


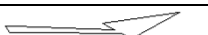



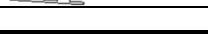





**ROAD DESIGN  
(PACKAGE 3)**

## Contents

	Page
§1 Summary of Quantity .....	1
§2 Detailed Statement .....	3
§2-1 Design Section .....	4
§2-2 Waterway Works .....	6
§2-3 Pavement .....	8
§2-4 Miscellaneous .....	10
§2-5 Removal of Existing Structures .....	13
§2-6 Road Improvement .....	16
§2-7 Retaining Wall .....	18
§3 Mechanically Stabilised Earth Wall Works Quantity Report .....	20
§4 Quantity breakdown sheet .....	99
§4-1 Earth Works .....	100
§4-2 Drainage .....	121
§4-3 Pavement .....	129
§4-4 Road .....	138
§4-5 Road Marking .....	147
§4-6 Demolition .....	163
§5 Unit of Quantity .....	168

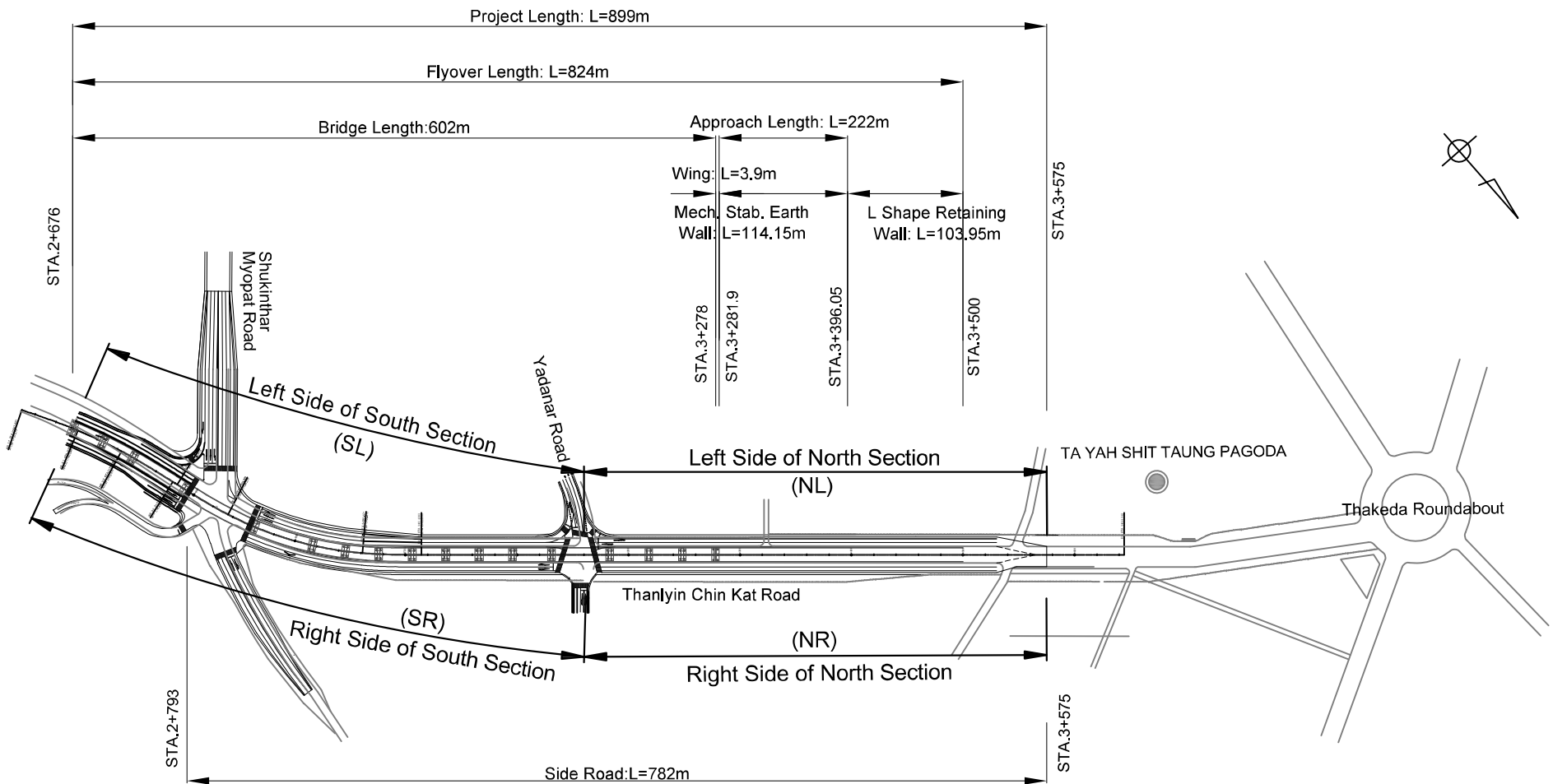
## §1. Summary of Quantity

Construction type	Classification	standard	UNIT	Quantity			Total	Remark
				Side Road	Approach Road	Fly Over		
<b>DIVISION 02 SITE WORKS</b>								
	Demolition of Existing Concrete Structure (Unreinforced concrete)		m3	218			218	
	Demolition of Existing Concrete Structure Asphalt Pavement		m3	1,068			1,068	
	Clearing and Grubbing		m2	427			427	
<b>DIVISION 03 EARTH WORKS</b>								
	ROAD EARTH WORK							
	Excavation - Type 1 (Open Cut for Road)		m3	3,604			3,604	
	Backfill for Filled-up ground		m3	34			34	
	Gravel Removal		m3	396			396	
	Excavation - Type 1 (Open Cut for Road Structure)		m3		3,893		3,893	
	Backfill		m3		6,180		6,180	
<b>DIVISION 04 WATERWAY WORKS</b>								
	SIDE DITCH TYPE U-500x850 with Cover		m	37			37	
	SIDE DITCH TYPE U-300x300		m			81	81	
	SIDE DITCH TYPE U-300x300 TYPE V		m			82	82	
	CATCH PIT 500x500x500		each			14	14	
	CATCH PIT (C-DITCH) TYPE A		each		14		14	
	CONCRETE PIPE CULVERT φ300 (CON. 360°) TYPE B		m		385		385	
<b>DIVISION 05 PAVEMENTS</b>								
	Prime Coat		m2	3,951	2,383		6,334	
	Tack Coat		m2	3,951	2,220		6,171	
	Normal A/C Surface Course, thickness 5cm		m2	3,951	2,383		6,334	
	Normal A/C Subbase Course , thickness 5cm		m2	3,951	2,220		6,171	
	Aggregate Base thickness 15cm		m2	3,051			3,051	
	Aggregate Base thickness 25cm		m2		2,220		2,220	
	Aggregate Subbase thickness 25cm		m2	3,051	2,220		5,271	
	Aggregate Subbase thickness 30cm		m2	900			900	
	Concrete Plate for Sidewalk		m2	140			140	
	Sand(Side walk)		m2	140			140	
	Aggregate Base thickness 10cm(Sidewalk)		m2	140			140	
	Concrete Seal		m2	5,015			5,015	
	Median type A		m		221		221	
	Median type B		m	448			448	
<b>DIVISION 08 MISCELLANEOUS</b>								
	CONCRETE KERB TYPE A-1		m	1,929			1,929	
	CONCRETE KERB TYPE A-2		each	4			4	
	CONCRETE KERB TYPE A-3		m	44			44	
	CONCRETE KERB TYPE C		m	62			62	
	INFORMATORY SIGN BOARD -TypeA(Arm2.5m)		each	2			2	
	INFORMATORY SIGN BOARD -TypeB(Arm1.0m)		each	4			4	
	Boundary Fence		m			744	744	
	Fence Gate		each			11	11	
	Box Beam		m		25		25	
	LANE LINE(w=100)		m	145			145	
	SIDE LINE(w=100)		m	2,970	888	2,410	6,268	
	BROKEN LINE(w=100)		m	290			290	
	STOP LINE(w=300)		m	24			24	
	CROSSWALK ARKING(w=450)		m	266			266	
	ZEBRA LINE(w=150)		m	288			288	
	ZEBRA LINE(w=450)		m	280			280	
			each	5			5	Converted value to w=10cm
			m2	6			6	1.248m2/each
			each	13			13	Ditto
			m2	21			21	1.576m2/each
			each	4			4	Ditto
			m2	6			6	1.418m2/each
			each	4			4	Ditto
			m2	4			4	0.992m2/each
			each		2	3	5	Ditto
			m2		7	11	18	3.501m2/each
			each			2	2	Ditto
			m2			9	9	4.614m2/each



## § 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													
	SIDE DITCH TYPE	(Inner Width, Inner Depth) SIDE DITCH TYPE U-500x850 with Cover SIDE DITCH TYPE U-300x300 SIDE DITCH TYPE U-300x300 TYPE V	m	m	TOTAL	<b>199.7</b>	<b>36.5</b>	<b>98.1</b>	<b>0.0</b>	<b>65.1</b>	<b>0.0</b>		
						36.5	36.5						
						80.8		66.1		14.7			
						82.4		32.0		50.5			
	CONCRETE COVER TYPE	(Inner Width, Inner Depth) CONCRETE COVER TYPE A CONCRETE COVER TYPE B	Nos	Nos	TOTAL	<b>442</b>	<b>0</b>	<b>0</b>	<b>202</b>	<b>240</b>	<b>0</b>		
						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	<b>516.5</b>	<b>79.5</b>	<b>132.0</b>	<b>239.0</b>	<b>66.0</b>	<b>0.0</b>		
						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 $\phi$ 300 (CON. 360° ) TYPE B	m	m	TOTAL	<b>384.8</b>	<b>0.0</b>	<b>0.0</b>	<b>192.4</b>	<b>192.4</b>	<b>0.0</b>		
						384.8			192.4	192.4			
CATCH PIT													
	CATCH PIT TYPE	(Inner Width, Inner Depth) CATCH PIT 500x500x500 CATCH PIT (C-DITCH) TYPE A	Nos	Nos	TOTAL	<b>28</b>	<b>0</b>	<b>9</b>	<b>8</b>	<b>11</b>	<b>0</b>		
						14			7	7			
						14		9	1	4			



## § 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	<b>6,333.6</b>	<b>1,301.6</b>	<b>737.0</b>	<b>2,470.6</b>	<b>1,824.4</b>	<b>0.0</b>		
		PAVEMENT(TYPE E3)				899.8			789.0	130.8			
		PAVEMENT(TYPE E4)				2,383.2			1,191.6	1,191.6			
		PAVEMENT(TYPE E5)				3,050.6	1,301.6	737.0	510.0	502.0			
SIDEWALK													
	SIDEWALK		m2	m2	TOTAL	<b>421.2</b>	<b>187.1</b>	<b>110.7</b>	<b>143.4</b>	<b>0.0</b>	<b>0.0</b>		
		Concrete Plate for Sidewalk				140.4	55.7	36.9	47.8				
		Sand(Side walk)				140.4	55.7	36.9	47.8				
		Aggregate Base thickness 10cm(Sidewalk)				140.4	55.7	36.9	47.8				
CONCRETE SEAL & MEDIAN			m2	m2									
	CONCRETE SEAL		m2	m2	TOTAL	<b>5,014.7</b>	<b>3,714.1</b>	<b>0.0</b>	<b>1,300.6</b>	<b>0.0</b>	<b>0.0</b>		
		Concrete Seal				5,014.7	3,714.1		1,300.6				
	MEDIAN		m	m	TOTAL	<b>668.9</b>	<b>0.0</b>	<b>0.0</b>	<b>223.9</b>	<b>223.9</b>	<b>221.1</b>		
		Median type A				221.1					221.1		
		Median type B				447.8			223.9	223.9			

§ 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	<b>2,035.0</b>	<b>531.4</b>	<b>375.0</b>	<b>576.6</b>	<b>552.0</b>	<b>0.0</b>		
		CONCRETE KERB TYPE A-1				1,928.5	472.2	338.2	566.1	552.0			
		CONCRETE KERB TYPE A-3				44.3	26.8	7.0	10.5				
		CONCRETE KERB TYPE C				62.2	32.4	29.8					
		CONCRETE KERB TYPE A-2	Nos	Nos	TOTAL	<b>4</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>		
						4	2	2					
SIGN BOARD													
	SIGN BOARD		Nos	Nos	TOTAL	<b>6</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>		
		INFORMATORY SIGN BOARD – Type A				2	1		1				
		INFORMATORY SIGN BOARD – Type B				4	1	1	1	1			
FENCE & FENCE GATE													
	FENCE		m	m	TOTAL	<b>768.5</b>	<b>249.5</b>	<b>294.3</b>	<b>92.0</b>	<b>132.7</b>	<b>0.0</b>		
		Boundary Fence				743.5	249.5	294.3	92.0	107.7			
		Box Beam				25.0				25.0			
	FENCE GATE		Nos	Nos	TOTAL	<b>11</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>		
		Fence Gate				11	8		3				

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) STOP LINE(w=300) CROSSWALK MARKING(w=450) ZEBRA LINE(w=150) ZEBRA LINE(w=450)	m	m	TOTAL	<b>7,819.9</b>	<b>2,144.2</b>	<b>1,864.1</b>	<b>1,843.9</b>	<b>1,767.7</b>	<b>0.0</b>		
						145.2	30.0	30.0	30.0	55.2			
						6,268.4	1,651.1	1,597.3	1,554.9	1,465.1			
						290.0	61.2	62.7	79.5	86.6			
						23.5	17.0	3.1	3.4				
						266.0	105.0	161.0					
						288.2	98.3		97.1	92.8			
			279.6	158.6		62.0	59.0						
		ARROW  	Nos	Nos	TOTAL	<b>26</b>	<b>10</b>	<b>4</b>	<b>8</b>	<b>4</b>	<b>0</b>		
						26	10	4	8	4			
						5	1	2	1	1			
	2				2								

§ 2 - 5 Removal of Existing Structures

Removal

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		
						0						3-6	
						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		
					Plain Concrete Structures	218.2	218.2						H: Height from construction base surface
						0.0							
						0.0							
					RC Structures	0.0							
						0.0							
						0.0							
						0.0							
	PAVEMENT DEMILOTION	[Classification and Thickness of Asphalt]	m2	m2	TOTAL	0.0	LR						
					Machine Construction	t ≤ 10cm	10,680.0	10,680.0					3-7
						10cm < t ≤ 15cm	0.0						t: Pavement plate thickness
						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						
	CONCRETE DEMILOTION & TRANSPORT	[Structure Classification & Transport distance]	m3	m3	TOTAL	0.0	Plain Concrete	RC	Flat Plate-Shaped Concrete	Curbs			
					Plain Concrete Structures	218.2	218.2						
					RC Structures	0.0		0.0					
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	0.0	0.0	0.0	0.0	0.0	0.0		
						0.0							
						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							

Removal

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total						Reference	Remarks
CURB REMOVAL													
	REMOVE PEDESTRIAN BOUNDARY BLOCKS		m	m	TOTAL	923.5	923.5	0.0	0.0	0.0	0.0		
					Median Curbs	923.5	923.5						
					Pedestrian Curbs	0.0	0.0						
	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	427.0	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							

§ 2 - 6 Road Improvement

Road Improvement

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR	NM	Refference	Remarks		
CONSOLIDATION METHOD			Nos	Nos											
	SLURRY STIRRING	cement, $\phi=1200\text{mm}$ (A=2.17m2),improve long=11.80m cement, $\phi=1200\text{mm}$ (A=2.17m2),improve long=11.30m cement, $\phi=1200\text{mm}$ (A=2.17m2),improve long=4.00m cement, $\phi=1200\text{mm}$ (A=2.17m2),improve long=3.80m	Nos	Nos	TOTAL	1149	1149	0	0	0	0				
					2-axis	399	399								
					2-axis	204	204								
					2-axis	378	378								
					2-axis	168	168								

§ 2 - 7 Retaining Wall



Retaining Wall

Work Item1	Work Item2	Work Item3	Unit	Unit	Class of Work Item	Total	SL	SR	NL	NR	NM	Refference	Remarks
RETAINING WALL	L-TYPE RETAINING WALL	$\sigma_{ck}=24N/mm^2$	m3	m3	TOTAL	<b>327.8</b>	<b>327.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>		
					LEFT	163.9	163.9					1-19	
					RIGHT	163.9	163.9						
MECHANICALLY-STABILIZED EARTH WALL													
	CONCRETE FOUNDATION	B=400mm,t=200mm	m	m	TOTAL	<b>228.3</b>	<b>228.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>		
					LEFT	114.2	114.2					1-24	
					RIGHT	114.2	114.2						
	MECHANICALLY-STABILIZED EARTH WALL	TERRE ARMEE	m2	m2	TOTAL	<b>823.4</b>	<b>823.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>		
					LEFT	411.7	411.7					1-25	CONCRETE SKIN
					RIGHT	411.7	411.7						

### § 3 Mechanically-Stabilised Earth Wall Works Quantity Report

# Contents

§ 1. Total BoQ of Mechanically-Stabilised Earth Wall Works .....	23
§ 2. MECHANICALLY-STABILISED EARTH WALL L TYPE RETAINING WALL BoQ (LEFT) .....	24
§ 3. MECHANICALLY-STABILISED EARTH WALL L TYPE RETAINING WALL BoQ (RIGHT) .....	60
§ 4. LIGHTING FOUNDATION BoQ .....	96
§ 5. SOFT SOIL IMPROVEMENT MEASURES BoQ .....	98

## § 1. Total BoQ of Mechanically-Stabilised Earth Wall Works

### Total BoQ of Mechanically-Stabilised Earth Wall Works

【BOTH SIDE】

Items	Code	Unit	Quantity			Note	
			LEFT SIDE	RIGHT SIDE	TOTAL		
Wall Area		m <sup>2</sup>	411.72	411.72	823.44		
Wall Length		m	114.150	114.150	228.30		
Wall Height		m	5.230	5.230	10.46		
Total Strip Length		m	3,850.000	3,850.000	7,700.00		
Concrete Coping	Concrete	$\sigma_{ck}=24\text{N/mm}^2$	m <sup>3</sup>	24.08	24.08	48.16	
	Form		m <sup>2</sup>	158.61	158.61	317.22	
	Steel bar	SD345	kg	1,524.3	1,524.3	3,049	
	Joint filler	t=10mm	m <sup>2</sup>	8.23	8.23	16.46	
	Scaffolding	Bracket type	m	114.11	114.11	228.22	Bracket type
Concrete foundation	Concrete	$\sigma_{ck}=18\text{N/mm}^2$	m <sup>3</sup>	9.13	9.13	18.26	
	Form		m <sup>2</sup>	45.66	45.66	91.32	
	Steel bar	D13, SD345	kg	60.6	60.6	121	
Concrete Barrier	Concrete	$\sigma_{ck}=24\text{N/mm}^2$	m <sup>3</sup>	146.86	146.86	293.72	
	Form		m <sup>2</sup>	493.82	493.82	987.64	
	Leveling Concrete	$\sigma_{ck}=18\text{N/mm}^2$	m <sup>3</sup>	14.26	14.26	28.52	
	Form		m <sup>2</sup>	11.54	11.54	23.08	
	Gravel		m <sup>3</sup>	94.14	94.14	188.28	
	Steel bar	SD345	kg	8,603.9	8,603.9	17,208	
	Joint filler	t=10mm	m <sup>2</sup>	12.87	12.87	25.74	
		t=20mm	m <sup>2</sup>	2.57	2.57	5.14	
	Rubber Plate	t=10mm	m <sup>2</sup>	34.23	34.23	68.46	Size:10×300×600 Pices - 191
Styrene Foam	b=50mm	m <sup>3</sup>	2.85	2.85	5.70	Size:50×500×1000 Pices - 114	
Soil work	Excavation		m <sup>3</sup>	1,125.5	1,138.4	2,263.9	soil
	Backfill		m <sup>3</sup>	2,315.2	2,315.2	4,630.4	Reinforced/E
	Backfill		m <sup>3</sup>	41.2	41.2	82.4	
	Surplus		m <sup>3</sup>	1,202.6	1,222.0	2,424.6	Sat change rate 0.9
	Subgrade		m <sup>3</sup>	342.5	342.5	685.0	
	Rear Filter	Gravel	m <sup>3</sup>	334.1	334.1	668.2	
Drainage	Gravel	C-40	m <sup>3</sup>	383.5	383.5	767.0	
	Geotextile	t=2.0mm	m <sup>2</sup>	456.60	456.60	913.20	
Joint filler	t=20mm	m <sup>2</sup>	0.67	0.67	1.34		

### Total BoQ of L type retaining wall

Items	Code	Unit	Quantity			Note	
			LEFT SIDE	RIGHT SIDE	TOTAL		
L type retaining wall	Concrete	WALL	m <sup>3</sup>	163.89	163.89	327.77	
		HANDRAIL	m <sup>3</sup>	32.47	28.71	61.18	
	Form		m <sup>2</sup>	634.58	634.01	1,268.59	
	Steel bar (WALL)	SD345, overD16	kg	1,225.0	1,225.00	2,450	
		SD345, D13	kg	6,627.0	6,627.0	13,254	
	Steel bar (HANDRAIL)	SD345, D10	kg	3,078.0	2,418.0	5,496	
	Scaffolding		m <sup>2</sup>	303.71	303.71	607.42	Usual frame type
	Base concrete		m <sup>3</sup>	23.01	23.01	46.02	
	Form		m <sup>2</sup>	23.49	23.49	46.98	
Joint filler	t=20mm	m <sup>2</sup>	19.29	18.72	38.01		
Soil work	Excavation		m <sup>3</sup>	817.8	810.8	1,628.6	soil
	Backfill		m <sup>3</sup>	301.1	301.1	602.2	L type retaining/W
	Backfill		m <sup>3</sup>	66.2	66.2	132.4	
	Surplus		m <sup>3</sup>	849.7	838.6	1,688.2	Sat change rate 0.9
	Subgrade		m <sup>3</sup>	539.3	539.3	1,078.6	

§ 2. MECHANICALLY-STABILISED EARTH WALL L TYPE RETAINING WALL BoQ (LEFT)

Total BoQ of Mechanically-Stabilised Earth Wall Works

【LEFT SIDE】

Items		Code	Unit	Quantity	Note
Wall Area			m2	411.72	
Wall Length			m	114.150	
Wall Height			m	5.230	
Total Strip Length			m	3,850.000	
Concrete Coping	Concrete	$\sigma$ ck=24N/mm2	m3	24.08	
	Form		m2	158.61	
	Steel bar	SD345	kg	1,524.3	
	Joint filler	t=10mm	m2	8.23	
	Scaffolding	Bracket type	m	114.11	Bracket type
Concrete foundation	Concrete	$\sigma$ ck=18N/mm2	m3	9.13	
	Form		m2	45.66	
	Steel bar	D13, SD345	kg	60.6	
Concrete Barrier	Concrete	$\sigma$ ck=24N/mm2	m3	146.86	
	Form		m2	493.82	
	Leveling Concrete	$\sigma$ ck=18N/mm2	m3	14.26	
	Form		m2	11.54	
	Gravel		m3	94.14	
	Steel bar	SD345	kg	8,603.9	
	Joint filler	t=10mm	m2	12.87	
		t=20mm	m2	2.57	
	Rubber Plate	t=10mm	m2	34.23	Size:10×300×600 Pices - 191
	Styrene Foam	b=50mm	m3	2.85	Size:50×500×1000 Pices - 114
Soil work	Excavation		m3	1,125.5	soil
	Backfill		m3	2,315.2	Reinforced/E
	Backfill		m3	41.2	
	Surplus		m3	1,202.6	Sat change rate 0.9
	Subgrade		m3	342.5	
	Rear Filter	Gravel	m3	334.1	
Drainage	Gravel	C-40	m3	383.5	
	Geotextile	t=2.0mm	m2	456.60	
Joint filler		t=20mm	m2	0.67	

Total BoQ of L type retaining wall

Items		Code	Unit	Quantity	Note
L type retaining wall	Concrete	WALL	m3	163.89	
		HANDRAIL	m3	32.47	
	Form		m2	634.58	
	Steel bar (WALL)	SD345, overD16	kg	1,225.0	
		SD345, D13	kg	6,627.0	
	Steel bar (HANDRAIL)	SD345, D10	kg	3,078.0	
	Scaffolding		m2	303.71	Usual frame type
	Base concrete		m3	23.01	
	Form		m2	23.49	
Joint filler	t=20mm	m2	19.29		
Soil work	Excavation		m3	817.8	soil
	Backfill		m3	301.1	L type retaining/W
	Backfill		m3	66.2	
	Surplus		m3	849.7	Sat change rate 0.9
	Subgrade		m3	539.3	

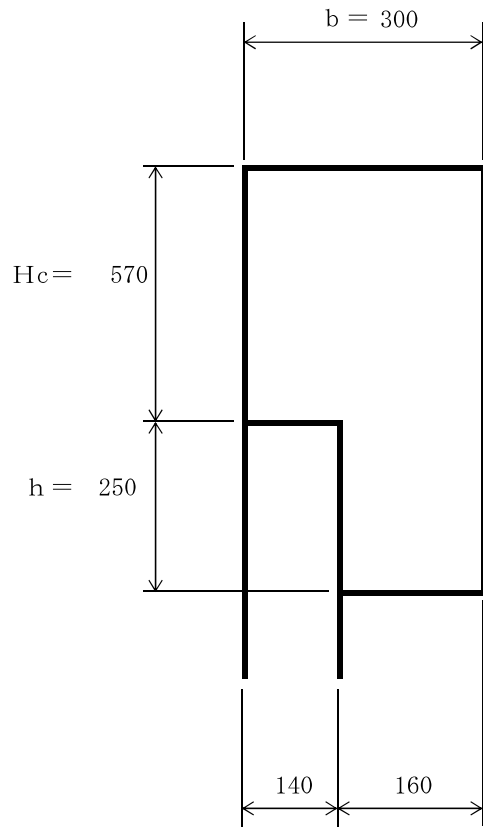
The Mechanically-Stabilised Earth wall materials

【LEFT SIDE】

(t=140)

ITEM	Mark	Shape and size	Unit	Quantity	Note
Concrete Skin	A 4	$1.50 \times 1.50 = 2.2500$ m <sup>2</sup>	Pieces	94	
	AL 4	$1.35 \times 1.50 = 2.0250$ "	"	8	
	AR 4	$1.35 \times 1.50 = 2.0250$ "	"	8	
	BP 4	$1.50 \times 1.48 = 2.2200$ "	"	35	Steel Bar b=300
	BLP 4	$1.35 \times 1.48 = 1.9980$ "	"	1	Steel Bar b=300
	BRP 4	$1.35 \times 1.48 = 1.9980$ "	"	1	Steel Bar b=300
	C 2	$1.50 \times 0.75 = 1.1250$ "	"	33	
	CL 2	$1.35 \times 0.75 = 1.0125$ "	"	3	
	CR 2	$1.35 \times 0.75 = 1.0125$ "	"	3	
	DP 2	$1.50 \times 0.73 = 1.0950$ "	"	32	Steel Bar b=300
	DLP 2	$1.35 \times 0.73 = 0.9855$ "	"	4	Steel Bar b=300
	DRP 2	$1.35 \times 0.73 = 0.9855$ "	"	4	Steel Bar b=300
Ribbed strip	PL (SS400)	$80 \times 4.0 \times 6,500$	Pieces	20	
		" 6,000	"	244	
		" 5,000	"	328	
		" 4,000	"	154	
	Total			m	3,850.00
Bolt/Nut		M12 × 40	Pieces	746	
Bearing Pad		85 × 20 × 600	Pieces	298	
Filter Cloth		420 × 4	m	293.9	
Edge Angle	L	$125 \times 210 \times 3.2 \times 1500$	Pieces	3	$\theta = 90^\circ$
	L	$125 \times 210 \times 3.2 \times 750$	"	1	$\theta = 90^\circ$
Concrete Anchor Bolt		M12 × 90	Pieces	8	
Backing Plate		GALVANIZED STEEL PLATE (100×1.6×750)	Pieces	18	
Nominal wall area				411.72 m <sup>2</sup>	
Wall High :				5.230 m	
Wall Length :				114.150 m	

## Concrete Coping



Coping Length		114.110 m	
Joint filler	Type	Quantity	Height (Hc)
	t = 10	39 Set	0.570 m
Form	No End Formwork		
Steel bar	1.0m <sup>3</sup> Weight Of Re-Bar 63.3 kg		

• Concrete  $( 0.570 \times 0.300 + 0.250 \times 0.160 ) \times 114.110 = 24.08 \text{ m}^3$

• Form  $( 0.570 \times 2 + 0.250 ) \times 114.110 = 158.61 \text{ m}^2$

• Steel bar  $( 63.3 \text{ kg/m}^3 ) \times 24.08 \text{ m}^3 = 1,524.3 \text{ kg}$

• Joint filler **【 t = 10mm 】**  $( 0.570 \times 0.300 + 0.250 \times 0.160 ) \times 39 = 8.23 \text{ m}^2$  Set

• Scaffolding Bracket type  $= 114.11 \text{ m}$

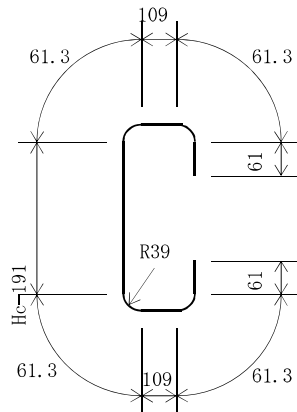
## Weight Of Reinforcement (per 3m) b= 300

Code	Diameter	Length (m)	Number	Unit Weight (kg)	Weight/Bar (kg)	Weight (kg)	Remarks
①	D13	0.965	11	0.995	0.96	10.6	
②	D13	0.857	11	0.995	0.85	9.4	
③	D13	2.850	7	0.995	2.84	19.9	
Total						39.9	

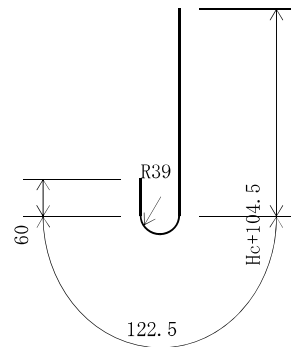
Coping Height	Hc=	0.570 m	Width b1=	0.300 m
Concrete Volume/3m	V=	0.63 m <sup>3</sup>	Cover t1=	0.250 m
Re-Bar Volume/3m	W=	39.9 kg	Width b2=	0.160 m
Re-Bar Volume/m <sup>3</sup>	W/V=	63.3 kg	Thick t2=	0.140 m

### Bar Scheduling

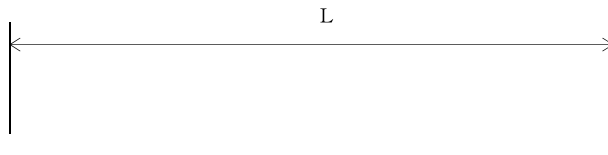
① D13— 965



② D13— 857



③ D13— 2850





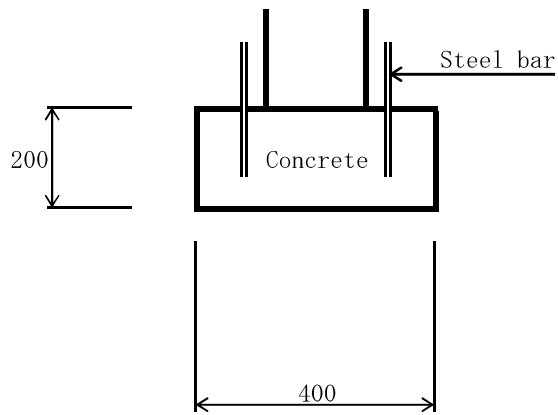
Coping average height (Weighted average height)

( n )	(H 1)	(H 2)	(L)	(A)
A 1	= 1 / 2 × ( 0.662 + 0.221 )	×	14.730	= 6.503 m <sup>2</sup>
A 2	= 1 / 2 × ( 0.971 + 0.870 )	×	3.350	= 3.084 m <sup>2</sup>
A 3	= 1 / 2 × ( 0.870 + 0.270 )	×	20.000	= 11.400 m <sup>2</sup>
A 4	= 1 / 2 × ( 0.270 + 0.214 )	×	1.870	= 0.453 m <sup>2</sup>
A 5	= 1 / 2 × ( 0.964 + 0.420 )	×	18.130	= 12.546 m <sup>2</sup>
A 6	= 1 / 2 × ( 0.420 + 0.207 )	×	7.090	= 2.223 m <sup>2</sup>
A 7	= 1 / 2 × ( 0.957 + 0.570 )	×	12.910	= 9.857 m <sup>2</sup>
A 8	= 1 / 2 × ( 0.570 + 0.201 )	×	12.310	= 4.746 m <sup>2</sup>
A 9	= 1 / 2 × ( 0.951 + 0.720 )	×	7.690	= 6.425 m <sup>2</sup>
A 10	= 1 / 2 × ( 0.720 + 0.253 )	×	16.030	= 7.799 m <sup>2</sup>
Total			114.110 m	65.036 m <sup>2</sup>

• Weighted average height

$$H_c = \Sigma A / \Sigma L = \underline{\underline{0.570 \text{ m}}}$$

### Concrete Foundation (400×200)



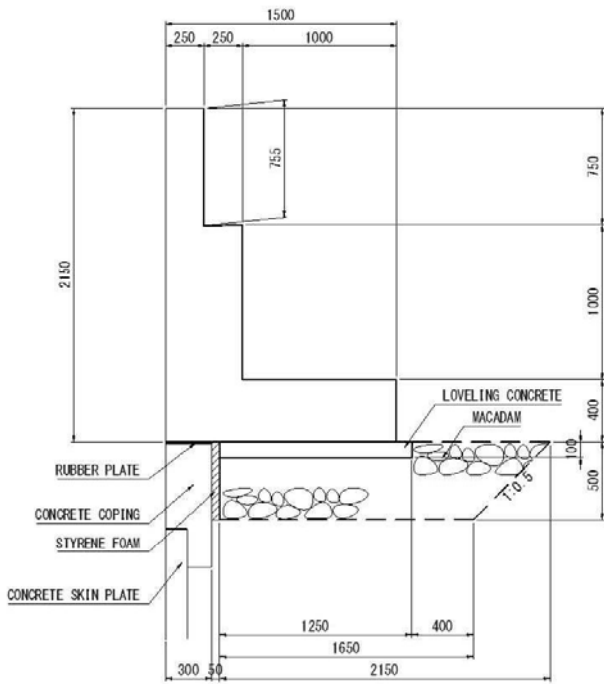
Foundation Length Length Of Concrete	L= 114.150 m
No End Formwork	
Interval of bar (2-D13×200)	0.750 m

Concrete                      0.200    ×    0.400    ×    114.150    =    9.13    m<sup>3</sup>

Form                            0.200    ×    114.150    ×                      2 Place =    45.66 m<sup>2</sup>

Steel bar                      114.150    /    0.750    ×    0.398    =    60.6    kg

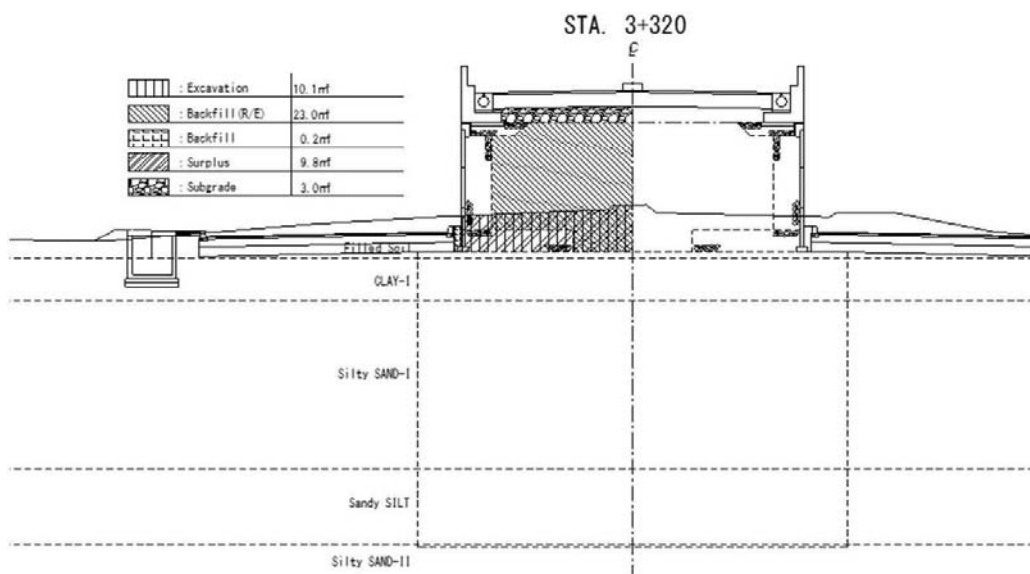
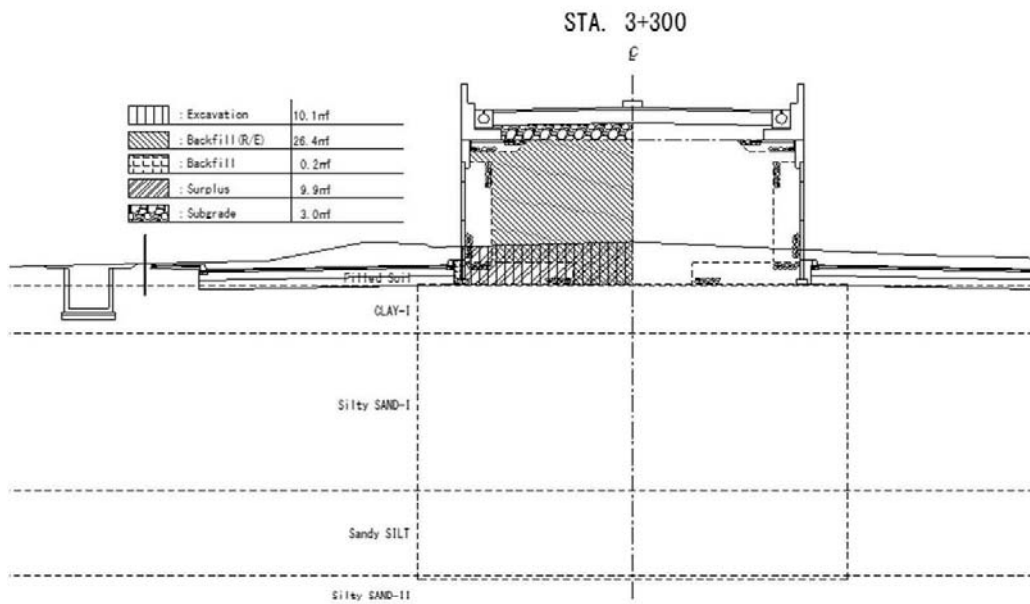
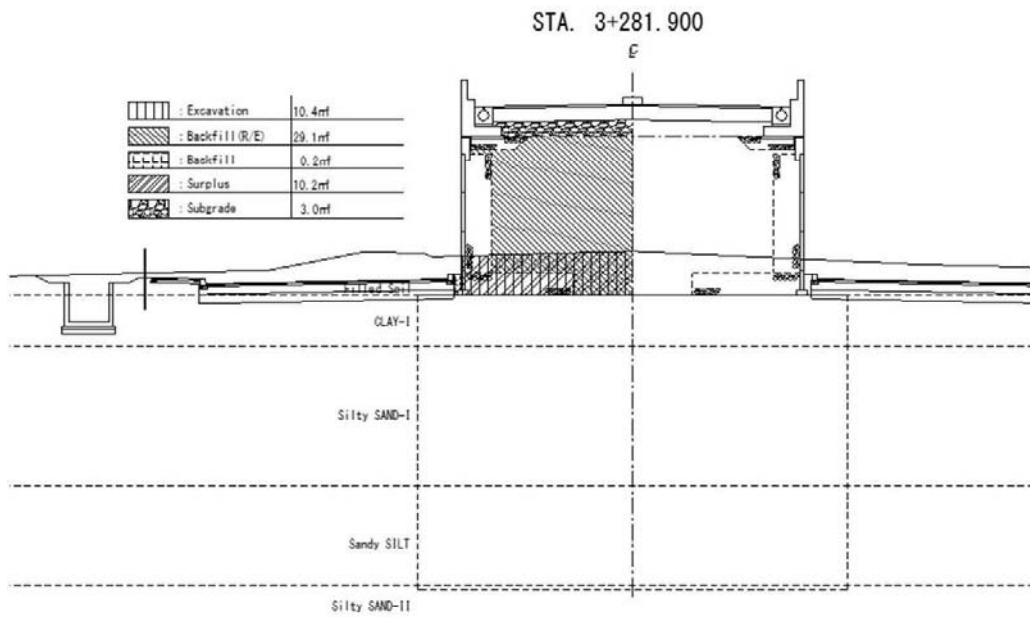
## Concrete Barrier



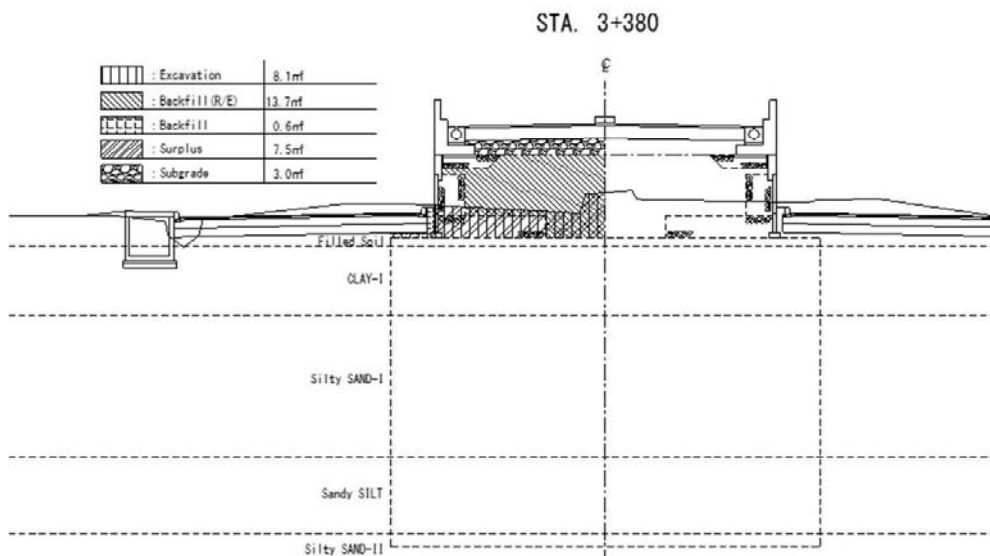
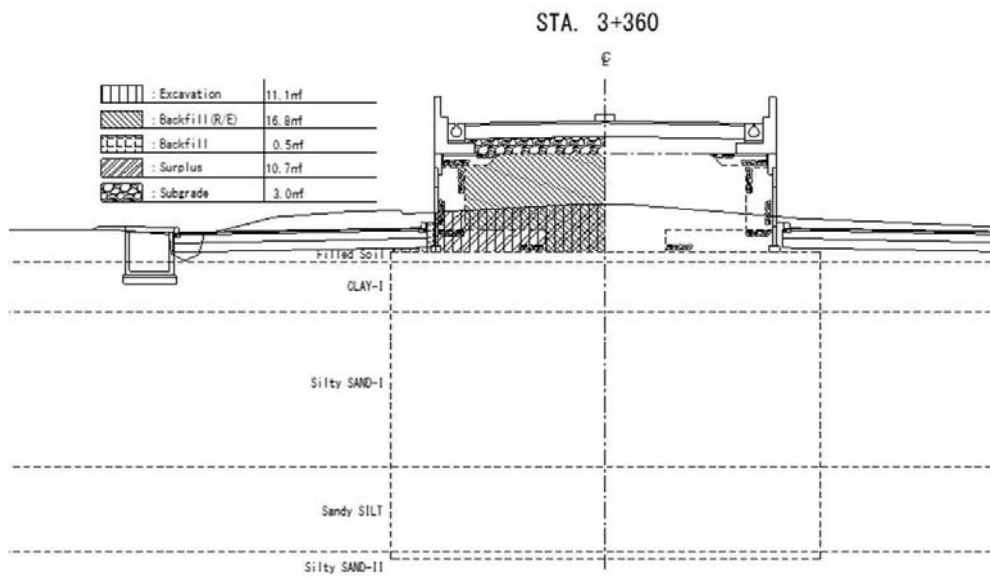
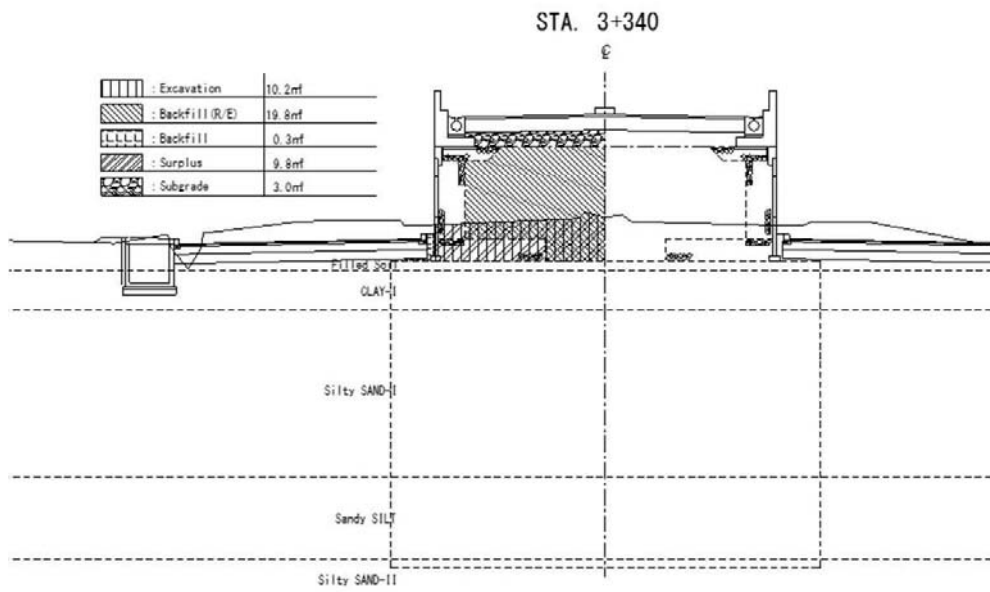
Longitudinal	L =	114.110	m
Bar weight	W =	75.4	kg/m
Concrete Area	A =	1.287	m <sup>2</sup>

• Concrete	=	1.287 × 114.110	=	146.86	m <sup>3</sup>	
• Form	=	( 2.150 + 0.755 + 1.000 + 0.400 ) × 114.110	+ 1.287 × 2 Place	=	493.82	m <sup>2</sup>
• Leveling concrete	=	( 1.250 × 0.100 ) × 114.110	=	14.264	m <sup>3</sup>	
" foam	=	( 0.100 × 114.110 ) × 1 Place	+ ( 1.250 × 0.100 ) × 1 Place	=	11.536	m <sup>2</sup>
• Gravel	=	( 1/2 × ( 1.650 + 2.150 ) × 0.500 ) × 114.110	- ( 1.250 × 0.100 × 114.110 )	=	94.141	m <sup>3</sup>
• Steel bar	=	75.4 × 114.110	=	8,603.894	kg	
• Joint filler (t=10mm)	=	1.287 × 10 Place	=	12.870	m <sup>2</sup>	
• Joint filler (t=20mm)	=	1.287 × 2 Place	=	2.574	m <sup>2</sup>	
• Rubber plate (t=10mm)	=	0.300 × 114.110	=	34.233	m <sup>2</sup>	
• Styrene Foam (b=50mm)	=	0.500 × 114.110 × 0.050	=	2.853	m <sup>2</sup>	

# Soil work(Mechanically-Stabilised Earth Wall)①



## Soil work(Mechanically-Stabilised Earth Wall)②



## Soil work (Excavation)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		10.4			
STA. 3+300	18.100	10.1	10.25	185.5	
STA. 3+320	20.000	10.1	10.10	202.0	
STA. 3+340	20.000	10.2	10.15	203.0	
STA. 3+360	20.000	11.1	10.65	213.0	
STA. 3+380	20.000	8.1	9.60	192.0	
STA. 3+396.050	16.050	8.1	8.10	130.0	apply STA. 3+380
Total				1,125.5 m <sup>3</sup>	

## Soil work (Backfill • Reinforced/E)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		29.1			
STA. 3+300	18.100	26.4	27.75	502.3	
STA. 3+320	20.000	23.0	24.70	494.0	
STA. 3+340	20.000	19.8	21.40	428.0	
STA. 3+360	20.000	16.8	18.30	366.0	
STA. 3+380	20.000	13.7	15.25	305.0	
STA. 3+396.050	16.050	13.7	13.70	219.9	apply STA. 3+380
Total				2,315.2 m3	

## Soil work (Backfill)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		0.2			
STA. 3+300	18.100	0.2	0.20	3.6	
STA. 3+320	20.000	0.2	0.20	4.0	
STA. 3+340	20.000	0.3	0.25	5.0	
STA. 3+360	20.000	0.5	0.40	8.0	
STA. 3+380	20.000	0.6	0.55	11.0	
STA. 3+396.050	16.050	0.6	0.60	9.6	apply STA. 3+380
Total				41.2 m3	



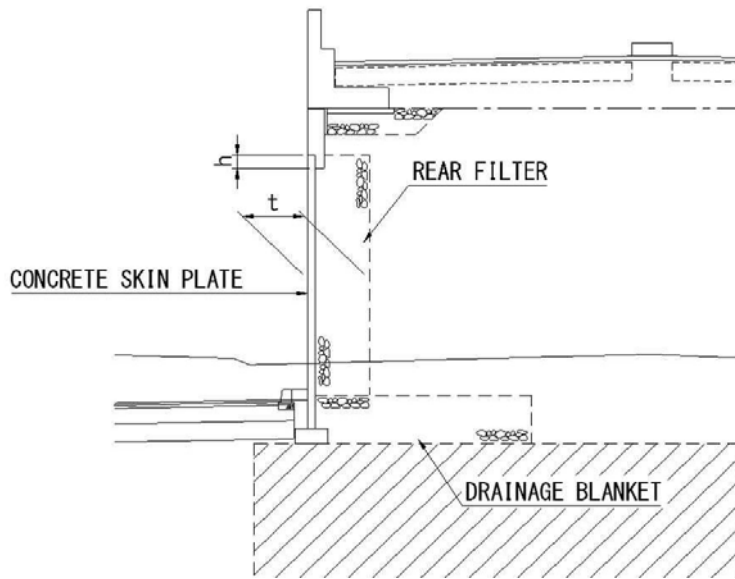
Soil work (Surplus Sat change rate 0.9)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		10.2			
STA. 3+300	18.100	9.9	10.05	181.9	
STA. 3+320	20.000	9.8	9.85	197.0	
STA. 3+340	20.000	9.8	9.80	196.0	
STA. 3+360	20.000	10.7	10.25	205.0	
STA. 3+380	20.000	7.5	9.10	182.0	
STA. 3+396.050	16.050	7.5	7.50	120.4	apply STA. 3+380
Total				1,082.3 m3	
				1,202.6 m3	
				(Surplus Sat change rate 0.9)	

## Soil work (Subgrade)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		3.0			
STA. 3+300	18.100	3.0	3.00	54.3	
STA. 3+320	20.000	3.0	3.00	60.0	
STA. 3+340	20.000	3.0	3.00	60.0	
STA. 3+360	20.000	3.0	3.00	60.0	
STA. 3+380	20.000	3.0	3.00	60.0	
STA. 3+396.050	16.050	3.0	3.00	48.2	apply STA. 3+380
Total				342.5 m3	

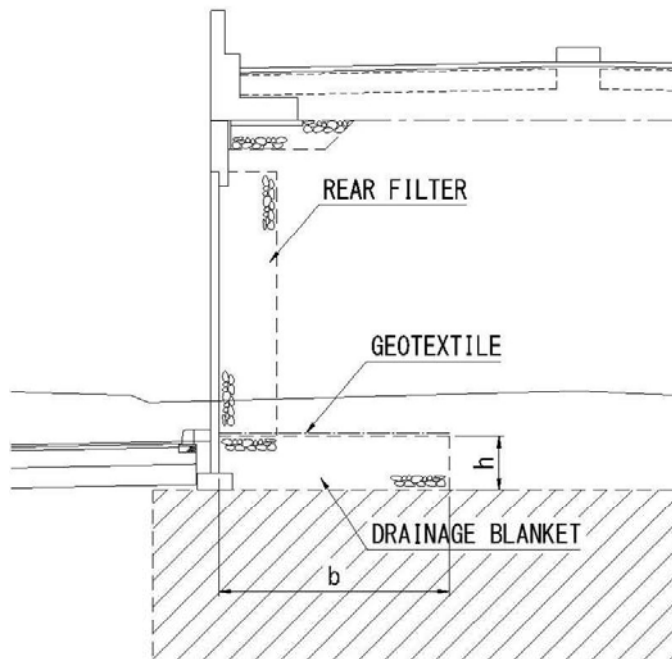
## Soil work (Rear Filter)



- Reinforced Earth wall area  $A = 411.72 \text{ m}^2$
- Reinforced Earth wall length  $L = 114.150 \text{ m}$
- Thick of rear filter  $t = 1.000 \text{ m}$
- Thick of skin  $= 0.140 \text{ m}$
- Coping width  $= 0.300 \text{ m}$
- Exemption of coping height  $h = 0.250 \text{ m}$
- Drainage height  $= 0.640 \text{ m}$

$$\begin{aligned}
 \text{Rear Filter } V &= 411.72 \times 1.000 \\
 &\quad - ((0.300 - 0.140) \times 0.250 + 0.640 \times 1.000) \times 114.150 \\
 &= 334.098 \qquad \qquad \qquad = 334.1 \text{ m}^3
 \end{aligned}$$

# Drainage

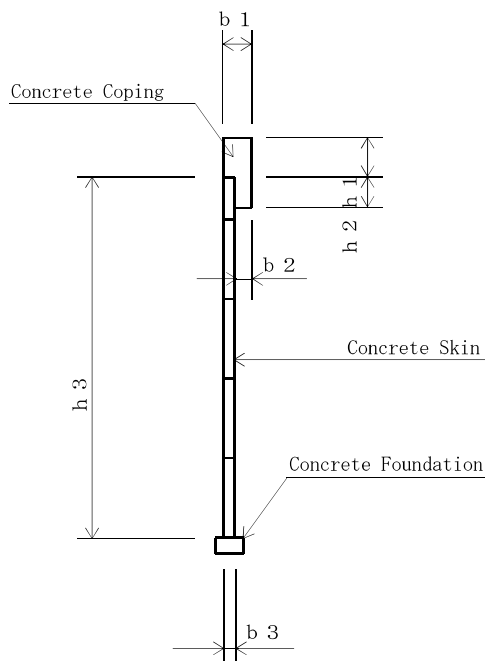


Bottom step Strip Length	Width	Thickness	Length	Volume	Area
b	b	h	L1	V	A
4.000	4.000	0.840	114.150	383.544	456.600
Total			114.150	383.54	456.60
average		0.84			

Drainage Blanket  $V = b \times h \times L1 = 383.5 \text{ m}^3$

Geotextile  $A = b \times L1 = 456.60 \text{ m}^2$

## Joint filler(Both Ends)



(Left)

Coping width	b 1 =	0.300 m
Coping Rear Width	b 2 =	0.160 m
Coping Height	h 1 =	0.662 m
Exemption of coping	h 2 =	0.250 m

Thick of skin	b 3 =	0.140 m
---------------	-------	---------

(Right)

Coping width	b 1 =	0.300 m
Coping Rear Width	b 2 =	0.160 m
Coping Height	h 1 =	0.253 m
Exemption of coping	h 2 =	0.250 m

Thick of skin	b 3 =	0.140 m
Concrete Skin Height	h 3 =	2.230 m

(Left)

Concrete Coping

$$\begin{aligned}
 A1 &= 0.662 \times 0.300 + 0.250 \times 0.160 \\
 &= 0.239 \qquad \qquad \qquad = 0.24 \text{ m}^2
 \end{aligned}$$

(Right)

Concrete Coping

$$\begin{aligned}
 A2 &= 0.253 \times 0.300 + 0.250 \times 0.160 \\
 &= 0.116 \qquad \qquad \qquad = 0.12 \text{ m}^2
 \end{aligned}$$

Concrete Skin

$$\begin{aligned}
 a2 &= 2.230 \times 0.140 \\
 &= 0.312 \qquad \qquad \qquad = 0.31 \text{ m}^2
 \end{aligned}$$

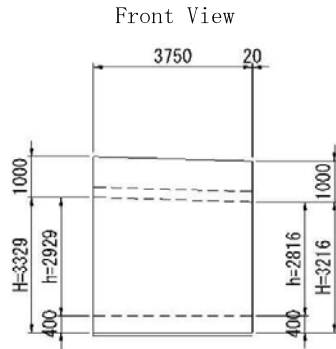
$$A1 + A2 + a2 = 0.67 \text{ m}^2$$

Total BoQ of L type retaining wall

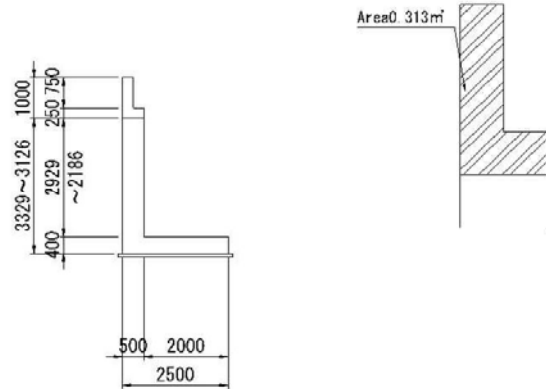
Items	Unit	Block1	Block2	Block3	Block4	Block5	Block6	Block7	Block8	Block9	Block10	Block11	Total
Concrete (WALL)	m3	9.14	23.33	21.83	20.32	16.82	15.37	13.94	12.72	10.75	10.06	9.64	163.89
Concrete (HANDRAIL)	m3	1.17	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	32.47
Form	m2	37.55	83.87	77.72	71.55	65.20	59.26	53.37	48.40	48.34	45.52	43.80	634.58
Steel bar (WALL overD16)	kg	152.0	377.0	358.0	338.0	-	-	-	-	-	-	-	1,225.0
Steel bar (WALL D13)	kg	297.0	783.0	720.0	687.0	752.0	697.0	654.0	605.0	500.0	469.0	463.0	6,627.0
Steel bar (HANDRAIL D10)	kg	108.0	297.0	297.0	297.0	297.0	297.0	297.0	297.0	297.0	297.0	297.0	3,078.0
Scaffolding	m2	30.55	77.30	71.30	65.28	59.28	-	-	-	-	-	-	303.71
Base concrete	m3	1.01	2.70	2.70	2.70	2.20	2.20	2.20	2.20	1.70	1.70	1.70	23.01
Form	m2	1.29	2.27	2.27	2.27	2.22	2.22	2.22	2.22	2.17	2.17	2.17	23.49
Joint filler	m2	2.72	2.57	2.42	2.07	1.92	1.78	1.63	1.54	1.34	1.30	-	19.29

# L Type Retaining Wall BoQ

## Block1

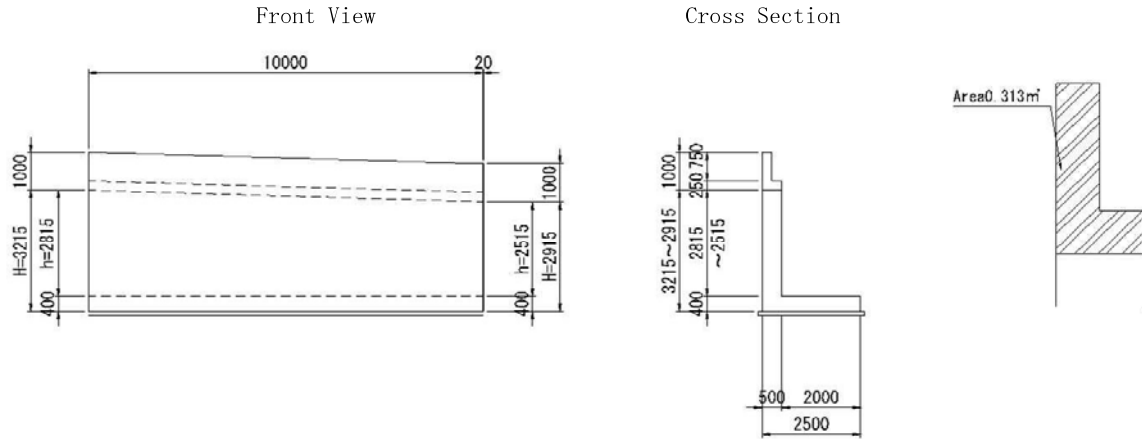


Cross Section



• Concrete (WALL)	=	( 0.500 × 3.273 + 0.400 × 2.000 ) × 3.750	=	9.14 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 3.750	=	1.17 m <sup>3</sup>
• Form	=	( 3.273 + 1.000 ) × 2Place × 3.750 + ( 0.500 × 3.329 + 0.400 × 2.000 ) + ( 0.500 × 3.216 + 0.400 × 2.000 ) + 0.313 × 2Place	=	37.546 m <sup>2</sup>
• Steel bar (WALL overD16)	=	152.0	=	152.0 kg
• Steel bar (WALL D13)	=	297.0	=	297.0 kg
• Steel bar (HANDRAIL D10)	=	108.0	=	108.0 kg
• Scaffolding	=	( 3.273 + 2.873 + 1.000 + 1.000 ) × 3.750	=	30.548 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 3.750	=	1.013 m <sup>3</sup>
• " Form	=	0.100 × 3.750 × 2Place + 0.100 × 2.700 × 2Place	=	1.290 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 3.216 + 0.400 × 2.000 ) + 0.313	=	2.721 m <sup>2</sup>

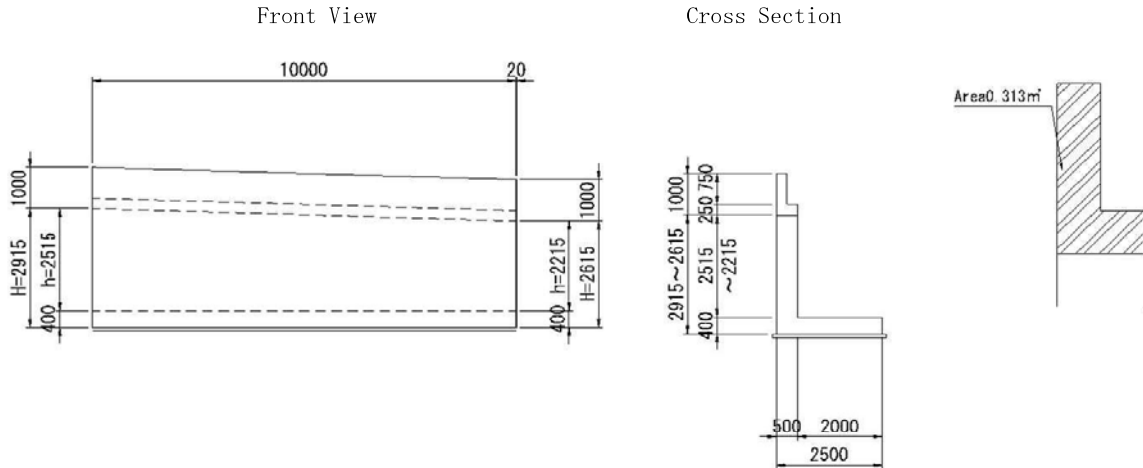
L Type Retaining Wall BoQ  
Block2



• Concrete (WALL)	=	( 0.500 × 3.065 + 0.400 × 2.000 ) × 10.000	=	23.33 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 3.065 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.915 + 0.400 × 2.000 ) + 0.313 × 1Place	=	83.87 m <sup>2</sup>
• Steel bar (WALL overD16)	=	377.0	=	377.0 kg
• Steel bar (WALL D13)	=	783.0	=	783.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 3.065 + 2.665 + 1.000 + 1.000 ) × 10.000	=	77.30 掛m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.915 + 0.400 × 2.000 ) + 0.313	=	2.57 m <sup>2</sup>



L Type Retaining Wall BoQ  
Block3

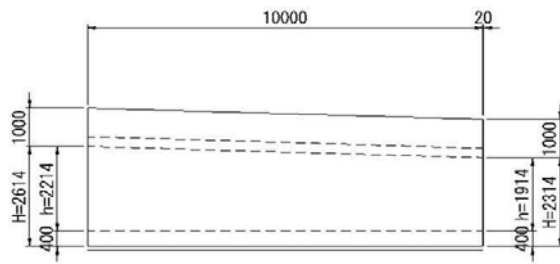


• Concrete (WALL)	=	( 0.500 × 2.765 + 0.400 × 2.000 ) × 10.000	=	21.83 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.765 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.615 + 0.400 × 2.000 ) + 0.313 × 1Place	=	77.721 m <sup>2</sup>
• Steel bar (WALL overD16)	=	358.0	=	358.0 kg
• Steel bar (WALL D13)	=	720.0	=	720.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.765 + 2.365 + 1.000 + 1.000 ) × 10.000	=	71.30 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.615 + 0.400 × 2.000 ) + 0.313	=	2.42 m <sup>2</sup>

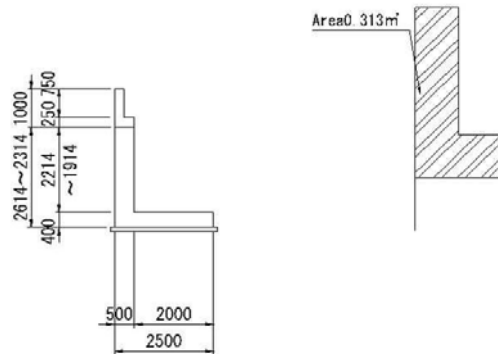
# L Type Retaining Wall BoQ

## Block4

Front View



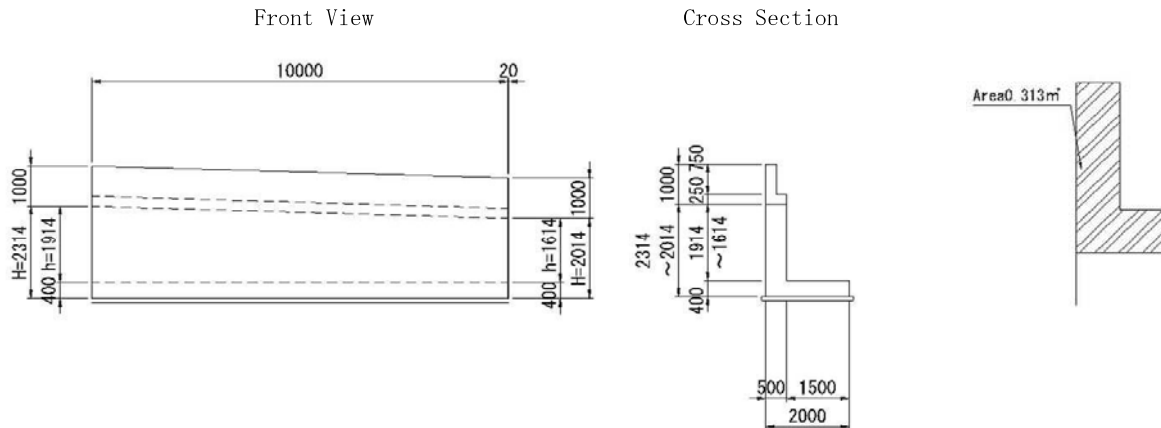
Cross Section



• Concrete (WALL)	=	( 0.500 × 2.464 + 0.400 × 2.000 ) × 10.000	=	20.32 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.464 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.314 + 0.400 × 2.000 ) + 0.313 × 1Place	=	71.55 m <sup>2</sup>
• Steel bar (WALL overD16)	=	338.0	=	338.0 kg
• Steel bar (WALL D13)	=	687.0	=	687.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.464 + 2.064 + 1.000 + 1.000 ) × 10.000	=	65.28 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.314 + 0.400 × 1.500 ) + 0.313	=	2.07 m <sup>2</sup>

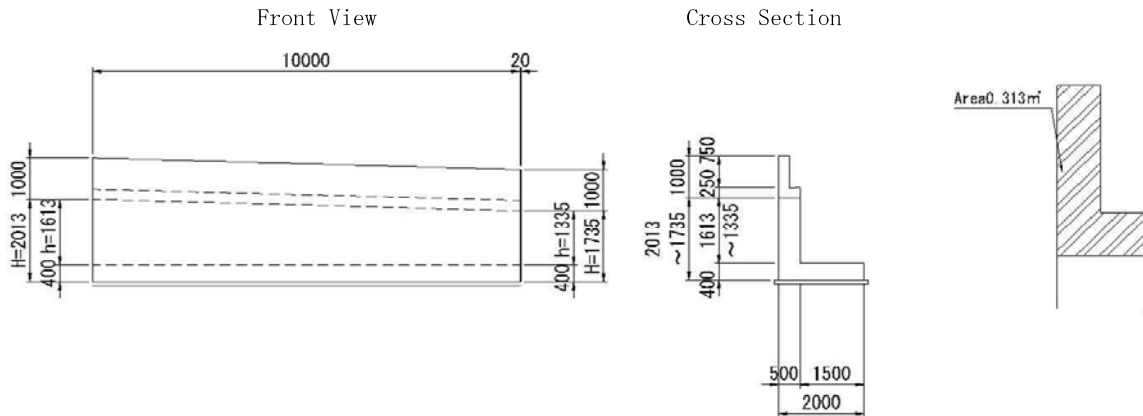
# L Type Retaining Wall BoQ

## Block5



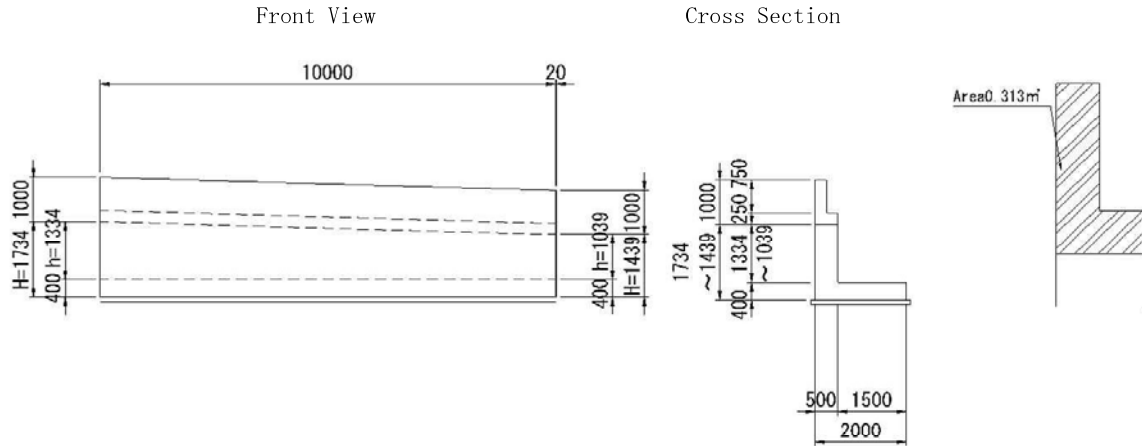
• Concrete (WALL)	=	( 0.500 × 2.164 + 0.400 × 1.500 ) × 10.000	=	16.82 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.164 + 1.000 ) × 2ヶ所 × 10.000 + ( 0.500 × 2.014 + 0.400 × 1.500 ) + 0.313 × 1ヶ所	=	65.20 m <sup>2</sup>
• Steel bar (WALL D13)	=	752.0	=	752.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.164 + 1.764 + 1.000 + 1.000 ) × 10.000	=	59.28 掛m <sup>2</sup>
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2ヶ所 + 0.100 × 2.200 × 1ヶ所	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.014 + 0.400 × 1.500 ) + 0.313	=	1.92 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block6



• Concrete (WALL)	=	( 0.500 × 1.874 + 0.400 × 1.500 ) × 10.000	=	15.37 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.874 + 1.000 ) × 2Place × 10.000		
	+ =	( 0.500 × 1.735 + 0.400 × 1.500 )		
	+ =	0.313 × 1Place		
	=	59.261	=	59.26 m <sup>2</sup>
• Steel bar (WALL D13)	=	697.0	=	697.0 kg
	=	697.0		
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
	=	297.0		
• Base concrete	=	2.200 × 0.100 × 10.000		
	=	2.200	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place		
	+ =	0.100 × 2.200 × 1Place		
	=	2.220	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.735 + 0.400 × 1.500 )		
	+ =	0.313		
	=	1.781	=	1.78 m <sup>2</sup>

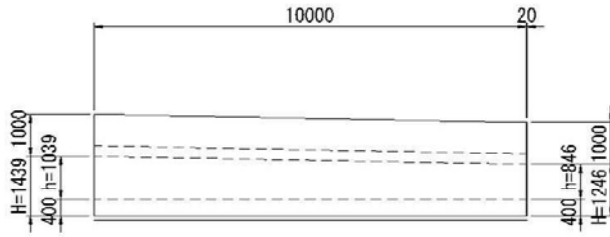
L Type Retaining Wall BoQ  
Block7



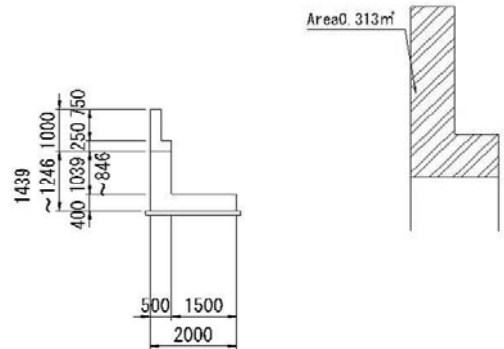
• Concrete (WALL)	=	( 0.500 × 1.587 + 0.400 × 1.500 ) × 10.000	=	13.94 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.587 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.439 + 0.400 × 1.500 ) + 0.313 × 1Place	=	53.37 m <sup>2</sup>
• Steel bar (WALL D13)	=	654.0	=	654.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.200 × 1Place	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.439 + 0.400 × 1.500 ) + 0.313	=	1.63 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block8

Front View



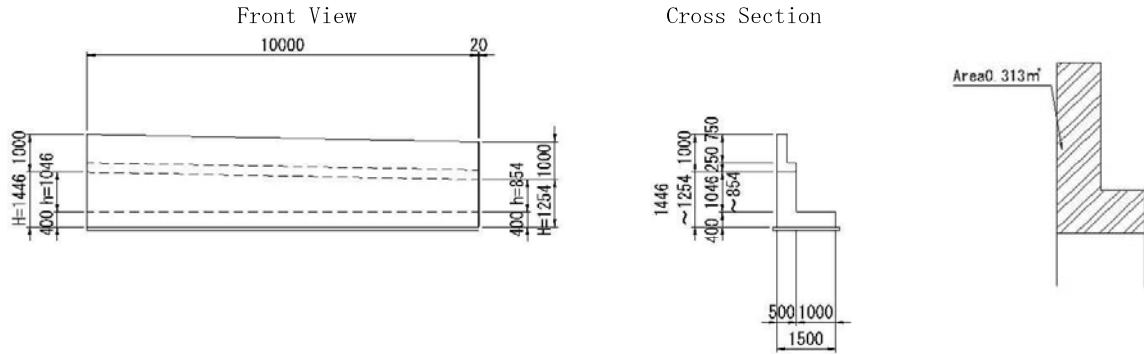
Cross Section



• Concrete (WALL)	=	( 0.500 × 1.343 + 0.400 × 1.500 ) × 10.000	=	12.72 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.343 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.246 + 0.400 × 1.500 ) + 0.313 × 1Place	=	48.396 m <sup>2</sup>
• Steel bar (WALL D13)	=	605.0	=	605.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.200 × 1Place	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.246 + 0.400 × 1.500 ) + 0.313	=	1.536 m <sup>2</sup>

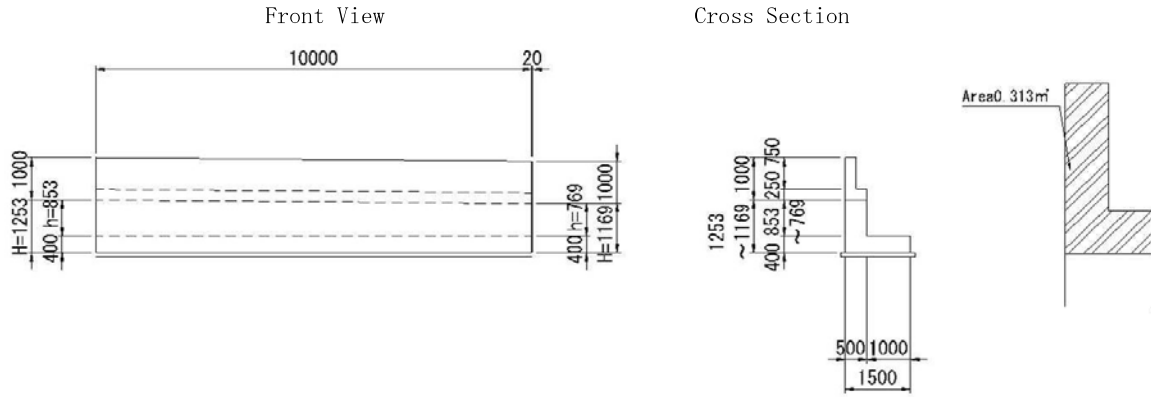
# L Type Retaining Wall BoQ

## Block9



• Concrete (WALL)	=	(	0.500	×	1.350	+	0.400	×	1.000	)	×	10.000	=	10.75	m <sup>3</sup>										
• Concrete (HANDRAIL)	=	0.313	×	10.000	=	3.13	m <sup>3</sup>																		
• Form	=	(	1.350	+	1.000	)	×	2Place	×	10.000	+ (	0.500	×	1.254	+	0.400	×	1.000	)	+ 0.313	×	1Place	=	48.34	m <sup>2</sup>
• Steel bar (WALL D13)	=	500.0	=	500.0	=	500.0	kg																		
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0	=	297.0	kg																		
• Base concrete	=	1.700	×	0.100	×	10.000	=	1.70	m <sup>3</sup>																
• " Form	=	0.100	×	10.000	×	2Place	+ 0.100	×	1.700	×	1Place	=	2.17	m <sup>2</sup>											
• Joint filler (t=20mm)	=	(	0.500	×	1.254	+	0.400	×	1.000	)	+ 0.313	=	1.34	m <sup>2</sup>											

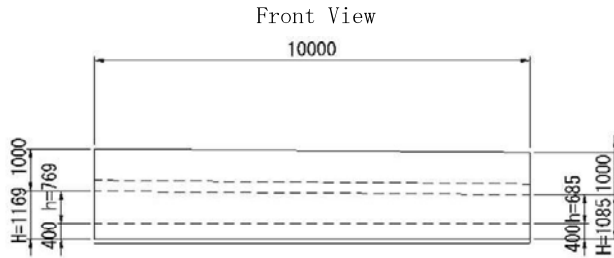
L Type Retaining Wall BoQ  
Block10



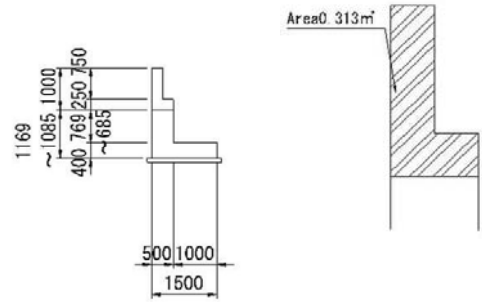
• Concrete (WALL)	=	(	0.500	×	1.211	+	0.400	×	1.000	)	×	10.000	=	10.06	m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313	×	10.000	=	3.13	m <sup>3</sup>								
• Form	=	(	1.211	+	1.000	)	×	2Place	×	10.000					
		+	(	0.500	×	1.169	+	0.400	×	1.000	)				
			+	0.313	×	1Place									
	=	45.518											=	45.52	m <sup>2</sup>
• Steel bar (WALL D13)	=	469.0											=	469.0	kg
	=	469.0													
• Steel bar (HANDRAIL D10)	=	297.0											=	297.0	kg
	=	297.0													
• Base concrete	=	1.700	×	0.100	×	10.000									
	=	1.700											=	1.70	m <sup>3</sup>
• " Form	=	0.100	×	10.000	×	2Place									
		+	0.100	×	1.700	×	1Place								
	=	2.170											=	2.17	m <sup>2</sup>
• Joint filler (t=20mm)	=	(	0.500	×	1.169	+	0.400	×	1.000	)					
		+	0.313												
	=	1.298											=	1.30	m <sup>2</sup>



L Type Retaining Wall BoQ  
Block11

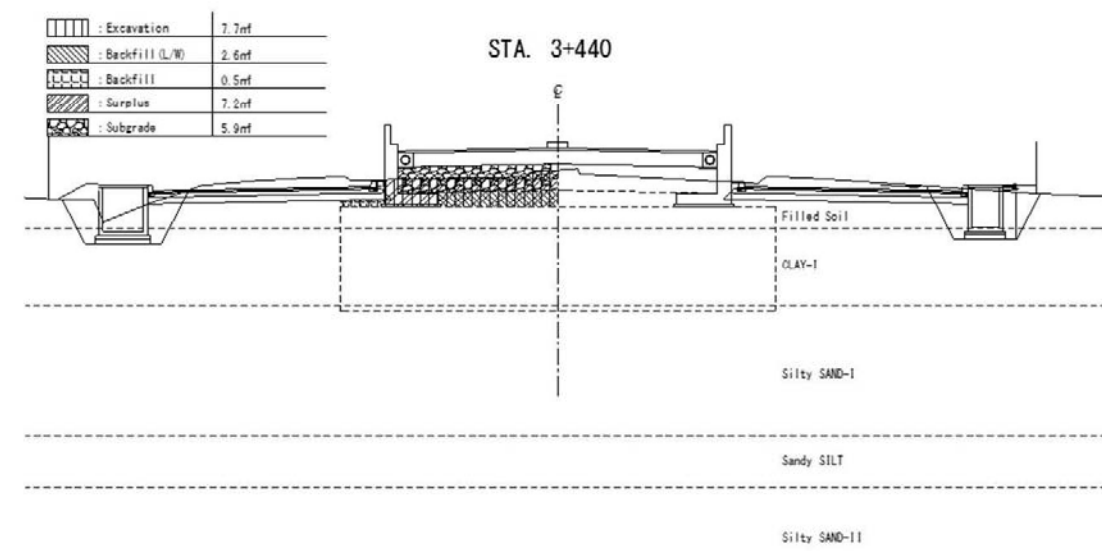
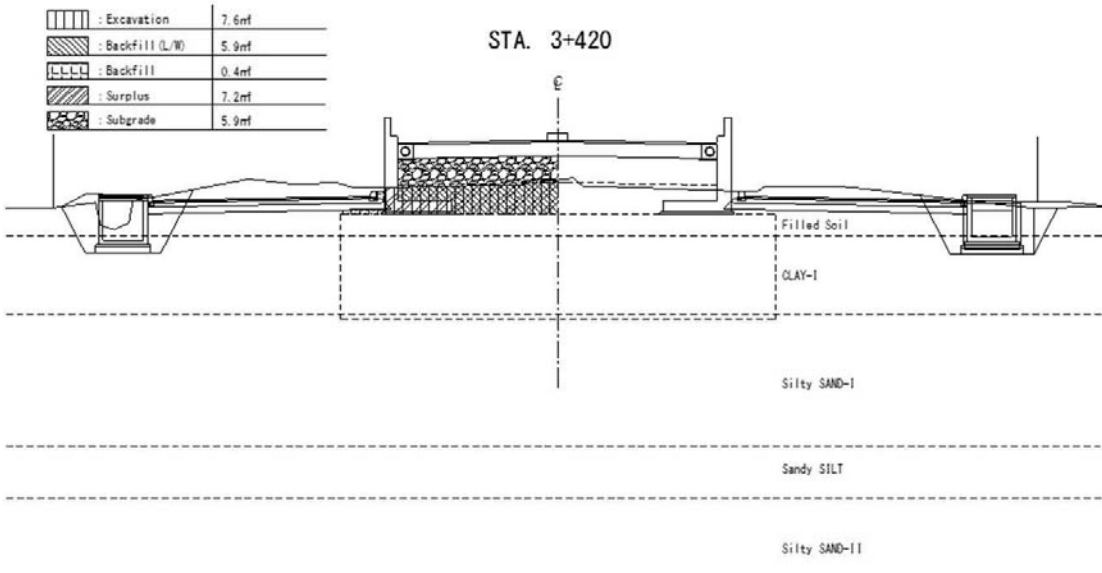
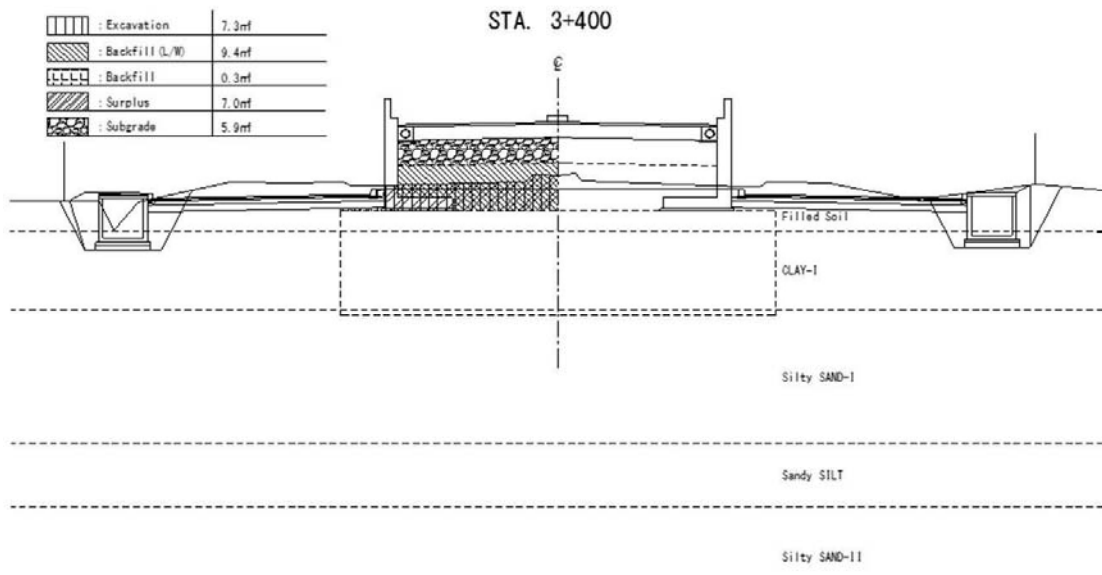


Cross Section

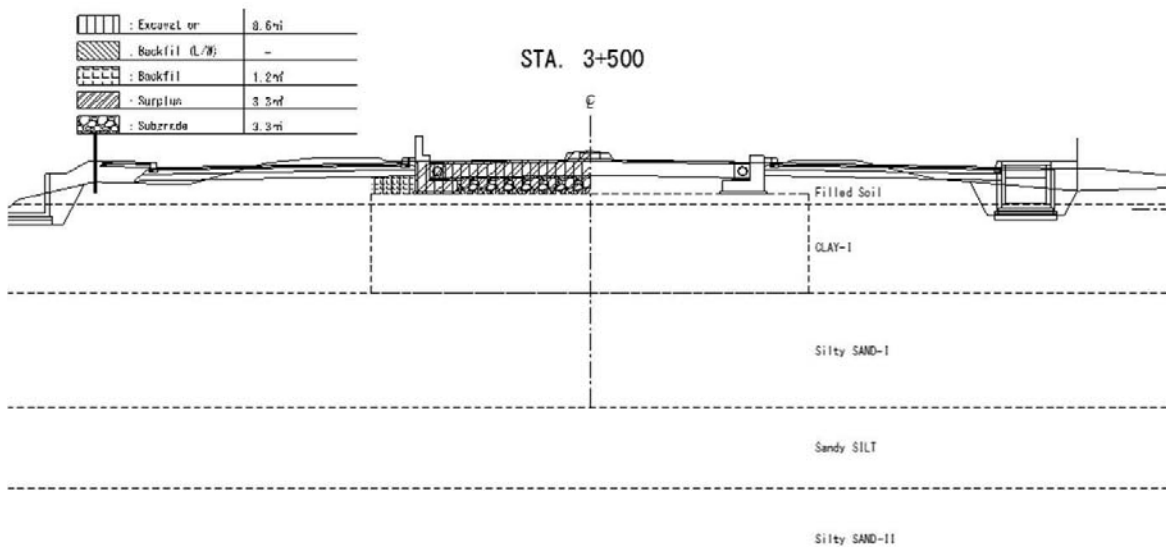
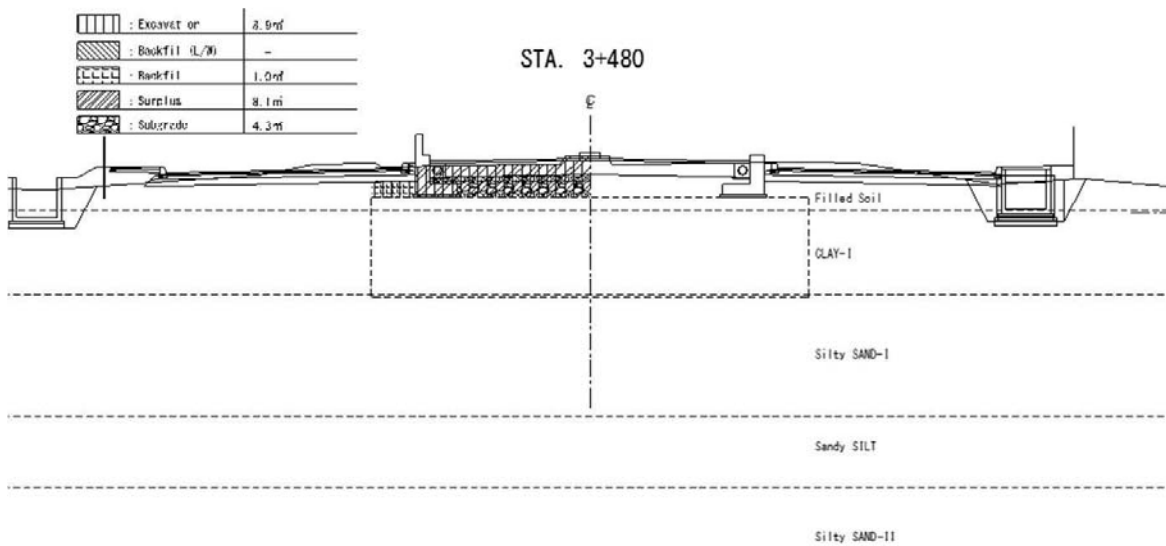
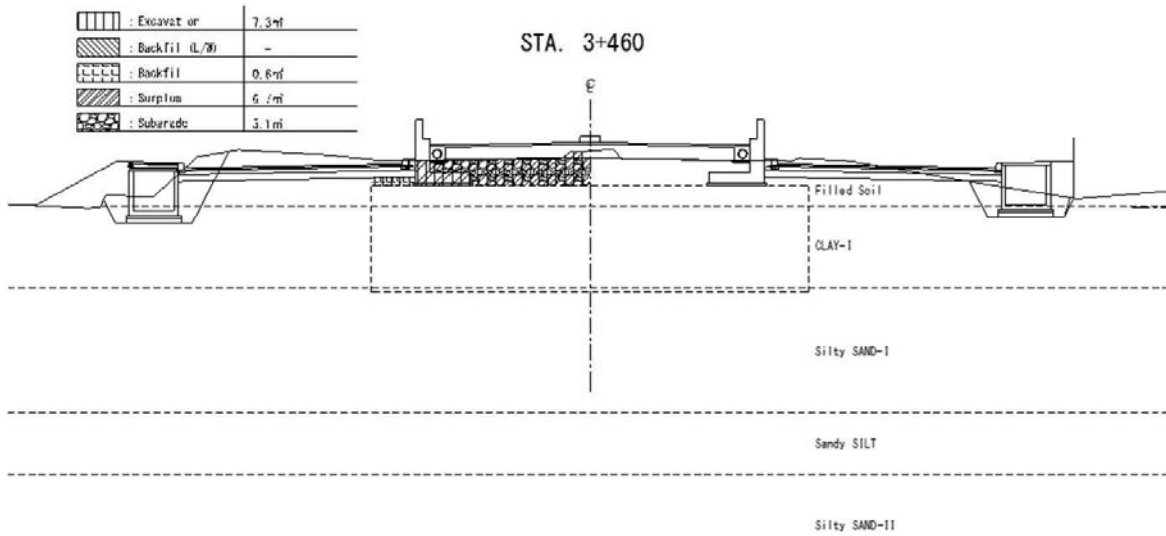


• Concrete (WALL)	=	( 0.500 × 1.127 + 0.400 × 1.000 ) × 10.000	=	9.64 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.127 + 1.000 ) × 2ヶ所 × 10.000		
		+ ( 0.500 × 1.085 + 0.400 × 1.000 )		
		+ 0.313 × 1ヶ所		
	=	43.796	=	43.80 m <sup>2</sup>
• Steel bar (WALL D13)	=	463.0	=	463.0 kg
	=	463.0		
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
	=	297.0		
• Base concrete	=	1.700 × 0.100 × 10.000		
	=	1.700	=	1.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2ヶ所		
	+ 0.100 × 1.700 × 1ヶ所			
	=	2.170	=	2.17 m <sup>2</sup>

# Soil work(L Type Retaining Wall)①



# Soil work(L Type Retaining Wall)②



## Soil work (Excavation)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		7.3			apply STA. 3+400
STA. 3+400	3.950	7.3	7.30	28.8	
STA. 3+420	20.000	7.6	7.45	149.0	
STA. 3+440	20.000	7.7	7.65	153.0	
STA. 3+460	20.000	7.3	7.50	150.0	
STA. 3+480	20.000	8.9	8.10	162.0	
STA. 3+500	20.000	8.6	8.75	175.0	
Total				817.8 m3	

## Soil work (Backfill • L Type Retaining/W)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		9.4			apply STA. 3+400
STA. 3+400	3.950	9.4	9.40	37.1	
STA. 3+420	20.000	5.9	7.65	153.0	
STA. 3+440	20.000	2.6	4.25	85.0	
STA. 3+460	20.000	0.0	1.30	26.0	
STA. 3+480	20.000	0.0	0.00	0.0	
STA. 3+500	20.000	0.0	0.00	0.0	
Total				301.1 m3	

## Soil work (Backfill)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		0.3			apply STA. 3+400
STA. 3+400	3.950	0.3	0.30	1.2	
STA. 3+420	20.000	0.4	0.35	7.0	
STA. 3+440	20.000	0.5	0.45	9.0	
STA. 3+460	20.000	0.6	0.55	11.0	
STA. 3+480	20.000	1.0	0.80	16.0	
STA. 3+500	20.000	1.2	1.10	22.0	
Total				66.2 m3	

Soil work (Surplus Sat change rate 0.9)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		7.0			apply STA. 3+400
STA. 3+400	3.950	7.0	7.00	27.7	
STA. 3+420	20.000	7.2	7.10	142.0	
STA. 3+440	20.000	7.2	7.20	144.0	
STA. 3+460	20.000	6.7	6.95	139.0	
STA. 3+480	20.000	8.1	7.40	148.0	
STA. 3+500	20.000	8.3	8.20	164.0	
Total				764.7 m3	
				849.7 m3	
				(Surplus Sat change rate 0.9)	

## Soil work (Subgrade)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		5.9			apply STA. 3+400
STA. 3+400	3.950	5.9	5.90	23.3	
STA. 3+420	20.000	5.9	5.90	118.0	
STA. 3+440	20.000	5.9	5.90	118.0	
STA. 3+460	20.000	5.1	5.50	110.0	
STA. 3+480	20.000	4.3	4.70	94.0	
STA. 3+500	20.000	3.3	3.80	76.0	
Total				539.3 m3	



§ 3. MECHANICALLY-STABILISED EARTH WALL L TYPE RETAINING WALL BoQ (RIGHT)

Total BoQ of Mechanically-Stabilised Earth Wall Works

【RIGHT SIDE】

Items		Code	Unit	Quantity	Note
Wall Area			m2	411.72	
Wall Length			m	114.150	
Wall Height			m	5.230	
Total Strip Length			m	3,850.000	
Concrete Coping	Concrete	$\sigma$ ck=24N/mm2	m3	24.08	
	Form		m2	158.61	
	Steel bar	SD345	kg	1,524.3	
	Joint filler	t=10mm	m2	8.23	
	Scaffolding	Bracket type	m	114.11	Bracket type
Concrete foundation	Concrete	$\sigma$ ck=18N/mm2	m3	9.13	
	Form		m2	45.66	
	Steel bar	D13, SD345	kg	60.6	
Concrete Barrier	Concrete	$\sigma$ ck=24N/mm2	m3	146.86	
	Form		m2	493.82	
	Leveling Concrete	$\sigma$ ck=18N/mm2	m3	14.26	
	Form		m2	11.54	
	Gravel		m3	94.14	
	Steel bar	SD345	kg	8,603.9	
	Joint filler	t=10mm	m2	12.87	
		t=20mm	m2	2.57	
	Rubber Plate	t=10mm	m2	34.23	Size:10×300×600 Pices - 191
Styrene Foam	b=50mm	m3	2.85	Size:50×500×1000 Pices - 114	
Soil work	Excavation		m3	1,138.4	soil
	Backfill		m3	2,315.2	Reinforced/E
	Backfill		m3	41.2	
	Surplus		m3	1,222.0	Sat change rate 0.9
	Subgrade		m3	342.5	
	Rear Filter	Gravel	m3	334.1	
Drainage	Gravel	C-40	m3	383.5	
	Geotextile	t=2.0mm	m2	456.60	
Joint filler		t=20mm	m2	0.67	

Total BoQ of L type retaining wall

Items		Code	Unit	Quantity	Note
L type retaining wall	Concrete	WALL	m3	163.89	
		HANDRAIL	m3	28.71	
	Form		m2	634.01	
	Steel bar (WALL)	SD345, overD16	kg	1,225.00	
		SD345, D13	kg	6,627.0	
	Steel bar (HANDRAIL)	SD345, D10	kg	2,418.0	
	Scaffolding		m2	303.71	Usual frame type
	Base concrete		m3	23.01	
	Form		m2	23.49	
Joint filler	t=20mm	m2	18.72		
Soil work	Excavation		m3	810.8	soil
	Backfill		m3	301.1	L type retaining/W
	Backfill		m3	66.2	
	Surplus		m3	838.6	Sat change rate 0.9
	Subgrade		m3	539.3	

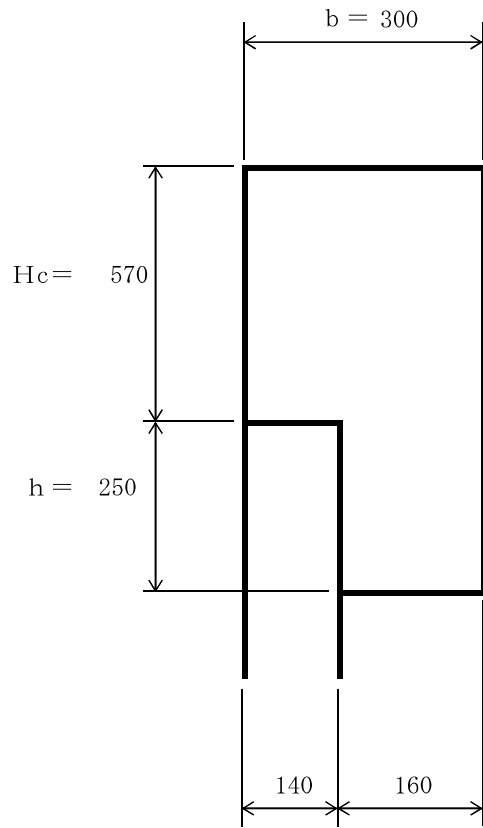
The Mechanically-Stabilised Earth wall materials

【RIGHT SIDE】

(t=140)

ITEM	Mark	Shape and size	Unit	Quantity	Note
Concrete Skin	A 4	$1.50 \times 1.50 = 2.2500$ m <sup>2</sup>	Pieces	94	
	AL 4	$1.35 \times 1.50 = 2.0250$ "	"	8	
	AR 4	$1.35 \times 1.50 = 2.0250$ "	"	8	
	BP 4	$1.50 \times 1.48 = 2.2200$ "	"	35	Steel Bar b=300
	BLP 4	$1.35 \times 1.48 = 1.9980$ "	"	1	Steel Bar b=300
	BRP 4	$1.35 \times 1.48 = 1.9980$ "	"	1	Steel Bar b=300
	C 2	$1.50 \times 0.75 = 1.1250$ "	"	33	
	CL 2	$1.35 \times 0.75 = 1.0125$ "	"	3	
	CR 2	$1.35 \times 0.75 = 1.0125$ "	"	3	
	DP 2	$1.50 \times 0.73 = 1.0950$ "	"	32	Steel Bar b=300
	DLP 2	$1.35 \times 0.73 = 0.9855$ "	"	4	Steel Bar b=300
	DRP 2	$1.35 \times 0.73 = 0.9855$ "	"	4	Steel Bar b=300
	Ribbed strip	PL (SS400)	$80 \times 4.0 \times 6,500$	Pieces	20
" 6,000			"	244	
" 5,000			"	328	
" 4,000			"	154	
Total			m	3,850.00	
Bolt/Nut		M12 $\times$ 40	Pieces	746	
Bearing Pad		85 $\times$ 20 $\times$ 600	Pieces	298	
Filter Cloth		420 $\times$ 4	m	293.9	
Edge Angle	L	125 $\times$ 210 $\times$ 3.2 $\times$ 1500	Pieces	3	$\theta = 90^\circ$
	L	125 $\times$ 210 $\times$ 3.2 $\times$ 750	"	1	$\theta = 90^\circ$
Concrete Anchor Bolt		M12 $\times$ 90	Pieces	8	
Backing Plate		GALVANIZED STEEL PLATE(100 $\times$ 1.6 $\times$ 750)	Pieces	18	
Nominal wall area				411.72 m <sup>2</sup>	
Wall High :				5.230 m	
Wall Length :				114.150 m	

## Concrete Coping



Coping Length		114.110 m	
Joint filler	Type	Quantity	Height (Hc)
	t = 10	39 Set	0.570 m
Form	No End Formwork		
Steel bar	1.0m <sup>3</sup> Weight Of Re-Bar 63.3 kg		

• Concrete  $( 0.570 \times 0.300 + 0.250 \times 0.160 ) \times 114.110 = 24.08 \text{ m}^3$

• Form  $( 0.570 \times 2 + 0.250 ) \times 114.110 = 158.61 \text{ m}^2$

• Steel bar  $( 63.3 \text{ kg/m}^3 ) \times 24.08 \text{ m}^3 = 1,524.3 \text{ kg}$

• Joint filler **【 t = 10mm 】**  $( 0.570 \times 0.300 + 0.250 \times 0.160 ) \times 39 = 8.23 \text{ m}^2$  Set

• Scaffolding Bracket type  $= 114.11 \text{ m}$

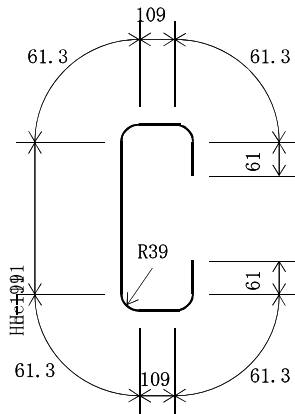
## Weight Of Reinforcement (per 3m) b= 300

Code	Diameter	Length (m)	Number	Unit Weight (kg)	Weight/Bar (kg)	Weight (kg)	Remarks
①	D13	0.965	11	0.995	0.96	10.6	
②	D13	0.857	11	0.995	0.85	9.4	
③	D13	2.850	7	0.995	2.84	19.9	
Total						39.9	

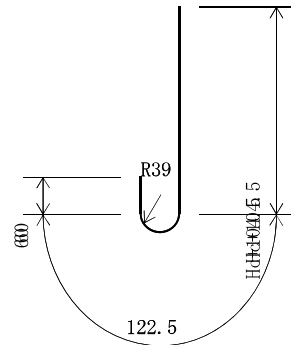
Coping Height	Hc=	0.570 m	Width b1=	0.300 m
Concrete Volume/3m	V=	0.63 m <sup>3</sup>	Cover t1=	0.250 m
Re-Bar Volume/3m	W=	39.9 kg	Width b2=	0.160 m
Re-Bar Volume/m <sup>3</sup>	W/V=	63.3 kg	Thick t2=	0.140 m

### Bar Scheduling

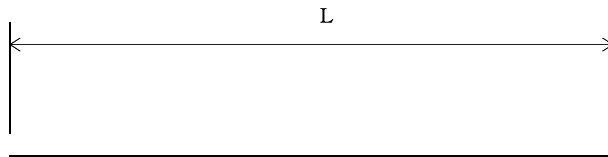
① D13— 965



② D13— 857



③ D13— 2850



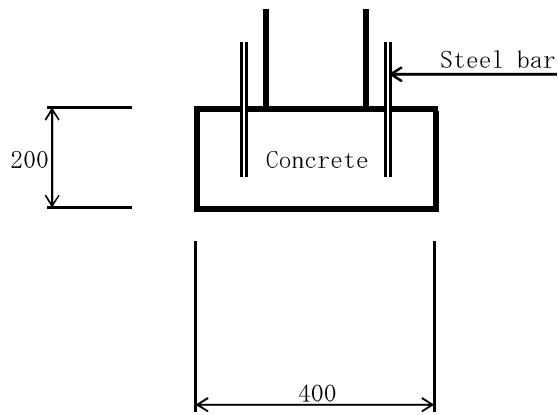
Coping average height (Weighted average height)

( n )	(H 1)	(H 2)	(L)	(A)
A 1	= 1 / 2 × ( 0.662 + 0.221 )	×	14.730	= 6.503 m <sup>2</sup>
A 2	= 1 / 2 × ( 0.971 + 0.870 )	×	3.350	= 3.084 m <sup>2</sup>
A 3	= 1 / 2 × ( 0.870 + 0.270 )	×	20.000	= 11.400 m <sup>2</sup>
A 4	= 1 / 2 × ( 0.270 + 0.214 )	×	1.870	= 0.453 m <sup>2</sup>
A 5	= 1 / 2 × ( 0.964 + 0.420 )	×	18.130	= 12.546 m <sup>2</sup>
A 6	= 1 / 2 × ( 0.420 + 0.207 )	×	7.090	= 2.223 m <sup>2</sup>
A 7	= 1 / 2 × ( 0.957 + 0.570 )	×	12.910	= 9.857 m <sup>2</sup>
A 8	= 1 / 2 × ( 0.570 + 0.201 )	×	12.310	= 4.746 m <sup>2</sup>
A 9	= 1 / 2 × ( 0.951 + 0.720 )	×	7.690	= 6.425 m <sup>2</sup>
A 10	= 1 / 2 × ( 0.720 + 0.253 )	×	16.030	= 7.799 m <sup>2</sup>
Total			114.110 m	65.036 m <sup>2</sup>

• Weighted average height

$$H_c = \Sigma A / \Sigma L = \underline{\underline{0.570 \text{ m}}}$$

### Concrete Foundation (400×200)



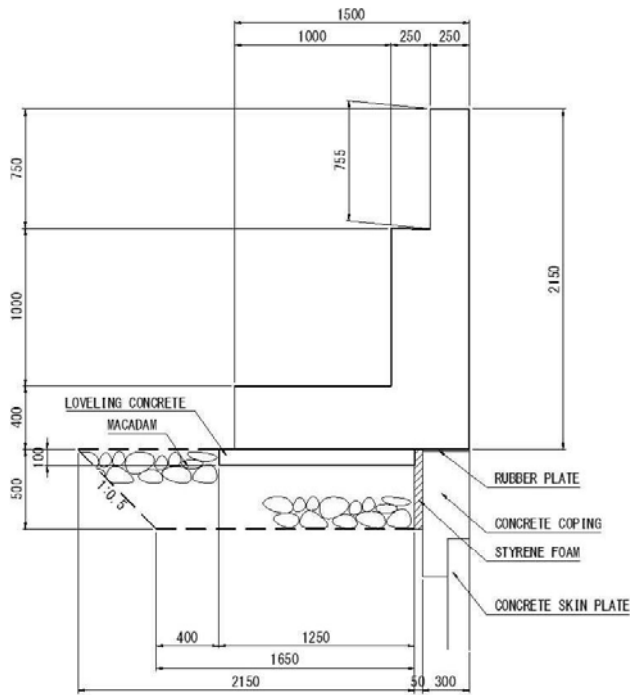
Foundation Length Length Of Concrete	L= 114.150 m
No End Formwork	
Interval of bar (2-D13×200)	0.750 m

Concrete                      0.200 × 0.400 × 114.150 = 9.13 m<sup>3</sup>

Form                            0.200 × 114.150 × 2 Place = 45.66 m<sup>2</sup>

Steel bar                      114.150 / 0.750 × 0.398 = 60.6 kg

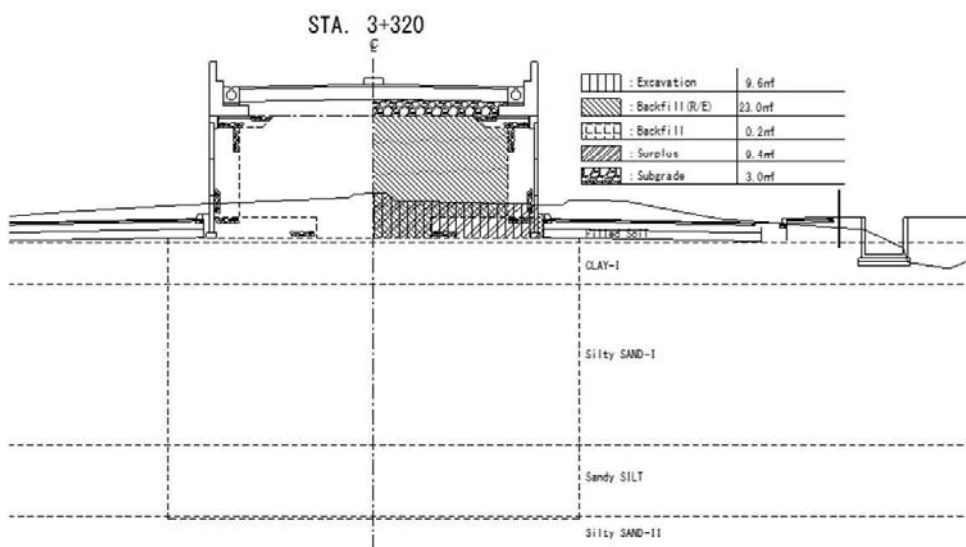
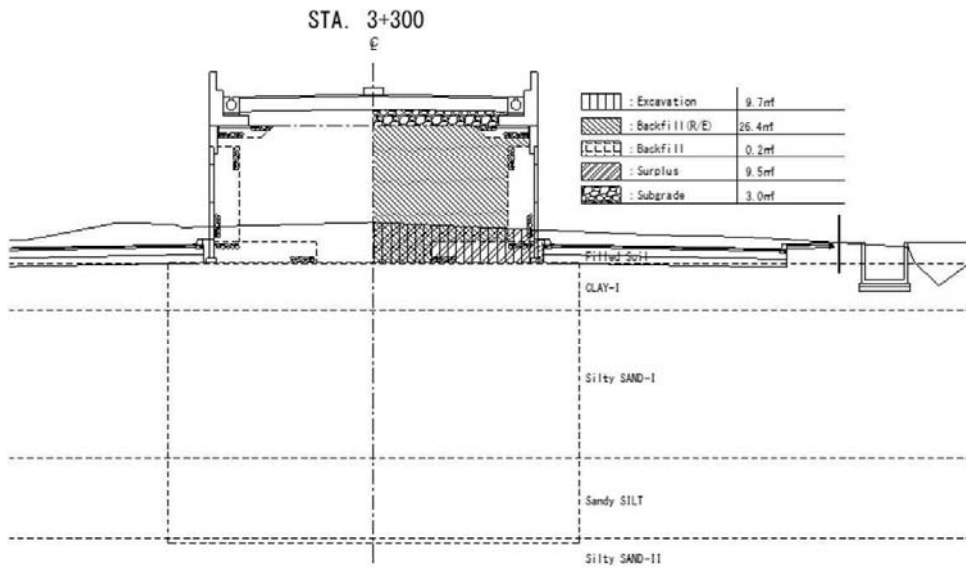
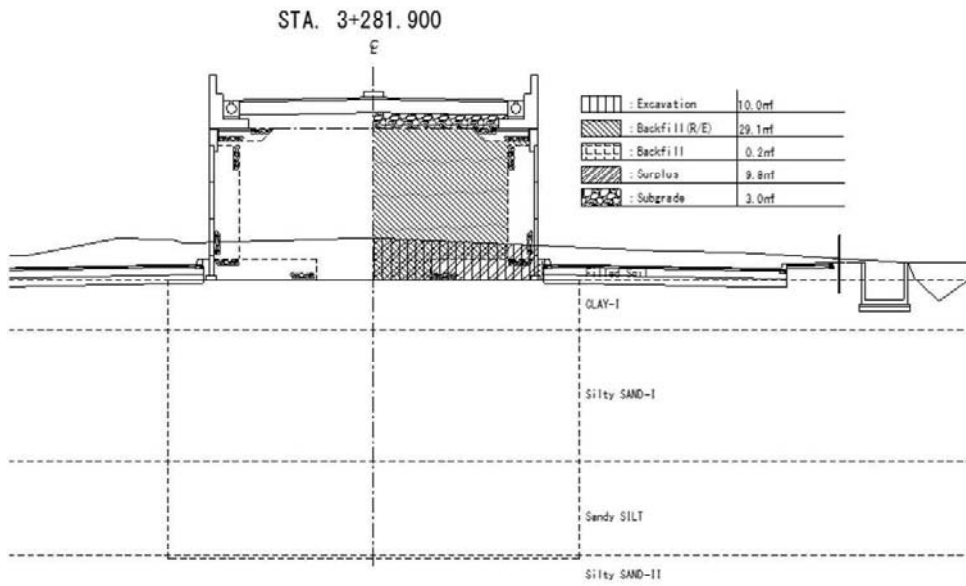
## Concrete Barrier



Longitudinal	L =	114.110	m
Bar weight	W =	75.4	kg/m
Concrete Area	A =	1.287	m <sup>2</sup>

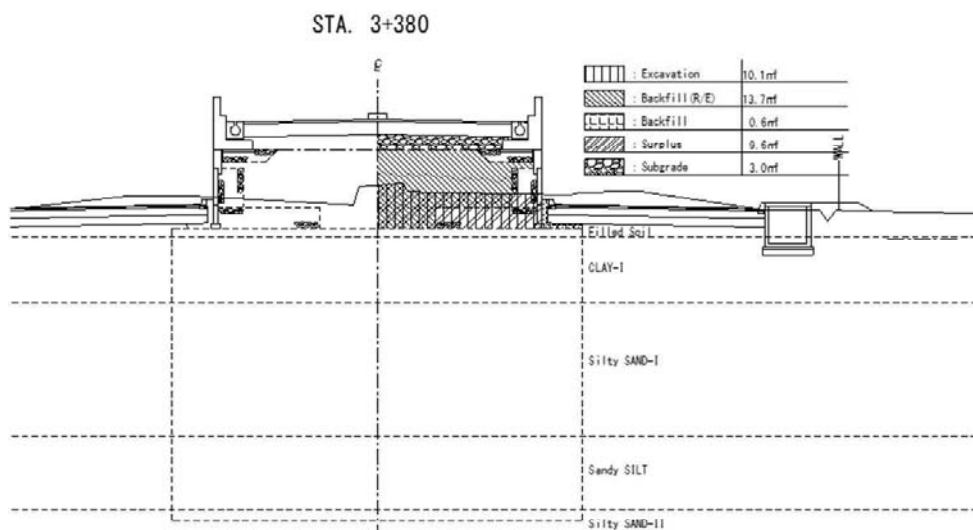
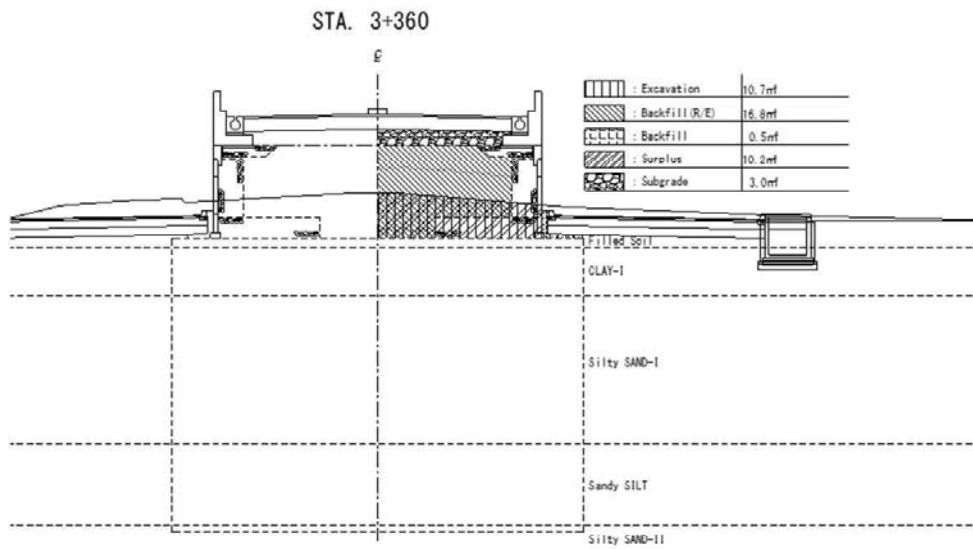
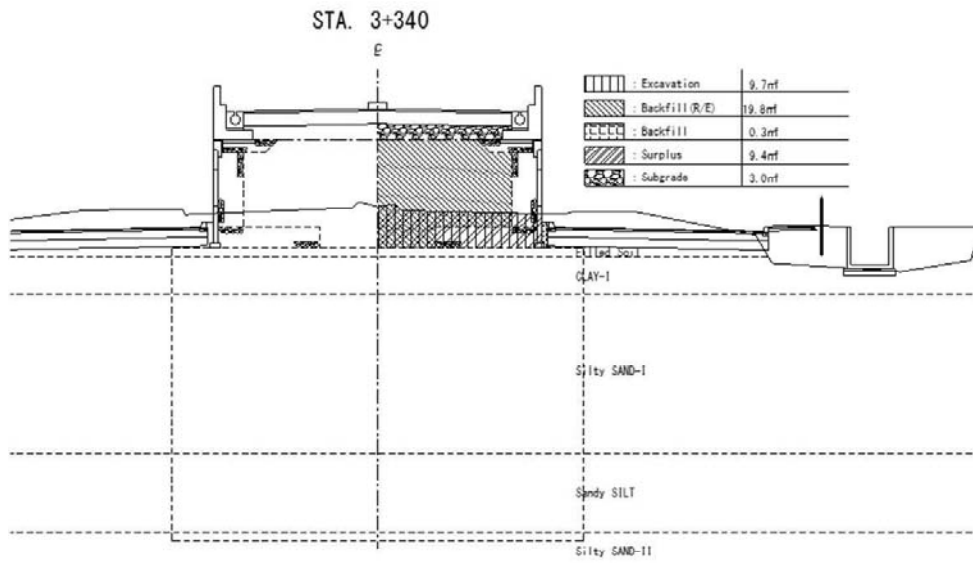
• Concrete	=	1.287 × 114.110	=	146.860	=	146.86	m <sup>3</sup>	
• Form	=	( 2.150 + 0.755 + 1.000 + 0.400 ) × 114.110	+ 1.287 × 2 Place	=	493.818	=	493.82	m <sup>2</sup>
• Leveling concrete	=	( 1.250 × 0.100 ) × 114.110	=	14.264	=	14.26	m <sup>3</sup>	
• " foam	=	( 0.100 × 114.110 ) × 1 Place	+ ( 1.250 × 0.100 ) × 1 Place	=	11.536	=	11.54	m <sup>2</sup>
• Gravel	=	( 1/2 × ( 1.650 + 2.150 ) × 0.500 ) × 114.110	- ( 1.250 × 0.100 × 114.110 )	=	94.141	=	94.14	m <sup>3</sup>
• Steel bar	=	75.4 × 114.110	=	8,603.894	=	8,603.9	kg	
• Joint filler (t=10mm)	=	1.287 × 10 Place	=	12.870	=	12.87	m <sup>2</sup>	
• Joint filler (t=20mm)	=	1.287 × 2 Place	=	2.574	=	2.57	m <sup>2</sup>	
• Rubber plate (t=10mm)	=	0.300 × 114.110	=	34.233	=	34.23	m <sup>2</sup>	
• Styrene Foam (b=50mm)	=	0.500 × 114.110 × 0.050	=	2.853	=	2.85	m <sup>2</sup>	

# Soil work(Reinforced Earth)①





# Soil work(Reinforced Earth)②



## Soil work (Excavation)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		10.0			
STA. 3+300	18.100	9.7	9.85	178.3	
STA. 3+320	20.000	9.6	9.65	193.0	
STA. 3+340	20.000	9.7	9.65	193.0	
STA. 3+360	20.000	10.7	10.20	204.0	
STA. 3+380	20.000	10.1	10.40	208.0	
STA. 3+396.050	16.050	10.1	10.10	162.1	apply STA. 3+380
Total				1,138.4 m <sup>3</sup>	

## Soil work (Backfill • Reinforced/E)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		29.1			
STA. 3+300	18.100	26.4	27.75	502.3	
STA. 3+320	20.000	23.0	24.70	494.0	
STA. 3+340	20.000	19.8	21.40	428.0	
STA. 3+360	20.000	16.8	18.30	366.0	
STA. 3+380	20.000	13.7	15.25	305.0	
STA. 3+396.050	16.050	13.7	13.70	219.9	apply STA. 3+380
Total				2,315.2 m3	

## Soil work (Backfill)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		0.2			
STA. 3+300	18.100	0.2	0.20	3.6	
STA. 3+320	20.000	0.2	0.20	4.0	
STA. 3+340	20.000	0.3	0.25	5.0	
STA. 3+360	20.000	0.5	0.40	8.0	
STA. 3+380	20.000	0.6	0.55	11.0	
STA. 3+396.050	16.050	0.6	0.60	9.6	apply STA. 3+380
Total				41.2 m3	

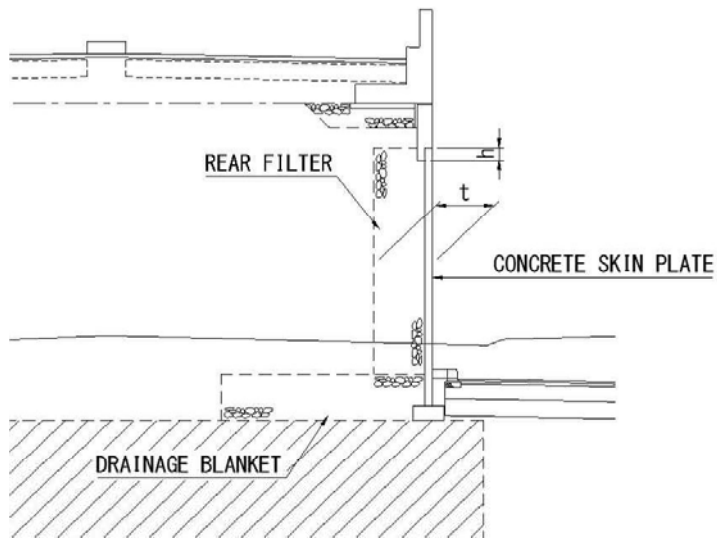
Soil work (Surplus Sat change rate 0.9)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		9.8			
STA. 3+300	18.100	9.5	9.65	174.7	
STA. 3+320	20.000	9.4	9.45	189.0	
STA. 3+340	20.000	9.4	9.40	188.0	
STA. 3+360	20.000	10.2	9.80	196.0	
STA. 3+380	20.000	9.6	9.90	198.0	
STA. 3+396.050	16.050	9.6	9.60	154.1	apply STA. 3+380
Total				1,099.8 m3	
				1,222.0 m3	
				(Surplus Sat change rate 0.9)	

## Soil work (Subgrade)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+281.900		3.0			
STA. 3+300	18.100	3.0	3.00	54.3	
STA. 3+320	20.000	3.0	3.00	60.0	
STA. 3+340	20.000	3.0	3.00	60.0	
STA. 3+360	20.000	3.0	3.00	60.0	
STA. 3+380	20.000	3.0	3.00	60.0	
STA. 3+396.050	16.050	3.0	3.00	48.2	apply STA. 3+380
Total				342.5 m3	

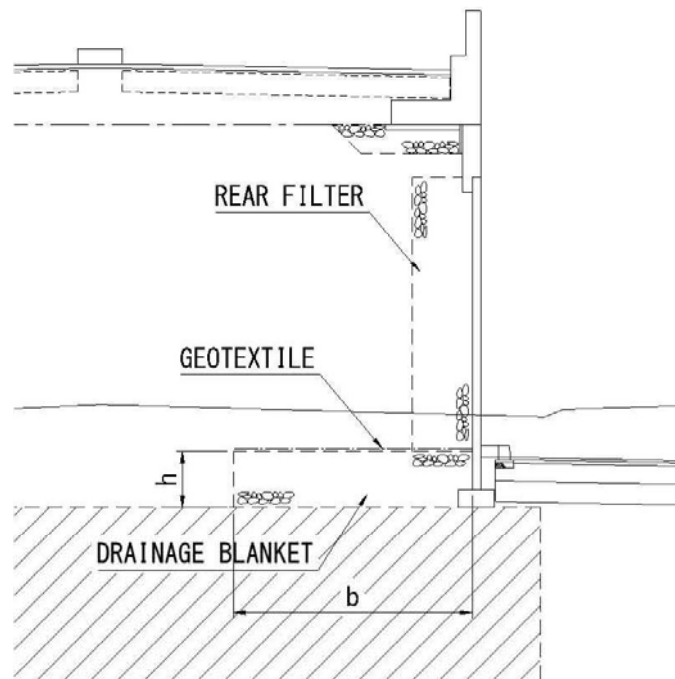
## Soil work (Rear Filter)



- Reinforced Earth wall area  $A = 411.72 \text{ m}^2$
- Reinforced Earth wall length  $L = 114.150 \text{ m}$
- Thick of rear filter  $t = 1.000 \text{ m}$
- Thick of skin  $= 0.140 \text{ m}$
- Coping width  $= 0.300 \text{ m}$
- Exemption of coping height  $h = 0.250 \text{ m}$
- Drainage height  $= 0.640 \text{ m}$

$$\begin{aligned}
 \text{Rear Filter } V &= 411.72 \times 1.000 \\
 &\quad - ((0.300 - 0.140) \times 0.250 + 0.640 \times 1.000) \times 114.150 \\
 &= 334.098 \qquad \qquad \qquad = 334.1 \text{ m}^3
 \end{aligned}$$

# Drainage



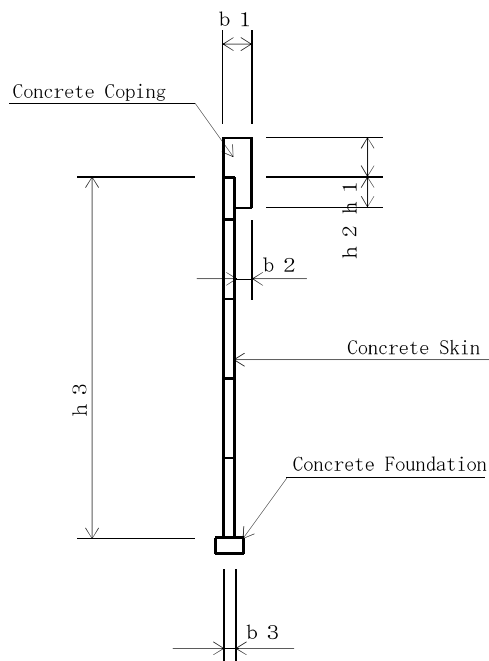
Bottom step Strip Length	Width	Thickness	Length	Volume	Area
b	b	h	L1	V	A
4.000	4.000	0.840	114.150	383.544	456.600
Total			114.150	383.54	456.60
average		0.84			

Drainage Blanket  $V = b \times h \times L1 = 383.5 \text{ m}^3$

Geotextile  $A = b \times L1 = 456.60 \text{ m}^2$



## Joint filler(Both Ends)



(Left)

Coping width	b 1 =	0.300 m
Coping Rear Width	b 2 =	0.160 m
Coping Height	h 1 =	0.673 m
Exemption of coping	h 2 =	0.250 m
Thick of skin	b 3 =	0.140 m

(Right)

Coping width	b 1 =	0.300 m
Coping Rear Width	b 2 =	0.160 m
Coping Height	h 1 =	0.253 m
Exemption of coping	h 2 =	0.250 m
Thick of skin	b 3 =	0.140 m
Concrete Skin Height	h 3 =	2.230 m

(Left)

Concrete Coping

$$\begin{aligned}
 A1 &= 0.673 \times 0.300 + 0.250 \times 0.160 \\
 &= 0.242 \qquad \qquad \qquad = 0.24 \text{ m}^2
 \end{aligned}$$

(Right)

Concrete Coping

$$\begin{aligned}
 A2 &= 0.253 \times 0.300 + 0.250 \times 0.160 \\
 &= 0.116 \qquad \qquad \qquad = 0.12 \text{ m}^2
 \end{aligned}$$

Concrete Skin

$$\begin{aligned}
 a2 &= 2.230 \times 0.140 \\
 &= 0.312 \qquad \qquad \qquad = 0.31 \text{ m}^2
 \end{aligned}$$

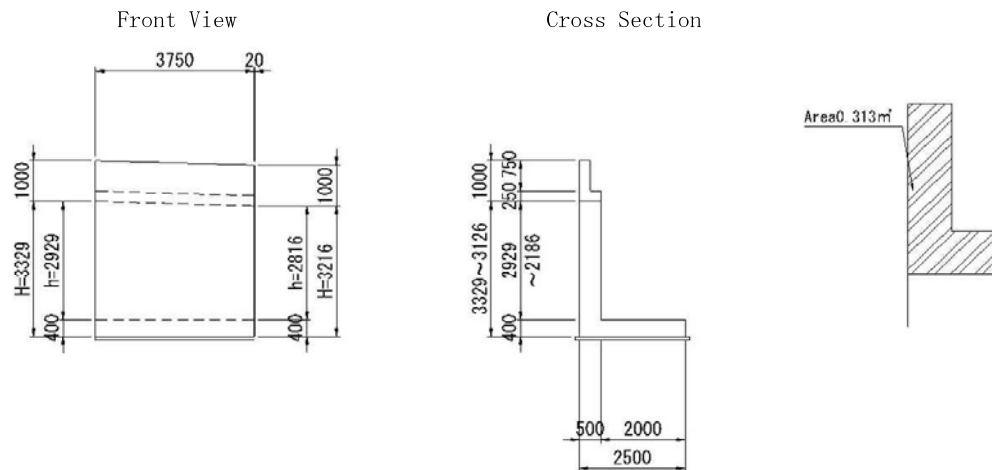
$$A1 + A2 + a2 = 0.67 \text{ m}^2$$

Total BoQ of L type retaining wall

Items	Unit	Block1	Block2	Block3	Block4	Block5	Block6	Block7	Block8	Block9	Block10	Block11	Total
Concrete (WALL)	m3	9.14	23.33	21.83	20.32	16.82	15.37	13.94	12.72	10.75	10.06	9.64	163.89
Concrete (HANDRAIL)	m3	1.17	3.13	3.13	3.13	3.13	3.13	3.13	3.13	1.25	1.25	3.13	28.71
Form	m2	37.55	83.87	77.72	71.55	65.20	59.26	53.37	48.40	48.15	45.33	43.61	634.01
Steel bar (WALL overD16)	kg	152.0	377.0	358.0	338.0	-	-	-	-	-	-	-	1,225.0
Steel bar (WALL D13)	kg	297.0	783.0	720.0	687.0	752.0	697.0	654.0	605.0	500.0	469.0	463.0	6,627.0
Steel bar (HANDRAIL D10)	kg	108.0	297.0	297.0	297.0	297.0	297.0	297.0	297.0	77.0	77.0	77.0	2,418.0
Scaffolding	m2	30.55	77.30	71.30	65.28	59.28	-	-	-	-	-	-	303.71
Base concrete	m3	1.01	2.70	2.70	2.70	2.20	2.20	2.20	2.20	1.70	1.70	1.70	23.01
Form	m2	1.29	2.27	2.27	2.27	2.22	2.22	2.22	2.22	2.17	2.17	2.17	23.49
Joint filler	m2	2.72	2.57	2.42	2.07	1.92	1.78	1.63	1.35	1.15	1.11	-	18.72

# L Type Retaining Wall BoQ

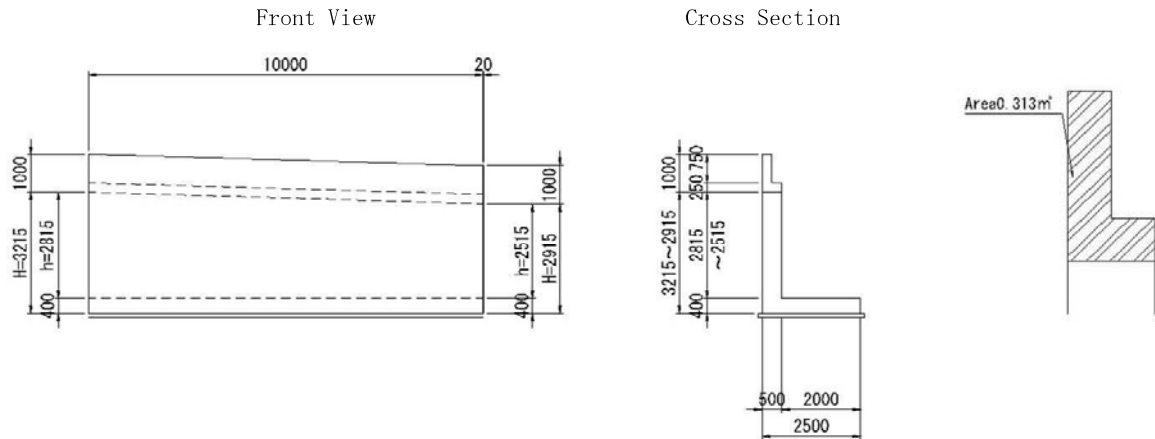
## Block1



• Concrete (WALL)	=	( 0.500 × 3.273 + 0.400 × 2.000 ) × 3.750	=	9.14 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 3.750	=	1.17 m <sup>3</sup>
• Form	=	( 3.273 + 1.000 ) × 2Place × 3.750 + ( 0.500 × 3.329 + 0.400 × 2.000 ) + ( 0.500 × 3.216 + 0.400 × 2.000 ) + 0.313 × 2Place	=	37.546 m <sup>2</sup>
• Steel bar (WALL overD16)	=	152.0	=	152.0 kg
• Steel bar (WALL D13)	=	297.0	=	297.0 kg
• Steel bar (HANDRAIL D10)	=	108.0	=	108.0 kg
• Scaffolding	=	( 3.273 + 2.873 + 1.000 + 1.000 ) × 3.750	=	30.55 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 3.750	=	1.01 m <sup>3</sup>
• " Form	=	0.100 × 3.750 × 2Place + 0.100 × 2.700 × 2Place	=	1.29 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 3.216 + 0.400 × 2.000 ) + 0.313	=	2.72 m <sup>2</sup>

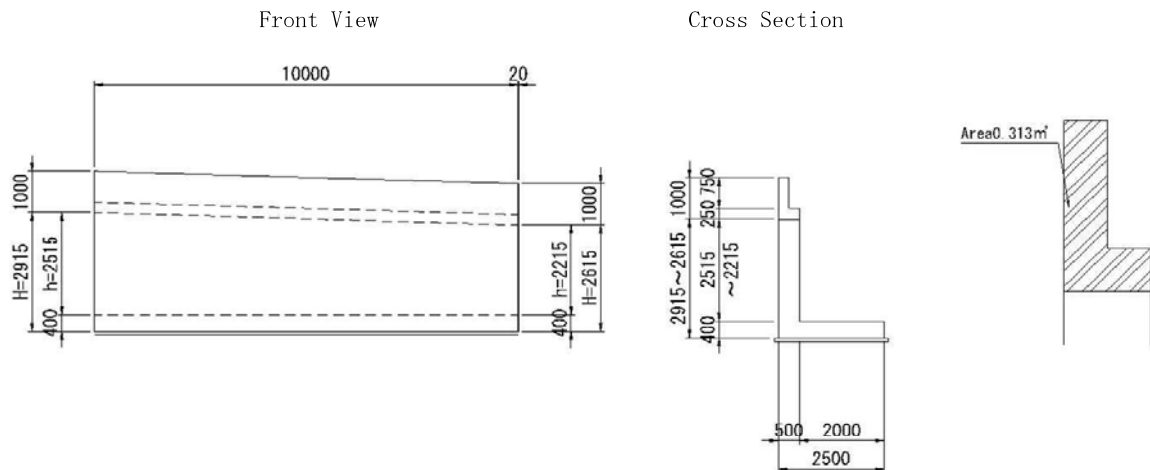
# L Type Retaining Wall BoQ

## Block2



• Concrete (WALL)	=	( 0.500 × 3.065 + 0.400 × 2.000 ) × 10.000	=	23.33 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 3.065 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.915 + 0.400 × 2.000 ) + 0.313 × 1Place	=	83.87 m <sup>2</sup>
• Steel bar (WALL overD16)	=	377.0	=	377.0 kg
• Steel bar (WALL D13)	=	783.0	=	783.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 3.065 + 2.665 + 1.000 + 1.000 ) × 10.000	=	77.30 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.915 + 0.400 × 2.000 ) + 0.313	=	2.57 m <sup>2</sup>

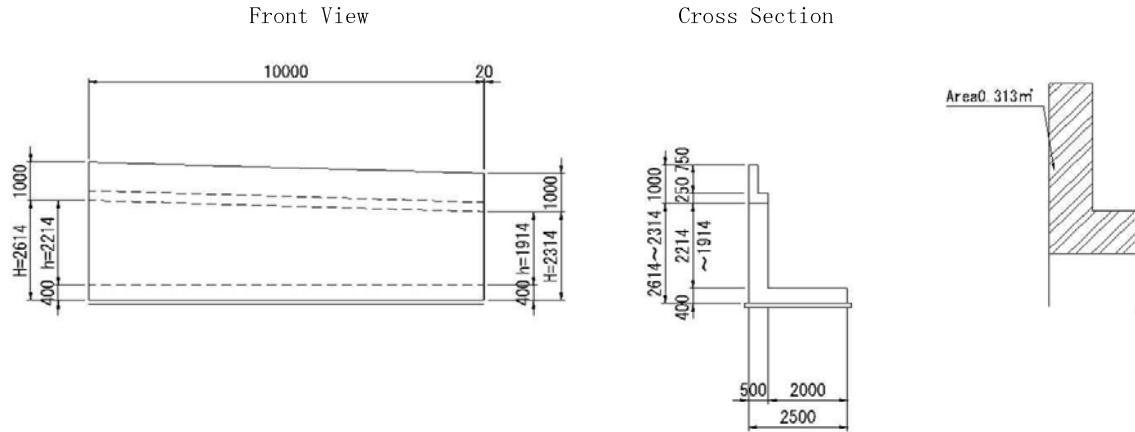
L Type Retaining Wall BoQ  
Block3



• Concrete (WALL)	=	( 0.500 × 2.765 + 0.400 × 2.000 ) × 10.000	=	21.83 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.765 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.615 + 0.400 × 2.000 ) + 0.313 × 1Place	=	77.721 m <sup>2</sup>
• Steel bar (WALL overD16)	=	358.0	=	358.0 kg
• Steel bar (WALL D13)	=	720.0	=	720.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.765 + 2.365 + 1.000 + 1.000 ) × 10.000	=	71.30 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.615 + 0.400 × 2.000 ) + 0.313	=	2.42 m <sup>2</sup>

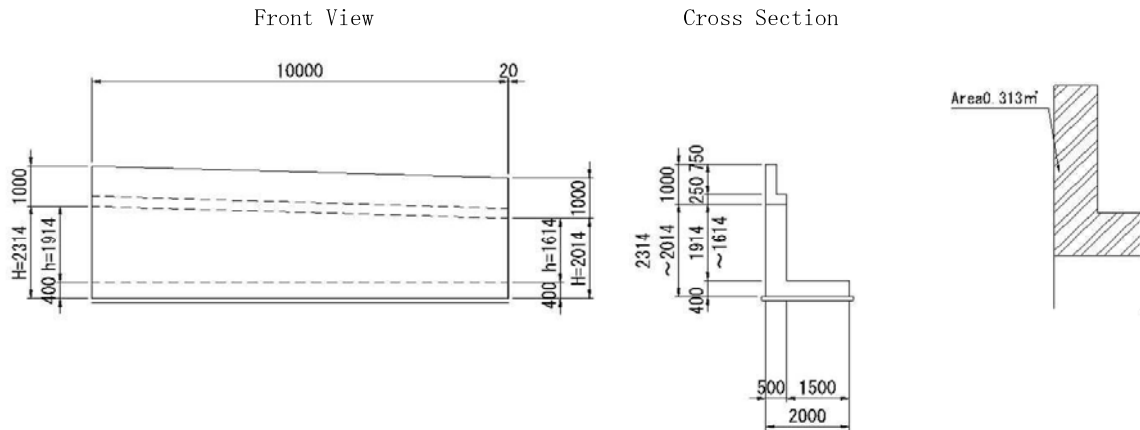
# L Type Retaining Wall BoQ

## Block4



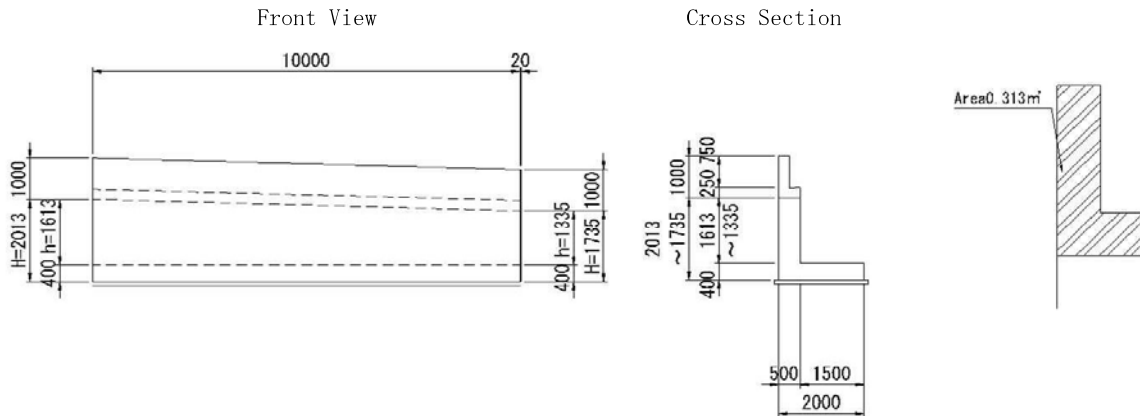
• Concrete (WALL)	=	( 0.500 × 2.464 + 0.400 × 2.000 ) × 10.000	=	20.32 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.464 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.314 + 0.400 × 2.000 ) + 0.313 × 1Place	=	71.55 m <sup>2</sup>
• Steel bar (WALL overD16)	=	338.0	=	338.0 kg
• Steel bar (WALL D13)	=	687.0	=	687.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.464 + 2.064 + 1.000 + 1.000 ) × 10.000	=	65.28 m <sup>2</sup>
• Base concrete	=	2.700 × 0.100 × 10.000	=	2.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.700 × 1Place	=	2.27 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.314 + 0.400 × 1.500 ) + 0.313	=	2.07 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block5



• Concrete (WALL)	=	( 0.500 × 2.164 + 0.400 × 1.500 ) × 10.000	=	16.82 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 2.164 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 2.014 + 0.400 × 1.500 ) + 0.313 × 1Place	=	65.20 m <sup>2</sup>
• Steel bar (WALL D13)	=	752.0	=	752.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Scaffolding	=	( 2.164 + 1.764 + 1.000 + 1.000 ) × 10.000	=	59.28 掛m <sup>2</sup>
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.200 × 1Place	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 2.014 + 0.400 × 1.500 ) + 0.313	=	1.92 m <sup>2</sup>

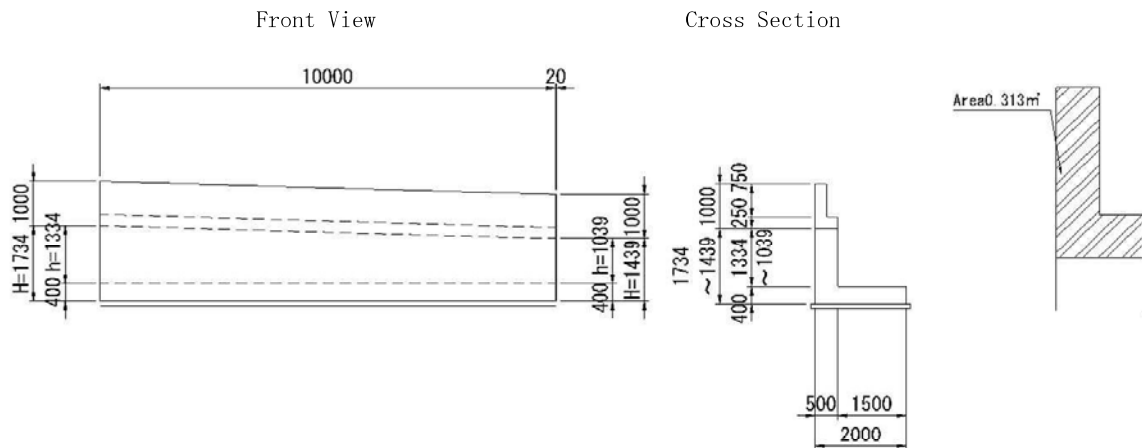
L Type Retaining Wall BoQ  
Block6



• Concrete (WALL)	=	( 0.500 × 1.874 + 0.400 × 1.500 ) × 10.000	=	15.37 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.874 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.735 + 0.400 × 1.500 ) + 0.313 × 1Place	=	59.261 m <sup>2</sup>
• Steel bar (WALL D13)	=	697.0	=	697.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.200 × 1Place	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.735 + 0.400 × 1.500 ) + 0.313	=	1.78 m <sup>2</sup>

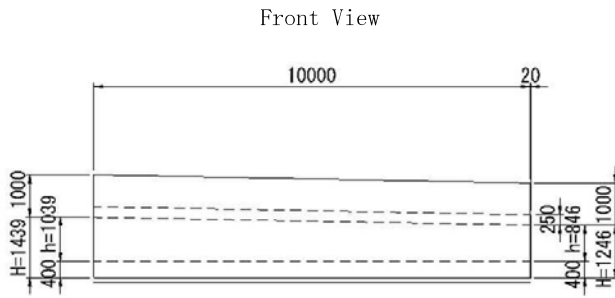


L Type Retaining Wall BoQ  
Block7

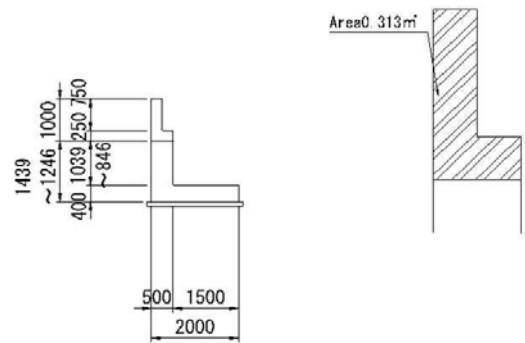


• Concrete (WALL)	=	( 0.500 × 1.587 + 0.400 × 1.500 ) × 10.000	=	13.94 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.587 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.439 + 0.400 × 1.500 ) + 0.313 × 1Place	=	53.37 m <sup>2</sup>
• Steel bar (WALL D13)	=	654.0	=	654.0 kg
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0 kg
• Base concrete	=	2.200 × 0.100 × 10.000	=	2.20 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 2.200 × 1Place	=	2.22 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.439 + 0.400 × 1.500 ) + 0.313	=	1.63 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block8

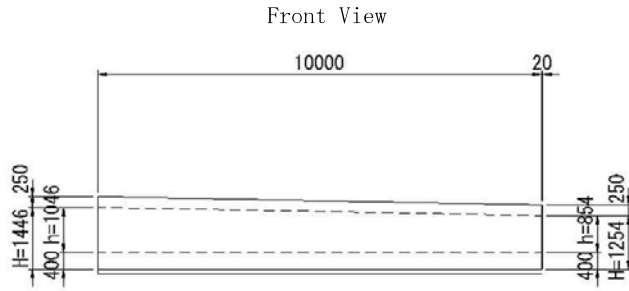


Cross Section

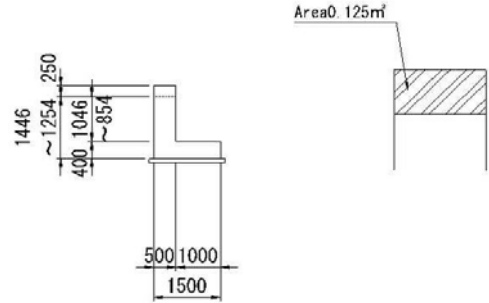


• Concrete (WALL)	=	(	0.500	×	1.343	+	0.400	×	1.500	)	×	10.000	=	12.72	m <sup>3</sup>												
• Concrete (HANDRAIL)	=	0.313	×	10.000	=	3.13	m <sup>3</sup>																				
• Form	=	(	1.343	+	1.000	)	×	2Place	×	10.000	+ (	0.500	×	1.246	+	0.400	×	1.500	)	+ 0.313	×	1Place	=	48.396	=	48.40	m <sup>2</sup>
• Steel bar (WALL D13)	=	605.0	=	605.0	=	605.0	kg																				
• Steel bar (HANDRAIL D10)	=	297.0	=	297.0	=	297.0	kg																				
• Base concrete	=	2.200	×	0.100	×	10.000	=	2.20	m <sup>3</sup>																		
• " Form	=	0.100	×	10.000	×	2Place	+ 0.100	×	2.200	×	1Place	=	2.22	m <sup>2</sup>													
• Joint filler (t=20mm)	=	(	0.500	×	1.246	+	0.400	×	1.500	)	+ 0.500	×	0.250	=	1.348	=	1.35	m <sup>2</sup>									

L Type Retaining Wall BoQ  
Block9

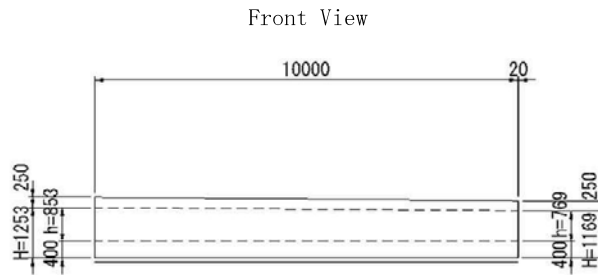


Cross Section

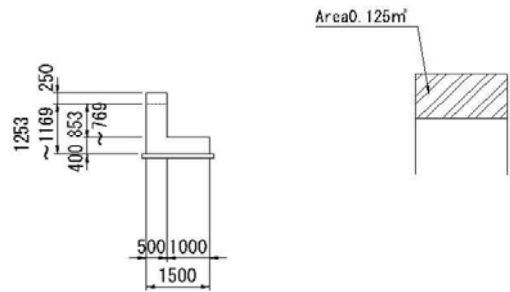


• Concrete (WALL)	=	( 0.500 × 1.350 + 0.400 × 1.000 ) × 10.000	=	10.75 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.125 × 10.000	=	1.25 m <sup>3</sup>
• Form	=	( 1.350 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.254 + 0.400 × 1.000 ) + 0.125 × 1Place	=	48.15 m <sup>2</sup>
• Steel bar (WALL D13)	=	500.0	=	500.0 kg
• Steel bar (HANDRAIL D10)	=	77.0	=	77.0 kg
• Base concrete	=	1.700 × 0.100 × 10.000	=	1.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 1.700 × 1Place	=	2.17 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.254 + 0.400 × 1.000 ) + 0.125	=	1.15 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block9

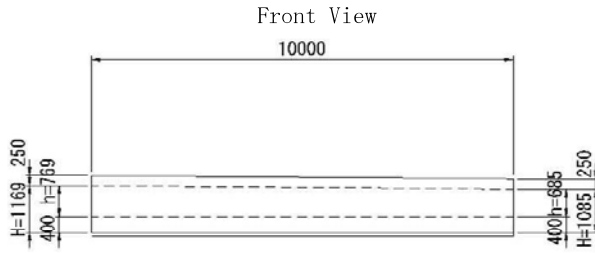


Cross Section

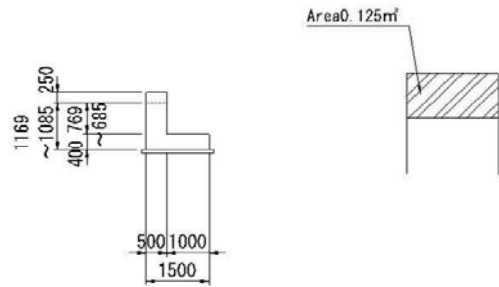


• Concrete (WALL)	=	( 0.500 × 1.211 + 0.400 × 1.000 ) × 10.000	=	10.06 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.125 × 10.000	=	1.25 m <sup>3</sup>
• Form	=	( 1.211 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.169 + 0.400 × 1.000 ) + 0.125 × 1Place	=	45.33 m <sup>2</sup>
• Steel bar (WALL D13)	=	469.0	=	469.0 kg
• Steel bar (HANDRAIL D10)	=	77.0	=	77.0 kg
• Base concrete	=	1.700 × 0.100 × 10.000	=	1.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 1.700 × 1Place	=	2.17 m <sup>2</sup>
• Joint filler (t=20mm)	=	( 0.500 × 1.169 + 0.400 × 1.000 ) + 0.125	=	1.11 m <sup>2</sup>

L Type Retaining Wall BoQ  
Block11

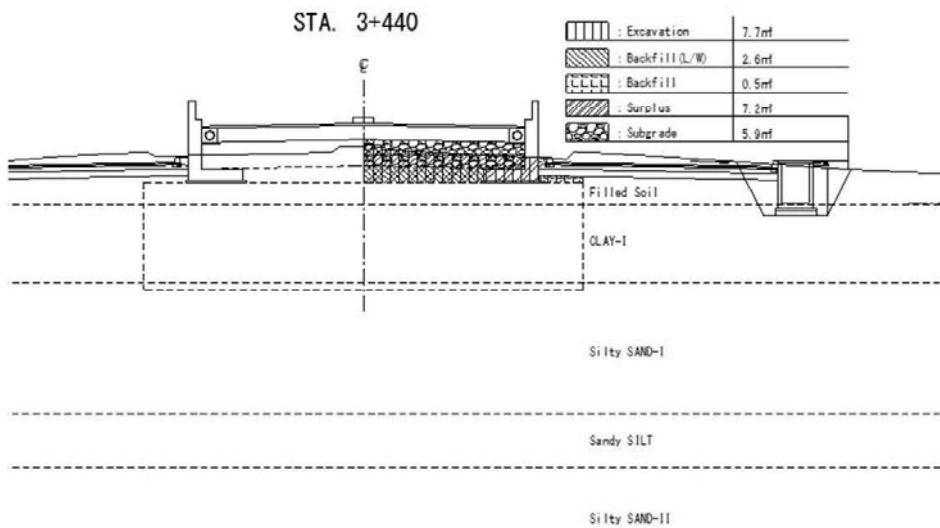
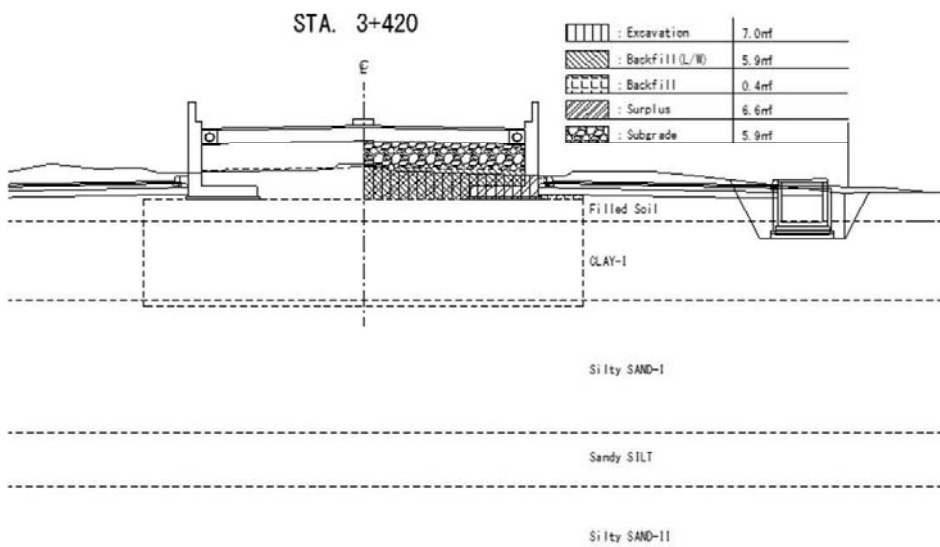
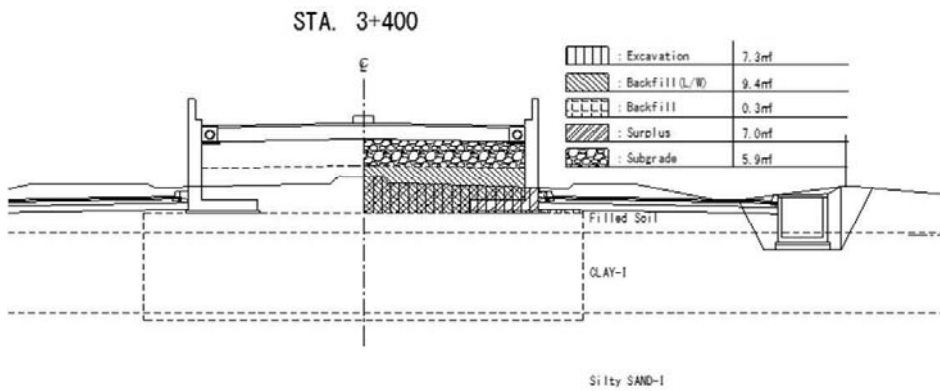


Cross Section

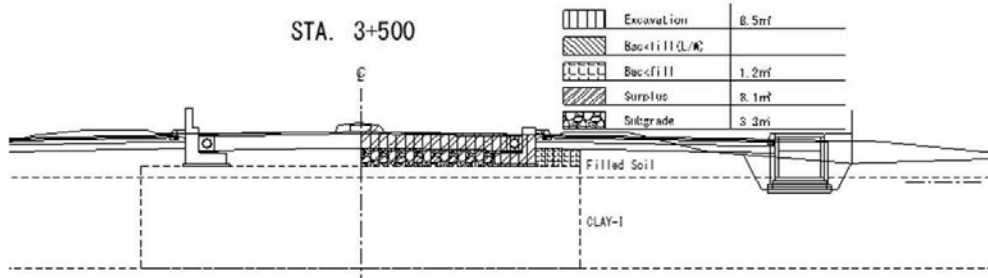
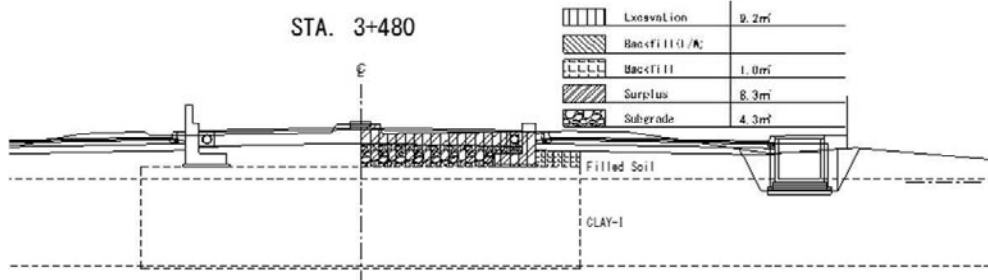
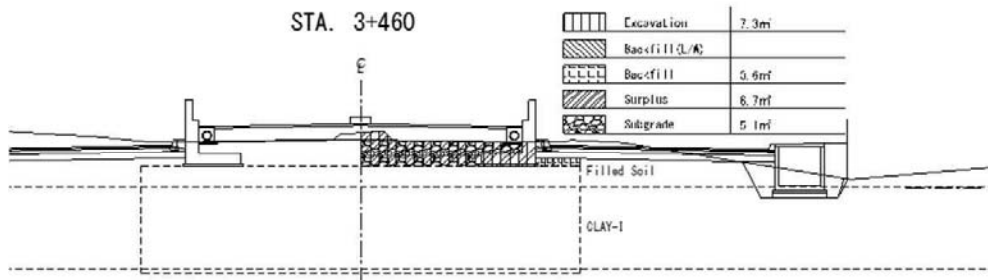


• Concrete (WALL)	=	( 0.500 × 1.127 + 0.400 × 1.000 ) × 10.000	=	9.64 m <sup>3</sup>
• Concrete (HANDRAIL)	=	0.313 × 10.000	=	3.13 m <sup>3</sup>
• Form	=	( 1.127 + 1.000 ) × 2Place × 10.000 + ( 0.500 × 1.085 + 0.400 × 1.000 ) + 0.125 × 1Place	=	43.61 m <sup>2</sup>
• Steel bar (WALL D13)	=	463.0	=	463.0 kg
• Steel bar (HANDRAIL D10)	=	77.0	=	77.0 kg
• Base concrete	=	1.700 × 0.100 × 10.000	=	1.70 m <sup>3</sup>
• " Form	=	0.100 × 10.000 × 2Place + 0.100 × 1.700 × 1Place	=	2.17 m <sup>2</sup>

# Soil work(L Type Retaining Wall)①



# Soil work(L Type Retaining Wall)②



## Soil work (Excavation)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		7.3			apply STA. 3+400
STA. 3+400	3.950	7.3	7.30	28.8	
STA. 3+420	20.000	7.0	7.15	143.0	
STA. 3+440	20.000	7.7	7.35	147.0	
STA. 3+460	20.000	7.3	7.50	150.0	
STA. 3+480	20.000	9.2	8.25	165.0	
STA. 3+500	20.000	8.5	8.85	177.0	
Total				810.8 m3	



Soil work (Backfill • L Type Retaining/W)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		9.4			apply STA. 3+400
STA. 3+400	3.950	9.4	9.40	37.1	
STA. 3+420	20.000	5.9	7.65	153.0	
STA. 3+440	20.000	2.6	4.25	85.0	
STA. 3+460	20.000	0.0	1.30	26.0	
STA. 3+480	20.000	0.0	0.00	0.0	
STA. 3+500	20.000	0.0	0.00	0.0	
Total				301.1 m3	

## Soil work (Backfill)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		0.3			apply STA. 3+400
STA. 3+400	3.950	0.3	0.30	1.2	
STA. 3+420	20.000	0.4	0.35	7.0	
STA. 3+440	20.000	0.5	0.45	9.0	
STA. 3+460	20.000	0.6	0.55	11.0	
STA. 3+480	20.000	1.0	0.80	16.0	
STA. 3+500	20.000	1.2	1.10	22.0	
Total				66.2 m3	

Soil work (Surplus Sat change rate 0.9)

Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		7.0			apply STA. 3+400
STA. 3+400	3.950	7.0	7.00	27.7	
STA. 3+420	20.000	6.6	6.80	136.0	
STA. 3+440	20.000	7.2	6.90	138.0	
STA. 3+460	20.000	6.7	6.95	139.0	
STA. 3+480	20.000	8.3	7.50	150.0	
STA. 3+500	20.000	8.1	8.20	164.0	
Total				754.7 m3	
				838.6 m3	
				(Surplus Sat change rate 0.9)	

## Soil work (Subgrade)

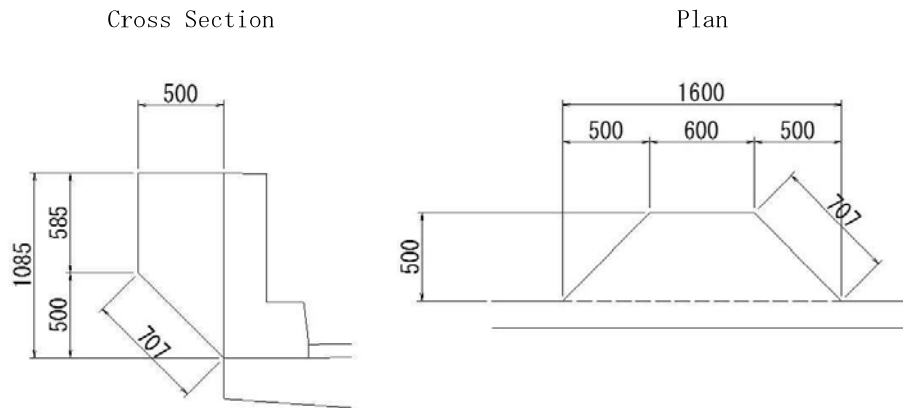
Station	Distance	Area	Ave. area	Volume	Note
STA. 3+396.050		5.9			apply STA. 3+400
STA. 3+400	3.950	5.9	5.90	23.3	
STA. 3+420	20.000	5.9	5.90	118.0	
STA. 3+440	20.000	5.9	5.90	118.0	
STA. 3+460	20.000	5.1	5.50	110.0	
STA. 3+480	20.000	4.3	4.70	94.0	
STA. 3+500	20.000	3.3	3.80	76.0	
Total				539.3 m3	

§ 4. LIGHTING FOUNDATION BoQ

Total BoQ of Lighting Foundation

Items		Code	Unit	Quantity	Note
Lighting Foundation	Concrete	$\sigma_{ck}=24\text{N/mm}^2$	m <sup>3</sup>	3.22	
	Form		m <sup>2</sup>	18.21	
	Steel bar	SD345	kg	280.0	

Lighting Foundation



1) Concrete ( $\sigma_{ck} = 24 \text{ N/mm}^2$ )

Area

$$a1 = 1/2 \times ( 0.600 + 1.600 ) \times 0.500 = 0.5500 \text{ m}^2$$

Concrete Volume

$$V1 = 0.550 \times 0.585 \times 7 = 2.252 \text{ m}^3$$

$$V2 = 0.550 \times 0.500 \times 1/2 \times 7 = 0.963 \text{ m}^3$$

$$\Sigma V = 3.215 \text{ m}^3$$

2) Form

Length

$$L1 = 0.707 \times 2 + 0.600 = 2.014 \text{ m}$$

Area

$$A1 = 2.014 \times ( 0.585 + 0.707 ) \times 7 = 18.215 \text{ m}^2$$

3) Steel bar

Type : SD345

$$D13 \quad 40 \times 7 = 280 \text{ kg}$$

§ 5. SOFT SOIL IMPROVEMENT MEASURES BoQ

Total BoQ of improvement

	Items	Unit	Quantity	Note
Soft soil Improvement	sets	set	1,149	
	Total improvement long	m	9,163.80	
	Total improvement area	m <sup>3</sup>	19,885.45	
	Solidifying material addition	t	5,965.64	cement-based (300kg/m <sup>3</sup> )

•DEEP IMPROVEMENT

REINFORCED EARTH AREA(quick=980kN/m <sup>2</sup> )											
Quick (kN/m <sup>2</sup> )	AREA	Improved radial	Section(m <sup>2</sup> )	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 area(m <sup>3</sup> )
980	A(L=11800)	1200mm@1000 2-axis	2.17	12.50	0.70	11.80	231	2887.50	161.70	2725.80	5914.99
	B(L=11300)	1200mm@1000 2-axis	2.17	12.00	0.70	11.30	120	1440.00	84.00	1356.00	2942.52
Subtotal							351	4327.50	245.70	4081.80	8857.51
790	C(L=11800)	1200mm@1000 2-axis	2.17	12.50	0.70	11.80	168	2100.00	117.60	1982.40	4301.81
	D(L=11300)	1200mm@1000 2-axis	2.17	12.00	0.70	11.30	84	1008.00	58.80	949.20	2059.76
Subtotal							252	3108.00	176.40	2931.60	6361.57
L TYPE RETAINING WALL AREA(quick=660kN/m <sup>2</sup> )											
660	E(L=4000)	1200mm@1000 2-axis	2.17	4.60	0.60	4.00	378	1738.80	226.80	1512.00	3281.04
	F(L=3800)	1200mm@1000 2-axis	2.17	4.40	0.60	3.80	168	739.20	100.80	638.40	1385.33
Subtotal							546	2478.00	327.60	2150.40	4666.37
Total							1149	9913.50	749.70	9163.80	19885.45



#### ξ4 .Quantity breakdown sheet

## §4-1. 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	5,290.6			-1,687.0	3,603.6	
	Gravel Removal	m3	396.0				396.0	
	Road Embankment	m3	34.0				34.0	
	Roadbed Embankment	m3	—				—	
Slope Works		m2	—				—	

## Earth Works

@ 1000.0 m

Station	Distance (m)	Cut			Bank			Remark
		Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	
STA.2 +800.000		11.8			3.4			
STA.2 +820.000	20.000		5.90	118.0		1.70	34.0	
STA.2 +835.298	15.298		0.00	0.0		0.00	0.0	
STA.2 +840.000	4.702	0.0	0.00	0.0		0.00	0.0	
STA.2 +860.000	20.000	3.5	1.75	35.0		0.00	0.0	
STA.2 +880.000	20.000	5.6	4.55	91.0		0.00	0.0	
STA.2 +900.000	20.000	8.6	7.10	142.0		0.00	0.0	
STA.2 +920.000	20.000	10.0	9.30	186.0		0.00	0.0	
STA.2 +940.000	20.000	11.6	10.80	216.0		0.00	0.0	
STA.2 +960.000	20.000	12.4	12.00	240.0		0.00	0.0	
STA.2 +961.571	1.571	12.1	12.25	19.2		0.00	0.0	
STA.2 +980.000	18.429	18.4	15.25	281.0		0.00	0.0	
STA.3 +0.000	20.000	12.9	15.65	313.0		0.00	0.0	
STA.3 +14.383	14.383	12.3	12.60	181.2		0.00	0.0	
STA.3 +20.000	5.617	12.0	12.15	68.2		0.00	0.0	
STA.3 +40.000	20.000	10.5	11.25	225.0		0.00	0.0	
STA.3 +60.000	20.000	8.5	9.50	190.0		0.00	0.0	
STA.3 +80.000	20.000	7.0	7.75	155.0		0.00	0.0	
STA.3 +100.000	20.000	6.9	6.95	139.0		0.00	0.0	
STA.3 +120.000	20.000	4.5	5.70	114.0		0.00	0.0	
STA.3 +140.000	20.000	6.2	5.35	107.0		0.00	0.0	
STA.3 +160.000	20.000	0.0	3.10	62.0		0.00	0.0	
STA.3 +180.000	20.000	3.9	1.95	39.0		0.00	0.0	
STA.3 +200.000	20.000	5.9	4.90	98.0		0.00	0.0	
STA.3 +220.000	20.000	7.1	6.50	130.0		0.00	0.0	
STA.3 +240.000	20.000	8.2	7.65	153.0		0.00	0.0	
STA.3 +260.000	20.000	9.5	8.85	177.0		0.00	0.0	
STA.3 +280.000	20.000	11.6	10.55	211.0		0.00	0.0	Abutment
STA.3 +280.000	0.000	11.6	11.60	0.0		0.00	0.0	
STA.3 +300.000	20.000	9.2	10.40	208.0		0.00	0.0	
STA.3 +320.000	20.000	9.5	9.35	187.0		0.00	0.0	
STA.3 +340.000	20.000	8.7	9.10	182.0		0.00	0.0	
STA.3 +360.000	20.000	9.5	9.10	182.0		0.00	0.0	
STA.3 +380.000	20.000	5.0	7.25	145.0		0.00	0.0	
STA.3 +400.000	20.000	6.1	5.55	111.0		0.00	0.0	
STA.3 +420.000	20.000	5.0	5.55	111.0		0.00	0.0	
<b>Total</b>	<b>620.000</b>			<b>4,816.6</b>			<b>34.0</b>	
<b>Total Volume</b>				<b>4,816.6</b>			<b>34.0</b>	

### Earth Works

@ 1000.0 m

Station	Distance (m)	Cut			Bank			Remark
		Area(m2)	Average(m)	Volume(m3)	Area(m2)	Average(m)	Volume(m3)	
STA.3 +420.000		5.0						
STA.3 +440.000	20.000	4.6	4.80	96.0		0.00	0.0	
STA.3 +460.000	20.000	2.8	3.70	74.0		0.00	0.0	
STA.3 +480.000	20.000	2.4	2.60	52.0		0.00	0.0	
STA.3 +500.000	20.000	1.6	2.00	40.0		0.00	0.0	
STA.3 +520.000	20.000	5.8	3.70	74.0		0.00	0.0	
STA.3 +540.000	20.000	4.0	4.90	98.0		0.00	0.0	
STA.3 +560.000	20.000	0.0	2.00	40.0		0.00	0.0	
Total	140.000			474.0			0.0	
Total Volume				5,290.6			34.0	

## Earth Works

@ 1000.0 m

Station	Distance (m)	Gravel Removal						Remark
		Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	
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				

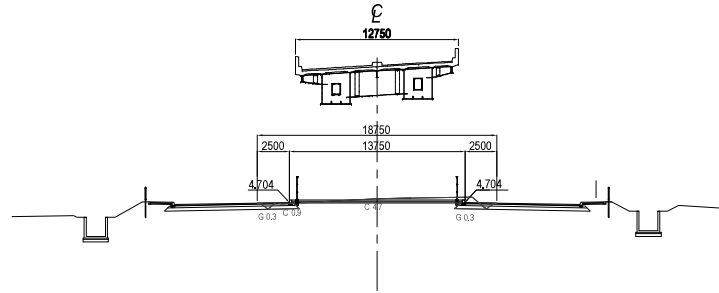
## Earth Works

@ 1000.0 m

Station	Distance (m)	Gravel Removal						Remark
		Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	Area(m <sup>2</sup> )	Average(m)	Volume(m <sup>3</sup> )	
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	20.000		0.00	0.0				
Total	140.000			54.0				
Total Volume				396.0				

# CROSS SECTION(2) S= 1:400

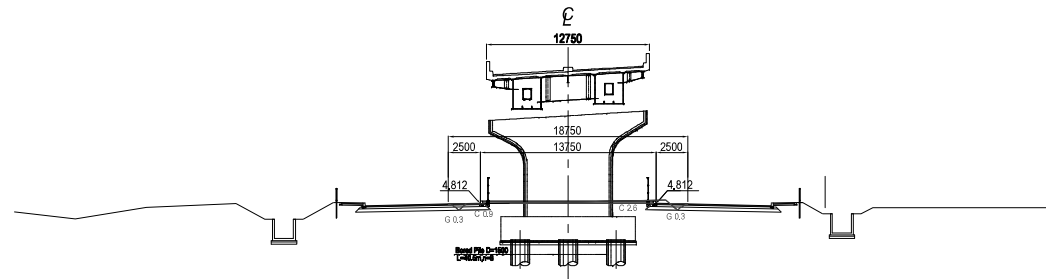
STA. 2+880  
GH = 4.98  
PH1 = 4.654



DL=3.00

C	m <sup>2</sup> /m	5.6	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

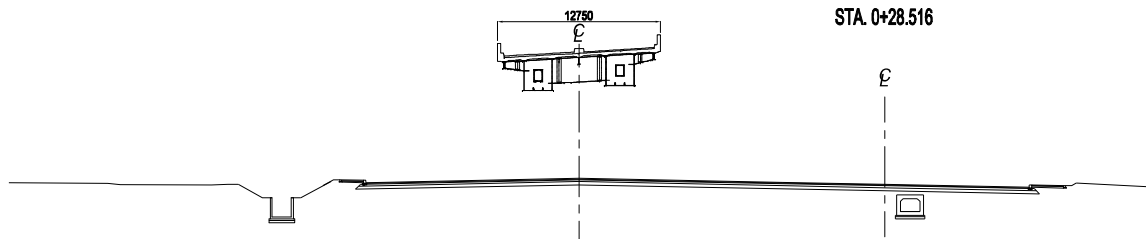
STA. 2+860  
GH = 4.88  
PH1 = 4.762



DL=3.00

C	m <sup>2</sup> /m	3.5	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 2+840  
GH = 4.91  
PH1 = 4.869



DL=3.00

SHUKHINTHAR MAYO PAT ROAD  
STA. 0+28.516

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

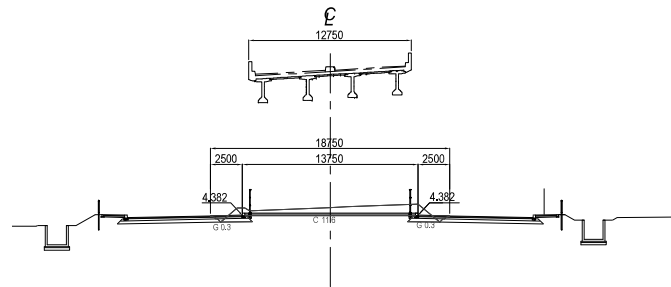
106

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b> K. TACHIBANA	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(2) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b>				<b>DWG No.</b> P0-RD-0410
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				



# CROSS SECTION(3) S= 1:400

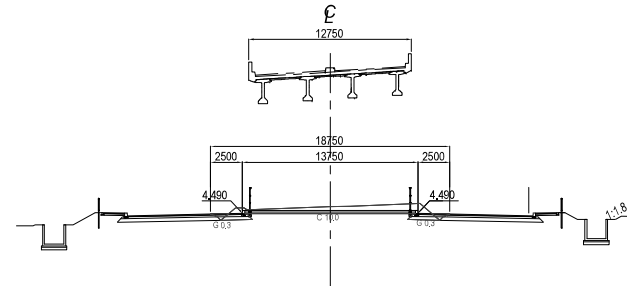
STA. 2+940  
GH = 4,99  
PH 1= 4.332



DL=3.00

C	m <sup>2</sup> /m	11.6	gravel removal 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

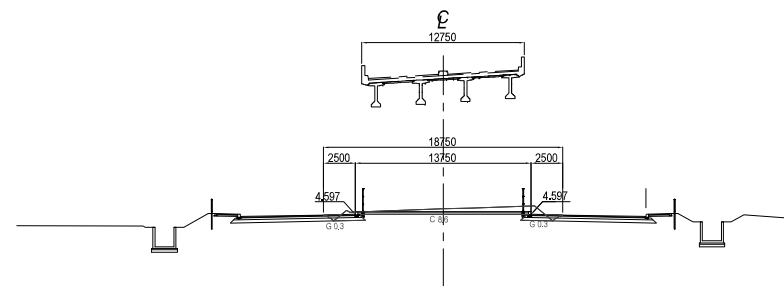
STA. 2+920  
GH = 5,01  
PH1 = 4,440



DL=3.00

C	m <sup>2</sup> /m	10.0	gravel removal 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 2+900  
GH = 5,04  
PH 1= 4,547



DL=3.00

C	m <sup>2</sup> /m	8.6	gravel removal 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

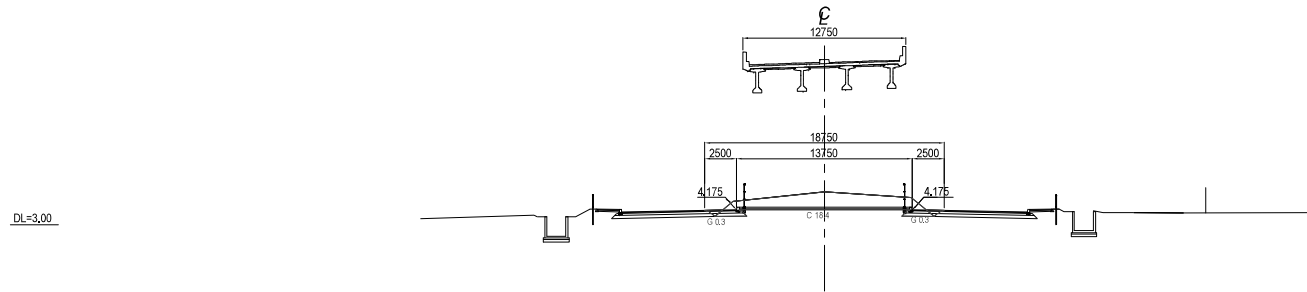
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

107

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>PREPARED BY</b> K. TACHIBANA	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(3) S= 1:400	<b>PACKAGE</b> 3
				<b>CHECKED BY</b> T. HAYAKAWA	<b>APPROVED BY</b> Y. SANO	<b>DWG No.</b> P3-RD-0420		

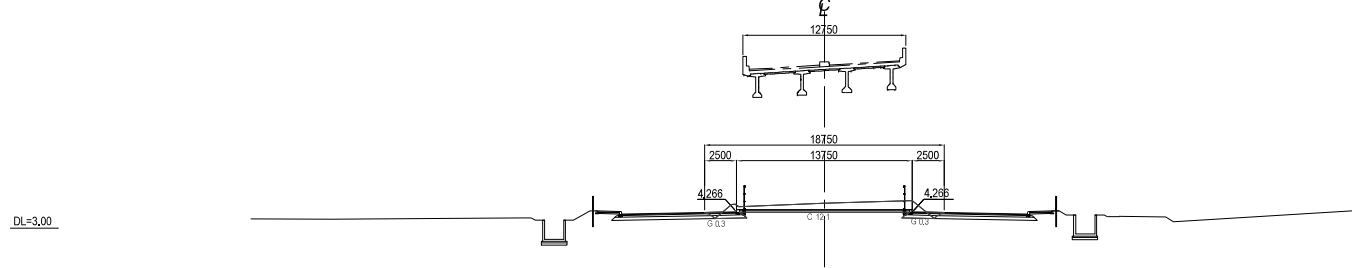
# CROSS SECTION(4) S= 1:400

STA. 2+980  
GH = 5.58  
PH1 = 4.125



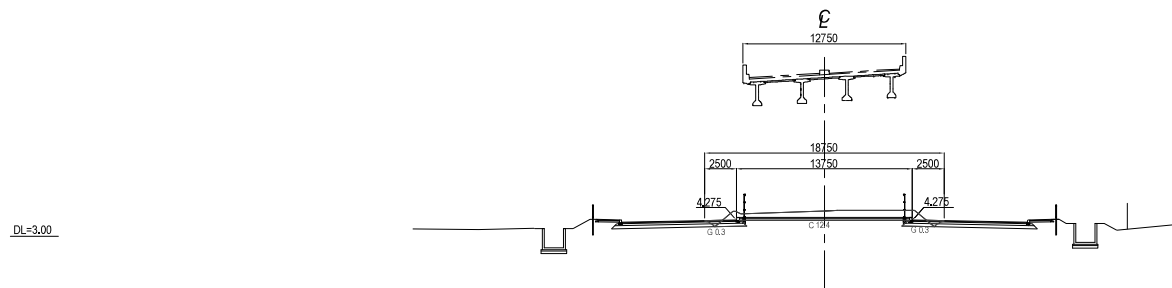
C	m/m	18.4	gravel removal 0.5m3
B	m/m	0.0	
SS	m/m	0.0	
LL	m/m	0.0	
RL	m/m	0.0	

STA. 2+961.571  
GH = 4.95  
PH1 = 4.216



C	m/m	12.1	gravel removal 0.5m3
B	m/m	0.0	
SS	m/m	0.0	
LL	m/m	0.0	
RL	m/m	0.0	

STA. 2+960  
GH = 4.97  
PH1=4.225



C	m/m	12.4	gravel removal 0.5m3
B	m/m	0.0	
SS	m/m	0.0	
LL	m/m	0.0	
RL	m/m	0.0	

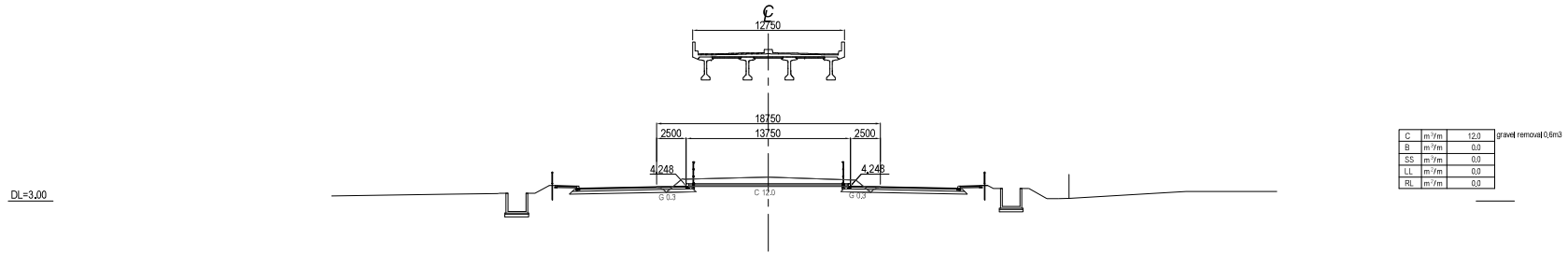
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

108

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b> K. TACHIBANA	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(4) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b>	<b>CHECKED BY</b> T. HAYAKAWA	<b>APPROVED BY</b> Y. SANO		<b>DWG No.</b> P3-RD-0430

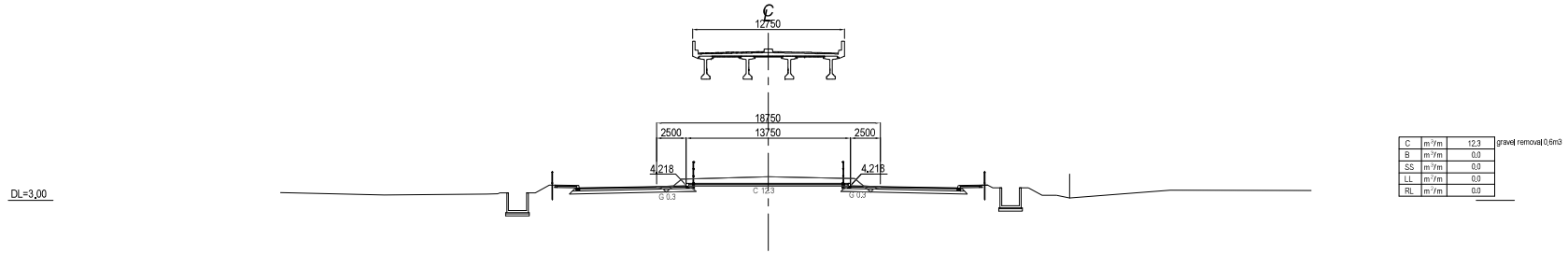
# CROSS SECTION(5) S= 1:400

STA. 3+020  
GH = 4.99  
PH1 = 4.198



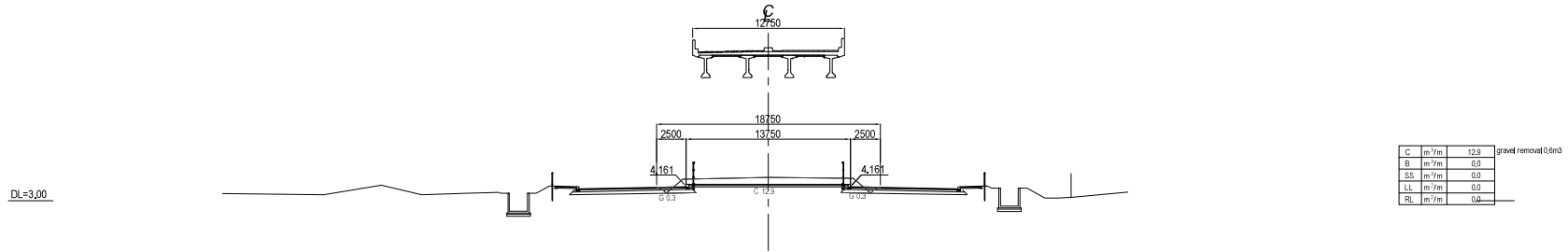
C	m <sup>2</sup> /m	12.0	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+014.383  
GH = 4.98  
PH1 = 4.168



C	m <sup>2</sup> /m	12.3	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+0.0  
GH = 4.92  
PH1 = 4.111



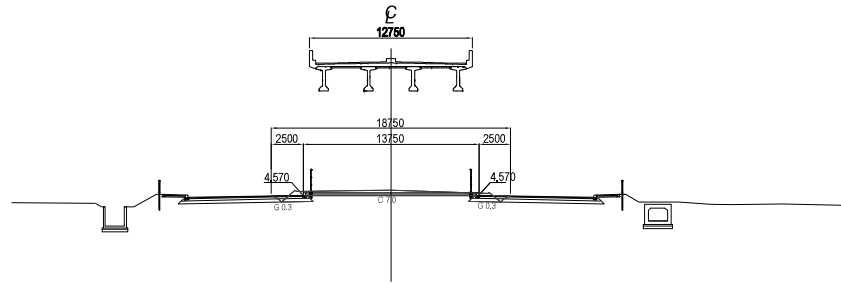
C	m <sup>2</sup> /m	12.9	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(5) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0440
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(6) S= 1:400

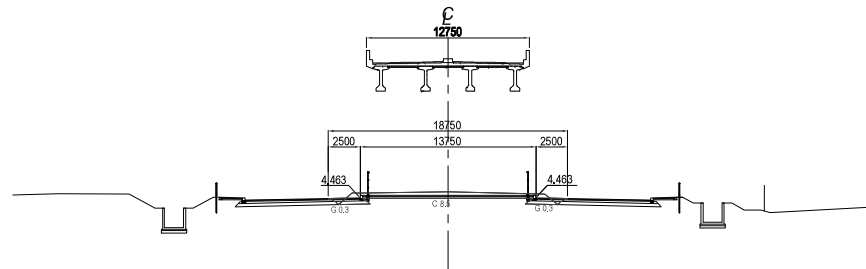
STA. 3+080  
GH = 4.96  
PH1 = 4.520



DL=3.00

C	m <sup>2</sup> /m	7.0	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

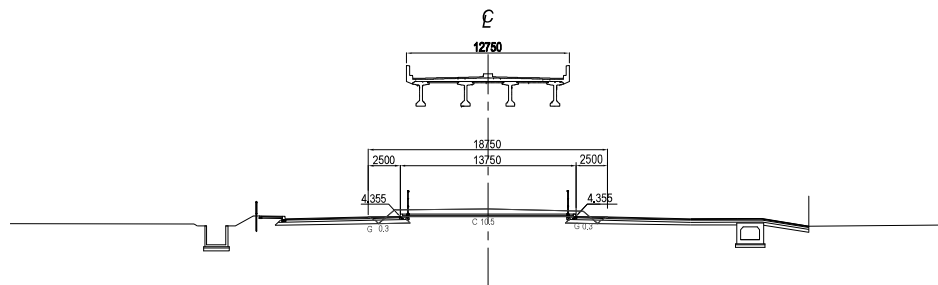
STA. 3+060  
GH = 4.95  
PH1 = 4.413



DL=3.00

C	m <sup>2</sup> /m	8.5	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+040  
GH = 4.97  
PH1 = 4.305



DL=3.00

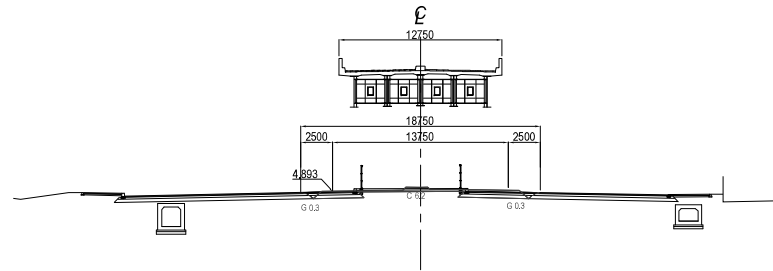
C	m <sup>2</sup> /m	10.5	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b> K. TACHIBANA	<b>SIGNATURE</b> _____	<b>DATE</b> _____	<b>DRAWING TITLE</b> CROSS SECTION(6) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> T. HAYAKAWA				<b>DWG No.</b> P3-RD-0450
				<b>CHECKED BY</b> Y. SANO				
				<b>APPROVED BY</b> _____				

# CROSS SECTION(7) S= 1:400

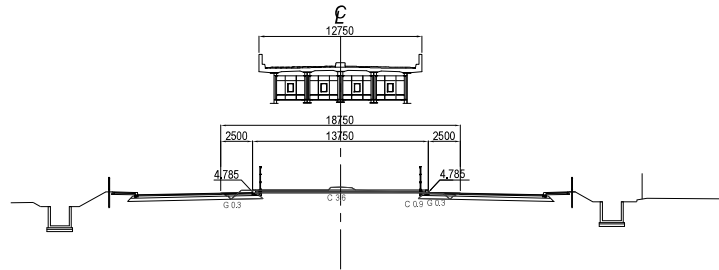
STA. 3+140  
GH = 5.22  
PH1 = 4.843



C	m <sup>2</sup> /m	6.2	gravel removed 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

DL=3.00

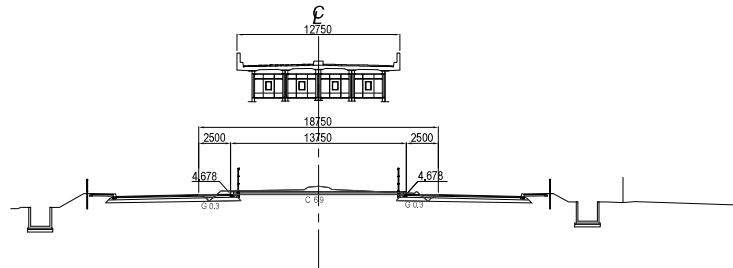
STA. 3+120  
GH = 5.22  
PH1 = 4.735



C	m <sup>2</sup> /m	4.5	gravel removed 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

DL=3.00

STA. 3+100  
GH = 5.30  
PH1 = 4.628



C	m <sup>2</sup> /m	6.9	gravel removed 0.6m3
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

DL=3.00

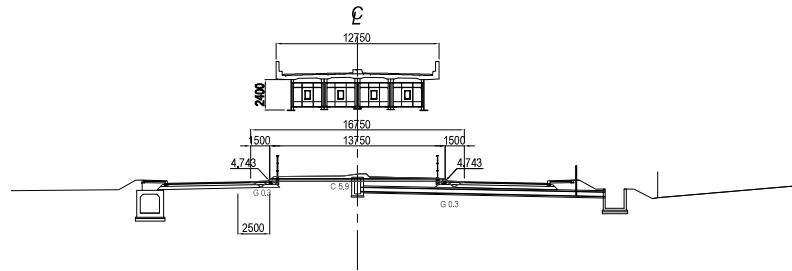
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

111

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>PREPARED BY</b> K. TACHIBANA	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(7) S= 1:400	<b>PACKAGE</b> 3
				<b>CHECKED BY</b> T. HAYAKAWA	<b>APPROVED BY</b> Y. SANO	<b>DWG No.</b> P3-RD-0460		

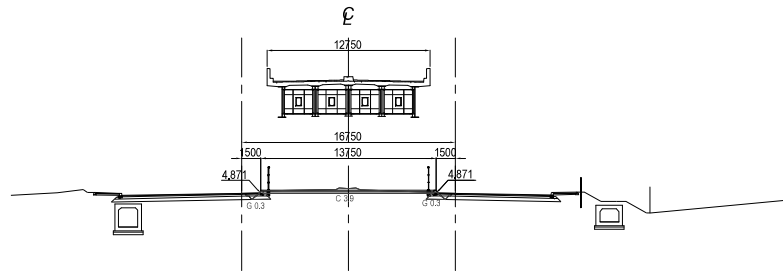
# CROSS SECTION(8) S= 1:400

STA. 3+200  
GH = 5.29  
PH2 = 4.713



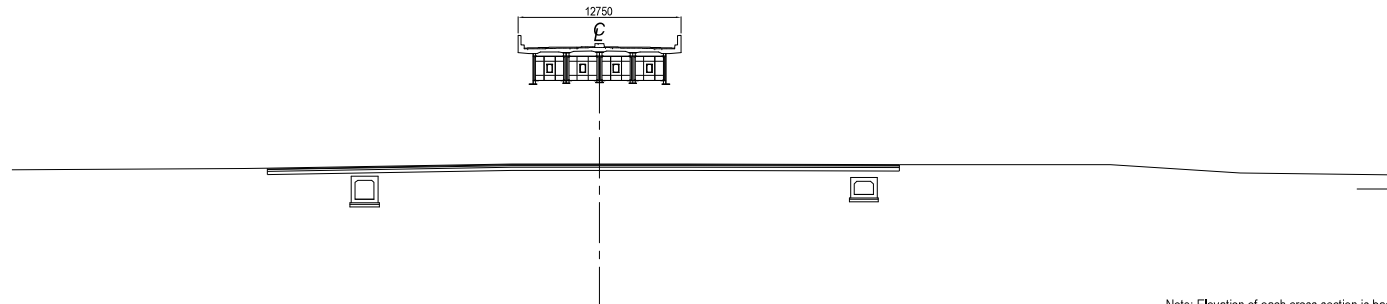
C	m <sup>2</sup> /m	5.9	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+180  
GH = 5.21  
PH2 = 4.841



C	m <sup>2</sup> /m	3.9	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

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



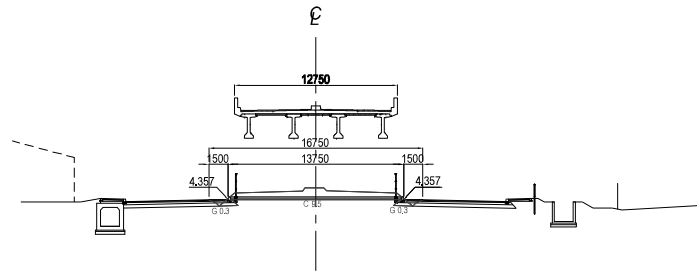
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

112

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(8) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0470
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(9) S= 1:400

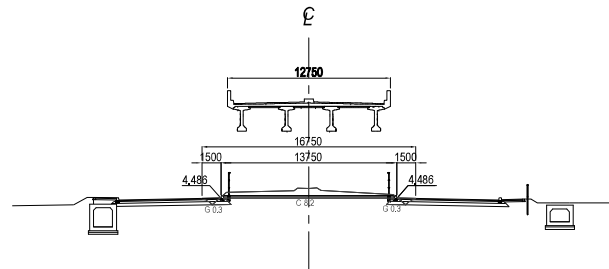
STA. 3+260  
GH = 5.24  
PH2 = 4.327



DL=3.00

C	m7/m	5.6	gravelremoval0.6m3
B	m7/m	0.0	
SS	m7/m	0.0	
LL	m7/m	0.0	
RL	m7/m	0.0	

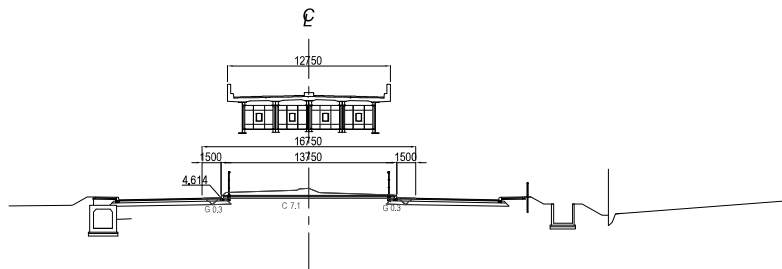
STA. 3+240  
GH = 5.25  
PH2 = 4.456



DL=3.00

C	m7/m	8.2	gravelremoval0.6m3
B	m7/m	0.0	
SS	m7/m	0.0	
LL	m7/m	0.0	
RL	m7/m	0.0	

STA. 3+220  
GH = 5.36  
PH2 = 4.584



DL=3.00

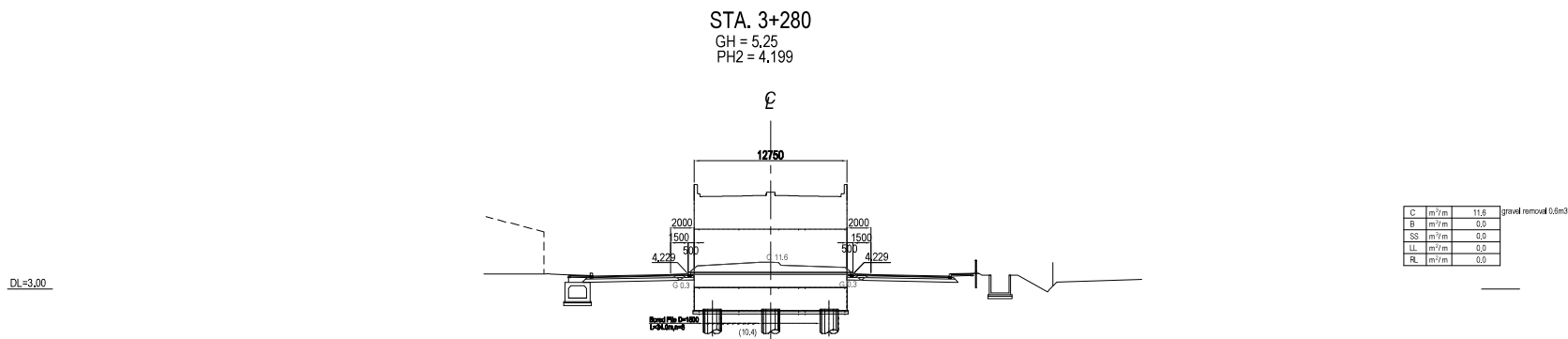
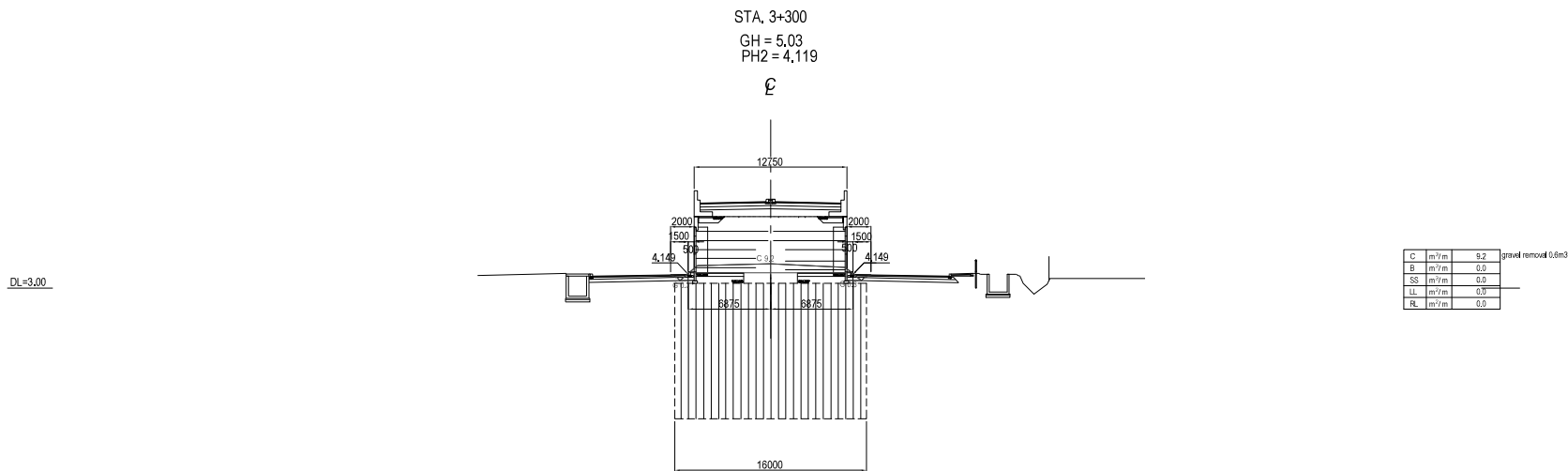
C	m7/m	7.1	gravelremoval0.6m3
B	m7/m	0.0	
SS	m7/m	0.0	
LL	m7/m	0.0	
RL	m7/m	0.0	

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

113

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CONSULTANT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(9) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0480
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(10) S= 1:400



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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(10) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0480
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

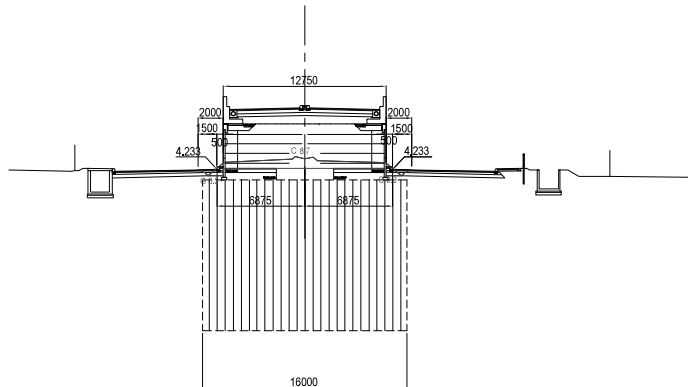


# CROSS SECTION(11) S= 1:400

STA. 3+340

GH = 5.06  
PH2 = 4.203

℄



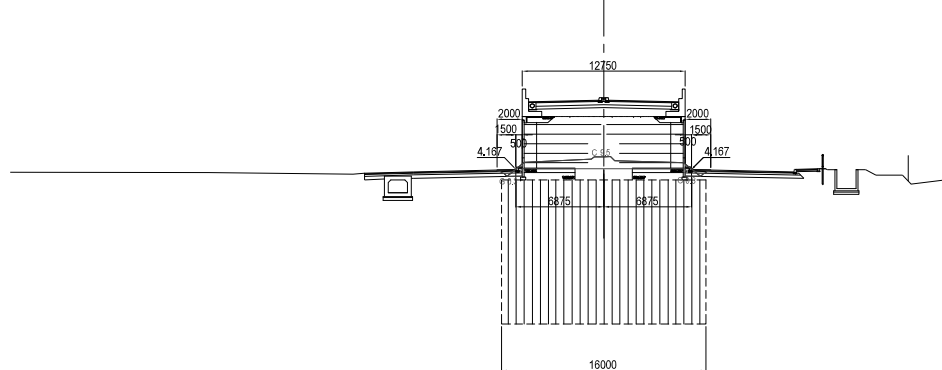
C	m <sup>2</sup> /m	8.7	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
R	m <sup>2</sup> /m	0.0	

DL=3.00

STA. 3+320

GH = 5.18  
PH2 = 4.137

℄



C	m <sup>2</sup> /m	9.5	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
R	m <sup>2</sup> /m	0.0	

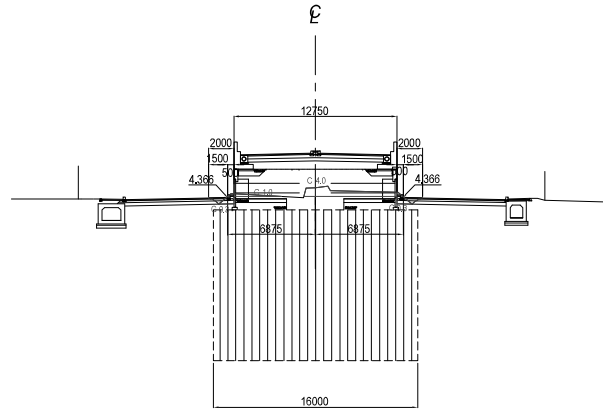
DL=3.00

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(11) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0500
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

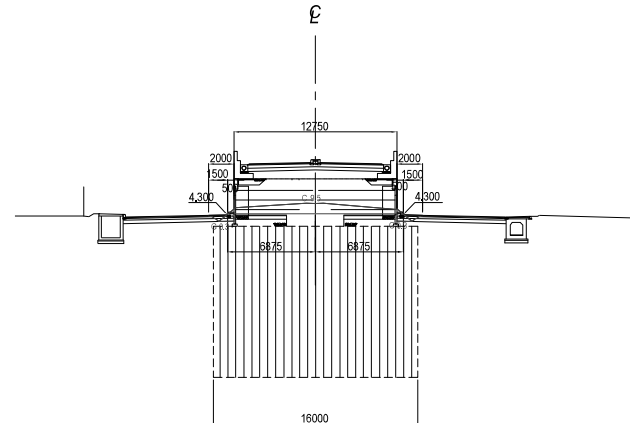
# CROSS SECTION(12) S= 1:400

STA. 3+380  
GH = 5.13  
PH2 = 4.336



C	m <sup>2</sup> /m	5.0	gravel removed 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
UL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+360  
GH = 5.20  
PH2 = 4.270



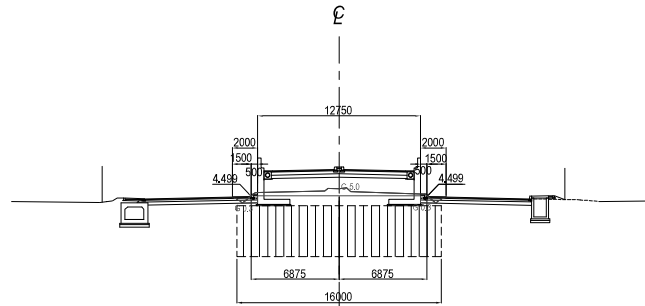
C	m <sup>2</sup> /m	5.0	gravel removed 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
UL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b> K. TACHIBANA	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(12) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b>	<b>CHECKED BY</b> T. HAYAKAWA	<b>APPROVED BY</b> Y. SANO		<b>DWG No.</b> P3-RD-0510

# CROSS SECTION(13) S= 1:400

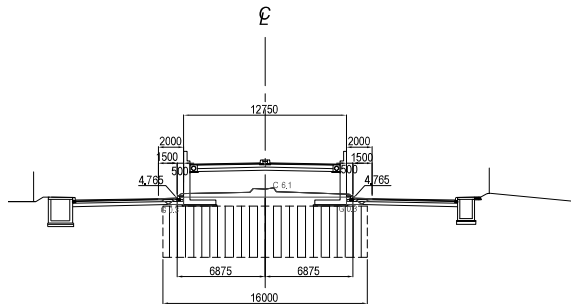
STA. 3+420  
GH = 5.12  
PH2= 4.469



DL=3.00

C	m <sup>3</sup> /m	5.0	gravel removal 0.6m <sup>3</sup>
B	m <sup>3</sup> /m	0.0	
SS	m <sup>3</sup> /m	0.0	
LL	m <sup>3</sup> /m	0.0	
RL	m <sup>3</sup> /m	0.0	

STA. 3+400  
GH = 5.15  
PH2 = 4.403



DL=3.00

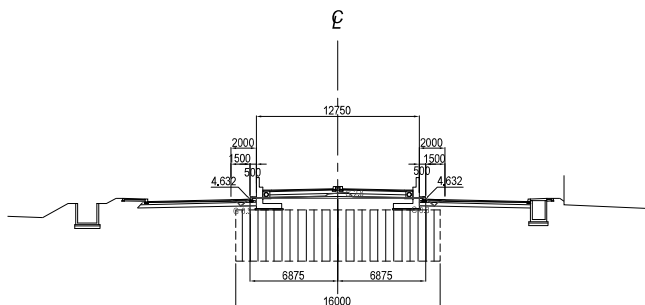
C	m <sup>3</sup> /m	6.1	gravel removal 0.6m <sup>3</sup>
B	m <sup>3</sup> /m	0.0	
SS	m <sup>3</sup> /m	0.0	
LL	m <sup>3</sup> /m	0.0	
RL	m <sup>3</sup> /m	0.0	

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(13) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0520
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(14) S= 1:400

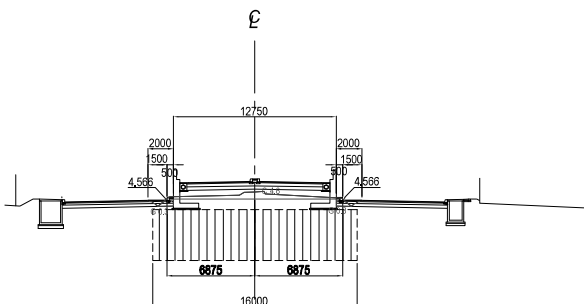
STA. 3+460  
GH = 5.11  
PH2 = 4.602



DL=3.00

C	m <sup>2</sup> /m	2.5	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LI	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+440  
GH = 5.19  
PH2 = 4.536



DL=3.00

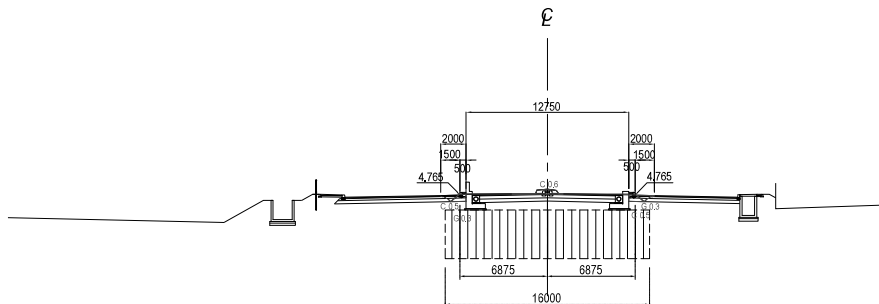
C	m <sup>2</sup> /m	4.0	gravel removal 0.0m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LI	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

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

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(14) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0530
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(15) S= 1:400

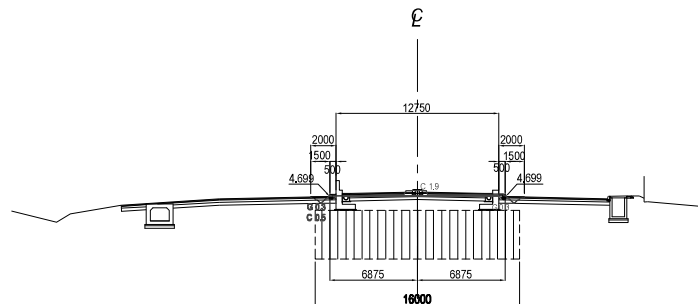
STA. 3+500  
GH = 5.23  
PH2 = 4.735



DL=3.00

C	m <sup>2</sup> /m	1.6	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

STA. 3+480  
GH = 5.16  
PH2 = 4.669



DL=3.00

C	m <sup>2</sup> /m	2.4	gravel removal 0.6m <sup>3</sup>
B	m <sup>2</sup> /m	0.0	
SS	m <sup>2</sup> /m	0.0	
LL	m <sup>2</sup> /m	0.0	
RL	m <sup>2</sup> /m	0.0	

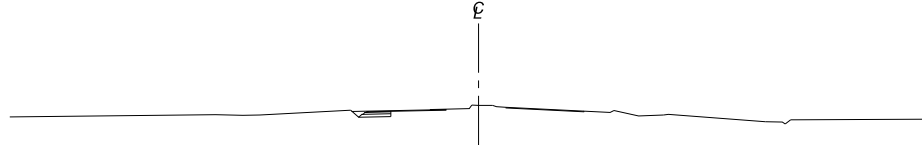
Note: Elevation of each cross section is based on Mean Sea Level (MSL).

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>CLIENT</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(15) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0540
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

# CROSS SECTION(16) S= 1:400

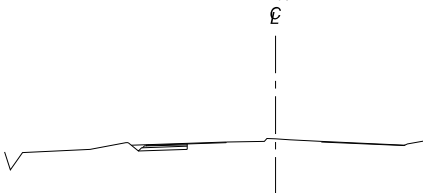
STA. 3+580  
GH = 5.08  
PH2 = 4.622

DL=3.00



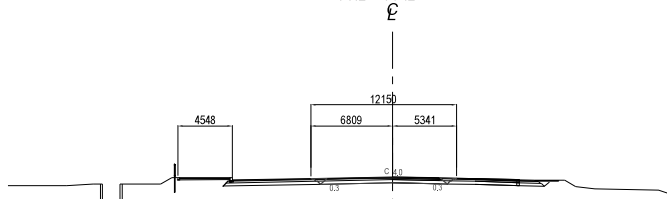
STA. 3+560  
GH = 5.10  
PH2 = 4.682

DL=3.00



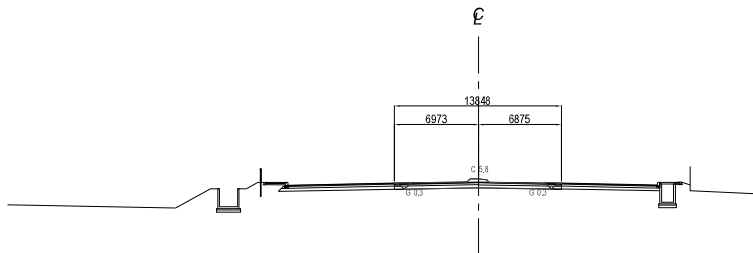
STA. 3+540  
GH = 4.87  
PH2 = 4.742

DL=3.00



STA. 3+520  
GH = 5.16  
PH2 = 4.802

DL=3.00



C	m/m	4.0
B	m/m	0.0
SS	m/m	0.0
LL	m/m	0.0
RL	m/m	0.0

C	m/m	5.8	[gravel removal 0.0m3]
B	m/m	0.0	
SS	m/m	0.0	
LL	m/m	0.0	
RL	m/m	0.0	

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

120

<b>PROJECT NAME</b> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<b>FINANCED BY</b> JAPAN INTERNATIONAL COOPERATION AGENCY	<b>COUNTRY</b> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<b>JOINT VENTURE</b> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b> CROSS SECTION(16) S= 1:400	<b>PACKAGE</b> 3
				<b>PREPARED BY</b> K. TACHIBANA				<b>DWG No.</b> P3-RD-0550
				<b>CHECKED BY</b> T. HAYAKAWA				
				<b>APPROVED BY</b> Y. SANO				

## §4-2. Drainage

## DRAINAGE

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INDEX	Classification	Unit	Quantity	Remark
	CONCRETE PIPE CULVERT $\phi$ 300 (CON. 360° ) TYPE B	m	384.80	
	SIDE DITCH TYPE U 500x850 WITH COVER	m	36.50	
	SIDE DITCH TYPE U-300x300	m	80.75	
	SIDE DITCH TYPE U-300x300 TYPE V	m	82.40	
	CATCH PIT (C-DITCH) TYPE A	Nos	14	
	CATCHPIT500x500x500	Nos	14	



Structure Position, Length or Numbers					
CENTER					
CONCRETE PIPE CULVERT $\phi$ 300 (CON. 360° ) TYPE B					
Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 302.5					
~ 3 + 331.6	L	29.10			
3 + 302.5					
~ 3 + 331.6	R	29.10			
3 + 332.5					
~ 3 + 361.6	L	29.10			
3 + 332.5					
~ 3 + 361.6	R	29.10			
3 + 362.5					
~ 3 + 391.6	L	29.10			
3 + 362.5					
~ 3 + 391.6	R	29.10			
3 + 392.5					
~ 3 + 421.6	L	29.10			
3 + 392.5					
~ 3 + 421.6	R	29.10			
3 + 422.5					
~ 3 + 451.6	L	29.10			
3 + 422.5					
~ 3 + 451.6	R	29.10			
3 + 452.5					
~ 3 + 481.6	L	29.10			
3 + 452.5					
~ 3 + 481.6	R	29.10			
3 + 482.5					
~ 3 + 500.3	L	17.80			
3 + 482.5					
~ 3 + 500.3	R	17.80			
SUBTOTAL		384.80	SUBTOTAL		
TOTAL		384.80	TOTAL		

## Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U 500x850 WITH COVER

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 772.1					
~ 2 + 778.4	L	36.50			
SUBTOTAL		36.50	SUBTOTAL		
TOTAL		36.50	TOTAL		

# Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U-300x300

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 79.5					
~ 3 + 93.7	R	14.25			
3 + 119.5					
~ 3 + 129.1	R	9.65			
3 + 184.9					
~ 3 + 199.6	R	14.65			
2 + 862.9					
~ 2 + 875.6	R	12.65			
2 + 918.3					
~ 2 + 928.6	R	10.25			
2 + 947.9					
~ 2 + 957.6	R	9.65			
2 + 977.9					
~ 2 + 987.6	R	9.65			
SUBTOTAL		80.75	SUBTOTAL		
TOTAL		80.75	TOTAL		

Structure Position, Length or Numbers

CENTER

SIDE DITCH TYPE U-300x300 TYPE V

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 7.9					
~ 3 + 18.6	R	10.65			
3 + 37.9					
~ 3 + 48.6	R	10.65			
3 + 67.9					
~ 3 + 78.6	R	10.65			
3 + 200.5					
~ 3 + 215.7	R	15.25			
3 + 233.5					
~ 3 + 246.1	R	12.65			
3 + 264.5					
~ 3 + 276.1	R	11.65			
3 + 276.5					
~ +	R	10.90			
SUBTOTAL		82.40	SUBTOTAL		
TOTAL		82.40	TOTAL		

## Structure Position, Length or Numbers

CENTER

CATCH PIT (C-DITCH) TYPE A

Station	LR	Length or Numbers	Station	LR	Length or Numbers
~ 3 + 302.0					
~ 3 + 482.0	L	7			
~ 3 + 302.0					
~ 3 + 482.0	R	7			
SUBTOTAL		14	SUBTOTAL		
TOTAL		14	TOTAL		

Structure Position, Length or Numbers					
CENTER					
CATCHPIT500x500x500					
Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 7.5	R	1			
~ +					
3 + 37.5	R	1			
~ +					
3 + 67.5	R	1			
~ +					
3 + 94.1	R	1			
~ +					
3 + 129.5	R	1			
~ +					
3 + 184.5	R	1			
~ +					
3 + 216.1	R	1			
~ +					
3 + 246.5	R	1			
~ +					
3 + 276.5	R	1			
~ +					
3 + 276.6	L	1			
~ +					
2 + 862.5	R	1			
~ +					
2 + 917.9	R	1			
~ +					
2 + 947.5	R	1			
~ +					
2 + 977.5	R	1			
~ +					
SUBTOTAL		14	SUBTOTAL		
TOTAL		14	TOTAL		

### §4-3. Pavement

PAVEMENT

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INDEX	Classification	Unit	Quantity	Remark
P A V E M E N T	PAVEMENT (TYPE E3)	m2	900	Smoothing Section of End
			2,383	Section of Mechanical ly- Stabilised Earth Wall
	PAVEMENT (TYPE E4)	m2	2,220	Under Base Layer
	PAVEMENT (TYPE E5)	m2	3,051	Frontage Road
	PRECAST CONCRETE SIDEWALK	m2	140	Sidewalk
	CONCRETE SEAL	m2	5,015	Under Flyover
	MEDIAN TYPE A	m	221	Concrete Seal for Median at Reinforced Earth
	MEDIAN TYPE B	m	448	Concrete Seal at the foot of Reinforced Earth





Structure Position, Length or Numbers						
CENTER						
PAVEMENT (TYPE E4)				PAVEMENT(TYPE E4) Under Base Layer(m2)		
Station	LR	Length or Numbers		Station	LR	Length or Numbers
~ 3 + 278.5						
~ 3 + 500.0	L	1191.60				1109.80
~ 3 + 278.5						
~ 3 + 500.3	R	1191.60				1109.80
SUBTOTAL		2383.20		SUBTOTAL		2219.60
TOTAL		2383.20		TOTAL		2219.60

Structure Position, Length or Numbers					
CENTER					
PAVEMENT (TYPE E5)					
Station	LR	Length or Numbers	Station	LR	Length or Numbers
~ 2 + 773.9					
~ 2 + 809.6	L	577.60			
~ 2 + 852.6					
~ 3 + 142.4	L	724.00			
~ 2 + 852.6					
~ 3 + 139.6	R	737.00			
~ 3 + 171.6					
~ 3 + 500.0	L	510.00			
~ 3 + 173.0					
~ 3 + 500.0	R	502.00			
SUBTOTAL		3050.60	SUBTOTAL		
TOTAL		3050.60	TOTAL		

**Structure Position, Length or Numbers**

CENTER

PRECAST CONCRETE SIDEWALK

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 775.2					
~ 2 + 781.7	L	55.70			
2 + 792.8					
~ 2 + 816.1	R	36.90			
3 + 520.0					
~ 3 + 539.0	L	47.80			
SUBTOTAL		140.40	SUBTOTAL		
TOTAL		140.40	TOTAL		

**Structure Position, Length or Numbers**

CENTER

CONCRETE SEAL

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 796.5					
~ 2 + 802.7	L	61.20			
2 + 847.9					
~ 2 + 855.6	L	79.70			
2 + 859.9					
~ 3 + 141.3	L	3573.20			
3 + 172.3					
~ 3 + 276.5	L	1300.60			
SUBTOTAL		5014.70	SUBTOTAL		
TOTAL		5014.70	TOTAL		

## Structure Position, Length or Numbers

CENTER

MEDIAN TYPE A

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 278.9					
~ 3 + 500.0	LR	221.10			
SUBTOTAL		221.10	SUBTOTAL		
TOTAL		221.10	TOTAL		

## Structure Position, Length or Numbers

CENTER

MEDIAN TYPE B

	Station	LR	Length or Numbers		Station	LR	Length or Numbers
~	3 + 276.5						
~	3 + 500.4	L	223.90				
~	3 + 276.5						
~	3 + 500.4	R	223.90				
	SUBTOTAL		447.80		SUBTOTAL		
	TOTAL		447.80		TOTAL		

#### §4-4. Road



ROAD

INDEX	Classification	Unit	Quantity	Remark
R O A D	CONCRETE KERB TYPE A-1	m	1928.50	
	CONCRETE KERB TYPE A-2	each	4	
	CONCRETE KERB TYPE A-3	m	44.30	
	CONCRETE KERB TYPE C	m	62.20	
	BOX BEAM	m	25.00	
	BOUNDARY FENCE	m	743.50	
	BOUNDARY FENCE GATE	each	11	

## Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE A-1

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 140.5					
~ 2 + 847.7	R	294.50			
3 + 140.7					
~ 3 + 149.7	L	22.20			
3 + 141.5					
~ 2 + 847.7	L	309.30			
3 + 165.4					
~ 3 + 172.4	L	13.50			
3 + 172.3					
~ 3 + 500.4	L	332.30			
3 + 172.5					
~ 3 + 500.4	R	331.70			
3 + 278.9					
~ 3 + 500.0	L	220.30			
3 + 278.9					
~ 3 + 500.0	R	220.30			
2 + 773.1					
~ 2 + 783.3	L	28.60			
2 + 789.4					
~ 2 + 803.9	L	48.10			
2 + 792.8					
~ 2 + 814.7	R	27.60			
2 + 796.3					
~ 2 + 803.0	L	16.50			
2 + 796.5					
~ 2 + 803.0	R	16.10			
2 + 820.5					
~ 2 + 830.0	L	19.50			
3 + 520.0					
~ 3 + 541.5	L	28.00			
SUBTOTAL		1928.50	SUBTOTAL		
TOTAL		1928.50	TOTAL		

**Structure Position, Length or Numbers**

CENTER

CONCRETE KERB TYPE A-2

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 773.1					
~ 2 + 783.3	L	2			
2 + 792.8					
~ 2 + 814.7	R	2			
SUBTOTAL		4	SUBTOTAL		
TOTAL		4	TOTAL		

### Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE A-3

	Station	LR	Length or Numbers		Station	LR	Length or Numbers
	3 + 140.7						
~	3 + 149.7	L	10.50				
	3 + 165.4						
~	3 + 172.4	L	10.50				
	2 + 773.1						
~	2 + 783.3	L	5.80				
	2 + 789.4						
~	2 + 803.9	L	10.50				
	2 + 792.8						
~	2 + 814.7	R	7.00				
	SUBTOTAL		44.30		SUBTOTAL		
	TOTAL		44.30		TOTAL		

## Structure Position, Length or Numbers

CENTER

CONCRETE KERB TYPE C

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 773.4					
~ 2 + 781.7	L	32.40			
2 + 792.8					
~ 2 + 813.4	R	29.80			
SUBTOTAL		62.20	SUBTOTAL		
TOTAL		62.20	TOTAL		

## Structure Position, Length or Numbers

CENTER

BOX BEAM

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 470.0					
~ 3 + 495.0	R	25.00			
SUBTOTAL		25.00	SUBTOTAL		
TOTAL		25.00	TOTAL		



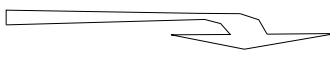

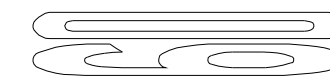
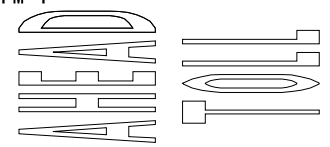
Structure Position, Length or Numbers					
CENTER					
BOUNDARY FENCE					
Station		LR	Length or Numbers	Station	
~	3 + 140.5				
~	2 + 859.3	R	294.30		
~	3 + 141.3				
~	2 + 859.3	L	249.50		
~	3 + 172.3				
~	3 + 276.5	L	92.00		
~	3 + 172.7				
~	3 + 276.5	R	107.70		
	SUBTOTAL		743.50	SUBTOTAL	
	TOTAL		743.50	TOTAL	





## §4-5. Road Marking

## ROAD MARKING

INDEX	Classification	Unit	Quantity				Remark	
			Main Line of Frontage	Flyover	Reinforced Earth	Total		
ROAD MARKING	LANE LINE (w=100)	m	145.2			145.2		
	SIDE LINE (w=100)	m	2970.8	2409.6	888.0	6268.4		
	BROKEN LINE (w=100)	m	290.0			290.0		
	STOP LINE (w=300)	m	23.5			23.5		
	CROSSWALK MARKING (w=450)	m	266.0			266.0		
	ZEBRA LINE (w=150)	m	288.2			288.2		
	ZEBRA LINE (w=450)	m	279.6			279.6		
	PM-AR1	Nos	5			Width:15cm (m)	1.248 by each	
		m2	6.2			41.3		
		PM-AR2	Nos	13			Width:15cm (m)	1.576 by each
		m2	20.5			136.7		
		PM-AR3	Nos	4			Width:15cm (m)	1.418 by each
		m2	5.7			38.0		
		PM-AR4	Nos	4			Width:15cm (m)	0.992 by each
		m2	4.0			26.7		
		PM-3	Nos		3	2	Width:15cm (m)	3.501 by each
		m2				70.0+46.7		
					10.5	7.0	116.7	
	PM-4		Nos		2		Width:15cm (m)	4.614 by each
			m2				61.3	

Structure Position, Length or Numbers					
CENTER					
LANE LINE (w=100)					
Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 105.5					
~ 3 + 135.5	R	30.00			
3 + 173.8					
~ 3 + 203.8	L	30.00			
3 + 520.0					
~ 3 + 575.0	R	55.20			
2 + 861.5					
~ 2 + 892.5	L	30.00			
SUBTOTAL		145.20	SUBTOTAL		
TOTAL		145.20	TOTAL		

## 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 + 135.5					
~ 2 + 859.3	R	283.20			
3 + 137.6					
~ 2 + 859.3	R	284.50			
3 + 138.0					
~ 3 + 150.3	L	33.80			
3 + 139.5					
~ 2 + 859.3	L	276.30			
3 + 142.0					
~ 2 + 833.4	L	303.90			
3 + 164.6					
~ 3 + 175.4	L	24.10			
3 + 171.7					
~ 3 + 500.5	L	328.60			
3 + 173.0					
~ 3 + 500.5	R	327.80			
3 + 173.7					
~ 3 + 536.4	L	365.30			
3 + 174.6					
~ 3 + 524.9	R	353.80			
3 + 500.5					
~ 3 + 575.0	L	74.50			
3 + 500.5					
~ 3 + 575.0	R	74.50			
3 + 520.0					
~ 3 + 575.0	L	55.20			
3 + 546.8					
~ 3 + 575.0	R	28.20			
3 + 548.6					
~ 3 + 575.0	L	26.40			
2 + 775.3					
~ 2 + 785.0	L	31.60			
2 + 790.4					
~ 2 + 791.4	L	21.10			
2 + 796.3					
~ 2 + 816.5	R	27.10			
2 + 822.5					
~ 2 + 839.6	R	24.40			
2 + 838.5					
~ 2 + 855.6	L	16.40			
2 + 851.2					
~ 2 + 855.9	R	10.10			
SUBTOTAL		2970.80	SUBTOTAL		
TOTAL		2970.80	TOTAL		

## Structure Position, Length or Numbers

CENTER											
SIDE LINE (w=100)			Flyover			SIDE LINE (w=100)			Reinforced Earth		
Station		LR	Length or Numbers			Station		LR	Length or Numbers		
~	3 + 278.4 2 + 676.0	L	602.40			~	3 + 278.5 3 + 500.5	L	222.00		
~	3 + 278.4 2 + 676.0	R	602.40			~	3 + 278.5 3 + 500.5	L	222.00		
~	3 + 278.4 2 + 676.0	R	602.40			~	3 + 278.5 3 + 500.5	R	222.00		
~	3 + 278.5 2 + 676.0	L	602.40			~	3 + 278.5 3 + 500.5	R	222.00		
SUBTOTAL			2409.60			SUBTOTAL			888.00		
TOTAL			2409.60			TOTAL			888.00		

### Structure Position, Length or Numbers

CENTER

BROKEN LINE (w=100)

	Station	LR	Length or Numbers		Station	LR	Length or Numbers
	3 + 105.5						
~	2 + 859.3	R	62.70				
	3 + 142.7						
~	2 + 892.5	L	61.20				
	3 + 173.7						
~	3 + 520.0	R	86.60				
	3 + 203.8						
~	3 + 520.0	L	79.50				
	SUBTOTAL		290.00		SUBTOTAL		
	TOTAL		290.00		TOTAL		

## Structure Position, Length or Numbers

CENTER

STOP LINE (w=300)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 135.7					
~ +	R	3.10			
3 + 173.7					
~ +	L	3.40			
2 + 785.3					
~ 2 + 791.2	L	6.00			
2 + 796.6					
~ 2 + 804.7	L	9.00			
2 + 861.4					
~ +	L	2.00			
SUBTOTAL		23.50	SUBTOTAL		
TOTAL		23.50	TOTAL		

**Structure Position, Length or Numbers**

**CENTER**

**CROSSWALK MARKING (w=450)**

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 783.6					
~ 2 + 790.4	L	24.50			
2 + 792.8					
~ 2 + 796.4	R	129.50			
2 + 799.7					
~ 2 + 816.1	L	80.50			
2 + 814.6					
~ 2 + 822.8	R	31.50			
SUBTOTAL		266.00	SUBTOTAL		
TOTAL		266.00	TOTAL		



## Structure Position, Length or Numbers

CENTER

ZEBRA LINE (w=150)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 500.5					
~ 3 + 548.6	L	48.60			
3 + 500.5					
~ 3 + 548.6	L	48.50			
3 + 500.5					
~ 3 + 546.8	R	46.30			
3 + 500.5					
~ 3 + 546.8	R	46.50			
2 + 796.4					
~ 2 + 807.1	L	14.30			
2 + 796.4					
~ 2 + 812.3	L	35.80			
2 + 833.4					
~ 2 + 855.7	L	48.20			
SUBTOTAL		288.20	SUBTOTAL		
TOTAL		288.20	TOTAL		

## Structure Position, Length or Numbers

CENTER

ZEBRA LINE (w=450)

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 501.0					
~ 3 + 538.0	L	62.00			
3 + 501.0					
~ 3 + 534.7	R	59.00			
2 + 796.4					
~ 2 + 805.2	L	17.00			
2 + 796.4					
~ 2 + 812.3	L	50.30			
2 + 833.4					
~ 2 + 855.7	L	91.30			
<b>SUBTOTAL</b>		279.60	<b>SUBTOTAL</b>		
<b>TOTAL</b>		279.60	<b>TOTAL</b>		

# Structure Position, Length or Numbers

CENTER

PM-AR1

Station	LR	Length or Numbers	Station	LR	Length or Numbers
~ 3 + 551.0					
~ 3 + 573.0	L	2			
~ 2 + 780.0					
~ 2 + 800.0	L	3			
SUBTOTAL		5	SUBTOTAL		
TOTAL		5	TOTAL		

## Structure Position, Length or Numbers

CENTER

PM-AR2

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 179.0					
~ 3 + 202.0	L	4			
3 + 485.5					
~ 3 + 515.5	R	2			
2 + 780.0					
~ 2 + 800.0	L	1			
3 + 105.5					
~ 3 + 133.7	R	4			
2 + 863.4					
~ 2 + 892.6	L	2			
SUBTOTAL		13	SUBTOTAL		
TOTAL		13	TOTAL		

### Structure Position, Length or Numbers

CENTER

PM-AR3

Station	LR	Length or Numbers	Station	LR	Length or Numbers
2 + 780.0					
~ 2 + 800.0	L	2			
2 + 863.4					
~ 2 + 892.6	L	2			
SUBTOTAL		4	SUBTOTAL		
TOTAL		4	TOTAL		

## Structure Position, Length or Numbers

CENTER

PM-AR4

Station	LR	Length or Numbers	Station	LR	Length or Numbers
3 + 485.5					
~ 3 + 515.5	R	2			
3 + 551.0					
~ 3 + 573.0	L	2			
SUBTOTAL		4	SUBTOTAL		
TOTAL		4	TOTAL		

## Structure Position, Length or Numbers

CENTER

PM-3

Station	LR	Length or Numbers	Station	LR	Length or Numbers
Flyover 2 + 680.0	R	1			
Flyover 2 + 980.0	R	1			
Flyover 3 + 170.0	L	1			
Reinforced Earth 3 + 280.0	R	1			
Reinforced Earth 3 + 470.0	L	1			
SUBTOTAL		5	SUBTOTAL		
TOTAL		5	TOTAL		

### Structure Position, Length or Numbers

CENTER

PM-4

Station	LR	Length or Numbers	Station	LR	Length or Numbers
Flyover 3 + 100.0	L	1			
Flyover 2 + 800.0	L	1			
SUBTOTAL		2	SUBTOTAL		
TOTAL		2	TOTAL		



#### §4-6. Demolition Quantity



## 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
		(m)									
[Crossing at SP & Traffickland]											
STA 2 + 806.7	L	22.5									
STA 2 + 814.3											
STA 2 + 827.9	L	26.6									
STA 2 + 839.3											
STA 3 + 91.1	L	58.0									
STA 3 + 148.4											
STA 3 + 178.0	L	111.7									
STA 3 + 288.5											
STA 3 + 303.7	L	226.5									
STA 3 + 529.2											
STA 3 + 544.7	L	40.9									
STA 3 + 585.0											
STA 3 + 91.1											
STA 3 + 148.4	R	58.6									
STA 3 + 178.0											
STA 3 + 288.5	R	111.7									
STA 3 + 303.7											
STA 3 + 529.2	R	226.5									
STA 3 + 544.7											
STA 3 + 585.0	R	40.5									
TOTAL		923.5	TOTAL		0.0	TOTAL		0.0	TOTAL	ΣL=	923.5
									Total Length of Median :		923.50 (m)
									Total Length of Pedestrian Boundary :		0.00

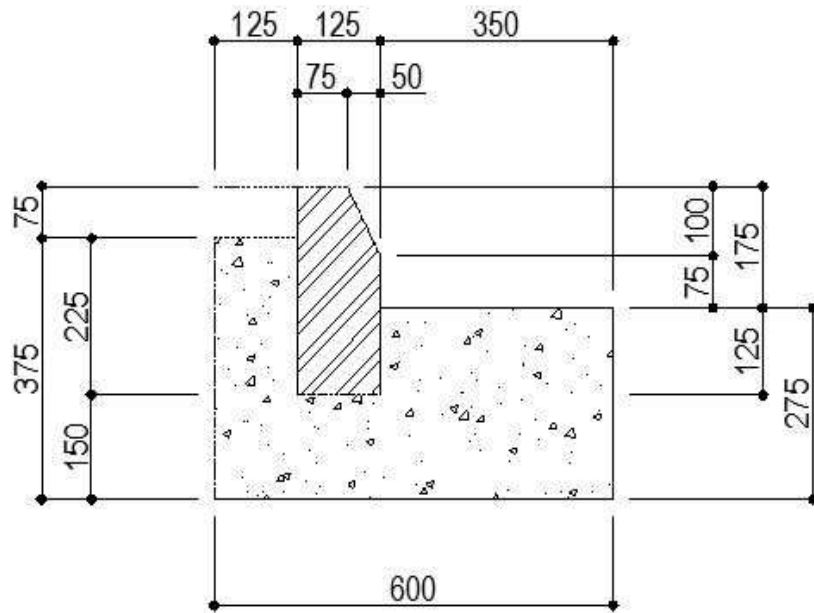
201

### Structure Position, Length or Numbers

Pavement Removal (Roadway)			Pavement Removal (Sidewalk)			Pavement Removal (Sidewalk)			Site Clearing		
Station	LR	A	Station	LR	A	Station	LR	A	Station	LR	A
	LR	16,870.0 (m)							STA 2 + 800.0	L	427.00 (m2)
TOTAL		16,870.0	TOTAL		0.0	TOTAL		0.0	TOTAL		427.0

166

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 <sup>3</sup>
Base		$=(0.375 \times 0.600 - 0.075 \times 0.350) \times 100.0$	= 19.875 m <sup>3</sup>
Concrete			$\Sigma V =$ 23.625 m <sup>3</sup>

§5 .Unit of Quantity

# Unit quantity sheets

## Road Drainage

- 1 - SIDE DITCH TYPE U-500x850 with Cover
- 2 - SIDE DITCH TYPE U 300X300
- 3 - SIDE DITCH TYPE U 300X300 TYPE V
- 4 - CATCH PIT 500x500x500
- 5 - CATCH PIT (C-DITCH) TYPE A
- 6 - CONCRETE PIPE CULVERT  $\phi$ 300 (CON. 360°)TYPE B

## Road

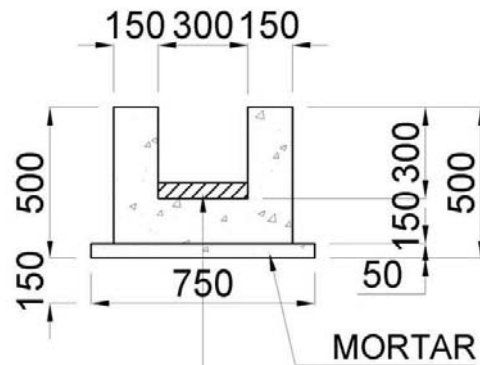
- 7 - CONCRETE KERB TYPE A-1
- 8 - CONCRETE KERB TYPE A-2
- 9 - CONCRETE KERB TYPE A-3
- 10 - CONCRETE KERB TYPE C
- 11 - CONCRETE SEAL
- 12 - MEDIAN TYPE A
- 13 - MEDIAN TYPE B
- 14 - INFORMATORY SIGNBOARD-TYPE A
- 15 - INFORMATORY SIGNBOARD-TYPE B
- 16 - BOUNDARY FENCE
- 17 - BOUNDARY FENCE GATE
- 18 - BOX BEAM (ORDINARY)
- 19 - BOX BEAM (EDGE)

No	Item	Name	Size • Type	Quantity	Unit			
	<b>OPEN DITCHES</b>	<b>SIDE DITCH TYPE U-500x850 with Cover</b>		<b>100</b>	<b>m</b>			
Item	Formula				Quantity			
U-500 x 850 with cover								
Concrete 24N/mm <sup>2</sup>	$V1 = 0.800 \times 0.150 \times 100.000$	= 12.000	m <sup>3</sup>					
	$V2 = 0.730 \times 0.150 \times 100.000 \times 2$	= 21.900	m <sup>3</sup>					
	$V3 = 0.120 \times 0.080 \times 100.000 \times 2$	= 1.920						
	$V4(\text{cover}) = 0.630 \times 0.120 \times 100.000$	= 7.560						
		<b>43.380</b>	<b>m<sup>3</sup></b>	<b>43.380 m<sup>3</sup></b>				
Form	$A1 = (1.000 + 0.730 + 0.12) \times 2 \times 100.000$	= 370.000	m <sup>2</sup>					
	$A2-a(\text{cover}) = (0.500 + 0.630) \times 0.12 \times (\frac{100.000}{0.500}) \times 2$	= 54.240	m <sup>2</sup>					
	$A2-b(\text{cover}) = 0.630 \times 100.000$	= 63.000	m <sup>2</sup>					
	$A2(a+b) = 54.240 + 63.000$	= 117.240	m <sup>2</sup>					
	$\text{Total A} = A1 + A2$ $= 370.000 + 117.240$ $= 487.240$	= 487.240	m <sup>2</sup>	<b>487.240 m<sup>2</sup></b>				
Foundation	$V = 0.950 \times 0.150 \times 100.000$	= 14.250	m <sup>3</sup>	<b>14.250 m<sup>3</sup></b>				
Leveling Con:	$V = 0.950 \times 0.100 \times 100.000$	= 9.500	m <sup>3</sup>	<b>9.500 m<sup>3</sup></b>				
Excavation	$V = (\frac{3.200 \times 1.950}{2}) \times 1.250 \times 100.000$	= 321.875	m <sup>3</sup>	<b>321.875 m<sup>3</sup></b>				
Backfill	$V1 = (\frac{1.125 + 0.500}{2}) \times 1.250$	= 1.016	m <sup>2</sup>					
	$V2 = 1.000 \times 0.075$	= 0.075	m <sup>2</sup>					
	$V = (1.016 + 0.075) \times 2.000 \times 100.000$	= 218.200	m <sup>3</sup>	<b>218.200 m<sup>3</sup></b>				
Concrete Cover	$N = \frac{100.000}{0.500}$	= 200.000	Nos	<b>200.000 Nos</b>				
Reinforcing -bar D13	NO. UNIT							
	BAR MARK	SIZE (mm)	LENGTH (mm)	OF BARS	WEIGHT (kgf/m)	WEIGHT (kgf/NOS)	REMARKS	
	R1	D13	2.460	500	0.995	2.45	1,225	
	R2	D13	100.000	15	0.995	99.5	1,493	
	R3(cover)	D13	570	800	0.995	0.567	454	
	R4(cover)	D13	400	600	0.995	0.398	239	
				<b>Total</b>		<b>3,411 kg</b>	<b>3,411 kg</b>	



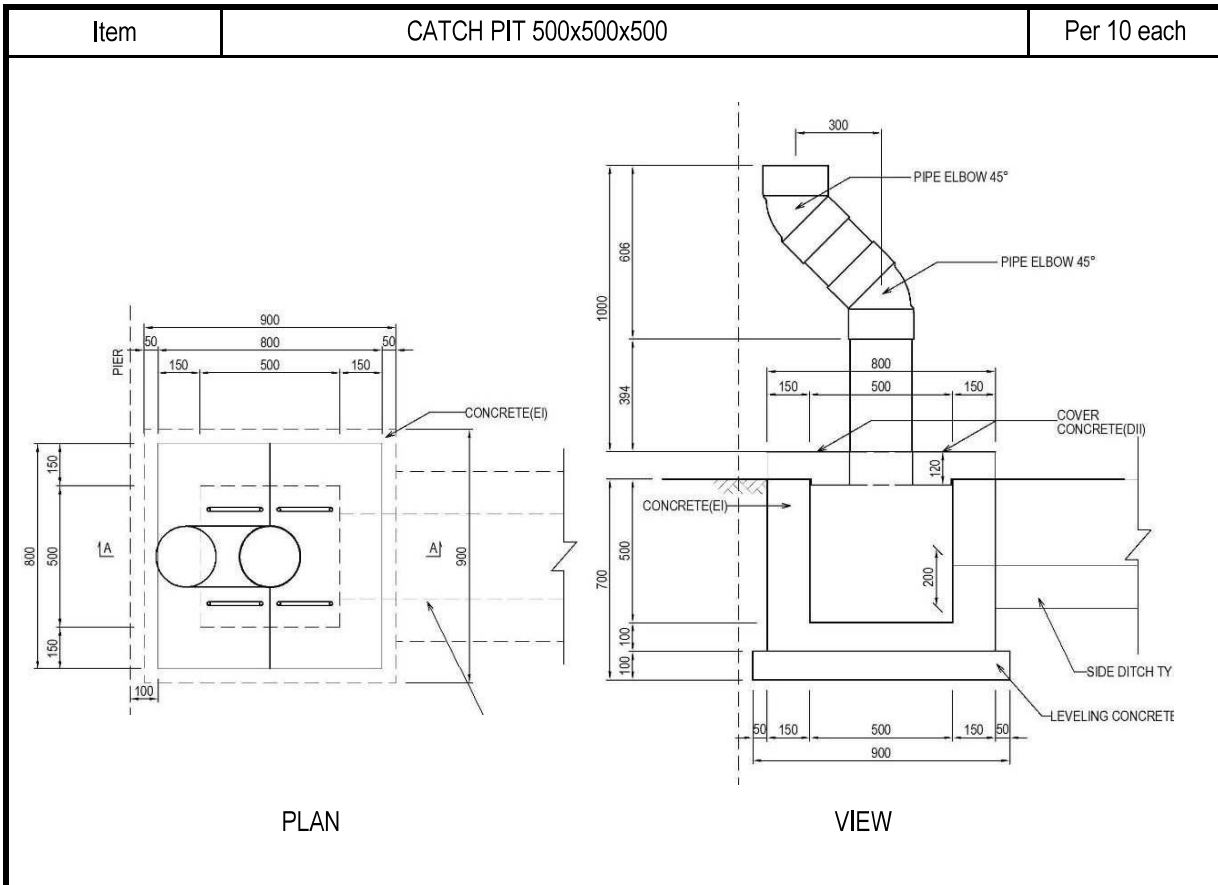
No	Item	Name	Quantity	Unit
	<b>OPEN DITCHES</b>	<b>SIDE DITCH TYPE U 300X300</b>	<b>10</b>	<b>m</b>
Item	Formula			Quantity
U-300 x 300 Concrete	$V1 = 0.600 \times 0.150 \times 10.000 = 0.900 \text{ m}^3$ $V2 = 0.300 \times 0.150 \times 10.000 \times 2 = 0.900 \text{ m}^3$		1.800 m <sup>3</sup>	
Form	$A1 = (0.450 + 0.300) \times 2 \times 10.000 = 15.000 \text{ m}^2$		15.000 m <sup>2</sup>	
Mortar	$V = 0.750 \times 0.050 \times 10.000 = 0.375 \text{ m}^3$		0.375 m <sup>3</sup>	
Excavation	$V = \left( \frac{2.250 + 1.750}{2} \right) \times 0.500 \times 10.000 = 10.000 \text{ m}^3$		10.000 m <sup>3</sup>	
Backfill	$V1 = \left( \frac{0.750 + 0.500}{2} \right) \times 0.500 = 0.313 \text{ m}^2$ $V2 = 0.450 \times 0.075 = 0.034 \text{ m}^2$ $V = (0.313 + 0.034) \times 2.000 \times 10.000 = 6.940 \text{ m}^3$		6.940 m <sup>3</sup>	

No	Item	Name	Quantity	Unit
	OPEN DITCHES	SIDE DITCH TYPE U 300X300 TYPE V	10	m

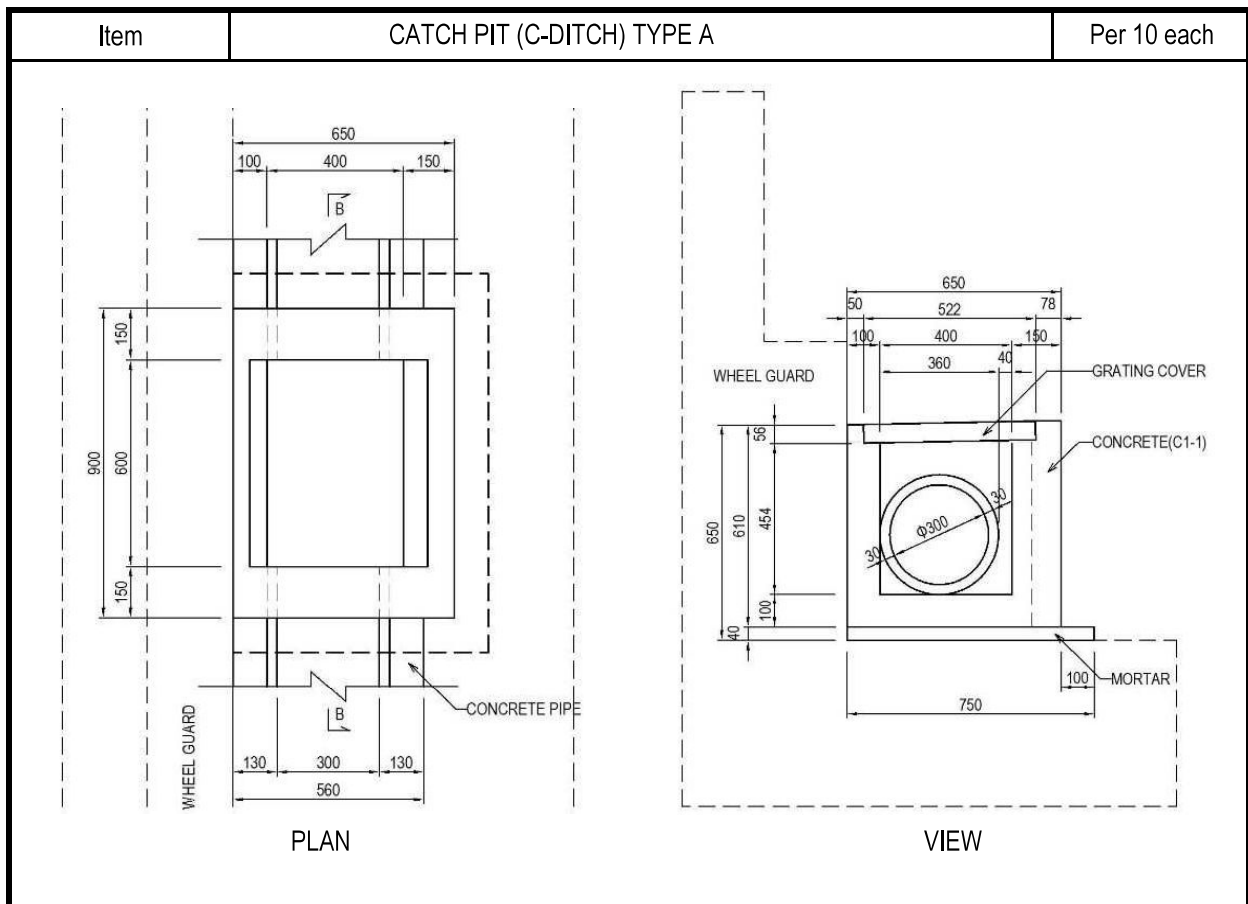


INVERT CONCRETE  
Minimum thickness:t=50mm

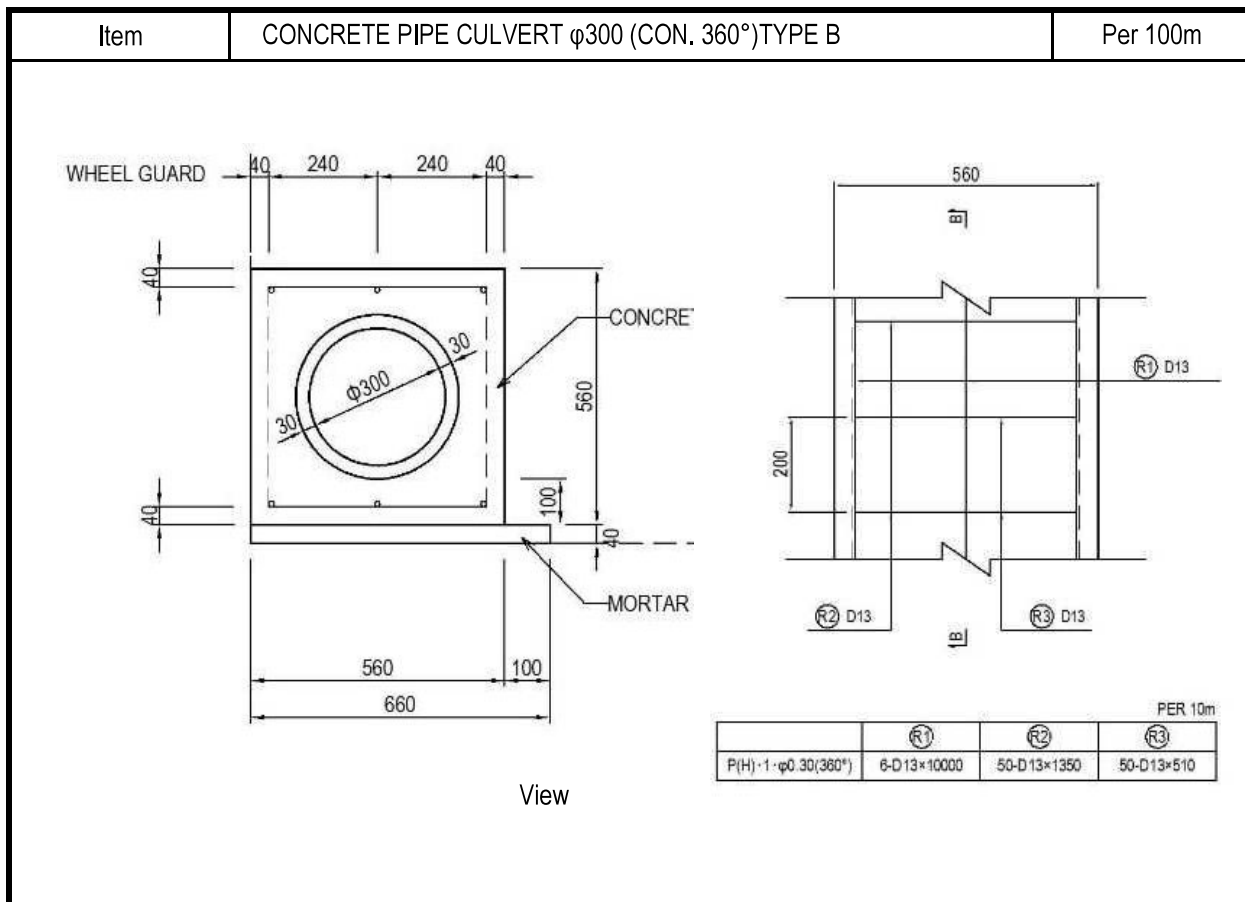
Item	Formula	Quantity
U-300 x 300 Concrete	$V1 = 0.600 \times 0.150 \times 10.000 = 0.900 \text{ m}^3$	1.800 m <sup>3</sup>
	$V2 = 0.300 \times 0.150 \times 10.000 \times 2 = 0.900 \text{ m}^3$	
Form	$A1 = (0.450 + 0.300) \times 2 \times 10.000 = 15.000 \text{ m}^2$	15.000 m <sup>2</sup>
Mortar	$V = 0.750 \times 0.050 \times 10.000 = 0.375 \text{ m}^3$	0.375 m <sup>3</sup>
Excavation	$V = \left( \frac{2.250 + 1.750}{2} \right) \times 0.500 \times 10.000 = 10.000 \text{ m}^3$	10.000 m <sup>3</sup>
Backfill	$V1 = \left( \frac{0.750 + 0.500}{2} \right) \times 0.500 \times 10.000 = 0.313 \text{ m}^3$	6.940 m <sup>3</sup>
	$V2 = 0.450 \times 0.075 \times 10.000 = 0.034 \text{ m}^3$	
	$V = (0.313 + 0.034) \times 2.000 \times 10.000 = 6.940 \text{ m}^3$	
Invert Concrete(E I) Average thickness:11cm x W:30cm x 10m	$= 0.330 \text{ m}^3$	0.330 m <sup>3</sup>



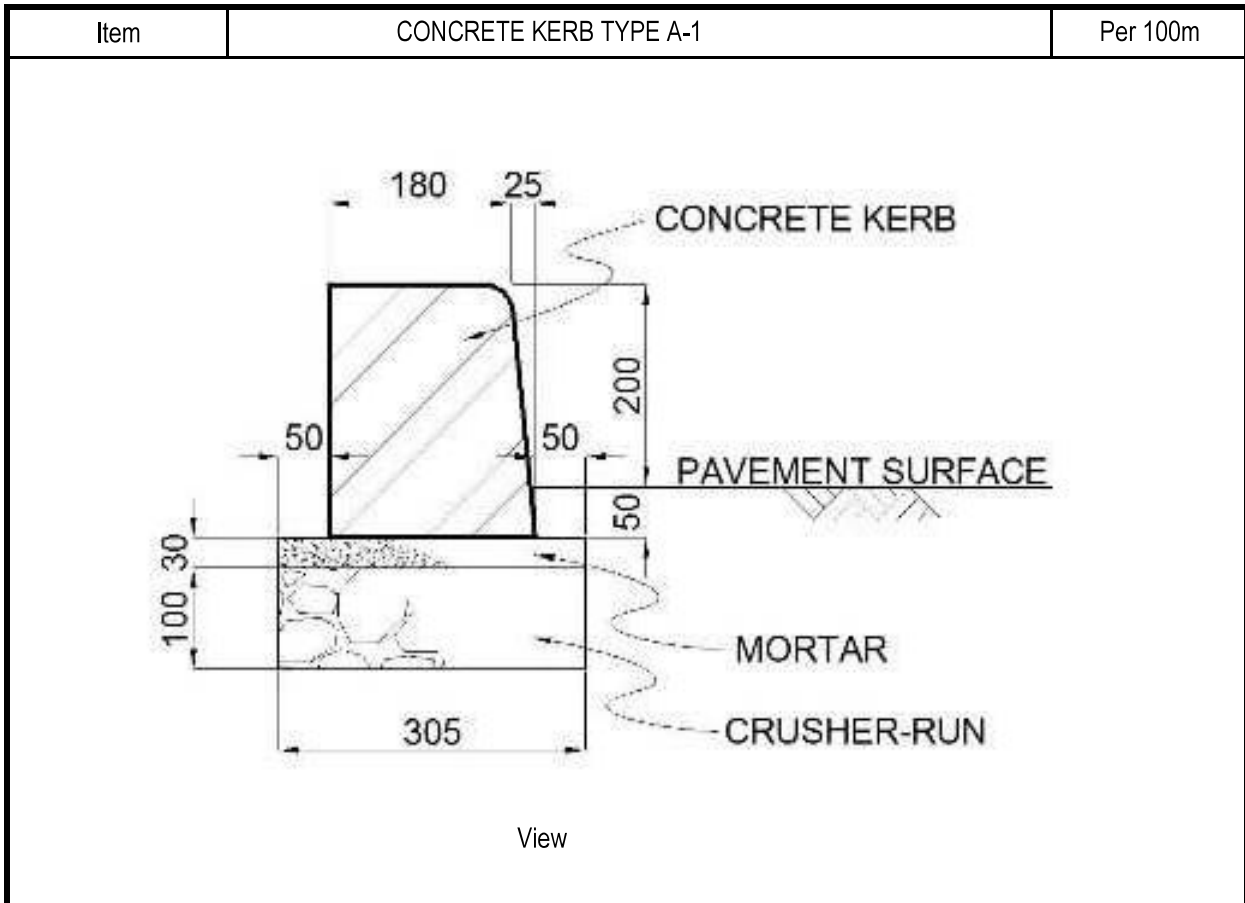
Title	Specification	Calculation Formula	Quantity
<b>Body</b>			
Concrete	18N/mm2	$(0.800 \times 0.800 \times 0.600 - 0.500 \times 0.500 \times 0.500) \times 10 = 2.590$	
		[Deduction] $-(0.300 \times 0.300 \times 0.150) \times 10 = -0.135$	
		<u>2.455</u>	2.46 m3
Form	Body	$(0.800 \times 0.600 \times 4 + 0.500 \times 0.500 \times 4 + 0.15 \times 0.300 \times 3) \times 10 = 30.550$	
		[Deduction] $-0.300 \times 0.300 \times 2 \times 10 = -1.800$	
	Leveling Concrete	$(0.900 \times 0.100 \times 4) \times 10 = 3.600$	
		<u>32.350</u>	32.35 m2
Leveling Concrete	t=100	$0.900 \times 0.900 \times 10 = 8.100$	8.10 m2
		$0.900 \times 0.900 \times 0.10 \times 10 = 0.810$	0.81 m3
<b>Cover</b>			
Concrete	24N/mm2	$(0.400 \times 0.800 \times 0.100 \times 2 + 0.49 \times 0.49 \times 0.02) \times 10 = 0.688$	
		[Deduction] $-(1/4 \times 3.14 \times 0.22 \times 0.22 \times 0.12) \times 10 = -0.046$	
		<u>0.642</u>	0.64 m3
Reinforcing bar	D10	$(0.74 \times 3 + 0.32 \times 6 + 0.25 \times 2 + 0.21) \times 2 \times 0.560 \times 10 = 54.320$	54.32 kg
	D13	$0.76 \times 2 \times 2 \times 1.042 \times 10 = 31.677$	31.68 kg
Form		$((0.8 \times 0.12 + 0.45 \times 0.12 \times 2 + 0.3 \times 0.12 \times 2) \times 2 + 3.14 \times 0.22 \times 0.12) \times 10 = 6.349$	6.35 m2
Pipe	VPφ200	2 Straight Pipes / each $(0.60 + 0.30) \times 10 = 9.00$	9.00 m
Pipe Elbow	45°	2 Elbows / each	20 each



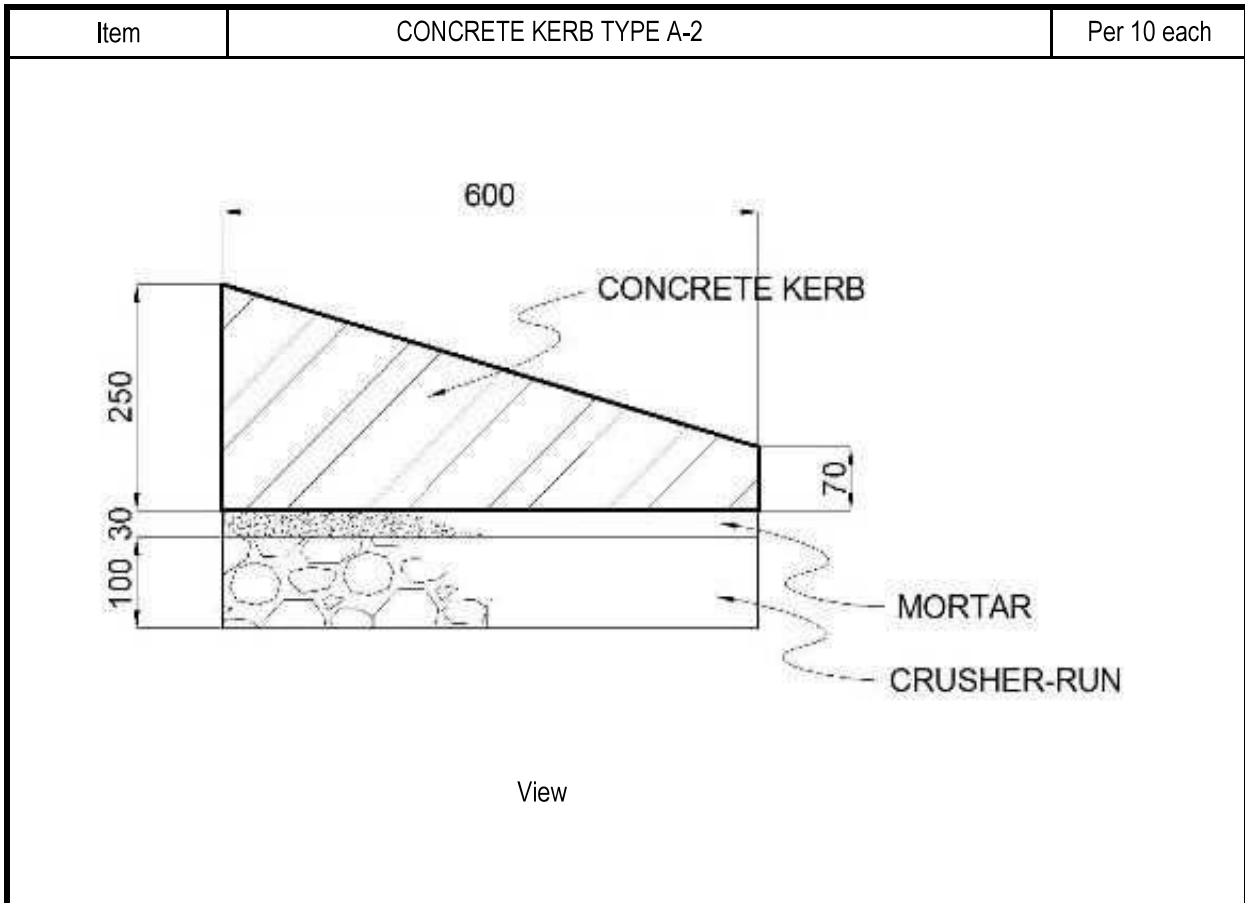
Title	Specification	Calculation Formula	Quantity
Excavation			= 0.00 m3
Backfilling			= 0.00 m3
Surplus soil			= 0.00 m3
<b>Body</b>			
Concrete	18N/mm2	$(0.65 \times 0.65 \times 0.90 - 0.40 \times 0.454 \times 0.60) \times 10 = 2.713$	
		[Deduction] $-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 0.15 \times 2 \times 10 = -0.305$	
		$-0.522 \times 0.056 \times 0.60 \times 10 = -0.175$	
		<u>2.232</u>	2.23 m3
<b>Reinforcing bar</b>			
			= 0.00 kg
Form	Body	$(0.65 \times 0.90 \times 2 + 0.65 \times 0.65 \times 2) \times 10 = 20.150$	
		$+(0.40 \times 0.51 + 0.60 \times 0.454 + 0.056 \times 0.60) \times 2 \times 10 = 10.200$	
		<u>30.350</u>	30.35 m2
<b>Mortar</b>			
	t=40	$1.10 \times 0.75 \times 10 = 8.250$	8.25 m2
		$1.10 \times 0.75 \times 0.04 \times 10 = 0.330$	0.33 m3
<b>Cover</b>			
Grating Cover	520x600		= 10 each



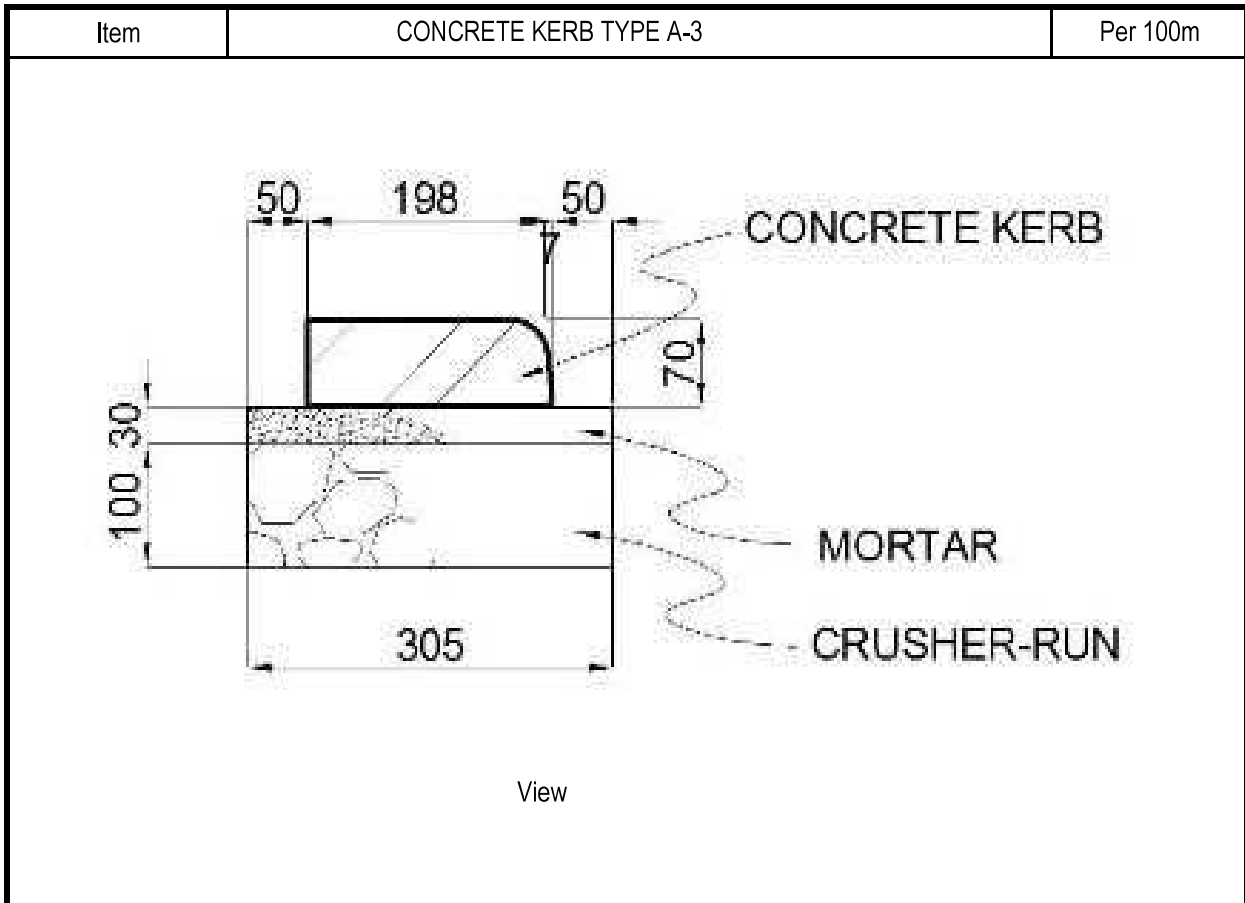
Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Hume concrete pipe	$\phi 300$		100.000 m
Concrete	24N/mm2	$0.56 \times 0.56 \times 100.0$	= 31.360
		[Deduction] $-(1/4 \times 3.14 \times 0.36 \times 0.36) \times 100.0$	= -10.174
		21.186	21.19 m3
Reinforcing bar	D13	$(100.0 \times 6 + 1.350 \times 500 + 0.510 \times 500) \times 0.995$	= 1522.35 kg
Form	Body	$0.56 \times 100.0$	= 56.000 m2
Mortar	t=40	$0.66 \times 100.0$	= 66.00 m2
		$0.66 \times 0.04 \times 100.0$	= 2.64 m3



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	$0.305 \times 100.0$ = 30.500	30.50 m2
		$0.305 \times 0.10 \times 100.0$ = 3.05	3.05 m3



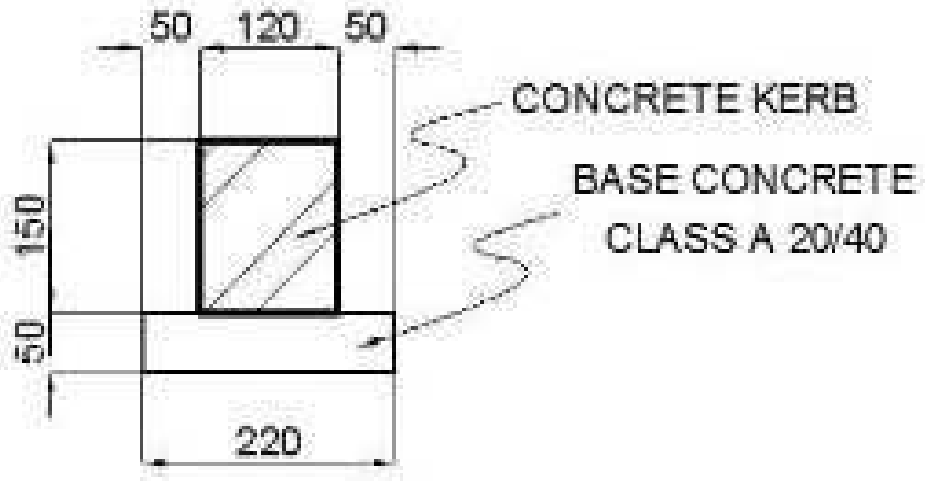
Title	Specification	Calculation Formula	Quantity
Excavation		=	m3
Backfilling		=	m3
Surplus soil		=	m3
Body			
Concrete Kerb Type A-2			
Concrete	18N/mm2	$(0.07+0.250) \times 1/2 \times 0.60 \times 0.205 = 0.020$	0.02 m3
Form		$(0.07+0.250) \times 1/2 \times 0.60 \times 2 + 0.07 \times 0.205 + 0.250 \times 0.205 = 0.258$	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

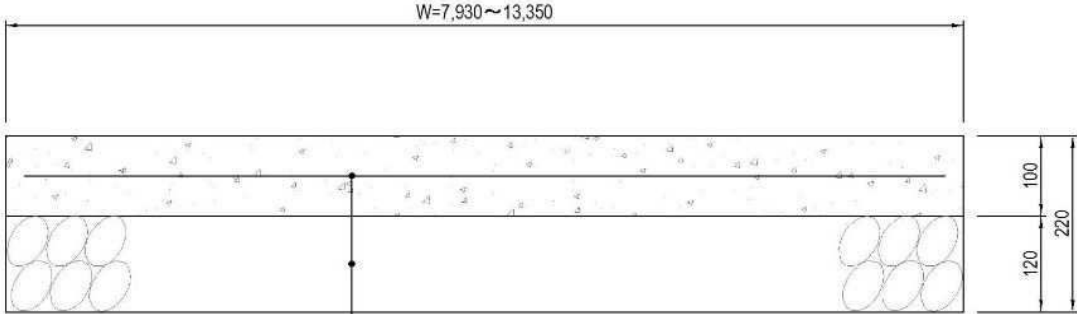


Item	CONCRETE KERB TYPE C	Per 100m
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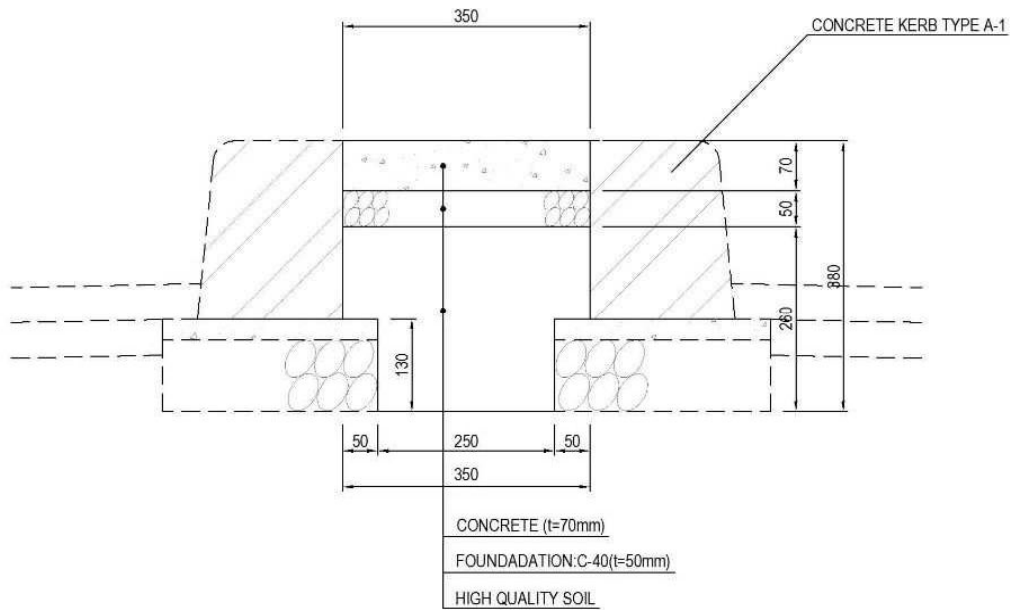


View

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

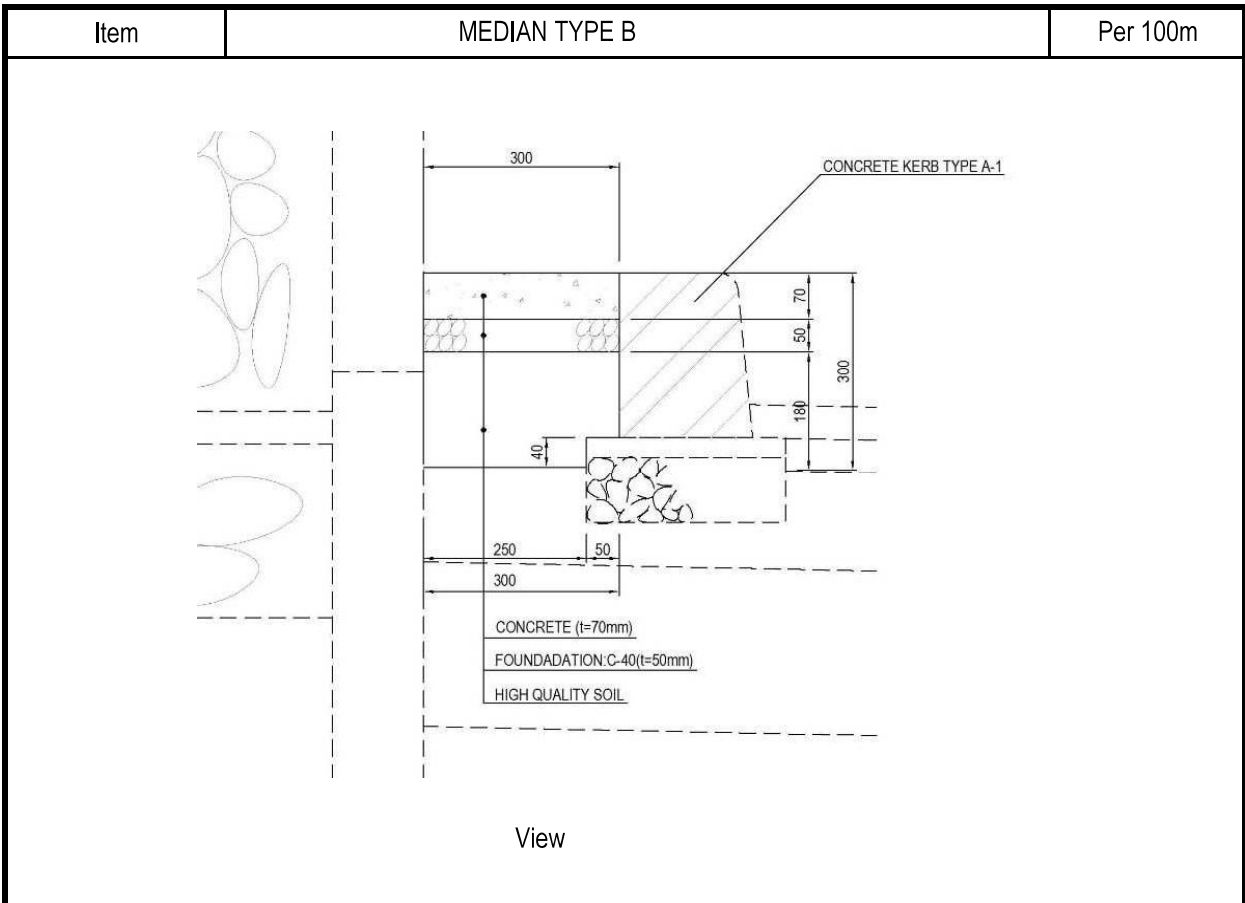
Item	CONCRETE SEAL		Per 100m2
 <p data-bbox="598 824 922 896"> CONCRETE WITH WIRE NET(t=100mm)  FOUNDATION:C-40(t=120mm) </p> <p data-bbox="675 954 730 987">View</p>			
Title	Specification	Calculation Formula	Quantity
Concrete	18N/mm2, t=100		100.00 m2
		$100.0 \times 0.1$ =    10.000	10.00 m3
Wire net			100.00 m2
Foundation	t=120		100.00 m2
		$100.0 \times 0.12$ =    12.000	12.00 m3

Item	MEDIAN TYPE A	Per 100m
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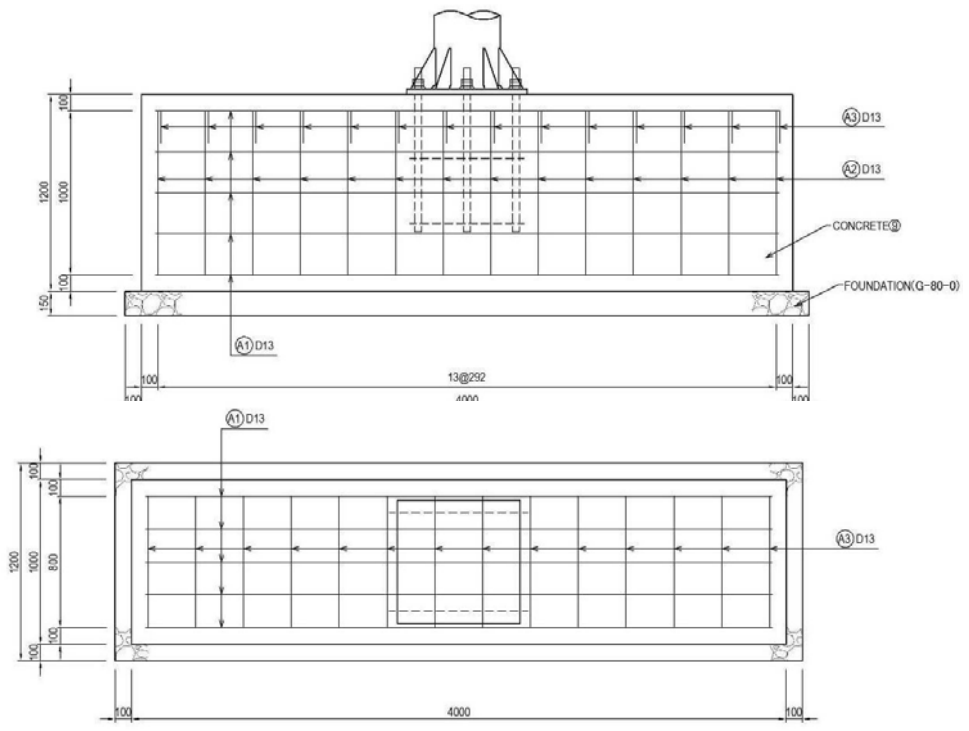
View

Title	Specification	Calculation Formula	Quantity
Concrete	18N/mm <sup>2</sup> , t=70	$0.35 \times 0.07 \times 100.0 = 2.450$	2.45 m <sup>3</sup>
Foundation	t=50	$0.35 \times 100.0 = 35.000$	35.00 m <sup>2</sup>
		$0.35 \times 0.05 \times 100.0 = 1.750$	1.75 m <sup>3</sup>
High Quality Soil		$(0.35 \times 0.26 - 0.05 \times 0.130 \times 2) \times 100.0 = 7.800$	7.80 m <sup>3</sup>



Title	Specification	Calculation Formula	Quantity
Concrete	18N/mm <sup>2</sup> , t=70	$0.30 \times 0.07 \times 100.0 = 2.100$	2.10 m <sup>3</sup>
Foundation	t=50	$0.30 \times 100.0 = 30.000$	30.00 m <sup>2</sup>
		$0.30 \times 0.05 \times 100.0 = 1.500$	1.50 m <sup>3</sup>
High Quality Soil		$(0.30 \times 0.18 - 0.05 \times 0.04) \times 100.0 = 5.200$	5.20 m <sup>3</sup>

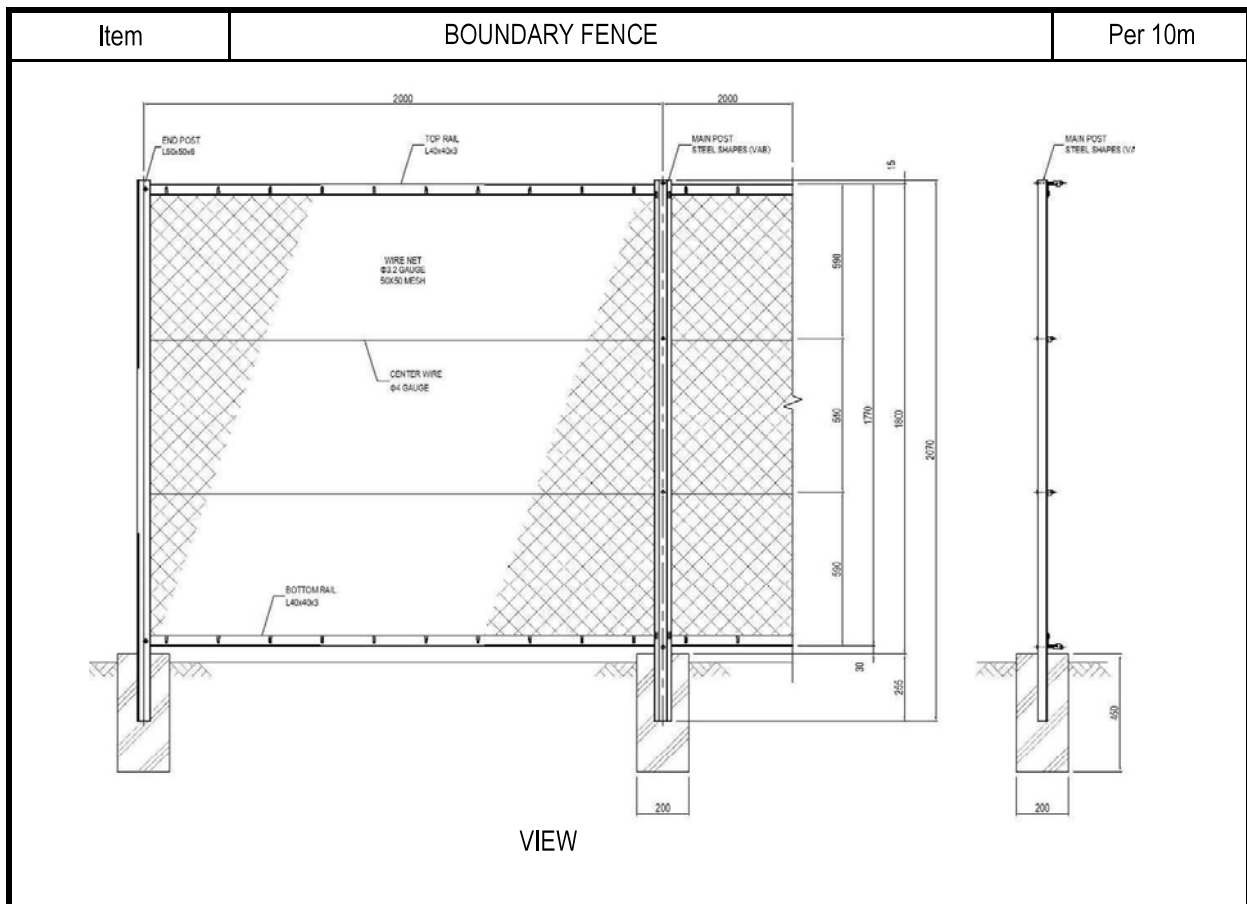
Item	INFORMATORY SIGNBOARD-TYPE A	Per 10 each
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VIEW

Title	Specification	Calculation Formula	Quantity
Excavation		$1.35/6 \times ((5.0 \times 3.35 + 2.0 \times 6.35 + 2 \times (5.0 \times 2.0 + 6.35 \times 3.35)) \times 10) = 206.989$	= 207.00 m <sup>3</sup>
Backfilling		$207.0 - (4.00 \times 1.00 \times 1.20 + 4.20 \times 1.20 \times 0.15) \times 10 = 151.440$	= 151.40 m <sup>3</sup>
Surplus soil		$207.0 - 151.40 \times 1/0.9 = 38.778$	= 38.80 m <sup>3</sup>
Body			
Concrete	24N/mm <sup>2</sup>	$4.00 \times 1.20 \times 1.000 \times 10 = 48.000$	= 48.00 m <sup>3</sup>
Reinforcing bar	D13	$(3.83 \times 16 + 3.19 \times 14 + 1.19 \times 14) \times 0.995 \times 10 = 1219.870$	= 1219.87 kg
Form		$(1.20 \times 4.00 + 1.20 \times 1.00) \times 2 \times 10 = 120.000$	= 120.00 m <sup>2</sup>
Foundation	t=150	$4.20 \times 1.20 \times 10 = 50.400$	= 50.40 m <sup>2</sup>
		$4.20 \times 1.20 \times 0.15 \times 10 = 7.560$	= 7.56 m <sup>3</sup>
Guide Sign			10 set
Other Materials	The specification of main members be referred to "Reference document (informatory sign board)"		

Item	INFORMATORY SIGNBOARD-TYPE B		Per 10 each
<p style="text-align: center;">VIEW</p>			
Title	Specification	Calculation Formula	Quantity
Excavation		$1.35/6 \times ((4.5 \times 3.35 + 2.0 \times 5.85 + 2 \times (4.5 \times 2.0 + 5.85 \times 3.35))) \times 10 = 188.933$	= 188.90 m <sup>3</sup>
Backfilling		$188.90 - (3.50 \times 1.20 \times 1.00 + 3.70 \times 1.20 \times 0.15) \times 10 = 140.240$	= 140.20 m <sup>3</sup>
Surplus soil		$188.90 - 140.20 \times 1/0.9 = 33.122$	= 33.10 m <sup>3</sup>
Body			
Concrete	24N/mm <sup>2</sup>	$3.50 \times 1.20 \times 1.00 \times 10 = 42.000$	42.00 m <sup>3</sup>
Reinforcing bar	D13	$(3.33 \times 16 + 3.19 \times 12 + 1.19 \times 12) \times 0.995 \times 10 = 1053.108$	1053.11 kg
Form		$(1.20 \times 3.50 + 1.20 \times 1.00) \times 2 \times 10 = 108.000$	108.00 m <sup>2</sup>
Foundation	t=150	$3.70 \times 1.20 \times 10 = 44.400$	44.40 m <sup>2</sup>
		$3.70 \times 1.20 \times 0.15 \times 10 = 6.660$	6.66 m <sup>3</sup>
Guide Sign			10 set
Other Materials	The specification of main members be referred to "Reference document (informatory sign board)"		

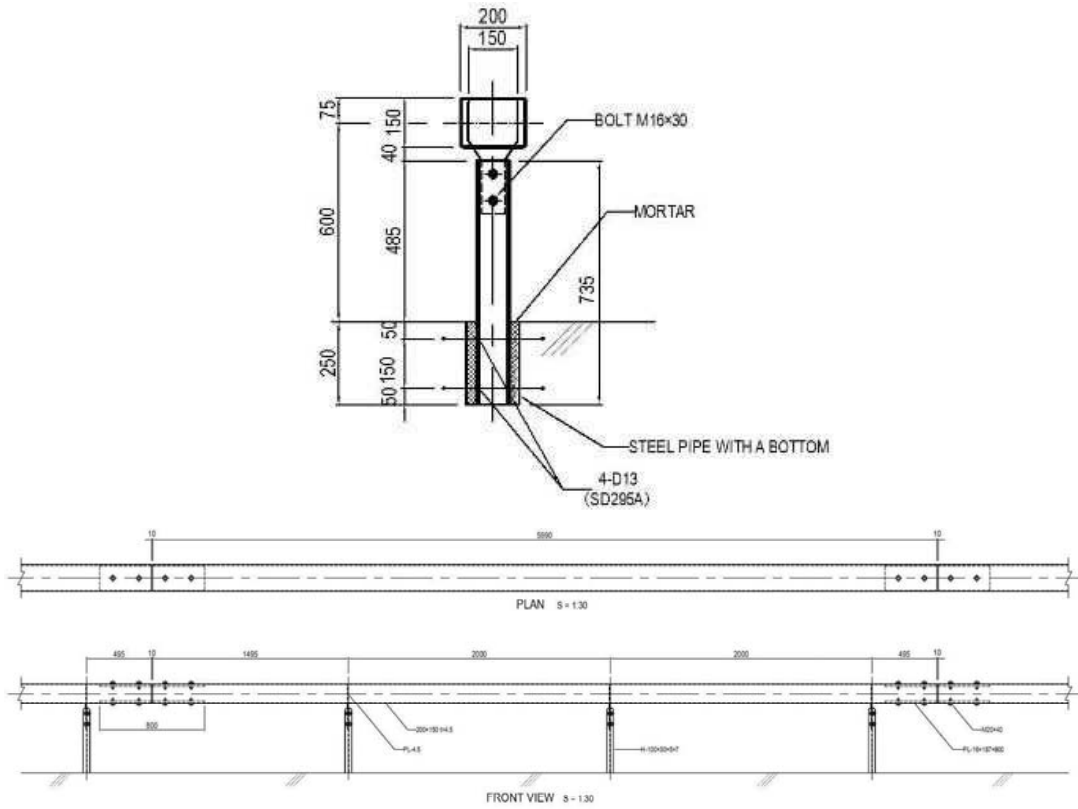


Title	Specification	Calculation Formula	Quantity
Excavation		$1.20 \times 1.20 \times 0.42 \times 5 = 3.024$	3.00 m3
Backfilling		$3.00 - 0.20 \times 0.20 \times 0.42 \times 5 = 2.916$	2.90 m3
Surplus soil		$3.00 - 2.90 \times 1/0.9 = -0.222$	-0.20 m3
Body			
Concrete	18N/mm2	$0.20 \times 0.20 \times 0.45 \times 5 = 0.090$	
		[Deduction]	
		0.090	0.09 m3
Form		$0.20 \times 0.45 \times 4 \times 5 = 1.800$	1.80 m2
Mainpost		$10/2.0 = 5$	5 each
Wirenet		$10/2.0 = 5$	5 set

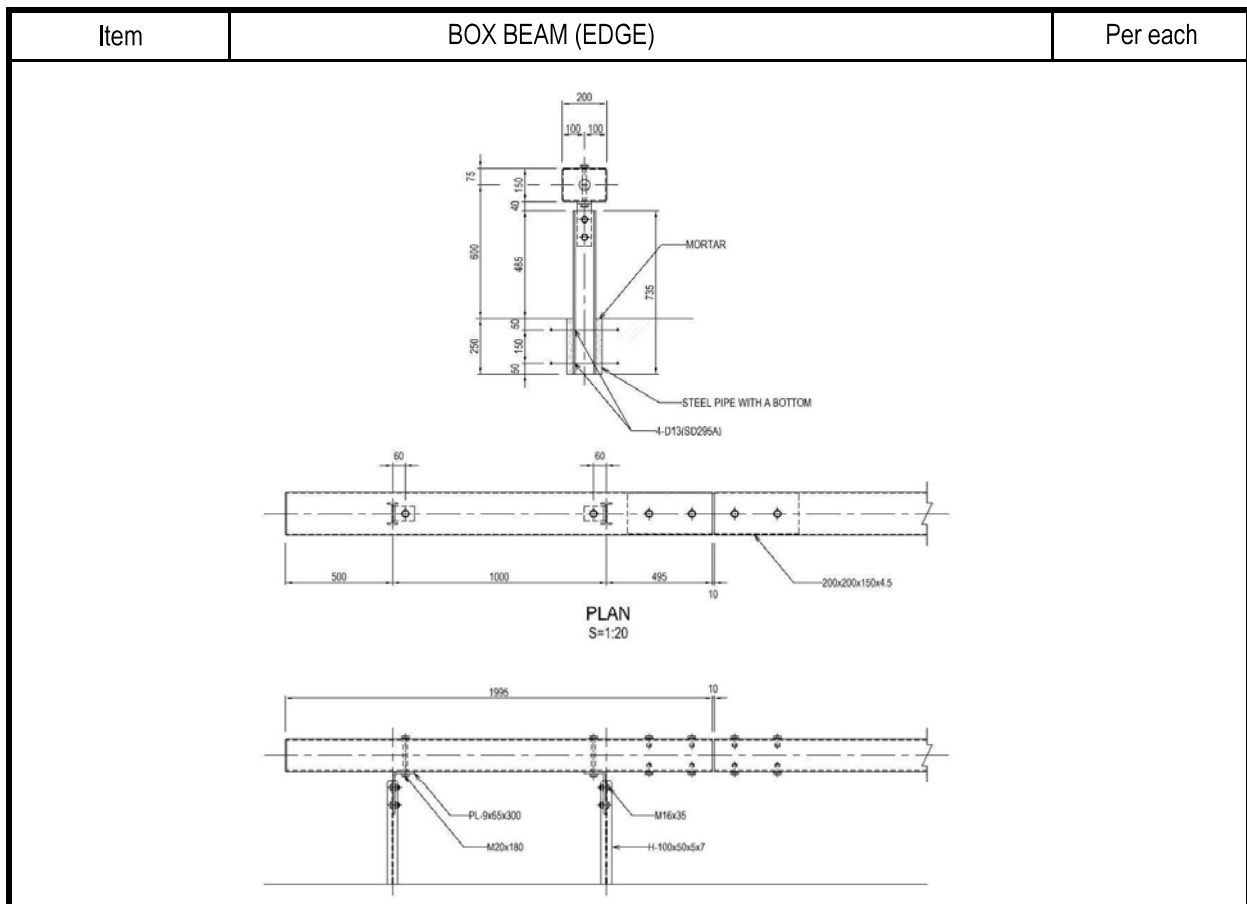
Item	BOUNDARY FENCE GATE		Per each
<p style="text-align: center;">FRONT VIEW</p>			
Title	Specification	Calculation Formula	Quantity
Excavation		$1.60 \times 1.60 \times 0.77 \times 2 + 1.20 \times 1.20 \times 0.20 = 4.230$	4.20 m <sup>3</sup>
Backfilling		$4.23 - (0.60 \times 0.60 \times 0.77 \times 2 + 0.20 \times 0.20 \times 0.20) = 3.668$	3.70 m <sup>3</sup>
Surplus soil		$4.20 - 370 \times 1/0.9 = 0.089$	0.10 m <sup>3</sup>
Body			
Concrete	18N/mm <sup>2</sup>	$0.60 \times 0.60 \times 0.80 \times 2 + 0.20 \times 0.20 \times 0.20 = 0.584$	
		[Deduction]	
		=	
		0.584	0.58 m <sup>3</sup>
Form		$0.80 \times 0.60 \times 4 \times 2 + 0.20 \times 0.20 \times 4 = 4.000$	4.00 m <sup>2</sup>
Gate			1 set



Item	BOX BEAM (ORDINARY)	Per 10m
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Title	Specification	Calculation	Formula	Quantity
Excavation		=	=	m3
Backfilling		=	=	m3
Surplus soil		=	=	m3
Body				
Steel Pipe		10/2.00	= 5	5 each
Boxbeam(Ordinary)	L=6.0m	10/6.00	= 1.67	1.7 set
Mortar		$(0.16 \times 0.16 - 0.10 \times 0.10) \times 3.14 \times 1/4 \times 0.25 \times 5 = 0.015$		= 0.02 m3



Title	Specification	Calculation	Formula	Quantity
Excavation		=	=	m3
Backfilling		=	=	m3
Surplus soil		=	=	m3
Body				
Steel Pipe		=	1	1 each
Boxbeam (Edge)	L=2.0m	=	2.00	2 set
Mortar		$(0.16 \times 0.16 - 0.10 \times 0.10) \times 3.14 \times 1/4 \times 0.25 \times 2 =$	0.006 =	0.01 m3

**02-OTHERS**

## 02-1-DRAINAGE (PC-I BRIDGE)

## 1.1 Steel material

<ACCESSORY>

Mtls	Form	Size (mm)	Total	AF1-PF2	PF5-PF7
SM400A	PL	8.0	348	48	46
		6.0	1,558	220	205
	M. Total		1,906	268	251
M. Total			1,906	268	251
SS400	FB	100 x 6.0	382	52	50
Subtotal of steel			2,288	320	301
SS400	B. N	M 12 x 40	174	24	23
		M 12 x 35	17	2	2
	M. Total		191	26	25
	W	M 12	191	26	25
	A. N	M 16 x 100	34	4	4
		M 12 x 100	174	24	23
	M. Total		208	28	27
M. Total			590	80	77
Subtotal of purchased part			590	80	77
Total (Kg)			2,878	400	378

<ACCESSORY>

Mtls	Form	Size (mm)	PF7-PF11	PF14-AF2
SM400A	PL	8.0	158	96
		6.0	693	440
	M. Total		851	536
M. Total			851	536
SS400	FB	100 x 6.0	176	104
Subtotal of steel			1,027	640
SS400	B. N	M 12 x 40	79	48
		M 12 x 35	9	4
	M. Total		88	52
	W	M 12	88	52
	A. N	M 16 x 100	18	8
		M 12 x 100	79	48
	M. Total		97	56
M. Total			273	160
Subtotal of purchased part			273	160
Total (Kg)			1,300	800

Shape name	
PL	Plate
CHPL	Applied plate
DECK	Deck plate
EX	Expanded metal
L	equilateral/unequal angle steel
LL	Unequal angle steel with unequal thickness
CT	CT-shaped steel
CH	Channel-shaped steel
H	H-shaped steel
I	I-shaped steel
U	U-shaped steel(The dimensions are names)
BULB	Bulb plate
FB	Flat bar
RB	Round bar
DB	Deformed bar
HRB	Half-round bar
SB	Square bar
6B	Hexagonal bar
LC	Light channel-shaped steel
LZ	Light Z-shaped steel
LA	Light angle steel
LRC	Lip channel-shaped steel
LRZ	Lip Z-shaped steel
LH	Hat steel
LSP	Square steel pipe
STK	Ordinary structural carbon steel pipe
STPY	Arc welding carbon steel pipe for piping
SGP	Carbon steel pipe for piping(The dimensions are names)
PIPE	Steel pipe for piping
SP5	Stainless steel pipe for piping(5S)
SP10	Stainless steel pipe for piping(10S)
HTB	Hexagon head bolt for high-strength structural bolting
TCB	Torshear type high strength bolt
HTBF	Driving high strength bolt(flat head)
HTBR	Driving high strength bol(round head)
B. N	Normal hexagon headed bolt set (1-nut、1-bolt)
B. UN	Hexagon headed bolt and lock nut set (1-lock nut、1-bolt)
BLT	Normal hexagon headed bolt
W	Washer
SW	Spring-washer
TW	Taper washer
RH	Roundhead rivet
WPIN	Split pin(The dimensions are names)
NUT	Hexagon nut (1 type)
NUT3	Hexagon nut (3 type)
UNUT	U nut
HLN	Hardlock nut
UBA	U bolt(TYPE-A)
UBB	U bolt(TYPE-B)
UBC	U bolt(TYPE-C)
STUD	Stud dowel
STUG	Cast-in-place stud dowel
TAP	Tap bolt (machine screw)
A. N	Driving anchor bolt (Sleeve driving type)
A. N2	Driving anchor bolt (Bolt driving type)
S. BT	Stud bolt
PIN	Pin
CHAN	Chain
MASU	Drainage basin
LL45	Steel pipe elbow4 5° long
LS90	Steel pipe elbow9 0° short
LL90	Steel pipe elbow9 0° long
RC	Reducer
FJ10	Flange joint S=10K
FJ5	Flange joint S=5K
HNUT	Nut for high strength bolt
S. N	Machine screw
PBT	Flat head bolt
T-NT	High nut
ST. 2	Stud dowel(with screw)
SP10	Stainless steel pipe for piping(10S)

## 1.2 Number of bolt

---

<ACCESSORY>

Number count

Mtls	Form	Size (mm)	Total	AF1-PF2	PF5-PF7
SS400	B. N	M 12 x 40	1,392	192	184
		M 12 x 35	68	8	8
	Subt		1,460	200	192
	W	M 12	2,920	400	384
A. N	M 16 x 100		136	16	16
		M 12 x 100	1,392	192	184
	Subt		1,528	208	200
Subtotal			5,908	808	776
Subtotal of			5,908	808	776
Total (Number)			5,908	808	776

<ACCESSORY>

Number count

Mtls	Form	Size (mm)	PF7-PF11	PF14-AF2
SS400	B. N	M 12 x 40	632	384
		M 12 x 35	36	16
	Subtota		668	400
	W	M 12	1,336	800
A. N	M 16 x 100		72	32
		M 12 x 100	632	384
	Subtota		704	416
Subtotal			2,708	1,616
Subtotal of purchased			2,708	1,616
Total (Number)			2,708	1,616

1.3 Galvanizing

[Unit:kg]

Shape	Quality	Size	Drainage metal fittings				Total	Standard
			AF. 1- PF. 2	PF. 5- PF. 7	PF. 7- PF. 11	PF. 14- AF. 2		
PL	SM400A	8	48	46	158	96	348	HDZ55
		6	220	205	693	440	1,558	"
Subtotal			268	251	851	536	1,906	-
	Subtotal		268	251	851	536	1,906	-
FB	SS400	100 x 6.0	52	50	176	104	382	HDZ55
	Subtotal of steel		320	301	1,027	640	2,288	-
B. N	SS400	M 12 x 40	24	23	79	48	174	HDZ35
		M 12 x 35	2	2	9	4	17	"
Subtotal			26	25	88	52	191	-
W	SS400	M 12	26	25	88	52	191	HDZ35
A. N	SS400	M 16 x 100	4	4	18	8	34	"
		M 12 x 100	24	23	79	48	174	"
Subtotal			28	27	97	56	208	-
	Subtotal		80	77	273	160	590	-
	Subtotal of purchased part		80	77	273	160	590	
	Total		400	378	1,300	800	2,878	

[Unit:kg]

Standard	AF. 1- PF. 2	PF. 5- PF. 7	PF. 7- PF. 11	PF. 14- AF. 2	Total
HDZ55	320	301	1,027	640	2,288
HDZ35	80	77	273	160	590



## 1.4 Weight of steel material weight

<ACCESSORY><AF1-PF2> Block:SUPPOT B1

Form	Size (mm)	Lg	Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL	120 x 8.0	140	1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL	140 x 8.0	160	1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB	100 x 6.0	452	1	4.710	2.130	2	SS400		PLATING	S. W C	
PL	100 x 6.0	815	1	47.100	3.840	4	SM400A		PLATING	S. W C	
PL	158 x 6.0	691	1	47.100	5.140	5	SM400A		PLATING	S. W C	
B. N	M 12	40	8		0.067	1	SS400		PLATING	B C	
W	M 12		16		0.005	1	SS400		PLATING	B C	
A. N	M 12	100	8		0.165	1	SS400		PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	13
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 16 Kg  
 22 Block Total Weight 352 Kg

<ACCESSORY><AF1-PF2> Block:SUPPOT B2

Form	Size (mm)	Lg	Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL	120 x 8.0	140	1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL	140 x 8.0	160	1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB	100 x 6.0	452	1	4.710	2.130	2	SS400		PLATING	S. W C	
PL	100 x 6.0	575	1	47.100	2.710	3	SM400A		PLATING	S. W C	
PL	158 x 6.0	451	1	47.100	3.360	3	SM400A		PLATING	S. W C	
B. N	M 12	40	8		0.067	1	SS400		PLATING	B C	
W	M 12		16		0.005	1	SS400		PLATING	B C	
A. N	M 12	100	8		0.165	1	SS400		PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	10
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 13 Kg  
 2 Block Total Weight 26 Kg

<ACCESSORY><AF1-PF2> Block: SUPPOT S1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
FB 100 x 6.0	469 1	4.710	2.210	2	SS400		PLATING	S. W C	
PL 100 x 6.0	467 2	47.100	2.200	4	SM400A		PLATING	S. W C	
PL 100 x 6.0	216 1	47.100	1.020	1	SM400A		PLATING	S. W C	
B. N M 12	35 4		0.063	1	SS400		PLATING	B C	
W M 12			0.005	1	SS400		PLATING	B C	
A. N M 16	100 8		0.281	2	SS400		PLATING	B C	
Large Shape	Number 0		Weight	0					
Small Shape	Number 0		Weight	0					
Acc Small			Weight	7					
Other Acc			Weight	0					
Butt Joint	0 mm								
TWELD LENGTH	0 mm								
1 Block Total			Weight	11 Kg					
2 Block Total			Weight	22 Kg					

<ACCESSORY><PF5-PF7> Block: SUPPOT B1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL 120 x 8.0	140 1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL 140 x 8.0	160 1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB 100 x 6.0	452 1	4.710	2.130	2	SS400		PLATING	S. W C	
PL 100 x 6.0	815 1	47.100	3.840	4	SM400A		PLATING	S. W C	
PL 158 x 6.0	691 1	47.100	5.140	5	SM400A		PLATING	S. W C	
B. N M 12	40 8		0.067	1	SS400		PLATING	B C	
W M 12			0.005	1	SS400		PLATING	B C	
A. N M 12	100 8		0.165	1	SS400		PLATING	B C	
Large Shape	Number 0		Weight	0					
Small Shape	Number 0		Weight	0					
Acc Small			Weight	13					
Other Acc			Weight	0					
Butt Joint	0 mm								
TWELD LENGTH	0 mm								
1 Block Total			Weight	16 Kg					
19 Block Total			Weight	304 Kg					

<ACCESSORY><PF5-PF7> Block:SUPPOT B2

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL 120 x 8.0	140	1	62.800	1.060	1	SM400A	PLATING	S. W C	
PL 140 x 8.0	160	1	62.800	1.410	1	SM400A	PLATING	S. W C	
FB 100 x 6.0	452	1	4.710	2.130	2	SS400	PLATING	S. W C	
PL 100 x 6.0	575	1	47.100	2.710	3	SM400A	PLATING	S. W C	
PL 158 x 6.0	451	1	47.100	3.360	3	SM400A	PLATING	S. W C	
B. N M 12	40	8		0.067	1	SS400	PLATING	B C	
W M 12		16		0.005	1	SS400	PLATING	B C	
A. N M 12	100	8		0.165	1	SS400	PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	10
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total			Weight	13 Kg
4 Block Total			Weight	52 Kg

<ACCESSORY><PF5-PF7> Block:SUPPOT S1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
FB 100 x 6.0	469	1	4.710	2.210	2	SS400	PLATING	S. W C	
PL 100 x 6.0	467	2	47.100	2.200	4	SM400A	PLATING	S. W C	
PL 100 x 6.0	216	1	47.100	1.020	1	SM400A	PLATING	S. W C	
B. N M 12	35	4		0.063	1	SS400	PLATING	B C	
W M 12		8		0.005	1	SS400	PLATING	B C	
A. N M 16	100	8		0.281	2	SS400	PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	7
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total			Weight	11 Kg
2 Block Total			Weight	22 Kg

<ACCESSORY><PF7-PF11> Block: SUPPOT B1

Form	Size (mm)	Lg	Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL	120 x 8.0	140	1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL	140 x 8.0	160	1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB	100 x 6.0	452	1	4.710	2.130	2	SS400		PLATING	S. W C	
PL	100 x 6.0	815	1	47.100	3.840	4	SM400A		PLATING	S. W C	
PL	158 x 6.0	691	1	47.100	5.140	5	SM400A		PLATING	S. W C	
B. N	M 12	40	8		0.067	1	SS400		PLATING	B C	
W	M 12		16		0.005	1	SS400		PLATING	B C	
A. N	M 12	100	8		0.165	1	SS400		PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	13
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 16 Kg  
 58 Block Total Weight 928 Kg

<ACCESSORY><PF7-PF11> Block: SUPPOT B2

Form	Size (mm)	Lg	Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL	120 x 8.0	140	1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL	140 x 8.0	160	1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB	100 x 6.0	452	1	4.710	2.130	2	SS400		PLATING	S. W C	
PL	100 x 6.0	575	1	47.100	2.710	3	SM400A		PLATING	S. W C	
PL	158 x 6.0	451	1	47.100	3.360	3	SM400A		PLATING	S. W C	
B. N	M 12	40	8		0.067	1	SS400		PLATING	B C	
W	M 12		16		0.005	1	SS400		PLATING	B C	
A. N	M 12	100	8		0.165	1	SS400		PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	10
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 13 Kg  
 21 Block Total Weight 273 Kg

<ACCESSORY><PF7-PF11> Block: SUPPOT S1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
FB 100 x 6.0	469 1	4.710	2.210	2	SS400		PLATING	S. W C	
PL 100 x 6.0	467 2	47.100	2.200	4	SM400A		PLATING	S. W C	
PL 100 x 6.0	216 1	47.100	1.020	1	SM400A		PLATING	S. W C	
B. N M 12	35 4		0.063	1	SS400		PLATING	B C	
W M 12			0.005	1	SS400		PLATING	B C	
A. N M 16	100 8		0.281	2	SS400		PLATING	B C	
Large Shape	Number 0		Weight 0						
Small Shape	Number 0		Weight 0						
Acc Small			Weight 7						
Other Acc			Weight 0						
Butt Joint	0 mm								
TWELD LENGTH	0 mm								
1 Block Total			Weight	11 Kg					
9 Block Total			Weight	99 Kg					

<ACCESSORY><PF14-AF2> Block: SUPPOT B1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL 120 x 8.0	140 1	62.800	1.060	1	SM400A		PLATING	S. W C	
PL 140 x 8.0	160 1	62.800	1.410	1	SM400A		PLATING	S. W C	
FB 100 x 6.0	452 1	4.710	2.130	2	SS400		PLATING	S. W C	
PL 100 x 6.0	815 1	47.100	3.840	4	SM400A		PLATING	S. W C	
PL 158 x 6.0	691 1	47.100	5.140	5	SM400A		PLATING	S. W C	
B. N M 12	40 8		0.067	1	SS400		PLATING	B C	
W M 12			0.005	1	SS400		PLATING	B C	
A. N M 12	100 8		0.165	1	SS400		PLATING	B C	
Large Shape	Number 0		Weight 0						
Small Shape	Number 0		Weight 0						
Acc Small			Weight 13						
Other Acc			Weight 0						
Butt Joint	0 mm								
TWELD LENGTH	0 mm								
1 Block Total			Weight	16 Kg					
44 Block Total			Weight	704 Kg					

<ACCESSORY><PF14-AF2> Block: SUPPOT B2

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
PL 120 x 8.0	140	1	62.800	1.060	1	SM400A	PLATING	S. W C	
PL 140 x 8.0	160	1	62.800	1.410	1	SM400A	PLATING	S. W C	
FB 100 x 6.0	452	1	4.710	2.130	2	SS400	PLATING	S. W C	
PL 100 x 6.0	575	1	47.100	2.710	3	SM400A	PLATING	S. W C	
PL 158 x 6.0	451	1	47.100	3.360	3	SM400A	PLATING	S. W C	
B. N M 12	40	8		0.067	1	SS400	PLATING	B C	
W M 12		16		0.005	1	SS400	PLATING	B C	
A. N M 12	100	8		0.165	1	SS400	PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	10
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 13 Kg  
 4 Block Total Weight 52 Kg

<ACCESSORY><PF14-AF2> Block: SUPPOT S1

Form Size (mm)	Lg Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
FB 100 x 6.0	469	1	4.710	2.210	2	SS400	PLATING	S. W C	
PL 100 x 6.0	467	2	47.100	2.200	4	SM400A	PLATING	S. W C	
PL 100 x 6.0	216	1	47.100	1.020	1	SM400A	PLATING	S. W C	
B. N M 12	35	4		0.063	1	SS400	PLATING	B C	
W M 12		8		0.005	1	SS400	PLATING	B C	
A. N M 16	100	8		0.281	2	SS400	PLATING	B C	

Large Shape	Number	0	Weight	0
Small Shape	Number	0	Weight	0
Acc Small			Weight	7
Other Acc			Weight	0
Butt Joint	0 mm			
TWELD LENGTH	0 mm			

1 Block Total Weight 11 Kg  
 4 Block Total Weight 44 Kg

## 1.5 Drainage

### Drainage of superstructure

Item		Unit	Quantity					備考
			AF.1-PF.2	PF.5-PF.7	PF.7-PF.11	PF.14-AF.2	TOTAL	
Pipe length	200A	m	57.1	63.0	228.9	110.4	459.3	VP
Straight pipe	200A	m	45.0	43.5	142.9	88.2	319.7	VP
Curve pipe	200A	No.	6	6	27	8	47	VP
Expansion joint	HORIZONTAL PULLING	No.	2	3	19	4	28	VP
	VERTICAL PULLING	No.	1	2	9	4	16	
End cap	VP200A	No.	2	2	6	4	14	
Device for flexible tube		set	10	9	21	20	60	For straight pipe
Flexible tube	φ20	m	8.5	8.8	19.2	18.4	54.9	SUS304
Flexible tube joint	φ20	No.	10	8	8	8	34	Polyvinyl chloride pipe
Drain pipe on deck slab		m	70.9	81.9	229.4	130.8	513.0	φ20
Edge joint treatment		m	261.6	261.6	501.2	261.6	1286.0	
Extension of molding joint		m	261.6	658.9	501.2	261.6	1683.3	
Joint filler		m <sup>2</sup>	658.4	658.9	1317.8	658.4	3293.4	Coated waterproofing membrane
Catch pit		No.	3	6	27	6	42	400x320

1) Quantity Calculation Of Drainage

(a) AF. 1-PF. 2

a) Pipe length

VP (200A)

AF. 1-PF. 1 (R)

DRR1	1.218	-	0.520	=	0.698
DRR2	1.240	-	0.520	=	0.720

	25.011	+	1.888	=	26.899
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PF. 1-PF. 2 (R)

DRR3	1.240	-	0.520	=	1.760
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	25.427	+	1.188	+	0.372	=	26.987
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$\Sigma$	57.1	m
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b) Straight pipe

VP (200A)					
AF. 1-PF. 1 (R)	4.302	+	18.309	=	22.611
PF. 1-PF. 2 (R)	14.307	+	8.121	=	22.428

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Σ                    45.0 m

c) Curve pipe

VP (200A)			
T1	No.	3	
T2	No.	2	
T3	No.	1	

d) Expansion joint

VP (200A)	EX	HORIZONTAL PULLING	No.	2
	EX-S	VERTICAL PULLING	No.	1

e) END CAP

VP (200A)			No.	2
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f) Device for flexible tube

SD set 10

g) Flexible tube

∅20 (SUS304)

AF. 1-PF. 1 (R)

SDR1 1.600 = 1.600

SDR2 1.238 - 0.470 = 0.768

SDR3 1.239 - 0.470 = 0.769

SDR4 1.239 - 0.470 = 0.769

SDL5 1.241 - 0.470 = 0.771

PF. 1-PF. 2 (R)

SDL6 1.247 - 0.470 = 0.777

SDL7 1.243 - 0.470 = 0.773

SDL8 1.237 - 0.470 = 0.767

SDL9 1.233 - 0.470 = 0.763

SDL10 1.229 - 0.470 = 0.759

Σ 8.5 m

h) Flexible tube joint ∅20

No. 10

i) Drain pipe on deck slab ∅20

R2 59.900 x 1 = 59.900

GE1 5.500 x 1 = 5.500

GE1 5.500 x 1 = 5.500

Σ 70.9 m

j) Edge joint treatment, Extension of molding joint

L2 GE1-GE2 59.900 = 59.900

L3 GE1-GE2 59.900 = 59.900

R2 GE1-GE2 59.900 = 59.900

R3 GE1-GE2 59.900 = 59.900

GE1 5.500 + 5.500 = 11.000

GE2 5.500 + 5.500 = 11.000

Σ 261.6 m

k) Joint filler

( 5.500 + 5.500 ) x 59.850 = 658.4 m<sup>2</sup>

l) Catch pit

MASU I set 3

(b) PF. 5-PF. 7

a) Pipe length

VP (200A)

PF. 5-PF. 6 (L)

DRL1	1.749	-	0.520	=	1.229
DRL2	1.240	-	0.520	=	0.720

	25.011	+	0.646	+	0.372	=	26.029
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PF. 6-PF. 7 (L)

DRL3	1.462	-	0.520	=	1.982
DRL4	1.140	-	0.520	=	1.660
DRL5	1.240	-	0.520	=	1.760
DRL6	1.518	-	0.520	=	2.038

	10.004	+	0.931	+	0.372	+	16.267	=	27.574
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Σ	63.0 m
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b) Straight pipe

VP (200A)						
PF. 5-PF. 6 (L)	4.302	+	18.309		=	22.611
PF. 6-PF. 7 (L)	8.005	+	4.302	+	8.604	= 20.911

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Σ	43.5 m
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c) Curve pipe

VP (200A)			
T1		No.	2
T2		No.	3
T4		No.	1

d) Expansion joint

VP (200A)	EX	HORIZONTAL PULLING	No.	3
	EX-S	VERTICAL PULLING	No.	2

e) End cap

VP (200A)		No.	2
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f) Device for flexible tube

SD set 9

g) Flexible tube

∅20 (SUS304)

PF. 5–PF. 6 (L)

SDR1	1.600			=	1.600
SDR2	1.622	–	0.470	=	1.152
SDR3	1.495	–	0.470	=	1.025
SDR4	1.367	–	0.470	=	0.897
SDL5	1.113	–	0.470	=	0.643
PF. 6–PF. 7 (L)					
SDL6	1.301	–	0.470	=	0.831
SDL7	1.101	–	0.470	=	0.631
SDL8	1.379	–	0.470	=	0.909
SDL9	1.540	–	0.470	=	1.070

Σ 8.8 m

h) Flexible tube joint ∅20

No. 8

i) Drain pipe on deck slab ∅20

L2	59.900	x	1	=	59.900
GE1	5.500	x	2	=	11.000
GE2	5.500	x	2	=	11.000
				Σ	81.9 m

j) Edge joint treatment, Extension of molding joint

L2	GE1–GE2	59.900		=	59.900
L3	GE1–GE2	59.900		=	59.900
R2	GE1–GE2	59.900		=	59.900
R3	GE1–GE2	59.900		=	59.900
GE1		5.500	+ 5.500	=	11.000
GE2		5.500	+ 5.500	=	11.000
				Σ	261.6 m

k) Joint filler

( 5.500 + 5.500 ) x 59.900 = 658.9 m<sup>2</sup>

l) Catch pit

MASU I set 6

(c) PF. 7–PF. 11

a) Pipe length

VP (200A)

PF. 7–PF. 8 (L)

DRL1	1.471	–	0.520					=	0.951
DRL2	1.305	–	0.520					=	0.785
DRL3	1.240	–	0.520					=	0.720
DRL4	1.140	–	0.520					=	0.620
DRL5	1.274	–	0.520					=	0.754
DRL6	1.408	–	0.520					=	0.888

$$10.004 + 1.300 + 0.171 + 0.818 + 0.372 + 15.007 = 27.672$$

PF. 8–PF. 9 (L)

DRL7	1.510	–	0.520					=	2.030
DRL8	1.140	–	0.520					=	1.660
DRL9	1.240	–	0.520					=	1.760

$$10.004 + 0.026 + 0.871 + 0.372 + 15.007 = 26.280$$

PF. 9–PF. 10 (L)

DRL10	1.469	–	0.520					=	0.949
DRL11	1.140	–	0.520					=	0.620
DRL12	1.240	–	0.520					=	0.720

$$10.004 + 0.043 + 0.896 + 0.372 + 15.007 = 26.322$$

PF. 10–PF. 11 (L)

DRL13	1.469	–	0.520					=	1.989
DRL14	1.140	–	0.520					=	1.660
DRL15	1.240	–	0.520					=	1.760
DRL16	1.469	–	0.520					=	1.989

$$10.004 + 0.043 + 0.896 + 0.372 + 15.007 + 1.001 + 0.372 = 27.695$$

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$$\Sigma (L) \quad 127.8 \text{ m}$$

$$\begin{array}{l} \text{PF. 7-PF. 8 (R)} \\ \text{DRR1} \end{array} \quad 1.140 - 0.520 = 0.620$$

$$5.002 = 5.002$$

$$\begin{array}{l} \text{PF. 8-PF. 9 (R)} \\ \text{DRL2} \\ \text{DRL3} \\ \text{DRL4} \end{array} \quad \begin{array}{l} 1.269 - 0.520 \\ 1.140 - 0.520 \\ 1.240 - 0.520 \end{array} = \begin{array}{l} 1.789 \\ 1.660 \\ 1.760 \end{array}$$

$$10.004 + 0.242 + 0.901 + 0.372 + 15.007 = 26.526$$

$$\begin{array}{l} \text{PF. 9-PF. 10 (R)} \\ \text{DRL5} \\ \text{DRL6} \\ \text{DRL7} \end{array} \quad \begin{array}{l} 1.469 - 0.520 \\ 1.140 - 0.520 \\ 1.240 - 0.520 \end{array} = \begin{array}{l} 0.949 \\ 0.620 \\ 0.720 \end{array}$$

$$10.004 + 0.043 + 0.896 + 0.372 + 15.007 = 26.322$$

$$\begin{array}{l} \text{PF. 10-PF. 11 (R)} \\ \text{DRL8} \\ \text{DRL9} \\ \text{DRL10} \\ \text{DRL11} \end{array} \quad \begin{array}{l} 1.469 - 0.520 \\ 1.140 - 0.520 \\ 1.240 - 0.520 \\ 1.469 - 0.520 \end{array} = \begin{array}{l} 1.989 \\ 1.660 \\ 1.760 \\ 1.989 \end{array}$$

$$10.004 + 0.043 + 0.896 + 0.372 + 15.007 + 1.001 + 0.372 = 27.695$$

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$$\Sigma (R) \quad 101.1 \text{ m}$$

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$$\Sigma (L) + \Sigma (R) \quad 228.9 \text{ m}$$

b) Straight pipe

VP (200A)											
PF. 7-PF. 8 (L)	3.302	+	3.302	+	3.302	+	3.602	+	3.302	=	16.810
PF. 8-PF. 9 (L)	8.005	+	4.302	+	8.604					=	20.911
PF. 9-PF. 10 (L)	8.005	+	4.302	+	8.004					=	20.311
PF. 10-PF. 11 (L)	8.005	+	4.302	+	8.005					=	20.312
PF. 7-PF. 8 (R)	3.002									=	3.002
PF. 8-PF. 9 (R)	8.005	+	4.302	+	8.604					=	20.911
PF. 9-PF. 10 (R)	8.005	+	4.302	+	8.004					=	20.311
PF. 10-PF. 11 (R)	8.005	+	4.302	+	8.005					=	20.312
										<hr/>	
										Σ	142.9 m

c) Curve pipe

VP (200A)				
T1		No.	2	
T2		No.	9	
T4		No.	9	
T5		No.	7	

d) Expansion joint

VP (200A)	EX	HORIZONTAL PULLING	No.	19
	EX-S	VERTICAL PULLING	No.	9

e) End cap

VP (200A)		No.	6
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f) Device for flexible tube

SD set 21

g) Flexible tube

∅20 (SUS304)

PF. 7-PF. 11 (L)

SDL1	1.600			=	1.600
SDL2	1.326	-	0.470	=	0.856
SDL3	1.126	-	0.470	=	0.656
SDL4	1.354	-	0.470	=	0.884
SDL5	1.326	-	0.470	=	0.856
SDL6	1.126	-	0.470	=	0.656
SDL7	1.354	-	0.470	=	0.884
SDL8	1.326	-	0.470	=	0.856
SDL9	1.126	-	0.470	=	0.656
SDL10	1.354	-	0.470	=	0.884
SDL11	1.600			=	1.600

PF. 7-PF. 11 (R)

SDR1	1.326	-	0.470	=	0.856
SDR2	1.126	-	0.470	=	0.656
SDR3	1.354	-	0.470	=	0.884
SDR4	1.326	-	0.470	=	0.856
SDR5	1.126	-	0.470	=	0.656
SDR6	1.354	-	0.470	=	0.884
SDR7	1.326	-	0.470	=	0.856
SDR8	1.126	-	0.470	=	0.656
SDR9	1.354	-	0.470	=	0.884
SDR10	1.600			=	1.600

---

Σ 19.2 m

h) Flexible tube joint ∅20

No. 8

i) Drain pipe on deck slab ∅20

L2	119.800	x	1	=	119.800
R2	98.600	x	1	=	98.600
GE2	5.500	x	1	=	5.500
GE2	5.500	x	1	=	5.500
					Σ 229.4 m

j) Edge joint treatment, Extension of molding joint

L2	GE1-GE2	119.800		=	119.800
L3	GE1-GE2	119.800		=	119.800
R2	GE1-GE2	119.800		=	119.800
R3	GE1-GE2	119.800		=	119.800
GE1		5.500	+ 5.500	=	11.000
GE2		5.500	+ 5.500	=	11.000
					Σ 501.2 m

k) Joint filler

$$( 5.500 + 5.500 ) \times 119.800 = 1317.8 \text{ m}^2$$

l) Catch pit

MASU I set 27

(d) PF. 14-AF. 2

a) Pipe length

VP (200A)

PF. 14-AF. 2 (L)

DRL1	1.240	-	0.520				=	0.720
DRL2	1.240	-	0.520				=	0.720
DRL3	1.230	-	0.520				=	0.710

$$25.011 + 1.140 + 0.372 + 25.011 + 1.13 + 0.372 = 53.036$$

PF. 14-AF. 2 (R)

DRR1	1.240	-	0.520				=	0.720
DRR2	1.240	-	0.520				=	0.720
DRR3	1.230	-	0.520				=	0.710

$$25.011 + 1.140 + 0.372 + 25.011 + 1.13 + 0.372 = 53.036$$

---

Σ 110.4 m

b) Straight pipe

VP (200A)									
PF. 14-AF. 2(L)	14.307	+	7.504	+	4.302	+	18.009	=	44.122
PF. 14-AF. 2(R)	14.307	+	7.504	+	4.302	+	18.009	=	44.122
								Σ	88.2 m

c) Curve pipe

VP (200A)			
T1		No.	2
T2		No.	4
T3		No.	2

d) Expansion joint

VP (200A)	EX	HORIZONTAL PULLING	No.	4
	EX-S	VERTICAL PULLING	No.	4

e) End cap

VP (200A)		No.	4
-----------	--	-----	---

f) Device for flexible tube

SD set 20

g) Flexible tube

∅20 (SUS304)

PF. 7-PF. 11 (L)

SDL1-9 ( 1.230 - 0.470 ) x 10 = 7.600  
 SDL10 1.600 = 1.600

PF. 7-PF. 11 (R)

SDL1-9 ( 1.230 - 0.470 ) x 10 = 7.600  
 SDL10 1.600 = 1.600

Σ 18.4 m

h) Flexible tube joint ∅20

No. 8

i) Drain pipe on deck slab ∅20

L2 59.900 x 1 = 59.900  
 R2 59.900 x 1 = 59.900  
 GE2 5.500 x 1 = 5.500  
 GE2 5.500 x 1 = 5.500

Σ 130.8 m

j) Edge joint treatment, Extension of molding joint

L2 GE1-GE2 59.900 = 59.900  
 L3 GE1-GE2 59.900 = 59.900  
 R2 GE1-GE2 59.900 = 59.900  
 R3 GE1-GE2 59.900 = 59.900  
 GE1 5.500 + 5.500 = 11.000  
 GE2 5.500 + 5.500 = 11.000

Σ 261.6 m

k) Joint filler

$$(5.500 + 5.500) \times 59.850 = 658.4 \text{ m}^2$$

l) Catch pit

MASU I set 6

Contracted word

• 1.4	Weight of steel material weight	
	Large Shape Piece	: Large Shape
	Small Shape Piece	: Small Shape
	Materials Single Number	: Number
	Accessory Small Shape Piece	: Acc Small
	Other Accessories	: Other Acc
	Butt Welded Joint Of Steel Plate	: Butt Joint
	The Tee-Fitting Weld Length	: Tweld Length
	Unit Weight	: U. Weight
	One Set Of Weight	: S. Weight
	Large	: L
	Small	: S
	Small Shape Single Weight	: S. W
	Buying	: B
	Length	: Lg
	Number	: Nb
	Materials	: Mtl s
	Materials Initial	: Mtas. I
	Comment	: Cmt
	Assortment	: Am
	Element	: Elt
	Abstract	: Abs

# 02-2-DRAINAGE (SUBSTRUCTURE)



## Contents

	Page
1. Quantity list -----	1
1.1 Steel material -----	2
1.2 Number of bolt -----	4
1.3 Galvanizing -----	5
1.4 Drainage -----	6
2. Amount check -----	7
2.1 Weight of steel material weight -----	8
2.2 Drainage -----	9

## 1. Quantity list

## 1.1 Steel material

---

<ACCESSORY>

Mtls	Form Size (mm)	TOTAL	DRAINAGE
SM400A	PL 6.0	608	608
M. Total		608	608
SS400	FB 100 x 6.0	304	304
Subtotal of steel		912	912
SS400	B. N M 12 x 35	152	152
	W M 12	152	152
	A. N M 16 x 100	152	152
M. Total		456	456
Subtotal of purchased part		456	456
Total (Kg)		1,368	1,368

## 1.2 Number of bolt

---

<ACCESSORY>

A number count single material: I close the spot

Mtls	Form Size (mm)	TOTAL	DRAINAGE
SS400	B. N M 12 x 35	608	608
	W M 12	1,216	1,216
	A. N M 16 x 100	608	608
M. Total		2,432	2,432
Purchase department total		2,432	2,432
Total (Number)		2,432	2,432

Shape name	
PL	Plate
CHPL	Applied plate
DECK	Deck plate
EX	Expanded metal
L	equilateral/unequal angle steel
LL	Unequal angle steel with unequal thickness
CT	CT-shaped steel
CH	Channel-shaped steel
H	H-shaped steel
I	I-shaped steel
U	U-shaped steel(The dimensions are names)
BULB	Bulb plate
FB	Flat bar
RB	Round bar
DB	Deformed bar
HRB	Half-round bar
SB	Square bar
6B	Hexagonal bar
LC	Light channel-shaped steel
LZ	Light Z-shaped steel
LA	Light angle steel
LRC	Lip channel-shaped steel
LRZ	Lip Z-shaped steel
LH	Hat steel
LSP	Square steel pipe
STK	Ordinary structural carbon steel pipe
STPY	Arc welding carbon steel pipe for piping
SGP	Carbon steel pipe for piping(The dimensions are names)
PIPE	Steel pipe for piping
SP5	Stainless steel pipe for piping(5S)
SP10	Stainless steel pipe for piping(10S)
HTB	Hexagon head bolt for high-strength structural bolting
TCB	Torshear type high strength bolt
HTBF	Driving high strength bolt(flat head)
HTBR	Driving high strength bol(round head)
B. N	Normal hexagon headed bolt set (1-nut、1-bolt)
B. UN	Hexagon headed bolt and lock nut set (1-lock nut、1-bolt)
BLT	Normal hexagon headed bolt
W	Washer
SW	Spring-washer
TW	Taper washer
RH	Roundhead rivet
WPIN	Split pin(The dimensions are names)
NUT	Hexagon nut (1 type)
NUT3	Hexagon nut (3 type)
UNUT	U nut
HLN	Hardlock nut
UBA	U bolt(TYPE-A)
UBB	U bolt(TYPE-B)
UBC	U bolt(TYPE-C)
STUD	Stud dowel
STUG	Cast-in-place stud dowel
TAP	Tap bolt (machine screw)
A. N	Driving anchor bolt (Sleeve driving type)
A. N2	Driving anchor bolt (Bolt driving type)
S. BT	Stud bolt
PIN	Pin
CHAN	Chain
MASU	Drainage basin
LL45	Steel pipe elbow4 5° long
LS90	Steel pipe elbow9 0° short
LL90	Steel pipe elbow9 0° long
RC	Reducer
FJ10	Flange joint S=10K
FJ5	Flange joint S=5K
HNUT	Nut for high strength bolt
S. N	Machine screw
PBT	Flat head bolt
T-NT	High nut
ST. 2	Stud dowel(with screw)
SP10	Stainless steel pipe for piping(10S)

1.3 Galvanizing

[Unit:kg]

Shape	Quality	Size	Main construction	The sum total	Standard
			substructure drainage		
PL	SM400A	6	608	608	HDZ55
	Subtotal		608	608	-
FB	SS400	100 x 6.0	304	304	HDZ55
	Subtotal of steel		912	912	-
B. N	SS400	M 12 x 35	152	152	HDZ35
W	SS400	M 12	152	152	"
A. N	SS400	M 16 x 100	152	152	"
	Subtotal		456	456	-
Subtotal of purchased part			456	456	
Total			1,368	1,368	

[Unit:kg]

Standard	Volume
HDZ55	912
HDZ45	
HDZ35	456

#### 1.4 Drainage

##### Substructure drainage

Item		Unit	Quantity	Remarks
Pipe length	200A	m	229.0	VP
Straight pipe	200A	m	178.0	VP
Curve pipe	200A	No.	39	VP

2. Amount check



## 2.1 Weight of steel material weight

---

<ACCESSORY><DRAINAGE> Block: SUPPOT S4

Form	Size (mm)	Lg	Nb	U. Weight	S. Weight	Weight	Mtls	NET Mtas. I	Cmt	Am Elt	Abs
FB	100 x 6.0	469	1	4.710	2.210	2	SS400		PLATING	S. W C	
PL	100 x 6.0	340	2	47.100	1.600	3	SM400A		PLATING	S. W C	
PL	100 x 6.0	216	1	47.100	1.020	1	SM400A		PLATING	S. W C	
B. N	M 12	35	4		0.063	1	SS400		PLATING	B C	
W	M 12		8		0.005	1	SS400		PLATING	B C	
A. N	M 16	100	4		0.281	1	SS400		PLATING	B C	
<hr/>											
	Large Shape	Number	0		Weight	0					
	Small Shape	Number	0		Weight	0					
	Acc Small				Weight	6					
	Other Acc				Weight	0					
	Butt Joint		0 mm								
	TWELD LENGTH		0 mm								
<hr/>											
	1 Block Total				Weight	9 Kg					
	152 Block Total				Weight	1,368 Kg					

2.2 Drainage

1) Quantity of drainage man-hour calculation

(a) Substructurec drainage

a) Pipe length

VP (200A)

AF. 2	3.427	+	3.427						=	6.854	
PF. 1	0.600	+	0.400	+	4.468	+	0.800	+	0.600	+	1.181 = 8.049
PF. 2	0.600	+	0.400	+	3.624	+	0.800	+	0.600	+	3.066 = 9.090
PF. 3	0.800	+	0.400	+	3.624	+	0.800	+	0.600	+	3.112 = 14.760
			1.000	+	3.624	+	0.800				
PF. 4	0.600	+	0.400	+	3.624	+	0.800	+	0.600	+	4.540 = 10.5640
PF. 5	0.600	+	0.400	+	4.468	+	0.800	+	0.600	+	5.942 = 12.810
PF. 6	0.600	+	0.400	+	4.468	+	0.800	+	0.600	+	6.246 = 13.114
PF. 7	0.600	+	0.400	+	4.468	+	0.800	+	0.600	+	6.1 = 12.968
PF. 8	0.500	+	0.400	+	4.745	+	0.800	+	0.600	+	6.343 = 19.633
			0.700	+	4.745	+	0.800				
PF. 9	0.500	+	0.400	+	4.745	+	0.800	+	0.600	+	5.973 = 19.263
			0.700	+	4.745	+	0.800				
PF. 10	0.500	+	0.400	+	4.745	+	0.800	+	0.600	+	5.597 = 18.887
			0.700	+	4.745	+	0.800				
PF. 11	0.500	+	0.400	+	4.745	+	0.800	+	0.600	+	4.38 = 17.670
			0.700	+	4.745	+	0.800				
PF. 15	0.500	+	0.400	+	4.745	+	0.800	+	0.600	+	2.433 = 15.723
			0.700	+	4.745	+	0.800				
PF. 12	0.800	+	0.400	+	4.543	+	0.800	+	0.600	+	3.892 = 17.378
			1.000	+	4.543	+	0.800				
PF. 13	0.800	+	0.400	+	4.543	+	0.800	+	0.600	+	2.987 = 16.473
			1.000	+	4.543	+	0.800				
PF. 14	0.800	+	0.400	+	4.543	+	0.800	+	0.600	+	2.325 = 15.811
			1.000	+	4.543	+	0.800				

---

Σ 229.047 m

b) Straight pipe

VP (200A)

AF. 2	3.427	x	2						=	6.854
PF. 1	4.468	+	1.181						=	5.649
PF. 2	3.624	+	3.066						=	6.690
PF. 3	3.624	+	3.624	+	3.112				=	10.360
PF. 4	3.624	+	4.540						=	8.164
PF. 5	4.468	+	5.942						=	10.410
PF. 6	4.468	+	6.246						=	10.714
PF. 7	4.468	+	6.100						=	10.568
PF. 8	4.745	+	4.745	+	6.343				=	15.833
PF. 9	4.745	+	4.745	+	5.973				=	15.463
PF. 10	4.745	+	4.745	+	5.597				=	15.087
PF. 11	4.745	+	4.745	+	4.380				=	13.870
PF. 15	4.745	+	4.745	+	2.433				=	11.923
PF. 12	4.543	+	4.543	+	3.892				=	12.978
PF. 13	4.543	+	4.543	+	2.987				=	12.073
PF. 14	4.543	+	4.543	+	2.325				=	11.411

---

Σ 178.047 m

c) Curve pipe

VP (200A)

L1  
L2  
L3

No.  
No.  
No.

24  
6  
9

Contracted word

- 2.1	Weight of steel material weight	
	Large Shape Piece	: Large Shape
	Small Shape Piece	: Small Shape
	Materials Single Number	: Number
	Accessory Small Shape Piece	: Acc Small
	Other Accessories	: Other Acc
	Butt Welded Joint Of Steel Plate	: Butt Joint
	The Tee-Fitting Weld Length	: Tweld Length
	Unit Weight	: U. Weight
	One Set Of Weight	: S. Weight
	Large	: L
	Small	: S
	Small Shape Single Weight	: S. W
	Buying	: B
	Length	: Lg
	Number	: Nb
	Materials	: Mtl s
	Materials Initial	: Mtas. I
	Comment	: Cmt
	Assortment	: Am
	Element	: Elt
	Abstract	: Abs