CHAPTER 4
INTERMEDIATE WASTEWATER PUMPING STATION CONSTRUCTION (PACKAGE C)

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TABLE C.2.1 (1/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
1. Clearing and Grubbing		(m2)
	1/2 x (98.0 + 109.0) x 60.0 =	6,210.00
	Total	6,210.00
	Allowance: 3%	**6,400 m2**
2. Excavation		
2.1 Common Excavation for Pumping Station		
	{1/2 x (9.655 + 13.155) x 3.00 + 1/2 x 26.7 + 27.2) x 0.50} x 20.60 =	982.4
	29.80 x 17.0 x 20.60 =	10,436.0
	1/2 x (9.655 + 13.155) x 3.3 x 3.5 + 1/2 x (9.804 + 12.877)x3.5x 17.2 =	705.5
	Total	12,123.9
	Allowance: 3%	**12,490 m3**
2.2 Common Excavation for Grid Chamber and Stormwater Drainage		
(1) Grit Chamber	V1 = {1/2 x (19.914 + 20.914) x 0.50 + 1/2 x (5.80 + 6.20) x 0.50}x 14.0 =	184.90
	A1 = 1/2 x (15.52 + 14.00) x 4.639 + 14.00 x 33.131 = 532.31m2	
	A2 = 1/2 x (24.76 + 23.24) x 4.639 + 23.24 x 37.751 = 988.67m2	
	V2 = 1/2 x (532.31 + 988.67) x 3.08 =	2,342.31
	Sub-total	2,527.21
(2) Stormwater Drainage (refer to other sheet prepared by Local Engineer, Ms. Nguyet(UDC)		
	U-300 x 400	531.52
	U-300 x 400	25.73
	600 dia	12.55
	600 dia	41.64
	Manhole	15.30
	Outlet	52.80
	Sub-total	679.54
	Total	3,021.85
	Allowance: 5%	**3,180 m3**
2.3 Excavation for Diaphragm Wall		
	{32.80+24.20+1/2x (11.304+11.995)+4.733+ 1/2x (17.732+18.423)+20.6}x 1.50x36.2 =	6,084.86
	Allowance: 5%	**6,390 m3**
3. Backfill by Excavated Materials		(m3)
3.1 Grit Chamber	V1 = {1/2 x (19.914 + 20.914) x 0.50 + 1/2 x (5.80 + 6.20) x 0.50}x 12.0 = 158.48m3	
	V2 = {1/2 x (12.72 + 11.2) x 4.639 + 11.2 x 32.131} x 3.08 = 1,279.28m3	
	V1 + V2 = 1,437.76m3	
	Therefore, Backfill volume is estimated as follows:	
	V = 2,527.21m3 - 1,279.28m3 =	1,247.93
	Sub-total	1,247.93
3.2 Stormwater Drainage		
	U-300 x 400	305.50
	U-300 x 400	14.07
	Sub-total	319.57
	Total	1,567.50
	Allowance: 5%	**1,650 m3**
4. Sandy Soil Backfill		
4.1 Stormwater Drainage		(m3)
(1) 600 dia		2.77
(2) 600dia		8.84
(3) Manhole		3.00
(4) Outfall		37.87
	Total	52.48
	Allowance: 5%	**55 m3**

TABLE C.2.1 (2/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
5. Sand Backfill		
5.1 Stormwater Drainage		(m3)
(1) 600 dia		6.08
(2) 600 dia		20.45
	Total	26.53
	Allowance: 5%	**30 m3**
6. Sandy Soil Fill		
6.1 Pump Station and Grit Chamber		(m3)
START - No.1	107.32m2 x 8.00m =	858.56
No.1 - No.2	1/2 x (107.32 + 106.90) x 15.00 =	1,606.65
No.2 - No.3	1/2 x (106.90 + 45.68) x 15.00 =	1,144.35
No.3 - No.4	1/2 x (45.68 + 47.89) x 15.00 =	701.78
No.4 - No.5	1/2 x (47.89 + 38.68) x 15.00 =	649.28
No.5 - No.6	1/2 x (38.68 ; 38.18) x 15.00 =	576.45
No.6 - No.7	1/2 x (38.18 + 47.21) x 15.00 =	640.43
No.7 - No.8	1/2 x (47.21 + 29.34) x 11.00 =	421.03
	Total	6,598.53
	Allowance: 5%	**6,930 m3**
7. Sand Bedding		
7.1 Pumping Station		(m3)
	{(9.655 + 4.61) x 24.20 + (13.545 + 0.70 + 2.60) x 20.60} x 0.20 =	138.44
7.2 Grit Chamber		
	1/2 x (13.72 + 12.2) x 5.30 x 0.20 =	13.74
	(3.193 + 0.70 + 19.94 + 0.70 + 1.843 + 0.64 + 4.90) x 12.2 x 0.20 =	77.88
	Sub-total	91.62
7.3 Stormwater Drainage		
(1) Manhole		3.93
(2) Outfall		2.02
	Sub-total	5.95
	Total	236.01
	Allowance: 3%	**243 m3**
8. Concrete Type C for Diaphrabm Wall		(m3)
	(32.8 + 24.2 + 11.995 + 4.733 + 17.732 + 20.6) x 1.5 x 35.5 =	5,933.58
	Total	5,933.58
	Allowance: 1%	**6,000 m3**
9.Reinforced Concrete (Concrete Type E)		
9.1 Pumping station		(m^3)
(1) Intake Pit Base	{1.20x3.70+1/2x(0.60+1.10)x0.50}x20.60=	100.22
(2) Inflow Channel Base	(13.50x1.20+1/2x0.55x0.476+1/2x0.30x0.30)x20.60=	337.34
(3) Pump Room Base	{1/2x(9.655+12.60)x2.524+12.60x1.676-1/2x(9.10+12.60)x3.00}x20.60=	343.06
(4) Thin Wall (t=100):Wes	12.35x0.10x15.80=	19.58
(5) Thin Wall (t=100):Nort	{3.6x15.8+13.5x16.3+1/2x(16.3+19.3)x3.5+9.0x19.3}x0.10=	51.29
(6) Thin Wall (t=100):East	24.20x0.10x19.3=	46.71
(7) Thin Wall (t=100):Sout	9.00x7.0x0.10+{1/2x(4.0+7.0)x3.5+14.1x4.0}x0.60+	
	(9.704+4.658+13.223)x12.3x0.10=	160.20
(8) Intake Pit Wall	(3.0x3x0.50+14.0x0.60)x15.8+2.4x0.6x3.2+(0.60+0.50)x1.50x4.60=	216.02
(9) Intake Pit Slab	(5.35x3.0-2.5x1.0-0.6x0.6)x0.30x3=	11.87
(10) Intake Pit Haunch	1/2x0.3x0.3x(5.35x4+3.0x3x4)=	2.58
(11) Inflow Channel Wall	10.50x0.60x3.70x3+13.5x0.6x3.20=	95.85
(12) Inflow Channel Haunch	1/2x0.30x0.30x(10.5x12+13.5x4+20.6x2+6.0x2)=	10.49
(13) Pump Pit Wall	7.00x0.60x6.70x5+1/2x(3.20+6.70)x5.39x0.60=	156.71
(14) Pump Pit Haunch	1/2x0.50x0.50x(6.7x12+7.0x12+3.50x6+5.391x4)=	25.87
(15) Pump Pit Haunch	1/2x0.30x0.30x(7.0x12+3.50x6)=	4.73

TABLE C.2.1 (3/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
(16) B-2 Floor	{24.0x9.0+1/2x(19.90+24.0)x3.50+19.9x13.5+5.9x3.60}x0.30-	
	(2.50x3.50x4-0.40x3.80x8-+1.65x2.55x3+2.20x3.20x3)x0.30=	150.54
(17) B-2 Floor Beam	0.70x0.40x6.1x5+ 0.2x0.4x3.0x3=	9.26
(18) B-2 Colum	(0.80x0.60x5+0.60x0.60x11)x6.00=	38.16
(19) B-1 Floor	{24.0x9.704+1/2x(24.0+20.4)x3.073+20.40x13.223+3.60x6.10}x0.30-	
	(2.00x4.00+1.50x4.20+1.65xx2.55x3+2.20x3.20x3}x0.30=	163.44
(20) B-1 Beam (Big)	0.60x0.90x(6.00x3+5.80x3+6.10x4)+1/2x0.20x0.60x0.60x20=	33.01
(21) B-1 Beam (Mid.)	0.40x0.60x(6.00x1+5.80x1+6.10x6)+1/2x0.20x0.60x0.40x18=	12.05
(22) B-1 Beam (Small)	0.40x0.40x(3.50x17+1.90)+1/2x0.10x0.30x0.40x36=	10.04
(23) B-1 Colum	(0.80x0.60x5+0.60x0.60x11)x5.70=	36.25
(24) Ground Floor	{24.0x9.704+1/2x(24.0+20.4)x3.073+20.40x13.223+3.60x6.10}x0.30-	
	(3.5x4.0+2.00x4.00+1.50x4.20+1.65xx2.55x3+2.20x3.20x3}x0.30=	159.24
(25) Ground Floor Beam (M	0.40x0.60x(6.00x4+5.80x4+6.10x10+3.0x1)+1/2x0.20x0.60x0.4x38=	37.60
(26) Ground Floor Beam (Sı	0.40x0.40x(3.50x17+1.90)+1/2x0.10x0.30x0.40x36=	10.04
(27) Temporary Wall (Inflov	3.00x3.20x0.30=	2.88
(28) Temporary Wall (P. Pit	{1/2x(2.0+5.50)x3.00+5.50x3.00}x0.40=	11.10
(29) Stair	{0.316x4.50x0.125x2+0.15x1.3x4.50+1/2x0.30x0.20x15}x4+	
	{0.20x1.00x3.50+0.30x0.30x3.50}x2=	
	Sub-total	2,256.13
	Allowance: 3%	**2,320 m3**
9.2 Grid Chamber		(m^3)
(1) Discharge Pit Base	{12.0x0.931+1/2x(12.0+13.52)x4.369}x0.50=	33.46
(2) Discharge Pit Haunch	1/2x0.30x0.30x4.467x2=	0.40
(3) Gate Base	1/2x(3.90+4.90)x0.50x12.00=	26.40
(4) Gate Haunch	1/2x0.30x0.30x3.90x10=	1.76
(5) Grid Chamber Base	1/2x(19.914+20.914)x0.50x12.00=	122.48
(6) Grid Chamber Haunch	1/2x0.30x0.30x20.50x10=	9.26
(7) Gate Base	1/(2.50+3.00)x0.50x12.00=	9.00
(8) Gate Haunch	1/2x0.30x0.30x2.50x10=	1.13
(9) Outlet Pit Base	1/2x(4.80+5.20)x0.50x12.00=	30.00
(10) Outlet Pit Haunch	1/2x0.30x0.30x(4.00+11.60)x2=	1.40
(11) Discharge Pit Wall	{1/2x(4.467+4.967)x0.50+4.967x3.20}x0.40+13.52x3.40x0.10=	11.90
(12) Gate Wall	3.90x3.20x0.40x3+(3.20x5.0-1.20x2.0)x0.40x2=	25.86
(13) Grid Chamber Wall	{1/2x(19.5+20.5)x0.50+20.50x3.20}x0.4x3=	90.72
(14) Gate Wall	2.50x3.20x0.40x3=	9.60
(15) Outlet Pit Wall	{(4.80+11.6x2)x3.60-2.80x1.20-1.40x5.0x2}x0.40	33.38
(16) Discharge Pit Slab	{11.60x0.50+1/2x(11.60+13.10)x4.369}x0.30=	17.93
(17) Gate Slab	(0.30x0.40+2.40x0.30)x11.60-0.50x2.50x0.40x2=	8.74
(18) Grid Chamber/Gate Sla	0.15x0.25x24.50x5=	4.59
(19) Outlet Pit Slab	11.60x4.00x0.30=	13.92
(20) Outlet Pit Support	0.50x(0.50x2+3.30)x0.30=	0.65
(21) Temporary Wall (1)	4.70x3.40x0.30=	4.79
(22) Temporary Wall (2)	4.00x3.30x0.30=	3.96
	Sub-total	461.33
	Allowance: 3%	**480 m3**
10. Plain Concrete (Concrete type F)		
10.1 Pumping Station		
(1) Control Room	5.80 x 8.2 x 0.20 =	9.51
(2) Electric Room	19.3 x 11.7 x 0.40 =	90.32
	Sub-total	99.83
	Allowance: 1%	**100 m3**

TABLE C.2.1 (4/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item		Calculation	Quantity
10.2 Grid Chamber			
		Sub-total	0.00
		Allowance: 1%	**0 m3**
		Total	99.83
		Allowance: 0%	**100 m3**
11. Leveling Concrete (Concrete Type G)			
11.1 Pumping Station		20.60x(2.60+0.70+13.545)x0.10+3.50x1/2x(20.60+24.20)x4.61x0.10+ 9.655x24.20x0.10=	87.74
		Total	87.74
		Allowance: 3%	**90 m3**
11.2 Grid Chamber		1/2x(13.72+12.20)x4.369x0.10+12.20x(0.931+3.931+0.70+19.914+0.70+ 2.50+0.70+4.90)x0.10=	47.48
		Total	47.48
		Allowance: 3%	**50 m3**
		Total	135.22
		Allowance: 3%	**140 m3**
12. Forming			
21.1 Pumping Station			(m^2)
(1)	Basement 3 Wall	(6.0 + 3.0 + 2.4 + 13.23 + 4.846 + 20.067) x 3.70 =	183.31
(2)	do	(13.5 x 2 + 15.8 + 10.50 x 6 + 0.6 x 6 + 3.0 x 2) x 3.70 =	426.98
(3)	do	(5.39 + 3.50) x 2 x 1/2 x (3.7 + 6.7) =	92.46
(4)	do	(9.0 x 2 + 7.0 x 10 + 0.6 x 5 + 3.5 x 6 + 2.0 x 2) x 6.70 =	777.20
(5)	do	(5.35 x 4 + 2.4 x 2 + 3.0 x 6) x 3.2 + 2.0 x 2.0 x 3 + 1.8 x 3 x 0.6 =	499.94
(6)	do, Ceiling	{2.4x3.0 + 1/2x(16.823 + 20.067)x 3.6 + 13.5x15.8 + 24.0x12.5 + 3.0x11.6 =	621.70
(7)	Basement 2 Wall	(29.4 + 24.0 + 9.704 + 4.66 + 16.823 + 2.3 + 3.6 + 12.2 + 3.6 + 5.9) x 6.0 =	673.12
(8)	do, Pit	(3.0 x 4 + 5.35 x 4) x 6.0 + 3.0 x 5.35 x 2 =	232.50
(9)	do, Column	{0.60 x 4 x 12 + (0.6 x 2 + 0.8 x 2) x 5 } x 6.0 =	256.80
(10)	do, Ceiling	20.4 x 29.6 + 1/2 x (9.704 + 12.777) x 3.7 =	645.43
(11)	do, Beam	(0.70 x 6 + 0.9 x 4) x 29.6 + (0.70 x 4) x (20.4 + 8.3) + 0.7 x 2 x 24.0 =	344.84
(12)	Basement 1 Wall	(29.4 + 24.0 + 9.704 + 4.66 + 16.823 + 2.3 + 3.6 + 12.2 + 3.6 + 5.9) x 5.7 =	639.46
(13)	do, Pit	(3.0 x 4 + 5.35 x 4) x 5.7 + 3.0 x 5.35 x 2 =	222.48
(14)	do, Column	{0.60 x 4 x 12 + (0.6 x 2 + 0.8 x 2) x 5 } x 5.7 =	243.96
(15)	do, Ceiling	20.4 x 29.6 + 1/2 x (9.704 + 12.777) x 3.7 =	645.43
(16)	do, Beam	(0.70 x 6 + 0.9 x 4) x 29.6 + (0.70 x 4) x (20.4 + 8.3) + 0.7 x 2 x 24.0 =	344.84
(17)	Outside Wall	1.00 x (23.6 + 32.8 + 27.2 + 11.995 + 4.73 + 17.732) =	118.06
(18)	Stair	(5.16 x 4 + 1.30 x 2) x 1.5 + 0.20 x (5.16 x 4 + 1.3 x 2) x 2 =	44.16
(19)	do	0.20 x 1.50 x (30 + 31) =	18.30
		Sub-total	7,030.97
		Allowance: 3%	**7,250 m2**
12.2 Grid Chamber			(m^2)
(1)	Discharge Pit Base	(4.56 + 2.50 + 6.8) x 0.50 =	6.93
(2)	Discharge Pit Wall	(13.1 + 4.56 + 2.50 + 4.36 + 2.50 + 6.50 + 6.50 + 2.50 + 2.50) x 2.90 =	130.56
(3)	Discharge Pit Slab	1/2 x (12.00 + 13.10) x 4.00 + 2.50 x 12.00 + (6.80 + 4.56 +2.5)x 0.30 =	84.36
(4)	Gate Opening and Bear	(0.50 x 2 + 2.50) x 2 x 0.30 + 0.30 x 2 x 12.00 =	16.30
(5)	Grit Chamber Base	1/2x(1.90+2.40)+1/2x(19.914+20.914)+1/2x (2.50+3.0)}x 0.50 x 2 =	24.95
(6)	Grit Chamber Wall	1/2 x (19.414 + 20.914) x 0.50 x 6 + (3.20 x 6 + 0.25 x 5) x 24.9 =	569.70
(7)	Grit Chamber Wall	(5.0 x 2.90 - 1.20 x 2.00) x 4 + (1.20 + 2.00 + 1.20) x 0.40 x 2 =	51.92
(8)	Outlet Pit Base	(4.80 x 2 + 12.0) x 0.50 =	10.80
(9)	Outlet Wall	4.80 x 3.3 x 2 + 4.00 x 3.30 x 2 + 2.80 x 10.80 + 3.30 x 12.0 - 1.40x5.0x2 =	113.92
(10)	Outlet Wall	12.0 x 3.30 +11.6 x 3.30 - 2.80 x 1.20 + (2.80 + 1.20 +1.20) x 0.40 =	76.60
(11)	Support	0.50 x (3.70 + 0.50 + 0.50) + (0.50 x 2 + 3.20) x 0.25 =	3.40
		Total	1,089.44
		Allowance: 3%	**1,130 m2**
		Total	8,120.41
		Allowance:3%	**8,380 m2**

TABLE C.2.1 (5/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
13. Reinforcig Bar (Mr. Miura's Estimation)		
13.1 Deformed Reinforcing Cage		
	6,000m3 x 100kg/m3 =	600,000.00
	Allowance:0%	**600,000kg**
13.2 Deformed Reinforcing Bars of Pumping Station		
	2,320m3 x 100kg/m3 =	232,000.00
	Allowance:0%	**232,000 kg**
13.3 Deformed Reinforcing Bars of Grit Chamber		
	480m3 x 80kg/m3 =	38,400.00
	Allowance:0%	**38,400 m3**
14. Shear Connectors (Mr. Kimura's Estimation)		
		17,640.35
	Allowance: 3%	**18,170 kg**
15. Water Stop for Diaphragm Wall		
	26places x 25.5m =	663.00
	Total	663.00
	Allowance: 1%	**670 m**
16. Cement Screed Surfacing		(m2)
16.1 Pumping Station (No Grit Chamber)		
(1) 1st Floor	(6.80 + 7.30) x 25.8 - 3.25 x 5.50 - 4.00 x 4.10 = 329.51m3	0.00
1st Floor Opening	(2.20 x 3.20 + 1.65 x 2.55) x 3 + 2.00 x 4.00 = -41.74m3	0.00
1st Floor Opening	3.14 x (0.55 x 0.55 + 0.35 x 0.35) x 3 = -4.00m3	0.00
(2) Basement 1	1/2 x (9.804 + 12.877) x 3.50 + 25.90 x 20.40 + 6.10 x 3.60 = 590.01m3	0.00
Basement 1 Opening	(2.20 x 3.20 + 1.65 x 2.55) x 3 + 2.00 x 4.00 = -41.74m3	0.00
Basement 1 Opening	3.14 x (0.55 x 0.55 + 0.35 x 0.35) x 3 = -4.00m3	0.00
Basement 2	1/2 x (9.804 + 12.877) x 3.50 + 25.90 x 20.40 + 6.10 x 3.60 = 590.01m3	0.00
Basement 2 Opening	(2.20 x 3.20 + 1.65 x 2.55) x 3 + 2.00 x 4.00 = -41.74m3	0.00
Basement 2 Opening	3.14 x (0.55 x 0.55 + 0.35 x 0.35) x 3 = -4.00m3	0.00
Basement 2 Opening	2.50 x 3.50 x 4 + 0.40 x 3.80 x 4 = -41.08m3	0.00
(3) Stairs	(0.2 x 15 + 0.3 x 14) x 1.5 x 4 + 3.25 x 1.6 x 2 = 53.60m3	53.60
	Total: 1,384.83m3	53.60
	Alloance: 1%	**55 m2**
17. Steel Balustrade (Mr. Kimura's Estimation)		
		1487.70
	Allowance: 3%	**1,530 kg**
18. Fabricated Manhole Cover		
18.1 Pumping Station		(kg)
(1) Checker Plate	650W x 650 H, t=3.2: W = 26.8kg/m2 x 0.65 x 0.65 = 11.323kg/nos.	
(2) Angle	L - 50 x 50 x 4 x 2320 : W = 3.06kg/m x 2.32 = 7.10kg/nos.	
(3) Handle	ϕ 12, L=250 : W = 0.888kg/m x 0.25 x 2 = 0.444kg/nos	
	So, W = 18.867 kg/nos	
	Number of cover: 6, W = 18.867 x 6 nos. =	113.20
	Total	113.20
	Allowance 3%	**120 kg**
18.2 Grid Chamber		
	Number of Cpver: 2 nos. W = 18.867kg/nos. x 2 nos =	37.74
	Total	37.74
	Allowance 3%	**40 kg**
19. Ladder rungs		(No.)
19.1 Pumping Station		
(1) Manhole of Inlet Pit	58 x 2 =	116
(2) Conveyance Channel	13 x 4 =	52
(3) Pump Pit	23 x 2 =	46
	Total	214
	Allowance 3%	**220 No.**

TABLE C.2.1 (6/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
19.2 Grit Chamber		
(1) Inlet Pit	11	11.00
(2) Discharge basin	11	**11.00**
	Total	22
	Allowance 3%	**23 No.**
20. Foundation Pile		
20.1 Wooden Pile (f80 - 100mm, L=4,500mm)		(nos).
(1) Discharge Basin	25 pcs./m^2x1/2x(12.00+13.52)x5.30=	1,690
(2) Gate	25 pcs./m2x12.00x3.693=	1,108
(3) Grid Chamber	25 pcs./m2x12.00x19.50=	5,850
(4) Gate	25 pcs./m2x12.00x2.90=	870
(5) Outlet Pit	25 pcs./m2x12.00x4.80=	1,440
	Total	10,958
	Allowance 1%	**11,070 m**
21. Landscape Works		
9.1 Gate and Fence		(set)
(1) Main Gate Post	Reinforced Concrete: 565W x 450L x 2500H	1
(2) Sliding Gate Door	Steel framed door with wheels on bottom	(set)
	5650L x 500W x 2000H	1
(3) Swing Door	Steel Swing Door: 1300W x 2000H	1
(4) Fence	Steel Grid Fence (Type A): 2000H x 3000span	
	L = 98.0 + 60.0 + 109.0 + 3.0 + 51.0 =	321.0 m
9.2 Planting Work		
(1) Tree		(No.)
(a)	Delonix regina	2
(b)	Lagerstroemina tomentosa	23
(c)	Mangifera indica	2
(d)	Mimusops elengi	14
(e)	Tamarindus indica	18
(f)	Areca catechu	6
	Total	65
(2) Shrub		(m2)
(a)	Hibiscus rosa-sinensis	28.00
(b)	Ixora coccina (Ixora chinesis)	12.00
(c)	Lantana camara	10.00
(d)	Bauhinia purpurea	34.00
(e)	Nerium oleander	35.00
	Sub-total	119.00
(3) Grass Sods	Axonopus compressus (Broad leafed grass)	110.00
(4) Grass Sprigs	Axonopus compressus (Broad leafed grass)	1,590.00
	Sub-total	1,700.00
22. Road Works		
22.1 Concrete Curb with leveling concrete and gravel bedding		(m)
	101.0 +71.0 + 83.0 + 49.0 + 106.0 + 109.0 + 66.0 =	585.00
	Allowance: 1%	**590 m**
22.2 Subgrade Preparation		(m2)
	A=2,300m2	2,300.00
	Allowance: 3%	**2,365 m2**
22.3 Subase Course		(m3)
	2,300m2 x 0.20m =	460.00
	Allowance: 3%	**475 m3**
22.4 Base Course (Crushed Aggragate)		(m3)
	2,300m2 x 0.10m =	230.00
	Allowance: 3%	**240 m3**

TABLE C.2.1 (7/7) CIVIL WORK QUANTITIES FOR CONSTRUCTION OF INTERMEDIATE WASTEWATER PUMPING STATION

Item	Calculation	Quantity
22.5 Asphalt Binder Course		(ton)
	2,300m2 x 0.09m x 2.2ton/m3 =	455.40
	Allowance: 3%	**470 ton**
22.6 Asphalt Prime Coat		(litre)
	1.5l/m2 x 2,300m2 =	3,450.00
	Allowance: 3%	**3,550 litre**
23. Stormwater Drainage		
23.1 Pile foundation (Timber Pile)		
(1) Pipe Foundation		0.0
(2) Manhole Foundation		0.0
(3) Outlet Foundation		1,144.0
	Total	1,144.0
	Allowance: 1%	**1150 m**
23.2Pipe Installation		
(1) Precast Reinforced Concrete Pipem(600 dia.) %.0m + 6.4m (7.0m) + 10.4m (11m) = 21.8m (23m)		21.80
	Total	**23 m**
23.3 Concrete Type E (Note: Invert Concrete and Granolitic Topping Cost are included)		
(1) U-Ditch	94.51 + 4.58 =	99.09
(2) Manhole	7.52 + 4.69 =	12.21
(3) Outlet	4.60 + 4.60 =	9.20
	Total	120.50
	Allowance: 3%	**125 m3**
23.4 Concrete type G		
(1) Leveling Concrete of U-ditch: 42.01 + 2.17 =		44.18
(2) Levelong Concrete of Manhole		1.97
(3) Levelong Concrete of Outlet		1.02
	Total	46.15
	Allowance: 3%	**50 m3**
23.5 Deformed Reinforcing Bars		
(1) U-Ditch	5,748 + 368 =	6,116.00
(2) Manhole	1,891.19	1,891.19
(3) Outlet	90kg/m3 x 9.2 m3 =	828.00
	Total	8,835.19
	Allowance: 3%	**9,100 kg**
23.6 Precast Reinforced Concrete Cover		
(1) U-Ditch	(567.70 + 29.30) / 0.50m =	1194.0
	Total	1,194.00
	Allowance: 1%	**1210 No.**
23.6 Concrete Manhole Cover (Type D)		(set)
	Total	10
	Allowance: 0%	**10 set**
23.7 Radder Lungth		(nos)
	Total	7
	Allowance: 0%	**7 set**

Table C.2.2
Breakdown of Work Quantities for Stormwater Drainage

Table C.2.2.1 U Type Channel (300W x 400H) Installation Work (1)
Table C.2.2.2 U Type Channel (300W x 400H) Installation Work (2)
Table C.2.2.3 Sewer Pipe (ϕ 600) Installation Work (1)
Table C.2.2.4 Sewer Pipe (ϕ 600) Installation Work (2)
Table C.2.2.5 Construction of Manholes
Table C.2.2.6 Construction of Outlets

Table C.2.2.1 U Type Channel (300W x 400H) Installation Work (1)

Bill of Quantity

Area : IPS Pipe Diameter : 300x400 Shoring Type : TIMBER

Sewer Line Name : U DITCH Foundation Type : S360 OK ! S360

Manhole No. :

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Foundation		Backfill (m^3)		Residual Soil (m^3)	U ditch			
						Upstream					Backhoe Depth	Clamshell Depth	Total	Sand bedding (m^2)	Leveling concrete G (m3)	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Deformed (kg)	Cover Deformed (kg)	Concrete E (m3)	Concrete D (m3)
		IE_1	ID_1			H_2					<= 6 m	=> 6 m										
		IE_2	ID_2	H_1	W_1	H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	S_1	V_5	V_6	V_7	V_8				
1	2.050	1.650	0.40	0.20		0.60																
M2	2.050	1.516	0.53	0.20	1.40	0.73	0.67	67.00	0.00	67.00	62.85	0.00	62.85		4.96		36.18	26.67	656.34	221.25	11.18	1.61
M2	2.050	1.596	0.45	0.20		0.65																
2	2.050	1.650	0.40	0.20	1.40	0.60	0.63	27.00	0.00	27.00	23.82	0.00	23.82		2.00		13.07	10.75	264.5	89.16	4.24	0.65
3	2.050	1.650	0.40	0.20		0.60																
4	2.050	1.586	0.46	0.20	1.40	0.66	0.64	13.00	0.00	13.00	11.65	0.00	11.65		0.96		6.48	5.17	127.35	42.93	2.07	0.31
4	2.050	1.586	0.46	0.20		0.66																
5	2.050	1.650	0.40	0.20	1.40	0.60	0.64	32.00	0.00	32.00	28.68	0.00	28.68		2.37		15.94	12.74	313.48	105.68	5.11	0.77
21	2.050	1.650	0.40	0.20		0.60																
22	2.050	1.603	0.45	0.20	1.40	0.65	0.63	23.70	0.00	23.70	20.91	0.00	20.91		1.75		11.48	9.43	232.17	78.27	3.73	0.57
22	2.050	1.603	0.45	0.20		0.65																
23	2.050	1.573	0.48	0.20	1.40	0.68	0.67	15.10	0.00	15.10	14.17	0.00	14.17		1.12		8.16	6.01	147.92	49.87	2.52	0.36
23	2.050	1.516	0.53	0.20		0.73																
24	2.050	1.484	0.57	0.20	1.40	0.77	0.75	16.50	0.00	16.50	17.33	0.00	17.33		1.22		10.76	6.57	161.64	54.49	3.07	0.40
6	2.050	1.650	0.40	0.20		0.60																
7	2.050	1.558	0.49	0.20	1.40	0.69	0.65	46.00	0.00	46.00	41.86	0.00	41.86		3.40		23.55	18.31	450.62	151.91	7.45	1.10
7	2.050	1.558	0.49	0.20		0.69																
4	2.050	1.624	0.43	0.20	1.40	0.63	0.66	6.60	0.00	6.60	6.10	0.00	6.10		0.49		3.47	2.63	145.35	49.00	1.09	0.26
8	2.050	1.650	0.40	0.20		0.60																
10	2.050	1.588	0.46	0.20	1.40	0.66	0.64	31.20	0.00	31.20	27.96	0.00	27.96		2.31		15.54	12.42	305.64	103.03	4.98	0.75
10	2.050	1.494	0.56	0.20		0.76																
7	2.050	1.558	0.49	0.20	1.40	0.69	0.73	32.20	0.00	32.20	32.91	0.00	32.91		2.38		20.09	12.82	315.44	106.34	5.83	0.77
9	2.050	1.650	0.40	0.20		0.60																
10	2.050	1.589	0.46	0.20	1.40	0.66	0.64	30.50	0.00	30.50	27.33	0.00	27.33		2.26		15.19	12.14	298.78	100.72	4.87	0.73
12	2.050	1.650	0.40	0.20		0.60																
24	2.050	1.474	0.58	0.20	1.40	0.78	0.69	88.20	0.00	88.20	85.21	0.00	85.21		6.53		50.11	35.10	888.47	299.5	15.14	2.12
13	2.050	1.650	0.40	0.20		0.60																
17	2.050	1.519	0.53	0.20	1.40	0.73	0.67	65.30	0.00	65.30	61.26	0.00	61.26		4.83		35.27	25.99	639.68	215.64	10.89	1.57
14	2.050	1.650	0.40	0.20		0.60																
16	2.050	1.540	0.51	0.20	1.40	0.71	0.66	55.20	0.00	55.20	51.01	0.00	51.01		4.08		29.04	21.97	540.74	182.29	9.07	1.32
15	2.050	1.552	0.50	0.20		0.70																
16	2.050	1.540	0.51	0.20	1.40	0.71	0.71	6.00	0.00	6.00	5.97	0.00	5.97		0.44		3.58	2.39	58.78	19.82	1.06	0.14
16	2.050	1.540	0.51	0.20		0.71																
17	2.050	1.529	0.52	0.20	1.40	0.72	0.72	5.50	0.00	5.50	5.55	0.00	5.55		0.41		3.36	2.19	53.88	18.17	0.98	0.13
17	2.050	1.519	0.53	0.20		0.73																
23	2.050	1.516	0.53	0.20	1.40	0.73	0.74	6.70	0.00	6.70	6.95	0.00	6.95		0.50		4.28	2.67	147.56	49.74	1.23	0.27
								567.70	0.00	567.70	531.52	0.00	531.52		42.01		305.55	225.97	5,748	1,938	94.51	13.84

Table C.2.2.2 U Type Channel (300W x 400H) Installation Work (2)

Bill of Quantity

Area : IPS Pipe Diameter : 300x400 Shoring Type : TIMBER

Sewer Line Name : U DITCH Foundation Type : S360 OK ! S360

Manhole No. :

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Foundation		Backfill (m^3)		Residual Soil (m^3)	U ditch			
						Upstream					Backhoe Depth	Clamshell Depth	Total	Sand bedding	Leveling concrete G	Yellow Sand	Black Sand Sandy Soil		Deformed	Cover deformed	Concrete E	Concrete F
						Downstream					<= 6 m	=> 6 m		(m^2)	(m3)	Sand Backfill	Backfill		(kg)	(kg)	(m3)	(m3)
		IE_1 IE_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	S_1	V_5	V_6	V_7	V_8				
18	2.050	1.650	0.40	0.20		0.60																
20	2.050	1.613	0.44	0.20	1.40	0.64	0.62	18.70	0.00	18.70	16.24	0.00	16.24		1.38		8.80	7.44	183.19	61.76	2.89	0.45
19	2.050	1.650	0.40	0.20		0.60																
20	2.050	1.627	0.42	0.20	1.40	0.62	0.62	4.00	0.00	4.00	3.48	0.00	3.48		0.30		1.89	1.59	39.19	13.21	0.62	0.10
20	2.050	1.613	0.44	0.20		0.64																
22	2.050	1.603	0.45	0.20	1.40	0.65	0.65	6.60	0.00	6.60	6.01	0.00	6.01		0.49		3.38	2.63	145.35	49.00	1.07	0.26
								29.30	0.00	29.30	25.73	0.00	25.73		2.17		14.07	11.66	368	124	4.58	0.81

Table C.2.2.3 Sewer Pipe (ϕ600) Installation Work (1)

Bill of Quantity

Area : IPS Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : 01 Foundation Type : S360 OK ! S360

Manhole No. : M1 M2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N pipes	N m	L_2	L_3	W_2
M1	2.050	0.700	1.35	0.26		1.61																		
M2	2.050	0.650	1.40	0.26	1.40	1.66	1.64	7.20	0.80	6.40	16.54	0.00	16.54	2.60	10.08	4.94	7.79	3.81	16.54	1	2.40	6.40	7.20	0.00
M2	2.050	0.650	1.40	0.26		1.66																		
OUTLET	2.000	0.600	1.40	0.26	1.40	1.66	1.66	10.80	0.40	10.40	25.10	0.00	25.10	4.23	15.12	7.41	12.66	5.03	25.10	2	2.40	10.40	10.80	0.00
								18.00	1.20	16.80	41.64	0.00	41.64	6.83	25.20	12.35	20.45	8.84	41.64	3	4.80	16.80	18.00	0.00

Table C.2.2.4 Sewer Pipe (ϕ600) Installation Work (2)

Bill of Quantity

Area : IPS Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : 02 Foundation Type : S360 OK ! S360

Manhole No. : M1 OUTLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
M1	2.050	0.700	1.35	0.26		1.61														pipes	m			
OUTLET	2.050	0.600	1.45	0.26	1.40	1.71	1.66	5.40	0.40	5.00	12.55	0.00	12.55	2.04	7.56	3.70	6.08	2.77	12.55	1	1.00	5.00	5.40	0.00
								5.40	0.40	5.00	12.55	0.00	12.55	2.04	7.56	3.70	6.08	2.77	12.55	1	1.00	5.00	5.40	0.00

Table C.2.2.5 Construction of Manholes

Type of manhole	Number	Earth work (m3)	Sand bedding (m3)	Concrete G (m3)	Concrete E (m3)				Deformed (kg)				Invert motar (m3)	Ladder Rungs (No.)
					Wall	Cover	Frame	Total	Cover	Frame	Wall	Total		
1	7	8.24	2.75	1.38	6.00	0.57	0.95	7.52	238.02	308.6	655.79	1262.54	0.17	
2	3	7.06	1.18	0.59	4.04	0.24	0.41	4.69	102.01	132.26	364.44	628.65	0.08	7
TOTAL	**10**	**15.30**	**3.93**	**1.97**	**10.04**	**0.81**	**1.36**	**12.21**	**340.03**	**440.86**	**1020.23**	**1891.19**	**0.25**	**7**

Table C.2.2.6 Construction of Outlets

No.	D	Earth work	Yellowsand	Concrete G	Wooden piles		Concrete E	Deformed	Residual soil	Backfill by sandy soil
	(mm)	(m3)	(m3)	(m3)	(trees)	(mdeep)	(m3)	(Tons)	(m3)	(m3)
1	600	26.40	1.01	0.51	127.00	572	4.60		7.49	18.91
2	600	26.40	1.01	0.51	127.00	572	4.60		7.49	18.91
TOTAL		**52.80**	**2.02**	**1.02**	**254.00**	**1,144.00**	**9.20**	**0.00**	**14.98**	**37.82**

Table C.2.3
Breakdown of Architectural Work Quantity
For Pump House and O/M Office

Table C.2.3.1 Breakdown of Reinforcing Bar Quantities (1)
Table C.2.3.2 Breakdown of Reinforcing Bar Quantities (2)
Table C.2.3.3 Breakdown of Concrete and Form Work Quantities
Table C.2.3.4 Breakdown of Brick, Roof and Other Work Quantities
Table C.2.3.5 Breakdown of Door and Window Work Quantities

BẢNG KHỐI LƯỢNG
TABLE C.2.3.1 BREAKDOWN OF QUANTITIES

HẠNG MỤC : INTERMEDIATE WASTEWATER PUMPING STATION
ITEM : INTERMEDIATE WASTEWATER PUMPING STATION
CÔNG TÁC : THÉP KẾT CẤU
WORK : STRUCTURE STEEL

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				THÉP KẾT CẤU - STRUCTURE STEEL										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	SS1	SS2	SS3	SS4	SS5	SS6	SS7	PS1	PS2	BL1	BL2
VÌ KÈO MÁI - ROOF TRUSS (7 No)																							
H1000x400x20x16	SS1	14.1	0.8					14.90	1	1	7	7	104.3										
H350x120x12x10	SS2	1.6						1.60	2	1	7	14		22.4									
2L50x50x5 - SS3																							
1	SS3	1.95						1.95	2	1	14	28			54.6								
2	SS3	1.9						1.90	2	1	14	28			53.2								
6	SS3	1.2						1.20	2	1	14	28			33.6								
7	SS3	1.1						1.10	2	1	14	28			30.8								
2L80x80x6 - SS4																							
3	SS4	3.6						3.60	2	1	14	28				100.8							
2L63x63x6 - SS5																							
4	SS5	3.3						3.30	2	1	14	28					92.4						
5	SS5	1.7						1.70	2	1	14	28					47.6						
2L100x100x6 - SS6																							
8	SS6	18.66						18.66	2	1	14	28						522.48					
Chi tiết 1 Detail 1 (14No)																							
Thép tấm dày 20mm PLATE STEEL (m2)																							
	PS1	0.3						0.30	1	1	14	14								4.2			
	PS1	0.152						0.15	2	1	14	28								4.2			
Bulong dk 20 - Bolt 20dia	BL1	1.991						1.99	2	1	14	28										55.72	
Chi tiết 2 - Detail 2 (5x7No)																							
Thép tấm dày 10mm PLA	PS2	0.0768						0.08	1	1	35	35									2.8		
Chi tiết 3 - Detail 3 (3x7No)																							
Thép tấm dày 10mm PLA	PS2	0.1344						0.13	1	1	21	21									2.73		
Chi tiết 4 - Detail 4 (2x7No)																							
Thép tấm dày 10mm PLA	PS2	0.104						0.10	1	1	14	14									1.4		
Roof wall detail (6 No.)																							
2 L 100x100x6	SS6	1.198						1.20	2	1	6	12						14.4					
Thép tấm dày 10mm PLA	PS2	0.04						0.04	1	1	6	6									0.24		
Thép tấm dày 10mm PLA	PS2	0.06						0.06	1	1	6	6									0.36		
Thép tấm dày 20mm PLA	PS1	0.36						0.36	2	1	6	12								4.32			
Bulong dk 16 - Bolt 16dia	BL2	1.871						1.87	4	1	6	24											44.88

VỊ TRÍ LOCATION	Đ.K. DIA.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				THÉP KẾT CẤU - STRUCTURE STEEL									
		1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	SS1	SS2	SS3	SS4	SS5	SS6	SS7	PS1	PS2	BL1	BL2
Dầm cầu trục - Crane rails																							
H400x150x10x18	SS7	26.4						26.40	2	1	1	2							52.8				
400X220X20 Plate	PS2	0.088						0.088	1	1	14	14									1.232		
Bolt 16 dia.	BL2	1.350						1.350	2	1	14	28											37.8
	GRANT TOTAL WEIGHT (Ton) TỔNG TRỌNG LƯỢNG							**41.84**	TOTAL LENGTH			(m)	104.3	22.4	172.2	100.8	140	536.88	52.8	12.72	8.762	55.72	82.68
									UNIT WEIGHT			(Kg/m-n	251.2	50.083	3.925	7.536	5.9346	9.42	80.07	157	78.5	2.466	1.579
									TOTAL WEIGHT			(Ton)	**26.20**	**1.12**	**0.68**	**0.76**	**0.83**	**5.06**	**4.23**	**2.00**	**0.69**	**0.14**	**0.13**

MÔ TẢ - DESCRIPTION	K. HIỆU SIGN	Đ. VỊ UNIT	Khối lượng Quantity
Thép hình H1000x400x20X16 Shaped steel H1000x400x20X16	SS1	ton	26.20
Thép hình H350x120x12x10 Shaped steel H350x120x12x10	SS2	ton	1.12
Thép hình L50x50x5 Shaped steel L50x50x5	SS3	ton	0.68
Thép hình L80x80x6 Shaped steel L80x80x6	SS4	ton	0.76
Thép hình L63x63x6 Shaped steel L63x63x6	SS5	ton	0.83
Thép hình L100x100x6 Shaped steel L100x100x6	SS6	ton	5.06
Thép hình H400x150x10x18 Shaped steel H400x150x10x18	SS7	ton	4.23
Thép tấm dày 20mm 20mm steel plate	PS1	ton	2.00
Thép tấm dày 10mm 10mm steel plate	PS2	ton	0.69
Bu long dk 20 Bolt dia.20mm	BL1	ton	0.14
Bu long dk 16 Bolt dia.16mm	BL2	ton	0.13
TOTAL		ton	41.84

BẢNG KHỐI LƯỢNG
TABLE C.2.3.2 BREAKDOWN OF QUANTITIES

HẠNG MỤC : INTERMEDIATE WASTEWATER PUMPING STATION
ITEM : INTERMEDIATE WASTEWATER PUMPING STATION
CÔNG TÁC : CỐT THÉP
WORK : REINFORCING STEEL

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
Cột - Columns																							
-C1 (6 No)																							
1	18	4.6						4.60	12	1	6	72							331.2				
2	8	0.35	0.35	0.55	0.55	2		1.93	1.6	0.1	6	96		185.28									
	8	0.35	0.35	0.55	0.55	2		1.93	3	0.2	6	90		173.7									
3	8	1.63				2		1.76	1.6	0.1	6	96		168.96									
	8	1.63				2		1.76	3	0.2	6	90		158.4									
-C1a (6No)																							
1	18	5.08						5.08	12	1	6	72							365.76				
2	8	0.35	0.35	0.55	0.55	2		1.93	1.7	0.1	6	102		196.86									
	8	0.35	0.35	0.55	0.55	2		1.93	3.38	0.2	6	102		196.86									
3	8	1.63				2		1.76	1.7	0.1	6	102		179.52									
	8	1.63				2		1.76	3.38	0.2	6	102		179.52									
-C2 (16No)																							
1a	18	8						8.00	9	1	16	144							1152				
1b	18	5.3	0.6					5.90	7	1	16	112							660.8				
1c	18	2.7	0.6					3.30	5	1	16	80							264				
5	18	2.85	0					2.85	5	1	16	80							228				
2	8	0.55	0.55	0.75	0.75	2		2.73	3.3	0.1	16	528		1441.44									
	8	0.55	0.55	0.75	0.75	2		2.73	2	0.2	16	160		436.8									
	8	0.55	0.55	0.45	0.45	2		2.13	1.5	0.1	16	240		511.2									
	8	0.55	0.55	0.45	0.45	2		2.13	1.2	0.2	16	96		204.48									
3	8	2.4				2		2.53	3.3	0.1	16	528		1335.84									
	8	2.4				2		2.53	2	0.2	16	160		404.8									
	8	1.84				2		1.97	1.5	0.1	16	240		472.8									
	8	1.84				2		1.97	1.2	0.2	16	96		189.12									
-BTM (6 No)																							
1	14	5.2						5.20	4	1	6	24					124.8						
2	6	0.15	0.15	0.15	0.15	2		0.70	3.6	0.1	6	216	151.2										
	6	0.15	0.15	0.15	0.15	2		0.70	1.7	0.2	6	54	37.8										

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
Bổ trụ - Sub column																							
-BTT(24No)																							
1	12	1.7	0	0				1.70	4	1	24	96				163.2							
2	6	0.15	0.15	0.15	0.15	2		0.70	1.1	0.1	24	264	184.8										
	6	0.15	0.15	0.15	0.15	2		0.70	0.6	0.2	24	72	50.4										
	GRANT TOTAL WEIGHT (Ton)							8.92	TOTAL LENGTH (m)				424.2	6435.58	0	163.2	124.8	0	3001.76	0	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT (Kg/m)				0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT (Ton)				**0.09**	**2.54**	**0**	**0.14**	**0.15**	**0**	**6**	**0**	**0**	**0**	**0**
Đà - Beams																							
DM1(6No)																							
1	18	13.9	0.3	0.3				14.50	3	1	6	18							261				
2	18	13.9	0.6	0.6				15.10	3	1	6	18							271.8				
3	6	0.35	0.35	0.55	0.55	2		1.90	11.95	0.15	6	480	912										
	6	0.35	0.35	0.55	0.55	2		1.90	11.95	0.2	6	360	684										
DM2(3No)																							
1	16	21.7	0.2	0.2				22.10	2	1	3	6						132.6					
2	16	21.7	0.4	0.4				22.50	2	1	3	6						135					
3	6	0.15	0.15	0.35	0.35	2		1.10	10.85	0.15	3	216	237.6										
	6	0.15	0.15	0.35	0.35	2		1.10	10.85	0.2	3	162	178.2										
DM3(2No)																							
1	16	26.4	0.2	0.2				26.80	2	1	2	4						107.2					
2	16	26.4	0.4	0.4				27.20	2	1	2	4						108.8					
3	6	0.15	0.15	0.35	0.35	2		1.10	13.2	0.15	2	176	193.6										
	6	0.15	0.15	0.35	0.35	2		1.10	13.2	0.2	2	132	145.2										
DG (6 No.)																							
	14	13.2	0.2	0.2				13.60	2	1	6	12					163.2						
	14	13.2	0.2	0.2				13.60	2	1	6	12					163.2						
	6	0.15	0.15	0.15	0.15	2		0.70	6.6	0.15	6	264	184.8										
	6	0.15	0.15	0.15	0.15	2		0.70	6.6	0.2	3	99	69.3										
DGT (12 No.)																							
	14	3.5	0.2	0.2				3.90	4	1	12	48					187.2						
	6	0.15	0.15	0.15	0.15	2		0.70	1.75	0.1	12	216	151.2										
	6	0.15	0.15	0.15	0.15	2		0.70	1.75	0.2	12	108	75.6										
DG1 (1No.)																							
1	20	4.5	0.2	0.2				4.90	2	1	1	2								9.8			
2	20	4.5	0.35	0.35				5.20	2	1	1	2								10.4			
3	6	0.15	0.15	0.3	0.3	2		1.00	2.25	0.1	1	23	23										
	6	0.15	0.15	0.3	0.3	2		1.00	2.25	0.2	1	11	11										

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH									
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
DG2 (2No.)																							
1	20	13.9	0.2	0.2				14.30	2	1	2	4								57.2			
2	20	13.9	0.35	0.35				14.60	2	1	2	4								58.4			
3	6	0.15	0.15	0.3	0.3	2		1.00	6.95	0.1	2	140	140										
	6	0.15	0.15	0.3	0.3	2		1.00	6.95	0.2	2	70	70										
DG3 (1No.)																							
1	20	7.5	0.2	0.2				7.90	2	1	1	2								15.8			
2	20	7.5	0.35	0.35				8.20	2	1	1	2								16.4			
3	6	0.15	0.15	0.3	0.3	2		1.00	0.375	0.1	1	4	4										
	6	0.15	0.15	0.3	0.3	2		1.00	0.375	0.2	1	2	2										
Đà lanh tô 1 - lintel 1 (5No)																							
1	10	1.2						1.20	28	1	5	140			168								
2	6	4.5				2		4.60	4	1	5	20	92										
Đà lanh tô 2 - lintel 2 (1No)																							
1	10	1.6						1.60	26	1	1	26			41.6								
2	6	5.1				2		5.20	5	1	1	5	26										
	GRANT TOTAL WEIGHT (Ton)							3.69	TOTAL LENGTH			(m)	3199.5	0	209.6	0	513.6	483.6	532.8	168	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.71**	**0**	**0.13**	**0**	**0.62**	**0.76**	**1.06**	**0.41**	**0**	**0**	**0**

BẢNG KHỐI LƯỢNG
table C.2.3.3 BREAKDOWN OF QUANTITIES

HẠNG MỤC : INTERMEDIATE WASTEWATER PUMPING STATION
ITEM : INTERMEDIATE WASTEWATER PUMPING STATION
CÔNG TÁC : BÊ TÔNG & VÁN KHUÔN
WORK : CONCRETE & FORMWORK

Mô tả Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY					BÊ TÔNG - CONCRETE		VÁN KHUÔN - FORMWORK	
		L	W	H	n	TOTAL	CC1	CB1	FC	FB
A. Bê tông - Concrete										
1. Cột -Columns (m3)										
Bê tông mác 300, đá 1x2 - Concrete garde 300, stone 10x20 (CC1)										
- C1 (6 No.)	CC1	0.40	0.60	4.60	6	6.62	6.62			
- C1a (6No)	CC1	0.40	0.60	5.08	6	7.32	7.32			
- C2 (16 No.)	CC1	0.80	0.60	5.30	16	40.70	40.70			
	CC1	0.60	0.50	2.70	16	12.96	12.96			
	CC1	0.10	0.60	0.60	16	0.58	0.58			
- BTM (6No.)	CC1	0.20	0.20	5.20	6	1.25	1.25			
Bổ trụ - SUB COLUMNS										
- BTT (24No.)	CC1	0.20	0.20	1.70	24	1.63	1.63			
2. Đà - Beams (m3)										
Concrete garde 300, stone 10x20										
- DM1 (6 No.)	CB1	11.80	0.40	0.60	6	16.99		16.99		
- DM2 (3 No.)	CB1	19.30	0.20	0.40	3	4.63		4.63		
- DM3 (2 No.)	CB1	22.20	0.20	0.40	2	3.55		3.55		
- DG (6 No.)	CB1	13.20	0.20	0.20	6	3.17		3.17		
- DGT (12 No.)	CB1	3.50	0.20	0.20	12	1.68		1.68		
- DG1 (1 No.)	CB1	4.50	0.20	0.35	1	0.32		0.32		
- DG2 (2 No.)	CB1	13.90	0.20	0.35	2	1.95		1.95		
- DG3 (1 No.)	CB1	7.50	0.20	0.35	1	0.53		0.53		
Đà lanh to - lintels										
	CB1	4.50	0.60	0.08	5	1.08		1.08		
	CB1	5.10	1.00	0.08	1	0.41		0.41		
B. Ván khuôn - Formwork										
1. Cột - Columns										
- C1 (6 No.)	FC	1.00	2.00	4.60	6	55.20			55.20	
- C1a (6 No.)	FC	1.00	2.00	5.08	6	60.96			60.96	
- C2 (16 No.)	FC	1.00	2.80	5.30	16	237.44			237.44	
	FC	1.00	2.20	2.70	16	95.04			95.04	
	FC	1.00	0.80	0.70	16	8.96			8.96	
- BTM (6 No.)	FC	1.00	0.80	5.20	6	24.96			24.96	
Bổ trụ - SUB COLUMNS										
- BTT (24 No.)	FC	1.00	0.80	1.70	24	32.64			32.64	
2. Đà - Beams										
Trên mái - On the roof										
- DM1 (6 No.)	FB	11.80	1.60	1.00	6	113.28				113.28
- DM2 (3 No.)	FB	19.30	1.00	1.00	3	57.90				57.90

Mô tả Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY					BÊ TÔNG - CONCRETE		VÁN KHUÔN - FORMWORK	
		L	W	H	n	TOTAL	CC1	CB1	FC	FB
- DM3 (2 No.)	FB	22.20	1.00	1.00	2	44.40				44.40
- DG (6 No.)	FB	13.20	0.40	1.00	6	31.68				31.68
- DGT (12 No.)	FB	3.50	0.40	1.00	12	16.80				16.80
- DG1 (1 No.)	FB	4.50	0.90	1.00	1	4.05				4.05
- DG2 (2 No.)	FB	13.90	0.90	1.00	2	25.02				25.02
- DG3 (1 No.)	FB	7.50	0.90	1.00	1	6.75				6.75
Đà lanh to - lintels										
	FB	4.50	0.80	1.00	5	18.00				18.00
	FB	5.10	1.20	1.00	1	6.12				6.12
	TOTAL						71.06	34.30	515.20	324.00

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ UNIT	QUANTITY
Bê tông cột mác 300, đá 1x2 Concrete garde 300, stone 10x20 - Coloumns	CC1	m3	71.06
Bê tông đà mác 300, đá 1x2 Concrete garde 300, stone 10x20 - Beams	CB1	m3	34.30
Ván khuôn cột Formwork - Columns	FC	m2	515.20
Ván khuôn đà Formwork - Beams	FB	m2	324.00

BẢNG KHỐI LƯỢNG
TABLE C.2.3.4 BREAKDOWN OF QUANTITIES

0.636172512

3252375

HẠNG MỤC : INTERMEDIATE WASTEWATER PUMPING STATION
ITEM : INTERMEDIATE WASTEWATER PUMPING STATION
CÔNG TÁC : XÂY TÔ, MÁI,HOÀN THIỆN
WORK : BRICK WORKS, ROOFING AND FINISHES

Mô tả	K.H	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING				TÔ TRÁT PLASTERING		HOÀN THIỆN SÀN FLOOR FINISHES			H. THIỆN TƯỜNG WALL FINISHES		TRẦN VÀ CÔNG TÁC KHÁC CEILING & OTHER				
Description	SIGN	L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	PL1	PL2	FR1	FR2	FR3	WL1	WL2	CL1	CL2	CL3	CL4	PT1
A. Xây tường - Brickwork																								
BR1: dày 200mm, BR2: dày 100mm (m2)																								
BR1: 200mm thick, BR2:100mm thick																								
- Trục A - Gridline A	BR1	6.40	1.00	8.00	1	51.20	51.20																	
	BR1	6.90	1.00	8.00	1	55.20	55.20																	
	BR1	13.30	1.00	2.80	1	37.24	37.24																	
	BR1	4.00	1.00	4.00	-1	-16.00	-16.00																	
	BR1	0.90	1.00	2.20	-1	-1.98	-1.98																	
	BR1	6.40	1.00	0.35	-1	-2.24	-2.24																	
	BR1	4.00	1.00	1.00	-2	-8.00	-8.00																	
- Trục B - Gridline B	BR1	6.00	1.00	6.30	1	37.80	37.80																	
	BR1	5.80	1.00	6.30	1	36.54	36.54																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	
	BR1	3.00	1.00	2.50	-1	-7.50	-7.50																	
	BR1	2.40	1.00	1.30	-1	-3.12	-3.12																	
	BR1	6.00	1.00	0.35	-1	-2.10	-2.10																	
- Trục C - Gridline C	BR1	4.10	1.00	6.30	1	25.83	25.83																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	
- Trục D - Gridline D	BR1	5.80	1.00	6.30	1	36.54	36.54																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	
- Trục D' - Gridline D'	BR1	4.30	1.00	6.30	1	27.09	27.09																	
- Trục E - Gridline E	BR1	5.80	1.00	6.30	1	36.54	36.54																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	

Mô tả	K.H	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING				TÔ TRÁT PLASTERING		HOÀN THIỆN SÀN FLOOR FINISHES			H. THIỆN TƯỜNG WALL FINISHES		TRẦN VÀ CÔNG TÁC KHÁC CEILING & OTHER				
Description	SIGN	L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	PL1	PL2	FR1	FR2	FR3	WL1	WL2	CL1	CL2	CL3	CL4	PT1
- Trục E' - Gridline E'	BR1	4.30	1.00	6.30	1	27.09	27.09																	
- Trục F - Gridline F	BR1	6.00	1.00	6.30	1	37.80	37.80																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	
	BR1	0.80	1.00	2.20	-1	-1.76	-1.76																	
- Trục G - Gridline G	BR1	6.00	1.00	6.30	1	37.80	37.80																	
	BR1	5.80	1.00	6.30	1	36.54	36.54																	
	BR1	3.10	1.00	2.00	1	6.20	6.20																	
	BR1	3.10	1.00	1.80	1	5.58	5.58																	
	BR1	3.10	1.00	1.40	1	4.34	4.34																	
	BR1	3.10	1.00	0.80	1	2.48	2.48																	
	BR1	6.40	1.00	8.00	1	51.20	51.20																	
	BR1	6.90	1.00	8.00	1	55.20	55.20																	
	BR1	13.30	1.00	2.80	1	37.24	37.24																	
	BR1	2.40	1.00	1.30	-2	-6.24	-6.24																	
	BR1	6.00	1.00	0.35	-1	-2.10	-2.10																	
	BR1	4.00	1.00	1.00	-2	-8.00	-8.00																	
- Trục 1 - Gridline 1	BR1	19.30	1.00	5.10	1	98.43	98.43																	
	BR1	19.30	1.00	0.40	-1	-7.72	-7.72																	
	BR1	1.20	1.00	0.60	-1	-0.72	-0.72																	
	BR1	0.60	1.00	0.60	-2	-0.72	-0.72																	
	BR1	4.00	1.00	1.00	-1	-4.00	-4.00																	
- Trục 1' - Gridline 1'	BR1	12.50	1.00	6.90	1	86.25	86.25																	
	BR1	0.70	1.00	2.00	-1	-1.40	-1.40																	
	BR1	1.60	1.00	2.20	-1	-3.52	-3.52																	
	BR1	0.80	1.00	2.20	-1	-1.76	-1.76																	
- Trục 2 - Gridline 2	BR1	19.30	1.00	4.20	1	81.06	81.06																	
	BR1	1.60	1.00	2.20	-2	-7.04	-7.04																	
	BR1	1.20	1.00	2.20	-2	-5.28	-5.28																	
- Trục 3 - Gridline3	BR1	22.20	1.00	8.00	1	177.60	177.60																	
	BR1	22.20	1.00	1.50	1	33.30	33.30																	
	BR1	22.20	1.00	0.40	-1	-8.88	-8.88																	
	BR1	2.40	1.00	1.30	-4	-12.48	-12.48																	
	BR1	1.60	1.00	2.20	-1	-3.52	-3.52																	
	BR1	0.80	1.00	2.20	-1	-1.76	-1.76																	
	BR1	2.00	1.00	1.00	-6	-12.00	-12.00																	
- Trục 5 - Gridline 5	BR1	22.20	1.00	8.00	1	177.60	177.60																	
	BR1	22.20	1.00	1.50	1	33.30	33.30																	
	BR1	22.20	1.00	0.40	-1	-8.88	-8.88																	
	BR1	2.00	1.00	1.00	-12	-24.00	-24.00																	
Tường phụ - Subwall	BR2	1.90	1.00	2.60	2	9.88		9.88																
	BR2	2.30	1.00	2.60	2	11.96		11.96																
	BR2	0.60	1.00	2.00	-2	-2.40		-2.40																

Mô tả Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING				TÔ TRÁT PLASTERING		HOÀN THIỆN SÀN FLOOR FINISHES			H. THIỆN TƯỜNG WALL FINISHES		TRẦN VÀ CÔNG TÁC KHÁC CEILING & OTHER				
		L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	PL1	PL2	FR1	FR2	FR3	WL1	WL2	CL1	CL2	CL3	CL4	PT1
B. Mái - Roofing																								
Tấm lợp mái Spandek (BHP) - Spandek Hi-ten roofsheet (BHP) (m2) - RF1																								
- Trục - Gridlines 1~3	RF1	23.30	16.10	1.00	1	375.13			375.13															
- Trục - Gridlines 3~5	RF1	28.00	19.10	1.00	1	534.80			534.80															
Xà gồ thép C203x71x1.5 - Purlin (BHP) (m) - RF2																								
- Trục - Gridlines 1~3	RF2	23.30	1.00	1.00	16	372.80				372.80														
- Trục - Gridlines 3~5	RF2	28.00	1.00	1.00	20	560.00				560.00														
Máng xối treo (BHP) - Eave gutter (BHP) (m) - RF3																								
- Trục - Gridlines 1	RF3	23.30	1.00	1.00	1	23.30					23.30													
- Trục - Gridlines 3~5	RF3	28.00	1.00	1.00	2	56.00					56.00													
Ống xối - Down spout 72x105 (BHP) - RF4																								
	RF4	10.10	1.00	1.00	8	80.80						80.80												
	RF4	6.40	1.00	1.00	6	38.40						38.40												
C. Tô trát - Plastering (m2)																								
Trát tường dày 20mm - 20mm thick cement/sand plastering on wall																								
- Tường 190mm - 190mm thick wall																								
= BR1x2	PL1	1263.3	1.00	1.00	2	2526.5							2526.5											
- Tường 90mm - 90mm thick wall																								
= BR2x2	PL1	19.4	1.00	1.00	2	38.9							38.9											
Trát đà dày 20mm - 20mm thick cement/sand plastering on beam																								
Trên mái - On the roof						0.00																		
- DM1 (6 No.)	PL2	11.90	1.40	1.00	6	99.96								99.96										
- DM2 (3 No.)	PL2	19.10	0.80	1.00	3	45.84								45.84										
- DM3 (2 No.)	PL2	22.20	0.80	1.00	2	35.52								35.52										
- DG (6 No.)	PL2	13.20	0.60	1.00	6	47.52								47.52										
- DGT (12 No.)	PL2	3.50	0.60	1.00	12	25.20								25.20										
- DG1 (1 No.)	PL2	4.50	0.90	1.00	1	4.05								4.05										
- DG2 (2 No.)	PL2	13.90	0.90	1.00	2	25.02								25.02										
- DG3 (1 No.)	PL2	7.50	0.90	1.00	1	6.75								6.75										
Trát trần dày 20mm - 20mm thick cement/sand plastering on ceilings																								
Ô vãng																								
	PL2	4.50	0.60	1.00	5	13.50								13.50										
	PL2	5.10	1.00	1.00	1	5.10								5.10										
Trát cột dày 20mm - 20mm thick cement/sand plastering on columns																								
- C1 (6 No.)	PL1	2.00	1.00	4.60	6	55.20							55.20											
	PL1	0.40	1.00	4.60	-6	-11.04							-11.04											
- C1a (6 No.)	PL1	2.00	1.00	5.10	6	61.20							61.20											
	PL1	0.40	1.00	5.10	-6	-12.24							-12.24											
- C2 (16 No.)	PL1	2.80	1.00	5.30	16	237.44							237.44											
	PL1	2.20	1.00	2.70	16	95.04							95.04											
	PL1	0.60	1.00	0.80	16	7.68							7.68											
	PL1	0.40	1.00	8.00	-16	-51.20							-51.20											
- BTM (6 No.)	PL1	0.40	1.00	5.10	6	12.24							12.24											
Bổ trụ - SUB COLUMNS																								
- BTT (24No.)	PL1	0.60	1.00	1.50	24	21.60							21.60											
D. Hoàn thiện nền - Floor finishing																								

Mô tả	K.H	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING				TÔ TRÁT PLASTERING		HOÀN THIỆN SÀN FLOOR FINISHES			H. THIỆN TƯỜNG WALL FINISHES		TRẦN VÀ CÔNG TÁC KHÁC CEILING & OTHER				
Description	SIGN	L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	PL1	PL2	FR1	FR2	FR3	WL1	WL2	CL1	CL2	CL3	CL4	PT1
- Nền BTCT xoa, son Epoxy hoàn thiện - Concrete trowel with epoxy paint (m2) - FR1																								
- Gạch quart tile 300 x 300 - Quart tile 300 x 300 - FR2																								
- Gạch men 200 x 200 - Ceramic tile 200 x 200 - FR3																								
- Phòng máy -Pump room	FR1	14.50	26.00	1.00	1	377.00									377.00									
Trừ Buồng cầu thang	FR1	5.50	3.50	1.00	-1	-19.25									-19.25									
Đường dốc	FR1	7.70	1.50	1.00	1	11.55																		
- Phòng họp - Meeting room	FR2	4.00	6.50	1.00	1	26.00										26.00								
- Khu Vệ sinh - WC	FR3	4.30	2.93	1.00	1	12.60											12.60							
- Sảnh - Lobby	FR2	4.10	6.60	1.00	1	27.06										27.06								
- Hành lang - Corridor	FR2	12.50	1.00	1.00	1	12.50										12.50								
- Bếp - Kitchen	FR2	3.00	4.30	1.00	1	12.90										12.90								
- Phòng công nhân- Operators	FR2	6.10	8.80	1.00	1	53.68										53.68								
- Phòng trực đêm- Night Duty	FR2	6.00	4.30	1.00	1	25.80										25.80								
- Phòng điều khiển -Control ro	FR2	8.20	6.50	1.00	1	53.30										53.30								
- Conveyor room	FR2	4.70	6.60	1.00	1	31.02										31.02								
E. Hoàn thiện tường - Wall finishes																								
- Gạch men 200x250 - Ceramic tile 200x250 - WL1																								
Khu vệ sinh - WC	WL1	24.30	1.00	2.00	1	48.60												48.60						
D04	WL1	0.80	1.00	2.00	-5	-8.00												-8.00						
W05	WL1	0.60	1.00	0.60	-2	-0.72												-0.72						
- Trét ma tít, son nước vào tường - Apply mastic and 02 layers of pain on walls -WL2																								
= PL1-WL1	WL2	2941.5	1.00	1.00	1	2941.5													2941.5					
F. Trần - Ceilings (m2)																								
CL1- Tấm trần treo tấm plaster, Plasterboard ceiling W suspended system 800x12																								
CL2- Tấm trần treo villaboard, Suspended villaboard system																								
CL3- Hệ thống trần thép treo (BHP) - Lysaght cedek- Suspended steel ceiling syst																								
- Phòng họp - Meeting room	CL1	4.00	6.50	1.00	1	26.00														26.00				
- Khu Vệ sinh - WC	CL2	4.30	2.93	1.00	1	12.60															12.60			
- Sảnh - Lobby	CL1	4.10	6.60	1.00	1	27.06														27.06				
- Hành lang - Corridor	CL1	12.50	1.00	1.00	1	12.50														12.50				
- Bếp - Kitchen	CL1	3.00	4.30	1.00	1	12.90														12.90				
- Phòng công nhân- Operators	CL1	6.10	8.80	1.00	1	53.68														53.68				
- Phòng trực đêm- Night Duty	CL1	6.00	4.30	1.00	1	25.80														25.80				
- Phòng điều khiển -Control ro	CL1	8.20	6.50	1.00	1	53.30														53.30				
- Conveyor room	CL1	4.70	6.60	1.00	1	31.02														31.02				
	CL3	28.00	1.40	1.00	2	78.40																78.40		
	CL3	23.30	1.40	1.00	1	32.62																32.62		
	CL3	18.10	0.80	1.00	2	28.96																28.96		
	CL3	15.10	0.80	1.00	2	24.16																24.16		
- Trét ma tít, son nước vào dầ, trần - Apply mastic and 02 layers of pain on beams, ceilings- CL4																								
= PL2	CL4	308.5	1.00	1.00	1	308.5																	308.46	
F. Công tác khác - Others																								
Sơn kết cấu thep																								

Mô tả Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY L	W	H	n	TOTAL	XÂY TƯỜNG BRICK WALL BR1	BR2	MÁI ROOFING RF1	RF2	RF3	RF4	TÔ TRÁT PLASTERING PL1	PL2	HOÀN THIỆN SÀN FLOOR FINISHES FR1	FR2	FR3	H. THIỆN TƯỜNG WALL FINISHES WL1	WL2	TRẦN VÀ CÔNG TÁC KHÁC CEILING & OTHER CL1	CL2	CL3	CL4	PT1
Thép hình H1000x400x20X16 Shaped steel H1000x400x20X16	PT1	104.30	3.60	1.00	1	375.48																		375.48
Thép hình H350x120x12x10 Shaped steel H350x120x12x10	PT1	22.40	1.18	1.00	1	26.43																		
Thép hình L50x50x5 Shaped steel L50x50x5	PT1	172.20	0.20	1.00	1	34.44																		34.44
Thép hình L80x80x6 Shaped steel L80x80x6	PT1	100.80	0.32	1.00	1	32.26																		32.26
Thép hình L63x63x6 Shaped steel L63x63x6	PT1	140.00	0.25	1.00	1	35.28																		35.28
Thép hình L100x100x6 Shaped steel L100x100x6	PT1	536.88	0.40	1.00	1	214.75																		214.75
Thép hình H400x150x10x18 Shaped steel H400x150x10x18	PT1	52.80	1.40	1.00	1	73.92																		73.92
Thép tấm dày 20mm 20mm steel plate	PT1	12.72	1.00	1.00	2	25.44																		25.44
Thép tấm dày 10mm 10mm steel plate	PT1	8.76	1.00	1.00	2	17.52																		17.52
	TOTAL						1263.3	19.44	909.93	932.8	79.30	119.2	2981.3	308.5	357.75	242.26	12.6	39.88	2941.5	242.26	12.60	164.14	308.46	809

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ UNIT	QUANTITY
Xây tường dày 190 190 thick brick wall	BR1	m2	1263.3
Xây tường dày 90 90 thick brick wall	BR2	m2	19.4
Tấm lợp mái Spandek (BHP) Spandek Hi-ten roofsheet (BHP)	RF1	m2	909.9
Xà gồ thép C203x76x1.5 (BHP) Purlin C203x76x1.5 (BHP)	RF2	m	932.8
Máng xối treo (BHP) Eave gutter (BHP)	RF3	m	79.3
Ống xối 72x105 (BHP) Down spout 72x105 (BHP)	RF4	m	119.2
Trát tường, cột dày 20mm 20mm thick cement/sand plastering on walls, coloumns	PL1	m2	2981.3
Trát đà, trần dày 20mm 20mm thick cement/sand plastering on beam, ceiling	PL2	m2	308.5
Gương soi Mirrors		No	1.0

	MÔ TẢ - DESCRIPTION	KÝ HIỆU	ĐƠN VỊ UNIT	QUANTITY
240.02	Nền BTCT xoa, son epoxy hoan thien Concrete trowel with epoxy paint	FR1	m2	357.8
1.75	Lát gạch quart 300 x 300 trên sàn Quart tile 300 x 300 on floors	FR2	m2	242.3
	Lát gạch men 200 x 200 trên sàn Ceramic tile 200 x 200 on floors	FR3	m2	12.6
	Ốp gạch men 200x250 trên tường Ceramic tile 200x250 on walls	WL1	m2	39.9
	Trét ma tít, sơn nước vào tường Apply mastic and 02 layers of pain on walls	WL2	m2	2941.5
	Tấm trần treo tấm plaster Plasterboard ceiling W suspended system 800x1200	CL1	m2	242.3
	Tấm trần treo villaboard Suspended villaboard system	CL2	m2	12.6
	Hệ thống trần thép treo (BHP) Lysaght cedek- Suspended steel ceiling system (BHP)	CL3	m2	164.1
	Trét ma tít, sơn nước vào đà, trần Apply mastic and 02 layers of pain on beams, ceilings	CL4	m2	308.5
	Sơn kết cấu thép Painting on structure steel	PT1	m2	809.1

BẢNG KHỐI LƯỢNG
TABLE C.2.3.5 BREAKDOWN OF QUANTITIES

HẠNG MỤC : INTERMEDIATE WASTEWATER PUMPING STATION
ITEM : INTERMEDIATE WASTEWATER PUMPING STATION
CÔNG TÁC : DOORS AND WINDOWS
WORK : CỬA VÀ CỬA SỔ

Mô tả Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY					CỬA VÀ CỬA SỔ DOORS AND WINDOWS						
		L	W	H	n	TOTAL	DR1	DR2	DR3	DR4	WD1	WD2	WD3
Cửa và cửa sổ - Doors and windows (m2)													
Cửa nhựa - Plastic doors													
- D05 (2 No)	DR1	0.65	1.00	2.00	2	2.60	2.60						
Cửa nhôm kính - Aluminium glass doors													
- D02 (3 No)	DR2	1.60	1.00	2.20	3	10.56		10.56					
- D03 (4 No)	DR2	0.80	1.00	2.20	4	7.04		7.04					
- D04 (1No)	DR2	0.75	1.00	2.20	1	1.65		1.65					
- D09 (1 No)	DR2	1.80	1.00	2.20	1	3.96		3.96					
Cửa sắt kính - Steel glass doors													
- D01 (1 No)	DR3	3.00	1.00	2.50	1	7.50			7.50				
- D08 (1 No)	DR3	1.20	1.00	2.20	1	2.64			2.64				
- D07 (1 No)	DR3	0.90	1.00	2.20	1	1.98			1.98				
Cửa sắt cuốn - Roller shutter													
- D010 (1No)	DR4	4.00	1.00	4.00	1	16.00				16.00			
Cửa sổ khung nhôm kính - Aluminium glass window													
- W01 (4 No)	WD1	2.40	1.00	1.30	4	12.48					12.48		
Cửa sổ bật khung nhôm kính - Aluminium glass slashing window													
- W02 (1 No)	WD2	1.20	1.00	0.60	1	0.72						0.72	
- W04 (2 No)	WD2	0.60	1.00	0.60	1	0.36						0.36	
Cửa nhôm thông gió (BHP) - Aluminium fixed lourve													
- L01 (7 No)	WD3	2.00	1.00	1.00	19	38.00							38.00
	WD3	4.00	1.00	1.00	4	16.00							16.00
	TOTAL						2.60	23.21	12.12	16.00	12.48	1.08	54.00

MÔ TẢ - DESCRIPTION	K. HIỆU SIGN	Đ. VỊ UNIT	QUANTITY
Cửa nhựa Plastic doors	DR1	m2	2.60
Cửa nhôm kính Aluminium glass doors	DR2	m2	23.21
Cửa sắt kính Steel glass doors	DR3	m2	12.12
Cửa sắt cuốn Roller shutter	DR4	m2	16.00
Cửa sổ khung nhôm kính Aluminium glass window	WD1	m	12.48
Cửa sổ bật khung nhôm kính Aluminium glass Slashing window	WD2	m2	1.08
Cửa nhôm thông gió (BHP) Aluminium fixed lourve	WD3	m2	54.00

Table C.2.4
Breakdown of Architectural Work Quantities for Generator Room

Table C.2.4.1 Breakdown of Reinforcing Bar Quantities
Table C.2.4.2 Breakdown of Pile, Earth Work, Concrete, Framework and Other Work Quantities
Table C.2.4.3 Breakdown of Brick, Door, Forming and Finishing Work Quantities

BẢNG KHỐI LƯỢNG
TABLE C.2.4.1 BREAKDOWN OF QUANTITIES

HẠNG MỤC : GENERATOR ROOM
ITEM : GENERATOR ROOM
CÔNG TÁC : CỐT THÉP
WORK : REINFORCEMENT

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
Móng -Foundation																							
-M1 (6 No)																							
1	20	1.35	0.2					1.55	6	1	6	36								55.8			
2	12	1.35	0.2					1.55	2	1	6	12				18.6							
3	6	0.25	0.25	0.35	0.35	2		1.30	0.65	0.2	6	18	23.4										
	6	0.25				2		0.35	0.65	0.2	6	18	6.3										
4	16	18.8						18.80	0.8	0.1	6	48						902.4					
5	12	0.75						0.75	1.8	0.2	6	54				40.5							
6	10	0.75						0.75	6	1	6	36			27								
Móng máy																							
FN- 4700x2100x1200																							
1	14	2.05	0.6	0.6				3.25	4.7	0.2	1	24					78						
1a	12	2.05	0.6	0.6				3.25	4.7	0.2	1	24				78							
2	14	4.65	0.6	0.6				5.85	2.1	0.2	1	11					64.35						
2a	12	4.65	0.6	0.6				5.85	2.1	0.2	1	11				64.35							
3	12	2.05						2.05	4.7	0.2	1	24				49.2							
4	12	4.65						4.65	2.1	0.2	1	11				51.15							
5	10	1.15						1.15	2.1	0.6	1	4			4.6								
	10	1.15						1.15	4.7	0.6	1	8			9.2								
FN- 6000x2100x2000																							
1	14	2.05	1	1				4.05	6	0.2	1	30					121.5						
1a	12	2.05	1	1				4.05	6	0.2	1	30				121.5							
2	14	5.95	1	1				7.95	2.1	0.2	1	11					87.45						
2a	12	5.95	1	1				7.95	2.1	0.2	1	11				87.45							
3	12	2.05						2.05	6	0.2	3	90				184.5							
4	12	5.95						5.95	2.1	0.2	3	33				196.35							
5	10	1.95				2		2.11	2.1	0.6	1	4			8.44								
	10	5.95				2		6.11	6	0.6	1	10			61.1								

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
Nền - Ground slab																							
1	12	16						16.00	9	0.2	2	90				1440							
	12	9						9.00	16	0.2	2	160				1440							
	GRANT TOTAL WEIGHT (Ton)							**5.41**	TOTAL LENGTH			(m)	29.7	0	110.34	3771.6	351.3	902.4	0	55.8	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.01**	**0**	**0.07**	**3.35**	**0.42**	**1.42**	**0**	**0.14**	**0**	**0**	**0**
Cột - Columns																							
-C1 (6 No)																							
1	20	4.5						4.50	6	1	6	36								162			
2	12	4.5						4.50	6	1	6	36				162							
3	6	0.25	0.25	0.35	0.35	2		1.30	2.6	0.1	6	156	202.8										
	6	0.25	0.25	0.35	0.35	2		1.30	1.3	0.2	6	42	54.6										
	6	0.25				2		0.35	2.6	0.1	6	156	54.6										
	6	0.25				2		0.35	1.3	0.2	6	42	14.7										
-Bộ trụ(6No)-sub column																							
1	12	4.5						4.50	4	1	6	24				108							
2	6	0.15	0.15	0.15	0.15	2		0.70	2.6	0.1	6	156	109.2										
	6	0.15	0.15	0.15	0.15	2		0.70	1.3	0.2	6	42	29.4										
	GRANT TOTAL WEIGHT (Ton)							**0.74**	TOTAL LENGTH			(m)	465.3	0	0	270	0	0	0	162	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.1**	**0**	**0**	**0.24**	**0**	**0**	**0**	**0.4**	**0**	**0**	**0**
Đà Kiềng - ground beam																							
DK1 (2No)																							
1	22	17.65						17.65	2	1	2	4									70.6		
2	20	16.95						16.95	2	1	2	4								67.8			
3	20	6						6.00	4	1	2	8								48			
4	22	4						4.00	2	1	2	4									16		
5	12	16.25						16.25	2	1	2	4				65							
6	6	0.15	0.15	0.65	0.65	2		1.70	7.4	0.1	2	148	251.6										
	6	0.15	0.15	0.65	0.65	2		1.70	8	0.2	2	80	136										
	6	0.15				2		0.25	7.4	0.1	2	148	37										
	6	0.15				2		0.25	8	0.2	2	80	20										
DK2 (2No)																							
1	16	10.8						10.80	2	1	2	4						43.2					
2	22	10.1						10.10	2	1	2	4									40.4		
3	22	6.2						6.20	3	1	2	6									37.2		
4	12	9.4						9.40	2	1	2	4				37.6							
5	6	0.15	0.15	0.65	0.65	2		1.70	3.8	0.1	2	76	129.2										

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
	6	0.15	0.15	0.65	0.65	2		1.70	4.2	0.2	2	42	71.4										
	6	0.15				2		0.25	3.8	0.1	2	76	19										
	6	0.15				2		0.25	4.2	0.2	2	42	10.5										
DẦM MÁI																							
DM1 (2 No)																							
1	22	16	0.6	0.6				17.20	2	1	2	4									68.8		
2	22	16	0.3	0.3				16.60	2	1	2	4									66.4		
3	22	6						6.00	6	1	2	12									72		
4	22	4						4.00	4	1	2	8									32		
5	6	0.25	0.25	0.55	0.55	2		1.70	7.4	0.15	2	98	166.6										
	6	0.25	0.25	0.55	0.55	2		1.70	7.4	0.2	2	74	125.8										
DM2 (3 No)																							
1	22	13	0.2	0.2				13.40	2	1	3	6									80.4		
2	22	9.4	0.35	0.35				10.10	2	1	3	6									60.6		
2A	16	2.5	0.1					2.60	4	1	3	12						31.2					
3	22	6.2						6.20	4	1	3	12									74.4		
4	22	6.4						6.40	4	1	3	12									76.8		
5	12	9.35						9.35	2	1	3	6				56.1							
6	6	0.25	0.25	0.65	0.65	2		1.90	4.4	0.15	3	87	165.3										
	6	0.25	0.25	0.65	0.65	2		1.90	4.2	0.2	3	63	119.7										
	6	0.25	0.25	0.25	0.25	2		1.10	2.4	0.15	3	48	52.8										
	6	0.25	0.25	0.25	0.25	2		1.10	1.2	0.2	3	18	19.8										
DM3 (2 No)																							
1	16	9.4	0.6	0.6				10.60	2	1	2	4						42.4					
2	22	9.4	0.3	0.3				10.00	2	1	2	4									40		
3	22	6.2						6.20	4	1	2	8									49.6		
6	6	0.25	0.25	0.55	0.55	2		1.70	4.4	0.15	3	87	147.9										
	6	0.25	0.25	0.55	0.55	2		1.70	4.2	0.2	3	63	107.1										
BTM (3No)																							
1	12	1.1						1.10	4	1	3	12				13.2							
2	6	0.15	0.15	0.15	0.15	2		0.70	0.7	0.1	3	21	14.7										
	6	0.15	0.15	0.15	0.15	2		0.70	0.4	0.2	3	6	4.2										
DG1 (3No)																							
1	12	14	0.4	0.4				14.80	2	1	3	6				88.8							
2	12	14	0.2	0.2				14.40	2	1	3	6				86.4							
3	6	0.15	0.15	0.15	0.15	2		0.70	7	0.1	3	210	147										
	6	0.15	0.15	0.15	0.15	2		0.70	7	0.2	3	105	73.5										

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
CT GIA CƯỜNG DẦM TRỰC GIAO																							
1	6	0.25	0.25	0.55	0.55	2		1.70	4	1	4	16	27.2										
	GRANT TOTAL WEIGHT (Ton)							3.53	TOTAL LENGTH			(m)	1846.3	0	0	347.1	0	116.8	0	115.8	785.2	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.41**	**0**	**0**	**0.31**	**0**	**0.18**	**0**	**0.29**	**2.34**	**0**	**0**
SÀN MÁI																							
1	8	16.3				2		16.43	8.7	0.15	1	58		952.94									
2	8	9.4				2		9.53	14.8	0.2	1	74		705.22									
3	10	1.25	0.1	0.1				1.45	8.8	0.15	2	118			171.1								
	10	1.25	0.1	0.1				1.45	23.3	0.15	2	310			449.5								
4	10	2.2	0.1	0.1				2.40	8.8	0.15	3	177			424.8								
5	6	16.3				2		16.40	0.95	0.2	2	10	164										
	6	9.2				2		9.30	7.6	0.2	1	38	353.4										
	GRANT TOTAL WEIGHT (Ton)							1.40	TOTAL LENGTH			(m)	517.4	1658.16	1045.4								
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.11**	**0.65**	**0.64**								

BẢNG KHỐI LƯỢNG

TABLE C.2.4.2 BREAKDOWN OF QUANTITIES

HẠNG MỤC : GENERATOR ROOM
ITEM : GENERATOR ROOM
CÔNG TÁC : ĐÓNG CỌC, ĐẤT, BÊTÔNG, VÁN KHUÔN
WORK : PILE, EARTH WORK, CONCRETE, FORMWORK

Mô tả	K.H	ỐNG - QUANTITY					CỌC - PILE		C.T ĐẤT - EARTH WORK			BÊ TÔNG - CONCRETE					VÁN KHUÔN - FORMWORK			
Description	SIGN	L	W	H	n	TOTAL	PL1	PL2	EW1	EW2	EW3	CM1	CM2	CC1	CB1	CS1	FM	FB	FC	FS
A. Bê tông - Concrete																				
Bê tông lót, mác 100, đá 4x6																				
Lean concrete garde 100, stone 40x60 (CF1)																				
Móng- Foundation (m3)																				
-M1 (6 No.)	CM1	2.00	1.00	0.10	6	1.20						1.20								
-móng máy - Machine foundation	CM1	4.70	2.30	0.10	1	1.08						1.08								
	CM1	6.20	2.30	0.10	1	1.43						1.43								
Bê tông mác 300, đá 1x2 - Concrete																				
garde 300, stone 10x20 (CC1)																				
Móng- Foundation (m3)																				
-M1 (6 No.)	CM2	1.80	0.80	0.80	6	6.91							6.91							
-móng máy - Machine foundation	CM2	4.70	2.10	1.20	1	11.84							11.84							
	CM2	6.00	2.10	2.00	1	25.20							25.20							
Đà kiềng - Ground beam (m3)																				
DK1(2No)	CB1	16.30	0.15	0.65	2	3.18									3.18					
DK2(2No)	CB1	9.40	0.15	0.65	2	1.83									1.83					
Cột - Columns (m3)																				
C1(6No)	CC1	0.40	0.30	6.80	6	4.90								4.90						
BT (6No)	CC1	0.20	0.20	6.20	6	1.49								1.49						
Đà - Beam (m3)																				
Bê tông mác 300, đá 1x2 - Concrete																				
garde 300, stone 10x20 (CB1)																				
DM1 (2No)	CB1	15.40	0.30	0.60	2	5.54									5.54					
DM2 (3No)	CB1	8.60	0.30	0.70	3	5.42									5.42					
	CB1	1.80	0.30	0.30	6	0.97									0.97					
DM3 (2No)	CB1	8.80	0.30	0.60	2	3.17									3.17					
BTM (3No)	CB1	1.10	0.20	0.20	3	0.13									0.13					
DG1 (3No)	CB1	14.00	0.20	0.20	3	1.68									1.68					
Sàn - Slab (m3)																				
	CS1	14.80	8.80	0.10	1	13.02										13.02				
Nền - ground slab(m3)	CS1	16.00	9.00	0.40	1	57.60										57.60				
	CS1	4.70	2.10	0.40	-1	-3.95										-3.95				
	CS1	6.00	9.00	0.40	-1	-21.60										-21.60				
B. Ván khuôn - Formwork																				
1. Móng - Foundation																				
-M1 (6 No.)	FM	5.20	1.00	0.80	6	24.96											24.96			
-móng máy l4700x2100x1200(1N	FM	13.60	1.00	1.20	1	16.32											16.32			
-móng máy l600x2100x2000(1No	FM	16.20	1.00	2.00	1	32.40											32.40			

Mô tả Description	K.H SIGN	ƯỢNG - QUANTITY L	W	H	n	TOTAL	CỌC - PILE PL1	PL2	C.T ĐẤT - EARTH WORK EW1	EW2	EW3	BÊ TÔNG - CONCRETE CM1	CM2	CC1	CB1	CS1	VÁN KHUÔN - FORMWORK FM	FB	FC	FS
2. Đà kiềng - ground beam																				
DK1(2No)	FB	32.60	1.00	0.65	2	42.38												42.38		
DK2(2No)	FB	18.80	1.00	0.65	2	24.44												24.44		
3. Cột - Columns (m2)																				
C1(6No)	FC	1.00	1.40	6.80	6	57.12													57.12	
4. Đà - Beam (m2)																				
DM1 (2No)	FB	15.40	1.50	1.00	2	46.20												46.20		
DM2 (3No)	FB	8.60	1.70	1.00	3	43.86												43.86		
	FB	1.80	0.90	1.00	6	9.72												9.72		
DM3 (2No)	FB	8.80	1.50	1.00	2	26.40												26.40		
BTM (3No)	FB	1.10	0.80	1.00	3	2.64												2.64		
DG1 (3No)	FB	14.00	0.60	1.00	3	25.20												25.20		
5. Sàn - Slab (m2)																				
	FS	14.80	8.80	1.00	1	130.24														130.24
C. Cừ tràm - WOODEN PILES (No.)																				
Cọc BTCT 300x300 - Concrete pile																				
- M1 (6 No)	PL1	70.00	1.00	1.00	6	420.00	420.00													
Cừ tràm d=80~100, L=5m, 25 piles/m2 - Wooden piles																				
- móng máy - machine foondation	PL2	9.87	1.00	1.00	25	246.75		246.75												
	PL2	12.60	1.00	1.00	25	315.00		315.00												
D. Công tác đất - EARTH WORK (m3)																				
Đào móng, lấp đất hố móng- Excavation and backfill for footings (m3)																				
- M1 (6 No)	EW1	2.00	1.00	1.45	6.0	17.40			17.40											
Hố móng máy	EW1	4.90	2.30	1.30	1.0	14.65			14.65											
	EW1	6.00	2.30	2.10	1.0	28.98			28.98											
Cát phủ đầu cừ tràm- Sand layer over the wooden pile heads (m3)																				
Hố móng máy	EW2	4.90	2.30	0.10	1.0	1.13				1.13										
	EW2	6.00	2.30	0.10	1.0	1.38				1.38										
Đắp và đầm đất nền nhà- Fill and compact soil base (m3)																				
	EW3	16.00	9.00	0.10	1.0	14.40					14.40									
	TOTAL						420.0	561.75	61.0	2.51	14.40	3.71	43.96	6.38	21.93	45.08	73.7	220.84	57.12	130.24

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ UNIT	Khối lượng Quantity	
Cọc BTCT Concrete pile	PL1	pile	420.00	
Cừ Tràm d=80~100, L=5m, 25 cây/m2 Wooden pile, 25 piles/m2	PL2	pile	561.75	2808.75
Đào móng, lấp đất hố móng Excavation and backfill soil for footings	EW1	m3	61.03	
Cát phủ đầu cừ tràm Sand layer over the wooden pile heads	EW2	m3	2.51	
Đắp và đầm đất nền nhà Fill and compact soil base	EW3	m3	14.40	
Bê tông lót, mác 100, đá 4x6 Lean concrete, garde 100, stone 40x60	CM1	m3	3.71	
Bê tông móng mác 300, đá 4x6 Concrete garde 300, stone 10x20 - Footings	CF2	m3	43.96	
Bê tông cột mác 300, đá 1x2	CC1	m3	6.38	

MÔ TẢ - DESCRIPTION	KÝ HIỆU SIGN	ĐƠN VỊ UNIT	Khối lượng Quantity
Bê tông đà mác 300, đá 1x2 Concrete grade 300, stone 10x20 - Beams	CB1	m3	21.93
Bê tông sàn mác 300, đá 4x6 Slab concrete garde 300, stone 10x20 - Slab	CS1	m3	45.08
Ván khuôn móng Formwork - Footings	FM	m2	73.68
Ván khuôn cột Formwork - Columns	FC	m2	57.12
Ván khuôn đà Formwork - Beams	FB	m2	220.84
Ván khuôn sàn Formwork - Slab	FS	m2	130.24

BẢNG KHỐI LƯỢNG
TABLE C.2.4.3 BREAKDOWN OF QUANTITIES

HẠNG MỤC : GENERATOR ROOM
ITEM : GENERATOR ROOM
CÔNG TÁC : TƯỜNG, CỬA, MÁI, HOÀN THIỆN
WORK : BRICK WORK, DOOR, ROOFING, FINISHES

Mô tả	K.H	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING				CỬA VÀ HOÀN THIỆN DOORS AND FINISHES					
Description	SIGN	L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	DR1	PL1	PL2	WL1	FR1	CL1
A. Xây tường - Brickwork																		
BR1: dày 190mm (m2)																		
BR1: 190mm thick																		
- Trục - Gridline 1,2	BR1	8.40	1.00	3.8	2	63.84	63.84											
	BR1	4.50	1.00	0.8	4	14.85	14.85											
	BR1	1.60	1.00	0.5	4	3.20	3.20											
- Trục - Gridline A,B	BR1	15.00	1.00	3.8	2	114.00	114.00											
	BR1	15.00	1.00	0.60	2	18.00	18.00											
D11	BR1	0.90	1.00	2.20	-1	-1.98	-1.98											
	BR1	4.00	1.00	1.5	-1	-6.00	-6.00											
	BR1	3.90	1.00	1.5	-1	-5.85	-5.85											
	BR1	3.80	1.00	1.5	-1	-5.70	-5.70											
B. Mái - Roofing																		
Tấm lợp mái Spandek (BHP) - Spandek Hi-ten roofsheet (BHP) (m2) - RF1																		
	RF1	17.60	13.00	1.00	1	228.80			228.80									
Xà gồ thép C203x71x1.5 - Purlin (BHP) (m) - RF2																		
	RF2	17.60	1.00	1.00	12	211.20				211.20								
Máng xối treo (BHP) - Eave gutter (BHP) (m) - RF3																		
	RF3	17.60	1.00	1.00	2	35.20					35.20							
Ống xối - Down spout 72x105 (BHP) - RF4																		
	RF4	6.50	1.00	1.00	4	26.00						26.00						
C. Cửa và cửa sổ - Doors and windows (m2)																		
Cửa sắt kính- Steel glass door																		
-D1(1No)	DR1	0.90	1.00	2.20	1	1.98							1.98					
D. Tô trát - Plastering (m2)																		
Trát tường dày 20mm - 20mm thick cement/sand plastering on wall																		
- Tường 190mm - 190mm thick wall																		
= BR1X2	PL1	194.36	1.00	1.00	2	388.72								388.72				
Trát cột dày 20mm - 20mm thick cement/sand plastering on columns																		
- C1 (6 No.)	PL2	1.00	0.70	3.80	6	15.96									15.96			
BT(6No)	PL2	1.00	0.40	3.80	6	9.12									9.12			
BTM(3No)	PL2	1.00	0.40	1.10	3	1.32									1.32			
Trát dầm dày 20mm - 20mm thick cement/sand plastering on beams																		
-DM1(2No)	PL2	1.00	1.50	14.80	2	44.40									44.40			
-DM2(3No)	PL2	1.00	1.70	13.00	3	66.30									66.30			
-DM3(2No)	PL2	1.00	1.50	8.80	2	26.40									26.40			
-DG1(3No)	PL2	1.00	0.60	14.00	3	25.20									25.20			
E. Hoàn thiện tường - wall finishes																		
Sơn tường - Painting walls																		
= PL1+PL2	WL1	577.42	1.00	1.00	1	577.42										577.42		
F. Hoàn thiện nền- floor finishes																		
Concrete trowel - epoxy painting																		
	FR1	16.00	9.00	1.00	1	144.00											144.00	
	FR1	4.70	2.10	1.00	-1	-9.87											-9.87	
	FR1	6.00	9.00	1.00	-1	-54.00											-54.00	
G. Hoàn thiện trần -Ceiling finishes (m2)																		
CL3- Hệ thống trần thép treo (BHP) - Lysaght cedek- Suspended steel ceiling system (BHP)																		
	CL1	16.00	9.00	1.00	1	144												144.00
	TOTAL						194.36	-	228.80	211.20	35.20	26.0	1.98	388.72	188.70	577.42	80.13	144.00

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ	Khối lượng
		UNIT	Quantity
Xây tường dày 190 190 thick brick wall	BR1	m2	194.36
Tấm lợp mái Spandek (BHP) Spandek Hi-ten roofsheet (BHP)	RF1	m2	228.80
Máng xối treo (BHP) Eave gutter (BHP)	RF3	m	35.20
Ống xối 72x105 (BHP) Down spout 72x105 (BHP)	RF4	m	26.00

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ	Khối lượng
	SIGN	UNIT	Quantity
Sơn nền epoxy Epoxy painting	FR1	m2	80.13
Trét ma tít, sơn nước vào tường Apply mastic and 02 layers of pain on walls	WL1	m2	577.42
Tấm trần thép (BHP) Lysaght cedek- Suspended steel ceiling system	CL1	m2	144.00
Cửa sắt kính Steel glass door	DR1	m2	1.98

Table C.2.5
Breakdown of Architectural Work Quantities for Guard House

Table C.2.5.1 Breakdown of Reinforcing Bar Quantities

Table C.2.5.2 Breakdown of Pile, Earth Work, Concrete Work Quantities

Table C.2.5.3 Breakdown of Brick, Roofing, Door and Window and Finishing Work Quantities

BẢNG KHỐI LƯỢNG
TABLE C.2.5.1 BREAKDOWN OF QUANTITIES

HẠNG MỤC : NHÀ BẢO VỆ - TRẠM BƠM BẾN MỄ CÓC
ITEM : GUARD HOUSE - BẾN MỄ CÓC PUMP STATION
CÔNG TÁC : CỐT THÉP
WORK : REINFORCEMENT

VỊ TRÍ / LOCATION	Đ.K. / DIA.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH									
		1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
Móng -Foundation																							
-M2 (4 No)																							
1	12	2.65	0.25					2.90	4	1	4	16				46.4							
2	6	0.25	0.25	0.25	0.25	2		1.10	1.35	0.2	4	28	30.8										
3	12	1.5	0.2	0.2				1.90	1.5	0.2	4	32				60.8							
4	12	1.5	0.2	0.2				1.90	1.5	0.2	4	32				60.8							
	GRANT TOTAL WEIGHT (Ton)							**0.16**	TOTAL LENGTH			(m)	30.8	0	0	168	0	0	0	0	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.01**	**0**	**0**	**0.15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cột - Columns																							
-C2 (4No)																							
1	12	3.05						3.05	4	1	4	16				48.8							
2	6	0.15	0.15	0.15	0.15	2		0.70	2	0.1	4	80	56										
	6	0.15	0.15	0.15	0.15	2		0.70	1.05	0.2	4	20	14										
-Bộ trụ (2No)-sub column BTM1																							
1	12	0.7						0.70	4	1	2	8				5.6							
2	6	0.15	0.15	0.15	0.15	2		0.70	0.4	0.1	2	8	5.6										
	6	0.15	0.15	0.15	0.15	2		0.70	0.3	0.2	2	4	2.8										
	GRANT TOTAL WEIGHT (Ton)							**0.07**	TOTAL LENGTH			(m)	78.4	0	0	54.4	0	0	0	0	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.02**	**0**	**0**	**0.05**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Đà Kiềng, Đà mái - Ground and roof beams																							
DK1a,DM1a (4No)																							
1	16	4.2	0.25	0.25				4.70	2	1	4	8						37.6					
2	20	4.2	0.15	0.15				4.50	2	1	4	8								36			
3	6	0.15	0.15	0.25	0.25	2		0.90	2.1	0.15	4	56	50.4										
	6	0.15	0.15	0.25	0.25	2		0.90	2.1	0.2	4	44	39.6										
DK2a (2No)																							
1	16	3.2	0.25	0.25				3.70	2	1	2	4						14.8					
2	20	3.2	0.15	0.15				3.50	2	1	2	4								14			
3	6	0.15	0.15	0.25	0.25	2		0.90	1.6	0.15	2	22	19.8										
	6	0.15	0.15	0.25	0.25	2		0.90	1.6	0.2	2	16	14.4										

VỊ TRÍ	Đ.K.	CHIỀU DÀI THANH - LENGTH OF BAR							SỐ THANH - NOS OF BAR				TỔNG CHIỀU DÀI - TOTAL LENGTH										
LOCATION	DIA.	1	2	3	4	8D	42D	TOTAL	L	a	n	TOTAL	6	8	10	12	14	16	18	20	22	25	28
DM2a (2No)																							
1	16	5.2	0.25	0.25				5.70	2	1	2	4						22.8					
2	20	5.2	0.15	0.15				5.50	2	1	2	4								22			
3	6	0.15	0.15	0.25	0.25	2		0.90	2.6	0.15	2	34	30.6										
	6	0.15	0.15	0.25	0.25	2		0.90	2.6	0.2	2	26	23.4										
DG1a (2No)																							
1	12	5.8	0.2	0.2				6.20	2	1	4	8				49.6							
2	12	5.8	0.1	0.1				6.00	2	1	4	8				48							
3	6	0.15	0.15	0.15	0.15	2		0.70	2.9	0.15	4	76	53.2										
	6	0.15	0.15	0.15	0.15	2		0.70	2.9	0.2	4	60	42										
Đà lanh tô - Lintels																							
- D12 (1 No)	16	1.15	0.2	0.2				1.55	2	1	1	2						3.1					
	6	0.15				2		0.25	1.15	0.15	1	8	2										
- D13 (1 No)	16	1.05	0.2	0.2				1.45	2	1	1	2						2.9					
	6	0.15				2		0.25	1.45	0.15	1	10	2.5										
- D14 (1 No)	16	1.30	0.2	0.2		2		1.96	2	1	1	2						3.92					
	6	0.15				2		0.25	1.3	0.15	1	9	2.25										
- W12 (1 No)	16	2.40	0.2	0.2		2		3.06	4	1	1	4						12.24					
	6	0.15	0.15	0.15	0.15	2		0.70	2.4	0.15	1	16	11.2										
W13 (1 No)	16	1.00	0.2	0.2		2		1.66	2	1	1	2						3.32					
	6	0.15				2		0.25	1	0.15	1	7	1.75										
	GRANT TOTAL WEIGHT (Ton)					**#REF!**			TOTAL LENGTH			(m)	293.1	0	0	97.6	0	100.68	0	72	0	0	#REF!
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0.07**	**0**	**0**	**0.09**	**0**	**0.16**	**0**	**0.18**	**0**	**0**	**#REF!**
Nền nhà -Ground floor slab																							
	12	4.2						4.20	2.8	0.2	1	14				58.8							
	12	3.2						3.20	3.8	0.2	1	19				60.8							
	GRANT TOTAL WEIGHT (Ton)							**0.11**	TOTAL LENGTH			(m)	0	0	0	119.6	0	0	0	0	0	0	0
	TỔNG TRỌNG LƯỢNG								UNIT WEIGHT			(Kg/m)	0.222	0.394	0.616	0.888	1.208	1.579	1.998	2.466	2.984	3.854	4.834
									TOTAL WEIGHT			(Ton)	**0**	**0**	**0**	**0.106**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

BẢNG KHỐI LƯỢNG

TABLE C.2.5.2 BREAKDOWN OF QUANTITIES

HẠNG MỤC : NHÀ BẢO VỆ - TRẠM BƠM BẾN MÊ CÓC
ITEM : GUARD HOUSE - BẾN MỄ CÓC PUMP STATION
CÔNG TÁC : CT. ĐẤT, CỌC, BT, VÁN KHUÔN
WORK : EARTHWORK, PILING, CONCRETE, FORMWORK

Mô tả / Description	K.H SIGN	KHỐI LƯỢNG - QUANTITY					CT.ĐẤT, CỌC PILING , EARTH WORK				BÊ TÔNG & VÁN KHUÔN CONCRETE & FORMWORK							
		L	W	H	n	TOTAL	PL	EW1	EW2	EW3	CF1	CF2	CC1	CB1	CS	FF	FC	FB
A. Công tác đất - EARTH WORK (m3)																		
Đào đất hố móng - Excavation for footings																		
- M2 (4No)	EW1	1.70	1.70	2.25	4.0	26.01		26.01										
Đắp và đầm đất nền nhà- Fill and compact soil base (m3)																		
	EW2	4.00	4.00	0.20	1.0	3.20			3.20									
Tấm nhựa Polyethylene - Polyethylene Sheet (m2)																		
	EW3	4.00	4.00	1.00	1.0	16.00				16.00								
C. Cừ tràm - WOODEN PILES (No.)																		
Cừ tràm d=80~100, L=5m, 25 piles/m2 - Wooden piles (No)																		
- M2 (4 No)	PL	1.70	1.70	25.00	4	289.00	289.00											
A. Bê tông - Concrete																		
Bê tông lót, mác 100, đá 4x6 Lean concrete garde 100, stone 40x60 (CF1)																		
- M2 (4 No)	CF1	1.90	1.90	0.10	4	1.44					1.44							
- Ground slab	CF1	3.80	3.80	0.10	1	1.44					1.44							
Bê tông mác 300, đá 1x2 - Concrete garde 300, stone 10x20 (CC1)																		
Móng - Footing(m3)																		
-M2 (4 No).	CF2	1.50	1.50	0.20	4	1.80						1.80						
	CF2	0.20	1.50	0.10	4	0.12						0.12						
Cột - Columns (m3)																		
C2 (4No)	CC1	0.20	0.20	3.05	4	0.49							0.49					
BTM1 (2No)	CC1	0.20	0.20	0.50	2	0.04							0.04					
Đà - Beams (m3)																		
DK1a, DM1a (2No)	CB1	4.00	0.20	0.30	4	0.96								0.96				
DK2a (2No)	CB1	3.00	0.20	0.30	2	0.36								0.36				
DM2a (2No)	CB1	4.80	0.20	0.30	2	0.58								0.58				
DG1a (2No)	CB1	5.80	0.20	0.20	2	0.46								0.46				
Đà lanh tô - Lintels																		
- D12 (1 No)	CB1	1.15	0.20	0.10	1	0.02								0.02				
- D13 (2 No)	CB1	1.05	0.20	0.10	2	0.04								0.04				
- D14 (1 No)	CB1	1.30	0.20	0.10	1	0.03								0.03				
- W12 (1 No)	CB1	2.40	0.20	0.20	1	0.10								0.10				
- W13 (1 No)	CB1	1.00	0.20	0.10	1	0.02								0.02				
Nền																		
	CS	3.80	3.80	0.15	1	2.17									2.17			
B. Ván khuôn - Formwork																		
1. Móng - Footing																		
-M2 (4 No).	FF	6.00	1.00	0.20	4	4.80										4.80		
2. Đà - Beam																		
DK1a, DM1a (2No)	FB	8.00	0.80	1.00	1	6.40												6.40
DK2a (2No)	FB	6.00	0.80	1.00	1	4.80												4.80
DM2a (2No)	FB	4.80	0.80	1.00	2	7.68												7.68
DG1a (2No)	FB	5.80	0.60	1.00	2	6.96												6.96
Đà lanh tô - Lintels																		
- W12 (1 No)	FB	2.40	0.60	1.00	1	1.44												1.44
- W13 (1 No)	FB	1.00	0.60	1.00	3	1.80												1.80
- D12 (1 No)	FB	1.15	0.40	1.00	1	0.46												0.46
- D13 (1 No)	FB	1.05	0.40	1.00	1	0.42												0.42
- D14 (1 No)	FB	1.30	0.40	1.00	1	0.52												0.52
3. Cột - Columns (m2)																		
C2 (4No)	FC	1.00	0.80	3.05	4	9.76											9.76	
BTM1 (2No)	FC	1.00	0.80	0.50	2	0.80											0.80	
	TOTAL						289.00	26.01	3.20	16.00	2.89	1.92	0.53	2.57	2.17	4.80	10.56	30.48

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ UNIT	Khối lượng Quantity
Cừ tràm L= 5m Wooden pile	WP	No	289.00
Đào móng, lấp đất hố móng Excavation and backfill soil for footings	EW1	m3	26.01
Đắp và đầm đất nền nhà Fill and compact soil base	EW2	m3	3.20
Tấm nhựa Polyethylene Polyethylene sheet	EW3	m2	16.00
Bê tông lót , mác 100, đá 4x6 Lean concrete, garde 100, stone 40x60	CF1	m3	2.89
Bê tông móng mác 300, đá 4x6 Concrete garde 300, stone 10x20 - Footings	CF2	m3	1.92
Bê tông cột mác 300, đá 1x2 Concrete garde 300, stone 10x20 - Coloumns	CC1	m3	0.53

MÔ TẢ - DESCRIPTION	KÝ HIỆU	ĐƠN VỊ	Khối lượng Quantity
Bê tông đà mác 300, đá 1x2 Concrete garde 300, stone 10x20 - Beams	CB1	m3	2.57
Bê tông sàn mác 300, đá 4x6 Slab concrete garde 300, stone 10x20 - Slab	CS	m3	2.17
Ván khuôn móng Formwork - Footings	FF	m2	4.80
Ván khuôn cột Formwork - Columns	FC	m2	10.56
Ván khuôn đà Formwork - Beams	FB	m2	30.48

BẢNG KHỐI LƯỢNG

TABLE C.2.5.3 BREAKDOWN OF QUANTITIES

HẠNG MỤC : NHÀ BẢO VỆ - TRẠM BƠM BẾN MỄ CÓC
ITEM : GUARD HOUSE - BẾN MỄ CÓC PUMP STATION
CÔNG TÁC : XÂY TÔ, MÁI, CỬA, HOÀN THIỆN
WORK : BRICKWORK, ROOFING, DOOR&WINDOWS, FINISHES

Mô tả / Description	K.H / SIGN	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG / BRICK WALL		MÁI / ROOFING					CỬA VÀ CỬA SỔ / DOORS AND WINDOWS					HOÀN THIỆN / FINISHES								
		L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	RF5	DR1	DR2	DR3	WD1	WD2	PL1	PL2	CL1	CL2	CL3	FR1	FR2	WL1	WL2
A. Xây tường - Brickwork																											
BR1: dày 200mm, BR2: dày 100mm (m2)																											
BR1: 190mm thick, BR2:90mm thick																											
- Trục - Gridline 1,2	BR2	8.40	1.00	3.1	2	51.24		51.24																			
	BR2	1.50	1.00	0.4	4	2.10		2.10																			
D12	BR2	0.80	1.00	2.2	-1	-1.76		-1.76																			
D14	BR2	0.90	1.00	2.2	-1	-1.98		-1.98																			
- Trục - Gridline A,B	BR2	3.80	1.00	3.1	2	23.18		23.18																			
W12	BR2	0.60	1.00	0.6	-1	-0.36		-0.36																			
B. Mái - Roofing																											
Tấm lợp mái Spandek (BHP) - Spandek Hi-ten roofsheet (BHP) (m2) - RF1																											
	RF1	6.34	5.34	1.00	1	33.86			33.86																		
Xà gồ thép C203x71x1.5 - Purlin (BHP) (m) - RF2																											
	RF2	6.34	1.00	1.00	7	44.38				44.38																	
Máng xối treo (BHP) - Eave gutter (BHP) (m) - RF3																											
	RF3	6.34	1.00	1.00	2	12.68					12.68																
Ống xối - Down spout 72x105 (BHP) - RF4																											
	RF4	4.42	1.00	1.00	4	17.68						17.68															
Flashing H=400																											
	RF5	6.34	1.00	1.00	4	25.36							25.36														
C. Tô trát - Plastering (m2)																											
Trát tường dày 20mm - 20mm thick cement/sand plastering on wall																											
- Tường 90mm - 90mm thick wall																											
= BR2X2	PL1	72.42	1.00	1.00	2	144.84													144.84								
Trát cột dày 20mm - 20mm																											
- C2 (4 No.)	PL2	1.00	0.60	2.75	4	6.60														6.60							
BTM(2No)	PL2	1.00	0.40	0.50	2	0.40														0.40							
Trát dầm dày 20mm																											
DM1a (2No)	PL2	4.20	0.80	1.00	2	6.72														6.72							
DM2a (2No)	PL2	5.20	0.80	1.00	2	8.32														8.32							
DG1a (2No) (GUARD HOUSE)	PL2	5.80	1.00	0.40	2	4.64														4.64							
D. Cửa và cửa sổ (m2)																											
Cửa sổ nhôm kính Aluminium windows glass																											
- D12 (1 No)	DR1	0.75	1.00	2.20	1	1.65								1.65													
Cửa nhựa Plastic doors																											
- D13 (1 No)	DR3	0.65	1.00	2.00	1	1.30										1.30											
Cửa sắt kính Steel glass doors																											
- D14 (1 No)	DR2	0.90	1.00	2.20	1	1.98									1.98												
Cửa sổ nhôm Aluminium window																											
- W12 (1 No)	WD1	2.00	1.20	1.00	1	2.40											2.40										
Cửa sổ nhôm bật Flash aluminium windows																											

Mô tả	K.H	KHỐI LƯỢNG - QUANTITY					XÂY TƯỜNG BRICK WALL		MÁI ROOFING					CỬA VÀ CỬA SỔ DOORS AND WINDOWS					HOÀN THIỆN FINISHES								
Description	SIGN	L	W	H	n	TOTAL	BR1	BR2	RF1	RF2	RF3	RF4	RF5	DR1	DR2	DR3	WD1	WD2	PL1	PL2	CL1	CL2	CL3	FR1	FR2	WL1	WL2
- W13 (1 No)	WD2	0.60	0.60	1.00	1	0.36												0.36									
D. Hoàn thiện trần -Ceiling finishes (m2)																											
CL1- Tấm trần villa - Villa board ceiling																											
CL2- Tấm trần plaster board - Plasterboard ceiling																											
CL3- Trần thép treo Lysaght ceidek- Lysaght ceidek ceiling (BHP)																											
	CL1	0.90	3.00	1.00	1	3															2.70						
	CL2	4.00	3.00	1.00	1	12																12.00					
	CL2	0.90	3.00	1.00	-1	-3																-2.70					
	CL3	19.00	1.00	1.00	1	19																	19.00				
D. Hoàn thiện sàn (m2)																											
FR1- Gạch ceramic 200x200 - Ceramic tile 200x200																											
FR2- Gạch Quart - quart tile																											
	FR1	0.90	3.00	1.00	1	3																		2.70			
	FR2	4.00	3.00	1.00	1	12																			12.00		
	FR2	0.90	3.00	1.00	-1	-3																			-2.70		
D. Hoàn thiện tường (m2)																											
WL1- Gạch ceramic 200x250 - Ceramic tile 200x250																											
WL2- Sơn nước - water paint																											
	WL1	3.00	1.00	2.00	2	12																				12.0	
	WL1	0.90	1.00	2.00	4	7																				7.2	
- D13 (1 No)	WL1	0.65	1.00	2.00	-2	-3																				-2.6	
- D12 (1 No)	WL1	0.90	1.00	2.00	-1	-2																				-1.8	
- W13	WL1	0.60	1.00	0.60	-1	0																				-0.4	
= PL1+PL2-WL1	WL2	152.52	1.00	1.00	1	153																					152.52
	TOTAL						0.00	72.42	33.86	44.38	12.68	17.68	25.4	1.65	1.98	1.30	2.40	0.36	144.84	26.68	2.70	9.30	19.00	2.70	9.30	14.4	152.52

MÔ TẢ - DESCRIPTION	K. HIỆU	Đ. VỊ UNIT	Khối lượng Quantity
Xây tường dày 190 190 thick brick wall	BR1	m2	0.00
Xây tường dày 90 90 thick brick wall	BR2	m2	72.42
Tấm lợp mái Spandek (BHP) Spandek Hi-ten roofsheet (BHP)	RF1	m2	33.86
Xà gồ thép C203x76x1.5 (BHP) Purlin C203x76x1.5 (BHP)	RF2	m	44.38
Máng xối treo (BHP) Eave gutter (BHP)	RF3	m	12.68
Ống xối 72x105 (BHP) Down spout 72x105 (BHP)	RF4	m	17.68
Flasing H=400 (BHP)	RF5	m	25.36

MÔ TẢ - DESCRIPTION	KÝ HIỆU	ĐƠN VỊ UNIT	Khối lượng Quantity
Cửa nhôm kính Aluminium glass doors	DR1	m2	1.65
Cửa sắt kính Steel glass doors	DR2	m2	1.98
Cửa nhựa Plastic doors	DR3	m2	1.30
Cửa sổ nhôm kính Aluminium windows glass	WD1	m2	2.40
Cửa sổ nhôm bật kính trong Aluminium windows glass	WD2	m2	0.36
Trát tường, cột dày 20mm 20mm thick cement/sand plastering on walls, coloumns	PL1	m2	144.84
Trát đà dày 20mm 20mm thick cement/sand plastering on beam	PL2	m2	26.68
Tấn trần villa Villa board ceiling	CL1	m2	2.70
Tấm trần Plasterboard Plasterboard ceiling	CL2	m2	9.30
Hệ thống trần thép treo (BHP) Lysaght cedek- Suspended steel ceiling system (BHP)	CL3	m2	19.00
Lát gạch ceramic 200x200 Ceramic tile 200x200 on floor	FR1	m2	2.70
Lát gạch quart Quart tile	FR2	m2	9.30
Ốp gạch tường 200x250 Ceramic tile on 200x250 walls	WL1	m2	14.44
Trét bả và sơn 2 lớp lên tường Apply admixture and 2 paint layers on walls	WL2	m2	152.52

TABLE C.2.6 (1/2) MECHANICAL EQUIPMENT LIST OF INTERMEDIATE WASTEWATER PUMPING STATION

	No.	Name	Model	Spec	Unit	Q'ty	Remarks
3.9.1 Mechanical	3.9.1.1	Main pump	Submersible motor pump	700mm dia. x 66.7m3/m x 14m	set	3	
Equipment	3.9.1.2	Pipework	Ductile iron made	700mm dia.	set	3	
	3.9.1.3	Siphon breaker valve	DC operated	150mm dia.	set	3	
	3.9.1.4	Portable type drain pump	Submersible motor pump	50mm dia.	set	1	
	3.9.1.5	Portable type drain pump	Submersible motor pump	100mm dia.	set	1	
	3.9.1.6	Overhead crane	Double girder type	10tonnes	set	1	
	3.9.1.7	Emergency gate	Cast iron made	2.0m W x 2.0m H	set	1	
	3.9.1.8	Stoplog	Steel made	3.5m W x 4.0m H	set	2	
	3.9.1.9	Rotary fine screen	Steel made	3.5m W x 4.0m H	set	1	
	3.9.1.10	Bar screen	Steel made	3.5m W x 4.0m H	set	1	
	3.9.1.11	Horizontal conveyor	Belt type	750mm W x 6.5mL	set	1	
	3.9.1.12	Inclined conveyor	Belt with fin type	1050mm W x 12.5mL	set	1	
	3.9.1.13	Air inlet fan	Centrifugal type	13,000m3/h	set	1	
			Axial flow type	29,000m3/h	set	1	
		Exhaust fan	Axial flow type	29,000m3/h	set	1	
			Wall mounted type	6,500m3/h	set	2	
	3.9.1.14	Sluice gate	Cast iron made	2.0m W x 1.2m H	set	2	
	3.9.1.15	Grit removal equipment	Grab bucket type	5.0m W x 11.0m L	set	1	
	3.9.1.16	Spare parts			lot	1	
		Weather cover		Dia.: 600mm	pieces	2	
				Material: stainless steel			
		Frame for wall mounted fan		Material: stainless steel	pieces	4	
3.9.2 Duct work							
	3.9.2.1	Rectangular duct		Galvanized steel plate, t=1.0mm	m^2	227	
	3.9.2.2	Spiral duct		Galvanized steel plate, t=0.6mm, 150mm dia.	m	26	
				Galvanized steel plate, t=0.6mm, 200mm dia.	m	29	
				Galvanized steel plate, t=0.8mm, 250mm dia.	m	13	
				Galvanized steel plate, t=0.8mm, 275mm dia.	m	5	
				Galvanized steel plate, t=0.8mm, 300mm dia.	m	9	
				Galvanized steel plate, t=0.8mm, 350mm dia.	m	19	
				Galvanized steel plate, t=0.8mm, 400mm dia.	m	2	
				Galvanized steel plate, t=0.8mm, 450mm dia.	m	17	
				Galvanized steel plate, t=0.8mm, 550mm dia.	m	20	
				Galvanized steel plate, t=0.8mm, 600mm dia.	m	9	

TABLE C.2.6 (2/2) MECHANICAL EQUIPMENT LIST OF INTERMEDIATE WASTEWATER PUMPING STATION

	No.	Name	Model	Spec	Unit	Q'ty	Remarks
	3.9.2.3	Flexible joint		For Item 1-1	set	1	
				For Item 1-2&3, 800mm dia.	sets	2	
	3.9.2.4	Outlet		Aluminium made, 1200x900	pieces	3	
				Aluminium made, 800x800	pieces	2	
				Aluminium made, 350x350	pieces	5	
				Aluminium made, 300x300	pieces	6	
				Aluminium made, 250x250	piece	1	
	3.9.2.5	Inlet		Aluminium made, 900x1500	pieces	4	
				Aluminium made, 1000x800	pieces	4	
	3.9.2.6	Adjustable damper		Steel made, 800x800	pieces	2	
				Steel made, 900x500	piece	1	
				Steel made, 150mm dia.	piece	1	
				Steel made, 200mm dia.	pieces	11	
	3.9.2.7	Chamber box		For inlet, 3600L x 1500H x 1100D	piece	1	
				For outlet, 3000L x 2000H x 800D	piece	1	
	3.9.2.8	Box for outlet		Galvanized steel plate, 400x400x300	piece	1	
				Galvanized steel plate, 450x450x400	pieces	6	
				Galvanized steel plate, 500x500x400	pieces	5	
				Galvanized steel plate, 950x950x600	pieces	2	

TABLE C.2.7 (1/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
A		22kV Substation (2L-2B)			
A-1		22kV Incoming C-GIS unit	DS, ES, CB, LA, VD	2	sets
A-2		22kV Bus C-GIS unit	CB	1	set
A-3		22kV Metring C-GIS unit	CT, VT	1	set
A-4		22kV Transformer primary C-GIS unit	DS, ES, CB	1	set
A-5		Anchor bolt (Chemical)	M22	24	pcs
A-6		Silicon seal		5	pcs
A-7		Sealing gun		5	pcs
A-10		Flexible Polyethylen Pipe (FEP)	FEP 150φ	210	m
A-11		Bell Mouth for FEP	for FEP 150φ	36	pcs
A-12		Checker plate (galvanized steel)	t=3.2	10	m2
A-13		Cable entrance seal		20	kg
A-14		Heat protect seal		10	kg
A-16		Cable rack support steel (Vertical)	L65,H800	5	m
A-17		Cable rack support steel (Horizontal)	L500	20	pcs
A-18		Cable rack support steel (R75)	R75	60	pcs
A-19		Cable rack	W300	5	m
A-20		Cable rack hold down clamp	for W300	6	pcs
A-21		Lateral bracing hanger	H100	12	pcs
A-22		Cable rack connentor	H100	2	pcs
A-23		Rack end cover	H100	2	pcs
A-24		Mechanical anchor	M10	12	pcs
B		Electrical Room F3 (-3.7m)			
B-1		(15)22kV/380-220V, 1500kVA Main Transformer	with OLTC	1	unit
B-2		1500kVA TR Secondary Panel		1	set
B-3		1500kVA TR Secondary Duct	2500A	1	set
B-4		750kVA Generator Incoming Panel		1	set
B-5		220kW Lift Pump Starter Panel		3	units
B-6		380V Capacitor / Reactor		3	units
B-7		AC Distribution Panel		1	unit
B-8		Motor Control Center		3	units
B-9		Ry Panel for MCC		1	units
B-10		DC Power supply system		1	unit
B-11		Grip anchor	M12	96	pcs
B-12		Anchor bolt (Chemical)	M22	4	pcs
B-13		Cable rack	W300	7	m
B-14		Cable rack	W1000	14	m
B-15		Cable rack hold down clamp	for W300	4	pcs
B-16		Cable rack hold down clamp	for W1000	8	pcs
B-17		Lateral bracing hanger	H100	24	pcs
B-18		Cable rack connentor	H100	12	pcs
B-19		Rack end cover	H100	12	pcs
B-20		Cable rack cover	for W300	7	m
B-21		Cable rack cover	for W1000	14	m
B-22		Cable rack cover clamp	for W300	12	pcs
B-23		Cable rack cover clamp	for W1000	24	pcs
B-24		Mechanical anchor	M10	152	pcs
B-25		Conduit pipe	G28	40	m
B-26		Conduit pipe	G54	65	m
B-27		Conduit pipe	G70	15	m
B-28		Conduit pipe (Normal bend)	for G28	5	pcs
B-29		Conduit pipe (Normal bend)	for G54	4	pcs
B-30		Conduit pipe (Normal bend)	for G70	5	pcs
B-31		Conduit pipe (Coupling)	for G28	28	pcs

TABLE C.2.7 (2/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
B-32		Conduit pipe (Coupling)	for G54	44	pcs
B-33		Conduit pipe (Coupling)	for G70	14	pcs
B-34		Conduit pipe (Lock nut)	for G28	16	pcs
B-35		Conduit pipe (Lock nut)	for G54	12	pcs
B-36		Conduit pipe (Lock nut)	for G70	12	pcs
B-37		Conduit pipe (Bushing)	for G28	16	pcs
B-38		Conduit pipe (Bushing)	for G54	12	pcs
B-39		Conduit pipe (Bushing)	for G70	12	pcs
B-40		Conduit pipe (Saddle)	for G28	27	pcs
B-41		Conduit pipe (Saddle)	for G54	43	pcs
B-42		Conduit pipe (Saddle)	for G70	10	pcs
B-43		Ducter	D2 (40x30x2500)	12	pcs
B-44		Ducter clip	for G28	27	pcs
B-45		Ducter clip	for G54	43	pcs
B-46		Ducter clip	for G70	10	pcs
B-47		Flexible metal conduit pipe	30φ	10	m
B-48		Flexible metal conduit pipe	63φ	10	m
B-49		Flexible metal conduit pipe	76φ	10	m
B-50		Conbination coupling	for 30φ-G28	5	pcs
B-51		Conbination coupling	for 63φ-G54	5	pcs
B-52		Conbination coupling	for 76φ-G70	5	pcs
B-53		Box connector	for 30φ	12	pcs
B-54		Box connector	for 63φ	5	pcs
B-55		Box connector	for 76φ	5	pcs
B-56		Bushing	for 30φ	17	pcs
B-57		Bushing	for 63φ	10	pcs
B-58		Bushing	for 76φ	10	pcs
B-59		Suddle	for 30φ	7	pcs
B-60		Suddle	for 63φ	7	pcs
B-61		Suddle	for 76φ	7	pcs
B-62		Pull Box (Galvanized)	400X400	7	pcs
B-63		Steel Duct (Galvanized)	500X500	10	m
B-64		Concrete anchor plug	M6	202	pcs
B-65		Cable separator	H300	60	m
B-66		Checker plate	t=3.2	70	m2
B-67		Plaster board	t=9.2	1	m2
B-68		Silicon seal		7	pcs
B-69		Cable entrance seal		40	kg
B-70		Heat protect seal		20	kg
C		Control Room F4 (+2.3m)			
C-1		22kV Control & Protection Panel		1	unit
C-2		1500kVA TR OLTC Panel		1	unit
C-3		Supervisory Panel		1	unit
C-4		Billmetering Panel		1	unit
C-5		Communication system		1	unit
C-6		Grip anchor	M12	96	pcs
C-7		Conduit pipe	G22	4.5	m
C-8		Conduit pipe	G36	1.5	m
C-9		Conduit pipe	G54	1.5	m
C-10		Conduit pipe	G104	1.5	m
C-11		Conduit pipe (Coupling)	for G22	2	pcs
C-12		Conduit pipe (Coupling)	for G36	1	pc
C-13		Conduit pipe (Coupling)	for G54	1	pc
C-14		Conduit pipe (Coupling)	for G104	1	pc

TABLE C.2.7 (3/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
C-15		Conduit pipe (Lock nut)	for G22	12	pcs
C-16		Conduit pipe (Lock nut)	for G36	4	pcs
C-17		Conduit pipe (Lock nut)	for G54	4	pcs
C-18		Conduit pipe (Lock nut)	for G104	4	pcs
C-19		Conduit pipe (Bushing)	for G22	6	pcs
C-20		Conduit pipe (Bushing)	for G36	2	pcs
C-21		Conduit pipe (Bushing)	for G54	2	pcs
C-22		Conduit pipe (Bushing)	for G104	2	pcs
C-23		Ducter	D2 (40x30x2500)	2	pcs
C-24		Ducter clip	for G22	8	pcs
C-25		Ducter clip	for G36	4	pcs
C-26		Ducter clip	for G54	4	pcs
C-27		Ducter clip	for G104	4	pcs
C-28		Mechanical anchor	M10	16	pcs
C-29		Concrete anchor plug	M6	32	pcs
C-30		Cable separator	H300	16	m
C-31		Checker plate	t=3.2	6	m2
C-32		Plaster board	t=9.2	0	m2
C-33		Silicon seal		2	pcs
C-34		Cable entrance seal		5	kg
C-35		Heat protect seal		2	kg
D		Emergency Diesel Generator			
D-1		750kVA, 380V Diesel engine generator		1	unit
D-2		Main fuel tank		1	unit
D-3		Generator control panel		1	unit
D-4		Generator primary circuit breaker panel		1	unit
D-5		DC Power supply system		1	unit
D-6		Grip anchor	M12	16	pcs
D-7		Anchor bolt (Chemical)	M22	4	pcs
D-8		Conduit pipe	G22	3	m
D-9		Conduit pipe (Coupling)	for G22	1	pc
D-10		Conduit pipe (Lock nut)	for G22	2	pcs
D-11		Conduit pipe (Bushing)	for G22	2	pcs
D-12		Ducter	D2 (40x30x2500)	1	pcs
D-13		Ducter clip	for G22	3	pcs
D-14		Beam clamp	2W	10	pcs
D-15		Pipe clip for Beam clamp	for G22	4	pcs
D-16		Pipe clip for Beam clamp	for G54	6	pcs
D-17		Mechanical anchor	M10	12	pcs
D-18		Concrete anchor plug	M6	10	pcs
D-19		Flexible metal conduit pipe	50φ	5	m
D-20		Box connector	for 50φ	4	pcs
D-21		Bushing	for 50φ	4	pcs
D-22		Saddle	for 50φ	6	pcs
D-23		Cable separator	H300	60	m
D-24		Checker plate	t=3.2	24	m2
D-25		Plaster board	t=9.2	1.8	m2
D-26		Silicon seal		2	pcs
D-27		Cable entrance seal		6	kg
D-28		Heat protect seal		3	kg
D-29		□□□□□□	20m	5	pcs

TABLE C.2.7 (4/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
E		Instrumentation Equipment			
E-1		Submerged Diaphram Type Level Meter		2	units
E-2		Electrode Type Level Contorol Switch		3	sets
E-3		Conduit pipe	G22	5	m
E-4		Conduit pipe (Normal bend)	for G22	4	pcs
E-5		Conduit pipe (Coupling)	for G22	2	pcs
E-6		Conduit pipe (Lock nut)	for G22	8	pcs
E-7		Conduit pipe (Bushing)	for G22	4	pcs
E-8		Ducter	D2 (40x30x2500)	2	pcs
E-9		Ducter clip	for G22	3	pcs
E-10		Beam clamp	2W	10	pcs
E-11		Pipe clip for Beam clamp	for G22	4	pcs
E-12		Pipe clip for Beam clamp	for G54	6	pcs
E-13		Mechanical anchor	M10	54	pcs
E-14		Concrete anchor plug	M6	10	pcs
E-15		Flexible metal conduit pipe	24φ	6	m
E-16		Box connector	for 24φ	8	pcs
E-17		Bushing	for 24φ	8	pcs
E-18		Saddle	for 24φ	10	pcs
E-19		Protection pipe for level control switch	65φ	6	m
E-20		Protection pipe for level meter	400φ	20	m
E-21		Protection pipe connector	for 65φ	1	pc
E-22		Protection pipe connector	for 400φ	6	pcs
E-23		Protection pipe support	for 65φ	3	pcs
E-24		Protection pipe support	for 400φ	10	pcs
E-25		Support for level control switch		1	pc
F		Cable and wiring materials			
F-1		Power Cable			
	1	22kV Power Cable for 1500kVA TR	22kV CVT 60	300	m
	2	22kV Cable termination for 1500kVA TR pri. GIS	22kV CVT 60	3	phase
	3	22kV Cable termination for 1500kVA TR	22kV CVT 60	3	phase
	4	600V Power Cable	CV 2C- 8sqmm	110	m
	5	600V Power Cable	CV 3C- 8sqmm	180	m
	6	600V Power Cable	CV 4C- 8sqmm	180	m
	7	600V Power Cable	CV 3C- 14sqmm	450	m
	8	600V Power Cable	CV 4C- 14sqmm	60	m
	9	600V Power Cable	CV 3C- 22sqmm	130	m
	10	600V Power Cable	CV 3C- 38sqmm	710	m
	11	600V Power Cable	CV 4C- 38sqmm	250	m
	12	600V Power Cable	CV 4C- 60sqmm	100	m
	13	600V Power Cable	CV 3C-100sqmm	170	m
	14	600V Power Cable	CV 3C-200sqmm	180	m
	15	600V Power Cable	CV 3C-250sqmm	70	m
	16	600V Power Cable	CV 1C-600sqmm	370	m
	17	600V Power Cable	CV 1C-800sqmm	210	m
	18	600V Power Cable	CV 1C-1000sqmm	800	m
	19	600V Power Cable	CV-MAZV 3C-14sq	880	m
	20	600V Cable termination	CV 3C- 38sqmm	6	sets
	21	600V Cable termination	CV 4C- 38sqmm	4	sets
	22	600V Cable termination	CV 4C- 60sqmm	4	sets
	23	600V Cable termination	CV 3C-100sqmm	2	sets
	24	600V Cable termination	CV 3C-200sqmm	2	sets
	25	600V Cable termination	CV 3C-250sqmm	2	sets
	26	600V Cable termination	CV 1C-600sqmm	12	sets
	27	600V Cable termination	CV 1C-800sqmm	6	sets

TABLE C.2.7 (5/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
	28	600V Cable termination	CV 1C-1000sqmm	16	sets
	29	termina□	8sqmm-5	54	pcs
	30	termina□	8sqmm-10	54	pcs
	31	termina□	14sqmm-5	116	pcs
	32	termina□	14sqmm-10	116	pcs
	33	termina□	14sqmm-12	116	pcs
F-2		Control Cable			
	1	Control Cable	CVVS 3.5- 2C	195	m
	2	Control Cable	CVVS 3.5- 3C	540	m
	3	Control Cable	CVVS 3.5- 4C	570	m
	4	Control Cable	CVVS 3.5- 6C	450	m
	5	Control Cable	CVVS 3.5- 10C	320	m
	6	Control Cable	CVVS 3.5- 15C	970	m
	7	Control Cable	CVVS 3.5- 20C	1,200	m
	8	Control Cable	CVVS 5.5- 4C	260	m
	9	Control Cable	CVVS 5.5- 10C	160	m
	10	Control Cable	CVVS 5.5- 15C	235	m
	11	Control Cable	CVVS 5.5- 20C	900	m
	12	Control Cable	CVVS 8- 4C	60	m
	13	Control Cable	CVVS 8- 6C	1,380	m
	14	termina□	3.5sqmm-4	1,500	pcs
	15	termina□	3.5sqmm-6	1,500	pcs
	16	termina□	3.5sqmm-10	1,500	pcs
	17	termina□	5.5sqmm-4	350	pcs
	18	termina□	5.5sqmm-6	350	pcs
	19	termina□	5.5sqmm-10	350	pcs
	20	termina□	8sqmm-5	150	pcs
	21	termina□	8sqmm-10	150	pcs
F-3		Cable Trench & Fittings			
	1	Cable rack (Streight)	W1000	35	m
	2	Cable rack (T type)	for W1000	2	pcs
	3	Suspention bolt	M10,L2000	40	pcs
	4	Suspention fitting	M10	40	pcs
	5	Support fitting	for W1000	20	pcs
	6	Lateral bracing hanger	H100	40	pcs
	7	Cable rack connentor	H100	12	pcs
	8	Rack end cover	for W1000	4	pcs
	9	Cable protection net	for W1000	35	m
	10	Cable rack cover	for W1000	35	m
	11	Cable rack cover clamp	for W1000	24	pcs
F-4		Piping Materials			
	1	Conduit pipe	G36	5.0	m
	2	Conduit pipe	G70	15	m
	3	Conduit pipe (Normal bend)	G36□	2	pcs
	4	Conduit pipe (Normal bend)	G70□	6	pcs
	5	Conduit pipe (Coupling)	G36□	6	pc
	6	Conduit pipe (Coupling)	G70□	9	pcs
	7	Conduit pipe (Lock nut)	G36□	8	pcs
	8	Conduit pipe (Lock nut)	G70□	12	pcs
	9	Conduit pipe (Bushing)	G36□	4	pcs
	10	Conduit pipe (Bushing)	G70□	6	pcs
	11	Ducter	D2 (40x30x2500)	1	pcs

TABLE C.2.7 (6/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
	12	Ducter clip	G36□	8	pcs
	13	Ducter clip	G70□	12	pcs
	14	Mechanical anchor	M10	30	pcs
	15	Concrete anchor plug	M6	10	pcs
	16	Flexible metal conduit pipe	76φ	5	m
	17	Conbination coupling	76φ-G70□	2	pcs
	18	Box connector	76φ□	2	pcs
	19	Bushing	76φ□	2	pcs
	20	Saddle	76φ□	5	pcs
	21	Pull Box	400x400	4	pcs
	22	Flexible Polyethylen Pipe (FEP)	30φ	42	m
	23	Flexible Polyethylen Pipe (FEP)	50φ	60	m
	24	Flexible Polyethylen Pipe (FEP)	100φ	20	m
	25	Flexible Polyethylen Pipe (FEP)	150φ	1,250	m
	26	Joint Connector for FEP	150φ□	50	pcs
	27	Bell Mouth for FEP	30φ□	2	pcs
	28	Bell Mouth for FEP	50φ□	4	pcs
	29	Bell Mouth for FEP	100φ□	4	pcs
	30	Bell Mouth for FEP	150φ□	100	pcs
	31	Waterproof cap for FEP	30φ□	2	pcs
	32	Waterproof cap for FEP	50φ□	4	pcs
	33	Waterproof cap for FEP	100φ□	4	pcs
	34	Waterproof cap for FEP	150φ□	100	pcs
	35	Cable embed sign tape	W150X50m	30	pcs
	36	Cable embed sign pole		60	pcs
	37	Man Hole	1500x1500x1500	3	□
	38	Man Hole	2000x2000x2000	8	□
F-5		Earthing materials			
	1	Copper conductor	H 100	450	m
	2	IV wire	IV 5.5	700	m
	3	IV wire	IV 8	400	m
	4	IV wire	IV 14	200	m
	5	IV wire	IV 22	200	m
	6	IV wire	IV 38	300	m
	7	IV wire	IV 60	800	m
	8	IV wire	IV 100	800	m
	9	IV wire	IV 150	300	m
	10	T-type connector	38sqmm	40	pcs
	11	T-type connector	100sqmm	150	pcs
	12	T-type connector	150sqmm	70	pcs
	13	T-type connector	250sqmm	20	pcs
	14	termina□	5.5sqmm-4	350	pcs
	15	termina□	5.5sqmm-6	350	pcs
	16	termina□	5.5sqmm-10	350	pcs
	17	termina□	8sqmm-5	200	pcs
	18	termina□	8sqmm-10	200	pcs
	19	termina□	14sqmm-5	100	pcs
	20	termina□	14sqmm-10	100	pcs
	21	termina□	14sqmm-12	100	pcs
	22	termina□	22sqmm-6	100	pcs
	23	termina□	22sqmm-10	100	pcs
	24	termina□	22sqmm-12	100	pcs
	25	termina□	38sqmm-8	100	pcs
	26	termina□	38sqmm-10	100	pcs

TABLE C.2.7 (7/7) ELECTRICAL WORK QUANTITIES OF
INTERMEDIATE WASTEWATER PUMPING STATION

Item		Description	Specification	Q'ty	unit
	27	termina□	38sqmm-12	100	pcs
	28	termina□	60sqmm-8	100	pcs
	29	termina□	60sqmm-10	100	pcs
	30	termina□	60sqmm-12	100	pcs
	31	termina□	100sqmm-10	200	pcs
	32	termina□	100sqmm-12	200	pcs
	33	termina□	100sqmm-20	200	pcs
	34	termina□	150sqmm-10	50	pcs
	35	termina□	150sqmm-12	50	pcs
	36	termina□	150sqmm-20	50	pcs
	45	Earthing rod	1500mmx16φ	110	pcs
	46	Earthing rod lead wire		60	pcs
	47	Earthing Plate	900x900x1.5t	10	pcs
	49	Earthing wire connection box	Concrete type	5	pcs
	50	Earthing terminal box	Outdoor type	3	pcs
G	Local Control Panel				
G-1		Local Control Panel for Motor		10	sets
G-2		Local Control Panel for Instrument		1	set
G-3		Mechanical anchor	M10	50	pcs
G-4		Silicon seal		3	pcs
G-5		Cable entrance seal		10	kg
G-6		Heat protect seal		5	kg
H	Outdoor Lighting Equipment				
H-1		Streight Pole Head Type Lighting Fixture	N360W	11	sets
H-2		Outdoor lighting control panel		1	set
H-3		Mechanical anchor	M10	50	pcs
H-4		Silicon seal		3	pcs
H-5		Cable entrance seal		5	kg
H-6		Heat protect seal		5	kg

CHAPTER 5
CONVEYANCE SEWER CONSTRUCTION (PACKAGE D)

Table D.2.1 Work Quantity for Construction of Conveyance

Accumulated Distance (m)	Section Distance (m)	Existing/Design Ground Level (m)	Stripping Start Level (m)	Culvert Invert Level (m)	Culvert Top Level (m)	Trench Bottom Level (m)	Excavation Depth (m)	Trench Length by Shoring Type			Sheet Pile Length	Waling & Strut (t)	Trench Type	Stripping Area			Trench Excavation			Total Excavation Volume (m³)	Culvert Volume (m³)	Backfill to Original Shape Volume (m³)	Backfill to Road Sub-base			Total Backfill Volume (m³)	Foundation Type Length (m)				
								Type	Timber	Sheet Pile (FSP-2)				Section Area (m²)	Average Area (m²)	Volume (m³)	Section Area (m²)	Average Area (m²)	Volume (m³)				Area (m²)	Average Area (m²)	Volume (m³)		Type	Timber Piling	Timber Pile No.	Concrete Piling	Concrete Pile No.
0 + 0.00	0.00	2.00	0.00	-0.400	1.000	-0.950	0.950	Timber	0.00	-	-	-	Type 1	4.911	-	-	8.524	-	-	-	-	-	-	-	-	-	-	-	-	-
0 + 19.43	19.43	1.27	1.18	-0.410	0.990	-0.960	2.140	Timber	19.43	-	-	-	Type 1	4.911	4.911	95.42	8.524	8.524	165.62	261.04	121.24	139.80	2.904	2.904	56.42	196.22	Timber	19.43	544	-	-
0 + 53.20	33.77	1.53	1.51	-0.427	0.973	-0.977	2.487	Timber	33.77	-	-	-	Type 1	4.007	4.459	150.58	10.338	9.431	318.48	469.06	210.72	258.34	0.564	1.734	58.56	316.90	Timber	33.77	946	-	-
0 + 103.20	50.00	0.91	0.83	-0.452	0.948	-1.002	1.832	Timber	50.00	-	-	-	Type 1	8.304	6.156	307.80	6.819	8.579	428.95	736.75	312.00	424.75	3.824	2.194	109.70	534.45	Timber	50.00	1,400	-	-
0 + 153.20	50.00	1.45	0.51	-0.477	0.923	-1.027	1.537	Timber	50.00	-	-	-	Type 1	10.791	9.548	477.40	5.398	6.109	305.45	782.85	312.00	470.85	4.039	3.932	196.60	667.45	Timber	50.00	1,400	-	-
0 + 177.84	24.64	0.77	0.51	-0.659	0.741	-1.209	1.719	Timber	24.64	-	-	-	Type 1	10.791	10.791	265.89	5.398	5.398	133.01	398.90	153.75	245.15	4.039	4.039	99.52	344.67	Timber	24.64	690	-	-
0 + 201.29	23.45	0.67	0.62	-0.671	0.729	-1.221	1.841	Timber	23.45	-	-	-	Type 1	5.775	8.283	194.24	6.094	5.746	134.74	328.98	146.33	182.65	8.103	6.071	142.36	325.01	Timber	23.45	657	-	-
0 + 237.13	35.84	1.71	0.62	-0.689	0.711	-1.239	1.859	Timber	35.84	-	-	-	Type 1	5.775	5.775	206.98	6.094	6.094	218.41	425.39	223.64	201.75	8.103	8.103	290.41	492.16	Timber	35.84	1,004	-	-
0 + 242.13	5.00	1.72	0.62	-0.692	0.708	-1.242	1.862	Timber	5.00	-	-	-	Type 1	0.000	2.888	14.44	15.402	15.402	77.01	91.45	31.20	60.25	8.103	8.103	40.52	100.77	Timber	5.00	140	-	-
PACKAGE C	**242.13**								**242.13**	**0.00**	**0.00**	**0.00**				**1,712.75**			**1,781.67**	**3,494.42**	**1,510.89**	**1,983.53**				**2,977.63**		**242.13**	**6,781**	**0.00**	**0**
0 + 245.09	2.96	1.64	1.64	-0.693	0.707	-1.243	2.883	Timber	2.96	-	-	-	Type 1	0.000	0.000	0.00	14.992	14.992	44.38	44.38	18.47	25.91	0.000	0.000	0.00	25.91	Timber	2.96	83	-	-
0 + 295.09	50.00	1.64	1.64	-0.718	0.682	-1.268	2.908	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	15.122	15.057	752.85	752.85	312.00	440.85	0.000	0.000	0.00	440.85	Timber	50.00	1,400	-	-
0 + 345.09	50.00	1.62	1.62	-0.743	0.657	-1.293	2.913	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	15.148	15.135	756.75	756.75	312.00	444.75	0.000	0.000	0.00	444.75	Timber	50.00	1,400	-	-
0 + 395.09	50.00	1.74	1.74	-0.768	0.632	-1.318	3.058	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	15.902	15.525	776.25	776.25	312.00	464.25	0.000	0.000	0.00	464.25	Timber	50.00	1,400	-	-
0 + 445.13	50.04	1.69	1.69	-0.793	0.607	-1.343	3.033	Timber	50.04	-	-	-	Type 1	0.000	0.000	0.00	15.772	15.837	792.48	792.48	312.25	480.23	0.000	0.000	0.00	480.23	Timber	50.04	1,401	-	-
0 + 495.13	50.00	1.73	1.73	-0.818	0.582	-1.368	3.098	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	16.110	15.941	797.05	797.05	312.00	485.05	0.000	0.000	0.00	485.05	Timber	50.00	1,400	-	-
0 + 545.13	50.00	1.73	1.73	-0.843	0.557	-1.393	3.123	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	16.240	16.175	808.75	808.75	312.00	496.75	0.000	0.000	0.00	496.75	Timber	50.00	1,400	-	-
0 + 595.13	50.00	1.73	1.73	-0.868	0.532	-1.418	3.148	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	16.370	16.305	815.25	815.25	312.00	503.25	0.000	0.000	0.00	503.25	Timber	50.00	1,400	-	-
0 + 645.12	49.99	1.80	1.80	-0.893	0.507	-1.443	3.243	Timber	49.99	-	-	-	Type 1	0.000	0.000	0.00	16.864	16.617	830.68	830.68	311.94	518.74	0.000	0.000	0.00	518.74	Timber	49.99	1,400	-	-
0 + 695.12	50.00	1.86	1.86	-0.918	0.482	-1.468	3.328	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	17.306	17.085	854.25	854.25	312.00	542.25	0.000	0.000	0.00	542.25	Timber	50.00	1,400	-	-
0 + 745.12	50.00	1.90	1.90	-0.943	0.457	-1.493	3.393	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	17.644	17.475	873.75	873.75	312.00	561.75	0.000	0.000	0.00	561.75	Timber	50.00	1,400	-	-
0 + 795.13	50.01	1.93	1.93	-0.968	0.432	-1.518	3.448	Timber	50.01	-	-	-	Type 1	0.000	0.000	0.00	17.930	17.787	889.53	889.53	312.06	577.47	0.000	0.000	0.00	577.47	Timber	50.01	1,400	-	-
0 + 845.14	50.01	1.98	1.98	-0.993	0.407	-1.543	3.523	Timber	50.01	-	-	-	Type 1	0.000	0.000	0.00	18.320	18.125	906.43	906.43	312.06	594.37	0.000	0.000	0.00	594.37	Timber	50.01	1,400	-	-
0 + 895.14	50.00	2.02	2.02	-1.018	0.382	-1.568	3.588	Timber	50.00	-	-	-	Type 1	0.000	0.000	0.00	18.658	18.489	924.45	924.45	312.00	612.45	0.000	0.000	0.00	612.45	Timber	50.00	1,400	-	-
0 + 945.15	50.01	1.89	1.89	-1.043	0.357	-1.593	3.483	Timber	50.01	-	-	-	Type 1	0.000	0.000	0.00	18.112	18.385	919.43	919.43	312.06	607.37	0.000	0.000	0.00	607.37	Timber	50.01	1,400	-	-
0 + 995.16	50.01	1.89	1.89	-1.068	0.332	-1.618	3.508	Timber	50.01	-	-	-	Type 1	0.000	0.000	0.00	18.242	18.177	909.03	909.03	312.06	596.97	0.000	0.000	0.00	596.97	Timber	50.01	1,400	-	-
1 + 39.68	44.52	1.95	1.95	-1.090	0.310	-1.640	3.590	Timber	44.52	-	-	-	Type 1	0.000	0.000	0.00	18.668	18.455	821.62	821.62	277.80	543.82	0.000	0.000	0.00	543.82	Timber	44.52	1,247	-	-
1 + 45.45	5.77	1.88	1.88	-1.093	0.307	-1.643	3.523	Timber	5.77	-	-	-	Type 1	0.000	0.000	0.00	18.320	18.494	106.71	106.71	36.00	70.71	0.000	0.000	0.00	70.71	Timber	5.77	162	-	-
1 + 50.75	5.30	1.89	1.89	-1.096	0.304	-1.646	3.536	Timber	5.30	-	-	-	Type 1	0.000	0.000	0.00	18.320	18.320	97.10	97.10	33.07	64.03	0.000	0.000	0.00	64.03	Timber	5.30	148	-	-
1 + 95.16	44.41	1.42	0.94	-1.118	0.282	-1.868	2.808	Timber	44.41	-	-	-	Type 1	13.211	13.211	586.70	11.688	15.004	666.33	1,253.03	305.54	947.49	1.739	0.870	38.64	986.13	Concrete	-	-	44.41	44
1 + 135.83	40.67	1.72	0.94	-1.885	-0.485	-2.635	3.575	Timber	40.67	-	-	-	Type 1	13.211	13.211	537.29	16.009	13.849	563.24	1,100.53	279.81	820.72	1.739	1.739	70.73	891.45	Concrete	-	-	40.67	41
1 + 145.16	9.33	1.27	0.92	-1.890	-0.490	-2.640	3.560	Timber	9.33	-	-	-	Type 1	9.154	11.183	104.34	16.009	16.009	149.36	253.70	64.19	189.51	4.096	2.918	27.22	216.73	Concrete	-	-	9.33	9
1 + 195.15	49.99	-0.72	-1.12	-1.915	-0.515	-2.665	1.545	Timber	49.99	-	-	-	Type 1	20.495	14.825	741.10	5.377	10.693	534.54	1,275.64	343.93	931.71	28.683	16.390	819.34	1,751.05	Concrete	-	-	49.99	50
1 + 242.31	47.16	-0.03	-0.20	-1.939	-0.539	-2.689	2.489	Timber	47.16	-	-	-	Type 1	11.171	15.833	746.68	10.338	7.858	370.58	1,117.26	324.46	792.80	18.073	23.378	1,102.51	1,895.31	Concrete	-	-	47.16	47
1 + 295.23	52.92	-0.45	-0.45	-1.965	-0.565	-2.715	2.265	Timber	52.92	-	-	-	Type 1	10.869	11.020	583.18	9.173	9.756	516.29	1,099.47	364.09	735.38	22.833	20.453	1,082.37	1,817.75	Concrete	-	-	52.92	53
1 + 345.19	49.96	1.33	1.31	-1.990	-0.590	-2.740	4.050	Timber	49.96	-	-	-	Type 1	6.132	8.501	424.71	18.455	13.814	690.15	1,114.86	343.72	771.14	2.589	12.711	635.04	1,406.18	Concrete	-	-	49.96	50
	1,103.06															3,724.00			17,167.23	20,891.23	7,071.54	13,819.69									
1 + 395.19	50.00	0.65	0.39	-2.015	-0.615	-2.765	3.155	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	11.281	8.707	435.35	14.300	16.378	818.90	1,254.25	344.00	910.25	10.143	6.366	318.30	1,228.55	Concrete	-	-	50.00	50
1 + 445.19	50.00	0.25	0.11	-2.040	-0.640	-2.790	2.900	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	10.701	10.991	549.55	14.300	14.300	715.00	1,264.55	344.00	920.55	13.242	11.693	584.65	1,505.20	Concrete	-	-	50.00	50
1 + 495.19	50.00	0.22	0.11	-2.065	-0.665	-2.815	2.925	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	11.501	11.101	555.05	14.300	14.300	715.00	1,270.05	344.00	926.05	13.022	13.132	656.60	1,582.65	Concrete	-	-	50.00	50
1 + 545.19	50.00	0.27	0.18	-2.090	-0.690	-2.840	3.020	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	10.947	11.224	561.20	14.300	14.300	715.00	1,276.20	344.00	932.20	13.217	13.120	656.00	1,588.20	Concrete	-	-	50.00	50
1 + 595.19	50.00	0.81	0.61	-2.115	-0.715	-2.865	3.475	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	11.179	11.063	553.15	15.465	14.883	744.15	1,297.30	344.00	953.30	5.903	9.560	478.00	1,431.30	Concrete	-	-	50.00	50
1 + 645.19	50.00	0.80	0.17	-2.140	-0.740	-2.890	3.060	Sheet Pile	-	50.00	1,220.00	21.20	Type 2	13.790	12.485	624.25	14.300	14.883	744.15	1,368.40	344.00	1,024.40	11.267	8.585	429.25	1,453.65	Concrete	-	-	50.00	50
1 + 695.18	49.99	0.21	1.37	-2.165	-0.765	-2.915	4.285	Sheet Pile	-	49.99	1,219.76	21.20	Type 2	5.495	9.643	482.05	19.677	16.989	849.28	1,331.33	343.93	987.40	2.195	6.731	336.48	1,323.88	Concrete	-	-	49.99	50
1 + 745.19	50.01	0.89	0.10	-2.190	-0.790	-2.940	3.040	Sheet Pile	-	50.01	1,220.24	21.20	Type 2	13.792	9.644	482.30	14.300	16.989	849.62	1,331.92	344.07	987.85	11.275	6.735	336.82	1,324.67	Concrete	-	-	50.01	50
1 + 795.18	49.99	1.21	1.15	-2.215	-0.815	-2.965	4.115	Sheet Pile	-	49.99	1,219.76	21.20	Type 2	6.611	10.202	510.00	18.793	16.547	827.18	1,337.18	343.93	993.25	3.685	7.480	373.93	1,367.18	Concrete	-	-	49.99	50
1 + 845.11	49.93	1.21	0.57	-2.240	-0.840	-2.990	3.560	Sheet Pile	-	49.93	1,218.29	21.17	Type 2	11.897	9.254	462.05	15.907	17.350	866.29	1,328.34	343.52	984.82	7.074	5.380	268.62	1,253.44	Concrete	-	-	49.93	50
1 + 895.12	50.01	0.30	0.21	-2.265	-0.865	-3.015	3.225	Sheet Pile	-	50.01	1,220.24	21.20	Type 2	13.189	12.543	627.28	14.300	15.104	755.35	1,382.63	344.07	1,038.56	11.065	9.070	453.59	1,492.15	Concrete	-	-	50.01	50
2 + 7.40	112.28	1.28	1.28	-2.321	-0.921	-3.071	4.351	Sheet Pile	-	112.28	2,739.63	47.61	Type 3	13.189	13.189	1,480.86	14.300	14.300	1,605.60	3,086.46	772.49	2,313.97	11.065	11.065	1,242.38	3,556.35	Concrete	-	-	112.28	112
2 + 22.30	14.90	1.88	1.88	-2.328	-0.928	-3.078	4.958	Sheet Pile	-	14.90	363.56	6.32	Type 3	13.464	13.327	198.57	14.300	14.300	213.07	411.64	102.51	309.13	10.818	10.942	163.04	472.17	Concrete	-	-	14.90	15
2 + 45.25	22.95	0.29	-0.01	-2.339	-0.939	-3.089	3.079	Sheet Pile	-	22.95	559.98	9.73	Type 3	13.464	13.464	309.00	14.300	14.300	328.19	637.19	157.90	479.29	10.818	10.818	248.27	727.56	Concrete	-	-	22.95	23
2 + 95.32	50.07	0.77	0.75	-2.364	-0.964	-3.114	3.864	Sheet Pile	-	50.07	1,221.71	21.23	Type 3	6.233	9.849	493.14	17.597	15.949	798.57	1,291.71	344.48	947.23	9.262	10.040	502.70	1,449.93	Concrete	-	-	50.07	50
2 + 145.01	49.69	0.76	0.71	-2.389	-0.989	-3.139	3.849	Sheet Pile	-	49.69	1,212.44	21.07	Type 3	7.012	6.623	329.10	23.315	20.456	1,016.46	1,345.56	341.87	1,003.69	9.754	9.508	472.45	1,476.14	Concrete	-	-	49.69	50
2 + 195.01	50.00	0.60	0.42	-2.414	-1.014	-3.164	3.584	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	8.470	7.741	387.05	20.464	21.890	1,094.50	1,481.55	344.00	1,137.55	12.035	10.895	544.75	1,682.30	Concrete	-	-	50.00	50
2 + 245.01	50.00	0.84	0.82	-2.439	-1.039	-3.189	4.009	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	6.701	7.586	379.30	26.450	23.457	1,172.85	1,552.15	344.00	1,208.15	7.974	10.005	500.25	1,708.40	Concrete	-	-	50.00	50
2 + 295.02	50.01	0.82	0.82	-2.464	-1.064	-3.214	4.034	Sheet Pile	-	50.01	1,220.24	21.20	Type 3	6.216	6.459	323.01	26.753	26.602	1,330.37	1,653.38	344.07	1,309.31	8.501	8.238	411.98	1,721.29	Concrete	-	-	50.01	50
2 + 345.04	50.02	0.88	0.85	-2.489	-1.089	-3.239	4.089	Sheet Pile	-	50.02	1,220.49	21.21	Type 3	6.356	6.286	314.43	27.520	27.137	1,357.39	1,671.82	344.14	1,327.68	7.930	8.216	410.96	1,738.64	Concrete	-	-	50.02	50
2 + 395.03	49.99	0.97	0.97	-2.514	-1.114	-3.264	4.234	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	6.444	6.400	319.94	29.147	28.334	1,416.42	1,736.36	343.93	1,392.43	6.597	7.264	363.13	1,755.56	Concrete	-	-	49.99	50
2 + 444.60	49.57	1.24	1.23	-2.539	-1.139	-3.289	4.519	Sheet Pile	-	49.57	1,209.51	21.02	Type 3	5.561	6.003	297.57	33.947	31.547	1,563.78	1,861.35	341.04	1,520.31	3.846	5.222	258.85	1,779.16	Concrete	-	-	49.57	50
2 + 494.65	50.05	1.36	0.79	-2.564	-1.164	-3.314	4.104	Sheet Pile	-	50.05	1,221.22	21.22	Type 3	9.908	7.735	387.14	29.788	31.868	1,594.99	1,982.13	344.34	1,637.79	5.543	4.695	234.98	1,872.77	Concrete	-	-	50.05	50
2 + 544.59	49.94	-0.08	-0.27	-2.589	-1.189	-3.339	3.069	Sheet Pile	-	49.94	1,218.54	21.17	Type 3	7.337	8.623	430.63	15.103	22.446	1,120.95	1,551.58	343.59	1,207.99	21.395	13.469	672.64	1,880.63	Concrete	-	-	49.94	50
2 + 594.59	50.00	1.17	1.16	-2.614	-1.214	-3.364	4.524	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	5.894	6.616	330.80	34.964	25.034	1,251.70	1,582.50	344.00	1,238.50	4.165	12.780	639.00	1,877.50	Concrete	-	-	50.00	50
2 + 639.81	45.22	1.25	1.16	-2.637	-1.237	-3.387	4.547	Sheet Pile	-	45.22	1,103.37	19.17	Type 3	0.000	0.000	0.00	34.964	34.964	1,581.07	1,581.07	311.11	1,269.96	5.165	4.665	210.95	1,480.91	Concrete	-	-	45.22	45
2 + 644.40	4.59	1.15	1.12	-2.639	-1.239	-3.389	4.509	Sheet Pile	-	4.59	112.00	1.95	Type 3	8.367	8.367	38.40	33.408	34.186	156.91	195.31	31.58	163.73	3.515	4.340	19.92	183.65	Concrete	-	-	4.59	5
2 + 694.39	49.99	0.25	0.20	-2.664	-1.264	-3.414	3.614	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	13.787	11.077	553.74	19.627	26.518	1,325.63	1,879.37	343.93	1,535.44	13.270	8.393	419.57	1,955.01	Concrete	-	-	49.99	50
2 + 744.39	50.00	1.35	1.35	-2.689	-1.289	-3.439	4.789	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	6.644	10.216	510.80	37.973	28.800	1,440.00	1,950.80	344.00	1,606.80	1.862	7.566	378.30	1,985.10	Concrete	-	-	50.00	50
2 + 794.38	49.99	0.84	0.79	-2.714	-1.314	-3.464	4.254	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	7.411	7.028	351.33	29.478	33.726	1,685.96	2,037.29	343.93	1,693.36	9.177	5.520	275.94	1,969.30	Concrete	-	-	49.99	50
2 + 844.39	50.01	0.73	0.73	-2.739	-1.339	-3.489	4.219	Sheet Pile	-	50.01	1,220.24	21.20	Type 3	7.336	7.374	368.77	28.848	29.163	1,458.44	1,827.21	344.07	1,483.14	10.188	9.683	484.25	1,967.39	Concrete	-	-	50.01	50
2 + 894.38	49.99	0.35	0.34	-2.764	-1.364	-3.514	3.854	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	8.048	7.692	384.52	23.386	26.117	1,305.59	1,690.11	343.93	1,346.18	15.711	12.950	647.37	1,993.55	Concrete	-	-	49.99	50
2 + 944.39	50.01	0.85	0.76	-2.789	-1.389	-3.539	4.299	Sheet Pile	-	50.01	1,220.24	21.20	Type 3	7.494	7.771	388.63	30.151	26.769	1,338.72	1,727.35	344.07	1,383.28	9.451	12.581	629.18	2,012.46	Concrete	-	-	50.01	50
2 + 994.38	49.99	0.75	0.69	-2.814	-1.414	-3.564	4.254	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	7.708	7.601	379.97	29.469	29.810	1,490.20	1,870.17	343.93	1,526.24	10.361	9.906	495.20	2,021.44	Concrete	-	-	49.99	50
3 + 44.37	49.99	0.83	0.71	-2.839	-1.439	-3.589	4.299	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	8.063	7.886	394.22	30.253	29.861	1,492.75	1,886.97	343.93	1,543.04	9.717	10.039	501.85	2,044.89	Concrete	-	-	49.99	50
3 + 94.37	50.00	0.45	0.43	-2.864	-1.464	-3.614	4.044	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	8.958	8.511	425.55	26.559	28.406	1,420.30	1,845.85	344.00	1,501.85	13.085	11.401	570.05	2,071.90	Concrete	-	-	50.00	50
3 + 144.37	50.00	1.07	0.37	-2.889	-1.489	-3.639	4.009	Sheet Pile	-	50.00	1,220.00	21.20	Type 3	18.552	13.755	687.75	20.611	23.585	1,179.25	1,867.00	344.00	1,523.00	10.706	11.896	594.80	2,117.80	Concrete	-	-	50.00	50
3 + 194.36	49.99	1.45	1.45	-2.914	-1.514	-3.664	5.114	Sheet Pile	-	49.99	1,219.76	21.20	Type 3	6.413	12.483	624.03	42.846	31.729	1,586.13	2,210.16	343.93	1,866.23	0.793	5.750	287.44	2,153.67	Concrete	-	-	49.99	50
3 + 233.55	39.19	-0.46	-0.46	-2.934	-1.534	-3.684	3.224	Sheet Pile	-	39.19	956.24	16.62	Type 3	6.413	6.413	251.33	16.765	29.805	1,168.06	1,419.39	269.63	1,149.76	0.793	0.793	31.08	1,180.84	Concrete	-	-	39.19	39
3 + 245.59	12.04	-0.58	-0.58	-2.940	-1.540	-3.690	3.110	Sheet Pile	-	12.04	293.78	5.10	Type 3	6.413	6.413	77.21	16.172	16.468	198.27	275.48	82.84	192.64	0.793	0.793	9.55	202.19	Concrete	-	-	12.04	12
	1,900.40															17,259.02			43,292.04	60,551.06	13,074.75	47,476.31									
PACKAGE D	**3,003.46**								**1,103.06**	**1,900.40**	**46,369.76**	**805.77**				**20,983.02**			**60,459.27**	**81,442.29**	**20,146.29**	**61,296.00**				**82,184.94**		**808.62**	**22,641**	**2,194.84**	**2,195**
3 + 361.09	115.50	0.00	-	-3.228	-1.828	-3.778	-	-	-	-	-	-	Type 3	0.000	0.000	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 + 535.05	173.96	0.00	0.00	-3.315	-1.915	-3.865	3.865	Sheet Pile	-	173.96	4,244.62	73.76	Type 3	0.000	0.000	0.00	20.098	20.098	3,496.25	3,496.25	1,196.84	2,299.41		0.000	0.00	2,299.41	Concrete	-	-	173.96	174
PACKAGE E	**289.46**								**0.00**	**173.96**	**4,244.62**	**73.76**				**0.00**			**3,496.25**	**3,496.25**	**1,196.84**	**2,299.41**				**2,299.41**		**0.00**	**0**	**173.96**	**174**
TOTAL	**3,535.05**								**1,345.19**	**2,074.36**	**50,614.38**	**879.53**				**22,695.77**			**65,737.19**	**88,432.96**	**22,854.02**	**65,578.94**				**87,461.98**		**1,050.75**	**29,422**	**2,368.80**	**2,369**
										3,419.55																				32,841.55

Adjusted Volume for Earth Work coefficient = 1%

PACKAGE C	**242**								**242**	**0**	**0**	**0**				**1,730**			**1,800**	**3,530**	**1,511**	**1,984**				**3,098**		**242**	**6,781**	**0**	**0**
PACKAGE D	**3,003**								**1,103**	**1,900**	**46,370**	**806**				**21,193**			**61,064**	**82,257**	**20,146**	**61,296**				**83,007**		**809**	**22,641**	**2,195**	**2,195**
PACKAGE E	**289**								**0**	**174**	**4,245**	**74**				**0**			**3,532**	**3,532**	**1,197**	**2,299**				**3,323**		**0**	**0**	**174**	**174**
TOTAL	**3,535**								**1,345**	**2,074**	**50,614**	**880**				**22,923**			**66,396**	**89,319**	**22,854**	**65,579**				**88,338**		**1,051**	**29,422**	**2,369**	**2,369**

CHAPTER 6
EXISTING COMBINED SEWER IMPROVEMENT (PACKAGE D)

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Table D.1.1 Work Quantities Of Existing Combined Sewer Improvement

Existing Combined Sewer Improvement				D1000	D1000	D1000	2xD800	D1500	2.0x2.0	2.5x2.0	2.5x2.0	2.5x2.0	D1500	2.0X2.0	2.0X2.0	D1000	D1500	D1500	D1800	D2000	2.0X2.0	D1800	2.0X2.0	D1500	D2000	2.5X2.0	2.5X2.0	2.5X2.0	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		21	22	23	24	Total
Earth Works:																													
	Excavation (m^3)																												
		< 4 m		3,119.62	1,065.41	904.38					1,165.72		3,026.86			985.63	2,088.81												12,356.43
		4m < D < 6 m					393.35	6,079.26	7,985.01	9,192.64		7,958.72		13,001.84	10,533.34			1,651.09	6,546.09		11,003.45		4,304.28		*11,278.07*	*13,655.87*	*11,943.14*	*10,242.17*	125,768.32
		6 m <																		5,919.07		336.96		*174.82*	*293.67*				6,724.52
		Connection pipes		582.67			339.57		1,334.12				1,507.71			1,354.55									772.80				5,891.42
	Sand Backfill (m^3)			1,196.01	289.15	255.68	218.50	1,543.15	2,203.25	2,107.54	246.05	1,750.77	1,464.83	3,216.24	2,587.60	734.18	606.61	439.66	1,916.03	224.40	2,725.05	9.79	1,076.48		*3,702.04*	*3,409.38*	*2,990.70*	*2,302.12*	37,215.21
	Sandy Soil Backfill (m^3)			1,845.37	612.72	508.73	392.89	3,833.12	6,046.64	6,083.26	762.78	5,312.88	2,369.47	8,300.22	6,797.23	1,186.67	1,193.75	1,193.75	3,827.36	5,076.22	7,017.59	302.47	2,712.75		*7,252.78*	*8,558.07*	*7,429.40*	*6,806.05*	95,422.17
Pipe Installation:																													
	Concrete Class E (m3)																			1,190.91		44.83		*19.17*	*67.47*				1,322.37
	Concrete Class F (m3)																								*1,011.32*				1,011.32
	Reinforced Bar (kg)																			14,082.05		665.68		*391.58*	*797.84*				15,937.14
		Length (m/m)																											
		Unit Weight (kg/m)																											
	Main Sewer Length (m)																												
	ϕ800						26.00																						26.00
	ϕ1000			535.70	151.55	134.00										181.70													1,002.95
	ϕ1500							484.35					344.75				204.10	138.00							*8.00*				1,179.20
	ϕ1800																		489.90			13.60							503.50
	ϕ2000																			287.70					*726.50*				1,014.20
	Box 2000x2000								430.50					744.50	561.00						630.80		264.90						2,631.70
	Box 2500x2000									398.70	69.90	374.10														*728.50*	*658.10*	*469.10*	2,698.40
	Connection pipes Length (m)																												
	ϕ400						20.60									36.50													57.10
	ϕ600			2.00			8.00		132.00							59.00									*155.50*				356.50
	ϕ800			72.30			16.00		34.00				4.00			52.00									*6.00*				184.30
	ϕ1000			13.60			27.40		30.00				138.00			56.40									*2.00*				267.40
	ϕ1200			2.00									38.00			13.80													53.80
	ϕ1500																								*4.00*				4.00
Excavated Area (m^2)				1,261.99	308.56	264.10	240.70	1,326.39	2,048.42	1,890.26	296.02	1,688.82	1,355.55	2,802.60	2,167.00	825.73	544.25	385.32	1,514.53	1,166.88	2,378.88	56.16	971.80		*2,951.96*	*3,185.70*	*2,873.66*	*2,139.62*	34,644.90
	On T.H.Dao Street						89.60				38.00	56.70										56.16						*92.00*	332.46
	On Other Streets			1,261.99	308.56	264.10	151.10	1,326.39	2,048.42	1,890.26	258.02	1,632.12	1,355.55	2,802.60	2,167.00	825.73	544.25	385.32	1,514.53	1,166.88	2,378.88	0.00	971.80		*1,421.48*	*3,185.70*	*2,873.66*	*2,047.62*	32,781.96
	On 3/2 Street																								1,530.48				1,530.48
Road Works																													
	On T.H.Dao & 3/2 Street			Excavated Area =			1,862.94	m^2																					
		Wearing Course (t)		0.05		204.92																							
		Tack Coat (litter)		0.50		931.47																							
		Binder Course (t)		0.09		368.86																							
		Prime Coat (litter)		1.50		2,794.41																							
		Base Course (m^3)		0.29		540.25																							
		Sub Base Course (m^3)		0.20		372.59																							
	On Other Streets			Excavated Area =			32,781.96	m^2																					
		Wearing Course (t)		0.05		3,606.02																							
		Tack Coat (litter)		0.50		16,390.98																							
		Binder Course (t)		0.07		5,048.42																							
		Prime Coat (litter)		1.50		49,172.94																							
		Base Course (m^3)		0.26		8,523.31																							
		Sub Base Course (m^3)		0.15		4,917.29																							
	Total			Excavated Area =			34,644.90	m^2																					
		Wearing Course (t)				3,810.94																							
		Tack Coat (litter)				17,322.45																							
		Binder Course (t)				5,417.28																							
		Prime Coat (litter)				51,967.35																							
		Base Course (m^3)				9,063.56																							
		Sub Base Course (m^3)				5,289.88																							

Table D.1.2.1(1) Installation Work For Main Sewers - Line 1 (M1 _ M18)

Bill of Quantity

Area : ECSI Pipe Diameter : 1000

Sewer Line Name : LINE 1(1) Foundation Type : S360 OK ! S360

Manhole No. : M1 M18

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	pipes	m	L_2		h	L_3		W_2	
M1	4.49	1.73	2.76	0.29		3.05																						
M2	4.35	1.70	2.65	0.29	1.90	2.94	3.00	34.00	2.40	31.60	193.80	0.00	193.80	34.57	64.60	34.24	60.29	99.27	193.80	7	3.60	31.60	-	2.5	34.00	85.00	0.00	TIMBER
M2	4.35	1.70	2.65	0.29		2.94																						
M3	4.26	1.67	2.59	0.29	1.90	2.88	2.91	34.00	1.20	32.80	187.99	0.00	187.99	35.88	64.60	34.24	62.59	91.16	187.99	8	0.80	32.80	-	2.5	34.00	85.00	0.00	TIMBER
M3	4.26	1.67	2.59	0.29		2.88																						
M4	4.21	1.64	2.57	0.29	1.90	2.86	2.87	33.00	1.20	31.80	179.95	0.00	179.95	34.79	62.70	33.23	60.67	86.05	179.95	7	3.80	31.80	-	2.5	33.00	82.50	0.00	TIMBER
M4	4.21	1.64	2.57	0.29		2.86																						
M5	4.17	1.61	2.56	0.29	1.90	2.85	2.86	32.80	1.35	31.45	178.24	0.00	178.24	34.41	62.32	33.03	60.00	85.21	178.24	7	3.45	31.45	-	2.5	32.80	82.00	0.00	TIMBER
M5	4.17	1.61	2.56	0.29		2.85																						
M6	4.14	1.58	2.56	0.29	1.90	2.85	2.85	32.00	1.35	30.65	173.28	0.00	173.28	33.53	60.80	32.22	58.48	82.58	173.28	7	2.65	30.65	-	2.5	32.00	80.00	0.00	TIMBER
M6	4.14	1.58	2.56	0.29		2.85																						
M7	4.11	1.55	2.56	0.29	1.90	2.85	2.85	33.00	1.20	31.80	178.70	0.00	178.70	34.79	62.70	33.23	60.67	84.80	178.70	7	3.80	31.80	-	2.5	33.00	82.50	0.00	TIMBER
M7	4.11	1.55	2.56	0.29		2.85																						
M8	4.10	1.52	2.58	0.29	1.90	2.87	2.86	31.00	1.20	29.80	168.46	0.00	168.46	32.60	58.90	31.22	56.86	80.38	168.46	7	1.80	29.80	-	2.5	31.00	77.50	0.00	TIMBER
M8	4.10	1.52	2.58	0.29		2.87																						
M9	4.09	1.49	2.60	0.29	1.90	2.89	2.88	29.00	1.20	27.80	158.69	0.00	158.69	30.41	55.10	29.20	53.05	76.44	158.69	6	3.80	27.80	-	2.5	29.00	72.50	0.00	TIMBER
M9	4.09	1.49	2.60	0.29		2.89																						
M10	4.07	1.46	2.61	0.29	1.90	2.90	2.90	29.00	1.20	27.80	159.79	0.00	159.79	30.41	55.10	29.20	53.05	77.54	159.79	6	3.80	27.80	-	2.5	29.00	72.50	0.00	TIMBER
M10	4.07	1.46	2.61	0.29		2.90																						
M11	4.05	1.43	2.62	0.29	1.90	2.91	2.91	28.00	1.20	26.80	154.82	0.00	154.82	29.32	53.20	28.20	51.13	75.49	154.82	6	2.80	26.80	-	2.5	28.00	70.00	0.00	TIMBER
M11	4.05	1.43	2.62	0.29		2.91																						
M12	4.03	1.40	2.63	0.29	1.90	2.92	2.92	25.30	1.80	23.50	140.37	0.00	140.37	25.71	48.07	25.48	44.84	70.05	140.37	5	3.50	23.50	-	2.5	25.30	63.25	0.00	TIMBER
M12	4.03	1.40	2.63	0.29		2.92																						
M13	3.99	1.36	2.63	0.29	1.90	2.92	2.92	37.40	1.80	35.60	207.50	0.00	207.50	38.95	71.06	37.66	67.92	101.92	207.50	8	3.60	35.60	-	2.5	37.40	93.50	0.00	TIMBER
M13	3.99	1.36	2.63	0.29		2.92																						
M14	3.97	1.32	2.65	0.29	1.90	2.94	2.93	35.00	1.20	33.80	194.85	0.00	194.85	36.98	66.50	35.25	64.49	95.12	194.85	8	1.80	33.80	-	2.5	35.00	87.50	0.00	TIMBER
M14	3.97	1.32	2.65	0.29		2.94																						
M15	3.98	1.28	2.70	0.29	1.90	2.99	2.97	39.40	1.35	38.05	222.34	0.00	222.34	41.63	74.86	39.68	72.60	110.06	222.34	9	2.05	38.05	-	2.5	39.40	98.50	0.00	TIMBER
M15	3.98	1.28	2.70	0.29		2.99																						
M16	3.99	1.25	2.74	0.29	1.90	3.03	3.01	31.60	1.50	30.10	180.73	0.00	180.73	32.93	60.04	31.82	57.43	91.48	180.73	7	2.10	30.10	-	2.5	31.60	79.00	0.00	TIMBER
M16	3.99	1.25	2.74	0.29		3.03																						
M17	4.00	1.21	2.79	0.29	1.90	3.08	3.06	37.20	1.50	35.70	216.29	0.00	216.29	39.06	70.68	37.46	68.11	110.72	216.29	8	3.70	35.70	-	2.5	37.20	93.00	0.00	TIMBER
M17	4.00	1.21	2.79	0.29		3.08																						
M18	4.00	1.17	2.83	0.29	1.90	3.12	3.10	38.00	1.35	36.65	223.82	0.00	223.82	40.10	72.20	38.27	69.92	115.63	223.82	9	0.65	36.65	-	2.5	38.00	95.00	0.00	TIMBER
								559.70	24.00	535.70	3,119.62	0.00	3,119.62	586.07	1,063.43	563.62	1,022.10	1,533.90	3,119.62	122	47.70	535.70			559.70	1,399.25	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.1 (2) Installation Work For Main Sewers - Line 1 (M18 _ M10 - LHP)

Bill of Quantity

Area : ECSI Pipe Diameter : 1000

Sewer Line Name : LINE 1(2) Foundation Type : S360 OK ! S360

Manhole No. : M18 M10-LHP

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Backfill	Black Sand / Sandy Soil Backfill		Type / Length (m)	Concrete 4.00		Type	Height (m)	Length (m)	Area (m^2)		
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M18	4.00	1.17	2.83	0.29		3.12														pipes	m							
M19	3.99	1.14	2.85	0.29	1.90	3.14	3.13	25.00	1.20	23.80	148.68	0.00	148.68	26.04	47.50	25.18	45.41	78.10	148.68	5	3.80	23.80	-	2.5	25.00	62.50	0.00	TIMBER
M19	3.99	1.14	2.85	0.29		3.14																						
M20	4.05	1.11	2.94	0.29	1.90	3.23	3.19	27.70	1.20	26.50	167.89	0.00	167.89	28.99	52.63	27.89	50.56	89.44	167.89	6	2.50	26.50	-	2.5	27.70	69.25	0.00	TIMBER
M20	4.05	1.11	2.94	0.29		3.23																						
M21	4.15	1.08	3.07	0.29	1.90	3.36	3.30	30.70	1.20	29.50	192.49	0.00	192.49	32.27	58.33	30.91	56.29	105.29	192.49	7	1.50	29.50	-	2.5	30.70	76.75	0.00	TIMBER
M21	4.15	1.08	3.07	0.29		3.36																						
M22	4.40	1.05	3.35	0.29	1.90	3.64	3.50	27.90	1.35	26.55	185.54	0.00	185.54	29.05	53.01	28.10	50.65	106.79	185.54	6	2.55	26.55	-	2.5	27.90	69.75	0.00	TIMBER
M22	4.40	1.05	3.35	0.29		3.64																						
M23	4.63	1.02	3.61	0.29	1.90	3.90	3.77	33.60	2.00	31.60	240.68	0.00	240.68	34.57	63.84	33.84	60.29	146.55	240.68	7	3.60	31.60	-	2.5	33.60	84.00	0.00	TIMBER
M23	4.63	1.02	3.61	0.29		3.90																						
M24	4.63	1.01	3.62	0.29	1.90	3.91	3.91	11.50	2.40	9.10	85.44	0.00	85.44	9.96	21.85	11.58	17.36	56.50	85.44	2	1.10	9.10	-	2.5	11.50	28.75	0.00	TIMBER
M24	4.63	1.01	3.62	0.29		3.91																						
M10-LHP	4.63	1.00	3.63	0.29	1.90	3.92	3.92	6.00	1.50	4.50	44.69	0.00	44.69	4.92	11.40	6.04	8.59	30.06	44.69	1	0.50	4.50	-	2.5	6.00	15.00	0.00	TIMBER
								162.40	10.85	151.55	1,065.41	0.00	1,065.41	165.80	308.56	163.54	289.15	612.72	1,065.41	34	15.55	151.55			162.40	406.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.2 (1) Installation Work For Main Sewers - Line 2 (M1 _ M4)

Bill of Quantity

Area : ECSI Pipe Diameter : 1000
Sewer Line Name : LINE 2(1) Foundation Type : S360 OK ! S360
Manhole No. : M1 M4

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand	Black Sand		Type	Concrete		Type	Height (m)	Length (m)	Area (m^2)		
						Downstream					<= 6 m	=> 6 m				0.53	Sand Backfill	Sandy Soil Backfill		Length (m)	4.00							
		IL_1	ID_1			H_2														N								
		IL_2	ID_2	H_1	W_1	H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8			L_2		h	L_3		W_2	
M1	1.80	-1.30	3.10	0.29		3.39														pipes	m							
M2	1.70	-1.36	3.06	0.29	1.90	3.35	3.37	41.00	1.20	39.80	262.53	0.00	262.53	43.54	77.90	41.29	75.94	145.30	262.53	9	3.80	39.80	-	2.5	41.00	102.50	0.00	TIMBER
M2	1.70	-1.36	3.06	0.29		3.35																						
M3	1.69	-1.44	3.13	0.29	1.90	3.42	3.39	55.00	1.80	53.20	354.26	0.00	354.26	58.20	104.50	55.39	101.51	197.37	354.26	13	1.20	53.20	-	2.5	55.00	137.50	0.00	TIMBER
M3	1.69	-1.44	3.13	0.29		3.42																						
M4	1.82	-1.51	3.33	0.29	1.90	3.62	3.52	43.00	2.00	41.00	287.59	0.00	287.59	44.85	81.70	43.30	78.23	166.06	287.59	10	1.00	41.00	-	2.5	43.00	107.50	0.00	TIMBER
								139.00	5.00	134.00	904.38	0.00	904.38	146.59	264.10	139.97	255.68	508.73	904.38	32	6.00	134.00			139.00	347.50	0.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.2 (2) Installation Work For Main Sewers - Line 2 (M4 _ M5)

Bill of Quantity

Area : ECSI Pipe Diameter : 800 2xD800
Sewer Line Name : LINE 2(2) Foundation Type : S360 OK ! S360
Manhole No. : M4 M5

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		Type	Height (m)	Length (m)	Area (m^2)		
						Downstream					<= 6 m	=> 6 m				0.53				Length (m)	4.00							
		IL_1 IL_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M4	1.82	-2.24	4.06	0.28		4.34														pipes	m							
M5	1.90	-2.26	4.16	0.28	3.20	4.44	4.39	28.00	2.00	26.00	393.35	0.00	393.35	18.82	89.60	47.49	94.33	251.53	393.35	6	2.00	26.00	FSP-2	8.6	52.00	447.20	14.00	TYPE1
								28.00	2.00	26.00	393.35	0.00	393.35	18.82	89.60	47.49	94.33	251.53	393.35	6	2.00	26.00			52.00	447.20	14.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.2 (3) Installation Work For Main Sewers - Line 2 (M5 _ OUTLET)

Bill of Quantity

Area : ECSI Pipe Diameter : 1500
Sewer Line Name : LINE 2(3) Foundation Type : S360 OK ! S360
Manhole No. : M5 OUTLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		Type	Height (m)	Length (m)	Area (m^2)		
						Downstream					<= 6 m	=> 6 m				0.53				Length (m)	3.00							
		IL_1	ID_1			H_2																						
		IL_2	ID_2	H_1	W_1	H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M5	1.90	-2.26	4.16	0.32		4.48														pipes	m							
M6	1.91	-2.27	4.18	0.32	2.60	4.50	4.49	20.10	2.00	18.10	234.65	0.00	234.65	43.04	52.26	27.70	57.67	149.28	234.65	6	0.10	18.10	FSP-2	8.6	36.20	311.32	9.85	TYPE1
M6	1.91	-2.27	4.18	0.32		4.50																						
M7	1.91	-2.28	4.19	0.32	2.60	4.51	4.51	21.40	2.00	19.40	250.94	0.00	250.94	46.13	55.64	29.49	61.81	159.64	250.94	6	1.40	19.40	FSP-2	8.6	38.80	333.68	10.49	TYPE1
M7	1.91	-2.28	4.19	0.32		4.51																						
M8	1.89	-2.30	4.19	0.32	2.60	4.51	4.51	32.40	2.00	30.40	379.93	0.00	379.93	72.29	84.24	44.65	96.86	238.42	379.93	10	0.40	30.40	FSP-2	8.6	60.80	522.88	15.88	TYPE1
M8	1.89	-2.30	4.19	0.32		4.51																						
M9	1.87	-2.32	4.19	0.32	2.60	4.51	4.51	28.50	2.00	26.50	334.20	0.00	334.20	63.02	74.10	39.27	84.43	210.50	334.20	8	2.50	26.50	FSP-2	8.6	53.00	455.80	13.97	TYPE1
M9	1.87	-2.32	4.19	0.32		4.51																						
M10	1.88	-2.34	4.22	0.32	2.60	4.54	4.53	37.00	2.00	35.00	435.79	0.00	435.79	83.23	96.20	50.99	111.51	273.29	435.79	11	2.00	35.00	FSP-2	8.6	70.00	602.00	18.13	TYPE1
M10	1.88	-2.34	4.22	0.32		4.54																						
M11	1.87	-2.35	4.22	0.32	2.60	4.54	4.54	15.70	2.00	13.70	185.33	0.00	185.33	32.58	40.82	21.63	43.65	120.05	185.33	4	1.70	13.70	FSP-2	8.6	27.40	235.64	7.69	TYPE1
M11	1.87	-2.35	4.22	0.32		4.54																						
M12	1.85	-2.37	4.22	0.32	2.60	4.54	4.54	30.00	2.00	28.00	354.12	0.00	354.12	66.58	78.00	41.34	89.21	223.57	354.12	9	1.00	28.00	FSP-2	8.6	56.00	481.60	14.70	TYPE1
M12	1.85	-2.37	4.22	0.32		4.54																						
M13	1.80	-2.40	4.20	0.32	2.60	4.52	4.53	47.20	1.60	45.60	555.93	0.00	555.93	108.44	122.72	65.04	145.28	345.61	555.93	15	0.60	45.60	FSP-2	8.6	91.20	784.32	23.13	TYPE1
M13	1.80	-2.40	4.20	0.32		4.52																						
M14	1.80	-2.42	4.22	0.32	2.60	4.54	4.53	31.00	1.60	29.40	365.12	0.00	365.12	69.91	80.60	42.72	93.67	228.73	365.12	9	2.40	29.40	FSP-2	8.6	58.80	505.68	15.19	TYPE1
M14	1.80	-2.42	4.22	0.32		4.54																						
M15	1.83	-2.43	4.26	0.32	2.60	4.58	4.56	30.00	1.60	28.40	355.68	0.00	355.68	67.54	78.00	41.34	90.48	223.86	355.68	9	1.40	28.40	FSP-2	8.6	56.80	488.48	14.70	TYPE1
M15	1.83	-2.43	4.26	0.32		4.58																						
M16	1.78	-2.46	4.24	0.32	2.60	4.56	4.57	52.40	1.20	51.20	622.62	0.00	622.62	121.75	136.24	72.21	163.13	387.28	622.62	17	0.20	51.20	FSP-2	8.6	102.40	880.64	25.68	TYPE1
M16	1.78	-2.46	4.24	0.32		4.56																						
M17	1.78	-2.49	4.27	0.32	2.60	4.59	4.58	38.60	1.60	37.00	459.65	0.00	459.65	87.99	100.36	53.19	117.88	288.58	459.65	12	1.00	37.00	FSP-2	8.6	74.00	636.40	18.91	TYPE1
M17	1.78	-2.49	4.27	0.32		4.59																						
M18	1.83	-2.52	4.35	0.32	2.60	4.67	4.63	49.00	1.60	47.40	589.87	0.00	589.87	112.72	127.40	67.52	151.01	371.34	589.87	15	2.40	47.40	FSP-2	8.6	94.80	815.28	24.01	TYPE1
M18	1.83	-2.52	4.35	0.32		4.67																						
M19	1.91	-2.53	4.44	0.32	2.60	4.76	4.72	29.50	1.60	27.90	362.03	0.00	362.03	66.35	76.70	40.65	88.89	232.49	362.03	9	0.90	27.90	FSP-2	8.6	55.80	479.88	14.46	TYPE1
M19	1.91	-2.53	4.44	0.32		4.76																						
OUTLET	2.00	-2.56	4.56	0.32	2.60	4.88	4.82	47.35	1.00	46.35	593.40	0.00	593.40	110.22	123.11	65.25	147.67	380.48	593.40	15	1.35	46.35	FSP-2	8.6	92.70	797.22	23.20	TYPE1
								510.15	25.80	484.35	6,079.26	0.00	6,079.26	1,151.79	1,326.39	702.99	1,543.15	3,833.12	6,079.26	155	19.35	484.35			968.70	8,330.82	249.97	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.3 (1) Installation Work For Main Sewers - Line 3 (M1 _ M12)

Bill of Quantity

Area : ECSI Dimension : BOX-2 2.00*2.00
Sewer Line Name : LINE 3(1) Foundation Type : S360 OK ! S360
Manhole No. : M1 M12

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 1.20		Pipe Bedding Length (m)	Sheeting (piles) Type	Height (m)	Length (m)	Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M1	4.34	-0.28	4.62	0.40		5.02														pipes	m						
M2	4.34	-0.30	4.64	0.40	4.00	5.04	5.03	22.00	2.00	20.00	442.64	0.00	442.64	115.20	88.00	46.64	108.80	287.20	442.64	16	0.80	20.00	FSP-2	10.1	40.00	404.00	14.30	TYPE2
M2	4.34	-0.30	4.64	0.40		5.04																					
M3	4.17	-0.34	4.51	0.40	3.60	4.91	4.98	51.70	2.00	49.70	926.88	0.00	926.88	286.27	186.12	98.64	214.71	613.53	926.88	41	0.50	49.70	FSP-2	8.6	99.40	854.84	25.95	TYPE1
M3	4.17	-0.34	4.51	0.40		4.91																					
M4	4.20	-0.37	4.57	0.40	3.60	4.97	4.94	41.00	2.00	39.00	729.15	0.00	729.15	224.64	147.60	78.23	168.48	482.44	729.15	32	0.60	39.00	FSP-2	8.6	78.00	670.80	20.58	TYPE1
M4	4.20	-0.37	4.57	0.40		4.97																					
M5	4.11	-0.39	4.50	0.40	3.60	4.90	4.94	18.20	2.00	16.20	323.67	0.00	323.67	93.31	65.52	34.73	69.99	218.95	323.67	13	0.60	16.20	FSP-2	8.6	32.40	278.64	9.14	TYPE1
M5	4.11	-0.39	4.50	0.40		4.90																					
M6	3.89	-0.42	4.31	0.40	3.60	4.71	4.81	44.80	2.00	42.80	775.76	0.00	775.76	246.53	161.28	85.48	184.89	505.39	775.76	35	0.80	42.80	FSP-2	8.6	85.60	736.16	22.49	TYPE1
M6	3.89	-0.42	4.31	0.40		4.71																					
M7	3.87	-0.46	4.33	0.40	3.60	4.73	4.72	49.60	2.00	47.60	842.81	0.00	842.81	274.18	178.56	94.64	205.63	542.54	842.81	39	0.80	47.60	FSP-2	8.6	95.20	818.72	24.90	TYPE1
M7	3.87	-0.46	4.33	0.40		4.73																					
M8	3.88	-0.50	4.38	0.40	3.60	4.78	4.76	49.20	2.00	47.20	843.10	0.00	843.10	271.87	177.12	93.87	203.91	545.32	843.10	39	0.40	47.20	FSP-2	8.6	94.40	811.84	24.70	TYPE1
M8	3.88	-0.50	4.38	0.40		4.78																					
M9	3.90	-0.54	4.44	0.40	3.60	4.84	4.81	50.60	2.00	48.60	876.19	0.00	876.19	279.94	182.16	96.54	209.95	569.70	876.19	40	0.60	48.60	FSP-2	8.6	97.20	835.92	25.40	TYPE1
M9	3.90	-0.54	4.44	0.40		4.84																					
M10	3.93	-0.58	4.51	0.40	3.60	4.91	4.88	50.40	2.00	48.40	885.43	0.00	885.43	278.78	181.44	96.16	209.09	580.18	885.43	40	0.40	48.40	FSP-2	8.6	96.80	832.48	25.30	TYPE1
M10	3.93	-0.58	4.51	0.40		4.91																					
M11	3.96	-0.63	4.59	0.40	3.60	4.99	4.95	55.00	2.00	53.00	980.10	0.00	980.10	305.28	198.00	104.94	228.96	646.20	980.10	44	0.20	53.00	FSP-2	8.6	106.00	911.60	27.61	TYPE1
M11	3.96	-0.63	4.59	0.40		4.99																					
M12	3.95	-0.64	4.59	0.40	3.60	4.99	4.99	20.00	2.00	18.00	359.28	0.00	359.28	103.68	72.00	38.16	77.76	243.36	359.28	15	0.00	18.00	FSP-2	8.6	36.00	309.60	10.04	TYPE1
								452.50	22.00	430.50	7,985.01	0.00	7,985.01	2,479.68	1,637.80	868.03	1,882.17	5,234.81	7,985.01	354	5.70	430.50			861.00	7,464.60	230.41	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.3 (2) Installation Work For Main Sewers - Line 3 (M12 _ M27)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00

Sewer Line Name : LINE 3(2) Foundation Type : S360 OK ! S360

Manhole No. : M12 M27

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 1.20 m	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M12	3.95	-0.64	4.59	0.45		5.04														pipes	m							
M13	3.93	-0.68	4.61	0.45	4.60	5.06	5.05	26.90	2.00	24.90	624.89	0.00	624.89	186.75	123.74	65.58	145.42	413.89	624.89	20	0.90	24.90	FSP-2	10.1	49.80	502.98	17.75	TYPE2
M13	3.93	-0.68	4.61	0.45		5.06																						
M14	3.86	-0.74	4.60	0.45	4.60	5.05	5.06	35.60	2.00	33.60	828.63	0.00	828.63	252.00	163.76	86.79	196.22	545.62	828.63	28	0.00	33.60	FSP-2	10.1	67.20	678.72	23.50	TYPE2
M14	3.86	-0.74	4.60	0.45		5.05																						
M15	3.82	-0.80	4.62	0.45	4.60	5.07	5.06	41.20	2.00	39.20	958.98	0.00	958.98	294.00	189.52	100.45	228.93	629.60	958.98	32	0.80	39.20	FSP-2	10.1	78.40	791.84	27.19	TYPE2
M15	3.82	-0.80	4.62	0.45		5.07																						
M16	3.79	-0.83	4.62	0.45	4.60	5.07	5.07	22.50	2.00	20.50	524.75	0.00	524.75	153.75	103.50	54.86	119.72	350.18	524.75	17	0.10	20.50	FSP-2	10.1	41.00	414.10	14.85	TYPE2
M16	3.79	-0.83	4.62	0.45		5.07																						
M17	3.76	-0.87	4.63	0.45	4.60	5.08	5.08	25.70	2.00	23.70	600.56	0.00	600.56	177.75	118.22	62.66	138.41	399.49	600.56	19	0.90	23.70	FSP-2	10.1	47.40	478.74	16.96	TYPE2
M17	3.76	-0.87	4.63	0.45		5.08																						
M18	3.72	-0.92	4.64	0.45	4.60	5.09	5.09	32.40	2.00	30.40	758.62	0.00	758.62	228.00	149.04	78.99	177.54	502.09	758.62	25	0.40	30.40	FSP-2	10.1	60.80	614.08	21.38	TYPE2
M18	3.72	-0.92	4.64	0.45		5.09																						
M19	3.67	-0.94	4.61	0.45	4.60	5.06	5.08	12.60	2.00	10.60	294.44	0.00	294.44	79.50	57.96	30.72	61.90	201.82	294.44	8	1.00	10.60	FSP-2	10.1	21.20	214.12	8.32	TYPE2
M19	3.67	-0.94	4.61	0.45		5.06																						
M20	3.59	-0.98	4.57	0.45	4.60	5.02	5.04	27.40	2.00	25.40	635.25	0.00	635.25	190.50	126.04	66.80	148.34	420.11	635.25	21	0.20	25.40	FSP-2	10.1	50.80	513.08	18.08	TYPE2
M20	3.59	-0.98	4.57	0.45		5.02																						
M21	3.45	-1.03	4.48	0.45	4.20	4.93	4.98	32.40	2.00	30.40	677.68	0.00	677.68	228.00	136.08	72.12	142.27	463.29	677.68	25	0.40	30.40	FSP-2	8.6	60.80	522.88	16.72	TYPE1
M21	3.45	-1.03	4.48	0.45		4.93																						
M22	3.33	-1.06	4.39	0.45	4.20	4.84	4.89	21.80	2.00	19.80	447.73	0.00	447.73	148.50	91.56	48.53	92.66	306.54	447.73	16	0.60	19.80	FSP-2	8.6	39.60	340.56	11.25	TYPE1
M22	3.33	-1.06	4.39	0.45		4.84																						
M23	3.16	-1.11	4.27	0.45	4.20	4.72	4.78	30.00	2.00	28.00	602.28	0.00	602.28	210.00	126.00	66.78	131.04	404.46	602.28	23	0.40	28.00	FSP-2	8.6	56.00	481.60	15.48	TYPE1
M23	3.16	-1.11	4.27	0.45		4.72																						
M24	3.03	-1.14	4.17	0.45	4.20	4.62	4.67	23.40	2.00	21.40	458.97	0.00	458.97	160.50	98.28	52.09	100.15	306.73	458.97	17	1.00	21.40	FSP-2	8.6	42.80	368.08	12.07	TYPE1
M24	3.03	-1.14	4.17	0.45		4.62																						
M25	2.89	-1.18	4.07	0.45	4.20	4.52	4.57	27.70	2.00	25.70	531.68	0.00	531.68	192.75	116.34	61.66	120.28	349.74	531.68	21	0.50	25.70	FSP-2	8.6	51.40	442.04	14.29	TYPE1
M25	2.89	-1.18	4.07	0.45		4.52																						
M26	2.53	-1.25	3.78	0.45	4.20	4.23	4.38	45.30	2.00	43.30	833.34	0.00	833.34	324.75	190.26	100.84	202.64	529.86	833.34	36	0.10	43.30	FSP-2	8.6	86.60	744.76	23.37	TYPE1
M26	2.53	-1.25	3.78	0.45		4.23																						
M27	2.32	-1.29	3.61	0.45	4.20	4.06	4.15	23.80	2.00	21.80	414.84	0.00	414.84	163.50	99.96	52.98	102.02	259.84	414.84	18	0.20	21.80	FSP-2	8.6	43.60	374.96	12.28	TYPE1
								428.70	30.00	398.70	9,192.64	0.00	9,192.64	2,990.25	1,890.26	1,001.84	2,107.54	6,083.26	9,192.64	326	7.50	398.70			797.40	7,482.54	253.51	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.3 (3) Installation Work For Main Sewers - Line 3 (M27 _ M31)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00
Sewer Line Name : LINE 3(3) Foundation Type : S360 OK ! S360
Manhole No. : M27 M31

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m)	Pipe Number Concrete 1.20 N	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M27	2.32	-1.29	3.61	0.45		4.06														pipes	m							
M28	2.08	-1.33	3.41	0.45	3.80	3.86	3.96	27.00	2.00	25.00	406.30	0.00	406.30	187.50	102.60	54.38	88.00	263.92	406.30	20	1.00	25.00	-	2.5	27.00	67.50	0.00	TIMBER
M28	2.08	-1.33	3.41	0.45		3.86																						
M29	2.22	-1.37	3.59	0.45	3.80	4.04	3.95	30.00	2.00	28.00	450.30	0.00	450.30	210.00	114.00	60.42	98.56	291.32	450.30	23	0.40	28.00	-	2.5	30.00	75.00	0.00	TIMBER
M29	2.22	-1.37	3.59	0.45		4.04																						
M30	1.99	-1.39	3.38	0.45	3.80	3.83	3.94	10.90	2.00	8.90	163.20	0.00	163.20	66.75	41.42	21.95	31.33	109.92	163.20	7	0.50	8.90	-	2.5	10.90	27.25	0.00	TIMBER
M30	1.99	-1.39	3.38	0.45		3.83																						
M31	2.00	-1.40	3.40	0.45	3.80	3.85	3.84	10.00	2.00	8.00	145.92	0.00	145.92	60.00	38.00	20.14	28.16	97.62	145.92	6	0.80	8.00	-	2.5	10.00	25.00	0.00	TIMBER
								77.90	8.00	69.90	1,165.72	0.00	1,165.72	524.25	296.02	156.89	246.05	762.78	1,165.72	56	2.70	69.90			77.90	194.75	0.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.3 (4) Installation Work For Main Sewers - Line 3 (M31 _ OUTLET)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00
Sewer Line Name : LINE 3(4)* Foundation Type : S360 OK ! S360
Manhole No. : M31 OUTLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) 6 W_1	Excavation Depth (m) Upstream Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 1.20	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M31	2.00	-1.77	3.77	0.45		4.22														pipes	m							
M32	1.99	-1.79	3.78	0.45	4.20	4.23	4.23	13.50	2.00	11.50	239.85	0.00	239.85	86.25	56.70	30.05	53.82	155.98	239.85	9	0.70	11.50	FSP-2	8.6	23.00	197.80	6.97	TYPE1
M32	1.99	-1.79	3.78	0.45		4.23																						
M33	2.12	-1.84	3.96	0.45	4.20	4.41	4.32	33.50	2.00	31.50	607.83	0.00	607.83	236.25	140.70	74.57	147.42	385.84	607.83	26	0.30	31.50	FSP-2	8.6	63.00	541.80	17.29	TYPE1
M33	2.12	-1.84	3.96	0.45		4.41																						
M34	2.22	-1.90	4.12	0.45	4.20	4.57	4.49	38.00	2.00	36.00	716.61	0.00	716.61	270.00	159.60	84.59	168.48	463.54	716.61	30	0.00	36.00	FSP-2	8.6	72.00	619.20	19.61	TYPE1
M34	2.22	-1.90	4.12	0.45		4.57																						
M35	2.26	-1.93	4.19	0.45	4.20	4.64	4.61	19.80	2.00	17.80	383.37	0.00	383.37	133.50	83.16	44.07	83.30	256.00	383.37	14	1.00	17.80	FSP-2	8.6	35.60	306.16	10.22	TYPE1
M35	2.26	-1.93	4.19	0.45		4.64																						
M36	2.27	-1.97	4.24	0.45	4.20	4.69	4.67	29.30	2.00	27.30	574.70	0.00	574.70	204.75	123.06	65.22	127.76	381.72	574.70	22	0.90	27.30	FSP-2	8.6	54.60	469.56	15.12	TYPE1
M36	2.27	-1.97	4.24	0.45		4.69																						
M37	2.26	-2.00	4.26	0.45	4.20	4.71	4.70	17.00	2.00	15.00	335.58	0.00	335.58	112.50	71.40	37.84	70.20	227.54	335.58	12	0.60	15.00	FSP-2	8.6	30.00	258.00	8.77	TYPE1
M37	2.26	-2.00	4.26	0.45		4.71																						
M38	2.27	-2.02	4.29	0.45	4.20	4.74	4.73	16.50	2.00	14.50	327.79	0.00	327.79	108.75	69.30	36.73	67.86	223.20	327.79	12	0.10	14.50	FSP-2	8.6	29.00	249.40	8.51	TYPE1
M38	2.27	-2.02	4.29	0.45		4.74																						
M39	2.32	-2.07	4.39	0.45	4.20	4.84	4.79	33.50	2.00	31.50	673.96	0.00	673.96	236.25	140.70	74.57	147.42	451.97	673.96	26	0.30	31.50	FSP-2	8.6	63.00	541.80	17.29	TYPE1
M39	2.32	-2.07	4.39	0.45		4.84																						
M40	2.25	-2.14	4.39	0.45	4.20	4.84	4.84	43.30	2.00	41.30	880.21	0.00	880.21	309.75	181.86	96.39	193.28	590.54	880.21	34	0.50	41.30	FSP-2	8.6	82.60	710.36	22.34	TYPE1
M40	2.25	-2.14	4.39	0.45		4.84																						
M41	2.16	-2.19	4.35	0.45	4.20	4.80	4.82	34.90	2.00	32.90	706.52	0.00	706.52	246.75	146.58	77.69	153.97	474.86	706.52	27	0.50	32.90	FSP-2	8.6	65.80	565.88	18.01	TYPE1
M41	2.16	-2.19	4.35	0.45		4.80																						
M42	2.10	-2.23	4.33	0.45	4.20	4.78	4.79	25.30	2.00	23.30	508.99	0.00	508.99	174.75	106.26	56.32	109.04	343.63	508.99	19	0.50	23.30	FSP-2	8.6	46.60	400.76	13.05	TYPE1
M42	2.10	-2.23	4.33	0.45		4.78																						
M43	2.10	-2.26	4.36	0.45	4.20	4.81	4.80	24.40	2.00	22.40	491.91	0.00	491.91	168.00	102.48	54.31	104.83	332.77	491.91	18	0.80	22.40	FSP-2	8.6	44.80	385.28	12.59	TYPE1
M43	2.10	-2.26	4.36	0.45		4.81																						
M44	2.14	-2.31	4.45	0.45	4.20	4.90	4.86	27.20	2.00	25.20	555.21	0.00	555.21	189.00	114.24	60.55	117.94	376.72	555.21	21	0.00	25.20	FSP-2	8.6	50.40	433.44	14.04	TYPE1
M44	2.14	-2.31	4.45	0.45		4.90																						
OUTLET	2.20	-2.37	4.57	0.45	4.20	5.02	4.96	45.90	2.00	43.90	956.19	0.00	956.19	329.25	192.78	102.17	205.45	648.57	956.19	36	0.70	43.90	FSP-2	8.6	87.80	755.08	23.68	TYPE1
								402.10	28.00	374.10	7,958.72	0.00	7,958.72	2,805.75	1,688.82	895.07	1,750.77	5,312.88	7,958.72	306	6.90	374.10			748.20	6,434.52	207.48	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.4 (1) Installation Work For Main Sewers - Line 4 (M1 _ M10)

Area : ECSI Pipe Diameter : 1500
Sewer Line Name : LINE 4(1) Foundation Type : S360 OK ! S360
Manhole No. : M1 M10

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand	Black Sand		Type	Concrete		Type	Height (m)	Length (m)	Area (m^2)		
						Downstream					<= 6 m	=> 6 m				0.53	Sand Backfill	Sandy Soil Backfill		Length (m)	3.00							
		IL_1	ID_1			H_2																						
		IL_2	ID_2	H_1	W_1	H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M1	3.66	0.81	2.85	0.32		3.17														pipes	m							
M2	3.63	0.79	2.84	0.32	2.50	3.16	3.17	28.00	1.75	26.25	221.90	0.00	221.90	62.42	70.00	37.10	78.02	106.78	221.90	8	2.25	26.25	-	2.5	28.00	70.00	0.00	TIMBER
M2	3.63	0.79	2.84	0.32		3.16																						
M3	3.49	0.76	2.73	0.32	2.50	3.05	3.11	44.00	1.60	42.40	342.10	0.00	342.10	100.83	110.00	58.30	126.01	157.79	342.10	14	0.40	42.40	-	2.5	44.00	110.00	0.00	TIMBER
M3	3.49	0.76	2.73	0.32		3.05																						
M4	3.48	0.72	2.76	0.32	2.50	3.08	3.07	45.00	1.20	43.80	345.38	0.00	345.38	104.16	112.50	59.63	130.17	155.59	345.38	14	1.80	43.80	-	2.5	45.00	112.50	0.00	TIMBER
M4	3.48	0.72	2.76	0.32		3.08																						
M5	3.45	0.69	2.76	0.32	2.50	3.08	3.08	40.00	1.60	38.40	308.00	0.00	308.00	91.32	100.00	53.00	114.12	140.88	308.00	12	2.40	38.40	-	2.5	40.00	100.00	0.00	TIMBER
M5	3.45	0.69	2.76	0.32		3.08																						
M6	3.48	0.65	2.83	0.32	2.50	3.15	3.12	49.30	1.75	47.55	384.54	0.00	384.54	113.07	123.25	65.32	141.32	177.90	384.54	15	2.55	47.55	-	2.5	49.30	123.25	0.00	TIMBER
M6	3.48	0.65	2.83	0.32		3.15																						
M7	3.65	0.62	3.03	0.32	2.50	3.35	3.25	40.00	1.35	38.65	325.00	0.00	325.00	91.91	100.00	53.00	114.87	157.13	325.00	12	2.65	38.65	-	2.5	40.00	100.00	0.00	TIMBER
M7	3.65	0.62	3.03	0.32		3.35																						
M8	3.90	0.59	3.31	0.32	2.50	3.63	3.49	40.00	1.20	38.80	349.00	0.00	349.00	92.27	100.00	53.00	115.31	180.69	349.00	12	2.80	38.80	-	2.5	40.00	100.00	0.00	TIMBER
M8	3.90	0.59	3.31	0.32		3.63																						
M9	4.36	0.55	3.81	0.32	2.50	4.13	3.88	43.00	2.10	40.90	417.10	0.00	417.10	97.26	107.50	56.98	121.56	238.57	417.10	13	1.90	40.90	-	2.5	43.00	107.50	0.00	TIMBER
M9	4.36	0.55	3.81	0.32		4.13																						
M10	4.63	0.53	4.10	0.32	2.60	4.42	4.28	30.00	2.00	28.00	333.84	0.00	333.84	66.58	78.00	41.34	89.21	203.29	333.84	9	1.00	28.00	FSP-2	8.6	56.00	481.60	14.70	TYPE1
								359.30	14.55	344.75	3,026.86	0.00	3,026.86	819.82	901.25	477.66	1,030.59	1,518.61	3,026.86	109	17.75	344.75			385.30	1,304.85	14.70	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.4 (2) Installation Work For Main Sewers - Line 4 (M10 _ M27)

Bill of Quantity

Area : ECSI Dimension : BOX-2 2.00*2.00

Sewer Line Name : LINE 4(2) Foundation Type : S360 OK ! S360

Manhole No. : M10 M27

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 1.20	Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M10	4.63	0.53	4.10	0.40		4.50														pipes	m							
M11	4.65	0.52	4.13	0.40	3.60	4.53	4.52	22.00	2.00	20.00	357.99	0.00	357.99	115.20	79.20	41.98	86.40	229.61	357.99	16	0.80	20.00	FSP-2	8.6	40.00	344.00	11.04	TYPE1
M11	4.65	0.52	4.13	0.40		4.53																						
M12	4.67	0.50	4.17	0.40	3.60	4.57	4.55	28.00	2.00	26.00	458.64	0.00	458.64	149.76	100.80	53.42	112.32	292.90	458.64	21	0.80	26.00	FSP-2	8.6	52.00	447.20	14.06	TYPE1
M12	4.67	0.50	4.17	0.40		4.57																						
M13	4.68	0.49	4.19	0.40	3.60	4.59	4.58	18.00	2.00	16.00	296.79	0.00	296.79	92.16	64.80	34.34	69.12	193.33	296.79	13	0.40	16.00	FSP-2	8.6	32.00	275.20	9.04	TYPE1
M13	4.68	0.49	4.19	0.40		4.59																						
M14	4.70	0.45	4.25	0.40	3.60	4.65	4.62	57.00	2.00	55.00	948.03	0.00	948.03	316.80	205.20	108.76	237.60	601.67	948.03	45	1.00	55.00	FSP-2	8.6	110.00	946.00	28.61	TYPE1
M14	4.70	0.45	4.25	0.40		4.65																						
M15	4.74	0.42	4.32	0.40	3.60	4.72	4.69	57.00	2.00	55.00	962.39	0.00	962.39	316.80	205.20	108.76	237.60	616.03	962.39	45	1.00	55.00	FSP-2	8.6	110.00	946.00	28.61	TYPE1
M15	4.74	0.42	4.32	0.40		4.72																						
M16	4.98	0.39	4.59	0.40	3.60	4.99	4.86	56.00	2.00	54.00	979.78	0.00	979.78	311.04	201.60	106.85	233.28	639.65	979.78	45	0.00	54.00	FSP-2	8.6	108.00	928.80	28.11	TYPE1
M16	4.98	0.39	4.59	0.40		4.99																						
M17	4.84	0.35	4.49	0.40	3.60	4.89	4.94	55.00	2.00	53.00	978.12	0.00	978.12	305.28	198.00	104.94	228.96	644.22	978.12	44	0.20	53.00	FSP-2	8.6	106.00	911.60	27.61	TYPE1
M17	4.84	0.35	4.49	0.40		4.89																						
M18	4.78	0.33	4.45	0.40	3.60	4.85	4.87	43.00	2.00	41.00	753.88	0.00	753.88	236.16	154.80	82.04	177.12	494.72	753.88	34	0.20	41.00	FSP-2	8.6	82.00	705.20	21.59	TYPE1
M18	4.78	0.33	4.45	0.40		4.85																						
M19	4.67	0.30	4.37	0.40	3.60	4.77	4.81	42.10	2.00	40.10	729.01	0.00	729.01	230.98	151.56	80.33	173.23	475.45	729.01	33	0.50	40.10	FSP-2	8.6	80.20	689.72	21.13	TYPE1
M19	4.67	0.30	4.37	0.40		4.77																						
M20	4.61	0.27	4.34	0.40	3.60	4.74	4.76	50.00	2.00	48.00	856.80	0.00	856.80	276.48	180.00	95.40	207.36	554.04	856.80	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M20	4.61	0.27	4.34	0.40		4.74																						
M21	4.53	0.24	4.29	0.40	3.60	4.69	4.72	50.00	2.00	48.00	849.60	0.00	849.60	276.48	180.00	95.40	207.36	546.84	849.60	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M21	4.53	0.24	4.29	0.40		4.69																						
M22	4.16	0.21	3.95	0.40	3.60	4.35	4.52	50.00	2.00	48.00	813.60	0.00	813.60	276.48	180.00	95.40	207.36	510.84	813.60	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M22	4.16	0.21	3.95	0.40		4.35																						
M23	4.14	0.18	3.96	0.40	3.60	4.36	4.36	50.00	2.00	48.00	784.80	0.00	784.80	276.48	180.00	95.40	207.36	482.04	784.80	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M23	4.14	0.18	3.96	0.40		4.36																						
M24	4.14	0.15	3.99	0.40	3.60	4.39	4.38	55.10	2.00	53.10	868.82	0.00	868.82	305.86	198.36	105.13	229.39	534.30	868.82	44	0.30	53.10	FSP-2	8.6	106.20	913.32	27.66	TYPE1
M24	4.14	0.15	3.99	0.40		4.39																						
M25	4.46	0.12	4.34	0.40	3.60	4.74	4.57	44.90	2.00	42.90	738.70	0.00	738.70	247.10	161.64	85.67	185.33	467.70	738.70	35	0.90	42.90	FSP-2	8.6	85.80	737.88	22.54	TYPE1
M25	4.46	0.12	4.34	0.40		4.74																						
M26	4.10	0.07	4.03	0.40	3.60	4.43	4.59	53.00	2.00	51.00	875.78	0.00	875.78	293.76	190.80	101.12	220.32	554.34	875.78	42	0.60	51.00	FSP-2	8.6	102.00	877.20	26.61	TYPE1
M26	4.10	0.07	4.03	0.40		4.43																						
M27	3.97	0.02	3.95	0.40	3.60	4.35	4.39	47.40	2.00	45.40	749.11	0.00	749.11	261.50	170.64	90.44	196.13	462.54	749.11	37	1.00	45.40	FSP-2	8.6	90.80	780.88	23.79	TYPE1
								778.50	34.00	744.50	13,001.84	0.00	13,001.84	4,288.32	2,802.60	1,485.38	3,216.24	8,300.22	13,001.84	614	7.70	744.50			1,489.00	12,805.40	390.81	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.4 (3) Installation Work For Main Sewers - Line 4 (M27 _ M12 - TBT)

Bill of Quantity

Area : ECSI Dimension : BOX-2 2.00*2.00

Sewer Line Name : LINE 4(3) Foundation Type : S360 OK ! S360

Manhole No. : M27 M12-TBT

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) / 1.20		Pipe Bedding Length (m)	Sheeting (piles) Type	Height (m)	Length (m)	Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M27	3.97	0.02	3.95	0.40		4.35														pipes	m							
M28	4.01	-0.04	4.05	0.40	3.60	4.45	4.40	60.60	2.00	58.60	959.91	0.00	959.91	337.54	218.16	115.62	253.15	591.14	959.91	48	1.00	58.60	FSP-2	8.6	117.20	1,007.92	30.42	TYPE1
M28	4.01	-0.04	4.05	0.40		4.45																					
M29	4.25	-0.09	4.34	0.40	3.60	4.74	4.60	52.90	2.00	50.90	876.03	0.00	876.03	293.18	190.44	100.93	219.89	555.21	876.03	42	0.50	50.90	FSP-2	8.6	101.80	875.48	26.56	TYPE1
M29	4.25	-0.09	4.34	0.40		4.74																					
M30	3.85	-1.43	5.28	0.40	4.00	5.68	5.21	50.00	2.00	48.00	1,042.00	0.00	1,042.00	276.48	200.00	106.00	261.12	674.88	1,042.00	40	0.00	48.00	FSP-2	10.1	96.00	969.60	32.50	TYPE2
M30	3.85	-1.43	5.28	0.40		5.68																					
M31	3.68	-1.93	5.61	0.40	4.00	6.01	5.85	50.00	2.00	48.00	1,170.00	0.00	1,170.00	276.48	200.00	106.00	261.12	802.88	1,170.00	40	0.00	48.00	FSP-2	10.1	96.00	969.60	32.50	TYPE2
M31	3.68	-1.93	5.61	0.40		6.01																					
M32	3.70	-0.25	3.95	0.40	4.00	4.35	5.18	52.50	2.00	50.50	1,087.80	0.00	1,087.80	290.88	210.00	111.30	274.72	701.78	1,087.80	42	0.10	50.50	FSP-2	10.1	101.00	1,020.10	34.13	TYPE2
M32	3.70	-0.25	3.95	0.40		4.35																					
M33	3.77	-0.27	4.04	0.40	3.60	4.44	4.40	22.40	2.00	20.40	354.82	0.00	354.82	117.50	80.64	42.74	88.13	223.95	354.82	17	0.00	20.40	FSP-2	8.6	40.80	350.88	11.24	TYPE1
M33	3.77	-0.27	4.04	0.40		4.44																					
M34	3.86	-0.33	4.19	0.40	3.60	4.59	4.52	50.00	2.00	48.00	813.60	0.00	813.60	276.48	180.00	95.40	207.36	510.84	813.60	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M34	3.86	-0.33	4.19	0.40		4.59																					
M35	3.87	-0.39	4.26	0.40	3.60	4.66	4.63	50.00	2.00	48.00	833.40	0.00	833.40	276.48	180.00	95.40	207.36	530.64	833.40	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M35	3.87	-0.39	4.26	0.40		4.66																					
M36	3.87	-0.45	4.32	0.40	3.60	4.72	4.69	50.00	2.00	48.00	844.20	0.00	844.20	276.48	180.00	95.40	207.36	541.44	844.20	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M36	3.87	-0.45	4.32	0.40		4.72																					
M37	3.88	-0.51	4.39	0.40	3.60	4.79	4.76	50.00	2.00	48.00	856.80	0.00	856.80	276.48	180.00	95.40	207.36	554.04	856.80	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M37	3.88	-0.51	4.39	0.40		4.79																					
M38	3.90	-0.57	4.47	0.40	3.60	4.87	4.83	50.00	2.00	48.00	869.40	0.00	869.40	276.48	180.00	95.40	207.36	566.64	869.40	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M38	3.90	-0.57	4.47	0.40		4.87																					
M12-TBT	3.94	-0.62	4.56	0.40	3.60	4.96	4.92	46.60	2.00	44.60	825.38	0.00	825.38	256.90	167.76	88.91	192.67	543.80	825.38	37	0.20	44.60	FSP-2	8.6	89.20	767.12	23.39	TYPE1
								585.00	24.00	561.00	10,533.34	0.00	10,533.34	3,231.36	2,167.00	1,148.51	2,587.60	6,797.23	10,533.34	466	1.80	561.00			1,122.00	10,088.70	316.24	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (1) Installation Work For Main Sewers - Line 5 (M1 _ M7)

Bill of Quantity

Area : ECSI Pipe Diameter : 1000
Sewer Line Name : LINE 5(1) Foundation Type : S360 OK ! S360
Manhole No. : M1 M7

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 4.00 m	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M1	4.34	2.00	2.34	0.29		2.63														pipes								
M2	4.24	1.96	2.28	0.29	1.90	2.57	2.60	33.80	2.00	31.80	166.98	0.00	166.98	34.79	64.22	34.04	60.67	72.27	166.98	7	3.80	31.80	-	2.5	33.80	84.50	0.00	TIMBER
M2	4.24	1.96	2.28	0.29		2.57																						
M3	4.25	1.92	2.33	0.29	1.90	2.62	2.60	33.10	2.00	31.10	163.52	0.00	163.52	34.02	62.89	33.33	59.34	70.85	163.52	7	3.10	31.10	-	2.5	33.10	82.75	0.00	TIMBER
M3	4.25	1.92	2.33	0.29		2.62																						
M4	4.24	1.89	2.35	0.29	1.90	2.64	2.63	26.50	2.00	24.50	132.43	0.00	132.43	26.80	50.35	26.69	46.75	58.99	132.43	6	0.50	24.50	-	2.5	26.50	66.25	0.00	TIMBER
M4	4.24	1.89	2.35	0.29		2.64																						
M5	4.19	1.85	2.34	0.29	1.90	2.63	2.64	30.20	2.00	28.20	151.49	0.00	151.49	30.85	57.38	30.41	53.81	67.27	151.49	7	0.20	28.20	-	2.5	30.20	75.50	0.00	TIMBER
M5	4.19	1.85	2.34	0.29		2.63																						
M6	4.27	1.81	2.46	0.29	1.90	2.75	2.69	30.10	2.00	28.10	153.85	0.00	153.85	30.74	57.19	30.31	53.62	69.92	153.85	7	0.10	28.10	-	2.5	30.10	75.25	0.00	TIMBER
M6	4.27	1.81	2.46	0.29		2.75																						
M7	4.45	1.77	2.68	0.29	1.90	2.97	2.86	40.00	2.00	38.00	217.36	0.00	217.36	41.57	76.00	40.28	72.51	104.57	217.36	9	2.00	38.00	-	2.5	40.00	100.00	0.00	TIMBER
								193.70	12.00	181.70	985.63	0.00	985.63	198.77	368.03	195.06	346.70	443.87	985.63	43	9.70	181.70			193.70	484.25	0.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (2) Installation Work For Main Sewers - Line 5 (M7 _ M14)

Bill of Quantity

Area : ECSI Pipe Diameter : 1500

Sewer Line Name : LINE 5(2) Foundation Type : S360 OK ! S360

Manhole No. : M7 M14

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type / Length (m) N	Pipe Number Concrete 3.00 m	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M7	4.45	1.27	3.18	0.32		3.50														pipes	m							
M8	4.49	1.23	3.26	0.32	2.50	3.58	3.54	26.90	2.00	24.90	238.07	0.00	238.07	59.21	67.25	35.64	74.01	128.42	238.07	8	0.90	24.90	-	2.5	26.90	67.25	0.00	TIMBER
M8	4.49	1.23	3.26	0.32		3.58																						
M9	4.55	1.21	3.34	0.32	2.50	3.66	3.62	24.60	2.00	22.60	222.63	0.00	222.63	53.74	61.50	32.60	67.17	122.87	222.63	7	1.60	22.60	-	2.5	24.60	61.50	0.00	TIMBER
M9	4.55	1.21	3.34	0.32		3.66																						
M10	4.62	1.17	3.45	0.32	2.50	3.77	3.72	29.30	2.00	27.30	272.49	0.00	272.49	64.92	73.25	38.82	81.14	152.53	272.49	9	0.30	27.30	-	2.5	29.30	73.25	0.00	TIMBER
M10	4.62	1.17	3.45	0.32		3.77																						
M11	4.73	1.14	3.59	0.32	2.50	3.91	3.84	28.80	1.60	27.20	276.48	0.00	276.48	64.68	72.00	38.16	80.84	157.48	276.48	9	0.20	27.20	-	2.5	28.80	72.00	0.00	TIMBER
M11	4.73	1.14	3.59	0.32		3.91																						
M12	4.82	1.08	3.74	0.32	2.50	4.06	3.99	41.70	1.80	39.90	415.96	0.00	415.96	94.88	104.25	55.25	118.59	242.12	415.96	13	0.90	39.90	-	2.5	41.70	104.25	0.00	TIMBER
M12	4.82	1.08	3.74	0.32		4.06																						
M13	4.67	1.05	3.62	0.32	2.50	3.94	4.00	33.30	2.20	31.10	333.00	0.00	333.00	73.96	83.25	44.12	92.43	196.45	333.00	10	1.10	31.10	-	2.5	33.30	83.25	0.00	TIMBER
M13	4.67	1.05	3.62	0.32		3.94																						
M14	4.72	1.01	3.71	0.32	2.50	4.03	3.99	33.10	2.00	31.10	330.18	0.00	330.18	73.96	82.75	43.86	92.43	193.89	330.18	10	1.10	31.10	-	2.5	33.10	82.75	0.00	TIMBER
								217.70	13.60	204.10	2,088.81	0.00	2,088.81	485.35	544.25	288.45	606.61	1,193.75	2,088.81	66	6.10	204.10			217.70	544.25	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (3) Installation Work For Main Sewers - Line 5 (M14 _ M19)

Bill of Quantity

Area : ECSI Pipe Diameter : 1500
Sewer Line Name : LINE 5(3) Foundation Type : S360 OK ! S360
Manhole No. : M14 M19

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) / 3.00		Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M14	4.72	1.01	3.71	0.32		4.03														pipes	m							
M15	4.80	0.97	3.83	0.32	2.60	4.15	4.09	29.40	2.00	27.40	312.64	0.00	312.64	65.16	76.44	40.51	87.29	184.84	312.64	9	0.40	27.40	FSP-2	8.6	54.80	471.28	14.41	TYPE1
M15	4.80	0.97	3.83	0.32		4.15																						
M16	4.85	0.93	3.92	0.32	2.60	4.24	4.20	30.60	2.00	28.60	334.16	0.00	334.16	68.01	79.56	42.17	91.12	200.87	334.16	9	1.60	28.60	FSP-2	8.6	57.20	491.92	14.99	TYPE1
M16	4.85	0.93	3.92	0.32		4.24																						
M17	4.90	0.90	4.00	0.32	2.60	4.32	4.28	28.30	2.00	26.30	314.93	0.00	314.93	62.54	73.58	39.00	83.79	192.14	314.93	8	2.30	26.30	FSP-2	8.6	52.60	452.36	13.87	TYPE1
M17	4.90	0.90	4.00	0.32		4.32																						
M18	4.97	0.86	4.11	0.32	2.60	4.43	4.38	29.10	2.00	27.10	331.40	0.00	331.40	64.44	75.66	40.10	86.34	204.96	331.40	9	0.10	27.10	FSP-2	8.6	54.20	466.12	14.26	TYPE1
M18	4.97	0.86	4.11	0.32		4.43																						
M19	5.01	0.83	4.18	0.32	2.60	4.50	4.47	30.80	2.20	28.60	357.96	0.00	357.96	68.01	80.08	42.44	91.12	224.40	357.96	9	1.60	28.60	FSP-2	8.6	57.20	491.92	15.09	TYPE1
								148.20	10.20	138.00	1,651.09	0.00	1,651.09	328.16	385.32	204.22	439.66	1,007.21	1,651.09	44	6.00	138.00			276.00	2,373.60	72.62	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (4) Installation Work For Main Sewers - Line 5 (M19 _ M32)

Bill of Quantity

Area : ECSI Pipe Diameter : 1800
Sewer Line Name : LINE 5(4) Foundation Type : S360 OK ! S360
Manhole No. : M19 M32

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 3.00 m	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M19	5.01	0.53	4.48	0.35		4.83														pipes								
M20	5.02	0.51	4.51	0.35	2.95	4.86	4.85	21.00	2.40	18.60	300.46	0.00	300.46	64.43	61.95	32.83	72.75	194.88	300.46	6	0.60	18.60	FSP-2	8.6	37.20	319.92	10.37	TYPE1
M20	5.02	0.51	4.51	0.35		4.86																						
M21	4.86	0.47	4.39	0.35	2.95	4.74	4.80	40.00	1.80	38.20	566.40	0.00	566.40	132.32	118.00	62.54	149.41	354.45	566.40	12	2.20	38.20	FSP-2	8.6	76.40	657.04	19.76	TYPE1
M21	4.86	0.47	4.39	0.35		4.74																						
M22	4.65	0.43	4.22	0.35	2.95	4.57	4.66	39.50	1.35	38.15	543.01	0.00	543.01	132.15	116.53	61.76	149.21	332.04	543.01	12	2.15	38.15	FSP-2	8.6	76.30	656.18	19.51	TYPE1
M22	4.65	0.43	4.22	0.35		4.57																						
M23	4.35	0.37	3.98	0.35	2.95	4.33	4.45	55.00	1.35	53.65	722.02	0.00	722.02	185.84	162.25	85.99	209.83	426.20	722.02	17	2.65	53.65	FSP-2	8.6	107.30	922.78	27.17	TYPE1
M23	4.35	0.37	3.98	0.35		4.33																						
M24	4.28	0.32	3.96	0.35	2.95	4.31	4.32	54.70	1.60	53.10	697.10	0.00	697.10	183.94	161.37	85.52	207.67	403.91	697.10	17	2.10	53.10	FSP-2	8.6	106.20	913.32	27.02	TYPE1
M24	4.28	0.32	3.96	0.35		4.31																						
M25	4.26	0.30	3.96	0.35	2.95	4.31	4.31	12.70	2.50	10.20	161.48	0.00	161.48	35.33	37.47	19.86	39.90	101.72	161.48	3	1.20	10.20	FSP-2	8.6	20.40	175.44	6.27	TYPE1
M25	4.26	0.30	3.96	0.35		4.31																						
M26	4.05	0.26	3.79	0.35	2.95	4.14	4.23	43.00	2.10	40.90	536.58	0.00	536.58	141.68	126.85	67.23	159.96	309.39	536.58	13	1.90	40.90	FSP-2	8.6	81.80	703.48	21.24	TYPE1
M26	4.05	0.26	3.79	0.35		4.14																						
M27	3.98	0.22	3.76	0.35	2.95	4.11	4.13	43.00	1.20	41.80	523.90	0.00	523.90	144.80	126.85	67.23	163.48	293.19	523.90	13	2.80	41.80	FSP-2	8.6	83.60	718.96	21.24	TYPE1
M27	3.98	0.22	3.76	0.35		4.11																						
M28	3.88	0.17	3.71	0.35	2.95	4.06	4.09	43.30	1.80	41.50	522.44	0.00	522.44	143.76	127.74	67.70	162.30	292.44	522.44	13	2.50	41.50	FSP-2	8.6	83.00	713.80	21.39	TYPE1
M28	3.88	0.17	3.71	0.35		4.06																						
M29	3.78	0.13	3.65	0.35	2.95	4.00	4.03	50.00	1.80	48.20	594.43	0.00	594.43	166.96	147.50	78.18	188.52	327.74	594.43	16	0.20	48.20	FSP-2	8.6	96.40	829.04	24.70	TYPE1
M29	3.78	0.13	3.65	0.35		4.00																						
M30	3.83	0.08	3.75	0.35	2.95	4.10	4.05	42.70	1.60	41.10	510.16	0.00	510.16	142.37	125.97	66.76	160.74	282.66	510.16	13	2.10	41.10	FSP-2	8.6	82.20	706.92	21.09	TYPE1
M30	3.83	0.08	3.75	0.35		4.10																						
M31	3.86	0.07	3.79	0.35	2.95	4.14	4.12	11.10	2.00	9.10	134.91	0.00	134.91	31.52	32.75	17.35	35.59	81.97	134.91	3	0.10	9.10	FSP-2	8.6	18.20	156.52	5.48	TYPE1
M31	3.86	0.07	3.79	0.35		4.14																						
M32	4.18	0.01	4.17	0.35	2.95	4.52	4.33	57.40	2.00	55.40	733.20	0.00	733.20	191.91	169.33	89.74	216.67	426.79	733.20	18	1.40	55.40	FSP-2	8.6	110.80	952.88	28.36	TYPE1
								513.40	23.50	489.90	6,546.09	0.00	6,546.09	1,697.01	1,514.53	802.70	1,916.03	3,827.36	6,546.09	156	21.90	489.90			979.80	8,426.28	253.62	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (5) Installation Work For Main Sewers - Line 5 (M32 _ M38)

Bill of Quantity

Area : ECSI Pipe Diameter : 2000
Sewer Line Name : LINE 5(5) Foundation Type : C360 OK ! C360
Manhole No. : M32 M38

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete 3.00		Type	Height (m)	Length (m)	Area (m^2)		
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N	Length (m)	L_2		h	L_3		W_2	
M32	4.18	-0.19	4.37	0.64		5.01														pipes	m							
M33	4.18	-0.21	4.39	0.64	3.90	5.03	5.02	34.80	2.00	32.80	681.32	0.00	681.32	272.06	135.72	71.93	25.58	583.81	681.32	10	2.80	32.80	FSP-2	10.1	65.60	662.56	21.37	TYPE2
M33	4.18	-0.21	4.39	0.64		5.03																						
M34	4.12	-0.26	4.38	0.64	3.90	5.02	5.03	53.10	1.75	51.35	1,041.67	0.00	1,041.67	425.92	207.09	109.76	40.05	891.86	1,041.67	17	0.35	51.35	FSP-2	10.1	102.70	1,037.27	32.60	TYPE2
M34	4.12	-0.26	4.38	0.64		5.02																						
M35	4.13	-0.30	4.43	0.64	3.90	5.07	5.05	56.30	1.50	54.80	1,108.83	0.00	1,108.83	454.53	219.57	116.37	42.74	949.72	1,108.83	18	0.80	54.80	FSP-2	10.1	109.60	1,106.96	34.57	TYPE2
M35	4.13	-0.30	4.43	0.64		5.07																						
M36	4.16	-0.35	4.51	0.64	3.90	5.15	5.11	55.00	1.95	53.05	1,096.10	0.00	1,096.10	440.02	214.50	113.69	41.38	941.04	1,096.10	17	2.05	53.05	FSP-2	10.1	106.10	1,071.61	33.77	TYPE2
M36	4.16	-0.35	4.51	0.64		5.15																						
M37	4.04	-0.39	4.43	0.64	3.90	5.07	5.11	55.00	1.80	53.20	1,096.10	0.00	1,096.10	441.26	214.50	113.69	41.50	940.92	1,096.10	17	2.20	53.20	FSP-2	10.1	106.40	1,074.64	33.77	TYPE2
M37	4.04	-0.39	4.43	0.64		5.07																						
M38	4.06	-0.43	4.49	0.64	3.90	5.13	5.10	45.00	2.50	42.50	895.05	0.00	895.05	352.51	175.50	93.02	33.15	768.89	895.05	14	0.50	42.50	FSP-2	10.1	85.00	858.50	27.63	TYPE2
								299.20	11.50	287.70	5,919.07	0.00	5,919.07	2,386.30	1,166.88	618.45	224.40	5,076.22	5,919.07	93	8.70	287.70			575.40	5,811.54	183.71	

Area of Concrete Bedding (m^2): 4.14
Volume of Concrete Bedding (m^3): 1190.91

Table D.1.2.5 (6) Installation Work For Main Sewers - Line 5 (M38 _ M53)

Bill of Quantity

Area : ECSI Dimension : BOX-2 2.00*2.00

Sewer Line Name : LINE 5(6) Foundation Type : S360 OK ! S360

Manhole No. : M38 M53

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 1.20	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M38	4.06	-0.43	4.49	0.40		4.89														pipes	m							
M39	3.99	-0.46	4.45	0.40	3.60	4.85	4.87	54.90	2.00	52.90	962.51	0.00	962.51	304.70	197.64	104.75	228.53	629.23	962.51	44	0.10	52.90	FSP-2	8.6	105.80	909.88	27.56	TYPE1
M39	3.99	-0.46	4.45	0.40		4.85																						
M40	4.02	-0.47	4.49	0.40	3.60	4.89	4.87	19.60	2.00	17.60	343.63	0.00	343.63	101.38	70.56	37.40	76.03	230.20	343.63	14	0.80	17.60	FSP-2	8.6	35.20	302.72	9.84	TYPE1
M40	4.02	-0.47	4.49	0.40		4.89																						
M41	4.04	-0.50	4.54	0.40	3.60	4.94	4.92	42.00	2.00	40.00	743.91	0.00	743.91	230.40	151.20	80.14	172.80	490.97	743.91	33	0.40	40.00	FSP-2	8.6	80.00	688.00	21.08	TYPE1
M41	4.04	-0.50	4.54	0.40		4.94																						
M42	3.97	-0.53	4.50	0.40	3.60	4.90	4.92	50.00	2.00	48.00	885.60	0.00	885.60	276.48	180.00	95.40	207.36	582.84	885.60	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M42	3.97	-0.53	4.50	0.40		4.90																						
M43	3.93	-0.56	4.49	0.40	3.60	4.89	4.90	50.00	2.00	48.00	882.00	0.00	882.00	276.48	180.00	95.40	207.36	579.24	882.00	40	0.00	48.00	FSP-2	8.6	96.00	825.60	25.10	TYPE1
M43	3.93	-0.56	4.49	0.40		4.89																						
M44	3.84	-0.57	4.41	0.40	3.60	4.81	4.85	17.00	2.00	15.00	296.82	0.00	296.82	86.40	61.20	32.44	64.80	199.58	296.82	12	0.60	15.00	FSP-2	8.6	30.00	258.00	8.53	TYPE1
M44	3.84	-0.57	4.41	0.40		4.81																						
M45	3.71	-0.58	4.29	0.40	3.60	4.69	4.75	24.50	2.00	22.50	418.95	0.00	418.95	129.60	88.20	46.75	97.20	275.00	418.95	18	0.90	22.50	FSP-2	8.6	45.00	387.00	12.30	TYPE1
M45	3.71	-0.58	4.29	0.40		4.69																						
M46	3.56	-0.61	4.17	0.40	3.60	4.57	4.63	45.00	2.00	43.00	750.06	0.00	750.06	247.68	162.00	85.86	185.76	478.44	750.06	35	1.00	43.00	FSP-2	8.6	86.00	739.60	22.59	TYPE1
M46	3.56	-0.61	4.17	0.40		4.57																						
M47	3.54	-0.64	4.18	0.40	3.60	4.58	4.58	49.50	2.00	47.50	816.16	0.00	816.16	273.60	178.20	94.45	205.20	516.51	816.16	39	0.70	47.50	FSP-2	8.6	95.00	817.00	24.85	TYPE1
M47	3.54	-0.64	4.18	0.40		4.58																						
M48	3.57	-0.66	4.23	0.40	3.60	4.63	4.61	41.00	2.00	39.00	680.44	0.00	680.44	224.64	147.60	78.23	168.48	433.73	680.44	32	0.60	39.00	FSP-2	8.6	78.00	670.80	20.58	TYPE1
M48	3.57	-0.66	4.23	0.40		4.63																						
M49	3.43	-0.69	4.12	0.40	3.60	4.52	4.58	39.80	2.00	37.80	656.23	0.00	656.23	217.73	143.28	75.94	163.29	417.00	656.23	31	0.60	37.80	FSP-2	8.6	75.60	650.16	19.98	TYPE1
M49	3.43	-0.69	4.12	0.40		4.52																						
M50	2.77	-0.72	3.49	0.40	3.60	3.89	4.21	58.20	2.00	56.20	882.08	0.00	882.08	323.71	209.52	111.05	242.79	528.24	882.08	46	1.00	56.20	FSP-2	8.6	112.40	966.64	29.22	TYPE1
M50	2.77	-1.60	4.37	0.40		4.77																						
M51	2.46	-1.63	4.09	0.40	3.60	4.49	4.63	58.00	2.00	56.00	966.75	0.00	966.75	322.56	208.80	110.66	241.92	614.17	966.75	46	0.80	56.00	FSP-2	8.6	112.00	963.20	29.12	TYPE1
M51	2.46	-1.63	4.09	0.40		4.49																						
M52	2.27	-1.67	3.94	0.40	3.60	4.34	4.42	55.00	2.00	53.00	875.16	0.00	875.16	305.28	198.00	104.94	228.96	541.26	875.16	44	0.20	53.00	FSP-2	8.6	106.00	911.60	27.61	TYPE1
M52	2.27	-1.67	3.94	0.40		4.34																						
M53	1.88	-1.70	3.58	0.40	3.60	3.98	4.16	56.30	2.00	54.30	843.15	0.00	843.15	312.77	202.68	107.42	234.57	501.16	843.15	45	0.30	54.30	FSP-2	8.6	108.60	933.96	28.26	TYPE1
								660.80	30.00	630.80	11,003.45	0.00	11,003.45	3,633.41	2,378.88	1,260.81	2,725.05	7,017.59	11,003.45	519	8.00	630.80			1,261.60	10,849.76	331.72	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.5 (7) Installation Work For Main Sewers - Line 5 (M53 _ M54)

Bill of Quantity

Area : ECSI Pipe Diameter : 1800
Sewer Line Name : LINE 5(7) Foundation Type : C360 OK ! C360
Manhole No. : M53 M54

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type	Pipe Number Concrete Length (m) 3.00	Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	S_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M53	1.88	-3.65	5.53	0.60		6.13														pipes	m							
M54	1.79	-3.65	5.44	0.60	3.60	6.04	6.09	15.60	2.00	13.60	336.96	5.06	342.02	91.94	56.16	29.76	9.79	302.47	342.02	4	1.60	13.60	FSP-2	11.2	27.20	304.64	13.70	TYPE3
								15.60	2.00	13.60	336.96	5.06	342.02	91.94	56.16	29.76	9.79	302.47	342.02	4	1.60	13.60			27.20	304.64	13.70	

Area of Concrete Bedding (m^2): 3.30
Volume of Concrete Bedding (m^3): 44.83

Table D.1.2.5 (8) Installation Work For Main Sewers - Line 5 (M54 _ OUTLET)

Bill of Quantity

Area : ECSI Dimension : BOX-2 2.00*2.00
Sewer Line Name : LINE 5(8)* Foundation Type : S360 OK ! S360
Manhole No. : M54 OUTLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) 5.4 W_1	Excavation Depth (m) Upstream / Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type / Length (m) N	Pipe Number Concrete 1.20	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M54	1.79	-2.24	4.03	0.40		4.43														pipes	m							
M55	1.78	-2.25	4.03	0.40	3.60	4.43	4.43	12.80	2.00	10.80	204.14	0.00	204.14	62.21	46.08	24.42	46.65	133.07	204.14	9	0.00	10.80	FSP-2	8.6	21.60	185.76	6.43	TYPE1
M55	1.78	-2.25	4.03	0.40		4.43																						
M56	1.82	-2.27	4.09	0.40	3.60	4.49	4.46	37.00	2.00	35.00	594.08	0.00	594.08	201.60	133.20	70.60	151.20	372.28	594.08	29	0.20	35.00	FSP-2	8.6	70.00	602.00	18.57	TYPE1
M56	1.82	-2.27	4.09	0.40		4.49																						
M57	1.73	-2.30	4.03	0.40	3.60	4.43	4.46	56.90	2.00	54.90	913.59	0.00	913.59	316.22	204.84	108.57	237.17	567.85	913.59	45	0.90	54.90	FSP-2	8.6	109.80	944.28	28.56	TYPE1
M57	1.73	-2.30	4.03	0.40		4.43																						
M58	1.68	-2.34	4.02	0.40	3.60	4.42	4.43	61.80	2.00	59.80	985.59	0.00	985.59	344.45	222.48	117.91	258.33	609.35	985.59	49	1.00	59.80	FSP-2	8.6	119.60	1,028.56	31.02	TYPE1
M58	1.68	-2.34	4.02	0.40		4.42																						
M59	1.94	-2.37	4.31	0.40	3.60	4.71	4.57	45.80	2.00	43.80	753.51	0.00	753.51	252.29	164.88	87.39	189.21	476.91	753.51	36	0.60	43.80	FSP-2	8.6	87.60	753.36	22.99	TYPE1
M59	1.94	-2.37	4.31	0.40		4.71																						
OUTLET	1.00	-2.41	3.41	0.40	3.20	3.81	4.26	62.60	2.00	60.60	853.37	0.00	853.37	349.06	200.32	106.17	193.92	553.28	853.37	50	0.60	60.60	FSP-2	8.6	121.20	1,042.32	31.43	TYPE1
								276.90	12.00	264.90	4,304.28	0.00	4,304.28	1,525.83	971.80	515.05	1,076.48	2,712.75	4,304.28	218	3.30	264.90			529.80	4,556.28	139.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.6 (1) Installation Work For Main Sewers - Line 6 (M1 _ M16)

Bill of Quantity

Area : ECSI Pipe Diameter : 2000

Sewer Line Name : LINE 6(1) Foundation Type : C120 OK ! C120

Manhole No. : M1 M16

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 3.00		Type	Height (m)	Length (m)	Area (m^2)		
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M1	4.72	1.10	3.62	0.64		4.26														pipes	m							
M2	4.53	1.05	3.48	0.64	3.50	4.12	4.19	45.00	1.20	43.80	659.93	0.00	659.93	244.36	157.50	83.48	213.24	363.22	659.93	14	1.80	43.80	FSP-2	8.6	87.60	753.36	22.50	TYPE1
M2	4.53	1.05	3.48	0.64		4.12																						
M3	4.53	0.99	3.54	0.64	3.50	4.18	4.15	47.90	1.20	46.70	695.75	0.00	695.75	260.54	167.65	88.85	227.36	379.54	695.75	15	1.70	46.70	FSP-2	8.6	93.40	803.24	23.95	TYPE1
M3	4.53	0.99	3.54	0.64		4.18																						
M4	4.52	0.93	3.59	0.64	3.50	4.23	4.20	52.50	1.20	51.30	771.75	0.00	771.75	286.20	183.75	97.39	249.76	424.60	771.75	17	0.30	51.30	FSP-2	8.6	102.60	882.36	26.25	TYPE1
M4	4.52	0.93	3.59	0.64		4.23																						
M5	4.34	0.86	3.48	0.64	3.50	4.12	4.17	54.70	1.20	53.50	798.35	0.00	798.35	298.48	191.45	101.47	260.46	436.42	798.35	17	2.50	53.50	FSP-2	8.6	107.00	920.20	27.35	TYPE1
M5	4.34	0.86	3.48	0.64		4.12																						
M6	4.26	0.80	3.46	0.64	3.50	4.10	4.11	52.10	1.20	50.90	749.46	0.00	749.46	283.97	182.35	96.65	247.81	405.00	749.46	16	2.90	50.90	FSP-2	8.6	101.80	875.48	26.05	TYPE1
M6	4.26	0.80	3.46	0.64		4.10																						
M7	4.38	0.74	3.64	0.64	3.50	4.28	4.19	50.60	1.20	49.40	742.05	0.00	742.05	275.60	177.10	93.86	240.51	407.68	742.05	16	1.40	49.40	FSP-2	8.6	98.80	849.68	25.30	TYPE1
M7	4.38	0.74	3.64	0.64		4.28																						
M8	4.23	0.67	3.56	0.64	3.50	4.20	4.24	55.10	1.60	53.50	817.69	0.00	817.69	298.48	192.85	102.21	260.46	455.02	817.69	17	2.50	53.50	FSP-2	8.6	107.00	920.20	27.55	TYPE1
M8	4.23	0.67	3.56	0.64		4.20																						
M9	4.25	0.61	3.64	0.64	3.50	4.28	4.24	49.00	2.00	47.00	727.16	0.00	727.16	262.21	171.50	90.90	228.82	407.45	727.16	15	2.00	47.00	FSP-2	8.6	94.00	808.40	24.50	TYPE1
M9	4.25	0.61	3.64	0.64		4.28																						
M10	4.27	0.57	3.70	0.64	3.50	4.34	4.31	32.50	2.00	30.50	490.27	0.00	490.27	170.16	113.75	60.29	148.49	281.49	490.27	10	0.50	30.50	FSP-2	8.6	61.00	524.60	16.25	TYPE1
M10	4.27	0.57	3.70	0.64		4.34																						
M11	4.25	0.51	3.74	0.64	3.50	4.38	4.36	51.50	2.00	49.50	785.89	0.00	785.89	276.16	180.25	95.53	240.99	449.37	785.89	16	1.50	49.50	FSP-2	8.6	99.00	851.40	25.75	TYPE1
M11	4.25	0.51	3.74	0.64		4.38																						
M12	4.29	0.44	3.85	0.64	3.50	4.49	4.43	60.00	2.00	58.00	930.30	0.00	930.30	323.58	210.00	111.30	282.38	536.62	930.30	19	1.00	58.00	FSP-2	8.6	116.00	997.60	30.00	TYPE1
M12	4.29	0.44	3.85	0.64		4.49																						
M13	4.29	0.38	3.91	0.64	3.50	4.55	4.52	45.00	2.00	43.00	711.90	0.00	711.90	239.90	157.50	83.48	209.34	419.09	711.90	14	1.00	43.00	FSP-2	8.6	86.00	739.60	22.50	TYPE1
M13	4.29	0.38	3.91	0.64		4.55																						
M14	4.30	0.32	3.98	0.64	3.50	4.62	4.58	53.10	2.00	51.10	851.20	0.00	851.20	285.09	185.85	98.50	248.78	503.92	851.20	17	0.10	51.10	FSP-2	8.6	102.20	878.92	26.55	TYPE1
M14	4.30	0.32	3.98	0.64		4.62																						
M15	4.31	0.26	4.05	0.64	3.50	4.69	4.65	49.00	2.00	47.00	797.48	0.00	797.48	262.21	171.50	90.90	228.82	477.77	797.48	15	2.00	47.00	FSP-2	8.6	94.00	808.40	24.50	TYPE1
M15	4.31	0.26	4.05	0.64		4.69																						
M16	4.30	0.22	4.08	0.64	3.50	4.72	4.70	37.00	2.00	35.00	608.65	0.00	608.65	195.27	129.50	68.64	170.39	369.63	608.65	11	2.00	35.00	FSP-2	8.6	70.00	602.00	18.50	TYPE1
								735.00	24.80	710.20	11,137.83	0.00	11,137.83	3,962.21	2,572.50	1,363.43	3,457.61	6,316.80	11,137.83	229	23.20	710.20			1,420.40	12,215.44	367.50	

Area of Concrete Bedding (m^2): 1.42

Volume of Concrete Bedding (m^3): 1011.32

Table D.1.2.6 (2) Installation Work For Main Sewers - Line 6 (M16 _ M17)

Bill of Quantity

Area : ECSI Pipe Diameter : 1500
Sewer Line Name : LINE 6(2) Foundation Type : C360 OK ! C360
Manhole No. : M16 M17

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		Type	Height (m)	Length (m)	Area (m^2)		
						Downstream														Length (m)	3.00							
		IL_1 IL_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M16	4.30	-1.25	5.55	0.54		6.09														pipes	m							
M17	4.26	-1.25	5.51	0.54	3.60	6.05	6.07	8.00	0.00	8.00	172.80	2.02	174.82	38.19	28.80	15.26	5.76	153.80	174.82	2	2.00	8.00	FSP-2	11.2	16.00	179.20	7.02	TYPE3
								8.00	0.00	8.00	172.80	2.02	174.82	38.19	28.80	15.26	5.76	153.80	174.82	2	2.00	8.00			16.00	179.20	7.02	

Area of Concrete Bedding (m^2): 2.40
Volume of Concrete Bedding (m^3): 19.17

Table D.1.2.6 (3) Installation Work For Main Sewers - Line 6 (M17 _ M32)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00

Sewer Line Name : LINE 6(3) Foundation Type : S360 OK ! S360

Manhole No. : M17 M32

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 1.20		Type	Height (m)	Length (m)	Area (m^2)		
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M17	4.26	0.22	4.04	0.45		4.49														pipes	m							
M18	3.97	0.17	3.80	0.45	4.20	4.25	4.37	62.30	2.00	60.30	1,143.46	0.00	1,143.46	452.25	261.66	138.68	282.20	722.58	1,143.46	50	0.30	60.30	FSP-2	8.6	120.60	1,037.16	32.15	TYPE1
M18	3.97	0.17	3.80	0.45		4.25																						
M19	3.97	0.13	3.84	0.45	4.20	4.29	4.27	53.90	2.00	51.90	966.65	0.00	966.65	389.25	226.38	119.98	242.89	603.78	966.65	43	0.30	51.90	FSP-2	8.6	103.80	892.68	27.81	TYPE1
M19	3.97	0.13	3.84	0.45		4.29																						
M20	3.93	0.08	3.85	0.45	4.20	4.30	4.30	56.60	2.00	54.60	1,022.20	0.00	1,022.20	409.50	237.72	125.99	255.53	640.68	1,022.20	45	0.60	54.60	FSP-2	8.6	109.20	939.12	29.21	TYPE1
M20	3.93	0.08	3.85	0.45		4.30																						
M21	3.86	0.04	3.82	0.45	4.20	4.27	4.29	56.60	2.00	54.60	1,019.82	0.00	1,019.82	409.50	237.72	125.99	255.53	638.30	1,019.82	45	0.60	54.60	FSP-2	8.6	109.20	939.12	29.21	TYPE1
M21	3.86	0.04	3.82	0.45		4.27																						
M22	3.80	-0.01	3.81	0.45	4.20	4.26	4.27	58.50	2.00	56.50	1,049.14	0.00	1,049.14	423.75	245.70	130.22	264.42	654.50	1,049.14	47	0.10	56.50	FSP-2	8.6	113.00	971.80	30.19	TYPE1
M22	3.80	-0.01	3.81	0.45		4.26																						
M23	3.76	-0.05	3.81	0.45	4.20	4.26	4.26	51.50	2.00	49.50	921.44	0.00	921.44	371.25	216.30	114.64	231.66	575.14	921.44	41	0.30	49.50	FSP-2	8.6	99.00	851.40	26.57	TYPE1
M23	3.76	-0.05	3.81	0.45		4.26																						
M24	3.68	-0.07	3.75	0.45	4.20	4.20	4.23	25.00	2.00	23.00	444.15	0.00	444.15	172.50	105.00	55.65	107.64	280.86	444.15	19	0.20	23.00	FSP-2	8.6	46.00	395.60	12.90	TYPE1
M24	3.68	-0.07	3.75	0.45		4.20																						
M25	3.71	-0.12	3.83	0.45	4.20	4.28	4.24	63.10	2.00	61.10	1,123.69	0.00	1,123.69	458.25	265.02	140.46	285.95	697.28	1,123.69	50	1.10	61.10	FSP-2	8.6	122.20	1,050.92	32.56	TYPE1
M25	3.71	-0.12	3.83	0.45		4.28																						
M26	3.68	-0.15	3.83	0.45	4.20	4.28	4.28	35.50	2.00	33.50	638.15	0.00	638.15	251.25	149.10	79.02	156.78	402.35	638.15	27	1.10	33.50	FSP-2	8.6	67.00	576.20	18.32	TYPE1
M26	3.68	-0.15	3.83	0.45		4.28																						
M27	3.66	-0.21	3.87	0.45	4.20	4.32	4.30	72.50	2.00	70.50	1,309.35	0.00	1,309.35	528.75	304.50	161.39	329.94	818.03	1,309.35	58	0.90	70.50	FSP-2	8.6	141.00	1,212.60	37.41	TYPE1
M27	3.66	-0.21	3.87	0.45		4.32																						
M28	3.60	-0.26	3.86	0.45	4.20	4.31	4.32	65.50	2.00	63.50	1,188.44	0.00	1,188.44	476.25	275.10	145.80	297.18	745.46	1,188.44	52	1.10	63.50	FSP-2	8.6	127.00	1,092.20	33.80	TYPE1
M28	3.60	-0.26	3.86	0.45		4.31																						
M29	3.59	-0.31	3.90	0.45	4.20	4.35	4.33	59.10	2.00	57.10	1,074.80	0.00	1,074.80	428.25	248.22	131.56	267.23	676.01	1,074.80	47	0.70	57.10	FSP-2	8.6	114.20	982.12	30.50	TYPE1
M29	3.59	-0.31	3.90	0.45		4.35																						
M30	3.51	-0.33	3.84	0.45	4.20	4.29	4.32	24.90	2.00	22.90	451.79	0.00	451.79	171.75	104.58	55.43	107.17	289.19	451.79	19	0.10	22.90	FSP-2	8.6	45.80	393.88	12.85	TYPE1
M30	3.51	-0.33	3.84	0.45		4.29																						
M31	3.45	-0.34	3.79	0.45	4.20	4.24	4.27	12.50	2.00	10.50	224.18	0.00	224.18	78.75	52.50	27.83	49.14	147.22	224.18	8	0.90	10.50	FSP-2	8.6	21.00	180.60	6.45	TYPE1
M31	3.45	-0.34	3.79	0.45		4.24																						
M32	3.34	-0.39	3.73	0.45	4.20	4.18	4.21	61.00	2.00	59.00	1,078.61	0.00	1,078.61	442.50	256.20	135.79	276.12	666.70	1,078.61	49	0.20	59.00	FSP-2	8.6	118.00	1,014.80	31.48	TYPE1
								758.50	30.00	728.50	13,655.87	0.00	13,655.87	5,463.75	3,185.70	1,688.42	3,409.38	8,558.07	13,655.87	600	8.50	728.50			1,457.00	12,530.20	391.39	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.6 (4) Installation Work For Main Sewers - Line 6 (M32 _ M50)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00

Sewer Line Name : LINE 6(4) Foundation Type : S360 OK ! S360

Manhole No. : M32 M50

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)				Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.53	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 1.20		Type	Height (m)	Length (m)	Area (m^2)		
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2		h	L_3		W_2	
M32	3.34	-0.39	3.73	0.45		4.18														pipes	m							
M33	3.24	-0.43	3.67	0.45	4.20	4.12	4.15	57.90	2.00	55.90	1,009.20	0.00	1,009.20	419.25	243.18	128.89	261.61	618.70	1,009.20	46	0.70	55.90	FSP-2	8.6	111.80	961.48	29.88	TYPE1
M33	3.24	-0.43	3.67	0.45		4.12																						
M34	3.21	-0.47	3.68	0.45	4.20	4.13	4.13	46.50	2.00	44.50	806.59	0.00	806.59	333.75	195.30	103.51	208.26	494.82	806.59	37	0.10	44.50	FSP-2	8.6	89.00	765.40	23.99	TYPE1
M34	3.21	-0.47	3.68	0.45		4.13																						
M35	3.11	-0.51	3.62	0.45	4.20	4.07	4.10	50.50	2.00	48.50	869.61	0.00	869.61	363.75	212.10	112.41	226.98	530.22	869.61	40	0.50	48.50	FSP-2	8.6	97.00	834.20	26.06	TYPE1
M35	3.11	-0.51	3.62	0.45		4.07																						
M36	2.99	-0.53	3.52	0.45	4.20	3.97	4.02	24.50	2.00	22.50	413.66	0.00	413.66	168.75	102.90	54.54	105.30	253.82	413.66	18	0.90	22.50	FSP-2	8.6	45.00	387.00	12.64	TYPE1
M36	2.99	-0.53	3.52	0.45		3.97																						
M37	2.90	-0.57	3.47	0.45	3.80	3.92	3.95	49.50	2.00	47.50	743.00	0.00	743.00	356.25	188.10	99.69	167.20	476.11	743.00	39	0.70	47.50	-	2.5	49.50	123.75	0.00	TIMBER
M37	2.90	-0.87	3.77	0.45		4.22																						
M38	2.81	-0.91	3.72	0.45	4.20	4.17	4.20	48.90	2.00	46.90	862.60	0.00	862.60	351.75	205.38	108.85	219.49	534.26	862.60	39	0.10	46.90	FSP-2	8.6	93.80	806.68	25.23	TYPE1
M38	2.81	-0.91	3.72	0.45		4.17																						
M39	2.71	-0.95	3.66	0.45	4.20	4.11	4.14	45.60	2.00	43.60	792.90	0.00	792.90	327.00	191.52	101.51	204.05	487.34	792.90	36	0.40	43.60	FSP-2	8.6	87.20	749.92	23.53	TYPE1
M39	2.71	-0.95	3.66	0.45		4.11																						
M40	2.54	-0.99	3.53	0.45	4.20	3.98	4.05	55.20	2.00	53.20	938.96	0.00	938.96	399.00	231.84	122.88	248.98	567.10	938.96	44	0.40	53.20	FSP-2	8.6	106.40	915.04	28.48	TYPE1
M40	2.54	-1.29	3.83	0.45		4.28																						
M41	2.36	-1.33	3.69	0.45	4.20	4.14	4.21	53.80	2.00	51.80	951.30	0.00	951.30	388.50	225.96	119.76	242.42	589.12	951.30	43	0.20	51.80	FSP-2	8.6	103.60	890.96	27.76	TYPE1
M41	2.36	-1.33	3.69	0.45		4.14																						
M42	2.29	-1.35	3.64	0.45	4.20	4.09	4.12	17.50	2.00	15.50	302.82	0.00	302.82	116.25	73.50	38.96	72.54	191.33	302.82	12	1.10	15.50	FSP-2	8.6	31.00	266.60	9.03	TYPE1
M42	2.29	-1.35	3.64	0.45		4.09																						
M43	2.26	-1.38	3.64	0.45	4.20	4.09	4.09	38.00	2.00	36.00	652.77	0.00	652.77	270.00	159.60	84.59	168.48	399.70	652.77	30	0.00	36.00	FSP-2	8.6	72.00	619.20	19.61	TYPE1
M44	2.26	-1.38	3.64	0.45		4.09																						
M45	2.15	-1.40	3.55	0.45	4.20	4.00	4.05	24.30	2.00	22.30	413.35	0.00	413.35	167.25	102.06	54.09	104.36	254.90	413.35	18	0.70	22.30	FSP-2	8.6	44.60	383.56	12.54	TYPE1
M45	2.15	-1.40	3.55	0.45		4.00																						
M46	2.10	-1.41	3.51	0.45	3.80	3.96	3.98	12.00	2.00	10.00	181.49	0.00	181.49	75.00	45.60	24.17	35.20	122.12	181.49	8	0.40	10.00	-	2.5	12.00	30.00	0.00	TIMBER
M46	2.10	-1.41	3.51	0.45		3.96																						
M47	2.08	-1.43	3.51	0.45	3.80	3.96	3.96	21.40	2.00	19.40	322.03	0.00	322.03	145.50	81.32	43.10	68.29	210.64	322.03	16	0.20	19.40	-	2.5	21.40	53.50	0.00	TIMBER
M47	2.08	-1.43	3.51	0.45		3.96																						
M48	2.21	-1.47	3.68	0.45	4.20	4.13	4.05	56.50	2.00	54.50	961.07	0.00	961.07	408.75	237.30	125.77	255.06	580.24	961.07	45	0.50	54.50	FSP-2	8.6	109.00	937.40	29.15	TYPE1
M48	2.21	-1.47	3.68	0.45		4.13																						
M49	2.61	-1.51	4.12	0.45	4.20	4.57	4.35	45.00	2.00	43.00	822.15	0.00	822.15	322.50	189.00	100.17	201.24	520.74	822.15	35	1.00	43.00	FSP-2	8.6	86.00	739.60	23.22	TYPE1
M49	2.61	-1.51	4.12	0.45		4.57																						
M50	2.96	-1.54	4.50	0.45	4.20	4.95	4.76	45.00	2.00	43.00	899.64	0.00	899.64	322.50	189.00	100.17	201.24	598.23	899.64	35	1.00	43.00	FSP-2	8.6	86.00	739.60	23.22	TYPE1
								692.10	34.00	658.10	11943.14	0.00	11943.14	4935.75	2873.66	1523.04	2990.70	7429.40	11943.14	541.00	8.90	658.10	0.00	0.00	1245.30	10203.89	314.35	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.6 (5) Installation Work For Main Sewers - Line 6 (M50 _ OUTLET)

Bill of Quantity

Area : ECSI Dimension : BOX-3 2.50*2.00
Sewer Line Name : LINE 6(5) Foundation Type : S360 OK ! S360
Manhole No. : M50 OUTLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type Length (m)	Pipe Number Concrete 1.20	Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N pipes	N m	L_2		h	L_3		W_2	
M50	2.96	-1.54	4.50	0.45		4.95																						
M51	3.00	-1.55	4.55	0.45	4.20	5.00	4.98	7.50	2.00	5.50	156.87	0.00	156.87	41.25	31.50	16.70	25.74	114.44	156.87	4	0.70	5.50	FSP-2	8.6	11.00	94.60	3.87	TYPE1
M51	3.00	-1.55	4.55	0.45		5.00																						
M52	3.07	-1.56	4.63	0.45	4.60	5.08	5.04	10.00	2.00	8.00	231.84	0.00	231.84	60.00	46.00	24.38	46.72	160.74	231.84	6	0.80	8.00	FSP-2	10.1	16.00	161.60	6.60	TYPE2
M52	3.07	-1.56	4.63	0.45		5.08																						
M53	2.96	-1.59	4.55	0.45	4.60	5.00	5.04	41.50	2.00	39.50	962.14	0.00	962.14	296.25	190.90	101.18	230.68	630.28	962.14	32	1.10	39.50	FSP-2	10.1	79.00	797.90	27.39	TYPE2
M53	2.96	-1.59	4.55	0.45		5.00																						
M54	2.80	-1.63	4.43	0.45	4.20	4.88	4.94	45.30	2.00	43.30	939.89	0.00	939.89	324.75	190.26	100.84	202.64	636.41	939.89	36	0.10	43.30	FSP-2	8.6	86.60	744.76	23.37	TYPE1
M55	2.77	-1.63	4.40	0.45		4.85																						
M56	2.75	-1.64	4.39	0.45	4.20	4.84	4.85	10.00	2.00	8.00	203.70	0.00	203.70	60.00	42.00	22.26	37.44	144.00	203.70	6	0.80	8.00	FSP-2	8.6	16.00	137.60	5.16	TYPE1
M56	2.75	-1.64	4.39	0.45		4.84																						
M57	2.75	-1.64	4.39	0.45	4.20	4.84	4.84	4.50	2.00	2.50	91.48	0.00	91.48	18.75	18.90	10.02	11.70	69.76	91.48	2	0.10	2.50	FSP-2	8.6	5.00	43.00	2.32	TYPE1
M57	2.75	-1.64	4.39	0.45		4.84																						
M58	2.74	-1.68	4.42	0.45	4.20	4.87	4.86	40.70	2.00	38.70	830.77	0.00	830.77	290.25	170.94	90.60	181.12	559.05	830.77	32	0.30	38.70	FSP-2	8.6	77.40	665.64	21.00	TYPE1
M58	2.74	-1.68	4.42	0.45		4.87																						
M59	2.90	-1.71	4.61	0.45	4.20	5.06	4.97	38.20	2.00	36.20	797.39	0.00	797.39	271.50	160.44	85.03	169.42	542.94	797.39	30	0.20	36.20	FSP-2	8.6	72.40	622.64	19.71	TYPE1
M59	2.90	-1.71	4.61	0.45		5.06																						
M60	2.70	-1.73	4.43	0.45	4.20	4.88	4.97	33.50	2.00	31.50	699.28	0.00	699.28	236.25	140.70	74.57	147.42	477.29	699.28	26	0.30	31.50	FSP-2	8.6	63.00	541.80	17.29	TYPE1
M60	2.70	-1.73	4.43	0.45		4.88																						
M61	2.40	-1.76	4.16	0.45	4.20	4.61	4.75	37.20	2.00	35.20	742.14	0.00	742.14	264.00	156.24	82.81	164.74	494.59	742.14	29	0.40	35.20	FSP-2	8.6	70.40	605.44	19.20	TYPE1
M61	2.40	-1.76	4.16	0.45		4.61																						
M62	2.07	-1.79	3.86	0.45	4.20	4.31	4.46	31.60	2.00	29.60	591.94	0.00	591.94	222.00	132.72	70.34	138.53	383.07	591.94	24	0.80	29.60	FSP-2	8.6	59.20	509.12	16.31	TYPE1
M62	2.07	-1.79	3.86	0.45		4.31																						
M63	1.85	-1.82	3.67	0.45	4.20	4.12	4.22	36.10	2.00	34.10	639.84	0.00	639.84	255.75	151.62	80.36	159.59	399.89	639.84	28	0.50	34.10	FSP-2	8.6	68.20	586.52	18.63	TYPE1
M63	1.85	-1.82	3.67	0.45		4.12																						
M64	2.14	-1.86	4.00	0.45	4.20	4.45	4.29	53.50	2.00	51.50	963.97	0.00	963.97	386.25	224.70	119.09	241.02	603.86	963.97	42	1.10	51.50	FSP-2	8.6	103.00	885.80	27.61	TYPE1
M64	2.14	-1.86	4.00	0.45		4.45																						
M65	2.49	-1.88	4.37	0.45	4.20	4.82	4.64	30.50	2.00	28.50	594.39	0.00	594.39	213.75	128.10	67.89	133.38	393.12	594.39	23	0.90	28.50	FSP-2	8.6	57.00	490.20	15.74	TYPE1
M65	2.49	-1.88	4.37	0.45		4.82																						
M66	3.03	-1.92	4.95	0.45	4.60	5.40	5.11	46.50	2.00	44.50	1,093.03	0.00	1,093.03	333.75	213.90	113.37	259.88	719.78	1,093.03	37	0.10	44.50	FSP-2	10.1	89.00	898.90	30.69	TYPE2
M66	3.03	-1.92	4.95	0.45		5.40																						
OUTLET	2.20	-1.95	4.15	0.45	4.20	4.60	5.00	33.50	1.00	32.50	703.50	0.00	703.50	243.75	140.70	74.57	152.10	476.83	703.50	27	0.10	32.50	FSP-2	8.6	65.00	559.00	17.29	TYPE1
								500.10	31.00	469.10	10242.17	0.00	10242.17	3518.25	2139.62	1134.00	2302.12	6806.05	10242.17	384.00	8.30	469.10	0.00	0.00	938.20	8344.52	272.16	0.00

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.2.6 (6) Installation Work For Main Sewers - Line 6 (M43 _ M44)

Bill of Quantity

Area : ECSI Pipe Diameter : 2000
Sewer Line Name : LINE 6(6) Foundation Type : C360 OK ! C360
Manhole No. : M43 M44

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type pipes N	Pipe Number Concrete m	Pipe Bedding Length (m) L_2	Sheeting (piles) Type	Sheeting (piles) Height (m) h	Sheeting (piles) Length (m) L_3	Sheeting (piles) Area (m^2)	Waling & Strut (ton) W_2	Shoring Type
M43	2.26	-2.40	4.66	0.64		5.30																						
M44	2.26	-2.40	4.66	0.64	4.20	5.30	5.30	6.30	0.00	6.30	140.24	0.00	140.24	52.25	26.46	14.02	5.29	120.93	140.24	2	0.30	6.30	FSP-2	10.1	12.60	127.26	3.87	TYPE2
								6.30	0.00	6.30	140.24	0.00	140.24	52.25	26.46	14.02	5.29	120.93	140.24	2	0.30	6.30			12.60	127.26	3.87	

Area of Concrete Bedding (m^2): 4.14
Volume of Concrete Bedding (m^3): 26.08

Table D.1.2.6 (7) Installation Work For Main Sewers - Line 6 (M54 _ M55)

Bill of Quantity

Area : ECSI Pipe Diameter : 2000
Sewer Line Name : LINE 6(7) Foundation Type : C360 OK ! C360
Manhole No. : M54 M55

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete	Pipe Bedding Length (m)	Sheeting (piles) Type	Sheeting (piles) Height (m)	Sheeting (piles) Length (m)	Sheeting (piles) Area (m^2)	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	Length (m) / 3.00	L_2		h	L_3		W_2	
M54	2.80	-4.10	6.90	0.64		7.54														pipes	m						
M55	2.77	-4.10	6.87	0.64	3.90	7.51	7.53	10.00	0.00	10.00	234.00	59.67	293.67	82.94	39.00	20.67	7.80	265.20	293.67	3	1.00	10.00	FSP-3	14.3	20.00	286.00	10.00	TYPE5
								10.00	0.00	10.00	234.00	59.67	293.67	82.94	39.00	20.67	7.80	265.20	293.67	3	1.00	10.00			20.00	286.00	10.00	

Area of Concrete Bedding (m^2): 4.14
Volume of Concrete Bedding (m^3): 41.39

Table D.1.3.1 (1) Installation Work For Connection Pipes-Line1

Bill of Quantity

Area : ECSI | Pipe Diameter : 600 | Shoring Type : TIMBER

Sewer Line Name : LINE 1 | Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE | Number of connections: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		$_m$	
						Downstream					<= 6 m	=> 6 m				0.49				Length (m)	4.00		2.5	
		IE_1	ID_1			H_2														N				
		IE_2	ID_2	H_1	W_1	H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8			L_2	L_3	W_2
I23	4.630	1.250	3.38	0.26		3.64														pipes	m			
M23	4.630	1.230	3.40	0.26	1.60	3.66	3.65	1.00	0.00	1.00	5.84	0.00	5.84	0.41	1.60	0.78	1.45	3.61	5.84	0	1.00	1.00	1.00	0.00
I'23	4.630	1.270	3.36	0.26		3.62																		
M23	4.630	1.230	3.40	0.26	1.60	3.66	3.64	1.00	0.00	1.00	5.83	0.00	5.83	0.41	1.60	0.78	1.45	3.60	5.83			1.00	1.00	0.00
								2.00	0.00	2.00	11.67	0.00	11.67	0.82	3.20	1.57	2.90	7.20	11.67	0	1.00	2.00	2.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.1 (2) Installation Work For Connection Pipes-Line1

Bill of Quantity

Area : ECSI Pipe Diameter : 800 Shoring Type : TIMBER

Sewer Line Name : LINE 1 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connections: 9

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m 0.49	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type Length (m)	Concrete 4.00		$_m$ 2.5	
		IE_1 IE_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I1	4.490	1.971	2.52	0.27		2.79														pipes	m			
M1	4.490	1.950	2.54	0.27	1.90	2.81	2.80	10.60	1.10	9.50	56.40	0.00	56.40	6.88	20.14	9.87	17.67	28.86	56.40	2	2.00	9.50	10.60	0.00
I'1	4.490	1.971	2.52	0.27		2.79																		
M1	4.490	1.950	2.54	0.27	1.90	2.81	2.80	10.60	1.10	9.50	56.40	0.00	56.40	6.88	20.14	9.87	17.67	28.86	56.40	2	1.50	9.50	10.60	0.00
I5	4.170	1.621	2.55	0.27		2.82																		
M5	4.170	1.600	2.57	0.27	1.90	2.84	2.83	10.60	1.10	9.50	57.00	0.00	57.00	6.88	20.14	9.87	17.67	29.46	57.00	2	1.50	9.50	10.60	0.00
I12	4.030	1.521	2.51	0.27		2.78																		
M12	4.030	1.500	2.53	0.27	1.90	2.80	2.79	10.60	1.10	9.50	56.20	0.00	56.20	6.88	20.14	9.87	17.67	28.66	56.20	2	1.50	9.50	10.60	0.00
I'12	4.030	1.516	2.51	0.27		2.78																		
M12	4.030	1.500	2.53	0.27	1.90	2.80	2.80	8.00	1.10	6.90	42.56	0.00	42.56	5.00	15.20	7.45	12.83	22.28	42.56	1	2.90	6.90	8.00	0.00
I15	3.980	1.216	2.76	0.27		3.03																		
M15	3.980	**1.200**	2.78	0.27	1.90	3.05	3.05	8.00	1.10	6.90	46.36	0.00	46.36	5.00	15.20	7.45	12.83	26.08	46.36	1	2.90	6.90	8.00	0.00
I'16	3.990	1.560	2.43	0.27		2.70																		
M16	3.990	1.400	2.59	0.27	1.90	2.86	2.78	8.00	1.10	6.90	42.26	0.00	42.26	5.00	15.20	7.45	12.83	21.98	42.26	1	6.90	6.90	8.00	0.00
I'17	4.000	1.616	2.38	0.27		2.65																		
M17	4.000	1.600	2.40	0.27	1.90	2.67	2.67	8.00	1.20	6.80	40.59	0.00	40.59	4.92	15.20	7.45	12.65	20.49	40.59	1	6.80	6.80	8.00	0.00
I'22	4.400	1.616	2.78	0.27		3.05																		
M22	4.400	1.600	2.80	0.27	1.90	3.07	3.07	8.00	1.20	6.80	46.67	0.00	46.67	4.92	15.20	7.45	12.65	26.57	46.67	1	6.80	6.80	8.00	0.00
								74.40	8.90	72.30	444.44	0.00	444.44	52.36	156.56	76.71	134.47	233.26	444.44	13	32.80	72.30	82.40	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.1 (3) Installation Work For Connection Pipes-Line1

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 1 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connections: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I'17	4.000	1.216	2.78	0.29		3.07														pipes	m			
M17	4.000	1.200	2.80	0.29	2.10	3.09	3.09	8.00	1.20	6.80	51.92	0.00	51.92	7.44	16.80	8.23	15.12	28.57	51.92	1	2.80	6.80	8.00	0.00
I'22	4.400	1.416	2.98	0.29		3.27																		
M22	4.400	1.400	3.00	0.29	2.10	3.29	3.29	8.00	1.20	6.80	55.28	0.00	55.28	7.44	16.80	8.23	15.12	31.93	55.28	1	2.80	6.80	8.00	0.00
								16.00	2.40	13.60	107.20	0.00	107.20	14.88	33.60	16.46	30.24	60.50	107.20	2	5.60	13.60	16.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.1 (4) Installation Work For Connection Pipes-Line1

Bill of Quantity

Area : ECSI Pipe Diameter : 1200 Shoring Type : TIMBER

Sewer Line Name : LINE 1 Foundation Type : S360 OK ! S360

Manhole No. : Co.CP-MANHOLE Number of connections: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand	Black Sand		Type	Concrete			
						Downstream					<= 6 m	=> 6 m				0.49	Sand Backfill	Sandy Soil Backfill		Length (m)	3.00		2.5	
		IE_1	ID_1			H_2														N				
		IE_2	ID_2	H_1	W_1	H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8			L_2	L_3	W_2
I24	4.630	1.201	3.43	0.29		3.72														pipes	m			
M24	4.630	1.200	3.43	0.29	2.60	3.72	3.72	1.00	0.00	1.00	9.68	0.00	9.68	1.63	2.60	1.27	3.15	5.26	9.68	0	1.00	1.00	1.00	0.00
I'24	4.630	1.201	3.43	0.29		3.72																		
M24	4.630	1.200	3.43	0.29	2.60	3.72	3.72	1.00	0.00	1.00	9.68	0.00	9.68	1.63	2.60	1.27	3.15	5.26	9.68	0	1.00	1.00	1.00	0.00
								2.00	0.00	2.00	19.36	0.00	19.36	3.26	5.20	2.55	6.30	10.51	19.36	0	2.00	2.00	2.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.2 (1) Installation Work For Connection Pipes-Line2

Bill of Quantity

Area : ECSI Pipe Diameter : 400 Shoring Type : TIMBER

Sewer Line Name : LINE 2 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.49	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 4.00		$_m$ 2.5	
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I6	1.910	0.070	1.84	0.25		2.09														pipes	m			
M6	1.910	0.050	1.86	0.25	1.40	2.11	2.10	1.00	0.00	1.00	2.94	0.00	2.94	0.20	1.40	0.69	1.06	1.19	2.94	0	1.00	1.00	1.00	0.00
I'6	1.910	0.070	1.84	0.25		2.09																		
M6	1.910	0.050	1.86	0.25	1.40	2.11	2.10	1.00	0.00	1.00	2.94	0.00	2.94	0.20	1.40	0.69	1.06	1.19	2.94	0	1.00	1.00	1.00	0.00
I7	1.910	0.070	1.84	0.25		2.09																		
M7	1.910	0.050	1.86	0.25	1.40	2.11	2.10	1.00	0.00	1.00	2.94	0.00	2.94	0.20	1.40	0.69	1.06	1.19	2.94	0	1.00	1.00	1.00	0.00
I'7	1.910	0.070	1.84	0.25		2.09																		
M7	1.910	0.050	1.86	0.25	1.40	2.11	2.10	1.00	0.00	1.00	2.94	0.00	2.94	0.20	1.40	0.69	1.06	1.19	2.94	0	1.00	1.00	1.00	0.00
I8	1.890	0.070	1.82	0.25		2.07																		
M8	1.890	0.050	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I'8	1.890	0.070	1.82	0.25		2.07																		
M8	1.890	0.050	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I9	1.870	0.020	1.85	0.25		2.10																		
M9	1.870	0.000	1.87	0.25	1.40	2.12	2.11	1.00	0.00	1.00	2.96	0.00	2.96	0.20	1.40	0.69	1.06	1.21	2.96	0	1.00	1.00	1.00	0.00
I'9	1.870	0.020	1.85	0.25		2.10																		
M9	1.870	0.000	1.87	0.25	1.40	2.12	2.11	1.00	0.00	1.00	2.96	0.00	2.96	0.20	1.40	0.69	1.06	1.21	2.96	0	1.00	1.00	1.00	0.00
I10	1.880	0.020	1.86	0.25		2.11																		
M10	1.880	0.000	1.88	0.25	1.40	2.13	2.12	1.00	0.00	1.00	2.97	0.00	2.97	0.20	1.40	0.69	1.06	1.22	2.97	0	1.00	1.00	1.00	0.00
I'10	1.880	0.020	1.86	0.25		2.11																		
M10	1.880	0.000	1.88	0.25	1.40	2.13	2.12	1.00	0.00	1.00	2.97	0.00	2.97	0.20	1.40	0.69	1.06	1.22	2.97	0	1.00	1.00	1.00	0.00
I11	1.870	0.020	1.85	0.25		2.10																		
M11	1.870	0.000	1.87	0.25	1.40	2.12	2.11	1.00	0.00	1.00	2.96	0.00	2.96	0.20	1.40	0.69	1.06	1.21	2.96	0	1.00	1.00	1.00	0.00
I'11	1.870	0.020	1.85	0.25		2.10																		
M11	1.870	0.000	1.87	0.25	1.40	2.12	2.11	1.00	0.00	1.00	2.96	0.00	2.96	0.20	1.40	0.69	1.06	1.21	2.96	0	1.00	1.00	1.00	0.00
I'12	4.550	2.820	1.73	0.25		1.98																		
M12	4.550	2.800	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79	0	1.00	1.00	1.00	0.00
I'15	1.830	0.372	1.46	0.25		1.71																		
M15	1.830	0.300	1.53	0.25	1.40	1.78	1.75	3.60	1.40	2.20	8.82	0.00	8.82	0.43	5.04	2.47	2.34	4.01	8.82	0	2.20	2.20	3.60	0.00
I16	1.780	0.020	1.76	0.25		2.01																		
M16	1.780	0.000	1.78	0.25	1.40	2.03	2.02	1.00	0.00	1.00	2.83	0.00	2.83	0.20	1.40	0.69	1.06	1.08	2.83	0	1.00	1.00	1.00	0.00
I'16	1.780	0.072	1.71	0.25		1.96																		
M16	1.780	0.000	1.78	0.25	1.40	2.03	2.00	3.60	1.40	2.20	10.08	0.00	10.08	0.43	5.04	2.47	2.34	5.27	10.08	0	2.20	2.20	3.60	0.00
I'17	1.780	0.072	1.71	0.25		1.96																		
M17	1.780	0.000	1.78	0.25	1.40	2.03	2.00	3.60	1.40	2.20	10.08	0.00	10.08	0.43	5.04	2.47	2.34	5.27	10.08	0	2.20	2.20	3.60	0.00
								25.80	4.20	20.60	69.98	0.00	69.98	4.09	34.72	17.01	21.86	31.11	69.98	0	20.60	20.60	24.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.2 (2) Installation Work For Connection Pipes-Line2

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 2 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connections : 4

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00		Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N: pipes	N: m	L_2	L_3	W_2
I14	1.800	-0.012	1.81	0.26		2.07																		
M14	1.800	-0.100	1.90	0.26	1.60	2.16	2.12	**4.40**	1.40	3.00	14.93	0.00	14.93	1.22	7.04	3.45	4.35	7.13	14.93	0	3.00	3.00	4.40	0.00
I19	1.920	0.320	1.60	0.26		1.86																		
M19	1.920	0.300	1.62	0.26	1.60	1.88	1.87	1.00	0.00	1.00	3.00	0.00	3.00	0.41	1.60	0.78	1.45	0.77	3.00			1.00	1.00	0.00
I'19	1.920	0.320	1.60	0.26		1.86																		
M19	1.920	0.300	1.62	0.26	1.60	1.88	1.87	1.00	0.00	1.00	3.00	0.00	3.00	0.41	1.60	0.78	1.45	0.77	3.00			1.00	1.00	0.00
I17	1.780	-0.012	1.79	0.26		2.05																		
M17	1.780	-0.100	1.88	0.26	1.60	2.14	2.10	**4.40**	1.40	3.00	14.79	0.00	14.79	1.22	7.04	3.45	4.35	6.99	14.79			3.00	4.40	0.00
								10.80	2.80	8.00	35.72	0.00	35.72	3.26	17.28	8.47	11.60	15.65	35.72	0.00	3.00	8.00	10.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.2 (3) Installation Work For Connection Pipes-Line2

Bill of Quantity

Area : ECSI Pipe Diameter : 800 Shoring Type : TIMBER

Sewer Line Name : LINE 2 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connections: 4

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N	L_2	L_3	W_2
I3	1.690	0.016	1.67	0.27		1.94														pipes	m			
M3	1.690	0.000	1.69	0.27	1.90	1.96	1.96	8.00	1.50	6.50	29.80	0.00	29.80	4.71	15.20	7.45	12.09	10.26	29.80	1	3.00	6.50	8.00	0.00
I'3	1.690	0.018	1.67	0.27		1.94																		
M3	1.690	0.000	1.69	0.27	1.90	1.96	1.96	9.00	1.50	7.50	33.52	0.00	33.52	5.43	17.10	8.38	13.95	11.19	33.52	1	3.50	7.50	9.00	0.00
I5	1.900	-0.338	2.24	0.27		2.51																		
M5	1.900	-0.340	2.24	0.27	1.90	2.51	2.51	1.00	0.00	1.00	4.77	0.00	4.77	0.72	1.90	0.93	1.86	1.98	4.77	0	1.00	1.00	1.00	0.00
I'5	1.900	-0.338	2.24	0.27		2.51																		
M5	1.900	-0.340	2.24	0.27	1.90	2.51	2.51	1.00	0.00	1.00	4.77	0.00	4.77	0.72	1.90	0.93	1.86	1.98	4.77	0	1.00	1.00	1.00	0.00
								19.00	3.00	16.00	72.86	0.00	72.86	11.58	36.10	17.69	29.76	25.41	72.86	2	8.50	16.00	19.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.2 (4) Installation Work For Connection Pipes-Line2

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 2 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connections 3

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I4	1.820	-0.099	1.92	0.29		2.21														pipes	m			
M4	1.820	-0.100	1.92	0.29	2.10	2.21	2.21	1.00	0.00	1.00	4.65	0.00	4.65	1.09	2.10	1.03	2.23	1.39	4.65	0	1.00	1.00	1.00	0.00
I'4	1.820	-0.099	1.92	0.29		2.21																		
M4	1.820	-0.100	1.92	0.29	2.10	2.21	2.21	1.00	0.00	1.00	4.65	0.00	4.65	1.09	2.10	1.03	2.23	1.39	4.65	0	1.00	1.00	1.00	0.00
I'14	1.800	-0.472	2.27	0.29		2.56																		
M14	1.800	-0.500	2.30	0.29	2.10	2.59	2.58	28.00	2.60	25.40	151.71	0.00	151.71	27.79	58.80	28.81	56.49	66.41	151.71	6	1.40	25.40	28.00	0.00
								30.00	2.60	27.40	161.01	0.00	161.01	29.97	63.00	30.87	60.95	69.19	161.01	6	3.40	27.40	30.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (1) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 3 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IE_1 / IE_2	Sewer Invert Depth (m) ID_1 / ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 / H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.49 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type N	Pipe Number Concrete 4.00	Pipe Bedding Length (m) L_2	Sheeting (m) L_3	Waling & Strut (ton) W_2
																Length (m)				pipes	m			
I'2	4.340	0.854	3.49	0.26		3.75														0	2.00			
M2	4.340	0.850	3.49	0.26	1.60	3.75	3.75	2.00	0.00	2.00	12.00	0.00	12.00	0.81	3.20	1.57	2.90	7.53	12.00			2.00	2.00	0.00
I1	4.250	1.040	3.21	0.26		3.47																		
B	4.250	1.020	3.23	0.26	1.60	3.49	3.48	3.40	1.40	2.00	18.94	0.00	18.94	0.81	5.44	2.67	2.90	13.37	18.94	0	2.00	2.00	3.40	0.00
I'3	4.170	0.714	3.46	0.26		3.72																		
M3	4.170	0.710	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I'6	3.890	0.434	3.46	0.26		3.72																		
M6	3.890	0.430	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I2	4.100	0.947	3.15	0.26		3.41																		
M	4.100	0.940	3.16	0.26	1.60	3.42	3.42	3.40	1.40	2.00	18.61	0.00	18.61	0.81	5.44	2.67	2.90	13.04	18.61	0	2.00	2.00	3.40	0.00
I3	3.880	0.907	2.97	0.26		3.23																		
M	3.880	0.900	2.98	0.26	1.60	3.24	3.24	3.40	1.40	2.00	17.63	0.00	17.63	0.81	5.44	2.67	2.90	12.06	17.63	0	2.00	2.00	3.40	0.00
I'7	3.870	0.414	3.46	0.26		3.72																		
M7	3.870	0.410	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I4	3.880	0.867	3.01	0.26		3.27																		
M	3.880	0.860	3.02	0.26	1.60	3.28	3.28	3.40	1.40	2.00	17.85	0.00	17.85	0.81	5.44	2.67	2.90	12.28	17.85	0	2.00	2.00	3.40	0.00
I'8	3.880	0.424	3.46	0.26		3.72																		
M8	3.880	0.420	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I5	3.900	0.827	3.07	0.26		3.33																		
M	3.900	0.820	3.08	0.26	1.60	3.34	3.34	3.40	1.40	2.00	18.17	0.00	18.17	0.81	5.44	2.67	2.90	12.60	18.17	0	2.00	2.00	3.40	0.00
I'9	3.900	0.444	3.46	0.26		3.72																		
M9	3.900	0.440	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I6	3.910	0.787	3.12	0.26		3.38																		
M	3.910	0.780	3.13	0.26	1.60	3.39	3.39	3.40	1.40	2.00	18.45	0.00	18.45	0.81	5.44	2.67	2.90	12.88	18.45	0	2.00	2.00	3.40	0.00
I'10	3.930	0.474	3.46	0.26		3.72																		
M10	3.930	0.470	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I7	3.940	0.747	3.19	0.26		3.45																		
M	3.940	0.740	3.20	0.26	1.60	3.46	3.46	3.40	1.40	2.00	18.83	0.00	18.83	0.81	5.44	2.67	2.90	13.26	18.83	0	2.00	2.00	3.40	0.00
I7-11	3.960	0.504	3.46	0.26		3.72																		
M11	3.960	0.500	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I'13	3.930	0.474	3.46	0.26		3.72																		
M13	3.930	0.470	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I8	3.930	0.667	3.26	0.26		3.52																		
M	3.930	0.660	3.27	0.26	1.60	3.53	3.53	3.40	1.40	2.00	19.21	0.00	19.21	0.81	5.44	2.67	2.90	13.64	19.21	0	2.00	2.00	3.40	0.00
								45.20	**11.20**	**34.00**	**254.97**	**0.00**	**254.97**	**13.77**	**72.32**	**35.44**	**49.30**	**170.23**	**254.97**	**0**	**34.00**	**34.00**	**45.20**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (2) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 3 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		$_m$	
						Downstream					<= 6 m	=> 6 m				0.49				Length (m)	4.00		2.5	
		IE_1	ID_1			H_2														N				
		IE_2	ID_2	H_1	W_1	H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8			L_2	L_3	W_2
I'14	3.860	0.404	3.46	0.26		3.72														pipes	m			
M14	3.860	0.400	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I9	3.860	0.637	3.22	0.26		3.48																		
M	3.860	0.630	3.23	0.26	1.60	3.49	3.49	3.40	1.40	2.00	18.99	0.00	18.99	0.81	5.44	2.67	2.90	13.42	18.99	0	2.00	2.00	3.40	0.00
I15	3.820	0.367	3.45	0.26		3.71																		
M15	3.820	0.360	3.46	0.26	1.60	3.72	3.72	3.40	1.40	2.00	20.24	0.00	20.24	0.81	5.44	2.67	2.90	14.67	20.24	0	2.00	2.00	3.40	0.00
I'16	3.790	0.334	3.46	0.26		3.72																		
M16	3.790	0.330	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I17	3.760	0.307	3.45	0.26		3.71																		
M17	3.760	0.300	3.46	0.26	1.60	3.72	3.72	3.40	1.40	2.00	20.24	0.00	20.24	0.81	5.44	2.67	2.90	14.67	20.24	0	2.00	2.00	3.40	0.00
I10	3.720	0.501	3.22	0.26		3.48																		
M	3.720	0.490	3.23	0.26	1.60	3.49	3.49	5.40	1.40	4.00	30.16	0.00	30.16	1.63	8.64	4.23	5.79	20.14	30.16	1	0.00	4.00	5.40	0.00
I19	3.670	0.214	3.46	0.26		3.72																		
M19	3.670	0.210	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I'19	3.670	0.204	3.47	0.26		3.73																		
M19	3.670	**0.200**	3.47	0.26	1.60	3.73	3.73	2.00	0.00	2.00	11.94	0.00	11.94	0.81	3.20	1.57	2.90	7.47	11.94	0	2.00	2.00	2.00	0.00
I'20	3.590	0.134	3.46	0.26		3.72																		
M20	3.590	0.130	3.46	0.26	1.60	3.72	3.72	2.00	0.00	2.00	11.91	0.00	11.91	0.81	3.20	1.57	2.90	7.44	11.91	0	2.00	2.00	2.00	0.00
I11	3.440	0.347	3.09	0.26		3.35																		
M	3.550	**0.340**	3.21	0.26	1.60	3.47	3.42	3.40	1.40	2.00	18.61	0.00	18.61	0.81	5.44	2.67	2.90	13.04	18.61	0	2.00	2.00	3.40	0.00
I21	3.450	0.217	3.23	0.26		3.49																		
M21	3.450	0.210	3.24	0.26	1.60	3.50	3.50	3.40	1.40	2.00	19.04	0.00	19.04	0.81	5.44	2.67	2.90	13.47	19.04	0	2.00	2.00	3.40	0.00
I'22	3.330	0.204	3.13	0.26		3.39																		
M22	3.330	0.200	3.13	0.26	1.60	3.39	3.39	2.00	0.00	2.00	10.85	0.00	10.85	0.81	3.20	1.57	2.90	6.38	10.85	0	2.00	2.00	2.00	0.00
I23	3.160	0.207	2.95	0.26		3.21																		
M23	3.160	0.200	2.96	0.26	1.60	3.22	3.22	3.40	1.40	2.00	17.52	0.00	17.52	0.81	5.44	2.67	2.90	11.95	17.52	0	2.00	2.00	3.40	0.00
I'24	3.030	0.204	2.83	0.26		3.09																		
M24	3.030	0.200	2.83	0.26	1.60	3.09	3.09	2.00	0.00	2.00	9.89	0.00	9.89	0.81	3.20	1.57	2.90	5.42	9.89	0	2.00	2.00	2.00	0.00
I25	2.890	-0.035	2.93	0.26		3.19																		
M25	2.890	**-0.050**	2.94	0.26	1.60	3.20	3.20	7.40	1.40	6.00	37.89	0.00	37.89	2.44	11.84	5.80	8.70	23.39	37.89	1	2.00	6.00	7.40	0.00
I'25	2.890	-0.046	2.94	0.26		3.20																		
M25	2.890	**-0.050**	2.94	0.26	1.60	3.20	3.20	2.00	0.00	2.00	10.24	0.00	10.24	0.81	3.20	1.57	2.90	5.77	10.24	0	2.00	2.00	2.00	0.00
I12	2.550	0.117	2.43	0.26		2.69																		
M	2.550	**0.110**	2.44	0.26	1.60	2.70	2.70	3.40	1.40	2.00	14.69	0.00	14.69	0.81	5.44	2.67	2.90	9.12	14.69	0	2.00	2.00	3.40	0.00
								52.60	**12.60**	**40.00**	**287.94**	**0.00**	**287.94**	**16.22**	**84.16**	**41.24**	**57.99**	**188.71**	**287.94**	**2**	**32.00**	**40.00**	**52.60**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (3) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 3 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IE_1 IE_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.49 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type N	Pipe Number Concrete Length (m) 4.00	Pipe Bedding Length (m) L_2	Sheeting (m) $_m$ 2.5 L_3	Waling & Strut (ton) W_2
																				pipes	m			
I'26	2.530	0.024	2.51	0.26		2.77																		
M26	2.530	**0.020**	2.51	0.26	1.60	2.77	2.77	2.00	0.00	2.00	8.87	0.00	8.87	0.81	3.20	1.57	2.90	4.40	8.87	0	2.00	2.00	2.00	0.00
I'27	2.320	0.004	2.32	0.26		2.58																		
M27	2.320	**0.000**	2.32	0.26	1.60	2.58	2.58	2.00	0.00	2.00	8.26	0.00	8.26	0.81	3.20	1.57	2.90	3.79	8.26	0	2.00	2.00	2.00	0.00
I28	2.080	-0.093	2.17	0.26		2.43																		
M28	2.080	-0.100	2.18	0.26	1.60	2.44	2.44	3.40	1.40	2.00	13.28	0.00	13.28	0.81	5.44	2.67	2.90	7.71	13.28	0	2.00	2.00	3.40	0.00
I'29	2.220	-0.096	2.32	0.26		2.58																		
M29	2.220	**-0.100**	2.32	0.26	1.60	2.58	2.58	2.00	0.00	2.00	8.26	0.00	8.26	0.81	3.20	1.57	2.90	3.79	8.26	0	2.00	2.00	2.00	0.00
I33	2.120	-0.593	2.71	0.26		2.97																		
M33	2.120	**-0.600**	2.72	0.26	1.60	2.98	2.98	3.40	1.40	2.00	16.22	0.00	16.22	0.81	5.44	2.67	2.90	10.65	16.22	0	2.00	2.00	3.40	0.00
I35	2.260	-0.593	2.85	0.26		3.11																		
M35	2.260	**-0.600**	2.86	0.26	1.60	3.12	3.12	3.40	1.40	2.00	16.98	0.00	16.98	0.81	5.44	2.67	2.90	11.41	16.98	0	2.00	2.00	3.40	0.00
I'36	2.270	-0.646	2.92	0.26		3.18																		
M36	2.270	**-0.650**	2.92	0.26	1.60	3.18	3.18	2.00	0.00	2.00	10.18	0.00	10.18	0.81	3.20	1.57	2.90	5.71	10.18	0	2.00	2.00	2.00	0.00
I38	2.270	-0.489	2.76	0.26		3.02																		
M38	2.270	**-0.500**	2.77	0.26	1.60	3.03	3.03	5.40	1.40	4.00	26.18	0.00	26.18	1.63	8.64	4.23	5.79	16.16	26.18	1	0.00	4.00	5.40	0.00
I'38	2.270	-0.496	2.77	0.26		3.03																		
M38	2.270	**-0.500**	2.77	0.26	1.60	3.03	3.03	2.00	0.00	2.00	9.70	0.00	9.70	0.81	3.20	1.57	2.90	5.23	9.70	0	2.00	2.00	2.00	0.00
I'39	2.320	-0.296	2.62	0.26		2.88																		
M39	2.320	**-0.300**	2.62	0.26	1.60	2.88	2.88	2.00	0.00	2.00	9.22	0.00	9.22	0.81	3.20	1.57	2.90	4.75	9.22	0	2.00	2.00	2.00	0.00
I13	2.250	-0.763	3.01	0.26		3.27																		
M	2.250	-0.770	3.02	0.26	1.60	3.28	3.28	3.40	1.40	2.00	17.85	0.00	17.85	0.81	5.44	2.67	2.90	12.28	17.85	0	2.00	2.00	3.40	0.00
I40	2.250	-0.531	2.78	0.26		3.04																		
M40	2.250	**-0.550**	2.80	0.26	1.60	3.06	3.06	9.40	1.40	8.00	46.03	0.00	46.03	3.26	15.04	7.37	11.59	27.07	46.03	2	0.00	8.00	9.40	0.00
I'40	2.250	-0.546	2.80	0.26		3.06																		
M40	2.250	**-0.550**	2.80	0.26	1.60	3.06	3.06	2.00	0.00	2.00	9.80	0.00	9.80	0.81	3.20	1.57	2.90	5.33	9.80	0	2.00	2.00	2.00	0.00
I41	2.160	-0.593	2.75	0.26		3.01																		
M41	2.160	**-0.600**	2.76	0.26	1.60	3.02	3.02	3.40	1.40	2.00	16.43	0.00	16.43	0.81	5.44	2.67	2.90	10.86	16.43	0	2.00	2.00	3.40	0.00
I'41	2.160	-0.596	2.76	0.26		3.02																		
M41	2.160	**-0.600**	2.76	0.26	1.60	3.02	3.02	2.00	0.00	2.00	9.67	0.00	9.67	0.81	3.20	1.57	2.90	5.20	9.67	0	2.00	2.00	2.00	0.00
I42	2.100	-0.693	2.79	0.26		3.05																		
M42	2.100	**-0.700**	2.80	0.26	1.60	3.06	3.06	3.40	1.40	2.00	16.65	0.00	16.65	0.81	5.44	2.67	2.90	11.08	16.65	0	2.00	2.00	3.40	0.00
I'42	2.100	-0.696	2.80	0.26		3.06																		
M42	2.100	**-0.700**	2.80	0.26	1.60	3.06	3.06	2.00	0.00	2.00	9.80	0.00	9.80	0.81	3.20	1.57	2.90	5.33	9.80	0	2.00	2.00	2.00	0.00
								53.20	**11.20**	**42.00**	**253.38**	**0.00**	**253.38**	**17.04**	**85.12**	**41.71**	**60.88**	**150.79**	**253.38**	**3**	**30.00**	**42.00**	**53.20**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (4) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 3 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I43	2.100	-0.053	2.15	0.26		2.41														pipes	m			
M43	2.100	-0.060	2.16	0.26	1.60	2.42	2.42	3.40	1.40	2.00	13.17	0.00	13.17	0.81	5.44	2.67	2.90	7.60	13.17	0	2.00	2.00	3.40	0.00
I44	2.140	0.031	2.11	0.26		2.37																		
M44	2.140	**0.000**	2.14	0.26	1.60	2.40	2.39	15.40	1.40	14.00	58.89	0.00	58.89	5.70	24.64	12.07	20.28	26.54	58.89	3	2.00	14.00	15.40	0.00
								18.80	2.80	16.00	72.06	0.00	72.06	6.51	30.08	14.74	23.18	34.14	72.06	3	4.00	16.00	18.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (5) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI Pipe Diameter : 800
Sewer Line Name : LINE 3 Foundation Type : S360 OK ! S360
Inlet No. : Co.BOX-MANHOLE Number of connection : 12

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)	Shoring Type
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2	
I1-4	4.200	1.977	2.22	0.27		2.49														pipes	m				
M4	4.200	1.950	2.25	0.27	1.90	2.52	2.51	13.40	1.40	12.00	63.91	0.00	63.91	8.69	25.46	12.48	22.32	29.11	63.91	3	0.00	12.00	13.40	0.00	TIMBER
I'4	4.200	1.954	2.25	0.27		2.52																			
M4	4.200	1.950	2.25	0.27	1.90	2.52	2.52	2.00	0.00	2.00	9.58	0.00	9.58	1.45	3.80	1.86	3.72	4.00	9.58	0	2.00	2.00	2.00	0.00	TIMBER
I1-5	4.110	-0.096	4.21	0.27		4.48																			
M5	4.110	-0.100	4.21	0.27	2.00	4.48	4.48	2.00	0.00	2.00	17.92	0.00	17.92	1.45	4.00	1.96	3.99	11.97	17.92	0	2.00	2.00	2.00	0.00	TYPE1
I'5	4.110	-0.096	4.21	0.27		4.48																			
M5	4.110	-0.100	4.21	0.27	2.00	4.48	4.48	2.00	0.00	2.00	17.92	0.00	17.92	1.45	4.00	1.96	3.99	11.97	17.92	0	2.00	2.00	2.00	0.00	TYPE1
I7-12	3.950	-0.146	4.10	0.27		4.37																			
M12	3.950	-0.150	4.10	0.27	2.00	4.37	4.37	2.00	0.00	2.00	17.48	0.00	17.48	1.45	4.00	1.96	3.99	11.53	17.48	0	2.00	2.00	2.00	0.00	TYPE1
I'12	3.950	-0.106	4.06	0.27		4.33																			
M12	3.950	-0.110	4.06	0.27	2.00	4.33	4.33	2.00	0.00	2.00	17.32	0.00	17.32	1.45	4.00	1.96	3.99	11.37	17.32	0	2.00	2.00	2.00	0.00	TYPE1
I18	3.720	-0.146	3.87	0.27		4.14																			
M18	3.720	-0.150	3.87	0.27	2.00	4.14	4.14	2.00	0.00	2.00	16.56	0.00	16.56	1.45	4.00	1.96	3.99	10.61	16.56	0	2.00	2.00	2.00	0.00	TYPE1
I32	1.990	-0.446	2.44	0.27		2.71																			
M32	1.990	**-0.450**	2.44	0.27	1.90	2.71	2.71	2.00	0.00	2.00	10.30	0.00	10.30	1.45	3.80	1.86	3.72	4.72	10.30	0	2.00	2.00	2.00	0.00	TIMBER
I'32	1.990	-0.446	2.44	0.27		2.71																			
M32	1.990	**-0.450**	2.44	0.27	1.90	2.71	2.71	2.00	0.00	2.00	10.30	0.00	10.30	1.45	3.80	1.86	3.72	4.72	10.30	0	2.00	2.00	2.00	0.00	TIMBER
I37	2.260	-0.696	2.96	0.27		3.23																			
M37	2.260	**-0.700**	2.96	0.27	1.90	3.23	3.23	2.00	0.00	2.00	12.28	0.00	12.28	1.45	3.80	1.86	3.72	6.70	12.28	0	2.00	2.00	2.00	0.00	TIMBER
I'37	2.260	-0.696	2.96	0.27		3.23																			
M37	2.260	**-0.700**	2.96	0.27	1.90	3.23	3.23	2.00	0.00	2.00	12.28	0.00	12.28	1.45	3.80	1.86	3.72	6.70	12.28	0	2.00	2.00	2.00	0.00	TIMBER
I'44	2.140	0.004	2.14	0.27		2.41																			
M44	2.140	0.000	2.14	0.27	1.90	2.41	2.41	2.00	0.00	2.00	9.16	0.00	9.16	1.45	3.80	1.86	3.72	3.58	9.16	0	2.00	2.00	2.00	0.00	TIMBER
****								**38.20**	**4.20**	**34.00**	**215.01**	**0.00**	**215.01**	**24.64**	**68.26**	**33.45**	**64.59**	**116.97**	**215.01**	**3**	**22.00**	**34.00**	**35.40**	**0.00**	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.3 (6) Installation Work For Connection Pipes-Line3

Bill of Quantity

Area : ECSI
Sewer Line Name : LINE 3
Inlet No. : Co.BOX-MANHOLE

Pipe Diameter : 1000
Foundation Type : S360 OK ! S360
Number of connection : 3

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (piles)	Waling & Strut (ton)	Shoring Type
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.49	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type Length (m)	Concrete 4.00		m 8.6		
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2	
I'11	3.960	-0.597	4.56	0.29		4.85														pipes	m				
M11	3.960	-0.620	4.58	0.29	2.00	4.87	4.86	11.40	1.40	10.00	110.81	0.00	110.81	10.94	22.80	11.17	20.66	78.98	110.81	2	2.00	10.00	50.00	2.42	TYPE1
I30	1.990	-0.637	2.63	0.29		2.92																			
M30	1.990	-0.650	2.64	0.29	2.10	2.93	2.93	6.40	1.40	5.00	39.38	0.00	39.38	5.47	13.44	6.59	11.12	21.67	39.38	1	1.00	5.00	25.00	2.43	TIMBER
I'30	1.990	-0.617	2.61	0.29		2.90																			
M30	1.990	-0.650	2.64	0.29	2.10	2.93	2.92	16.40	1.40	15.00	100.57	0.00	100.57	16.41	34.44	16.88	33.36	50.33	100.57	3	3.00	15.00	75.00	2.43	TIMBER
								34.20	**4.20**	**30.00**	**250.76**	**0.00**	**250.76**	**32.82**	**70.68**	**34.63**	**65.14**	**150.99**	**250.76**	**6**	**6.00**	**30.00**	**150.00**	**7.28**	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.4 (1) Installation Work For Connection Pipes-Line4

Bill of Quantity

Area : ECSI Pipe Diameter : 800 Shoring Type : TIMBER

Sewer Line Name : LINE 4 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-MANHOLE Number of connection: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.49	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete		$_m$ 2.5	
						Downstream														Length (m)	4.00			
		IE_1 IE_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I25	4.460	1.548	2.91	0.27		3.18														pipes	m			
M25	4.460	**1.500**	2.96	0.27	1.90	3.23	3.21	2.40	1.40	1.00	14.64	0.00	14.64	0.72	4.56	2.23	1.86	10.55	14.64	0	1.00	1.00	2.40	0.00
I'25	4.460	1.588	2.87	0.27		3.14																		
M25	4.460	**1.500**	2.96	0.27	1.90	3.23	3.19	4.40	1.40	3.00	26.67	0.00	26.67	2.17	8.36	4.10	5.58	16.99	26.67			3.00	4.40	0.00
								6.80	2.80	4.00	41.31	0.00	41.31	2.89	12.92	6.33	7.44	27.54	41.31	0	1.00	4.00	6.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.4 (2) Installation Work For Connection Pipes-Line4

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 4 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-MANHOLE Number of connection: 9

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IE_1 / IE_2	Sewer Invert Depth (m) ID_1 / ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 / H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m 0.49 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type / Concrete Length (m) / 4.00 N	Pipe Bedding Length (m) L_2	Sheeting (m) 2.5 L_3	Waling & Strut (ton) W_2
																				pipes / m			
I'13	4.680	1.411	3.27	0.29		3.56																	
M13	4.680	1.400	3.28	0.29	2.10	3.57	3.57	11.40	1.40	10.00	85.47	0.00	85.47	10.94	23.94	11.73	22.24	51.50	85.47	2 / 2.00	10.00	11.40	0.00
I14	4.700	1.814	2.89	0.29		3.18																	
M14	4.700	1.800	2.90	0.29	2.10	3.19	3.19	14.40	1.40	13.00	96.47	0.00	96.47	14.22	30.24	14.82	28.91	52.74	96.47		13.00	14.40	0.00
I24	4.140	1.514	2.63	0.29		2.92																	
M24	4.140	**1.500**	2.64	0.29	2.10	2.93	2.93	14.40	1.40	13.00	88.61	0.00	88.61	14.22	30.24	14.82	28.91	44.88	88.61		13.00	14.40	0.00
I27	3.970	0.721	3.25	0.29		3.54																	
M27	3.970	**0.700**	3.27	0.29	2.10	3.56	3.55	21.40	1.40	20.00	159.54	0.00	159.54	21.88	44.94	22.02	44.48	93.04	159.54		20.00	21.40	0.00
I'27	3.970	0.709	3.26	0.29		3.55																	
M27	3.970	**0.700**	3.27	0.29	2.10	3.56	3.56	9.40	1.40	8.00	70.28	0.00	70.28	8.75	19.74	9.67	17.79	42.82	70.28		8.00	9.40	0.00
I32	3.700	0.914	2.79	0.29		3.08																	
M32	3.700	**0.900**	2.80	0.29	2.10	3.09	3.09	14.40	1.40	13.00	93.45	0.00	93.45	14.22	30.24	14.82	28.91	49.72	93.45		13.00	14.40	0.00
I'32	3.700	0.907	2.79	0.29		3.08																	
M32	3.700	**0.900**	2.80	0.29	2.10	3.09	3.09	7.40	1.40	6.00	48.02	0.00	48.02	6.56	15.54	7.61	13.35	27.06	48.02		6.00	7.40	0.00
I'38	3.900	1.162	2.74	0.29		3.03																	
M38	3.900	**1.150**	2.75	0.29	2.10	3.04	3.04	12.40	1.40	11.00	79.17	0.00	79.17	12.03	26.04	12.76	24.47	41.94	79.17		11.00	12.40	0.00
I 35	3.870	1.012	2.86	0.29		3.15																	
M35	3.870	**1.000**	2.87	0.29	2.10	3.16	3.16	12.40	1.40	11.00	82.29	0.00	82.29	12.03	26.04	12.76	24.47	45.06	82.29		11.00	12.40	0.00
								117.60	**12.60**	**105.00**	**803.30**	**0.00**	**803.30**	**114.85**	**246.96**	**121.01**	**233.53**	**448.76**	**803.30**	**2 / 2.00**	**105.00**	**117.60**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.4 (3) Installation Work For Connection Pipes-Line4

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 4 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connection: 4

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I'1	3.660	0.929	2.73	0.29		3.02														pipes	m			
M1	3.660	0.900	2.76	0.29	2.10	3.05	3.04	14.40	1.40	13.00	91.93	0.00	91.93	14.22	30.24	14.82	28.91	48.20	91.93	3	1.00	13.00	14.40	0.00
I 2	3.630	0.913	2.72	0.29		3.01																		
M2	3.630	0.900	2.73	0.29	2.10	3.02	3.02	6.40	1.40	5.00	40.59	0.00	40.59	5.47	13.44	6.59	11.12	22.88	40.59	1	1.00	5.00	6.40	0.00
I 5	3.450	0.713	2.74	0.29		3.03																		
M5	3.450	0.700	2.75	0.29	2.10	3.04	3.04	6.40	1.40	5.00	40.86	0.00	40.86	5.47	13.44	6.59	11.12	23.15	40.86	1	1.00	5.00	6.40	0.00
I 6	3.480	0.723	2.76	0.29		3.05																		
M6	3.480	0.700	2.78	0.29	2.10	3.07	3.06	11.40	1.40	10.00	73.26	0.00	73.26	10.94	23.94	11.73	22.24	39.29	73.26	2	2.00	10.00	11.40	0.00
								38.60	5.60	33.00	246.64	0.00	246.64	36.10	81.06	39.72	73.39	133.53	246.64	7.00	5.00	33.00	38.60	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.4 (4) Installation Work For Connection Pipes-Line4

Bill of Quantity

Area : ECSI Pipe Diameter : 1200 Shoring Type : TIMBER

Sewer Line Name : LINE 4 Foundation Type : S360 OK ! S360

Manhole No. : Co.BOX-MANHOLE Number of connection: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 3.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I29	4.250	0.863	3.39	0.29		3.68														pipes	m			
M29	4.250	0.850	3.40	0.29	2.60	3.69	3.69	13.40	1.40	12.00	128.56	0.00	128.56	19.55	34.84	17.07	37.86	73.63	128.56	4	0.00	12.00	13.40	0.00
I'29	4.250	0.862	3.39	0.29		3.68																		
M29	4.250	0.850	3.40	0.29	2.60	3.69	3.69	12.40	1.40	11.00	118.97	0.00	118.97	17.92	32.24	15.80	34.70	68.47	118.97	3	2.00	11.00	12.40	0.00
								25.80	2.80	23.00	247.53	0.00	247.53	37.47	67.08	32.87	72.56	142.10	247.53	7	2.00	23.00	25.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.4 (5) Installation Work For Connection Pipes-Line4

Bill of Quantity

Area : ECSI Pipe Diameter : 1200 Shoring Type : TIMBER

Sewer Line Name : LINE 4 Foundation Type : S360 OK ! S360

Manhole No. : Co.CP-MANHOLE Number of connection: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream					Backhoe Depth	Clamshell Depth	Total		Excavated Area (m^2)	Designed Thickness (m)	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type	Concrete			
						Downstream					<= 6 m	=> 6 m				0.49				Length (m)	3.00		2.5	
		IE_1	ID_1			H_2																		
		IE_2	ID_2	H_1	W_1	H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I9	4.360	1.005	3.35	0.29		3.64														pipes	m			
M9	4.360	1.000	3.36	0.29	2.60	3.65	3.65	5.40	1.40	4.00	51.25	0.00	51.25	6.52	14.04	6.88	12.62	31.75	51.25	1	1.00	4.00	5.40	0.00
I'9	4.360	1.012	3.35	0.29		3.64																		
M9	4.360	1.000	3.36	0.29	2.60	3.65	3.65	12.40	1.40	11.00	117.68	0.00	117.68	17.92	32.24	15.80	34.70	67.18	117.68	3	2.00	11.00	12.40	0.00
								17.80	2.80	15.00	168.93	0.00	168.93	24.44	46.28	22.68	47.32	98.93	168.93	4	3.00	15.00	17.80	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (1) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 400 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.49	Yellow Sand Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 4.00		$_m$ 2.5	
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I1	4.340	2.472	1.87	0.25		2.12														pipes	m			
M1	4.340	2.300	2.04	0.25	1.40	2.29	2.21	8.60	1.10	7.50	26.61	0.00	26.61	1.47	12.04	5.90	7.98	12.73	26.61	1	3.50	7.50	8.60	0.00
I2	4.240	2.420	1.82	0.25		2.07																		
M2	4.240	2.400	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I'2	4.240	2.420	1.82	0.25		2.07																		
M2	4.240	2.400	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I3	4.250	2.520	1.73	0.25		1.98																		
M3	4.250	2.500	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79	0	1.00	1.00	1.00	0.00
I'3	4.250	2.520	1.73	0.25		1.98																		
M3	4.250	2.500	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79	0	1.00	1.00	1.00	0.00
I4	4.240	2.420	1.82	0.25		2.07																		
M4	4.240	2.400	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I'4	4.240	2.420	1.82	0.25		2.07																		
M4	4.240	2.400	1.84	0.25	1.40	2.09	2.08	1.00	0.00	1.00	2.92	0.00	2.92	0.20	1.40	0.69	1.06	1.17	2.92	0	1.00	1.00	1.00	0.00
I5	4.190	2.420	1.77	0.25		2.02																		
M5	4.190	2.400	1.79	0.25	1.40	2.04	2.03	1.00	0.00	1.00	2.85	0.00	2.85	0.20	1.40	0.69	1.06	1.10	2.85	0	1.00	1.00	1.00	0.00
I'5	4.190	2.420	1.77	0.25		2.02																		
M5	4.190	2.400	1.79	0.25	1.40	2.04	2.03	1.00	0.00	1.00	2.85	0.00	2.85	0.20	1.40	0.69	1.06	1.10	2.85	0	1.00	1.00	1.00	0.00
I6	4.270	2.520	1.75	0.25		2.00																		
M6	4.270	2.500	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82	0	1.00	1.00	1.00	0.00
I'6	4.270	2.520	1.75	0.25		2.00																		
M6	4.270	2.500	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82	0	1.00	1.00	1.00	0.00
I9	4.550	2.820	1.73	0.25		1.98																		
M9	4.550	2.800	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79	0	1.00	1.00	1.00	0.00
I'9	4.550	2.820	1.73	0.25		1.98																		
M9	4.550	2.800	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79	0	1.00	1.00	1.00	0.00
I10	4.620	2.820	1.80	0.25		2.05																		
M10	4.620	2.800	1.82	0.25	1.40	2.07	2.06	1.00	0.00	1.00	2.89	0.00	2.89	0.20	1.40	0.69	1.06	1.14	2.89	0	1.00	1.00	1.00	0.00
I'10	4.620	2.820	1.80	0.25		2.05																		
M10	4.620	2.800	1.82	0.25	1.40	2.07	2.06	1.00	0.00	1.00	2.89	0.00	2.89	0.20	1.40	0.69	1.06	1.14	2.89	0	1.00	1.00	1.00	0.00
I11	4.730	2.920	1.81	0.25		2.06																		
M11	4.730	2.900	1.83	0.25	1.40	2.08	2.07	1.00	0.00	1.00	2.90	0.00	2.90	0.20	1.40	0.69	1.06	1.15	2.90	0	1.00	1.00	1.00	0.00
I'11	4.730	2.920	1.81	0.25		2.06																		
M11	4.730	2.900	1.83	0.25	1.40	2.08	2.07	1.00	0.00	1.00	2.90	0.00	2.90	0.20	1.40	0.69	1.06	1.15	2.90	0	1.00	1.00	1.00	0.00
								25.60	1.10	23.50	72.37	0.00	72.37	4.67	34.44	16.88	24.94	30.55	72.37	1	19.50	23.50	24.60	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (2) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 400 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-INLET

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00		Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I13	4.670	2.920	1.75	0.25		2.00														pipes	m			
M13	4.670	2.900	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82	0	1.00	1.00	1.00	0.00
I'13	4.670	2.920	1.75	0.25		2.00																		
M13	4.670	2.900	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82			1.00	1.00	0.00
I14	4.720	2.920	1.80	0.25		2.05																		
M14	4.720	2.900	1.82	0.25	1.40	2.07	2.06	1.00	0.00	1.00	2.89	0.00	2.89	0.20	1.40	0.69	1.06	1.14	2.89			1.00	1.00	0.00
I'14	4.720	2.920	1.80	0.25		2.05																		
M14	4.720	2.900	1.82	0.25	1.40	2.07	2.06	1.00	0.00	1.00	2.89	0.00	2.89	0.20	1.40	0.69	1.06	1.14	2.89			1.00	1.00	0.00
I15	4.800	3.020	1.78	0.25		2.03																		
M15	4.800	3.000	1.80	0.25	1.40	2.05	2.04	1.00	0.00	1.00	2.86	0.00	2.86	0.20	1.40	0.69	1.06	1.11	2.86			1.00	1.00	0.00
I'15	4.800	3.020	1.78	0.25		2.03																		
M15	4.800	3.000	1.80	0.25	1.40	2.05	2.04	1.00	0.00	1.00	2.86	0.00	2.86	0.20	1.40	0.69	1.06	1.11	2.86			1.00	1.00	0.00
I16	4.850	3.120	1.73	0.25		1.98																		
M16	4.850	3.100	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79			1.00	1.00	0.00
I'16	4.850	3.120	1.73	0.25		1.98																		
M16	4.850	3.100	1.75	0.25	1.40	2.00	1.99	1.00	0.00	1.00	2.79	0.00	2.79	0.20	1.40	0.69	1.06	1.04	2.79			1.00	1.00	0.00
I17	4.900	3.120	1.78	0.25		2.03																		
M17	4.900	3.100	1.80	0.25	1.40	2.05	2.04	1.00	0.00	1.00	2.86	0.00	2.86	0.20	1.40	0.69	1.06	1.11	2.86			1.00	1.00	0.00
I'17	4.900	3.120	1.78	0.25		2.03																		
M17	4.900	3.100	1.80	0.25	1.40	2.05	2.04	1.00	0.00	1.00	2.86	0.00	2.86	0.20	1.40	0.69	1.06	1.11	2.86			1.00	1.00	0.00
I18	4.970	3.220	1.75	0.25		2.00																		
M18	4.970	3.200	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82			1.00	1.00	0.00
I'18	4.970	3.220	1.75	0.25		2.00																		
M18	4.970	3.200	1.77	0.25	1.40	2.02	2.01	1.00	0.00	1.00	2.82	0.00	2.82	0.20	1.40	0.69	1.06	1.07	2.82			1.00	1.00	0.00
								13.00	0.00	13.00	34.08	0.00	34.08	2.40	16.80	8.23	12.72	13.13	34.08	0	1.00	13.00	12.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (3) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-MANHOLE Number of connection: 13

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I39	3.990	1.104	2.89	0.26		3.15														pipes	m			
M39	3.990	1.100	2.89	0.26	1.60	3.15	3.15	2.00	0.00	2.00	10.08	0.00	10.08	0.81	3.20	1.57	2.90	5.61	10.08	0	2.00	2.00	2.00	0.00
I'39	3.990	1.104	2.89	0.26		3.15																		
M39	3.990	1.100	2.89	0.26	1.60	3.15	3.15	2.00	0.00	2.00	10.08	0.00	10.08	0.81	3.20	1.57	2.90	5.61	10.08			2.00	2.00	0.00
I40	4.020	1.104	2.92	0.26		3.18																		
M40	4.020	1.100	2.92	0.26	1.60	3.18	3.18	2.00	0.00	2.00	10.18	0.00	10.18	0.81	3.20	1.57	2.90	5.71	10.18			2.00	2.00	0.00
I'40	4.020	1.104	2.92	0.26		3.18																		
M40	4.020	1.100	2.92	0.26	1.60	3.18	3.18	2.00	0.00	2.00	10.18	0.00	10.18	0.81	3.20	1.57	2.90	5.71	10.18			2.00	2.00	0.00
I44	3.840	1.004	2.84	0.26		3.10																		
M44	3.840	1.000	2.84	0.26	1.60	3.10	3.10	2.00	0.00	2.00	9.92	0.00	9.92	0.81	3.20	1.57	2.90	5.45	9.92			2.00	2.00	0.00
I'44	3.840	1.004	2.84	0.26		3.10																		
M44	3.840	1.000	2.84	0.26	1.60	3.10	3.10	2.00	0.00	2.00	9.92	0.00	9.92	0.81	3.20	1.57	2.90	5.45	9.92			2.00	2.00	0.00
I53	1.880	-1.096	2.98	0.26		3.24																		
M53	1.880	-1.100	2.98	0.26	1.60	3.24	3.24	2.00	0.00	2.00	10.37	0.00	10.37	0.81	3.20	1.57	2.90	5.90	10.37			2.00	2.00	0.00
I'53	1.880	-1.096	2.98	0.26		3.24																		
M53	1.880	-1.100	2.98	0.26	1.60	3.24	3.24	2.00	0.00	2.00	10.37	0.00	10.37	0.81	3.20	1.57	2.90	5.90	10.37			2.00	2.00	0.00
I55	1.780	-1.146	2.93	0.26		3.19																		
M55	1.780	-1.150	2.93	0.26	1.60	3.19	3.19	2.00	0.00	2.00	10.21	0.00	10.21	0.81	3.20	1.57	2.90	5.74	10.21			2.00	2.00	0.00
I'55	1.780	-1.146	2.93	0.26		3.19																		
M55	1.780	-1.150	2.93	0.26	1.60	3.19	3.19	2.00	0.00	2.00	10.21	0.00	10.21	0.81	3.20	1.57	2.90	5.74	10.21			2.00	2.00	0.00
I59	2.100	-0.773	2.87	0.26		3.13																		
M59	2.100	-0.800	2.90	0.26	1.60	3.16	3.15	13.40	1.40	12.00	67.54	0.00	67.54	4.88	21.44	10.51	17.39	39.64	67.54			12.00	13.40	0.00
I'59	2.100	-0.775	2.88	0.26		3.14																		
M59	2.100	-0.800	2.90	0.26	1.60	3.16	3.15	12.40	1.40	11.00	62.50	0.00	62.50	4.48	19.84	9.72	15.94	36.84	62.50			11.00	12.40	0.00
								46.80	**2.80**	**44.00**	**231.56**	**0.00**	**231.56**	**17.46**	**73.28**	**35.91**	**62.33**	**133.32**	**231.56**	**0**	**2.00**	**44.00**	**45.80**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (4) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 600 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connection: 15

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N	L_2	L_3	W_2
I7	4.450	2.370	2.08	0.26		2.34														pipes			
M7	4.450	2.350	2.10	0.26	1.60	2.36	2.35	1.00	0.00	1.00	3.76	0.00	3.76	0.41	1.60	0.78	1.45	1.53	3.76	0	1.00	1.00	0.00
I'7	4.450	2.370	2.08	0.26		2.34																	
M7	4.450	2.350	2.10	0.26	1.60	2.36	2.35	1.00	0.00	1.00	3.76	0.00	3.76	0.41	1.60	0.78	1.45	1.53	3.76		1.00	1.00	0.00
I8	4.490	2.770	1.72	0.26		1.98																	
M8	4.490	2.750	1.74	0.26	1.60	2.00	1.99	1.00	0.00	1.00	3.19	0.00	3.19	0.41	1.60	0.78	1.45	0.96	3.19		1.00	1.00	0.00
I'8	4.490	2.770	1.72	0.26		1.98																	
M8	4.490	2.750	1.74	0.26	1.60	2.00	1.99	1.00	0.00	1.00	3.19	0.00	3.19	0.41	1.60	0.78	1.45	0.96	3.19		1.00	1.00	0.00
I24	4.280	2.870	1.41	0.26		1.67																	
M24	4.280	2.850	1.43	0.26	1.60	1.69	1.68	1.00	0.00	1.00	2.69	0.00	2.69	0.41	1.60	0.78	1.45	0.46	2.69		1.00	1.00	0.00
I'24	4.280	2.870	1.41	0.26		1.67																	
M24	4.280	2.850	1.43	0.26	1.60	1.69	1.68	1.00	0.00	1.00	2.69	0.00	2.69	0.41	1.60	0.78	1.45	0.46	2.69		1.00	1.00	0.00
I25	4.260	2.420	1.84	0.26		2.10																	
M25	4.260	2.400	1.86	0.26	1.60	2.12	2.11	1.00	0.00	1.00	3.38	0.00	3.38	0.41	1.60	0.78	1.45	1.15	3.38		1.00	1.00	0.00
I'25	4.260	2.420	1.84	0.26		2.10																	
M25	4.260	2.400	1.86	0.26	1.60	2.12	2.11	1.00	0.00	1.00	3.38	0.00	3.38	0.41	1.60	0.78	1.45	1.15	3.38		1.00	1.00	0.00
I30	3.830	1.770	2.06	0.26		2.32																	
M30	3.830	1.750	2.08	0.26	1.60	2.34	2.33	1.00	0.00	1.00	3.73	0.00	3.73	0.41	1.60	0.78	1.45	1.50	3.73		1.00	1.00	0.00
I'30	3.830	1.770	2.06	0.26		2.32																	
M30	3.830	1.750	2.08	0.26	1.60	2.34	2.33	1.00	0.00	1.00	3.73	0.00	3.73	0.41	1.60	0.78	1.45	1.50	3.73		1.00	1.00	0.00
I31	3.860	1.770	2.09	0.26		2.35																	
M31	3.860	1.750	2.11	0.26	1.60	2.37	2.36	1.00	0.00	1.00	3.78	0.00	3.78	0.41	1.60	0.78	1.45	1.55	3.78		1.00	1.00	0.00
I'31	3.860	1.770	2.09	0.26		2.35																	
M31	3.860	1.750	2.11	0.26	1.60	2.37	2.36	1.00	0.00	1.00	3.78	0.00	3.78	0.41	1.60	0.78	1.45	1.55	3.78		1.00	1.00	0.00
I33	4.180	2.220	1.96	0.26		2.22																	
M33	4.180	2.200	1.98	0.26	1.60	2.24	2.23	1.00	0.00	1.00	3.57	0.00	3.57	0.41	1.60	0.78	1.45	1.34	3.57		1.00	1.00	0.00
I'33	4.180	2.220	1.96	0.26		2.22																	
M33	4.180	2.200	1.98	0.26	1.60	2.24	2.23	1.00	0.00	1.00	3.57	0.00	3.57	0.41	1.60	0.78	1.45	1.34	3.57		1.00	1.00	0.00
								15.00	0.00	15.00	41.00	0.00	41.00	6.15	24.00	11.76	21.75	7.49	41.00	0	15.00	15.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (5) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI | Pipe Diameter : 800 | Shoring Type : TIMBER

Sewer Line Name : LINE 5 | Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE | Number of connection: 9

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m)	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3)			Pipe & Foundation Volume (m^3)	Road		Backfill (m^3)		Residual Soil (m^3)	Pipe Number		Pipe Bedding Length (m)	Sheeting (m)	Waling & Strut (ton)
						Upstream / Downstream					Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total		Excavated Area (m^2)	Designed Thickness (m) 0.49	Yellow Sand Backfill	Black Sand Sandy Soil Backfill		Type / Length (m)	Concrete 4.00		$_m$ 2.5	
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I22	4.650	1.965	2.68	0.27		2.95														pipes	m			
M22	4.650	1.950	2.70	0.27	1.90	2.97	2.97	7.60	1.60	6.00	42.89	0.00	42.89	4.34	14.44	7.08	11.16	24.65	42.89	1	2.00	6.00	7.60	0.00
I'28	3.880	1.217	2.66	0.27		2.93																		
M28	3.880	**1.200**	2.68	0.27	1.90	2.95	2.95	8.60	1.60	7.00	48.21	0.00	48.21	5.07	16.34	8.01	13.02	27.18	48.21	1	3.00	7.00	8.60	0.00
I'1	4.340	1.917	2.42	0.27		2.69																		
M1	4.340	1.900	2.44	0.27	1.90	2.71	2.71	8.60	1.60	7.00	44.29	0.00	44.29	5.07	16.34	8.01	13.02	23.26	44.29	1	3.00	7.00	8.60	0.00
I'34	4.120	1.419	2.70	0.27		2.97																		
M34	4.120	1.400	2.72	0.27	1.90	2.99	2.99	9.60	1.60	8.00	54.54	0.00	54.54	5.79	18.24	8.94	14.88	30.72	54.54	2	0.00	8.00	9.60	0.00
I35	4.130	1.417	2.71	0.27		2.98																		
M35	4.130	1.400	2.73	0.27	1.90	3.00	3.00	8.60	1.60	7.00	49.02	0.00	49.02	5.07	16.34	8.01	13.02	27.99	49.02	1	3.00	7.00	8.60	0.00
I36	4.160	1.417	2.74	0.27		3.01																		
M36	4.160	1.400	2.76	0.27	1.90	3.03	3.03	8.60	1.60	7.00	49.52	0.00	49.52	5.07	16.34	8.01	13.02	28.49	49.52	1	3.00	7.00	8.60	0.00
I'36	4.160	1.419	2.74	0.27		3.01																		
M36	4.160	1.400	2.76	0.27	1.90	3.03	3.03	9.60	1.60	8.00	55.27	0.00	55.27	5.79	18.24	8.94	14.88	31.45	55.27	2	0.00	8.00	9.60	0.00
I20	5.020	2.952	2.07	0.27		2.34																		
M20	5.020	2.950	2.07	0.27	1.90	2.34	2.34	1.00	0.00	1.00	4.45	0.00	4.45	0.72	1.90	0.93	1.86	1.66	4.45	0	1.00	1.00	1.00	0.00
I'20	5.020	2.952	2.07	0.27		2.34																		
M20	5.020	2.950	2.07	0.27	1.90	2.34	2.34	1.00	0.00	1.00	4.45	0.00	4.45	0.72	1.90	0.93	1.86	1.66	4.45	0	1.00	1.00	1.00	0.00
								63.20	**11.20**	**52.00**	**352.64**	**0.00**	**352.64**	**37.64**	**120.08**	**58.84**	**96.72**	**197.08**	**352.64**	**9**	**16.00**	**52.00**	**63.20**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (6) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.BOX-MANHOLE Number of connection: 7

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_t	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I45	3.710	0.807	2.90	0.29		3.19														pipes	m			
M45	3.710	0.800	2.91	0.29	2.10	3.20	3.20	7.40	1.40	6.00	49.73	0.00	49.73	6.56	15.54	7.61	13.35	28.77	49.73	1	2.00	6.00	7.40	0.00
I47	3.540	0.507	3.03	0.29		3.32																		
M47	3.540	**0.500**	3.04	0.29	2.10	3.33	3.33	7.40	1.40	6.00	51.75	0.00	51.75	6.56	15.54	7.61	13.35	30.79	51.75			6.00	7.40	0.00
I'49	3.430	0.207	3.22	0.29		3.51																		
M49	3.430	**0.200**	3.23	0.29	2.10	3.52	3.52	7.40	1.40	6.00	54.71	0.00	54.71	6.56	15.54	7.61	13.35	33.75	54.71			6.00	7.40	0.00
I51	2.460	-0.943	3.40	0.29		3.69																		
M51	2.460	**-0.950**	3.41	0.29	2.10	3.70	3.70	7.40	1.40	6.00	57.50	0.00	57.50	6.56	15.54	7.61	13.35	36.54	57.50			6.00	7.40	0.00
I'51	2.460	-0.943	3.40	0.29		3.69																		
M51	2.460	**-0.950**	3.41	0.29	2.10	3.70	3.70	7.40	1.40	6.00	57.50	0.00	57.50	6.56	15.54	7.61	13.35	36.54	57.50			6.00	7.40	0.00
I56	1.820	-0.893	2.71	0.29		3.00																		
M56	1.820	**-0.900**	2.72	0.29	2.10	3.01	3.01	7.40	1.40	6.00	46.78	0.00	46.78	6.56	15.54	7.61	13.35	25.82	46.78			6.00	7.40	0.00
I'58	1.680	-0.944	2.62	0.29		2.91																		
M58	1.680	**-0.950**	2.63	0.29	2.10	2.92	2.92	6.40	1.40	5.00	39.25	0.00	39.25	5.47	13.44	6.59	11.12	21.54	39.25			5.00	6.40	0.00
								50.80	**9.80**	**41.00**	**357.22**	**0.00**	**357.22**	**44.83**	**106.68**	**52.27**	**91.22**	**213.73**	**357.22**	**1**	**2.00**	**41.00**	**50.80**	**0.00**

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (7) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Inlet No. : Co.CP-MANHOLE Number of connection: 6

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2
I20	0.000	0.000	0.00	0.00		0.00														pipes	m			
M20	0.000	0.000	0.00	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
I'20	0.000	0.000	0.00	0.00		0.00																		
M20	0.000	0.000	0.00	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
I12	4.820	1.915	2.90	0.29		3.19																		
M12	4.820	1.900	2.92	0.29	2.10	3.21	3.21	7.60	1.40	6.20	51.24	0.00	51.24	6.78	15.96	7.82	13.79	29.63	51.24	1	2.20	6.20	7.60	0.00
I'12	4.820	1.917	2.90	0.29		3.19																		
M12	4.820	1.900	2.92	0.29	2.10	3.21	3.21	8.60	1.40	7.20	57.98	0.00	57.98	7.88	18.06	8.85	16.01	33.12	57.98	1	3.20	7.20	8.60	0.00
I19	5.010	2.402	2.61	0.29		2.90																		
M19	5.010	2.400	2.61	0.29	2.10	2.90	2.90	1.00	0.00	1.00	6.09	0.00	6.09	1.09	2.10	1.03	2.23	2.83	6.09	0	1.00	1.00	1.00	0.00
I'19	5.010	2.402	2.61	0.29		2.90																		
M19	5.010	2.400	2.61	0.29	2.10	2.90	2.90	1.00	0.00	1.00	6.09	0.00	6.09	1.09	2.10	1.03	2.23	2.83	6.09	0	1.00	1.00	1.00	0.00
								18.20	2.80	15.40	121.40	0.00	121.40	16.84	38.22	18.73	34.26	68.41	121.40	2.00	7.40	15.40	18.20	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.5 (8) Installation Work For Connection Pipes-Line5

Bill of Quantity

Area : ECSI Pipe Diameter : 1200 Shoring Type : TIMBER

Sewer Line Name : LINE 5 Foundation Type : S360 OK ! S360

Manhole No. : Co.CP-MANHOLE Number of connection: 2

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.49	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type	Pipe Number Concrete	Pipe Bedding Length (m)	Sheeting (m) $_m$ 2.5	Waling & Strut (ton)
		IE_1 / IE_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	Length (m)	3.00	L_2	L_3	W_2
																				N				
I28	3.880	0.808	3.07	0.29		3.36														pipes	m			
M28	3.880	0.800	3.08	0.29	2.60	3.37	3.37	8.00	1.60	6.40	70.10	0.00	70.10	10.43	20.80	10.19	20.19	39.72	70.10	2	0.40	6.40	8.00	0.00
I'32	4.180	1.309	2.87	0.29		3.16																		
M32	4.180	1.300	2.88	0.29	2.60	3.17	3.17	9.00	1.60	7.40	74.18	0.00	74.18	12.05	23.40	11.47	23.35	39.36	74.18	2	1.40	7.40	9.00	0.00
								17.00	3.20	13.80	144.28	0.00	144.28	22.48	44.20	21.66	43.54	79.08	144.28	4	1.80	13.80	17.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (1) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: ECSI: Pipe - D2000
Sewer Line Name : LINE 6(1) Foundation Type : S360 OK ! S360
Manhole No. : Co.CP-Inlet New

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number N Type pipes Length (m) 0	Pipe Number N Concrete m 4.00	Pipe Bedding Length (m) L_2	Sheeting Length (m) 2.5 L_3	Waling & Strut (ton) W_2	Shoring Type
I1	4.82	2.25	2.57	0.28		2.85																			
M1	4.72	2.15	2.57	0.28	1.50	2.85	2.85	5.00	1.25	3.75	21.38	0.00	21.38	1.70	7.50	3.98	4.83	12.58	21.38	0	3.75	3.75	3.75	0.00	TIMBER
I3	4.63	2.10	2.53	0.28		2.81																			
M3	4.53	2.00	2.53	0.28	1.50	2.81	2.81	5.00	1.25	3.75	21.08	0.00	21.08	1.70	7.50	3.98	4.83	12.28	21.08	0	3.75	3.75	3.75	0.00	TIMBER
I5	4.44	1.90	2.54	0.28		2.82																			
M5	4.34	1.80	2.54	0.28	1.50	2.82	2.82	5.00	1.25	3.75	21.15	0.00	21.15	1.70	7.50	3.98	4.83	12.35	21.15	0	3.75	3.75	3.75	0.00	TIMBER
I6	4.36	1.80	2.56	0.28		2.84																			
M6	4.26	1.70	2.56	0.28	1.50	2.84	2.84	5.00	1.25	3.75	21.30	0.00	21.30	1.70	7.50	3.98	4.83	12.50	21.30	0	3.75	3.75	3.75	0.00	TIMBER
I7	4.48	1.80	2.68	0.28		2.96																			
M7	4.38	1.70	2.68	0.28	1.50	2.96	2.96	5.00	1.25	3.75	22.20	0.00	22.20	1.70	7.50	3.98	4.83	13.40	22.20	0	3.75	3.75	3.75	0.00	TIMBER
I8	4.33	1.80	2.53	0.28		2.81																			
M8	4.23	1.70	2.53	0.28	1.50	2.81	2.81	5.00	1.25	3.75	21.08	0.00	21.08	1.70	7.50	3.98	4.83	12.28	21.08	0	3.75	3.75	3.75	0.00	TIMBER
I10	4.37	2.55	1.82	0.28		2.10																			
M10	4.27	1.80	2.47	0.28	1.50	2.75	2.43	5.00	1.25	3.75	18.23	0.00	18.23	1.70	7.50	3.98	4.83	9.43	18.23	0	3.75	3.75	3.75	0.00	TIMBER
I11	4.35	1.70	2.65	0.28		2.93																			
M11	4.25	1.80	2.45	0.28	1.50	2.73	2.83	5.00	1.25	3.75	21.23	0.00	21.23	1.70	7.50	3.98	4.83	12.43	21.23	0	3.75	3.75	3.75	0.00	TIMBER
I14	4.40	1.80	2.60	0.28		2.88																			
M14	4.30	1.70	2.60	0.28	1.50	2.88	2.88	5.00	1.25	3.75	21.60	0.00	21.60	1.70	7.50	3.98	4.83	12.80	21.60	0	3.75	3.75	3.75	0.00	TIMBER
								45.00	11.25	33.75	189.25	0.00	189.25	15.30	67.50	35.78	43.47	110.01	189.25	0	33.75	33.75	33.75	0.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (2) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: Box - 2.5 x 2.0 m
Sewer Line Name : LINE 6(2) Foundation Type : S360 OK ! S360
Manhole No. : Co.Box-Inlet New

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number N Type	Pipe Number N Concrete Length (m) 4.00	Pipe Bedding Length (m) L_2	Sheeting Length (m) 2.5 L_3	Waling & Strut (ton) W_2	Shoring Type
I18	4.07	0.75	3.32	0.28		3.60														pipes	m				
M18	3.97	0.65	3.32	0.28	1.50	3.60	3.60	6.00	1.25	4.75	32.40	0.00	32.40	2.16	9.00	4.77	6.11	21.52	32.40	1	0.75	4.75	4.75	0.00	TIMBER
I19	4.07	0.75	3.32	0.28		3.60																			
M19	3.97	0.65	3.32	0.28	1.50	3.60	3.60	6.00	1.25	4.75	32.40	0.00	32.40	2.16	9.00	4.77	6.11	21.52	32.40	1	0.75	4.75	4.75	0.00	TIMBER
I20	4.03	0.70	3.33	0.28		3.61																			
M20	3.93	0.60	3.33	0.28	1.50	3.61	3.61	6.00	1.25	4.75	32.49	0.00	32.49	2.16	9.00	4.77	6.11	21.61	32.49	1	0.75	4.75	4.75	0.00	TIMBER
I21	3.96	0.65	3.31	0.28		3.59																			
M21	3.86	0.55	3.31	0.28	1.50	3.59	3.59	6.00	1.25	4.75	32.31	0.00	32.31	2.16	9.00	4.77	6.11	21.43	32.31	1	0.75	4.75	4.75	0.00	TIMBER
I22	3.90	0.60	3.30	0.28		3.58																			
M22	3.80	0.50	3.30	0.28	1.50	3.58	3.58	6.00	1.25	4.75	32.22	0.00	32.22	2.16	9.00	4.77	6.11	21.34	32.22	1	0.75	4.75	4.75	0.00	TIMBER
								30.00	6.25	23.75	161.82	0.00	161.82	10.80	45.00	23.85	30.55	107.42	161.82	5	3.75	23.75	23.75	0.00	

Area of Concrete Bedding (m^2): 0.00
Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (3) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Inlet Replay

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	1/2 Width in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting Length (m) 2.5	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	I_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2	
																				pipes	m				
I25	3.81	1.70	2.11	0.28		2.39																			
M25	3.71	1.60	2.11	0.28	1.50	2.39	2.39	2.00	0.00	2.00	7.17	0.00	7.17	0.91	3.00	1.59	2.57	3.01	7.17	0	2.00	2.00	2.00	0.00	TIMBER
I'25	3.81	1.70	2.11	0.28		2.39																			
M25	3.71	1.60	2.11	0.28	1.50	2.39	2.39	2.00	0.00	2.00	7.17	0.00	7.17	0.91	3.00	1.59	2.57	3.01	7.17	0	2.00	2.00	2.00	0.00	TIMBER
I27	3.76	1.70	2.06	0.28		2.34																			
M27	3.66	1.60	2.06	0.28	1.50	2.34	2.34	2.00	0.00	2.00	7.02	0.00	7.02	0.91	3.00	1.59	2.57	2.86	7.02	0	2.00	2.00	2.00	0.00	TIMBER
I28	3.70	1.49	2.21	0.28		2.49																			
M28	3.60	1.39	2.21	0.28	1.50	2.49	2.49	2.00	0.00	2.00	7.47	0.00	7.47	0.91	3.00	1.59	2.57	3.31	7.47	0	2.00	2.00	2.00	0.00	TIMBER
I'28	3.70	1.49	2.21	0.28		2.49																			
M28	3.60	1.39	2.21	0.28	1.50	2.49	2.49	2.00	0.00	2.00	7.47	0.00	7.47	0.91	3.00	1.59	2.57	3.31	7.47	0	2.00	2.00	2.00	0.00	TIMBER
I29	3.69	1.50	2.19	0.28		2.47																			
M29	3.59	1.40	2.19	0.28	1.50	2.47	2.47	2.00	0.00	2.00	7.41	0.00	7.41	0.91	3.00	1.59	2.57	3.25	7.41	0	2.00	2.00	2.00	0.00	TIMBER
I32	3.44	1.80	1.64	0.28		1.92																			
M32	3.34	1.70	1.64	0.28	1.50	1.92	1.92	2.00	0.00	2.00	5.76	0.00	5.76	0.91	3.00	1.59	2.57	1.60	5.76	0	2.00	2.00	2.00	0.00	TIMBER
I'32	3.44	1.80	1.64	0.28		1.92																			
M32	3.34	1.70	1.64	0.28	1.50	1.92	1.92	2.00	0.00	2.00	5.76	0.00	5.76	0.91	3.00	1.59	2.57	1.60	5.76	0	2.00	2.00	2.00	0.00	TIMBER
I33	3.34	1.70	1.64	0.28		1.92																			
M33	3.24	1.60	1.64	0.28	1.50	1.92	1.92	2.00	0.00	2.00	5.76	0.00	5.76	0.91	3.00	1.59	2.57	1.60	5.76	0	2.00	2.00	2.00	0.00	TIMBER
I'33	3.34	1.70	1.64	0.28		1.92																			
M33	3.24	1.60	1.64	0.28	1.50	1.92	1.92	2.00	0.00	2.00	5.76	0.00	5.76	0.91	3.00	1.59	2.57	1.60	5.76	0	2.00	2.00	2.00	0.00	TIMBER
I'27	3.76	1.70	2.06	0.28		2.34																			
M27	3.66	1.60	2.06	0.28	1.50	2.34	2.34	3.00	1.00	2.00	10.53	0.00	10.53	0.91	4.50	2.39	2.57	5.58	10.53	0	2.00	2.00	2.00	0.00	TIMBER
								23.00	1.00	22.00	77.28	0.00	77.28	10.01	34.50	18.29	28.27	30.73	77.28	0	22.00	22.00	22.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (4) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Inlet Replay

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream / Downstream H_2 H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Width in Manhole (m) I_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Clamshell Depth => 6 m V_2	Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number N Type pipes Length (m)	Pipe Number N Concrete m 4.00	Pipe Bedding Length (m) L_2	Sheeting Length (m) 2.5 L_3	Waling & Strut (ton) W_2	Shoring Type
I36	3.09	1.15	1.94	0.28		2.22																			
M36	2.99	1.05	1.94	0.28	1.50	2.22	2.22	2.00	0.00	2.00	6.66	0.00	6.66	0.91	3.00	1.59	2.57	2.50	6.66	0	2.00	2.00	2.00	0.00	TIMBER
I'36	3.09	1.15	1.94	0.28		2.22																			
M36	2.99	1.05	1.94	0.28	1.50	2.22	2.22	2.00	0.00	2.00	6.66	0.00	6.66	0.91	3.00	1.59	2.57	2.50	6.66	0	2.00	2.00	2.00	0.00	TIMBER
I37	3.00	1.10	1.90	0.28		2.18																			
M37	2.90	1.00	1.90	0.28	1.50	2.18	2.18	2.00	0.00	2.00	6.54	0.00	6.54	0.91	3.00	1.59	2.57	2.38	6.54	0	2.00	2.00	2.00	0.00	TIMBER
I'37	3.00	1.10	1.90	0.28		2.18																			
M37	2.90	1.00	1.90	0.28	1.50	2.18	2.18	2.00	0.00	2.00	6.54	0.00	6.54	0.91	3.00	1.59	2.57	2.38	6.54	0	2.00	2.00	2.00	0.00	TIMBER
I38	2.91	1.00	1.91	0.28		2.19																			
M38	2.81	0.90	1.91	0.28	1.50	2.19	2.19	2.00	0.00	2.00	6.57	0.00	6.57	0.91	3.00	1.59	2.57	2.41	6.57	0	2.00	2.00	2.00	0.00	TIMBER
I'38	2.91	1.00	1.91	0.28		2.19																			
M38	2.81	0.90	1.91	0.28	1.50	2.19	2.19	2.00	0.00	2.00	6.57	0.00	6.57	0.91	3.00	1.59	2.57	2.41	6.57	0	2.00	2.00	2.00	0.00	TIMBER
I39	2.81	0.90	1.91	0.28		2.19																			
M39	2.71	0.80	1.91	0.28	1.50	2.19	2.19	2.00	0.00	2.00	6.57	0.00	6.57	0.91	3.00	1.59	2.57	2.41	6.57	0	2.00	2.00	2.00	0.00	TIMBER
I'39	2.81	0.90	1.91	0.28		2.19																			
M39	2.71	0.80	1.91	0.28	1.50	2.19	2.19	2.00	0.00	2.00	6.57	0.00	6.57	0.91	3.00	1.59	2.57	2.41	6.57	0	2.00	2.00	2.00	0.00	TIMBER
I41	2.46	0.60	1.86	0.28		2.14																			
M41	2.36	0.50	1.86	0.28	1.50	2.14	2.14	2.00	0.00	2.00	6.42	0.00	6.42	0.91	3.00	1.59	2.57	2.26	6.42	0	2.00	2.00	2.00	0.00	TIMBER
I'41	2.46	0.60	1.86	0.28		2.14																			
M41	2.36	0.50	1.86	0.28	1.50	2.14	2.14	2.00	0.00	2.00	6.42	0.00	6.42	0.91	3.00	1.59	2.57	2.26	6.42	0	2.00	2.00	2.00	0.00	TIMBER
I47	2.18	0.40	1.78	0.28		2.06																			
M47	2.08	0.30	1.78	0.28	1.50	2.06	2.06	2.00	0.00	2.00	6.18	0.00	6.18	0.91	3.00	1.59	2.57	2.02	6.18	0	2.00	2.00	2.00	0.00	TIMBER
I48	2.31	0.18	2.13	0.28		2.41																			
M48	2.21	0.08	2.13	0.28	1.50	2.41	2.41	2.00	0.00	2.00	7.23	0.00	7.23	0.91	3.00	1.59	2.57	3.07	7.23	0	2.00	2.00	2.00	0.00	TIMBER
I52	3.17	0.49	2.68	0.28		2.96																			
M52	3.07	0.39	2.68	0.28	1.50	2.96	2.96	2.00	0.00	2.00	8.88	0.00	8.88	0.91	3.00	1.59	2.57	4.72	8.88	0	2.00	2.00	2.00	0.00	TIMBER
I53	3.06	0.60	2.46	0.28		2.74																			
M53	2.96	0.50	2.46	0.28	1.50	2.74	2.74	2.00	0.00	2.00	8.22	0.00	8.22	0.91	3.00	1.59	2.57	4.06	8.22	0	2.00	2.00	2.00	0.00	TIMBER
I63	1.95	-0.10	2.05	0.28		2.33																			
M63	1.85	-0.20	2.05	0.28	1.50	2.33	2.33	2.00	0.00	2.00	6.99	0.00	6.99	0.91	3.00	1.59	2.57	2.83	6.99	0	2.00	2.00	2.00	0.00	TIMBER
I64	2.24	0.05	2.19	0.28		2.47																			
M64	2.14	-0.05	2.19	0.28	1.50	2.47	2.47	2.00	0.00	2.00	7.41	0.00	7.41	0.91	3.00	1.59	2.57	3.25	7.41	0	2.00	2.00	2.00	0.00	TIMBER
I65	2.59	0.34	2.25	0.28		2.53																			
M65	2.49	0.24	2.25	0.28	1.50	2.53	2.53	2.00	0.00	2.00	7.59	0.00	7.59	0.91	3.00	1.59	2.57	3.43	7.59	0	2.00	2.00	2.00	0.00	TIMBER
I66	3.13	0.34	2.79	0.28		3.07																			
M66	3.03	0.24	2.79	0.28	1.50	3.07	3.07	2.00	0.00	2.00	9.21	0.00	9.21	0.91	3.00	1.59	2.57	5.05	9.21	0	2.00	2.00	2.00	0.00	TIMBER
I'63	1.95	-0.10	2.05	0.28		2.33																			
M63	1.85	-0.20	2.05	0.28	1.50	2.33	2.33	2.00	0.00	2.00	6.99	0.00	6.99	0.91	3.00	1.59	2.57	2.83	6.99	0	2.00	2.00	2.00	0.00	TIMBER
								38.00	0.00	38.00	134.22	0.00	134.22	17.29	57.00	30.21	48.83	55.18	134.22	0.00	38.00	38.00	38.00	0.00	0.00

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (5) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Manhole

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	1/2 Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Length (m)	Pipe Number Concrete 4.00	Pipe Bedding Length (m)	Sheeting Length (m) 2.5	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2	
I35	3.21	1.36	1.85	0.28		2.13														pipes	m				
M35	3.11	1.26	1.85	0.28	1.50	2.13	2.13	2.00	0.00	2.00	6.39	0.00	6.39	0.91	3.00	1.59	2.57	2.23	6.39	0	2.00	2.00	2.00	0.00	TIMBER
I'35	3.21	1.36	1.85	0.28		2.13																			
M35	3.11	1.26	1.85	0.28	1.50	2.13	2.13	2.00	0.00	2.00	6.39	0.00	6.39	0.91	3.00	1.59	2.57	2.23	6.39	0	2.00	2.00	2.00	0.00	TIMBER
I40	2.64	0.39	2.25	0.28		2.53																			
M40	2.54	0.29	2.25	0.28	1.50	2.53	2.53	2.00	0.00	2.00	7.59	0.00	7.59	0.91	3.00	1.59	2.57	3.43	7.59	0	2.00	2.00	2.00	0.00	TIMBER
I'40	2.64	0.59	2.05	0.28		2.33																			
M40	2.54	0.49	2.05	0.28	1.50	2.33	2.33	2.00	0.00	2.00	6.99	0.00	6.99	0.91	3.00	1.59	2.57	2.83	6.99	0	2.00	2.00	2.00	0.00	TIMBER
I42	2.39	0.40	1.99	0.28		2.27																			
M42	2.29	0.30	1.99	0.28	1.50	2.27	2.27	2.00	0.00	2.00	6.81	0.00	6.81	0.91	3.00	1.59	2.57	2.65	6.81	0	2.00	2.00	2.00	0.00	TIMBER
I'42	2.39	0.40	1.99	0.28		2.27																			
M42	2.29	0.30	1.99	0.28	1.50	2.27	2.27	2.00	0.00	2.00	6.81	0.00	6.81	0.91	3.00	1.59	2.57	2.65	6.81	0	2.00	2.00	2.00	0.00	TIMBER
I46	2.09	0.15	1.94	0.28		2.22																			
M46	2.09	0.05	2.04	0.28	1.50	2.32	2.27	2.00	0.00	2.00	6.81	0.00	6.81	0.91	3.00	1.59	2.57	2.65	6.81	0	2.00	2.00	2.00	0.00	TIMBER
I'46	2.09	0.15	1.94	0.28		2.22																			
M46	2.09	0.05	2.04	0.28	1.50	2.32	2.27	2.00	0.00	2.00	6.81	0.00	6.81	0.91	3.00	1.59	2.57	2.65	6.81	0	2.00	2.00	2.00	0.00	TIMBER
I'48	2.31	0.18	2.13	0.28		2.41																			
M48	2.21	0.08	2.13	0.28	1.50	2.41	2.41	2.00	0.00	2.00	7.23	0.00	7.23	0.91	3.00	1.59	2.57	3.07	7.23	0	2.00	2.00	2.00	0.00	TIMBER
I'53	3.06	0.60	2.46	0.28		2.74																			
M53	2.96	0.50	2.46	0.28	1.50	2.74	2.74	2.00	0.00	2.00	8.22	0.00	8.22	0.91	3.00	1.59	2.57	4.06	8.22	0	2.00	2.00	2.00	0.00	TIMBER
I'64	2.24	0.00	2.24	0.28		2.52																			
M64	2.14	-0.10	2.24	0.28	1.50	2.52	2.52	2.00	0.00	2.00	7.56	0.00	7.56	0.91	3.00	1.59	2.57	3.40	7.56	0	2.00	2.00	2.00	0.00	TIMBER
								22.00	0.00	22.00	77.61	0.00	77.61	10.01	33.00	17.49	28.27	31.85	77.61	0	22.00	22.00	22.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (6) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 800 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Manhole

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00	Pipe Bedding Length (m)	Sheeting Length (m) 2.5	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N	L_2	L_3	W_2	
I26	3.68	1.59	2.09	0.28		2.37														pipes	m			
M26	3.68	1.59	2.09	0.28	1.70	2.37	2.37	2.00	0.00	2.00	8.06	0.00	8.06	1.45	3.40	1.80	3.17	3.09	8.06	0	2.00	2.00	2.00	0.00	TIMBER
I57	2.75	0.39	2.36	0.28		2.64																		
M57	2.75	0.29	2.46	0.28	1.70	2.74	2.69	2.00	0.00	2.00	9.15	0.00	9.15	1.45	3.40	1.80	3.17	4.18	9.15	0	2.00	2.00	2.00	0.00	TIMBER
I58	2.74	0.40	2.34	0.28		2.62																		
M58	2.74	0.30	2.44	0.28	1.70	2.72	2.67	2.00	0.00	2.00	9.08	0.00	9.08	1.45	3.40	1.80	3.17	4.11	9.08	0	2.00	2.00	2.00	0.00	TIMBER
								6.00	0.00	6.00	26.29	0.00	26.29	4.35	10.20	5.41	9.51	11.37	26.29	0	6.00	6.00	6.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (7) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 1000 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Manhole

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type	Pipe Number Concrete Length (m) 4.00	Pipe Bedding Length (m)	Sheeting Length (m) 2.5	Waling & Strut (ton)	Shoring Type
		IL_1 / IL_2	ID_1 / ID_2	H_1	W_1	H_2 / H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N		L_2	L_3	W_2	
I31	3.45	1.15	2.30	0.29		2.59														pipes	m				
M31	3.45	1.05	2.40	0.29	1.90	2.69	2.64	2.00	0.00	2.00	10.04	0.00	10.04	2.19	3.80	2.01	3.81	4.22	10.04	0	2.00	2.00	2.00	0.00	TIMBER
								2.00	0.00	2.00	10.04	0.00	10.04	2.19	3.80	2.01	3.81	4.22	10.04	0	2.00	2.00	2.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (8) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI — Pipe Diameter : 1500 — ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 — Foundation Type : S360 — OK ! — S360

Manhole No. : Co.Box-Manhole

Manhole No.	Ground Level (m)	Sewer Invert Level (m) IL_1 IL_2	Sewer Invert Depth (m) ID_1 ID_2	Foundation Height (m) H_1	Excavation Width (m) W_1	Excavation Depth (m) Upstream H_2 / Downstream H_3	Average Excavation Depth (m) H_4	Excavation Length (m) L_1	Length in Manhole (m) l_1	Pipe Length (m) L_2	Excavation Work (m^3) Backhoe Depth <= 6 m V_1	Excavation Work (m^3) Clamshell Depth => 6 m V_2	Excavation Work (m^3) Total V_3	Pipe & Foundation Volume (m^3) V_4	Road Excavated Area (m^2) S_1	Road Designed Thickness (m) 0.53 V_5	Backfill (m^3) Yellow Sand Sand Backfill V_6	Backfill (m^3) Black Sand Sandy Soil Backfill V_7	Residual Soil (m^3) V_8	Pipe Number Type Length (m) N	Pipe Number Concrete 3.00	Pipe Bedding Length (m) L_2	Sheeting Length (m) 2.5 L_3	Waling & Strut (ton) W_2	Shoring Type
I24	3.68	0.40	3.28	0.32		3.60														pipes	m				
M24	3.68	0.30	3.38	0.32	2.50	3.70	3.65	2.00	0.00	2.00	18.25	0.00	18.25	4.76	5.00	2.65	5.94	9.66	18.25	0	2.00	2.00	2.00	0.00	TIMBER
I30	3.51	-0.35	3.86	0.32		4.18																			
M30	3.51	-0.45	3.96	0.32	2.60	4.28	4.23	2.00	0.00	2.00	22.00	0.00	22.00	4.76	5.20	2.76	6.37	12.87	22.00	0	2.00	2.00	4.00	0.98	TYPE1
								4.00	0.00	4.00	40.25	0.00	40.25	9.52	10.20	5.41	12.31	22.53	40.25	0	4.00	4.00	6.00	0.98	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.3.6 (9) Installation Work For Connection Pipes-Line6

Bill of Quantity

Area : ECSI Pipe Diameter : 600 ECSI: Box - 2.5 x 2.0 m

Sewer Line Name : LINE 6 Foundation Type : S360 OK ! S360

Manhole No. : Co.Box-Manhole

Manhole No.	Ground Level (m)	Sewer Invert Level (m)	Sewer Invert Depth (m)	Foundation Height (m)	Excavation Width (m)	Excavation Depth (m) Upstream / Downstream	Average Excavation Depth (m)	Excavation Length (m)	1/2 Length in Manhole (m)	Pipe Length (m)	Excavation Work (m^3) Backhoe Depth <= 6 m	Clamshell Depth => 6 m	Total	Pipe & Foundation Volume (m^3)	Road Excavated Area (m^2)	Road Designed Thickness (m) 0.53	Backfill (m^3) Yellow Sand Backfill	Backfill (m^3) Black Sand Sandy Soil Backfill	Residual Soil (m^3)	Pipe Number Type / Concrete Length (m) 4.00	Pipe Bedding Length (m)	Sheeting Length (m) 2.5	Waling & Strut (ton)	Shoring Type
		IL_1 IL_2	ID_1 ID_2	H_1	W_1	H_2 H_3	H_4	L_1	l_1	L_2	V_1	V_2	V_3	V_4	S_1	V_5	V_6	V_7	V_8	N	L_2	L_3	W_2	
I43	2.36	0.60	1.76	0.28		2.04														pipes				
M43	2.26	0.50	1.76	0.28	1.50	2.04	2.04	2.00	0.00	2.00	6.12	0.00	6.12	0.91	3.00	1.59	2.57	1.96	6.12	0	2.00	2.00	2.00	0.00	TIMBER
I'43	2.36	0.60	1.76	0.28		2.04																		
M43	2.26	0.50	1.76	0.28	1.50	2.04	2.04	2.00	0.00	2.00	6.12	0.00	6.12	0.91	3.00	1.59	2.57	1.96	6.12	0	2.00	2.00	2.00	0.00	TIMBER
I44	2.36	0.60	1.76	0.28		2.04																		
M44	2.26	0.50	1.76	0.28	1.50	2.04	2.04	2.00	0.00	2.00	6.12	0.00	6.12	0.91	3.00	1.59	2.57	1.96	6.12	0	2.00	2.00	2.00	0.00	TIMBER
I'44	2.36	0.60	1.76	0.28		2.04																		
M44	2.26	0.50	1.76	0.28	1.50	2.04	2.04	2.00	0.00	2.00	6.12	0.00	6.12	0.91	3.00	1.59	2.57	1.96	6.12	0	2.00	2.00	2.00	0.00	TIMBER
I50	3.06	0.90	2.16	0.28		2.44																		
M50	2.96	0.80	2.16	0.28	1.50	2.44	2.44	2.00	0.00	2.00	7.32	0.00	7.32	0.91	3.00	1.59	2.57	3.16	7.32	0	2.00	2.00	2.00	0.00	TIMBER
I'51	3.10	0.90	2.20	0.28		2.48																		
M51	3.00	0.80	2.20	0.28	1.50	2.48	2.48	2.00	0.00	2.00	7.44	0.00	7.44	0.91	3.00	1.59	2.57	3.28	7.44	0	2.00	2.00	2.00	0.00	TIMBER
I56	2.85	0.60	2.25	0.28		2.53																		
M56	2.75	0.50	2.25	0.28	1.50	2.53	2.53	2.00	0.00	2.00	7.59	0.00	7.59	0.91	3.00	1.59	2.57	3.43	7.59	0	2.00	2.00	2.00	0.00	TIMBER
I66	3.13	0.34	2.79	0.28		3.07																		
M66	3.03	0.24	2.79	0.28	1.50	3.07	3.07	2.00	0.00	2.00	9.21	0.00	9.21	0.91	3.00	1.59	2.57	5.05	9.21	0	2.00	2.00	2.00	0.00	TIMBER
								16.00	0.00	16.00	56.04	0.00	56.04	7.28	24.00	12.72	20.56	22.76	56.04	0	16.00	16.00	16.00	0.00	

Area of Concrete Bedding (m^2): 0.00

Volume of Concrete Bedding (m^3): 0.00

Table D.1.4 Construction of Inlets and Manholes For Pipes

	Concrete Volume (m^3)				Total	Level Conc	Sand	Timber Wood	Invert			Ladder
	Slub		Wall						Vol	Area		
	Bottom S_b (m^3)	Up S_u (m^3)	Main C_m (m^3)	Up C_u (m^3)	(m^3)	L_e (m^3)	S_a (m^3)	T_w (no)	I_v (m^3)	BQ I_{a1} (m^2)	cost est I_{a2} (m^2)	L_a (no)
Manhole												
new	204.843	134.398	393.095	98.312	830.647	71.247	142.494	0	106.025	348.630	422.394	1,025
improved	62.500	42.160	153.537	29.912	288.109	24.498	48.996	0	41.606	109.940	143.136	403
Sub Total	267.343	176.558	546.632	128.224	1,118.756	95.745	191.490	0	147.631	458.570	565.530	1,428
Inlet	40.470	25.245	120.904	32.248	218.867	17.024	34.048	0	0	0	0	410
Total	307.81	201.80	667.54	160.47	1,337.62	112.77	225.54	0	147.63	458.57	565.53	1,838.00

	Bar		Cover Type		Frame Work				Struct Vol
					Slub		Wall		
	Wt (kg)	Unit Wt (kg/m3)	Type A	Type E	Bottom F_b (m^2)	Up F_u (m^2)	Main F_m (m^2)	Up F_u (m^2)	(m^2)
Manhole									
new	53,615.83	64.547	107		343.17	621.05	3,921.60	983.12	1,896.23
improved	18,262.81	63.389	1	51	126.24	220.71	1,408.12	299.12	583.04
Sub Total	71,878.64		108	51	469.41	841.76	5,329.72	1,282.24	2,479.28
Inlet	14,141.30	64.611		53	99.66	156.63	1,101.58	322.48	416.12
Total	86,019.94		108	104	569.07	998.39	6,431.30	1,604.72	2,895.40

Table D.1.5 Construction of Manholes For Box Culverts

Type of Connection in Manhole	Type of Manhole	Volume of B-Manhole V1, (m3)	Volume of Concrete G V2, (m3)	Volume of sand V3, (m3)	Connection Pipe V4 (m3)	Volume of Concrete E V1-V4 (m3)	Number of Manhole	Total Volume of Con. E (m3)
1A-0	1-1	6.645	14.500	29.000		6.645	25	166.125
1A-1	1-2	9.685	0.812	1.624	0.091	9.594	1	9.594
1B-1	1-3	8.568	5.278	10.556	0.159	8.409	7	58.865
1B-2	1-4	11.022	1.914	3.828	0.383	10.639	2	21.278
1C-1	1-3	8.568	0.754	1.508	0.318	8.250	1	8.250
1C-2	1-4	11.022	2.871	5.742	0.766	10.256	3	30.769
2A-0	2-1	7.932	7.350	14.700		7.932	10	79.320
2A-1	2-2	11.972	36.540	73.080	0.159	11.813	36	425.276
2B-1	2-3	10.650	16.065	32.130	0.181	10.469	17	177.965
2B-2	2-4	13.821	1.190	2.380	0.437	13.384	1	13.384
2C-1	2-3	10.650	1.890	3.780	0.363	10.287	2	20.574
2C-2	2-4	13.821	1.190	2.380	0.875	12.946	1	12.946
3B-1	3	12.274	0.957	1.914	0.159	12.115	1	12.115
3B-2	3	12.274	7.656	15.312	0.181	12.093	8	96.740
3C-1	3	12.274	3.828	7.656	0.318	11.956	4	47.826
3C-2	3	12.274	4.785	9.570	0.363	11.911	5	59.555
4B-1	4	17.866	1.365	2.730	0.159	17.707	1	17.707
4B-2	4	17.866	2.730	5.460	0.383	17.483	2	34.966
4C-1	4	17.866	8.190	16.380	0.363	17.503	6	105.018
SPECIAL	4	17.866	8.880	17.760	0.000	29.000	10	290.000
							143	1688.276
Volume of Concrete Type E, m3								**1,688.28**
Reinfoced Bar, kg				(65 kg/m3)				**109,737.96**
Ladder				15 x 124 =	1860			
				20 x 19 =	380			
					2240			
Volume of Concrete Type G, m3								**128.75**
Volume of sand, m3								**257.49**

Table D.1.6 (1) Construction Work For Outlets

Outlet Name	Dimensions	Length (m)	Excavation (m3)	Backfilling (m3)	Piling (Trees)	Piling (m)	Sand bedding (m3)	Concrete Class G (m3)	Concrete Class E (m3)	Deformed Reinforcing bar (kg)
Additional sewers										
TH - L2 TRAN BINH TRONG	2500mm x 2000mm	7.2	182.52	128.09	288	1,296.00	4.32	2.16		
TH - L21 MAC CUU	2500mm x 2000mm	7.2	187.92	138.67	288	1,296.00	4.32	2.16		
HUYNH MAN DAT	2000mm x 2000mm	7.2	161.88	120.41	230	1,035.00	3.89	1.94		
NGUYEN BIEU	D1500mm	7.2	174.96	124.07	173	778.50		5.88		
TOTAL			**707.28**	**511.24**	**979**	**4,405.50**	**12.53**	**12.14**		
Outlets										
TH - L2 TRAN BINH TRONG	2500mm x 2000mm	-	45.54	19.08	460	2,070.00			13.21	858.65
TH - L21 MAC CUU	2500mm x 2000mm	-	37.40	16.28	428	1,926.00			13.19	857.35
HUYNH MAN DAT	2000mm x 2000mm	-	27.90	12.78	371	1,670.00			11.55	750.75
NGUYEN BIEU	D1500mm	-	59.20	16.26	194	873.00			7.35	477.75
TOTAL			**170.04**	**64.40**	**1,453**	**6,539.00**			**45.30**	**2944.50**

Table D.1.6 (2) Construction Work For Revetment

No	Item	Unit	TH - L1 NGUYEN BIEU	TH - L2 TRAN BINH TRONG	TH - L5 HUYNH MAN DAT	TH - L21 MAC CUU	TOTAL	Note
1	Clearing area	m2	Refered to E/W high way project	150	Has been estimated in package A	40		
2	Demolition of existing revetment	m2		0		0		
3	Excavation volume	m3		-				PackageA
4	Filling volume	m3		-				PackageA
5	Timber piling							
5.1	Foundation of revetment	pcs		105		60		
5.2	Bank protection for sliding	pcs		302		0		
6	Free draining gravel	m3		13.97		6.65	**20.62**	
7	Geotextile cloth	m2		45.15		13.68	**58.83**	
8	Precast reinforced concrete block 800 W x 500 H	m3		1.26		0.77	**2.03**	
9	Concrete class F (Backfill concrete)	m3		4.52		2.57	**7.08**	
10	Concrete class G (Leveling concrete)	m3		0.42		0.24	**0.66**	
11	Wet stone masonry (250 dia, t = 300)	m3		13.55		7.695	**21.24**	
12	Weep holes, PVC 100 dia x 1000 with filter	nos		6		4	**10**	
13	Riprap	m3		15		12	**27**	

CHAPTER 7
WASTEWATER TREATMENT PLANT CONSTRUCTION (PACKAGE E)

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1. SITE PREPARATION WORKS

Project: HCMC Water Environment Improvement

Item: Wastewater Treatment Plant

Table E.1.1 QUANTITY SUMMARY SHEET

ITEM: SITE PREPARATION - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
		Jetty			
1		RC Pile 400 x 400	m	2,288.00	
2		Pile Connection	pcs	104.00	
3		Steel Sheet Pile			
		Type FSP - 1V	m^2	778.80	
4		Break Pile Ends			
		- RC Square pile	m^3	8.30	
5		Concrete Grade 21MPa			
		- Slab	m^3	92.70	
		- Stiffener	m^3	9.40	
6		Formwork	m^2	277.80	
7		Rebar	ton	8.90	
8		Steel Stair (Painted 1 Set)	kg	1,051.60	
		Bridge Abutment Stabilization			
		Temporary Dike	m^2	480.00	
		Temporary Dike Removal	m^3	360.00	
1		Excavation of Soft Soil	m^3	250.00	
2		Backfill with Black Sand	m^3	250.00	
3		SCMM	m^3	2,400.00	
		Temporary Dike	m^3	7,948.30	
		Soft Soil Excavation	m^3	141,804.00	
		Ditch Excavation		643.80	
		Back Fill for Working Area	m^3	75,700.90	
		SCM Soil Improvement	m^3	45,937.50	
		Sand Pile f 900	m^3	8,268.80	

		Temporary Access Road			
1		Black Sand Well Compacted	m^3	3,925.40	
2		Laterite	m^3	1,818.90	
3		Crushed Stone 50 x 70 with clay	m^3	556.80	
		Temporary Road			
1		Black Sand Well Compacted	m^3	16,016.00	
2		Crushed Stone 50 x 70 with clay	m^3	672.00	
		Loading Bay			
1		Black Sand Well Compacted	m^3	2,250.00	
2		Crushed Stone 50 x 70 with clay	m^3	264.00	
3		Fine Stone - 50 THK	m^3	66.00	
		Permanent Dike	m^3	12,616.00	
		Pump 22 KW			
		Shaft Diameter = 100mm	pcs	4.00	
		Pumping Pit 1000 x 1000 x 1200	pcs	2.00	
		Water Emergency Gate 2000 x 2000	pcs	2.00	

Table E.1.2 QUANTITY SURVEY SHEET

ITEM: SITE PREPARATION

Item		Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
Jetty										
	1		RC pile 400 x 400	m	52	44.00			2,288.00	**2,288.00**
	2		Pile connection	pcs	52	2.00			104.00	**104.00**
	3		Steel sheet pile type FSP-IV	m^2	59	33.00	0.40		778.80	**778.80**
	5		Break pile ends	m^3						**8.30**
			RC square pile	m^3	52	0.40	0.40	1.00	8.30	
	6		Concrete grade 21 mpa	m^3						**102.00**
			- Slab	m^3	1	23.40	9.90	0.40	92.70	
			- Stiffener	m^3	1	23.40	1.00	0.40	9.40	
	7		Formwork	m^2						**277.80**
			- Slab soffit	m^2	1	23.40	9.90		231.70	
			- Side of slab	m^2	2	23.40	0.40		18.70	
				m^2	2	9.90	0.40		7.90	
			- Side of stiffener	m^2	2	24.40	0.40		19.50	
	8		Rebar	ton						**8.90**
			- Longitudinal F16@200	ton	98	24.37	0.001578		3.80	
			- Horizontal F16@200	ton	232	10.20	0.001578		3.70	
			- Stiffener (longitudinal)	ton	2	23.30	0.001578		0.10	
			(cross section)	ton	232	3.60	0.001578		1.30	
	10		Steel bar (Painted) 1 set	kg						**1,051.60**
Bridge abutment stabilization										
			Temporary dike	m^2	4	30.00	4.00		480.00	**480.00**
			Temporary dike removal	m^3	4	30.00	3.00	1.00	360.00	**360.00**
	1		Excavation of soft soil	m^3	1	20.00	25.00	0.50	250.00	**250.00**
	2		Backfill with black sand	m^3	1	20.00	25.00	0.50	250.00	**250.00**
	4		SCMM	m^3	8	25.00	24.00	0.50	2,400.00	**2,400.00**
Temporary dike										**7,948.30**
			- Section A-A	m^3	1	630.00	1.50		945.00	
			- Section B-B (outer)	m^3	1	323.00	9,435.00		3,047.50	
			- Section B-B (inner)	m^3	1	300.00	1.50		450.00	
			- Section C-C	m^3	1	273.00	9,435.00		2,575.80	
			- Section 1-1	m^3	1	310.00	3.00		930.00	
Soft soil excavation, AREA: 141804 m^2 (Fr. Dwg)				m^3	1	141,804.00	1.00		141,804.00	**141,804.00**
Ditch excavation										
			- Section A-A	m^3	1	683.27	0.80	0.80	437.30	
			- Section B-B	m^3	1	322.66	0.80	0.80	206.50	
Backfill for working area				m^3						**75,700.90**
			2.3 x 22 x 1.35 = 683.1 M^3	m^3	1	316.60	26.00	0.50	4,115.80	
			Jetty	m^3	1	141,804.00	1.00	0.50	70,902.00	
SCM soil improvement				m^3	147	25.00	25.00	0.50	45,937.50	**45,937.50**
Sand pile Φ900				m^3	147	25.00	4.50	0.50	8,268.80	**8,268.80**

Table E.1.2 QUANTITY SURVEY SHEET

ITEM: SITE PREPARATION

Item		Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
Temporary access road										
	1		Black sand well compacted	m^3	1	464.00	14.10	0.60	3,925.40	**3,925.40**
	2		Laterite	m^3	1	464.00	9.80	0.40	1,818.90	**1,818.90**
	3		Crushed stone 50 x 70 with clay	m^3	1	464.00	6.00	0.20	556.80	**556.80**
Temporary road										
	1		Black sand well compacted	m^3	1	560.00	13.00	2.20	16,016.00	**16,016.00**
	2		Crushed stone 50 x 70 with clay	m^3	1	560.00	6.00	0.20	672.00	**672.00**
Loading bay										
	1		Black sand well compacted	m^3	1	25.00	60.00	1.50	2,250.00	**2,250.00**
	2		Crushed stone 50 x 70 with clay	m^3	1	22.00	60.00	0.20	264.00	**264.00**
	3		Fine stone - 50 thick	m^3	1	22.00	60.00	0.05	66.00	**66.00**
Pump 22kw, shaft diameter = 100mm				pcs						**4.00**
Pumping pit 1000 x 1000 x 1200				pcs						**2.00**
Water emergency gate 2000 x 1000				pcs						**2.00**
			Permanent Dike	M3	1	1,631.00		7,735.00	12,615.79	**12,616.00**
			Site Boundary = 1631M (Fr. Dwg)							
			Dike Area = 7,735 m^2							
			Site Fill F2 A: 2.2M							
			From L.0000 to L.2.20	m^3	(See Break down Qty sh.)				262,133.00	**262,133.00**

Table E.1.3 QUANTITY SURVEY SHEET

Item : Site Preparation (WWTP) Package E Temporary Dike and Ditch (1)

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Preparation Dike							
		L=1631 m (From Computer)							
		S : 7.735 m2							
				0.5	1.70	1.70		1,445	
				0.5	3.40	1.70		2,890	
					2.00	1.70		3,400	
					1,631.00		x	7.74	12,615.78
			m3						

Table E.1.4 QUANTITY SURVEY SHEET

Item : Site Preparation (WWTP) Package E Temporary Dike and Ditch (2)

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
1		Embankment:	m3						7,948.30
		To Section A_A			(m)	(m2)		(m3)	
1.1		Inner Dike	m3		630	1.50		945.00	
		L: 630M							
		S: 1.50 M2							
		To Section B-B							
1.2		Outer Dike	m3		323	9.44		3,047.50	
		L: 322.66							
		S: 9.435 M2							
1.3		Outer Dike	m3		300	1.50		450.00	
		L: 300							
		S: 1.50 M2							
		To Section C-C							
1.4		Outer Dike	m3		273	9,435.00		2,575.80	
		L: 272.78							
		S: 9.435 M2							
		To Section 1-1							
1.5		Temporary Dike	m3		310	3.00		930.00	
		L: 310 M							
		S: 3.00 M2							
		To Section 1-1							
2		sand Backfilling	m3						73,910.80
		1000 THK							
		To Section 1-1							
2.1		Sand Pile ϕ 900	m3						
		Follow SCM Layout		147	25	4.50	0.50	8,268.80	8,268.80
		Depth : 4.50 M@20000.cm							
		(4.5 x 0.45 x 3.14) = 0.64							

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
2.2		To Section 1-1							
		Soil Cement	m3						
		Mixing Methods		147	25	25.00	0.50	45,937.50	45,937.50
		Depth : 25M,							
3		Excavation	m3						643.80
		To Section A-A			(m)	(m2)			
3.1		Ditch:	m3		683.27	0.24			
		L: 683.27M				0.80	0.80	437.30	
		S: 0.24 M							
		To Section B-B			(m)	(m2)			
3.2		Ditch:	m3		322.66	0.24			
		L: 322.66M				0.80	0.80	206.50	
		S:0.24 M2							
		To Section 1-1							
3.3		Exca of Exist	m3						
		Ground (Area SCM)			(m)	(m)	(m)		
		1000 THK.			310	15.50	1.00	4,805.00	
		Excavation of Sed Soil	m3	141804	x	9.00			141,804.00
4		Temporary Access Road (A)							
4.1		Blacksand Well Compacted	m3		(m)	(m)	(m)		3,925.50
		600 THK, L = 464 m			464.00	14.10	0.60	3,925.50	
4.2		Laterite - 400 THK.	m3					1,818.90	
		L = 464 m			464	9.80	0.40	1,818.90	
4.3		Crushed Stone	m3					556.80	
		50 x 70 mixed with clay 200 THK			464	6.00	0.20	556.80	
		L = 464 m							
5		Temporary Road ®							
5.1		Crushed Stone	m3						672.00
		50 x 70 mixed with clay 200 THK							
		L = 560m			560.00	6.00	0.20	672.00	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
5.2		Sand Filling	m3						
		2.20 M THK			(m2)	(m2)			16,016.00
		S : 44.44 m2			560	13.00	2.20	16.02	

Table E.1.5 QUANTITY SRVEY SHEET

Item : Site Preparation (WWTP) Package E Emergency Gate

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Concrete:							
		top			2.00	1.00	0.20	0.40	
		Bot			2.00	2.00	0.15	0.60	
		Side		2	1.70	3.00	0.15	1.53	
									2.53
		Formwork							x 2
		top							5.06
		(1.0=2.0)2=6M	side		6.00		0.20	1.20	
		"	toffit		1.00	2.00		2.00	
		Bot of Base							
		"	side	4	2.00		0.15	1.20	
		Support	face	4	3.00	1.70		20.40	
		"	Side	4		1.70	0.15	1.02	
									25.82
									x 2
									51.64
		Rebar :							
		@100kg / m3			5.06	x 100			506 kg
		Steel :							
		[100 x 70 @ 15.8 kg / m		2	1.5			3	
				2	2			4	
								7	
								x 15.8	
								110.6	
								x 2	
									221.2 kg
		H 150 x 150 @ 31.5 kg/m3			2.0 x 31.5			63	
								x 2	
									126 kg
		Round Turn Bar ϕ 24 @ 3.55			0.80 + 0.11			0.91	
								x 3.55	
								3.23	
								x 2	
									6.46 kg

Table E.1.6 QUANTITY SRVEY SHEET

Item : Site Preparation (WWTP) Package E Pumping Pit

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
1		Concrete: Pit =							
		1.3 x 1.3 x 1.33 = 2.248 m3							
	less (-)	1.0 x 1.0 x 1.18 = 11.18							
		1.068 m3						1.07	
									1.148
		Cover =							x 2
		1.0 x 1.0 x 0.08			1.00	1.00	0.08	0.08	2.296 m3
2		Form Work :							
		outside face		4	1.30	1.33		6.916	
		inside face		4	1.00	1.18		4.720	
		cover		1	1.00	1.00		1.000	
									12.636
									x 2
									25.27 m2
		Rebar :							
		@ 100kg /m3			2.296	100			229.6 kg

2. EARTH WORKS

Project: HCMC Water Environment Improvement

Item: Wastewater Treatment Plant

TableE.2.1 QUANTITY SUMMARY SHEET

EXCAVATION - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity			Remarks
				Machinery	Manual	Total	
1		Effluent pipe ϕ2500	m^3	884.00	229.00	1,113.00	
2		Pipe gallery A, E, G, H, D, F	m^3	13,837.00	988.00	14,825.00	
3		Pipe gallery B	m^3	3,102.00	254.00	3,356.00	
4		Lift pumping station	m^3	5,057.00	396.00	5,453.00	
5		Sedimentation tank	m^3	40,036.00	4,528.00	44,564.00	
6		Disinfection tank & Chlorination store tank	m^3	10,300.00	1,128.00	11,428.00	
7		Gravity thickener tank	m^3	1,153.00	77.00	1,230.00	
8		Dewatering & centrifugal thickener buildin	m^3	5,619.00	389.00	6,008.00	
9		Blower building	m^3	5,961.00	1,139.00	7,100.00	
10		Main building (Control & Elec. Room)	m^3	3,157.00	469.00	3,626.00	
11		Connection pipe ϕ2500	m^3	1,989.00	116.00	2,105.00	
		Total	**m^3**	**91,095.00**	**9,713.00**	**100,808.00**	

Project: HCMC Water Environment Improvement

Item: Wastewater Treatment Plant

Table E.2.2 QUANTITY SUMMARY SHEET

BACK FILLING - WASTEWATER TREATMENT PLANT

OVER EXCAVATION (F1)

No.	Code	Description	Unit	Quantity		Remarks
				Machinery	Manual	
1		Effluent pipe ϕ2500	m^3	168.00		by black sand
2		Pipe gallery A, E, G, H, D, F	m^3	6,949.00		by black sand
3		Pipe gallery B	m^3	865.00		by black sand
4		Lift pumping station	m^3	1,007.00		by black sand
5		Sedimentation tank	m^3	12,176.00		by black sand
6		Disinfection tank & Chlorination store tank	m^3	2,800.00		by black sand
7		Gravity thickener tank	m^3	630.00		by black sand
8		Dewatering & centrifugal thickener building	m^3	2,979.00		by black sand
9		Blower building	m^3	2,964.00		by black sand
10		Main building (Control & Elec. Room)	m^3	1,843.00		by black sand
11		Connection pipe ϕ2500	m^3	1,469.00		by black sand
		Total		**33,850.00**		
12		Site Filling (F 2)	m^3	262,133.00		by black sand
			Total	295,983.00		
				x 1.03		
				304,862.49	BOQ	
13		Landscape Filling Soil	m^3	59,752.00		

Project: HCMC Water Environment Improvement

Item: Wastewater Treatment Plant

Table E.2.3 QUANTITY SUMMARY SHEET

ITEM: FILL AND BACK FILL - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1		**Backfill for Excavation**			
1.1		Effluent pipe ϕ2500	m^3	168.00	by black sand
1.2		Pipe gallery A, E, G, H, D, F	m^3	6,949.00	by black sand
1.3		Pipe gallery B	m^3	865.00	by black sand
1.4		Lift pumping station	m^3	1,007.00	by black sand
1.4		Sedimentation tank	m^3	12,176.00	by black sand
1.6		Disinfection tank & Chlorination store tank	m^3	2,800.00	by black sand
1.7		Gravity thickener tank	m^3	630.00	by black sand
1.8		Dewatering & centrifugal thickener building	m^3	2,979.00	by black sand
1.9		Blower building	m^3	2,964.00	by black sand
1.10		Main building (Control & Elec. Room)	m^3	1,843.00	by black sand
1.11		Connection pipe ϕ2500	m^3	1,469.00	by black sand
		Total Backfill for Excavation	m^3	**33,850.00**	by black sand
		General Fill	**m^3**	**262,133.00**	by black sand

Project: HCMC Water Environment Improvement

Item: Wastewater Treatment Plant

Table E.2.4 QUANTITY SUMMARY SHEET

ITEM: PILING - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1		**Timber Pile f 80 - 100**	m	300,342.00	
		L: 3M @ 16 piles/m2			
1.1		Sedimentation Tank	m	38,358.00	
1.2		Pile Gallery A	m	26,145.00	
		Pile Gallery D	m	3,534.00	
		Pile Gallery E	m	9,747.00	
		Pile Gallery F	m	17,931.00	
		Pile Gallery G	m	9,783.00	
		Pile Gallery H	m	5,214.00	
1.3		Chlorination Store Building	m	52,722.00	
1.4		Dewatering Building	m	41,520.00	
1.5		Blower Building	m	51,912.00	
1.6		Main Building	m	20,190.00	
1.7		Gravity Thickner Tank	m	8,424.00	
1.8		Lift Pumping Station	m	14,862.00	
2		**Steel Sheet Pile**	m^2	14,449.00	
2.1		Pile Gallery B L. -32M	m^2	1,015.00	
2.2		Sedimentation Tank L. -17M	m^2	8,220.00	
		Sedimentation Tank L. -10M	m^2	1,230.00	
2.3		Lift Pumping Station L-33M	m^2	3,984.00	

r Environment Improvement
ater Treatment Plant

Table E.2.5 QUANTITY SURVEY SHEET
ITEM: EXCAVATION SEDIMENTATION TANK 2,3,4,17 - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						44,564.00
		To Sedimentation 1 -1, 2 -2							
L	-2.00	From Link 1 to 7 - A1			128.65	22.00	2.00	2,830.30	
L	-4.10	Area A 2		0.5	128.65	1.00	4.10	263.70	
L		Area A 3		0.5	128.65	5.00	4.10	2,637.30	
L	-6.30	Atea A 4			109.15	5.60	6.30	3,850.80	
L		Area A 5			109.15	7.20	6.30	4,951.00	
L	0.00	Area A 6			10-9.15	8.50	0.00		
L	-4.10	Area A 7			109.15	9.60	4.10	4,296.20	
L	-2.75	Area A 8 + 10			109.15	3.30	2.85	1,026.60	
I	-1.25	Area A 9			109.15	28.90	1.25	3,943.00	
L	-4.10	Area A 11			109.15	12.05	4.10	5,392.60	
L	-1.50	Area a 12		0.5	109.15	2.00	1.50	163.70	
L	-1.50	Area a 13		0.5	109.15	31.00	1.50	5,075.50	
		SECTION 3 - 13							
		Line A - B, 1 -7							
L	-4.00	A - 14			97.00	5.50	6.30	3,361.00	
		SECTION 3 - 13							
		Line G - H, 1 - 7	(Scum Gallery)						
L	-4.00	(0.3+1.3)x1.5x2=1.60	A15		88.00	3.50	2.85	877.80	
L	-4.00	(1.3+3.3)x0.5x2=4.60	A16		26.00	12.4m2		322.40	
L	-4.00	2 x 6.2 - 12.4	A12		25.00	12.4m2		310.00	
		SECTION 3 - 13							
L	-4.00	Line M - M, 1 -7	(Pipe gallery)						
		A 78			88.00	9.60	2.85	2,407.70	
		A 19		0.5	26.00	12.40		332.40	
		A 20		0.5	25.00	12.40		310.00	
		A 21		0.5	41.00	13.00	2.00	533.00	
				0.5	41.00	2.00	1.50	61.50	
		EXCA. ACCESS		0.5	61.00	25.00	1.50	1,143.80	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Disinfection Tank			8.60	8.60	6.40	473.30	

Water Environment Improvement
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Table E.2.6 QUANTITY SURVEY SHEET
ITEM: PIPE GALLERY EXCAVATION A, D, F, G, H, E, B- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						
		Gallery A, D, F, G	Level -4.10						11,531.00
		W : (9.2+0.6) x D 4.10 = 40.18m2							
		One side of slope = 15.39 m2							
		Gallery A			67.00				
		Gallery D			8.00				
		Gallery F			17.00				
		Gallery F			35.00				
		Gallery G			35.50				
					162.50	40.18		6,529.30	
		Excavation to							
		side of Gallery		2	162.50	15.39		5,001.75	
		GALLERY H, E	Level - 4.00						4,623.20
		W : (4.7+0.6) x D 4.00 = 21.2m2							
		One side of slope = 14.7 m2							
		Gallery H			40.00	21.20		848.00	
				2	40.00	14.70		1,176.00	
		Gallery E			51.60	21.20		1,093.90	
				2	51.60	14.70		1,505.30	
		GALLERY B	Level - 6.20						3,355.50
					82.00	6.60	6.20	3,355.44	
		EFFLUENT PIPE	Level - 1.91						1,113.70
		W : (4.0+0.6) x D 1.91 = 8.76m2							

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		One side of slope = 0.955 m2							
		Pipe Line			99.00	8.76		867.30	
		Cut Slope		2	99.00	0.955		189.10	
		Outlet Pipe		0.5	10.00	6.00	1.91	57.30	

r Environment Improvement
ater Treatment Plant

Table E.2.7 QUANTITY SURVEY SHEET
ITEM: GENERAL SITE FILLING F - 2 - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EARTH WORK							
		Site Area to be Filled	m2						141,804.00
	Less	All Structures							
		On site level over + 2.200							
		Sedimenhtation Tank			126.00	100.00		12,600.00	
		Elec. Room		2	16.50	5.00		165.00	
		Disinfection tank			33.50	22.50		753.75	
		Water supply Fac.			20.30	60.50		1,228.15	
		Gravity Thickener			14.00	22.00		308.00	
		Lift Pumping St.			9.50	14.30		135.85	
					12.50	13.50		168.75	
		Blower Buil.			71.00	8.50		603.50	
					22.80	16.00		364.80	
		Main Buil.		2	3.50	9.35		65.45	
					9.20	48.80		448.96	
		Chemical Buil.			72.00	26.00		1,872.00	
		Deodorizing Filter			90.00	10.00		900.00	
									(-) 19614.21
			m2						122,190.00
									x 2.20
		FILL H : 2.20 m	m3						268,818.00
		Less	m3		316.60	26.00	0.50		(-) 4115.8
		Less Volum of Gallery structures							
		undergriund from L 0.000 to L + 1.000							
		H : 1 m	m3						
		Gallery A			70.00	9.20	1.00	644.00	
		Gallery B			75.00	5.70	1.00	427.50	
		Gallery D			18.00	9.20	1.00	165.60	
		Gallery F			85.00	9.20	1.00	782.00	
		Gallery G			27.00	9.20	1.00	248.40	
		Gallery E			28.00	5.70	1.00	159.60	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Gallery H			25.00	5.70	1.00	142.50	
								=	(-) 2569.6
		TOTAL VOLUM TO BE FILLED							
			m3						262,132.60

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.8 QUANTITY SURVEY SHEET
ITEM: BACKFILL SEDIMENTATION TANK 2,3,4,17 - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		SECTION 1, 2							
		From Line 1 - 7	m3						12,176.00
		Backfill B - A 1		0.5	128.00	21.00	2.00	2,688.00	
		B - A 2			128.00	1.00	3.00	384.00	
		B - A 3			128.00	1.80	3.00	691.20	
		B - A 4		2	128.00	0.30	2.10	161.30	
		B - A 5		0.5	109.15	1.00	4.10	223.80	
		B - A 6			109.15	0.30	4.10	134.30	
		B - A 7		2	109.15	0.30	2.85	186.60	
		B - A 8		2x0.5	109.15	3.00	2.85	933.20	
		B - A 9		0.5	109.15	0.30	2.00	32.70	
		B - A 10		0.5	109.15	2.00	3.10	338.40	
		B - A 11		0.5	109.15	31.00	2.10	3,552.80	
		SECTION 3							
		Line A - B 1 - 7							
		B - A 12			102.00	1.50	4.95	757.35	
		Line G - H 1 - 7							
		B - A 13			26.00	12.4m2		322.40	
		B - A 14			25.00	12.4m2		310.00	
		SECTION 3							
		Line M - M 1 - 7							
		B - A 15		0.5	26.00	12.4m2		161.20	
		B - A 16		0.5	25.00	12.4m2		155.00	
		ACCESS		0.5	61.00	25.00	1.50	1,143.75	
									END
		EXCAVATION BY HAND							
		500 THK	m3						4,528.00
		Line A - M 1 - 2			128.00	19.00	0.50	1,216.00	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Line A - M 3 - 10			128.00	49.95	0.50	3,196.80	
		Line 2 - 3 A - M			10.50	21.90	0.50	114.98	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.9 QUANTITY SURVEY SHEET
ITEM: PIPE GALLERY BACKFILL A, D, F, G, H, E, B- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EFFLUENT PIPE	m3				EXCA. = 1113.7		
		Less Conc. Encaxmat			99.00	4.00	1.91	(-) 756.36	
		OUT LET		0.5	10.00	6.00	1.91	(-) 189.1	168.24
		GALERY B	m3						864.69
					82.00	1.90	1.80	280.44	
					82.00	1.90	3.75	584.25	
							EXCA. 14825		
	Less	GALLERY A, F, D, G			162.50	9.20	4.10	(-) 6129.5	
		GALLERY H			40.00	4.70	4.00	(-) 752.0	
		GALLERY E			51.60	4.70	4.10	(-) 994.33	
								(-)	7,876.00
								=	6,949.00
		EXCAVATION BY HAND (500THK)							988.17
		GALLERY A, , D, E, F, G, H			162.50	9.40	0.50	763.75	
					40.00	4.90	0.50	98.00	
					51.60	4.90	0.50	126.42	
		GALLERY B			92.00	6.20	0.50		254.20
		EFFLUENT PIPE			99.00	4.20	0.50	207.90	
		EFFLUENT OUTLET		0.5	10.00	6.00	0.50	15.00	222.90

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
								Total	1,465.27

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.10 QUANTITY SURVEY SHEET
ITEM: EXCAVATION LIFT PUMP, PIPE GALLERY G- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						5,452.70
		Base Slab Level - 6.50			2.00	2.10	6.50	27.30	
					15.40	10.70	6.50	1,071.07	
					6.50	5.25	6.50	221.82	
		Base Slab - 6.5 - -8.5		0.5	19.20	2.00	2.00	38.40	
		Base Slab - 8.5			19.20	15.20	8.50	2,480.64	
		Cut - Side of Slope of Gallery							
		Area Slope Section : 15.39 m2			31.10	15.39		478.63	
		Gallery H Extention			31.10	8.90	4.10	1,134.84	
		L - 4.10							
		BACKFILL SAND	m3						1,006.64
		Level - 6.50			15.40	10.70	1.00	10.70	
					6.50	5.10	2.40	240.24	
		LEVEL - 8.50			2.10	2.00	2.40	10.08	
					17.20	5.10	8.50	745.62	
		EXCAVATION BY HAND							395.46
		500 THK			2.00	2.10	0.50	2.10	
					15.40	10.70	0.50	82.39	
					6.50	5.25	0.50	17.06	
				0.5	19.20	2.00	0.50	9.60	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
					19.20	15.20	0.50	145.92	
		Gallery Extension G			31.10	8.900	0.50	138.39	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.11 QUANTITY SURVEY SHEET
ITEM: EXCAVATION CHLORINATION AND DISINFECTION - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						11,427.61
		CHLORINATION STRAGE TANK							
		BLD 6 (60.5 x 6.5)	Level - 3.23						
					60.80	6.80	3.23	1,335.41	
		(60.5 x 14.0)	Level - 4.10						
					60.80	14.30	4.10	3,564.70	
		(8.60 x 25.0)			7.20	25.60	4.10	755.70	
		DISINFECTION TANK	Level - 3.23						
		(22.5 x 34.5)			22.80	34.80	3.23	2,562.82	
		Cut Side of Slope Section			42.00				
		A 2 2.73 x 1.0 = 2.73			37.00				
		A3 2.23x9.9x0.5=10.81			23.00				
		A = 13.54 m2			50.00				
					50.00				
					35.00				
				Total	237.00	13.54		3,208.98	
		BACKFILL						EXCA 11427.61	
	Less	CHLORINATION TANK			26.00	9.40	4.10	(-) 1002.04	
					60.50	14.00	4.10	(-) 3472.70	
					60.50	6.50	3.23	(-) 1270.20	
	Less	DISINFECTION TANK			35.00	25.50	3.23	(-) 2882.70	
			m3						2,799.97

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION BY HAND 500 THK							1,127.71
		CHLORINATION TANK			60.70	6.70	0.50	204.00	
					60.70	14.20	0.50	430.90	
					7.40	25.80	0.50	95.96	
		DISINFECTION TANK			22.70	35.00	0.50	397.25	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.12 QUANTITY SURVEY SHEET
ITEM: EXCAVATION UNDER MAIN BUI. PIPE GAL. - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						3,626.00
		Main Building	Level - 4.15						
		(48.8 x 9.6)							
		Pipe Gallery			49.40	10.20	4.15	2,091.10	
		Cut Side of Slope							
		Area : 15.73 m2		2	48.80	15.73		1,535.25	
									END
		BACKFILL							
		Less Gallery			48.80	8.80	4.15	(-) 1782.17	
			m3						1,843.80
		EXCAVATION BY HAND 500 (THK)							469.00
					48.80	9.60		468.48	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.13 QUANTITY SURVEY SHEET
ITEM: EXCAVATION UNDER BLOWER PIPE GAL..- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						7,099.65
		Pipe Gallery level	-4.15						
		(25.6 x 25.6)			26.20	26.30	4.15	2,848.73	
		(50.4 x 50.4)			51.00	10.20	4.15	2,158.83	
		Cut Slope of Section			15.00				
		Area Section 15.73 m2			25.00				
					8.00				
					35.00				
					42.00				
				Total	133.00	15.73		2,092.00	
									END
		BACKFILL							
					71.60	8.80	4.15	(-) 2614.83	
					21.80	16.80	4.15	(-) 1519.9	
			m3						2,964.92
		EXCAVATION BY HAND 500(THK)							1,139.20
			m3		25.60	25.60		655.36	
					50.40	9.60		483.84	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.14 QUANTITY SURVEY SHEET
ITEM: EXCAVATION UNDER DEWATER PIPE GAL.- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						6,008.27
		Gallery under							
		Dewater Buil.	L = 73 x 8.1 = 591.3						
			19.5 x 9.6 = 187.2						
		Level - 4.00 - - 4.20		Total	778.50				
		D : 4.10							
					778.50	4.10		3,191.90	
		Cut							
		Side of Slope Section			15.00				
		A 2 1.0 x 3.1 - 3.10			80.00				
		A 3 11.7 x 2.1 = 12.29			20.00				
		15.39 m2			53.00				
					15.00				
				Total	183.00	15.39		2,816.37	
									END
		BACKFILL							
		Less Gallery			38.00	7.50	4.10	(-) 1168.5	
					38.00	7.50	4.30	(-) 1225.5	
					18.00	8.40	4.20	(-) 635.00	
			m3						2,979.27
		EXCAVATION BY HAND 500 (THK)							
			m3		778.5m2		0.50	389.25	389.00

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.15 QUANTITY SURVEY SHEET
ITEM: EXCAVATION UNDER GRAVITY PIPE GAL.- WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		EXCAVATION	m3						1,229.80
		Gallery under Tank							
		(13 x 11) Level -3.90			13.60	11.30	3.90	599.35	
		Cut Side of Slope			10.00				
		Area Section : 14.01 m2			10.00				
					25.00				
				Total	45.00	14.01		630.45	
									END
		BACKFILL	m3		45.00	4.01		630.45	631.00
		EXCAVATION BY HAND (500 THK)							
			m3		13.60	11.30	0.50	76.84	77.00

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.16 QUANTITY SURVEY SHEET
ITEM: EXCAVATION CONNECTION PIPE 2500 - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		MECHA and HAND							
		EXCAVATION			66.00	18.25	3.03	1,204.50	
				0.5	66.00	9.00	3.03	899.90	
			m3						2,104.40
1		HAND EXCA.	m3		66.00	3.50	0.50		116.00
2		MECH. EXCA.	m3		(2104.4 - 116) =				1,989.00
		New Structure							
		bellow L 0.00			66.00	3.50	2.02	473.55	
			3.14 x 0.5		66.00	1.25	1.25	161.90	
			m3						635.50
3		BACKFILL OVER							
		EXCAVATION	m3		(2104.4 - 635.5) =				1,469.00
		EXCAVATION ONE			80.00	0.30	4.10	98.40	
		SIDE of PIPE			80.00	1.00	3.10	248.00	
		GALLERY		0.5	80.00	11.70	2.10	982.80	
			m3						1,329.00

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.17 QUANTITY SURVEY SHEET
ITEM: TIMBER PILE UNDER PIPE GALLARY - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Timber Pile					3m x 100114 = 300342		
		80mm - 100mm							
		16 pile / m2							
		AT Sedimentation							
		Tank Gallery							
			No.	16	62.92	9.20		9,261.40	
				16	62.92	3.50		3,523.40	12,786.00
		Gallery A	No	16	59.20	9.20		8,714.50	
		Gallery D	No.	16	8.00	9.20		1,177.50	
		Gallery E	No.	16	43.20	4.70		3,248.50	
		Gallery F							
		14.6+26.0 = 40.6 m	No	16	40.60	9.20		5,977.00	
		Gallery G	No.	16	22.15	9.20		3,260.50	
		Gallery H	No	16	23.10	4.70		1,737.50	
		Chlorination Buil.	No.	16	14.20	60.50		13,745.60	
				16	26.00	9.20		3,828.40	17,574.00
		Gravity Thickener	No.	16	13.50	13.00		2,808.00	
		Dewatering Buil.	No.	16	80.00	8.00		10,240.00	
			No.	16	20.00	9.50		3,040.00	
			No.	16	35.00	1.00		560.00	13,840.00
		Blower Buil.	No.	16	23.00	15.50		5,704.00	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
			NO.	16	72.50	10.00		11,600.00	17,304.00
		Main Buil.	NO.	16	47.80	8.80		6,730.00	
		Lift Pumping St.	NO.	16	36.00	8.60		4,953.50	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.18 QUANTITY SURVEY SHEET
ITEM: STEEL SHEET PILE - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Steel Sheet Pile	m2						16,164.00
		AT Lift Pumping St.	m2						3,406.00
		Level - 33.00 m			32.6				
					19.2				
		103 / 0.4 = 257.5			19.3				
					2				
					3.15				
					6.5				
					10.15				
					10.7				
					103.6				
				258		33.00	0.40	3,406.00	
		AT Pipe Gallery B							2,788.00
		Level - 17.00 m		2	82.00				
				410		17.00	0.40	2,788.00	
		AT Sed. Tank							7,724.00
		Level - 17.00 m							
		Grid I			117.80				
		Grid T			112.30				
		Grid A			97.30				
		Grid B			91.70				
		Distribution Tank			35.20				
					454.30				
		454 / 0.4 = 1135.75		1136		17.00	0.40	7,724.00	
		Level - 10.00							2,246.00
		Grid 3			112.30				
		Grid 4			112.30				

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
					224.60				
		224.6 / 0.4 = 561.5		562		10.00	0.40	2,246.00	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.2.19 QUANTITY SURVEY SHEET
ITEM: LANDSCAPE WORK - WASTEWATER TREATMENT PLANT(Site preparation)

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Top Soil	m2						59,752.00
		1			45.00	5.00		225.00	
		2			45.00	21.00		945.00	
		3		0.5	70.00	32.00		1,120.00	
		4		0.5	105.00	19.00		997.50	
		5			60.00	17.00		1,020.00	
		6			270.00	9.00		2,430.00	
		7			132.00	41.00		5,412.00	
		8			110.00	25.00		2,750.00	
		9			82.00	5.00		410.00	
		10			127.00	9.00		1,143.00	
		11			180.00	8.00		1,440.00	
		12			144.00	42.00		6,048.00	
		13			115.00	18.00		2,070.00	
		14			80.00	7.00		560.00	
		15			115.00	12.00		1,380.00	
		16			125.00	5.00		625.00	
		17			71.00	25.00		1,800.00	
		18			79.00	25.00		1,975.00	
		19			80.00	14.00		1,120.00	
		20			48.00	11.00		528.00	
		21			20.00	4.00		80.00	
		22			62.00	4.00		248.00	
		23			33.00	4.00		132.00	
		24			81.00	10.00		810.00	
					8.00	4.00		32.00	
					7.00	5.00		35.00	
		25			7.00	7.00		49.00	
		26			69.00	9.00		621.00	
		27			38.00	24.00		912.00	
		28			60.00	13.00		780.00	
		29			121.00	25.00		3,025.00	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		30			44.00	31.00		1,364.00	
		31			49.00	5.00		245.00	
		32			12.00	25.00		300.00	
		33			18.00	10.00		180.00	
		34			13.00	2.00		26.00	
		35			25.00	9.00		225.00	
		36		2	10.00	10.00		200.00	
		37			15.00	8.00		120.00	
					135.00	24.00		3,240.00	
				0.5	118.00	55.00		3,245.00	
					55.00	16.00		880.00	
		38			9.00	7.00		133.00	
					12.00	4.00		48.00	
		39			88.00	38.00		3,230.00	
		40			60.00	25.00		1,500.00	
				0.5	51.00	25.00		637.50	
		41			135.00	8.00		1,080.00	
		42			20.00	18.00		360.00	
		43			30.00	8.00		240.00	
		44			100.00	4.00		400.00	
		45			96.00	4.00		384.00	
		46			120.00	4.00		480.00	
		47			18.00	4.00		72.00	
		48			110.00	4.00		440.00	
									END

Table E2.20 Pile Length Calculation

Facility Name	Lower level of Bottom Slab	The tip point elevation of Pile	Driving Length	Necessary Pile Length		Extend Pile Length	Pile Number	ALL LENGTH			REMARK
				Net	Practical			Driving Length	Necessary Pile Length		
1. Treatment Plant		-36.60									
(1) Case 1(Primary S.)	2.21		36.60	39.41	40.00	0.00	365	13,359.00	14,600.00		
(2) Case 2(Aration Ta.)	-0.95		36.60	36.25	37.00	0.00	708	25,912.80	26,196.00		
(3) Case 3(Final S.)	0.57		36.60	37.77	38.00	0.00	482	17,641.20	18,316.00		
(4) Case 4(Pipe Ga.)	-3.70		36.60	33.50	34.00	2.60	1345	49,227.00	45,730.00		
(5) Case 5 (Water Way)	-5.90		36.60	32.60	33.00	3.60	378	13,834.80	12,474.00		
(6) Case 6 (Water Way)	-6.00		36.60	32.60	33.00	3.60		0.00	0.00		
(7) Case 7(Discharge)	-2.63		36.60	34.57	35.00	1.60	2	73.20	70.00		
Total							3280	120,048.00	117,386.00		
2. Disinfection Tank		-35.10									
	-2.93		35.10	32.77	33.00	2.10	192	6,739.20	6,336.00		
3. Lift Pumping Station		-35.00									
(1) Case 1	-5.50		35.00	31.00	31.00	4.00	35	1,225.00	1,085.00		
(2) Case 2	-6.20		35.00	31.00	31.00	4.00	29	1,015.00	899.00		
(3) Case 3	-8.20		35.00	31.00	31.00	4.00	93	3,255.00	2,883.00		
(4) Case 4	-2.20		35.00	33.40	34.00	1.00	11	385.00	374.00		
(5) Case 5	-3.70		35.00	31.90	32.00	3.00	76	2,660.00	2,432.00		
(6) Case 6	-5.90		35.00	29.70	31.00	4.00	28	980.00	868.00		
Total							272	9,520.00	8,541.00		
4. Main Building		-35.00									
(1) Case 1	1.70		35.00	37.30	38.00	0.00	25	875.00	950.00		
(2) Case 2	1.40		35.00	37.00	37.00	0.00	56	1,960.00	2,072.00		
(3) Case 3	-3.95		35.00	31.65	32.00	3.00	131	4,585.00	4,192.00		
							212	7,420.00	7,214.00		
5. Blower Building		-35.40									
	-3.95		35.40	32.05	33.00	2.40	270	9,558.00	8,910.00		
6. Dewatering Building		-34.60									
(1) Case 1	1.70		34.60	36.90	37.00	0.00	217	7,508.20	8,029.00		

Facility Name		Lower level of Bottom Slab	The tip point elevation of Pile	Driving Length	Necessary Pile Length		Extend Pile Length	Pile Number	ALL LENGTH			REMARK
					Net	Practical			Driving Length	Necessary Pile Length		
	(2) Case 2	1.40		34.60	36.60	37.00	0.00		0.00	0.00		
	(3) Case 3	-3.90		34.60	31.30	32.00	2.60	300	10,380.00	9,600.00		
	(4) Case 4	-4.10		34.60	31.10	32.00	2.60		0.00	0.00		
	Total							517	17,888.20	17,629.00		
7. Gravity Thickner			-34.30									
	(1) Case 1	-1.75		34.30	33.15	34.00	0.30	34	1,166.20	1,156.00		
	(2) Case 2	-2.50		34.30	32.40	33.00	1.30	1	34.30	33.00		
	(3) Case 3	-3.60		34.30	31.30	32.00	2.30	28	960.40	896.00		
	Total							63	2,160.90	2,085.00		
8. Cpmpost Facility			-33.70									
8.1	Fermenting Vessel											
	(1) Case 1	1.43		33.70	35.73	36.00	0.00	434	14,625.80	15,624.00		
	(2) Case 2	0.60		33.70	34.90	35.00	0.00	90	3,033.00	3,150.00		
	(3) Case 3	-2.40		33.70	31.90	32.00	1.70	3	101.10	96.00		
	Total							527	17,759.90	18,870.00		
8.2	Deodrization Tank											
	(1) Case 1	1.80		33.70	36.10	37.00	0.00	68	2,291.60	2,516.00		
	(2) Case 2	-1.20		33.70	33.10	34.00	0.00	2	67.40	68.00		
	Total							70	2,359.00	2,584.00		
8.3	Track Scale											
		1.65		33.70	35.95	36.00	0.00	4	134.80	144.00		300 * 300
9. Water Supply Facility			-35.10									
	(1) Case 1	-2.93		35.10	32.77	33.00	2.10	84	2,948.40	2,772.00		
	(2) Case 2	-3.80		35.10	31.90	32.00	3.10	240	8,424.00	7,680.00		
	Total							324	11,372.40	10,452.00		
12. Pipe Gallery												
	(A)Water Supply - WWTP	-3.80	-35.70	35.70	32.50	33.00	2.70	116	4,141.20	3,828.00		
	(B)Lift Pump - WWTP	-5.90	-35.70	35.70	31.70	32.00	3.70	81	2,891.70	2,592.00		
	(D)Water Supply	-3.80	-35.10	35.10	31.90	32.00	3.10	16	561.60	512.00		
	(E)Blower - High Voltage	-3.70	-34.90	34.90	31.80	32.00	2.90	51	1,779.90	1,632.00		

Facility Name	Lower level of Bottom Slab	The tip point elevation of Pile	Driving Length	Necessary Pile Length		Extend Pile Length	Pile Number	ALL LENGTH			REMARK
				Net	Practical			Driving Length	Necessary Pile Length		
(F)Lift Pump - Blower	-3.80	-35.20	35.20	32.00	32.00	3.20	36	1,267.20	1,152.00		
(F)Main Bu. - Lift Pump	-3.80	-35.00	35.00	31.80	32.00	3.00	56	1,960.00	1,792.00		
(G)Dewater - Main Bu.	-3.80	-34.80	34.80	31.60	32.00	2.80	40	1,392.00	1,280.00		
(H) Dewater - Compost	-3.70	-34.20	34.20	31.10	32.00	2.20	27	923.40	864.00		
Total							423	14,917.00	13,652.00		
13. Lift Pump Transfarmer		-34.90									
	1.85		34.90	37.35	38.00	0.00	6	209.40	228.00		

Total Driving Length	300 * 300	344.20	m
	400 * 400	219,742.60	m
Total Pile Lemgth	300 * 300	372.00	
	400 * 400	213,659.00	
Total Pile Numbers	300 * 300	10	
	400 * 400	6,150	

3. STRUCTURES WORKS

Table E.1 Total Quantity

		unit	1 Lift Pumping Station	2 Treatment Plant	3 Disinfection Tank	4 Water Supply Facility	5 Effluent Pipe	6 Pipe Gallery	7 Main Building	8 Blower Building	9 Dewatering Building	10 Gravity Thickener	11 Compost Plant Fermenting Vessel	12 Compost Plant Deodrizing Soil Filter	13 Compost Plant Weigh Bridge	Total
1.Concrete	Type E (21)															
	Base	m3	854.13	9321.14	739.36	1192.88	532.28	1328.28	830.18	1001.99	1975.64	163.26	2240.67	192.33	14.11	20386.26
	Wall	m3	1086.65	12285.92	485.03	1002.79		1099.22	378.33	391.46	531.27	139.26	1212.03	78.26		18690.22
	Slab	m3	553.20	3464.92	69.22	604.30		1126.48	241.54	565.57	660.02	41.10	369.98	5.72		7702.04
	Mechanic Base	m3	11.87	7.85	8.08	10.89				20.13		97.56	4.07			160.43
	Electric Base	m3	81.69													81.69
	Type E Total	m3	2587.53	25079.83	1301.68	2810.86	532.28	3553.97	1450.04	1979.16	3166.94	441.17	3826.75	276.31	14.11	47020.64
	Type F (18)															
	Normal	m3	54.59	1818.98	195.91				126.05							2195.53
	Cinder	m3	53.56	731.79		97.13		149.98	40.46	88.09	203.39	6.80				1371.20
	Type F Total	m3	108.15	2550.77	195.91	97.13	0.00	149.98	166.51	88.09	203.39	6.80				3566.73
	Class G (10) (Inc.Elec.)	m3	103.95	1418.31	70.45	164.29	46.55	201.69	106.41	114.31	213.37	30.90	443.81	50.24	5.80	2970.08
(For Mecha. Base)	Mortar Nonshink t = 20	m2	36.60	47.83	21.68	68.68				72.80		296.16	22.11			565.86
(For Elect. Base)	Mortar Nonshink t = 20	m2	332.50													332.50
(For Staiers)	Mortar Finishing t = 20	m2	2.06		17.10	41.20			41.35	23.20	45.05		15.64	26.78		212.38
(For Thickener)	Mortar Finishing t = 50	m2										158.93				158.93
(For Treatment)	Mortar Surfacing t = 100			3869.81												
2. Forming	Type E (21)															
	Base	m2	208.06	2404.02	315.18	315.18	704.41	400.77	123.60	175.10	226.60	192.61	294.58	49.96	20.67	5430.74
	Wall	m2	2915.93	50665.19	3770.32	3770.42		4808.89	390.66	1019.70	700.40	796.19	4353.30	477.71		73668.70
	Slab	m2	1681.99	29611.16	463.50	2199.46		2805.16	1543.66	2800.60	2902.83	183.34	1739.67	15.86		45947.24
	Mechanic Base	m2	21.75	32.14	14.57	45.92				23.28		104.52	13.97			256.15
	Electric Base	m2	115.48													115.48
	Type E Total	m2	4943.22	82712.50	4563.57	6330.98	704.41	8014.83	2057.92	4018.68	3829.83	1276.66	6401.51	543.53	20.67	125418.31
	Type F (18)															
	Normal	m2							31.64							31.64
	Cinder	m2	17.72	127.72		20.19		54.50	14.03	15.16	53.56	3.91				306.79
	Type F Total	m2	17.72	127.72	0.00	20.19	0.00	54.50	45.67	15.16	53.56	3.91	0.00	0.00	0.00	338.43
	Class G (10) (Inc.Elec.)	m2	22.53	164.49	21.63	16.69	11.23	68.43	19.86	20.27	31.14	6.79	65.88	12.11	2.64	463.68
3. Reinforcement	Structure	kg	251708.3	2341750.5	109053.2	264439.9	25568.1	291887.4	156068.7	238778.7	294790.1	33577.0	305817.5	22104.6	622.1	4336166.2
	Mechanic Base	kg	474.6	313.9	323.0	435.5	0.0	0.0	0.0	805.0	0.0	3902.4	162.7	0.0	0.0	6417.1
	Electric Base	kg	3267.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3267.60
	Type E Total	kg	255450.5	2342064.4	109376.2	264875.4	25568.1	291887.4	156068.7	239583.7	294790.1	37479.4	305980.2	22104.6	622.1	4345850.9
4. Sand	(Include Elec.)	m3	185.95	2836.62	140.80	328.57	93.09	404.21	212.81	228.62	426.75	59.50	887.60	100.49	11.59	5916.60
5. Expansion Joint	Water Stop	m	95.79	1852.04	44.93	101.48	20.76	682.51	51.50	51.50	125.76		176.34	14.63		3217.24
	Elastic Joint Filer	m2		257.36		59.08	37.22	261.99	23.94	23.94	67.99		84.17	4.91		820.60
	Sealing	L		1234.06		56.26	21.12	345.42	33.70	33.70	65.38		119.48	11.70		1920.83
6. Balustlade	Flat Slab	m			214.40	92.00							6.54	8.00		320.94
	Stairs	m			7.80	49.70							16.42	4.80		78.72

Table E.1 Total Quantity

7. Ludder					12.00	22.00								10.00		44.00
8. Grating Cover	Grating	kg														7094.03
	Plate and Bar	kg														3624.77
															Total	10718.80
9. Checkerd Plate Cover		kg											280.57			280.57
													(t = 3.2mm)			
10. Precast Concrete Cover																
	Concrete	m3														134.15
	Forming	m2														3623.22
	Reinforcement	kg														13415.00
	Plate and Bar	kg														22870.69
															Total No.	5030.00
11. Fabricated Manhole Cover																
12. Other Covers																
13. Precast Concrete Pipe							100.50									100.50
	D = 2500 mm															
14. Steel Pipe	D = 2500 mm				64.00											64.00
	D = 100 mm												155.70			155.70
15. Flexible Joint	Allowable Settle				n = 2											n = 2
	200 mm															
16. Stop Log																
17. Sky Light		unit														
18. V U Pipe		unit		D 150mm												
				L = 300												
				11780.00												
19. Tar Epoxy Lining		m2	1436.00	8440.00							1631.00	540.00				12047.00
20. Floor Finishing		m2				299.50			1280.00	1861.56	2088.51					5529.57
21. Concrete Piles			400 * 400	400 * 400	400 * 400	400 * 400		400 * 400	400 * 400	400 * 400	400 * 400	400 * 400	400 * 400	400 * 400	300 * 300	
			L = 34	L = 40	L = 33	L = 33		L = 33	L = 38	L = 33	L = 37	L = 34	L = 36	L = 37	L = 36	
			n = 11	n = 365	n = 192	n = 84		n = 116	n = 25	n = 270	n = 217	n = 34	n = 434	n = 68	n = 4	
			L = 32	L = 38		L = 32		L = 32	L = 37		L = 32	L = 33	L = 35	L = 34		
			n = 76	n = 482		n = 240		n = 307	n = 56		n = 300	n = 1	n = 90	n = 2		
			L = 31	L = 37					L = 32			L = 32	L = 32			
			n = 185	n = 708					n = 131			n = 28	n = 3			
				L = 35												
				n = 2												
				L = 34												
				n = 1345												
				L = 33												
				n = 378												
22. Wooden Piles		m					47259.00						418.50	900.00		48577.50

Table E.1 Total Quantity

23. Others																
	Rip Rap	m3					88.80									
	Door								W 850	W 850	W 850		W 2000			
									H 2200	H 2200	H 2200		H 2500			
									n = 2	n = 3	n = 2		n = 2			
									TYPE C	TYPE C	TYPE C		TYPE D			
	Embankment	m3					710.18		Steel	Steel	Steel		Steel			
									5 mm THK	5 mm THK	5 mm THK					
	Fence	m	71.00						Clear Glass	Clear Glass	Clear Glass					

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E 3.1.1 QUANTITY SUMMARY SHEET
ITEM: LIFT PUMPING STATION - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	172.00	
1.2		Levelling Conc. Class G			
		Base	m^3	86.00	
1.3		Cinder Conc. Class F			
		Base	m^3	53.00	
1.4		Reinforced Conc. Class E			
		Base	m^3	728.50	
		Column	m^3	6.50	
		Beam	m^3	18.20	
		Slab	m^3	535.00	
		Wall	m^3	966.50	
		Temporary Wall	m^3	51.50	
		Stair	m^3	1.50	
		Construction Joint	m^3	100.75	
1.5		Non R.Conc. Class F18			
		Slab	m^3	46.50	
		Wall	m^3	6.50	
1.6		Formwork			
		Side Base	m^2	202.00	
		Side Slab	m^2	205.00	
		Side Wall	m^2	2,762.00	
		Side Temporary Wall	m^2	234.00	
		Side Beam	m^2	91.00	
		Side Column	m^2	58.00	
1.6		Formwork Cont.			
		Stair	m^2	4.00	
		Soffit Slab	m^2	1,110.00	
		Side Cinder Conc.	m^2	17.20	

No.	Code	Description	Unit	Quantity	Remarks
1.7		Jointing			
		Water Stop	m	93.00	
		Sealing	m	115.00	
		Tar Epoxy: Wall		1,019.00	
		Slab		417.00	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.1.2 QUANTITY SUMMARY SHEET
ITEM: TRANSFORMER PAD - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Reinf. Conc. Pile 300 x 300 L: 38M	m	228.00	
1.2		Pile Connection	pcs	12.00	
1.3		Sand Base	m^3	8.53	
1.4		Leveling Conc. Class G	m^3	4.30	
1.5		Reinforced Conc. Class E	m^3	14.00	
1.6		Formwork	m^2	9.10	
1.7		Rebar	kg	876.26	

Table E.3.1.3 QUANTITY SURVEY SHEET

ITEM: 2.4

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantit	Quantity
1		CONCRETE .CLASS G	m^3						**85.22**
		(Levling concrete)							
		To Pumping st			9.55	31.40	0.10	29.99	
					9.50	20.40	0.10	19.38	
		Gallry			17.00	1.80	0.10	3.06	
					9.20	4.00	0.10	3.68	
					8.20	35.50	0.10	29.11	
2		CONCRETE .CLASS E	m^3						**2,401.43**
		a - Base							**773.85**
		L - 7.200			11.50	1.80	1.00	20.70	
					11.80	4.95	1.00	55.34	
					13.55	13.65	1.00	184.96	
		L - 5.200			9.55	5.00	1.00	47.75	
		L - 4.200			9.55	5.80	1.00	55.39	
					9.55	5.00	1.30	62.06	
		Grid chamber		2	3.50	1.00	0.50	3.50	
		L - 3.100			13.60	4.50	0.60	36.72	
		L - 1.500			8.60	8.00	0.60	41.28	
		Less							
		L - 6.200			12.60	9.00	0.60	68.04	
		L - 4.100			27.00	8.50	0.70	160.65	
					1.60	4.50	0.70	5.04	
		Cont. joint base							
		t:1300			5.00	1.00	1.30	6.50	
		t:1000			37.00	1.00	1.00	37.50	
		t:600			4.50	0.60	0.60	1.60	
		b - Wall	m^3						**1,048.50**
		Int.wall							
		L -3.100			1.500	3.80	0.50	2.85	
		L - 1.500			3.15	4.10	0.50	6.46	

		L - 1.500			6.50	4.10	0.50	13.33	
		Wall							
		L -1.500			4.50	2.10	0.60	5.67	
		L -7.200			3.00	16.80	0.50	25.20	
		L -7.200		3	7.00	5.30	0.50	55.65	
		L -4.200		2	7.40	2.30	0.50	17.20	
		L -4.200		2	8.80	2.30	0.50	20.24	
		L -1.500			8.80	3.70	0.50	16.28	
		Less opening							
				2	1.50	1.50	0.50	-2.25	
				2	2.00	3.30	0.50	-6.60	
				2	1.50	1.50	0.50	-2.25	
				1	1.00	1.00	0.50	-0.50	
		R.wall L-4.200		3.14	0.75	2.30	0.75	4.06	
		"		2	1.80	2.30	1.50	12.42	
		Wall hunch		0.5x6	0.50	5.30	0.50	3.98	
		External wall							
		Grid 10			1.00	16.80	0.80	13.44	
		Grid A			24.10	16.80	0.80	323.91	
		Grid 2			3.00	16.80	0.80	40.32	
		Grid B			13.60	7.10	0.80	77.25	
		Grid 2			9.00	7.10	0.80	51.12	
					5.50	7.10	0.80	31.24	
		Grid 3			14.20	6.00	0.80	68.16	
		Grid 4			8.60	6.00	0.80	41.78	
		Less opening		1	2.80	1.20	0.80	-2.69	
				2	1.80	1.80	0.80	-5.19	
		Gallery wall		1	27.00	3.50	0.60	56.70	
				1	1.60	3.50	0.60	3.36	
				5	12.60	1.80	0.40	45.36	
				1	9.00	0.80	0.60	4.32	
				2	11.00	0.80	0.60	10.56	

				3	4.60	4.10	0.35	19.80	
		C.J wall							
		t:800			40.00	1.00	0.80	32.00	
		t:500			6.50	1.00	0.50	3.25	
		b - Temporary wall							
		Grid 5 L-7.200			1.75	5.30	0.50	4.64	
					3.50	3.80	0.50	6.65	
		L-4.500			2.50	4.10	0.50	5.13	
		L-1.500			5.50	3.20	0.50	8.80	
					7.00	3.00	0.50	10.50	
					12.50	2.50	0.50	15.63	
		Gallery		2	3.80	3.75	0.40	11.40	
		c - Column	m^3						**6.45**
		Grid 1,2		5	0.40	0.40	3.70	2.37	
				4	0.50	0.50	2.60	3.25	
				2	0.40	0.40	2.60	0.83	
		d - Beam	m^3						**18.21**
		L+ 2.500		2	6.50	0.40	0.40	2.08	
				2	7.50	0.70	0.40	4.20	
				3	14.20	0.70	0.40	11.93	
		e - Slab	m^3						**554.42**
		L-1.500			14.30	9.55	0.40	54.63	
					11.75	3.66	0.40	16.92	
					13.50	9.00	0.40	48.60	
		Less							
				2	1.00	1.00	0.40	(-)0.80	
				2	0.80	2.50	0.40	(-)1.60	
				2	0.80	2.00	0.40	(-)1.28	
				3	1.65	2.25	0.40	(-)4.46	
				3.14x3	0.40	0.40	0.40	(-)0.60	
				2	3.50	1.50	0.40	(-)4.20	
				2	3.50	2.00	0.40	(-)5.60	

		L+2.500			13.75	9.55	0.30	39.39	
					13.50	16.00	0.30	64.86	
					6.50	3.30	0.30	6.44	
					2.50	0.60	0.30	0.45	
		Less opening		3	2.25	1.65	0.30	(-)3.34	
				3.14x3	0.40	0.40	0.30	(-)0.45	
				2	2.00	3.50	0.30	(-)4.20	
				1	1.00	1.00	0.30	(-)0.30	
				2	0.80	2.50	0.30	(-)1.20	
		L+10.000			13.50	4.60	0.40	24.84	
					11.50	1.80	0.40	8.28	
		Less opening		3	0.40	0.40	0.40	(-)0.20	
		Gallery			12.60	9.00	0.40	113.40	
					13.20	9.00	0.40	47.50	
					27.00	8.50	0.60	137.70	
		Cont. joint slab							
		t:400			26.50	1.00	0.40	10.60	
		t:300			31.00	1.00	0.30	9.30	
		e' - Stair			1.10	0.25	0.187	0.05	
					1.10	0.25	0.374	0.10	
					1.10	0.25	0.561	0.154	
					1.10	0.25	0.935	0.257	
					1.10	0.25	1.310	0.361	
3		CINDER CONCRETE .CLASS	m^3						**52.20**
		Pump R.M L-1.500			11.10	8.80	0.10	9.80	
					3.50	9.20	0.10	3.20	
					7.80	7.80	0.10	6.80	
					7.80	4.60	0.10	3.59	

		Less		2	1.50	3.50		(-)10.5	
				2	2.00	3.50		(-)14.00	
				2	0.80	2.00		(-)3.20	
				2	0.80	2.50		(-)4.00	
				2	1.00	1.00		(-)2.00	
				3	1.65	2.25		(-)11.20	
				3	0.40	0.40	3.14	(-)1.50	
		Gallery			13.50	3.75	0.10	5.06	
					36.00	7.40	0.10	26.64	
					4.20	3.80	0.10	1.60	
					3.50	2.50	0.10	0.87	
		NON-R.CONC Class F	m^3						**52.68**
		To Slab							
		L - 4.200			8.50	5.00	0.30	12.75	
		L + 2.500			9.20	3.50	0.30	9.66	
					11.50	8.50	0.30	29.33	
		Less opening		3	1.65	2.25	0.30	-3.34	
				1	1.00	1.00	0.30	-0.30	
				2	2.00	1.50	0.30	-1.80	
		To Wall			5.00	2.50	0.50	6.25	
				.0.5	0.50	2.50	0.50	0.31	
4		MORTAR FINISHING							
		t : 20 (for stair)		7	1.10	0.25		1.925	**1.925**
5		FORM WORK							**4656.15**
		for conc class E							
		a - Base	m^2						
		Pump room							
		Grid A			25.10		1.00	25.10	
		Grid 8			1.80		1.00	1.80	
		Grid 2			14.00		1.00	14.00	
		Grid 2-3			4.00		1.00	4.00	
		Grid 3			5.00		2.00	10.00	
		Grid 3			9.20		1.30	11.96	

		Grid G			9.60		1.00	9.60	
		Grid 5			5.80		1.00	5.80	
		Grid 5			3.40		1.30	4.42	
		Grid 5			5.00		2.00	10.00	
		Grid 5			4.00		1.00	4.00	
		Grid 5			13.00		1.00	13.00	
		Grid A'			11.50		1.00	11.50	
		Gallery		2	12.60		0.60	15.12	
					9.00		0.60	5.40	
				1	27.00		0.70	18.90	
				2	5.50		0.70	7.70	
				1	1.00		0.70	7.70	
				2	9.00		0.60	10.80	
					13.50		0.60	8.10	
					4.80		0.60	2.88	
					2.00		0.60	1.20	
					3.20		0.60	1.92	
					6.20		0.60	3.72	
		b - Wall	m^2					SubTotal	**2989.53**
		Pump room	m^2	2	3.00	16.80		100.80	
				2x3	7.00	5.30		222.60	
				2x2	7.40	2.30		68.10	
				2x2	8.40	2.30		80.96	
				2	8.00	3.70		59.20	
		Less							
				2	1.50	1.50		(-)4.50	
				2	2.00	3.30		(-)13.20	
				2	1.50	1.50		(-)4.50	
				1	1.00	1.00		(-)1.0	
		R.wall			4.70	2.30		10.81	
				4	1.75	2.30		16.10	
		Wall hunch		6	0.50	5.30		15.90	
				2	1.00	16.80		33.60	
				2	25.10	16.80		843.36	

				2	3.00	16.80		100.80	
				2	13.60	7.10		193.12	
				2	9.00	7.10		127.80	
				2	5.50	7.10		78.10	
				2	14.20	6.00		170.40	
				2	8.60	6.00		103.30	
		Less							
				2	2.80	1.20		(-)6.72	
				2x2	1.80	1.80		(-)12.96	
		Gallery		2	27.00	3.50		189.00	
				2	1.00	3.50		7.00	
				2	1.60	3.50		11.20	
				2x5	12.60	1.80		226.80	
				2	9.00	0.80		14.40	
				2x2	11.00	6.80		35.20	
				2x3	4.60	4.10		113.16	
		Temporary Wall		2	1.75	5.30		18.55	
				2	3.50	3.80		26.60	
				2	2.50	4.10		20.50	
				2	5.50	3.20		35.20	
				2	7.00	3.00		42.00	
				2	12.50	2.50		62.50	
		Gallery		2x2	3.80	3.75		28.50	
		c, Slab	m²					Subtotal	**1,465.00**
		PumpRM			19.40				
		(Beam, Slab)			6.50				
		(Column Side)			10.00				
					9.55				
					26.40				
		Opening			2.20				
		3(2.25x1.65)			23.40				
		3(ϕ800)			7.54				
		7(3.5x2.05)			22.20				
					4.00				
					13.00				
			m²		144.19		0.30	43.26	

		L+10.000	m²		60.00		0.40	24.00	
		L-1.500			9.50				
					5.50				
					14.00				
					9.55				
					26.80				
		Opening Cover							
		2-1000x1000			8.00				
		2-800x2500			19.60				
		2-800x2000			11.20				
		3-1650x2250			23.40				
		3(ϕ800)			6.00				
		2-3500x1500			20.00				
		2-3500x2000			22.00				
			m²		175.50		0.40	70.22	
		Gallery							
		L+1.000			22.20		0.40	8.88	
					27.00		0.60	16.20	
			2		9.00		0.60	10.80	
			2		1.00		0.60	1.20	
			2		11.50		0.40	9.20	
			3		9.00		0.40	10.80	
			2		12.60		0.40	10.10	
		Stair							
			8		1.10		1.87	1.65	
					9.50	0.25		2.38	
		Soffit							
		Slab/Beam							
		L-1.500			11.50	9.00		103.50	
					3.50	9.50		33.25	
					8.00	7.50		60.00	
					7.50	5.00		37.50	
					1.00	25.00		25.00	
		L+2.500			8.50	5.00		42.50	
					8.50	7.50		63.75	
					2.50	2.50		6.25	

					15.50	13.50		209.25	
					6.50	3.00		19.50	
		L+1.000			2.00	17.50		35.00	
					1.00	12.50		12.50	
					11.50	3.00		34.50	
		Soffit - Gallery							
				4	12.60	1.80		90.72	
					27.00	8.00		216.00	
					8.00	10.50		84.00	
				2	4.00	4.50		36.00	
		Column	m²						**58.00**
		Side Column		4	1.60		3.70	23.68	
				5	2.00		2.60	26.00	
				2	1.60		2.60	8.32	
		Beam	m²						**90.40**
				2x2	6.50		0.40	10.40	
				2x2	7.50		0.70	21.00	
				2x3	14.20		0.70	59.64	
6		FORM WORK FOR CONCRETE CLASS F							
					13.60				
					54.40				
					104.00				
			m²		172.00		0.10		**17.20**
7		CONCRETE CLASS G							
8		DEFORMED REINFORCING BAR							
9		SAND BASE	m³						**171.55**
		(Red Soil)							
		Pump Room							
		L-5.800			11.50	1.80	0.20	4.14	
		L-6.500			14.90	9.70	0.20	28.91	

		L-8.500			12.40	2.80	0.20	6.95	
					14.30	13.80	0.20	39.47	
		Gallery							
		L-4.100			18.10	4.60	0.20	16.65	
					6.60	3.60	0.20	6.72	
					2.00	2.00	0.20	0.80	
					30.50	8.50	0.20	51.85	
		L-6.200			12.60	5.80	0.20	14.62	
					1.60	4.50	0.20	1.44	
10		WATER STOP	m						**93.00**
		To C.J							
		Base (t:1300)			5.00				
		Base (t:1000)			37.50				
		Base (t:600)			4.50				
		Wall (t:800)			40.00				
		Wall (t:500)			6.50				
11		TAR EPOXY RESIN COATING							**1,435.50**
		3 times Coating							
		t : 0.35 mm	m²					Subtotal	**1,018.42**
		To wall		2	3.00		16.80	100.80	
				2	11.50		16.80	386.40	
				2	9.60		5.20	99.80	
				1	5.30		3.80	20.14	
				1	3.50		3.80	13.30	
				4	7.50		2.30	69.00	
				4	7.50		2.30	69.00	
				3	2.50		2.30	17.25	
				1	5.50		2.30	12.65	
				1	6.00		2.30	13.80	
				1	2.50		2.30	5.75	
				4	8.00		5.20	166.40	
				4	1.00		0.40	1.60	
		Less							
		2(1.5x1.5)						-4.50	
		2(2.0x2.3)						-9.20	

		2(2.8x1.2)						-3.36	
		1(1.00x1.00)						-1.00	
		To Round Opening							
		2(1.5x1.5)		2	6.00		0.50	6.00	
		2(2.0x2.3)		2	8.60		0.50	8.60	
		1(1x1.7)		1	4.00		0.50	2.00	
		2(1x1)		2	4.00		0.40	3.20	
		4(0.8x2.5)		4	6.60		0.40	10.56	
		2(1.5x3.5)		2	10.00		0.40	8.00	
		2(0.8x2.0)		2	5.60		0.40	4.48	
		3(1.65x2.25)		3	7.80		0.40	9.36	
		2(1.3x1.3)		2	5.20		0.80	8.32	
		To Base	m²					Subtotal	**229.13**
					11.50	3.00		34.50	
					10.50	7.25		76.13	
					11.50	1.50		17.25	
					9.50	4.00		38.00	
				2	4.00	1.00		8.00	
				1	4.00	0.50		2.00	
					6.50	3.50		22.75	
					7.00	5.00		35.00	
		Less							
		1(1.5x2.0)						-3.00	
		1(0.75x2.0)						-1.50	
		To Ceiling	m²					Total	**187.90**
					11.50	9.00		103.50	
					3.50	9.50		33.30	
					8.00	7.50		60.00	
					7.50	5.00		37.50	
		Less							
		2(1.5x3.5)						-10.50	
		2(2.0x3.5)						-14.00	
		2(0.8x2.0)						-3.20	
		2(0.8x2.5)						-4.00	
		2(1.0x1.0)						-2.00	
		3(1.65x2.25)						-11.20	

		3(0.4x0.4x3.14)						-1.50	
12		RC PILE 400x400							
		a/ L=34 m	m		374.00				
		b/ L=32 m	m		######				
		c/ L=31 m	m		######				

Table E.3.1.4 QUANTITY SURVEY SHEET

ITEM: Lift Pump Station - Transformer - (Elec. Base)

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Piling							
		R.C pile	m						228
		300x300 L=38m		6	38			228	
			PCS						12
		Pile connection		2x6				12	
		Bedding							
			m3						8.53
		Sand t:200			8.20	5.20	0.2	8.528	
			m3						4.30
		Leveling conc t:100			8.20	5.20	0.1	4.264	
		Concrete							
			m3						14.00
		R.C.Plint t:350			8.00	5.00	0.35	14.00	
		Rebar	kg						876.26
		Longitudinal setion							
		(T+B) D 16@250		2x21	8.20		1.578	543.46	
		Cross setion							
		(T+B) D 16@250		2x32	5.20		1.578	332.80	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.2.1 QUANTITY SUMMARY SHEET
ITEM: SEDIMENTATION TANK AND ELEC. ROOM - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1		**SEDIMENTATION TANK**			
1.1		Sand Base	m^3	2,720.60	
1.2		Leveling Conc. Class G			
		Base	m^3	1,360.30	
1.3		Non R. Conc. Class F18			
		Mech. Work: Slab	m^3	375.70	
		Sludge Hopper: Wall	m^3	1,766.00	
1.4		Cinder Conc. Class F			
		Aeration Tank and			
		Pipe Gallery: Slab	m^3	701.60	
1.5		Reinforced Conc. Class E			
		Tank: Base	m^3	8,585.00	
		Tank: Wall	m^3	11,116.20	
		Tank: Column	m^3	70.40	
		Tank: Beam	m^3	72.30	
		Tank: Slab	m^3	3,260.50	
		Temporary: Wall	m^3	187.00	
		Baffle Wall	m^3	320.70	
		Baffle Plate	m^3	13.00	
		Drain Pit Wall	m^3	42.10	
		Stair Wall	m^3	14.20	
		Construction Joint	m^3	311.60	
1.6		Formwork			
		Side Base	m^2	1,796.50	
		Side: Slab	m^2	3,412.00	
		Side: Wall	m^2	53,789.00	
		Side Column	m^2	563.20	
		Side: Beam	m^2	380.00	
		Temporary: Wall	m^2	808.00	
		Baffle: Wall	m^2	2,138.00	
		Baffle: Plate	m^2	143.00	

No.	Code	Description	Unit	Quantity	Remarks
		Hopper: Wall	m^2	2,038.50	
		Drain Pit Wall	m^2	260.50	
		Side Cinder Conc.	m^2	124.00	
		Stair Wall	m^2	41.00	
1.6		Formwork			
		Soffit Slab	m^2	12,851.00	
		Sointing Base	m^2	569.90	
		Wall	m^2	300.60	
		Slab	m^2	258.31	
1.7		Jointing: Water Stop	m	1,798.30	
		Sealing	m	2,995.30	
		Elastic Joint Filler	m^2	249.90	
2		**ELECTRICAL ROOM**			
2.1		Sand Base	m^3	33.10	
2.2		Leveling Conc. Class E			
		Base	m^3	16.60	
2.3		Cinder Conc. Class H			
		Pile Gallery Slab	m^3	8.95	
2.4		Reinforced Concrete			
		Type Base	m^3	111.00	
		Wall	m^3	193.80	
		Slab	m^3	26.00	
		Beam	m^3	5.40	
		Stair	m^3	13.30	
2.5		Formwork			
		Base	m^3	45.46	
		Wall	m^3	677.20	
		Beam	m^3	36.00	
		Slab	m^3	161.10	

Table E.3.2.2 QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		BEDDING							
		Red Soil t:200	m^3						**2,720.64**
		Inflow Water							
		L - 6.200			94.50	5.80	0.20	109.62	
					116.00	5.20	0.20	120.64	
		Distribution Tank			8.95	8.20	0.20	14.68	
		Pipe Gallery L -4.100							
		Sec 3-3			118.65	5.00	0.20	118.65	
		Sec 3-3			8.95	3.50	0.20	6.27	
		Sec 4-4			109.75	6.60	0.20	144.87	
		Sec 7-7			109.75	9.20	0.20	201.94	
		Sec 9-9			109.75	11.70	0.20	256.82	
		Scum Pipe Gallery							
		Sec 2'-2'			84.00	3.70	0.20	62.16	
					90.50	9.20	0.20	166.52	
					3.50	9.20	0.20	6.44	
		Aeration Tank L-1.250							
		Sec 8-8			109.50	29.50	0.20	647.53	
		Final Sed. Tank L+0.010							
		Sec 11-11, 12-12			109.75	23.00	0.20	504.85	
		Outflow Channel L+1.900							
		Sec 13-13			146.50	5.20	0.20	146.12	
		Primary Sed. Tank L+1.780							
		Sec 5-5, 6-6			109.75	9.50	0.20	208.53	
		Outflow Pil			5.00	5.00	0.20	5.00	
		Concrete Leveling t:100	m^3						**1,360.32**

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CINDER CONCRETE							
		To Pipe Gallery	m^3						**701.56**
Grid	M-N	Sec 2-2			102.00	7.60	0.10	77.52	
Grid	1-2	Sec 3-3			113.25	11.60	0.10	131.37	
Grid	A-B	Sec 3-3 to 13-13			88.00	4.40	0.10	38.72	
Grid	G-H	Sec Scum Gallery			101.50	2.10	0.10	21.32	
Grid	3-4				110.25	7.60	0.10	83.79	
Grid	5-6				110.25	7.60	0.10	83.79	
		To Aeration Tank		10	28.50	9.30	0.10	265.05	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK - WWTP

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CONCRETE BASE	m3						**8,584.30**
		Inflow Water							
					118.00	5.00	6.00	354.00	
					99.50	5.70	0.60	340.50	
		Pipe Gallery							
				2	55.00	11.50	0.70	885.50	
					118.00	5.00	0.70	413.00	
					113.00	7.00	0.70	553.70	
				2	55.00	9.00	0.70	693.00	
					109.00	9.00	0.70	686.70	
					16.00	1.50	0.70	16.80	
				2	9.00	1.50	0.70	18.90	
		Scum Gallery		1	84.00	3.50	0.70	205.80	
		Primary Sed. Tank		2	55.00	10.00	0.60	660.00	
		Aeration Tank		2	55.00	30.50	0.60	2,013.00	
		Final Sed. Tank		2	55.00	23.50	0.60	1,551.00	
		Outflow Water		1	141.50	2.30	0.40	130.18	
		Pit Base ϕ2500		1	4.00	2.30	0.60	5.52	
				1	1.50	10.00	0.60	9.00	
				1	1.50	29.50	0.60	26.55	
				1	1.50	23.50	0.60	21.15	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK - WWTP

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		R. CONCRETE							
		Base	m3						**8,584.98**
		Inflow Water L-5.300							
		t:600			94.50	5.70	0.60	328.86	
					116.00	5.00	0.60	348.00	
		Distribution Tank							
		t:700			8.75	8.00	0.70	49.00	
		Pipe Gallery L-3.100							
		t:700							
		Sec 3-3			118.65	5.00	0.70	415.28	
		Sec 4-4			109.00	6.60	0.70	503.58	
		Sec 7-7			109.00	9.00	0.70	686.70	
		Sec 9-9			109.00	11.50	0.70	877.45	
		Sec 2'-2'			102.00	10.50	0.70	749.70	
		Scum Gallery			84.00	3.50	0.70	205.00	
		Aeration Tank L-0.250							
		t:600							
		Sec 8-8			110.50	30.50	0.60	2,022.15	
		Final Sed. Tank L+1.010							
		and +1.530							
		t:700							
		Sec 11, 12-12			110.50	23.50	0.60	1,558.05	
		Outflow Channel L+2.700							
		t:400							
		Sec 13-13			140.50	2.30	0.40	129.26	
		Primary Sed. Tank L+2.780							
		t:600							
		Sec 5-5, 6-6			110.50	10.50	0.60	696.15	
		Outflow Pit L-2.150							
		t:600			5.00	5.00	0.60	15.00	
		Mech. Work: Slab	m^3						**375.71**
		t:100							
		Final Sed. Tank L+2.780			110.50	23.50	0.10	259.68	
		Primary Sed. Tank L+1.530			110.50	10.50	0.10	116.03	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CONCRETE							
2.2		**SUSPENDED SLAB**	m^3						**3,260.50**
		To Inflow Water Slab L-3.100							
		t:400							
		Sec 3-3			94.50	5.80	0.40	219.24	
					116.00	5.00	0.40	232.00	
		To Distribution Tank Slab L-3.100							
		t:400							
		Sec 3-3			8.75	8.00	0.40	28.00	
		Less Opening			1.50	4.30	0.40	-2.58	**476.66**
		To Gallery Slab L+3.700		2					
		Sec 3-3		2*10	2.10	1.20	0.40	20.16	
				2*10	6.55	5.75	0.40	301.30	
		Sec 3-3 (L+5.800)		1	108.00	2.80	0.40	120.96	
		Sec 2-2 (L+5.500)		2	3.25	5.30	0.30	10.34	
		Sec 2-2 (L+5.500)		1	2.80	2.00	0.30	1.68	
		Sec 7-7 (L+5.200)		1	1.75	9.00	0.30	4.73	
		Sec 7-7 (L+5.200)		1	2.30	9.00	0.30	6.21	
		Sec 7-7 (L+5.200)		1	3.55	9.00	0.30	9.59	
		Sec 7-7 (L+5.200)		4	3.00	9.00	0.30	32.40	
		Sec 7-7 (L+3.100)		10	2.50	1.25	0.30	9.37	
		Sec 9-9 (L+4.700)		10	1.50	3.50	0.45	23.63	
				2*5	6.25	6.50	0.45	182.81	
					95.00	1.85	0.45	79.08	
				2	55.00	1.00	0.30	33.00	
				2*5	2.00	1.00	0.30	6.00	
		Sec 12-12 (L+4.800)		20*2	13.50	0.50	0.20	54.00	
		Bottom E		70*2	13.50	0.30	0.15	24.30	
				10	1.50	1.20	0.20	3.60	
				10	4.20	1.20	0.15	7.56	
		Bottom B		20	14.00	0.50	0.20	28.00	
		Sec 6-6 (L+5.800)		20	14.00	0.30	0.15	12.60	
				10	1.80	1.50	0.20	5.40	
		Wall		10	4.20	1.20	0.15	7.56	
		Sec 5-5, 11-11 (L-5.500)		2*2	50.50	1.00	0.15	30.30	
		Bottom A, D		2*2	50.50	0.60	0.25	30.30	
		CONCRETE							
		SUSPENDED SLAB CONT.							
		By Pass Waterway							

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		L+5.70, L+5.20, L+4.70							
		Sec 2-2		2	96.70	1.80	0.35	121.84	
		Sec 2-2 (L+5.80)		2	5.30	3.00	0.30	9.54	
		Sec 1-1, 2'-2' (L+6.90)			129.90	1.00	0.25	32.47	
		Sec 3-3 (L+8.00)			119.65	13.00	0.20	311.09	
		Less Cover Opening							
					108.00	2.80	0.20	-60.48	**81.28**
				22	2.00	2.00	1.20	-17.60	**81.28**
				20	1.00	0.80	0.20	-3.20	**81.28**
		Sec 4, 5, 6, 7 (L+6.90)			129.90	22.00	0.25	714.45	**1,408.50**
		Less Cover Opening		13	2.00	2.00	0.25	-13.00	
		Less Cover Opening		20	8.35	3.70	0.25	-154.47	
		Less Cover Opening		1	8.35	0.80	0.25	-1.67	
		Less Cover Opening		20	4.85	1.00	0.25	-24.25	
		Less Cover Opening		1	1.50	1.00	0.25	-0.38	
		Less Cover Opening		10	2.00	1.50	0.25	-7.50	
		Less Cover Opening		20	14.00	0.65	0.25	-45.50	
		Less Cover Opening		17	0.70	0.65	0.25	-1.93	
		Less Cover Opening		1	0.60	0.65	0.25	-0.97	
		Less Cover Opening		1	3.00	2.40	0.25	-1.80	
		Less Cover Opening		1	8.00	1.00	0.25	-2.00	
		Less Cover Opening		2	43.00	1.00	0.25	-21.50	
		Less Cover Opening		1	24.50	1.00	0.25	-6.12	
		Less Cover Opening		10	2.00	1.00	0.25	-5.00	
		Less Cover Opening		10	6.50	1.00	0.25	-16.25	
		Sec 8, 9 (L+6.40)			129.90	28.50	0.20	740.43	**412.11**
		Less Opening		13.5	2.00	2.00	0.20	-10.80	
		Less Opening		13	29.50	1.00	0.20	-76.70	
		Less Opening		4	29.50	2.00	0.20	-47.20	
		Less Opening		2	38.50	1.50	0.20	-23.10	
		Less Opening		1	114.10	1.00	0.20	-22.80	
		CONCRETE							
		SUSPENDED SLAB CONT.							
		Less Opening		10	2.00	1.00	0.20	-4.00	
		Less Opening		10	8.25	3.75	0.20	-61.87	
		Less Opening		2*10	8.25	5.25	0.20	-173.25	
		Less Opening		10	8.25	9.25	0.20	-152.63	
		Less Opening		1	1.50	1.00	0.20	-0.30	
									167.78

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Distribution Tank							
		Sec 3-3 (L+8.000)			13.00	10.50	0.20	27.30	
		Less Opening		4	3.50	1.50	0.20	-4.20	
		Less Opening		2	4.00	2.30	0.20	-3.68	
		Less Opening		2	4.00	1.00	0.20	-1.60	
									17.82
		CONCRETE							
2.2		**SUSPENDED SLAB CONT.**							
		Sec 11-11, 12-12, 13-13 (L+5.900)			129.90	29.50	0.20	766.41	
		Less Covers and Opening		20.25	5.00	2.00	0.20	-40.50	
		Less Covers and Opening		40	13.50	0.55	0.20	-59.40	
		Less Covers and Opening		17	1.00	0.55	0.20	-1.87	
		Less Covers and Opening		10	2.00	1.70	0.20	-6.80	
		Less Covers and Opening		1	3.00	2.40	0.20	-1.44	
		Less Covers and Opening		20	18.00	3.70	0.20	-266.40	
		Less Covers and Opening		2	26.50	1.50	0.20	-15.90	
		Less Covers and Opening		1	114.25	2.00	0.20	-45.70	
		Less Covers and Opening		2	2.00	2.00	0.20	-1.60	
		Less Covers and Opening		1	18.00	0.80	0.20	-2.88	
		Sec 8-8 (L+4.500)		4	30.50	2.50	0.25	76.25	**323.92**
		Hunch (L+4.500)		5.5	30.50	1.00	0.50	83.88	
		Hunch (L+4.500)		2	30.50	1.50	0.25	22.87	
		Hunch (L+4.500)		1	30.50	1.75	0.50	26.69	
		Sec 8-8 (L+5.200)		5.5	37.50	3.00	0.25	154.68	
		Sec 8-8 (L+5.200)		5.5	37.50	0.50	0.50	51.56	
		Sec 8-8 (L+5.200)			113.00	1.25	0.25	35.31	
		Scum Pit Slab							
		L+2.500		2	2.50	2.50	0.20	2.50	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CONCRETE	m^3						**11,116.20**
2.3		**WALL**	m^3						**5,776.22**
				2*2	55.50	5.38	0.50	597.18	
		Grid 1, 2 (t:500)		2	1.50	5.38	0.50	8.07	
				2*2	55.50	1.27	0.30	25.37	
				2	1.50	1.27	0.30	1.14	
		Grid 1, 2 (t:300)		2*10	0.80	3.50	0.30	16.80	
		Grid 1, 2 (t:200)		2*10	0.40	5.20	0.20	8.32	
		Grid 1', 1" (t:400)		2	108.00	1.70	0.40	146.88	
		Grid 1', 1" (t:400)		1	2.00	1.70	0.40	1.36	
		Grid 1', 1" (t:300)		2	108.00	3.00	0.30	58.32	
		Grid 1', 1" (t:300)		1	2.00	3.00	0.30	1.80	
		Grid 1', 1" (t:200)		1	108.00	3.00	0.20	64.80	
		Bottom Wall (t:300)		2*20	5.50	4.71	0.30	310.86	
		Above Gallery		2*20	1.00	4.10	0.30	49.20	
		Grid C, D, E, F (t:500)		2*4	1.00	9.75	0.50	39.00	
		Grid I, J, K, L (t:500)		2*4	3.00	9.75	0.50	117.00	
				2*4	10.00	3.80	0.50	152.00	
		Wall Hunch		2*10	10.00	0.50	0.30	30.00	
		Sec 5-5 Support		2*5	5.00	2.68	0.50	67.00	
		Sec 6-6 Support (t:500)		2*5	5.00	3.65	0.50	91.25	
		Scum Pit		4*5	4.20	1.20	0.15	15.12	
				4*2	50.50	1.20	0.15	72.72	
		Pipe Gallery Wall							
		Grid 3, 4		2*2	55.50	9.45	0.50	1,048.95	
				2	1.50	9.45	0.50	14.17	
		Grid 5		2	55.50	8.80	0.50	488.40	
				1	1.50	8.80	0.50	6.60	
		Grid 6		2	55.50	4.01	0.50	222.56	
				1	1.50	4.01	0.50	3.00	
				2*5	0.80	4.20	0.30	10.08	
				2*5	0.40	4.69	0.20	3.75	
				2	55.50	0.67	0.30	22.31	
		Grid 7		1	113.50	4.17	0.50	236.65	
		Grid C, D, E, F		2*5	13.50	4.36	0.50	294.30	
		Grid I, J, K, L, G		2*5	8.00	3.50	0.50	140.00	
				2*4	3.00	8.80	0.50	105.60	
				2*4	23.00	4.43	0.50	407.56	
		Grid 4 (t:700)		2	55.50	5.10	0.70	396.27	
		Grid 10 (t:700)		2	55.50	3.31	0.70	257.19	
		Sec 7-7 (t:500)		2	55.50	4.17	0.50	221.44	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Scum Gallery		1	3.00	8.80	0.50	13.20	
		CONC. WALL CONT.	m^3						**1,242.53**
		Inflow Waterway			118.65	1.80	0.50	106.79	
		Sec 1-1 (L-5.300)			112.50	1.80	0.50	101.25	
					114.00	1.80	0.40	82.08	
		Level +8.000			13.75	12.70	0.40	69.85	
		Sec 3-3			4.25	12.70	0.50	76.99	
					6.50	1.80	0.40	4.68	
		Level +6.900			21.75	11.55	0.40	100.48	
		Sec 5-5, 6-6, 7-7			21.75	11.55	0.50	125.60	
					21.75	1.80	0.40	15.66	
		Level +6.400			38.50	11.10	0.40	170.94	
		Sec 8-8, 9-9			38.50	1.80	0.40	27.72	
					38.50	10.60	0.50	102.03	
		Level +5.900			27.75	10.60	0.40	117.66	
		Sec 10-10, 11-11, 12-12			27.75	1.80	0.40	19.98	
					27.75	10.60	0.50	147.08	
		Hunch		0.5	94.50	0.50	0.30	7.09	
				4*0.5	55.50	0.30	0.50	16.65	
		Scum Gallery	m^3						**881.40**
		Level +6.900		2	23.20	9.75	0.50	323.70	
		Level +6.400		2	30.00	8.00	0.50	240.00	
		Level +6.400		2	8.50	8.00	0.50	68.00	
		Level +5.900		2	26.50	8.80	0.50	233.20	
		Level +5.900		2	2.80	5.90	0.50	16.50	
		Scum Pit Wall	m^3	4	2.50	9.75	0.30	29.25	**29.25**
		Overflow Wall	m^3						**154.65**
					141.00	3.00	0.30	126.90	
					18.50	3.00	0.50	27.75	
		Overflow Pit Wall	m^3		13.60	4.70	0.30	19.18	**19.18**
		Return Sludge Pit	m^3	10	4.50	3.55	0.25	39.94	**39.94**
		CONCRETE WALL							
		PIPE GALLERY	m^3						**738.17**
		Sec 2 to 13 (L+2.700)		2	2.80	5.40	0.50	15.12	
		Sec 2 to 10, 11, 12							
		Sec 2 to 10, 11, 12 (L+5.900)		2	26.00	8.80	0.50	228.80	
		Sec 2, 8, 9 (L+6.400)		2	30.50	9.30	0.50	283.65	
		Sec 2, 5, 6, 7 (L+6.900)		2	13.10	9.75	0.50	127.73	
		Sec 2, 4		2	8.50	9.75	0.50	82.87	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
			m^3						**133.29**
		Distribution Tank		2	1.50	1.80	0.50	2.70	
				1	4.40	1.50	0.50	3.30	
				2	9.00	1.50	0.50	13.50	
				1	9.00	1.80	0.40	6.48	
					10.60	3.00	0.50	15.90	
				2	4.30	3.00	0.50	12.90	
		Partition Wall		2	2.50	3.50	0.30	5.25	
				2	5.30	9.80	0.50	51.94	
				2	2.50	4.50	0.50	11.25	
				2	1.50	6.10	0.50	9.15	
		Wall L+6.900 around Tank		4	0.85	0.90	0.30	0.92	
		By Pass Waterway	m^3						**68.06**
		Sec 2-2 (L+5.70)		2	8.50	0.95	0.35	5.65	
		Sec 7-2 (L+5.200)		2	3.00	1.20	0.35	2.52	
		Sec 2-2		2	10.00	1.45	0.35	10.15	
		Sec 2-2 (L+5.200)		2	25.00	1.00	0.35	17.50	
		Sec 2-2 (L+5.200)		2	3.00	1.25	0.35	2.63	
		Sec 2-2 (L+4.700)		2	10.20	1.50	0.35	10.71	
		Sec 2-2 (L+4.700)		2	27.00	1.00	0.35	18.90	
		CONCRETE WALL							
		Inflow Waterway	m^3						**302.84**
		Sec 7-7		10	9.00	1.45	0.25	32.63	
		Sec 7-7		4	9.00	1.45	0.50	26.10	
		Sec 8-8		10	29.50	1.25	0.20	73.75	
		Sec 8-8		4	29.50	1.25	0.50	73.75	
		Sec 1-1		4	19.50	1.45	0.25	28.27	
		Sec 1-1		1	22.50	1.45	0.25	8.16	
		Air Pipe Pit		8	29.50	1.70	0.15	60.18	
		Wall under Air Pipe Pit		4	29.50	4.00	0.50	236.00	
		Wall under Waterway		4	29.50	4.75	0.50	280.25	
		Wall under Waterway		30	10.50	6.45	0.50	1,015.87	
		Hunch		20*0.5	29.50	0.50	0.50	73.75	
				20*0.5	10.50	0.50	0.50	26.25	
			m^3						**1,632.12**
		Less Opening (To all)	m^3						
		Drain Flow	m^3	30	1.00	1.00	0.50	-15.00	
		Opening	m^3	3*20	0.50	0.30	0.50	-4.50	
		Direct Pit	m^3	3*4	2.00	1.70	0.50	-20.40	
		Waterway	m^3	3*10	1.25	1.00	0.50	-18.75	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Waterway	m^3	3*2	1.25	1.70	0.50	-6.38	
		Return Sludge Pit	m^3	10	0.60	0.60	0.50	-1.80	
			m^3	40	0.50	0.50	0.50	-5.00	
		Inflow Water	m^3						
		Sec 3-3	m^3	2*10	0.50	1.00	0.30	-3.00	
		Sec 3-3	m^3	10	0.50	0.50	0.50	-1.25	
		Sec 9-9	m^3	40	0.50	0.50	0.50	-5.00	
		Sec 12-12	m^3	1	1.00	1.45	0.50	-0.73	
		Sec 2-2	m^3	1	1.00	0.50	0.50	-0.75	
		Distribution Tank	m^3	8	1.00	1.00	0.50	-4.00	
		Distribution Tank	m^3	4	2.00	1.00	0.50	-4.00	
									-90.56
		CONCRETE WALL	m^3						**189.12**
		Direct Wall - Bottom C		2*10	7.00	3.45	0.25	120.75	
		On L+3.70 and L+4.70		2*10	2.75	1.50	0.25	20.63	
					113.50	1.50	0.25	42.56	
				3	2.00	3.45	0.25	5.18	
		CONCRETE							
		TEMPORARY WALL	m^3						**186.93**
		Grid 1: A and B (t:500)			4.00	0.50	10.90	21.80	
		Grid 1: G and H (t:500)			2.50	0.50	11.70	14.63	
		Grid 1: M and N (t:500)			8.00	0.50	11.70	46.80	
		Grid H: 7-7' (t:400)			2.00	0.40	3.00	2.40	
		Grid N: 1-2 (t:500)			10.00	0.50	8.30	41.50	
		Grid N: 3-4 (t:500)			8.00	0.50	7.95	31.80	
		Grid N: 5-6 (t:500)			8.00	0.50	7.00	28.00	
		CONCRETE							
		BAFFLE WALL	m^3						**320.68**
		t:300		2*70	4.85	3.50	0.30	203.70	
				20	4.85	4.02	0.30	116.98	
		CONCRETE	m^3						**13.00**
		BASE PLATE		10	1.00	1.50	0.20	3.00	
				20	1.00	2.50	0.20	10.00	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: WALL

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		SCUM GALLERY L=89.8M							
		t:500							
		Grid G and H	m^3						**572.35**
		Sec 4-4 (L+6.90)		2	4.50	9.75	0.50	43.88	
		Sec 5-5, 6-6 (L+6.90)		2	10.50	9.05	0.50	95.03	
		Sec 7-7 (Grating+6.90)			8.00				
		Sec 8-8 (L+6.400)		2	30.50	6.40	0.50	195.20	
		Sec 9-9 (L+6.400)		2	8.00	1.80	0.50	14.40	
		Sec 10-10 (L+5.900)		2	3.50	8.80	0.50	30.80	
		Sec 11-11, 12-12 (L+5.900)		2	23.50	8.10	0.50	190.35	
		Sec 13-13 (L+2.700)		2	0.50	5.40	0.50	2.70	
		GALLERY L=89.8M (t:500)							
		Grid B	m^3						**324.83**
		Sec 4, 5, 6-6 (L+6.90)		1	15.00	9.75	0.50	73.13	
		Sec 7-7 (Grating below)		1	8.00	1.50	0.50	6.00	
		Sec 8-8 (L+6.40)		1	30.50	8.30	0.50	126.58	
		Sec 9-9 (L+6.40)		1	8.00	1.80	0.50	7.20	
		Sec 10-10 (L+5.90)		1	3.50	8.80	0.50	15.40	
		Sec 11, 12-12 (L+5.90)		1	23.50	8.10	0.50	95.18	
		Sec 13-13 (L+2.70)		1	0.50	5.40	0.50	1.35	
		GALLERY L=89.8M (t:500)							
		Grid M and N	m^3						**620.50**
		Sec 4-4 (L+6.90)		2	4.50	9.80	0.50	44.10	
		Sec 5-5, 6-6 (L+6.90)		2	10.50	9.10	0.50	95.55	
		Sec 7-7 (L+6.90)		2	8.00	1.50	0.50	12.00	
		Sec 8-8 (L+6.40)		2	30.50	7.10	0.50	216.55	
		Sec 9-9 (L+6.40)		2	8.00	1.50	0.50	12.00	
		Sec 10-10 (L+5.90)		2	27.00	8.80	0.50	237.60	
		Sec 11, 12-12 (L+5.90)							
		Sec 13-13 (L+2.70)		2	0.50	5.40	0.50	2.70	
		GALLERY L=111M (t:500)							**2,980.04**
		Grid 1 and 2							
		Sec 1-1 (L+3.300)		2	55.00	6.40	0.50	252.00	
				2	56.00	6.40	0.50	358.40	
					128.50	1.96	0.30	151.12	
		Grid 3 and 4 (L+6.900)		2	55.00	9.80	0.50	539.00	
				2	56.00	9.80	0.50	548.80	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: WALL

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Grid 5 (L+6.400)		1	55.00	9.30	0.50	255.75	
				1	56.00	9.30	0.50	260.40	
						8.90			
		Grid 6 (L+1.010)		1	55.00	4.11	0.50	113.03	
				1	56.00	4.11	0.50	115.10	
				2	55.00	1.00	0.50	55.00	
		Grid 7 (L+5.900)		1	55.00	4.17	0.50	114.68	
				1	56.00	4.17	0.50	116.76	
		WALL @ HOPPER (t:700)	m^3						**668.96**
		Sec 1-1 (L+2.080)		1	55.00	5.20	0.70	200.20	
				1	56.00	5.20	0.70	203.80	
		Sec 1-1 (L+0.310)		1	55.00	3.41	0.70	131.29	
				1	56.00	3.41	0.70	133.67	
		COLUMN BETWEEN							**67.53**
		Baffle Wall		8*2	0.50	5.02	0.20	8.03	
		Grid 1 and 2		2*10	1.00	3.92	0.30	23.52	
				2*10	0.50	3.92	0.20	7.84	
		Grid 6		1*10	0.50	4.69	0.20	4.69	
				1*10	1.00	4.69	0.30	14.07	
				1*8	0.50	4.69	0.50	9.38	
		INFLOW WATERWAY (-3.100)							**930.37**
		(t:500, t:400)	m^3	1	212.50	1.80	0.50	191.25	
				1	118.50	1.80	0.50	106.65	
				1	114.50	1.80	0.40	82.44	
				1	102.00	1.80	0.40	73.44	
				1	104.00	1.80	0.40	74.88	
		ABOVE INFLOW WATERWAY							
		(L+8.000)		1	14.00	10.90	0.40	61.04	
		Line A and B (L+6.900)		1	22.00	9.80	0.40	86.24	
		Sec 8-8, 9 (L+6.400)		1	38.50	9.30	0.40	143.22	
		Sec 10, 11, 12-12 (L+5.900)		1	26.50	8.80	0.40	93.28	
		Sec 13-13 (L+5.900)		1	8.30	5.40	0.40	17.93	
		PRIMARY SED. TANK (t:500)							**3,401.43**
		Support Wall							
		Sec 5, 6-6		2*4	13.00	3.79	0.50	197.08	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: WALL

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		@ Hopper		2*4	3.25	5.78	0.50	75.14	
				2*5	10.00	3.79	0.50	189.50	
		Aeration Tank		2*2	29.50	5.45	0.50	321.55	
		Gross		2*2	29.50	4.00	0.50	236.00	
		Longit		2*3	54.50	6.45	0.50	1,054.58	
		Hunch 500*500							
		(10*29)2=78M	2	0.5*10	78.00	0.50	0.50	97.50	
		(9.5*2)+4.5=23M	2	0.5*20	23.50	0.60	0.30	42.30	
		(22.7*2)+4.5=50M	2	0.5*20	50.00	0.60	0.30	90.00	
				0.5*10	29.50	0.50	0.50	36.88	
				0.5*10	29.50	0.60	0.30	26.55	
		OUTFLOW WATERWAY	m^3						**184.44**
					5.50	4.12	0.50	11.33	
					3.50	4.12	0.50	7.21	
					18.00	3.00	0.50	27.00	
					141.00	3.00	0.30	126.90	
					8.00	3.00	0.50	12.00	
		Pit ϕ2500	m^3						**35.50**
					10.00	5.00	0.50	25.00	
					4.00	5.00	0.30	6.00	
					3.00	3.00	0.50	4.50	
		INFLOW WATERWAY							**376.68**
				2	109.50	1.50	0.40	131.40	
				2	109.50	2.80	0.30	183.96	
				1	109.50	2.80	0.20	61.32	
		DIAGONAL WALL ABOVE							
		INFLOW WATER	m^3						**534.31**
				2*20	5.50	4.71	0.30	310.86	
				2*20	1.00	4.10	0.30	49.20	
		DIAGONAL WALL ABOVE							
		OUTFLOW (GALLERY)							
		(5.2+1.5)0.5=3.35M		2*10	7.00	3.35	0.25	117.25	
				2*10	2.00	1.50	0.25	15.00	

ITEM: SEDIMENTATION TANK: WALL

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				1	112.00	1.50	0.25	42.00	
		SCUM GALLERY PIT	m^3						**12.60**
				2	2.50	4.20	0.30	6.30	
				2	2.50	4.20	0.30	6.30	
		DISTRIBUTION TANK (t:500	m^3						**115.37**
					3.00	1.80	0.50	2.70	
					24.00	1.80	0.50	21.60	
				2	5.50	10.20	0.50	26.10	
				2	1.50	10.20	0.50	15.30	
				2	1.00	6.00	0.50	6.00	
					6.00	3.10	0.50	9.30	
					3.00	3.10	0.50	4.65	
					4.00	3.10	0.30	3.72	
		Less Opening		8	1.00	1.00	0.50	-4.00	
		BY PASS WATERWAY	m^3						**68.06**
		L+5.700		2	8.50	0.95	0.35	5.65	
		L+5.200		2	3.00	1.20	0.35	2.52	
				2	10.00	1.45	0.35	10.15	
				2	25.00	1.00	0.35	17.50	
				2	3.00	1.25	0.35	2.63	
		L+4.700		2	10.20	1.50	0.35	10.71	
		L+4.700		2	27.00	1.00	0.35	18.90	
		SCUM PIT							**151.80**
				2*20	1.20	0.85	0.15	6.12	
		Scum Waterway		4	50.00	0.85	0.15	25.50	
		Return Sludge Pit		10	4.50	3.55	0.25	39.94	
		Airpipe Pit		8	29.50	1.70	0.20	80.24	
		STOP WATERWAY							**188.40**
				4	37.00	1.50	0.25	55.50	
				8	7.00	1.50	0.25	21.00	
				8	29.50	1.50	0.15	53.10	
				4	19.00	1.50	0.40	45.60	

ITEM: SEDIMENTATION TANK: WALL

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				1	22.00	1.50	0.40	13.20	
		OUTFLOW THROUGH BOTTOM LEVEL							**37.47**
				2*20	17.50	0.23	0.15	24.15	
				2*20	18.50	0.24	0.15	13.32	
		TOTAL CONCRETE WALL							**11,270.64**
		Less Hole Opening	m^3						**-90.64**
			m^3						**11,180.00**

ITEM: SEDIMENTATION TANK

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CONCRETE CONT.							
		R.C COLUMN	m^3	44	0.50	0.50	6.40	70.40	**70.40**
		R.C BEAM	m^3	4	45.20	0.50	0.80		**72.30**
		R.CONCRETE TO STAIR	m^3						**14.16**
		Floor L+8.000		6	1.00	0.33	0.20	0.40	
				6	1.00	0.33	0.40	0.79	
				6	1.00	0.33	0.60	1.19	
		L+6.900		4	2.00	0.50	0.22	0.88	
		and L+6.800		4	2.00	0.50	0.44	1.76	
				4	2.00	0.50	0.66	2.64	
				4	2.00	0.50	0.88	3.52	
		L+6.40		3	2.00	0.50	0.17	0.50	
				3	2.00	0.50	0.33	1.00	
		L+5.90		3	2.00	0.50	0.17	0.50	
				3	2.00	0.50	0.33	1.00	
		R.C	m^3		1.30	1.30	1.25	2.11	**42.13**
		DRAIN PIT:							**29.46**
		800*800*1000H	m^3	-20	0.80	0.80	1.00	-0.64	
		1000*1000*1000H			1.50	1.50	1.25	2.81	
					-1.00	1.00	1.00	-1.00	
				7				1.81	**12.67**
		NON R. CONCRETE	m^3						**1,766.00**
		To Sludge Hopper							
		Sec 4-4			10.50	3.00	5.78	182.07	
		Less		0.334	10.50	3.00	6.48	-67.97	
		Less		0.334	0.80	0.80	0.70	-0.15	
			m^3						**1,267.05**
		Sec 10-10			10.50	3.00	4.01	126.32	**76.77**
				0.333	10.50	3.00	4.71	-49.40	
				0.333	0.80	0.80	0.70	-0.15	
			m^3						**499.20**

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		JOINTING							
2		**EXPANSION JOINT**							
		To Base:	m						**499.10**
		Bottom Grid G - H (t:700)		1	110.00			110.00	
		Bottom Grid 2 - 3 (t:600)		3*1	5.70			17.10	
		Bottom Grid 4 - 5 (t:700)		3*1	3.50			10.50	
		Bottom Grid 6 - 7 (t:700)		3*1	9.00			27.00	
		Bottom Grid 6 - 7 (t:700)		3*2	55.00			330.00	
		Bottom Grid 6 - 7 (t:700)		3*1	1.50			4.50	
		To Slab	m						**261.01**
		Bottom Grid 2 - 3 (t:400)		1	5.70			5.70	
		Sec 6-6 (t:200)		1	6.50			6.50	
		Sec 6-6 (t:200)		18	1.80			32.40	
		Sec 6-6 (t:200)		1	3.00			3.00	
		Sec 6-6 (t:200)		1	11.00			11.00	
		Bottom Grid 4 - 5							
		Sec 8-8 (t:400)		1	5.70			5.70	
		Sec 8-8 (t:200)		1	5.70			5.70	
		Sec 8-8 (t:200)		1	128.56			128.56	
		Sec 8-8 (t:200)		2	1.50			3.00	
		Bottom Grid 6 - 7							
		Sec 11-11 (t:400)		1	6.35			6.35	
		Sec 11-11 (t:200)		10	2.00			2.00	
		Sec 11-11 (t:200)		8	1.80			14.40	
		Sec 11-11 (t:200)		1	4.70			4.70	
		Sec 11-11 (t:200)		1	11.00			11.00	
		Sec 11-11 (t:200)		2	1.50			3.00	
		EXPANSION JOINT CONT.							
		To Wall	m						**450.52**
		Bottom Grid G and H							
		Temporary Wall (t:300)			10.90			10.90	
		Sec 6-6 (t:300)		2	9.80			19.60	
		Sec 11-11 (t:300)		2	8.80			17.60	
		Sec 13-13 (t:500)		1	8.80			8.80	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Bottom Grid 2 and 3							
		Sec 6-6 (t:500)		1	12.00			12.00	
		Sec 6-6 (t:400)		2	1.80			3.60	
		Sec 6-6 (t:500)		18	3.00			54.00	
		Sec 6-6 (t:500)		5	9.80			49.00	
		Sec 6-6 (t:300)		2	1.00			2.00	
		Bottom Grid 4 and 5							
		Sec 8-8 (t:500)		1	11.50			11.50	
		Sec 8-8 (t:400)		1	1.80			1.80	
		Sec 8-8 (t:400)		1	11.50			11.50	
		Sec 8-8 (t:500)		4	5.00			20.00	
		Sec 8-8 (t:500)		4	6.70			26.80	
		Sec 8-8 (t:500)		2	9.30			18.60	
		Sec 8-8 (t:250)		8	1.70			13.60	
		Sec 8-8 (t:250)		10	1.00			10.00	
		Sec 8-8 (t:250)		2	1.70			3.40	
		Sec 8-8 (t:300)		2	1.00			2.00	
		Bottom Grid 6 and 7							
		Sec 11-11 (t:400)		1	5.70			5.70	
		Sec 11-11 (t:400)		1	8.80			8.80	
		Sec 11-11 (t:400)		1	1.80			1.80	
		Sec 11-11 (t:500)		1	8.80			8.80	
		Sec 11-11 (t:500)		10	3.00			30.00	
		Sec 11-11 (t:500)		8	4.69			37.52	
		Sec 11-11 (t:500)		4	8.80			35.20	
		Sec 11-11 (t:300)		2	1.00			2.00	
		Sec 11-11 (t:150)		20	1.20			24.00	
		JOINTING CONT.							
		EXPANSION JOINT							**1,205.00**
		Water Stop							
		To Base + Wall							
		To Base t > 300						499.10	
		To Wall t >= 300						445.00	
		To Slab						261.00	
		Sealing	m						**1,911.00**
		To Base						499.10	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		To Wall		2	445.00			890.00	
		To Slab		2	261.00			522.00	
		Elastic Joint Filler	m^2						**249.86**
									194.26
		t : 500 - to wall			24.00		0.15	3.60	
		t : 250 - to wall			23.60		0.25	5.90	
		t : 300 - to wall			54.00		0.30	16.20	
		t : 400 - to wall			31.40		0.40	12.56	
		t : 500 - to wall			312.00		0.50	156.00	
			m^2						**55.60**
		t : 200 - to slab			244.00		0.20	48.80	
		t : 400 - to slab			17.00		0.40	6.80	
		CONCRETE (WALL + BASE)	m^3						**311.65**
		Construction Joint							
		Base							**171.70**
		t : 600			103.30	0.85	0.60	52.68	
		t : 700			128.60	0.80	0.70	72.02	
		t : 700			103.30	0.65	0.70	47.00	
		Grid N							**94.42**
		Wall t : 500		2	11.10	0.65	0.50	7.22	
		Wall t : 500		2	10.00	0.65	0.50	6.50	
		Wall t : 500		3	6.45	0.65	0.50	6.29	
		Wall t : 500		2	9.50	0.65	0.50	6.18	
		Wall t : 700		1	4.10	0.65	0.70	1.86	
		Wall t : 700		1	5.88	0.65	0.70	2.68	
		Wall t : 500		1	4.18	0.65	0.50	1.35	
		Wall t : 300		1	3.00	0.65	0.30	0.58	
		Grid 1							
		Wall t : 500		13	11.10	0.80	0.50	57.72	
		Grid N							
		Hopper t : 400		1	4.01	0.65	0.40	1.04	
		Hopper t : 400		2	5.78	0.65	0.40	3.00	
		Grid N							**45.54**

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Slab t : 200			103.30	0.65	0.20	20.66	
		Slab t : 450			9.00	0.65	0.45	2.64	
		Slab t : 400			18.00	0.65	0.40	4.68	
		Grid A							
		t : 200			103.30	0.85	0.20	17.56	
		Sealing	m						**1,084.30**
		To Construction Joint							
		t : 600 - base			103.00			103.30	
		t : 700 - base			232.00			232.00	
		t : 200 - slab			206.00			206.00	
		t : 400 - slab			18.00			18.00	
		t : 450 - slab			9.00			9.00	
		t : 400 - wall		2	13.00			26.00	
		t : 500 - wall		2	242.00			484.00	
		t : 300 - wall		2	3.00			6.00	
		Rebar (Non)							
		To Construction Joint							
		Water Stop							**593.30**
		To Base						103.30	
		To Base						232.00	
		To Wall						13.00	
		To Wall						242.00	
		To Wall						3.00	

ITEM: SEDIMENTATION TANK

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		METAL WORK							
		Grating Cover	m^2						**532.00**
		W : 200		1	8.00	7.95		63.60	
		To Pipe Gallery		3	8.00	9.65		231.60	
				4	8.00	7.40		236.80	
		Grating Cover							**6.00**
		To Drain Pit							
		1000*1000		6	1.00	1.00		6.00	
		Weir Plate - Level + 6.000	m^2						**246.00**
		Bottom B (t : ?) - Level + 5.000		20	14.00	0.30		84.00	
		Bottom E (t : ?)		40	13.50	0.30		162.00	
		Weir Fix: L+5.30							
		Bottom A:							
		500*600*t:100						10.00	
		Mechanical Work							
		Movable Weir						4.00	
		Mechanical Work							
		By Pass Gate						4.00	
		Steel Ladder	m						**147.40**
		To Distribution Tank			9.20			9.20	
		To Final Sedimentation Tank		20	6.91			138.20	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		FORMWORK							
		SIDE OF BASE	m^2						**1,796.50**
		To Inflow Water L - 5.30							
		Grid 1			118.50		0.60	71.10	
		Grid 1			113.50		0.60	68.10	
		Grid B			97.00		0.60	58.20	
					92.00		0.60	55.20	
		To Distribution Tank L - 5.30		4	8.50		0.70	23.80	
		To Pipe Gallery L: -3.10							
		Grid 1			128.50		0.70	89.90	
		Grid 2			109.00		0.70	76.30	
		Grid 3			109.00		0.70	76.30	
		Grid 4			109.00		0.70	76.30	
		Grid 5			109.00		0.70	76.30	
		Grid 6			109.00		0.70	76.30	
		Grid 7 (L + 1.530)			109.00		0.70	76.30	
		Grid 7 (L + 1.530)							
		Grid 7 (L + 2.700)							
		To Outflow Water Line (L + 2.700)		1	121.00		0.40	48.40	
				1	14.00		0.40	5.60	
		To Outflow Water Pit (L - 2.15)		4	4.00		0.60	9.60	
		To Pipe Gallery (L - 3.100)							
		Grid A and B		1	102.00		0.40	40.80	
		Grid A and B		1	70.00		0.40	28.00	
		Grid G and H		2	69.00		0.70	96.60	
		Grid M and N		2	70.00		0.70	98.00	
		To around Primary Sed. Tank (L+2.700)		4	10.00		0.70	28.00	
				4	55.50		0.70	155.40	
		To around Final Sed. Tank (L+1.010)		4	24.00		0.70	37.20	
				4	55.00		0.70	154.00	
		To around Aeration Tank (L-0.250)		4	30.50		0.70	85.40	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		To around Aeration Tank (L-0.250)		4	55.50		0.70	155.40	
		SIDE OF SLAB	m^3						**3,412.00**
		To Inflow Waterway (L-3.10)			111.50		0.40	44.60	
		To Inflow Waterway (L-3.10)			116.50		0.40	46.60	
		To Inflow Waterway (L-3.10)			97.00		0.40	38.80	
		To Inflow Waterway (L-3.10)			92.00		0.40	36.80	
		To Pipe Gallery 1			128.65		0.40	20.59	
		L + 3.700		2	55.50		0.40	44.40	
		L + 3.700		2	109.50		0.40	87.60	
		L + 5.800		2	109.50		0.40	87.60	
		L + 8.000		2	128.65		0.20	51.40	
		L + 8.800		2	109.50		0.20	43.80	
		L + 8.800		2	2.80		0.20	1.12	
		L + 6.900		4	128.65		0.25	128.65	
		L + 5.200		2	55.50		0.25	27.75	
		L + 5.200		2	57.00		0.25	28.50	
		L + 5.500		2	50.00		0.40	40.00	
		L + 5.500		2	50.00		0.30	30.00	
		L + 4.500		2	50.00		0.40	40.00	
		L + 4.000		2	50.00		0.30	30.00	
		L + 3.100		10	7.50		0.30	22.50	
		L + 4.700		2*2	55.50		0.45	99.90	
		L + 6.400		2*2	55.50		0.20	44.40	
		Edge of Slab Opening							
		L + 6.400		10	23.90		0.20	47.80	
		L + 6.400		20	27.00		0.20	108.00	
		L + 6.400		10	34.90		0.20	69.80	
		L + 6.900		20	28.40		0.25	142.00	
		L + 5.900		20	43.40		0.20	173.60	
		L + 5.900		2*2	55.50		0.20	44.40	
		L + 5.900		2	17.00		0.20	6.80	
		L + 4.800		40	13.50		0.15	81.00	
		Scum Pit		20	5.00		0.15	15.00	
		L + 5.800		10	19.00		0.15	28.50	
		L + 5.200		11	38.50		0.30	127.00	
		L + 5.200		4	19.00		0.30	22.80	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		L + 5.200		1	22.00		0.30	6.60	
		L + 4.500		10	30.00		0.30	90.00	
		By Pass Waterway		2	102.00		0.30	61.20	
		Grid A and B		6	104.00		0.25	156.00	
		SIDE OF COVER	m^3						**1,235.86**
		Around Cover		50.5	4.00		0.25	50.50	
		L + 6.900		40	4.50		0.25	45.00	
				20	3.70		0.25	18.50	
				20	13.00		0.25	65.00	
				2	13.00		0.25	6.50	
				2*8	9.00		0.25	36.00	
				2*2	5.00		0.25	5.00	
				20	13.00		0.25	65.00	
		L + 8.800		4	108.00		0.25	108.00	
		L + 6.900		1	103.50		0.25	25.88	
		L + 6.900		4	19.00		0.25	19.00	
		L + 6.900		1	22.00		0.25	5.50	
		L + 6.900		3	8.00		0.25	6.00	
		L + 6.900		19	7.00		0.25	33.25	
		L + 6.900		11	1.50		0.25	4.13	
		L + 6.900		10	4.00		0.25	10.00	
		L + 6.400		34	30.00		0.25	255.00	
				2	103.00		0.25	51.50	
		L + 5.900		21	15.00		0.25	78.75	
				2*8	9.00		0.25	36.00	
				2*2	5.00		0.25	5.00	
				40	13.50		0.25	135.00	
		Outflow Waterway		2	140.00		0.25	70.00	
		By Pass Waterway		2*2	95.00		0.25	95.00	
		Distribution Tank		4	4.50		0.25	4.50	
				2	2.50		0.25	1.25	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				2	1.20		0.25	0.60	
		FORMWORK CONT.							**53,789.00**
		FACE OF WALL (ALL)							**26,882.64**
				2*4	55.50	5.38		2,388.72	
				2*2	1.50	5.38		32.28	
				2*4	55.50	1.27		563.88	
				2*2	1.50	1.27		7.62	
				2*20	0.80	3.50		112.00	
				2*20	0.40	5.20		83.20	
				2*2	108.00	1.70		734.40	
				2*1	2.00	1.70		6.80	
				2*2	108.00	3.00		1,298.00	
				2*1	2.00	3.00		12.00	
				2*1	108.00	3.00		648.00	
				2*40	5.50	4.71		2,072.40	
				2*40	1.00	4.10		328.00	
				2*8	1.00	9.75		156.00	
				2*8	3.00	9.75		468.00	
				2*8	10.00	3.80		608.00	
				2*20	10.00	0.50		200.00	
				2*10	5.00	2.68		268.00	
				2*10	5.00	3.65		365.00	
				2*20	4.20	1.20		201.60	
				2*8	50.50	1.20		969.60	
				2*4	55.20	9.45		4,173.10	
				2*4	1.50	9.45		56.70	
				2*2	1.50	9.45		56.70	
				2*2	55.20	8.80		1,943.00	
				2*1	1.50	8.80		26.40	
				2*2	55.50	4.01		890.20	
				2*1	1.50	4.01		12.00	
				2*10	0.80	4.20		67.20	
				2*10	0.40	4.69		37.50	
				2*2	55.50	0.67		148.70	
				2*1	113.50	4.17		946.60	
				2*10	13.50	4.36		1,177.20	
				2*10	8.00	3.50		560.00	
				2*8	6.00	8.80		844.80	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				2*8	23.00	4.43		1,630.20	
				2*2	55.50	5.10		1,132.20	
				2*2	55.50	3.31		734.80	
				2*2	55.50	4.17		925.74	
				2*1	3.00	8.80		52.80	
				2	118.65	1.80		427.14	
		WALL CONT.		2	112.50	1.80		405.00	
				2	114.00	1.80		410.40	
				2	13.75	12.70		319.20	
				2	4.25	12.70		107.95	
				2	6.50	1.80		23.40	
				2	21.75	11.55		502.43	
				2	21.75	11.55		502.00	
				2	21.75	1.80		78.30	
				2	38.50	11.10		854.70	
				2	38.50	1.80		138.60	
				2	38.50	10.60		816.20	
				2	27.75	10.60		588.30	
				2	27.75	1.80		99.90	
				2	27.75	10.60		588.30	
				2*0.5	94.50	0.50		47.25	
				2*4*0.5	55.50	0.30		66.60	
				2*2	33.20	9.75		1,294.80	
				2*2	30.00	8.00		960.00	
				2*2	8.50	8.00		272.00	
				2*2	26.50	8.80		932.00	
				2*2	2.80	5.90		66.10	
				2*4	2.50	9.75		195.00	
				2	141.00	3.00		846.00	
				2	18.50	3.00		111.00	
				2	136.00	4.70		1,278.40	
				2*10	4.50	3.55		319.50	
				2*2	2.80	5.40		60.48	
				2*2	26.00	8.80		915.20	
				2*2	30.50	9.30		1,134.60	
				2*2	13.10	9.75		510.90	
				2*2	8.50	9.75		331.50	
				2*2	1.50	1.80		10.80	
				2*1	4.40	1.50		13.20	
				2*2	9.00	1.50		54.00	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				2*1	9.00	1.80		32.40	
				2	10.60	3.00		63.60	
				2*2	4.30	3.00		51.60	
				2*2	2.50	3.50		35.00	
				2*2	5.30	9.80		207.76	
									9,690.80
				2*2	2.50	4.50		45.00	
				2*2	1.50	6.10		36.60	
				2*4	0.85	0.90		6.10	
				2*3	8.50	0.95		48.45	
				2*3	3.00	1.20		21.16	
				2*3	10.00	1.45		87.00	
				2*3	25.00	1.00		150.00	
				2*3	3.00	1.25		22.50	
				2*3	10.20	1.50		91.80	
				2*3	27.00	1.00		162.00	
				2*10	9.00	1.45		261.00	
				2*4	9.00	1.45		104.40	
				2*10	29.50	1.25		737.50	
				2*4	29.50	1.25		295.00	
				2*4	19.50	1.45		226.20	
				2*1	22.50	1.45		65.20	
				2*8	29.50	1.70		802.40	
				2*4	29.50	4.00		944.00	
				2*4	29.50	4.75		1,121.00	
				2*30	10.50	6.45		4,063.50	
				2*20*0.5	29.50	0.50		295.00	
				2*20*0.5	10.50	0.50		105.00	
		Less Opening to All							**-150.20**
				2*30	1.00	1.00		-60.00	
				2*60	0.50	0.30		-18.00	
				2*12	2.00	1.70		-81.60	
				2*30	1.25	1.00		-75.00	
				2*6	1.25	1.70		-25.50	
				2*10	0.60	0.60		-7.20	
				2*40	0.50	0.50		-20.00	
				2*20	0.50	1.00		-20.00	

QUANTITY SURVEY SHEET

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				2*10	0.50	0.50		-5.00	
				2*40	1.50	0.50		-20.00	
				2*1	1.00	1.45		-2.90	
				2*1	1.00	1.50		-3.00	
				2*8	1.00	1.00		-16.00	
				2*4	2.00	1.00		-16.00	
									1,512.90
		Direct Wall		2*20	7.00	3.45		-966.00	
				2*20	2.75	1.50		-165.00	
				2	113.50	1.50		340.50	
				2*3	2.00	3.45		41.40	
		End of Wall							**808.00**
		Temporary Wall							
		Grid 1: A and B (t:500)		2	4.00		10.90	87.20	
		Grid 1: G and H		2	2.50		11.70	58.50	
		Grid 1: M and N		2	8.00		11.70	187.20	
		Grid 1: 7-7' (t:400)		2	2.00		3.00	12.00	
		Grid N: 1-2 (t:500)		2	10.00		8.30	166.00	
		Grid N: 3-4 (t:500)		2	8.00		7.95	127.20	
		Grid N: 5-6 (t:500)		2	8.00		7.00	112.00	
		Baffle Wall	m^2	2*40	4.85	3.50		1,358.00	
				2*20	4.85	4.02		779.90	
									2,138.00
		Baffle Plate	m^2	2*10	1.10	1.50		33.00	
				2*20	1.10	2.50		110.00	
									143.00
		Column	m^2	44	2.00	6.40			**563.20**
		Beam	m^2	4	45.20	0.50		90.40	
				2*4	45.20	0.80		289.30	
									380.00
		Stair	m^2						
		Level + 8.000		6*3	1.00		0.20	3.60	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				6*12	0.33		0.20	4.75	
		Level + 6.900		4*4	2.00		0.22	3.10	
		Level + 8.000		4*20	0.50		0.22	8.80	
		Level + 6.400		3*2	2.00		0.17	2.00	
				3*6	0.50		0.17	15.00	
		Level + 5.900		3*2	2.00		0.17	2.00	
				3*6	0.50		0.17	1.50	
									41.00
		FORMWORK CONT.							**12,851.00**
		Soffit Form							**6,035.80**
					94.50	5.80		548.10	
					116.00	5.00		580.00	
					8.75	8.00		70.00	
					1.50	4.30		6.50	
				2*10	2.10	1.20		50.40	
				2*10	6.55	5.75		753.25	
					108.00	2.80		302.40	
				2	3.25	5.30		34.40	
					2.80	2.00		5.60	
					1.75	9.00		15.75	
					2.30	9.00		20.70	
					3.55	9.00		31.90	
				4	3.00	9.00		108.00	
				10	2.50	1.25		31.25	
				10	1.50	3.50		52.50	
				2*5	6.25	6.50		406.25	
					95.00	1.85		175.75	
				2	55.00	1.00		110.00	
				2*20	13.50	0.50		270.00	
				2*20	13.50	0.30		162.00	
				1*10	1.50	1.20		18.00	
				20	14.00	0.50		140.00	
				20	14.00	0.30		84.00	
				10	1.80	1.50		27.00	
				10	4.20	1.20		50.40	
				2*2	50.50	1.00		202.00	
				2*2	50.50	1.60		121.20	
				2	96.70	1.80		348.10	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				2	5.30	3.00		31.80	
					129.10	1.00		129.10	
					119.00	13.00		1,555.45	
		Less Opening			108.00	2.80		-302.40	
				22	2.00	2.00		-88.00	
				20	1.00	0.80		-16.00	
									1,149.45
					129.90	22.00		2,838.00	
				13	2.00	2.00		-52.00	
				20	8.35	3.70		-617.90	
					8.35	0.80		-6.68	
				20	4.85	1.00		-97.00	
					1.50	1.00		-1.50	
				10	2.00	1.50		-30.00	
				20	14.00	0.65		-182.00	
				17	0.70	0.65		-7.80	
					6.00	0.65		-3.90	
					3.00	2.40		-7.20	
					8.00	1.00		-8.00	
				2	43.00	1.00		-86.00	
					24.50	1.00		-24.50	
				10	2.00	1.00		-20.00	
									1,628.52
					129.90	28.50		3,702.15	
				13.5	2.00	2.00		-54.00	
				13	29.50	1.00		-383.50	
				4	29.50	2.00		-236.00	
				2	38.50	1.50		-115.50	
				1	114.10	1.00		-114.10	
				10	-2.00	1.00		-20.00	
				10	8.25	3.75		-309.40	
				2*10	8.25	5.25		-866.30	
				10	8.25	9.25		-763.20	
					1.50	1.00		-1.50	
									838.65
					13.00	10.15		131.95	

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				4	3.50	1.50		-21.00	
				2	4.00	2.30		-18.40	
				2	4.00	1.00		-8.00	
									84.55
					129.90	29.50		3,832.05	
				20.25	5.00	2.00		-202.50	
				40	13.50	0.55		-297.00	
				17	1.00	0.55		-9.35	
				10	2.00	1.70		-34.00	
					3.00	2.40		-7.20	
				20	18.00	3.70		-1,332.00	
				2	26.50	1.50		-79.50	
					114.25	2.00		-228.50	
				2	2.00	2.00		-8.00	
					18.00	0.80		-14.40	
									1,619.60
				4	30.50	2.50		305.00	
				5.5	30.50	1.00		167.80	
				2	30.50	1.50		91.50	
					30.50	1.75		53.38	
				5.5	37.50	3.00		618.75	
				5.5	37.50	0.50		103.20	
					113.00	1.25		141.30	
				2	2.50	2.50		12.50	
									1,493.43
		Grand							**260.55**
		Drain Pit	m^2						**181.80**
		800*800*1000 (t:250)		20	4.20		1.25	105.00	
				20	3.20		1.00	64.00	
				20	0.80	0.80		12.80	
		1000*1000*1000 (t:250)	m^2	7	5.00		1.25	43.75	
				7	4.00		1.00	28.00	
				7	1.00	1.00		7.00	
									78.75

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Hopper	m^2	2*10	5.65		7.50	847.50	
				2*10	1.90		7.50	285.00	
				2*10	1.90		6.00	228.00	
				2*10	5.65		6.00	678.00	
									2,038.50
		CONSTRUCTION JOINT	m^2						
		Base (t : 700)		1	230.65		0.70	161.00	
		Base (t : 600)		1	102.00		0.60	61.20	
									222.20
		Suspended Slab	m						
		t : 200		1	332.65		0.20	66.53	
		t : 400		1	204.00		0.40	81.60	
		t : 450		1	102.00		0.45	45.90	
									194.10
		Wall	m^2						
		t : 500			130.00				
					70.00				
					19.35				
							0.50	109.75	
									109.75
		EXPANSION JOINT	m^2						
		Base (t : 600)			17.10		0.60	10.26	
		Base (t : 700)			110.00				
					10.50				
					27.00				
					330.00				
					4.50				
							0.70	337.40	
									347.66
		Slab (t : 200)	m^2		6.50				
					32.40				
					3.00				
					11.00				
					5.70				
					128.56				

ITEM: SEDIMENTATION TANK: 2, 3, 4, 17

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
					3.00				
					20.00				
					3.60				
					4.70				
					22.00				
					3.00				
							0.20	48.69	**64.21**
		t : 400			5.70				
					5.70				
					6.30				
							0.40	15.52	
		Wall	m^2						
		t : 150			24.00		0.15	3.60	
		t : 250			27.00		0.25	6.75	
		t : 300			95.50		0.30	28.65	
		t : 400			33.20		0.40	13.28	
		t : 500			277.10		0.50	138.55	
									190.83
		SEDIMENTATION TANK							
		(FORM FOR CINDER CONC.)			125.00				
					100.00				
					89.00				
					110.00				
					89.00				
					89.00				
					110.00				
					110.00				
					110.00				
					89.00				
					100.00				
					9.00				
							0.10		**124.00**

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.2.3 QUANTITY SURVEY SHEET
ITEM: SEDIMENTATION TANK ELECTLIC ROOM - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
1		Bedding							
		Red Soil t : 200	m3						33.09
		Gallery A Side (1)			5.00	9.20	0.20	9.20	
		Gallery A Side (2)			8.70	5.20	0.20	9.05	
		Gallery B Side(1)			8.70	5.20	0.20	9.05	
		Gallery B Side(2)			5.00	5.80	0.20	5.80	
		Concrete lev. T : 100	m3						16.55
				0.5	33.09			16.55	
		Cinder Concrete	m3						8.95
		t : 100			5.00	4.30	0.10	2.15	
					5.00	13.60	0.10	6.80	
2		CONCRETE							
		Base	m3						111.40
		Gallery A Side			5.00	9.20	0.70	32.50	
					8.50	5.00	0.60	25.50	
		Gallery B Side			8.50	5.00	0.60	25.50	
					5.00	5.70	0.60	17.10	
					5.00	5.40	0.40	10.80	
		Wall	m3						193.70
		A and B Side		2x2	6.40	5.20	0.50	66.56	
				2x2	5.00	5.20	0.40	41.60	
				2x2	2.80	5.20	0.50	29.12	
				1	7.30	1.80	0.40	5.256	
				2	2.00	5.20	0.20	4.160	
				2	5.00	5.20	0.20	10.40	
				2x2	10.30	1.20	0.50	24.72	
				2	2.30	3.50	0.50	8.05	
				2	2.30	1.80	0.40	1.656	
				1	2.30	1.80	0.50	2.07	
		Slab	m3						31.74
		Gallery A Side		1	10.10	9.30	0.12	8.85	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Less opening		1	4.00	3.00	0.12	(-) 1.44	
		Gallery B Side		1	10.10	7.30	0.12	8.85	
		Less opening		1	4.00	3.00	0.12	(-) 1.44	
				1	5.70	7.30	0.40	16.65	
		Beam	m3						5.40
		Gallery A, B		2x2	5.00	0.70	0.30	4.20	
				2x1	4.00	0.50	0.30	1.20	
		Stair							
		Gallery A, B	m3						12.79
		Slab		2x2	5.20	2.00	0.20	8.32	
		Step		0.5x2x32	2.00	0.28	0.17	1.47	
		Platform		2	5.00	1.50	0.20	3.00	
3		Formwork	m2						919.71
		Base	m2						115.46
		Gallery A + B Side		2x2	5.00		0.60	12.00	
				2x2	6.00		0.60	14.40	
				2x2	2.00		0.60	4.80	
				2x2	2.30		0.60	5.50	
				2	7.30		0.60	8.76	
		Wall	m2						677.20
				2x2x2	6.40		5.20	266.24	
				2x2x2	5.00		5.20	208.00	
				2x2x3	1.80		5.20	112.32	
				2x2	10.30		5.20	90.64	
		Beam	m2						36.00
				2x2x2	5.00		0.70	28.00	
				2x2x1	4.00		0.50	8.00	
		Slab	m2						161.05
				2	9.20	5.00		92.00	
		Stair		2	5.20	2.00		20.80	
		Platform		2	5.00	1.50		15.00	
		Step		2x32		1.50	0.163	15.65	
		Side		2x4	5.50		0.40	17.60	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.3.1QUANTITY SUMMARY SHEET
ITEM: DISINFECTION TANK - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1.1		Sand Base	m^3	136.70	
1.2		Leveling Conc. Class G			
		Base	m^3	68.40	
1.3		Non R. Concrete Class F18			
		Botl. Slab	m^3	190.20	
		Mortar Finish Stair	m^2	16.50	
1.4		Reinforced Concrete			
		Class E Base	m^3	470.90	
		Wall	m^3	426.00	
		Slab	m^3	67.20	
		Stair	m^3	3.90	
		Cont. Joint	m^3	20.73	
1.5		Formwork			
		Base	m^2	165.00	
		Wall	m^2	2,430.50	
		Stair	m^2	15.00	
		Soffit Stair	m^2	10.50	
		Soffit Slab	m^2	405.00	
1.6		Jointing:			
		Water Stop	m	43.62	
		Sealing	m	106.74	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.3.2 QUANTITY SURVEY SHEET
ITEM: DISINFECTION TANK - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
1		BEDDING							
		Red Soil T : 200	m3		34.70	19.70	0.20	157.54	136.70
		LEBELING							
		Conc Leveling T : 100	m3		34.70	19.70	0.10	78.77	68.40
2		CONCRETE							
		R.C Stair - Case	m3						3.95
		Beam		2 x 2	1.50	0.70	0.30	1.26	
		Slab(stair)		2 x 1	2.50	1.50	0.20	1.50	
		Slab Platform		1	2.00	1.50	0.20	0.60	
		Step		0.5x16	1.50	0.25	0.20	0.59	
		Cement Leveling	m2						16.35
		Sorced to stair step		2 x 10	1.50	0.45		13.35	
		Plat Form		1	1.50	2.00		3.00	
		R.C. TANK							
		Tank Slab Found	m3		34.50	19.50	0.70	470.93	470.93
		700 THK							
		Tank Slab Topping							
		200 THK	m3		335.87		0.20	67.18	67.18
		34.5x20.5 = 707.25							
		less grating opening							
		2(5.00x5.00) = (-) 50.00							
		2(2.00x2.00) = (-) 8.00							
		2(1.30x1.30) = (-) 3.38							
		2(2.70x25.00) = (-)135.00							
		2(3.50x25.00) = (-)175.00							
		Total = 335.87 m2							
			m3						425.93
		WALL		2	5.00	0.50	6.33	31.25	
		Ext. Tank Wall		1	17.50	0.50	6.03	52.76	
		500 THK							

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		500 THK		1	34.00	0.50	6.03	102.50	
		Into Tank wall		1	21.50	0.50	6.03	15.83	
		500 THK		1	20.50	0.50	6.03	61.80	
				2	5.00	0.50	6.03	30.15	
				1	5.00	0.50	4.23	10.52	
				2	22.00	0.50	6.03	132.66	
		less hole opening						(-) 12.00	
		3(2.00x2.00) = (-) 12.00							
		Infill Conc. to Base t = 1730			20.15	5.00	1.73	174.30	total
		Infill Conc. to Base			5.00	5.00	0.30	7.50	190.20
		Infill Conc. to corner		0.5	185.60	0.30	0.30	8.35	
		wall							
		Temporary Wall	m3		17.00	0.40	6.03	41.00	41.00
		400 THK							
3		FORM WORK	m2						164.83
		Pit Side		3	6.80		0.30	6.12	
		Pit (1.0x4) = 4 m			4.00		0.50	2.00	
		Slab Found		2	34.50		0.70	48.30	
				3	22.50		0.70	47.25	
		Side Slab Top		2	22.50		0.20	9.00	
				2	34.50		0.20	13.80	
		Side of Opening		2	5.50		0.20	2.20	
		2(5.10x4) = 40.8			180.80		0.20	36.16	
		2(2.10x4) = 16.8							
		2(1.40x4) = 11.2							
		2(25.00+2.50) = 55.0							
		2(25.00+3.50) = 57.0							
		Tootal = 180.8 m							
		Soffit Form	m2					404.87	404.87
		Stair Case	m2						15.09
		Beam (side)		2	1.50	1.50		4.50	
				2	1.50	1.80		2.40	
		Step (side)		2x9	1.50	0.20		5.40	
				2	2.50	0.35		1.75	
				1	1.00	0.20		0.20	
				4	0.70	0.30		0.84	
		Soffit Form		2	2.50	1.50		7.50	total
					2.00	1.50		3.00	10.50

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		FORM WORK	m2						2,430.30
		Side of Conc.		2	28.50		6.03	343.70	
		Walls		2	17.50		6.03	211.10	
		Ext. Wall		2	5.00		6.33	63.30	
				2	34.00		6.03	410.10	
		Int Wall		4 x 2	5.00		6.03	241.20	
		Weir Wall		2	5.00		4.23	42.30	
				3 x 2	5.00		6.03	180.90	
				2	10.50		6.03	126.60	
				2 x 2	22.00		6.03	530.60	
				2	23.50		6.03	283.40	
				3	0.50		6.03	9.10	
		Hole Opening(Wall)							
		less 3(2.00x4) = 24 m			24.00	0.50		(-) 12	
4		JOINTING							
			m						106.74
		Sealing to Base			19.50			19.50	
		20 x 20 to Wall		2 x 4	6.03			48.24	
		20 x 20 to Slab		2	19.50			39.00	
		Construction Joint	m3						20.73
		To Base			19.50	0.70	0.70	9.56	
		To Top Slab			19.50	0.70	0.20	2.73	
		To Wall		4	6.03	0.70	0.50	8.44	
		Water Stop t >300	m						43.62
				4	6.03			24.12	
				1	19.50			19.50	
5		METAL WORKS							
		Grating Covers	m2						37.38
		Type 1		1	5.00	5.00		25.00	
		Type 2		2	2.00	2.00		8.00	
		Type 3		2	1.30	1.30		3.38	
				1	1.00	1.00		1.00	
		Ladder	m	2	6.03			12.06	12.06
		Weir B-0.5, L=5.0	no.	1					1.00
		Balustrade	m						214.40
				4	3.20			12.80	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
				4	4.00			16.00	
				8	23.20			185.60	
		Balustrade to stair	m					7.80	7.80
6		REINFORCEMENT BAR	kg				1.05 x 99798.65 = 104788.58 kg		
		Cross (B)							
		D24 @ 125		278	5.50		3.551	5,429.34	
		D24 @ 250		139	19.00		3.551	9,376.94	
		Long (B)							
		D16 @ 250		82	35.30		1.578	4,567.40	
		33.8 + 1.50 = 35.30							
		D18 @ 125		164	5.70		1.998	1,866.32	
		Cross (T)							
		D22 @ 250		138	18.30		2.984	7,534.80	
		D22 @ 125		278	3.50		2.984	2,902.30	
		Long (T)							
		D16 @ 250		82	37.80		1.578	4,890.48	
		D14 @250		82	1.80		1.208	177.94	
		D24 @ 250		2x82	1.80		3.551	1,047.96	
		D24 @ 250		138	1.80		3.551	881.82	
		D16 @ 250		6x89	1.80		1.578	1,516.56	
		D24 @ 125		278	2.80		3.551	2,763.32	
		D16 @ 125		4x216	2.50		1.578	3,404.16	
		D14 @ 125		2x49	21.00		1.208	2,485.28	
		D18 @ 250		79	6.23		1.998	982.76	
		D14 @ 250		79	6.23		1.208	594.08	
		D18 @ 125		2x49	21.00		1.998	4,111.10	
		D24 @ 125		2x158	3.00		3.551	3,365.40	
		D24 @ 250		2x79	6.23		3.551	3,494.96	
		D20 @ 125		3x36	1.30		2.466	345.60	
		D20 @ 125		1x18	1.30		2.466	57.60	
		D20 @ 250		3x18	3.00		2.466	399.06	
		D20 @ 250		1x18	3.00		2.466	133.02	
		D20 @ 250		3x18	6.23		2.466	829.44	
		D20 @ 250		1x18	6.23		2.466	276.48	
		D14 @ 125		2x48	20.00		1.208	2,319.36	
		D20 @ 250		3.5x21	1.50		2.466	271.21	
		D14 @ 125		3.5x48	2.00		1.208	404.88	
		D16 @ 250		2x24	37.80		1.578	2,862.72	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		D24 @ 250		2x141	6.23		3.551	6,237.84	
		D16 @ 250		4x24	30.60		1.578	4,634.88	
		D16 @ 250		4x114	6.23		1.578	4,482.48	
		D16 @ 250		2x24	24.77		1.578	1,875.84	
		D16 @ 250		2x94	6.23		1.578	1,848.04	
		D16 @ 250		2x24	31.62		1.578	2,394.72	
		D16 @ 250		2x116	6.23		1.578	2,280.56	
									93,046.65
	Slab								
		D12 @ 250 (T+B)	2x136	20			0.888	4,830.72	
		D14 @ 250 (T+B)	2x78	35.5			1.208	6,689.28	
		Less opening							
		D12 @ 250 (T+B)	2x92	11.3			0.888	(-) 1845.52	
		D14 @ 250 (T+B)	2x42	23.7			1.208	(-) 2404.08	
		D12 @ 250	2x20	5.2			0.888	(-) 184.4	
		D14 @ 250	2x20	5.2			1.208	(-) 251.2	
		D12 @ 250	2x9	2.2			0.888	(-) 35.1	
		D14 @ 250	2x9	2.2			1.208	(-) 47.7	
									6,752.00

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.4.1 QUANTITY SUMMARY SHEET
ITEM: CHLORINATION TANK - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	319.00	
1.2		Leveling Concrete Class G			
		Base	m^3	159.50	
1.3		Cinder Concrete Class F			
		Base	m^3	94.30	
1.4		Reinforcement Concrete Class E			
		Base	m^3	1,154.50	
		Column	m^3	68.00	
		Beam	m^3	115.90	
		Wall	m^3	879.20	
		Temporary Wall	m^3	9.00	
		Slab	m^3	474.50	
		Stair Case:			
		Slab	m^3	11.78	
		Beam	m^3	2.20	
		Step	m^3	3.40	
1.5		Mortar Finishing	m^2	40.00	
1.6		Formwork			
		Side: Base	m^2	306.00	
		Side: Beam	m^2	395.00	
		Side: Slab	m^2	100.00	
		Side: Column	m^2	296.00	
		Side: Wall	m^2	3,263.00	
		Soffit: Slab	m^2	1,617.00	
1.7		Stair Form			
		Side:	m^2	67.00	
		Soffit	m^2	58.00	
		Cinder Concrete			
		Side	m^2	1.96	
1.8		Jointing			
		Water Stop	m	98.52	
		Sealing	m	136.54	
		Elastic Joint Filler	m^2	57.31	

Table E.3.4.2 QUANTITY SURVER SHEET
ITEM: CHLORINATION STORAGE TANK

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		BEDDING							
		RED SOIL T: 200	M3					TOTAL	319.1
		TANK L - 2230			60.70	2.5	0.2	30.35	
		TANK L - 2230			60.70	6.0	0.2	72.84	
		BULDING L - 3100			60.70	14.2	0.2	172.39	
		GALLERY L - 3100			25.0	8.7	0.2	43.50	
		LEVELING T:200	M3	0.5	x 319.1			159.54	159.54
		CONCRETE	M3						
		STAIR CASE (1) L + 2200						TOTAL	17.38
		BEAM		2 x 2	1.50	0.70	0.30	1.26	
		SLAB		2 x 1	2.50	1.50	0.20	1.50	
		PLATFORM		1	1.50	1.50	0.20	0.45	
		STEP		0.5 x 16	1.50	0.25	0.20	0.60	
		STAIR CASE (2) L + 2200							
		BEAM		3	2	0.70	0.30	0.945	
		SLAB		1	3	1.50	0.20	0.75	
		PLATFORM		1	5	1.50	0.20	1.50	
		STEP		0.5 x 8	2	0.25	0.20	0.30	
		STAIR CASE (3) L-3100							
		SLAB		1	4.80	1.40	0.20	1.35	
		SLAB		1	6.20	1.40	0.20	1.74	
		PLATFORM		1	1.40	1.40	0.20	0.39	
		STEP		0.5 x 33	1.40	0.25	0.20	1.16	
		STAIR CASE (4)							
		SLAB			6.20	1.40	0.20	1.74	
		SLAB			4.80	1.40	0.20	1.74	
		PLATFORM			3.60	1.40	0.20	1.01	
		STEP		0.5 X 33	1.40	0.25	0.20	1.16	
		STAIR CASE (5)							
		STEP		1	1.50	0.25	0.17	0.06	
		STEP		1	1.50	0.25	0.332	0.12	
		CEMENT SCREED	M2					TOTAL	33.75
		LEVELING TO ALL		90	1.50	0.25		33.75	
		STAIR STEP FISHING							

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		BASE T: 700	M3					TOTAL	1154.43
		L- 2230			60.5	2.50	0.7	105.88	
		L- 2230			60.5	6.5	0.7	275.88	
		HUNCH		0.5	60.5	0.5	0.5	7.56	
		HUNCH		8 x 0.5	6.8	0.5	0.5	6.25	
		HUNCH		2 x 0.5	17.5	0.5	0.5	4.38	
		HUNCH		2 x 0.5	28.5	0.5	0.5	17.3	
		BASE T: 700			60.5	14.0	0.7	592.9	
		GALLERY			25.0	8.5	0.7	148.75	
		GALLERY			1.0	9.0	0.7	6.3	
			M3					TOTAL	67.96
		COLUMN: (500 x 700)		4	0.70	0.50	5.80	8.12	
		(600 x 600)		3	0.60	0.60	5.80	6.26	
		(600 x 600)		4	0.60	1.00	6.00	14.40	
		(600 x 1000)		7	0.60	1.00	5.90	24.28	
		CRAME SUPPORT		2	36.00	0.40	0.50	14.04	
			M3					TOTAL	115.82
		BEAM: (700 x 1300)		2	16.40	0.70	1.00	22.96	
		(500 x 600)		2	14.00	0.50	0.30	4.20	
		(600 x 600)		1	28.25	0.60	0.40	6.78	
		(600 x 800)		1	13.25	0.60	0.60	4.77	
		(600 x 1000)		4	14.00	0.60	0.80	26.88	
		(600 x 1200)		3	14.00	0.60	1.00	25.20	
		BEAM SEE 1-1							
		(500 x 900)		11	7.00	0.50	0.65	25.03	
								TOTAL	879.19
		WALL		1	3.0	6.48	0.50	9.72	
		T: 500			55.8	6.90	0.50	192.51	
		T: 500			17.0	6.90	0.50	58.65	
		T: 500			3.50	6.90	0.50	12.08	
		T: 500			29.0	6.90	0.50	100.05	
		T: 500		1	9.0	6.90	0.50	31.05	
		T: 500			34.4	6.90	0.50	118.68	
		T: 500			9.0	6.48	0.50	87.48	
		T: 500			25.50	6.48	0.50	82.62	
		T: 500			25.40	6.03	0.50	76.58	
		T: 500			14.00	6.90	0.50	48.30	
		LESS DOOR (1800 x 2200)			2.20	1.80	0.50	(-) 1.98	

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
								TOTAL	63.45
		GALLERY T: 600			27.0	3.50	0.60	56.70	
		HUNCH		0.5 x 2	27.0	0.50	0.50	6.75	
			M3					TOTAL	9.05
		TEMPORARY WALL (R.C)			3.0	6.03	0.50	9.045	
		SLAB (R.C)							
			M3					TOTAL	470.82
		GALLERY T: 600			26.0	9.0	0.60	140.4	
		EFFLUENT TANK T:250 L + 4500			25.0	8.5	0.25	53.13	
		TREATMEN TANK T:250 L + 4000			35.0	8.5	0.25	74.38	
		LESS OPENING 1000 x 1000		4	1.0	1.0	0.25	(-) 1	
		LESS OPENING 1000 x 1000		1	2.0	0.8	0.25	(-) 0.4	
		BIG TANK T: 300			19.65	14.25	0.30	84	
		BIG TANK T: 200			40.85	14.25	0.20	116.42	
		LESS OPENING			3.0	2.0	0.20	1.20	
		LESS STAIR OPENING			5.05	2.8	0.20	(-) 2.83	
		LESS STAIR OPENING			3.75	1.4	0.30	(-) 1.58	
		HUNCH		0.5 x 2	59.0	0.5	0.20	5.90	
		HUNCH		0.5 x 4	6.0	0.5	0.20	1.20	
			M3						
		CINDER CONCRETE							94.31
		TANK T: 100			59.1	12.6	0.1	74.47	
		GALLERY T: 100			26.1	7.6	0.1	19.84	

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		FORMWORK							
		SIDE OF BASE	M2					TOTAL	306.25
		GALLERY T: 700	L- 3100		35.5		0.70	25.85	
		BIG TANK T: 700	L- 3100		124		0.70	86.8	
		S/ TANK T: 700	L- 2230		139		0.70	97.3	
		SIDE OF SLAB	M2					TOTAL	99.6
		GALLERY T: 600			27		0.7	18.9	
		SLAB L+ 4.50 T: 300			64		0.3	19.2	
		SLAB L+ 400 T: 250			79		0.25	19.8	
		SLAB L+ 400 T: 200			208.7		0.20	41.7	
		SIDE OF BEAM						TOTAL	394.8
		700 x 1300		2 x 2	16.4		1.0	65.6	
		500 x 600		2 x 2	14		0.3	16.8	
		600 x 600		2 x 1	28.25		0.4	22.8	
		600 x 800		2 x 1	13.25		0.6	15.9	
		600 x 1000		2 x 4	14		0.8	89.6	
		600 x 1200		2 x 3	14		1.0	84	
		500 x 900		2 x 11	7		0.65	100.1	
			M2						
		SIDE OF COLUMN							
		500 x 700		4	2.40		5.8	55.68	
		600 x 600		3	2.40		5.8	41.76	
		600 x 600		4	2.40		6.0	57.60	
		600 x 1000		7	3.20		5.9	132.16	
		Crane Support		14	1.20		0.5	8.40	
								TOTAL	1617.65
		SOFFIT FORM	M2						
		SLAB + BEAM			60.5	23.3		1409.65	
		GALLERY			26	8.0		208	
		FACE TO WALL	M2					TOTAL	3262.94
				2	3.0	6.48		38.88	
				2	55.8	6.90		770.04	
				2	17	6.90		234.60	
				2	3.5	6.90		48.30	
				2	29	6.90		400.20	
				2	9	6.90		124.20	
				2	34.4	6.90		474.72	
				2 x 3	9	6.48		349.92	
				2	25.5	6.48		330.48	
				2	25.4	6.03		306.32	
				2	14	6.90		193.20	

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		LESS DOOR		2	2.2	1.08		(-) 7.92	
		STAIR							
		STAIR (1)	M2					TOTAL	17.04
		BEAM SIDE		2	1.5	1.5		4.5	
		BEAM SIDE		2	1.5	1.3		3.9	
		STEP SIDE		2 x 9	1.5	0.2		5.4	
		STEP SIDE		2	3	0.35		2.1	
		STEP SIDE		1	1.5	0.2		0.3	
		STEP SIDE		4	0.7	0.3		0.84	
			M2					TOTAL	9.6
		SOFFIT FORM		2	2.5	1.5		7.5	
		SOFFIT FORM		1	1.4	1.5		2.1	
		STAIR (2)	M2					TOTAL	11.93
		SIDE FACE		2	1.5	1.5		4.5	
		SIDE FACE		1	1.5	1.3		1.95	
		SIDE FACE		9	1.5	0.2		2.7	
		SIDE FACE		1	3	0.35		1.05	
		SIDE FACE		1	5.5	0.2		1.1	
		SIDE FACE		3	0.7	0.3		0.63	
			M2					TOTAL	12.0
		SOFFIT FORM		1	2.5	1.5		3.75	
		SOFFIT FORM		1	5.5	1.5		8.25	
		STAIR (3)	M2					TOTAL	13.09
		SIDE SLAB		1	4.8	0.35		1.68	
		SIDE SLAB		1	6.2	0.35		2.17	
		SIDE STEP		33	1.4	0.2		9.24	
			M2					TOTAL	17.36
		SOFFIT FORM		1	1.4	1.4		1.96	
		SOFFIT FORM		1	4.8	1.4		6.72	
		SOFFIT FORM		1	6.2	1.4		8.68	
		STAIR (4)						TOTAL	16.94
		SIDE SLAB		2	6.2	0.35		4.34	
		SIDE SLAB		2	4.8	0.35		3.36	
		SIDE STEP		33	1.4	0.2		9.24	
								TOTAL	19.32
		SOFFIT SLAB		1	6.2	1.4		8.68	
		SOFFIT SLAB		1	4.8	1.4		6.72	
		PLATFORM		1	2.8	1.4		3.92	
		STAIR (5)	M2					TOTAL	7.65
		SIDE STEP		2	1.5	1.7		5.1	
		END STEP		2	1.5	1.7		1.7	
		END STEP		2	0.25	1.7		0.85	

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		JOINTING	M						
		EXPANSION JOINT		WATER	STOP				85.6
		BASE T: 700			60.5			60.5	
		WALL T: 500		2	6.03			12.6	
		WALL T: 500		2	6.23			12.46	
			M						
		SEALING (20 x 20)							
		TO BASE			60.5			60.5	
		TO WALL		2	6.03			12.06	
		TO WALL		2 x 2	6.23			24.92	
		TO SLAB		2	13.5			27	
		ELASTIC JOINT FILLER							NO.
			M3						
		CONC PROTECTION TO							3.64
		DOWEL BAR @ CLAB			26	0.7	0.2	3.64	
		METAL WORK	M						
		STAIR HANORAIL						TOTAL	141.7
		H : 1100 (1)		1	7.5			49.7	
		H : 1100 (2)		1	9.5				
		H : 1100 (3)		1	13.5				
		H : 1100 (4)		1	11.7				
		H : 1100 (5)		1	49.7				
								92.0	
		FLOOR HANARAIL			26				
					22				
					6				
					7.5				
					30.5				
					92				
		GRATING COVER W: 200						TOTAL	4.0
		DRAIN PIT COVER							
		1000 x 1000	M2	4	1.00	1.00		4.00	
		GRATING COVER						TOTAL	10.0
		1000 x 1000		4	1.00	1.00		4.0	
		2000 x 3000		1	2.00	3.00		6.0	
			M2						
		OPENING COVER BY		1	2.00	0.80		1.6	1.6
		MECH WORK							
			M2					TOTAL	
		STEEL LADDER		2	6.0			12	
				2	5.0			10	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.5.1 QUANTITY SUMMARY SHEET
ITEM: MAIN BUILDING - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
I		CONCRETE TYPE E (21)	m^3	1,407.81	
I1		* BOTTOM SLAB	-	806.00	
		- Pipe Gallery	-	345.20	
		- Bottom Stair	-	41.93	
		- Shallow Footing	-	366.03	
		- Generator Base	-	37.05	
		- Bottom Beam	-	15.80	
I2		* WALL AND COLUMN	m^3	367.31	
		- Pipe Gallery	-	165.20	
		- Stair Case Wall	-	115.43	
		- Entrance Base	-	2.62	
		- Column	-	71.68	
		- Stair Slap	-	12.38	
I3		* SLAB AND BEAM	m^3	234.50	
		- Pipe Gallery	-	82.95	
		- Entrance Base	-	14.58	
		- Beam A, B Axis	-	71.81	
		- Beam Span 8 m	-	65.16	
I4		* CONCRETE CLASS F (15)	m^3	122.38	
		(Raising Concrete)			
I5		* CONCRETE CLASS G	m^3	103.31	
		- Pipe Gallery	-	47.83	
		- Bottom Stair Case	-	8.05	
		- Shallow Footing	-	47.43	
I6		* CONCRETE CLASS F (CINDER)	m^3	39.28	
		- Pipe Gallery	-	35.52	
I7		* STAIR CASE	m^3	3.76	
II		* MORTAR FINISHING T = 20 MM	m^2	40.15	
		- For Stair	-	40.15	
III1		* FORMING	m^2		
		- For Concrete Class G	-	19.28	
		- For Cinder	-	13.62	

No.	Code	Description	Unit	Quantity	Remarks
III2		* FORMING	m^2	1,997.98	
		- Base	-	120.00	
		- Wall	-	379.28	
		- Slab	-	1,498.70	
IV		* REINFORCEMENT	Kg	151,523.00	
		- Bottom Slab	-	71,200.00	
		- Column and Wall	-	53,323.00	
		- Beam and Slab	-	27.00	
V		* SAND BEDDING	m^3	206.61	
		- Pipe Gallery	-	95.65	
		- Bottom Stair	-	16.10	
		- Shallow Footing	-	94.86	
VI		* EXPANSION JOINT			
		- Water Stop	m	50.00	
		- Elastic Joint Filler	-	23.24	
		- Sealing	-	32.72	
VII		* CONCRETE PILE 400x400	Pile		
		- L = 38 m	-	25	
		- L = 37 m	-	56	
		- L = 32 m	-	131	
VIII		* DOOR W= 800MM, H= 2000MM	Each	2	
		(Between Stair and Gallery			

Table E.3.5.2 QUANTITY CALCULATION SHEET

MAIN BUILDING

ITEM	DESCRIPTION	QUATITY	
1. SAND BEDDING		M^3	
(1) PIPE GALLARY	9.8 x 0.2 x 48.8	95.65	
(2) BOTTOM STAIR	4.3 x 0.2 x 9.35 x 2	16.10	
(3) SHALLOW FOOTING	12.1 x 39.2 x 0.2	94.86	
	TOTAL	206.61	
2. Loveling Concrete		M^3	
(1) PIPE GALLARY	9.8 x 0.1 x 48.8	47.83	
(2) BOTTOM STAIR	4.3 x 0.1 x 9.35 x 2	8.05	
(3) SHALLOW FOOTING	12.1 x 39.2 x 0.1	47.43	
	TOTAL	103.31	
3. REINF. CONCRETE TYPE E (21)			
3.1 BOTTOM SLAB		M^3	
(1) PIPE GALLARY	9.6 x 0.85 x 42.3	345.20	
(2) BOTTOM STAIR	4.3 x 0.5 x 9.75 x 2	41.93	
(3) SHALLOW FOOTING	[12x40-(6x2.1+2.1x4.7)]x0.8	366.03	
(4) GENERATOR BASE	6 x 2.1 x 2 + 2.1 x 4.7 x 1.2	37.05	
(5) BOTTOM BEAM	39.5 x 0.4 x 1	15.80	
	SUBTOTAL	806.00	
3.2 WALL			
(1) PIPE GALLARY	4.3(40-8 x 0.8) x 0.5 x 2 + 3.6x 3.7 x 0.5 x 4 - (20x0.5x0.3x2)	165.20	
(2) STAIR CASE	(2 x 9.35 + 2.5)x 5.3 x 0.5 x 2 +1.6 x 0.2 x 4.8 x 2	115.43	
(3) ENTRANCE BASE	2.5 x 0.2 x 1.3 x 2 x 2	2.62	
	SUBTOTAL	283.25	
3.3 COLUMN			
(1) 20 COLUMN	0.8 x 0.8 x 5.6 x 20	71.68	
	SUBTOTAL	71.68	
3.4 BEAM			
(1) BEAM A,B AXIS	(40 - 8 x 0.8) x 0.8 x 1.3 x 2 +0.5 x 2.4 x 0.8 x 2	71.81	
(2) BEAM SPAN 8M	1.2 x 0.8 x 7.2 x 7 + 1.3 x 0.8 x 7.2 x 2 + 0.5 x 0.5 x 0.5 x 0.8 x 2 x 9	65.16	
	SUBTOTAL	136.97	
3.5 1^{ST} FLOOR SLAB			
(EXCLUDING SHALLOW			
FOOTING)			
(1) PIPE GALLARY	(40 - 8 x 0.8) x 7.2 x 0.25 + 7.8 x 3.6 x 0.4 x 2	82.95	
(2) ENTRANCE	2 x 0.2 x 2.4 x 3 + 0.6 x 0.3 + 3.5 x 1.2 x 0.6 + 2 x 1.2 x 0.6 + 8.5 x 1.58 x 0.6	14.58	
	SUBTOTAL	97.53	
	SUM 5)	1,395.43	
SLAB + BEAM		234.50	

MAIN BUILDING

ITEM	DESCRIPTION	QUATITY	
4.1 CONCRETE CLASS F (18)		M^3	
(1) 1ST FLOOR	0.3x[20.8 x 24 - (10 x 0.8 x 0.8 + 2.1 x 6 + 2.1 x 4.7)]	122.38	
4.2 CLASS F (Cinder)			
(1) PIPE GALLARY	7.4 x 48 x 0.1	35.52	
(-3.1)			
(2) STAIR	2.1 x 8.95 x 0.1 x 2	3.76	
	TOTAL	39.28	
5. FINISHING SURFACE		M^2	
5.1 FLOOR			
(1) PIPE GALLERY	7.8 x 4.8	374.4	
(2) STAIR CASE	9.35 x 2.5 x 2	46.75	
(3) 1st FLOOR	40.8 x 20.8 + 3.4 x 3	858.84	
	SUBTOTAL	1280	
5.2 OUTSIDE WALL			
(1) PIPE GALLERY	40.8 x 5.6 + 40 x 4.8 + 4 x 4.1 x 2 + 0.75 x 4.1 x 2	459.43	
(2) STAIR CASE	(9.35 + 3) x 5.5 x 2 + (9.35 x 4.7) x 2	224.68	
	SUBTOTAL	684.11	
5.3 INSIDE WALL			
(1) PIPE GALLERY	24 x 5.35 x 2 +16 x 5.05 x 2 + 0.3 x 4.3 x 8 x 4 + (40 - 6.4) x 0.3 x 2 + 4 x 3.7 x4 - (0.8*2.2*2)	515.36	
(2) STAIR CASE	(2 x 8.85 + 2.5) x 5.5 x 2	222.2	
	SUBTOTAL	737.56	
5.4 CEILLING			
(1) PIPE GALLERY	40.8 x 7.2 + 5 x 0.95 x 8 + 2 x 9 x 0.8 x 0.7 + 4 x 8 x 0.5 x 0.5 x 0.5 + 7.8 x 4 x 2	385.44	
	SUBTOTAL	385.44	
	SUM 7)	3087.11	
6. REINF. STEEL		M	KG
6.1 BOTTOM SLAB			
(1) PIPE GALLARY, f 16	173 x 10.8 + 168 x 10.8 + (44 + 1.8) x 41 x 2	7439	11665
(2) PIPE GALLARY, f 32	(173 x 6.2) + 4.5 x 168 x 2	2585	16216
(3) PIPE GALLARY, f 12	(37 x 3) x 2 x 2 + 11 x 9.5 x 2	653	576
(4) PIPE GALLARY, f 14	11 x 9.5 x 2	209	251
(5)STAIR CASE, f 14	20 x 2 x 10.1 x 2	808	971
(6) STAIR CASE, f 16	40 x 4.8 x 2 x 2	768	1204
(7) SHALLOW FOOTING f 16	133 x 12.6 + 30 x 5.1 + 41 x 42.8 + 126 x 12.6 + 24 x 8.2 + 41 x 42.8 + 26 x 6 + 14 x 6	7363	11545
(8) SHALLOW FOOTING f 18	11 x 13 + 8 x 13	143	286
(9) SHALLOW FOOTING f 14	5.6 x 161 + 3.6 x 33 + 5.6 x 33 + 5.1 x 33 x 2 + 4.1 x 33 + 2.5 x 33 + 1.4 x 60	1844	2215
(10) SHALLOW FOOTING f 36	11 x (8 + 4.8 + 6.4 + 4.8 + 8 + 3.3 + 5.6 + 5.1 + 5.1 + 5.6 + 3.3 + 1)	671	5362
(11) SHALLOW FOOTING f 20	5 x 61	305	747
(12) SHALLOW FOOTING f 32	22 x 61 + (6.7 + 5.6) (14 x 4 + 7)	2117	13280
(13) SHALLOW FOOTING f 12	160 x 4	640	565
(14) GENERATOR BASE f 14	(25 x 9.4) + (10 x 17.2) + (9 x 17.4) + (20 x 7.8) + (10 x 13) + (7 x 14.8)	954	1146
(15) GENERATOR BASE f 12	0.9 x 25 x 81 + 0.5 x 9 x 17 x 2 + 0.5 x 6 x 7 x 2	2018	1780
	SUBTOTAL	28517	67809
6.2 COLUMN			
(1) f 32	8 x 30 x 12 + 8 x 16 x 6 + 8 x 26 x 2	4064	25494
(2) f 12	(7 x 27 x 12) + (5.2 x 27 x 6) + (5 x 27 x 2)	3381	2982

MAIN BUILDING

ITEM	DESCRIPTION	QUATITY	
	SUBTOTAL		28476
6.3 WALL			
(1) PIPE GALLARY, f 14	6.7 x 136 x 2 + 19 x (42 + 2.4) x 2 + 136 x 2 x 3.1 + 17 x 2 x 5.8 x 2 + 16 x 4.6 x 2 x 2	5042	6056
(2) PIPE GALLARY, f 20	2.8 x 136 x 2 + 17 x 2 x 2.8 x 2	952	2333
(3) PIPE GALLARY, f 10	2.8 x 136 x 2 + 17 x 2 x 2.8 x 2	952	584
(4) PIPE GALLARY, f 18	6.7 x 136 x 2 + 17 x 2 x 5.5 x 2	2197	4390
(5) PIPE GALLARY, f 12	(42 + 2.4) x 38 x 2 + 30 x 4.6 x 2 x 2 + 11 x 2 x 2 x 6.3 + 23 x 2 x 2 x 3	4480	3952
(6) STAIR CASE, f 14	6.4 x 57 x 2 + 2.6 x 57 x 2 + 21.9 x 24 x 2	2078	2496
(7) STAIR CASE, f 20	2.5 x 57 x 2	285	699
(8) STAIR CASE, f 10	2.5 x 57 x 2	285	175
(9) STAIR CASE, f 18	6.4 x 50 x 2	640	1279
(10) ENTRANCE BASE, f 12	2 x 7 x 7 x 2 + 2 x 2 x 24 x 2	388	344
	SUBTOTAL		22308
6.4 BEAM	10 x 41.6 x 2	824	2459
(1) f 22	(12 x 7 + 8 + 14) x 10.4	1103	4224
(2) f 25 - f 32	9 x 2 x 10.4 + 1.5 x 4 x 9 x 2	295	354
(3) f 14	(16 x 3.8 x 7) + (16 x 4 x 2) + 4 x 1.2 x 9 x 2 + 160 x 2 x 4 + 8 x 2 x 2.4	1959	1728
(4) f 12	8 x 2 x 5.2	83	204
(5) f 20	SUBTOTAL		8969
6.5 COVER SLAB 1ST FLOOR			
(1) f 16	65 x 10 + 30 x 17.6 + 17 x 2 x 10.8	1545	2423
(2) f 12	65 x 10 + 30 x 17.6 + 33 x 2 x 5	1508	1330
(3) f 14	97 x 10 x 2 + 30 x 25.6 x 2	3476	4175
(4) f 18	97 x 2 x 3.2 + 1.8 x 30 + 30(3 + 3.5 + 3.8 + 3.6 + 2.2)	1158	2314
(5) f 20	9.5 x 32 x 2 + 5 x 64 x 2	1248	3058
(6) f 10	2.4 x 21 x 2 + 3 x 17 x 2	203	125
(10) ENTRANCE, f 12	15.6 x 120		1872
	SUBTOTAL		15297
6.6 STAIR	SUM TOTAL)		144.307
	x 105		151.523
7 FORMING		M^2	
	3087.11 - 1280 + (40 + 7) x 0.85 + (12 + 43.7) x 0.8 + (6 + 2.1) x 2 x 2 + (2.1 + 4.7) x 2 x 1.2 + 0.5 x 4 x 2 x 2 + 0.4 x 8 + 0.5 x 9.6 x 2 + 71.28 3.72	2028.7	
8. EXPAUSIM JOINT			
_ Water stop	(8.3 + 4.2) x 2 x 2	50 M	
_ Elastic Joint Filler	2 x 8.8 x (0.4 + 0.5) + 2 x 2 x 0.5 x 3.7	23.24 M^2	
_ Sealing	2 x (8.3 x 2 + 8.3) 4 x 2 x 2 x 2	82.8 M	
FORMING			
_ Nonconcrete F# 18	[8.8 x 2 + 24 x 2 + 3.5 x 2] x 0.3 + [(2.1 + 6) x 2 + (2.1 + 47) x 2] x 0.3	30.72	
_ Cinder	48 x 2 x 0.1 + (9 + 2.1 + 9) x 2 x 0.1	13.62	

MAIN BUILDING

ITEM	DESCRIPTION	QUATITY	
1.REINFORCED CONCRETE (Type E)		M^3	
(1) STAIR SLAB	1.15 x 0.2 x 5.3 x 2 x 2 + 1.05 x 0.2 x 2.5 x 2 + 3.6 x 2.5 x 0.2 x 2 + 0.183 x 0.3 x 0.5 x 15 x 2 x 2	11.18	
(2) BEAM	0.4 x 0.3 x 2.5 x 2 x 2	1.20	
	TOTAL	12.38	
2.FINISHING SURFACE FOR STEP		M^2	
(1) STEP	(0.3 + 0.183) x 1.15 x 16 x 2 x 2	35.55	
(2) SLAB AT LEVEL (- 0.25)	2.5 x 1.05 x 0.2 x 2	1.05	
(3) 1st FLOOR SLAB	3.6 x 2.5 x 0.2 x 2	3.60	
	TOTAL	40.15	
3. FINISH SURFACE FOR BACK SIDE OF STAIR SLAB		M^2	
(1) BACK SLABS	1.15 x 5.3 x 2 x 2 + 1.05 x 2.5 x 2 + 3.6 x 2.5 x 2	47.63	
(2) BEAM	(0.4 + 0.3) x 2.5 x 2 x 2	7.00	
	TOTAL	54.63	
4. FORMWORK		M^2	
(1) STEP	0.183 x 1.15 x 16 x 2 x 2	13.47	
(2) BACK SLABS	5.3 x 1.15 x 2 x 2 + 1.05 x 2.5 x 2 + 3.6 x 2.5 x 2	47.63	
(3) BEAM	(0.4 + 0.3) x 2.5 x 2 x 2	7.00	
(4) SIDE FACE SLAB	0.3 x 5.3 x 2	3.18	
	TOTAL	71.28	
5. REINF STEEL		M	KG
(1) f 8	9 x 0.68 x 15 x 2 x 2 + 14 x 1.6 x 2 x 2	457	179.3
(2) f 10	1.3 x 2 x 15 x 2 x 2 + 1.3 x 2 x 37 x 2 x 2	541	332
(3) f 12	1.7 x 12 x 2 x 2 + 2.9 x 5 x 2 x 2 + 4 x 12 x 2 x 2 + 2.9 x 15 x 2 x 2	506	448.3
(4) f 14	6.1 x 5 x 2 x 2	122	146.6
(5) f 16	3.1 x 5 x 2 x 2	62	97.5
(6) f 18	6.1 x 5 x 2 x 2	122	244
	TOTAL		1448

QUANTITY SURVEY SHEET
ITEM : MAIN BULDING

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
								Grand total	1461.75
		Concrete							
		Base	m3						959.47
					41	9.6	0.85	334.56	
		Gallery			6.5	9.2	0.50	29.90	
		Stair			9.8	4.3	0.50	21.07	
		Conc. layer-300			11.8	41	0.30	145.14	
					45.8 x	2 =	549.6		
		Less plinth			4.7 x	2.1 =	(-) 9.9		
		Less plinth			6.0 x	2.1 =	(-) 12.6		
		Stair		2	9.4 x	3.0 =	(-) 56.4		
						0.80 x	470.7 =	376	
		Plinth			4.7	2.1	1.2	11.84	
					6.0	2.1	2.00	25.20	
					39.4	1.0	0.4	15.76	
		Wall + column	m3						252.76
		Stair			40.2	5.60	0.50	112.56	
		Wall			50.95	4.50	0.50	114.64	
					4.4	4.50	0.20	3.96	
		Column							
		800 x 800		20	0.80	0.30	4.50	21.60	
		Slab + beam	m3						249.52
		Slab			43.6	5.6	0.25	73.74	
					7.0	8.80	0.40	24.64	
		1300 x 800		2	40.8	0.8	1.05	68.54	
		1200 x 800		7	7.2	0.8	0.95	38.30	

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		1300 x 800		2	7.2	0.8	1.05	12.10	
								total	2421.75
		Formwork							
		Base	m2						340.9
		Stair			90	0.50		45	
		upper base			93				
					7				
					79				
					179	0.80		143.2	
		Beam		2	79	0.4		63.2	
		Plinth			16.2	2.0		32.4	
					13.6	1.2		16.3	
		Conc layer			136	0.3		40.8	
		Wall + Column	m2						1236.39
				2	40.2	5.60		450.24	
		stair		2	50.95	4.50		39.60	
				2	4.40	4.50		39.60	
		Column		40 x 2	0.80	4.50		288	
		Slab + Beam	m2						844.46
		Slab Soffit			48.00	8.80		422.4	
		Slab edge		2	49.4	0.25		24.7	
		Beam		2 x 2	40.8	1.05		171.36	
				2 x 7	7.2	0.95		95.76	
				2 x 2	7.2	1.05		30.24	
		Stair 2 number	m2					100.0	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.6.1 QUANTITY SUMMARY SHEET
ITEM: BLOWER BUILDING - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
I		CONCRETE TYPE E (21)	m^3	1,901.97	
I1		* BOTTOM SLAB	-	926.71	
		*CONSTRUCTION JOINT	-	46.10	
		Sum Base	-	972.81	
I2		* WALL AND COLUMN	m^3	380.06	
		- Wall 500 mm thick	-	214.61	
		- Wall 200 mm thick	-	37.00	
		- Main Column	-	107.52	
		- Stair Column	-	0.20	
		- Construction Joint	-	20.73	
I3		* SLAB AND BEAM	m^3	549.10	
		- Main Beam	-	237.86	
		- Machine Hatch	-	4.40	
		- Stair Beam	-	1.76	
		- 1^{st} Floor Slab	-	271.04	
		- Stair Slab	-	5.33	
		- Construction Joint	-	28.71	
I4		* CONCRETE CLASS G (10)	m^3	110.98	
I5		* CONCRETE CLASS F (CINDER)			
		B1 FLOOR	m^3	85.52	
II		* MORTAR FINISHING			
		- For Stairs	m^2	22.52	
III1		* FORMING	m^2		
		- For Concrete Class G	-	19.68	
		- For Cinder	-	14.72	
III2		* FORMING	m^2	3,809.03	
		- Base	-	170.00	
		- Wall and Column	-	990.00	
		- Slab and Beam	-	2,719.03	
IV		* REINFORCEMENT	Kg	231,824.00	
		- Bottom Slab	-	78,073.00	
		- Column and Wall	-	76,476.00	

No.	Code	Description	Unit	Quantity	Remarks
		- Beam and Slab	-	77,275.00	
V		* SAND BEDDING	m^3	221.96	
VI		* EXPANSION JOINT			
		- Water Stop	m	50.00	
		- Elastic Joint Filler	m^2	23.24	
		- Sealing	m	32.72	
VII		* CONCRETE PILE 400x400	Pile		
		- L = 33 m	-	270	
VIII		* DOOR W= 900MM, H= 2000MM	Each	3	
		(At B1 Floor)			

Table E.3.6.2 QUANTITY CALCULATION SHEET

BLOWER BUILDING

ITEM	DISTRIPTION	QUANTITY	
1. SAND BEDDING	17.6 x 10.4 x 0.2 + 25.8 x 23.4 x 0.2 + 0.6 x 9.2 x 0.2 x 2	221.96	
	TOTAL	221.96	
2. LEVETING CONCRETE	47.6 x 10.4 x 0.1 + 25.5 x 23.4 x 0.1 + 0.6 x 9.2 x 0.1 x 2	110.98	
	TOTAL	110.98	
3. REINF . CONCRETE TYPE E (21)		m^3	
3.1 BOTTOM SLAB	4.7 x 10.2 x 0.85 + 25.6 x 23.2 x 0.85 + 0.85 x 9 x 0.6 x 2	926.71	
3.2 COLUMN			
(1) MAIN COLUMN	0.8 x 0.8 x 5.6 x 30	107.52	
(2) STAIR COLUMN	2.25 x 0.3 x 0.3	0.2	
	SUBTOTAL	107.72	
3.3 WALL			
(1) MAIN WALL 500 MM THICK	6.2 x 13 x 4.3 x 0.5 + 7.2 x 2 x 4.3 x 0.5 + 0.5 x 1 x 4.1 x 2 x 2	214.61	
(2) WALL 200MM THICK	3.3 x 2 x 5.6 x 0.2 - 0.9 x 2 x 2 + 5.6 x 0.2 x (14 + 6 + 2.1) + 4.1 x 6 x 0.2 + 0.9 x 3.6 x 0.2	37.00	
TEMP. WALL	7.2 x 2 x 4.1 x 0.5 + 7 x 6.2 x 0.5 x 5.6 - 8 x 0.7 x 0.7 x 0.5	149.08	
	SUBTOTAL	400.69	
3.4 BEAM			
(1) MAIN BEAM	1 x 0.8 x 9.4 + 1 x 0.8 x 21 + 1 x 0.8 x 70 + 1 x 0.8 x 24 + 7.2 x 2 x 0.7 x 0.7 x 3 + 4 x 0.5 x 0.5 x 0.5 x 0.7 x 3 + 7.2 x 0.8 x 1.2 x 3 + 2 x 0.5 x 0.5 x 0.5 x 0.8 x 3 + 0.7 x 0.7 x (70 + 21) + 6 x 0.7 x 0.7 x 8.2 + 3 x 0.5 x 0.5 x 0.5 x 0.7 x 6 + 21 x 0.65 x 0.7 x 2	237.86	
(2) MACHINE HATCH	8 x 2 x 0.4 x 0.5 + 3 x 2 x 0.4 x 0.5	4.4	
(3) STAIR BEAM	0.5 x 0.4 x 7 + 0.4 x 0.3 x 3	1.76	
	SUBTOTAL	244.02	
3.5 FLOOR SLAB			
(1) 1^{ST} FLOOR SLAB	[0.3 x (22.8 x 24.8 + 9.8 x 48 - 0.3 x (3 x 3 + 2 x 1.4 x 1.4 + 1.375 x 59.5) - (6 x 33 x 0.3 x 2)]	271.04	
(2) STAIR SLAB	(1.5 x 3.3 x 0.2) + (5.3 x 0.2 x 1.5 x 2) + (0.183 x 0.3 x 0.5 x 1.5 x 14 x 2)	5.33	
BEAM + SLAB		520.39	
	SUM TOTAL 3)	1955.51	
4. CONCRETE CLASS F (Cinder)		m^3	
(1) B1 FLOOR	(24 - 0.6)(21 - 0.6) x 0.1 + 7.4 x 49 x 0.1 + 1 x 7.6 x 2 x 0.1	85.52	
	TOTAL	85.52	
Construction joint	1.1 x (7.4 + 55.4) x 0.85 + 62 x 1.1 x 0.3 + 2 x 1 x 0.7 + 7 x 0.7 x 0.7 + 2 x 0.65 x 0.7 + 4.3 x 0.5 x 2 x 11	89.65	

BLOWER BUILDING

ITEM	DISTRIPTION	QUANTITY	
5 FINISHING SURFACE			
5.1 FLOOR			
(1) B1 FLOOR	23.8 x 20.8 + 49 x 7.8 - (4 x 0.8 x 0.8 x 0.3 26)	868.44	
(2) 1ST FLOOR SLAB	24.8 x 22.8 - (3 x 3 + 2 x 1.4 x 1.4) - (2 x 6 x 3.3) + 9.8 x 49	993.12	
	SUBTOTAL	1861.56	
5.2 STAIR			
(1) STAIR STEP	(0.183 + 0.3) x 14 x 2 + 1.8 x 3.3 + (5.3 x 2 + 0.3) x 0.28	22.52	
(2) BACK STAIR SLAB	5.3 x 1.5 x 2 + 1.5 x 3.3	20.85	
	SUBTOTAL	43.37	
5.3 OUTSIDE WALL	(70.8 x 2 + 16 x 2) x 5.6 + 0.3 x 9 x 2 + 1 x 4.4 x 4	995.16	
	SUBTOTAL	995.16	
5.4 INSIDE WALL			
(1) WALL 500MM THICK	(6.2 x 10 x 2 x 4.5) + (7.2 x 2 x 2 x 4.5) + (8 x 0.3 x 2) + (1.5 x 3.7 x 4)	714.6	
(2) WALL 200MM THICK	[5.6 x (14 + 6 + 2.1) + 4.1 x 6 + 0.9 x 3.6] x 2	370	
	SUBTOTAL	1084.6	
5.5 COLUMN			
(1) MAIN COLUMN	0.8 x 4 x 4.7 x 4 + 1.4 x 4.7 x 26	231.24	
(2) STAIR COLUMN	0.3 x 4 x 2.15	2.58	
	SUBTOTAL	233.82	
5.6 BEAM			
(1) MAIN BEAM	6.2 x 10 x 2 x (0.3 + 0.85) + 7.2 x 2 x 2 x (0.3 + 0.85) + 7.2 x (1 + 0.3) x 2 + 7.2 x 3 x (0.7 + 3) x 2 + 6.2 x 3 x 2 x (0.7 + 3) + 14 x 2 x (0.65 + 2 x 0.7) + 2 x 0.3 x 14 +9.8 x 0.7 x 3 x 7	573.98	
(2) STAIR BEAM	(0.4 + 0.4 + 0.3) x 6.2 + 1.1 (3.3 + 1.6	12.21	
(3) MACHINE HATCH	(0.8 + 0.4 + 0.5) x 3.4 x 4	23.12	
(4) HOLES	1.4 x 4 x 0.3 + 0.9 x 4 x 0.3 + (3.3 + 6) x 2	349.27	
	SUBTOTAL	649.27	
5.7 CEILING	6.3 x 7.3 x 16 - (6 x 3.3 + 3 x 3 + 2 x 1.4 x 1.4 + 2 x 0.9 x 0.9 + 1.38 x 14) + 8 x 1 x 2	698.18	
	SUBTOTAL	698.18	
	SUM TOTAL 5)	5565.66	
6. STEEL BAR REINF		M	KG
6.1 BOTTOM SLAB			
(1) ϕ 18	30 x [72.4 + 0.63 x 7] x 2 + 54 x (23.7 + 0.63 x 1) x 2 + [2.33 + 3.26 x 3] x 21 + 3.86 x 3 x 21 + 3.26 x 7 x 11 + 3.86 x 7 x 11 + [26.6 + 0.63 x 2] x 94 x 2 + 138 x 10.2 x 2 + (2.33 + 3.66) x 2 x 21 + 4.46 x 36 + (2.33 + 4.43) x 36 + (4.46 x 2 +	15737	31443
(2) ϕ 12	84 x [3.5 + 4.4 x 3] + 4.4 x 7 x 33 + 232 x [3.7 + 4.8] + (5 + 4.8) x 53 + 1.9 x [46 x 49] + 1.9 x 16 x 147	9561	8433

BLOWER BUILDING

ITEM	DISTRIPTION	QUANTITY	
(3) ϕ 36	[11 x 5 + 22 x 4.8 x 2 + 11 x 3.7] x 3 + [6 x 5 + 11 x 4.8 x 2 + 6 x 3.7] + 6 x 3.7 + 11 x 3.7 x 6 + 4.8 x 11 x 6 + 6 x 4.8	1691	13511
(4) ϕ 32	11 x 44 x 9 + 6 x 4.4 x 9 + 2.6 x (6 + 11) x 2 + 11 x 4.4 x 2 + 6 x 4.4 x 2 + 3.6 x (11 + 6) + 2.6 x (6 +11) + (6.4 x 2 x 23 + 5.5 x 14) x 3 + (6.4 x 2 x 12 + 5.5 x 7) + 6.4 x 6 x 23 + 6.4 x	3283	20594
(5) ϕ 14	207 x 1.5	311	374
	SUBTOTAL		74.355
6.2 COLUMN			
(1) ϕ 36	6.73 x [22 x 17 + 20 x 2 + 12 x 2 +26 x 4] + 6.73 x 20 x 3 + 6.73 x 28 x 2	4428	35380
(2) f 12	5.07 x 24 x 17 + 5.08 x 7 x 24 + 6.12 x 24 x 4 + 6.68 x 24 x 2	3830	3378
	SUBTOTAL		38.578
6.3 WALL			
(1) ϕ 18	5.6 x 613 + 4.8 x 5 x 4	3529	7051
(2) ϕ 14	6.4 x 613+4.8 x 5 x 4+2.4 x 613+2.9 x 613+(173 +16 x 0.5) x (18 + 5) + 1.6 x 4 x 16	7515	9026
(3) ϕ 12	24 x [173 + (16 x 0.5) + 8.8 x 7 x 2] + 24 x [3 x 8 + 4.4 x 9 x 2 + 4.8 x 2] + 0.5 x 9 x 306 + 0.2 x 64 x 10	15858	13987
(4) ϕ 10	613 x 1.93 + 34 x 39 x 2 + 215 x 6.3 x 2	6554	4012
	SUBTOTAL		34076
6.4 BEAM			
(1) MAIN BEAM ϕ 22	9 x (70 + 7 x 0.77) + (22.5 + 0.77) x 9 + 4 x 4.4 x 15 + 3 x 4.8 x 13 + 10 x 22.6 + (2 + 2) x 4.4 x 2 + 3.6 x 4 x 4 + (2 + 3) x 4.2 x 4	1743	5201
(2) MAIN BEAM ϕ 25	7 x (25.6 + 10.2) + 3 x 5.6 x 4 + 5 x 5.6 x 4 + 5 x 6 x 4.8	574	2198
(3) MAIN BEAM ϕ 28	4 x (71.6 + 6 x 0.98) + 4 x (22.5 + 0.98) + 4.8 x 13 x 2 + 4.4 x 15 x 2	661	3196
(4) MAIN BEAM ϕ 32	8 x 18.5 x 3 + 8 x 10.6 x 6 + 3 x 5.6 x 12 + 5 x 4.8 x 21	1925	12076
(5) MAIN BEAM ϕ 36	10 x 10.6 x 3 + 4 x 3.3 x 6 + 5.6 x 6 x 3	498	3979
(6) MAIN BEAM ϕ 14	2 x 3 x 2 x 24 + 6 x 2 x 8 x 2 + 21 x 2 x 2 + 70 x 2 + 21 x 2 x 2 + 5 x (24 + 8)	948	1139
(7) MAIN BEAM ϕ 18	2.2 x 4 x 2	18	36
(8) MAIN BEAM ϕ 12	4 x 460 + 3.20 x 472 + 4.4 x 96 + 3.1 x 168 + 1.5 x 4 x 47 x	4858	4285
(9) MACHINE HATCH ϕ 32	9.2 x 8 x 2 + 4.2 x 8 x 2	215	1349
(10) MACHINE HATCH ϕ 12	2.2 x 88	194	171
(11) STAIR BEAM ϕ 16	6 x 5 x 5 + 4 x 3.2	163	256
(12) STAIR BEAM ϕ 18	7 x 9	63	305
(13) STAIR BEAM ϕ 8	1.6 x 20 + 1.9 x 28 + 1 x 11	97	38
	SUBTOTAL		34229
6.5 1ST FLOOR SLAB			
(1) ϕ 12	35 x (71 + 6 x 0.42) + 11 x 174 + 50 x (18.8 + 0.42) + 26 x (25.4 + 0.42 x 2) + 64 x (22.4 + 0.42) + 15 (15.4 + 0.42) + 5 x 4 + 5 x 50.6 + 11 x 218 + 68 x (22.4 + 0.42) + 14 x 25.4 + 17 x (17.8 + 0.42) - (30 x 3) + (3400 x 0.35)	13817	12187
(2) ϕ 14	37 x (71 + 6 x 0.42)	5276	6337
(3) ϕ 16	3.2 x 248 + 218 x 3.8 + 68 x 2 x 4.8	2275	3567
(4) ϕ 18	4.4 x 388 + 3 x 32 x 3 + 3.6 x 30	7908	15800
(5) STAIR SLAB ϕ 14	6.2 x 7 x 2	87	105
(6) STAIR SLAB ϕ 18	6.2 x 7 x 2	87	174

BLOWER BUILDING

ITEM	DISTRIPTION	QUANTITY	
(7) STAIR SLAB ϕ 10	1.6 x 37 x 2 x 2 + 1.6 x 3 x 14 x 2 + 3.9 x 11 x 2 + 2.6 x 23 x 2	577	354
(8) STAIR SLAB ϕ 8	0.7 x 11 x 14 x 2	216	85
(9) STAIR SLAB ϕ 12	120 x 0.2	24	22
(10) ADD.REINF ϕ 25	24 x 2.6 x 2 + 16 x 2.1 x 2	192	735
	SUBTOTAL		39366
	SUM 6)		220.784
	x 1.05		231824
7. FORMING	5565.66 - (1861.56 + 0.3 x 14 x 1.5 x 2 + 1.8 x 3.3) + (25.6 + 71.6) x 2 x 0.85 + (48 + 15) x 0.3 + 1 x 0.8 x 2 + 7 x 0.7 x 0.7 + 4.3 x 0.5 x 2	3879.03	
_ Cinder	73.6 x 2 x 0.1	14.72	
8. EXPANSION JOINT			
_ Water stop	(8.3 + 4.2) x 2 x 2	50 M	
_ Elastic Joint filler	2 x 8.8 x (0.4 + 0.5) + 2 x 2 x 0.5 x 3.7	23.24 M^2	
_ Sealing	2 x (8.3 x 2 + 8.3) + 4 x 2 x 2 x 2	81.80 M	

QUANTITY SURVEY SHEET

ITEM BLOWER BUILDING

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
		CONCRETE	M3					GRAND TOTAL	1974.7
		BASE			71.10	10.50	0.85	634.567	
					15.50	23.50	0.85	309.612	
		GALLERY			2.00	8.80	0.70	12.32	
					1.00	4.70	0.60	2.82	
			M3						492.8
		WALL		9	6.20	4.30	0.50	119.97	
				1	2.50	4.30	0.50	5.37	
		TEMPORARY WALL		7	6.20	4.50	0.50	97.65	
		TEMPORARY WALL		1	7.20	4.00	0.50	14.4	
		TEMPORARY WALL		1	7.20	4.50	0.50	16.7	
				2	7.20	4.50	0.50	32.4	
				3	6.20	4.30	0.50	39.99	
					15.75	5.30	0.20	16.695	
				3	6.50	5.30	0.20	20.67	
		GALLERY		2	8.80	3.50	0.60	36.96	
				1	4.70	3.75	0.35	6.068	
		COLUMN		30	8.80	0.80	4.50	86.40	
									277.54
		SLAB		1	1.0	4.7	0.35	1.645	
		GALLERY		2	2.0	8.8	0.60	21.12	
					48.5	10	0.30	145.5	
		BUILDING			23.5	15.5	0.30	109.275	
		BEAM							239.04
		1500 x 800		3	8.40	0.80	1.20	24.19	
		1000 x 700		3	8.00	0.70	0.70	11.76	
		1000 x 700		3	8.00	0.70	0.70	11.76	
		1000x 700		6	10.00	0.70	0.70	29.40	
		1300 x 800		1	10.00	0.80	1.00	10.8	
		1300 x 800		1	24.50	0.80	1.00	19.6	
		1300 x 800		1	71.50	0.80	1.00	57.2	
		1300 x 800		1	23.00	0.80	1.00	18.4	
		1000 x 700		1	71.50	0.70	0.70	35	
		1000 x 650		2	23.00	0.65	0.70	20.93	
		STAIR							6.00

ITEM BLOWER BUILDING

NO	CODE	DESTRIPTION	UNIT	NUMBER	LENGTH	WIDTH	DEPTH	UB-QUANTIT	QUANTITY
								GRAND TOTAL	3725
		FORM							164.5
		BASE	M2						
					71.5				
					10.5				
					48.5				
					15				
					23				
					193.5		0.85	164.5	
		WALL + COL	M2						1882.73
		WALL		2 x 9	6.2	4.3		479.88	
				2 x 1	2.5	4.3		21.5	
				2 x 7	6.2	4.5		390.6	
				2 x 1	7.2	4		57.6	
				2 x 1	7.2	4.5		64.8	
				2 x 2	7.2	4.5		129.6	
				2 x 3	6.2	4.3		159.9	
				2 x 1	15.75	5.3		166.9	
				2 x 3	6.5	5.3		206.7	
				2 x 2	8.8	3.5		123.2	
				2 x 1	4.7	3.75		35.25	
		COLUMN		4 x 3	0.8	4.5		46.8	
		SLAB + BEAM	M2						1678.08
		SLAB		1	1	4.7		4.7	
				2	2	8.0		32	
					49	10		485	
					24	15.5		364.25	
		SLAB - SIDE			193.5		0.3	58.05	
		BEAM		2 x 3	8.4		1.20	60.48	
				2 x 3	8.0		0.70	33.60	
				2 x 3	8.0		0.70	33.60	
				2 x 6	10.0		0.70	84	
				2 x 1	10.0		0.70	20	
				2 x 1	24.5		1.00	49	
				2 x 1	71.5		1.00	143	
				2 x 1	23.0		1.00	46	
				2 x 1	71.5		0.70	100	
				2 x 2	23.0		0.70	64.4	
		STAIR						100	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.7.1 QUANTITY SUMMARY SHEET
ITEM: DEWATERING BUILDING - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
I		CONCRETE TYPE E (21)	m^3	3,074.70	
I1		* BOTTOM SLAB	-	1,918.10	
		- Pipe Gallery	-	820.27	
		- Shallow Footing	-	1,081.69	
		- Construction Joint	-	16.14	
I2		* WALL AND COLUMN	m^3	515.80	
		- Column	-	185.70	
		- Wall	-	316.47	
		- Construction Joint	-	13.63	
I3		* SLAB AND BEAM	m^3	640.80	
		- Beam	-	290.12	
		- Cover Slab t = 400	-	345.98	
		- Construction Joint	-	4.70	
I4		* CONCRETE CLASS G (10)	-	207.16	
I5		* CONCRETE CLASS F (CINDER)	m^3	197.47	
		- 1^{st} Floor	-	124.67	
		- Pipe Gallery	-	72.80	
II		* MORTAR FINISHING	m^2	43.74	
		- For B_9B_{10} Stair	-	19.68	
		- For (1) Axis Stair	-	4.56	
III1		* FORMING	m^2		
		- For Concrete Class G	-	30.23	
		- For Cinder	-	197.47	
III2		* FORMING	m^2	3,718.28	
		- Base	-	220.00	
		- Wall and Column	-	680.00	
		- Slab and Beam	-	2,818.28	
IV		* REINFORCEMENT	Kg	286,204.00	
		- Deep Footing	-	76,280.40	
		- Shallow Footing	-	78,398.25	
		- Column	-	25,473.00	
		- Wall	-	42,324.45	
		- Beam, Slab and others	-	63,727.90	
V		* SAND BEDDING	m^3	414.32	
		- Shallow Footing	-	258.00	

No.	Code	Description	Unit	Quantity	Remarks
		- Deep Footing	-	156.32	
VI		* EXPANSION JOINT			
		- Water Stop	m	122.10	
		- Elastic Joint Filler	m^2	66.01	
		- Sealing	m	63.48	
VII		* CONCRETE PILE 400x400	Pile		
		- L = 37 m	-	217	
		- L = 32 m	-	300	
VIII		* DOOR W= 800MM, H= 2000MM	Each	2	
		(At under ground stair)			

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.7.1 QUANTITY SUMMARY SHEET
ITEM: DEWATERING BUILDING - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
I		CONCRETE TYPE E (21)	m^3	3,074.70	
I1		* BOTTOM SLAB	-	1,918.10	
		- Pipe Gallery	-	820.27	
		- Shallow Footing	-	1,081.69	
		- Construction Joint	-	16.14	
I2		* WALL AND COLUMN	m^3	515.80	
		- Column	-	185.70	
		- Wall	-	316.47	
		- Construction Joint	-	13.63	
I3		* SLAB AND BEAM	m^3	640.80	
		- Beam	-	290.12	
		- Cover Slab t = 400	-	345.98	
		- Construction Joint	-	4.70	
I4		* CONCRETE CLASS G (10)	-	207.16	
I5		* CONCRETE CLASS F (CINDER)	m^3	197.47	
		- 1^{st} Floor	-	124.67	
		- Pipe Gallery	-	72.80	
II		* MORTAR FINISHING	m^2	43.74	
		- For B_9B_{10} Stair	-	19.68	
		- For (1) Axis Stair	-	4.56	
III1		* FORMING	m^2		
		- For Concrete Class G	-	30.23	
		- For Cinder	-	197.47	
III2		* FORMING	m^2	3,718.28	
		- Base	-	220.00	
		- Wall and Column	-	680.00	
		- Slab and Beam	-	2,818.28	
IV		* REINFORCEMENT	Kg	286,204.00	
		- Deep Footing	-	76,280.40	
		- Shallow Footing	-	78,398.25	
		- Column	-	25,473.00	
		- Wall	-	42,324.45	
		- Beam, Slab and others	-	63,727.90	
V		* SAND BEDDING	m^3	414.32	
		- Shallow Footing	-	258.00	

No.	Code	Description	Unit	Quantity	Remarks
		- Deep Footing	-	156.32	
VI		* EXPANSION JOINT			
		- Water Stop	m	122.10	
		- Elastic Joint Filler	m^2	66.01	
		- Sealing	m	63.48	
VII		* CONCRETE PILE 400x400	Pile		
		- L = 37 m	-	217	
		- L = 32 m	-	300	
VIII		* DOOR W= 800MM, H= 2000MM	Each	2	
		(At under ground stair)			

Table E.3.7.2 QUANTITY CALCULATION SHEET

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
1.SAND BEDDING		m3	
(1) SHALLOW FOOTING	64.5 x 20 x 0.2	258.00	
(2) GALLERY	(80 x 7.4 + 20 x 8.1 + 3.1 x 8.9) x 0.2	156.32	
	TOTAL 3)	414.32	
2. LEVELING CONCRETE (CLASS G)	64.5 x 20 x 0.1 + (80 x 7.4 + 20 x 8.1 + 3.1 x 8.9) x 0.1	107.16	
3. REINF CONCRETE TYPE E (21)		m3	
3.1 BOTTOM SLAB			
(1) PIPE GALLERY	32 x 8.1 x 1 + 32 x 8.1 x 0.8 + 17.9 x 9.6 x 0.8 + 9 x 9.6 x 0.8 + 8 x 7.4 x 0.8 + 2.3 x 8.7 x 0.8 + 1.3 x 1.28 x 1 + 4.25 x 8.3 x 0.5 + 3.5 x 8.1 x 1 + 0.6 x (13 x 3 + 5) x 0.8	820.27	
(2) SHALLOW FOOTING	20 x 65.4 x 0.8 - 1.3 x 12.8 x 0.8 + 0.5 x 0.5 x 0.5 x 64 + 3 x 3.25 x 0.8 + 0.55 x 7.5 x 2 + 0.55 x 9 x 2 + 0.55 x 5 x	1081.69	
	SUBTOTAL 3.1)	1901.96	
3.2 COLUMN	1 x 1 x 5.6 x 5 + 0.8 x 0.8 x 5.69 x 44	185.7	
3.3 BEAM	18 x 0.8 x 1 x 5.7 + 18 x 2 x 0.1 + 6 x 0.8 x 1.2 x 7.2 + 12 x 0.1 + (16 x 2 x 3.2 + 7.2 x 2 + 5.7 + 4 x 2 x 2.45 + 7.2 + 4.2 + 2.05) x 1.3 x 0.8	290.12	
3.4 WALL	4.3 x 0.5 x (18 x 3.2 + 5.7 + 2.45 x 7 + 3.2) + 0.5 x 5.6 x 26.1 + 7 x 4 x 0.5 x 2 + 3 x 4 x 0.5 + 3.8 x 4 x 0.5 + 3.1 x 4 x 0.5 + 3.2 x 3 x 4.3 x 0.2 + 8.7 x 4.3 x 0.2	316.47	
3.5 TEMP. WALL	3.6 x 0.5 x (6.5 + 8 + 12 x 2)	69.30	
3.6 COVER SLAB T= 400 MM	(16 x 3.2 x 5.7) x 0.4 + (4 x 7.2 x 2.45 + 5.3 x 7.2 + 7.2 x 5.7) x 0.4 + 2.45 x 8 x 0.4 + 3.1 x 6.5 x 0.4 + 1 x (24 + 8) x 0.4 + 4 x 1 x 0.4 + 2.2 (2.07 + 1.7) x 0.2	345.98	
SLAB + BEAM		636.1	
_Construction joint	0.8 x 0.7 x (18.6 + 3.1) + 0.4 x 0.7 x 6.5 + 0.7 x 1.3 x 0.8 x 2 + 0.7 x 1 x 8.1 + 4.3 x 0.5 x 2	25.40 m3	
4. CONCRETE CLASS F (Cinder)		m3	
(1) 1st FLOOR	24 x 13 x 0.05 + 32 x 6.5 x 0.1 - 1.7 x 12.4 x 0.1 + 13 x 7.8 x 0.1 + 19.1 x 39.8 x 0.1	124.67	
(2) PIPE GALLERY (-3.1)	6.3 x 67.5 x 0.1 + 26 x 7.8 x 0.1 + 4 x 7.2 x 0.1 + 48 x 1 x 0.1 + 0.8 x 11.4 x 0.1 + 1.8 x 7.8 x 0.1	72.80	
	SUBTOTAL	197.47	
5. FINSHING SURFACE		m2	
5.1 FLOOR	24 x 13 + 32 x 6.5 - (1.7 x 12.4) + 13 x 7.8 + 19.1 x 39.8 + 6.3 x 67.5 + 26 x 7.8 + 4 x 7.2 + 48 x 1 + 0.8 x 11.4 + 1.8 x 7.8	2008.51	
5.2 OUTSIDE WALL	5.6 x (72 + 3.5) + (64 + 3.4) x 5 + 5 x 19.5 + (4 + 9.75 + 10.9) x 5.6 + 8 x 1 x 4.4 + (4.25 + 1 x 3) x 1.1	1062.44	
5.3 INSIDE WALL AND COLUMN	(72 + 3.5) x 6.3 + 3 x 4 x 5.3 + 6 x 4 x 0.8 x 5.3 + 8 x 0.1 x 4 + 4.25 x 4 + (64 + 3.5) x 5.3 + 10 x 2 x 4.3 + 0.9 x 2 x 11.8 + 17 x 2 x 2 x 0.3 x 5.3 + 19.5 x 5.3 + 5 x 0.3 x 2 x 5.3 + 8 x 5.3 - 4 x 4 + (19.5 + 2.2 + 1) x 5.3 + 2 x 0.8 x 4 x 5.3 + 4.3 x 5.3 x 2 + 2 x 4.3 x 2 + 2 x 2 x 0.3 x 5.3 + x3	1543.74	

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
5.4 CEILING	(72 + 4.25 +3.5) x 6.5 + 19 x 2 x 0.6 + 19.5 x 8 + 4 x 2 x 0.8 + 1.4 x 12 x 3 + 1.4 x 8	765.18	
6. FORMING	1062.44 + 1543.74 + 765.18 + (64 + 3.5) x 2 x 1 + 2.6 x 1 + 0.6 x 4 x 1 + 32 x 2 x 0.8 + 0.6 x 2 x 0.8 + 19.5 x 0.8 + (19.5 + 64 + 8 + 19.5 + 2.7 + 1) x 0.8	3670.88	
STAIR		47.4	
	TOTAL 8)	3718.28	
_Cinder	(79.75 x 2 - 36 8 + 65 x 2 x 3) x 0.1 + (19.5 + 4 + 4 x 2 + 19.5 + 9.5) x 0.1 + (1 x 2 x 0.1) + 40 x 2 x 0.3 x 0.1 + 139.5 x 2 x 0.1	52 M2	
7. STEEL BAR REINF		M	KG
7.1 BOTTOM SLAB (DEEP FOOTING)			
(1) ϕ 32	9.7 x 22 x 2 + 3 x 2.4 x 3 x 2 + 6.4 x 27 + 10.6 x 27 x 2 + 4.1 x 27 x 2	1567	9827
(2) ϕ 36	5 x 146 + 3.8 x 2 x 146 + 2.6 x 2 x 48	2090	16700
(3) ϕ 28	6.2 x 78 + 4.4 x 65 + 6.3 x 52 + 4.3 x 26 x 2 + 128 x 2 x 3.7 + 3.5 x 39	2405	11626
(4) ϕ 25	5 x 128	640	2451
(5) ϕ 18	26 x 36.7 x 2 + 142 x 2 x 9.1 + 0.6 x 48 x 2 + 1.6 x 48 x 2 + 9.5 x 32 + 14 x 9 x 2 + 0.63 x 26 x 2 + 20 x 4 x 2 + 3 x (2 x 20 x 3.6)	5889	11766
(6) ϕ 16	28.8 x 40 + 19.7 x 40 +3.5 x 2 x 39 + 10.6 x 12 x 2 + (42.6 + 4 x 0.56) x 34 x 2 + 10.4 x 84 x 2 + (33.6 + 3 x 0.56) x 33 x 2 + 2 x 0.56 x 40	9637	15111
(7) ϕ 14	12 x 10.5	126	152
(8) ϕ 12	(3 x 33 + 10 x 8.9 + 3 x 33) + 1.45 x (17 x 70) + 1.45 x 20 x 16 + 1.30 x 65 x 18 + 1.3 x 20 x 40 + 1.45 x 3 x 23 + 1.3 x 7 x 18 + 1 x 9 x 21	5482	4835
	SUBTOTAL		72648
9.2 BOTTOM SLAB (SHALLOW FOOTING)			
(1) ϕ 16	(21.1 + 2 x 0.56) x 124 x 2 + (33.6 + 3 x 0.56) x 62 x 2 + (34.6 + 3 x 0.56) x 75 x 2 + (21.1 + 2 x 0.56) x 116 + 2.4 x 37 x 2 + 9.8 x 9 x 2 + 25 x (4.52 x 3 + 5.8)	18945	29706
(2) ϕ 18	6.45 x 124 + 4 x 124	1296	2590
(3) ϕ 32	(34 + 2 x 1.12) x 50 + (21.1 x 1.12) x 14 + (6.8 + 4) x 45	2628.85	46490.77
(4) ϕ 25	5.3 x 51	271	1038
(5) ϕ 36	(3 + 5.3 + 5.6 + 2.8) x 51	851.7	6805
(6) ϕ 12	(4.8 x 2 + 4 x 2 + 2.2) x 128 + 3 x 32 + 1.6 x 128 + 1.1 x 128 x 39	8327	7345
(7) ϕ 20	4 x [3 x 22 x (2 + 5.4 + 2) + 2 x 2.8 x 28 x 3]	4363.2	10690
	SUBTOTAL		74665
9.3 COLUMN			
(1) ϕ 32	6.8 x 38 x 5 + 6.8 x 40 x 3 + 6.8 x 41	2369	14861
(2) ϕ 12	(3 + 4 x 1.1) x 24 x 5 + (2.5 + 8 x 1.1) x 24 x 3 + (2.5 + 6 x 1.1) x 24 x 41	10656	9399

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
9.4 WALL			
(1) PIPR GALLERY ϕ 14	6.3 x 420 + (132 + 12 x 0.49) x 18 x 2	7610	9140
(2) PIPR GALLERY ϕ 16	(132 + 12 x 0.56) x 24 x 2	6659	10442
(3) PIPR GALLERY ϕ 12	2 x 6.3 x 420 + 2.6 x 420 x 2 + 210 x 9 x 0.58	8573	7562
(4) PIPR GALLERY SPAN 6.5 M ϕ 14	17.2 x 8.1 x 18 + 23 x 6.3	2653	3287
(5) PIPR GALLERY SPAN 6.5 M ϕ 18	23 x 63	145	260
(6) PIPR GALLERY SPAN 6.5 M ϕ 10	23 x 2.6	60	37
(7) PIPR GALLERY SPAN 6.5 M ϕ 20	23 x 2.6	60	147
(8) PIPR GALLERY SPAN 6.5 M ϕ 12	49 x 8.1 + 3 x 9 x 0.58	413	365
(9) STAIR WALL ϕ 18	6.3 x 106	397	794
(10) STAIR WALL ϕ 14	2.6 x 106	164	197
(11) STAIR WALL ϕ 16	6.3 x 106 + 23. x 2 x 28.1	2010	3075
(12) STAIR WALL ϕ 12	74 x 5.1 x 2 + 23.1 x 2 x 18 + 11 x 53 x 0.58 + 9 x 47 x 0.2	152	1773
(13) TEMP. WALL H= 5.6 M ϕ 18	6.3 x 26	58	304
(14) TEMP. WALL H= 5.6 M ϕ 14	2.6 x 26	537	82
(15) TEMP. WALL H= 5.6 M ϕ 16	6.3 x 26 + 8.1 x 2 x 23	91	742
(16) TEMP. WALL H= 5.6 M ϕ 12	13 x 12 x 0.58	192	81
(17) TEMP. WALL H= 4 M ϕ 14	5.5 x 128	192	231
(18) TEMP. WALL H= 4 M ϕ 16	5.5 x 128	192	301
(19) TEMP. WALL H= 4 M ϕ 12	2 x 33.6 x 16 + 2.2 x 128 + 64 x 8 x 0.58	1654	1459
	SUBTOTAL		40.309
9.5 BEAM			
(1) ϕ 20	20 x (33.6 + 6 x 0.7) + 10 x (44.4 + 3 x 0.7) + 4 x 88	2748	6733
(2) ϕ 12	8.1 x 16 x 9	1167	4469
(3) ϕ 28	9 x (2 x 8.5 x 8 + 3 x 2 x 7 + 4.7 x 7) + (24 x 9.6 + 22 x 2 x 9.6 + 14 x 3 x 9.6) + 10 x 9.6	3051	14749
(4) ϕ 14	7 x 2 x 8.8 + 18 x 2 x 7	376	452
(5) ϕ 12	412 x 4 + 17 x 26 x 3.4 + 5 x 32 x 3.8 + 48 x 1 x 8 + 3 x 2 x 32	4335	3824
	SUBTOTAL		30227

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
9.6 1ST FLOOR COVER SLAB			
(1) ϕ 25	41.8 x 26 + 8.1 x 132	2156	8256
(2) ϕ 22	41.8 x 26 + 8.1 x 132 + 33.6 x 26 + 14.6 x 2 x 32	3964	11829
(3) ϕ 18	52 x 9.6	500	999
(4) ϕ 16	14.6 x 32	468	734
(5) ϕ 12	(33.6 + 3 x 0.42) x 26 + 116 x 7.3 + 85 x 9.6 + 13.8 x 32 + 0.45 x (144 x 13 + 39 x 16)	4134	3647
(6) ϕ 28	3 x 2 x 4 x 4	96	464
	SUBTOTAL		25929
9.7 STAIR			
_ Other	SUB TOTAL		272575
	x 1.05		286204
10. EXP,JOINT			
(1) AT (6) AXIS			
_Water stop	20 + 6.5 + 5.8 x 2 + 7	45.1	
_ Elastic joint filler	20 x 0.8 + 7.3 x 0.4 + 1.3 x 0.8 x 2 + 4.3 x 0.5 x 2 x 0.8 x 8.1	31.78	
_ Sealing	20 + 6.5 + 5.8 x 2 x 2 + 7	56.7	
(2) AT G. THICKENER			
_Water stop	13 x 2 + 4.2 x 2	34.4	
_ Elastic joint filler	13 x 0.4 + 4 x 2 x 0.5 + 13 x 0.5	15.7	
_ Sealing	13 x 2 + 4 x 2 x 2	42	
(3) AT (1) AXIS			
_Water stop	8.5 x 2 + 4.2 x 2	25.4	
_ Elastic joint filler	9 x (0.4 + 0.5) + 4.2 x 0.5 x 2	12.3	
_ Sealing	8.5 x 2 + 4.2 x 2 x 2	33.8	
(4) AT (E) AXIS			
_Water stop	4.4 x 2 + 4.2 x 2	17.2	
_ Elastic joint filler	0.35 x 2 x 4.7 + 0.35 x 4.2 x 2	6.23	
_ Sealing	4.7 x 2 + 4.2 x 2 x 2	26.2	
STAIRS			
1.Reinforced concrete (Concrete type E- Rb28=210kg/cm2)		m3	
(1) Stair slab	1.2x0.2x5.3x2+12x0.2x1.2+15x2x(0.175x0.3x1/2x1.2)	3.78	
for B9-B10 stair			
(2) Stair slab	1.0x0.2x5.3x2+2.2x1.88x0.2+15x2x(0.18x0.3x1/2x1)		
for Axis 1-stair	+0.2x2.2x2.07=	4.67	
(3) Beam	0.4x0.3x2.2x2=	0.53	
	Total:	**8.98**	
2.Finishing for step		m2	
(1) Step	(0.3+0.175)x1.2x16x2+1.2x1.2=	19.68	
for B9-B10 stair			

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
(2) Step	(0.3+0.18)x1x16x2+2.2x1.88=	19.5	
for Axis 1-stair			
(3) 1st floor	2.07x2.2	4.56	
	Total:	**43.74**	
3.Finishing back side of stair slab			
(1)Stair B9-B10	1.2x5.3x2+1x1.2=	13.92	
(2) Stair Axis-1	1x5.3x2+1.88x2.2+(0.4+0.3)x2.2x2+0.3x5.3x2x2+2.07	28.74	
	Total:	**42.65**	
4.Forming			
(1)Stair B9-B10	0.175x1.2x16x2+1.2x5.3x2+1x1.2=	20.64	
(2) Stair Axis-1	0.18x1x16x2+1x5.3x3+1.88x2.2+(0.4+0.3)x2.2x2+0.3	26.76	
	Total:	**47.4**	
STAIRS			
6.Reinforced steel		m	kg
6.1 For B9-B10 stair			
(1) D8	7x0.68x15x2=	143	56.1
(2) D10	1.5x2x15x2=	90	55.2
(3) D12	12.5x2x6+1.6x2x50+1.5x4x6=	346	305.2
6.2 For Axis-1 stair			
(1) D8	8x0.68x15x2+16x2x1.6=	214.4	84.1
(2) D10	1.2x2x15x2+37x2x1.2=	161	99
(3) D12	2.4x10x2+2.1x11x2+2.3x11x2+2.4x10x2=	193	171
(4) D14	6.3x5x2=	63	75.7
(5) D16	2.8x5x2=	28	44
(6) D18	6.3x5x2=	63	126
	Total		**1017**
2.Finishing for step		m2	
(1) Step	(0.3+0.175)x1.2x16x2+1.2x1.2=	19.68	
for B9-B10 stair			
(2) Step	(0.3+0.18)x1x16x2+2.2x1.88=	19.5	
for Axis 1-stair			

DEWATERING BUILDING

ITEM	DISTRIPTION	QUANTITY	
(3) 1st floor	2.07x2.2	4.56	
	Total:	**43.74**	
3.Finishing back side of stair slab			
(1)Stair B9-B10	1.2x5.3x2+1x1.2=	13.92	
(2) Stair Axis-1	1x5.3x2+1.88x2.2+(0.4+0.3)x2.2x2+0.3x5.3x2x2+2.07	28.74	
	Total:	**42.65**	
4.Forming			
(1)Stair B9-B10	0.175x1.2x16x2+1.2x5.3x2+1x1.2=	20.64	
(2) Stair Axis-1	0.18x1x16x2+1x5.3x3+1.88x2.2+(0.4+0.3)x2.2x2+0.3	26.76	
	Total:	**47.4**	

QUANTITY CALCULATION SHEET

ITEM : DEWATERING BUILDING

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		CONCRETE	M3						
		Base							**1,850.56**
		Building	m3		9.00	9.50	1.00	85.50	
					19.50	9.50	0.80	118.56	
		Stair	m3		8.00	2.50	0.80	16.00	
					3.50	9.50	0.80	26.60	
					33.50	8.00	0.80	214.40	
					13.50	1.00	0.80	10.80	
					67.00	20.00	0.80	1,072.00	
					34.50	8.00	1.00	276.00	
				2	13.00	1.00	1.00	13.00	
				1	4.70	1.00	1.00	4.70	
		Wall							**514.43**
		Stair			2.70	5.60	0.50	7.56	
					8.00	5.60	0.50	22.40	
		Grid (1)			10.00				
		Grid (E)			4.50				
		Grid (2)			20.00				
		Grid (B)			55.00				
		Grid (A)			37.00				
					8.00				
		Temporary A			38.00				
					172.50	4.30	0.50	370.88	
		(1)+(B)			18.50	4.30	0.20	15.91	
		Stair			15.50	5.60	0.50	43.40	
		Gallery			2.00	5.30	0.35	3.71	
		Column (800x800)		49	0.80	4.30	0.30	50.57	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		Wall							**365.71**
		Gallery			1.00	4.70	0.35	2.645	
		Gallery			6.75	9.20	0.60	37.26	
					28.00	9.00	0.40	100.80	
					68.00	7.50	0.40	204.00	
					1.00	35.00	0.60	21.00	
		Beam							
		Boundary beams	m3						**228.26**
		1300x800			198.00	0.80	1.00	158.40	
		1000x800		17	5.75	0.80	0.70	54.74	
		1200x800		3	7.00	0.80	0.90	15.12	
		Stair	m3						**12.00**
		Formworks							
		Base	m2						**230.00**
		t=1000		4	9.00		1.00	36.00	
		t=800			171.00		0.80	109.00	
		t=1000			85.00		1.00	85.00	
		Wall + column	m2						**2,631.48**
		Wall		2	2.70	5.60		30.24	
				2	8.00	5.60		89.60	
				2	172.50	4.30		1,483.50	
				2	18.50	4.30		159.10	
				2	15.50	5.60		173.60	
				2	2.00	5.30		21.20	
		Column		4x49	0.80	4.30		674.24	
		Slab+ beams							**1,463.85**
		Slab			9.00	3.50		31.50	
					28.00	8.50		238.00	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
					68.00	7.50		510.00	
					26.00	1.00		26.00	
					8.50	1.00		8.50	
		Slab edge			198.00	0.40		79.20	
		BEAM							
		1000x800		2x17	5.75	0.70		136.85	
				2x	198.00	1.00		396.00	
				2x3	7.00	0.90		37.80	
		Stair							**50.00**

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.8.1 QUANTITY SUMMARY SHEET
ITEM: GRAVITY THICKENER - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	59.50	
1.2		Leveling Concrete Class G			
		Base	m^3	30.00	
1.3		Cinder Concrete Class F			
		Pipe Gallery Base	m^3	6.60	
1.4		Reinforcement Concrete Class E			
		Base	m^3	154.30	
		Slab	m^3	39.90	
		Column	m^3	1.70	
		Beam	m^3	4.20	
		Wall	m^3	133.50	
1.5		Formwork			
		Side: Base	m^2	187.00	
		Side: Wall	m^2	759.00	
		Side: Column	m^2	14.00	
		Side: Beam	m^2	20.00	
		Soffit: Slab	m^2	158.00	
		Side: Cinder Concrete	m^2	3.70	
1.6		Rebar	Kg	33,577.00	
1.7		Jointing			
		Water Stop	m	33.20	
		Sealler	m	53.40	
		Elastic Joint Filler	m^2	15.30	

Table E.3.8.2 QUANTITY CALCULATION SHEET

ITEM 2.13: GRAVITY THICKENER

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		BEDDING	m3						**59.33**
		- Sand t=200	m3		3.14	60.84	0.20	38.21	
		(7.8x7.8=60.84m2)	m3		8.00	13.20	0.20	21.12	
		LEVELING	m3						**29.66**
		Concrete Mpa- t=100	m3		3.14	60.84	0.10	19.10	
		(7.8x7.8=60.84m2)	m3		8.00	13.20	0.10	10.56	
		CINDER CONCRETE (Class F)							**6.61**
		- Concrete Mpa, t=100	m3		11.80	5.60	0.10	6.61	
		CONCRETE - Mpa							**154.22**
		-Slab foundation	m3	3.14	7.70	7.70	0.50	93.08	
		-Pit 500thk.	m3	3.14	1.60	1.60	0.50	4.02	
		-Pipe protection	m3		6.00	0.80	0.90	4.32	
		- Slab L=3000	m3		13.20	8.00	0.50	52.80	
		SUSPENDED SLAB - Mpa	m3						**39.83**
		L+0.600			1.50	1.00	0.30	0.45	
		L+1.000			2.00	1.70	0.40	1.36	
					13.00	4.40	0.40	22.88	
		L+3.200			5.00	2.50	0.40	5.00	
		(5.8x2.5)-2.5=12m2			12.00		0.20	2.40	
		Gutter A det.			13.70	3.14	0.18	7.74	
		BEAM	m3						**4.20**
		6.00+12.00=18M- B1,B2			0.40	18.00	0.40	2.88	
		B3			0.40	6.60	0.50	1.32	
		COLUMN	m3						**1.65**
		C1, C2		2	0.50	3.30	0.50	1.65	
		WALL	m3						**133.49**

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		-Tank wall		0.4	14.40	3.14	4.20	75.96	
		-Sludge wall		0.3	8.70		6.20	16.18	
		-Sludge wall		0.3	2.80		2.50	2.10	
		-Tank cover		0.25	6.00		1.50	2.25	
		-External wall (R)		0.50	10.00		3.70	18.50	
		-External wall (L)		0.50	10.00		3.70	18.50	
									Page 1 of 2
		FORMWORK	m2						**152.08**
		-R Slab foundation D=15.4m			15.40	3.14	0.50	24.18	
		-R Pit D=3.2m			3.20	3.14	0.70	7.04	
		-R Pit D=3.2m			1.30	3.14	0.70	2.86	
		-R Sludge tank		2	10.00		0.50	10.00	
		-Pipe protection		2	6.00		9.00	108.00	
		-Suspended slab	m2						**157.82**
		L+1000			8.50	13.00		110.50	
		L+3200							
		Gutter			1.10	13.70	3.14	47.32	
		-Suspended beam	m2						**19.68**
		(400x800) B1, B2		2	18.00	0.40		14.40	
		B3		2	6.60	0.40		5.28	
		-Colum 500x500	m2						**13.20**
				2	2.00	3.30		13.20	
		-Wall	m2						**758.12**
		Round tank D=14.8m		2	14.80	3.14	4.20	390.36	
		Rec tank		4		10.00	4.60	184.00	
		Rec tank		2		9.50	6.20	117.80	
		Scrum cage wall		2		3.40	2.20	14.96	
		Wall cover		2		6.00	1.50	18.00	
		Rec decper wall				16.50	2.00	33.00	

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		Top light (1000x1000)	no.	1					
		Tank cover (1000x1000)	no.	1					
		Tank cover (1000x1500)	no.	1					
		REBAR:							7,961.73
		Round	kg						
		Tank slab foundation (500thk.)							**457.42**
		Protection pipe							
		d10-200		27	1.90	2.00	0.617	63.31	
		d12		5	5.40	2.00	0.888	47.96	
		d12		2	5.40	4.00	0.888	38.36	
		Dit found							
		Lower D14-140		22	3.80	2.00	1.208	201.98	
		Upper D12-140		22	1.60	2.00	0.888	62.52	
		D12-200		5	9.75		0.888	43.29	
		Base slab (lower layer)	kg						**4,355.21**
		d14-140							
		@R=2m		90	7.20		1.208	782.79	
		d14-140							
		@R=4m		90	6.00		1.208	652.32	
		d14-140							
		@R=6m		176	2.00		1.578	555.46	
		d12-200		36	35.74		0.888	1,142.54	
		d14-140		23	8.15		1.208	226.44	
		d12		6	49.81		0.888	265.39	
		d25		4	47.42		3.850	730.27	
		Base slab (upper layer)	kg						**3,149.10**
		d14-140							
		@R=2m		90	8.30		1.208	902.38	
		d14-200							
		@R=5.5m		87	6.00		1.208	630.58	
		d18-125							

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		@R=7m		175	2.50		1.998	874.13	
		d12-200		11	43.53		0.888	425.20	
		d12-140		34	9.89		0.888	298.60	
		d12-140		5	4.10		0.888	18.21	
		Round tank wall (400mm thk.)							**11,835.15**
		d20-125 outer (v)		369	1.80		2.466	1,637.92	
		d12-125 outer (v)		369	3.50		0.888	1,146.85	
		d12-125 inner (v)		354	3.50		0.888	1,100.23	
		d22-125 inner (v)		354	1.80		2.984	1,901.41	
		d14-150 outer (h)		8	48.36		1.208	467.35	
		d12-150 outer (h)		6	48.36		0.888	257.66	
		d10-150 outer (h)		13	48.36		0.617	387.89	
		d25 (h)		1	48.36		3.850	186.19	
		d14-150 inner (h)		8	46.48		1.208	449.18	
		d12-150 inner (h)		6	46.48		0.888	247.65	
		d10-150 inner (h)		13	46.48		0.617	372.82	
		d25 (h)		1	46.48		3.850	178.95	
		Gutter							
		d10 (slab)		3	45.22		0.617	83.70	
		d10-150 (wall)		3	44.32		0.617	82.04	
		d10-150 (tie)		287	1.08		0.617	191.25	
		Lower round tank wall							
		d14-@150(h)		12	16.84		0.888	179.45	
		d20-@125(v)		132	4.00		2.466	1,302.05	
		d14-@150(h)		11	16.84		1.208	223.77	
		d22-@250(v)		66	4.00		2.984	787.78	
		d20-@250(v)		66	4.00		2.466	651.02	
		RECTANGULAR THICKENER EFFLUENT TANK							
		Base Slab foundation (500mm thk.)							
		<u>Ground beam B3</u>							**479.09**
		d28-Str. (b)		4	7.00		4.83	135.24	
		d28-support. (b)		4	1.75		4.83	33.81	
		d28-support. (b)		4	2.40		4.83	46.37	

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		d14-. (m)		2	6.60		1.208	15.95	
		d25-Str. (t)		4	7.00		3.85	107.80	
		d25-mid. (t)		4	3.50		3.85	53.90	
		d8-150 (tie)		44	0.45		0.395	7.82	
		d8-150		44	2.25	2	0.395	78.21	
		Base slab (L-3.000)	kg					**3,424.12**	
		d14-250 (t)(b)		48	8.30	2	1.208	962.54	
		d14-250 (t)(b)		34	13.60	2	1.208	1,117.16	
		d25-250 (s)(b)		40	2.10	2	3.850	646.80	
		d25-250 (m)(b)		40	3.10	1	3.850	477.40	
		d12-250 (m)(t)		40	3.10	2	0.888	220.22	
		Suspended slab (L+1.000)	kg						**2,553.40**
		d14-250 (b)		18	13.60	1	1.208	295.72	
		d12-200 (t)		20	13.60	1	0.888	241.54	
		d12-170 (b)		76	5.40	1	1.578	647.62	
		d14-140 (t)		92	5.40	1	1.208	600.13	
		d16-170 (b)		8	4.50	1	1.578	56.81	
		d14-250 (b)		21	1.80	1	1.208	45.66	
		d12-200 (t)		27	1.80	1	0.888	43.16	
		d14-140 (t)		10	4.50	1	1.208	54.36	
		d16-170 (b)		11	5.50		1.578	95.47	
		d16-170 (b)		22	2.10		1.578	72.90	
		d16-170 (b)		11	1.40		1.578	24.30	
		d14-250 (b)		8	2.30		1.208	22.23	
		d14-250 (b)		22	2.30		1.208	61.13	
		d14-250 (b)		5	2.00		1.208	12.08	
		d14-140 (t)		12	2.80		1.208	40.59	
		d14-140 (t)		14	4.80		1.208	81.18	
		d14-140 (t)		14	1.40		1.208	23.68	

No.	Code	Description	Unit	Numbe	Length	Width	Depth	Sub-Quantit	Quantity
		d12-200 (t)		13	1.80		0.888	20.78	
		d12-200 (t)		25	2.30		0.888	51.06	
		d12-200 (t)		8	2.00		0.888	14.21	
		Suspended slab (L+1.000)	kg	L+6.000)					
		(1500x1000)							**51.69**
		d12-200(t,b)		7	2.10	2	0.888	26.11	
		d12-200(t,b)		9	1.60	2	0.888	25.58	
		Beam (L+1.000)	kg						**1,170.28**
		Beam B1-(L-13m)							
		d20-(b)		4	14.50		2.466	143.03	
		d20-(b)		4	4.10		2.466	40.44	
		d20-(b)		4	3.60		2.466	35.51	
		d28-(t)		4	14.86		4.830	287.09	
		d28-(t)		4	3.20		4.830	61.82	
		d14-(m)		2	13.60		1.208	32.86	
		d8-150 (tie)		76	0.40		0.395	12.01	
		d8-150 (tie)		76	1.90	2.00	0.395	114.08	
		Beam B1a-(L-7m)							
		d20-(b)		4	8.10		2.466	79.90	
		d20-(b)		4	4.10		2.466	40.44	
		d28-(t)		4	8.10		4.830	156.49	
		d28-(t)		4	2.20	2	4.830	85.01	
		d14-(m)		2	7.00		1.208	16.91	
		d8-150(tie)		39	0.40		0.395	6.16	
		d8-150(tie)		39	1.90	2	0.395	58.54	
		Column (H:3.3m)	kg						**465.38**

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
		C1+C2							
		d28(v)		8	5.20	2	4.830	401.86	
		d14(v)		2	4.70	2	1.208	22.71	
		d8-180		18	1.67	2	0.395	23.75	
		d8-180		18	1.20	2	0.395	17.06	
		TOP SLAB l+3.200	(200mm thk.)						**140.30**
		d12-200 (t,b)		20	1.70	2	0.888	60.38	
		d12-200 (t,b)		10	4.50	2	0.888	79.92	
		EXPANSION JOINT							
		Base t:500			13.00			13.00	
		Wall t:500		2	3.60			7.20	
		Slab t:400			13.00			13.00	
		Water stop	m					33.20	**33.20**
		Sealer							**53.40**
		Base			13.00			13.00	
		Wall		2x2	3.60			14.40	
		Slab		2	13.00			26.00	
		Elastic joint filler							**15.30**
		Base t:500			13.00		0.5	6.50	
		Wall t:500		2	3.60		0.5	3.60	
		Slab t:400			13.00		0.4	5.20	
		Formworks for cinder concrete							
					59.00				
					59.00				
					11.60				
					11.60				

No.	Code	Description	Unit	Numbe	Length	Width	Depth	ub-Quantit	Quantity
					5.60				
					21.20				
					16.80				
					9.40				
					2.00				
			m2		196.20		0.10	19.6	
		Gravity thicknener							
					9.20				
					9.20				
					3.80				
					1.40				
					5.80				
					1.80				
					6.00				
					37.20		0.10	3.7	
			m2						

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.9.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY A - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	111.30	
1.2		Leveling Concrete Class G			
		Base	m^3	55.65	
1.3		Cinder Concrete Class F			
		Base	m^3	45.00	
1.4		Reinforcement Concrete Class E			
		Base	m^3	381.25	
		Slab	m^3	326.79	
		Wall	m^3	252.34	
1.5		Formwork			
		Wall and Base	m^2	1,076.00	
		Soffit Slab	m^2	473.60	
		Side Cinder Concrete	m^2	11.80	
1.6		Jointing			
		Water Stop	m	75.30	
		Sealing	m	138.60	
		Elastic Joint Filler	m^2	47.70	

Table E.3.9.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY A

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY A	Level -3.100						
		L:59.2m x W:8m							
		BEDDING							
1.1	12	- Sand t=200	m3		59.20	9.40	0.20	111.30	**111.30**
1.2	01	- Leveling t=100	m3		59.20	9.40	0.10	55.65	**55.65**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		59.20	7.60	0.10	44.99	**44.99**
1.4	02	**REINFORCEMENT CONCRETE - CLASS E**							
		-Base t=700	m3		59.20	9.20	0.70	381.25	**381.25**
		-Wall t=600	m3	2	59.20	3.50	0.60	248.64	
		-Hunch Wall	m3	2x0.5	59.20	0.50	0.50	14.80	**263.44**
		- Top slab t=600	m3		59.20	9.20	0.60	326.78	**326.78**
		FORMWORK							**1,028.68**
	10	-Leveling (side) - Class G	m2	2	59.20		0.10	11.84	
		-Leveling (side)	m2	2	9.40		0.10	1.80	
	09	-Base (side)- Class F	m2	2	59.20		0.70	82.88	
		-Base (side)	m2	2	9.20		0.70	12.88	
		-Wall (side)- Class F	m2	2x2	59.20		3.50	828.80	
		-Wall (end)	m2	2x2	3.50		0.60	8.40	
		-Top (side)	m2	2	59.20		0.60	71.04	
		-Top (side)	m2	2	9.20		0.60	11.04	
		-Top (soffit)	m2		59.20	8.00		473.60	**473.60**
		-Top (soffit)- Class F	m2	2	59.20		0.10	11.84	**11.84**
		REBARS (later)							

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		JOINTING							
		EXPANSION JOINT							
		FORMWORKS							
		-Base	m2	3	9.00		0.70	18.90	
		-Wall	m2	3x2	3.50		0.60	12.60	
		-Slab	m2	3	9.00		0.60	16.20	
									47.70
		WATER STOP							
		-Wall	m	3x2	4.15			24.90	
		-Slab and base	m	3x2	8.40			50.40	
									75.30
		SEALING 20x20							
		-Wall	m	3x4	4.80			57.60	
		-Slab	m	3x2	9.00			54.00	
		-Base	m	3	9.00			27.00	
									138.60
		ELASTIC JOINT FILLER							
		-Base (t=700)	m2	3	9.00		0.70	18.90	
		-Wall	m2	2x3	3.50		0.60	12.60	
		-Slab	m2	3	9.00		0.60	16.20	
									47.70

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.10.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY B - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	87.07	
1.2		Leveling Concrete Class G			
		Base	m^3	43.54	
1.3		Cinder Concrete Class F			
		Base	m^3	24.88	
1.4		Reinforcement Concrete Class E			
		Base	m^3	236.30	
		Slab	m^3	275.70	
		Wall	m^3	317.50	
		Construction Joint	m^3	44.92	
1.5		Formwork			
		Wall and Base	m^2	2,135.82	
		Soffit Slab	m^2	691.00	
		Side Cinder Concrete	m^2	13.80	
1.6		Jointing			
		Water Stop	m	326.90	
		Sealing	m	238.00	
		Elastic Joint Filler	m^2	50.66	

Table E.3.10.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY B

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY B							
		L:69.1m x W:4.7m							
1		**BEDDING**							
		- Sand t=200	m3		69.10	6.30	0.20	87.07	**87.07**
		- Leveling t=100	m3		69.10	6.30	0.10	43.53	**43.53**
		(Concrete Class G)							
2		**CINDER CONCRETE**							
		- Concrete class F, t=100	m3		69.10	3.60	0.10	24.88	**24.88**
3		**REINFORCEMENT CONCRETE - Class E**							**829.53**
		-Base t=600	m3		69.10	5.70	0.60	236.32	
		-Wall t=350	m3	2	69.10	5.55	0.35	268.45	
		-C Wall 400x40	m3	1x0.5	69.10	0.40	0.40	5.53	
		- Top slab t=350	m3		69.10	5.70	0.35	137.85	
		- M slab t=350	m3		69.10	5.70	0.35	137.85	
		-Wall t=350	m3		69.10	1.80	0.35	43.53	
4		**FORMWORK**							**1,985.51**
		-Leveling (side)- Class G	m2	2	6.30		0.10	1.26	
		-Leveling (side)- Class G	m2	2	69.10		0.10	13.80	
		-Base (side)- Class E	m2	2	5.70		0.60	6.84	
		-Base (side)- Class E	m2	2	69.10		0.60	82.92	
		-Wall (side)- Class E	m2	2x2	69.10		5.50	1,520.20	
			m2	2	69.10		1.80	248.76	
		-Wall (end)- Class E	m2	3x2	1.80		0.35	3.80	
			m2	2x2	3.70		0.35	5.20	
		-Top (side)- Class E	m2	2x2	69.10		0.35	**96.74**	
		-Top (side)- Class E	m2	3	5.70		0.35	5.99	
		-Top (soffit)	m2	2	69.10	5.00		691.00	**691.00**
		- (side)- Class F	m2	2	69.10	0.10		13.80	**13.80**
5		**EXPANSION JOINT**	m						**136.40**
		- Base & Slab	m	4x3	6.20			74.40	
		- Wall	m	4x2	6.85			54.80	
			m	4x1	1.80			7.20	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
6		**CONSTRUCTION JOINT**	m						**255.01**
		-Base	m	1	69.10	0.50	0.60	**57.58**	
		-Slab	m	2	69.10	0.50	0.35	**197.43**	
		EXPANSION JOINT							
		FORMWORKS							**213.23**
		-To construction							
		- To suffit	m2	2	69.10		0.50	69.10	
		-To side	m2	1	69.10		0.60	41.46	
		-To side	m2	2	69.10		0.35	48.37	
		-To expansion joint							
		-Base	m	4	6.20		0.60	14.88	
		-Slab	m	2x4	6.20		0.35	17.36	
		-Wall	m	2x4	6.85		0.35	19.18	
		-Wall	m	4	1.80		0.40	2.88	
									326.90
		WATERSTOP TO C.J	m	3	69.10			207.30	**207.30**
		WATERSTOP TO E.J							**119.60**
		-Slab & base	m	4x3	5.00			60.00	
		-Wall	m	4x1	2.15			8.60	
		-Wall	m	4x2	6.375			51.00	
		JOINT SEALANT	m						**238.00**
		- 20x20 Base	m	4	5.70	1.00		22.80	
		-Slab	m	4x2	5.70	2.00		91.20	
		-Wall	m	4x1	1.80	2.00		14.40	
		-Wall	m	4x2	6.85	2.00		109.60	
		ELASTIC JOINT FILLER							**50.66**
		-Base	m2	4	6.20		0.60	14.88	
		-Slab	m2	2x4	6.20		0.35	17.36	
		-Wall	m2	4	1.80		0.40	2.88	
		-Wall	m2	2x4	5.55		0.35	15.54	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.11.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY D - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	15.00	
1.2		Leveling Concrete Class G			
		Base	m^3	7.50	
1.3		Cinder Concrete Class F			
		Base	m^3	6.00	
1.4		Reinforcement Concrete Class E			
		Base	m^3	51.50	
		Slab	m^3	44.20	
		Wall	m^3	35.60	
		Beam	m^3	4.80	
1.5		Formwork			
		Wall and Base	m^2	225.00	
		Soffit Slab	m^2	64.00	
		Form for Cinder Concrete	m^2	1.60	
1.6		Jointing			
		Water Stop	m	50.20	
		Sealing	m	92.40	
		Elastic Joint Filler	m^2	31.80	

Table E.3.11.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY D

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY D							
		L:8m x W:8m							
		BEDDING							
1.1	12	- Sand t=200	m3		8.00	9.40	0.20	15.04	**15.04**
1.2	01	- Leveling t=100	m3		8.00	9.40	0.10	7.52	**7.52**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		8.00	7.60	0.10	6.08	**6.08**
1.4	02	**REINFORCEMENT CONCRETE - Class E**							**136.08**
		-Base t=700	m3		8.00	9.20	0.70	51.52	
		-Wall t=600	m3	2	8.00	3.50	0.60	33.60	
		-C Wall	m3	2x0.5	8.00	0.50	0.50	2.00	
		- Top slab t=600	m3		8.00	9.20	0.60	44.16	
		- Beam 600x1100	m3	2	8.00	0.50	0.60	4.80	
		FORMWORK							**194.20**
	10	-Leveling (side) - Class G	m2	2	8.00		0.10	1.60	
		-Leveling (side)	m2	2	9.40		0.10	1.88	
	09	-Base (side)- Class E	m2	2	8.00		0.70	11.20	
		-Base (side)	m2	2	9.20		0.70	**12.88**	
		-Wall (side)- Class E	m2	2x2	8.00		3.50	112.00	
		-Wall (end)	m2	2x2	3.50		0.60	8.40	
		-Beam	m2	2	8.00	1.60		25.60	
		-Top (side)	m2	2	8.00		0.60	9.60	
			m2	2	9.20		0.60	11.04	
		-Top (soffit)-Class E	m2		8.00	8.00		64.00	**64.00**
		-Side (soffit)- Class F	m2	2	8.00		0.10	1.60	**1.60**

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		JOINTING							
		EXPANSION JOINT							
		FORMWORKS	m2						**31.80**
		-Base	m2	2	9.00		0.70	12.60	
		-Wall	m2	2x2	3.50		0.60	8.40	
		-Slab	m2	2	9.00		0.60	10.80	
		WATER STOP							**50.20**
		-Wall	m	2x2	4.15			16.60	
		-Slab and base	m	2x2	8.40			33.60	
		SEALING 20x20							**92.40**
		-Wall	m	2x4	4.80			38.40	
		-Slab	m	2x2	9.00			36.00	
		-Base	m	2	9.00			18.00	
		ELASTIC JOINT FILLER							**31.80**
		-Base (t=700)	m2	2	9.00		0.70	12.60	
		-Slab (t=600)	m2	2	9.00		0.60	10.80	
		-Wall (t=600)	m2	2x2	3.50		0.60	8.40	

Project: HCMC Water Environment Improvement
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Table E.3.12.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY E - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	42.40	
1.2		Leveling Concrete Class G			
		Base	m^3	21.17	
1.3		Cinder Concrete Class F			
		Base	m^3	15.55	
1.4		Reinforcement Concrete Class E			
		Base	m^3	121.83	
		Slab	m^3	71.06	
		Wall	m^3	128.88	
1.5		Formwork			
		Wall and Base	m^2	768.08	
		Soffit Slab	m^2	203.04	
		Form for Cinder Concrete	m^2	8.64	
1.6		Jointing			
		Water Stop	m	51.66	
		Sealing	m	58.20	
		Elastic Joint Filler	m^2	14.18	

Table E.3.12.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY E

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY E							
		L:43.2m x W:4.7m							
		BEDDING							
1.1	12	- Sand t=200	m3		43.20	4.90	0.20	42.34	**42.34**
1.2	01	- Leveling t=100	m3		43.20	4.90	0.10	21.17	**21.17**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		43.20	3.60	0.10	15.55	**15.55**
1.4	02	**REINFORCEMENT CONCRETE - Class E**							**321.77**
		-Base t=600	m3		43.20	4.70	0.60	121.82	
		-Wall t=350	m3	2	43.20	3.75	0.35	113.40	
		-C Wall	m3	2x0.5	43.20	0.40	0.40	6.91	
		- Top slab t=350	m3		43.20	4.70	0.35	71.06	
		- Wall end	m3	1	4.70	3.75	0.35	6.17	
		- Wall cover	m3	2	4.80	1.00	0.25	2.40	
		FORMWORK							**753.88**
	Class G	-Leveling (side)	m2	2	43.20		0.10	8.64	
		-Leveling (side)	m2	2	4.90		0.10	0.98	
	Class E	-Base (side)	m2	2	43.20		0.60	51.84	
		-Base (side)	m2	2	4.70		0.60	5.64	
		-Wall (side)	m2	2x2	43.20		3.75	648.00	
		-Wall (end)	m2	2x2	3.75		0.35	5.25	
		-Top (side)	m2	2	43.20		0.35	30.24	
			m2	2	4.70		0.35	3.29	
	Class E	-Top (soffit)	m2		43.20	4.70		203.04	**203.04**
	Class F	-Side (soffit)	m2	2	43.20		0.10	8.60	**8.96**
			m2	1	3.60		0.10	0.36	

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		JOINTING							
		EXPANSION JOINT							
		FORMWORKS	m2						**14.19**
		-Wall	m2	2x2	3.75		0.35	5.25	
		-Top Slab	m2	2x1	4.70		0.35	3.30	
		-Base	m2	2x1	4.70		0.60	5.64	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.13.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY F - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	76.33	
1.2		Leveling Concrete Class G			
		Base	m^3	38.14	
1.3		Cinder Concrete Class F			
		Base	m^3	30.85	
1.4		Reinforcement Concrete Class E			
		Base	m^3	261.46	
		Slab	m^3	224.11	
		Wall	m^3	180.67	
1.5		Formwork			
		Wall and Base	m^2	724.68	
		Soffit Slab	m^2	324.80	
		Form for Cinder Concrete	m^2	2.90	
1.6		Jointing			
		Water Stop	m	66.80	
		Sealing	m	184.80	
		Elastic Joint Filler	m^2	63.60	

Table E.3.13.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY F

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY F							
		L:40.6m x W:8m							
		BEDDING							
1.1	12	- Sand t=200	m3		40.60	9.40	0.20	76.33	**76.33**
1.2	01	- Leveling t=100	m3		40.60	9.40	0.10	38.16	**38.16**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		40.60	7.60	0.10	30.85	**30.85**
1.4	02	**REINFORCEMENT CONCRETE - Class E**							**666.24**
		-Base t=700	m3		40.60	9.20	0.70	261.46	
		-Wall t=600	m3	2	40.60	3.50	0.60	170.52	
		-C Wall	m3	2x0.5	40.60	0.50	0.50	10.15	
		- Top slab t=600	m3		40.60	9.20	0.60	224.11	
		FORMWORK							**763.08**
	Class G	-Leveling (side)	m2	2	40.60		0.10	8.12	
		-Leveling (side)	m2	2	9.40		0.10	1.88	
	Class E	-Base (side)	m2	2	40.60		0.70	56.84	
		-Base (side)	m2	2	9.20		0.70	12.88	
		-Wall (side)	m2	2x2	40.60		3.50	568.40	
		-Wall (end)	m2	2x4	3.50		0.60	8.40	
		-Bottom slab (end)	m2	4	9.00		1.30	46.80	
		-Top (side)	m2	2	40.60		0.60	48.72	
			m2	2	9.20		0.60	11.04	
	Class E	-Top (soffit)	m2		40.60	8.00		324.80	**324.80**

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		JOINTING							
		EXPANSION JOINT							
		WATERSTOP							**100.40**
		-Base	m2	4	8.40			33.60	
		-Wall	m2	2x4	4.15			33.20	
		-Slab	m2	4	8.40			33.60	
		ELASTIC JOINT FILLER							**63.60**
		-Base (t=700)	m2	4	9.00		0.70	25.20	
		-Slab (t=600)	m2	4	9.00		0.60	21.60	
		-Wall (t=600)	m2	2x4	3.50		0.60	16.80	
		SEALING							**184.80**
		-Base		4	9.00			36.00	
		-Slab		4x2	9.00			72.00	
		-Wall		4x2x2	4.80			76.80	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.14.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY G - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	37.13	
1.2		Leveling Concrete Class G			
		Base	m^3	18.56	
1.3		Cinder Concrete Class F			
		Base	m^3	15.01	
1.4		Reinforcement Concrete Class E			
		Base	m^3	127.19	
		Slab	m^3	109.02	
		Wall	m^3	87.89	
1.5		Formwork			
		Wall and Base	m^2	408.95	
		Soffit Slab	m^2	158.00	
		Form for Cinder Concrete	m^2	3.91	
1.6		Jointing			
		Water Stop	m	50.81	
		Sealing	m	83.20	
		Elastic Joint Filler	m^2	32.24	

Table E.3.14.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY G

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY G- Level -3.100							
		L:19.75m x W:8m							
		BEDDING							
1.1	12	- Sand t=200	m3		19.75	9.40	0.20	37.13	**37.13**
1.2	01	- Leveling t=100	m3		19.75	9.40	0.10	18.56	**18.56**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		19.75	7.60	0.10	15.01	**15.01**
1.4	02	**REINFORCEMENT CONCRETE - Class E**							**324.10**
		-Base t=700	m3		19.75	9.20	0.70	127.19	
		-Wall t=600	m3	2	19.75	3.50	0.60	82.95	
		-C Wall	m3	2x0.5	19.75	0.50	0.50	4.94	
		- Top slab t=600	m3		19.75	9.20	0.60	109.02	
		FORMWORK							**412.80**
	Class G	-Leveling (side)	m2	2	19.75		0.10	3.95	
		-Leveling (side)	m2	2	9.40		0.10	1.88	
	Class E	-Base (side)	m2	2	19.75		0.70	27.65	
		-Base (side)	m2	2	9.20		0.70	12.88	
		-Wall (side)	m2	2x2	19.75		3.50	276.50	
		-Bottom slab (end)	m2	2x2	9.00		1.30	46.80	
		-Wall (end)	m2	2x2	3.50		0.60	8.40	
		-Top (side)	m2	2	19.75		0.60	23.70	
			m2	2	9.20		0.60	11.04	
	Class E	-Top (soffit)	m2		19.75	8.00		158.00	**158.00**

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		-Top (side)	m2		22.20		0.10		**2.22**
		JOINTING							
		EXPANSION JOINT							
		WATERSTOP							**100.40**
		-Base	m2	4	8.40			33.60	
		-Wall	m2	2x4	4.15			33.20	
		-Slab	m2	4	8.40			33.60	
		ELASTIC JOINT FILLER							**63.60**
		-Base (t=700)	m2	4	9.00		0.70	25.20	
		-Slab (t=600)	m2	4	9.00		0.60	21.60	
		-Wall (t=600)	m2	2x4	3.50		0.60	16.80	
		SEALING							**184.80**
		-Base		4	9.00			36.00	
		-Slab		4x2	9.00			72.00	
		-Wall		4x2x2	4.80			76.80	

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.15.1 QUANTITY SUMMARY SHEET
ITEM: PIPE GALLERY H - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Quantity	Remarks
1					
1.1		Sand Base	m^3	22.64	
1.2		Leveling Concrete Class G			
		Base	m^3	11.32	
1.3		Cinder Concrete Class F			
		Base	m^3	8.32	
1.4		Reinforcement Concrete Class E			
		Base	m^3	65.14	
		Slab	m^3	37.99	
		Wall	m^3	64.32	
1.5		Formwork			
		Wall and Base	m^2	419.77	
		Soffit Slab	m^2	108.57	
		Form for Cinder Concrete	m^2	4.60	
1.6		Jointing			
		Water Stop	m	25.83	
		Sealing	m	43.20	
		Elastic Joint Filler	m^2	14.18	

Table E.3.15.2 QUANTITY CALCULATION SHEET

ITEM 2.9: PIPE GALLARY H

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		PIPE GALLARY H- Level -3.100							
		L:23.1m x W:4.7m							
		BEDDING							
1.1	12	- Sand t=200	m3		23.10	4.90	0.20	22.64	**22.64**
1.2	01	- Leveling t=100	m3		23.10	4.90	0.10	11.32	**11.32**
		(Concrete Class G)							
	03	**CINDER CONCRETE (Class F)**							
1.3		- t=100	m3		23.10	3.60	0.10	8.32	**8.32**
1.4	02	**REINFORCEMENT CONCRETE - Class E**							**167.45**
		-Base t=600	m3		23.10	4.70	0.60	65.14	
		-Wall t=350	m3	2	23.10	3.75	0.35	60.63	
		-C Wall	m3	2x0.5	23.10	0.40	0.40	3.69	
		- Top slab t=350	m3		23.10	4.70	0.35	37.99	
		FORMWORK							**434.02**
	Class G	-Leveling (side)	m2	2	23.10		0.10	4.62	
		-Leveling (side)	m2	2	4.90		0.10	0.98	
	Class E	-Base (side)	m2	2	23.10		0.60	27.72	
		-Base (side)	m2	2	4.70		0.60	5.64	
		-Wall (side)	m2	2x2	23.10		3.75	346.50	
		-Bottom slab (end)	m2	2x2	3.75		1.30	19.50	
		-Wall (end)	m2	2	4.80		1.00	9.60	
		-Top (side)	m2	2	23.10		0.35	16.17	
			m2	2	4.70		0.35	3.29	
	Class E	-Top (soffit)	m2		23.10	4.70		108.57	**108.57**

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		-Top (side)	m2	2	23.10		0.10	4.62	**4.62**
		JOINTING							
		EXPANSION JOINT							
		WATERSTOP							**100.40**
		-Base	m2	4	8.40			33.60	
		-Wall	m2	2x4	4.15			33.20	
		-Slab	m2	4	8.40			33.60	
		ELASTIC JOINT FILLER							**63.60**
		-Base (t=700)	m2	4	9.00		0.70	25.20	
		-Slab (t=600)	m2	4	9.00		0.60	21.60	
		-Wall (t=600)	m2	2x4	3.50		0.60	16.80	
		SEALING							**184.80**
		-Base		4	9.00			36.00	
		-Slab		4x2	9.00			72.00	
		-Wall		4x2x2	4.80			76.80	

Table E.3.16 CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME (PIPE GALLERY)

Item	Calculation		Quantity
Reinforcement			(kg)
1. Pipe Gallery Axis A, D, F, G			
D24	14.34x237x3.551	=	12068.36
D24	4.65x236x3.551	=	7793.73
D18	14.19x237x2.000	=	6726.06
D18	4.68x2x236x2.000	=	4417.92
D24	9.06x473x3.551	=	15217.38
D20	9.06x473x2.470	=	10584.89
D20	4.66x2x237x2.470	=	5455.83
D18	2.00x4x237x2.00	=	3792.00
D16	59.06x36x1.580	=	3359.33
D16	59.06x34x1.580	=	3172.70
D14	59.06x34x1.210	=	2429.73
D12	59.06x36x0.888	=	1888.03
D14	59.06x18x2x1.210	=	2572.65
D12	59.06x14x2x0.888	=	1468.47
		Total	80947.08
	80947.08x1.05		84994.43
	Concrete Volumn		
	(9.20x4.80-8.00x3.50+0.50^{2}x1/2x2)x59.20	=	971.47 m³
	84994.43 /971.47	=	87.49 kg/m³
2. Pipe Gallery Axis B			
D20	9.40x293x2.470	=	6802.87
D20	2.33x2x292x2.470	=	3360.98
D20	2.68x585x2.470	=	3872.47
D14	14.05x293x1.210	=	4981.15
D14	2.24x292x1.210	=	791.44
D14	2.68x585x1.210	=	1897.04
D16	6.33x585x1.580	=	5850.82
D14	6.33x2x293x1.210	=	4488.35
D14	6.33x293x1.210	=	2244.17
D14	6.76x293x1.210	=	2396.62
D14	6.76x293x1.210	=	2396.62
D14	2.66x293x1.210	=	943.05
D14	72.96x22x1.210	=	1942.20
D12	72.96x24x0.888	=	1554.92
D14	72.96x24x2x1.210	=	4237.52
D12	72.96x24x2x0.888	=	3109.85
D14	72.96x22x1.210	=	1942.20
D12	72.96x22x0.888	=	1425.35
D14	72.96x22x1.210	=	1942.20
D12	72.96x22x0.888	=	1425.35
D14	72.96x7x2x1.210	=	1235.94
D14	1.25x3x293x1.210	=	1329.49
D14	0.90x3x293x1.210	=	957.23

Item	Calculation		Quantity
	Total		61127.83 kg
	61127.83x1.05	=	64184.22
	* Concrete Volumn		
	6.47x(0.35+0.40+0.60)	=	8.73 m²
	(3.75+1.80)x0.35x2	=	3.89 m²
	1.80x0.40	=	0.72 m²
	0.45^2x1/2x3	=	0.30 m²
	Total		13.64 m²
	13.64x73.10	=	997.08 m³
	68184.22/997.08	=	64.37 kg/m³
3. Pipe Gallery Axis H, E			
D20	9.64x93x2.47	=	2214.40
D20	2.33x2x93x2.47	=	1070.45
D14	9.49x93x1.21	=	1067.91
D14	2.44x93x1.21	=	274.57
D16	4.54x186x1.58	=	1334.22
D14	4.54x186x1.21	=	1021.77
D14	4.54x93x2x1.21	=	1021.77
D14	1.30x2x93x1.21	=	292.58
D14	0.90x2x93x1.21	=	202.55
D14	22.96x18x1.21	=	500.07
D12	22.96x20x0.888	=	407.77
D12	22.96x20x2x0.888	=	815.54
D14	22.96x15x2x1.21	=	833.45
D12	22.96x15x2x0.888	=	611.65
	Total		11668.70
			(kg)
	11668.70x1.05	=	12252.14
	* Concrete Volumn		
			(m³)
	(4.70^2-4.00x3.75+0.45^2x1/2x2)x23.10	=	168.46
			(kg/m³)
	12252.14 / 168.46	=	72.73

TABLE E.3.17. CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME (COMPOST PLANT)

Item		Calculation				Quantity
1. Felmenting Vessle						
Total						
		Fermenting Vessle	Drainage Ditch	Drainage Pit(1)	Drainage Pit(2)	
	Concrete (m³)					
	Bottom	2142.27	25.25	1.32	6.77	2175.41
	Wall	1171.81				1171.81
	Slab	359.20				359.20
	Stair	5.63				5.63
	Leveling	424.09	5.95	0.38	0.46	430.88
	Mortar finishing	15.18				15.18
	Forming (m²)	5883.91	255.72	12.94	49.35	6201.47
	Reinforcement (kg)	294312.80	1966.34	102.96	528.06	296910.16
	Sand (m³)	848.18	11.90	0.75	0.92	861.75
	EXP.J Water Stop (m)	166.40	4.80			171.20
	Elastic Joint Filter (m²)	81.00	0.72			81.72
	Sealing (m)	279.78	10.20			289.98
	Wooden pile				418.50	418.50
	Door W2000, H2500	2				
	Steel pile (ϕ100 mm)		155.70			155.70
	Checherd Plate Cover (kg)		49.00	101.50	121.90	272.40
2. Fermenting Vessle						
(1) Concrete						
Bottom slab		4.00x8.00x0.50		=		16.00

Item	Calculation		Quantity
	(4.00x8.00-3.00x7.10)x2.50	=	27.50
	8.00x0.50x89.80	=	359.20
	-1.50x7.00x0.50	=	-5.25
	19.40x89.80x0.50x2	=	1742.12
	3.00x1.50x0.30x2	=	2.70
	Sub Total		2142.27
Wall	0.50x4.10x89.80x2	=	368.12
	(0.80+0.50)x1/2x1.00x89.80x2	=	116.74
	0.40x4.10x74.60x2	=	244.69
	0.40x0.20x14.50x10	=	11.60
	4.50x0.50x2x88.80	=	399.60
	4.50x8.00x0.50x2	=	36.00
	-2.00x2.50x0.50x2	=	-5.00
	Sub Total		1171.81
Slab	8.00x0.50x89.80	=	359.20
	Total		3673.28
Stairs	3.00x1.50x0.20	=	0.90
	0.20x4.42x1.40x2	=	2.48
	0.20x2.44x2.00	=	0.98
	0.18x0.28x1/2x1.40x(13+13)	=	0.92
	0.18x0.28x1/2x2.00x7	=	0.35
			(m^3)
	Stairs Total		5.63
			(m^3)
	All Total		3678.91
(2) Forming			
	4.60x89.80x2	=	826.16
	3.30x89.80x2	=	592.68
	$(1.00^2+0.30^2)^{1/2}$x89.80x2	=	187.51
	0.50x89.80x2	=	89.80
	4.10x2x89.80x2	=	1472.72
	(4.10x0.50+(0.80+0.50)x1/2x1.00)x2x2	=	10.80
	4.10x0.40x2x2	=	6.56
	19.40x0.50x2x2	=	38.80
	0.40x14.50x10x2	=	116.00
	0.40x0.50x2x2	=	0.80
	0.40x0.50x2	=	0.40
	(8.00+4.00)x2.50x2	=	60.00
	(7.00+3.00)x2.50x2	=	50.00
	7.00x3.00	=	21.00
	4.50x89.80x2	=	808.20
	4.50x88.80x2	=	799.20
	7.00x4.50x2	=	63.00
	8.00x5.50x2	=	88.00
	7.00x88.80	=	621.60
	(3.00+150x2)x0.30x2	=	3.60
	Sub Total		5856.83
Stairs	1.50x0.20+0.30x0.20	=	0.36
	1.50x3.00	=	4.50
	0.20x4.42x3	=	2.65
	1.40x4.42x2	=	12.38

Item	Calculation		Quantity
	0.18x0.28x1/2x13x3	=	0.98
	2.00x2.44	=	4.88
	0.20x2.44x2	=	0.98
	0.18x0.28x1/2x7x2	=	0.35
	Sub Total		27.08
			(m²)
	All Total		5883.91
(3) Sand	90.00x47.00x0.20	=	846.00
	3.20x1.70x0.20x2	=	2.18
			(m³)
	Total		848.18
(4) Leveling Concrete			
	90.00x47.00x0.10	=	432.00
	3.20x1.70x0.10x2	=	1.09
			(m³)
	Total		424.09
(5) Mortar Forming (Stair)			(m²)
	(0.18+0.28)x13x2x1.20	=	14.35
	3.20x1.70x0.10x2	=	0.83
			(m²)
	Total		15.18
(6) Door	W2000, H2500, n=2		2.00
(7) Reinforcement	3678.91x80	=	294312.80
(8) Pile	Refer to fermenting vessel calculation		
(9) EXP . J			
Water Stop (m)	(1.25+4.10+4.35+19.40)x2x2	=	116.40
	(5.00+7.50)x2x2	=	50.00
			(m)
	Total		166.40
Elastic Joint Filler (m²)	(0.50+0.80)x1/2x1.00x2x2	=	2.60
	0.50x4.10x2x2	=	8.20
	0.40x4.10x2x2	=	6.40
	19.40x0.50x2x2	=	38.80
	(8.00x5.50-7.00x4.50)x2	=	25.00
			(m²)
	Total		81.00
Sealing (m²)	$(1.50+0.50+(1.0^2+0.30^2)^{1/2}+4.60+3.30)x2x2$		
		=	43.78
	(4.10x2+0.40)x2x2	=	34.40
	(19.40+18.50)x2x2	=	151.60
	(8.00+7.00+5.50+4.50)x2	=	50.00
			(m²)
	Total		279.78
3. Drain Pipe (ϕ100 mm, Steel pipe)			(m)
(1) Drain pit(1) to drain pit (2)	20.0+17.2+20.0+60.0-1.5	=	115.70
(2) Dehydrated Sludge Storage Vessel			(m)
	10.00x2	=	20.00
(3) Curing yard			(m)
	10.00x2	=	20.00

Item	Calculation			Quantity
				(m)
	Total			155.70
4. Drainage Ditch (300x300)				
(1) Dehydrated Sludge Storage Vessel				(m)
	15.00x2	=		30.00
(2) Curing yard				
	140.00			140.00
				(m)
	Total			170.00
. Concrete				
	$(0.60x0.45-0.30^2)x170.0$	=		25.20
	$0.30^2x0.15x2x2$	=		0.05
				(m^3)
	Total			25.25
. Forming				
	(0.45+0.30x2x170.0	=		255.00
	0.30^2x2x4	=		0.72
				(m^2)
	Total			255.72
. Reinforcement				
	14.90/0.25	=	61	
	61x2	=	122	
	139.90/0.25	=	561	
	Total		683	
				(kg)
D12	(0.325x2+0.45)x683x0.888	=		667.15
D12	14.90x8x2x0.888	=		211.70
D12	139.90x8x0.888	=		993.85
	Total			1872.70
				(kg)
	1872.70x1.05	=		1966.34
. Sand				(m^3)
	0.70x(30.0+140.0)x0.10	=		11.90
. Leveling Concrete				(m^3)
	0.70x(30.0+140.0)x0.05	=		5.95
. EXP.J				
Water Stop				(m)
	(0.375x2+0.450)x4	=		4.80
				(m^2)
Elastic Joint Filler	0.15x(0.30x2+0.60)x4	=		0.72
				(m)
Sealing	(0.45x3+0.30x3+0.15x2)x4	=		10.20
5. Drainage Pit (1)				
. Concrete	2.30x1.30x0.95	=		2.84
	-2.00x1.00x0.80	=		-1.60
	0.15x1.00x0.50	=		0.08
				(m^3)
	Total			1.32
. Forming				(m^2)
	(2.30+1.30)x2x0.95	=		6.84
	(2.00-0.15+1.00)x2x0.80	=		4.56
	0.15x0.30x2	=		1.00
				(m^2)
	Total			12.49
. Reinforcement				(kg)

Item	Calculation		Quantity
	1.32x78		102.96
. Sand			
	2.50x1.50x0.20	=	0.75
. Leveling Concrete			(m³)
	2.50x1.50x0.10	=	0.38
. Steel Plate Cover			(kg)
	2.30x1.30x26.79	=	80.10
	L- 50x50x4		
	(2.00x2+1.00x3)x3.06	=	21.40
			(kg)
	Total		101.50
6. Drainage Pit (2)			
. Concrete	2.50x1.50x3.45	=	12.94
	-2.00x1.00x3.20	=	-6.40
	0.15x1.50x1.00		0.23
			(m³)
	Total		6.77
. Forming			
	(2.50+1.50)x2x3.45	=	27.60
	(2.00-0.15+1.00)x2x3.20	=	18.24
	0.15x1.70x2	=	0.51
	1.50x1.00x2	=	3.00
			(m²)
	Total		49.35
. Reinforcement			(kg)
	6.77x78	=	528.06
. Sand			(m³)
	2.70x1.70x0.10	=	0.92
. Leveling Concrete			(m³)
	2.70x1.70x0.10	=	0.46
. Steel Plate Cover			(kg)
	2.50x1.50x26.79	=	100.46
	L- 50x50x4		
	(2.00x2+1.00x3)x3.06	=	21.40
			(kg)
	Total		121.90
. Wooden pile		(m²)	
	2.50x1.50 =	3.75	
		(Piles)	
	3.75x25 =	93	
			(m)
	93x4.5	=	418.50
7. Deodrization Soil Filter			
(1) Concrete			
Bottom Slab	42.30x10.60x0.40	=	179.35
	0.40x0.50x(0.90+0.50)	=	0.28
	4.60x3.60x0.40	=	6.62
	0.40x0.50x(1.40+1.00)	=	0.48
	Sub Total		186.73
Wall	10.60x0.30x1.75	=	5.57
	42.00x0.30x1.75x2	=	44.10

Item	Calculation		Quantity
	10.60x0.30x1.75	=	5.57
	(4.60x3.60-4.00x3.00)x3.00	=	13.68
	Sub Total		68.92
Slab	4.60x3.30x0.30	=	5.55
Stairs	2.00x2.00x0.20x2	=	1.60
	0.20x2.47x2.00x2	=	1.98
	0.20x0.30x1/2x2.00x9x2	=	1.08
	Sub Total		4.66
Pipe support foundation			
	2.00x2.00x0.30x2	=	2.40
			(m^3)
	Total		268.26
(2) Forming			
	(42.60x2+10.60)x2.15	=	205.97
	6.00x2.15	=	12.90
	(42.00x2+10.0x2)x1.75	=	182.00
	0.50x(0.90+0.50)	=	0.70
	0.50^2x4	=	1.00
	4.60x3.70	=	17.02
	3.30x3.70x2	=	24.42
	-0.90x0.90	=	-0.81
	(4.00+3.00)x2x3.00	=	42.00
	4.00x3.00	=	12.00
	0.50x1.70x2	=	1.70
	0.50x1.00x4	=	2.00
Stairs			
	2.00x0.20x2x2	=	1.60
	2.00x2.00x2	=	8.00
	2.00x2.97x2	=	11.88
	0.20x0.30x1/2x9x2	=	0.54
Pipe Support			
	2.00x0.30x2	=	4.80
			(m^2)
	Total		527.72
(3) Sand			
	(42.80x10.80-0.10x4.60)x0.20	=	92.36
	4.80x3.40x0.20	=	3.26
	2.20x2.20x0.20x2	=	1.94
			(m^3)
	Total		97.56
(4) Leveling Concrete			
	(42.80x10.80-0.10x4.60)x0.10	=	46.18
	4.80x3.40x0.10	=	1.63
	2.20x2.20x0.20x2	=	0.97
			(m^3)
	Total		47.78
(5) Checkerd Concrete Cover (t=3.2 mm)			
	0.80x0.80x2x26.79	=	34.30
	L- 50x50x4		
	0.60x4x2x3.06	=	14.70
			(kg)
	Total		49.00
(6) Reinforcement			
	268.26x80	=	21460.80
(7) Rudder			
	n=10		10.00

Item	Calculation		Quantity
(8) Pile	Refer to Deodrization Soil Filter calculation		
(9) EXP.J			(m)
Water Stop	1.95x2+10.30	=	14.20
			(m^2)
Elastic Joint Filler	0.30x1.75+0.40x10.60	=	4.77
			(m)
Sealing	(2.15+1.75)x2+10.00+10.60	=	28.40
(10) Mortar Finishing t=20 mm			
	2.00x2.00x2	=	8.00
	(0.30+0.20)x2.00x9x2	=	18.00
			(m^2)
	Total		26.00
(11) Wooden pile			
	2.00x2.00x2 =	8.00	
	8.00x25 =	200	(m)
	200x4.50	=	900.00
8. Track Scale (Weigh Bridge)			
(1) Concrete	(0.10+0.35)x1/2x(3.30+3.80)x1/2x3.40x2		
		=	5.43
	0.45x1.40x3.80x2	=	4.79
	0.285x0.55x3.80x2	=	1.19
	0.10x4.30x3.80	=	1.63
	$0.30x0.20x(3.40^2+0.20^2)^{1/2}x4$	=	0.82
	-0.285x0.20x2.70x2	=	-0.31
			(m^3)
	Total		13.70
(2) Forming			
	0.10x3.80x2	=	0.76
	0.30x0.20x4	=	0.24
	$(0.30+0.55)x1/2x(3.40^2+0.20^2)^{1/2}x4$		
		=	5.79
	$0.20x(3.40^2+0.20^2)^{1/2}x4$	=	2.72
	0.285x0.55x4	=	0.63
	0.285x0.20x4	=	0.23
	0.30x0.20x4	=	0.24
	0.35x3.80x2	=	2.66
	0.45x1.40x4	=	2.52
	0.45x3.80x2	=	3.42
	0.10x4.30x2	=	0.86
			(m^2)
	Total		20.07
(3) Sand			
	(4.00+3.50)1/2x3.50x0.20x2	=	5.25
	1.60x4.00x0.20x2	=	2.56
	4.30x4.00x0.20	=	3.44
			(m^3)
	Total		11.25
(4) Leveling Concrete			(m^3)
	11.25x0.50	=	5.63
(5) Reinforcement			
D14	(0.29x2+3.25)x14x2x1.21	=	129.76
D12	3.26x19x2x0.888	=	110.01
D14	(1.26+0.28)x2x16x2x1.21	=	119.26

Item	Calculation			Quantity
D14	(0.145+0.610)x2x16x2x1.21	=		58.47
D14	5.50x16x1.21	=		106.48
D12	3.66x49x0.888	=		159.25
				(kg)
	Total			683.23
			(kg)	
	683.23x1.05	=	717.39	
			(kg/m³)	
	717.39/13.70	=	52.36	
(6) Pile				
	7.10x3.80+(3.30+3.80)x1/2x3.40x2		(m²)	
		=	51.12	
	Concrete		(t)	
	13.70x2.50	=	34.25	
			(t)	
	Track	=	10	
	Others		(t)	
	7.10x3.80x0.50	=	13.49	
	Total		57.74	
	Pile 300x300			
			(t)	
	Allowable bearing capacity of pile		17.00	
	54.74/17.0	=	3.4	
				(piles)
	Total			4.00

TABLE E.3.18 CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME (EFFLUENT PIPE)

Item	Calculation		Quantity
1. Reinforced Concrete (Concrete type E)			(m^3)
(1) Disinfection Tank Part			
	(4.06x2.43-3.46x1.93)x3.20	=	10.20
(2) 360° Foundation			
	(3.46x3.66-2.86^{2}x3.1416/4)x26.80	=	167.30
(3) 180° Foundation			
	(3.86x1.93-2.86^{2}x3.1416/4x0.5)x69.00	=	292.51
(4) Discharge Part			
	1.00x4.10x0.30	=	1.23
	(3.77x4.10-3.00^{2}x3.1416/4)x0.50	=	4.20
	0.5x0.5x4.10	=	1.03
	3.32x0.30x(1.00^2+2.00^2)$^{1/2}$x2	=	20.31
	(4.10+8.10)x0.5x10.00x0.30	=	18.30
	0.30x0.70x8.10	=	1.70
	Total		516.78
2. Forming			(m^2)
(1) Disinfection Tank Part			
	(2.43+1.93)x2x3.20	=	27.90
	(4.06x2.43-3.46x1.93)x2	=	6.38
(2) 360° Foundation		=	
	3.66x2x26.80	=	196.18
	(3.66x3.46-2.86^{2}x3.1416/4)x2	=	12.49
(3) 180° Foundation			
	1.93x2x69.00	=	266.34
(4) Discharge Part			
	0.3x1.00x2	=	0.60
	0.50x3.77x2	=	3.77
	0.50^{2}x2	=	0.50
	(4.10x3.77-3.00^{2}x3.1416/4)	=	8.39
	(3.50x3.62-3.00^{2}x3.1416/4)	=	5.61
	3.62x(10.00^2+2.00^2)$^{1/2}$x2	=	73.83
	3.32x(10.00^2+2.00^2)$^{1/2}$x2	=	67.71
	(0.70+1.00)x8.10	=	13.77
	0.30x0.70x2	=	0.42
	Total		683.89
3. Leveling Concrete (Concrete type G)			(m^3)
	4.26x0.10x2.50	=	1.07
	3.66x0.10x26.80	=	9.81
	4.06x0.10x69.00	=	28.01
	(4.30+8.30)x1/2x10.00x0.10	=	6.30
	Total		45.19
4. Sand			(m^3)
	45.19x2	=	90.38
	Total		90.38

Item	Calculation		Quantity
5. Reinforcement			(kg)
(1) 360° Foundation			
D25	3.32x215x3.85	=	2748.13
D14	7.26x2x215x1.21	=	3777.38
D14	0.40x4x108x1.21	=	209.09
D12	3.32x215x0.888	=	633.85
D12	3.52x2x215x0.888	=	1344.08
D12	27.50x100x0.888	=	2442.00
	Sub Total		11154.53
(2) 180° Foundation			
D14	(0.36+1.79)x2x277x1.21	=	1441.23
D14	3.72x277x1.21	=	1246.83
D14	(0.36x2+3.72)x277x1.21	=	1488.15
D14	1.00x2x277x1.21	=	670.34
D12	71.52x54x0.888	=	3429.53
	Sub Total		8276.08
(3) Discharge Part			
D25	(3.58+0.90)x1/2x2x83x3.85	=	1431.58
D12	3.58x1/2x2x83x0.888	=	263.86
D14	(3.96+7.96)x1/2x83x1.21	=	598.56
D12	(3.96+7.96)x1/2x83x0.888	=	439.28
D12	10.06x1/2x14x4x0.888	=	250.13
D12	10.06x34x((4.10+8.10)x1/2x10.00)/4.10x10.00))x0.888		451.89
D12	7.96x6x0.888	=	42.41
D12	(0.16+0.86)x2x33x0.888	=	59.78
	Sub Total		3537.49
(4) Disinfection tank Part			
	10.20 x 66	=	673.20
	Sub Total: 23641.30		
(5) Total	Total = 23641.30x1.05		24823.37
6. Pipe			(m)
Φ2500 Precast Concrete Pipe			
	L = 100.50 m		100.50
7. Wooden pile			
Φ100 , L=4.50 m	3.46x26.80	= 92.37	
25 pile/m²	3.86x69.00	= 266.34	
	(4.10+8.10)x1/2x10.00	= 61	
	Total : 420.07		
	420.07x25	= 10502	
	Total length : 10502 x 4.5	=	47259.00
8. Embankment			
	((5.00+10.10)x1/2x1.70-(3.00²x3.1416/4x1/2-		
	- 0.33x3.0))x69.00	=	710.18

Item	Calculation		Quantity
9. Rip Rap	((20.0+11.0)x1/2x15.00-(4.10+8.10)x		
	x1/2x9.00)x0.50	=	88.80
10. Exspansion Material			
(1) Elastic Joint Filter (t=20 mm, Formed Polyethylene)			(m^2)
	(1.93x2+3.46)x3.20	=	23.42
(2) Sealing (t=20 mm)			(m)
	(1.93x2+3.46)x2	=	14.64
11. Exspansion Joint			(m)
(1) Water Stop			
	(1.68x2+3.36)x3	=	20.16
(2) Elastic Joint Filter (t=20, Formed Polyethylene)			
	(3.86x1.93-2.86^{2}x3.1416x1/2)x3	=	12.72
(3) Sealing (t=20)			
	(1.93x2+3.86+2.86x3.1416x1/2)x3	=	36.63

HO CHI MINH CITY WATER ENVIRONMENT IMPROVEMENT PROJECT PACKAGE E WASTEWATER TREATMENT PLANT

Table E.3.19 BILL OF QUANTIES

ITEM NO.	DESCRIPTION	UNIT	Q'ty	CULCULATION BASE
111	Main gate posts (2 Posts in 1 set) 565 x 450 x H 2500, Steel reinforced concrete	No.	2	Quantities refer to the layout plan Quantities refer to the layout plan (PE-WWTP-252-01)
112	Sliding gate door (Type-2) H 2000 x W 500 x L 5650, Steel 50 x 50 framed door with wheels on bottom (Both sides sliding door), Railway included	No.	4	Quantities refer to the layout plan Quantities refer to the layout plan (PE-WWTP-252-01)
113	Swing door with reinforced concrete column H 2000 x W 1300 Steel 50 x 50 framed door H 2500 X W 335 x 335 concrete end column	No.	1	Quantities refer to the layout plan Quantities refer to the layout plan (PE-WWTP-252-01)
114	Grid fence Type-A, (Steel fence and column) H 2200 x 3000 Span, Steel bar with base trim H 2500 X W 335 x 220 Reinforced concrete column, H 2500 X W 335 x 335 reinforced concrete end column	m	125.62	(40.49+34.43+50.70)=125.62m Quantities refer to the layout plan (PE-WWTP-252-01)
115	Wire netfenceType-B, (Steel wire net and column), H 2500 x 3000 Span net fence with 200 x 200 X H 2200 concrete column Barbed wires on fence top.	m	1,497.91	Quantities refer to the layout plan (PE-WWTP-251-01)
211	Tree planting: Cassia fistula: H=3.0m, Stem dia. in 1.2m D=0.03m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	66	(7+7+5+7+9+2+4+8+3)=66 Quantities refer to the layout plan (PE-WWTP-251-01)
212	Tree planting: Khaya senegalensis H=3.0m, Stem dia. in 1.2m D=0.05m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	8	Quantities refer to the layout plan (PE-WWTP-251-01)
213	Tree planting: Lagerstroemia reginae (=Lagaestroemia speciosa) H=4.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.45m, with tripod type with pole support.	No.	47	(18+22+4+3)=47 Quantities refer to the layout plan (PE-WWTP-251-01)
214	Tree planting: Mangifera indica H=3.0m, Stem dia. in 1.2m D=0.05m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	15	(3+4+2+3+3)=15 Quantities refer to the layout plan (PE-WWTP-251-01)
215	Tree planting: Melaleuca leucadendra H=3.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	20	(16+4)=20 Quantities refer to the layout plan (PE-WWTP-251-01)
216	Tree planting: Mimusops elengi H=4.0m, Stem dia. in 1.2m D=0.04m, Root ball	No.	32	(10+10+4+8)=32 Quantities refer to the layout plan (PE-WWTP-251-01)

HO CHI MINH CITY WATER ENVIRONMENT IMPROVEMENT PROJECT PACKAGE E WASTEWATER TREATMENT PLANT

Table E.3.19 BILL OF QUANTIES

ITEM NO.	DESCRIPTION	UNIT	Q'ty	CULCULATION BASE
	dia. D=0.45m, with tripod type with pole support.			
217	Tree planting: Plumeria rubra H=3.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	4	(4+4+2)=8 Quantities refer to the layout plan (PE-WWTP-251-01)
218	Tree planting: Polyalthia longifolia H=3.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	22	(4+18)=22 Quantities refer to the layout plan (PE-WWTP-251-01)
219	Tree planting: Tamarindus indica H=3.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	8	Quantities refer to the layout plan (PE-WWTP-251-01)
220	Tree planting: Terminalia catapa H=3.0m, Stem dia. in 1.2m D=0.04m, Root ball dia. D=0.4m, with tripod type with pole support.	No.	12	(7+5)=12 Quantities refer to the layout plan (PE-WWTP-251-01)
230	Palm planting: Cocos nucifera H=1.5m,	No.	63	(4+4+5+11+3+5+7+11+6+5+2)=63 Quantities refer to the layout plan (PE-WWTP-251-01)
231	Palm planting: Roystonea regia H=2.5m, Stem dia. in 1.2m D=0.15m, Root ball dia. D=0.45m, with tripod type support.	No.	6	Quantities refer to the layout plan (PE-WWTP-251-01)
232	Shrub planting: Bauhinia purpurea H=1.0m, Stem dia. in 1.2m D=0.01m,	No.	89	Quantities refer to the layout plan (PE-WWTP-251-01)
233	Shrub planting: Thevetia peruviana (=Cerbera peruviana) H=1.0m, Stem dia. in 1.2m D=0.01m,	No.	76	Quantities refer to the layout plan (PE-WWTP-251-01)
234	Shrub planting: Hibiscus rosa-sinensis H=0.4m, Crown dia .D=0.25m 10Nos./m2 Group planting	m2	180	Quantities refer to the layout plan (PE-WWTP-252-01)
235	Shrub planting: Ixora coccina (=Ixora chinensis) H=0.4m, Crown dia .D=0.25m 10Nos./m2 Group planting	m2	6	(3+3)=6 Quantities refer to the layout plan (PE-WWTP-252-01)
236	Shrub planting: Lantana camara H=0.4m, Crown dia .D=0.25m 10Nos./m2 Group planting	m2	36	(18+18)=36 Quantities refer to the layout plan (PE-WWTP-252-01)
237	Shrub planting: Musaenda pubescens	m2	54	(24+24+6)=54

HO CHI MINH CITY WATER ENVIRONMENT IMPROVEMENT PROJECT PACKAGE E WASTEWATER TREATMENT PLANT

Table E.3.19 BILL OF QUANTIES

ITEM NO.	DESCRIPTION	UNIT	Q'ty	CULCULATION BASE
	H=0.4m, Crown dia .D=0.25m 10Nos./m2 Group planting			Quantities refer to the layout plan (PE-WWTP-252-01)
238	Grass sods: Axonopus compressus (Broad leafed grass)	m2	694.93	(248.50+209.01+192.42+37.00+8.00)=694.93m2 Quantities refer to the layout plan (PE-WWTP-251-01)
239	Grass sprigs: Axonopus compressus (Broad leafed grass)	m2	62,225.71	(243.08+354.71+1151.02+3454.00+35846.57+212.84 +150.50+319.75+678.6+957.95+57.7+680.5+137.21 +1027.75+2054.66+2837.37+818.00+4436.90+228.73 +61.05+43.75+264.26+80.85+341.00+192.38+292.40 +292.38+23.00+451.84+4280.21)=62405.71 Quantities refer to the layout plan (PE-WWTP-251-01)

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

Table E.3.20 QUANTITY SURVEY SHEET
ITEM: ROAD AND KERB - WASTEWATER TREATMENT PLANT

No.	Description	Unit	Length	Width	Number	Sub-Quantity	Quantity
1			2 x (5 + 10) + (3 x 3)			109.0	
2			(21 + 16)	0.50	10	185.0	
3			(17.5 + 13.5)	0.50	10	155.0	
4			(190+193)	0.50	10	1,915.0	
5			9 x 10			90.0	
6			(9 + 13)	0.50	6.5	71.5	
7			40 x 13			520.0	
8			(16 x 13)	0.50		104.0	
9			192.5 x 20			3,850.0	
10			15 x 5			75.0	
11			18 x 3			54.0	
12			2 x 15			30.0	
13			2 x 15			30.0	
14			18 x 3			54.0	
15			(7 + 16)	0.50	10	115.0	
16			(125+140)	0.50	10	1,325.0	
17			18 x 3			54.0	
18			2 x 15			30.0	
19			(12 + 7)	0.50	15	142.5	
20			(190+145)	0.50	15	2,887.5	
21			33 x 3			99.0	
22			30 x 2			60.0	
23			8 x 3			24.0	
24			5 x 3			15.0	
25			15 x 5			75.0	
26			125 x 10			1,250.0	
27			18 x 3			54.0	
28			15 x 2			30.0	
29			15 x 5			75.0	
30			15 x 5			75.0	
31			15 x 5			75.0	
32			38 x 5			190.0	
33			48 x 10			480.0	
34			25 x 5			125.0	
35			15 x 5			75.0	
36			15 x 5			75.0	
37			42 x 10			420.0	

No.	Description	Unit	Length	Width	Number	Sub-Quantity	Quantity
38			5 x 3			15.0	
39			5 x 3			15.0	
40			17 x 5			85.0	
41			22 x 5			110.0	
42			23 x 5			115.0	
43			70 x 22			1,540.0	
44			5 x 5			25.0	
45			5 x 15			75.0	
46						12.5	
47			22 x 10			220.0	
48			22 x 3			66.0	
49			11 x 100			1,100.0	
50			8.5 x 20			170.0	
51			3 x 3			9.0	
52			137 x 20			2,740.0	
53			40 x 20			800.0	
54			(5 x 5)		4	100.0	
55			10 x 40			400.0	
56			17 x 10			170.0	
57			(5 x 5)		2	50.0	
58			5 x 5			25.0	
59			8.5 x 40			340.0	
60			5 x 15			75.0	
51			5 x 15			75.0	
62			5 x 15			75.0	
63			21 x 10			210.0	
64			10 x 61			610.0	
65			25 x 5			125.0	
66			12 x 10			120.0	
67			75 x 10			750.0	
68			5 x 20			100.0	
69			(5 x 5)		2	50.0	
70			373 x 10			3,730.0	
71			37 x 2			74.0	
72			34 x 10			340.0	
73			237 x 10			2,370.0	
74			80 x 5			400.0	
75			26 x 20			520.0	
76			26 x 10			260.0	
77			135 x 10			1,350.0	
78			149 x 10			1,490.0	
79			124 x 10			1,240.0	

No.	Description	Unit	Length	Width	Number	Sub-Quantity	Quantity
80			(5 x 5)		7	175.0	
	ROAD Pavement		37221 m2				
	Car Parking		120 x 7 = 840 m2				
	Kerb		5097 m				

Table E.3.21. VOLUME FORECAST TABLE
CONSTRUCTION : TAC RO BRIDGE

I- THE PIER

Supplying 40x40cm precast reinforced concrete piles (12m/segment)		
24 piles x 3 segments x 4 piers =	288	piles
Producing & installing pile connector box		
- Shape steel L100x100x10mm		
0.2m x 8 segments x 17.9 kg/m x 192 boxes =	5498.88	Tonne
-12mm thick plate		
(0.012m x 0.405m x 0.9m x 4) + (0.012 x 0.405m x 0.405m) x 7.85 x192 =	29.33659	Tonne
Driving skew 40x40cm reinforced concrete piles		
18 piles x 3 segments x 12m x 4 piers =	2592	m
Driving straight 40x40cm reinforced concrete piles		
6 piles x 3 segments x 12m x 4 piers =	864	m
Shipping pile head		
288 piles x 1m x 0.4m x 0.4m =	46.08	m^3
4x6cm gravel M100 concrete wedge layer for the foundation hole		
[(8.4m x 2.7m) + (2.7m x 2.7m x pi/4)] x 0.2m x 4 piers =	22.72444	m^3
1x2cm gravel M250 concrete for the pier		
- Pier T1 and T4		
{(0.5m x 10m) + [(6.5m + 10m) / 2 x 0.7m] x 1m x 2 piers} =	21.55	
2.176m x 1m x 1m x 2 columns x 2 piers =	8.704	
(8.4m x 2.7m) + (2.7m x 2.7m x pi/4) x 1.2m x 2 piers =	68.17333	
	98.42733	m3
- Pier 2 and 3		
(0.5m x 10m +(6.5m + 10m)/2 x 0.7m) x 1m x 2 piers =	21.55	
1.2m x 1m x 1m x 2columns x 2piers =	4.8	
(6.5m x 1.2m + 1.2m x 1.2m x pi/4) x 2.677m x 2 piers =	47.81643	
(8.4m x 2.7m + 2.7m x 2.7m x pi/4) x 1.2m x 2 piers =	68.17333	
	142.3398	m3

Producing and setting up D<=18mm reinforcement for the pier	9104.08	
Producing and setting up D>18mm reinforcement for the pier	6910.732	
Producing and setting up D<=10mm reinforcement for the pier		
Form for the pier		
- piers 1&4		
((0.5m x 10m +(6.5m + 10m)/2 x 0.7m) x 2 +0.5m x 1m x 2 +		
1.884m x 1m x 2 + 4.7m x 1m) x 2piers =	41.2596	
2.176m x 1m x 4 x 2columns x 2piers =	34.816	
(8.4m x 2 + 2.7m x pi) x 1.4m x 2piers =	70.79044	
	146.866	m2

- piers 2&3			
	((0.5m x 10m +(6.5m + 10m)/2 x 0.7m) x 2 +0.5m x 1m x 2 +		
	1.884m x 1m x 2 + 4.7m x 1m) x 2piers =	80.5192	
	1.2m x 1m x 4 x 2columns x 2piers =	19.2	
	(6.5m x 2 + 1.2m x pi) x 2.677m x 2 piers =	89.7861	
	(8.4m x 2 + 2.7m x pi) x 1.4m x 2piers =	70.79044	
		260.2957	m2
M75 mortar used to make slope			
	(0.01m + 0.02m)/2 x (1mx 10m -0.6m x 0.88mx 10) x 4piers =	0.2832	m3
	Transfer to the equivalent thickness 2cm:	14.16	m2
Driving test for 4 piers			
Water aspring pump for foundation hole of piers (estimate)			
	4piers x 10shifts =	40	shifts

II- THE ABUTMENT

Supplying 40x40cm precast reinforced concrete piles (12m/segment)			
	20piles x 3segments x 2 abutments =	120	cycles
Carrying piles to the site (distance 60 km)			
Driving test for 4 abutments			
Producing & installing pile connector box			
- Shape steel L100x100x10			
	0.2m x 8segments x 17,9kg/m x 80 boxs =	2291.2	kg
- Plate, thickness 12 mm			
	(0.012m x 0.405m x 0.9m x4 + 0.012mx 0.405mx 0.405m) x 7,85 x 80 =	12.22358	tonne
Unloading piles (from the truck down to the site)			
Driving skew 40x40cm reinforced concrete piles (coeficient = 1.2)			
	13piles x 3segments x 12m x 2 abutments=	936	m
Driving straight 40x40cm reinforced concrete piles			
	7piles x 3segment x 12m x 2abutments=	504	m
Shipping the pile head			
	120 piles x 1m x 0.4m x 0.4m =	19.2	m3
4x6cm gravel M100 concrete wedge layer for the foundation hole			
	2.7m x 10.2m x 0.1m x 2abutments=	5.508	m3
4x6cm gravel wedge layer for the foundation hole			
	2.7m x 10.2m x 0.1m x 2abuments=	5.508	m3
1x2cm gravel M 250 concrete of the abutment			
- Abutment A =		#REF!	
- Abutment B =		#REF!	
		#REF!	m3
Form of the abutment			
- Abutment B =			
Body :	4.264m x 10m x 2sides =	85.28	
Platform:	(10m x 1.2m + 2.5m x 1.2) x 2 =	30	

Wall :	(1m + 3.135m)/2 x 3mx 4sides + 1m x 0.2m x 2sides +		
	3.6m x 0.25m x 2sides =	27.01	
		142.29	m2
- Abutment A =			
Body :	3.264m x 10m x 2sides =	65.28	
Platform:	(10m x 1.2m + 2.5m x 1.2) x 2 =	30	
Wall :	(1m + 3.135m)/2 x 3mx 4sides + 1m x 0.2m x 2sides +		
	3.6m x 0.25m x 2sides =	27.01	
		122.29	m2
M75 mortar used to make slope			
	(0.01m + 0.018m)/2 x (0.4mx 10m -0.4m x 0.6mx 10) x 2abutments =	0.0448	m3
	Transfer to the equivalent thickness 2cm:	2.24	m2
Producing and setting up D<=10mm reinforcement for the pier		525.45	kg
Producing and setting up D<=18mm reinforcement for the pier		5266.76	kg
Producing and setting up D>18mm reinforcement for the pier		1363.39	kg
Excavation (cutting) to make foundation hole			
	10.2m x 2.7m x 1.7m x 1.5 x 2abutments=	140.454	m3
Filling foundation hole with sand after the concrete work			
	140.454 m3 - (10mx 2.5m x 1.2m) x 2 - (10.2m x 2.7m x 0.2m) x 2 =	69.438	m3
Driving wooden pile to stabilize the foundation slope			
- Abutment A =			
	1.6m x 10m + 5.4m^2 x pi/2 + 2m x5.4m x 2 +		
	(5.4mx pi +2mx 2)x 1m =	104.369	m2
- Abutment B =			
	2.8m x 10m + 6.3m^2 x pi/2 + 2m x 6.3m x 2 +		
	(6.3mx pi +2m + 5m)x 1m =	142.3369	m2
		246.706	m2
Number of wooden pile stabilized in front of the butment and slope :			
	246.706 m2 x 25piles/m2 =	6167.649	piles
	Equivalent	27754.42	m
4x6cm gravel wedge layer for the slope			
- Abutment A =			
	2.4m x 10m + (5.4m+1m) x pi x 5.6m/2 + (2m + 5m) 5.6m		
	1.5m x (3m + 3m) =	128.4973	m2
- Abutment B =			
	3.5m x 10m + (6.3m+1m) x pi x 6.5m/2 + (2m + 5m) 6.5m +		
	1.5m x (3m + 6m) =	168.5343	m2
		297.0316	m2
Weight of gravel :	297.0316 m2 x 0.1m =	29.70316	m3
Wedge mortar on the gravel layer thickness 5cm		297.0316	m2
Cobble with M100 mortar			

297.03 m2 x 0.2m =	59.40633	m3
M250 concrete for the embankment toe		
- Abutment A =		
0.5m x 0.7m x (5.4mx pi +2mx 2 +10m) =	10.83761	
- Abutment B =		
0.5m x 0.7m x (6.3mx pi +2m + 5m +10m) =	12.87721	
	23.71482	m3
Water aspring pump for foundation hole (estimate)		
2abutments x 10shifts =	20	shifts

III. THE BEAM, FLOOR SLAP, HAND RAIL, DRAINAGE, PREFORMED JOINT

Supplying 20m pretensioned beam		
10beams x 5spans =	50	piles
Carrying beams to the site (distance 60 km)	50	piles
Supplying elastomatric bearing		
10beams x 2bearings x 5spans =	100	bearings
Unloading beams (from the truck down to the site ground)	50	piles
Launching (by sliding) the beam		
20m x 10beams x 5spans =	1000	m
Producing and setting up D<=10mm reinforcement	1691.564	kg
Producing and setting up D<=18mm reinforcement	28235.55	kg
Producing and setting up D>18mm reinforcement		
Producing steel elements of hand rail		
(0.24m x 0.14m x 0.01m +0.24m x 0.14m x 0.003m) x 120bo x 7.85t/m3 =	0.411466	tonne
(0.25mx 0.15m x 0.01mx 2 + 0.25m x 0.094mx 0.01m) x120bo x 7.85t/m3 =	0.92787	tonne
	1.339336	tonne
Producing 3mm thick zinc-plated round steel tube of hand rail		
(0.114m^2 - 0.108m^2) x pi /4 x 0.2m x 7.85t/m3 x 120tubes =	0.197095	
(0.106m^2 - 0.100m^2) x pi /4 x 2.5m x 7.85t/m3 x 80tubes =	1.524081	
	1.721176	tonne
Supplying d=20mm & 15cm long anchor bolt of hand rail		
4bolts x 120 =	480	bolts
Installing zinc-plated d=100mm drain-pipe		
0.7m x 40 holes =	28	m
1x2cm gravel M250 concrete for hand rail (casted in place)		
(0.2mx 0.9m + 0.225mx 0.05m + (0.2m + 0.344m)/2 x 0.295m		
+ 0,285m x 0,085m) x 200m =	59.143	m3
Steel form for hand rail		
(0.435m + 0,600m+ 0.23m + 0.34m+ 0.2m) x 5mx 40segments =	361	m2
1x2cm gravel M300 concrete for floor slap		
(0.1m x 0.5m x 2 + (0.1m+ 0.19m)/2 x 9m) x 20m x 5spans =	140.5	
((5m x 0.09m)/2 x 20m)/2 + 0.5m x 0.2m x 0.4m x 6 =	2.49	

		142.99	m3
Plywood for floor slap			
	(20m x 0.35m + 10m x 0.65m) x 2 x 5spans =	135	m2
Painting the hand rail with quicklime (3 layers)		361	m2
	(0.256m + 0.288m+0.35m + 0.25m+ 0.2m+ 0.2m) x 5mx 40segments =	307.6	m2
Sprinkling the floor slap with 0.8kg/m^2 cut-back bitumen			
	20m x 9m x 5 spans =	900	m2
Sprinkling the floor slap with 5cm thick fine asphalt concrete			
	20m x 9m x 5 spans =	900	m2
Bolts for fixing the light post, d=22mm, length 50cm			
	6piers x 4 bolts =	24	bolts
Installing PVC pipe for the light post			
	0.5m x 6piers =	3	m
Supplying joint			
	9m x 6 expansions =	54	m
VI. THE TRANSITION SLAP & THE APPROACH ROADWAY			
1x2 gravel M250 concrete for the transition slap			
	2m x 4m x 0.3m x 10ban + 2.9m x 2.1m x 0.3m + 0.4m x 0.4mx 22.1m=	29.363	m3
Plywood for the transition slap			
	0.3m x (10m+12.1m+1m+1m+1m +1.8m) +0.4m x(0.4mx2 + 22.1mx2) =	26.07	m2
Producing and setting up D>18mm reinforcement		1182.35	kg
Producing and setting up D<=18mm reinforcement		3653.31	kg
Producing and setting up D<=10mm reinforcement		72.54	kg
20cm thick-0x4cm gravel wedge layer under the transition slap			
	2m x 4m x 0.2m x 10ban + 2.9m x 2.1m x 0.2m =	17.218	m3
Sprinkling the surface of the transition slap with 0.8kg/m^2 cut-back bitumen			
	2m x 4m x 10ban + 2.9m x 2.1m =	86.09	m2
Sprinkling the surface of the transition slap with avarage 5cm thick fine asphalt concrete			
	(2m x 4m x 10slaps + 2.9m x 2.1m) x 0.07m/0.05m =	120.526	m2
Supplying geotextile (type PEC 100 solitary direction)			
	8.5m x 10m x 5 layers +8.5m x 10m x 6 layers =	935	m2
4x6cm gravel for the bearing of the trasition slap			
	(0.7m + 1.7m)/2 x 0.5m x 22m + 0,3m x 10m x 7m x 2abutments =	55.2	m3
M250 concrete for the marker post			
	0.12m x 0.12m x 1.2m x 26 posts =	0.44928	m3
Reinforcement of the marker post			
Producing and setting up D<=18mm reinforcement			
Producing and setting up D<=10mm reinforcement			
Plywood for the marker post			
	0.12m x 4 x 1.2m x 26 posts =	14.976	m2
Painting the marker post with paint (3 layers)			
	0.12m x 4 x 0.8m x 26 posts =	9.984	m2

V. THE CLAMPING FRAME FOR DRIVING THE PILE

Producing location frame

Driving shap pile I 450 = 12piles x 18m x 12times 2592 mlong

Extracting shape pile I450 = 2592 mlong

Weight of shape steel of a set of the location frame (precasted 5% of producing miner members) :

Shape steel pile I450 = 18m x 12 piles x 65,2kg/m x 1,05 =	14787.36	kg	(1)
Steel beam I450 =14m x 6 beams x 65,2kg/m x 1,05 =	5750.64	kg	(2)
Steel beam I450 = 8m x 6 beams x 65,2kg/m x 1,05 =	3286.08	kg	(3)
Steel beam U300 = 9m x 24 beams x 31,8kg/m x 1,05 =	7212.24	kg	(4)
Steel beam U300 = 8m x 6beams x 31,8kg/m x 1,05 =	1602.72	kg	(5)
Steel beam U300 = 2m x 6 beams x 31,8kg/m x 1,05 =	400.68	kg	(6)
	33039.72	kg	

Installing and uninstalling location frame

33039.72 kg x 4 piers = 132158.9 kg

Driving piles for the location frame

18m x 12piles x 4 piers = 864 m

Extracting piles of the location frame

18m x 12piles x 4 piers = 864 m

Driving sheet piles to prevent water for executing the pier

12m x 80piles x 4 times = 3840 m

Extracting sheet piles

12m x 80piles x 4 times = 3840 m

VI. THE TEMPORARY ROAD FOR EXECUTING THE 2 ABUTMENTS

Filling subgrade of the temporary road with sand

(6m +7.5m)/2 x 45mx 1.5m - 5.5m x 0.3m x 45m = 381.375 m3

30cm red gravel soil pavement

5.5m x 0.3m x 45m = 74.25 m3

Supplying sand sack

(381.3m3 - 1.2m x 5m x 45m)/(0.2m x 0.6mx 0.4m) = 1006.25 sacks

VI. THE WATERWAY COMMUNICATION ASSURANCE

Setting up buoys, signs 1 (all)

4. OTHER WORKS

CALULATION SHEET FOR B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME (CONNECTION PIPE)

Item	Calculation		Quantity
1. Reinforced Concrete (Concrete type E)			(m³)
	(1.75x3.50-2.50²x3.1416x1/2)x61.60	=	226.20
	Total		226.20
2. Forming			(m²)
	1.75x61.60x2	=	215.60
	Total		215.60
3. Leveling Concrete (Concrete type G)			(m³)
	3.10x61.60x0.10	=	22.79
	Total		22.79
4. Sand			(m³)
	3.70x61.60x0.20	=	45.58
	Total		45.58
5. Reinforcement			(kg)
D14	((0.36+1.61)x2x247)x1.21	=	1177.55
D14	3.36x247x1.21	=	1004.20
D14	(0.36x2+3.36)x247x1.21	=	1219.39
D14	1.0x2x247x1.21	=	597.74
D12	63.56x48x0.888	=	2709.18
	Sub Total		6708.06
	6708.06x1.05	=	7043.46
	Total		7043.46
6. Wooden pile			(m)
Φ100 , L=4.50 m	3.50x61.60	=	215.6 m²
25 pile/m²			
	215.6x25	=	5390 piles
	Total length : 5390 x 4.5	=	24255.00
7. Pipe			(kg)
Steel Pipe	67.00-1.50x2	=	64.00 m
Φ2500 , t=18 mm	64.00x1120	=	71680.00
	Total		71680.00
8. Flexible Joint			(Units)
Φ2500 , Allowable Displacement 200 mm			
	n = 2 units		2.00

TABLE (1/2)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME(GRATING COVER)

Item			Calculation		Quantity
	Grating Quantity				
		1. Grating (Weight)			
			1.10 m x 1.10 m x 29 x 34 kg/m2	=	1193.06
			1.10 x 1.60 x 1 x 34	=	59.84
			0.50 x 0.30 x 384 x 27	=	1555.20
			1.40 x 1.90 x 2 x 34	=	180.88
			2.10 x 2.10 x 2 x 43	=	379.26
			2.60 x 2.60 x 1 x 64	=	432.64
			2.10 x 2.20 x 1 x 43	=	198.66
			2.10 x 4.10 x 1 x 43	=	370.23
			1.60 x 7.00 x 1 x 37	=	414.40
			0.50 x 0.40 x 340 x 27	=	1836.00
			1.10 x 1.10 x 3 x 34	=	123.42
			0.90 x 2.10 x 34	=	64.26
			0.90 x 2.60 x 34	=	79.56
			Total 6887.41		kg
			6887.41 x 1.03	=	7094.03
		2.Bearer Plate Area			m2
			(1.10+1.00) x 2 x (0.06+0.025)	=	10.35
			(1.10+1.50) x 2 x (0.06+0.025)	=	0.44
			0.50 x 2 x (0.06+0.025) x 384	=	32.64
			(1.40+1.80) x 2 x (0.06+0.032)	=	1.18
			(2.10+2.00) x 2 x (0.06+0.038)	=	1.61
			(2.60+2.50) x 2 x (0.06+0.044)	=	1.06
			(2.10+2.10) x 2 x (0.06+0.038)	=	0.82
			(2.10+4.00) x 2 x (0.06+0.038)	=	1.20
			7.00 x 2 x (0.06+0.032) x 1	=	1.29
			0.50 x 2 x (0.06+0.025) x 340	=	28.90
			(1.10+1.00) x 2 x (0.06+0.025)	=	1.07
			(0.90+2.00) x 2 x (0.06+0.025)	=	0.49
			(0.90+2.50) x 2 x (0.06+0.025)	=	0.58
			Total		81.63
			t = 4.5 mm		
			w = 81.63 m2 x 0.0045 x 7850 kg/m3		
			= 2883.58 kg		
					kg
			2883.58 x 1.03	=	2970.09

TABLE (2/2)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME(GRATING COVER)

Item	Calculation	Quantity
3. Anchor Bar		
	D 14 mm l =150 mm	
	(3+3) x 2 x 29 = 348	
	(3+4) x 2 x 1 = 14	
	2 x 384 x 2 = 1536	
	(4+4) x 2 x 2 = 32	
	(5+5) x 2 x 2 = 40	
	(6+6) x 2 x 1 = 24	
	(5+5) x 2 x 1 = 20	
	(5+9) x 2 x 1 = 28	
	15 x 2 x 1 = 30	
	2 x 340 x 2 = 1360	
	(3+3) x 2 x 3 = 36	
	(3+5) x 2 = 16	
	(3+6) x 2 = 18	
	Total 3502	
	3502 x 0.15m x 1.210 kg/m	
	= 635.61 kg	
		kg
	635.61 x 1.03 =	654.68
	Plate and Bar Total	
		kg
	2970.09 + 654.68 =	3624.77
	All Total	
		kg
	7094.03 + 3624.77 =	10718.80

TABLE (1/3)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME(CONCRETE COVER)

Item	Calculation	Quantity
Concrete Cover		
1. Concrete		
	1.10 x 0.40 x 0.04 x 70= 1.23	
	1.00 x 0.50 x 0.04 x 40= 0.80	
	1.10 x 0.50 x 0.04 x 1773= 39.01	
	1.60 x 0.40 x 0.05 x 100= 3.20	
	0.80 x 0.50 x 0.04 x 324= 5.18	
	0.60 x 0.50 x 0.04 x 1620= 19.44	
	2.10 x 0.50 x 0.06 x 717= 45.17	
	2.60 x 0.50 x 0.08 x 12= 1.25	
	1.60 x 0.50 x 0.05 x 374= 14.96	
	Total 130.24	
	130.24 x 1.03 =	134.15
2.Forming		
	1.10 x 0.40 x 70 =	30.80
	(1.10+0.40) x 2 x 0.04 x 70 =	8.40
	1.00 x 0.50 x 40 =	20.00
	(1.00+0.50) x 2 x 0.04 x 40 =	4.80
	1.10 x 0.50 x 1773 =	975.15
	(1.10+0.50) x 2 x 0.04 x 1773 =	226.94
	1.60 x 0.40 x 100 =	64.00
	(1.60+0.40) x 2 x 0.05 x 100 =	20.00
	0.80 x 0.50 x 324 =	129.60
	(0.80+0.05) x 2 x 0.04 x 324 =	33.70
	0.60 x 0.50 x 1620 =	486.00
	(0.60+0.50) x 2 x 0.04 x 1620 =	142.56
	2.10 x 0.50 x 717 =	752.85
	(2.10+0.50) x 2 x 0.06 x 717 =	223.70
	2.60 x 0.50 x 12 =	15.60
	(2.60+0.50) x 2 x 0.08 x 12 =	5.95
	1.60 x 0.50 x 374 =	299.20
	(1.60+0.50) x 2 x 0.05 x 374 =	78.54
	Total	3517.79
		m^2
	3517.79 x 1.03 =	3623.32

TABLE (2/3)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME(CONCRETE COVER)

Item	Calculation		Quantity
3. Reinforcement			
	134.15 ^{m3} x 100 ^{m3} = 13415.0 ^{kg}		13415.0 ^{kg}
4. Bearer Plate			
	Area		m^2
	(1.10+2.00) x 2 x (0.06+0.04) x 14	=	8.68
	(1.00+2.25) x 2 x (0.06+0.04) x 8	=	5.20
	(1.10+108.0) x 2 x (0.06+0.04) x 2	=	43.64
	(1.10+5.00) x 2 x (0.06+0.04) x 20	=	24.40
	(1.10+113.0) x 2 x (0.06+0.04) x 1	=	22.82
	(1.10+28.25) x 2 x (0.06+0.04) x 10	=	58.70
	(1.10+29.40) x 2 x (0.06+0.04) x 2	=	12.20
	(1.10+113.0) x 2 x (0.06+0.04) x 1	=	22.82
	(1.10+1.00) x 2 x (0.06+0.04) x 1	=	0.42
	(1.10+1.60) x 2 x (0.06+0.04) x 1	=	0.54
	(1.60+2.00) x 2 x (0.06+0.05) x 20	=	15.84
	(0.80+4.60) x 2 x (0.06+0.04) x 36	=	38.88
	(0.60+13.70) x 2 x (0.06+0.04) x 20	=	57.20
	(0.60+13.50) x 2 x (0.06+0.04) x 40	=	112.80
	(2.10+29.50) x 2 x (0.06+0.06) x 4	=	30.34
	(2.10+5.00) x 2 x (0.06+0.06) x 20	=	34.08
	(2.10+141.5) x 2 x (0.06+0.06) x 1	=	34.46
	(2.60+3.00) x 2 x (0.06+0.08) x 2	=	3.14
	(1.60+94.2) x 2 x (0.06+0.05) x 2	=	42.15
			m^2
	Total		568.31
	t = 4.5 ^{mm}		
	w = 568.31 ^{m2} x 0.0045 ^{m} x 7850 $^{kg/m3}$		
	= 20075.55 ^{kg}		
	20075.55 ^{kg} x 1.03	=	20677.82 ^{kg}

TABLE (3/3)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME(CONCRETE COVER)

Item	Calculation	Quantity
5.Anchor Bar		
	D 14 l = 150 mm	
	(3+5) x 2 x 14 = 224	
	(3+5) x 2 x 8 = 128	
	(3+218) x 2 x 2 = 884	
	(3+11) x 2 x 20 = 560	
	(3+228) x 2 x 1 = 462	
	(3+58) x 2 x 10 = 1220	
	(3+60) x 2 x 2 = 252	
	(3+228) x 2 x 1 = 462	
	(3+3) x 2 x 1 = 12	
	(3+4) x 2 x 1 = 14	
	(4+5) x 2 x 20 = 360	
	(2+10) x 2 x 36 = 864	
	(2+29) x 2 x 20 = 1240	
	(2+29) x 2 x 40 = 2480	
	(5+60) x 2 x 4 = 520	
	(5+11) x 2 x 20 = 640	
	(6+284) x 2 x 1 = 580	
	(6+7) x 2 x 2 = 52	
	(4+190) x 2 x 2 = 776	
	Total 11730	
	11730 x 0.15 m x 1.21 kg/m	
	= 2129.0 kg	
	2129.0 x 1.03 =	2192.87
	Plate and Bar Total	
	20677.82 + 2192.87 =	22870.69

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME (TEMPORARY WORKS)

Item	Calculation			Quantity
1. Pipe Gallary (Inlet Water Way)				
(1) Sheet pile (SPIII, L=17.0 m)			units	
	91.00 : 0.40	=	228	
	25.00 : 0.40	=	63	
	29.50 : 0.40	=	74	
	10.00 : 0.40	=	25	
	(228+63+74+25):	=	780	
	780x0.40x17.0	=	5304	
	5304 x 150	=	795600	
	Driving length			
	780 x 17.0	=	13260	
(2) H Section Steel				(kg)
(2).1 Wale				
H - 300:	(91.00+25.00+29.50+10.00)x2x2			
		=	622	
	622.00 x 93	=	57846	57846.00
(2).2 Strut				
H - 300:	7.85x2x35	=	549.5	
	549.50 x 93	=		51103.50
(2).3 Angle Brace				
H - 250:	$(1.0^2+1.0^2)^{1/2}$x(36+10+12+4)x4			
		=	350.72	
	350.72 x 71.8	=		25181.70
(2).4 H-Section Steel Total				(kg)
				134131.20
(3). Soil Improvement				(m^3)
	8.70x2.00x(91.00+25.00+29.50+10.00)	=		2705.70
2. Treatment Plant				
(Case 1) Excavation Depth H=3.20 m				
(1) Sheet pile (SPIII, L=14.00m)				
	10.00 : 0.40	=	25	
	9.00 : 0.40	=	23	
	12.00 : 0.40	=	30	
	Total : 78			
	78x0.40x14.0	=	436.8	
	436.80x 150	=	65520	
	Driving length		(m)	
	78 x 14.0		1092	
(Case 2) Excavation Depth H=4.10 m				
(1) Sheet pile (SPIII, L=10.00m)				
	114.00 : 0.40	=	285	
	285x 2	=	570	

Item	Calculation			Quantity
	570x0.40x10.0	=	2280	
	2280.00 x 150	=	342000	
	Driving length			
	570 x 10.0	=	5700	
(Case 3) Excavation Depth H=2.10 m				
(1) Sheet pile (SPIII, L=15.00m)				
	(114.00x2) : 0.40	=	570	
	3.0 : 0.40	=	8	
	11.0 : 0.40	=	28	
	9.0 : 0.40	=	23	
	10.0 : 0.40	=	25	
	Total : 654 units			
	654x0.40x15.0	=	3924	
	3924.00x 120	=	470880	
	Driving length		(m)	
	654 x 15.0	=	9810	

Table E. 4.5

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME (LIFT PUMPING STATION)

Item	Calculation			Quantity
1. Sheet Pile (SPIII, L= 33.0 m)				
	33.85/ 0.40	=	85	
	21.05/0.40	=	53	
				(units)
	(85 + 53)x2	=	276	276.00
				(m2)
	276 x 33.0 x 0.40	=		3643.20
				(kg)
	3643.20 x 150	=		546480
	Driving Length			(m)
	276 x 33.0	=		9108.00
2. H Section Steel				(kg)
2.1 Wale				
H - 300:	(20.80x2+33.60x2)x2	=	217.6	
	217.6 x 93	=		20236.80
H - 350:	(20.80x2+19.00x2)x2	=	79.6	
	79.6 x 135	=		10746.00
2.2 Strut				
H - 300:	(11.70x2+20.20x4)x2	=	208.4	
	(23.50x2+33.0x2)x2	=	226	
	(18.20x4+20.10x3)	=	133.1	
	Total: 567.50			
	567.50 x 93	=		52777.50
2.3 Angle Brace				
H - 250:	$(1.0^2+1.0^2)^{1/2}$x(44x2+32)	=	169.7	
	169.70 x 71.8	=		12184.00
2.4 H piles				
H - 300:	(10.0x4+11.0x4+13.0x12)	=	240	
	240.0 x 93	=		22320.00
2.5 H - Section Steel Total				(kg)
				118264.30
3. Soil Improvement				(m^3)
	(33.85x21.05-9.50x8.50)x3	=		1895.38

Project: HCMC Water Environment Improvement
Item: Wastewater Treatment Plant

QUANTITY SURVEY SHEET
ITEM: BALUSTRADE - WASTEWATER TREATMENT PLANT

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
		BALUSTRADE	kg						88,864.53
		Handrail post							
		50 x 50 x 3.2							
		@ 5.024 kg/m		2064	1.15		5.024	11,924.97	
		L - 50 x 50 x 3.2							
		@ 2.512kg/m		2024	0.20		2.512	1,016.86	
		PL 150x150x3.2							
		@0.565kg/m		40			0.565	22.60	
		Bolt 12mm nut and head							
		@ 0.15 kg/m		2024			0.150	309.90	
		Bolt sus - 304		4x40			0.150	24.00	
		Guard Pipe							
		25 x 25 x 1.6							
		@ 1.256 kg/m		28446	1.00		1.256	35,728.18	
		Handrail							
		50 x 50 x 3.2							
		@ 5.024 kg/m		2x1	22.40		5.024	225.07	
		Top and Bottom		2x2	98.00		5.024	1,969.41	
		Rail		2x1	267.00		5.024	2,682.82	
				2x1	163.00		5.024	1,637.83	
				2x18	25.80		5.024	4,666.29	
				2x2	21.10		5.024	424.03	
				2x1	195.25		5.024	1,961.87	
				2x10	100.40		5.024	10,088.19	
				2x1	55.00		5.024	552.64	
				2x18	45.00		5.024	8,138.88	
				2x2	43.40		5.024	872.17	
				2x1	119.45		5.024	1,200.24	
				2x6	2.20		5.024	132.64	
				2x1	38.00		5.024	381.83	
				2x1	43.00		5.024	432.67	
				2x1	6.10		5.024	61.29	
				2x1	292.76		5.024	2,941.65	
				2x20	3.70		5.024	743.55	
				2x20	3.70		5.024	743.55	

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME ( )

Item	Calculation		Quantity
Balustlad (Civil Part)			
1. Main Building			(m)
	(4.30+5.30)x2	=	19.20
2. Blower Building			
	5.40x2+1.80	=	12.60
3. Dewatering Building			
	4.20+1.20+1.20+1.60+4.80	=	13.00
4. Water Supply Facility			
	1.50+11.90	=	13.40
	2.70+1.70x3+3.10x4	=	18.70
5. Compost Plant			
	(1.60+5.00+4.50x2)x2	=	31.20
	2.20x2x2	=	8.80
	Total		116.90
	* Treatment Plant and Disinfection Tank		
			(m)
	Total		3980.71

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME ( )

Item	Calculation			Quantity
Bulastlade Quantity Calculation				
(1) For Flat Slab Type	For 2 m length			
	50x50 (t=3.2 mm)			
	(2.00x2+1.20)x4.50	=	23.4	
	25x25 (t=1.6 mm)			
	1.00x13x1.28	=	16.64	
			(kg)	
		Total:	40.04	
	40.04x1.05	=	42	
				(kg/m)
	For 1 m : 42.0/2.0	=		21.00
(2) For Stair type				
	For 1.50 m length (Slant length 1.80 m)			
	50x50 (t=3.2 mm)			
	(1.80x2+1.20)x4.50	=	20.7	
	25x25 (t=1.6 mm)			
	(0.80x11)x1.28	=	11.26	
			(kg)	
		Total:	31.96	
	31.96x1.05	=	33.56	
				(kg/m)
	For 1 m : 33.56/1.50	=		22.40
	(For Slant length 1.0 m)			
			(kg/m)	
	33.56/1.80	=	18.6	
	Weight			(kg)
	21.0x33.2+18.6x42.5	=		1487.70

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME ( )

Item	Calculation			Quantity
Forming for Leveling Concrete				m^2
1. Lift Pumping Sation				
	17.0+14.0x2+3.0x2+14.0x2+25.0+9.5x2+17.45x2			
	+14.0x2+12.5x2+3.9x2	=	218.7	
	218.7 x 0.10	=	21.78	21.78
2. Treatment plant				
	100.0x2+128.0x2+114.0+55.5x14 +(10.0+29.5			
	+23.0) x 4	=	1597	
	1597 x 0.10	=	159.7	159.70
3. Disinfection Tank				
	22.5x2+34.4+(61.6+3.7)x2	=	210	
	210.0 x 0.10	=	21	21.00
4. Water Supply Facility				
	20.5x2+60.5x2	=	162	
	162.0 x 0.10	=		16.20
5. Effluent Pipe				
	109.0 x 0.10	=		10.90
6.Pipe gallery				
	(58.6+69.5+8.0+43.6+17.5+27.55+22.2+23.1)x2			
	+9.40x10+5.80x2+4.90x4	=	664.4	
	664.4 x 0.10	=		66.44
7.Main building				
	48.8+40.0+3.5x2+9.35x4+40.80+9.40x2			
		=	192.8	
	192.8 x 0.10	=		19.28
8.Blower Building				
	(72.8+25.6)x2	=	196.8	
	196.8 x 0.10	=		19.68
9.Dewatering Building				
	79.75x2+27.0x2+66.7+18.7+1.70x2			
		=	302.3	
	302.3 x 0.10	=		30.23
10.Gravity Thickener				
	15.6xpi()x2/3+10.0x2+13.20	=	65.86	
	65.86 x 0.10	=		6.59

Item	Calculation			Quantity
11.Fermenting Vessel				
	89.8x4+46.8x2+2.70x2+1.70x2+2.50x2x1.50x2			
		=	469.6	
	(30.0+140.0)x2	=	340	
	469.6 x 0.10 +340.0 x 0.05	=		63.96
12.Deodrizing Soil Filter				
	(42.60+10.60)x2+3.30x2+4.60	=	117.6	
	117.6 x 0.10	=		11.76
12.Weigh Bridge				
	13.9x2+3.9x6	=	51.2	
	51.2x0.05	=		2.56

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)
FACILITY NAME (WASTE WATER TREATMENT PLANT)

Item	Calculation	Quantity
Buffle Wall ϕ 150 mm VU Pipe		
1. Primary Sedimentation Tank		
	(15x20)x10x2 = 6000	
2. Final Sedimentaion Tank	(18x20)x10x2 = 7200	
	Total : 13200	
		(m)
	13200x0.30 =	3960.00

TABLE (/)CALULATION SHEET F B/Q(THBNDT WASTEWATER TREATMENT PLANT)

FACILITY NAME ( )

Item	Calculation	Quantity
Tar Expoxy Rasin Coating		
1. Total	m^2	
(1) Lift Pumping Station	1,436	
	m^2	
(2) Inlet Water way	4320	
	m^2	
(3) Ditribution Tank	368	
	m^2	
(4) Treatment Plant	3,752	
	m^2	
(5) Gravity Thickener	540	
	m^2	
(6) Dewatering Sludge Tank	1,631	
	m^2	
	Total 12.047	
2. Inlet Water way		
	1.80 x 4 x 2 x 300.00 m = 4320 m^2	4320 m^2
3. Distribution Tank		
	m^2	
Bottom Tank	8.00 x 7.00 = 56.00	
	(8.00+7.00) x 1.80 x 2 = 54.00	
	8.00 x 7.00 - 1.50 x 450 = 50.00	
Wall	(4.30+1.50) x 2 x 6.50 = 76.00	
	1.00 x 4.30 = 4.30	
	(4.30+2.50) x 2 x 4.50 = 61.00	
	2.25 x 2.70 x 8 = 49.00	
	2.25 x 2.00 x 4 = 18.00	
	Total 368.00	368 m^2
4. Dewatering Sludge Tank	m^2	
NO.1		
Bottom	7.70 x 6.70 x 4 = 207.00	
Wall	7.70 x 3.80 x 4 = 117.00	
	6.70 x 4.10 x 8 = 220.00	
	7.70 x 4.10 x 4 = 190.00	
	(7.70 x 6.70 - 2.00^2)x4 = 190.00	
NO.2	m^2	
Bottom	15.70 x 6.70 x 2 = 211.00	
Wall	15.70 x 3.80 x 2 = 119.00	
	6.70 x 4.10 x 4 = 110.00	
	15.70 x 4.10 x 2 = 129.00	
	(15.70 x 6.7 - 2.00^2) x 2= 202.00	
	Total 1631.00	1631 m^2

QUANTITY SRVEY SHEET

Item : Sedimentation Tank. Tar Wpoxy

No.	Code	Description	Unit	Number	Length	Width	Depth	Sub-Quantity	Quantity
	Tar	Epoxy	m2						3752.3
		air pipe pit		10	6.0		3.55	213	
				10 x 2	2.0	1.00		40	
		Return Sludge Rit		10	2.4		0.5	12	
				20		5.4	1.5	162	
		Inflow water way			108	16.0		1728	
					108	6.0		648	
				10		3.0	0.5	15	
		Scum pit		.10 x 2		5.4	1.20	129.6	
		Scum water way		2 x 2	50	3.50		700	
				2 x 2		1.20	1.20	5.76	
		Main Scum pit		2		11.0	4.5	99	

WWTP Foundation for Mechanical Equipment

Package E

No.	Name	Basic Diameter (mm)			Quantity	Concrete	Forming	Mortar	Remarks
		L	W	H		M³	M²	M²	
	1. Grit chamber lift pump facility								
121	Lift pump	2400	2000	800	3	11.52	21.12	35.52	
	Subtotal					11.52	21.12	35.52	
	2. Blower facility								
211	Blower(1)	7500	3000	400	2	18	16.8	61.8	
215	Air filter	2200	700	500	2	1.54	5.8	8.88	
	Subtotal					19.54	22.6	70.68	
	3. Water treatment facility								
314	Scum pump	800	800	500	2	0.64	3.2	4.48	
315	Raw sludge pump	800	800	500	3	0.96	4.8	6.72	
317	Comminuter	800	800	500	1	0.32	1.6	2.24	
334	Scum pump	800	800	500	2	0.64	3.2	4.48	
335	Return sludge pump (25%)	1800	900	500	4	3.24	10.8	17.28	
338	Excess sludge pump	1000	1000	500	3	1.5	6	9	
340	Comminuter	800	800	500	1	0.32	1.6	2.24	
	Subtotal					7.62	31.2	46.44	
	4.Disinfection facility								
413	Sodium hypochlorite tank	2800	dia	600	2	7.39	10.55	16.7	
414	Sodium hypochlorite pump	500	500	600	3	0.45	3.6	4.35	
	Subtotal					7.84	14.15	21.05	
	5. Water supply facility								
512	Treated water supply pump (1)	1500	900	500	2	1.35	4.8	7.5	
513	Treated water strainer (1)	800	800	500	1	0.32	1.6	2.24	
516	Treated water supply pump (2)	1400	800	500	2	1.12	4.4	6.64	
517	Treated water strainer (2)	800	800	500	1	0.32	1.6	2.24	
521	Filtration supply pump	900	700	500	2	0.63	3.2	4.46	
522	Filtration supply strainer	600	600	500	2	0.36	2.4	3.12	
523	Sand Filter	500	500	300	8	0.6	4.8	6.8	4 legs per one filter
524	Filtered water supply pump	1300	800	500	2	1.04	4.2	6.28	
525	Backwash pump	1200	800	500	2	0.96	4	5.92	
526	Air wash blower	1000	800	500	2	0.8	3.6	5.2	
527	Backwash waste water pump	1000	700	500	2	0.7	3.4	4.8	
528,529	Air compressor, Dehumidifier	4500	1000	500	1	2.25	5.5	10	Shared foundation
530	Solenoid valve box	500	400	300	2	0.12	1.08	1.48	
	Subtotal					10.57	44.58	66.68	
	6. Sludge treatment facility								
613	Thickened sludge pump	800	800	500	2	0.64	3.2	4.48	
614	Thickener effluent pump	800	800	500	2	0.64	3.2	4.48	
622	Excess sludge feed pump	3500	1200	500	2	4.2	9.4	17.8	
623	Centrifugal thickenner	8400	4900	500	2	41.16	26.6	108.92	
632	Mixed sludge feed pump	2000	1200	500	2	2.4	6.4	11.2	
633	Centrifugal dehydrator	8200	4300	500	2	35.26	25	95.52	including " hopper "
636	Polymer disolution tank	3400	dia	500	2	9.07	10.68	19.75	
637	Polymer feed pump	1100	700	500	2	0.77	3.6	5.14	
638	Water supply pump unit	2200	900	500	1	0.99	3.1	5.08	
639	Air compressor	1700	600	500	2	1.02	4.6	6.64	
640	Dehumidifier	800	500	500	1	0.2	1.3	1.7	
652	Recycle flow pump	1100	1100	500	2	1.21	4.4	6.82	
	Subtotal					97.56	101.48	287.53	

	7. Compost facility								
712	Suction fan	1120	720	500	4	1.6128	7.36	10.5856	
732	Deodorization fan	1800	1300	500	2	2.34	6.2	10.88	
	Subtotal					3.95	13.56	21.47	
	Total					158.6	248.69	549.37	

WWTP Foundation for Electrical Equipment

No.	Name	Basic Diameter (mm)			Quantity	Concrete	Forming	Mortar	Remarks
		L	W	H		M³	M²	M²	
A-1	Local Control Panel	800	1000	200	116	18.56	83.52	176.32	Calculated by maximum size
A-2	22 kV Substation foundation	8500	11000	500	1	46.75	19.50	101.30	Mortar height H200 mm only
A-3									
	750 kVA Generator	4700	2100	1200	1	11.84	16.32	12.59	Mortar height H200 mm only
	1500 kVA Generator	6000	2100	2000	1	25.20	32.40	15.84	Mortar height H200 mm only
	Subtotal					37.04	48.72	28.43	
A-4	Lift PumpTR Area Foundation	8000	8000	300	1	32.00	16.00	70.40	
A	Foundation total					134.35	167.74	376.45	
B	Cinder concrete for each electric room	L	W	H	Quantity	Cinder	Forming	Mortar	
	Main Electric room	14000	20000	300	1	84.00	20.40	300.40	
	Generator Room	10000	20000	300	1	60.00	18.00	218.00	
	Lift Pump Electric Room	13300	16750	400	1	89.11	24.04	246.82	
	Watertreatment Electric Room	5700	20000	500	1	57.00	25.70	139.70	
	Chlorination Electric Room	12900	13500	500	1	87.08	26.40	200.55	
	Dewatering Electric Room	27000	10000	500	1	135.00	37.00	307.00	
	Total of Cinder Concrete					720.19		1873.47	
C	Femsing	L	W	Total		Door1	Door2		H2.3m
	22kV Substation	8500	11000	39		1	1		Door 1 : W2.4m, H2m
	Lift Pump TR	8000	8000	32		0	1		Doo2 : W1.2m, H2m
A-1	Local Control Panel Foundation	800	1000	200	10	1.60	7.20	15.20	Calculated by maximum size
A-2	22kV Substation	7700	4400	500	1	16.94	12.10	38.72	Mortar height = H200 mm only
A-3	Foundation for Generator								
	750kVA Generator	4700	2100	1200	1	11.84	16.32	12.59	Mortar height = H200 mm only
	1500kVA Generator	6000	2100	2000	1	25.20	32.40	15.84	Mortar height = H200 mm only
	Subtotal					37.04	48.72	28.43	
A	Foundation total					55.58	68.02	82.35	
B	Cinder concrete for each electric room	L	W	H	Quantity	Cinder concrete	Forming	Mortar	
	Electric Room	12000	20000	400	1	96.00	25.60	265.60	
	Control Room	6400	8100	200	1	10.37	5.80	57.64	
	Generator Room	16000	9000	400	1	57.60	20.00	164.00	
	Cinder concrete total					163.97		487.24	
C	Femsing	L	W	Total		Door1			H2.3m
	22kV Substation	7700	4000	23		1			Door1:W1.2m, H2m