000	20.000	14.6	15.90	318.0	3.5	2.75	55.0	
STA.3 +340.000	20.000	14.9	14.75	295.0	3.1	3.30	66.0	
STA.3 +360.000	20.000	12.3	13.60	272.0	0.1	1.60	32.0	
STA.3 +380.000	20.000	11.0	11.65	233.0	0.1	0.10	2.0	
STA.3 +400.000	20.000	11.7	11.35	227.0	0.1	0.10	2.0	
STA.3 +420.000	20.000	12.0	11.85	237.0	0.1	0.10	2.0	
Total	620.000			8,956.7			894.8	
Total Volume				8,956.7			894.8	

Earth Works

@ 1000.0 m

Station	Distance (m)	Cut			Bank			Remark
		Area(m ²)	Average(m)	Volume(m ³)	Area(m ²)	Average(m)	Volume(m ³)	
STA.3 +420.000		12.0			0.1			
STA.3 +440.000	20.000	10.2	11.10	222.0	0.8	0.45	9.0	
STA.3 +460.000	20.000	12.3	11.25	225.0	1.4	1.10	22.0	
STA.3 +480.000	20.000	8.1	10.20	204.0	1.1	1.25	25.0	
STA.3 +500.000	20.000	6.4	7.25	145.0	3.0	2.05	41.0	
STA.3 +520.000	20.000	7.6	7.00	140.0	3.9	3.45	69.0	
STA.3 +540.000	20.000	1.4	4.50	90.0	3.4	3.65	73.0	
STA.3 +560.000	20.000	3.4	2.40	48.0	0.3	1.85	37.0	
STA.3 +580.000	20.000	2.3	2.85	57.0	0.3	0.30	6.0	
Total	160.000			1,131.0			282.0	
Total Volume				10,087.7			1,176.8	

Earth Works

@ 1000.0 m

Station	Distance (m)	SUBGRADE SOIL						Remark
		Area(m ²)	Average(m)	Volume(m ³)	Area(m ²)	Average(m)	Volume(m ³)	
STA.2 +800.000								
STA.2 +820.000	20,000		0.00	0.0				
STA.2 +835.298	15,298		0.00	0.0				
STA.2 +840.000	4,702	0.4	0.20	0.9				
STA.2 +860.000	20,000	0.4	0.40	8.0				
STA.2 +880.000	20,000	2.1	1.25	25.0				
STA.2 +900.000	20,000	1.5	1.80	36.0				
STA.2 +920.000	20,000	2.2	1.85	37.0				
STA.2 +940.000	20,000	0.8	1.50	30.0				
STA.2 +960.000	20,000	0.8	0.80	16.0				
STA.2 +961.571	1,571	0.8	0.80	1.3				
STA.2 +980.000	18,429	0.8	0.80	14.7				
STA.3 +0.000	20,000	1.2	1.00	20.0				
STA.3 +14.383	14,383	1.1	1.15	16.5				
STA.3 +20.000	5,617	0.6	0.85	4.8				
STA.3 +40.000	20,000	2.0	1.30	26.0				
STA.3 +60.000	20,000	0.6	1.30	26.0				
STA.3 +80.000	20,000	1.0	0.80	16.0				
STA.3 +100.000	20,000	1.1	1.05	21.0				
STA.3 +120.000	20,000	1.7	1.40	28.0				
STA.3 +140.000	20,000	4.7	3.20	64.0				
STA.3 +160.000	20,000	0.0	2.35	47.0				
STA.3 +180.000	20,000	0.8	0.40	8.0				
STA.3 +200.000	20,000	1.5	1.15	23.0				
STA.3 +220.000	20,000	1.4	1.45	29.0				
STA.3 +240.000	20,000	0.8	1.10	22.0				
STA.3 +260.000	20,000	0.5	0.65	13.0				
STA.3 +280.000	20,000	0.9	0.70	14.0				
STA.3 +300.000	20,000	0.2	0.55	11.0				
STA.3 +320.000	20,000	0.2	0.20	4.0				
STA.3 +340.000	20,000	1.8	1.00	20.0				
STA.3 +360.000	20,000	0.0	0.90	18.0				
STA.3 +380.000	20,000	0.0	0.00	0.0				
STA.3 +400.000	20,000	0.0	0.00	0.0				
STA.3 +420.000	20,000	0.0	0.00	0.0				
STA.3 +440.000	20,000	0.0	0.00	0.0				
Total	640,000			600.2				
Total Volume				600.2				

Earth Works

@ 1000.0 m

Station	Distance (m)	SUBGRADE SOIL						Remark
		Area(m ²)	Average(m)	Volume(m ³)	Area(m ²)	Average(m)	Volume(m ³)	
STA.3 +440.000		0.0						
STA.3 +460.000	20,000	1.4	0.70	14.0				
STA.3 +480.000	20,000	0.2	0.80	16.0				
STA.3 +500.000	20,000	1.3	0.75	15.0				
STA.3 +520.000	20,000	2.1	1.70	34.0				
STA.3 +540.000	20,000	1.6	1.85	37.0				
STA.3 +560.000	20,000	0.0	0.80	16.0				
Total	120,000			132.0				
Total Volume				732.2				

Earth Works

@ 1000.0 m

Station	Distance (m)	Gravel Removal						Remark
		Area(m ²)	Average(m)	Volume(m ³)	Area(m ²)	Average(m)	Volume(m ³)	
STA.2 +800.000								
STA.2 +820.000	20,000		0.00	0.0				
STA.2 +835.298	15,298		0.00	0.0				
STA.2 +840.000	4,702	0.0	0.00	0.0				
STA.2 +860.000	20,000	0.6	0.30	6.0				
STA.2 +880.000	20,000	0.6	0.60	12.0				
STA.2 +900.000	20,000	0.6	0.60	12.0				
STA.2 +920.000	20,000	0.6	0.60	12.0				
STA.2 +940.000	20,000	0.6	0.60	12.0				
STA.2 +960.000	20,000	0.6	0.60	12.0				
STA.2 +961.571	1,571	0.6	0.60	0.9				
STA.2 +980.000	18,429	0.6	0.60	11.1				
STA.3 +0.000	20,000	0.6	0.60	12.0				
STA.3 +14.383	14,383	0.6	0.60	8.6				
STA.3 +20.000	5,617	0.6	0.60	3.4				
STA.3 +40.000	20,000	0.6	0.60	12.0				
STA.3 +60.000	20,000	0.6	0.60	12.0				
STA.3 +80.000	20,000	0.6	0.60	12.0				
STA.3 +100.000	20,000	0.6	0.60	12.0				
STA.3 +120.000	20,000	0.6	0.60	12.0				
STA.3 +140.000	20,000	0.6	0.60	12.0				
STA.3 +160.000	20,000		0.30	6.0				
STA.3 +180.000	20,000	0.6	0.30	6.0				
STA.3 +200.000	20,000	0.6	0.60	12.0				
STA.3 +220.000	20,000	0.6	0.60	12.0				
STA.3 +240.000	20,000	0.6	0.60	12.0				
STA.3 +260.000	20,000	0.6	0.60	12.0				
STA.3 +280.000	20,000	0.6	0.60	12.0				
STA.3 +300.000	20,000	0.6	0.60	12.0				
STA.3 +320.000	20,000	0.6	0.60	12.0				
STA.3 +340.000	20,000	0.6	0.60	12.0				
STA.3 +360.000	20,000	0.6	0.60	12.0				
STA.3 +380.000	20,000	0.6	0.60	12.0				
STA.3 +400.000	20,000	0.6	0.60	12.0				
STA.3 +420.000	20,000	0.6	0.60	12.0				
STA.3 +440.000	20,000	0.6	0.60	12.0				
Total	640,000			342.0				
Total Volume				342.0				

Earth Works

@ 1000.0 m

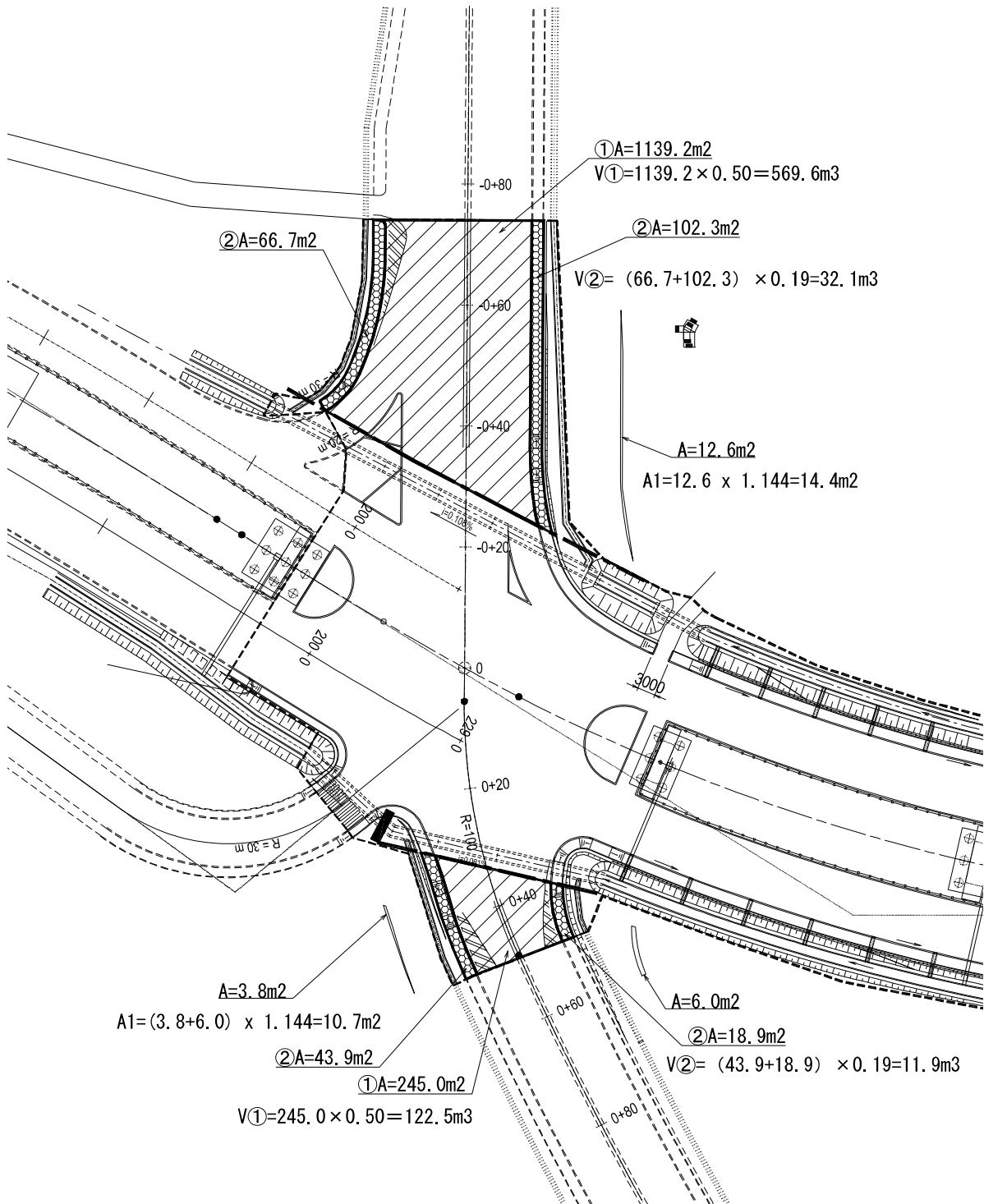
Station	Distance (m)	Gravel Removal						Remark
		Area(m2)	Average(m)	Volume(m3)	Area(m2)	Average(m)	Volume(m3)	
STA.3 +440.000		0.6						
STA.3 +460.000	20,000	0.6	0.60	12.0				
STA.3 +480.000	20,000	0.6	0.60	12.0				
STA.3 +500.000	20,000	0.6	0.60	12.0				
STA.3 +520.000	20,000	0.6	0.60	12.0				
STA.3 +540.000	20,000		0.30	6.0				
STA.3 +560.000	20,000		0.00	0.0				
STA.3 +580.000	3580.000		0.00	0.0				
Total	3700.000			54.0				
Total Volume				396.0				

Earth Works

@ 1000.0 m

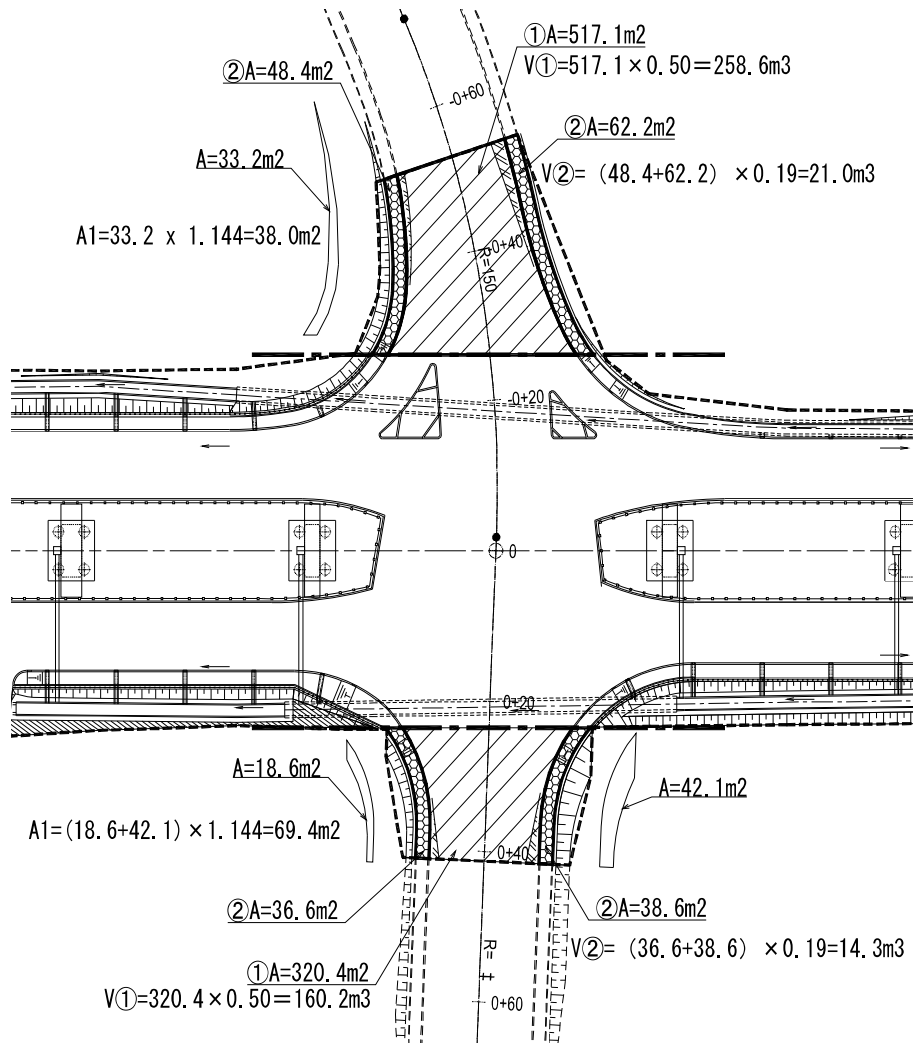
Station	Distance (m)	Slope Left			Slope Right			Remark	
		Slope Length(m)	Average(m)	Area(m ²)	Slope Length(m)	Average(m)	Area(m ²)		
STA.2 +800.000		0.0			0.0				
STA.2 +820.000	20.000	0.0	0.00	0.0	0.0	0.00	0.0		
STA.2 +835.298	15.298	0.3	0.15	2.3	0.7	0.35	5.4		
STA.2 +840.000	4.702	5.1	2.70	12.7	0.4	0.55	2.6		
STA.2 +860.000	20.000	5.3	5.20	104.0	2.8	1.60	32.0		
STA.2 +880.000	20.000	2.7	4.00	80.0	2.6	2.70	54.0		
STA.2 +900.000	20.000	2.4	2.55	51.0	2.4	2.50	50.0		
STA.2 +920.000	20.000	2.2	2.30	46.0	1.6	2.00	40.0		
STA.2 +940.000	20.000	1.8	2.00	40.0	1.3	1.45	29.0		
STA.2 +960.000	20.000	1.6	1.70	34.0	1.7	1.50	30.0		
STA.2 +961.571	1.571	1.6	1.60	2.5	0.7	1.20	1.9		
STA.2 +980.000	18.429	1.6	1.60	29.5	0.4	0.55	10.1		
STA.3 +0.000	20.000	1.3	1.45	29.0	2.1	1.25	25.0		
STA.3 +14.383	14.383	1.7	1.50	21.6	1.8	1.95	28.0		
STA.3 +20.000	5.617	1.5	1.60	9.0	1.2	1.50	8.4		
STA.3 +40.000	20.000	1.9	1.70	34.0	0.0	0.60	12.0		
STA.3 +60.000	20.000	4.1	3.00	60.0	2.1	1.05	21.0		
STA.3 +80.000	20.000	2.5	3.30	66.0	1.2	1.65	33.0		
STA.3 +100.000	20.000	2.5	2.50	50.0	1.4	1.30	26.0		
STA.3 +120.000	20.000	3.1	2.80	56.0	1.6	1.50	30.0		
STA.3 +140.000	20.000	0.0	1.55	31.0	0.0	0.80	16.0		
STA.3 +160.000	20.000	0.0	0.00	0.0	0.0	0.00	0.0		
STA.3 +180.000	20.000	0.4	0.20	4.0	3.4	1.70	34.0		
STA.3 +200.000	20.000	1.5	0.95	19.0	3.0	3.20	64.0		
STA.3 +220.000	20.000	1.3	1.40	28.0	3.0	3.00	60.0		
STA.3 +240.000	20.000	1.2	1.25	25.0	0.6	1.80	36.0		
STA.3 +260.000	20.000	0.0	0.60	12.0	1.5	1.05	21.0		
STA.3 +280.000	20.000	0.0	0.00	0.0	3.2	2.35	47.0		
STA.3 +300.000	20.000	0.0	0.00	0.0	0.3	1.75	35.0		
STA.3 +320.000	20.000	0.0	0.00	0.0	1.0	0.65	13.0		
STA.3 +340.000	20.000	0.4	0.20	4.0	1.3	1.15	23.0		
STA.3 +360.000	20.000	0.4	0.40	8.0	0.2	0.75	15.0		
STA.3 +380.000	20.000	0.0	0.20	4.0	0.6	0.40	8.0		
STA.3 +400.000	20.000	0.7	0.35	7.0	0.6	0.60	12.0		
STA.3 +420.000	20.000	0.5	0.60	12.0	0.8	0.70	14.0		
STA.3 +440.000	20.000	1.2	0.85	17.0	0.3	0.55	11.0		
Total					898.6			847.4	
Total Volume					898.6			847.4	

Shukhinthar



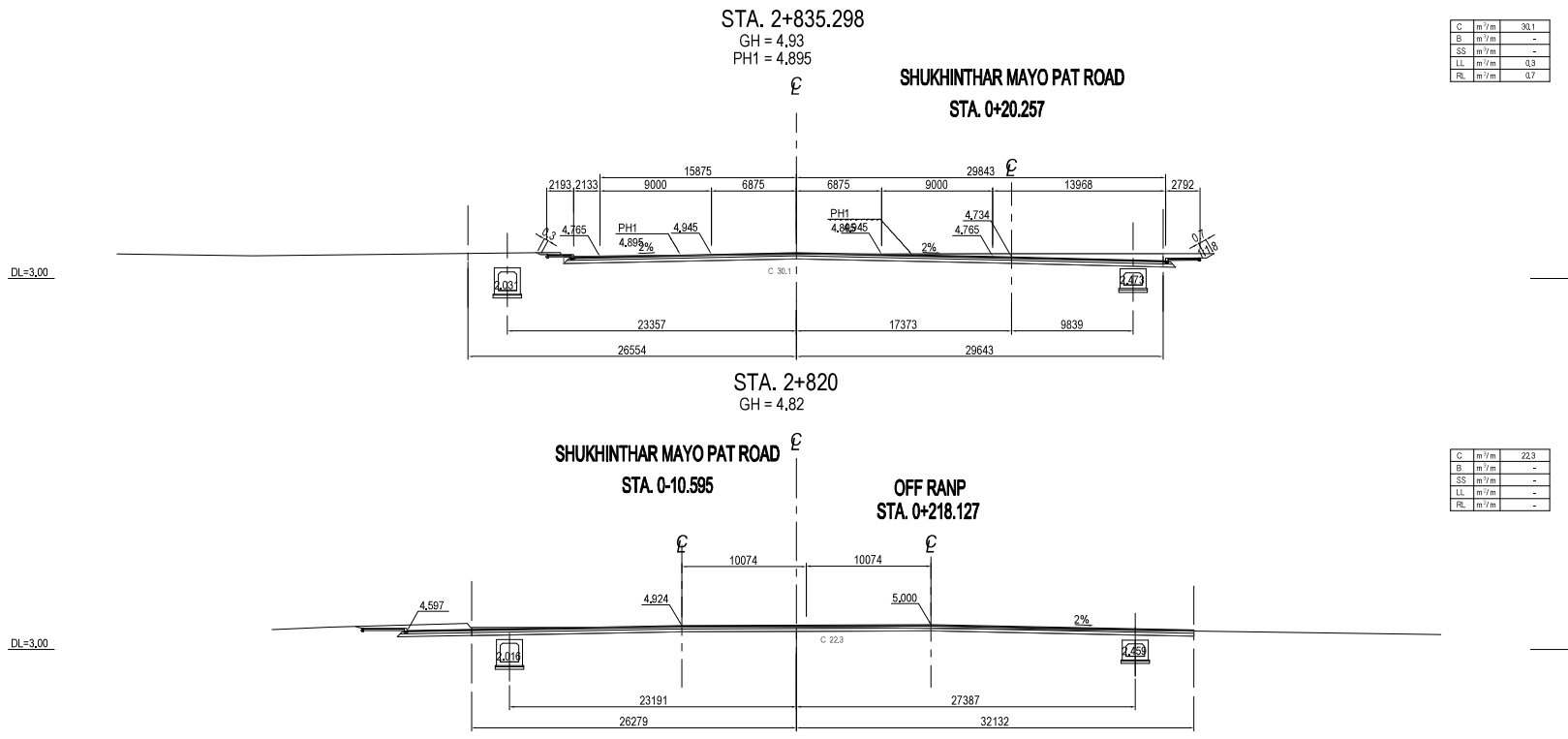
Drilling	V=	569.6+32.1+122.5+11.9	=	736.1 m ³
Slope Works	A=	14.4+10.7	=	25.1 m ²

Yadanar Road



Drilling	V=	258.6+21.0+160.2+14.3	=	454.1 m ³
Slope Works	A=	38.0+69.4	=	107.4 m ²

CROSS SECTION(1) S= 1:400



C	m/m	30.1
B	m/m	-
SS	m/m	-
LL	m/m	0.3
RL	m/m	0.7

C	m/m	22.3
B	m/m	-
SS	m/m	-
LL	m/m	-
RL	m/m	-

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

30

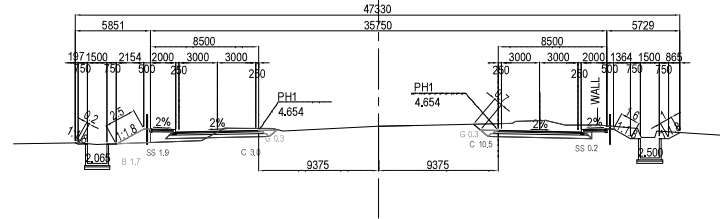
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	CONSULTANT TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(1) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			PO-RD-0400

CROSS SECTION(2) S= 1:400

STA. 2+880
GH = 4.98
PH1 = 4.654

℄

DL=3.00



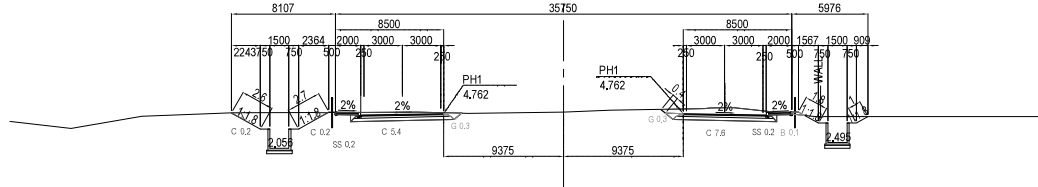
C	m ² /m	13.5
G	m ² /m	1.7
SS	m ² /m	2.1
LL	m ² /m	2.7
RL	m ² /m	3.3

Gravel 0.6m3

STA. 2+860
GH = 4.88
PH1 = 4.762

℄

DL=3.00



C	m ² /m	13.4
G	m ² /m	0.4
SS	m ² /m	0.4
LL	m ² /m	5.3
RL	m ² /m	3.2

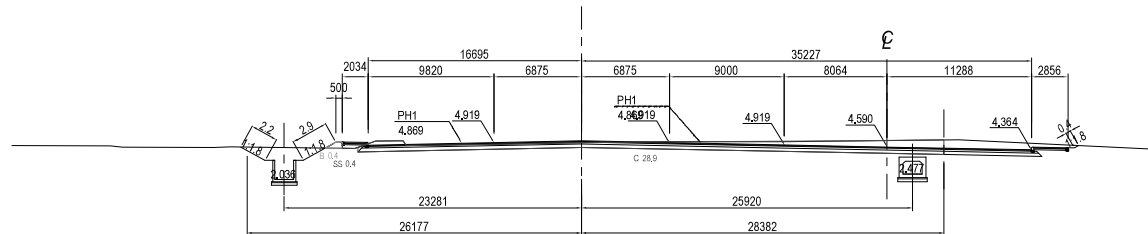
Gravel 0.6m3

STA. 2+840
GH = 4.91
PH1 = 4.869

SHUKHINTHAR MAYO PAT ROAD
STA. 0+28.516

℄

DL=3.00



C	m ² /m	28.9
B	m ² /m	0.4
SS	m ² /m	0.4
LL	m ² /m	5.1
RL	m ² /m	0.4

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

31

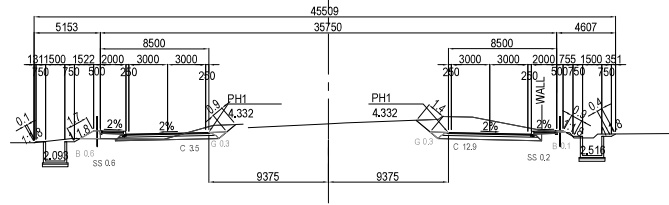
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COURTESY BY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	DESIGN TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY K. TACHIBANA	NAME K. TACHIBANA	SIGNATURE 	DATE 	DRAWING TITLE CROSS SECTION(2) S= 1:400	PACKAGE 0
				CHECKED BY T. HAYAKAWA	T. HAYAKAWA				DWG No. PC-RD-0410
				APPROVED BY Y. SANO	Y. SANO				

CROSS SECTION(3) S= 1:400

STA. 2+940

GH = 4.99
PH 1= 4.332

℄



C	m ³ /m	16.4
B	m ³ /m	0.7
SS	m ³ /m	0.8
LL	m ³ /m	2.7
RL	m ³ /m	2.7

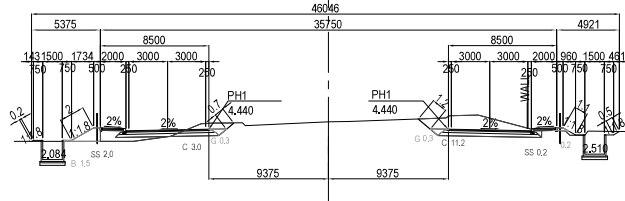
Gravel 0.6m³

DL=3.00

STA. 2+920

GH = 5.01
PH 1 = 4.440

℄



C	m ³ /m	14.2
B	m ³ /m	1.1
SS	m ³ /m	2.2
LL	m ³ /m	2.9
RL	m ³ /m	2.8

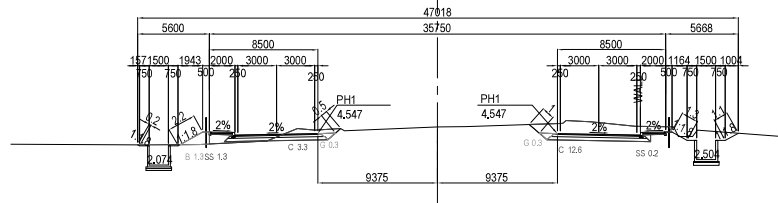
Gravel 0.6m³

DL=3.00

STA. 2+900

GH = 5.04
PH 1= 4.547

℄



C	m ³ /m	15.9
B	m ³ /m	1.3
SS	m ³ /m	1.5
LL	m ³ /m	2.9
RL	m ³ /m	3.4

Gravel 0.6m³

DL=3.00

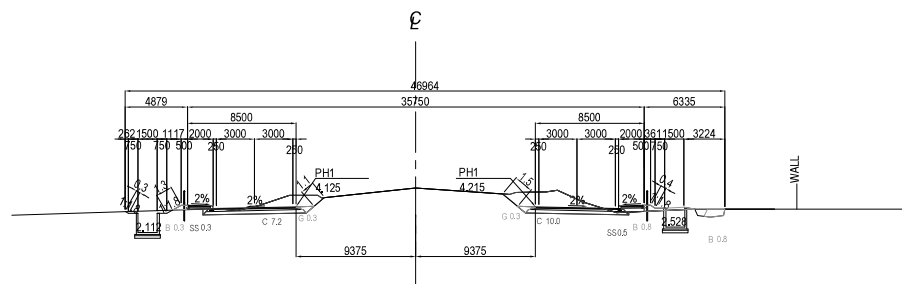
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

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PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	DESIGN TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME K. TACHIBANA	SIGNATURE 	DATE 	DRAWING TITLE CROSS SECTION(3) S= 1:400	PACKAGE 0
				PREPARED BY T. HAYAKAWA				DWG No. PO-RD-0420
				CHECKED BY Y. SANO				
				APPROVED BY 				

CROSS SECTION(4) S= 1:400

STA. 2+980
GH = 5.58
PH1 = 4.125

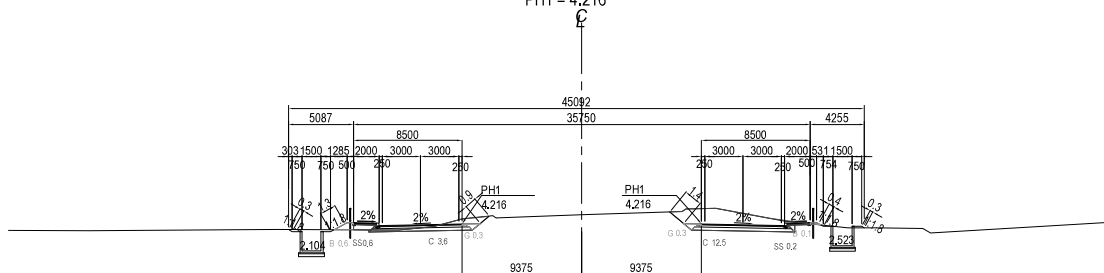


C	m/m	17.2
B	m/m	1.6
SS	m/m	0.8
LL	m/m	2.7
RL	m/m	1.8

Gravel 0.6mS

DL=3.00

STA. 2+961.571
GH = 4.95
PH1 = 4.216

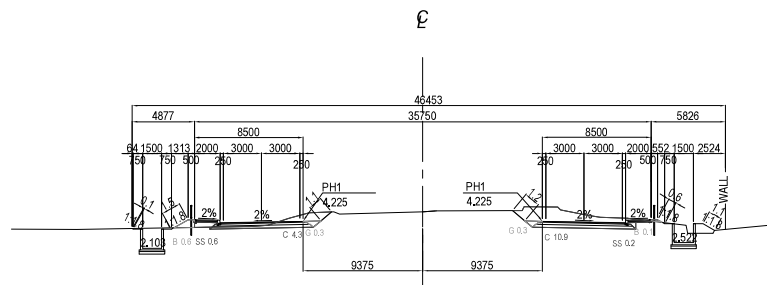


C	m/m	16.1
B	m/m	0.7
SS	m/m	0.8
LL	m/m	2.5
RL	m/m	2.1

Gravel 0.6mS

DL=3.00

STA. 2+960
GH = 4.97
PH1=4.225



C	m/m	15.2
B	m/m	0.7
SS	m/m	0.8
LL	m/m	2.7
RL	m/m	2.0

Gravel 0.6mS

DL=3.00

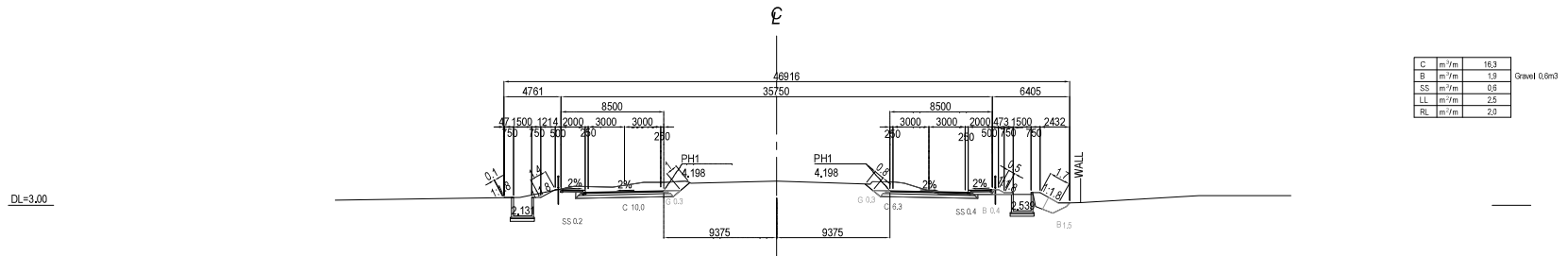
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

33

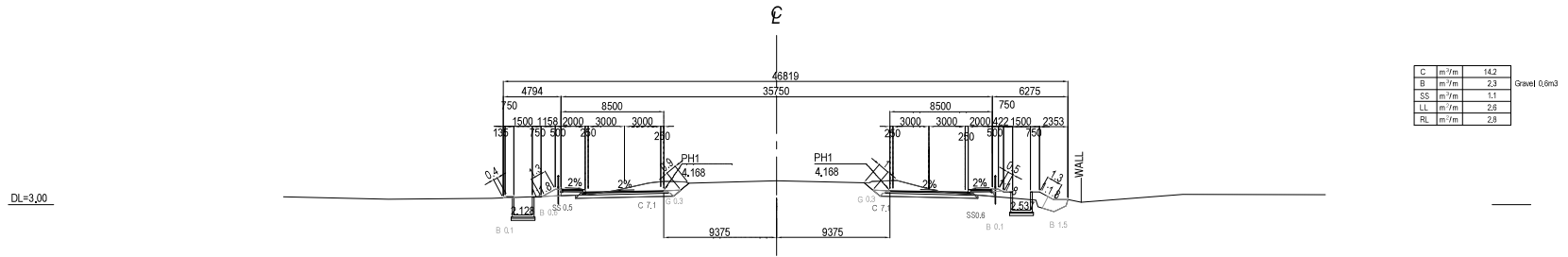
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COURTESY BY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	DESIGNER TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY K. TACHIBANA	NAME K. TACHIBANA	SIGNATURE 	DATE 	DRAWING TITLE CROSS SECTION(4) S= 1:400	PACKAGE 0
				CHECKED BY T. HAYAKAWA	T. HAYAKAWA				DWG No. PO-RD-0430
				APPROVED BY Y. SANO	Y. SANO				

CROSS SECTION(5) S= 1:400

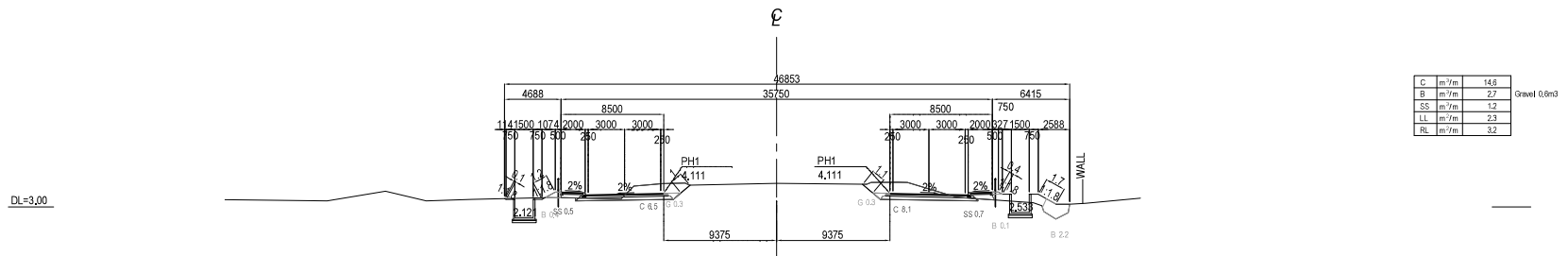
STA. 3+020
GH = 4.99
PH1 = 4.198



STA. 3+014.383
GH = 4.98
PH1 = 4.168



STA. 3+0.0
GH = 4.92
PH1 = 4.111

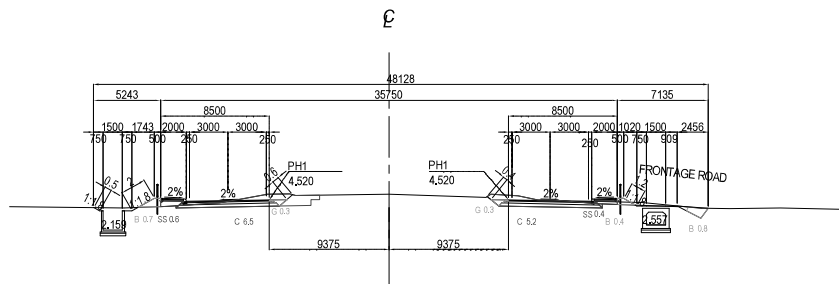


Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA FUND YEAR NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(5) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0440

CROSS SECTION(6) S= 1:400

STA. 3+080
GH = 4.96
PH1 = 4.520

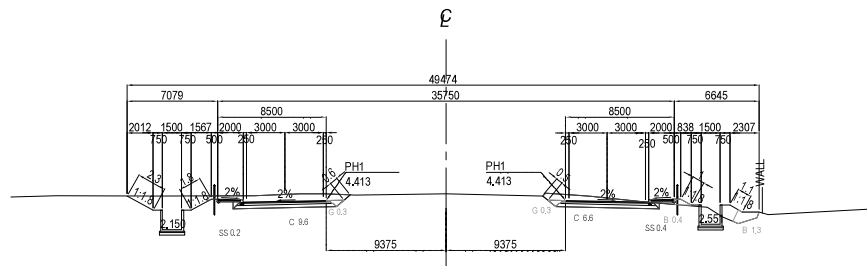


C	m/m	11.7
B	m/m	1.9
SS	m/m	1.0
LL	m/m	3.1
RL	m/m	1.8

Gravel 0.6m3

DL=3.00

STA. 3+060
GH = 4.95
PH1 = 4.413

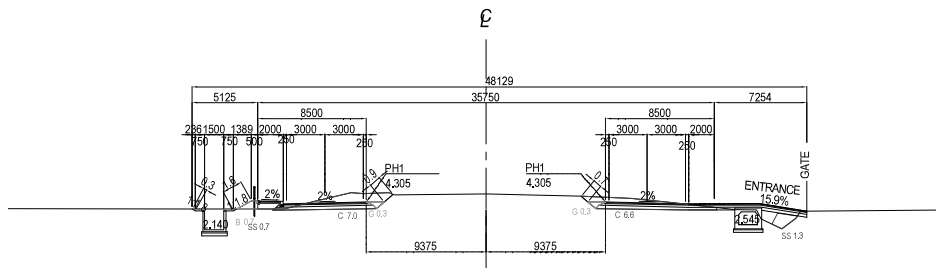


C	m/m	16.2
B	m/m	1.7
SS	m/m	0.8
LL	m/m	4.7
RL	m/m	2.8

Gravel 0.6m3

DL=3.00

STA. 3+040
GH = 4.97
PH1 = 4.305



C	m/m	13.8
B	m/m	0.7
SS	m/m	2.0
LL	m/m	2.8
RL	m/m	0.7

Gravel 0.6m3

DL=3.00

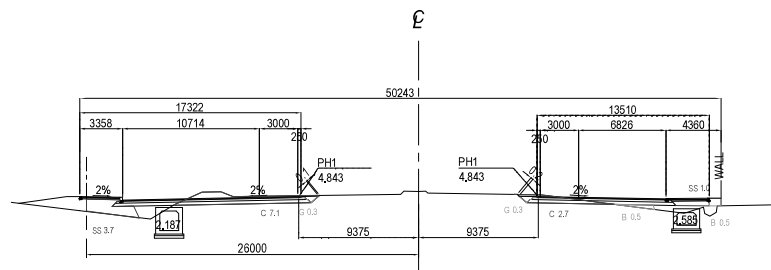
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

35

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA FUND YEAR NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(6) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0450

CROSS SECTION(7) S= 1:400

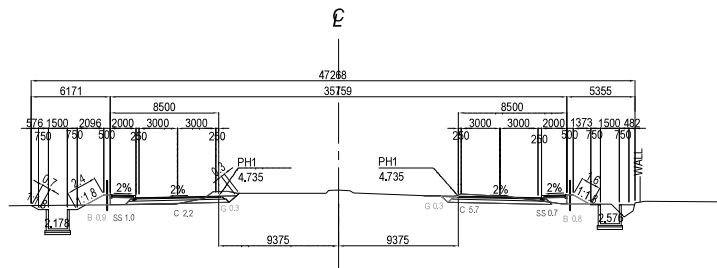
STA. 3+140
GH = 5.22
PH1 = 4.843



C	m ² /m	9.8	Gravel 0.8m ³
B	m ² /m	1.9	
SS	m ² /m	4.7	
LL	m ² /m	0.1	
R	m ² /m	0.2	

DL=3.00

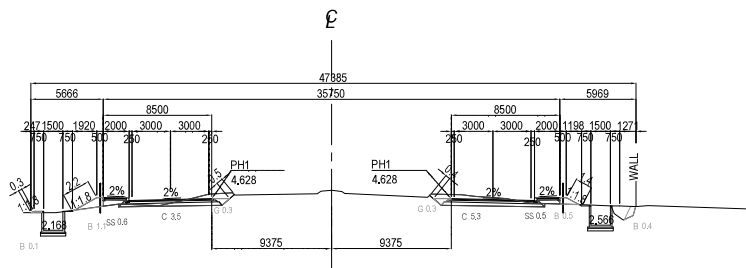
STA. 3+120
GH = 5.22
PH1 = 4.735



C	m ² /m	7.9	Gravel 0.8m ³
B	m ² /m	1.7	
SS	m ² /m	1.7	
LL	m ² /m	3.4	
R	m ² /m	1.6	

DL=3.00

STA. 3+100
GH = 5.30
PH1 = 4.628



C	m ² /m	8.8	Gravel 0.8m ³
B	m ² /m	2.4	
SS	m ² /m	1.1	
LL	m ² /m	3.0	
R	m ² /m	2.8	

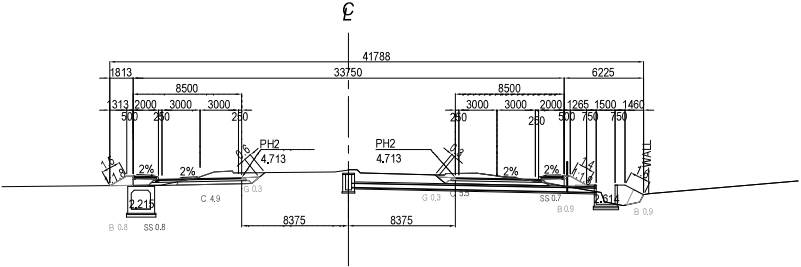
DL=3.00

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA FUNDING NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME K. TACHIBANA	SIGNATURE 	DATE 2023.08.11	DRAWING TITLE CROSS SECTION(7) S= 1:400	PACKAGE 0
				PREPARED BY T. HAYAKAWA				DWG No. PC-RD-0460
				CHECKED BY Y. SANO				
				APPROVED BY Y. SANO				

CROSS SECTION(8) S= 1:400

STA. 3+200
GH = 5.29
PH2 = 4.713

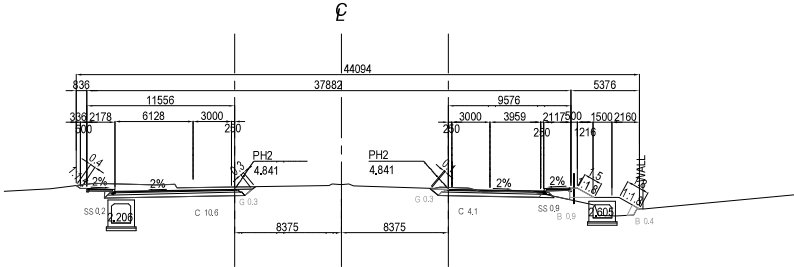


C	m ² /m	10.4
B	m ² /m	2.6
SS	m ² /m	1.5
LL	m ² /m	2.1
RL	m ² /m	3.3

Gravel 0.6m³

DL=3.00

STA. 3+180
GH = 5.21
PH2 = 4.841

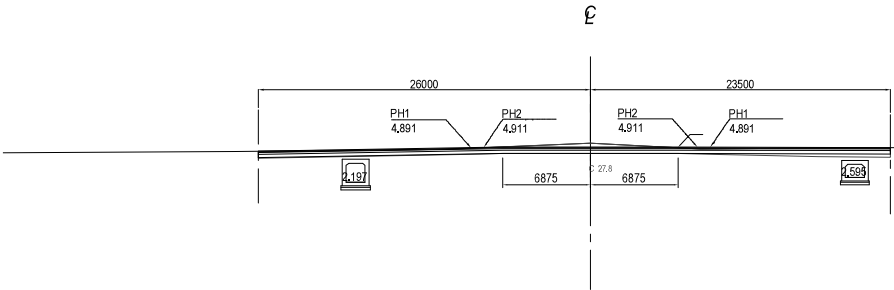


C	m ² /m	14.7
B	m ² /m	1.3
SS	m ² /m	0.8
LL	m ² /m	0.7
RL	m ² /m	3.4

Gravel 0.6m³

DL=3.00

STA. 3+160
GH = 5.26
PH1 = 4.891 PH2 = 4.911



C	m ² /m	27.8
S	m ² /m	-
SS	m ² /m	-
LL	m ² /m	-
RL	m ² /m	-

DL=3.00

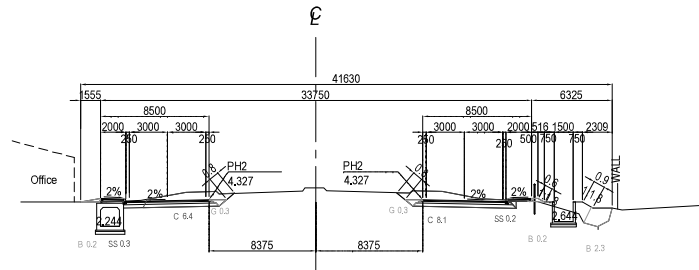
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

37

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTYPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(8) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0470

CROSS SECTION(9) S= 1:400

STA. 3+260
 GH = 5.24
 PH2 = 4.327

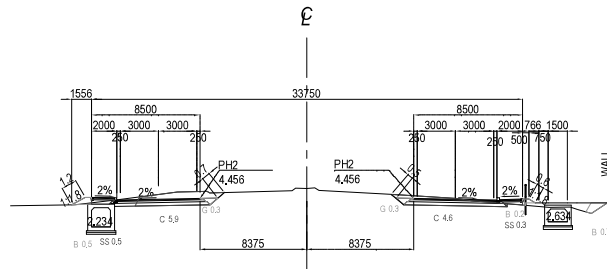


C	m/m	14.6
B	m/m	2.7
SS	m/m	0.6
LL	m/m	0.8
RL	m/m	2.3

Gravel 0.6m3

DL=3.00

STA. 3+240
 GH = 5.25
 PH2 = 4.456

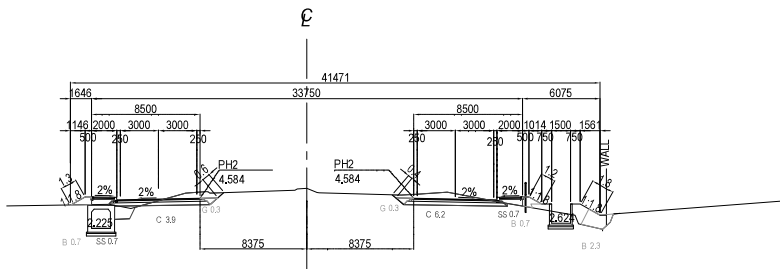


C	m/m	10.6
B	m/m	1.4
SS	m/m	0.8
LL	m/m	1.9
RL	m/m	1.1

Gravel 0.6m3

DL=3.00

STA. 3+220
 GH = 5.36
 PH2 = 4.584



C	m/m	10.1
B	m/m	3.7
SS	m/m	1.4
LL	m/m	1.9
RL	m/m	3.4

Gravel 0.6m3

DL=3.00

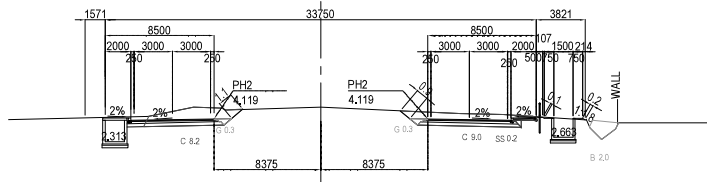
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(9) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0480

CROSS SECTION(10) S= 1:400

STA. 3+300
GH = 5.03
PH2 = 4.119

℄

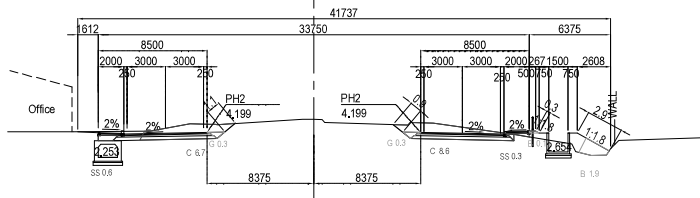


C	m/m	17.2	Gravel 0.6m3
B	m/m	2.0	
SS	m/m	0.2	
LL	m/m	1.1	
R	m/m	1.2	

DL=3.00

STA. 3+280
GH = 5.25
PH2 = 4.199

℄



C	m/m	15.3	Gravel 0.6m3
B	m/m	2.0	
SS	m/m	0.8	
LL	m/m	1.1	
R	m/m	4.1	

DL=3.00

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

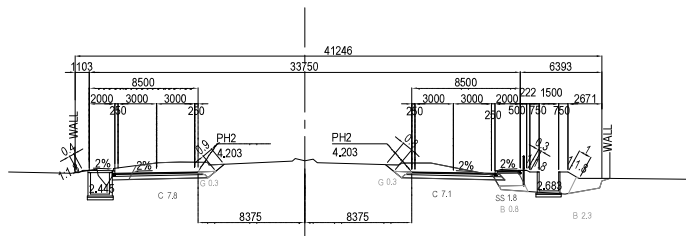
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(10) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			PC-RD-0490

CROSS SECTION(11) S= 1:400

STA. 3+340

GH = 5.06
PH2 = 4.203

℄

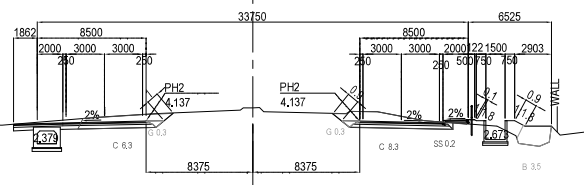


C	m ² /m	14.9	Gravel 0.6m ³
B	m ² /m	3.1	
SS	m ² /m	1.8	
LL	m ² /m	1.3	
R	m ² /m	2.1	

STA. 3+320

GH = 5.18
PH2 = 4.137

℄



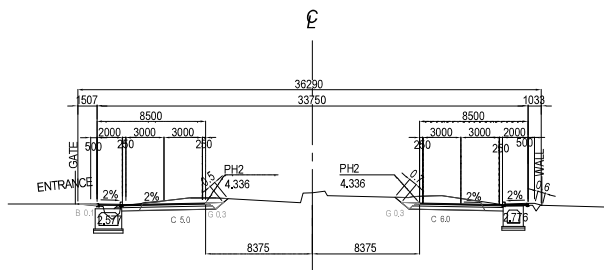
C	m ² /m	14.8	Gravel 0.6m ³
B	m ² /m	3.5	
SS	m ² /m	0.2	
LL	m ² /m	1.0	
R	m ² /m	1.9	

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(11) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0500

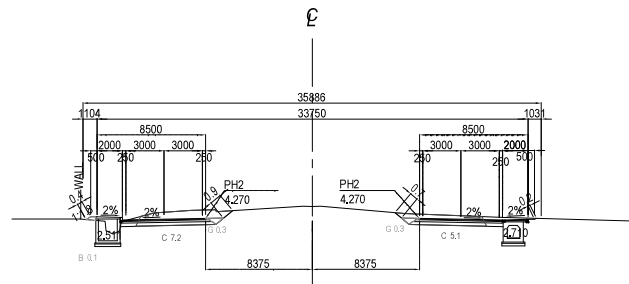
CROSS SECTION(12) S= 1:400

STA. 3+380
GH = 5.13
PH2 = 4.336



C	m ² /m	11.0	Gravel 0.6m ³
B	m ² /m	0.1	
SS	m ² /m	-	
LL	m ² /m	0.5	
R	m ² /m	1.3	

STA. 3+360
GH = 5.20
PH2 = 4.270



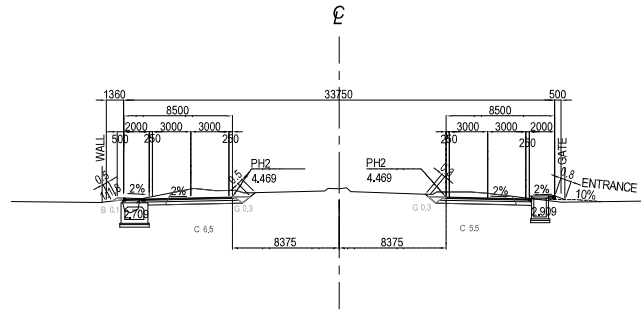
C	m ² /m	12.3	Gravel 0.6m ³
B	m ² /m	0.1	
SS	m ² /m	-	
LL	m ² /m	1.3	
R	m ² /m	0.9	

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME PREPARED BY K. TACHIBANA CHECKED BY T. HAYAKAWA APPROVED BY Y. SANO	SIGNATURE 	DATE 	DRAWING TITLE CROSS SECTION(12) S= 1:400	PACKAGE 0 DWG No. P0-RD-0510

CROSS SECTION(13) S= 1:400

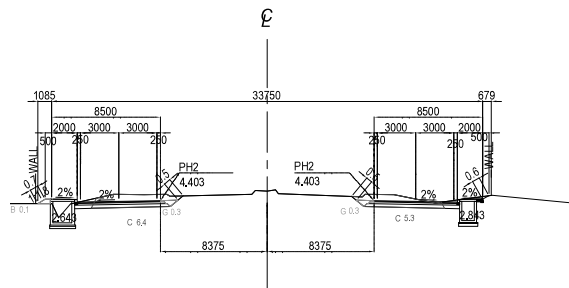
STA. 3+420
GH = 5.12
PH2= 4.469



C	m ² /m	120
B	m ² /m	0.1
SS	m ² /m	-
LL	m ² /m	1.0
RL	m ² /m	1.1

Gravel 0.6m³

STA. 3+400
GH = 5.15
PH2 = 4.403



C	m ² /m	117
B	m ² /m	0.1
SS	m ² /m	-
LL	m ² /m	1.2
RL	m ² /m	1.1

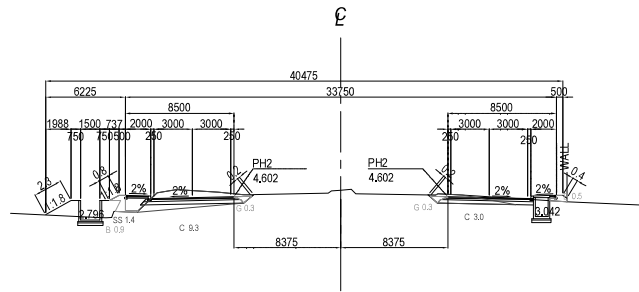
Gravel 0.6m³

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(13) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0520

CROSS SECTION(14) S= 1:400

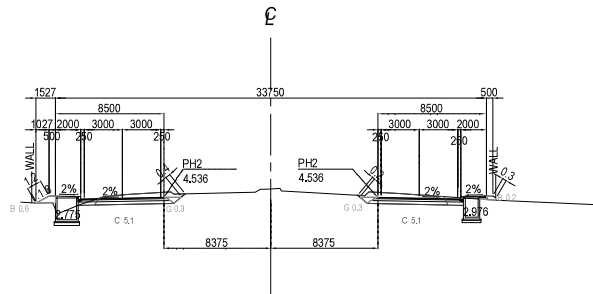
STA. 3+460
GH = 5.11
PH2 = 4.602



C	m ² /m	12.3	Gravel 0.6m ³
B	m ² /m	1.4	
SS	m ² /m	1.4	
LL	m ² /m	3.2	
RL	m ² /m	0.6	

DL=3.00

STA. 3+440
GH = 5.19
PH2 = 4.536



C	m ² /m	10.2	Gravel 0.6m ³
B	m ² /m	0.8	
SS	m ² /m	-	
LL	m ² /m	1.6	
RL	m ² /m	0.5	

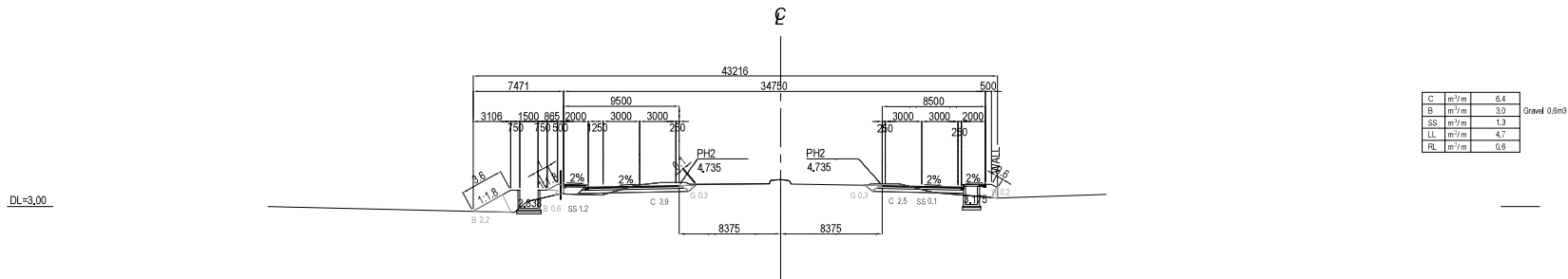
DL=3.00

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

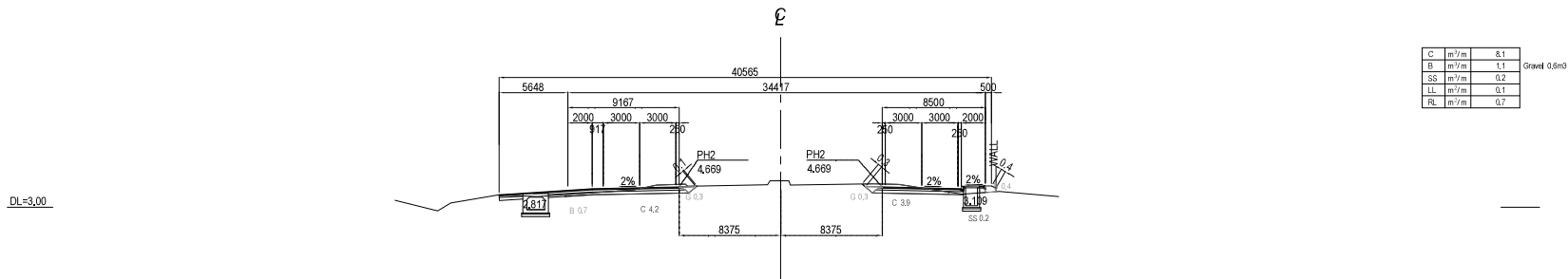
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA FUNDING TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME			DRAWING TITLE CROSS SECTION(14) S= 1:400	PACKAGE 0 DWG No. P04RD-0530	
				PREPARED BY	K. TACHIBANA	SIGNATURE			DATE
				CHECKED BY	T. HAYAKAWA				
				APPROVED BY	Y. SANO				

CROSS SECTION(15) S= 1:400

STA. 3+500
GH = 5.23
PH2 = 4.735



STA. 3+480
GH = 5.16
PH2 = 4.669



Note: Elevation of each cross section is based on Mean Sea Level (MSL).

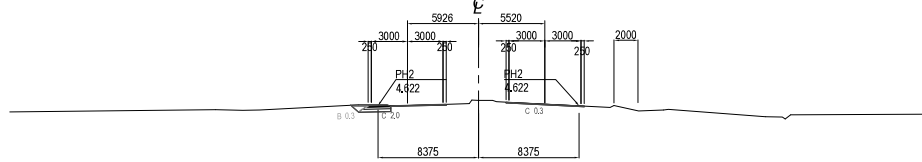
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE CROSS SECTION(15) S= 1:400	PACKAGE
				PREPARED BY	K. TACHIBANA			0
				CHECKED BY	T. HAYAKAWA			DWG No.
				APPROVED BY	Y. SANO			P0-RD-0540

CROSS SECTION(16) S= 1:400

STA. 3+580

GH = 5.08
PH2 = 4.622

DL=3.00

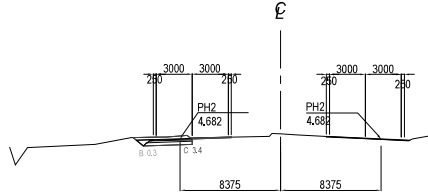


C	m/m	23
B	m/m	0.3
SS	m/m	-
LL	m/m	-
RL	m/m	-

STA. 3+560

GH = 5.10
PH2 = 4.682

DL=3.00

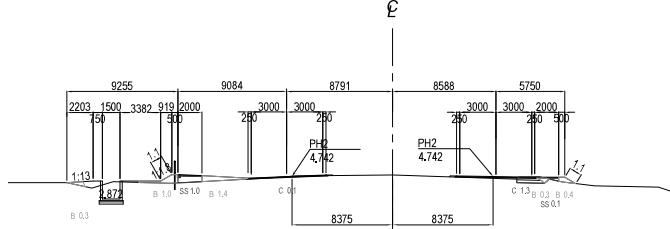


C	m/m	3.4
B	m/m	0.3
SS	m/m	-
LL	m/m	-
RL	m/m	-

STA. 3+540

GH = 4.87
PH2 = 4.742

DL=3.00

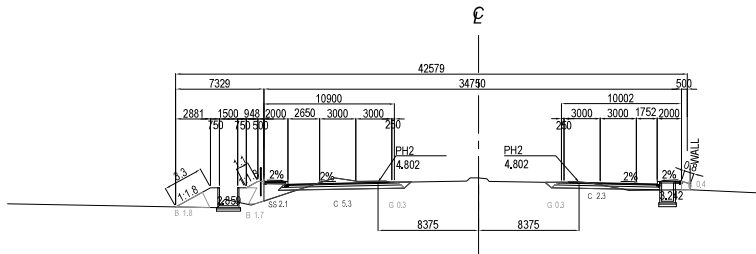


C	m/m	1.4
B	m/m	3.4
SS	m/m	1.6
LL	m/m	1.1
RL	m/m	1.1

STA. 3+520

GH = 5.16
PH2 = 4.802

DL=3.00



C	m/m	7.6
B	m/m	3.9
SS	m/m	2.1
LL	m/m	4.8
RL	m/m	0.5

Gravel 0.8m

Note: Elevation of each cross section is based on Mean Sea Level (MSL).

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTRY REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME			DRAWING TITLE CROSS SECTION(16) S= 1:400	PACKAGE 0 DWG No. PD-RD-0550
				PREPARED BY	SIGNATURE	DATE		
				CHECKED BY				
				APPROVED BY				

§3-2. Drainage

DRAINAGE

INDEX	Classification	Unit	Quantity	Remark	
D R A I N A G E	U-DITCH TYPE A	Nos	25		
	U-DITCH TYPE B	Nos	73		
	U-DITCH TYPE C	Nos	15		
	CONCRETE PIPE CULVERT ϕ 300 (CON. 360°) TYPE A	m	228.70		
	CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)	m	10.00		
	SIDE DITCH TYPE U 500x500 WITH COVER	m	33.80		
	SIDE DITCH TYPE U 800x800 WITH COVER	m	58.30		
	SIDE DITCH TYPE U-1000x1500	m	120.00		
	SIDE DITCH TYPE U-1500x1500	m	735.50		
	SIDE DITCH TYPE U-1500x1700	m	101.00		
	CONCRETE COVER TYPE A	Nos	240		
	CONCRETE COVER TYPE B	Nos	202		
	CATCH PIT (C-DITCH) TYPE B	Nos	2		
	CATCH PIT 500x500x1200	Nos	11		
	BOX CULVERT 1000x1000	m	52.00		
	BOX CULVERT 1500 x 1000	m	216.00		
	BOX CULVERT 1500x1500	m	248.50		
	TRENCH (W=1500)	m	36.50		
	TEMPORARY COFFERDAM	Nos	1		

Structure Position, Length or Numbers

CENTER

U-DITCH TYPE A

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 306.4					
~ +	L	1			
3 + 330.9					
~ 3 + 376.4	L	6			
3 + 366.4					
~ 3 + 376.4	R	2			
3 + 388.9					
~ 3 + 406.4	L	3			
3 + 396.9					
~ 3 + 476.4	R	9			
3 + 436.4					
~ 3 + 446.4	L	2			
3 + 498.8					
~ 3 + 516.2	R	2			
SUBTOTAL		25	SUBTOTAL		
TOTAL		25	TOTAL		

Structure Position, Length or Numbers

CENTER

U-DITCH TYPE B

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 32.5					
~ 2 + 994.8	R	5			
3 + 44.6					
~ 3 + 72.5	R	4			
3 + 62.5					
~ 2 + 862.5	L	21			
3 + 82.5					
~ 3 + 112.5	L	4			
3 + 92.5					
~ 3 + 122.5	R	4			
3 + 186.4					
~ 3 + 236.4	R	6			
3 + 248.4					
~ 3 + 296.4	R	6			
3 + 309.9					
~ 3 + 344.2	R	5			
3 + 456.4					
~ 3 + 496.4	L	5			
2 + 862.5					
~ 2 + 982.5	R	13			
SUBTOTAL		73	SUBTOTAL		
TOTAL		73	TOTAL		

Structure Position, Length or Numbers

CENTER

U-DITCH TYPE C

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 122.6					
~ 3 + 132.4	L	2			
3 + 132.5					
~ +	R	1			
3 + 176.4					
~ +	R	1			
3 + 196.4					
~ 3 + 276.4	L	9			
3 + 289.9					
~ 3 + 296.4	L	2			
SUBTOTAL		15	SUBTOTAL		
TOTAL		15	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE PIPE CULVERT ϕ 300 (CON. 360°) TYPE A

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 19.0					
~ +	R	19.000			
3 + 49.0					
~ +	R	19.300			
3 + 79.0					
~ +	R	19.600			
3 + 119.0					
~ +	R	20.000			
3 + 200.0					
~ +	R	18.900			
3 + 233.0					
~ +	R	18.500			
3 + 264.0					
~ +	R	12.200			
3 + 500.8					
~ +	L	13.700			
3 + 500.8					
~ +	R	9.000			
2 + 876.0					
~ +	R	20.100			
2 + 929.0					
~ +	R	19.500			
2 + 958.0					
~ +	R	19.200			
2 + 988.0					
~ +	L	19.700			
SUBTOTAL		228.70	SUBTOTAL		
TOTAL		228.70	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 883.4					
~ +	LR	10.00			
SUBTOTAL		10.00	SUBTOTAL		
TOTAL		10.00	TOTAL		

Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U 500x500 WITH COVER

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 830.1					
~ 2 + 846.3	R	25.00			
2 + 856.5					
~ 2 + 860.6	R	8.80			
SUBTOTAL		33.80	SUBTOTAL		
TOTAL		33.80	TOTAL		

Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U 800x800 WITH COVER

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 798.9					
~ 2 + 835.3	L	58.30			
SUBTOTAL		58.30	SUBTOTAL		
TOTAL		58.30	TOTAL		

Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U-1500x1500

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 860.0					
~ 2 + 987.0	R	135.00			
2 + 838.5					
~ 2 + 849.3	L	10.00			
3 + 37.0					
~ 2 + 993.0	R	44.00			
3 + 43.0					
~ 3 + 80.0	R	37.00			
3 + 68.6					
~ 2 + 860.0	L	200.00			
3 + 76.6					
~ 3 + 120.0	L	43.50			
3 + 88.0					
~ 3 + 127.0	R	39.00			
3 + 184.0					
~ 3 + 240.0	R	56.00			
3 + 247.0					
~ 3 + 301.0	R	54.00			
3 + 308.0					
~ 3 + 345.0	R	37.00			
3 + 455.0					
~ 3 + 478.0	L	23.00			
3 + 483.0					
~ 3 + 540.0	L	57.00			
SUBTOTAL		735.50	SUBTOTAL		
TOTAL		735.50	TOTAL		

Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U-1500x1700

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 300.0					
~ 3 + 311.0	L	11.00			
3 + 330.0					
~ 3 + 378.0	L	48.00			
3 + 388.0					
~ 3 + 409.0	L	21.00			
3 + 434.0					
~ 3 + 455.0	L	21.00			
SUBTOTAL		101.00	SUBTOTAL		
TOTAL		101.00	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE COVER TYPE A

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 363.0					
~ 3 + 378.0	R	30			
3 + 396.0					
~ 3 + 483.0	R	174			
3 + 499.0					
~ 3 + 517.0	R	36			
SUBTOTAL		240	SUBTOTAL		
TOTAL		240	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE COVER TYPE B

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 300.0					
~ 3 + 311.0	L	22			
3 + 330.0					
~ 3 + 378.0	L	96			
3 + 388.0					
~ 3 + 409.0	L	42			
3 + 434.0					
~ 3 + 455.0	L	42			
SUBTOTAL		202	SUBTOTAL		
TOTAL		202	TOTAL		

Structure Position, Length or Numbers

CENTER

CATCH PIT (C-DITCH) TYPE B

Station	LR	Length or Numbers	Station	LR	Length or Numbers
~ 3 + 500.8 +	L	1			
~ 3 + 500.8 +	R	1			
SUBTOTAL		2	SUBTOTAL		
TOTAL		2	TOTAL		

Structure Position, Length or Numbers

CENTER

BOX CULVERT 1500x1500

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 849.3					
~ 2 + 860.0	L	10.00			
2 + 775.0					
~ 2 + 838.5	L	61.50			
3 + 68.6					
~ 3 + 76.6	L	8.00			
3 + 120.0					
~ 3 + 278.0	L	158.00			
3 + 289.0					
~ 3 + 300.0	L	11.00			
SUBTOTAL		248.50	SUBTOTAL		
TOTAL		248.50	TOTAL		

Structure Position, Length or Numbers

CENTER

TRENCH (W=1500)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 849.3					
~ 2 + 860.0	R	36.50			
SUBTOTAL		36.50	SUBTOTAL		
TOTAL		36.50	TOTAL		

Structure Position, Length or Numbers

CENTER

TEMPORARY COFFERDAM

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 882.8 ~ +	L	1			
SUBTOTAL		1	SUBTOTAL		
TOTAL		1	TOTAL		

§3. Pavement

PAVEMENT

INDEX	Classification	Unit	Quantity	Remark
P A V E M E N T	PAVEMENT (TYPE E3)	m2	1, 532	Smoothing Section of End Point
	PAVEMENT (TYPE E5)	m2	13, 502	Frontage Road
	PAVEMENT (TYPE E6)	m2	1, 531	
	PRECAST CONCRETE SIDEWALK	m2	2, 100	Sidewalk
	Side Road			
	Normal A/C Surface Course, thickness 5cm	m2	13, 502	
	Normal A/C Subbase Course , thickness 5cm	m2	13, 502	
	Aggregate Base thickness 15cm	m2	13, 502	
	Aggregate Subbase thickness 25cm	m2	13, 502	
	Approach Road			
	Normal A/C Surface Course, thickness 5cm	m2	1, 532	
	Normal A/C Subbase Course , thickness 5cm	m2	1, 532	
	Aggregate Base thickness 25cm	m2	1, 532	
	Aggregate Subbase thickness 30cm	m2	1, 532	
	Approach Road (On. Off)			
	Normal A/C Surface Course, thickness 5cm	m2	1, 531	
	Normal A/C Subbase Course , thickness 5cm	m2	1, 531	
	Aggregate Base thickness 15cm	m2	1, 531	
	Aggregate Subbase thickness 15cm	m2	1, 531	

Structure Position, Length or Numbers

CENTER

PAVEMENT (TYPE E3)

	Station	LR	Length or Numbers		Station	LR	Length or Numbers
	3 + 500.0						
~	3 + 615.1	R	748.00				
	3 + 500.0						
~	3 + 615.1	L	784.00				
	SUBTOTAL		1532.00		SUBTOTAL		
	TOTAL		1532.00		TOTAL		

Structure Position, Length or Numbers

CENTER

PAVEMENT (TYPE E6)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 717.2					
~ 2 + 782.4	R	435.00			
2 + 721.1					
~ 2 + 782.4	R	403.00			
2 + 782.5					
~ 2 + 835.7	R	693.00			
SUBTOTAL		1531.00	SUBTOTAL		
TOTAL		1531.00	TOTAL		

Structure Position, Length or Numbers

CENTER

PRECAST CONCRETE SIDEWALK

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.0			2 + 821.8		
~ 2 + 992.3	R	82.30	~ 2 + 848.4	R	62.90
3 + 42.0			2 + 851.6		
~ 3 + 81.2	R	61.20	~ 2 + 988.3	R	253.10
3 + 71.3					
~ 2 + 855.6	L	329.00			
3 + 76.0					
~ 3 + 142.0	L	148.80			
3 + 87.7					
~ 3 + 147.8	R	138.10			
3 + 164.1					
~ 3 + 240.8	R	148.90			
3 + 159.1					
~ 3 + 280.7	L	187.30			
3 + 245.8					
~ 3 + 302.3	R	88.90			
3 + 286.7					
~ 3 + 300.0	L	22.30			
3 + 307.3					
~ 3 + 352.5	R	70.20			
3 + 311.0					
~ 3 + 315.1	L	6.20			
3 + 325.5					
~ 3 + 330.0	L	6.90			
3 + 358.2					
~ 3 + 382.2	R	20.50			
3 + 378.0					
~ 3 + 380.8	L	4.60			
3 + 385.3					
~ 3 + 388.0	L	4.60			
3 + 391.6					
~ 3 + 487.2	R	45.80			
3 + 409.0					
~ 3 + 411.6	L	4.40			
3 + 415.6					
~ 3 + 420.7	L	7.90			
3 + 440.1					
~ 3 + 479.0	L	54.70			
3 + 482.0					
~ 3 + 541.5	L	107.50			
3 + 494.4					
~ 3 + 523.1	R	18.30			
3 + 533.0					
~ 3 + 559.2	R	26.00			
3 + 543.9					
~ 3 + 590.4	L	66.00			
2 + 795.8					
~ 2 + 852.4	L	133.20			
SUBTOTAL		1783.60	SUBTOTAL		316.00
TOTAL		1783.60	TOTAL		2099.60

§-4. Road

ROAD

INDEX	Classification	Unit	Quantity	Remark
R O A D	CONCRETE KERB TYPE A-1	m	1255.90	
	CONCRETE KERB TYPE A-2	each	54	
	CONCRETE KERB TYPE A-3	m	122.30	
	CONCRETE KERB TYPE C	m	1298.70	
	GUARD FENCE	m	794.50	
	CONCRETE BARRIER	m	198.1	

Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE A-1

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.2					
~ 2 + 992.1	R	32.100			
3 + 41.8					
~ 3 + 81.5	R	33.900			
3 + 71.5					
~ 2 + 855.4	L	189.900			
3 + 75.8					
~ 3 + 143.3	L	82.800			
3 + 87.5					
~ 3 + 148.0	R	60.800			
3 + 157.9					
~ 3 + 280.9	L	134.300			
3 + 164.0					
~ 3 + 241.0	R	77.800			
3 + 245.6					
~ 3 + 302.5	R	51.700			
3 + 286.7					
~ 3 + 315.3	L	23.500			
3 + 307.1					
~ 3 + 352.9	R	39.200			
3 + 325.5					
~ 3 + 380.8	L	49.500			
3 + 358.0					
~ 3 + 382.4	R	18.600			
3 + 385.1					
~ 3 + 411.8	L	23.800			
3 + 391.4					
~ 3 + 487.4	R	85.400			
3 + 415.4					
~ 3 + 420.9	L	2.100			
3 + 428.9					
~ 3 + 479.2	L	43.900			
3 + 481.8					
~ 3 + 520.0	L	35.400			
3 + 494.2					
~ 3 + 523.3	R	21.400			
2 + 795.7					
~ 2 + 852.6	L	74.900			
2 + 821.7					
~ 2 + 848.5	R	32.100			
2 + 857.9					
~ 2 + 988.5	R	142.800			
SUBTOTAL		1255.90	SUBTOTAL		
TOTAL		1255.90	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE A-2

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.2					
~ 2 + 992.1	R	2			
3 + 41.8					
~ 3 + 81.5	R	2			
3 + 71.5					
~ 2 + 855.4	L	2			
3 + 75.8					
~ 3 + 143.3	L	3			
3 + 87.5					
~ 3 + 148.0	R	5			
3 + 157.9					
~ 3 + 280.9	L	3			
3 + 164.0					
~ 3 + 241.0	R	5			
3 + 245.6					
~ 3 + 302.5	R	2			
3 + 286.7					
~ 3 + 315.3	L	2			
3 + 307.1					
~ 3 + 352.9	R	2			
3 + 325.5					
~ 3 + 380.8	L	2			
3 + 358.0					
~ 3 + 382.4	R	2			
3 + 385.1					
~ 3 + 411.8	L	2			
3 + 391.4					
~ 3 + 487.4	R	2			
3 + 415.4					
~ 3 + 420.9	L	2			
3 + 428.9					
~ 3 + 479.2	L	2			
3 + 481.8					
~ 3 + 541.7	L	1			
3 + 494.2					
~ 3 + 523.3	R	2			
2 + 795.7					
~ 2 + 852.6	L	3			
2 + 821.7					
~ 2 + 848.5	R	3			
2 + 857.9					
~ 2 + 988.5	R	5			
SUBTOTAL		54	SUBTOTAL		
TOTAL		54	TOTAL		

Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE A-3

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.2					
~ 2 + 992.1	R	4.000			
3 + 41.8					
~ 3 + 81.5	R	4.800			
3 + 71.6					
~ 2 + 855.4	L	8.300			
3 + 75.8					
~ 3 + 143.3	L	6.300			
3 + 87.5					
~ 3 + 148.0	R	11.100			
3 + 157.9					
~ 3 + 280.9	L	5.500			
3 + 164.0					
~ 3 + 241.0	R	10.500			
3 + 245.6					
~ 3 + 302.5	R	4.000			
3 + 286.7					
~ 3 + 315.3	L	2.800			
3 + 307.1					
~ 3 + 352.9	R	4.800			
3 + 325.5					
~ 3 + 380.8	L	4.800			
3 + 358.0					
~ 3 + 382.4	R	5.600			
3 + 385.1					
~ 3 + 411.8	L	4.000			
3 + 391.4					
~ 3 + 487.4	R	5.600			
3 + 415.4					
~ 3 + 420.9	L	4.800			
3 + 428.9					
~ 3 + 479.2	L	4.800			
3 + 481.8					
~ 3 + 520.0	L	2.000			
3 + 494.2					
~ 3 + 523.3	R	7.100			
2 + 795.7					
~ 2 + 852.6	L	5.500			
2 + 821.7					
~ 2 + 848.5	R	7.000			
2 + 857.9					
~ 2 + 988.5	R	9.000			
SUBTOTAL		122.30	SUBTOTAL		
TOTAL		122.30	TOTAL		

Structure Position, Length or Numbers					
CENTER					
CONCRETE KERB TYPE C					
Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.0			2 + 859.1		
~ 2 + 992.3	R	43.00	~ 2 + 988.4	R	149.10
3 + 42.0					
~ 3 + 81.3	R	36.90			
3 + 71.3					
~ 2 + 855.6	L	195.80			
3 + 76.0					
~ 3 + 141.5	L	87.20			
3 + 87.7					
~ 3 + 146.1	R	70.60			
3 + 160.7					
~ 3 + 280.7	L	142.90			
3 + 165.8					
~ 3 + 240.8	R	86.50			
3 + 245.8					
~ 3 + 302.3	R	52.90			
3 + 286.7					
~ 3 + 300.0	L	13.30			
3 + 307.3					
~ 3 + 352.5	R	42.20			
3 + 311.0					
~ 3 + 315.1	L	4.10			
3 + 325.5					
~ 3 + 330.0	L	4.50			
3 + 358.2					
~ 3 + 382.2	R	24.00			
3 + 378.0					
~ 3 + 380.8	L	2.80			
3 + 385.3					
~ 3 + 388.0	L	2.70			
3 + 391.6					
~ 3 + 487.2	R	95.60			
3 + 409.0					
~ 3 + 411.6	L	2.60			
3 + 415.6					
~ 3 + 420.7	L	5.10			
3 + 429.1					
~ 3 + 434.0	L	4.90			
3 + 450.3					
~ 3 + 479.0	L	28.70			
3 + 482.0					
~ 3 + 541.5	L	58.30			
3 + 494.4					
~ 3 + 523.1	R	28.70			
2 + 797.4					
~ 2 + 852.6	L	78.30			
2 + 821.7					
~ 2 + 848.5	R	38.00			
SUBTOTAL		1149.60	SUBTOTAL		149.10
TOTAL		1149.60	TOTAL		1298.70

Structure Position, Length or Numbers

CENTER

GUARD FENCE

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 38.0					
~ 2 + 992.3	R	46.00			
3 + 42.0					
~ 3 + 81.5	R	39.50			
3 + 71.3					
~ 2 + 860.0	L	204.00			
3 + 75.9					
~ 3 + 139.7	L	66.50			
3 + 87.5					
~ 3 + 141.2	R	54.80			
3 + 171.9					
~ 3 + 240.8	R	70.60			
3 + 245.8					
~ 3 + 302.3	R	56.50			
3 + 307.3					
~ 3 + 348.7	R	41.40			
3 + 458.4					
~ 3 + 479.0	L	20.60			
3 + 482.0					
~ 3 + 541.3	L	59.30			
2 + 860.0					
~ 2 + 988.4	R	135.30			
SUBTOTAL		794.50	SUBTOTAL		
TOTAL		794.50	TOTAL		

Structure Position, Length or Numbers


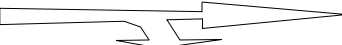



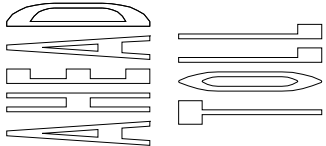
CENTER

CONCRETE BARRIER

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 717.2					
~ 2 + 799.6	LR	115.70			
2 + 811.8					
~ 2 + 832.1	R	19.00			
2 + 840.7					
~ 2 + 855.7	LR	37.40			
3 + 141.9					
~ 3 + 150.1	L	15.00			
3 + 165.5					
~ 3 + 172.6	L	11.00			
SUBTOTAL		198.10	SUBTOTAL		
TOTAL		198.10	TOTAL		

§-5. Road Marking

L I N E

INDEX	Classification	Unit	Quantity				Remark
			Main Line of Frontage Road	Flyover	Reinforced Earth	Total	
L I N E	LANE LINE (w=100)	m	381.0			381.0	
	SIDE LINE (w=100)	m	2472.7			2472.7	
	BROKEN LINE (w=100)	m	414.2			414.2	
	STOP LINE (w=300)	m	100.7			100.7	
	CROSSWALK MARKING (w=450)	m	819.5			819.5	
	GIVE WAY LINE (w=600)	m	109.8			109.8	
	ZEBRA LINE (w=150)	m	78.5			78.5	
	ZEBRA LINE (w=450)	m	84.0			84.0	
	PM-AR1	Nos	6			Width:15cm (m)	1.248m2 by each
		m2	7.5			50.0	
	PM-AR2	Nos	19			Width:15cm (m)	1.576m2 by each
		m2	29.9			199.3	
	PM-AR3	Nos	10			Width:15cm (m)	1.418m2 by each
		m2	14.2			94.7	
	PM-AR4	Nos	6			Width:15cm (m)	0.992m2 by each
		m2	6.0			40.0	
PM-3	Nos				Width:15cm (m)		
	m2						
PM-4	Nos				Width:15cm (m)		
	m2						

Structure Position, Length or Numbers					
CENTER					
SIDE LINE (w=100)			Main Line of Frontage Road		
Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 138.9					
~ 2 + 859.3	R	286.30			
~ 3 + 141.7					
~ 3 + 143.8	L	26.20			
~ 3 + 142.0					
~ 2 + 833.4	L	303.90			
~ 3 + 145.5					
~ 3 + 148.6	R	12.90			
~ 3 + 158.5					
~ 3 + 171.1	L	34.00			
~ 3 + 163.7					
~ 3 + 166.8	R	11.10			
~ 3 + 170.6					
~ 3 + 174.8	L	8.90			
~ 3 + 171.7					
~ 3 + 615.1	L	441.80			
~ 3 + 173.0					
~ 3 + 615.1	R	440.00			
~ 3 + 500.5					
~ 3 + 615.1	L	115.00			
~ 3 + 500.5					
~ 3 + 615.1	R	115.00			
~ 2 + 717.5					
~ 2 + 810.1	R	100.51			
~ 2 + 721.0					
~ 2 + 810.2	R	91.70			
~ 2 + 721.3					
~ 2 + 810.7	R	91.30			
~ 2 + 725.4					
~ 2 + 812.0	R	88.40			
~ 2 + 777.8					
~ 2 + 810.1	L	67.10			
~ 2 + 785.5					
~ 2 + 817.0	L	58.50			
~ 2 + 787.2					
~ 2 + 818.4	L	58.50			
~ 2 + 795.2					
~ 2 + 830.2	L	59.00			
~ 2 + 833.9					
~ 2 + 855.6	L	21.00			
~ 2 + 841.7					
~ 2 + 848.8	R	10.80			
~ 2 + 845.7					
~ 2 + 852.5	R	10.40			
~ 2 + 847.1					
~ 2 + 853.8	R	10.40			
~ 2 + 852.4					
~ 2 + 857.6	R	10.00			
SUBTOTAL		2472.71	SUBTOTAL		
TOTAL		2472.71	TOTAL		

Structure Position, Length or Numbers

CENTER

CROSSWALK MARKING (w=450)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 137.6					
~ 3 + 146.9	R	127.50			
3 + 139.5					
~ 3 + 145.6	L	21.00			
3 + 143.1					
~ 3 + 169.6	R	96.90			
3 + 149.6					
~ 3 + 158.6	L	59.50			
3 + 167.3					
~ 3 + 174.5	R	131.20			
3 + 168.3					
~ 3 + 173.6	L	17.54			
2 + 808.3					
~ 2 + 834.1	L	102.00			
2 + 808.8					
~ 2 + 818.5	R	75.70			
2 + 839.7					
~ 2 + 852.3	R	65.70			
2 + 855.6					
~ 2 + 859.3	L	122.50			
SUBTOTAL		819.54	SUBTOTAL		
TOTAL		819.54	TOTAL		

Structure Position, Length or Numbers

CENTER

ZEBRA LINE (w=150)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 820.9					
~ 2 + 838.0	L	39.60			
2 + 835.7					
~ 2 + 844.6	R	17.80			
2 + 842.6					
~ 2 + 850.7	R	10.80			
2 + 852.2					
~ 2 + 855.9	R	10.30			
SUBTOTAL		78.50	SUBTOTAL		
TOTAL		78.50	TOTAL		

Structure Position, Length or Numbers

CENTER

ZEBRA LINE (w=450)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 822.2					
~ 2 + 837.3	L	30.30			
2 + 835.9					
~ 2 + 844.6	R	30.50			
2 + 842.2					
~ 2 + 850.2	R	14.70			
2 + 852.4					
~ 2 + 857.4	R	8.50			
SUBTOTAL		84.00	SUBTOTAL		
TOTAL		84.00	TOTAL		

Structure Position, Length or Numbers

CENTER

PM-AR2

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 108.0					
~ 3 + 130.0	R	4			
3 + 146.0					
~ 3 + 157.0	L	1			
3 + 156.0					
~ 3 + 162.0	R	1			
3 + 179.0					
~ 3 + 202.0	L	4			
3 + 465.0					
~ 3 + 494.0	R	2			
2 + 784.5					
~ 2 + 805.6	R	2			
2 + 790.0					
~ 2 + 813.2	L	2			
2 + 853.0					
~ 2 + 855.0	R	1			
2 + 867.0					
~ 2 + 890.0	L	2			
SUBTOTAL		19	SUBTOTAL		
TOTAL		19	TOTAL		

Structure Position, Length or Numbers

CENTER

PM-AR4

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 465.0					
~ 3 + 494.0	R	2			
3 + 604.1					
~ 3 + 630.0	L	4			
SUBTOTAL		6	SUBTOTAL		
TOTAL		6	TOTAL		

§-6. Demolition Quantity

Calculation of Demolition Quantity

No	Item		Unit quantity	Length or Numbers	Removal Amount (m ³)	Application
1	Kerb(Median)	(UC)	0.236 m ³ /m	0.00 m	0.0	Contains Traffic Island
2	Kerb(Pedestrian Boundary Block)	(UC)	0.236 m ³ /m	1680.80 m	397.1	
3	U-Ditch Type- I	(RC)	0.513 m ³ /m	119.0 m	61.0	Remove All
4	U-Ditch Type- II	(RC)	0.579 m ³ /m	123.5 m	71.5	(same as above)
5	U-Ditch Type- III	(RC)	0.728 m ³ /m	10.6 m	7.7	(same as above)
6	U-Ditch Type- IV	(UC)	0.27 m ³ /m	22.5 m	6.1	(same as above)
7	U-Ditch Type- V	(RC)	0.303 m ³ /m	252.0 m	76.4	Remove Single Wall+Bottom Plate
8	U-Ditch Type- VI	(RC)	0.144 m ³ /m	53.5 m	7.7	Remove Single Wall
9	Box Culvert	(RC)	0.78 m ³ /m	71.5 m	55.8	Crossing of Approach
10	Box Culvert (Crossing)	(RC)	0.78 m ³ /m	25.0 m	19.5	Culvert Crossing Main Line
11	Box Culvert (Gable Wall) Type-①	(RC)	0.224 m ³ /Nos	12 Nos	2.7	
12	Box Culvert (Gable Wall) Type-②	(RC)	0.107 m ³ /Nos	8 Nos	0.9	
13	Box Culvert (Gable Wall) Type-③	(RC)	1.277 m ³ /Nos	2 Nos	2.6	
				【Area】		
14	Pavement (Roadway)	(As)	(t=10 cm)	2,593.0	259.3 m ³	
15	Pavement (Sidewalk)	(UC)	(t=10 cm)	3,063.5	306.4 m ³	
Removal Amount of Unreinforced Concrete Waste⇒					710 m ³	
Removal Amount of Reinforced Concrete Waste⇒					306 m ³	
Removal Amount of Asphalt Concrete Waste⇒					259 m ³	
Site Clearing⇒					14,204 m ²	

Structure Position, Length or Numbers											
Kerb Removal(Median)			Kerb Removal(Pedestrian Boundary Block)			Kerb Removal(Pedestrian Boundary Block)					
Station	LR	L or N	Station	LR	L or N	Station	LR	L or N	Station	LR	L or N
			STA 2 + 790.9	L	59.6	STA 2 + 993.7					
			STA 2 + 801.4			STA 3 + 36.4	R	45.80			
			STA 2 + 802.8	L	76.7	STA 3 + 40.7					
			STA 2 + 856.6			STA 3 + 80.9	R	43.30			
			STA 2 + 866.7	L	391.0	STA 3 + 89.0					
			STA 3 + 72.8			STA 3 + 113.3	R	29.70			
			STA 3 + 79.0	L	76.4	STA 3 + 118.4					
			STA 3 + 147.8			STA 3 + 150.9	R	34.30			
			STA 3 + 170.7	L	117.6	STA 3 + 165.0					
			STA 3 + 281.0			STA 3 + 238.9	R	74.80			
			STA 3 + 289.6	L	27.9	STA 3 + 248.5					
			STA 3 + 315.3			STA 3 + 300.7	R	58.60			
			STA 3 + 325.4	L	27.9	STA 3 + 310.5					
			STA 3 + 350.3			STA 3 + 352.0	R	44.90			
			STA 3 + 356.8	L	25.3	STA 3 + 360.6					
			STA 3 + 380.3			STA 3 + 383.6	R	24.30			
			STA 3 + 386.1	L	25.4	STA 3 + 391.7					
			STA 3 + 409.4			STA 3 + 487.6	R	99.20			
			STA 3 + 416.7	L	6.2	STA 3 + 495.1					
			STA 3 + 420.7			STA 3 + 528.2	R	34.20			
			STA 3 + 429.4	L	54.4	STA 3 + 533.9					
			STA 3 + 481.2			STA 3 + 584.6	R	51.60			
			STA 3 + 485.1	L	56.2						
			STA 3 + 538.6								
			STA 3 + 544.0	L	43.4						
			STA 3 + 585.0								
									Total Length of Median :		0.00
			STA 2 + 845.9						Total Length of Pedestrian Boundary :		1680.80
			STA 2 + 987.2	R	152.10						(m)
TOTAL		0.0	TOTAL		1140.1	TOTAL		540.7	TOTAL	ΣL=	1680.8

Structure Position, Length or Numbers

U-Ditch Removal Type-V			U-Ditch Removal Type-VI								
Station	LR	L or N	Station	LR	L or N	Station	LR	L or N	Station	LR	L or N
STA 3 + 5.0			STA 3 + 290.0								
STA 3 + 37.0	R	32.0	STA 3 + 302.0	R	12.0						
STA 3 + 43.0			STA 3 + 309.0								
STA 3 + 81.0	R	38.0	STA 3 + 351.0	R	41.5						
STA 3 + 87.0											
STA 3 + 149.0	R	62.0									
STA 3 + 164.5											
STA 3 + 240.5	R	76.0									
STA 3 + 246.0											
STA 3 + 290.0	R	44.0									
TOTAL		252.0	TOTAL		53.5	TOTAL		0.0	TOTAL		0.0

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Structure Position, Length or Numbers

Culvert Removal			Culvert Removal (Crossing)								
Station	LR	L or N	Station	LR	L or N	Station	LR	L or N	Station	LR	L or N
STA 2 + 987.0			STA 3 + 343.5		25.0						
STA 2 + 993.0	R	6.0									
STA 3 + 37.0											
STA 3 + 43.0	R	6.0									
STA 3 + 81.0											
STA 3 + 87.0	R	6.0									
STA 3 + 149.0											
STA 3 + 164.5	R	15.5									
STA 3 + 240.5											
STA 3 + 246.0	R	5.5									
STA 3 + 302.0											
STA 3 + 309.0	R	7.0									
STA 3 + 351.0	L	6.0									
STA 3 + 357.0											
STA 3 + 380.0	L	6.0									
STA 3 + 386.0											
STA 3 + 411.0	L	5.0									
STA 3 + 416.0											
STA 3 + 420.5	L	8.5									
STA 3 + 429.0											
TOTAL		71.5	TOTAL		25.0	TOTAL		0.0	TOTAL		0.0

101

Structure Position, Length or Numbers

Structure Position, Length or Numbers											
Culvert Removal (Gable Wall) Type-			Culvert Removal (Gable Wall) Type-2			Culvert Removal (Gable Wall) Type-					
Station	LR	L or N	Station	LR	L or N	Station	LR	L or N	Station	LR	L or N
STA 2 + 987.0			STA 3 + 351.0	L	2	STA 3 + 343.5	L	2			
STA 2 + 993.0	R	2	STA 3 + 357.0								
STA 3 + 37.0			STA 3 + 380.0	L	2						
STA 3 + 43.0	R	2	STA 3 + 386.0								
STA 3 + 81.0			STA 3 + 411.0	L	2						
STA 3 + 87.0	R	2	STA 3 + 416.0								
STA 3 + 149.0			STA 3 + 420.5	L	2						
STA 3 + 164.5	R	2	STA 3 + 429.0								
STA 3 + 240.5											
STA 3 + 246.0	R	2									
STA 3 + 302.0											
STA 3 + 309.0	R	2									
TOTAL		12	TOTAL		8	TOTAL		2	TOTAL		0.0

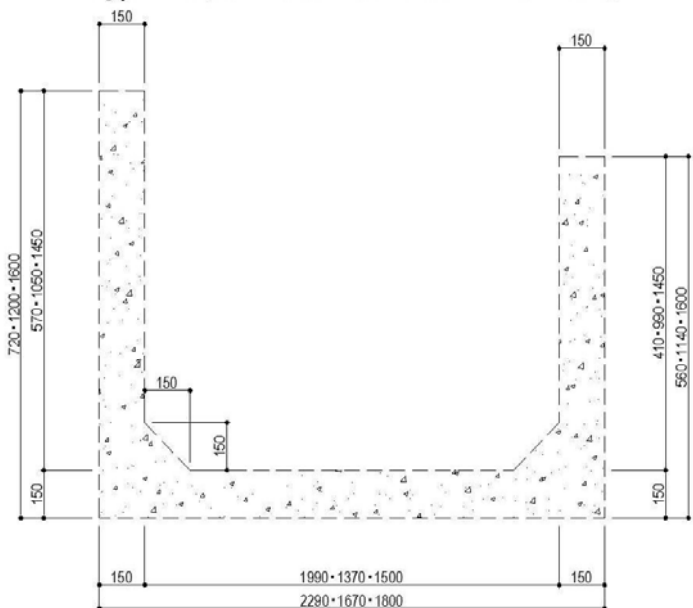
101

Structure Position, Length or Numbers

Pavement Removal (Roadway)			Pavement Removal (Sidewalk)			Pavement Removal (Sidewalk)			Site Clearing(m2)		
Station	LR	A	Station	LR	A	Station	LR	A	Station	LR	A
	LR	2,593.0		L	136.6		R	103.8	1	L	3471.00
				L	155.2		R	99.4	2	L	1028.00
				L	391.0		R	59.5	3	R	483.00
				L	95.2		R	74.0	4	R	2157.00
				L	212.7		R	192.1	5	R	718.00
				L	52.9		R	123.1	6	L	1173.00
				L	54.9		R	101.3	7	L	511.00
				L	56.9		R	30.9	8	L	1553.00
				L	39.6		R	235.1	9	R	1894.00
				L	5.0		R	64.1	10	R	199.00
				L	105.5		R	94.2	11	R	762.00
				L	120.5				12	R	255.00
				L	113.6						
				R	346.4						
TOTAL		2,593.0	TOTAL		1886.0	TOTAL		1177.5	TOTAL		14204.0

102

Item	Kerb Removal (Median and Pedestrian Boundary Block)		per 100m
Name	Size	Formula	Quantity
Kerb		$=0.125 \times 0.300 \times 100.0$	= 3.750 m ³
Base		$=(0.375 \times 0.600 - 0.075 \times 0.350) \times 100.0$	= 19.875 m ³
Concrete		$\Sigma V =$	23.625 m ³

Item	U-Ditch Removal Type- I · II · III		per 100m
<p>Type- I (HL:570 × W:1990 × HR: 410) Type- II (HL:1050 × W:1370 × HR: 990) Type- III (HL:1450 × W:1500 × HR: 1450)</p> 			
Name	Size	Formula	Quantity
Type- I			
Wall		$= (0.720 + 0.560) \times 0.150 \times 100.0$	$= 19.200 \text{ m}^3$
Bottom Plate		$= 1.990 \times 0.150 \times 100.0$	$= 29.850 \text{ m}^3$
Haunch		$= 1/2 \times 0.150 \times 0.150 \times 2 \times 100.0$	$= 2.250 \text{ m}^3$
Reinforced Concrete			$\Sigma V = 51.300 \text{ m}^3$
Type- II			
Wall		$= (1.200 + 1.140) \times 0.150 \times 100.0$	$= 35.100 \text{ m}^3$
Bottom Plate		$= 1.370 \times 0.150 \times 100.0$	$= 20.550 \text{ m}^3$
Haunch		$= 1/2 \times 0.150 \times 0.150 \times 100.0$	$= 2.250 \text{ m}^3$
Reinforced Concrete			$\Sigma V = 57.900 \text{ m}^3$
Type- III			
Wall		$= (1.600 + 1.600) \times 0.150 \times 100.0$	$= 48.000 \text{ m}^3$
Bottom Plate		$= 1.500 \times 0.150 \times 100.0$	$= 22.500 \text{ m}^3$
Haunch		$= 1/2 \times 0.150 \times 0.150 \times 100.0$	$= 2.250 \text{ m}^3$
Reinforced Concrete			$\Sigma V = 72.750 \text{ m}^3$

Item	Culvert (Gable Wall) Removal		per 100
Type-①(W:500 × H:1300 × 2) Type-②(W:200 × H:1300 × 2) Type-③(W:3200 × H:1300 × 2)			
Name	Size	Formula	Quantity
Type-①			
Wall		$=2 \times (0.500 \times 1.300 \times 0.150) \times 100$	$= 19.500 \text{ m}^3$
Haunch		$=2 \times (1/2 \times 0.150 \times 0.150 \times 1.300) \times 100.0$	$= 2.925 \text{ m}^3$
Reinforced Concrete		$\Sigma V =$	22.425 m^3
Type-②			
Wall		$=2 \times (0.200 \times 1.300 \times 0.150) \times 100$	$= 7.800 \text{ m}^3$
Haunch		$=2 \times (1/2 \times 0.150 \times 0.150 \times 1.300) 100.0$	$= 2.925 \text{ m}^3$
Reinforced Concrete		$\Sigma V =$	10.725 m^3
Type-③			
Wall		$=2 \times (3.200 \times 1.300 \times 0.150) \times 100$	$= 124.800 \text{ m}^3$
Haunch		$=2 \times (1/2 \times 0.150 \times 0.150 \times 1.300) 100.0$	$= 2.925 \text{ m}^3$
Reinforced Concrete		$\Sigma V =$	127.725 m^3

ξ4 .Unit of Quantity

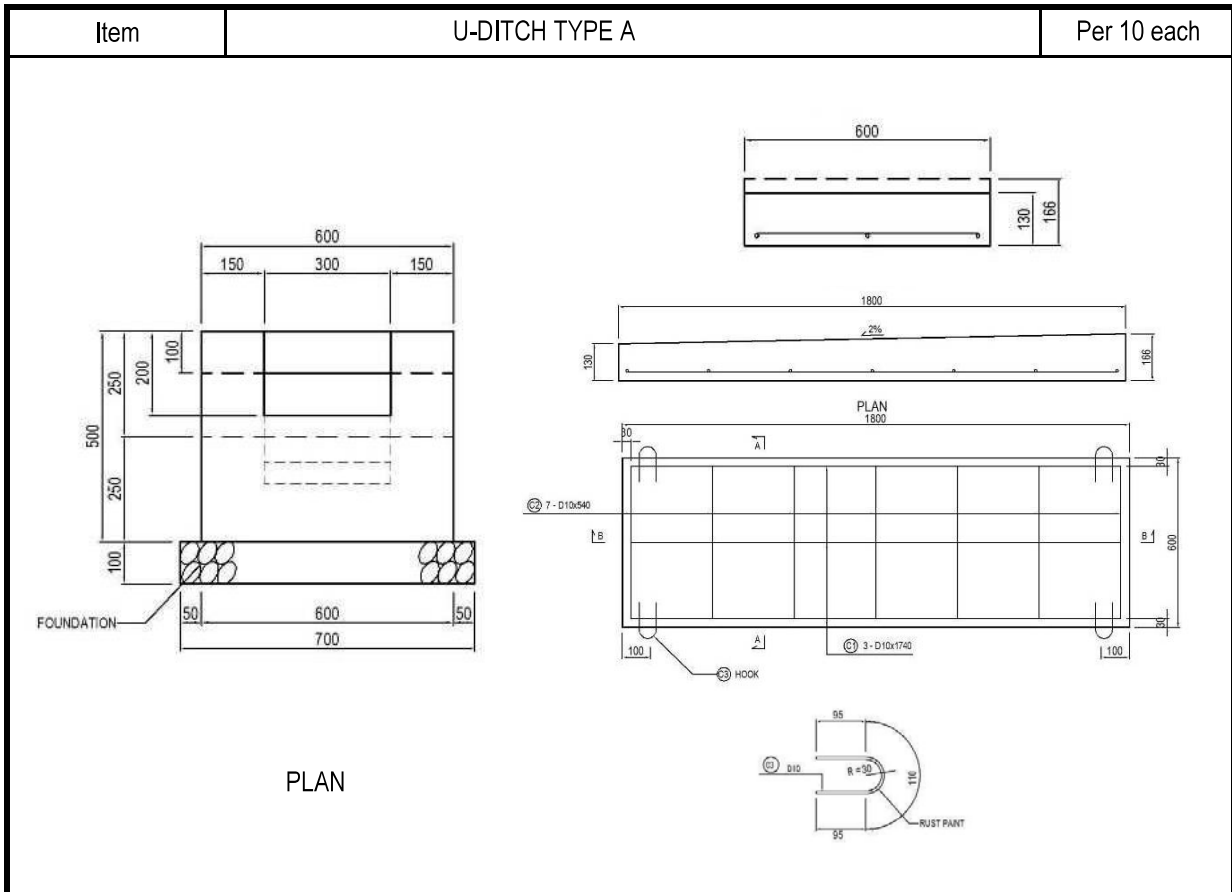
Unit quantity sheets

Road Drainage

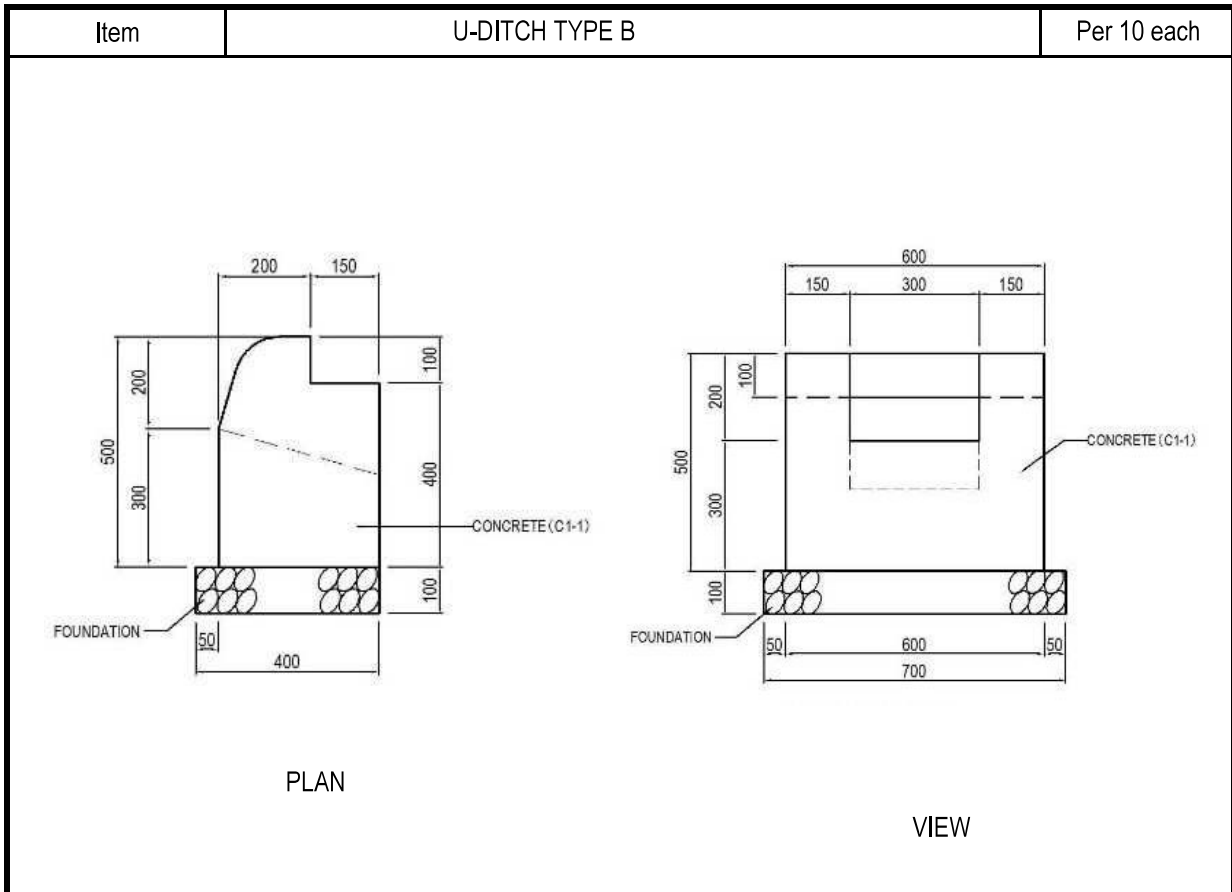
- 1 - U-DITCH TYPE A
- 2 - U-DITCH TYPE B
- 3 - U-DITCH TYPE C
- 4 - SIDE DITCH TYPE U-500x500 with Cover
- 5 - SIDE DITCH TYPE U-800x800 with Cover
- 6 - SIDE DITCH TYPE U-1000x1500
- 7 - SIDE DITCH TYPE U-1500x1500
- 8 - SIDE DITCH TYPE U-1500x1700
- 9 - CONCRETE COVER TYPE A
- 10 - CONCRETE COVER TYPE B
- 11 - BOX CULVERT TYPE 1000x1000
- 12 - BOX CULVERT TYPE 1500x1000
- 13 - BOX CULVERT TYPE 1500x1500
- 14 - CATCH PIT 500x500x1200
- 15 - CATCH PIT (C-DITCH) TYPE B
- 16 - CONCRETE PIPE CULVERT ϕ 300 (CON. 360°)TYPE A
- 17 - CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)
- 18 - TRENCH(W=1500)

Road

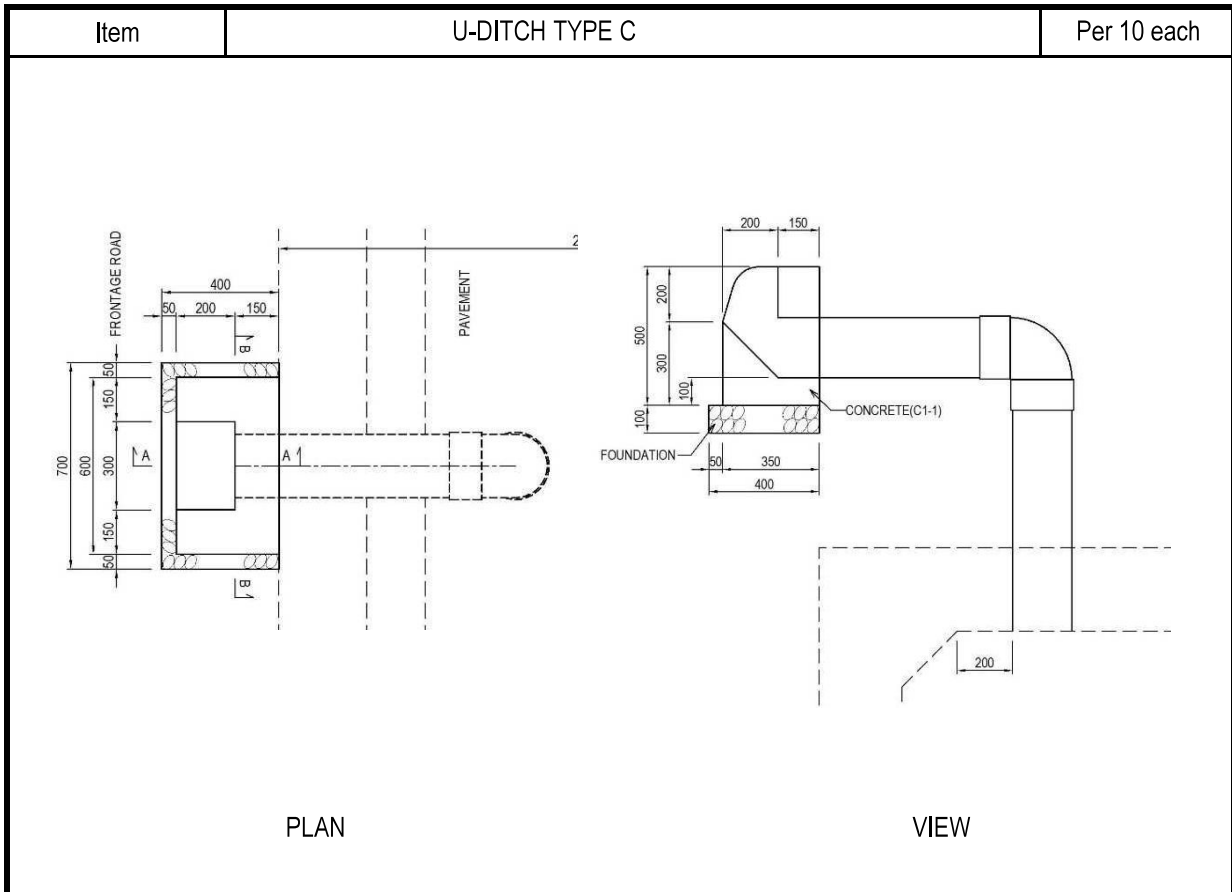
- 19 - CONCRETE KERB TYPE A-1
- 20 - CONCRETE KERB TYPE A-2
- 21 - CONCRETE KERB TYPE A-3
- 22 - CONCRETE KERB TYPE C
- 23 - SIGNBOARD FOUNDATION AND POST
- 24 - GUARD FENCE
- 25 - CONCRETE BARRIER



Title	Specification	Calculation Formula	Quantity
Body			
Concrete	24N/mm2	$(0.20 \times 0.50 + 1.80 \times 0.50 + 0.50 \times 0.50$ $+ 1.087 \times 0.50 + 0.75 \times 0.50) \times 0.15 \times 2 \times 10 = 6.506$ $(0.20 \times 0.25 + (1.80 + 0.50) \times 0.175$ $+ 1.087 \times 0.15 + 0.75 \times 0.15) \times 0.30 \times 10 = 2.184$ [Deduction] $-0.10 \times 1.80 \times 0.15 \times 2 \times 10 = -0.540$ <u>8.150</u>	8.15 m3
Reinforcing bar	D10	$(1.34 \times 17 + 4.337 \times 6 + 4.337 \times 3) \times 0.560 \times 10 = 346.153$	346.15 kg
Form		$(0.20 \times 0.50 + 1.80 \times 0.40 + 0.50 \times 0.50$ $+ 0.50 \times 1.087 + 0.75 \times 0.50) \times 2 \times 10 = 39.770$ $(0.2 \times 0.25 + 2.3 \times 0.325 + 1.087 \times 0.35$ $+ 0.75 \times 0.35) \times 2 \times 10 = 28.809$ [Deduction] $-0.1 \times 1.8 \times 2 \times 10 = -3.600$ <u>64.979</u>	64.98 m2
Foundation	t=100	$0.70 \times (2.55 + 1.087 + 0.75) \times 10 = 30.709$ $0.70 \times (2.55 + 1.087 + 0.75) \times 0.10 \times 10 = 3.071$	30.71 m2 3.07 m3
Cover			
Concrete	24N/mm2	$0.118 \times 0.60 \times 1.80 \times 10 = 1.274$	1.27 m3
Reinforcing bar	D10	$(1.74 \times 3 + 0.54 \times 7 + 0.30 \times 4) \times 0.560 \times 10 = 57.120$	57.12 kg
Form		$(0.10 \times 0.60 + 0.138 \times 0.60 + 0.118 \times 1.80 \times 2) \times 10 = 5.676$	5.68 m2



Title	Specification	Calculation Formula	Quantity
Excavation		=	0.00 m3
Backfilling		=	0.00 m3
Surplus soil		=	0.00 m3
Body			
Concrete	18N/mm2	$(0.20 \times 0.50 + 0.15 \times 0.40) \times 0.15 \times 2 \times 10 = 0.480$	
		$0.35 \times 0.25 \times 0.30 \times 10 = 0.263$	
		= 0.743	0.74 m3
Reinforcing bar		=	0.00 kg
Form		$(0.20 \times 0.50 + 0.15 \times 0.40 + 0.35 \times 0.25) \times 2 \times 10 = 4.950$	
		[Deduction] $-0.15 \times 0.10 \times 4 \times 10 = -0.600$	
		4.350	4.35 m2
Foundation	t=100	$0.40 \times 0.70 \times 10 = 2.800$	2.80 m2
		$0.40 \times 0.70 \times 0.10 \times 10 = 0.280$	0.28 m3

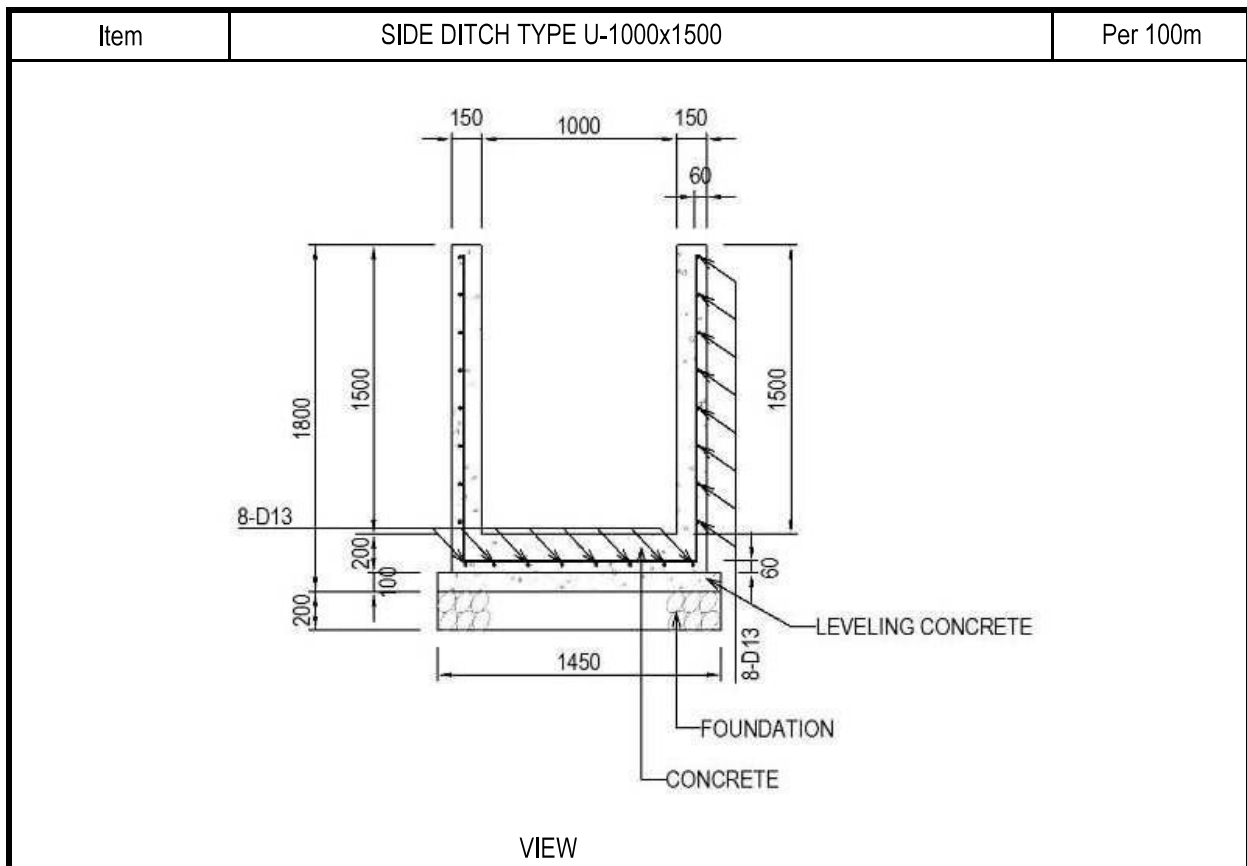


Title	Specification	Calculation Formula	Quantity
Excavation		=	0.00 m3
Backfilling		=	0.00 m3
Surplus soil		=	0.00 m3
Body			
Concrete	18N/mm2	$0.35 \times 0.50 \times 0.60 \times 10 = 1.050$	
		[Deduction] $-(0.20 \times 0.20 \times 0.30 + 0.20 \times 0.20 \times 0.5 \times 0.30) \times 10 = -0.180$	
		$-1/4 \times 3.14 \times 0.216 \times 0.216 \times 0.15 \times 10 = -0.055$	
		<u>0.815</u>	0.82 m3
Form		$0.35 \times 0.50 \times 2 \times 10 = 3.500$	
		$(0.20 \times 0.20 + 0.20 \times 0.20 \times 1/2) \times 2 \times 10 = 1.200$	
		$(0.50 \times 0.15 \times 2 + 0.3 \times 0.3) \times 10 = 2.400$	
		$(0.30 \times 0.40 + 0.60 \times 0.50) \times 10 = 4.200$	
		<u>11.300</u>	11.30 m2
Foundation	t=100	$0.40 \times 0.70 \times 10 = 2.800$	2.80 m2
		$0.40 \times 0.70 \times 0.10 \times 10 = 0.280$	0.28 m3
Pipe	VPφ200	2 Straight Pipes / each Total Avr. $2.0 \times 10 = 20.000$	20.00 m
Pipe Elbow	90°		10 each

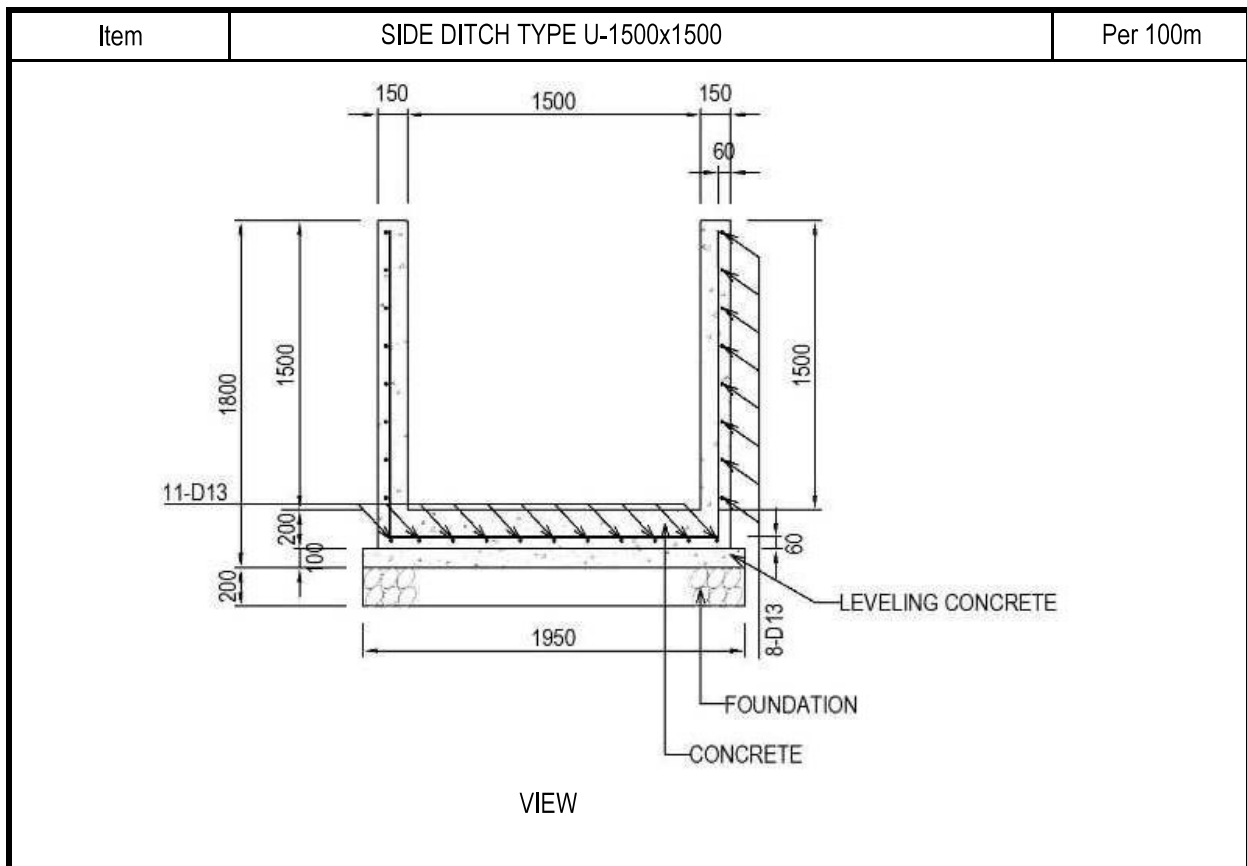
No	Item	Name	Size • Type	Quantity	Unit
	OPEN DITCHES	SIDE DITCH TYPE U-500x500 with Cover		100	m

Item	Formula	Quantity
U-500 x 500 with cover		
Concrete		
24N/mm ²	V1 = 0.800 x 0.150 x 100.000 = 12.000 m ³	
	V2 = 0.380 x 0.150 x 100.000 x 2 = 11.400 m ³	
	V3 = 0.120 x 0.080 x 100.000 x 2 = 1.920 m ³	
	V4 (cover) = 0.630 x 0.120 x 100.000 = 7.560 m ³	
		32.880 m ³
Form	A1 = (0.650 + 0.380 + 0.12) x 2 x 100.000 = 230.000 m ²	m ²
	A2-a (cover) = (0.500 + 0.630) x 0.12 x ($\frac{100.000}{0.500}$) x 2 = 54.240 m ²	m ²
	A2-b (cover) = 0.630 x 100.000 = 63.000 m ²	m ²
	A2 (a+b) = 54.240 + 63.000 = 117.240 m ²	m ²
	Total A = A1 + A2 = 230.000 + 117.240 = 347.240 m ²	347.240 m ²
Foundation	V = 0.950 x 0.150 x 100.000 = 14.250 m ³	14.250 m ³
Leveling Con:	V = 0.950 x 0.100 x 100.000 = 9.500 m ³	9.500 m ³
Excavation	V = ($\frac{2.850 + 1.950}{2}$) x 0.900 x 100.000 = 216.000 m ³	216.000 m ³
Backfill	V1 = ($\frac{0.950 + 0.500}{2}$) x 0.900 = 0.653 m ²	
	V2 = 0.650 x 0.075 = 0.049 m ²	
	V = (0.653 + 0.049) x 2.000 x 100.000 = 140.400 m ³	140.400 m ³
Concrete Cover	N = $\frac{100.000}{0.500}$ = 200.000 Nos	200.000 Nos
Reinforcing -bar D13		
	NO. UNIT	
	BAR MARK SIZE LENGTH OF WEIGHT WEIGHT REMARKS	
	(mm) (mm) BARS (kgf/m) (kgf/NOS) (kgf)	
	R1 D13 1.760 500 0.995 1.75 875	
	R2 D13 100.000 11 0.995 99.5 1,095	
	R3 (cover) D13 570 800 0.995 0.567 454	
	R4 (cover) D13 400 600 0.995 0.398 239	
	Total 2,663 kg	2,663 kg

No	Item	Name	Size • Type	Quantity	Unit																																										
	OPEN DITCHES	SIDE DITCH TYPE U-800x800 with Cover		100	m																																										
Item	Formula				Quantity																																										
U-800 x 800 with cover																																															
Concrete	$V1 = 1.100 \times 0.150 \times 100.000 = 16.500 \text{ m}^3$ $V2 = 0.680 \times 0.150 \times 100.000 \times 2 = 20.400$ $V3 = 0.120 \times 0.080 \times 100.000 \times 2 = 1.920 \text{ m}^3$ $V4(\text{cover}) = 0.930 \times 0.120 \times 100.000 = 11.160 \text{ m}^3$																																														
24N/mm ²					49.980 m ³																																										
Form	$A1 = (0.950 + 0.680 + 0.12) \times 2 \times 100.000 = 350.000 \text{ m}^2$ $A2\text{-a}(\text{cover}) = (0.500 + 0.930) \times 0.12 \times (\frac{100.000}{0.500}) \times 2 = 68.640 \text{ m}^2$ $A2\text{-b}(\text{cover}) = 0.930 \times 100.000 = 93.000 \text{ m}^2$ $A2(\text{a+b}) = 68.640 + 93.000 = 161.640 \text{ m}^2$ $\text{Total A} = 350.000 + 161.640 = 511.640 \text{ m}^2$				511.640 m ³																																										
Foundation	$V = 1.250 \times 0.150 \times 100.000 = 18.750 \text{ m}^3$				18.750 m ³																																										
Leveling Con:	$V = 1.250 \times 0.100 \times 100.000 = 12.500 \text{ m}^3$				12.500 m ³																																										
Excavation	$V = (\frac{3.450 + 2.250}{2}) \times 1.200 \times 100.000 = 342.000 \text{ m}^3$				342.000 m ³																																										
Backfill	$V1 = (\frac{1.100 + 0.500}{2}) \times 1.200 = 0.960 \text{ m}^2$ $V2 = 0.950 \times 0.075 = 0.071 \text{ m}^2$ $V = (0.960 + 0.071) \times 2.000 \times 100.000 = 206.200 \text{ m}^3$				206.200 m ³																																										
Concrete Cover	$N = \frac{100.000}{0.500} = 200.000 \text{ Nos}$				200.000 Nos																																										
Reinforcing -bar D13	<table border="1"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D13</td> <td>2.660</td> <td>500</td> <td>0.995</td> <td>2.65</td> <td>1,325</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>100,000</td> <td>14</td> <td>0.995</td> <td>99.5</td> <td>1,393</td> </tr> <tr> <td>R3 (cover)</td> <td>D13</td> <td>870</td> <td>1000</td> <td>0.995</td> <td>0.866</td> <td>866</td> </tr> <tr> <td>R4 (cover)</td> <td>D13</td> <td>400</td> <td>1000</td> <td>0.995</td> <td>0.398</td> <td>398</td> </tr> <tr> <td colspan="6" style="text-align: right;">Total</td> <td>3,982 kg</td> </tr> </tbody> </table>				BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D13	2.660	500	0.995	2.65	1,325	R2	D13	100,000	14	0.995	99.5	1,393	R3 (cover)	D13	870	1000	0.995	0.866	866	R4 (cover)	D13	400	1000	0.995	0.398	398	Total						3,982 kg	3,982 kg
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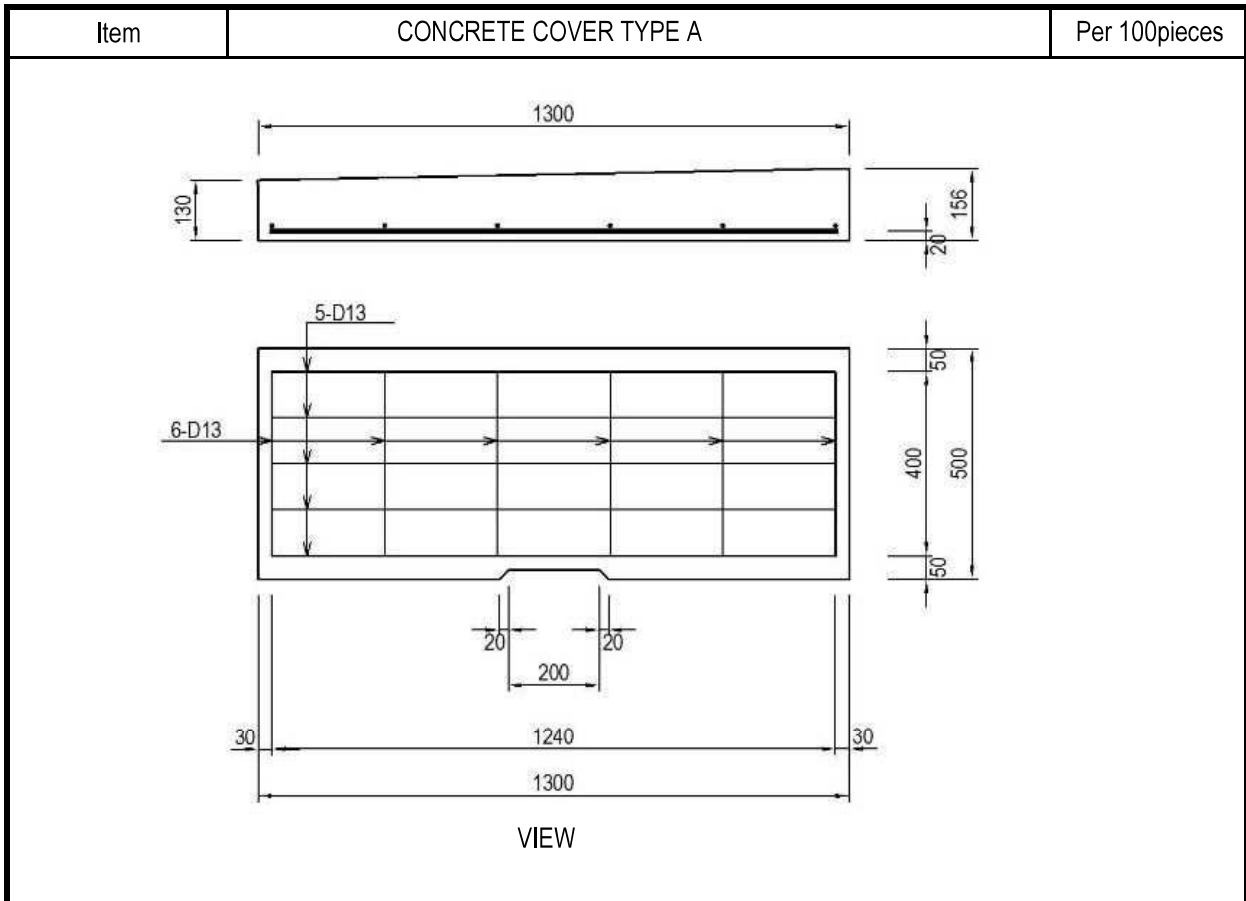


Title	Specification	Calculation Formula	Quantity
Excavation		$(4.45+2.45) \times 1/2 \times 2.0 \times 100.0 = 690.000$	= 690.00 m ³
Backfilling		$690.0 - (1.45 \times 0.3 + 1.30 \times 1.70) \times 100.0 = 425.500$	= 425.50 m ³
Surplus soil		$690.0 - 425.5 \times 1/0.9 = 217.222$	= 217.20 m ³
Body			
Concrete	24N/mm ²	$(1.30 \times 1.70 - 1.00 \times 1.50) \times 100.0 = 71.000$	71.000 m ³
Reinforcing bar	D13	$((8 \times 2 + 8) \times 100 + 4.34 \times 500) \times 0.995 = 4547.150$	4547.15 kg
Form	Body	$(1.70 + 1.50) \times 2 \times 100.0 = 640.000$	
	Leveling Concrete	$0.10 \times 2 \times 100.0 = 20.000$	
		660.000	660.00 m ²
Leveling Concrete	18N/mm ² , t=100	$1.45 \times 100.0 = 145.000$	155.00 m ²
		$1.45 \times 0.10 \times 100.0 = 15.500$	15.50 m ³
Foundation	t=200	$1.45 \times 100.0 = 145.000$	145.00 m ²
		$1.45 \times 0.20 \times 100.0 = 29.000$	29.00 m ³

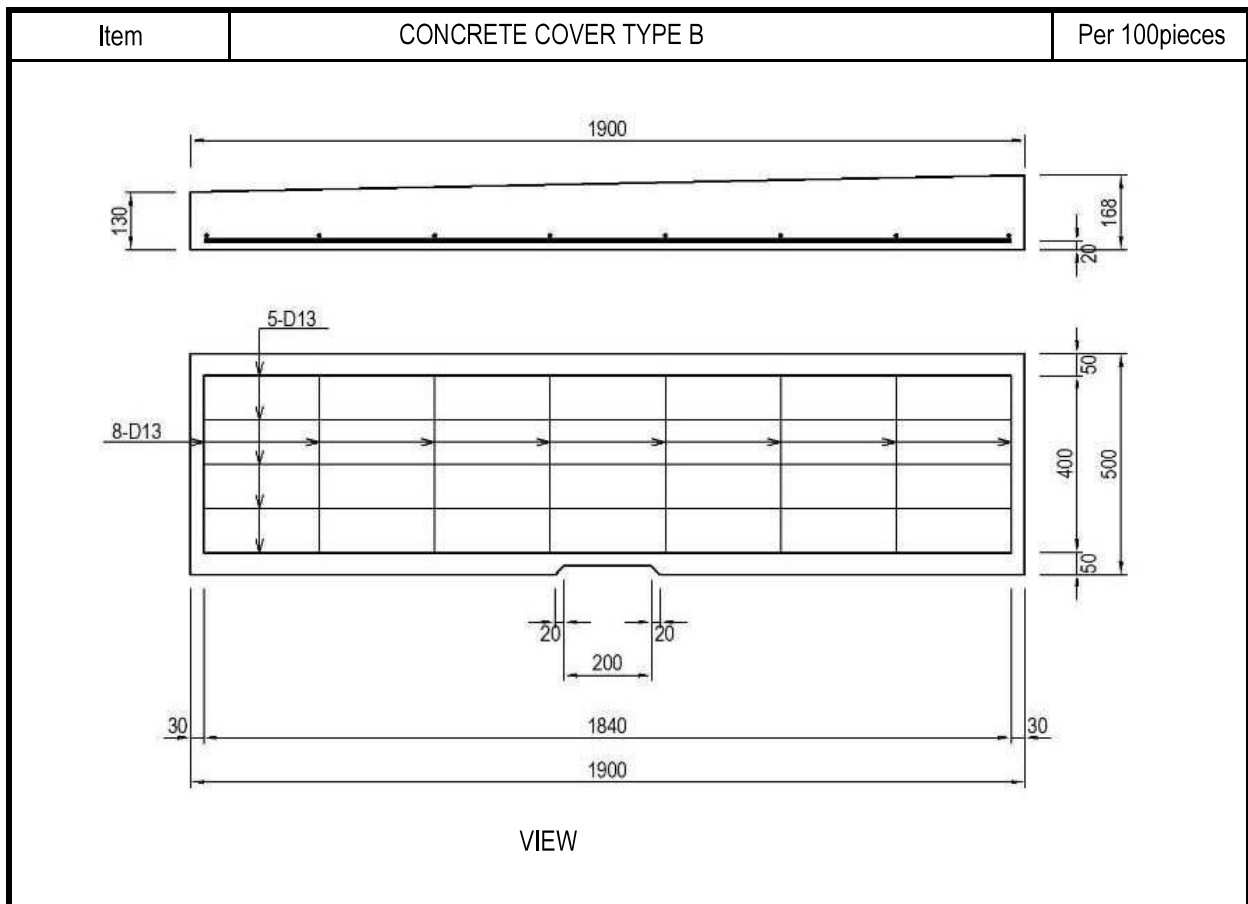


Title	Specification	Calculation Formula	Quantity
Excavation		$(4.80+2.80) \times 1/2 \times 2.0 \times 100.0 = 760.000$	= 760.00 m ³
Backfilling		$760.0 - (1.95 \times 0.30 + 1.80 \times 1.70) \times 100.0 = 395.500$	= 395.50 m ³
Surplus soil		$760.0 - 395.5 \times 1/0.9 = 320.556$	= 320.60 m ³
Body		=	
Concrete	24N/mm ²	$(1.80 \times 1.70 - 1.50 \times 1.50) \times 100.0 = 81.000$	81.000 m ³
Reinforcing bar	D13	$((8 \times 2 + 11) \times 100 + 4.84 \times 500) \times 0.995 = 5094.400$	5094.40 kg
Form	Body	$(1.70 + 1.50) \times 2 \times 100.0 = 640.000$	
	Leveling Concrete	$0.10 \times 100.0 \times 2 = 20.000$	
		660.000	660.00 m ²
Leveling Concrete	18N/mm ² , t=100	$1.95 \times 100.0 = 195.000$	195.00 m ²
		$1.95 \times 0.10 \times 100.0 = 19.500$	19.50 m ³
Foundation	t=200	$1.95 \times 100.0 = 195.000$	195.00 m ²
		$1.95 \times 0.20 \times 100.0 = 39.000$	39.00 m ³

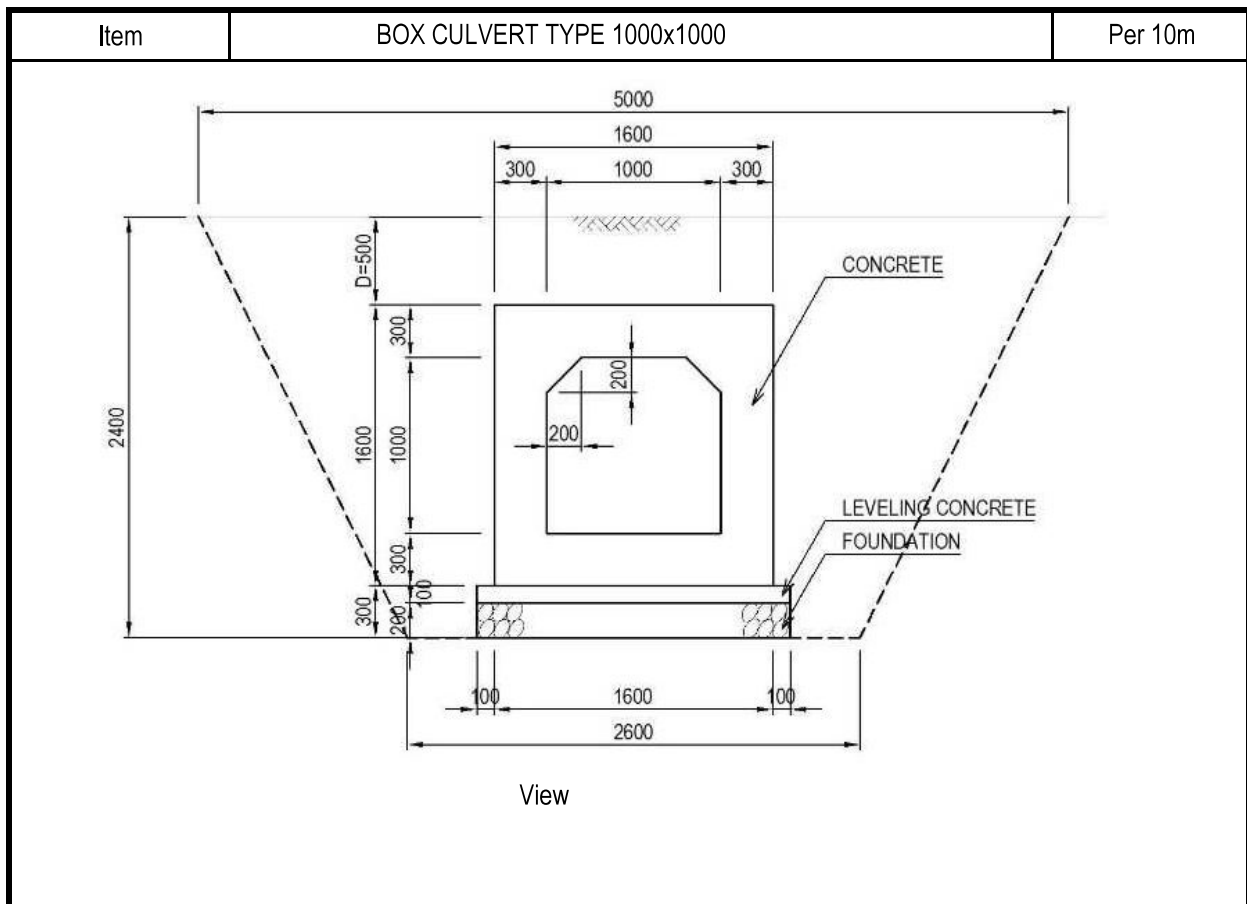
Item	SIDE DITCH TYPE U-1500x1700		Per 100m
<p>VIEW</p>			
Title	Specification	Calculation Formula	Quantity
Excavation		$(5.10+2.90) \times 1/2 \times 2.2 \times 100.0 = 880.000$	= 880.00 m ³
Backfilling		$880.0 - (2.05 \times 0.3 + 1.9 \times 1.9) \times 100.0 = 457.500$	= 457.50 m ³
Surplus soil		$880.0 - 457.5 \times 1/0.9 = 371.667$	= 371.70 m ³
Body			
Concrete	24N/mm ²	$(1.90 \times 1.90 - 1.50 \times 1.70) \times 100.0 = 106.000$	106.000 m ³
Reinforcing bar	D13	$((9 \times 2 + 11) \times 100 + 5.34 \times 500) \times 0.995 = 5542.150$	5542.15 kg
Form	Body	$(1.90 + 1.70) \times 2 \times 100.0 = 720.000$	= 720.000
	Leveling Concrete	$0.1 \times 2 \times 100.0 = 20.000$	= 20.000
		<u>740.000</u>	740.00 m ²
Leveling Concrete	18N/mm ² , t=100	$2.05 \times 100.0 = 205.000$	205.00 m ²
		$2.05 \times 0.10 \times 100.0 = 20.500$	20.50 m ³
Foundation	t=200	$2.05 \times 100.0 = 205.000$	205.00 m ²
		$2.05 \times 0.20 \times 100.0 = 41.000$	41.00 m ³



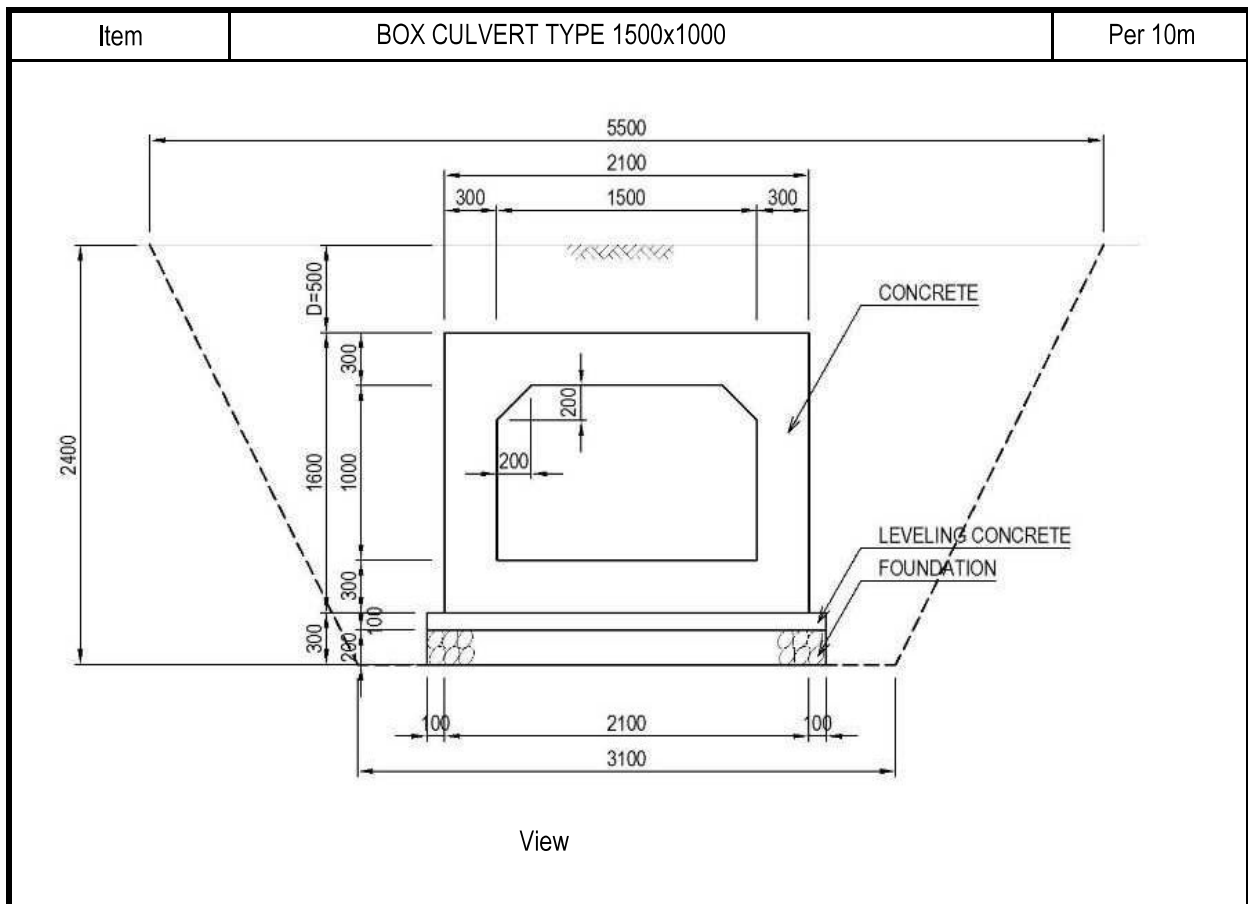
Title	Specification	Calculation Formula	Quantity
Excavation		=	0.00 m3
Backfilling		=	0.00 m3
Surplus soil		=	0.00 m3
Body			
Cover			
Concrete	24N/mm2	$(0.130+0.156) \times 1/2 \times 1.30 \times 0.50 \times 100 = 9.295$	9.30 m3
Reinforcing bar	D13	$(1.24 \times 5 + 0.40 \times 6) \times 0.995 \times 100 = 855.700$	855.70 kg
Form		$((0.130+0.156) \times 1/2 \times 1.30 \times 2 + 0.130 \times 0.5 + 0.156 \times 0.5) \times 100 = 51.480$	51.48 m2



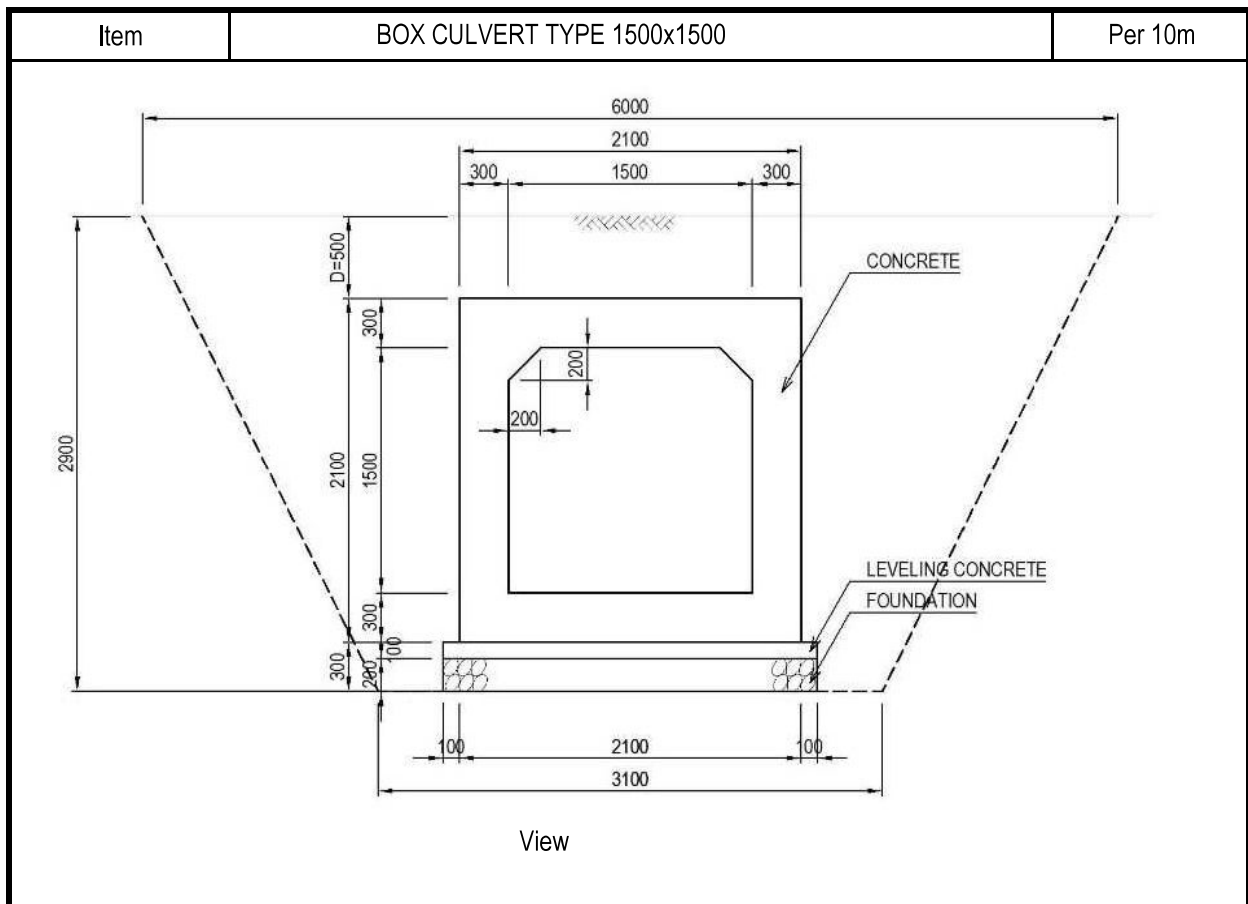
Title	Specification	Calculation Formula	Quantity
Excavation		=	0.00 m3
Backfilling		=	0.00 m3
Surplus soil		=	0.00 m3
Body			
Cover			
Concrete	24N/mm2	$(0.130+0.168) \times 1/2 \times 1.90 \times 0.50 \times 100 = 14.155$	14.16 m3
Reinforcing bar	D13	$(1.84 \times 5 + 0.40 \times 8) \times 0.995 \times 100 = 1233.800$	1233.80 kg
Form		$((0.130+0.168) \times 1/2 \times 1.90 \times 2 + 0.130 \times 0.5 + 0.184 \times 0.5) \times 100 = 72.320$	72.32 m2



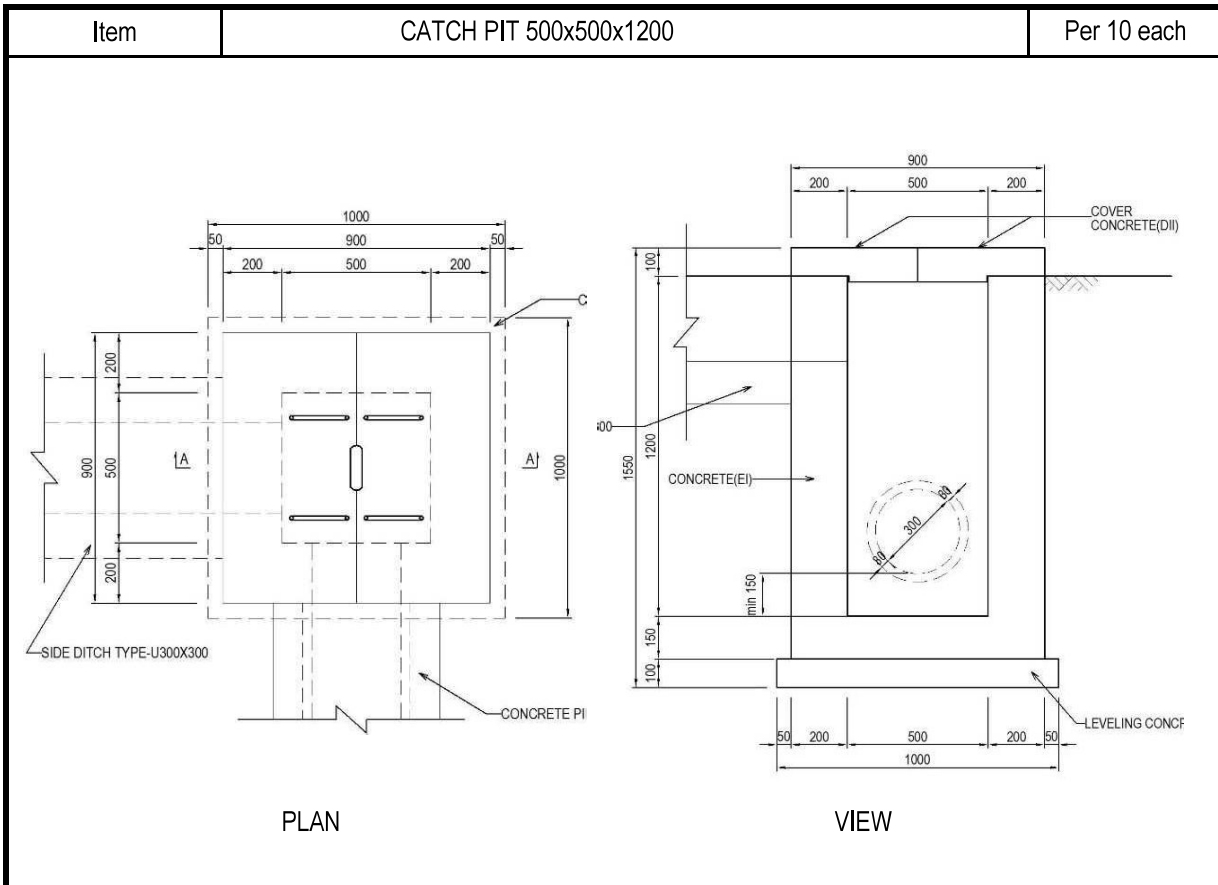
Title	Specification	Calculation Formula	Quantity
Excavation		$(5.0+2.6) \times 1/2 \times 2.4 \times 10.0 = 91.200$	91.20 m ³
Backfilling		$91.20 - (1.8 \times 0.3 + 1.6 \times 1.6) \times 10.0 = 60.200$	60.20 m ³
Surplus soil		$91.20 - 60.20 \times 1/0.9 = 24.311$	24.30 m ³
Body			
Concrete	24N/mm ²	As mentioned in the drawing = 16.000	16.000 m ³
Reinforcing bar	D13	Ditto = 1219.500	1219.50 kg
Form	Body	Ditto = 59.660	
	Leveling Concrete	$0.10 \times 10.0 \times 2 = 2.000$	
		61.660	61.66 m ²
Support		$(1.0 \times 1.0 - 0.2 \times 0.2) \times 10.0 = 9.600$	9.60 m ³
Leveling Concrete	t=100	$1.80 \times 10.0 = 18.000$	18.00 m ²
		$1.80 \times 0.10 \times 10.0 = 1.800$	1.80 m ³
Foundation	t=200	$1.80 \times 1.00 = 1.800$	1.80 m ²
		$1.80 \times 0.20 \times 1.00 = 0.360$	0.36 m ³
Retaining block			
Concrete	18N/mm ²	$0.10 \times 1.60 \times 2 \times 3 / 52.00 \times 10.00 = 0.185$	0.18 m ³
Form	Retaining block	$0.45 \times 1.60 \times 2 \times 3 / 52.00 \times 10.00 = 0.831$	0.83 m ²



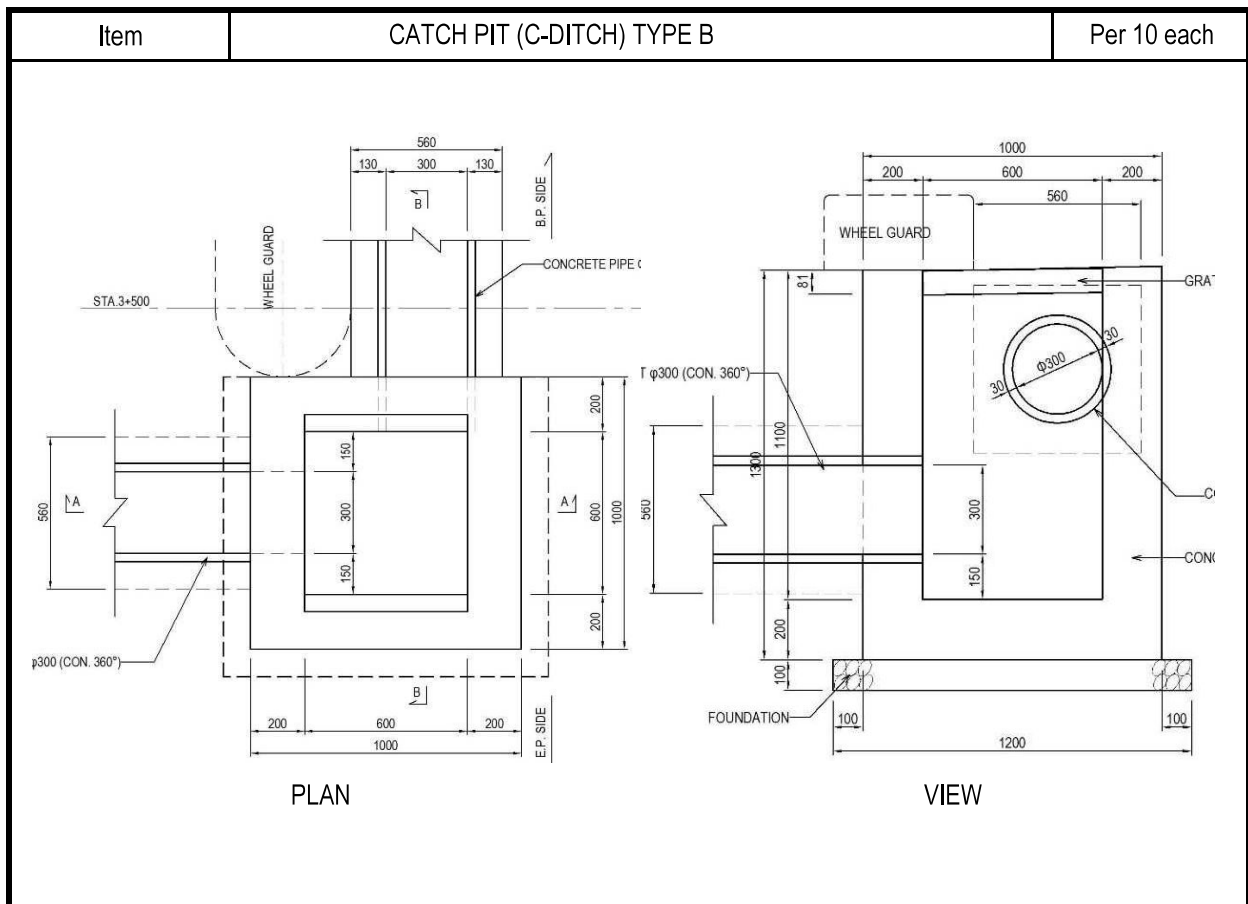
Title	Specification	Calculation Formula	Quantity
Excavation		$(5.5+3.1) \times 1/2 \times 2.4 \times 10 = 103.200$	103.20 m3
Backfilling		$103.20 - (2.3 \times 0.3 + 2.1 \times 1.6) \times 10 = 62.700$	62.70 m3
Surplus soil		$103.20 - 62.70 \times 1/0.9 = 33.533$	33.50 m3
Body			
Concrete	24N/mm2	As mentioned in the drawing = 19.000	19.000 m3
Reinforcing bar	D13	Ditto = 1465.180	1465.18 kg
Form	Body	Ditto = 64.660	
	Leveling Concrete	$0.10 \times 10.0 \times 2 = 2.000$	
		66.660	66.66 m2
Support		$(1.5 \times 1.0 - 0.2 \times 0.2) \times 10.0 = 14.600$	14.60 m3
Leveling Concrete	t=100	$2.30 \times 10.0 = 23.000$	23.00 m2
		$2.30 \times 0.10 \times 10.0 = 2.300$	2.30 m3
Foundation	t=200	$2.30 \times 1.00 = 2.300$	2.30 m2
		$2.30 \times 0.20 \times 1.00 = 0.460$	0.46 m3
Retaining block			
Concrete	18N/mm2	$0.10 \times 2.10 \times 2 \times 12/216.00 \times 10.00 = 0.233$	0.23 m3
Form	Retaining block	$0.45 \times 2.10 \times 2 \times 12/216.00 \times 10.00 = 1.050$	1.05 m2



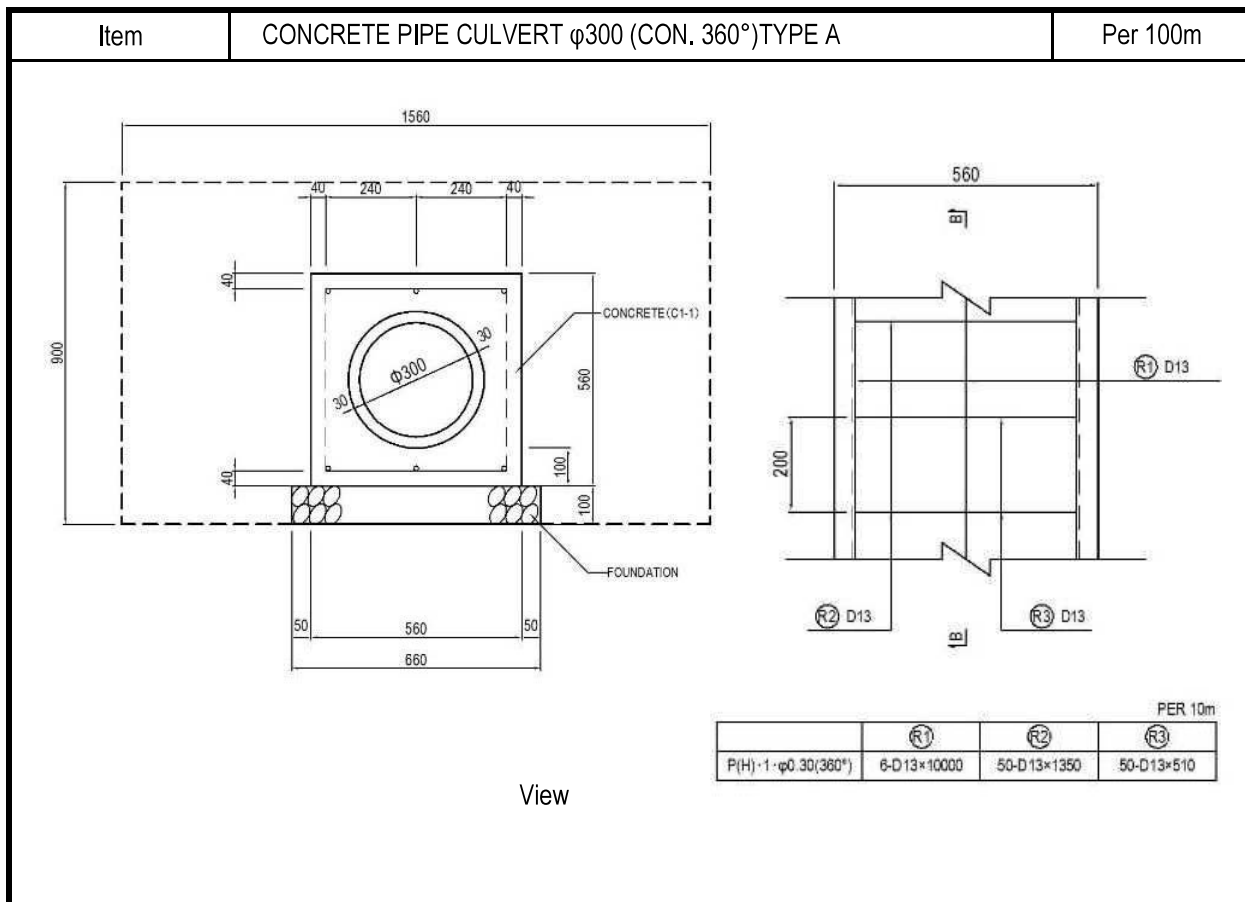
Title	Specification	Calculation Formula	Quantity
Excavation		$(6.0+3.1) \times 1/2 \times 2.9 \times 10.0 = 131.950$	132.00 m3
Backfilling		$132.0 - (2.30 \times 0.3 + 2.10 \times 2.10) \times 10.0 = 81.000$	81.00 m3
Surplus soil		$132.0 - 81.0 \times 1/0.9 = 42.000$	42.00 m3
Body			
Concrete	24N/mm2	As mentioned in the drawing = 22.000	22.000 m3
Reinforcing bar	D13	Ditto = 1637.940	1637.94 kg
Form	Body	Ditto = 84.660	
	Leveling Concrete	$0.10 \times 10.0 \times 2 = 2.000$	
		86.660	86.66 m2
Support		$(1.5 \times 1.5 - 0.2 \times 0.2) \times 10.0 = 22.100$	22.10 m3
Leveling Concrete	t=100	$2.30 \times 10.0 = 23.000$	23.00 m2
		$2.30 \times 0.10 \times 10.0 = 2.300$	2.30 m3
Foundation	t=200	$2.30 \times 10.0 = 23.000$	23.00 m2
		$2.30 \times 0.20 \times 10.0 = 4.600$	4.60 m3



Title	Specification	Calculation Formula	Quantity
Body			
Concrete	18N/mm2	$(0.900 \times 0.900 \times 1.35 - 0.500 \times 0.500 \times 1.200) \times 10 = 7.935$	
		[Deduction] $-(1/4 \times 3.14 \times 0.360 \times 0.360 \times 0.200) \times 10 = -0.203$	
		$-(0.300 \times 0.300 \times 0.200) \times 10 = -0.180$	
		<u>7.552</u>	7.55 m3
Form	Body	$(0.900 \times 1.350 \times 4 + 0.500 \times 1.200 \times 4) \times 10 = 72.600$	
		$(0.300 \times 0.200 \times 3 + 3.14 \times 0.360 \times 0.200) \times 10 = 4.061$	
		[Deduction] $-(0.300 \times 0.300 \times 2 + 1/4 \times 3.14 \times 0.360 \times 0.360 \times 2) \times 10 = -3.835$	
	Leveling Concrete	$(1.000 \times 0.100 \times 4) \times 10 = 4.000$	
		<u>76.826</u>	76.83 m2
Leveling Concrete	t=100	$1.000 \times 1.000 \times 10 = 10.000$	10.00 m2
		$1.000 \times 1.000 \times 0.100 \times 10 = 1.000$	1.00 m3
Cover			
Concrete	24N/mm2	$(0.450 \times 0.900 \times 0.100 \times 2 + 0.49 \times 0.49 \times 0.02) \times 10 = 0.858$	0.86 m3
Reinforcing bar	D10	$(0.84 \times 4 + 0.37 \times 8) \times 2 \times 0.560 \times 10 = 70.784$	70.78 kg
	D13	$0.76 \times 2 \times 2 \times 1.042 \times 10 = 31.677$	31.68 kg
Form		$(0.900 \times 0.12 + 0.45 \times 0.12) \times 2 \times 2 \times 10 = 6.480$	6.48 m2

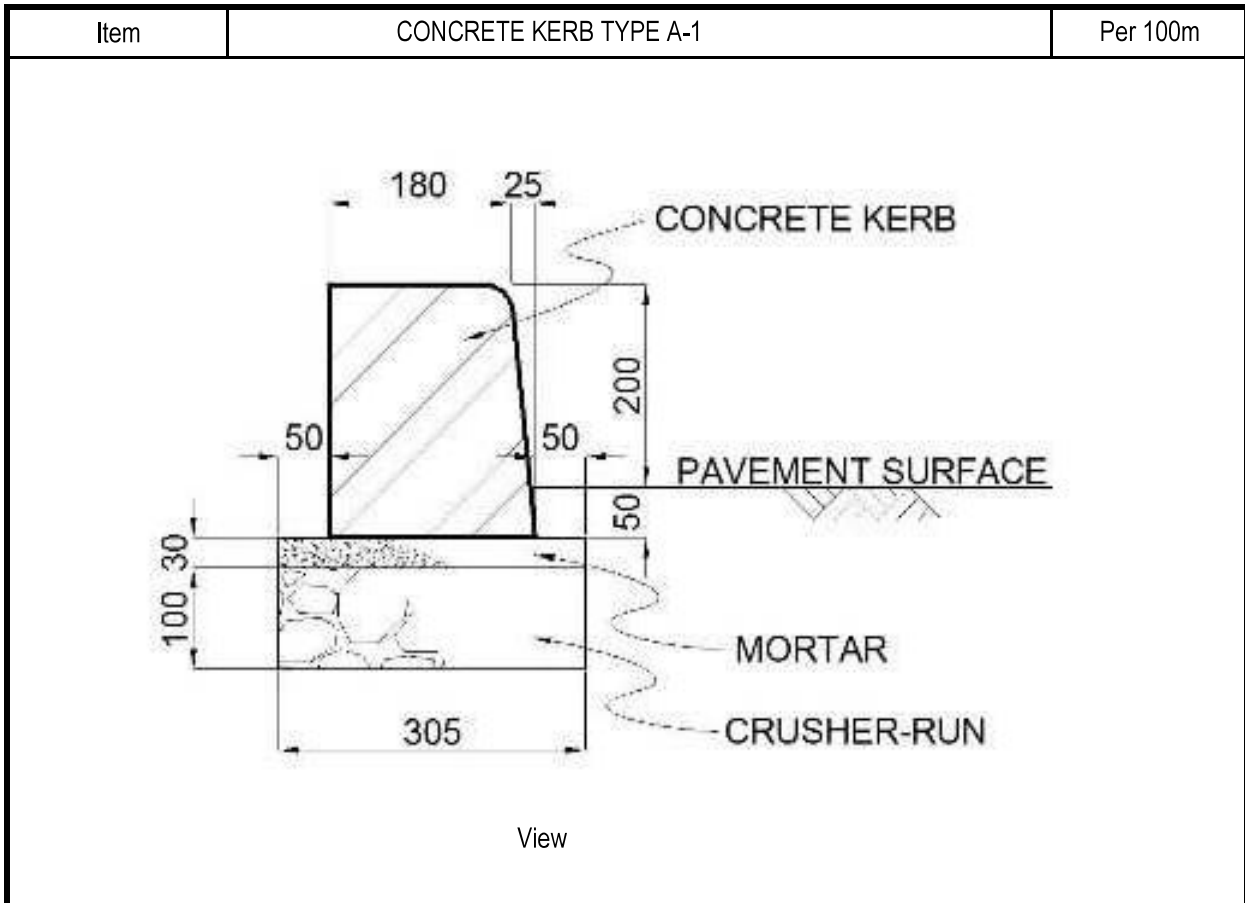


Title	Specification	Calculation Formula	Quantity
Excavation		$0.90/6 \times (2.0 \times 2.9 + 2.9 \times 2.0 + 2 \times (2.9 \times 2.9 + 2.0 \times 2.0)) \times 10 = 54.630$	= 54.60 m ³
Backfilling		$54.60 - (1.0 \times 1.0 \times 0.8 + 1.2 \times 1.1 \times 0.10) \times 10 = 45.280$	= 45.30 m ³
Surplus soil		$54.60 - 45.30 \times 1/0.9 = 4.267$	= 4.30 m ³
Body			
Concrete	18N/mm ²	$(1.00 \times 1.00 \times 1.30 - 0.60 \times 0.60 \times 1.10) \times 10 = 9.04$	
		[Deduction] $-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 0.20 \times 10 = -0.203$	
		$-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 0.20 \times 10 = -0.203$	
		$-0.07 \times 0.081 \times 0.60 \times 2 \times 10 = -0.068$	
		8.565	8.57 m ³
Reinforcing bar		=	kg
Form		$(1.00 \times 1.30 \times 4 + 0.60 \times 1.10 \times 4) \times 10 = 78.400$	78.40 m ²
Foundation	t=100	$1.10 \times 1.20 \times 10 = 13.2$	13.20 m ²
		$1.10 \times 1.20 \times 0.10 \times 10 = 1.320$	1.32 m ³
Cover			
Grating Cover	600x720	=	10 each

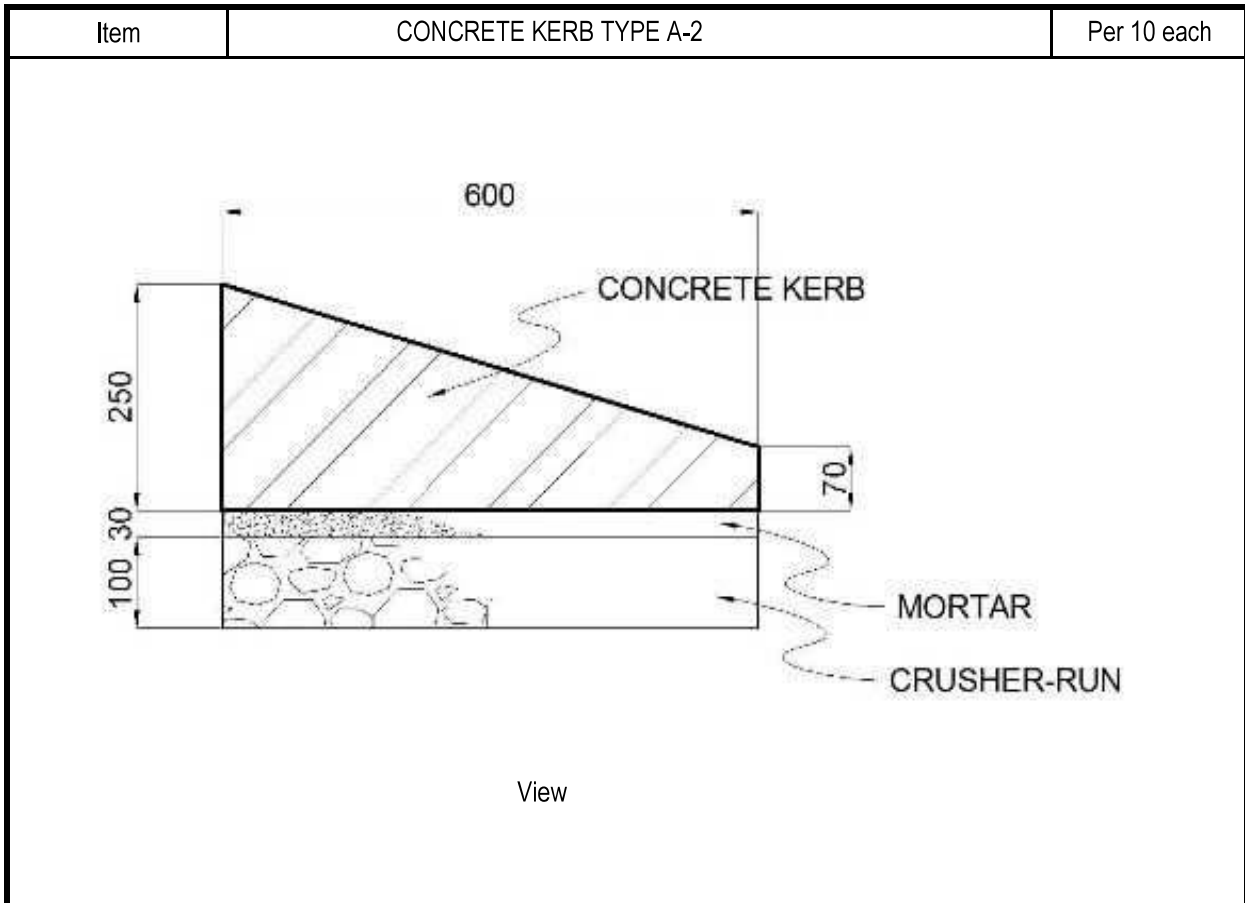


Title	Specification	Calculation Formula	Quantity
Excavation		$(0.50+0.56+0.50) \times 0.90 \times 100.0 = 140.400$	140.40 m ³
Backfilling		$140.40 - (0.56 \times 0.56 + 0.66 \times 0.10) \times 100.0 = 102.440$	102.40 m ³
Surplus soil		$140.40 - 102.40 \times 1/0.9 = 26.622$	26.60 m ³
Body			
Hume concrete pipe	ϕ 300		100.000 m
Concrete	24N/mm ²	$0.56 \times 0.56 \times 100.0 = 31.360$	
		[Deduction] $-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 100.0 = -10.174$	
		21.186	21.19 m ³
Reinforcing bar	D13	$(100.0 \times 6 + 1.350 \times 500 + 0.510 \times 500) \times 0.995 = 1522.35$	1522.35 kg
Form		$0.56 \times 2 \times 100.0 = 112.000$	112.00 m ²
Foundation	t=100	$0.66 \times 100.0 = 66.00$	66.00 m ²
		$0.66 \times 0.10 \times 100.0 = 6.6$	6.60 m ³

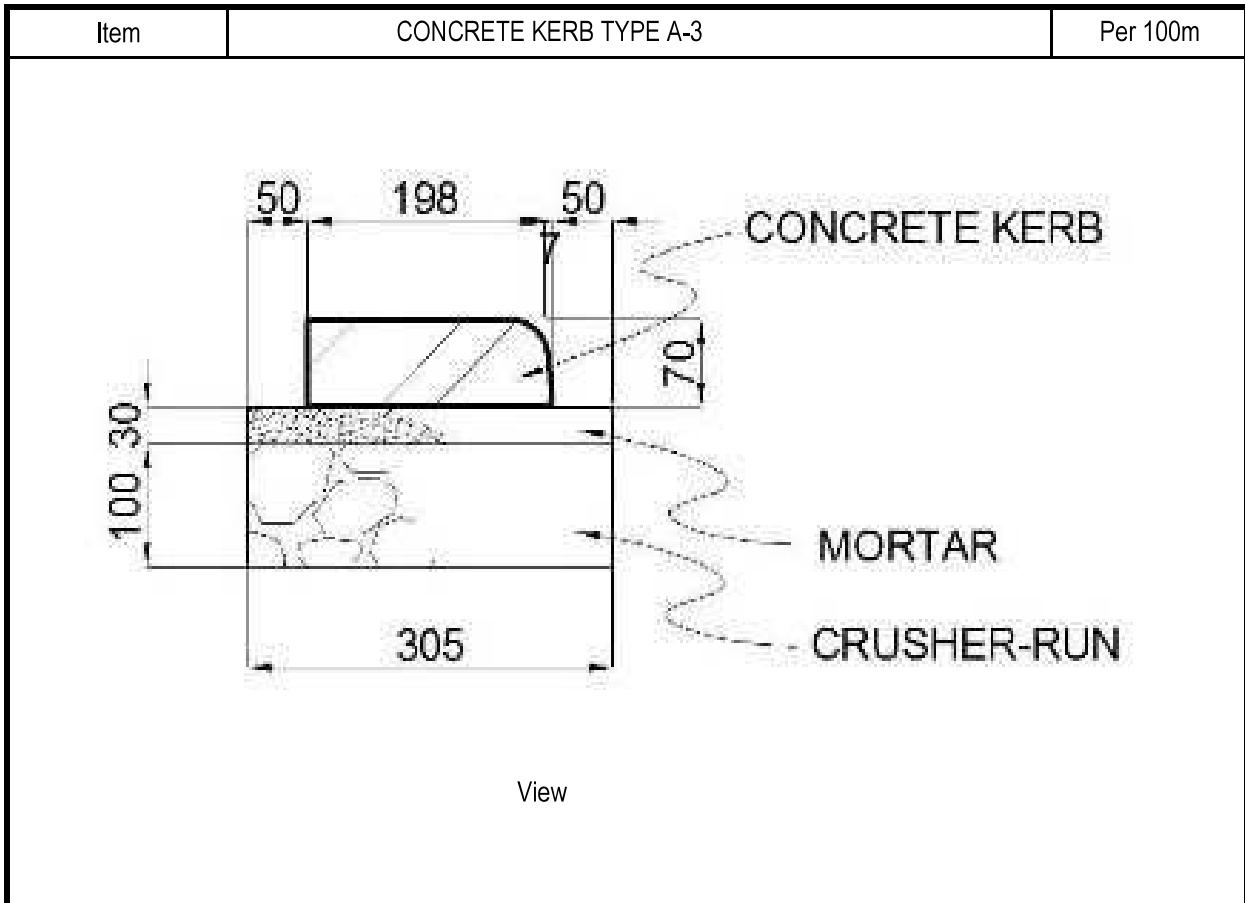
No	Item	Name	Quantity	Unit																												
		CONCRETE PIPE CULVERT ϕ 900 (CON. 360°)	10	m																												
Item	Formula			Quantity																												
R. C. pipe ϕ 0. 900	by Japanese Standard Design ϕ 0. 900 (con. 360°) Type P4-D900 L=			10.000 m																												
Concrete	$V = (1.460 \times 1.460 - 0.525^2 \times \pi) \times 10.000$			= 12.657 m ³																												
Form	$A = 1.460 \times 2 \times 10.000$			= 29.200 m ²																												
Reinforcing -ber D13	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>BAR MARK</th> <th>SIZE (mm)</th> <th>LENGTH (mm)</th> <th>NO. OF BARS</th> <th>UNIT WEIGHT (kgf/m)</th> <th>WEIGHT (kgf/NOS)</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>R1</td> <td>D16</td> <td>1,000</td> <td>280</td> <td>1.56</td> <td>437</td> <td>SD345</td> </tr> <tr> <td>R2</td> <td>D13</td> <td>3,110</td> <td>100</td> <td>0.995</td> <td>309</td> <td>SD345</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td>746 kg</td> <td></td> </tr> </tbody> </table>			BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	R1	D16	1,000	280	1.56	437	SD345	R2	D13	3,110	100	0.995	309	SD345	Total					746 kg		746 kg
BAR MARK	SIZE (mm)	LENGTH (mm)	NO. OF BARS	UNIT WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS																										
R1	D16	1,000	280	1.56	437	SD345																										
R2	D13	3,110	100	0.995	309	SD345																										
Total					746 kg																											
Foundation	$V = 1.660 \times 0.200 \times 10.000$			= 3.320 m ³																												
Leveling Con	$V = 1.660 \times 0.100 \times 10.000$			= 1.660 m ³																												
Excavation	$V = \frac{4.920 + 2.660}{2} \times (1.760 + 0.500) \times 10.000$			= 85.654 m ³																												
Backfill	$V1 = 85.654$			= 85.654 m ²																												
	$V2 = (1.460 \times 1.460) + 3.320 + 1.660$			= 7.112 m ²																												
	$V = V1 - V2$			= 78.542 m ³																												
	$= 85.654 - 7.112$			= 78.542 m ³																												



Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Concrete Kerb Type A-1			
Concrete	18N/mm2	$(0.18+0.205) \times 1/2 \times 0.250 \times 100.0$ = 4.813	4.81 m3
Form		$0.25 \times 2 \times 100.0$ = 50.000	50.00 m2
Mortar		$0.305 \times 0.03 \times 100.0$ = 0.915	0.92 m3
Foundation	t=100	0.305×100.0 = 30.500	30.50 m2
		$0.305 \times 0.10 \times 100.0$ = 3.05	3.05 m3

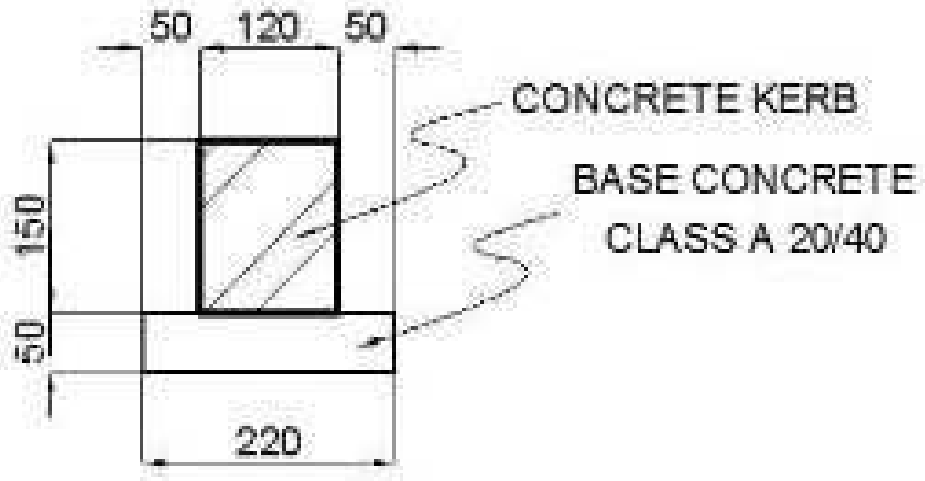


Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Concrete Kerb Type A-2			
Concrete	18N/mm2	$(0.07+0.250) \times 1/2 \times 0.60 \times 0.205 = 0.020$	0.02 m3
Form		$(0.07+0.250) \times 1/2 \times 0.60 \times 2 + 0.07 \times 0.205 + 0.250 \times 0.205 = 0.258$	0.26 m2
Mortar		$0.305 \times 0.03 \times 0.60 \times 10 = 0.055$	0.05 m3
Foundation	t=100	$0.305 \times 0.60 \times 10 = 1.830$	1.83 m2
		$0.305 \times 0.10 \times 0.60 \times 10 = 0.183$	0.18 m3



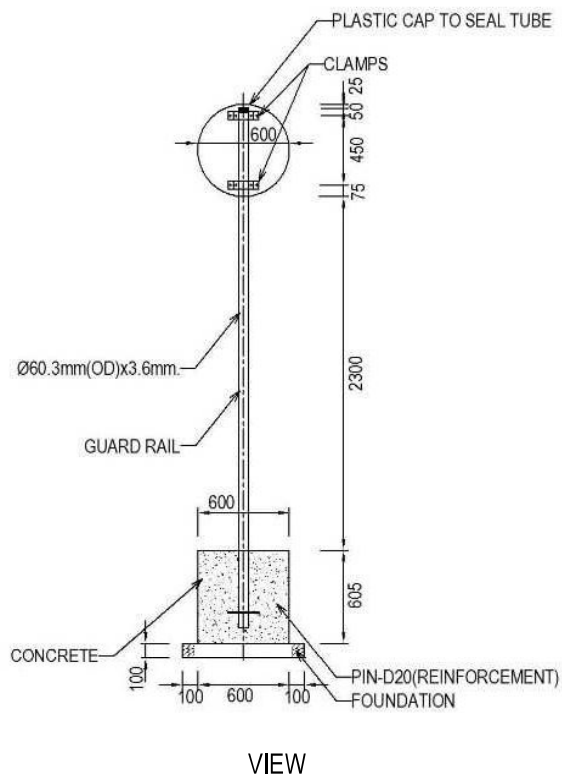
Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Concrete Kerb Type A-3			
Concrete	18N/mm2	$(0.198+0.205) \times 1/2 \times 0.070 \times 100.0 = 1.411$	1.41 m3
Form		$0.07 \times 2 \times 100.0 = 14.000$	14.00 m2
Mortar		$0.305 \times 0.03 \times 100.0 = 0.915$	0.92 m3
Foundation	t=100	$0.305 \times 100.0 = 30.500$	30.50 m2
		$0.305 \times 0.10 \times 100.0 = 3.05$	3.05 m3

Item	CONCRETE KERB TYPE C	Per 100m
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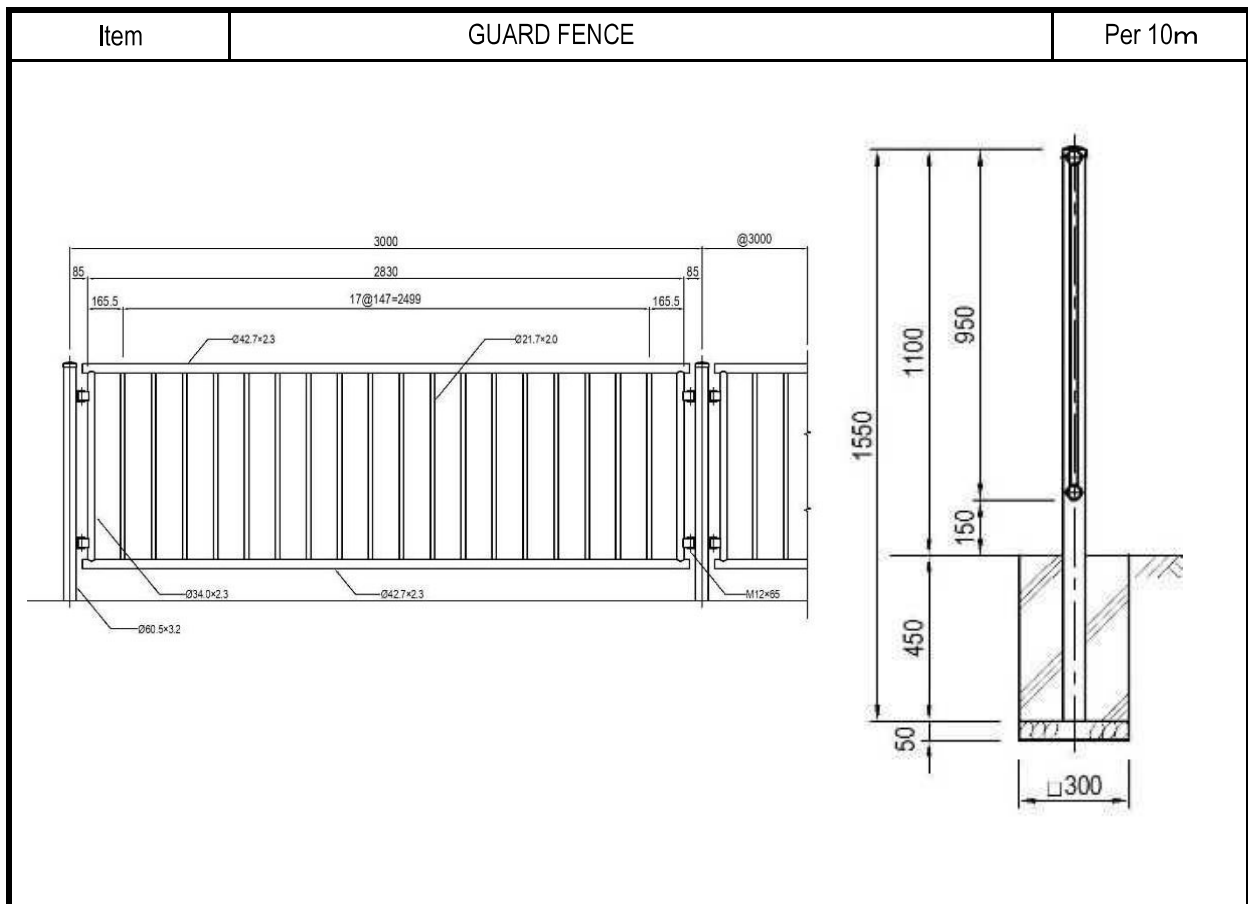


Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Concrete Kerb Type C			
Concrete	18N/mm2	$0.120 \times 0.150 \times 100.0$ = 1.800	1.80 m3
Form		$0.15 \times 100.0 \times 2$ = 30.000	30.00 m2
Level Concrete	18N/mm2, t=50	$0.22 \times 0.05 \times 100.0$ = 1.100	1.10 m3
Form		$0.05 \times 100.0 \times 2$ = 10.000	10.00 m2

Item	SIGNBOARD FOUNDATION AND POST	Per 10 each
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Title	Specification	Calculation Formula	Quantity
Excavation		$1.80 \times 1.80 \times 0.60 \times 10 = 19.440$	19.40 m ³
Backfilling		$19.40 - (0.60 \times 0.60 \times 0.60 + 0.80 \times 0.80 \times 0.10) \times 10 = 16.600$	16.60 m ³
Surplus soil		$19.40 - 16.60 \times 1/0.9 = 0.956$	1.00 m ³
Body			
Concrete	18N/mm ²	$0.60 \times 0.60 \times 0.605 \times 10 = 2.340$	
		[Deduction] $-(1/4 \times 3.14 \times 0.06 \times 0.06) \times 0.50 \times 10 = -0.014$	
		2.326	2.33 m ³
Form		$0.60 \times 0.60 \times 4 \times 10 = 14.400$	14.40 m ²
Foundation	t=100	$0.80 \times 0.80 \times 10 = 6.400$	6.40 m ²
		$0.80 \times 0.80 \times 0.10 \times 10 = 0.640$	0.64 m ³
Post			10 set
Panel			10 each



Title	Specification	Calculation Formula	Quantity	
Excavation		$1.30 \times 1.30 \times 0.50 \times 4 = 3.380$	= 3.40	m3
Backfilling		$3.40 - 0.30 \times 0.30 \times 0.50 \times 4 = 2.620$	= 2.60	m3
Surplus soil		$3.40 - 2.60 \times 1/0.9 = 0.511$	= 0.50	m3
Body				
Concrete	18N/mm2	$0.30 \times 0.30 \times 0.45 \times 4 = 0.162$	= 0.162	
		[Deduction]	= 0.162	
			0.16	m3
Form		$0.30 \times 0.45 \times 4 \times 4 = 2.160$	= 2.16	m2
Foundation	t=50	$0.30 \times 0.30 \times 4 = 0.360$	= 0.36	m2
		$0.30 \times 0.30 \times 0.05 \times 4 = 0.018$	= 0.018	m3
Post		10/3.0	= 4	4.0 each
Panel		10/3.0	= 4	4.0 set

