CHAPTER 3 DRAINAGE FACILITIES

Quantity calculation of drainage facilities is indicated from the following page.

3.1 Drainage Facilities in Lower Pasig

3.1.1 Summary of Quantity

Summary of Quantity

BQ No.	Name of Item	Unit	Qty.
BILL No. 4 -EXCAVATION AND EARTH WORKS			
4.8/1	**Excavation for manholes and junction manholes**		
	Excavation	Cu.m	3,276.95
	Clearing and Grubbing	Sq.m.	3,575.09
4.8/1-1	**Excavation for manholes**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	2,671.49
	Clearing and Grubbing	Sq.m.	3,019.75
4.8/1-2	**Excavation for junction manholes (junction pits)**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	605.46
	Clearing and Grubbing	Sq.m.	555.34
4.8/2	**Excavation for pipe culverts**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	3,511.60
	Clearing and Grubbing	Sq.m.	2,426.16
4.8/3	**Excavation for other structures**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	228.19
	Clearing and Grubbing	Sq.m.	281.72
	Common/Random Backfill (with Excavated Material)	Cu.m.	69.38
4.16/1	**Random backfill**	Cu.m.	2,384.53
	Common/Random Backfill (with Excavated Material)	Cu.m.	2,384.53
4.16/1-1	**Random backfill for manholes**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,932.86
4.16/1-2	**Random backfill for junction manholes (junction pits)**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	451.66
4.17/1	**Zone B pipe backfill**	Cu.m.	1,052.97
	Sand Fill, in Small Area: V<100 cu.m.	Cu.m.	1,052.97
4.17/2	**Zone C pipe backfill (excavated material)**	Cu.m.	1,510.95
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,510.95
4.5/31-A	**Temporary Removal and reinstallation of existing fences**	L.m.	83.47
	Temporary removal of existing fences (for manhole)	L.m.	27.94
	Tempoary removal of existing fences (for collector pipe)	L.m.	55.52
	Reinstallation of existing fences (for manhole)	L.m.	21.01
	Reinstallation of existing fences (for collector pipe)	L.m.	55.52
4.5/48-A	**Demolition and removal of existing revetment**	L.m.	510.96
	Demolition and removal of existing revetment (for manhole)	L.m.	245.46
	Demolition and removal of existing revetment (for collector pipe)	L.m.	265.50
4.5/50-A	**Demolition and restoration of existing CHB wall**	L.m.	406.41
	Temporary removal of existing fences (for manhole)	L.m.	196.43
	Tempoary removal of existing fences (for collector pipe)	L.m.	209.98
4.5/51-A	**Temporary Removal and reinstallation of existing steel handrail**	L.m.	186.01
	Temporary removal of existing steel handrail (for manhole)	L.m.	66.87
	Tempoary removal of existing steel handrail (for collector pipe)	L.m.	119.14
	Reinstallation of existing steel handrail (for manhole)	L.m.	66.87
	Reinstallation of existing steel handrail (for collector pipe)	L.m.	119.14
4.5/52-A	**Restoration of existing revetment**	L.m.	368.29
	Temporary removal of existing revetment (for manhole)	L.m.	113.17
	Tempoary removal of existing revetment (for collector pipe)	L.m.	255.12
BILL No. 5 - CONCRETE			
5.11/1	**Reinforcement Grade 275**	Ton	55.68
	Ladder Rung (16mm dia-Grade 275) in Manholes	Kg	691.31
	Ladder Rung (16mm dia-Grade 275) in Junction Manholes	Kg	231.07
	Reinforcement (16mm dia-Grade 275) in U - ditch	Kg	2,176.04
	Reinforcement (16mm dia-Grade 275) in box culvert	Kg	0.00
5.16/1	**Precast concrete manhole and junction boxes covers**	Cu.m.	21.45
	Formwork F2 (for Small Sized Structure)	Sq.m.	70.12
	Reinforcement	Ton	3.09
5.16/2	**Precast concrete U-ditch covers**	Cu.m.	4.91
	Formwork F2 (for Small Sized Structure)	Sq.m.	18.79
	Reinforcement	Ton	0.67
5.22/1	**Concrete in manholes, junction boxes and outlets**		584.29
	Formwork F2 (for Small Sized Structure)	Sq.m.	4,211.88
	Staging/Scaffolding Work	Sq.m.	2,946.23
	Supporting/Scaffolding Work	Cu.m.	102.86
5.22/1-1	**Concrete in manholes**		
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	344.60
	Formwork F2 (for Small Sized Structure)	Sq.m.	2,194.11
	Staging/Scaffolding Work	Sq.m.	1,476.69
	Supporting/Scaffolding Work	Cu.m.	48.48
5.22/1-2	**Concrete in junction manholes (junction pits)**		
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	83.92
	Formwork F2 (for Small Sized Structure)	Sq.m.	1,259.89
	Staging/Scaffolding Work	Sq.m.	898.48
	Supporting/Scaffolding Work	Cu.m.	2.25

BQ No.	Name of Item	Unit	Qty.
5.22/1-3	**Concrete in outlets**		
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	155.77
	Formwork F2 (for Small Sized Structure)	Sq.m.	757.87
	Staging/Scaffolding Work	Sq.m.	571.06
	Supporting/Scaffolding Work	Cu.m.	52.13
5.22/16	**Concrete in U-Ditches**	Cu.m.	33.48
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	33.48
	Formwork F2 (for Small Sized Structure)	Sq.m.	274.76
5.22/2	**Concrete for pipe bedding**	Cu.m.	33.44
	Concrete Work for Massive Concrete, Class-B, Manpower Placing	Cu.m.	33.44
	Formwork F2 (for Small Sized Structure)	Sq.m.	133.91
5.22/3	**Concrete for Box Culvert**	Cu.m.	0.00
	Concrete Work for Massive Concrete, Class-B, Manpower Placing	Cu.m.	0.00
	Formwork F2 (for Small Sized Structure)	Sq.m.	0.00
	Supporting/Scaffolding Work	Cu.m.	0.00
	Water Stop	L.m.	0.00
	Joint Sealant	L.m.	0.00
	Cork Filler	Sq.m.	0.00
5.23/1	**Levelling concrete**	Cu.m.	41.44
	Concrete Work for Leveling Concrete, Class-F, Concrete Pump Placing	Cu.m.	41.44
	Formwork F2 (for Small Sized Structure)	Sq.m.	132.79
BILL No. 8 - DRAINAGE			
8.4/9	**Unreinforced concrete pipe - 200mm dia.**		
	Installation of CDP, 200mm (10") Dia.	L.m.	0.00
	Cement Mortar (1:2) for Joint Collar of CDP	Cu.m.	0.00
8.4/12	**Unreinforced concrete pipe - 250mm dia.**		
	Installation of CDP, 250mm (10") Dia.	L.m.	1.00
	Cement Mortar (1:2) for Joint Collar of CDP	Cu.m.	0.01
8.4/1	**Reinforced concrete pipe – 300 mm dia.**		
	Installation of RC Pipe Culvert, 300mm (12") Dia.	L.m.	42.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.75
8.4/2	**Reinforced concrete pipe – 460 mm dia.**		
	Installation of RC Pipe Culvert, 460mm (18") Dia.	L.m.	65.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	1.53
8.4/4	**Reinforced concrete pipe – 610 mm dia.**		
	Installation of RC Pipe Culvert, 610mm (24") Dia.	L.m.	10.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.23
8.4/5	**Reinforced concrete pipe – 760 mm dia.**		
	Installation of RC Pipe Culvert, 760mm (30") Dia.	L.m.	12.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.33
8.4/6	**Reinforced concrete pipe – 910 mm dia.**		
	Installation of RC Pipe Culvert, 910mm (36") Dia.	L.m.	432.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	21.12
8.4/8	**Reinforced concrete pipe – 1,520 mm dia.**		
	Installation of RC Pipe Culvert, 1520mm (60") Dia.	L.m.	0.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.00
8.9/2	**PVC drainage pipes - 100mm dia.**		
	Installation of PVC Pipe, 100mm (4") Dia. X 6m	ea	26.00
	Coupling for PVC Joint	ea	10.00
8.9/3	**PVC drainage pipes - 150mm dia.**		
	Installation of PVC Pipe, 150mm (6") Dia. X 6m	ea	37.00
	Coupling for PVC Joint	ea	21.00
8.9/4	**PVC drainage pipes - 200mm dia.**		
	Installation of PVC Pipe, 200mm (8") Dia. X 6m	ea	31.00
	Coupling for PVC Joint	ea	21.00
8.9/5	**PVC drainage pipes - 250mm dia.**		
	Installation of PVC Pipe, 250mm (10") Dia. X 6m	ea	3.00
	Coupling for PVC Joint	ea	2.00
8.9/6	**PVC drainage pipes – 300 mm dia.**		
	Installation of PVC Pipe, 250mm (10") Dia. X 6m	ea	3.00
	Coupling for PVC Joint	ea	2.00
8.10/1	**Galvanised iron drainage pipes – 100 mm dia.**		
	Installation of Steel Pipe, 100mm Dia. X 6m	ea	1.00
8.10/2	**Galvanised iron drainage pipes – 150 mm dia.**		
	Installation of Steel Pipe, 150mm Dia. X 6m	ea	1.00
8.10/3	**Galvanised iron drainage pipes – 300 mm dia.**		
	Installation of Steel Pipe, 200mm Dia. X 6m	ea	1.00
8.6/1	**FRP flap gate – 300 mm**	Set	
	Installation of Flap Gate for 300mm (12") Dia. Pipe	Set	1.00
8.6/2	**FRP flap gate – 910 mm**	Set	
	Installation of Flap Gate for 910mm (36") Dia. Pipe	Set	33.00

Left Bank STA2+392 - 3+-072
Hospicio STA 3+160 - 3+216
Left Bank and Right Bank STA 3+649 - 6+639

BQ No.	Name of Item	Unit	Qty.
BILL No. 4 - EARTH WORKS			
4.8/1	**Excavation for manholes and junction manholes**		
	Excavation	Cu.m.	1,603.56
	Clearing and Grubbing	Sq.m.	1,215.61
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	1,263.14
	Clearing and Grubbing	Sq.m.	1,063.13
4.8/1-2	**Excavation for junction manholes (junction pits)**	Cu.m.	
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	340.42
	Clearing and Grubbing	Sq.m.	152.48
4.8/2	**Excavation for pipe culverts**	Cu.m.	
	Excavation	Cu.m.	837.80
	Clearing and Grubbing	Sq.m.	698.22
4.8/3	**Excavation for other structures**	Cu.m.	
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	216.19
	Clearing and Grubbing	Sq.m.	254.11
	Common/Random Backfill (with Excavated Material)	Cu.m.	0.00
4.16/1	**Random backfill**	Cu.m.	1,318.61
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,318.61
4.16/1-1	**Random backfill for manholes**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,025.97
4.16/1-2	**Random backfill for junction manholes (junction pits)**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	292.65
4.17/1	**Zone B pipe backfill**	Cu.m.	242.09
	Sand Fill, in Small Area: V<100 cu.m.	Cu.m.	242.09
4.17/2	**Zone C pipe backfill (excavated material)**	Cu.m.	361.61
	Common/Random Backfill (with Excavated Material)	Cu.m.	361.61
4.5/31-A	**Temporary Removal and reinstallation of existing fences**	L.m.	76.53
	Temporary removal of existing fences (for manhole)	L.m.	21.01
	Tempoary removal of existing fences (for collector pipe)	L.m.	55.52
	Reinstallation of existing fences (for manhole)	L.m.	21.01
	Reinstallation of existing fences (for collector pipe)	L.m.	55.52
4.5/48-A	**Demolition and removal of existing revetment**	L.m.	504.03
	Demolition and removal of existing revetment (for manhole)	L.m.	238.53
	Demolition and removal of existing revetment (for collector pipe)	L.m.	265.50
4.5/50-A	**Demolition and restoration of existing CHB wall**	L.m.	406.41
	Temporary removal of existing fences (for manhole)	L.m.	196.43
	Tempoary removal of existing fences (for collector pipe)	L.m.	209.98
4.5/51-A	**Temporary Removal and reinstallation of existing steel handrail**	L.m.	186.01
	Temporary removal of existing steel handrail (for manhole)	L.m.	66.87
	Tempoary removal of existing steel handrail (for collector pipe)	L.m.	119.14
	Reinstallation of existing steel handrail (for manhole)	L.m.	66.87
	Reinstallation of existing steel handrail (for collector pipe)	L.m.	119.14
4.5/52-A	**Restoration of existing revetment**	L.m.	368.29
	Temporary removal of existing revetment (for manhole)	L.m.	113.17
	Tempoary removal of existing revetment (for collector pipe)	L.m.	255.12
BILL No. 5 - CONCRETE			
5.11/1	**Reinforcement Grade 275**	Ton	19.44
	Ladder Rung (16mm dia-Grade 40) in Manholes	Kg	190.35
	Ladder Rung (16mm dia-Grade 40) in Junction Manholes	Kg	75.76
	Reinforcement (16mm dia-Grade 275) in U - ditch	Kg	1,602.28
	Reinforcement (16mm dia-Grade 275) in box culvert	Kg	0.00
5.16/1	**Precast concrete manhole and junction boxes covers**	Cu.m.	7.54
	Formwork F2 (for Small Sized Structure)	Sq.m.	25.63
	Reinforcement	Ton	1.09
5.16/2	**Precast concrete U-ditch covers**	Cu.m.	3.19
	Formwork F2 (for Small Sized Structure)	Sq.m.	12.20
	Reinforcement	Ton	0.44
5.22/1	**Concrete in manholes, junction boxes and outlets**	**Cu.m.**	195.19
5.22/1-1	**Concrete in manholes**	Cu.m.	
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	100.19
	Formwork F2 (for Small Sized Structure)	sq.m.	816.04
	Staging/Scaffolding Work	Sq.m.	503.29
	Supporting/Scaffolding Work	Cu.m.	9.28

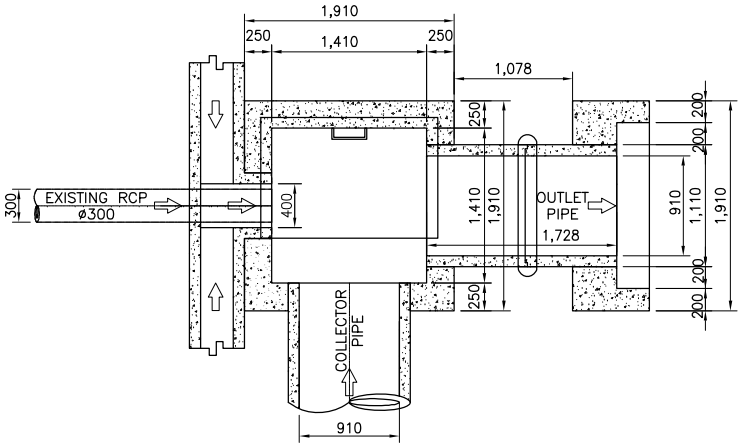
BQ No.	Name of Item		Unit	Qty.
5.22/1-2	**Concrete in junction manholes (junction pits)**		Cu.m.	
		Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	26.91
		Formwork F2 (for Small Sized Structure)	sq.m.	244.44
		Staging/Scaffolding Work	Sq.m.	441.82
		Supporting/Scaffolding Work	Cu.m.	0.56
5.22/1-3	**Concrete in outlets**		Cu.m.	
		Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	68.09
		Formwork F2 (for Small Sized Structure)	sq.m.	343.68
		Staging/Scaffolding Work	Sq.m.	211.87
		Supporting/Scaffolding Work	Cu.m.	23.13
5.22/16	**Concrete in U-Ditches**		Cu.m.	24.65
		Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	24.65
		Formwork F2 (for Small Sized Structure)	sq.m.	207.82
5.22/2	**Concrete for pipe bedding**		Cu.m.	11.26
		Concrete Work for Massive Concrete, Class-B, Manpower Placing	Cu.m.	11.26
		Formwork F2 (for Small Sized Structure)	sq.m.	53.45
5.23/1	**Levelling concrete**		Cu.m.	13.02
		Concrete Work for Leveling Concrete, Class-F, Concrete Pump Placing	Cu.m.	13.02
		Formwork for Leveling Concrete, Class-F	Sq.m.	54.94
BILL No. 8 - DRAINAGE				
8.4/1	**Reinforced concrete pipe – 300 mm dia.**			
		Installation of RC Pipe Culvert, 300mm (12") Dia.	L.m.	18.00
		Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.28
8.4/2	**Reinforced concrete pipe – 460 mm dia.**			
		Installation of RC Pipe Culvert, 460mm (18") Dia.	L.m.	5.00
		Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.14
8.4/4	**Reinforced concrete pipe – 610 mm dia.**			
		Installation of RC Pipe Culvert, 610mm (24") Dia.	L.m.	2.00
		Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.04
8.4/6	**Reinforced concrete pipe – 910 mm dia.**			
		Installation of RC Pipe Culvert, 910mm (36") Dia.	L.m.	175.00
		Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	8.23
8.4/8	**Reinforced concrete pipe – 1,520 mm dia.**			
		Installation of RC Pipe Culvert, 1520mm (60") Dia.	L.m.	0.00
		Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.00
8.9/2	**PVC drainage pipes - 100mm dia.**			
		Installation of PVC Pipe, 100mm (4") Dia. X 6m	ea	6.00
		Coupling for PVC Joint	ea	2.00
8.9/3	**PVC drainage pipes - 150mm dia.**			
		Installation of PVC Pipe, 150mm (6") Dia. X 6m	ea	14.00
		Coupling for PVC Joint	ea	9.00
8.9/4	**PVC drainage pipes - 200mm dia.**			
		Installation of PVC Pipe, 200mm (8") Dia. X 6m	ea	12.00
		Coupling for PVC Joint	ea	8.00

QUANTITIES OF MANHOLE

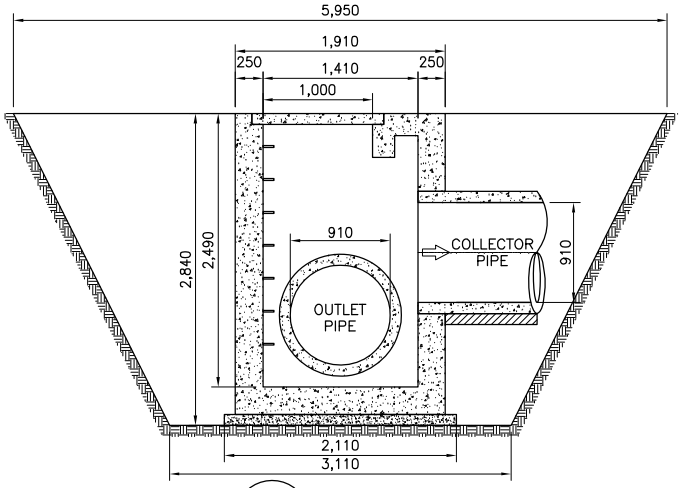
Manhole No.: ML 35.5

Location: 2 + 424

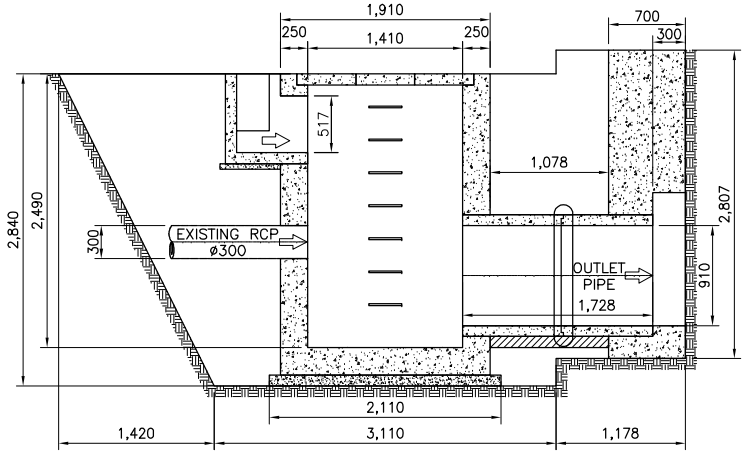
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.31	4.53	14.98	
		A2=10.82	4.53	49.02	
				64.00	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	3.65	0.25	**0.91**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.490	4.133	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
D=0.52	W=0.40	0.33	0.25	0.08	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.57**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.36	0.7	3.75	
	Lout=2.81				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.82	m3
9. Outlet Pipe	Dia=.910m	L=1.23		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.06**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.58		**0.06**	m3
12. Backfill				**53.33**	m3



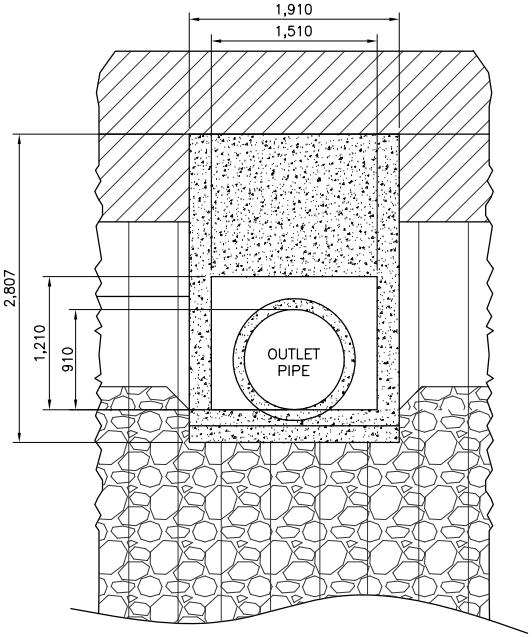
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



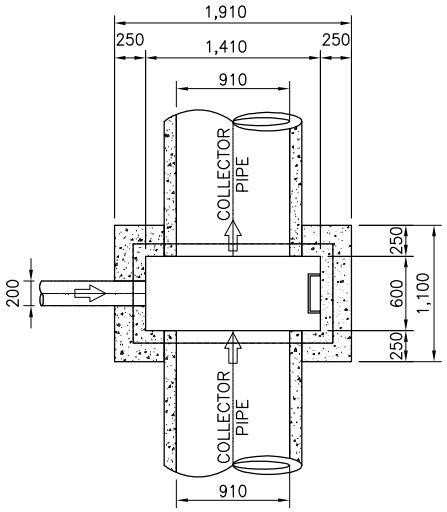
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

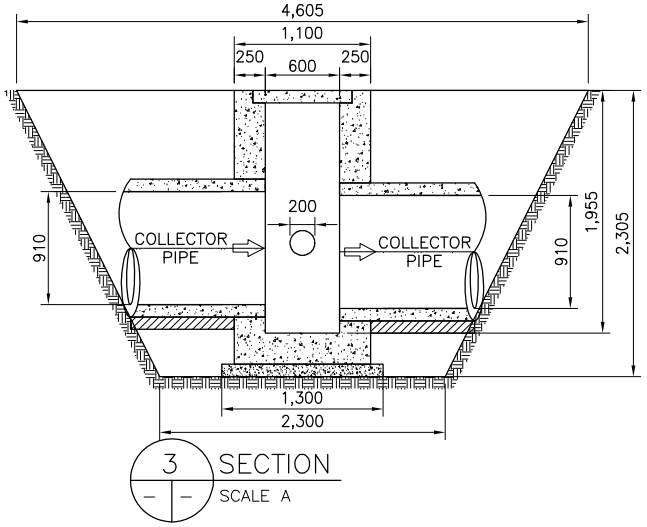
Manhole No.: ML 35.6

Location: 2 + 446

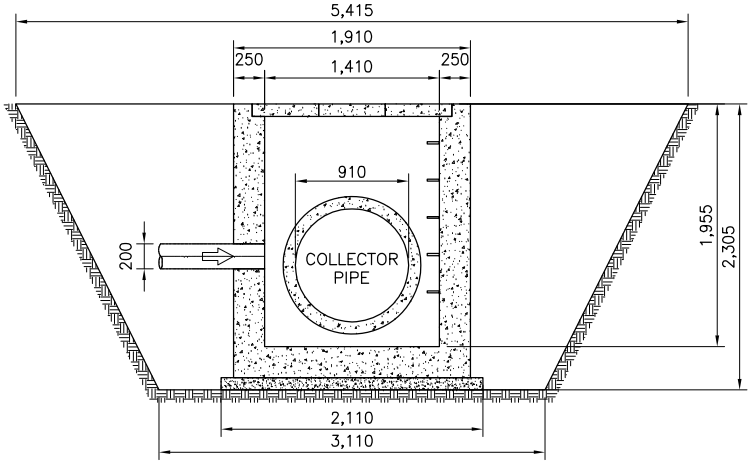
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A=9.83	3.45	33.92	
				33.92	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.10	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	1.96	2.45	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.20	0.03	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**1.96**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.29	0.10	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.00		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**28.27**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



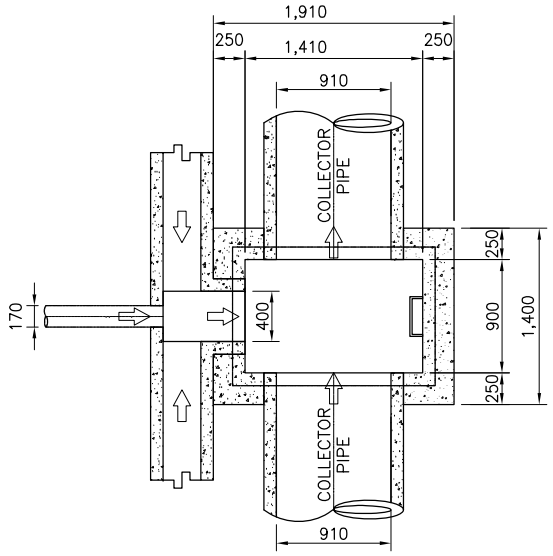
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

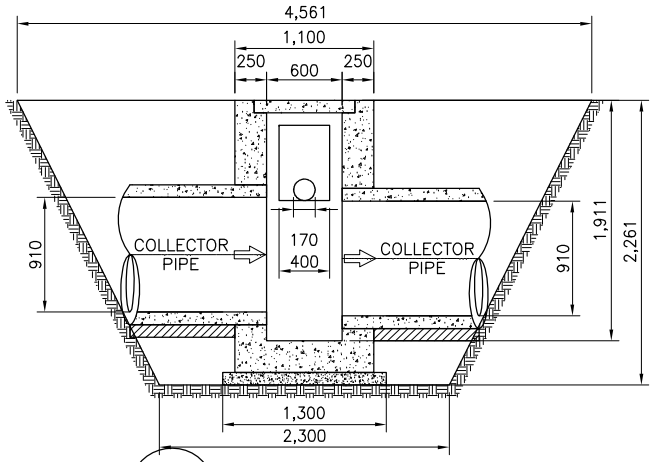
Manhole No.: ML 36

Location: 2 + 457

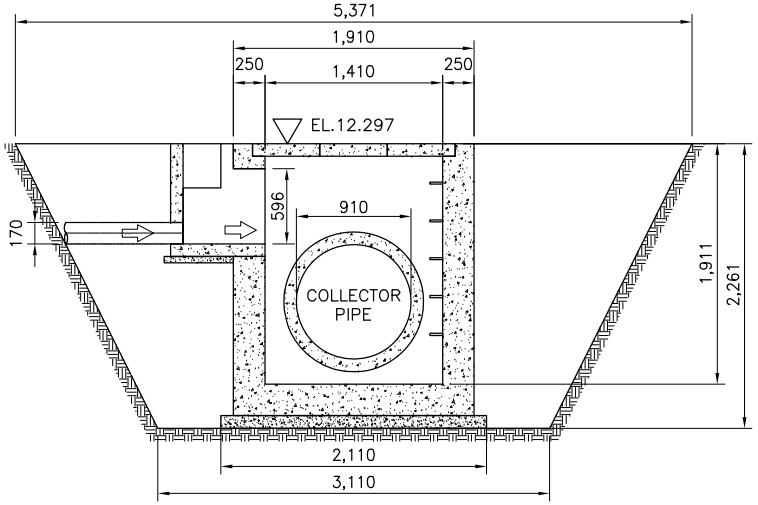
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A=9.59	3.43	32.89	
				32.89	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.10	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	1.91	2.40	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
D=0.60	W=0.40	0.24	0.25	0.06	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**1.85**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.29	0.10	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.00		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**27.41**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



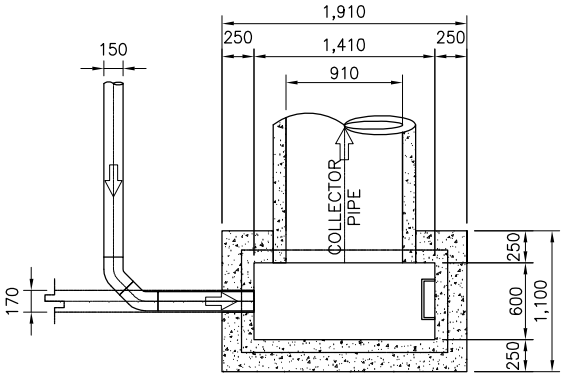
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

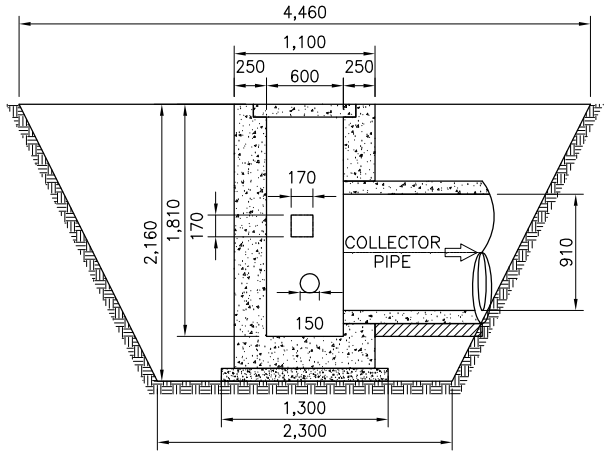
Manhole No.: ML 37

Location: 2 + 477

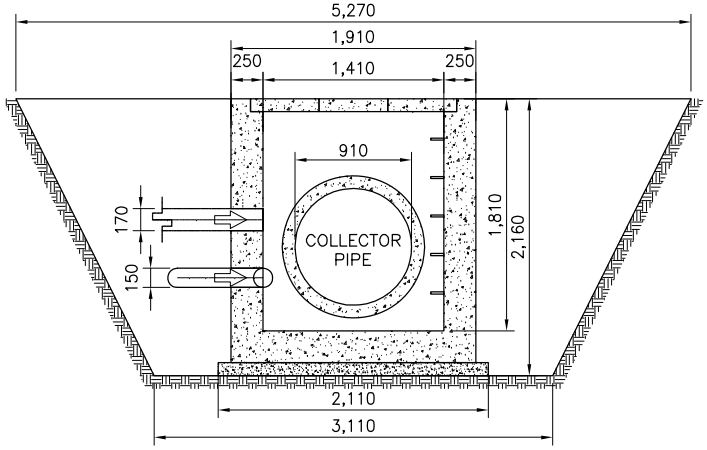
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A=9.05	3.38	30.59	
				30.59	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.10	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	1.81	2.27	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.17	0.04	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.02**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.29	0.10	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.00		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**25.49**	m3



1 PLAN
SCALE A



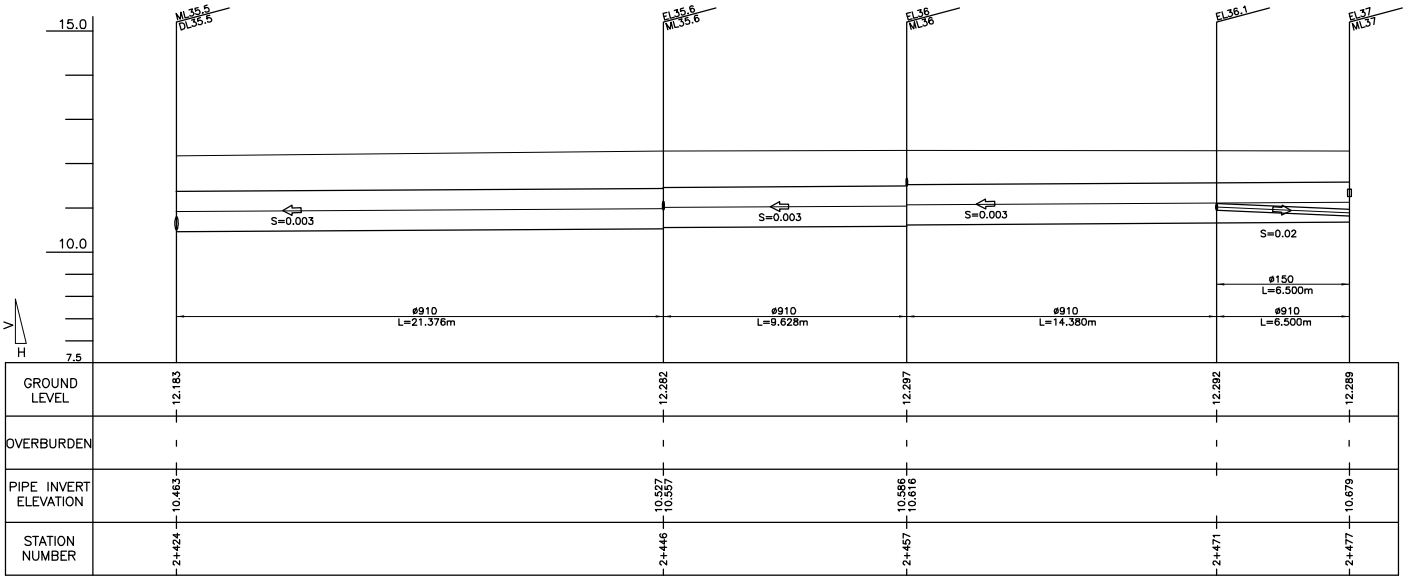
3 SECTION
SCALE A



2 SECTION
SCALE A

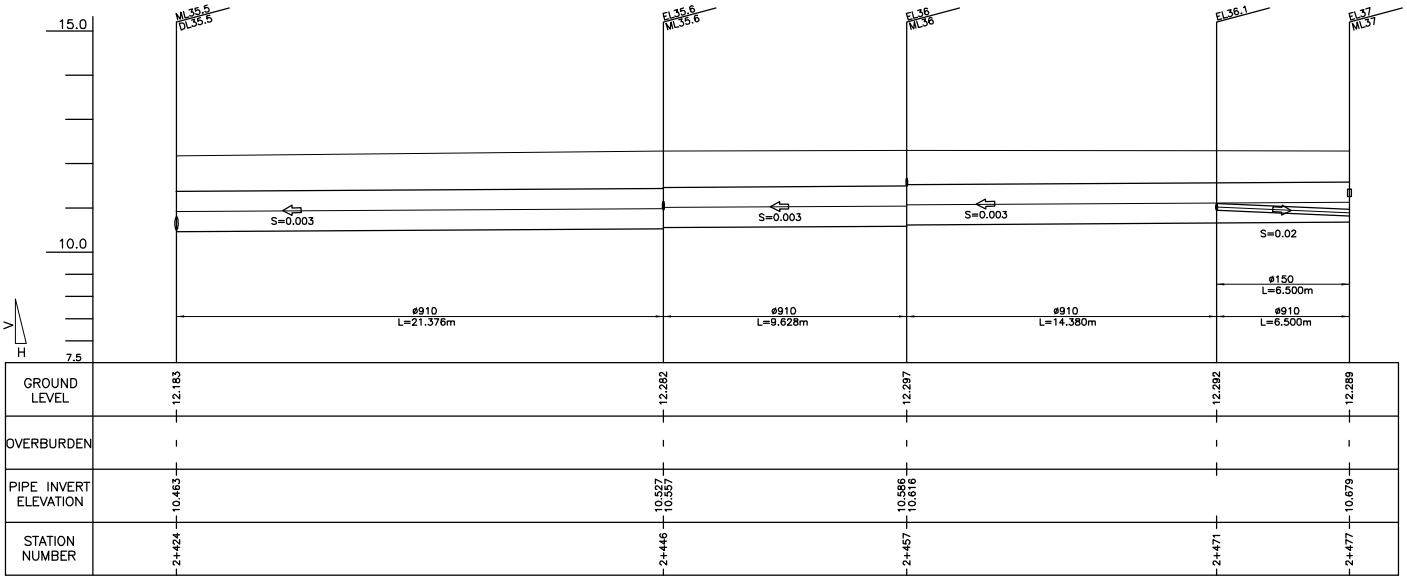
QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=52.04	53	pc
Collector Pipe (PVC)	Dia=0.10		L=6.63	2	pc
2. Conc. Bedding	Dia=0.91	L=52.04	0.1	4.74	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=52	3.00	m3
4. PVC coupling	Dia=0.10			1	pc
5. Formworks				54.14	m^3



QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=52.04	53	pc
Collector Pipe (PVC)	Dia=0.10		L=6.63	2	pc
2. Conc. Bedding	Dia=0.91	L=52.04	0.1	4.74	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=52	3.00	m3
4. PVC coupling	Dia=0.10			1	pc
5. Formworks				54.14	m^3



Clearing (Manhole 35.5)

L1	2.02 m	
W of Manhole	1.91 m	**A=33.96** m^2
L2	1.078 m	
W	5.95 m	

Clearing (Manhole 35.6)

W	5.415 m	**A=24.94** m^2
L	4.605 m	

Clearing (Manhole 36)

W	5.371 m	**A=24.50** m^2
L	4.561 m	

Clearing (Manhole 37)

W	5.27 m	**A=23.50** m^2
L	4.46 m	

Clearing (Collector 37 - 36)

W	3.9555 m	**A=82.59** m^2
L	20.88 m	

Clearing (Collector 36 - 35.6)

W	4.028 m	**A=38.78** m^2
L	9.628 m	

Clearing (Collector 35.6 - 35.5)

W	4.0475 m	**A=86.52** m^2
L	21.376 m	

(Collector Pipe) Downstream	37-36	Excavation
Do	1.11 m	A=5.74 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.24 m^2
H	1.881 m	Backfill Zone C
EL. A	12.297 m	A=1.90 m^2
EL. B	10.616 m	
W	3.991 m	

(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=5.46 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.13 m^2
H	1.81 m	Backfill Zone C
EL. A	12.289 m	A=1.82 m^2
EL. B	10.679 m	
W	3.92 m	

(Collector Pipe) Downstream	36-35.6	Excavation
Do	1.11 m	A=5.91 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.30 m^2
H	1.925 m	Backfill Zone C
EL. A	12.282 m	A=1.96 m^2
EL. B	10.557 m	
W	4.035 m	

(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=5.86 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.28 m^2
H	1.911 m	Backfill Zone C
EL. A	12.297 m	A=1.94 m^2
EL. B	10.586 m	
W	4.021 m	

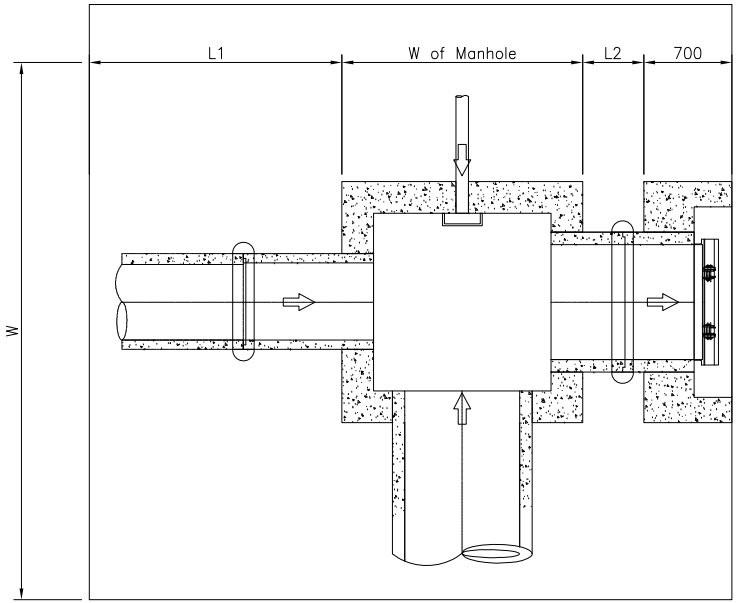
(Collector Pipe) Downstream	35.6-35.5	Excavation
Do	1.11 m	A=5.89 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.30 m^2
H	1.92 m	Backfill Zone C
EL. A	12.183 m	A=1.95 m^2
EL. B	10.463 m	
W	4.03 m	

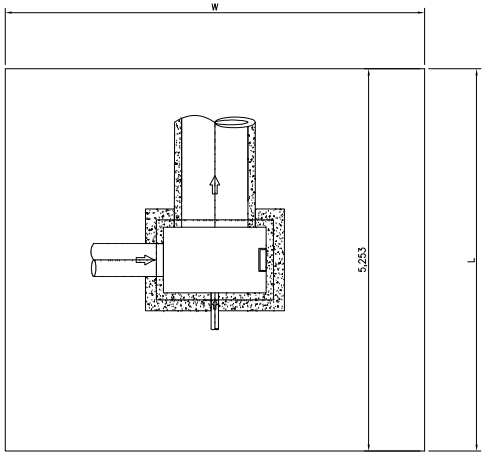
(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=6.04 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.35 m^2
H	1.955 m	Backfill Zone C
EL. A	12.282 m	A=2.00 m^2
EL. B	10.527 m	
W	4.065 m	

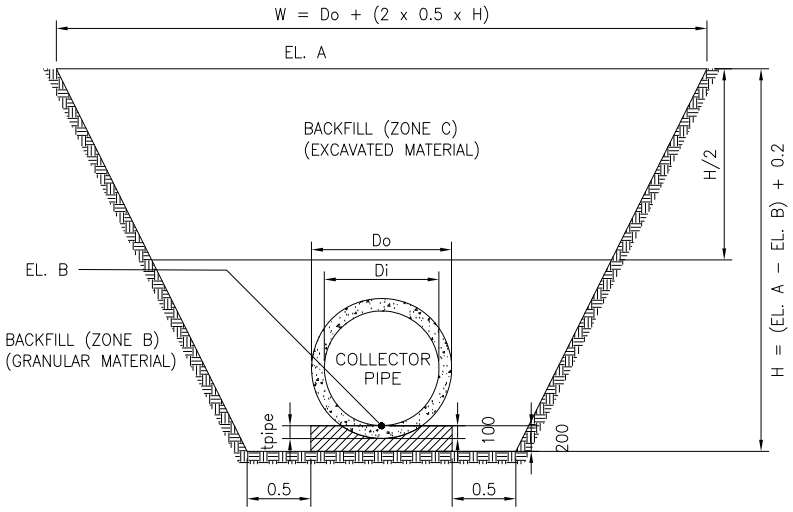
Collector Pipe 37-36	Volume
Excavation	**117.2279** m^3
Backfill Zone B	**24.66227** m^3
Backfill Zone C	**38.96939** m^3

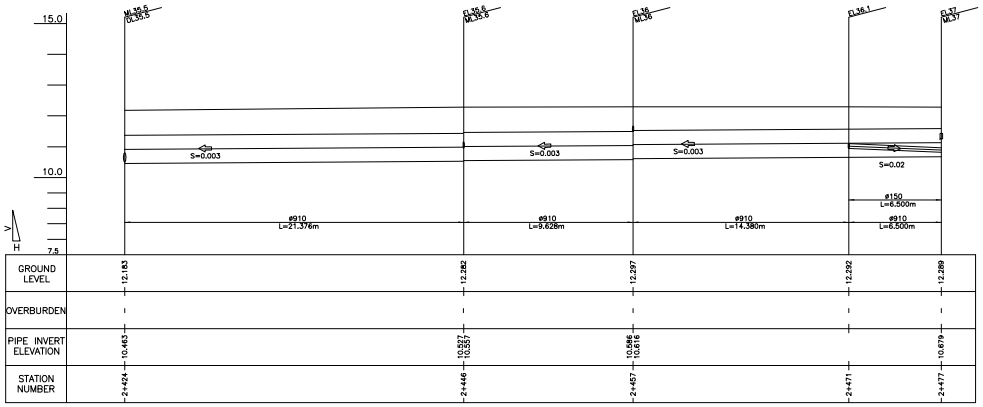
Collector Pipe 36-35.6	Volume
Excavation	**56.84396** m^3
Backfill Zone B	**12.4926** m^3
Backfill Zone C	**18.84147** m^3

Collector Pipe 35.6-35	Volume
Excavation	**127.8953** m^3
Backfill Zone B	**28.37923** m^3
Backfill Zone C	**42.35889** m^3


L1
W of Manhole
L2
700
W


W
5.253
L


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
tpipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5

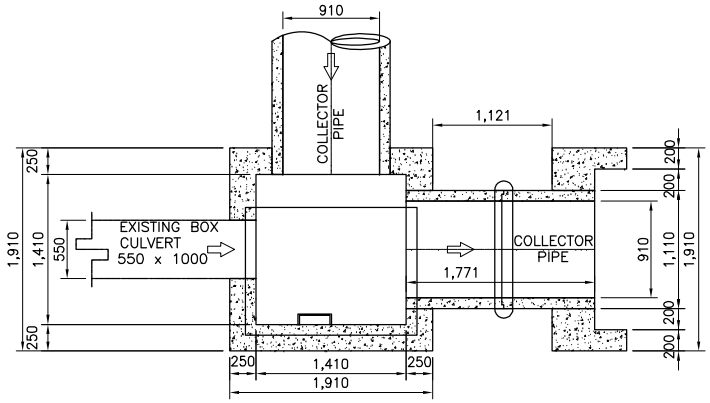

15.0
10.0
7.5
S=0.003
S=0.003
S=0.003
S=0.02
ø910
L=21.376m
ø910
L=9.628m
ø910
L=14.380m
ø150
L=6.500m
ø910
L=6.500m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
2+424
2+446
2+457
2+471
2+477

QUANTITIES OF MANHOLE

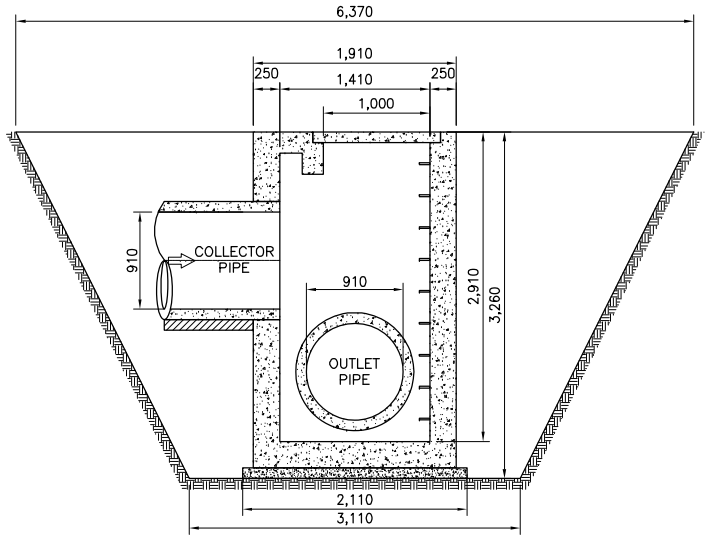
Manhole No.: ML 37.11

Location: 2 + 605

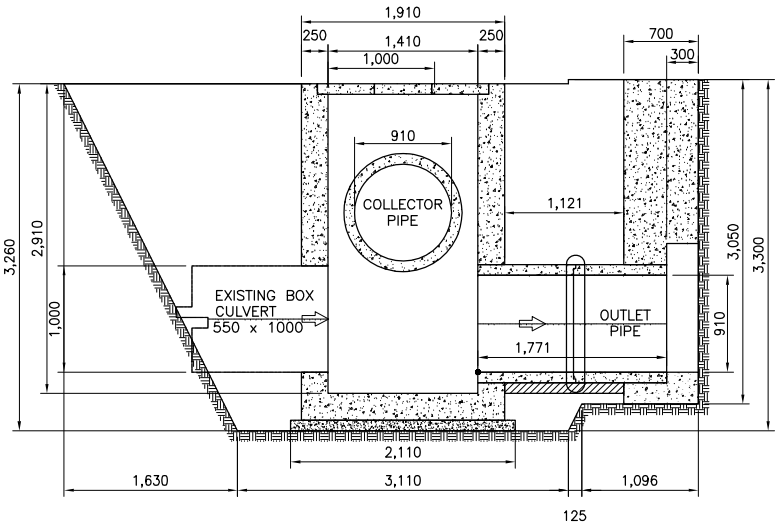
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.34	4.74	15.84	
		A2=0.40	4.74	1.88	
		A3=12.80	4.74	60.65	
				78.38	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	5.51	0.25	**1.38**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.910	4.831	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
D=1.00	W=0.55	0.55	0.25	0.14	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.21**	m^3
5. Conc. Cover	L=1.20	1.932	0.1	**0.19**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.83	0.7	4.08	
	Lout=3.05				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.14	m3
9. Outlet Pipe	Dia=.910m	L=1.27		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.06**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.62		**0.07**	m3
12. Backfill				**65.31**	m3



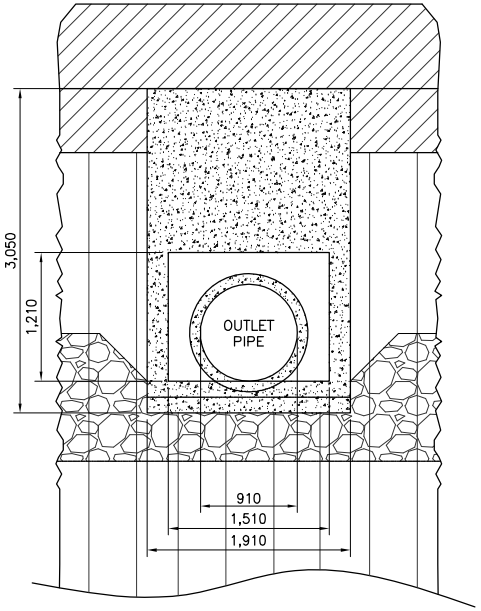
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



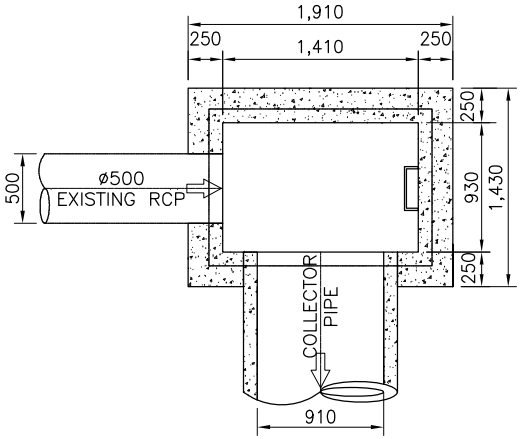
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

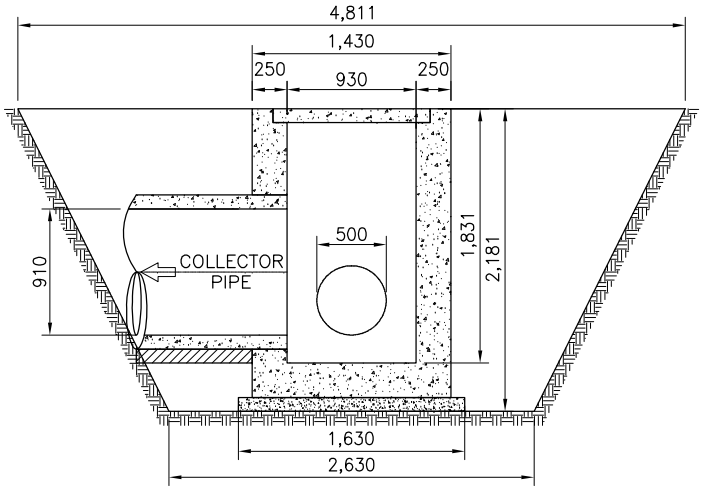
Manhole No.: ML 37.10

Location: 2 + 595

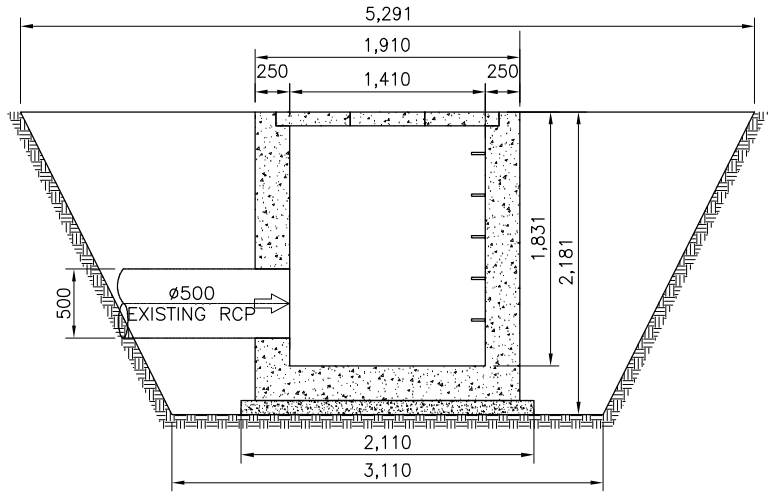
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=9.16	3.72	34.08	
				34.08	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.63	3.44	0.1	**0.34**	m^3
3. Bottom Slab	W=1.91 L=1.43	2.73	0.25	**0.68**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.43	Aout=2.73			
	Win=1.41 Lin=.93	Ain=1.31	1.831	2.600	m^3
	.	Anet=1.42			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.64	0.32	0.25	0.08	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.28**	m^3
5. Conc. Cover	L=1.13 W=1.61	1.8193	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**28.40**	m3



3 PLAN
SCALE C



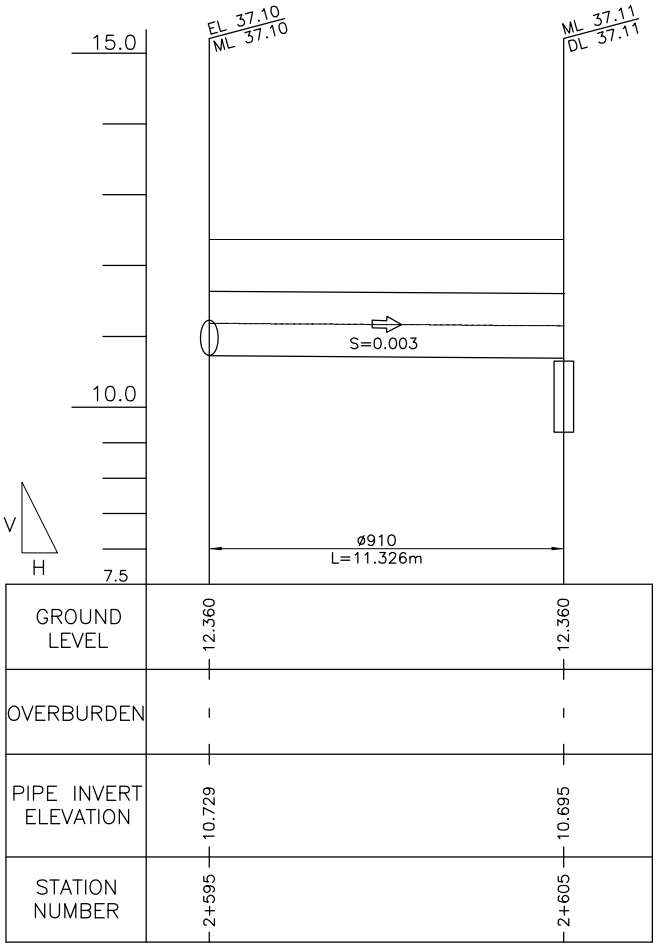
5 SECTION
SCALE C



4 SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (Rcp)	Dia=0.91		L=11.36	12	pc
2. Conc. Bedding	Dia=0.91	L=11.36	0.1	1.03	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=11	0.63	m3
4. Formworks				11.68	m^3



Clearing (Manhole 37.11)

L1	2.23	m	
W of Manhole	1.91	m	**A=37.97** m^2
L2	1.121	m	
W	6.37	m	

Clearing (Manhole 37.10)

W	5.291	m	**A=25.46** m^2
L	4.811	m	

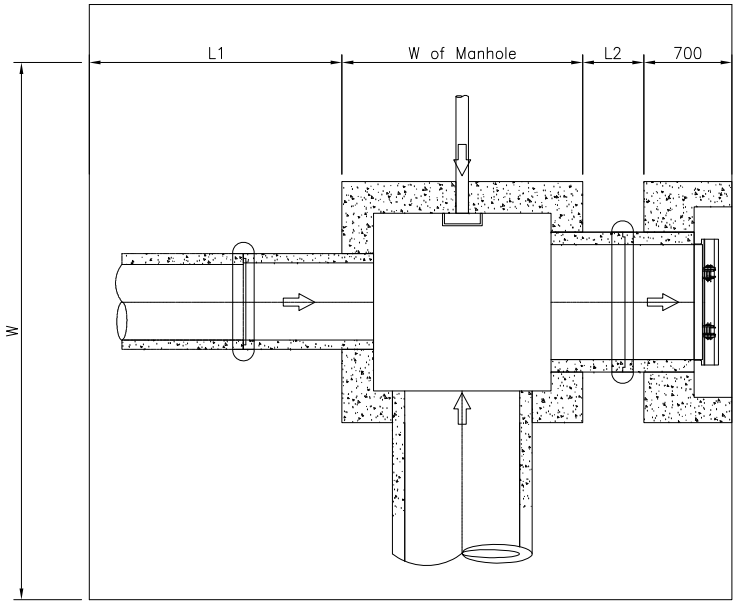
Clearing (Collector 37.10 - 37.11)

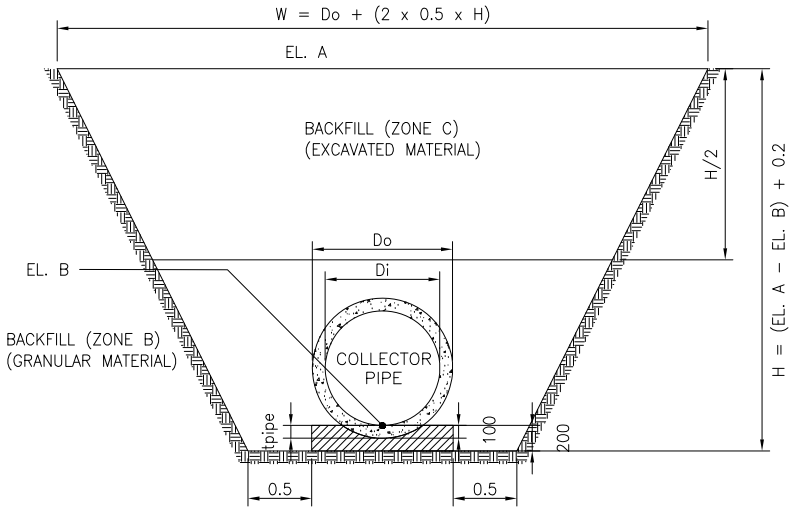
W	3.958	m	**A=44.83** m^2
L	11.326	m	

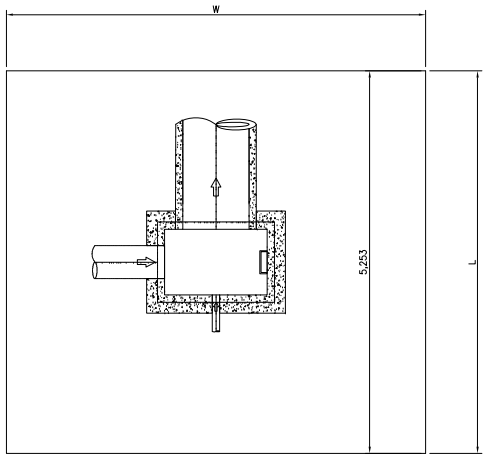
(Collector Pipe) Downstream	37.10 - 37.11		Excavation
Do	1.11	m	A=5.67 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.21 m^2
H	1.865	m	Backfill Zone C
EL. A	12.36	m	A=1.88 m^2
EL. B	10.695	m	
W	3.975	m	

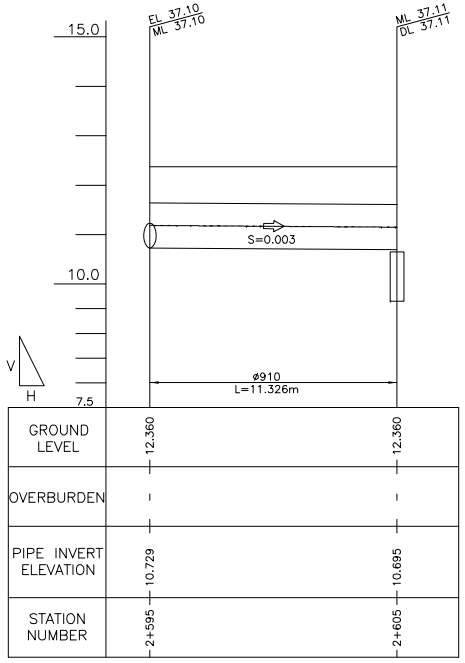
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=5.54 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.16 m^2
H	1.831	m	Backfill Zone C
EL. A	12.36	m	A=1.84 m^2
EL. B	10.729	m	
W	3.941	m	

Collector Pipe 37.10 37.11	Volume	
Excavation	**63.69513**	m^3
Backfill Zone B	**13.48**	m^3
Backfill Zone C	**21.17**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5


W
5,253
L

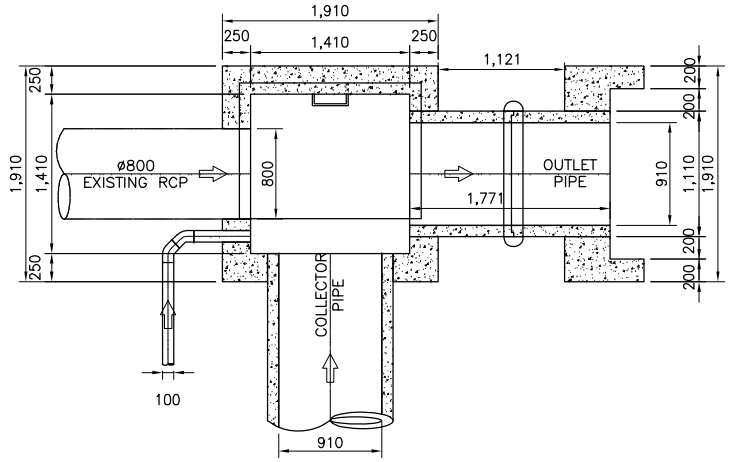

15.0
10.0
7.5
V
H
EL. 37.10
ML. 37.10
ML. 37.11
DL. 37.11
S=0.003
ø910
L=11.326m
GROUND LEVEL
12.360
12.360
OVERBURDEN
-
-
PIPE INVERT ELEVATION
10.729
10.695
STATION NUMBER
2+595
2+605

QUANTITIES OF MANHOLE

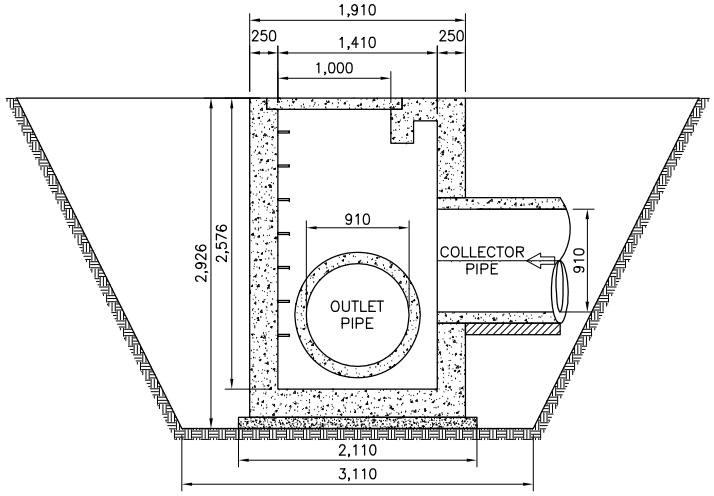
Manhole No.: ML 37.12

Location: 2 + 608

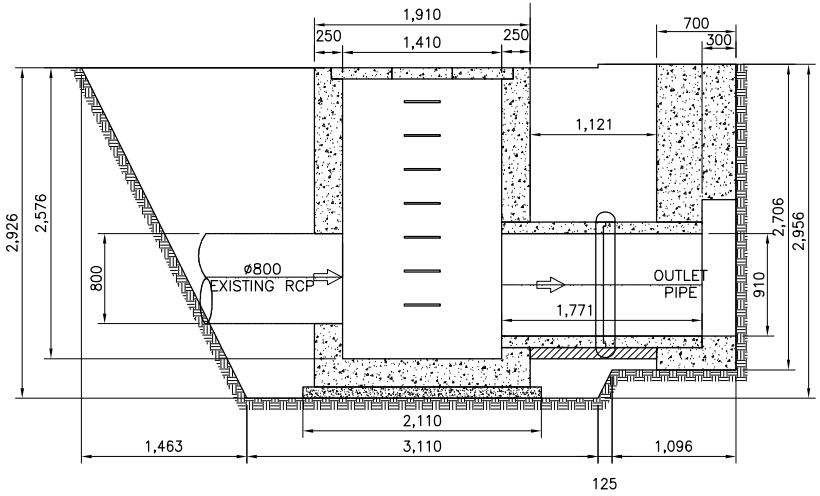
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.97	4.57	13.56	
		A2=0.33	4.57	1.52	
		A3=11.24	4.57	51.40	
				66.48	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.91	Aout=3.65			
	Win=1.41 Lin=1.41	Ain=1.99	2.576	4.276	m^3
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.98	0.76	0.25	0.19	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.60**	m^3
5. Conc. Cover	L=1.20 W=1.61	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.71	Ain=5.17	0.7	3.62	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.68	m3
9. Outlet Pipe	Dia=.910m	L=1.27		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.06**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.12		**0.12**	m3
12. Backfill				**55.40**	m3



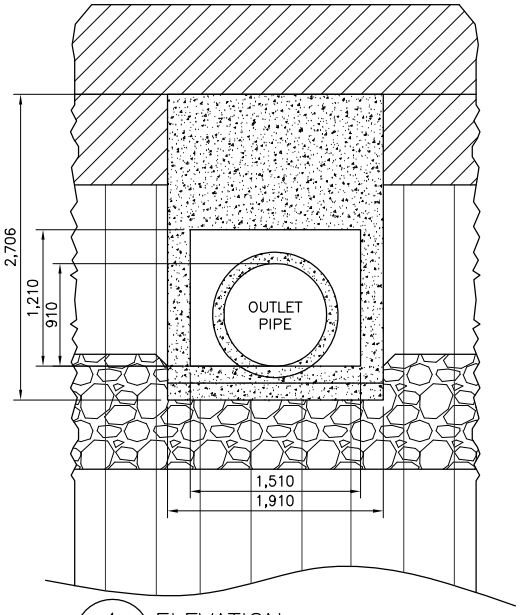
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



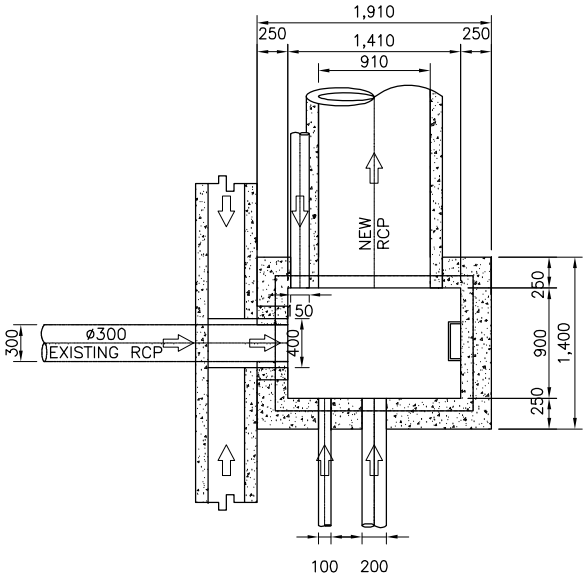
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

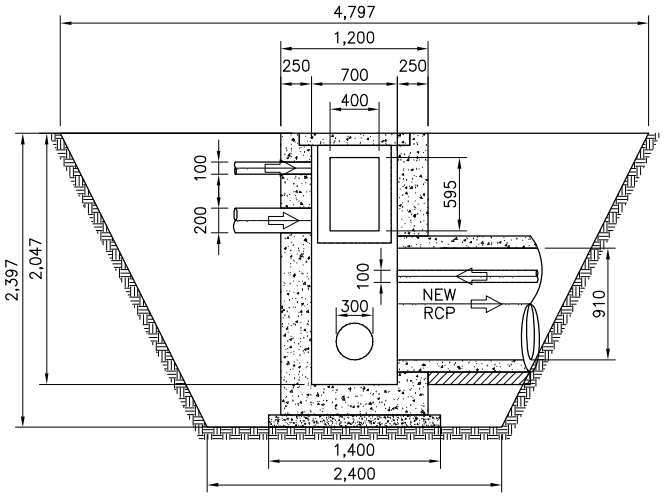
Manhole No.: ML 37.16

Location: 2 + 621

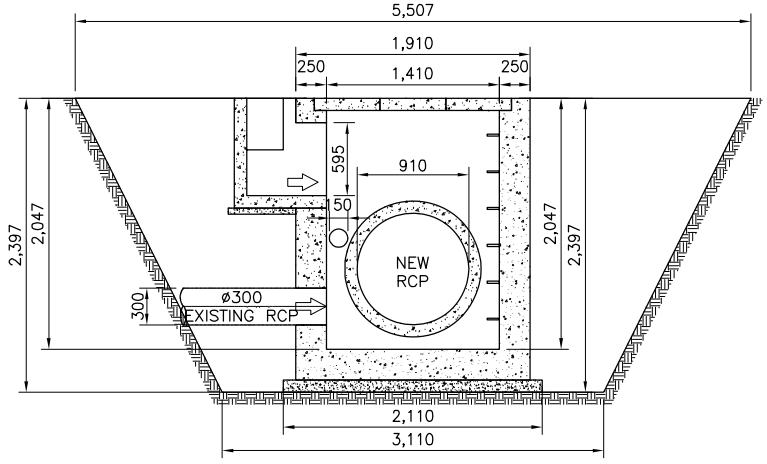
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=10.33	3.60	37.16	
				37.16	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.60	3.38	0.1	**0.34**	m^3
3. Bottom Slab	W=1.91 L=1.40	2.67	0.25	**0.67**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.40	Aout=2.67			
	Win=1.41 Lin=.90	Ain=1.27	2.047	2.876	m^3
	.	Anet=1.41			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.04	0.25	0.01	
D=0.60	W=0.40	0.36	0.25	0.09	
Pipe hole on Wall C	DiaC=1.11	0.99	0.25	0.25	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.53**	m^3
5. Conc. Cover	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**30.97**	m3



5 PLAN
SCALE A



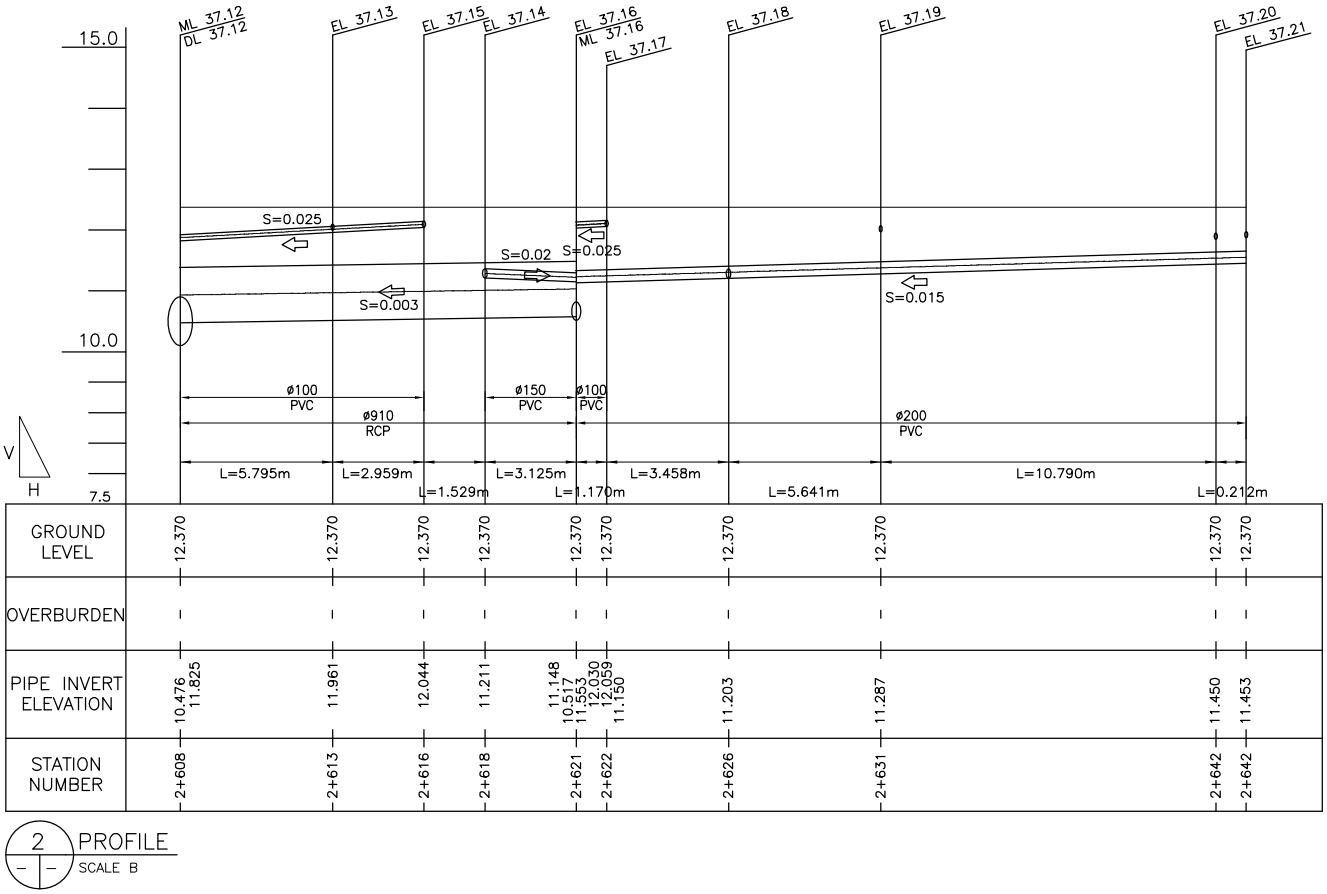
7 SECTION
SCALE A



6 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=13.45	14	pc
Collector Pipe (PVC)	Dia=0.20		L=21.59	4	pc
Collector Pipe (PVC)	Dia=0.15		L=3.19	1	pc
Collector Pipe (PVC)	Dia=0.10		L=10.17	2	pc
2. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=13	0.75	m3
3. Conc. Bedding	Dia=.910m	L=13.45		1.22	m3
4. PVC coupling	Dia=0.10			3	pc
PVC coupling	Dia=0.10			0	pc
PVC coupling	Dia=0.10			1	pc
5. Formworks				13.82	m3



2 PROFILE
SCALE B

Clearing (Manhole 37.12)

L1	2.063	m	
W of Manhole	1.91	m	**A=35.51** m^2
L2	1.21	m	
W	6.036	m	

Clearing (Manhole 37.16)

W	5.507	m	**A=26.42** m^2
L	4.797	m	

Clearing (Collector 37.16 - 37.12)

W	4.1835	m	**A=56.09** m^2
L	13.408	m	

Clearing (Collector 37.21 - 37.16)

W	2.2765	m	**A=48.42** m^2
L	21.271	m	

(Collector Pipe) Downstream	37.16 - 37.12		Excavation
Do	1.11	m	A=6.61 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.57 m^2
H	2.094	m	Backfill Zone C
EL. A	12.37	m	A=2.18 m^2
EL. B	10.476	m	
W	4.204	m	

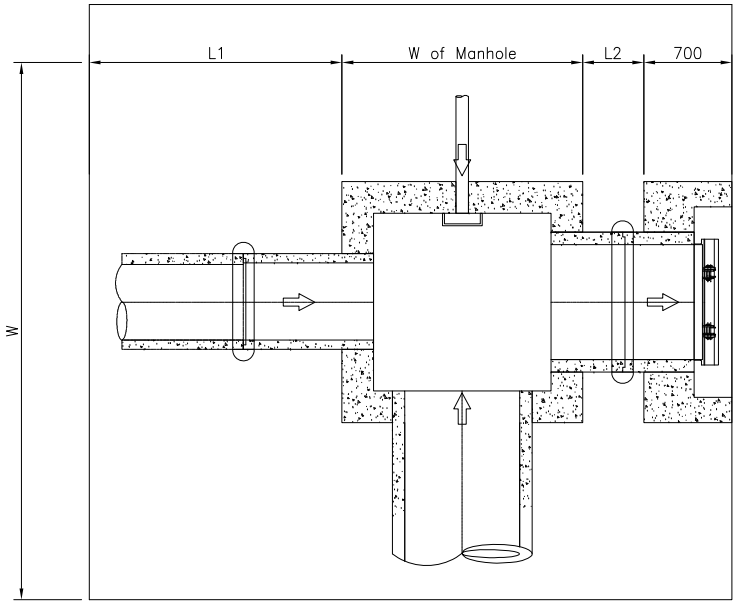
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=6.44 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.50 m^2
H	2.053	m	Backfill Zone C
EL. A	12.37	m	A=2.12 m^2
EL. B	10.517	m	
W	4.163	m	

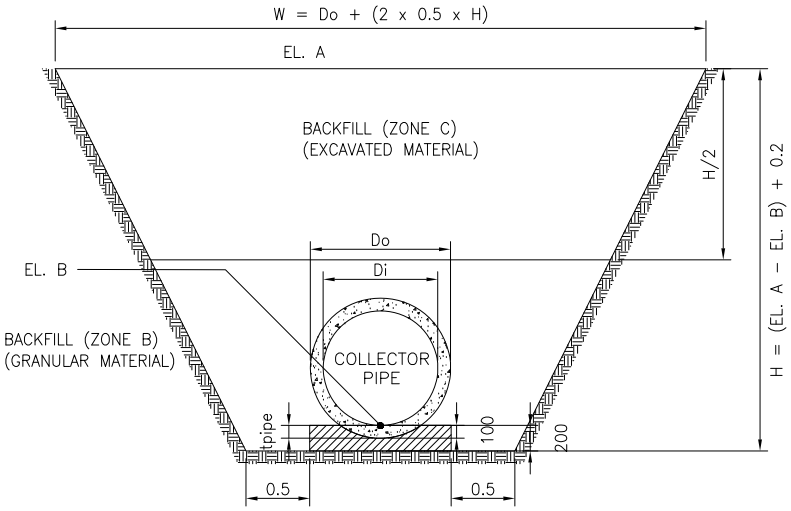
(Collector PVC) Downstream	37.21 - 37.16		
D	0.2	m	Excavation
W1	2.44	m	A=2.25 m^2
W2	1.82	m	Backfill Zone B
H	1.236	m	A=0.90 m^2
H/2	0.618	m	Backfill Zone C
EL. A	12.37	m	A=1.31 m^2
EL. B	11.134	m	

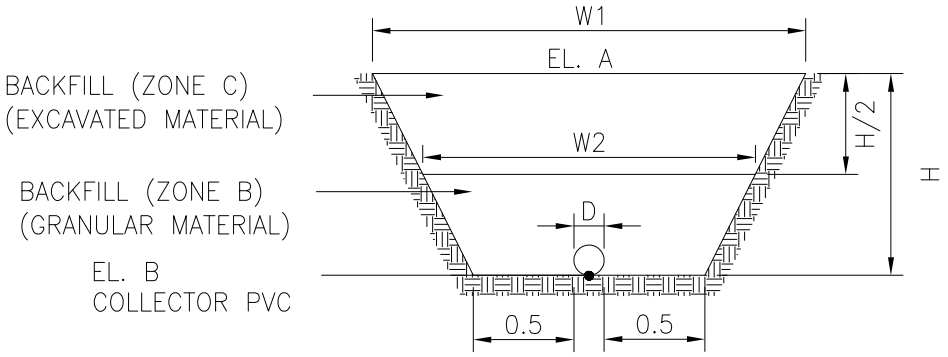
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	2.12	m	A=1.52 m^2
W2	1.66	m	Backfill Zone B
H	0.917	m	A=0.62 m^2
H/2	0.4585	m	Backfill Zone C
EL. A	12.37	m	A=0.87 m^2
EL. B	11.453	m	

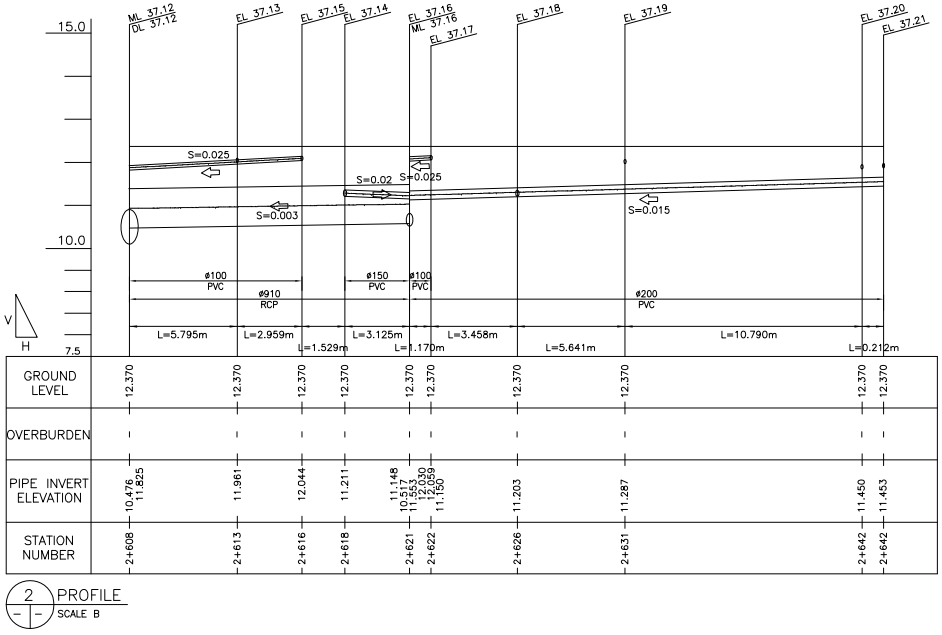
Collector Pipe 37.16 - 37.12	Volume	
Excavation	**87.74961**	m^3
Backfill Zone B	**20.59115**	m^3
Backfill Zone C	**28.83815**	m^3

Collector PVC 37.21 - 37.16	Volume	
Excavation	**40.67452**	m^3
Backfill Zone B	**16.46287**	m^3
Backfill Zone C	**23.52396**	m^3









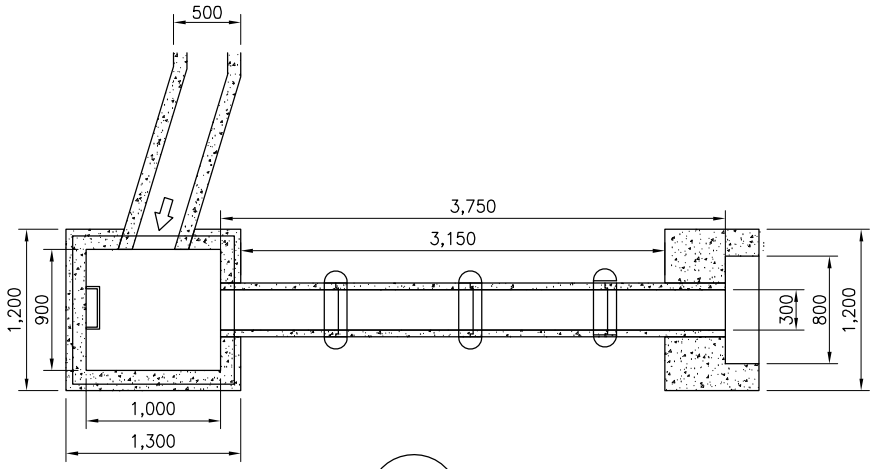
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

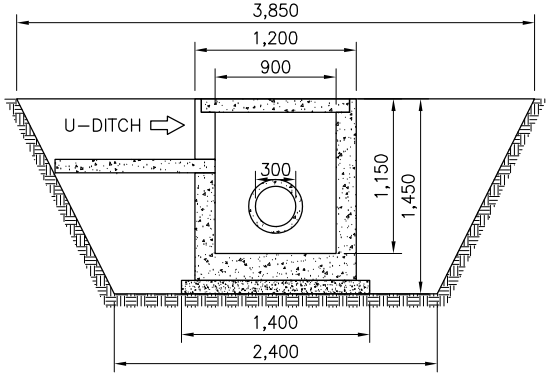
Manhole No.: ML 37.22

Location 2 + 694

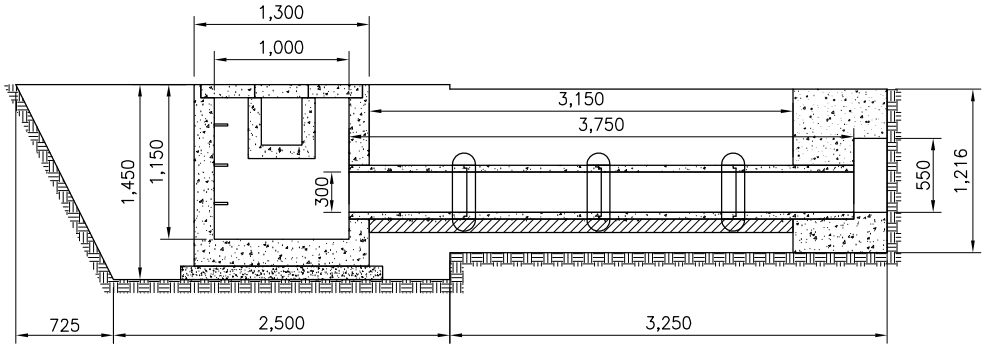
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.50 L=1.40	2.10	0.1	**0.21**	m^3
3. Bottom Slab	W=1.30 L=1.20	1.56	0.15	**0.23**	m^3
4. Wall					
Entire Wall	Wout=1.30 Lout=1.20	Aout=1.56			
	Win=1.00 Lin=.90	Ain=0.90	1.150	0.759	m^3
		Anet=0.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
D=0.55	W=0.50	0.28	0.15	0.07	
Pipe hole on Wall D	DiaD=0.40	0.13	0.15	0.03	
Net Wall Vol.				**0.66**	m^3
5. Conc. Cover	L=1.10 W=1.20	1.32	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.22	Ain=1.46	0.7	1.02	
	Win=0.80 Lin=.55	Aout=0.44	0.25	0.11	
	DiaD=0.40	Apipe=.13	0.45	0.06	
				0.85	m3
9. Outlet Pipe	Dia=.300m	L=3.75		**4**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=3	**0.07065756**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=3.15		**0.126**	m3
12. Backfill				**55.44**	m3



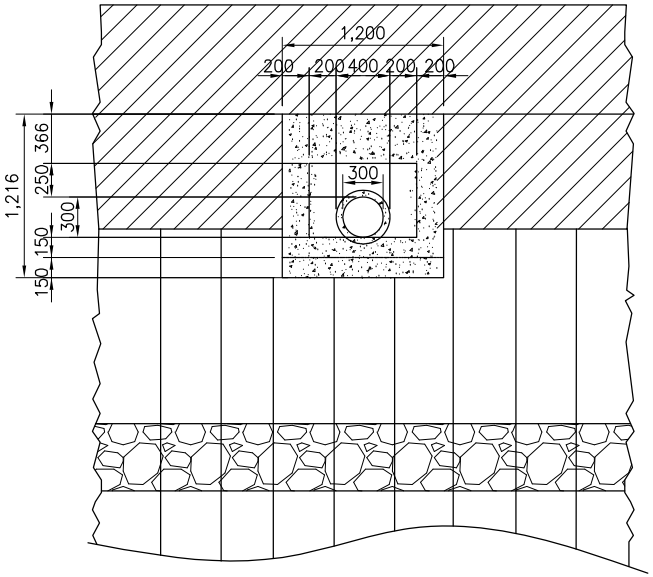
2 PLAN
SCALE B



4 SECTION (ML 37.22)
SCALE B



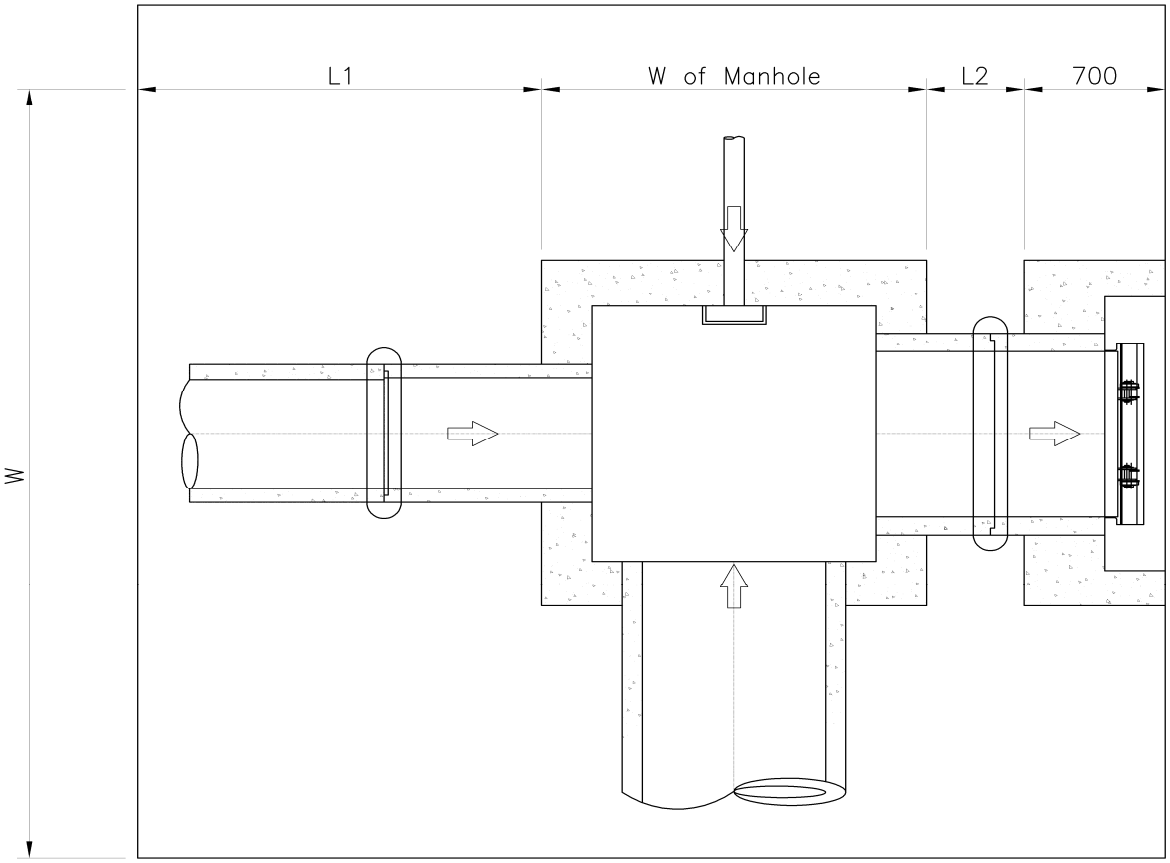
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 37.22)

L1	1.325 m	
W of Manhole	1.3 m	**A=24.93** m^2
L2	3.15 m	
W	3.85 m	

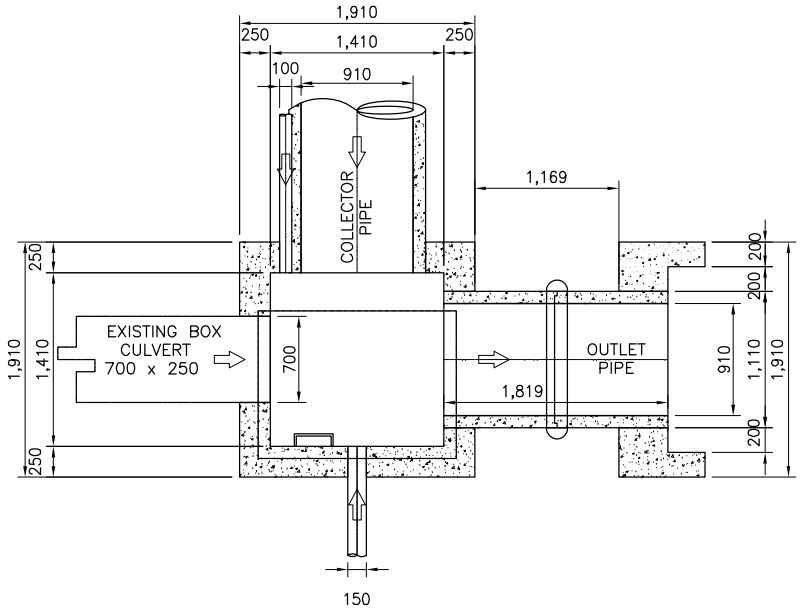


QUANTITIES OF MANHOLE

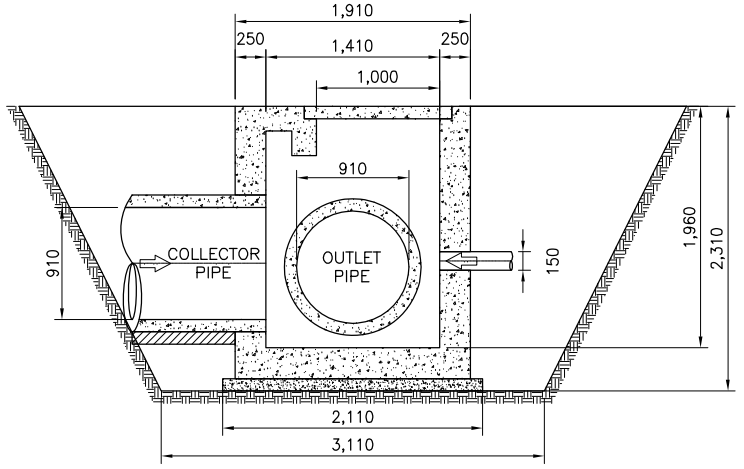
Manhole No.: ML 37.3

Location: 2 + 539

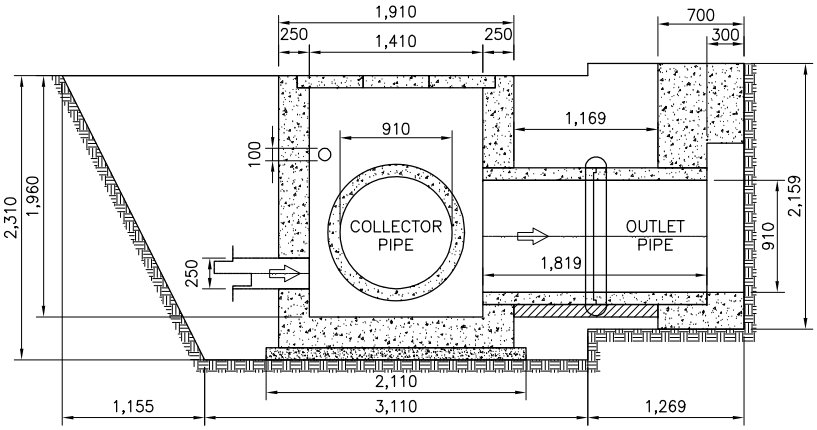
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.74	3.77	10.32	
		A2=8.52	3.77	32.07	
				42.39	m^3
2. Lev. Concrete	W=2.11	4.45	0.10	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	5.51	0.25	**1.38**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	1.96	3.25	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.15	0.02	0.25	0.00	
D=0.25	W=0.70	0.18	0.25	0.04	
Pipe hole on Wall C	DiaC=1.11	0.98	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.72**	m^3
5. Conc. Cover	L=1.20	1.93	0.10	**0.19**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.00		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0.00**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.12	0.70	2.89	
	Lout=2.16				
	Win=1.51	Aout=1.83	0.30	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.40	0.39	
				1.95	m3
9. Outlet Pipe	Dia=.910m	1.32		**2.00**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.06**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	0.67		**0.07**	m3
12. Backfill				**35.32**	m3



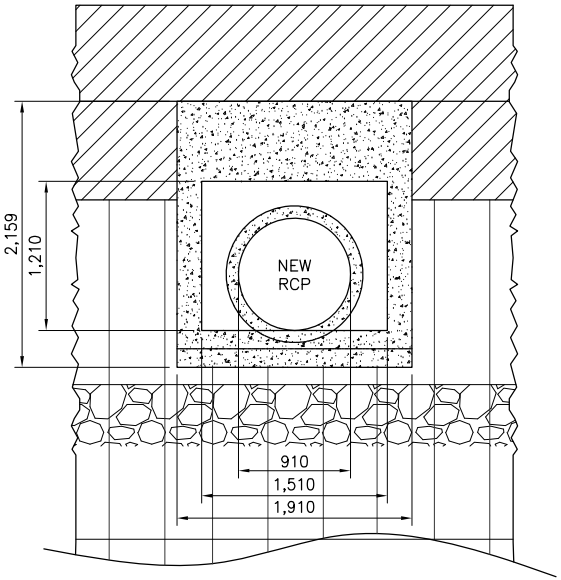
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



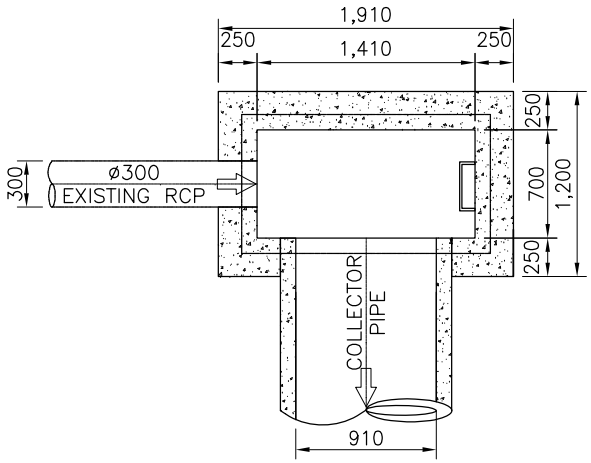
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

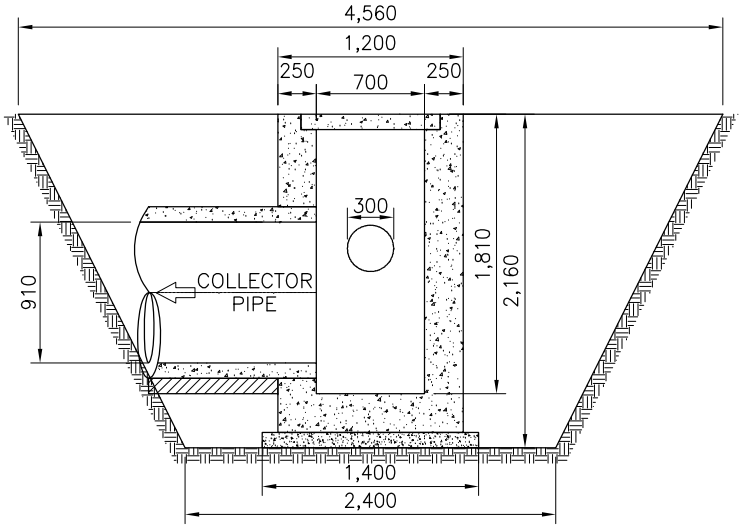
Manhole No.: ML 37.1

Location: 2 + 507

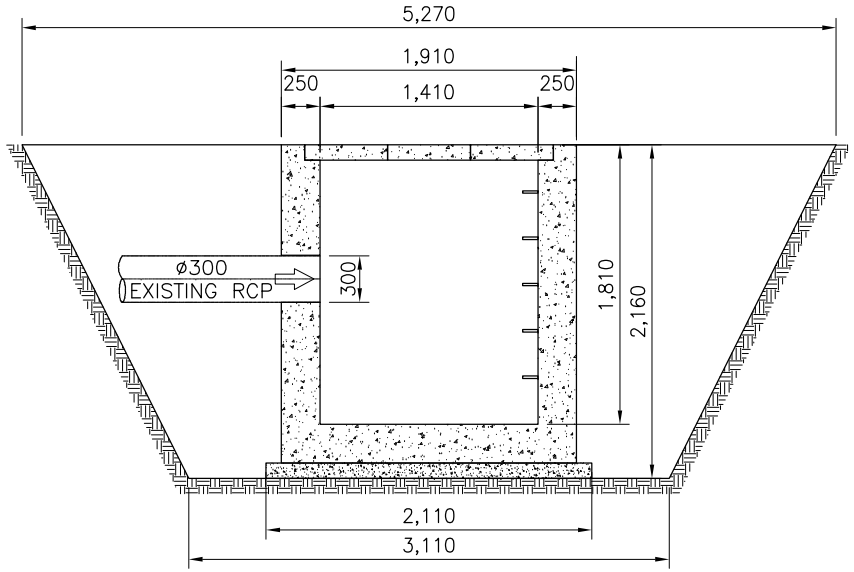
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A=9.05	3.48	31.50	
				31.50	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.10	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	1.81	2.36	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.09**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.45	0.10	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.00		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**26.25**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



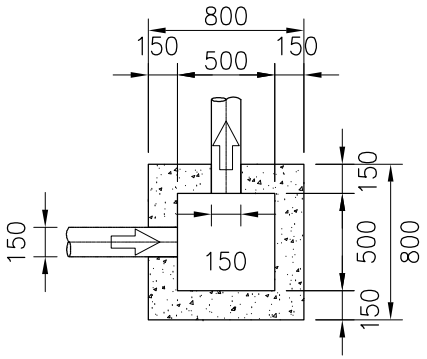
2 SECTION
SCALE A

QUANTITIES OF JUNCTION BOX

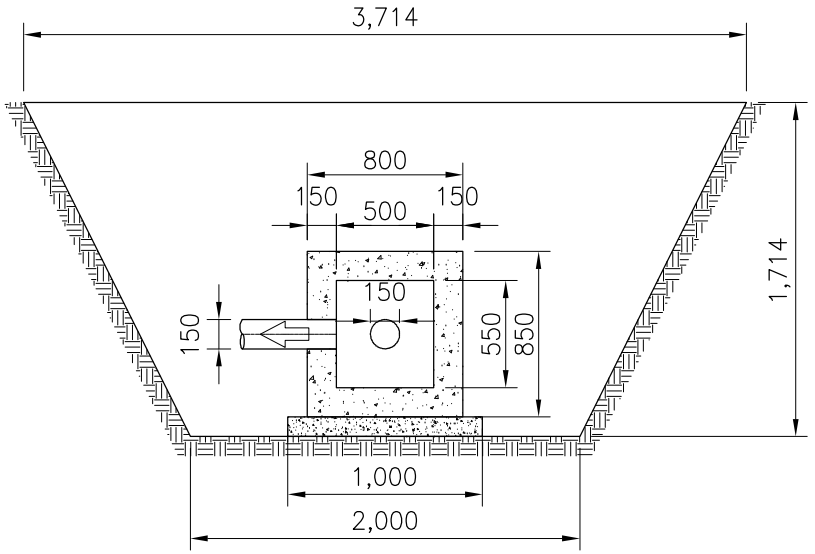
Junction Box No.: JB 37.4

Location: 2 + 543

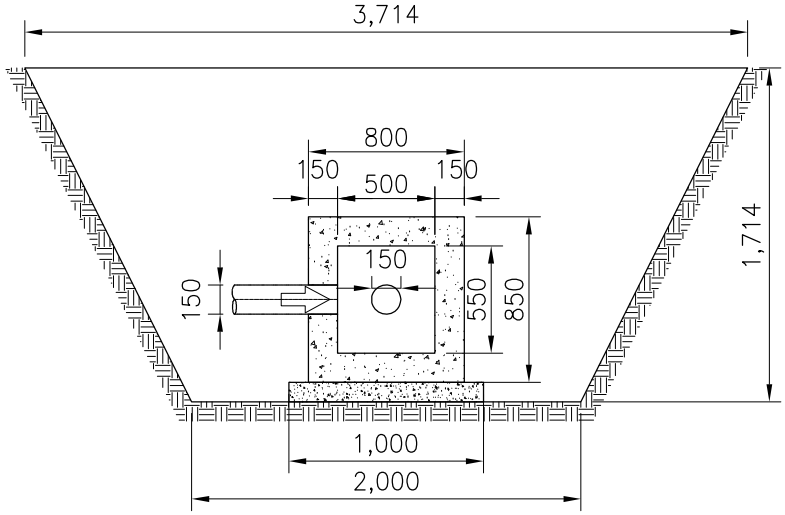
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A=4.90	2.86	13.99 **13.99**	m^3
2. Lev. Concrete	W=1.00 L=1.00	1.00	0.10	**0.10**	m^3
3. Bottom Slab	W=0.80 L=0.80	0.64	0.20	**0.13**	m^3
4. Wall					
Entire Wall	Wout=0.80 Lout=.80 Win=0.50 Lin=.50	Aout=0.64 Ain=0.25 Anet=0.39	0.55	0.21	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall A	DiaB=0.15	0.02	0.15	0.00	
Pipe hole on Wall C	DiaC=0.15	0.02	0.15	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.21**	m^3
5. Top Slab	W=0.80 L=0.80	0.64	0.15	**0.10**	m^3
7. Backfill				**11.66**	m3



4 PLAN (JB 37.4)
SCALE A



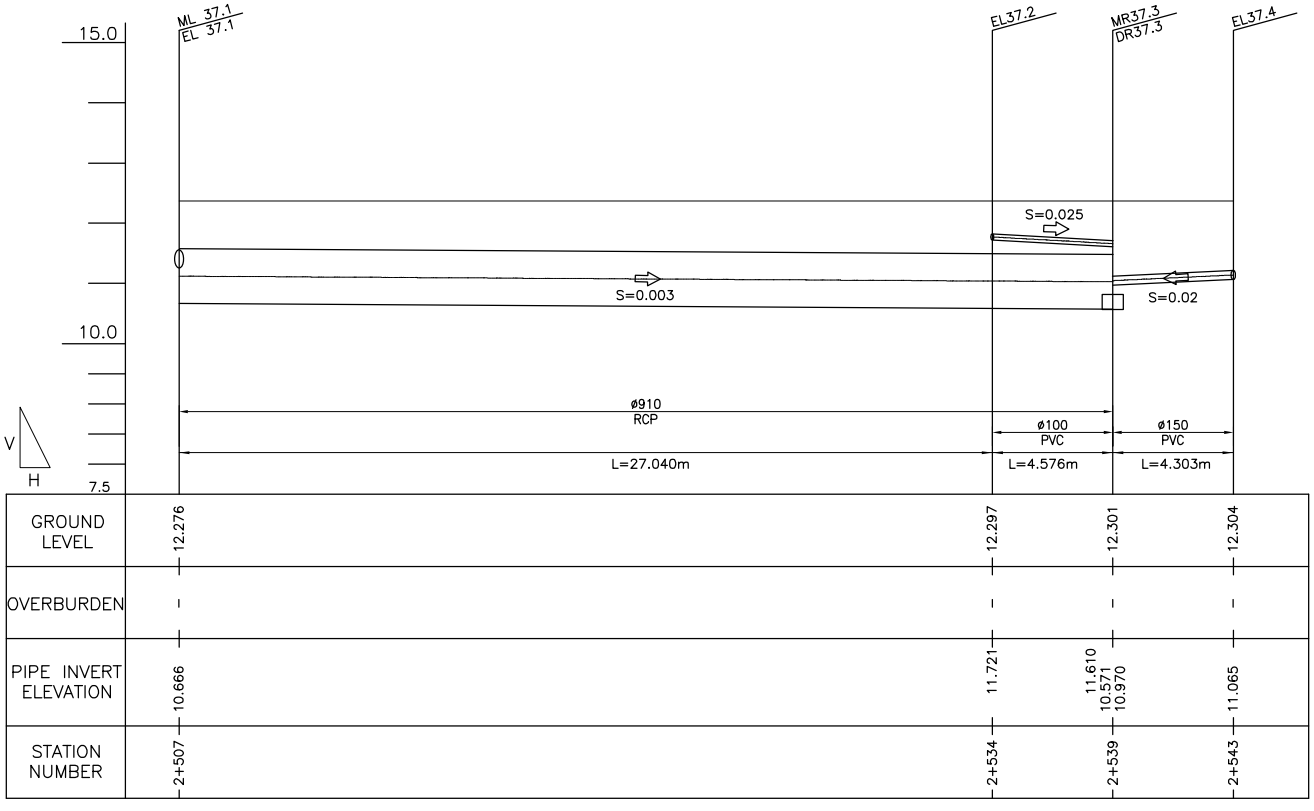
6 SECTION
SCALE A



5 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=27.12	28	pc
Collector Pipe (PVC)	Dia=0.15		L=4.39	1	pc
Collector Pipe (PVC)	Dia=0.10		L=4.69	1	pc
2. Conc. Bedding	Dia=0.91	L=27.12	0.1	2.47	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=27	1.56	m3
4. PVC coupling	Dia=0.10			0	pc
PVC coupling	Dia=0.20			0	pc
5. Formworks				28.18	m^3



Clearing (Manhole 37.3)

L1	1.755	m	
W of Manhole	1.91	m	**A=29.99** m^2
L2	1.169	m	
W	5.42	m	

Clearing (Manhole 37.1)

W	5.27	m	**A=24.03** m^2
L	4.56	m	

Clearing (Junction Manhole 37.4)

W	3.714	m	**A=13.79** m^2
L	3.714	m	

Clearing (Collector 37.1 - 37.3)

W	3.98	m	**A=125.83** m^2
L	31.616	m	

Clearing (Collector 37.4 - 37.3)

W	2.435	m	**A=10.48** m^2
L	4.303	m	

(Collector Pipe) Downstream	37.1-37.3		Excavation
Do	1.11	m	A=5.93 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.31 m^2
H	1.93	m	Backfill Zone C
EL. A	12.301	m	A=1.97 m^2
EL. B	10.571	m	
W	4.04	m	

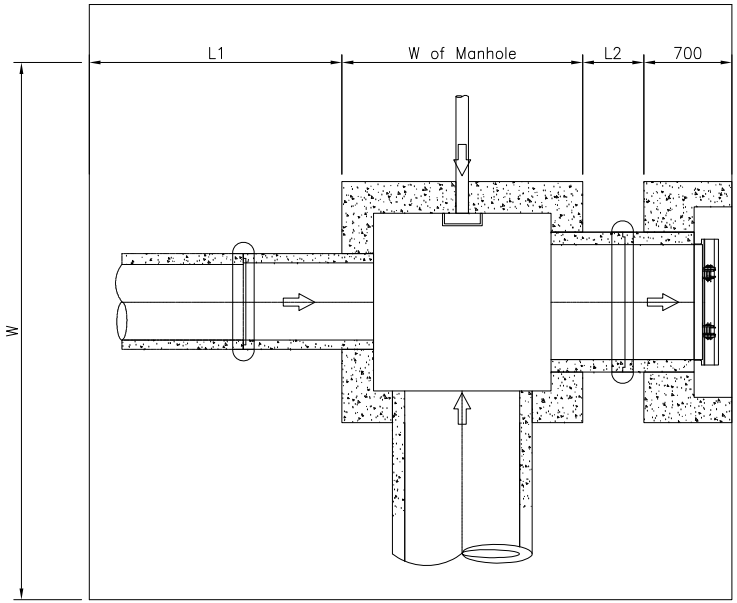
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=5.46 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.13 m^2
H	1.81	m	Backfill Zone C
EL. A	12.276	m	A=1.82 m^2
EL. B	10.666	m	
W	3.92	m	

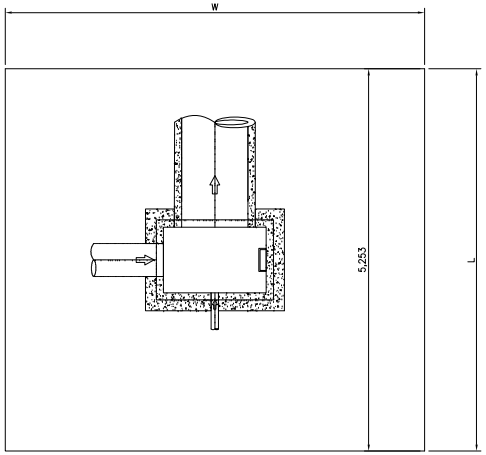
(Collector PVC) Downstream	37.4-37.3		Excavation
D	0.15	m	A=2.42 m2
W1	2.48	m	Backfill Zone B
W2	1.82	m	A=0.97 m2
H	1.331	m	Backfill Zone C
H/2	0.6655	m	A=1.43 m2
EL. A	12.301	m	
EL. B	10.97	m	

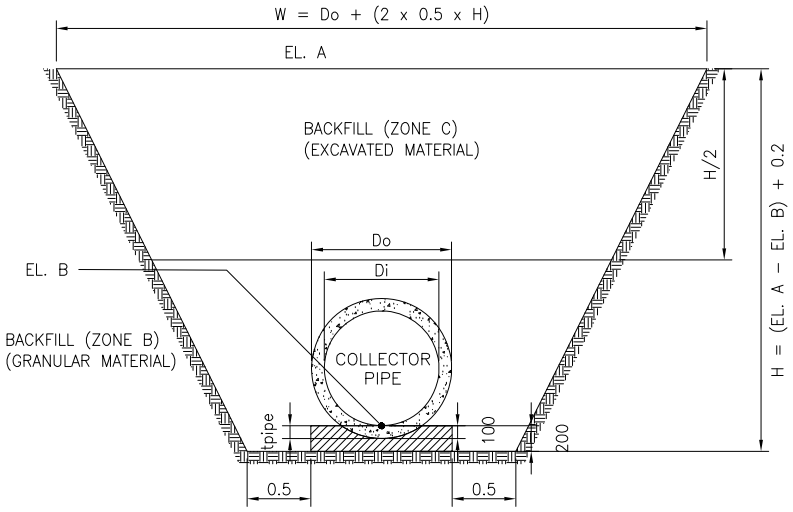
(Collector PVC) Upstream			Excavation
D	0.15	m	A=2.19 m2
W1	2.39	m	Backfill Zone B
W2	1.77	m	A=0.89 m2
H	1.239	m	Backfill Zone C
H/2	0.6195	m	A=1.29 m2
EL. A	12.304	m	
EL. B	11.065	m	

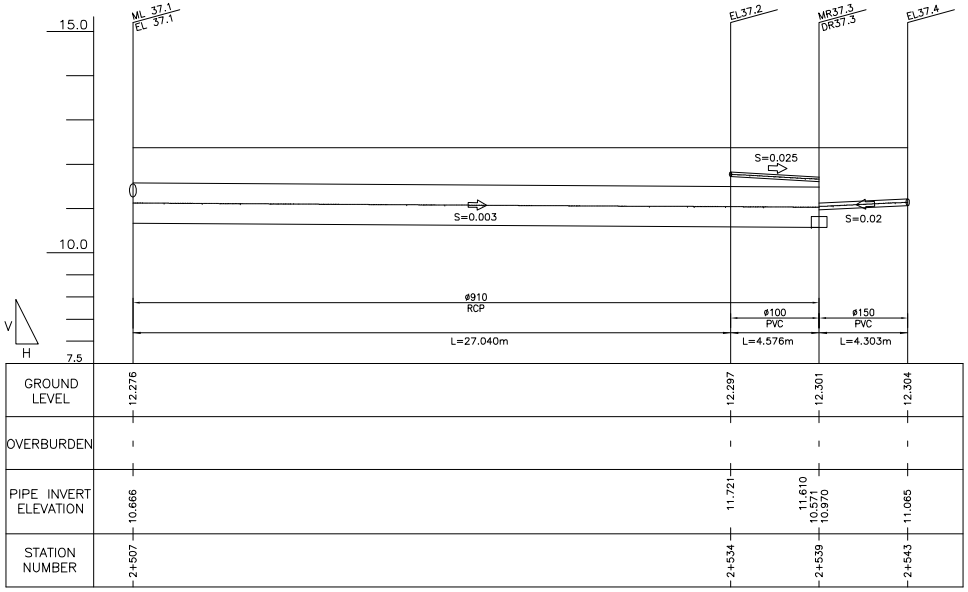
Collector Pipe 37.1-37.3	Volume	
Excavation	**180.6234**	m^3
Backfill Zone B	**38.67334**	m^3
Backfill Zone C	**59.98067**	m^3

Collector PVC 37.4-37.3	Volume	
Excavation	**10.11424**	m^3
Backfill Zone B	**4.072482**	m^3
Backfill Zone C	**5.964197**	m^3


L1
W of Manhole
L2
700
W


W
5,253
L


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
tpipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5

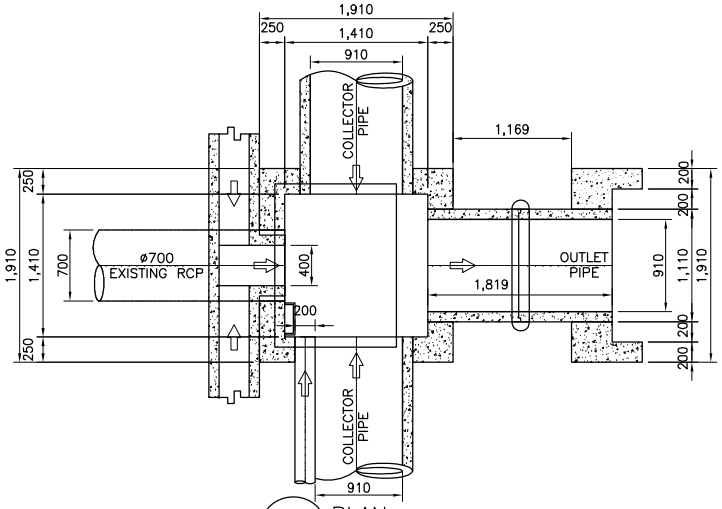

15.0
10.0
7.5
V
H
ML 37.1
EL 37.1
EL37.2
MR37.3
DR37.3
EL37.4
S=0,025
S=0.003
S=0.02
ø910
RCP
L=27.040m
ø100
PVC
L=4.576m
ø150
PVC
L=4.303m
GROUND LEVEL
12.276
12.297
12.301
12.304
OVERBURDEN
-
-
-
-
PIPE INVERT ELEVATION
10.666
11.721
11.610
10.571
10.970
11.065
STATION NUMBER
2+507
2+534
2+539
2+543

QUANTITIES OF MANHOLE

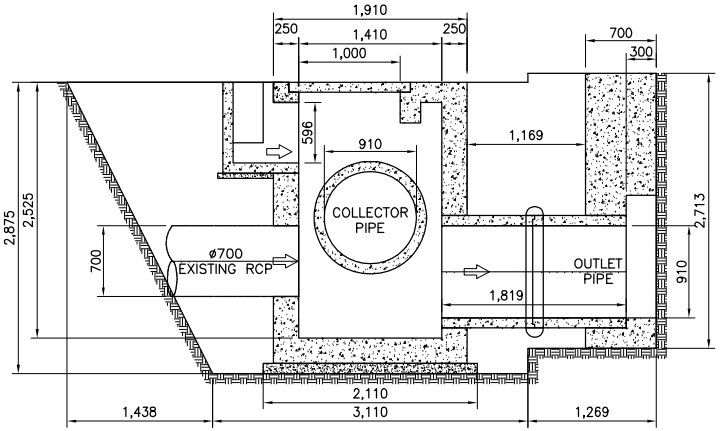
Manhole No.: ML 37.6

Location: 2 + 552

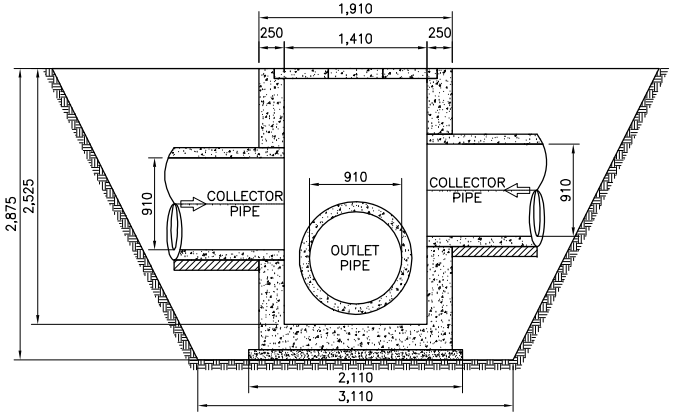
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.44	4.55	15.66	
		A2=11.01	4.55	50.06	
				65.72	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.525	4.192	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	1.00	0.25	0.25	
D=0.60	W=0.40	0.84	0.25	0.21	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.25**	m^3
5. Conc. Cover	L=1.20 W=1.61	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.18	0.7	3.63	
	Lout=2.71				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.69	m3
9. Outlet Pipe	Dia=.910m	L=1.82		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.06**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.17		**0.13**	m3
12. Backfill				**54.76**	m3



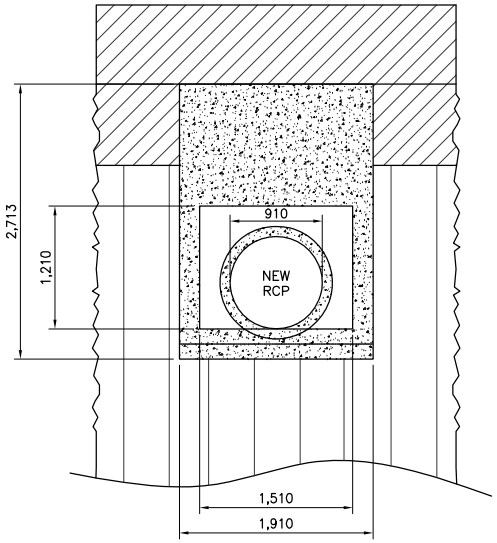
1 PLAN
SCALE A



2 SECTION
SCALE A



3 SECTION
SCALE A



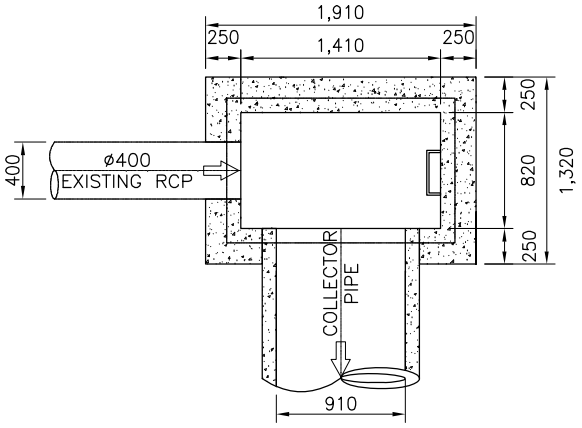
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

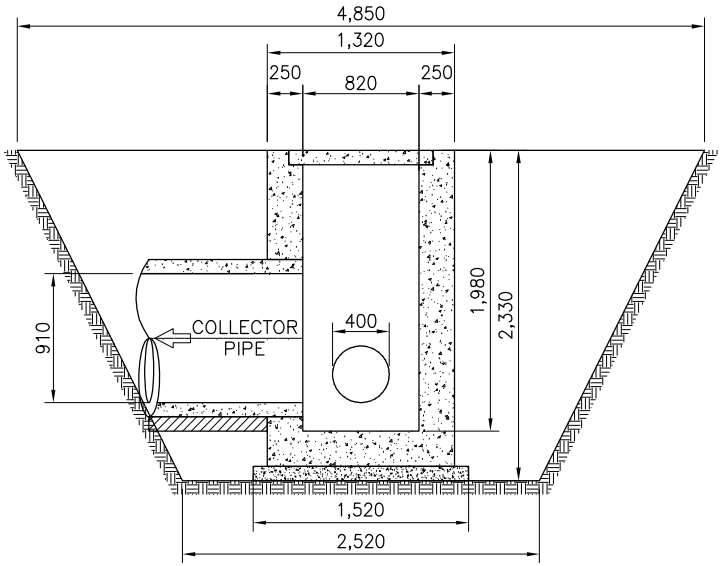
Manhole No.: ML 37.5

Location: 2 + 549

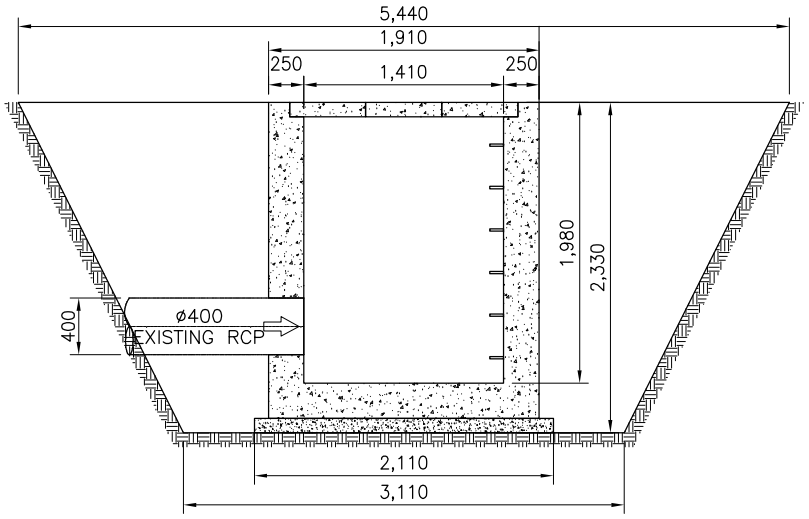
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=9.96	3.69	36.71	
				36.71	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.52	3.21	0.1	**0.32**	m^3
3. Bottom Slab	W=1.91 L=1.32	2.52	0.25	**0.63**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.32	Aout=2.52			
	Win=1.41 Lout=.82	Ain=1.16	1.980	2.703	m^3
	.	Anet=1.37			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.53	0.22	0.25	0.05	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.41**	m^3
5. Conc. Cover	L=1.02 W=1.61	1.6422	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**30.59**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



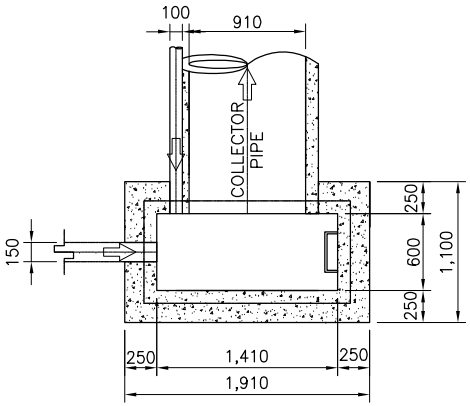
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

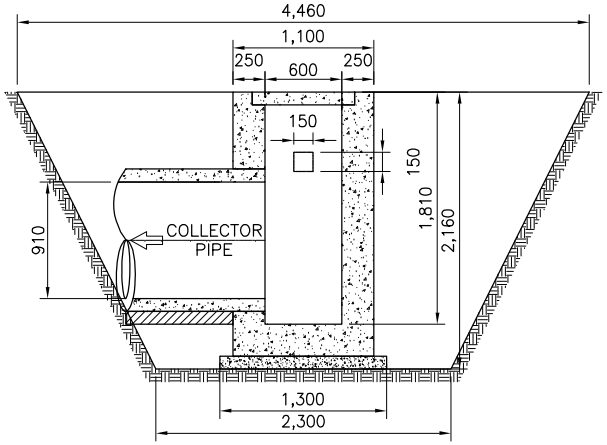
Manhole No.: ML 37.9

Location: 2 + 577

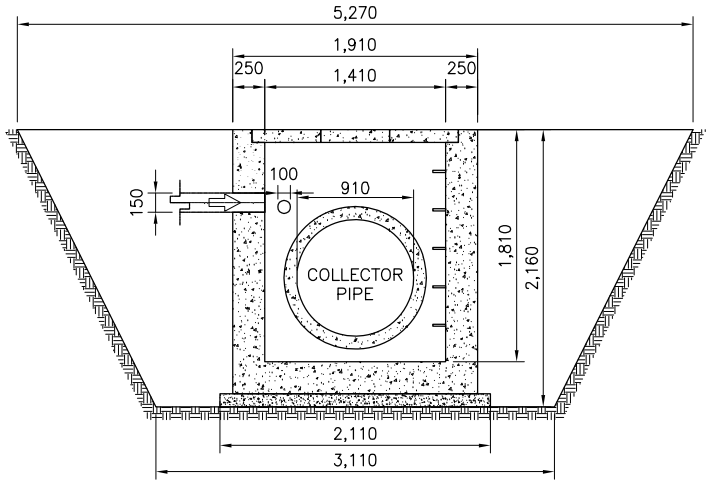
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=9.05	3.48	31.50	
				31.50	m^3
					m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	1.810	2.272	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
D=0.15	W=0.15	0.02	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.98	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.02**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**26.25**	m3



1 PLAN
SCALE A



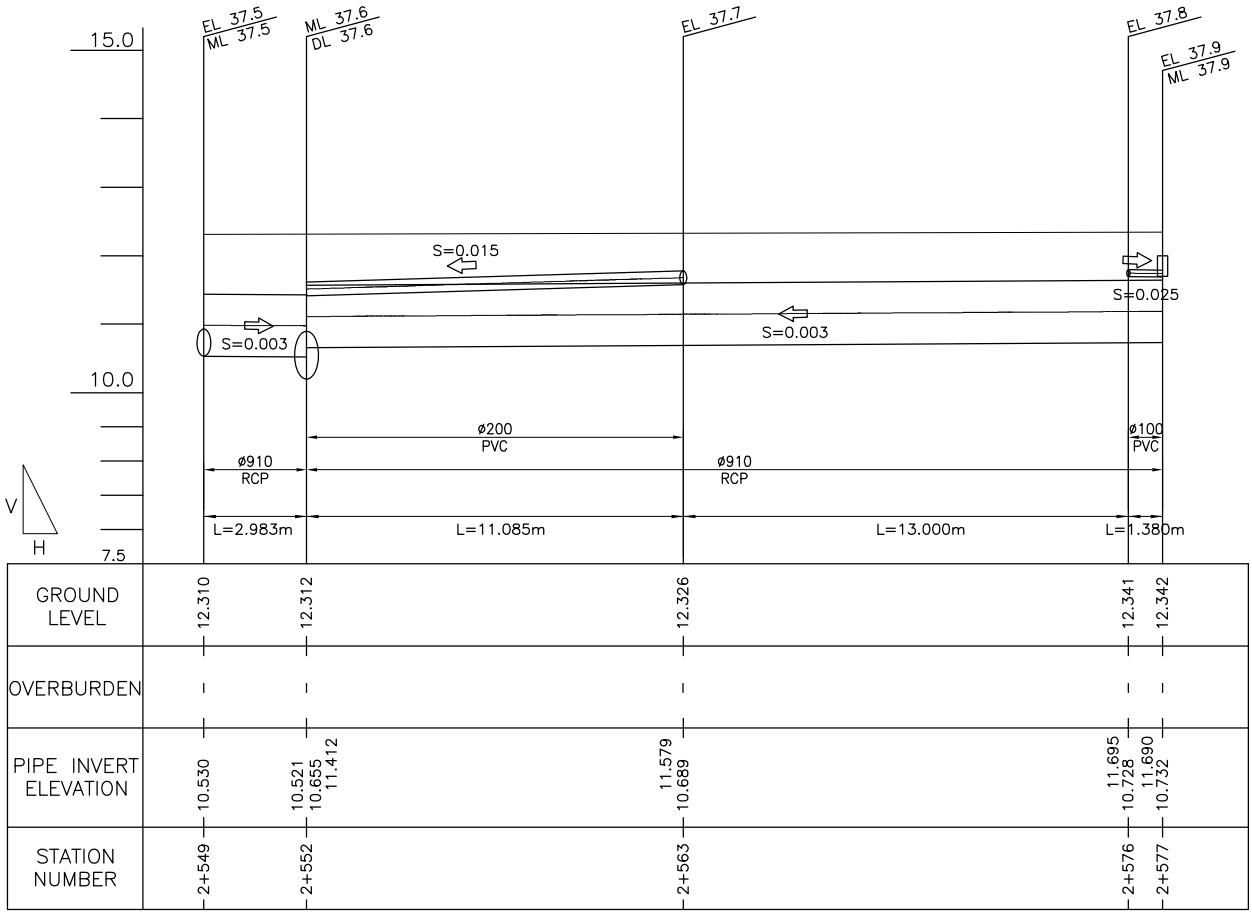
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=28.53	29	pc
Collector Pipe (PVC)	Dia=0.20		L=11.25	2	pc
Collector Pipe (PVC)	Dia=0.10		L=1.41	1	pc
2. Conc. Bedding	Dia=0.91	L=28.53	0.1	2.60	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=28	1.62	m3
4. PVC coupling	Dia=0.20			1	pc
PVC coupling	Dia=0.10			0	pc
5. Formworks				29.48	m^3



Clearing (Manhole 37.6)

L1	2.0375	m	
W of Manhole	1.91	m	**A=34.81** m^2
L2	1.169	m	
W	5.985	m	

Clearing (Manhole 37.9)

W	5.27	m	**A=23.50** m^2
L	4.46	m	

Clearing (Junction Manhole 37.5)

W	5.44	m	**A=26.38** m^2
L	4.85	m	

Clearing (Collector 37.9 - 37.6)

W	3.9435	m	**A=94.98** m^2
L	24.085	m	

Clearing (Collector 37.5 - 37.6)

W	4.0955	m	**A=12.22** m^2
L	2.983	m	

(Collector Pipe) Downstream	37.9-37.6		Excavation
Do	1.11	m	A=5.64 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.20 m^2
H	1.857	m	Backfill Zone C
EL. A	12.312	m	A=1.87 m^2
EL. B	10.655	m	
W	3.967	m	

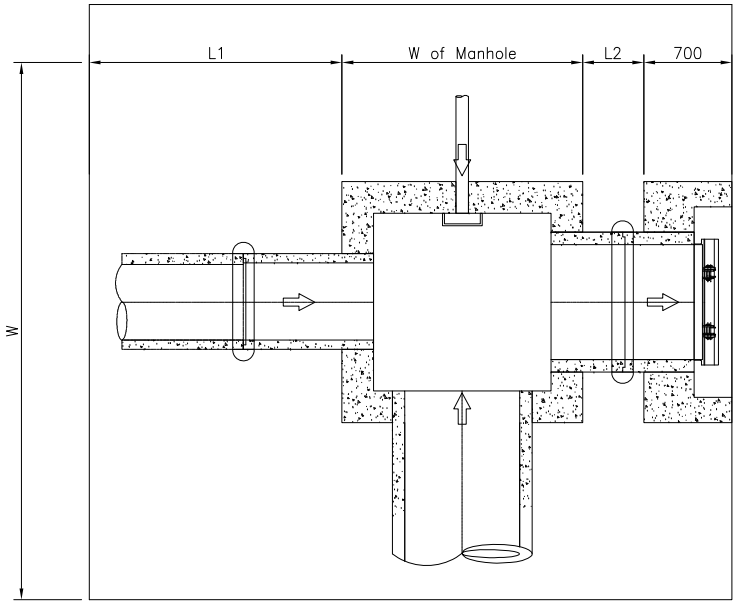
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=5.46 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.13 m^2
H	1.81	m	Backfill Zone C
EL. A	12.342	m	A=1.82 m^2
EL. B	10.732	m	
W	3.92	m	

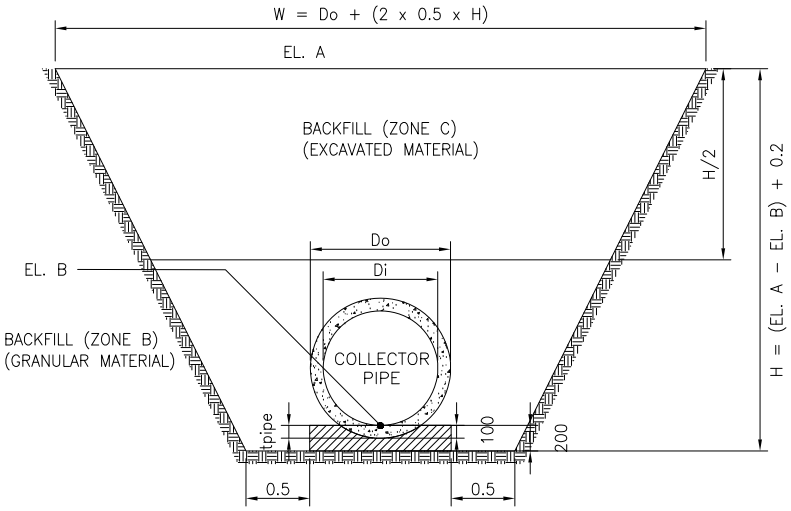
(Collector Pipe) Downstream	37.5-37.6		Excavation
Do	1.11	m	A=6.18 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.41 m^2
H	1.991	m	Backfill Zone C
EL. A	12.312	m	A=2.04 m^2
EL. B	10.521	m	
W	4.101	m	

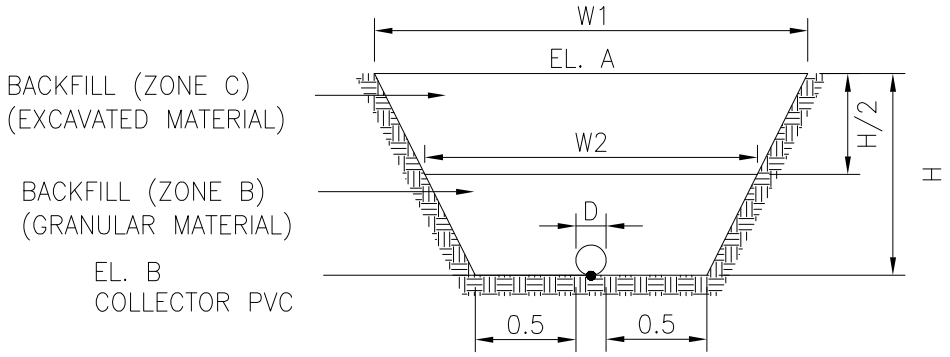
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=6.14 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.39 m^2
H	1.98	m	Backfill Zone C
EL. A	12.31	m	A=2.03 m^2
EL. B	10.53	m	
W	4.09	m	

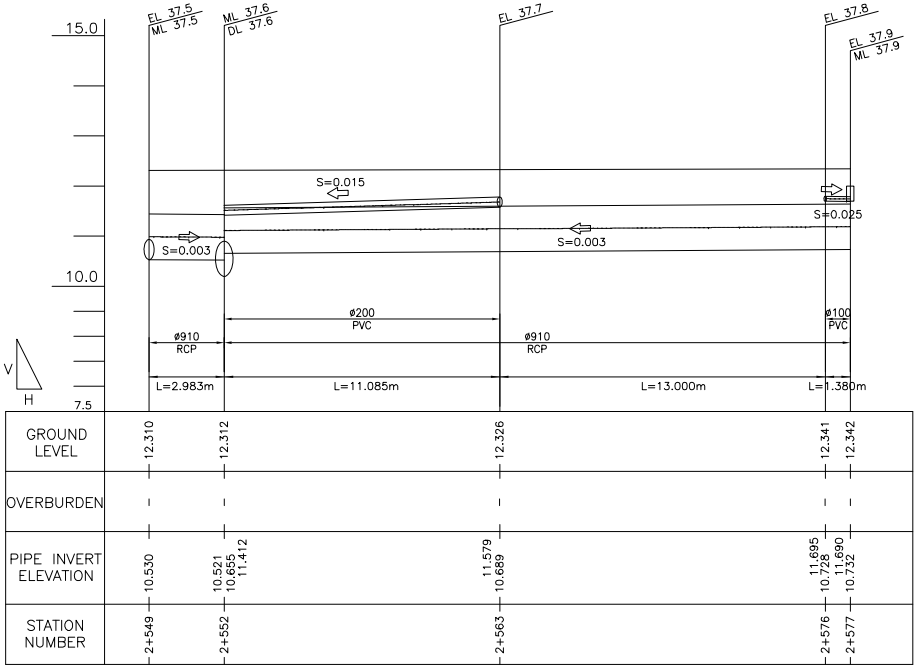
Collector Pipe 37.9-37.6	Volume	
Excavation	**141.7502**	m^3
Backfill Zone B	**29.38956**	m^3
Backfill Zone C	**47.14509**	m^3

Collector Pipe 37.5-37.6	Volume	
Excavation	**18.43198**	m^3
Backfill Zone B	**4.182127**	m^3
Backfill Zone C	**6.093123**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
H/2
H
0.5
0.5

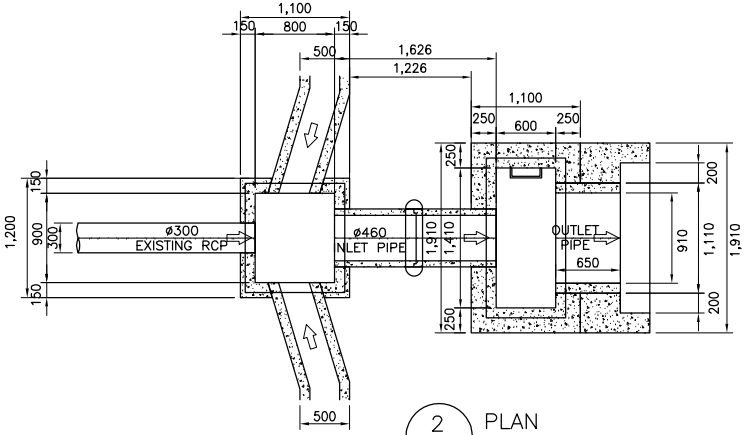

15.0
10.0
7.5
V
H
EL 37.5
ML 37.5
ML 37.6
DL 37.6
EL 37.7
EL 37.8
EL 37.9
ML 37.9
S=0.015
S=0.025
S=0.003
S=0.003
ø200
PVC
ø910
RCP
ø910
RCP
ø100
PVC
L=2.983m
L=11.085m
L=13.000m
L=1.380m
GROUND LEVEL
12.310
12.312
12.326
12.341
12.342
OVERBURDEN
PIPE INVERT ELEVATION
10.530
10.521
10.655
11.412
11.579
10.689
11.695
10.728
11.690
10.732
STATION NUMBER
2+549
2+552
2+563
2+576
2+577

QUANTITIES OF MANHOLE

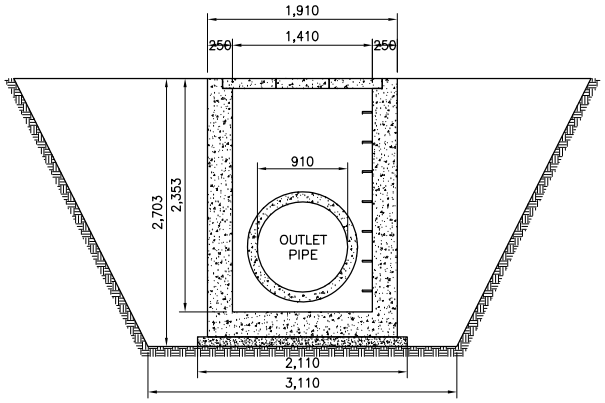
Manhole No.: ML 40

Location: 2 + 858

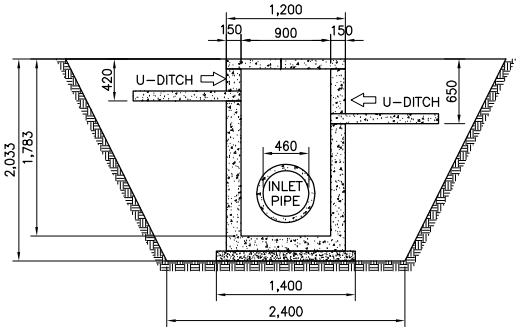
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=6.49	4.46	28.94	
		A2=0.72	3.42	2.45	
		A3=5.14	3.42	17.56	
				48.95	m^3
2. Lev. Concrete (Manhole)	W=1.50 L=2.11	3.17	0.1	**0.32**	m^3
3. Bottom Slab (Manhole)	W=1.30 L=1.91	2.48	0.25	**0.62**	m^3
4. Wall					
Manhole	Wout=1.30 Lout=1.91	Aout=2.48			
	Win=0.80 Lin=1.41	Ain=1.13	1.832	2.482	m^3
		Anet=1.36			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.17**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=1.00	1.61	0.1	**0.16**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=6	0.000201062		0.000120637 0.95 **5.68**	m^3 kg/pc kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=2.53		**3**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.88		**0.208347**	m3
12. Backfill				**40.79**	m3



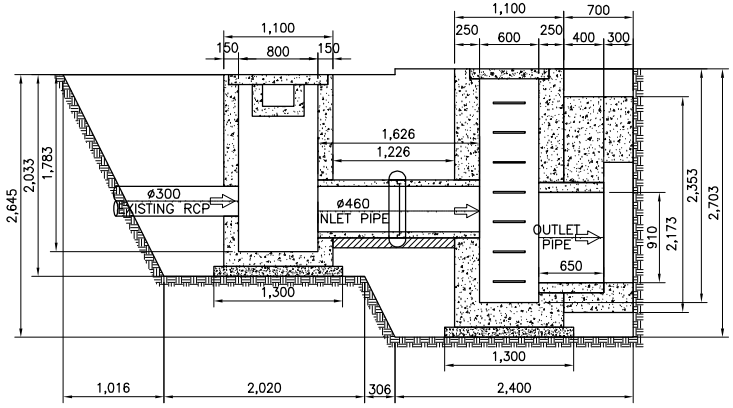
2 PLAN
SCALE B



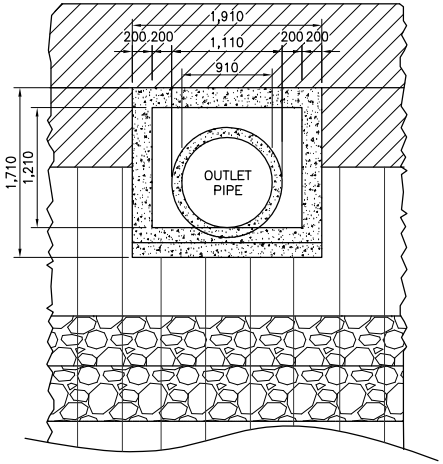
4 SECTION
SCALE B



6 SECTION
SCALE B



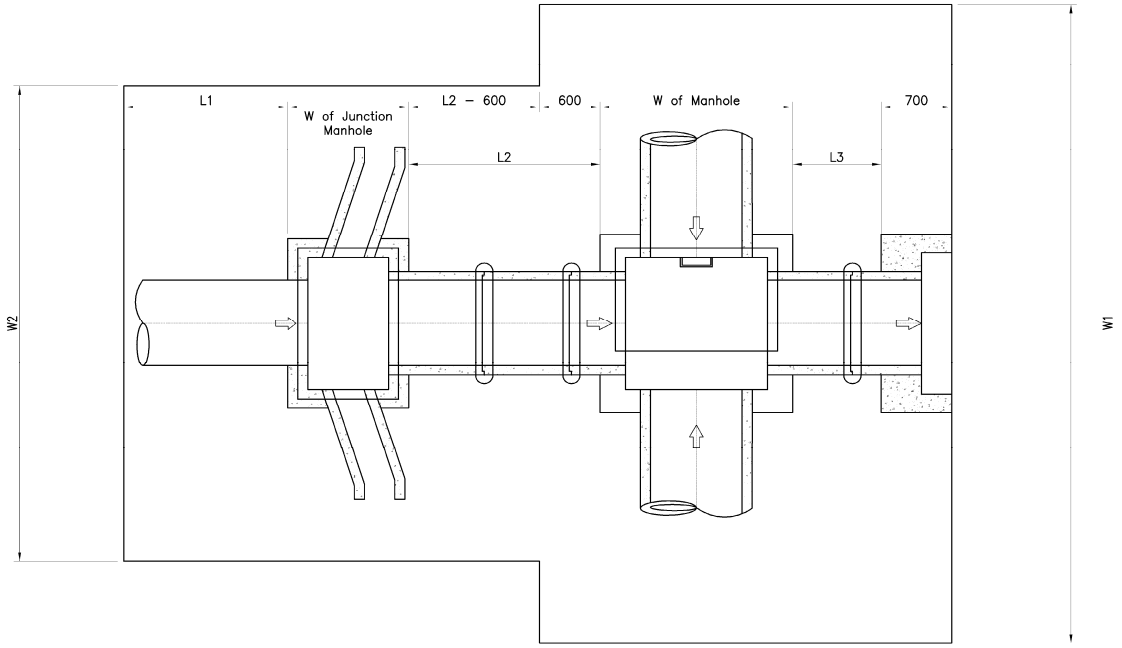
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 40)

L1	1.6165 m	
W of Junction Manhole	1.1 m	Am=13.95 m^2
L2	1.226 m	Ajb=14.82 m^2
W of Manhole	1.1 m	**At=28.77** m^2
L3	0 m	
W1	5.813 m	
W2	4.433 m	

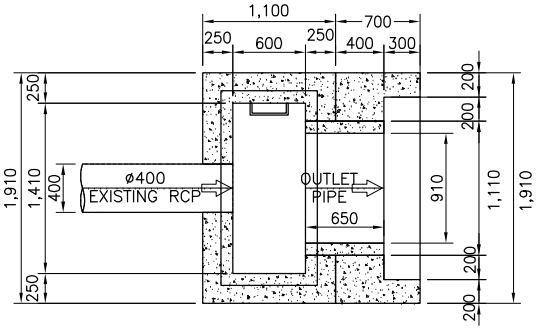


QUANTITIES OF MANHOLE

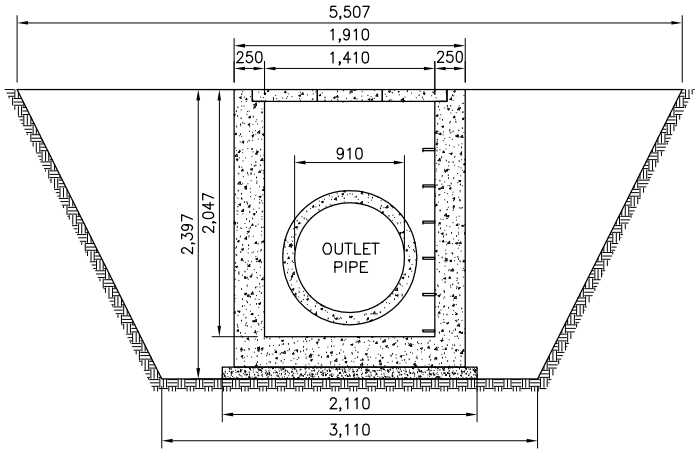
Manhole No.: ML 41

Location: 2 + 877

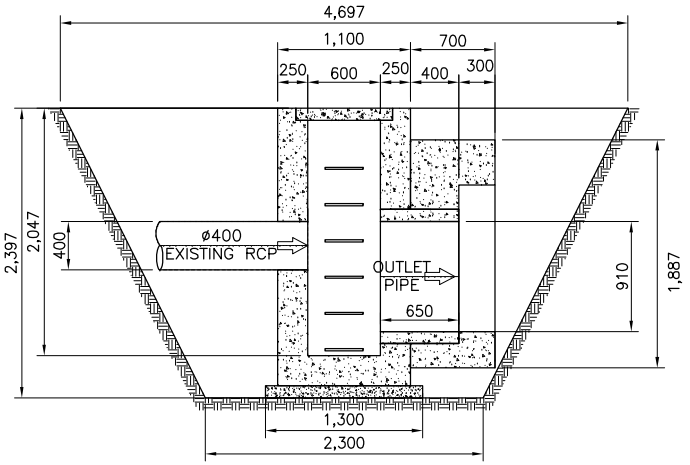
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=8.39	4.31	36.13	
				36.13	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.047	2.569	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.53	0.22	0.25	0.05	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.27**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				0	pc
8. Conc. Mouth	Wout=1.91 Lout=1.89	Ain=3.60	0.7	2.52	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.59	m3
9. Outlet Pipe	Dia=.910m	L=2.03		3	pc
10. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	0.115359282	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.38		0.152847	m3
12. Backfill				**30.11**	m3



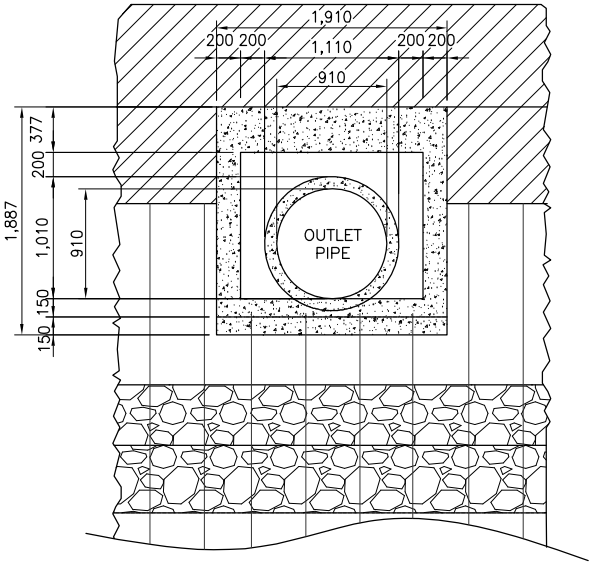
2 PLAN
SCALE B



4 SECTION
SCALE B



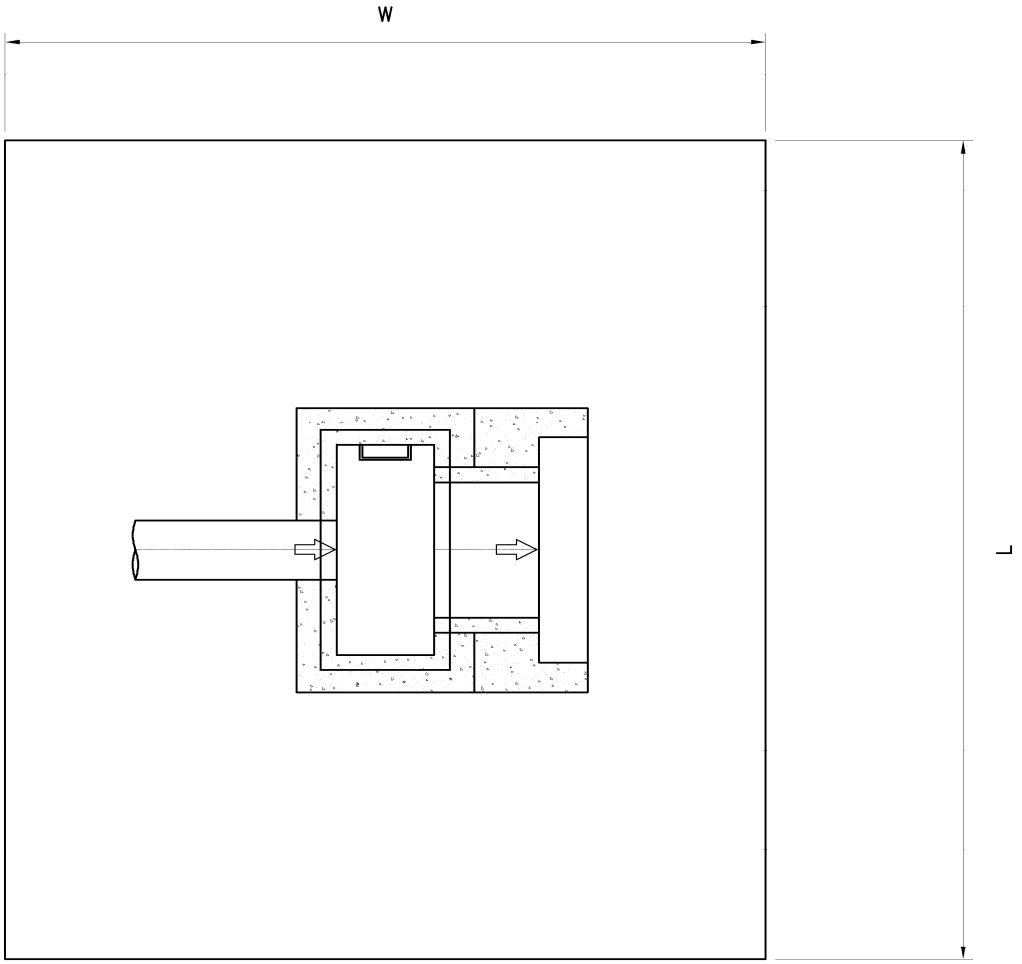
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 41)

W	4.697 m	**A=25.87**	m^2
L	5.507 m		

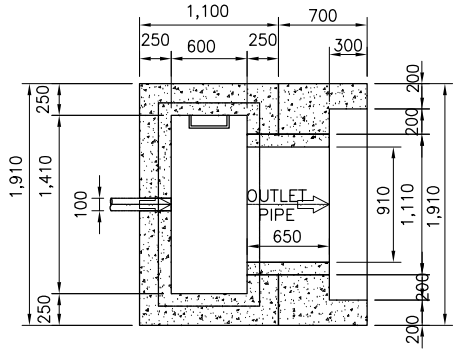


QUANTITIES OF MANHOLE

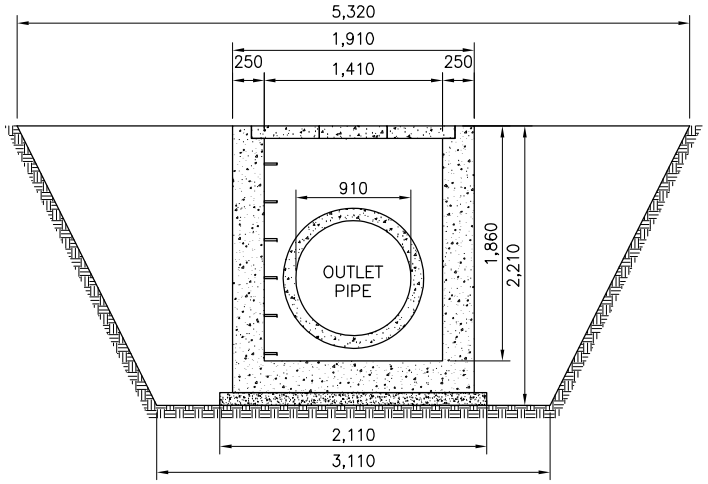
Manhole No.: ML 41.1

Location: 2 + 888

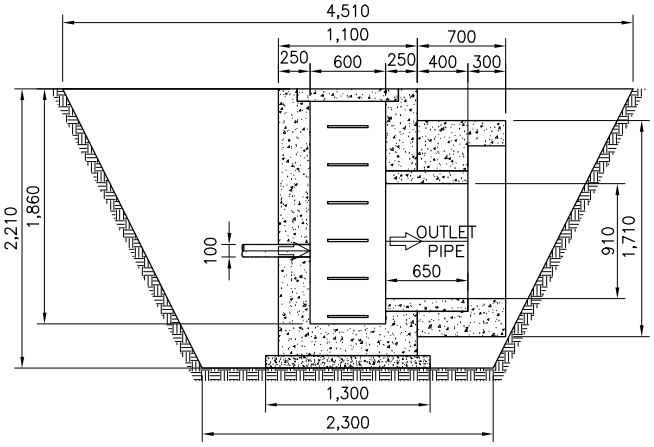
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.53	4.22	31.72	
				31.72	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.860	2.334	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.10	0.01	0.25	0.00	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.09**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.92		**2**	pc
10. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.27		**0.140526**	m3
12. Backfill				**26.43**	m3



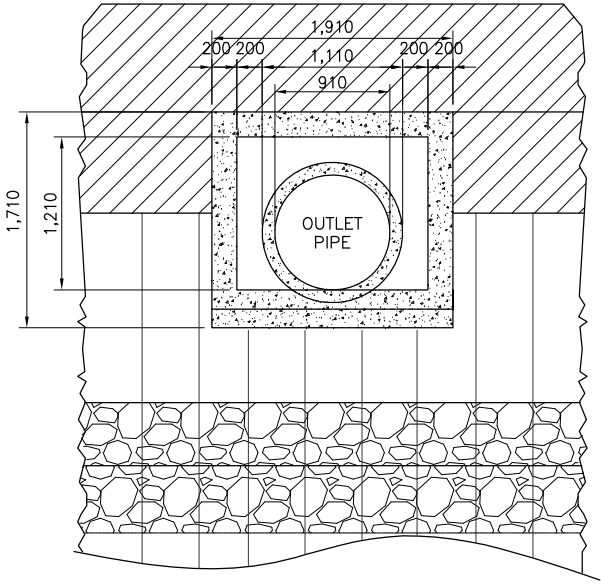
2 PLAN
SCALE B



4 SECTION
SCALE B



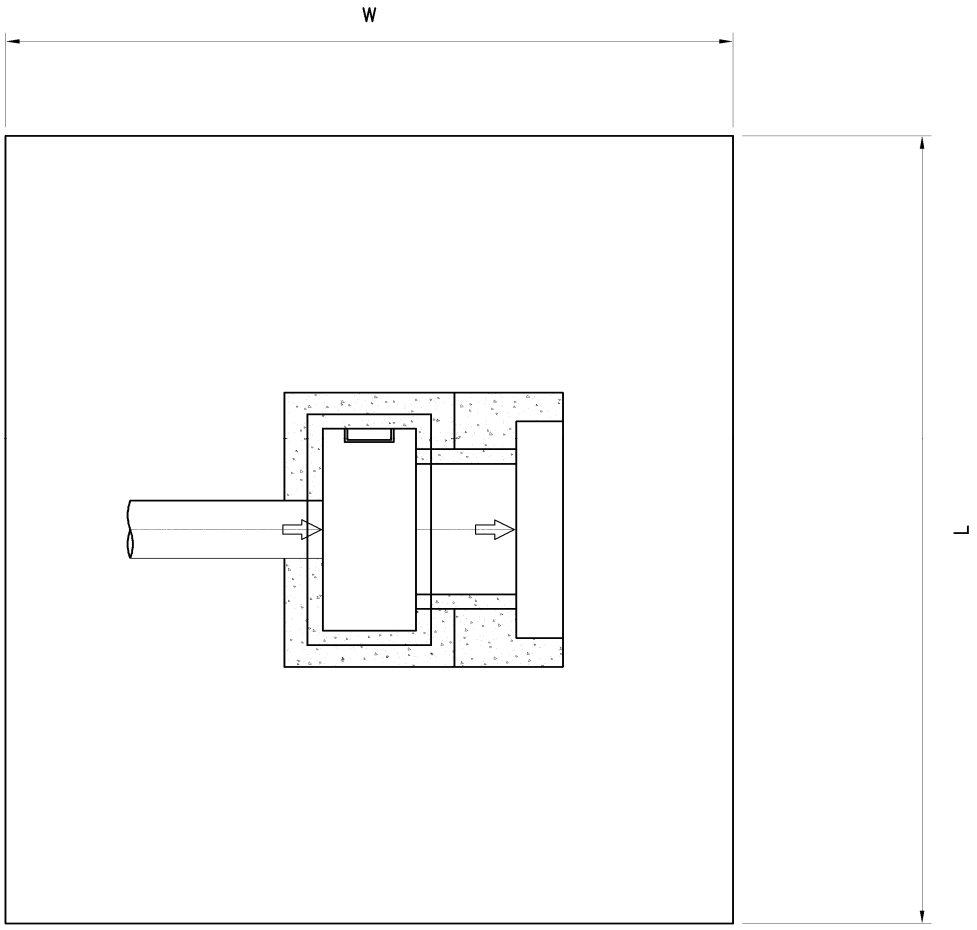
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 41.1)

W	4.51 m	**A=23.99**	m^2
L	5.32 m		

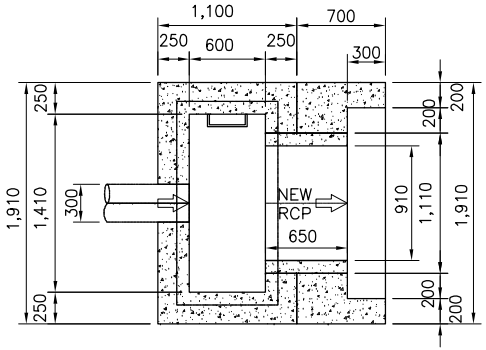


QUANTITIES OF MANHOLE

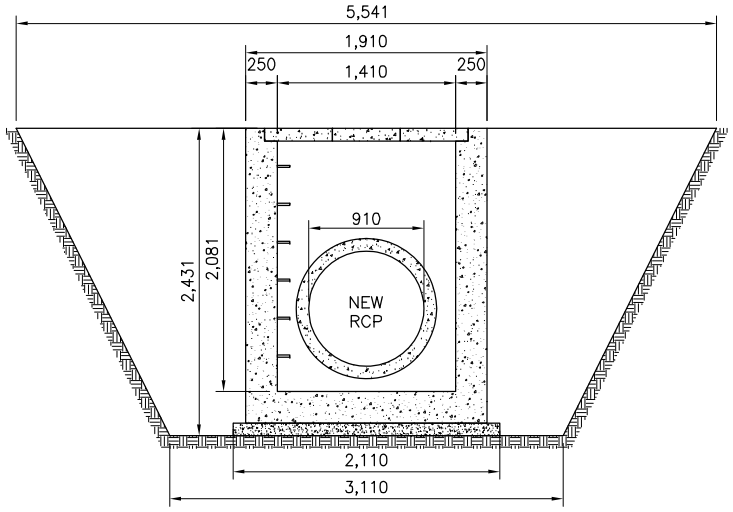
Manhole No.: ML 42

Location: 2 + 898

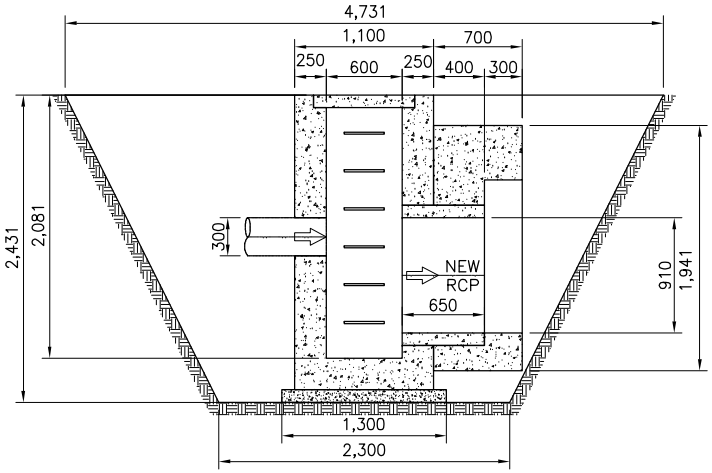
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=8.55	4.33	36.97	
				36.97	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.081	2.612	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.34**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.94	Ain=3.71	0.7	2.60	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.66	m3
9. Outlet Pipe	Dia=.910m	L=1.92		**2**	pc
10. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.27		**0.140526**	m3
12. Backfill				**30.81**	m3



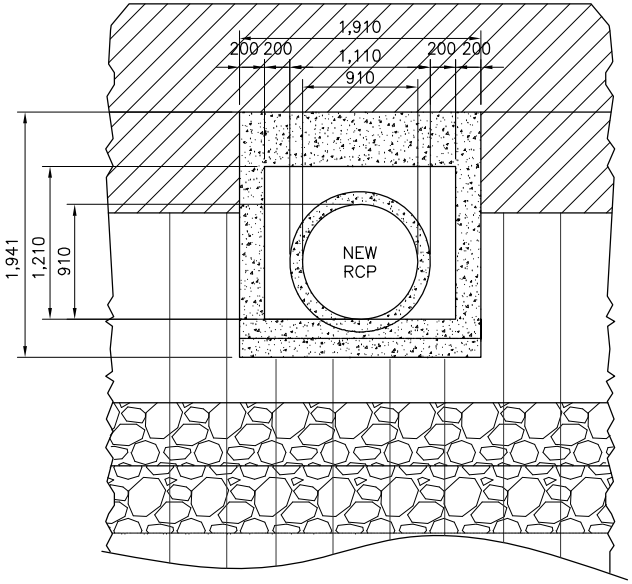
2 PLAN
SCALE B



4 SECTION
SCALE B



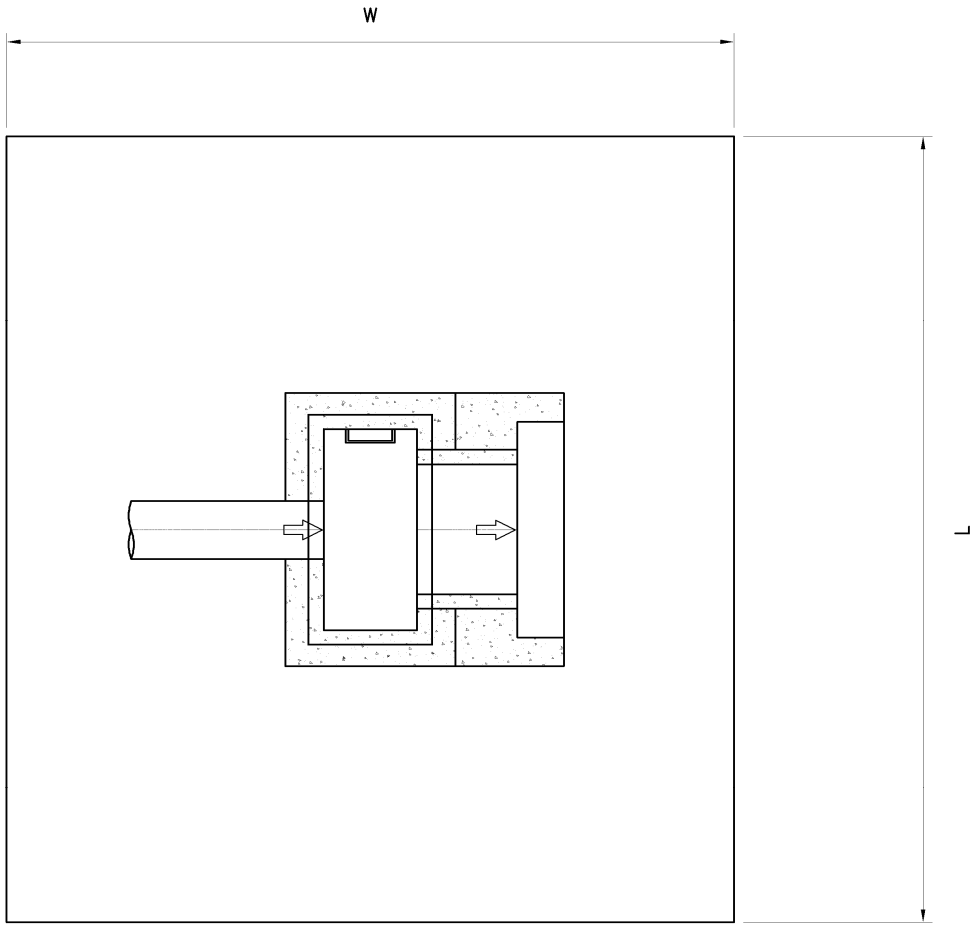
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 42)

W	4.731 m	**A=26.21**	m^2
L	5.541 m		

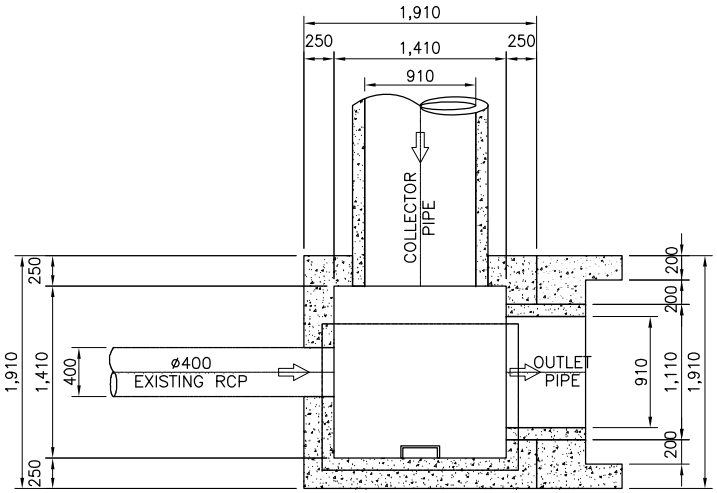


QUANTITIES OF MANHOLE

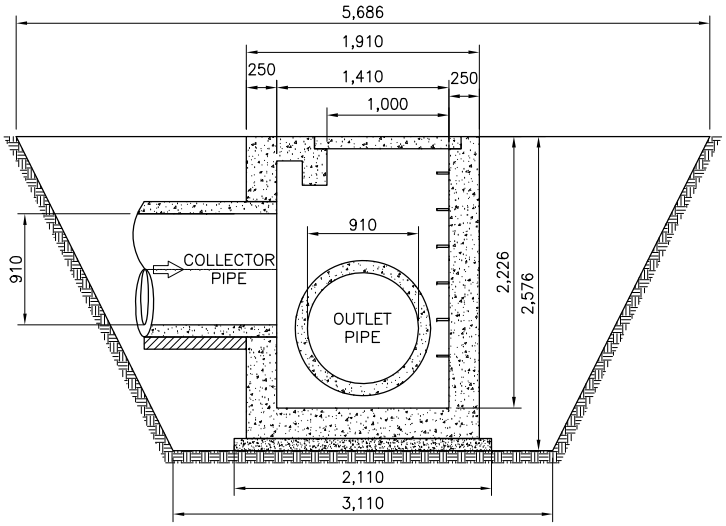
Manhole No.: ML 45

Location: 2 + 929

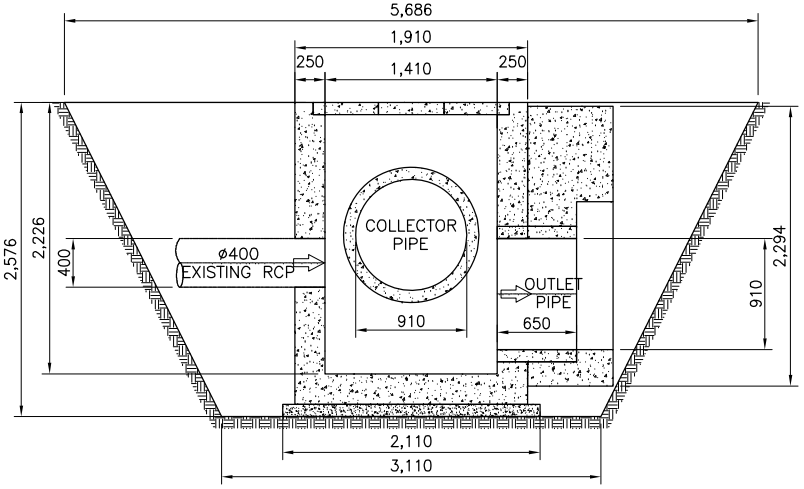
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.33	4.40	49.83	
				49.83	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.91	Aout=3.65			
	Win=1.41 Lin=1.41	Ain=1.99	2.226	3.695	m^3
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.53	0.22	0.25	0.05	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.16**	m^3
5. Conc. Cover	L=1.20 W=1.61	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Flapgate				0	pc
8. Conc. Mouth	Wout=1.91 Lout=2.29	Ain=4.38	0.7	3.07	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.13	m3
9. Outlet Pipe	Dia=.910m	L=0.65		**1**	pc
11. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=0	**0**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=.910m	L=0.00		**0**	m3
13. Backfill				**41.52**	m3



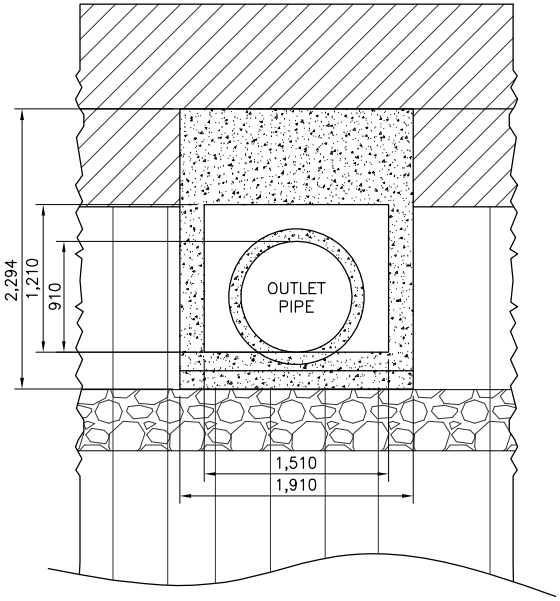
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



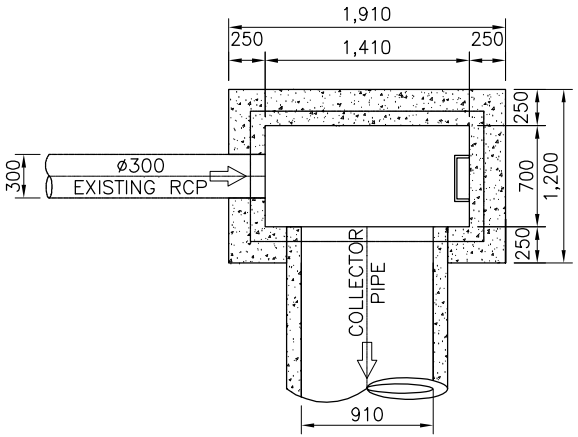
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

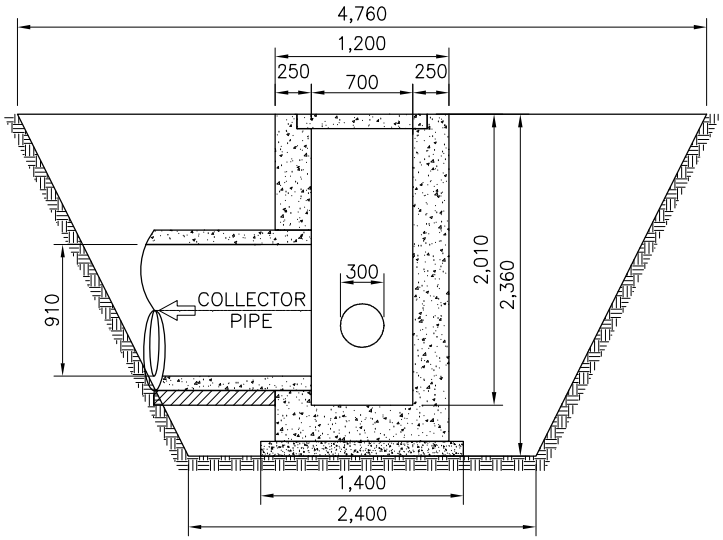
Manhole No.: ML 43

Location: 2 + 904

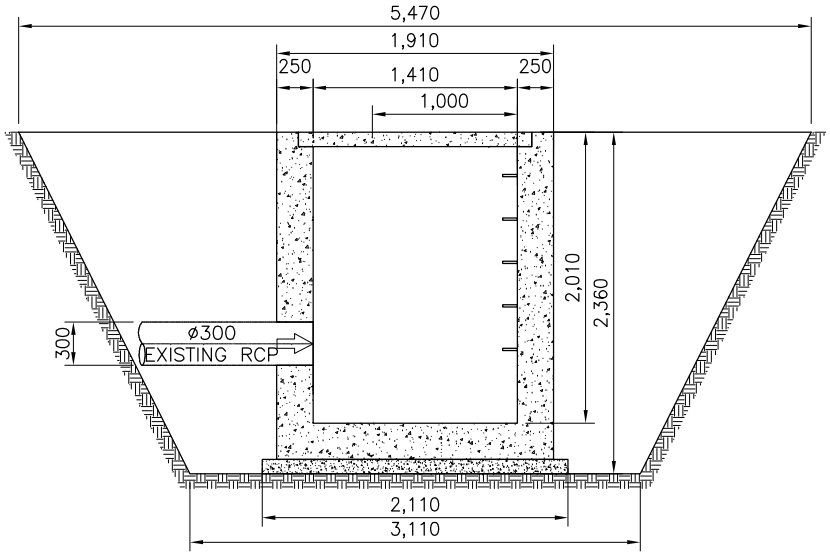
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=10.12	3.58	36.25	
				36.25	m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.1	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	2.010	2.623	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.35**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**30.20**	m3



3 PLAN
SCALE C



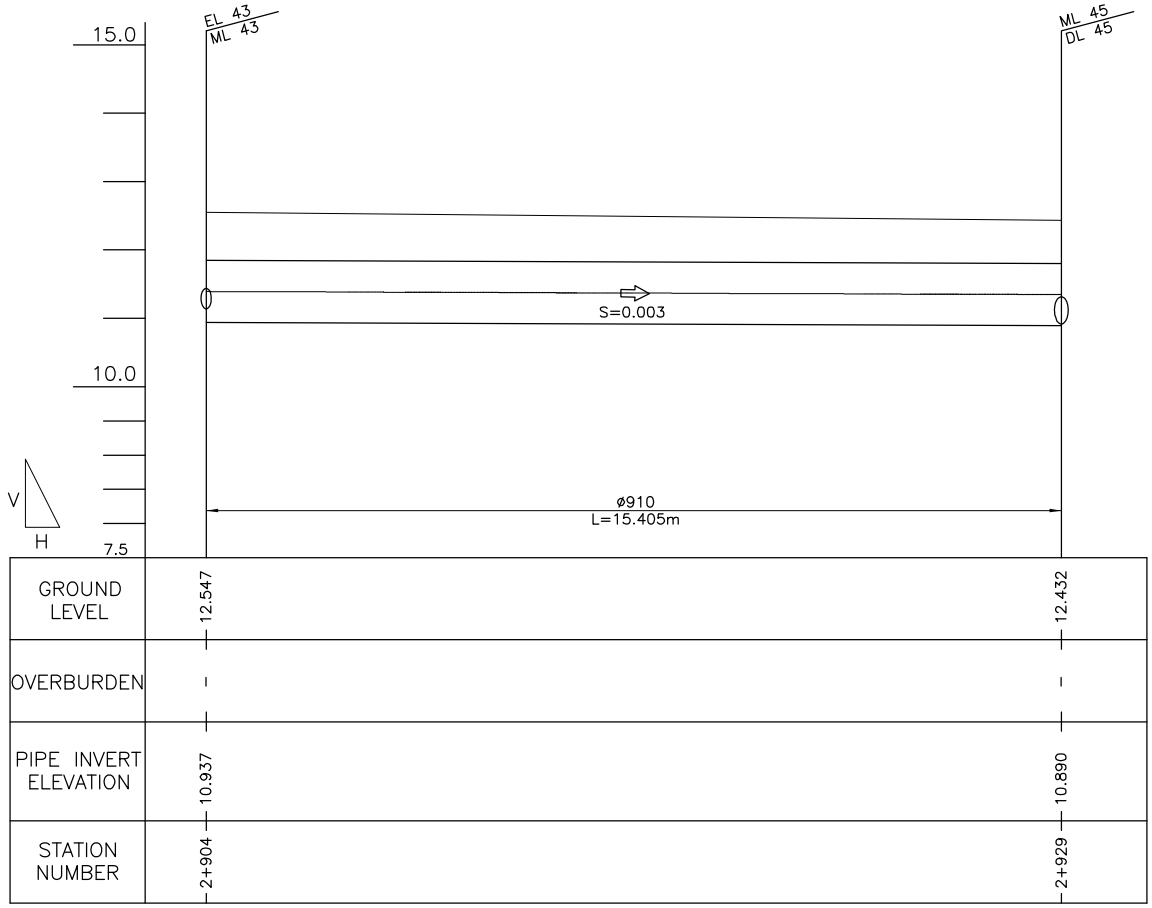
5 SECTION
SCALE C



4 SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (Rcp)	Dia=0.91		L=15.45	16	pc
2. Conc. Bedding	Dia=0.91	L=15.45	0.1	1.41	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=15	0.87	m3
4. Formworks				15.90	m3



Clearing (Manhole 45)

W	5.686 m	**A=32.33** m^2
L	5.686 m	

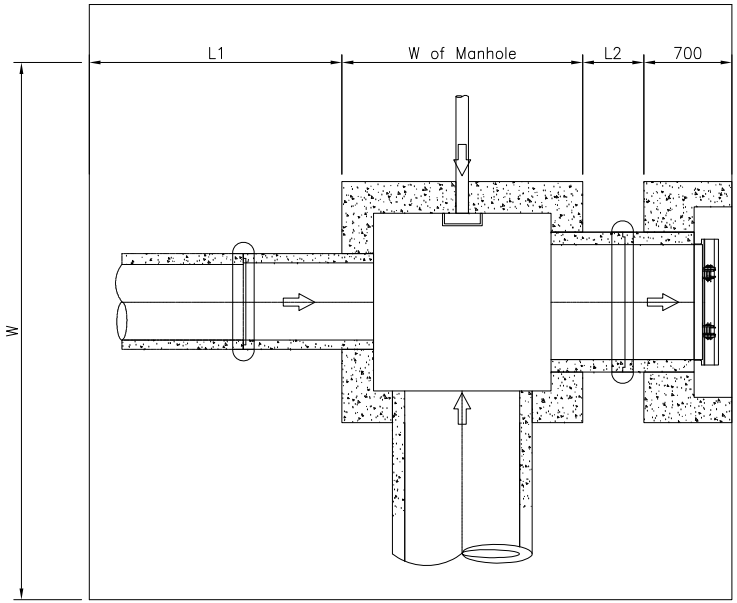
Clearing (Manhole 43)

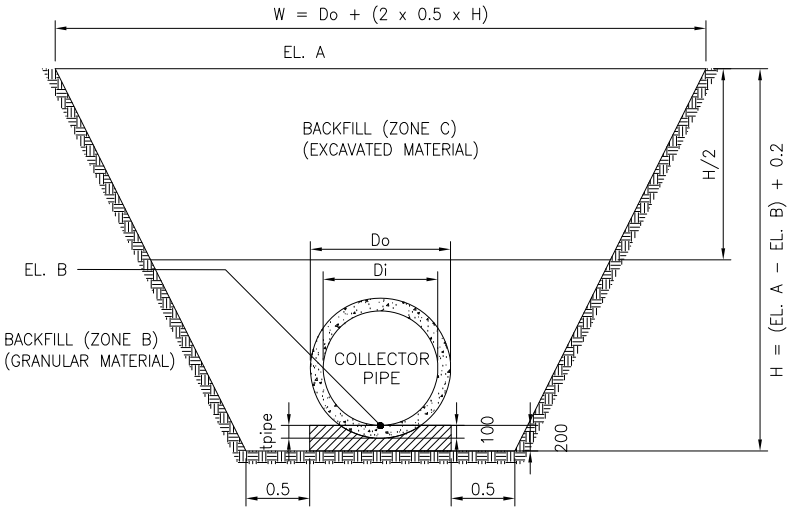
W	5.47 m	**A=26.04** m^2
L	4.76 m	

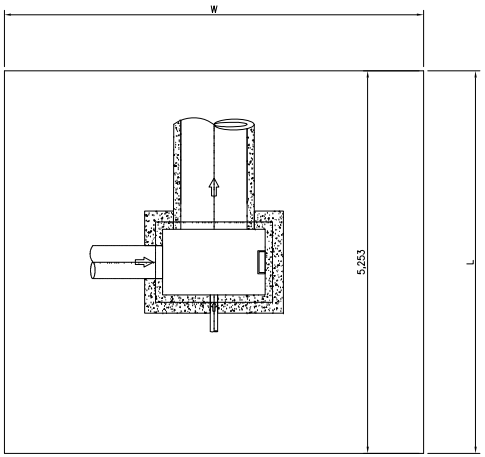
(Collector Pipe) Downstream		Excavation
Do	1.11 m	A=5.19 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.03 m^2
H	1.742 m	Backfill Zone C
EL. A	12.432 m	A=1.73 m^2
EL. B	10.89 m	
W	3.852 m	

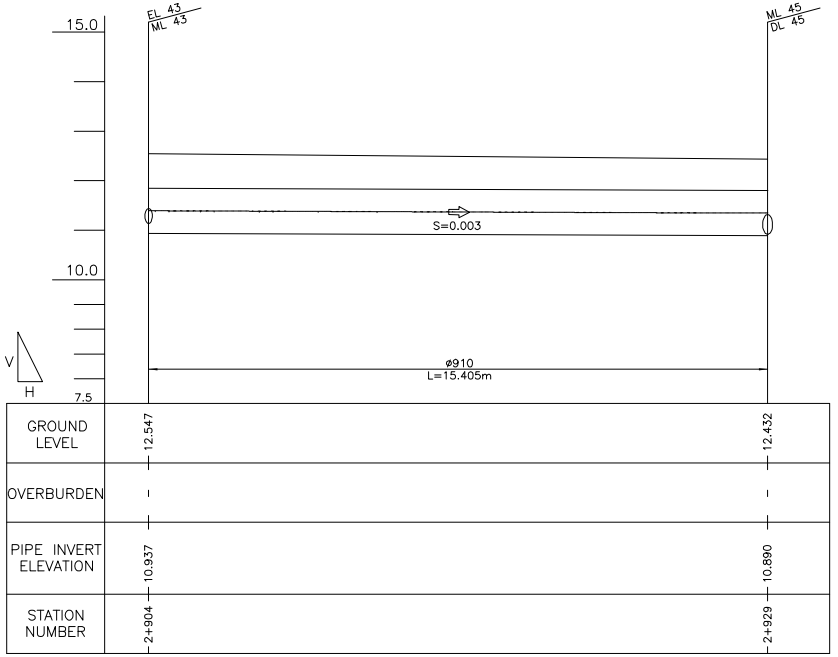
(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=5.46 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.13 m^2
H	1.81 m	Backfill Zone C
EL. A	12.547 m	A=1.82 m^2
EL. B	10.937 m	
W	3.92 m	

Collector Pipe	Volume
Excavation	**82.28** m^3
Backfill Zone B	**16.66** m^3
Backfill Zone C	**27.43** m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Ipipe
100
200
0.5
0.5


W
5,253
L

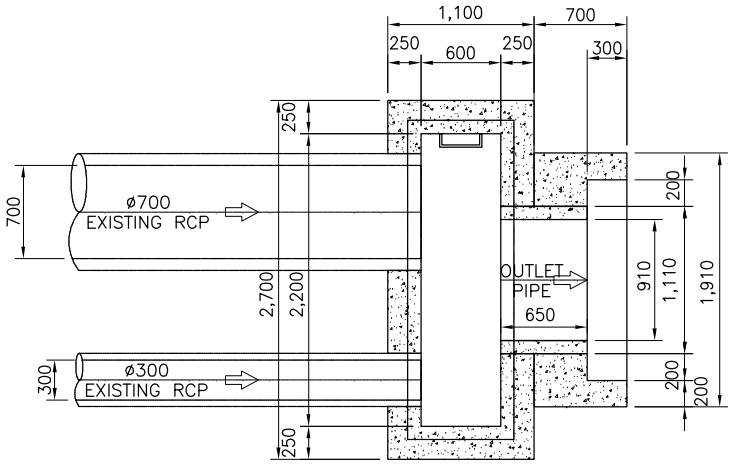

15.0
10.0
7.5
EL 43
ML 43
ML 45
DL 45
S=0.003
ø910
L=15.405m
V
H
GROUND LEVEL
12.547
12.432
OVERBURDEN
-
-
PIPE INVERT ELEVATION
10.937
10.890
STATION NUMBER
2+904
2+929

QUANTITIES OF MANHOLE

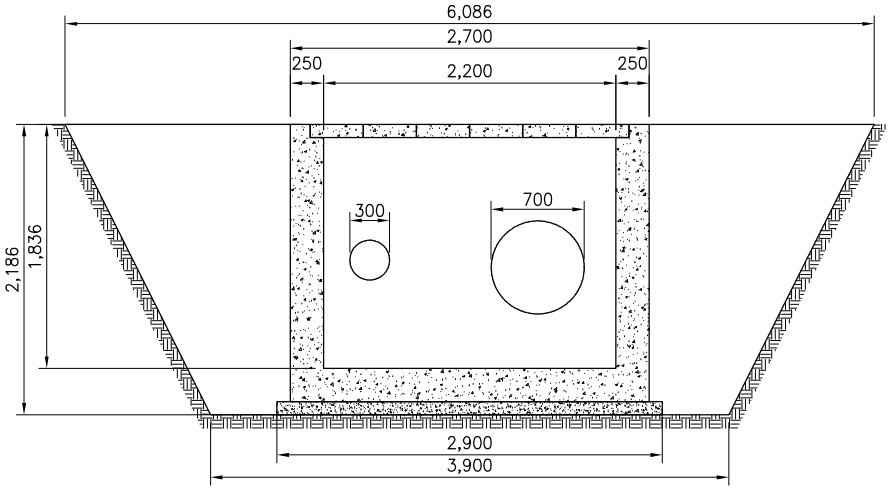
Manhole No.: ML 46

Location: 2 + 932

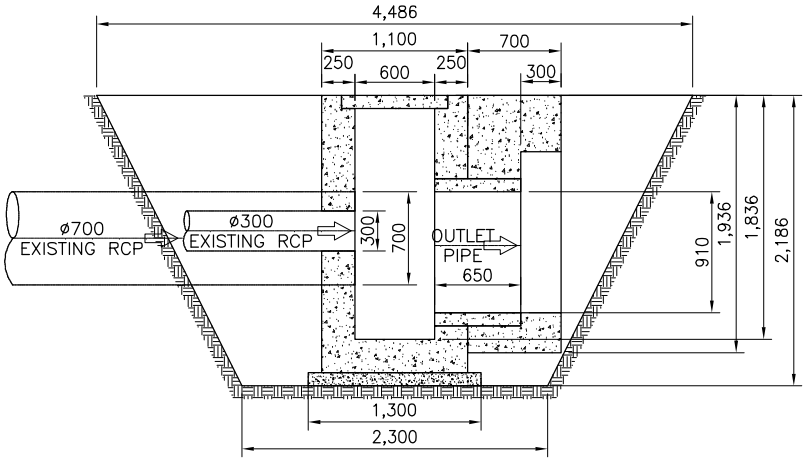
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.42	4.99	37.03	
				37.03	m^3
2. Lev. Concrete	W=1.30 L=2.90	3.77	0.1	**0.38**	m^3
3. Bottom Slab	W=1.10 L=2.70	2.97	0.25	**0.74**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.836	2.304	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.88	0.73	0.25	0.18	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.88**	m^3
5. Conc. Cover	L=1.61 W=1.10	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.94	Ain=3.70	0.7	2.59	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.65	m3
9. Outlet Pipe	Dia=.910m	L=0.65		**1**	pc
10. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=0	**0**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.910m	L=0.00		**0**	m3
12. Backfill				**30.86**	m3



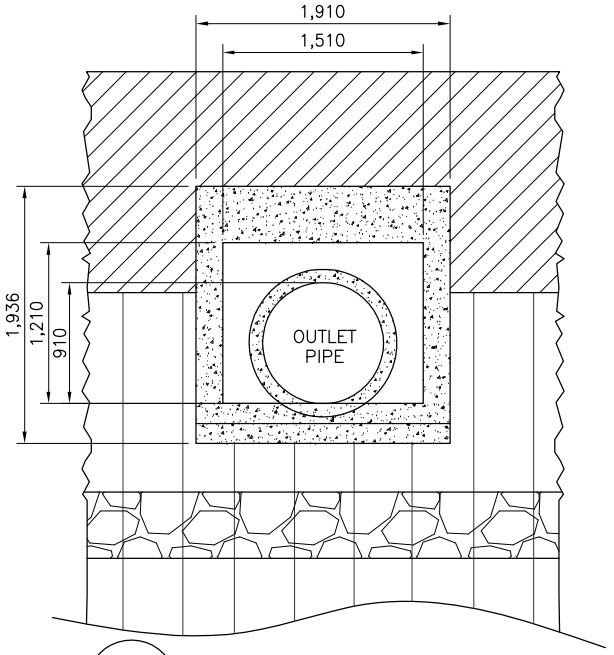
2 PLAN
SCALE B



4 SECTION
SCALE B



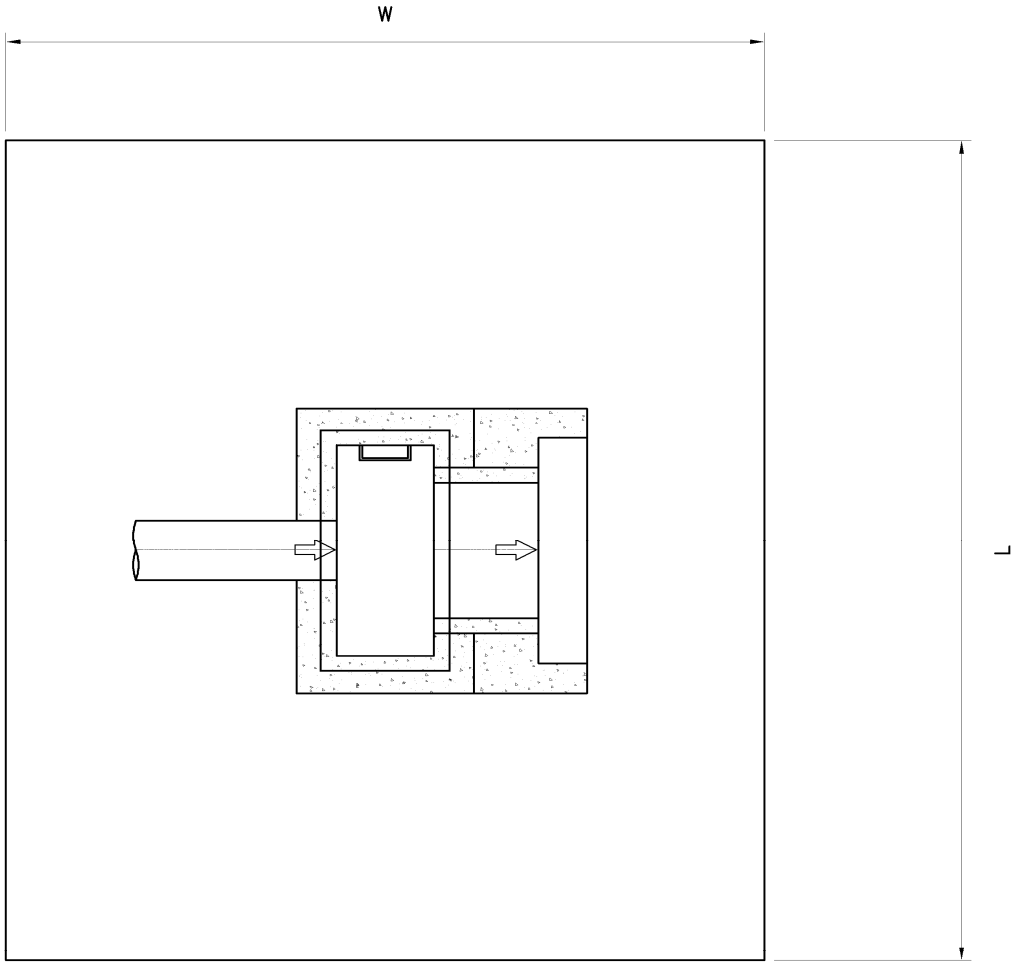
3 SECTION
SCALE A



5 ELEVATION
SCALE B

Clearing (Manhole 46)

W	4.486 m	**A=27.30**	m^2
L	6.086 m		

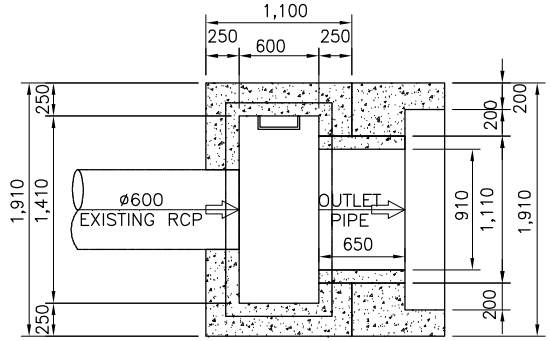


QUANTITIES OF MANHOLE

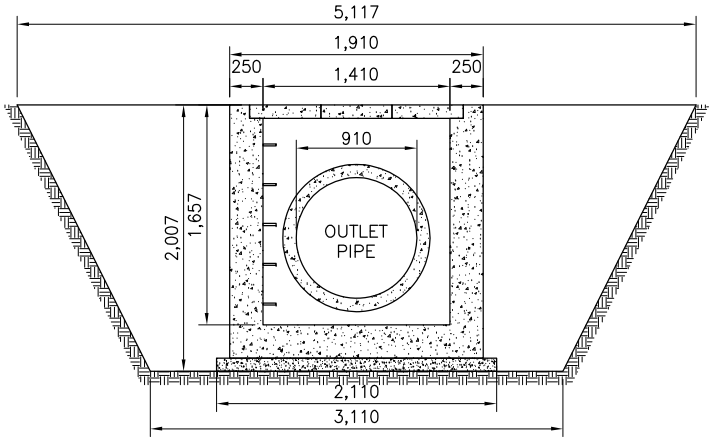
Manhole No.: ML 48

Location: 2 + 946

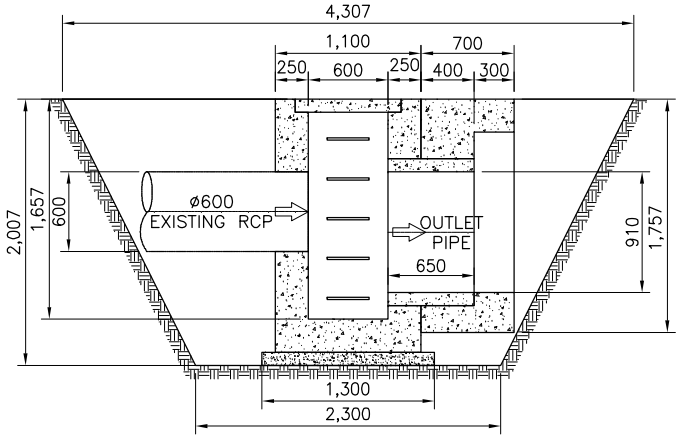
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.63	4.11	27.27	
				27.27	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.657	2.080	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.75	0.44	0.25	0.11	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.73**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.76	Ain=3.36	0.7	2.35	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.41	m3
9. Outlet Pipe	Dia=.910m	L=1.97		**2**	pc
10. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.32		**0.146631**	m3
12. Backfill				**22.73**	m3



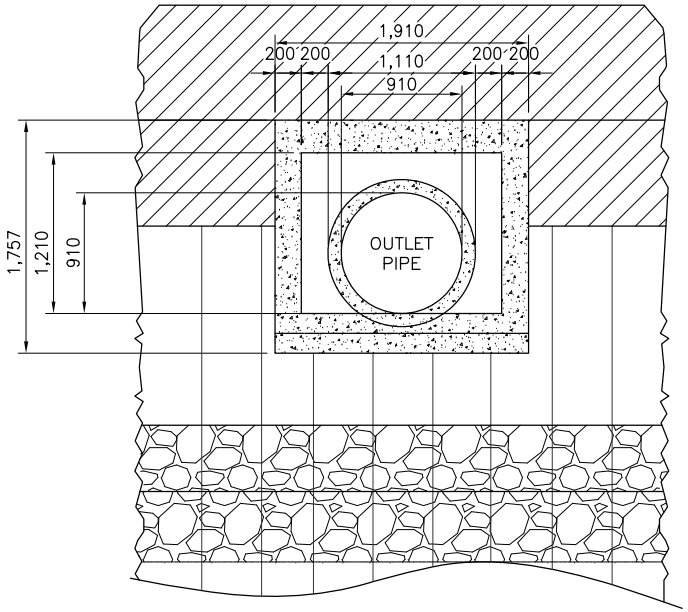
2 PLAN
SCALE B



4 SECTION
SCALE B



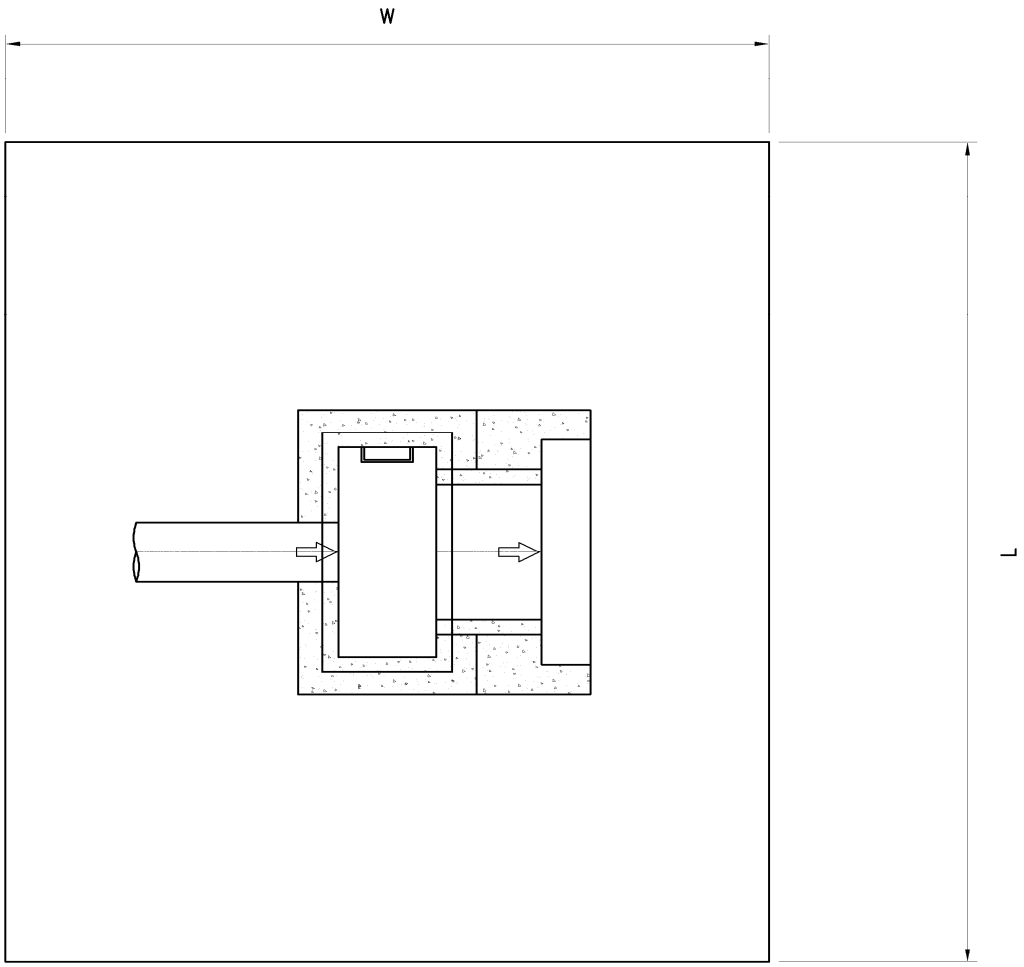
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 48)

W	4.307 m	**A=22.04**	m^2
L	5.117 m		

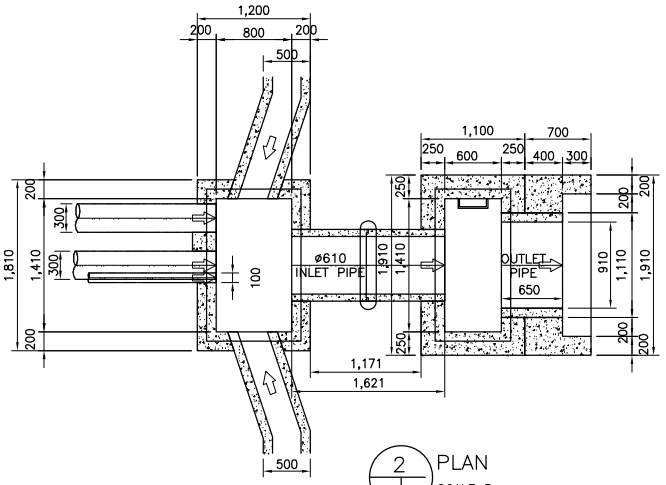


QUANTITIES OF MANHOLE

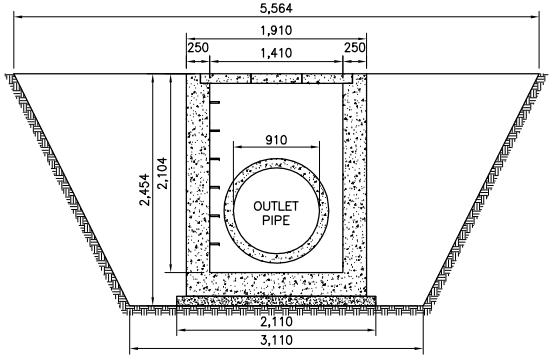
Manhole No.: ML 48.2

Location: 2 + 955

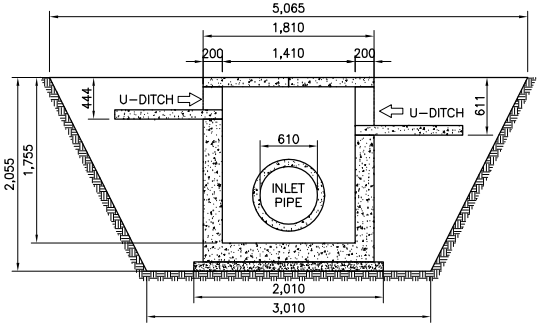
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=5.89	4.34	25.54	
		A2=0.39	4.04	1.58	
		A3=5.57	4.04	22.49	
				49.60	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.055	2.579	m^3
		Anet=1.26			
Minus					
D=0.51	W=0.50	0.26	0.25	0.06	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
D=0.34	W=0.50	0.17	0.25	0.04	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.12**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.20	Ain=4.21	0.7	2.95	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.01	m3
9. Outlet Pipe	Dia=.910m	L=1.77		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m .	L=1.12		**0.124431**	m3
12. Backfill				**41.34**	m3



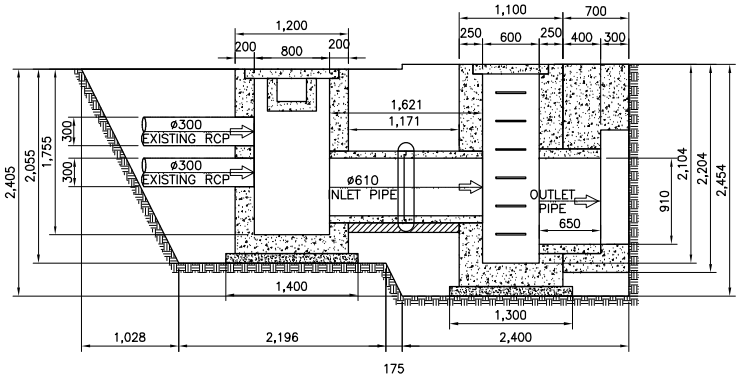
2 PLAN
SCALE B



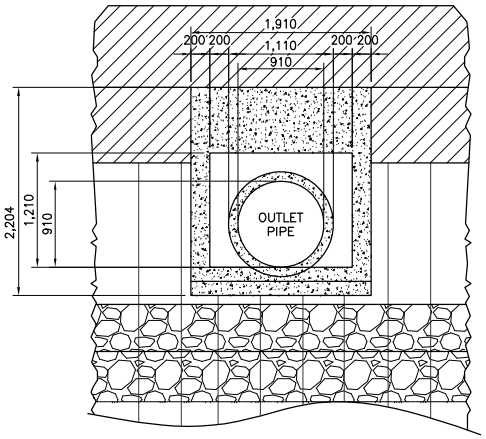
4 SECTION
SCALE B



6 SECTION
SCALE B



5 SECTION
SCALE B

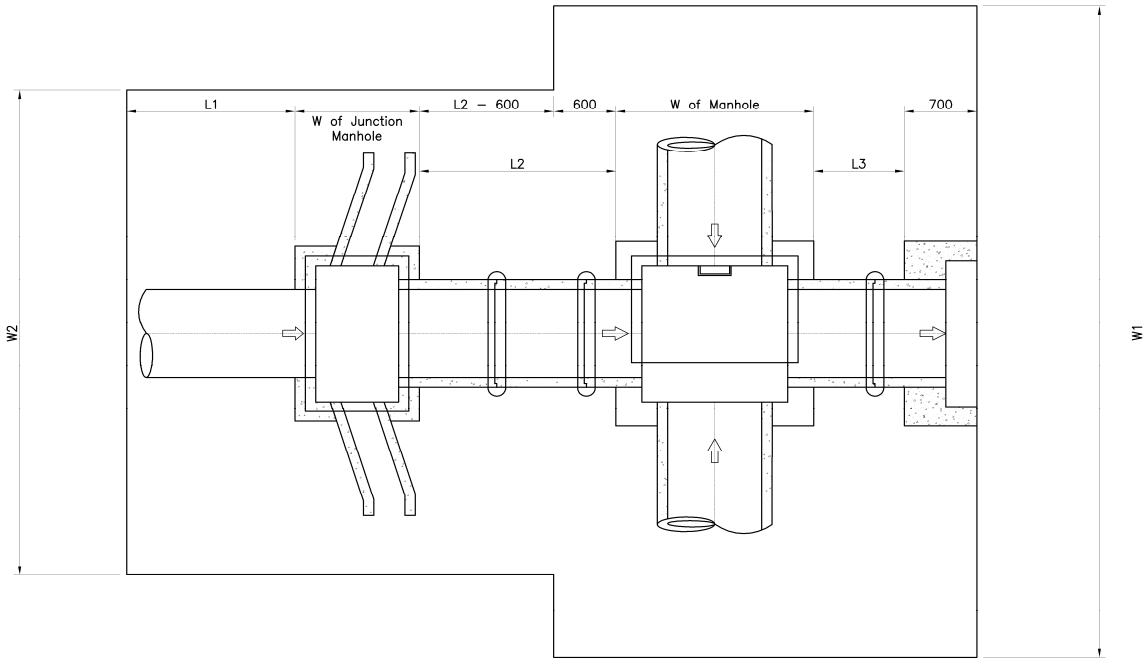


5 ELEVATION
SCALE B

3.81

Clearing (Manhole 48.2)

L1	1.6275 m	
W of Junction Manhole	1.2 m	Am=13.35 m^2
L2	1.171 m	Ajb=17.21 m^2
W of Manhole	1.1 m	**At=30.57** m^2
L3	0 m	
W1	5.564 m	
W2	5.065 m	

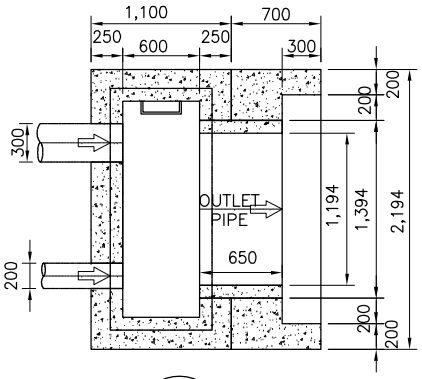


QUANTITIES OF MANHOLE

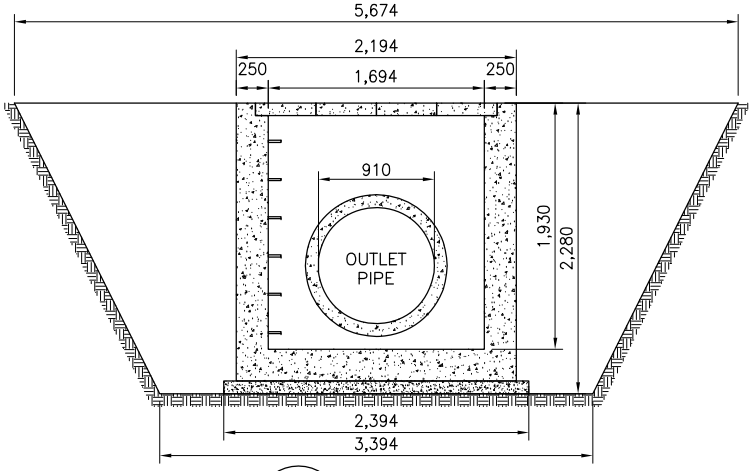
Manhole No.: ML 50

Location: 2 + 960

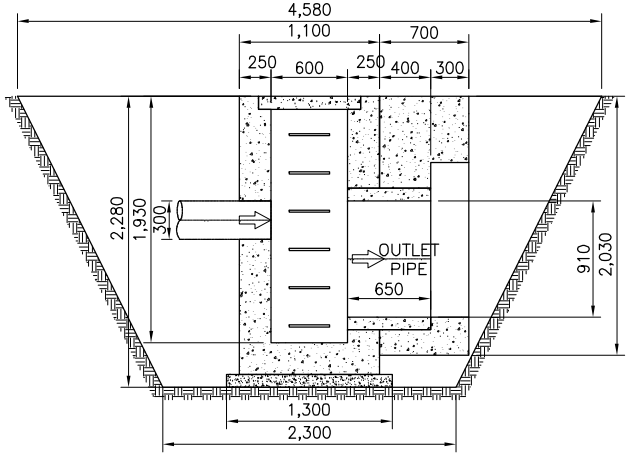
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.84	4.53	35.56	
				35.56	m^3
2. Lev. Concrete	W=1.30 L=2.39	3.11	0.1	**0.31**	m^3
3. Bottom Slab	W=1.10 L=2.19	2.41	0.25	**0.60**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=2.19	Aout=2.41			
	Win=0.60 Lin=1.69	Ain=1.02	1.930	2.696	m^3
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.16	0.25	0.04	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.42**	m^3
5. Conc. Cover	L=1.89 W=0.80	1.5152	0.1	**0.15**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.03	Ain=3.88	0.7	2.71	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.78	m3
9. Outlet Pipe	Dia=.910m	L=1.97		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.32		**0.146631**	m3
12. Backfill				**29.63**	m3



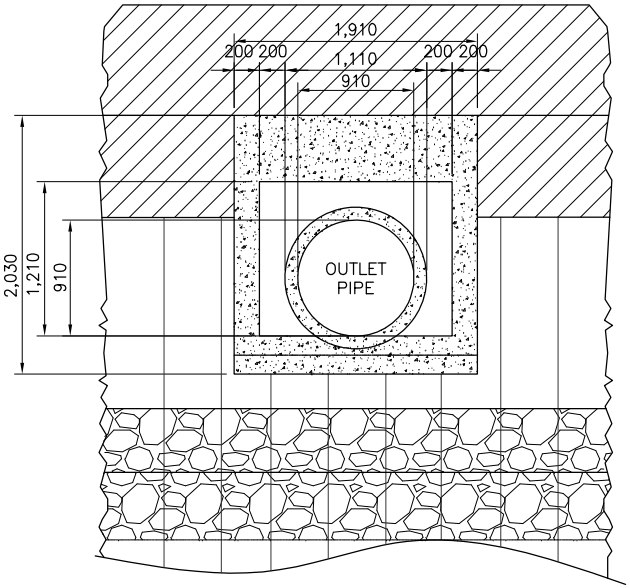
2 PLAN
SCALE B



4 SECTION
SCALE B



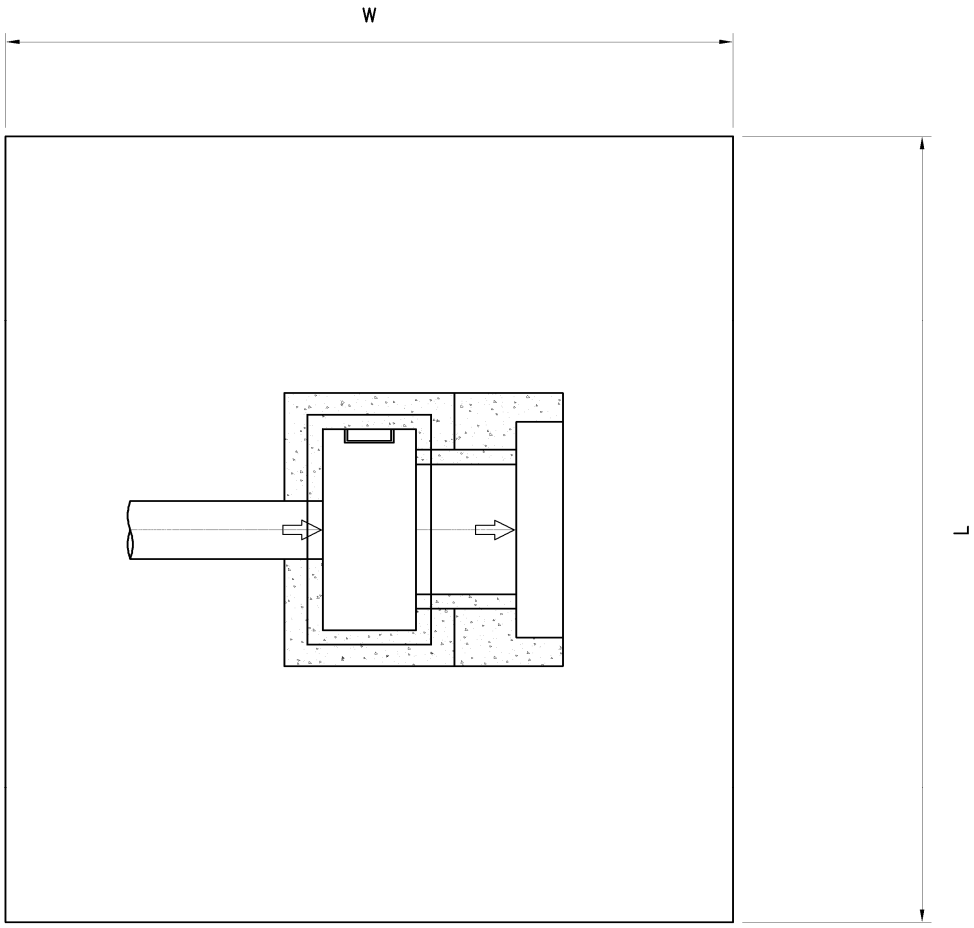
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 50)

W	4.58 m	**A=25.99**	m^2
L	5.674 m		

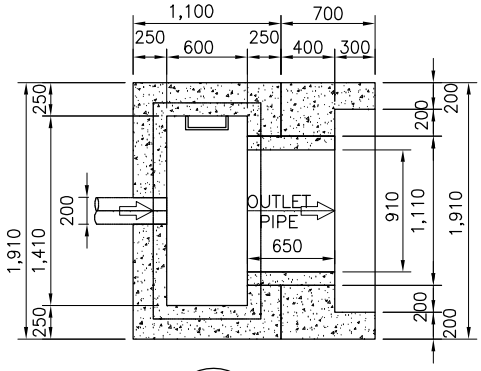


QUANTITIES OF MANHOLE

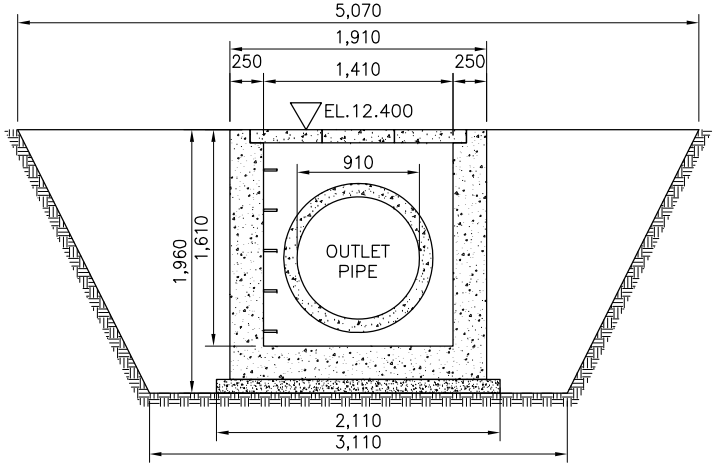
Manhole No.: ML 51

Location: 2 + 978

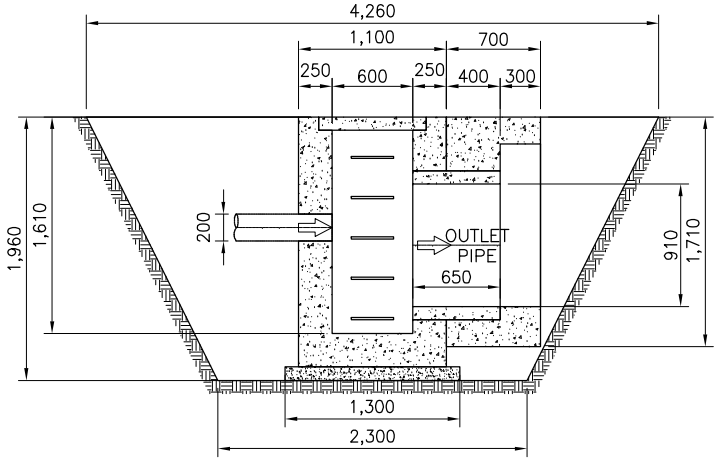
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.43	4.09	26.29	
				26.29	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.610	2.021	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.30	0.07	0.25	0.02	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.76**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=2.09		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.44		**0.159951**	m3
12. Backfill				**21.91**	m3



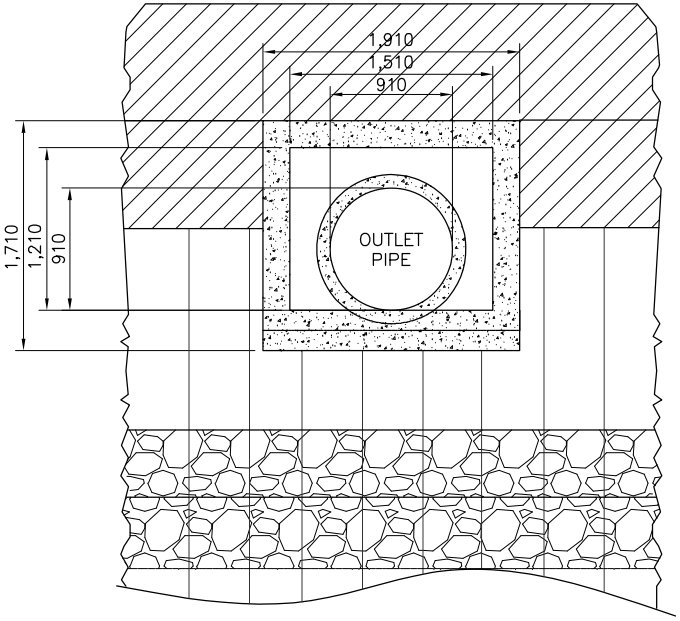
2 PLAN
SCALE B



4 SECTION
SCALE B



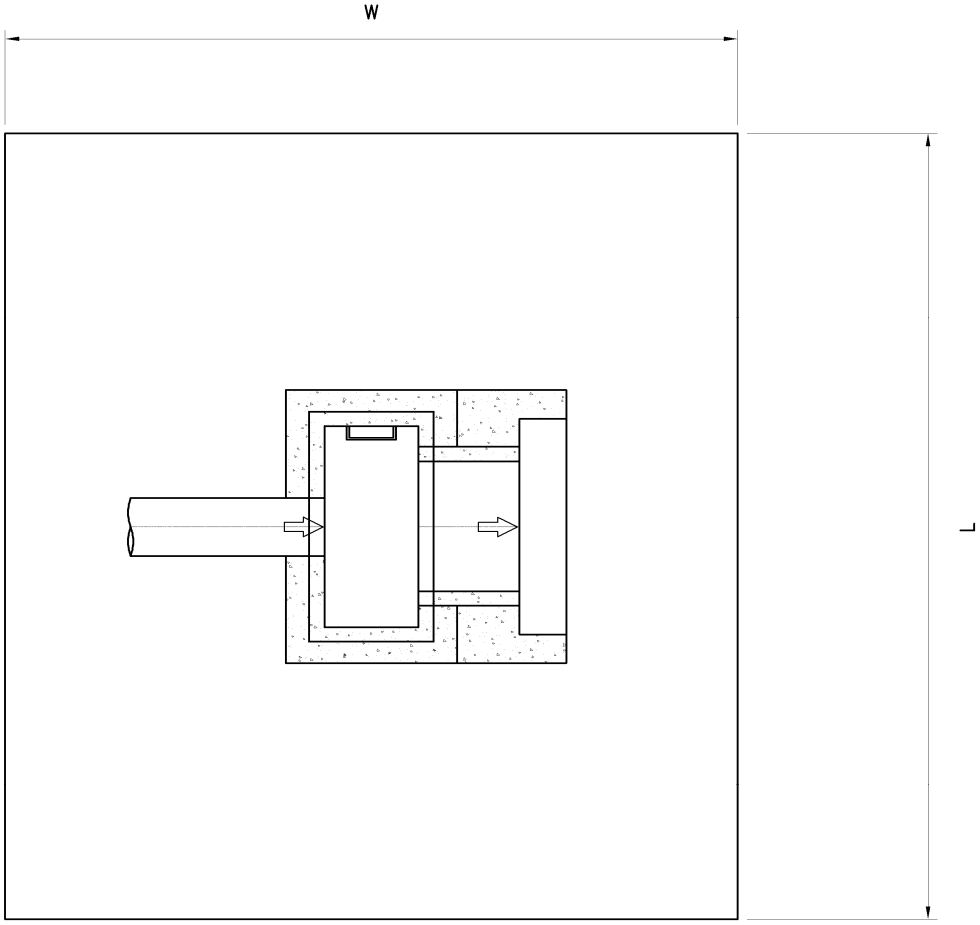
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 51)

W	4.26 m	**A=21.60**	m^2
L	5.07 m		

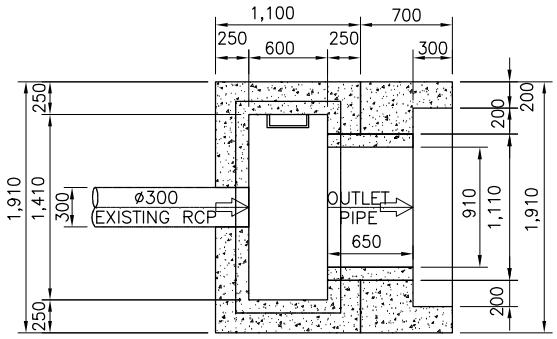


QUANTITIES OF MANHOLE

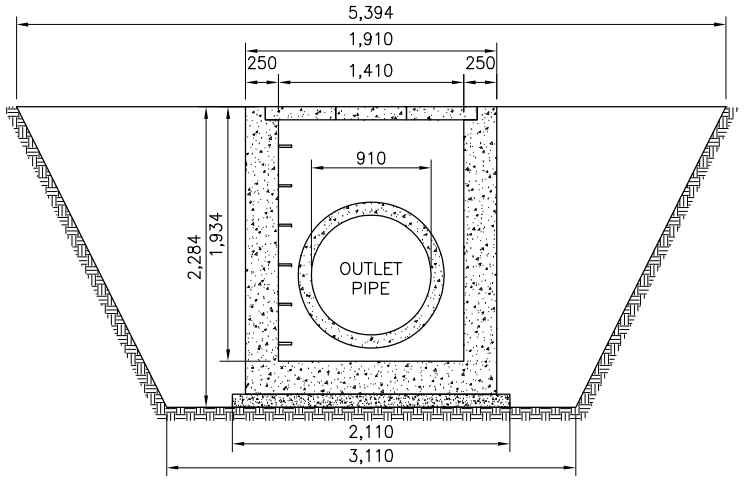
Manhole No.: ML 52

Location: 2 + 991

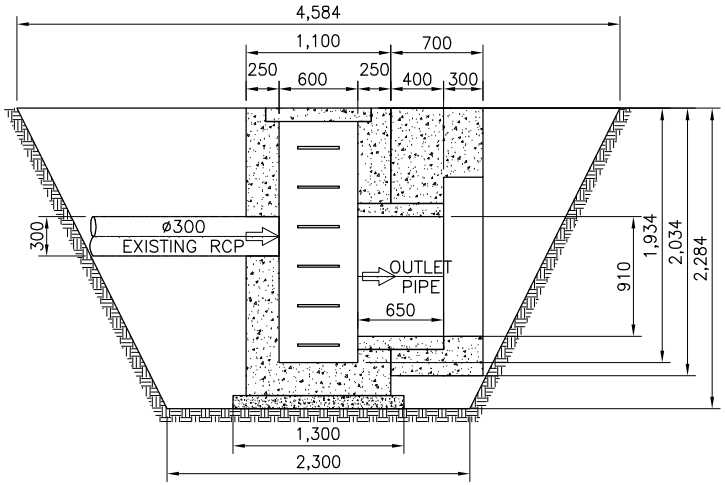
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.86	4.25	33.43	
				33.43	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.934	2.427	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.15**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.03	Ain=3.88	0.7	2.72	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.78	m3
9. Outlet Pipe	Dia=.910m	L=1.97		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.32		**0.146631**	m3
12. Backfill				**27.86**	m3



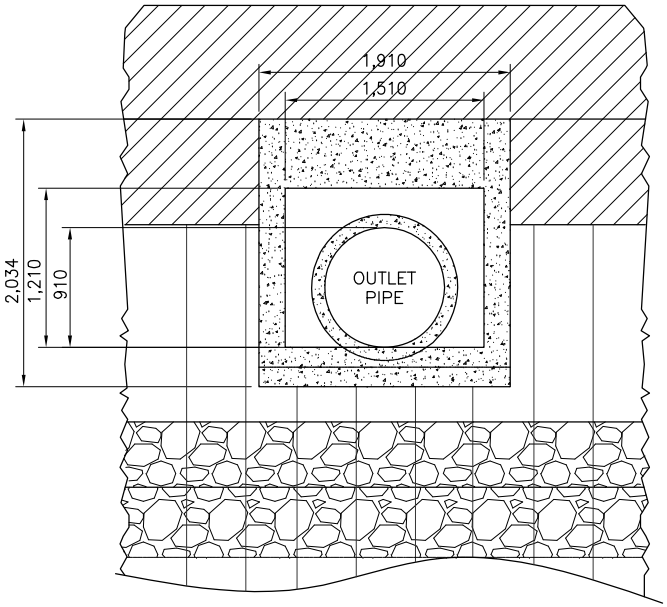
2 PLAN
SCALE B



4 SECTION
SCALE B



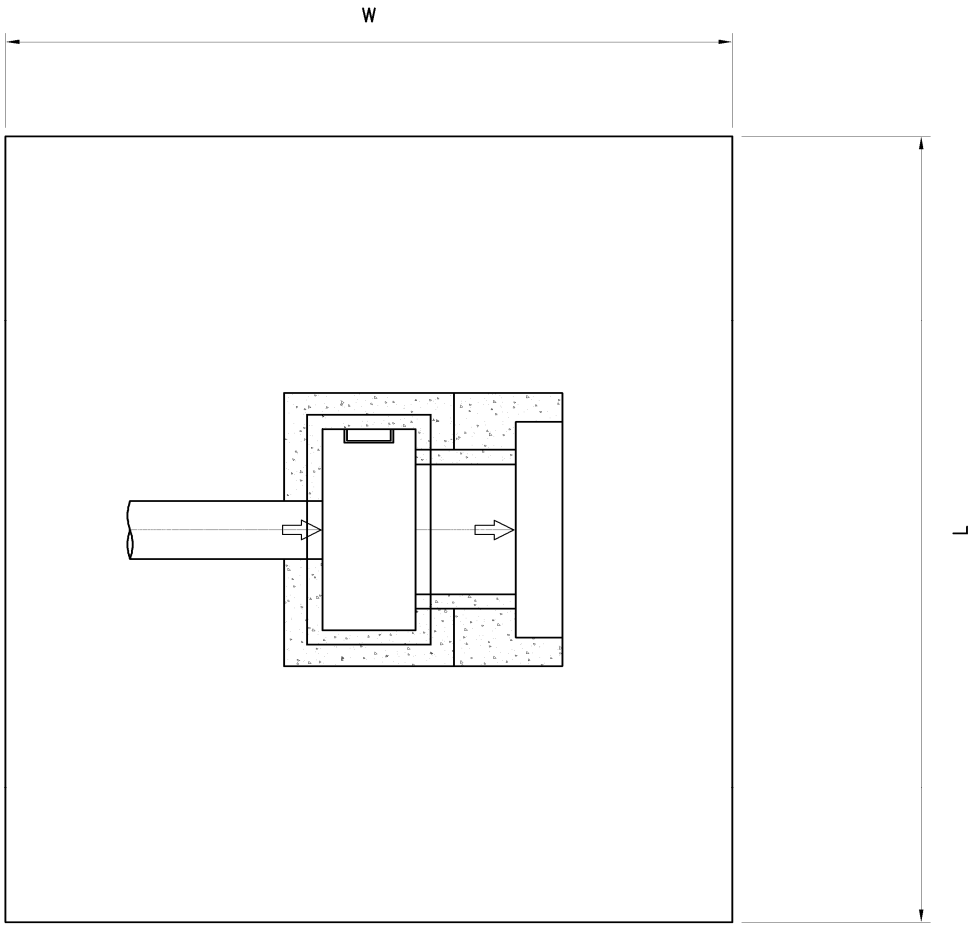
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 52)

W	4.584 m	**A=24.73**	m^2
L	5.394 m		

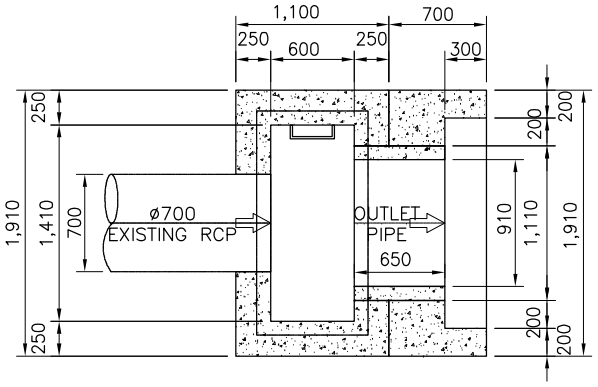


QUANTITIES OF MANHOLE

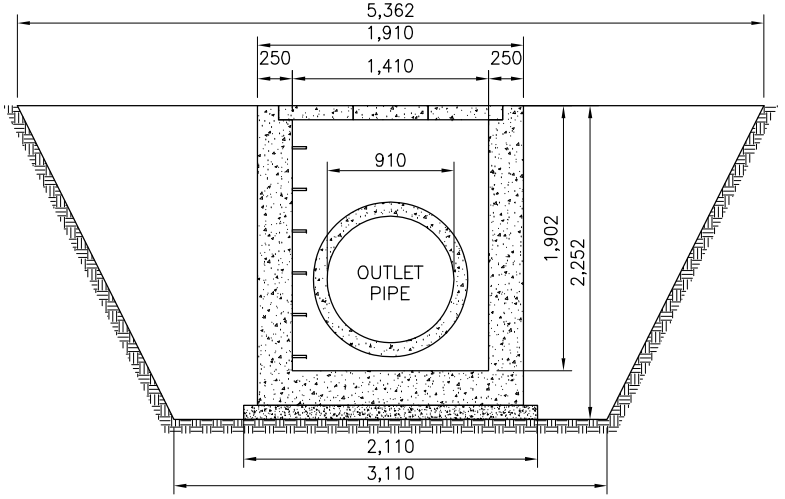
Manhole No.: ML 53

Location: 2 + 998

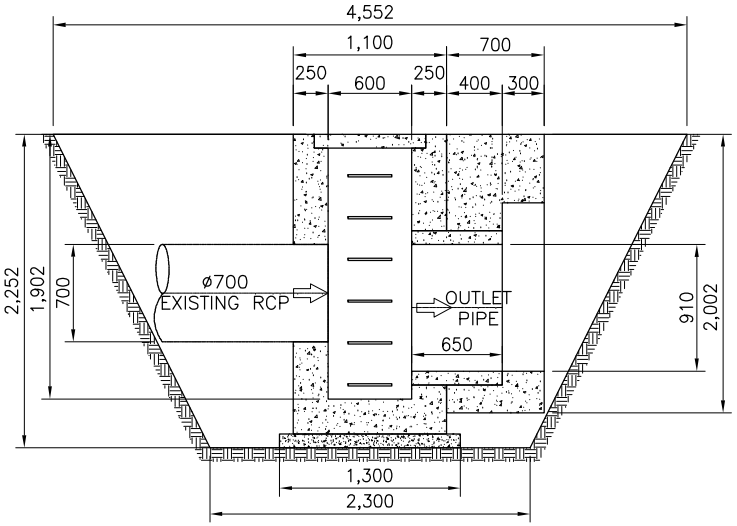
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.72	4.25	32.81	
				32.81	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.902	2.387	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.88	0.60	0.25	0.15	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.99**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.00	Ain=3.82	0.7	2.68	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.74	m3
9. Outlet Pipe	Dia=.910m	L=2.09		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.44		**0.159951**	m3
12. Backfill				**27.34**	m3



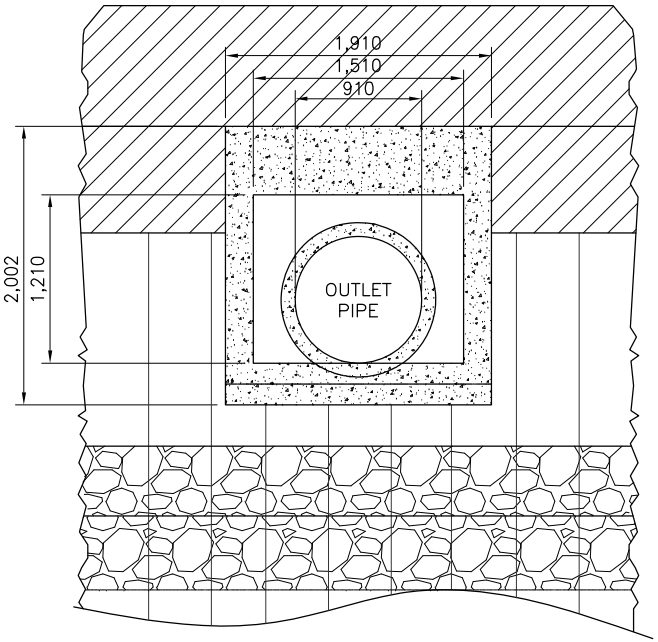
2 PLAN
SCALE B



4 SECTION
SCALE B



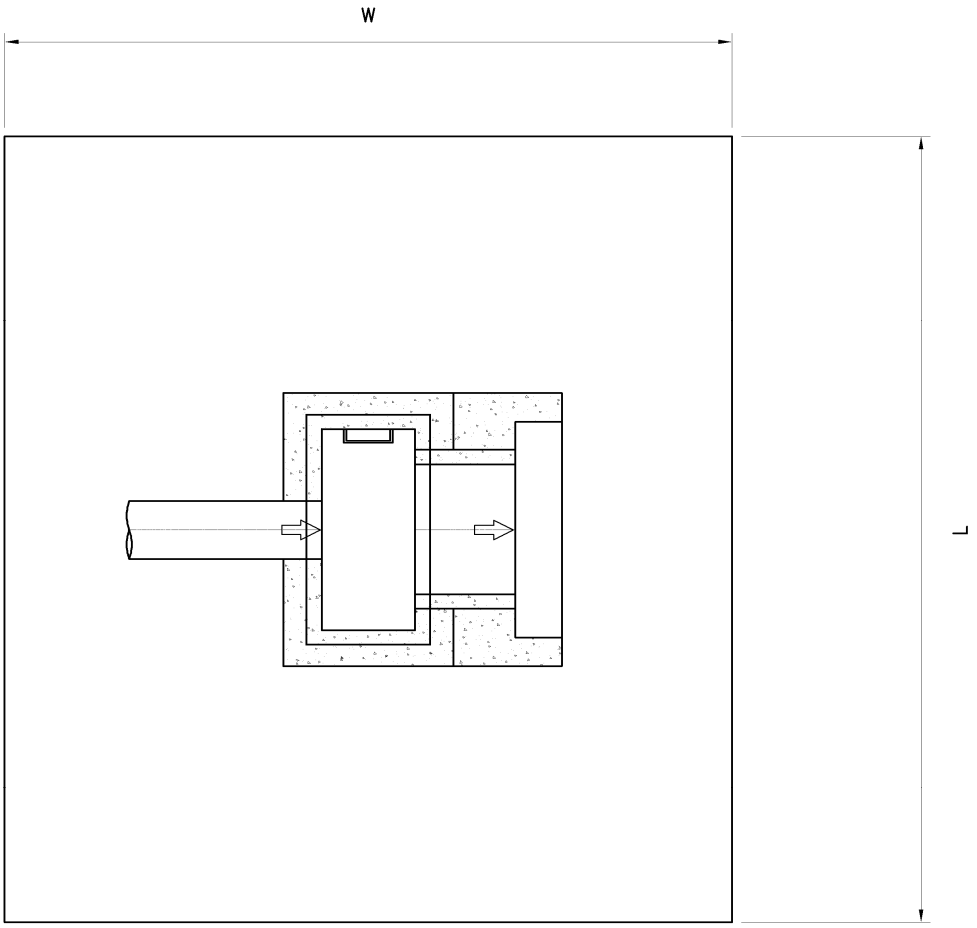
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 53)

W	4.552 m	**A=24.41**	m^2
L	5.362 m		

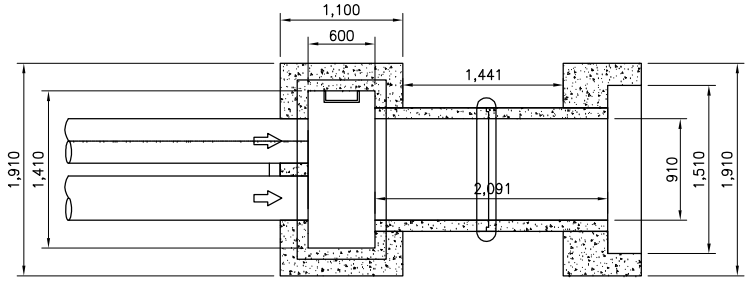


QUANTITIES OF MANHOLE

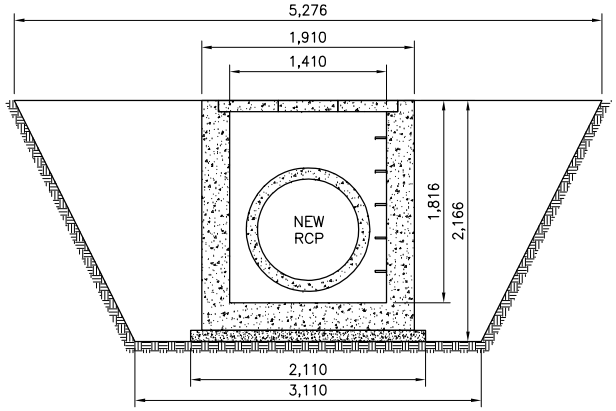
Manhole No.: ML 54

Location 2 + 998

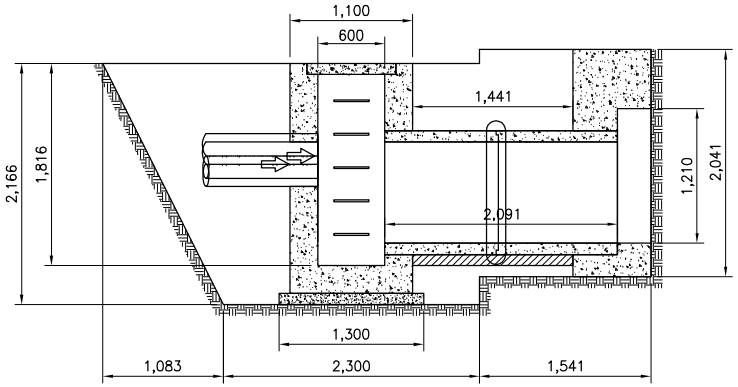
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.816	2.279	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.53	0.44	0.25	0.11	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.93**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.04	Ain=3.90	0.7	2.73	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.79	m3
9. Outlet Pipe	Dia=.910m	L=2.09		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.44		**0.159951**	m3
12. Backfill				**55.44**	m3



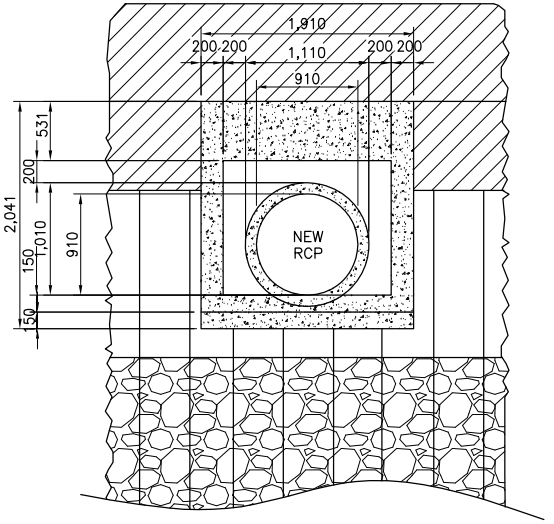
2 PLAN
SCALE B



4 SECTION (ML54)
SCALE B



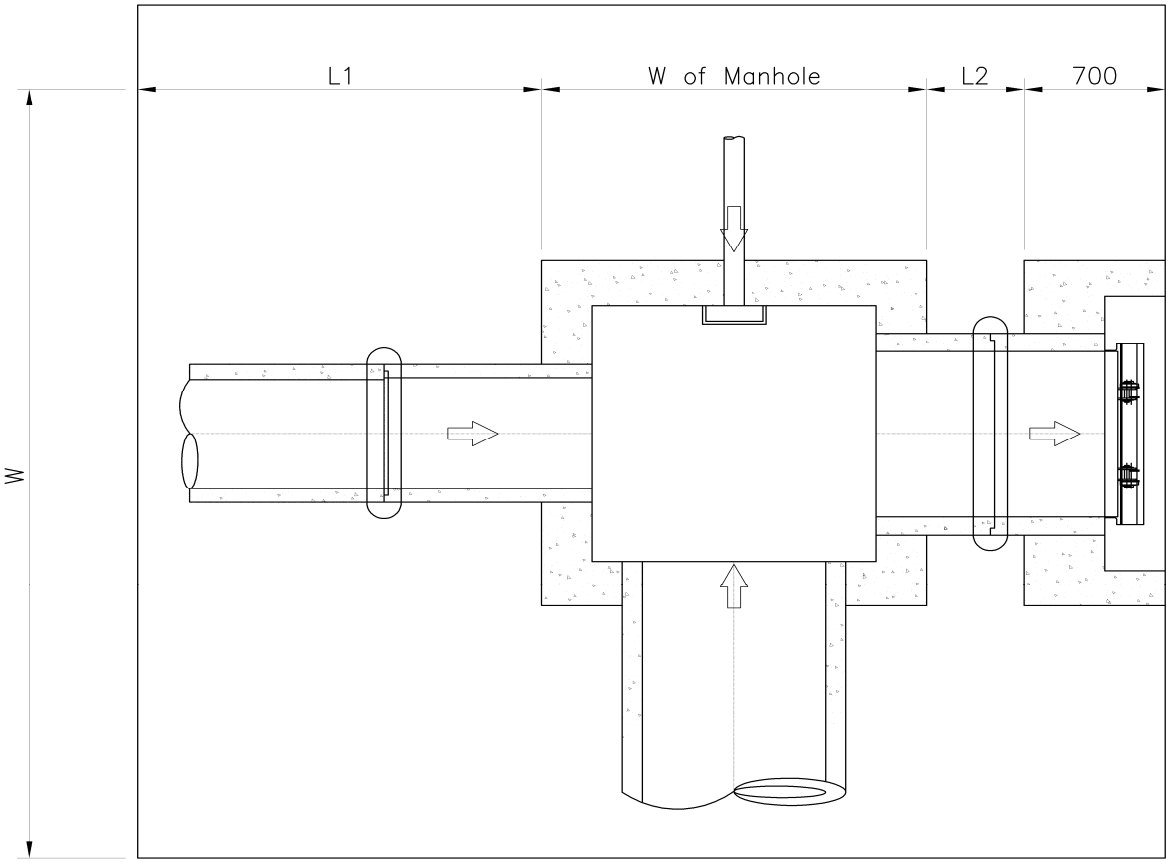
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 54)

L1	1.683 m	
W of Manhole	1.1 m	**A=25.98** m^2
L2	1.441 m	
W	5.276 m	

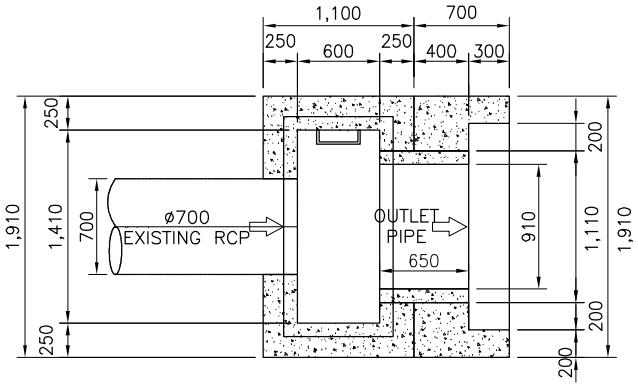


QUANTITIES OF MANHOLE

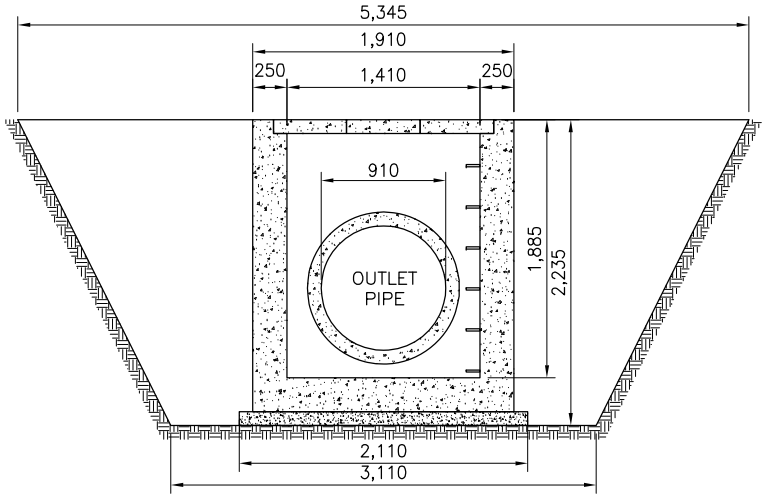
Manhole No.: ML 56

Location: 3 + 007

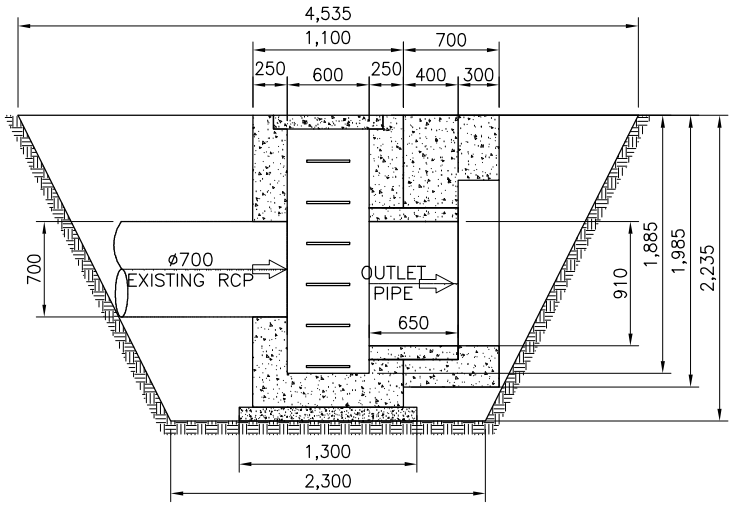
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.64	4.23	32.29	
				32.29	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.885	2.366	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.88	0.60	0.25	0.15	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.97**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.99	Ain=3.79	0.7	2.65	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.72	m3
9. Outlet Pipe	Dia=.910m	L=2.13		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.48		**0.164058**	m3
12. Backfill				**26.91**	m3



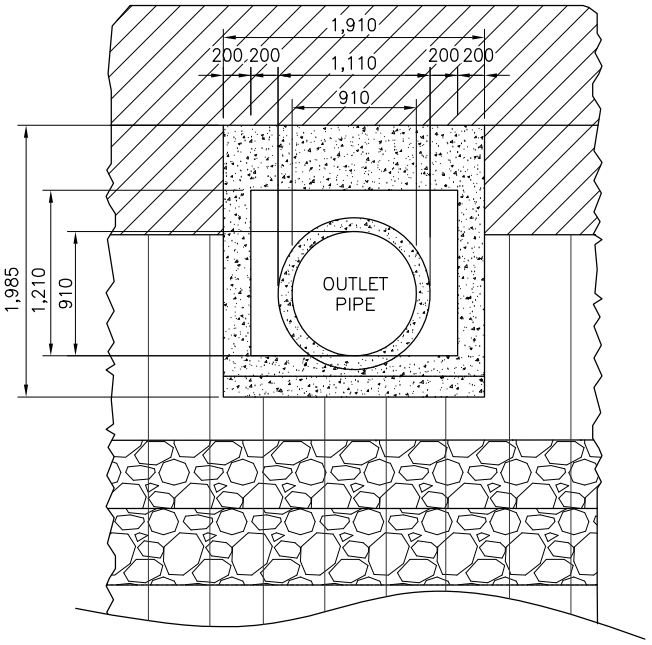
2 PLAN
SCALE B



4 SECTION
SCALE B



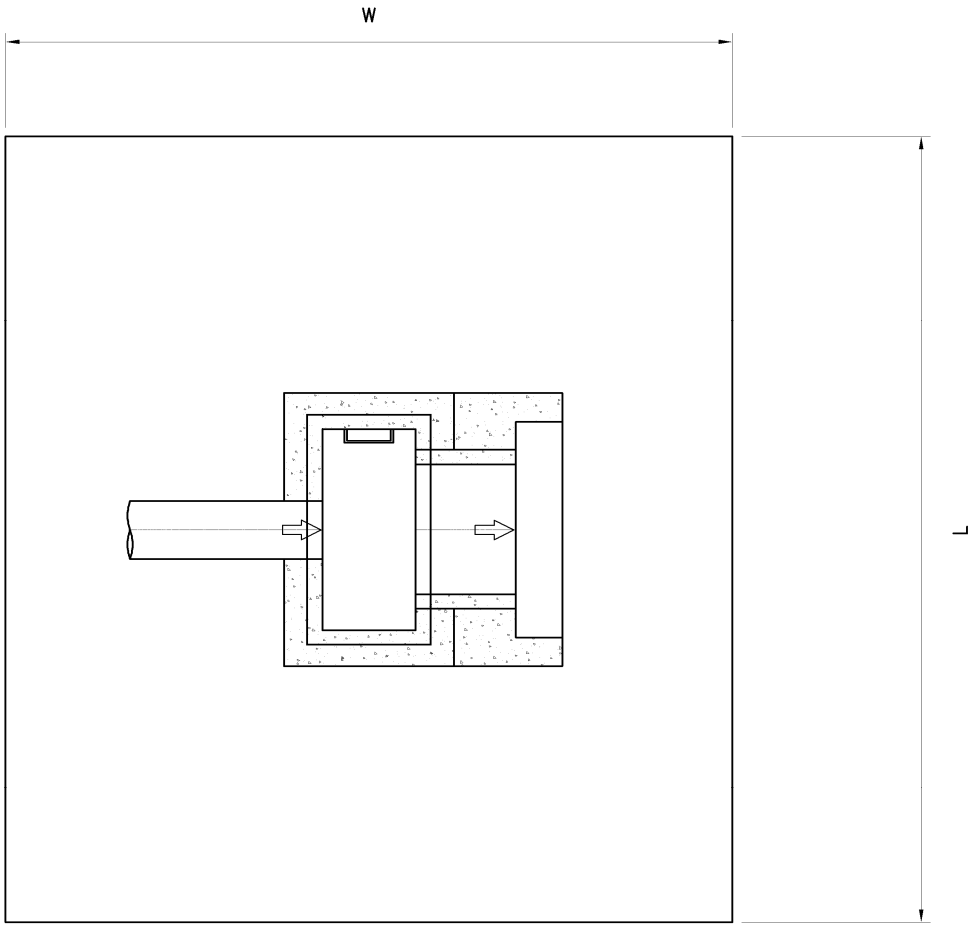
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 56)

W	4.535 m	**A=24.24**	m^2
L	5.345 m		

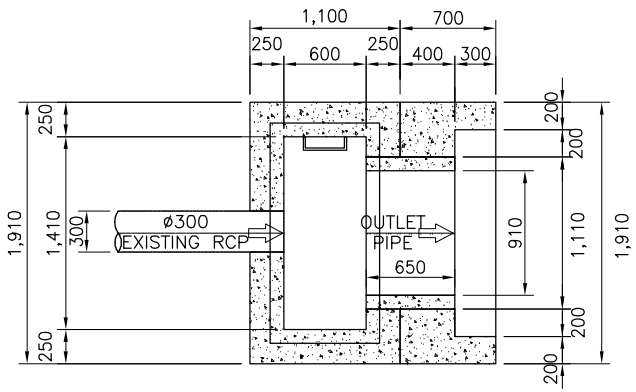


QUANTITIES OF MANHOLE

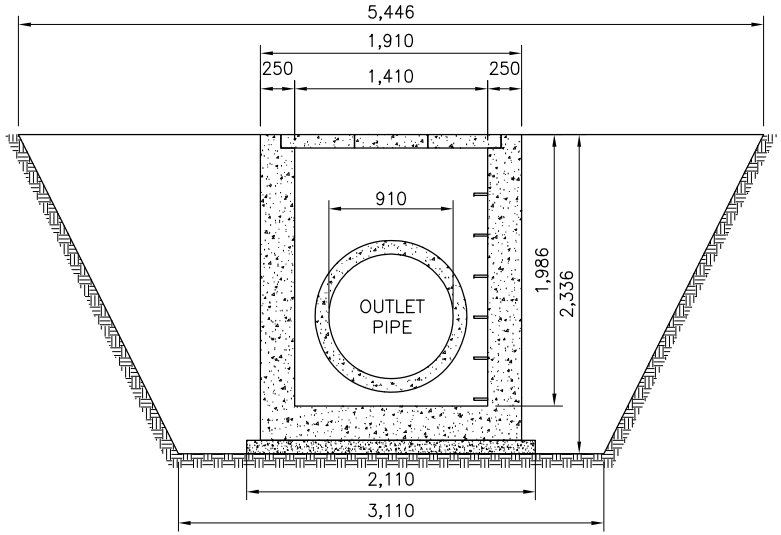
Manhole No.: ML 57

Location: 3 + 026

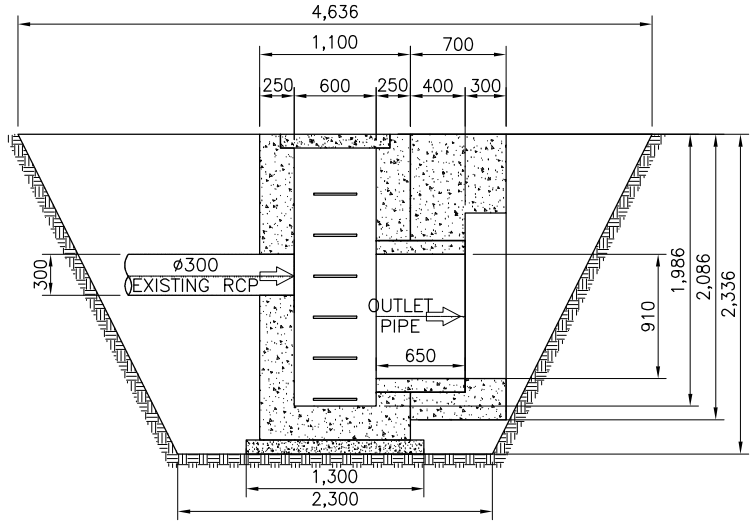
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.75	4.28	33.17	
				33.17	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.986	2.492	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.22**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.99	Ain=3.79	0.7	2.65	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.72	m3
9. Outlet Pipe	Dia=.910m	L=2.13		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.48		**0.163947**	m3
12. Backfill				**27.64**	m3



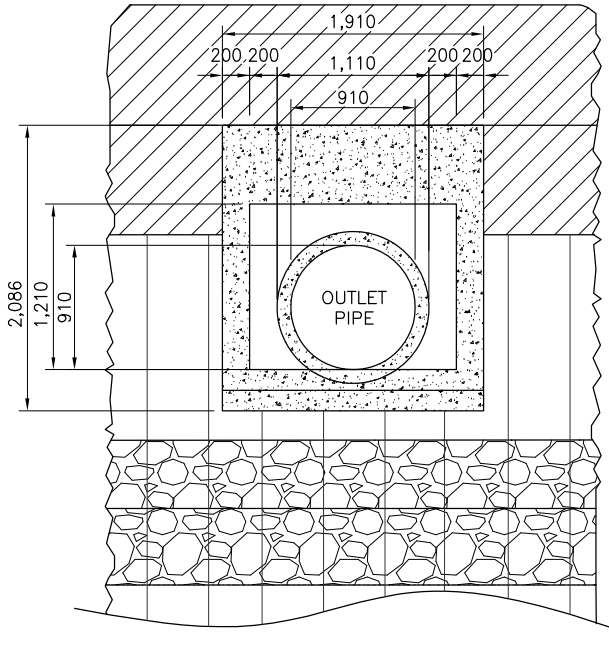
2 PLAN
SCALE B



4 SECTION
SCALE B



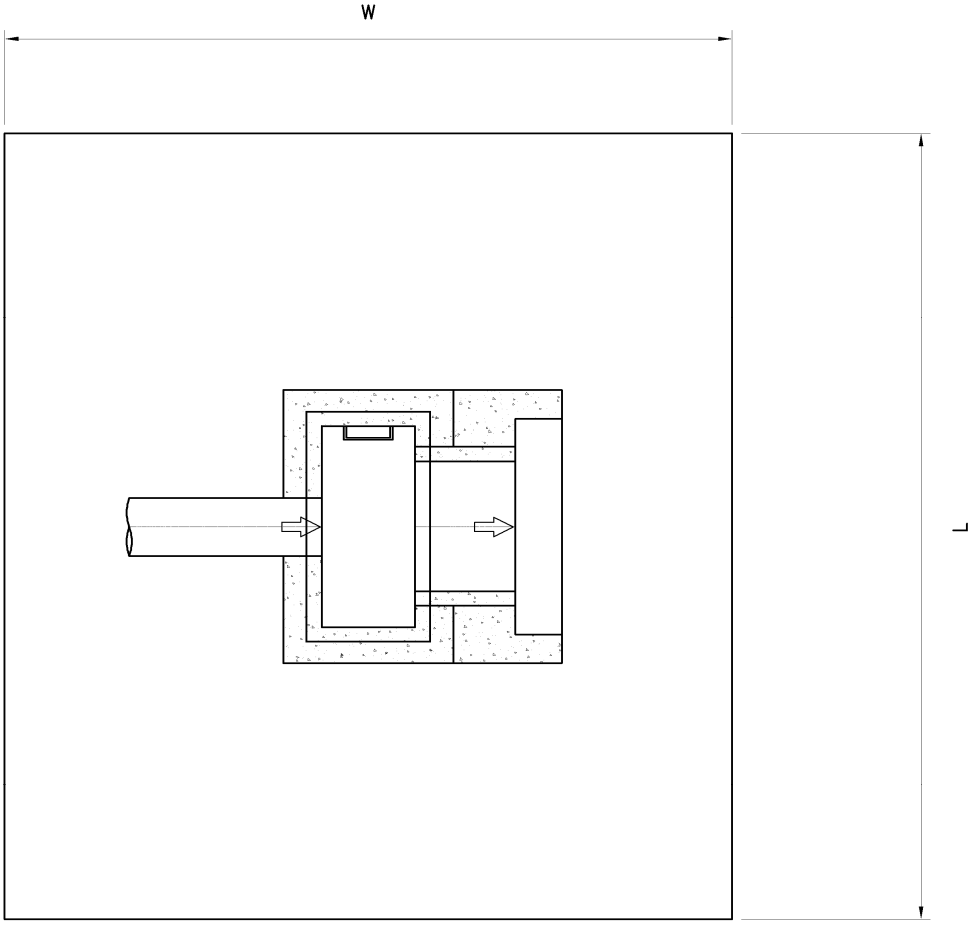
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 57)

W	4.636 m	**A=25.25**	m^2
L	5.446 m		

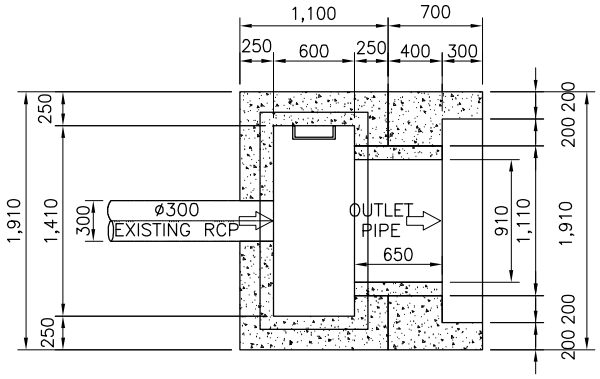


QUANTITIES OF MANHOLE

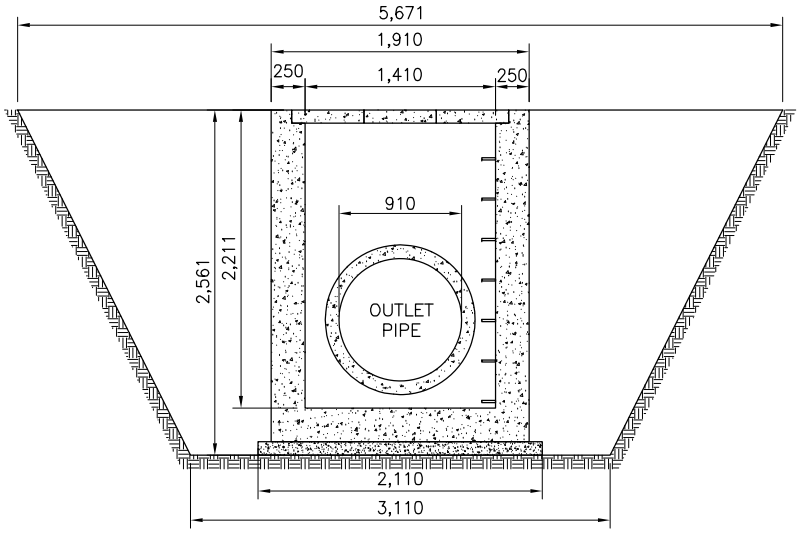
Manhole No.: ML 58

Location: 3 + 031

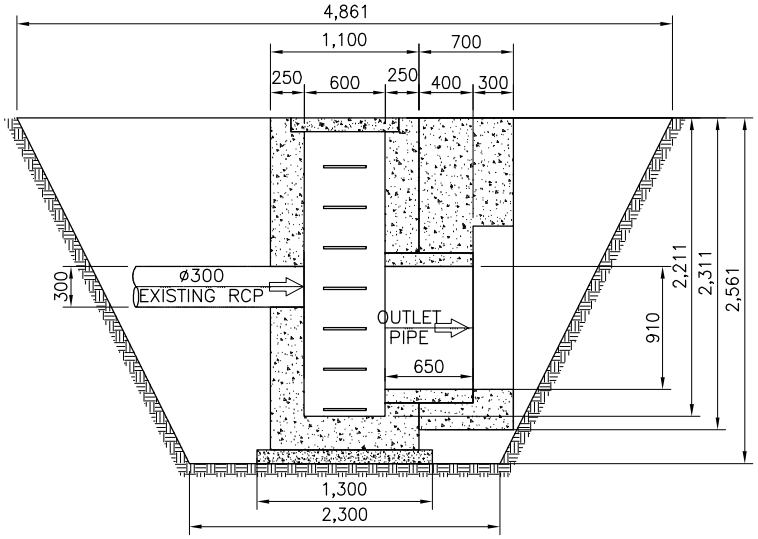
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=9.17	4.39	40.26	
				40.26	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.211	2.775	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.50**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.31	Ain=4.41	0.7	3.09	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.15	m3
9. Outlet Pipe	Dia=.910m	L=2.13		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.48		**0.164058**	m3
12. Backfill				**33.55**	m3



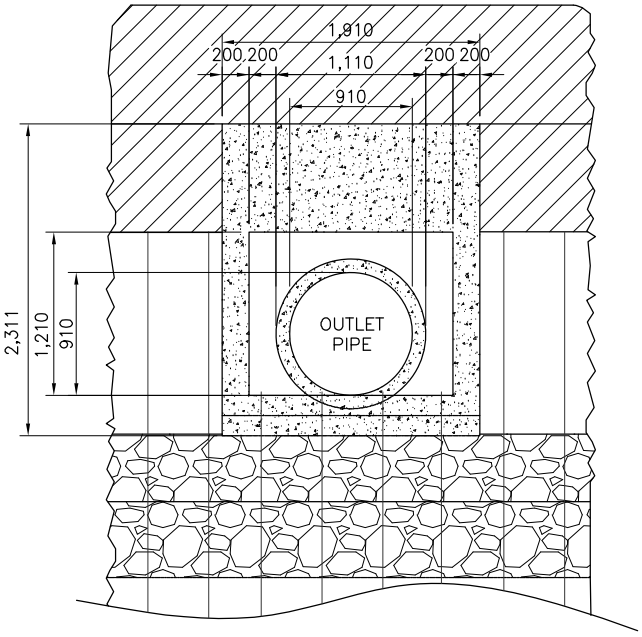
2 PLAN
SCALE B



4 SECTION
SCALE B



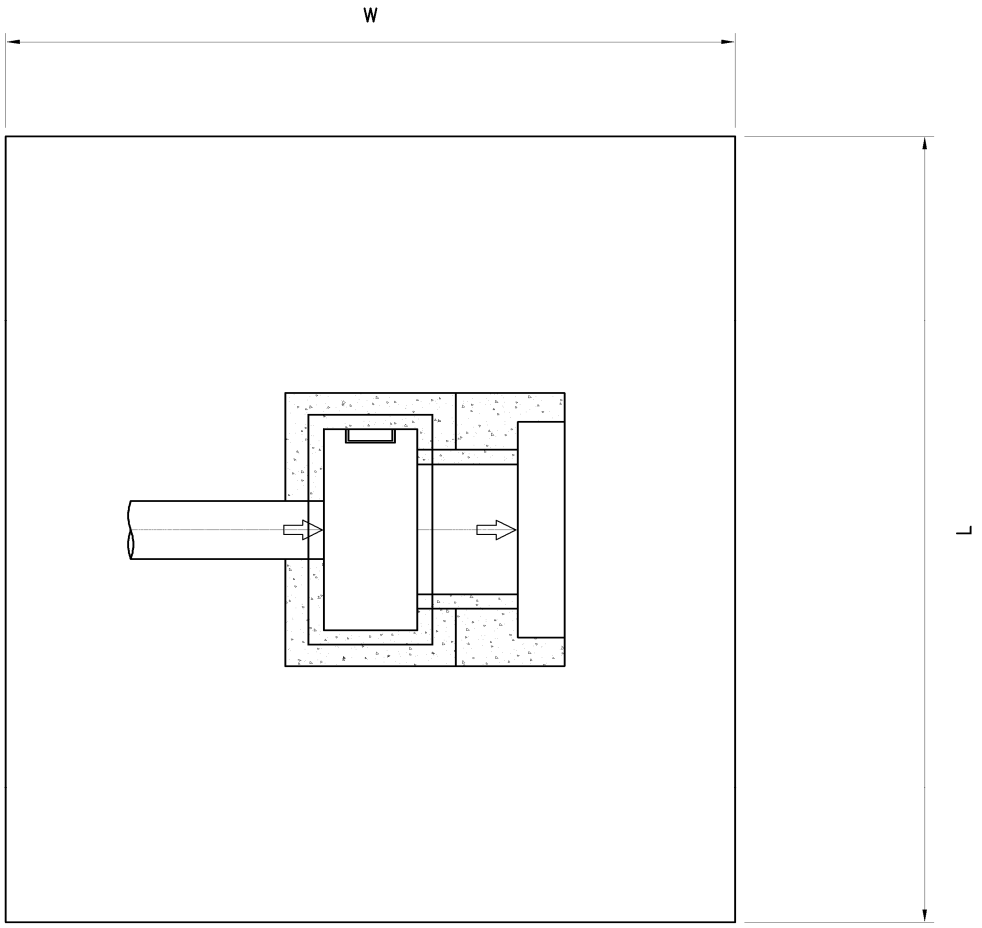
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 58)

W	4.861 m	**A=27.57**	m^2
L	5.671 m		

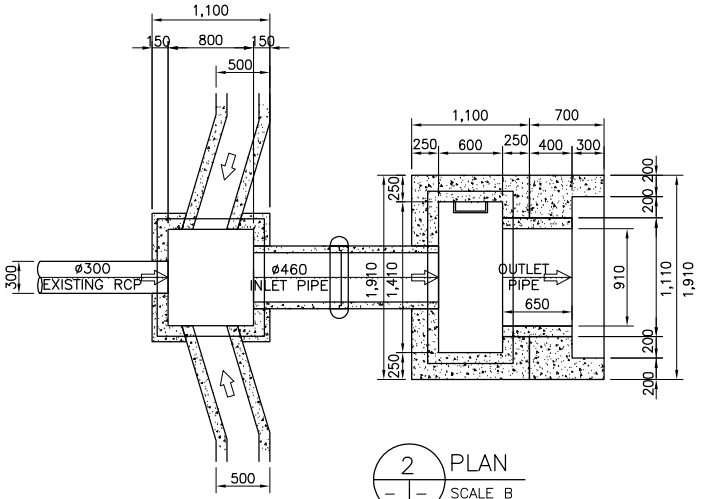


QUANTITIES OF MANHOLE

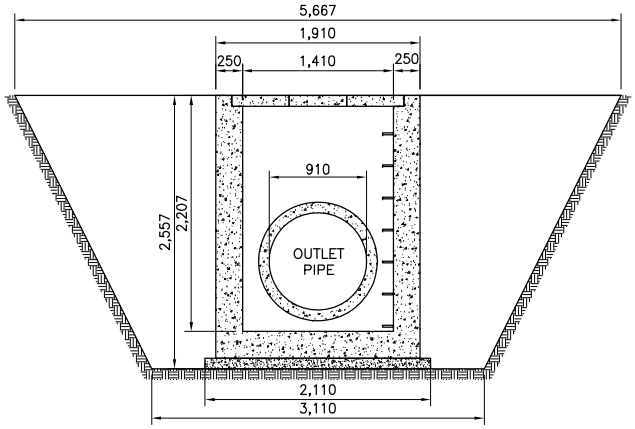
Manhole No.: ML 59

Location: 3 + 048

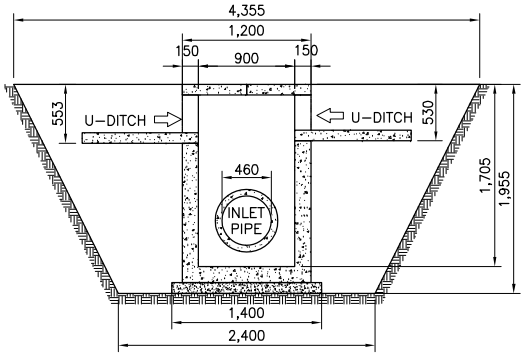
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=6.14	4.39	26.93	
		A2=0.61	3.38	2.07	
		A3=5.16	3.38	17.44	
				46.44	m^3
2. Lev. Concrete (Manhole)	W=1.50 L=2.11	3.17	0.1	**0.32**	m^3
3. Bottom Slab (Manhole)	W=1.30 L=1.91	2.48	0.25	**0.62**	m^3
4. Wall					
Manhole	Wout=1.30 Lout=1.91	Aout=2.48			
	Win=0.80 Lin=1.41	Ain=1.13	2.155	2.920	m^3
		Anet=1.36			
Minus					
D=0.43	W=0.50	0.22	0.25	0.05	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
D=0.45	W=0.50	0.23	0.25	0.06	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.50**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=1.00	1.61	0.1	**0.16**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=7	0.000201062		0.000120637 0.95 **6.63**	m^3 kg/pc kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.31	Ain=4.41	0.7	3.08	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.15	m3
9. Outlet Pipe	Dia=.910m	L=2.63		**3**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.98		**0.219558**	m3
12. Backfill				**38.70**	m3



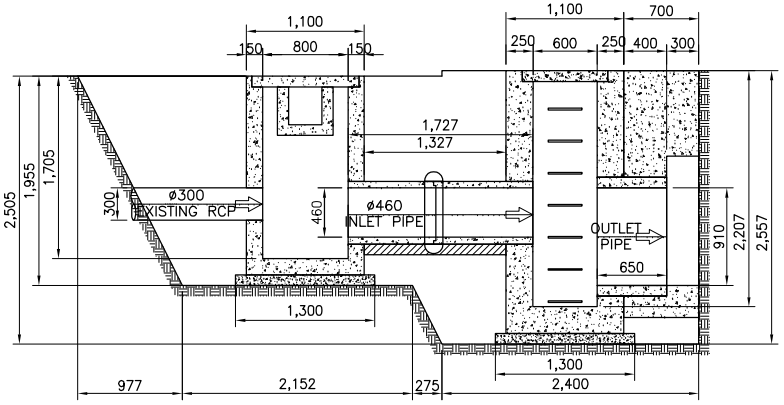
2 PLAN
SCALE B



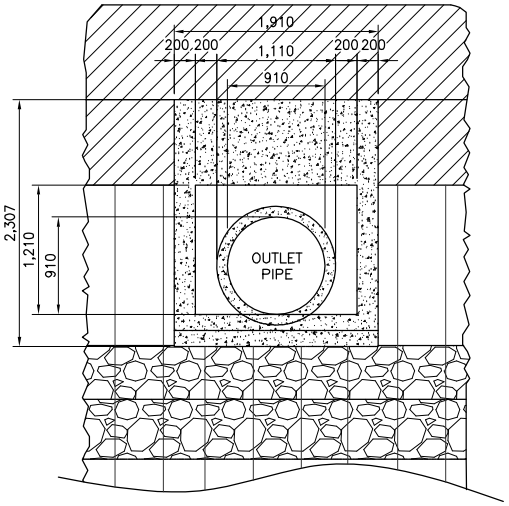
4 SECTION
SCALE B



6 SECTION
SCALE B



3 SECTION
SCALE B



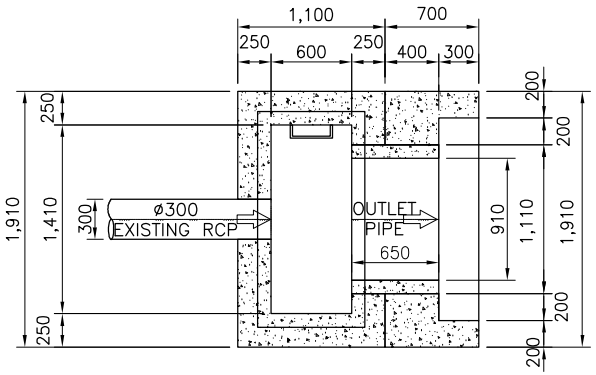
5 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

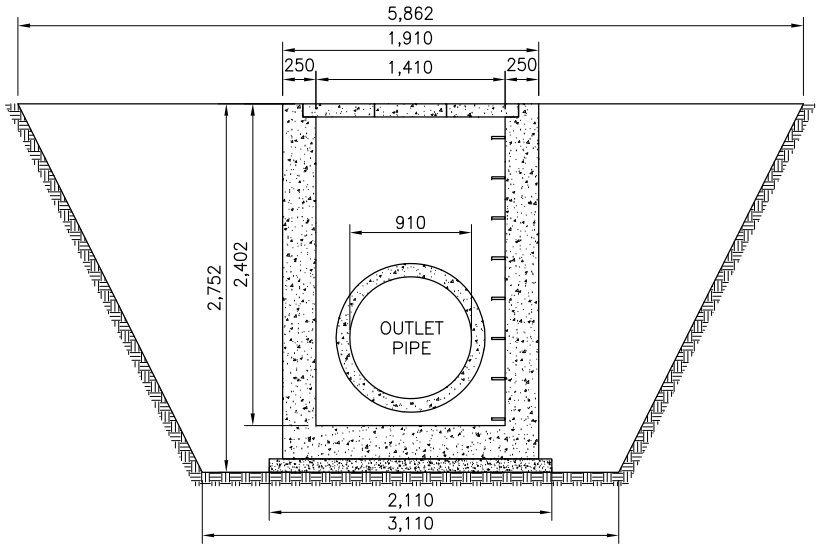
Manhole No.: ML 59.1

Location: 3 + 053

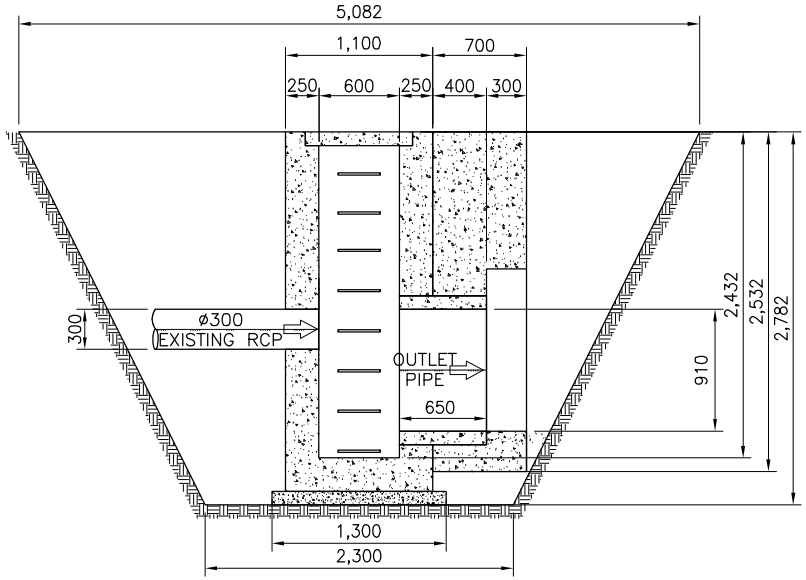
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=10.27	4.49	46.06	
				46.06	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.432	3.052	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.78**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.53	Ain=4.84	0.7	3.39	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.45	m3
9. Outlet Pipe	Dia=.910m	L=2.13		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.48		**0.163947**	m3
12. Backfill				**38.39**	m3



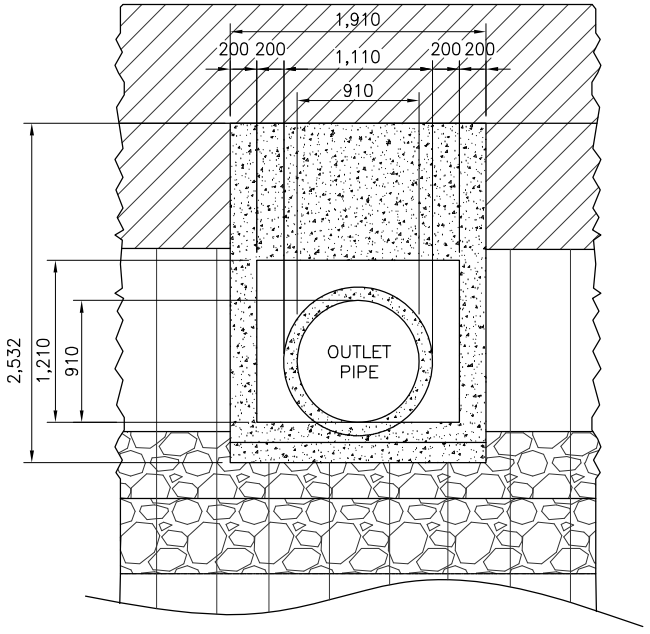
2 PLAN
SCALE B



4 SECTION
SCALE B



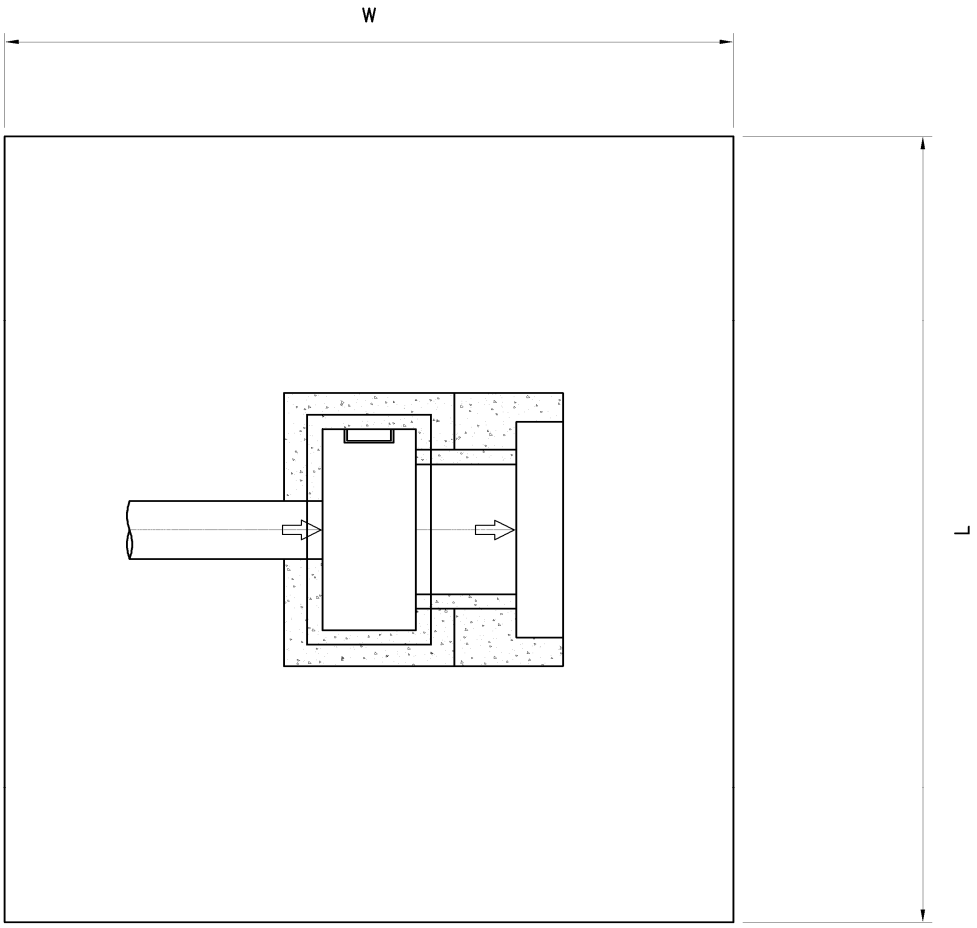
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 59.1)

W	5.082 m	**A=29.79**	m^2
L	5.862 m		

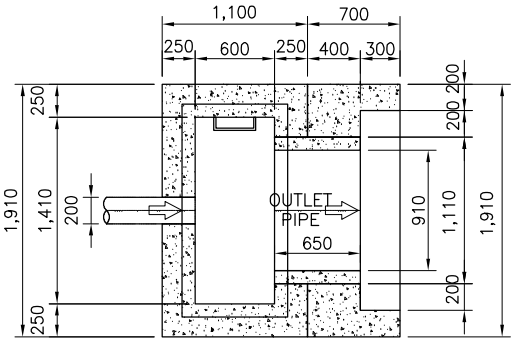


QUANTITIES OF MANHOLE

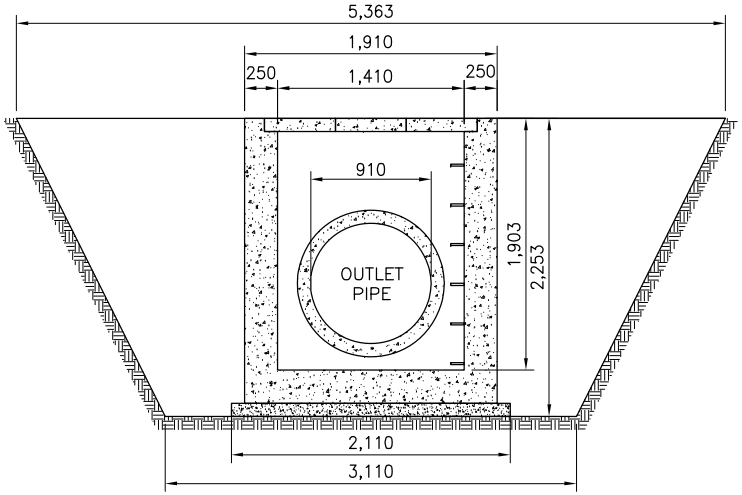
Manhole No.: ML 59.2

Location: 3 + 063

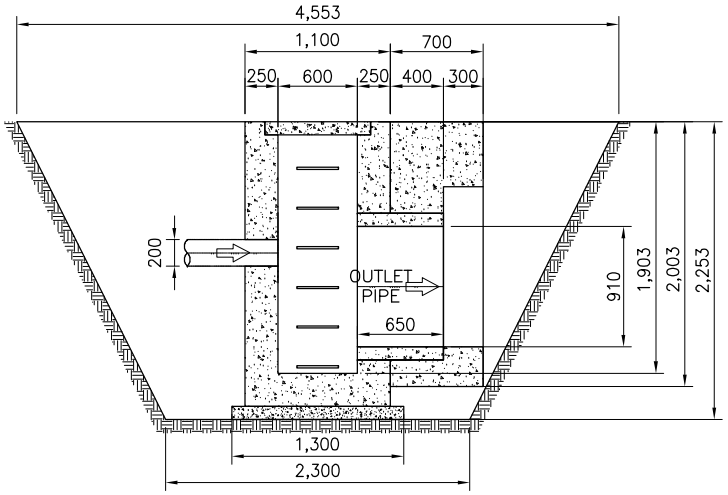
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.72	4.24	32.71	
				32.71	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.903	2.388	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.30	0.07	0.25	0.02	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.13**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.00	Ain=3.83	0.7	2.68	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.74	m3
9. Outlet Pipe	Dia=.910m	L=2.13		**3**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.48		**0.163947**	m3
12. Backfill				**27.25**	m3



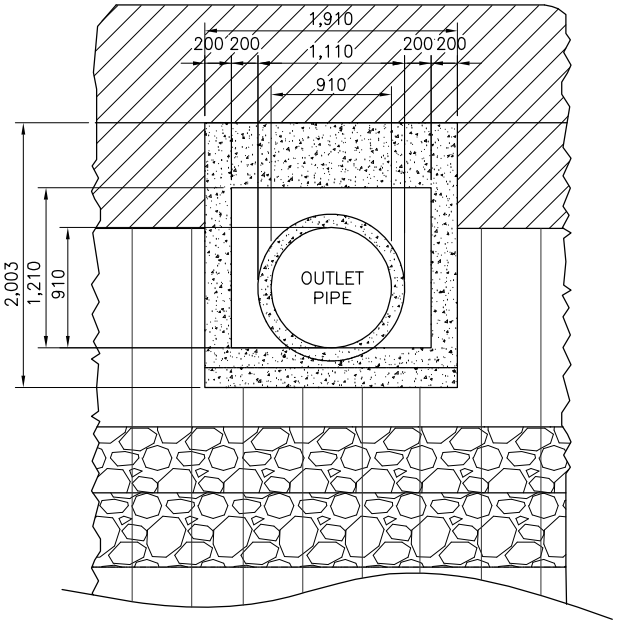
2 PLAN
SCALE B



4 SECTION
SCALE B



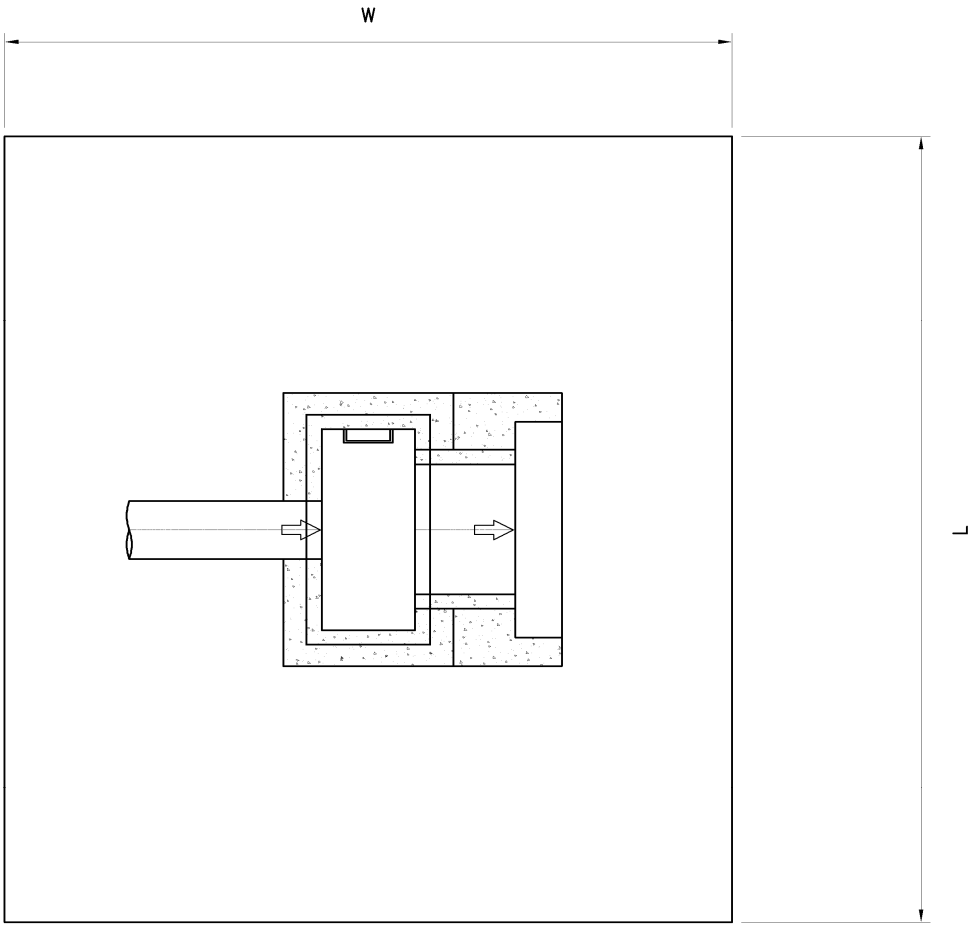
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 59.2)

W	4.553 m	**A=24.42**	m^2
L	5.363 m		

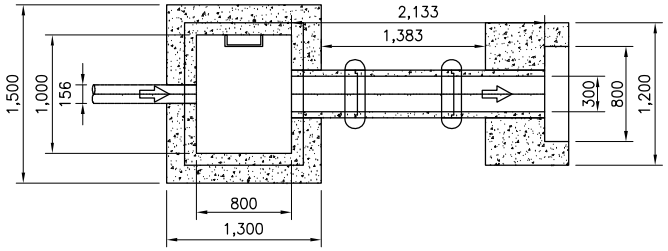


QUANTITIES OF MANHOLE

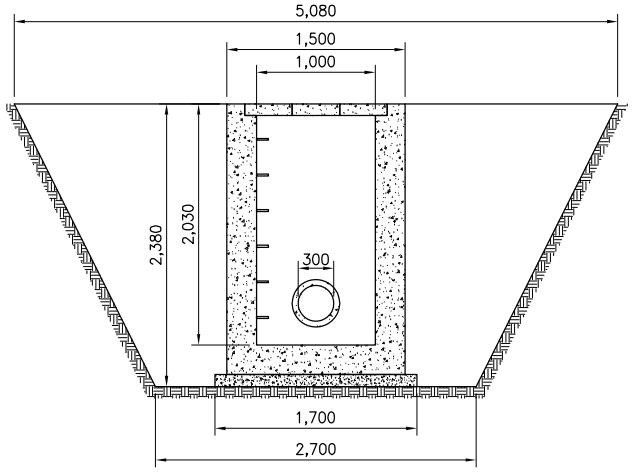
Manhole No.: ML 62A.10

Location 6 + 260

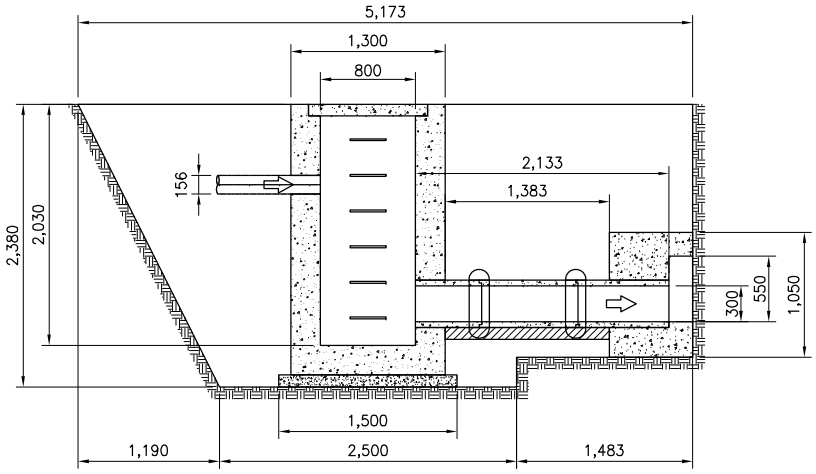
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.50 L=1.70	2.55	0.1	**0.26**	m^3
3. Bottom Slab	W=1.30 L=1.50	1.95	0.25	**0.49**	m^3
4. Wall					
Entire Wall	Wout=1.30 Lout=1.50	Aout=1.95			
	Win=0.80 Lin=1.00	Ain=0.80	2.030	2.335	m^3
		Anet=1.15			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall B	DiaB=0.16	0.02	0.15	0.00	
Pipe hole on Wall C	DiaC=0.00	0.00	0.15	0.00	
Pipe hole on Wall D	DiaD=0.40	0.13	0.15	0.03	
Net Wall Vol.				**2.30**	m^3
5. Conc. Cover	L=1.20 W=1.00	1.2	0.1	**0.12**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.05	Ain=1.26	0.7	0.88	
	Win=0.80 Lin=.55	Aout=0.44	0.25	0.11	
	DiaD=0.40	Apipe=.13	0.45	0.06	
				0.72	m3
9. Outlet Pipe	Dia=.300m	L=2.13		**3**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=2	**0.04710504**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=1.38		**0.05532**	m3
12. Backfill				**55.44**	m3



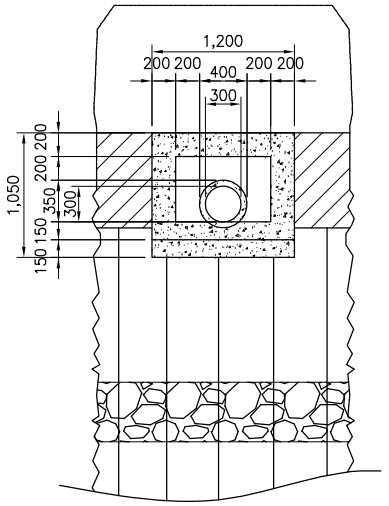
2 PLAN
SCALE B



4 SECTION(62A.10)
SCALE B



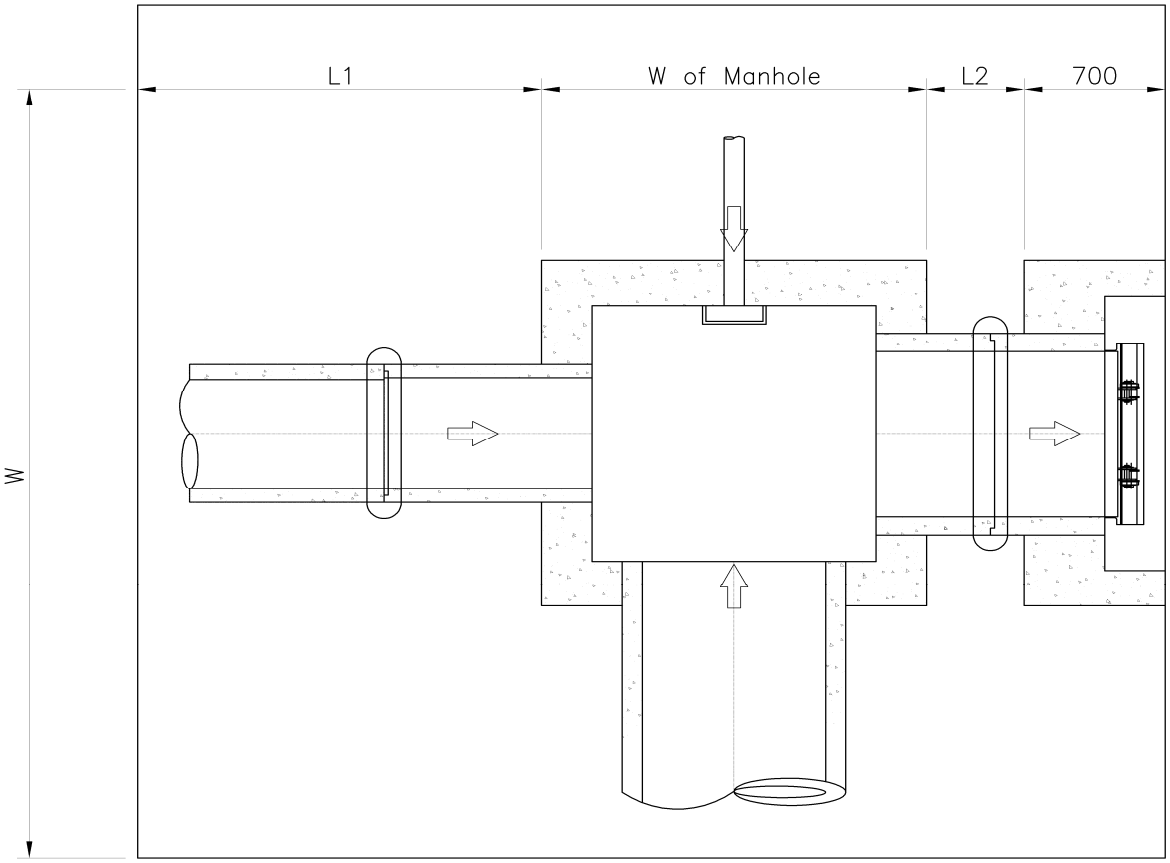
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 62A.10)

L1	1.79 m	
W of Manhole	1.3 m	**A=26.28** m^2
L2	1.383 m	
W	5.08 m	

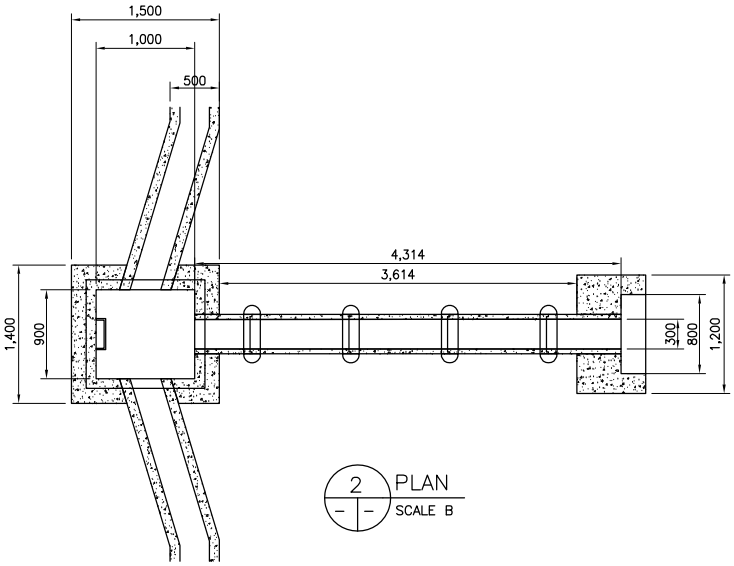


QUANTITIES OF MANHOLE

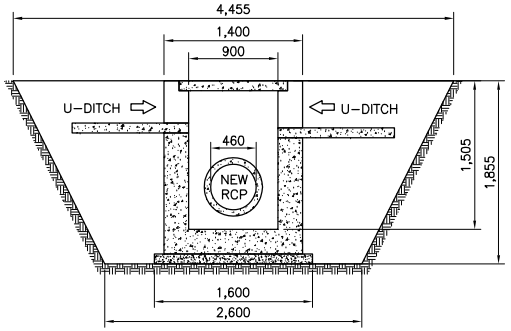
Manhole No.: ML 62A.13

Location 6 + 450

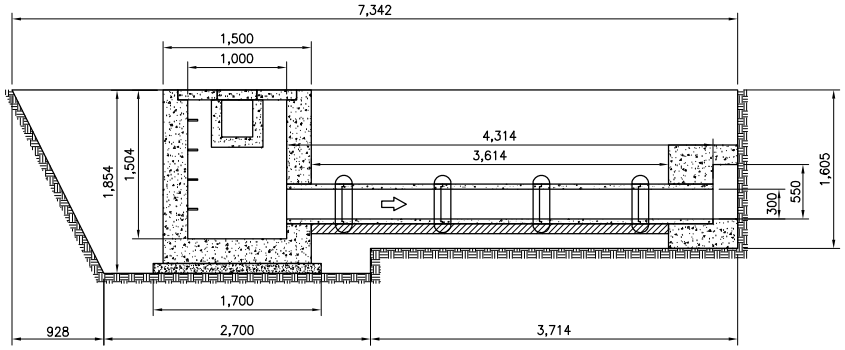
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.70 L=1.60	2.72	0.1	**0.27**	m^3
3. Bottom Slab	W=1.50 L=1.40	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.40	Aout=2.10			
	Win=1.00 Lin=.90	Ain=0.90	1.505	1.806	m^3
		Anet=1.20			
Minus					
D=0.53	W=0.50	0.27	0.25	0.07	
Pipe hole on Wall B	DiaB=0.00	0.00	0.25	0.00	
D=0.58	W=0.50	0.29	0.25	0.07	
Pipe hole on Wall D	DiaD=0.40	0.13	0.25	0.03	
Net Wall Vol.				**1.64**	m^3
5. Conc. Cover	L=1.10 W=1.20	1.32	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.05	Ain=1.26	0.7	0.88	
	Win=0.80 Lin=.55	Aout=0.44	0.25	0.11	
	DiaD=0.40	Apipe=.13	0.45	0.06	
				0.72	m3
9. Outlet Pipe	Dia=.300m	L=4.31		**5**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=4	**0.09421008**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=3.61		**0.14456**	m3
12. Backfill				**55.44**	m3



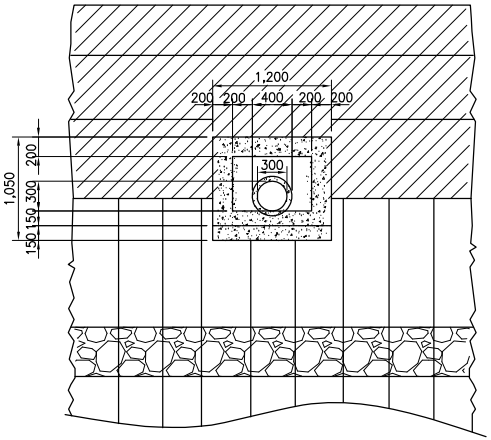
2 PLAN
SCALE B



4 SECTION (ML62A.13)
SCALE B



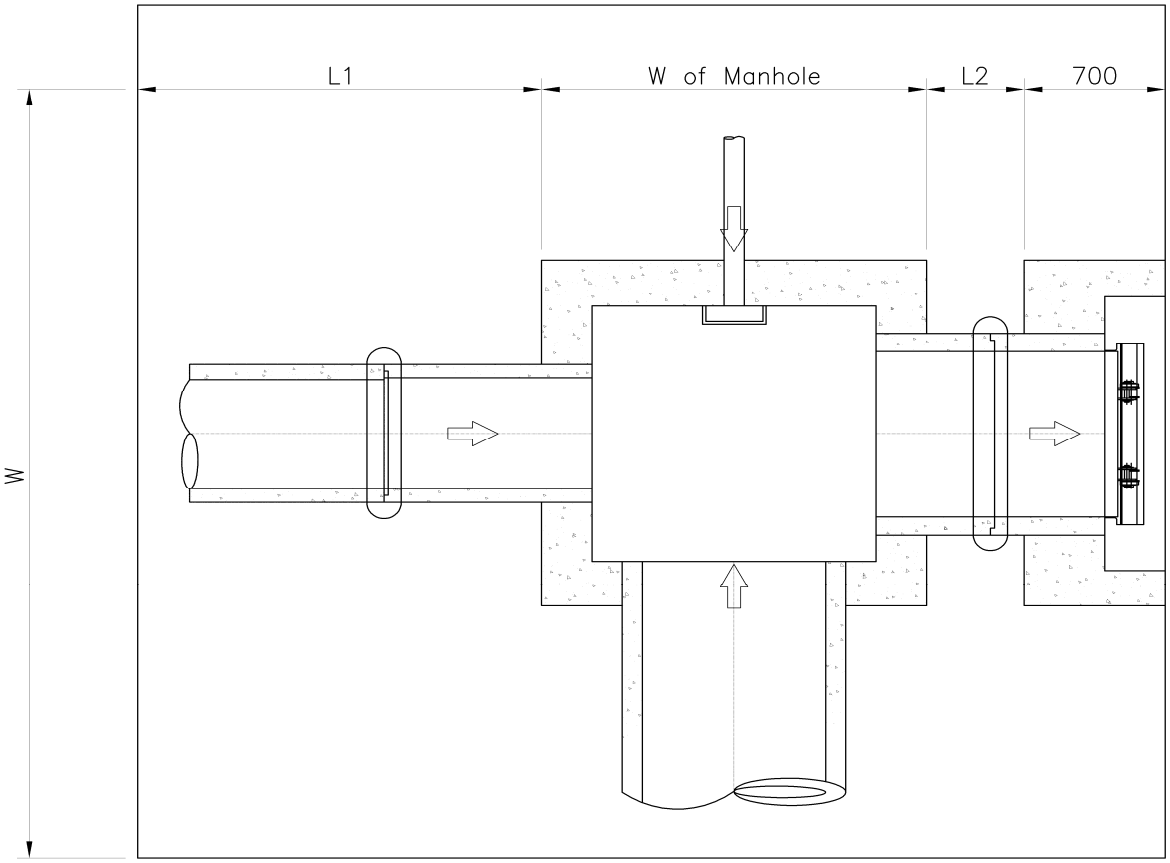
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 62A.13)

L1	1.5275 m	
W of Manhole	1.5 m	**A=32.71** m^2
L2	3.614 m	
W	4.455 m	

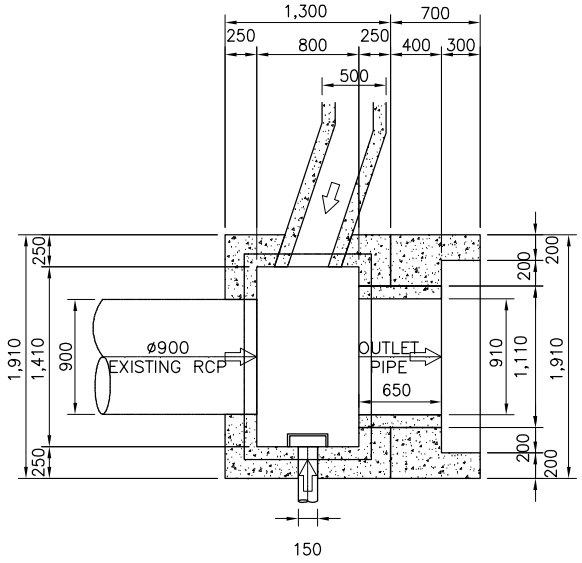


QUANTITIES OF MANHOLE

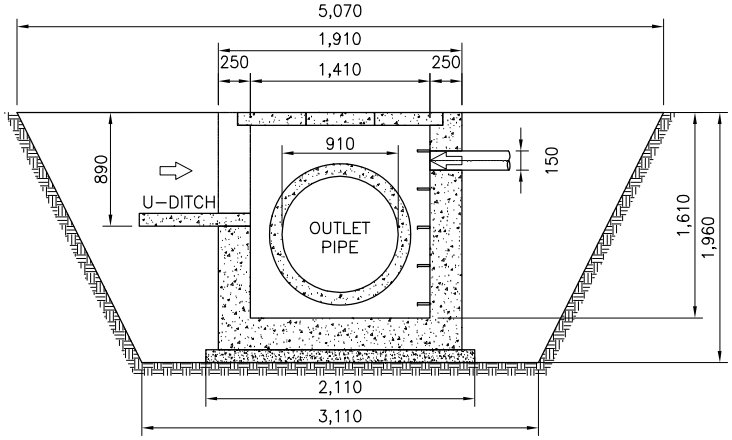
Manhole No.: ML 62A.6

Location: 6 +159

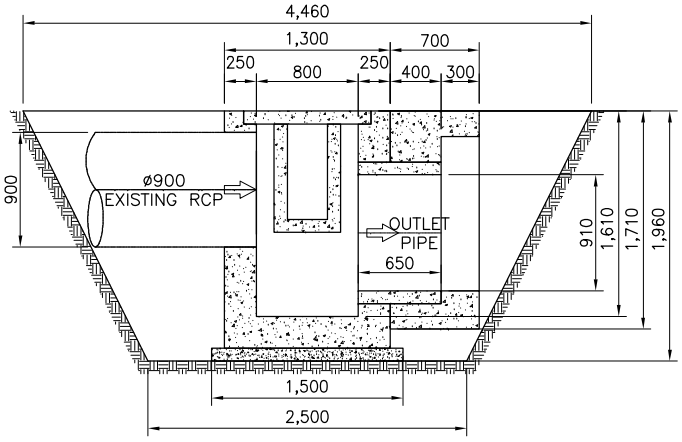
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.82	4.09	27.90	
				27.90	m^3
2. Lev. Concrete	W=1.65 L=2.11	3.48	0.1	**0.35**	m^3
3. Bottom Slab	W=1.45 L=1.91	2.77	0.25	**0.69**	m^3
4. Wall					
Entire Wall	Wout=1.30 Lout=1.91	Aout=2.48			
	Win=0.80 Lin=1.41	Ain=1.13	1.610	2.182	m^3
		Anet=1.36			
Minus					
Pipe hole on Wall A	DiaA=0.15	0.02	0.25	0.00	
Pipe hole on Wall B	DiaB=1.11	0.97	0.25	0.24	
D=0.89	W=0.50	0.45	0.25	0.11	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.58**	m^3
5. Conc. Cover	L=1.61 W=1.15	1.8515	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.98		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.910m	L=0.00		**0**	m3
12. Backfill				**23.25**	m3



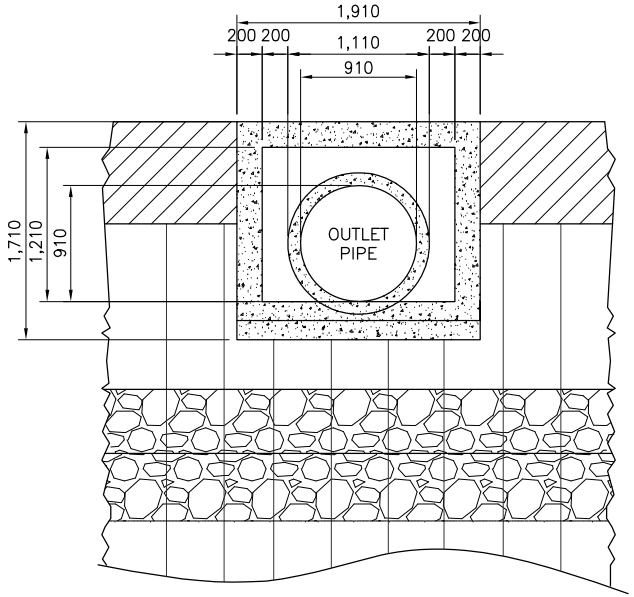
1 PLAN
SCALE A



3 SECTION
SCALE A



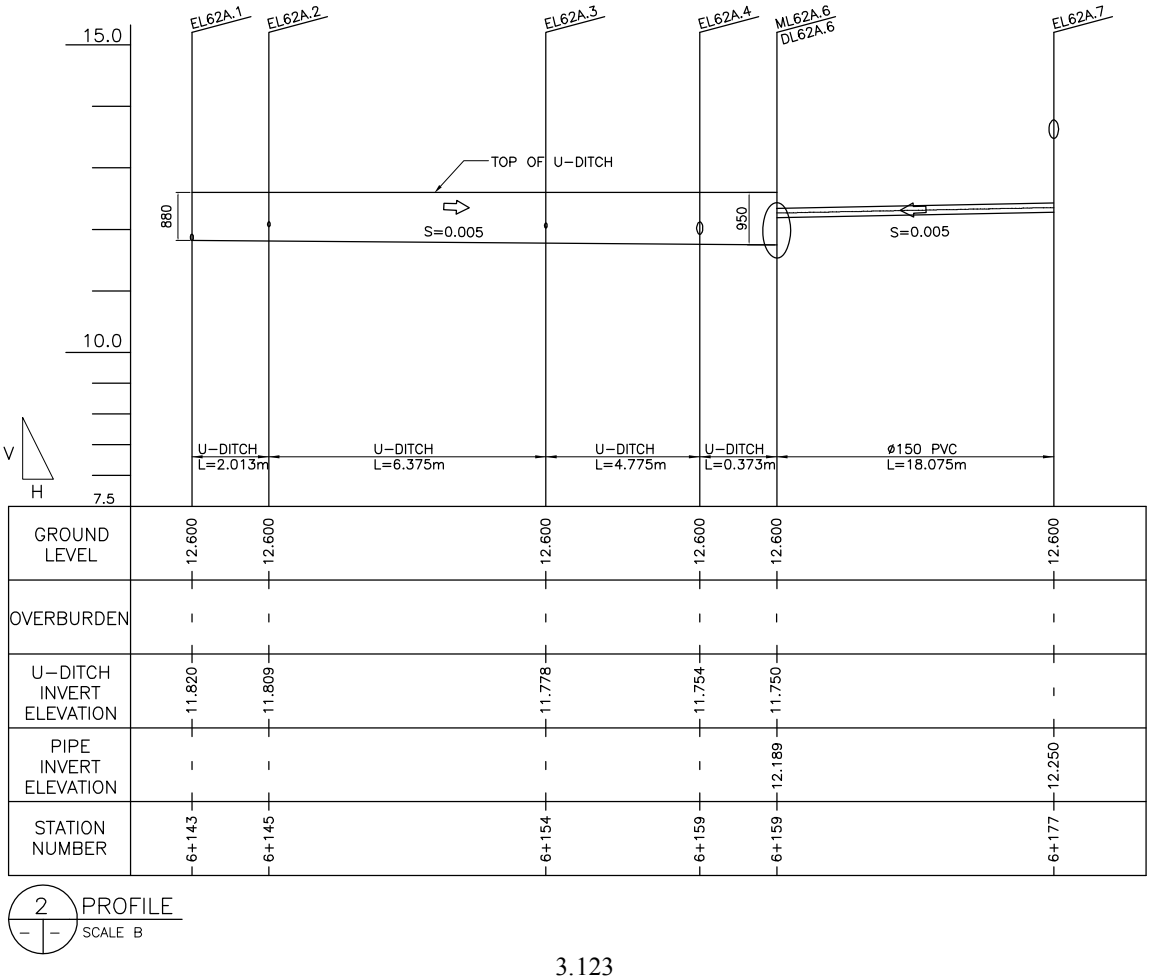
2 SECTION
SCALE A



4 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.15		L=18.17	4	pc
2. PVC Coupling	Dia=.150m			3	pc
3. U - Ditch					
Bottom	W=0.50 L=0.10	0.05	13.60	0.68	m^3
Wall	W=0.92 L=13.54	12.39	0.1	1.24	m^3
Top	W=0.50 L=0.10	0.05	13.536	0.68	m^3
Conc. Bedding	W=0.50 L=0.10	0.05	13.60	0.68	m^3
4. Formworks				22.93	m^3



2 PROFILE
SCALE B

Clearing (Manhole 62A.6)

W	4.46	m	
L	5.07	m	**A=22.61** m^2

Clearing (Collector 62A.7 - 62A.6)

W	1.5305	m	**A=27.66** m^2
L	18.075	m	

Clearing (U - Ditch 62A.1 - 62A.6)

W	2.565	m	**A=34.72** m^2
L	13.536	m	

(Collector PVC) Downstream	62A.7 - 62A.6		
D	0.15	m	Excavation
W1	1.56	m	A=0.56 m^2
W2	1.36	m	Backfill Zone B
H	0.411	m	A=0.24 m^2
H/2	0.2055	m	Backfill Zone C
EL. A	12.6	m	A=0.30 m^2
EL. B	12.189	m	

(Collector PVC) Upstream

D	0.15	m	Excavation
W1	1.50	m	A=0.46 m^2
W2	1.33	m	Backfill Zone B
H	0.35	m	A=0.20 m^2
H/2	0.175	m	Backfill Zone C
EL. A	12.6	m	A=0.25 m^2
EL. B	12.25	m	

(U - Ditch) Downsteram	62A.1 - 62A.6		
d	0.85	m	Excavation
D	1	m	A=2.10 m^2
D/2	0.5	m	Backfill Zone B
W1	2.6	m	A=0.67 m^2
W2	2.1	m	Backfill Zone C
EL. A	12.6	m	A=0.92 m^2
EL. B	11.75	m	

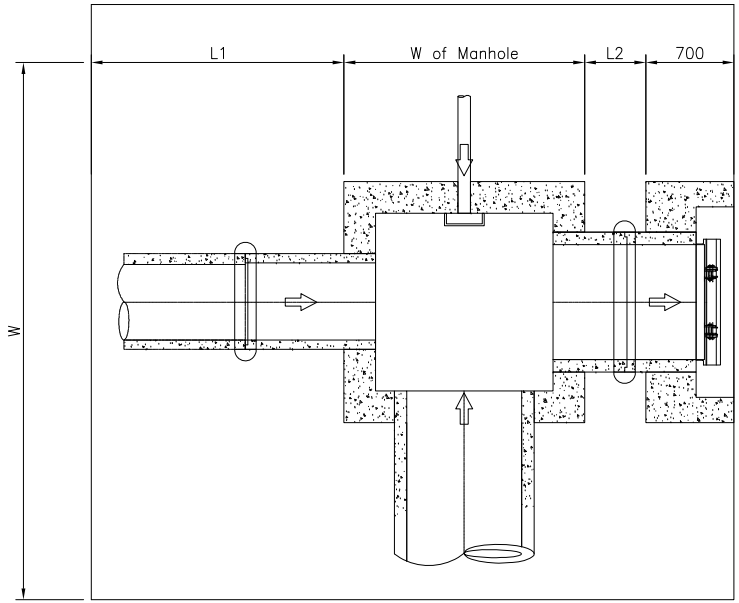
(U - Ditch) Upstream

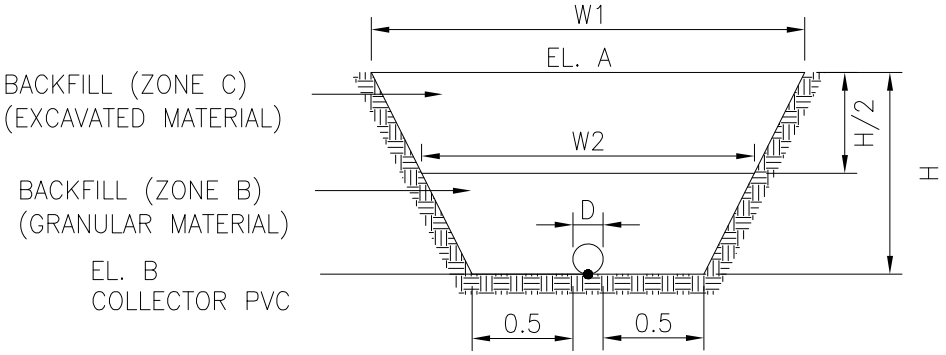
d	0.78	m	Excavation
D	0.93	m	A=1.92 m^2
D/2	0.465	m	Backfill Zone B
W1	2.53	m	A=0.61 m^2
W2	2.065	m	Backfill Zone C
EL. A	12.6	m	A=0.84 m^2
EL. B	11.82	m	

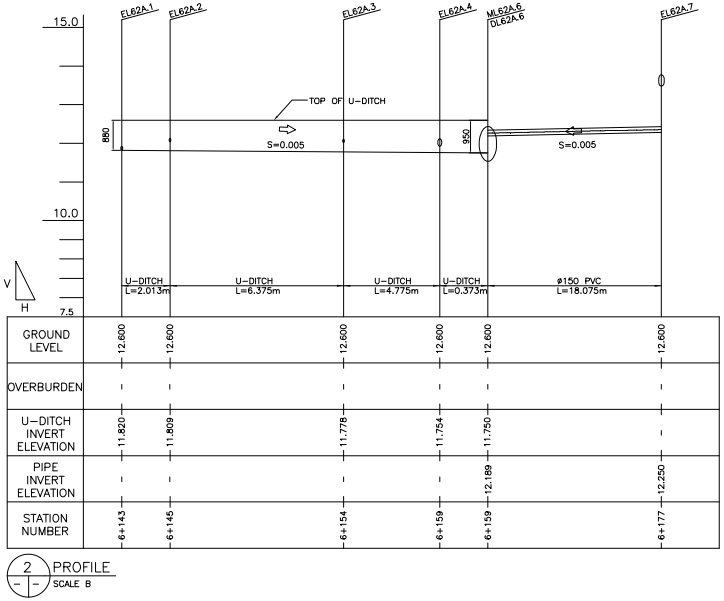
Collector Pipe 62A.7 - 62A.6	Volume	
Excavation	**9.272157**	m^3
Backfill Zone B	**3.984209**	m^3
Backfill Zone C	**4.966939**	m^3

U - Ditch 62A.1 - 92A.6

Excavation	**27.34646**	m^3
Backfill Zone B	**8.737729**	m^3
Backfill Zone C	**11.97693**	m^3







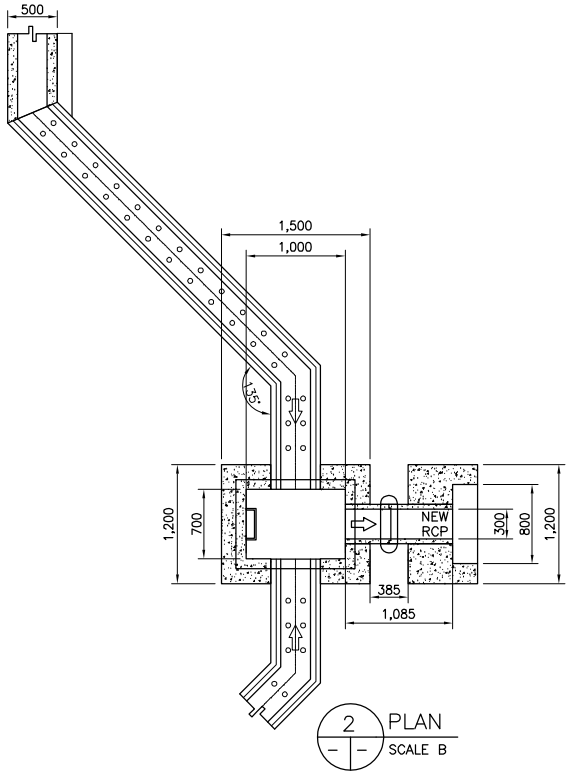
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

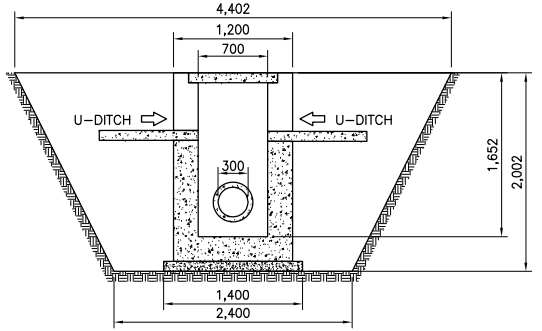
Manhole No.: ML 63

Location 7 + 385

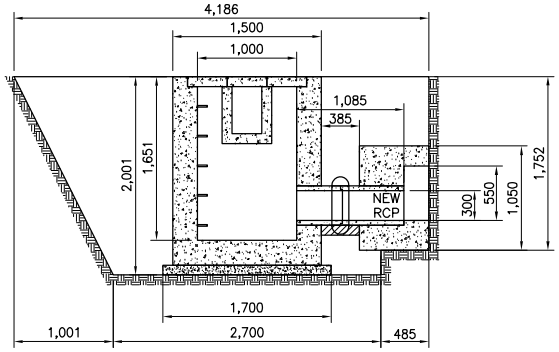
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.70 L=1.40	2.38	0.1	**0.24**	m^3
3. Bottom Slab	W=1.50 L=1.20	1.80	0.25	**0.45**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.20	Aout=1.80			
	Win=1.00 Lin=.70	Ain=0.70	1.652	1.817	m^3
		Anet=1.10			
Minus					
D=0.68	W=0.50	0.34	0.25	0.08	
Pipe hole on Wall B	DiaB=0.00	0.00	0.25	0.00	
D=0.69	W=0.50	0.35	0.25	0.09	
Pipe hole on Wall D	DiaD=0.40	0.13	0.25	0.03	
Net Wall Vol.				**1.61**	m^3
5. Conc. Cover	L=0.90 W=1.20	1.08	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.22	Ain=1.46	0.7	1.02	
	Win=0.80 Lin=.55	Aout=0.44	0.25	0.11	
	DiaD=0.40	Apipe=.13	0.45	0.06	
				0.85	m3
9. Outlet Pipe	Dia=.300m	L=1.09		**2**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=1	**0.02355252**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=0.39		**0.0154**	m3
12. Backfill				**55.44**	m3



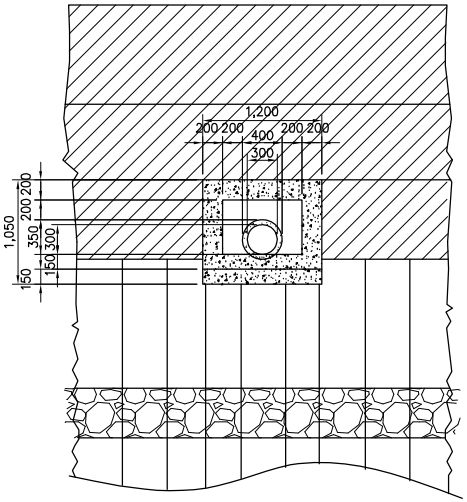
2 PLAN
SCALE B



4 SECTION (ML63)
SCALE B



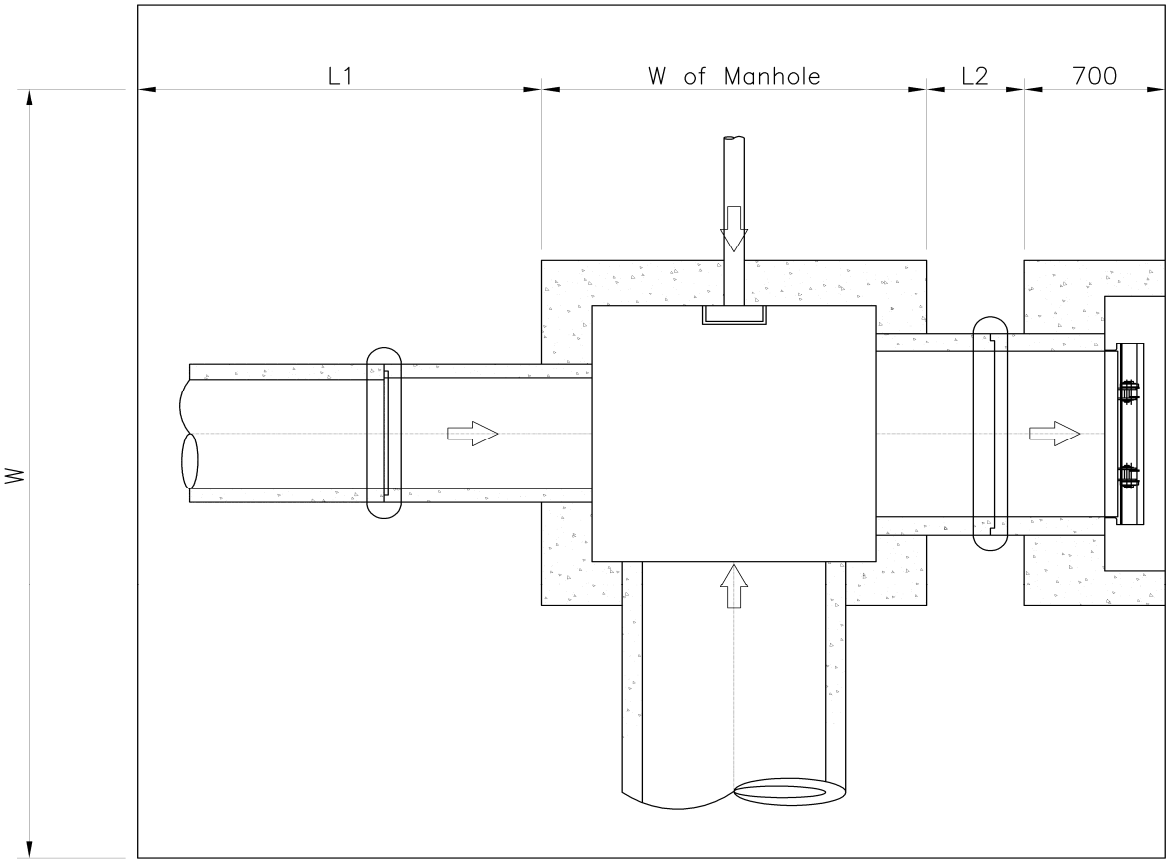
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 63)

L1	1.601 m	
W of Manhole	1.5 m	**A=18.43** m^2
L2	0.385 m	
W	4.402 m	

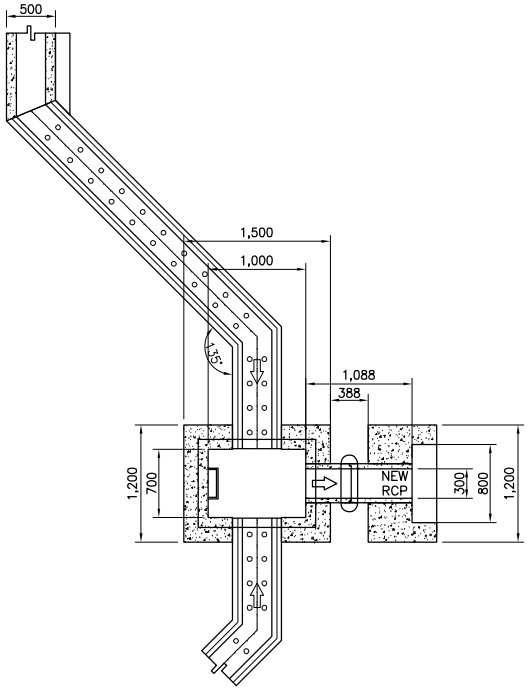


QUANTITIES OF MANHOLE

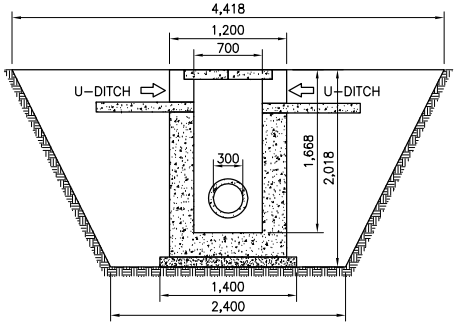
Manhole No.: ML 63.1

Location 7 + 504

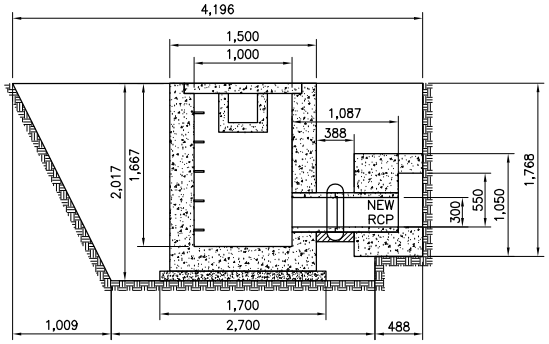
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.70	4.86	66.53	
				66.53	m^3
2. Lev. Concrete	W=1.70 L=1.40	2.38	0.1	**0.24**	m^3
3. Bottom Slab	W=1.50 L=1.20	1.80	0.25	**0.45**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.20	Aout=1.80			
	Win=1.00 Lin=.70	Ain=0.70	1.668	1.835	m^3
		Anet=1.10			
Minus					
D=0.44	W=0.50	0.22	0.25	0.05	
Pipe hole on Wall B	DiaB=0.00	0.00	0.25	0.00	
D=0.45	W=0.50	0.22	0.25	0.06	
Pipe hole on Wall D	DiaD=0.40	0.13	0.25	0.03	
Net Wall Vol.				**1.69**	m^3
5. Conc. Cover	L=0.90 W=1.20	1.08	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.05	Ain=1.26	0.7	0.88	
	Win=0.80 Lin=.55	Aout=0.44	0.25	0.11	
	DiaD=0.40	Apipe=.13	0.45	0.06	
				0.72	m3
9. Outlet Pipe	Dia=.300m	L=1.09		**2**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=1	**0.02355252**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=0.39		**0.01552**	m3
12. Backfill				**55.44**	m3



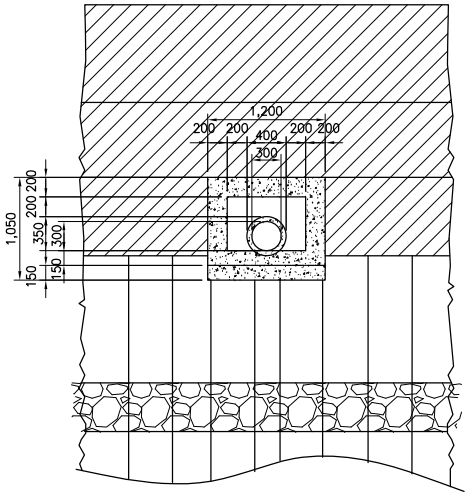
2 PLAN
SCALE B



4 SECTION (ML63.1)
SCALE B



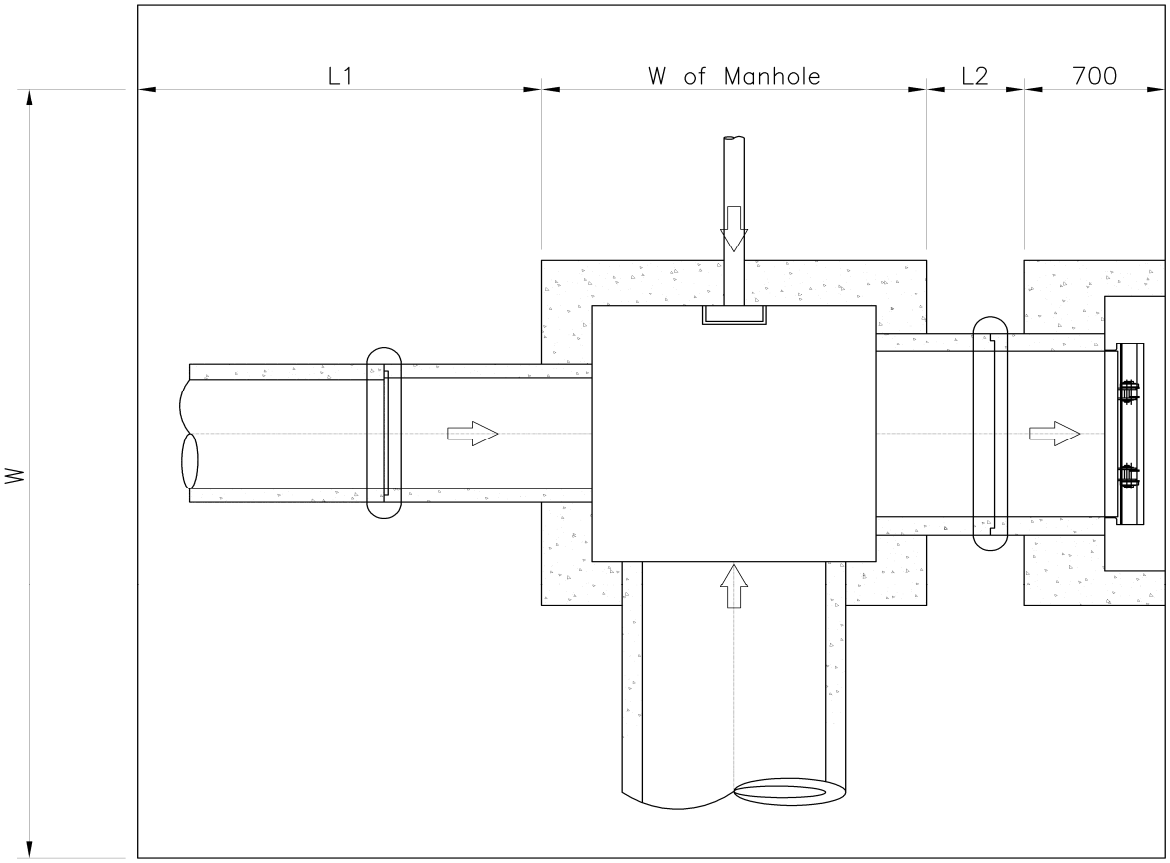
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 63.1)

L1	1.609 m	
W of Manhole	1.5 m	**A=18.54** m^2
L2	0.388 m	
W	4.418 m	

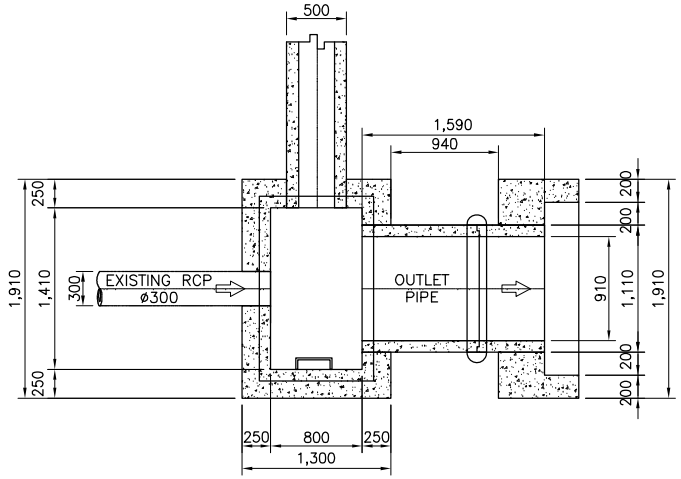


QUANTITIES OF MANHOLE

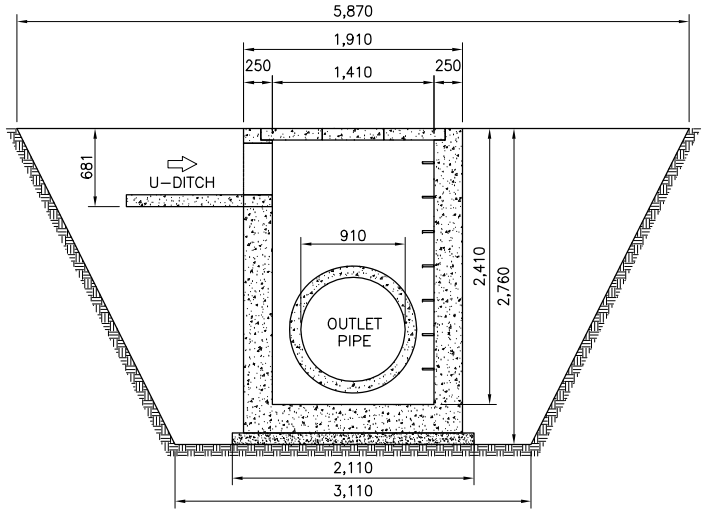
Manhole No.: ML HSP4

Location: 3 + 216

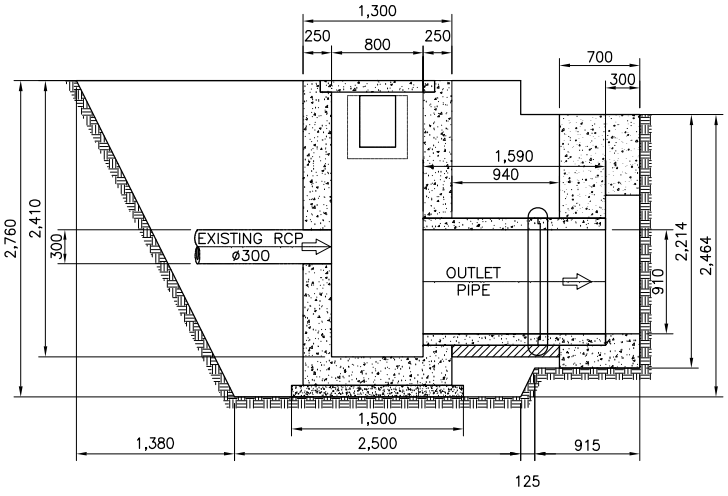
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.03	4.49	9.10	
		A2=0.29	4.49	1.31	
		A3=8.80	4.49	39.53	
				49.94	m^3
2. Lev. Concrete	W=1.50 L=2.11	3.17	0.1	**0.32**	m^3
3. Bottom Slab	W=1.30 L=1.91	2.48	0.25	**0.62**	m^3
4. Wall					
Entire Wall	Wout=1.30	Aout=2.48			
	Lout=1.91				
	Win=0.80	Ain=1.13	2.410	3.266	m^3
	Lin=1.41				
		Anet=1.36			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
D=0.68	W=0.50	0.34	0.25	0.09	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.91**	m^3
5. Conc. Cover	L=1.61 W=1.00	1.61	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.23	0.7	2.96	
	Lout=2.21				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.02	m3
9. Outlet Pipe	Dia=.910m	L=1.09		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.06**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.44		**0.05**	m3
12. Backfill				**41.62**	m3



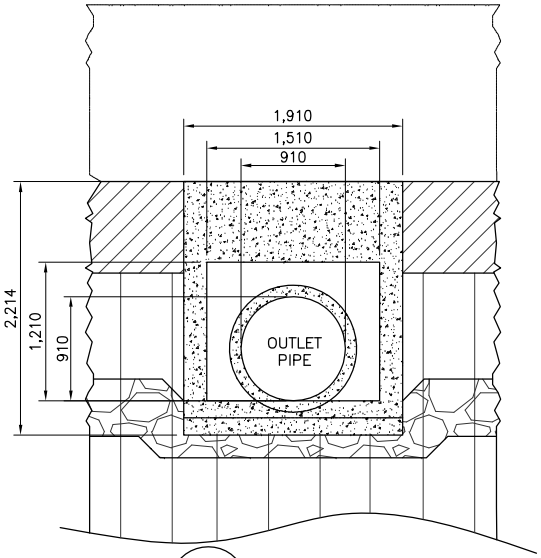
1 PLAN
SCALE A



3 SECTION (MHHSP4)
SCALE B



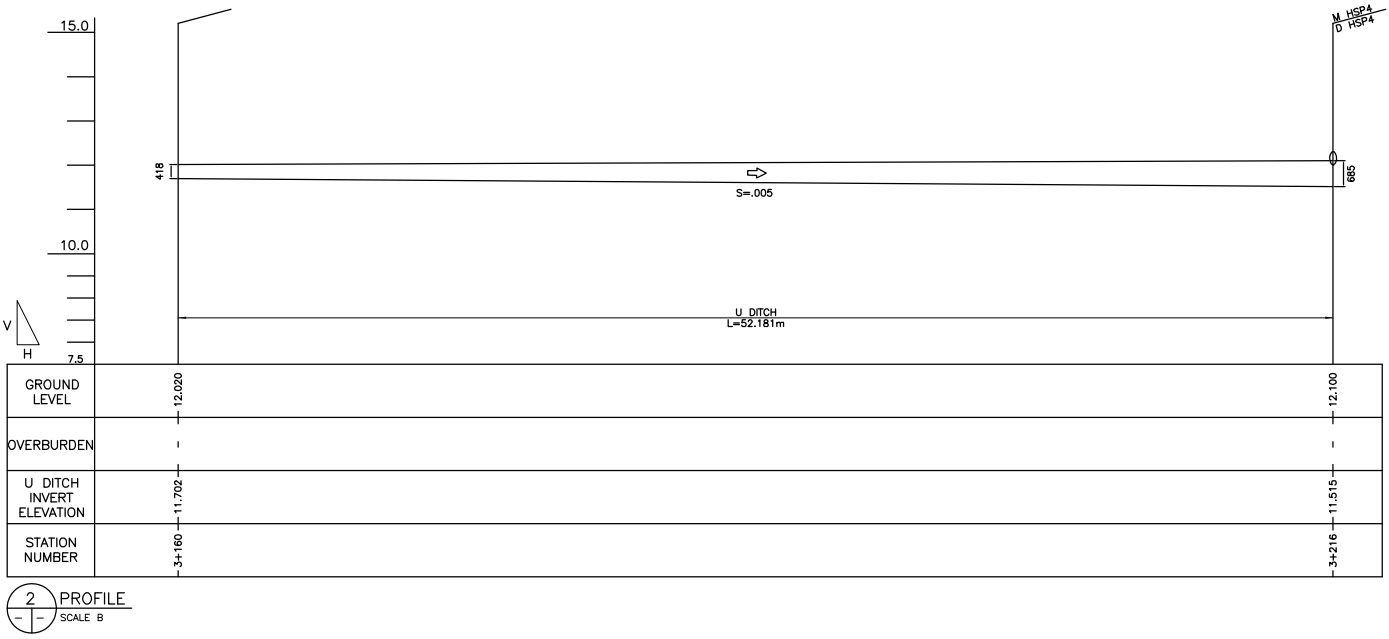
2 SECTION
SCALE A



4 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. U - Ditch					
Bottom	W=.500m L=.100m	0.05	52.44	2.62	m^3
Wall	W=.552m L=52.44m	28.92	0.1	2.89	m^3
Top	W=.500m L=.100m	0.05	52.18	2.61	m^3
Conc. Bedding	W=.500m L=.100m	0.05	52.44	2.62	m^3
4. Formworks				75.22	m^3



2 PROFILE
SCALE B

Clearing (Manhole HSP4)

L1	1.98	m	
W of Manhole	1.3	m	**A=28.88** m^2
L2	0.94	m	
W	5.87	m	

Clearing (U - Ditch HSP4)

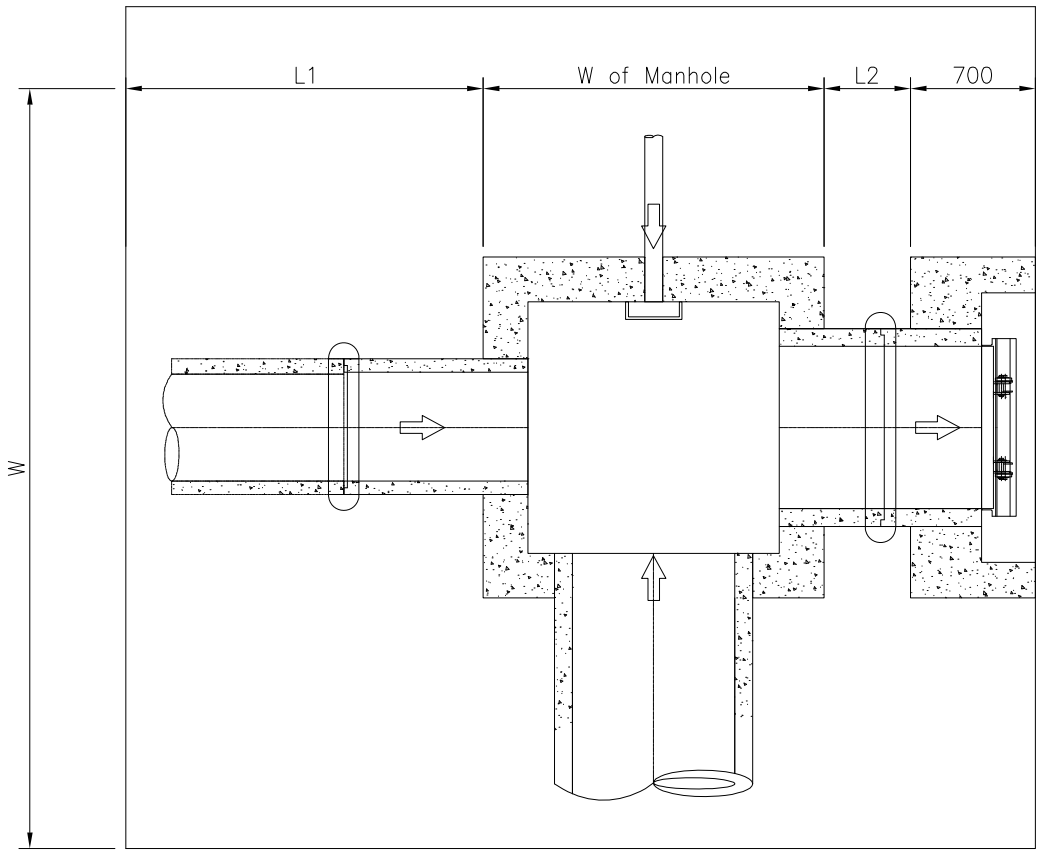
W	2.2015	m	**A=114.88** m^2
L	52.181	m	

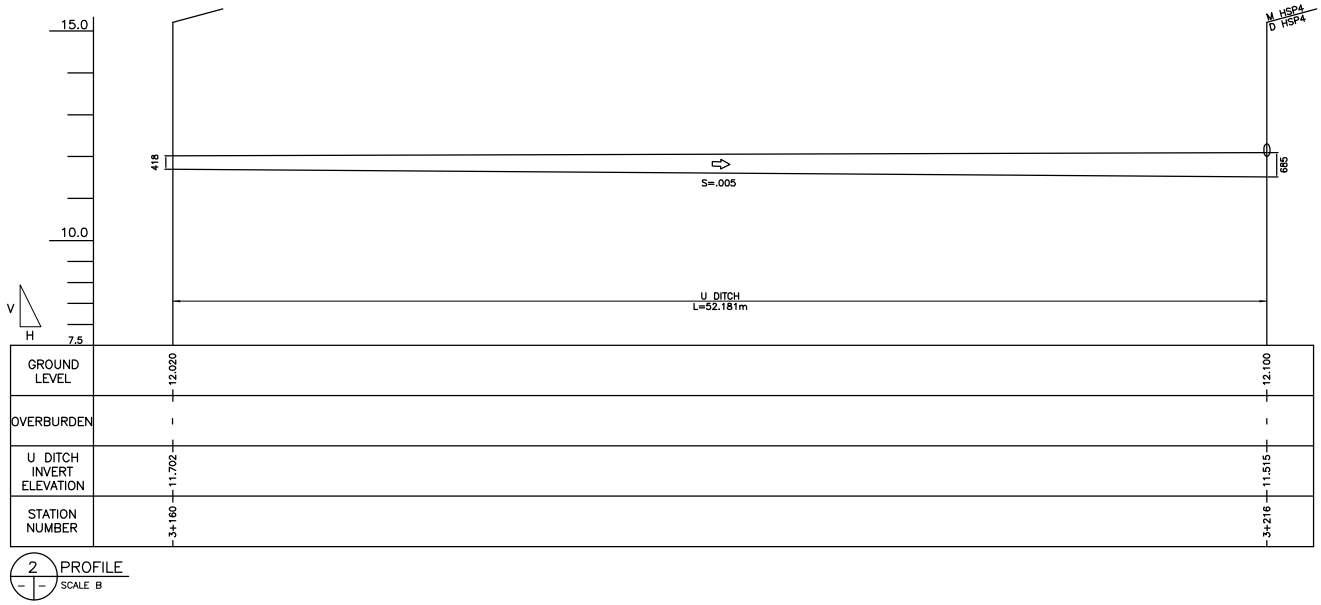
(U - Ditch) Downsteram	HSP4		
d	0.585	m	Excavation
D	0.735	m	A=1.45 m^2
D/2	0.3675	m	Backfill Zone B
W1	2.335	m	A=0.47 m^2
W2	1.9675	m	Backfill Zone C
EL. A	12.1	m	A=0.61 m^2
EL. B	11.515	m	

(U - Ditch) Upstream			
d	0.318	m	Excavation
D	0.468	m	A=0.86 m^2
D/2	0.234	m	Backfill Zone B
W1	2.068	m	A=0.28 m^2
W2	1.834	m	Backfill Zone C
EL. A	12.02	m	A=0.34 m^2
EL. B	11.702	m	

U - Ditch 83.35 - 83.29

Excavation	**60.42421**	m^3
Backfill Zone B	**19.57541**	m^3
Backfill Zone C	**24.81468**	m^3





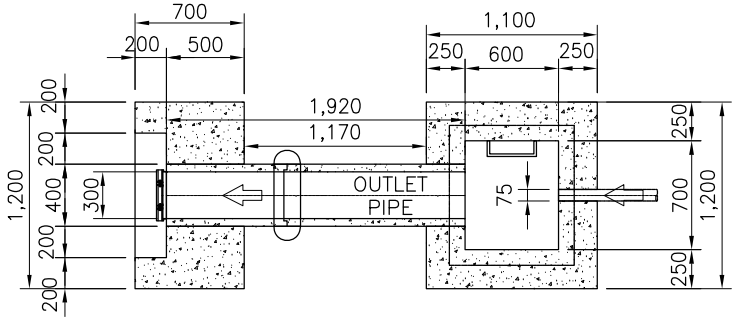
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

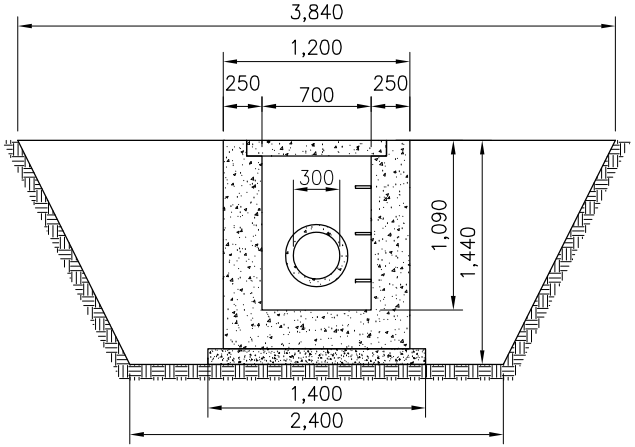
Manhole No.: MR 35.1

Location: 3 + 658

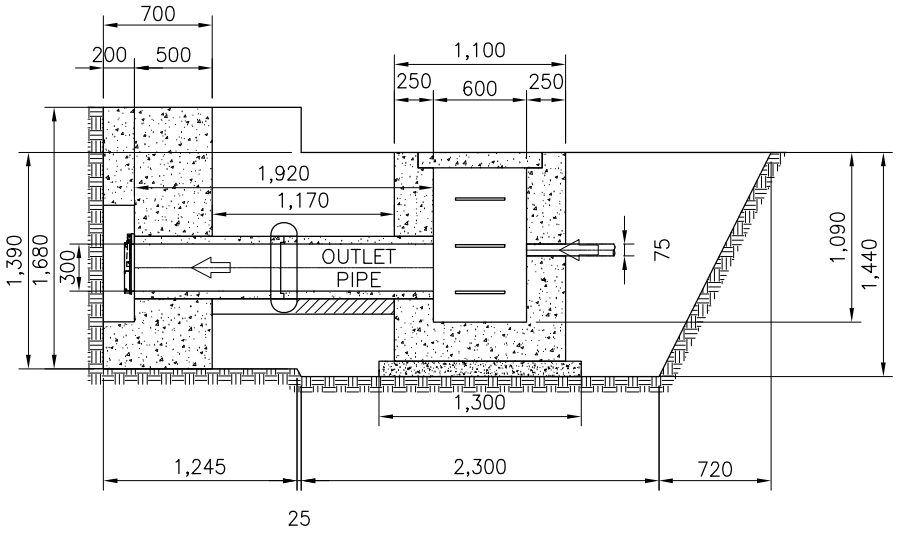
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.09	3.12	6.53	
		A2=0.04	3.12	0.11	
		A3=3.83	3.12	11.95	
				18.59	m^3
2. Lev. Concrete	W=1.10 L=1.20	1.32	0.1	**0.13**	m^3
3. Bottom Slab	W=0.90 L=1.00	0.90	0.2	**0.18**	m^3
4. Wall					
Entire Wall	Wout=0.90 Lout=1.00	Aout=0.90			
	Win=0.60 Lin=.70	Ain=0.42	1.090	0.523	m^3
		Anet=0.48			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall B	DiaB=0.08	0.004	0.15	0.001	
Pipe hole on Wall C	DiaC=0.00	0.00	0.15	0.00	
Pipe hole on Wall D	DiaD=0.40	0.13	0.15	0.03	
Net Wall Vol.				**0.49**	m^3
5. Conc. Cover	L=0.90 W=0.80	0.72	0.1	**0.07**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate	Dia=.300m			**1**	pc
8. Conc. Mouth	Wout=1.20 Lout=1.68	Ain=2.02	0.7	1.41	
	Win=0.80 Lin=.75	Aout=0.60	0.3	0.18	
	DiaD=0.40	Apipe=.13	0.4	0.05	
				1.18	m3
9. Outlet Pipe	Dia=.300m	L=1.82		**2**	pc
10. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=1	**0.02355252**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.400m	L=1.17		**0.0468**	m3
12. Backfill				**15.49**	m3



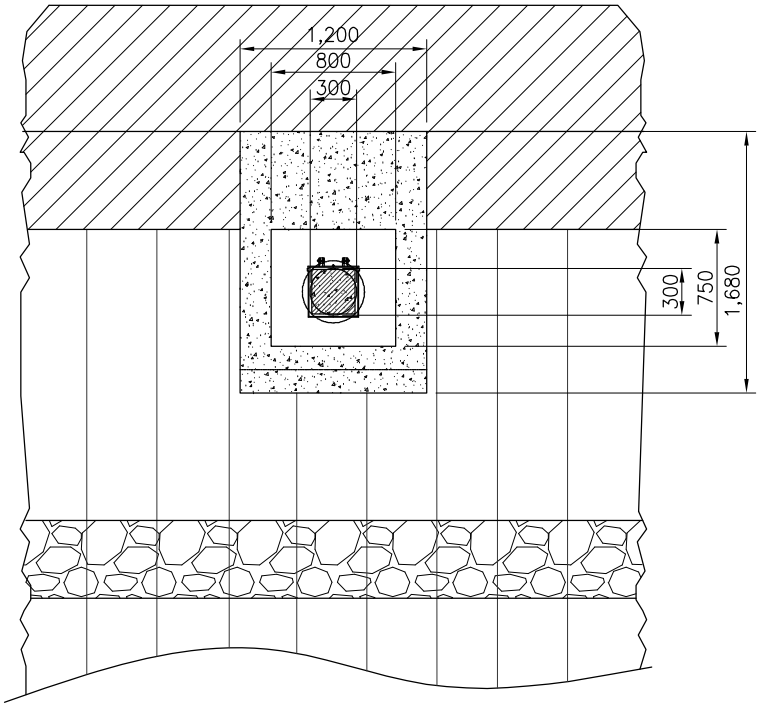
2 PLAN
SCALE B



4 SECTION
SCALE B



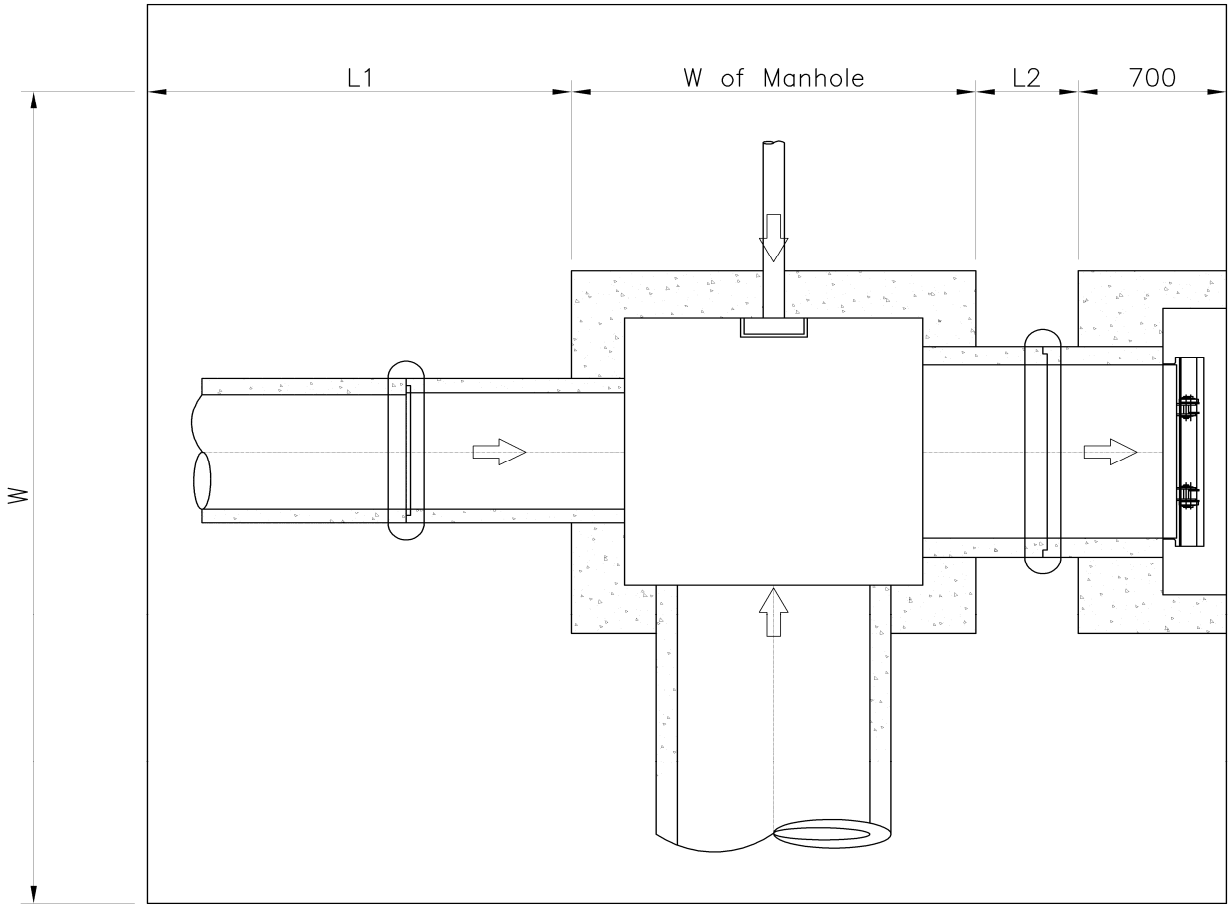
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 35.1)

L1	1.32 m	
W of Manhole	1.1 m	**A=16.47** m^2
L2	1.17 m	
W	3.84 m	

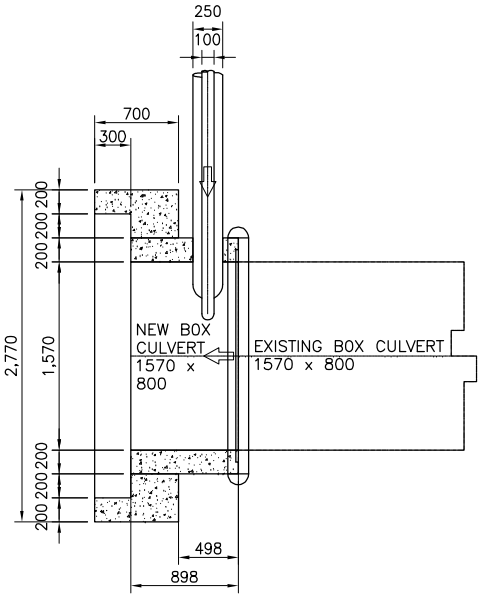


QUANTITIES OF MANHOLE

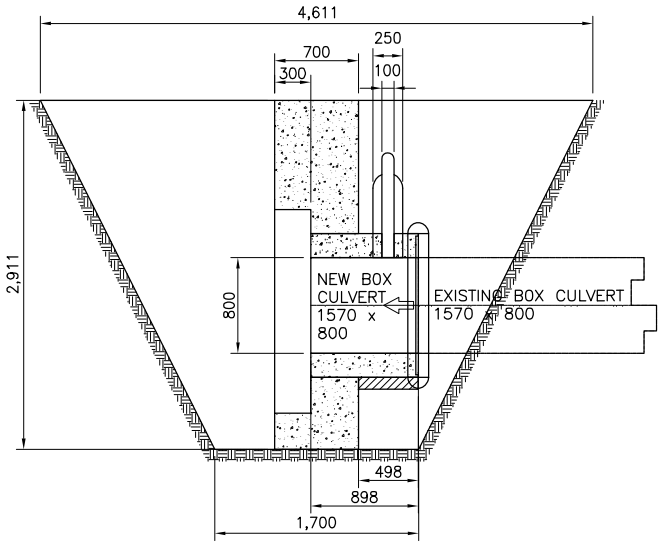
Manhole No.: MR 36.15

Location: 5 +192

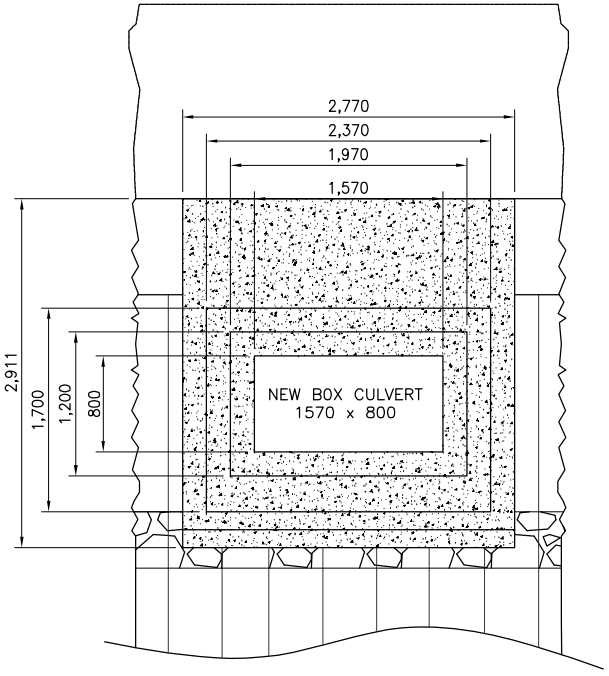
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=9.19	4.16	38.17	
				38.17	m^3
2. Conc. Mouth	Wout=2.77 Lout=2.91	Ain=8.06	0.7	5.64	
	Win=2.37 Lin=1.70	Aout=4.03	0.3	1.21	
	DiaD=0.80	Apipe=1.26	0.4	0.50	
				3.93	m3
3. Outlet Pipe	Wout=1.97 Lout=1.20	Ain=2.36			
	Win=1.57 Lin=.80	Aout=1.26	0.2	**0.21**	m3
	DiaD=0.25	Apipe=.06 Anet=1.05			
4. Concrete Collar	D1=1.000m D2=1.180m	A1=0.79 A2=1.09	0.17	**0.05**	m3
		Anet=0.31	Qty=1		
5. Conc. Bedding (Outlet Pipe)	Dia=1.970m	L=0.50		0.10	m3
6. Backfill				**31.81**	m3



1 PLAN
SCALE A



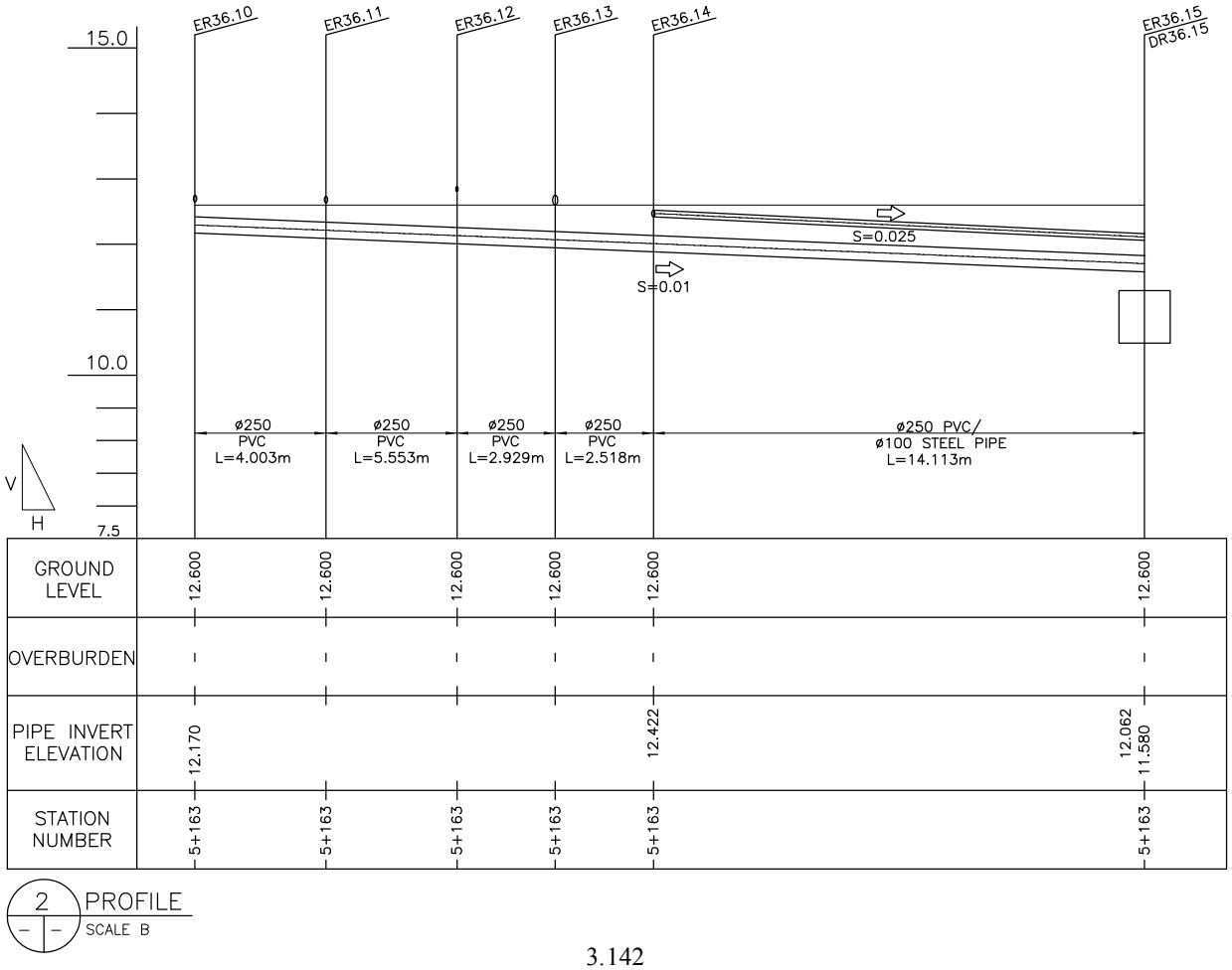
2 SECTION
SCALE A



3 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.25		L=29.41	10	pc
Collector Pipe (Steel)	Dia=0.10		L=14.47	3	pc
2. PVC coupling	Dia=0.25			9	pc



2 PROFILE
SCALE B

Clearing (Manhole 36.15)

W	4.611	m	
L	5.681	m	**A=26.20** m^2

Clearing (Collector 36.6 - 36.9)

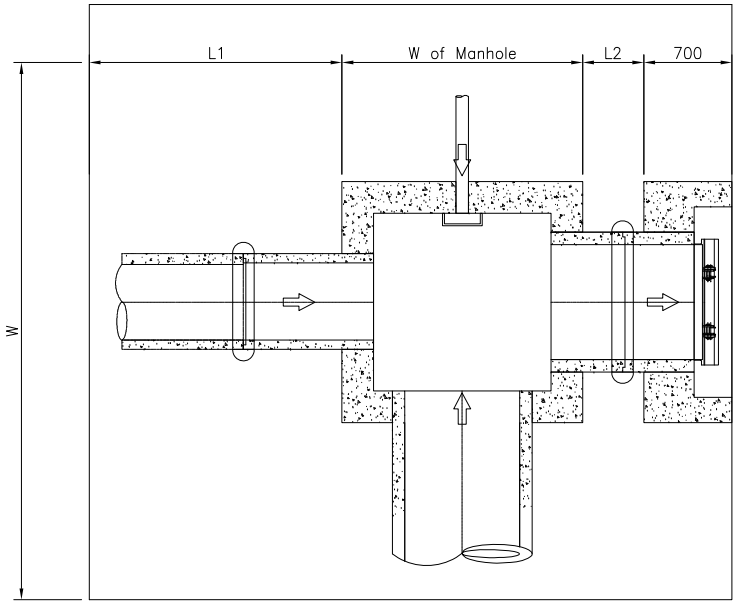
W	1.95	m	
L	29.116	m	**A=56.78** m^2

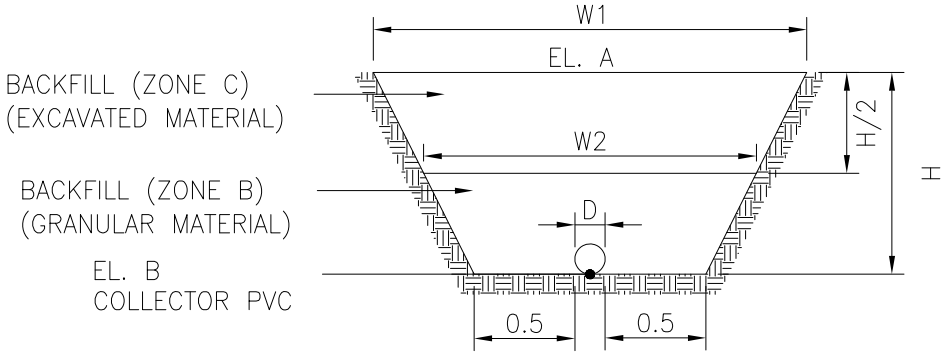
(Collector PVC) Downstream	36.10 - 36.15		
D	0.25	m	Excavation
W1	2.27	m	A=1.80 m^2
W2	1.76	m	Backfill Zone B
H	1.02	m	A=0.72 m^2
H/2	0.51	m	Backfill Zone C
EL. A	12.6	m	A=1.03 m^2
EL. B	11.58	m	

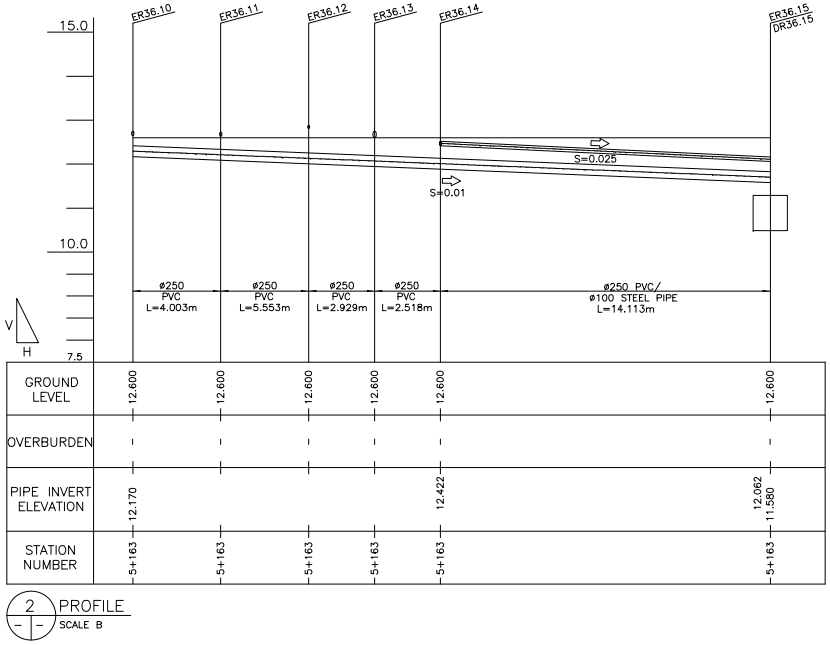
(Collector PVC) Upstream

D	0.2	m	Excavation
W1	1.63	m	A=0.61 m^2
W2	1.42	m	Backfill Zone B
H	0.43	m	A=0.25 m^2
H/2	0.215	m	Backfill Zone C
EL. A	12.6	m	A=0.33 m^2
EL. B	12.17	m	

Collector PVC 36.10 - 36.15	Volume	
Excavation	**28.72924**	m^3
Backfill Zone B	**11.45815**	m^3
Backfill Zone C	**16.19527**	m^3







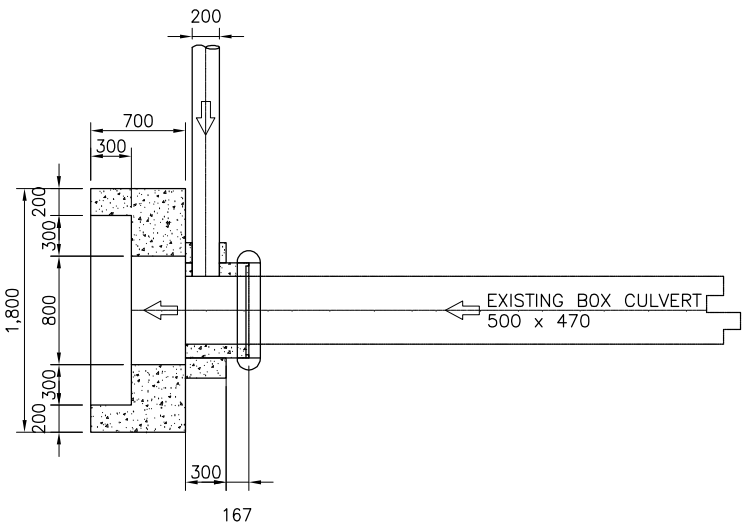
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

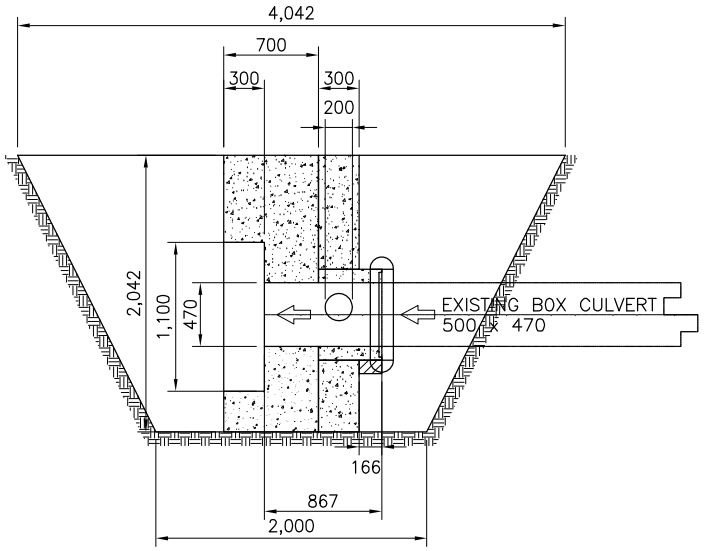
Manhole No.: MR 36.20

Location: 5 + 296

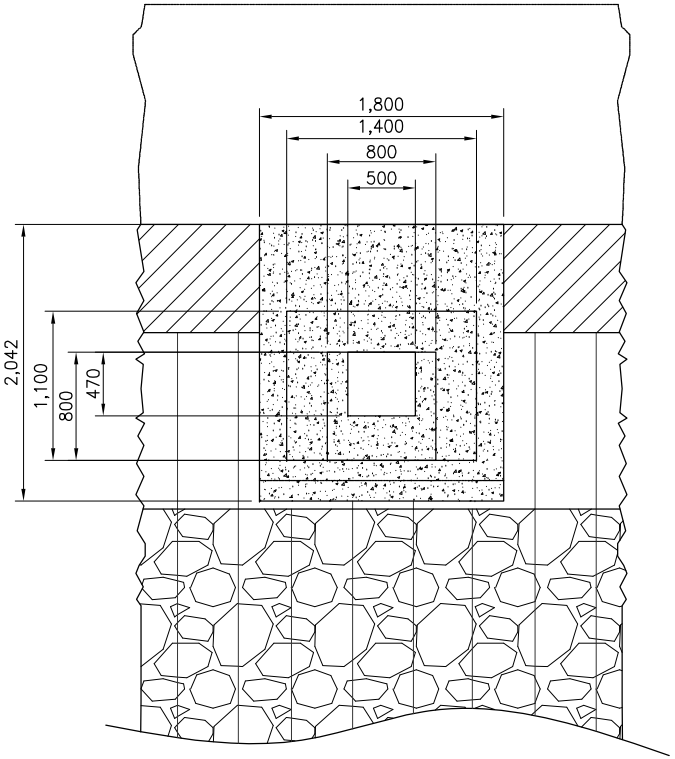
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.17	2.82	17.40 **17.40**	m^3
2. Conc. Mouth	Wout=1.80 Lout=2.04 Win=1.40 Lin=1.10 DiaD=0.80	Ain=3.68 Aout=1.54 Apipe=1.26	0.7 0.3 0.3	2.57 0.46 0.38 **1.48**	m3
3. Outlet Pipe	Wout=0.80 Lout=.80 Win=0.50 Lin=.47 DiaD=0.20	Ain=0.64 Aout=0.24 Apipe=.03 Anet=0.37	0.15	**0.06**	m3
4. Concrete Collar	D1=.770m D2=.950m	A1=0.47 A2=0.71 Anet=0.24	0.17 Qty=1	0.04	m3
5. Conc. Bedding (Outlet Pipe)	Dia=.700m	L=0.17		0.01162	m3
6. Backfill				**14.50**	m3



1 PLAN
SCALE A



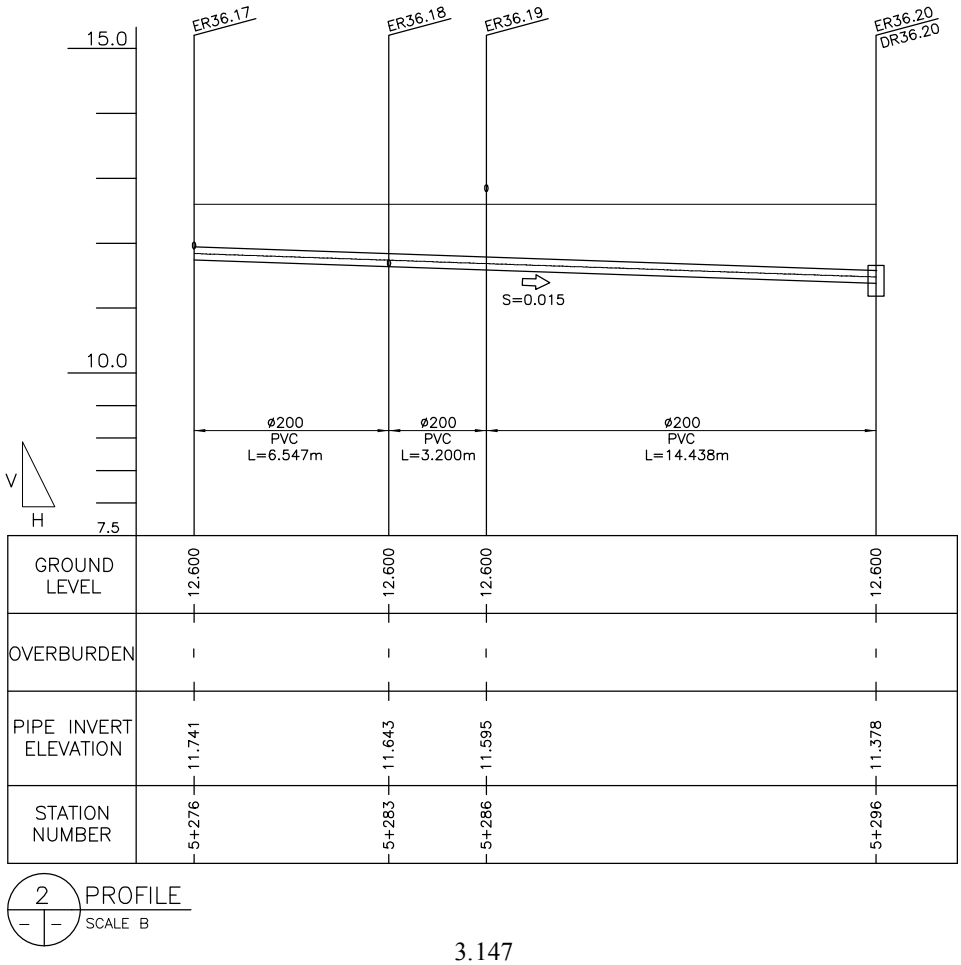
2 SECTION
SCALE A



3 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.20		L=24.55	5	pc
2. PVC coupling	Dia=0.20			4	pc



2 PROFILE
SCALE B

Clearing (Manhole 36.20)

W	4.042	m	
L	3.842	m	**A=15.53** m^2

Clearing (Collector 36.17 - 36.20)

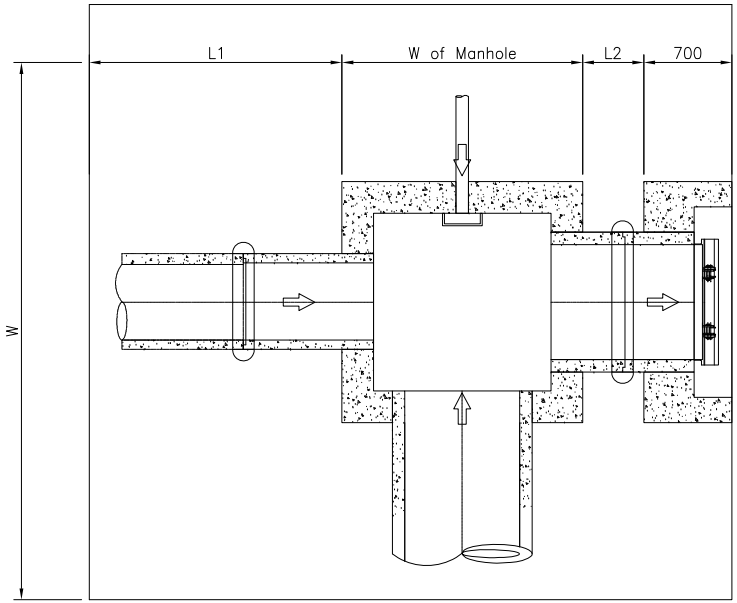
W	2.2405	m	
L	24.185	m	**A=54.19** m^2

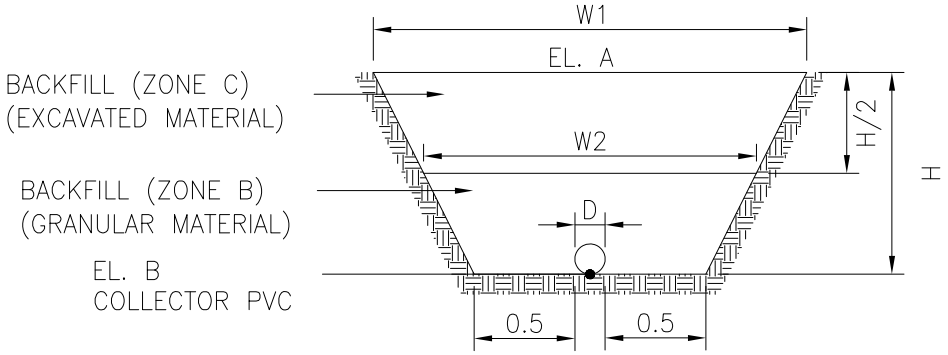
(Collector PVC) Downstream	36.17 - 36.20		
D	0.2	m	Excavation
W1	2.42	m	A=2.21 m^2
W2	1.81	m	Backfill Zone B
H	1.222	m	A=0.89 m^2
H/2	0.611	m	Backfill Zone C
EL. A	12.6	m	A=1.29 m^2
EL. B	11.378	m	

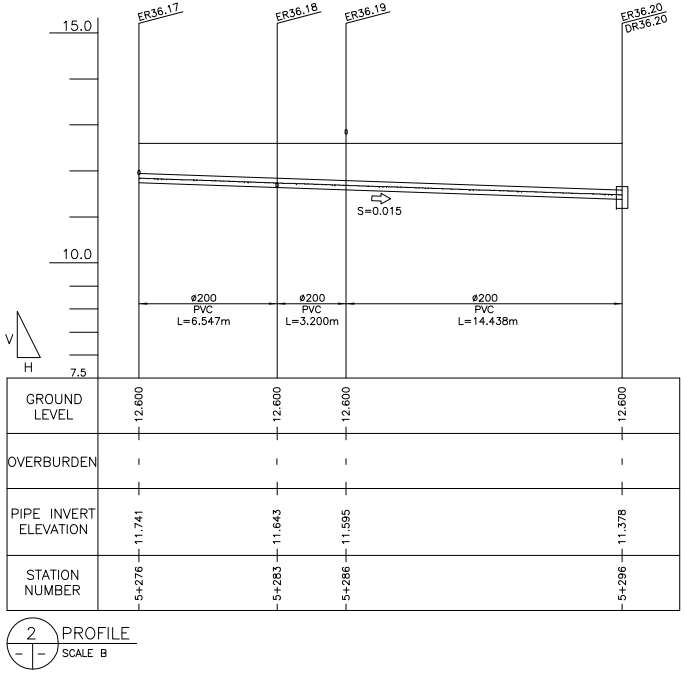
(Collector PVC) Upstream

D	0.2	m	Excavation
W1	2.06	m	A=1.40 m^2
W2	1.63	m	Backfill Zone B
H	0.859	m	A=0.58 m^2
H/2	0.4295	m	Backfill Zone C
EL. A	12.6	m	A=0.79 m^2
EL. B	11.741	m	

Collector PVC 36.17 - 36.20	Volume	
Excavation	**44.34289**	m^3
Backfill Zone B	**17.97712**	m^3
Backfill Zone C	**25.59458**	m^3







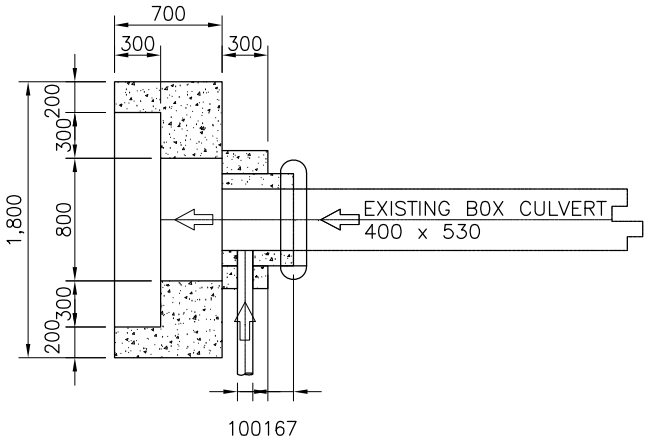
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

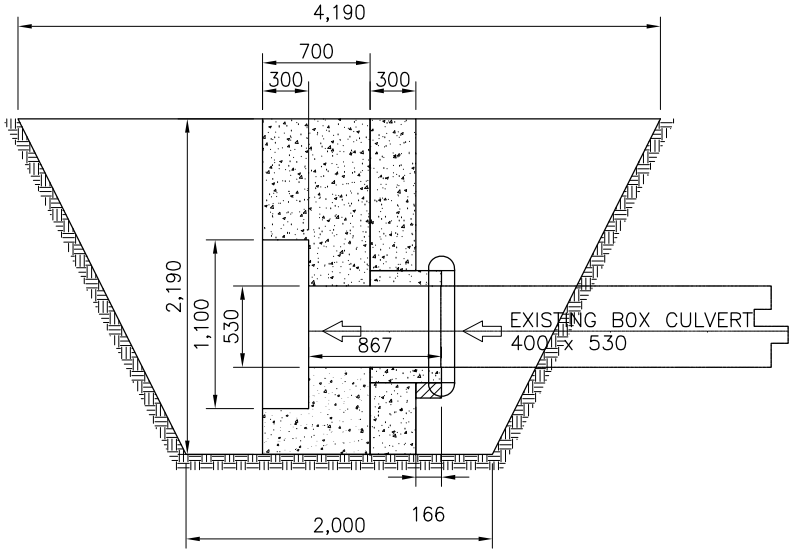
Manhole No.: MR 36.21

Location: 5 + 327

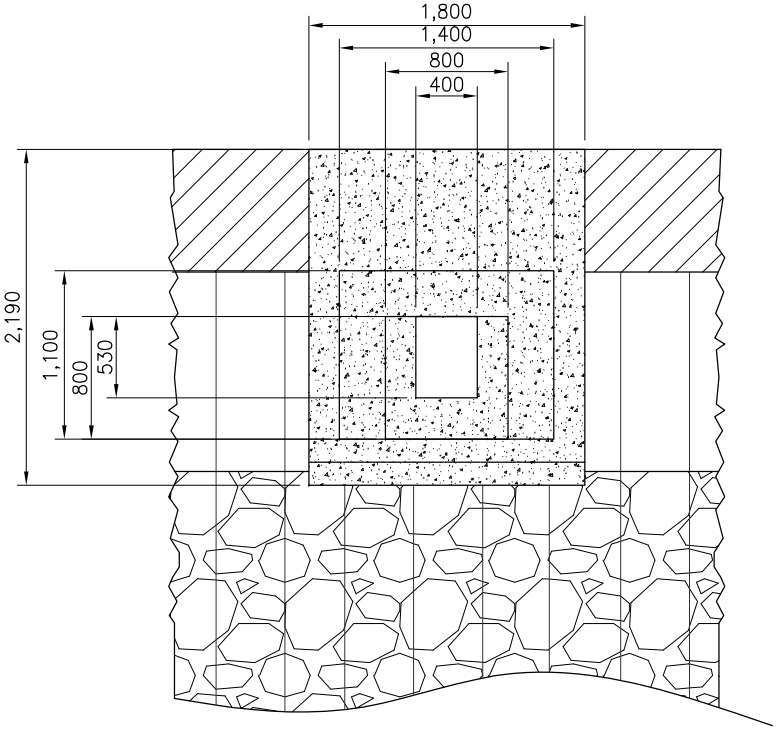
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.78	2.90	19.62 **19.62**	m^3
2. Conc. Mouth	Wout=1.80 Lout=2.19 Win=1.40 Lin=1.10 DiaD=0.40	Ain=3.94 Aout=1.54 Apipe=.21	1 0.3 0.7	3.94 0.46 0.15 **3.08**	m3
3. Outlet Pipe (Box Culvert)	Wout=0.80 Lout=.80 Win=0.40 Lin=.53 DiaD=0.10	Ain=0.64 Aout=0.21 Apipe=.01 Anet=0.42	0.15	**0.06**	m3
4. Concrete Collar	D1=.730m D2=.910m	A1=0.42 A2=0.65 Anet=0.23	0.17 Qty=1	0.04	m3
5. Conc. Bedding (Outlet Pipe)	Dia=.600m	L=0.17		**0.00996**	m3
6. Backfill				**16.35**	m3



4 PLAN
SCALE C



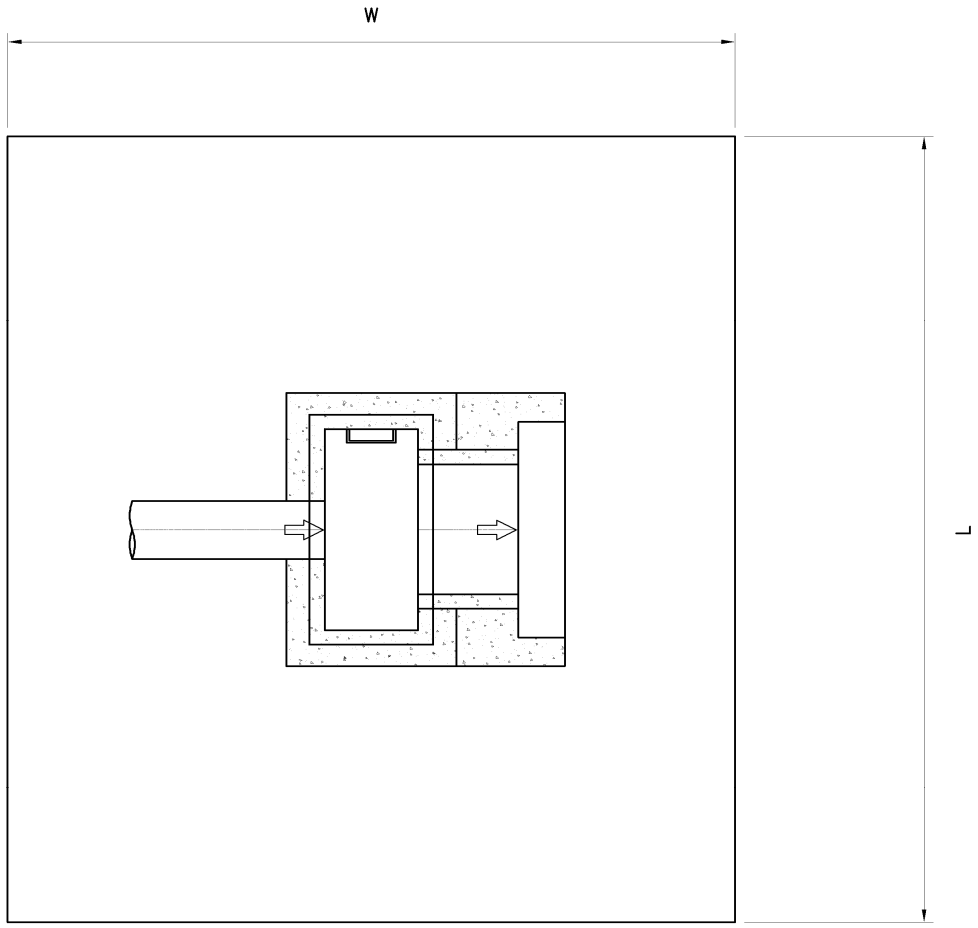
6 SECTION
SCALE C



5 ELEVATION
SCALE C

Clearing (Manhole 36.21)

W	4.19 m	**A=16.72**	m^2
L	3.99 m		

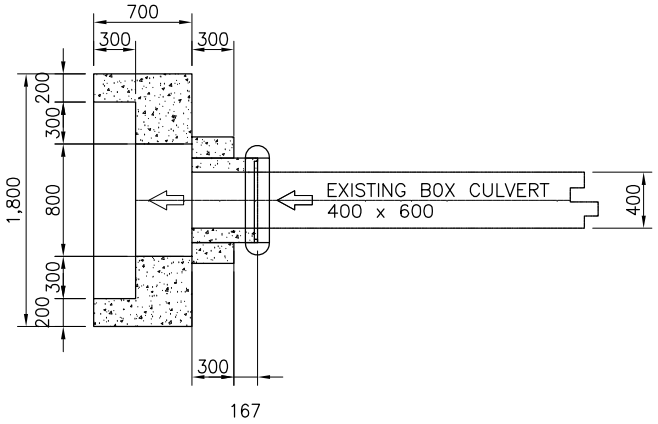


QUANTITIES OF MANHOLE

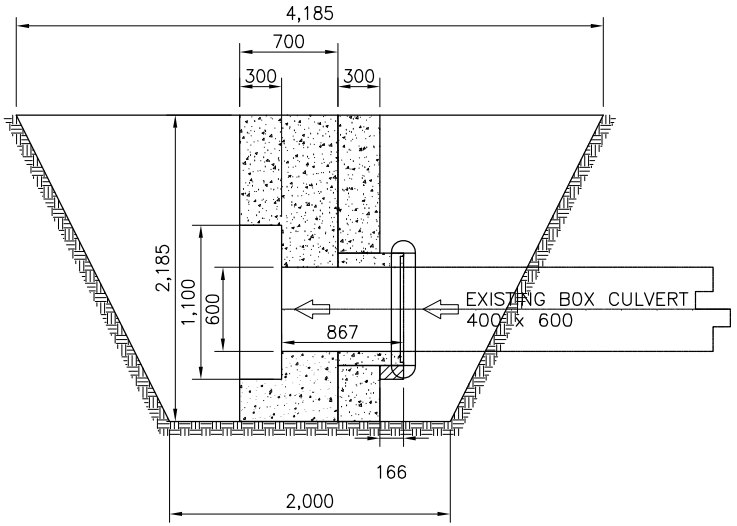
Manhole No.: MR 36.23

Location: 5 + 350

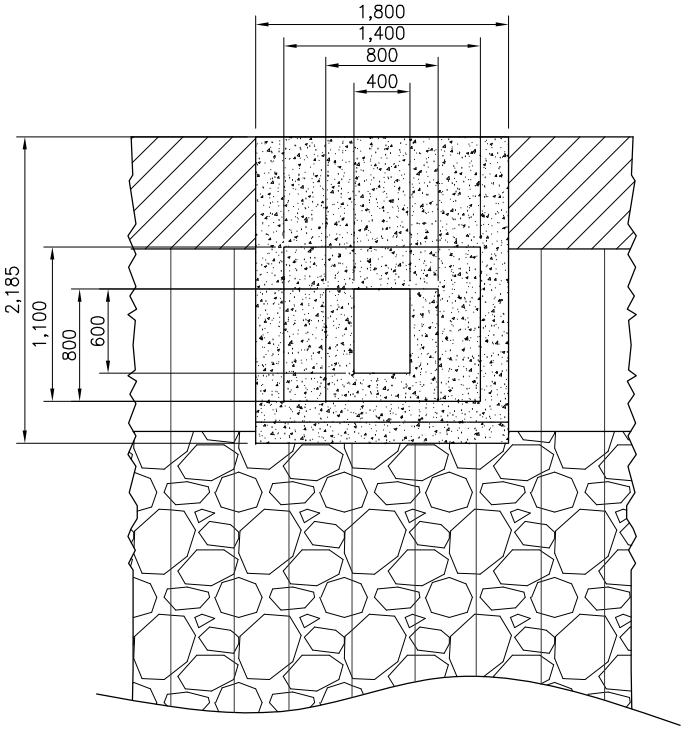
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.76	2.89	19.54	
				19.54	m^3
2. Conc. Mouth	Wout=1.80 Lout=2.19	Ain=3.93	1	3.93	
	Win=1.40 Lin=1.10	Aout=1.54	0.3	0.46	
	DiaD=0.40	Apipe=.24	0.7	0.17	
				3.05	m3
3. Outlet Pipe (Box Culvert)	Wout=0.80 Lout=.80 Win=0.40 Lin=.60 DiaD=0.00	Ain=0.64 Aout=0.24 Apipe=.00 Anet=0.40	0.15	**0.06**	m3
4. Concrete Collar	D1=.800m D2=.980m	A1=0.50 A2=0.75 Anet=0.25	0.17 Qty=1	0.04	m3
5. Conc. Bedding (Outlet Pipe)	Dia=.600m	L=0.17		0.00996	m3
6. Backfill				**16.29**	m3



2 PLAN
SCALE B



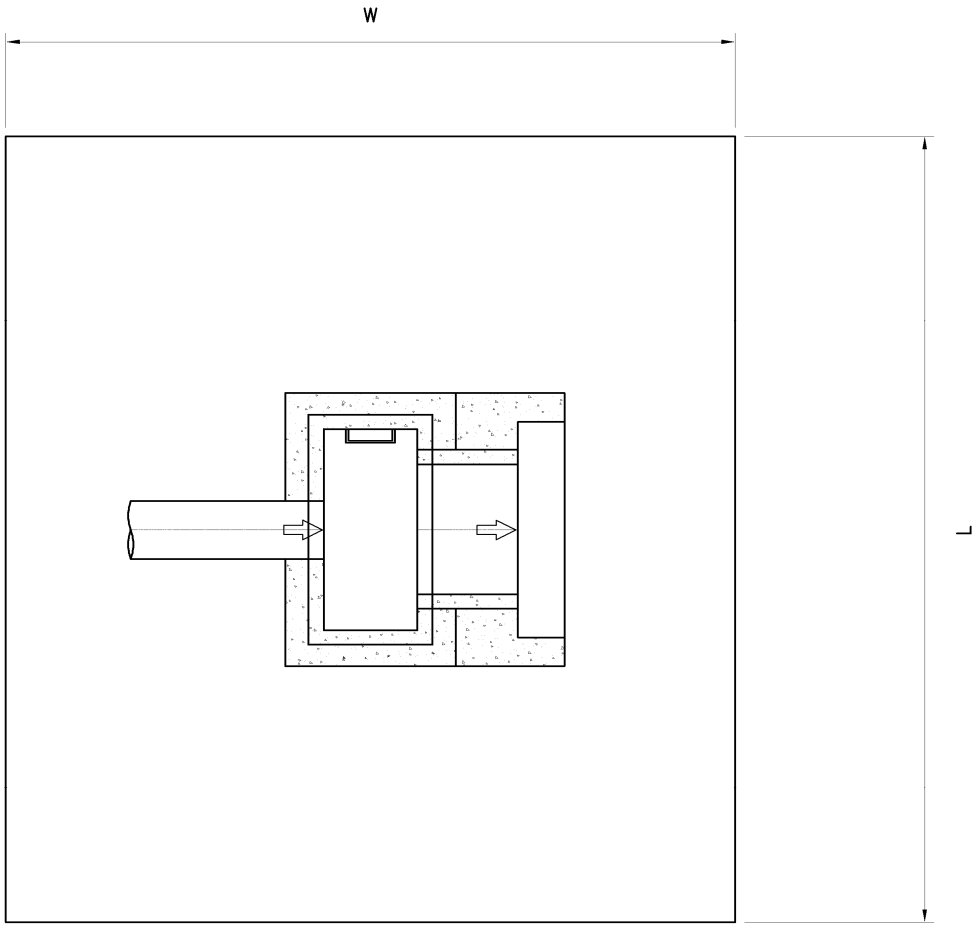
3 SECTION
SCALE B



4 ELEVATION
SCALE B

Clearing (Manhole 36.21)

W	4.185 m	**A=16.68**	m^2
L	3.985 m		

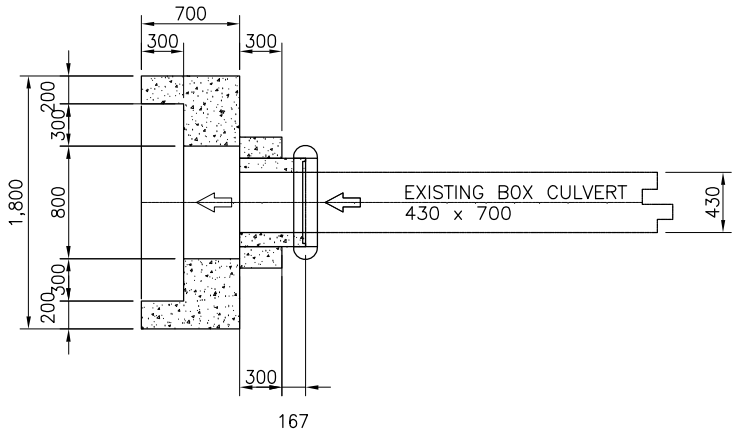


QUANTITIES OF MANHOLE

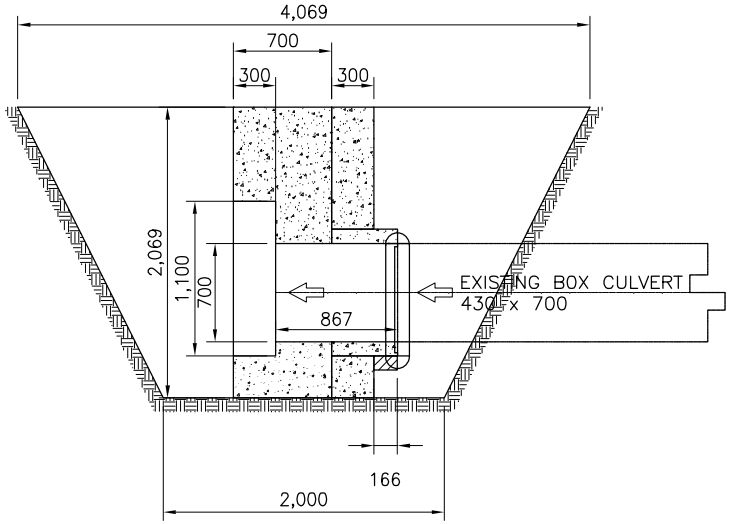
Manhole No.: MR 36.24

Location: 5 + 352

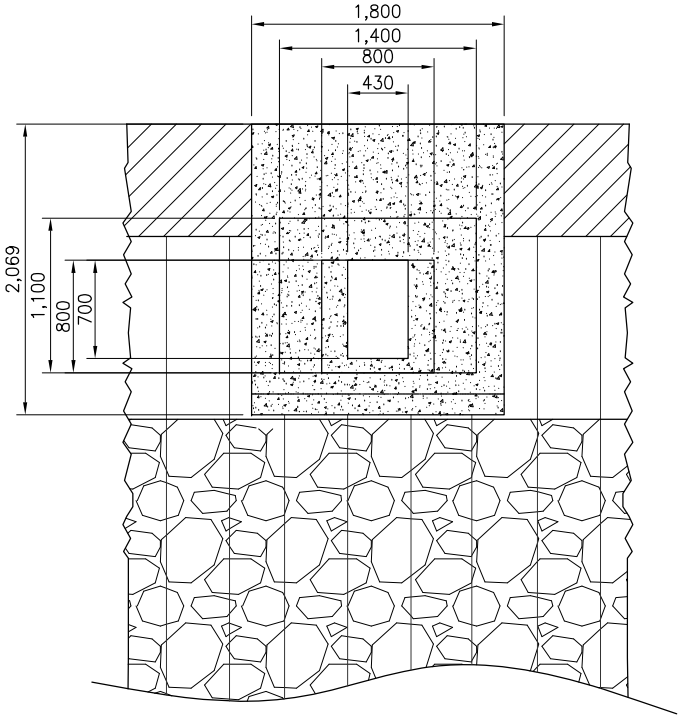
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=6.28	2.83	17.80 **17.80**	 m^3
2. Conc. Mouth	Wout=1.80 Lout=2.07 Win=1.40 Lin=1.10 DiaD=0.43	Ain=3.72 Aout=1.54 Apipe=.30	1 0.3 0.7	3.72 0.46 0.21 **2.80**	 m3
3. Outlet Pipe (Box Culvert)	Wout=0.80 Lout=.80 Win=0.43 Lin=.70 DiaD=0.00	Ain=0.64 Aout=0.30 Apipe=.00 Anet=0.34	 0.15	 **0.05**	 m3
4. Concrete Collar	D1=.900m D2=1.080m	A1=0.64 A2=0.92 Anet=0.28	0.17 Qty=1	**0.05**	m3
5. Conc. Bedding (Outlet Pipe)	Dia=.630m	L=0.17		0.010458	m3
6. Backfill				**14.83**	m3



2 PLAN
– – SCALE B



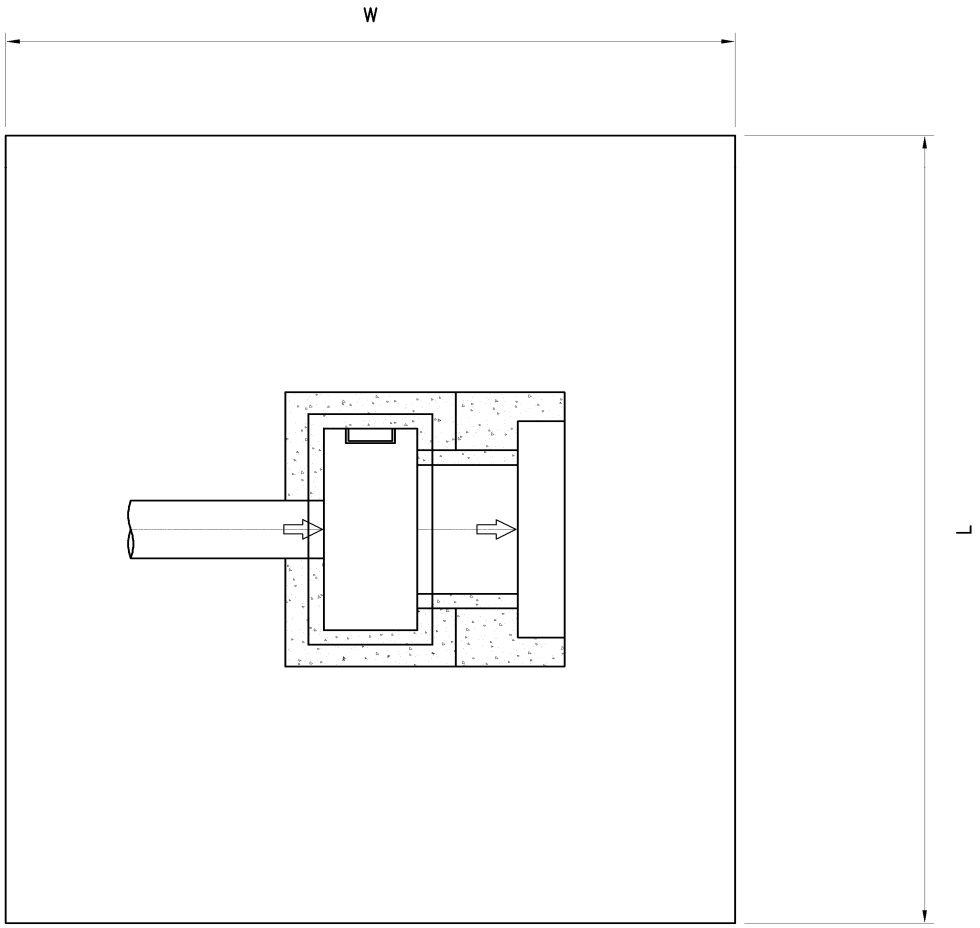
3 SECTION
– – SCALE B



4 ELEVATION
– – SCALE B

Clearing (Manhole 36.24)

W	4.069 m	**A=15.74**	m^2
L	3.869 m		

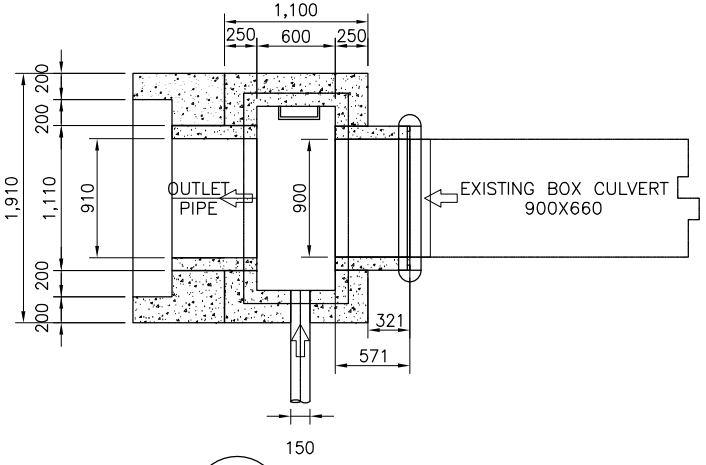


QUANTITIES OF MANHOLE

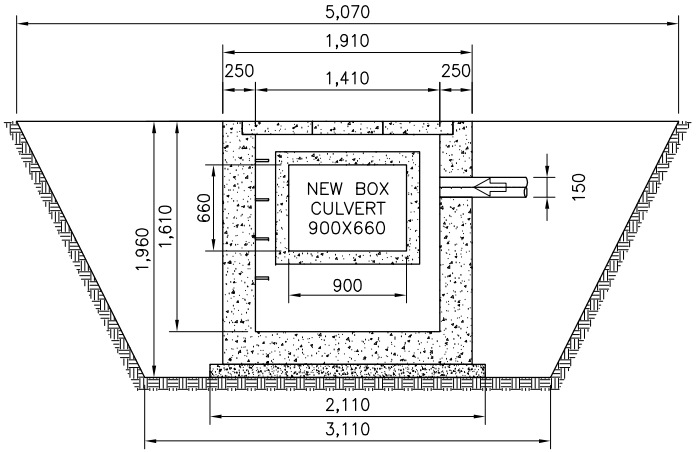
Manhole No.: MR 36.3

Location: 5 + 061

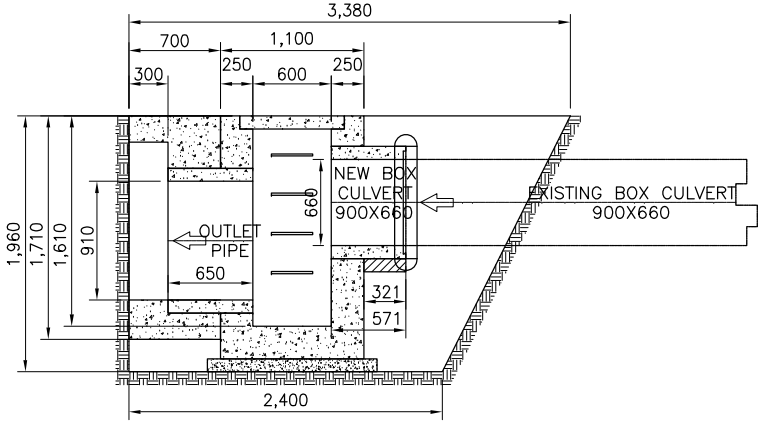
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=5.66	4.09	23.17	
				23.17	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91 Win=0.60 Lin=1.41	Aout=2.10 Ain=0.85 Anet=1.26	1.610	2.021	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
D=0.66	W=0.90	0.59	0.25	0.15	
Pipe hole on Wall C	DiaC=0.15	0.02	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.63**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.51	Aout=2.28	0.3	0.68	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.22	m3
9. Outlet Pipe	Dia=.910m	L=0.65		**1**	pc
10. New Pipe	Wout=1.10 Lout=.86	Ain=0.95			
	Win=0.90 Lin=.66	Aout=0.59 Anet=0.35	0.571	**0.20**	m3
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31 Anet=0.34	Qty=0	**0**	m3
	D1=.860m	A1=0.58	0.17		
(New Pipe)	D2=1.040m	A2=0.85 Anet=0.27	Qty=1	**0.045663049**	m3
12. Conc. Bedding	Dia=.910m	L=0.00		**0**	m3
(Outlet Pipe)					
(New Pipe)	Dia=1.100m	L=0.32		**0.04**	m3
13. Backfill				**19.31**	m3



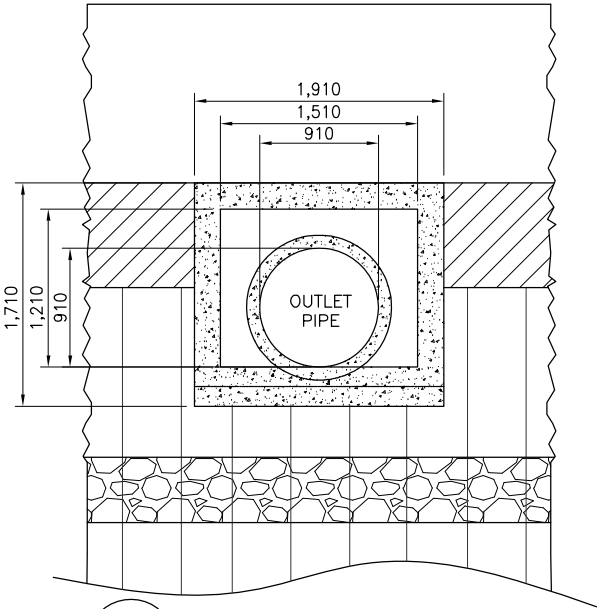
1 PLAN
SCALE A



3 SECTION (MH36.3)
SCALE A



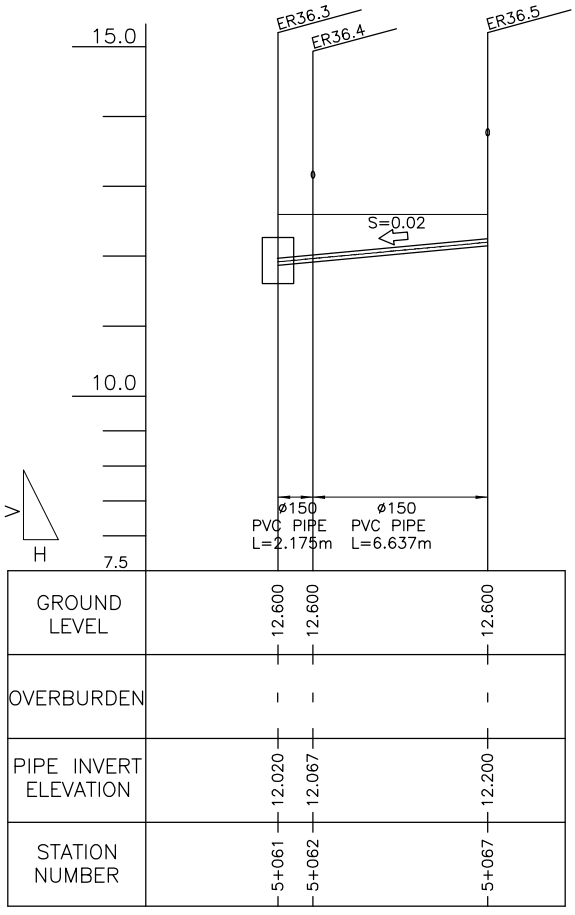
2 SECTION
SCALE A



4 ELEVATION
SCALE A

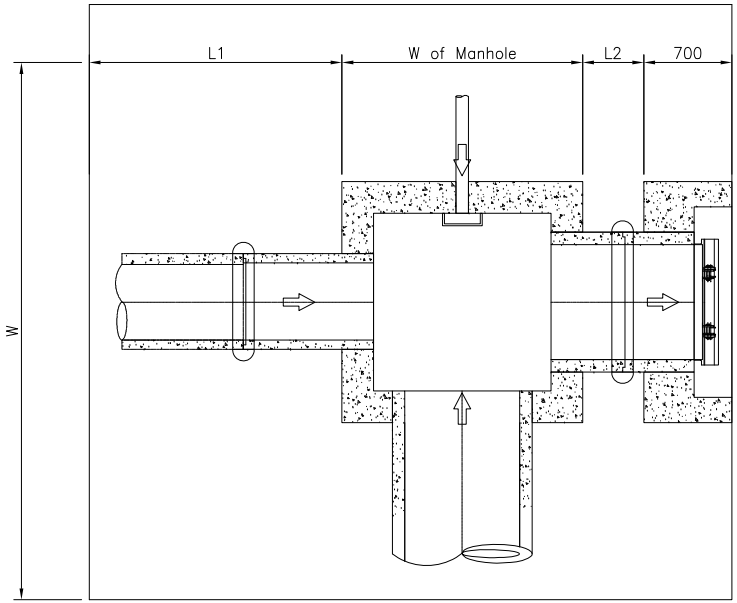
QUANTITIES

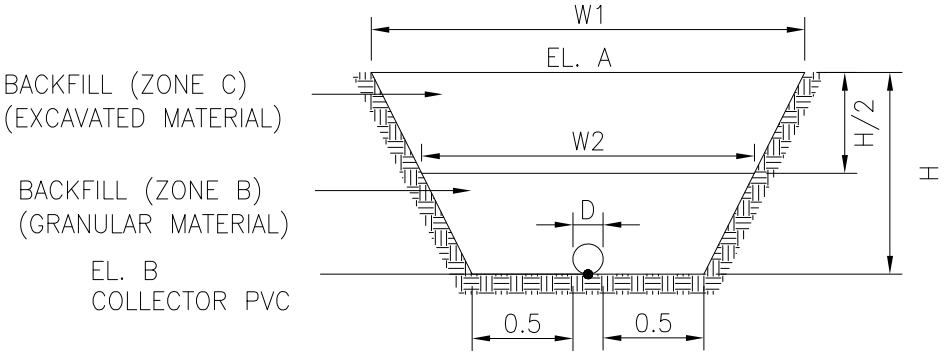
Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.15		L=8.99	2	pc
2. PVC coupling	Dia=0.15			1	pc

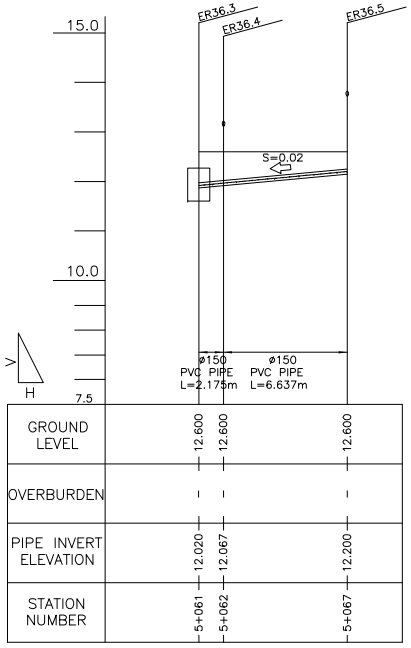


Clearing (Manhole 36.3)			
L1	1.58	m	
W of Manhole	1.1	m	**A=17.14** m^2
L2	0	m	
W	5.07	m	
Clearing (Collector 36.5 - 36.3)			
W	1.64	m	**A=14.45** m^2
L	8.812	m	
(Collector PVC) Downstream	36.5-36.3		
D	0.15	m	Excavation
W1	1.73	m	A=0.84 m^2
W2	1.44	m	Backfill Zone B
H	0.58	m	A=0.36 m^2
H/2	0.29	m	Backfill Zone C
EL. A	12.6	m	A=0.46 m^2
EL. B	12.02	m	
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	1.55	m	A=0.54 m^2
W2	1.35	m	Backfill Zone B
H	0.4	m	A=0.23 m^2
H/2	0.2	m	Backfill Zone C
EL. A	12.6	m	A=0.29 m^2
EL. B	12.2	m	

Collector PVC 133C.6-134	Volume	
Excavation	**6.180314**	m^3
Backfill Zone B	**2.652461**	m^3
Backfill Zone C	**3.369017**	m^3


L1
W of Manhole
L2
700
W


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

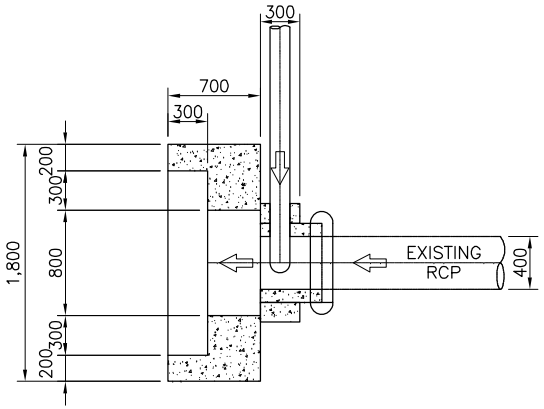

15.0
10.0
7.5
V
H
FR36.3
FR36.4
FR36.5
S=0.02
ø150
PVC PIPE
L=2.175m
ø150
PVC PIPE
L=6.637m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
12.600
12.600
12.600
-
-
-
12.020
12.067
12.200
5+061
5+062
5+067

QUANTITIES OF MANHOLE

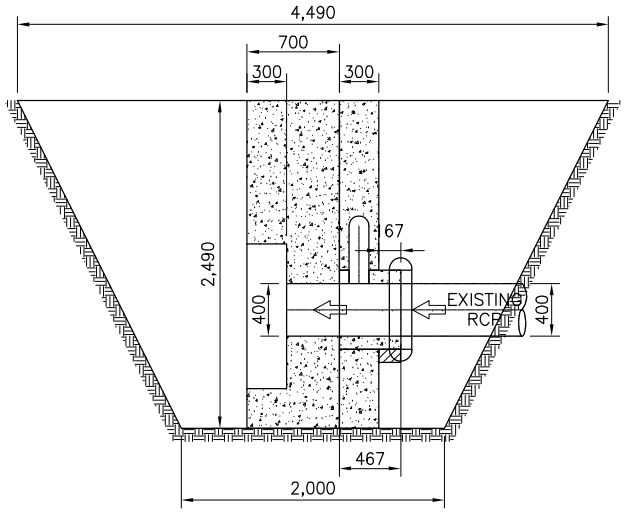
Manhole No.: MR 36.9

Location: 5 + 150

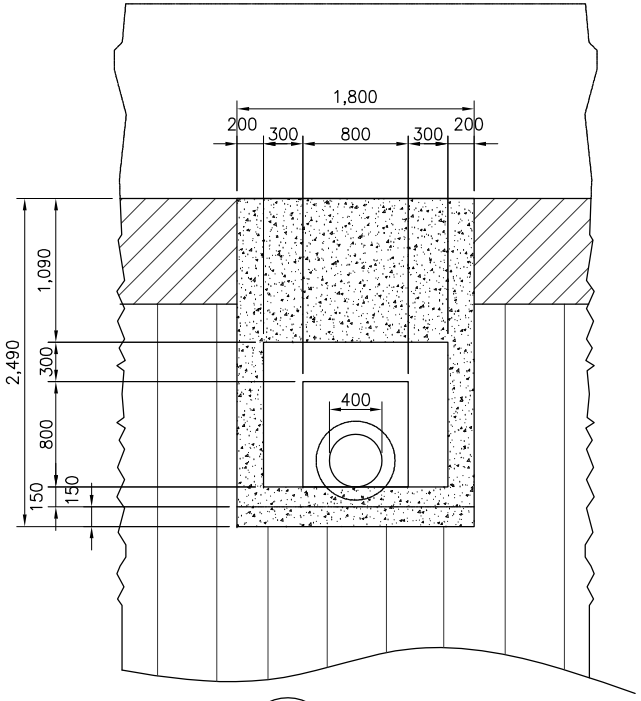
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=8.08	3.05	24.60	
				24.60	m^3
2. Conc. Mouth	Wout=1.80 Lout=2.49	Ain=4.48	1	4.48	
	Win=1.40 Lin=1.10	Aout=1.54	0.3	0.46	
	DiaD=0.59	Apipe=.27	0.3	0.08	
				3.68	m3
3. Outlet Pipe	Dia=.460m	L=0.47		1	pc
4. Conc. Collar	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=1	0.032492864	m3
5. Conc. Bedding (Outlet Pipe)	Dia=.590m	L=0.17		0.009853	m3
6. Backfill				**20.50**	m3



1 PLAN
SCALE A



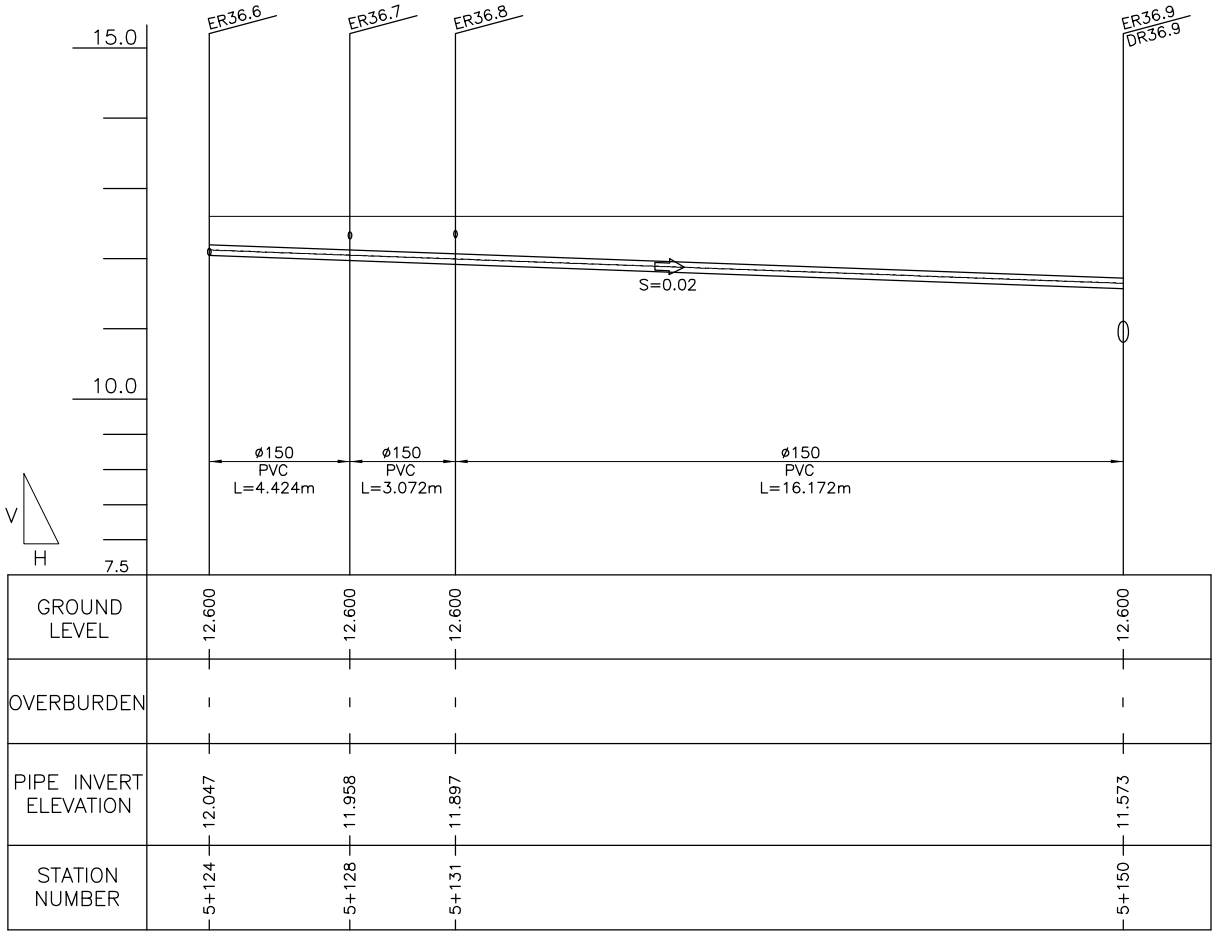
2 PLAN
SCALE A



3 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.15		L=24.14	5	pc
2. PVC coupling	Dia=0.15			4	pc



Clearing (Manhole 36.9)

W	4.49	m	
L	4.29	m	**A=19.26** m^2

Clearing (Collector 36.6 - 36.9)

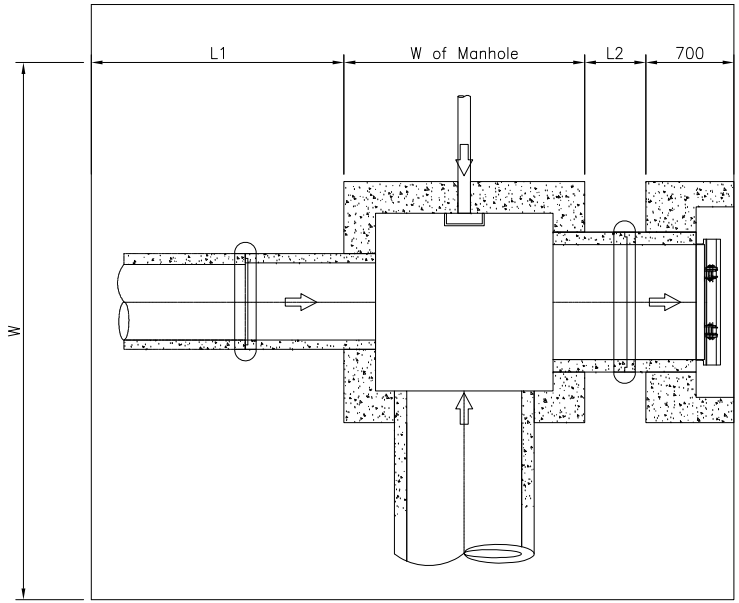
W	1.94	m	
L	23.668	m	**A=45.92** m^2

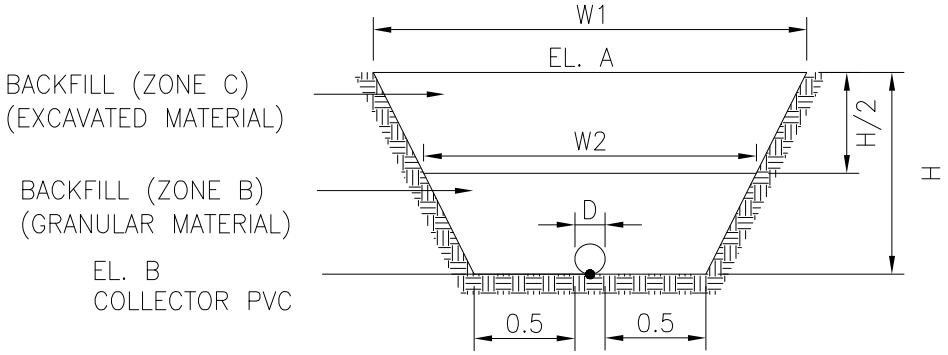
(Collector PVC) Downstream	36.6-36.9		
D	0.15	m	Excavation
W1	2.18	m	A=1.71 m^2
W2	1.66	m	Backfill Zone B
H	1.027	m	A=0.70 m^2
H/2	0.5135	m	Backfill Zone C
EL. A	12.6	m	A=0.99 m^2
EL. B	11.573	m	

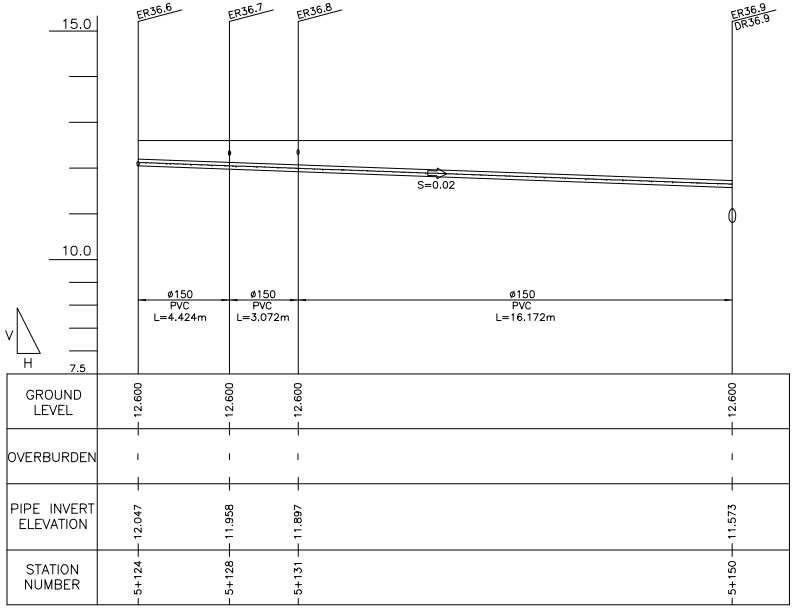
(Collector PVC) Upstream

D	0.15	m	Excavation
W1	1.70	m	A=0.79 m^2
W2	1.43	m	Backfill Zone B
H	0.553	m	A=0.34 m^2
H/2	0.2765	m	Backfill Zone C
EL. A	12.6	m	A=0.43 m^2
EL. B	12.047	m	

Collector PVC 36.6 - 36.9	Volume	
Excavation	**30.14373**	m^3
Backfill Zone B	**12.59243**	m^3
Backfill Zone C	**17.12469**	m^3


L1
W of Manhole
L2
700
W


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

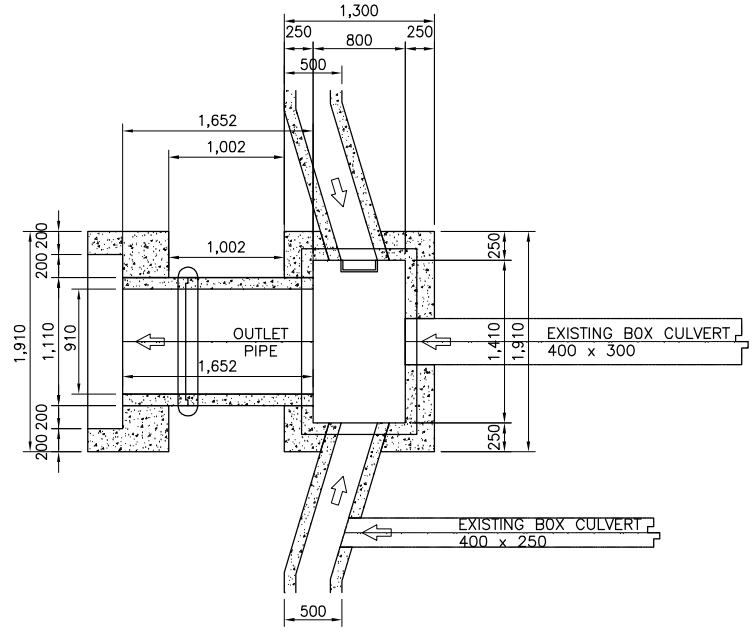

15.0
10.0
7.5
V
H
ER36.6
ER36.7
ER36.8
ER36.9
DR36.9
S=0.02
ø150 PVC L=4.424m
ø150 PVC L=3.072m
ø150 PVC L=16.172m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
12.600
12.600
12.600
12.600
12.047
11.958
11.897
11.573
5+124
5+128
5+131
5+150

QUANTITIES OF MANHOLE

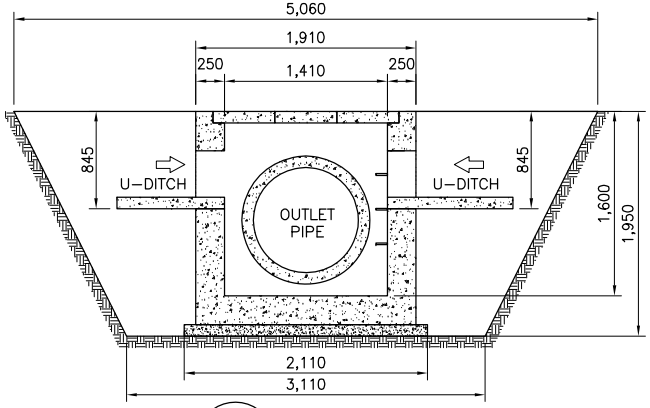
Manhole No.: MR 37.4

Location: 5 + 562

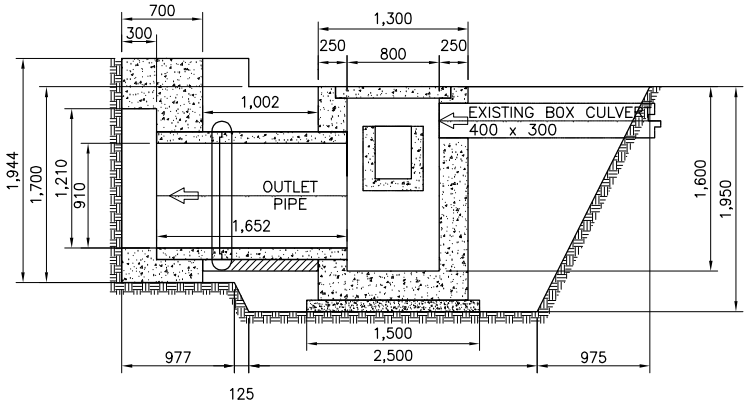
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=1.90	4.09	7.76	
		A2=0.26	4.09	1.06	
		A3=5.83	4.09	23.80	
				32.61	m^3
2. Lev. Concrete	W=1.50 L=2.11	3.17	0.1	**0.32**	m^3
3. Bottom Slab	W=1.30 L=1.91	2.48	0.25	**0.62**	m^3
4. Wall					
Entire Wall	Wout=1.30	Aout=2.48			
	Lout=1.91				
	Win=0.80	Ain=1.13	1.600	2.168	m^3
	Lin=1.41				
		Anet=1.36			
Minus					
D=0.85	W=0.50	0.42	0.25	0.11	
D=0.30	W=0.40	0.12	0.25	0.03	
D=0.85	W=0.50	0.42	0.25	0.11	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**1.68**	m^3
5. Conc. Cover	L=1.61 W=1.00	1.61	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				0	pc
8. Conc. Mouth	Wout=1.91	Ain=3.71	0.7	2.60	
	Lout=1.94				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.66	m3
9. Outlet Pipe	Dia=.910m	L=1.65		2	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		0.06	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.00		0.11	m3
12. Backfill				**27.18**	m3



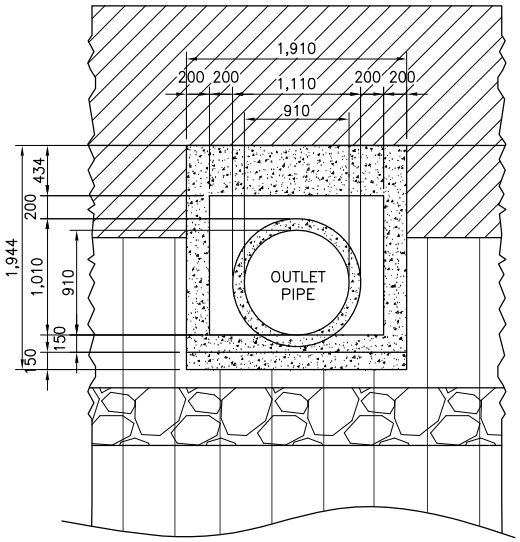
4 PLAN
SCALE C



6 SECTION
SCALE C



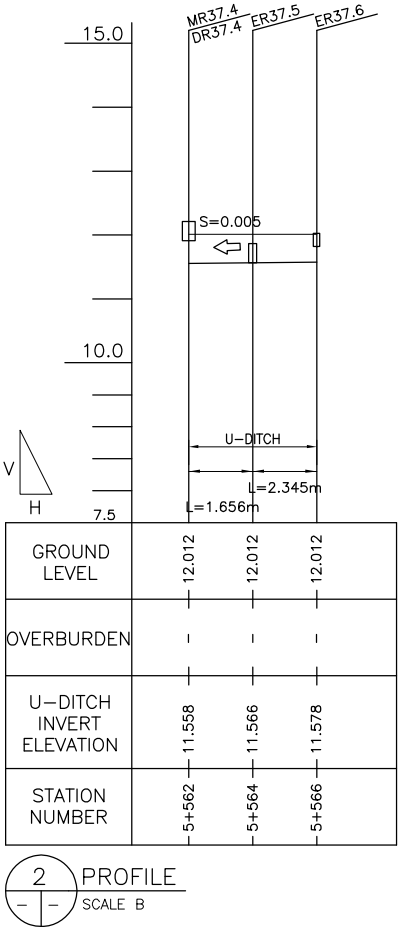
5 SECTION
SCALE C



7 ELEVATION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. U - Ditch					
Bottom	W=.500m L=.100m	0.05	4.02	**0.20**	m^3
Wall	W=.544m L=4.001m	4.35	0.10	**0.44**	m^3
Top	W=.500m L=.100m	0.05	4.00	**0.20**	m^3
Conc. Bedding	W=.500m L=.100m	0.05	4.02	0.20	m^3
2. Formworks				7.26	m3



Clearing (Manhole 37.4)

L1	1.575	m	
W of Manhole	1.3	m	**A=26.87** m^2
L2	1.002	m	
W	5.87	m	

Clearing (U - Ditch 37.6 - 37.4)

W	2.194	m	**A=8.78** m^2
L	4.001	m	

(U - Ditch) Downsteram 37.6 - 37.4

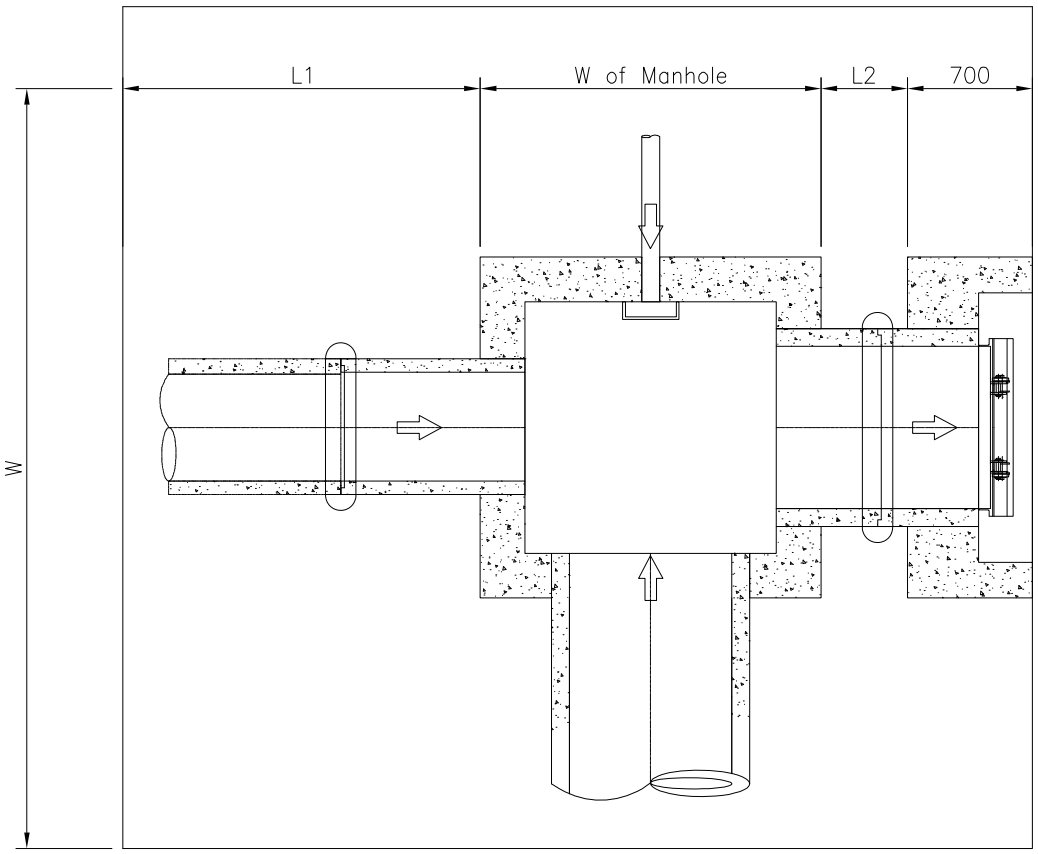
d	0.454	m	Excavation
D	0.604	m	A=1.15 m^2
D/2	0.302	m	Backfill Zone B
W1	2.204	m	A=0.37 m^2
W2	1.902	m	Backfill Zone C
EL. A	12.012	m	A=0.47 m^2
EL. B	11.558	m	

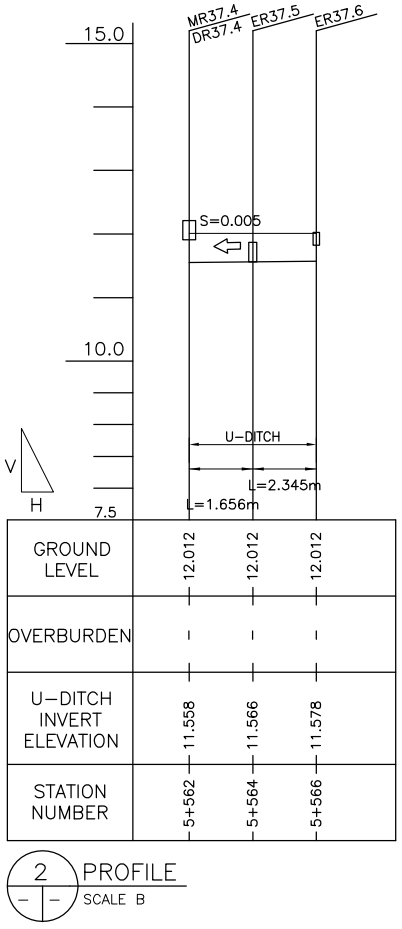
(U - Ditch) Upstream

d	0.434	m	Excavation
D	0.584	m	A=1.10 m^2
D/2	0.292	m	Backfill Zone B
W1	2.184	m	A=0.36 m^2
W2	1.892	m	Backfill Zone C
EL. A	12.012	m	A=0.45 m^2
EL. B	11.578	m	

U - Ditch 37.6 - 37.4

Excavation	**4.531142**	m^3
Backfill Zone B	**1.470952**	m^3
Backfill Zone C	**1.845846**	m^3





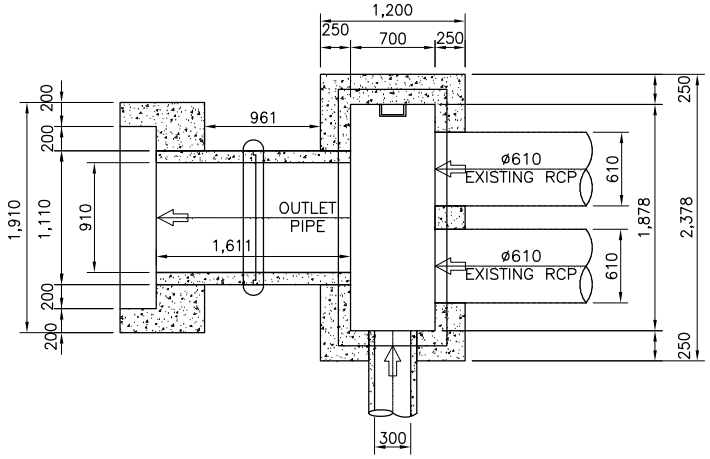
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

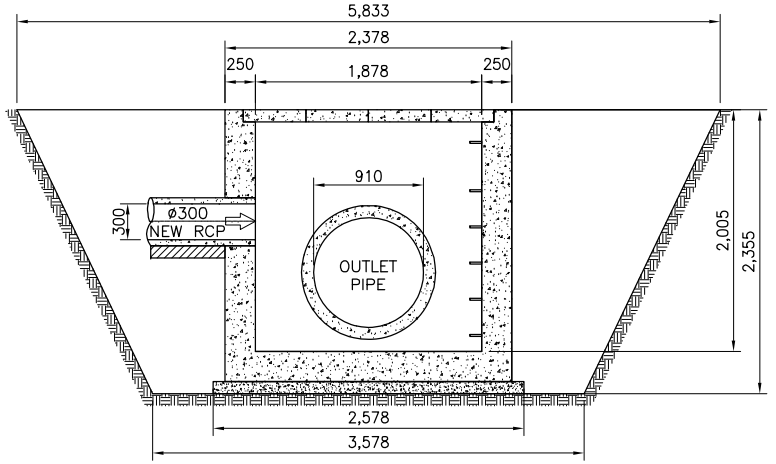
Manhole No.: MR 40

Location: 6 + 342

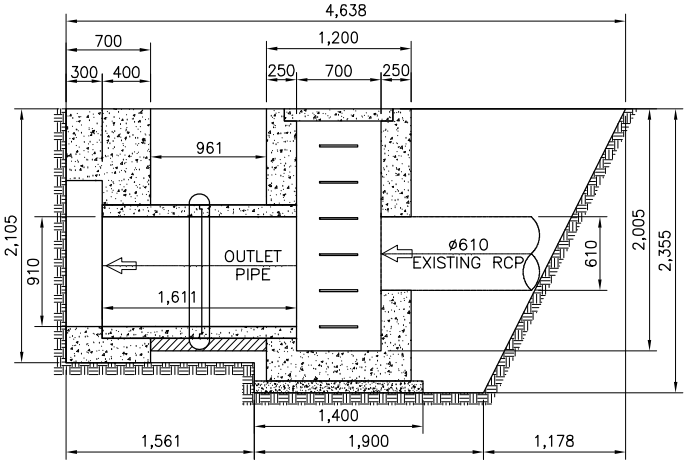
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=9.15	4.76	43.50	
				43.50	m^3
2. Lev. Concrete	W=1.40 L=2.58	3.61	0.1	**0.36**	m^3
3. Bottom Slab	W=1.20 L=2.38	2.85	0.25	**0.71**	m^3
4. Wall					
Entire Wall	Wout=1.20 Lout=2.38	Aout=2.85			
	Win=0.70 Lin=1.88	Ain=1.31	2.005	3.086	m^3
		Anet=1.54			
Minus					
Pipe hole on Wall A	DiaA=0.40	0.13	0.25	0.03	
Pipe hole on Wall B	DiaB=0.76	0.91	0.25	0.23	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.59**	m^3
5. Conc. Cover	L=2.13 W=0.90	1.9152	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.11	Ain=4.02	0.7	2.81	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.88	m3
9. Outlet Pipe	Dia=.910m	L=1.31		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.66		**0.073482**	m3
12. Backfill				**36.25**	m3



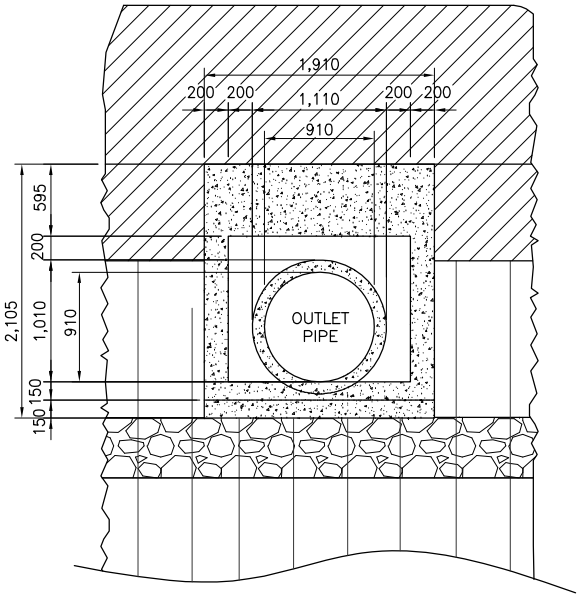
1 PLAN
SCALE B



3 SECTION(MR40)
SCALE A



2 SECTION
SCALE A



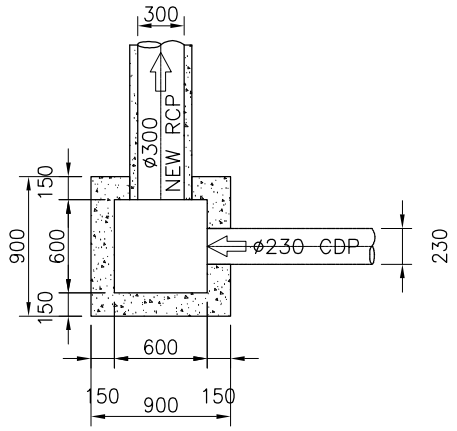
5 ELEVATION
SCALE B

QUANTITIES OF JUNCTION BOX

Junction Box No.: JR 41.1

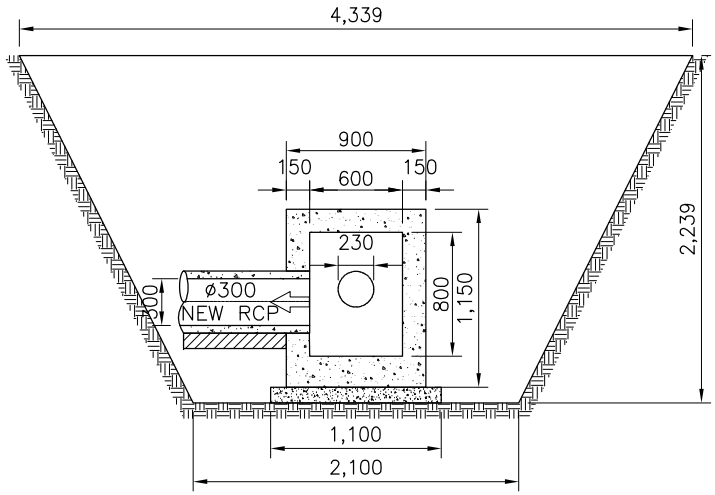
Location: 6 + 359

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.01	2.86	20.02	
				20.02	m^3
2. Lev. Concrete	W=1.10 L=1.10	1.21	0.1	**0.12**	m^3
3. Bottom Slab	W=0.90 L=0.90	0.81	0.15	**0.12**	m^3
4. Wall					
Entire Wall	Wout=0.90	Aout=0.81			
	Lout=.90				
	Win=0.60	Ain=0.36	0.550	0.248	m^3
	Lin=.60				
	0.8	Anet=0.45			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall A	DiaB=0.33	0.09	0.15	0.02	
Pipe hole on Wall C	DiaC=0.40	0.13	0.15	0.03	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.19**	m^3
5. Top Slab	L=0.90 W=0.90	0.81	0.15	**0.12**	m^3
6. Backfill				**16.68**	m3

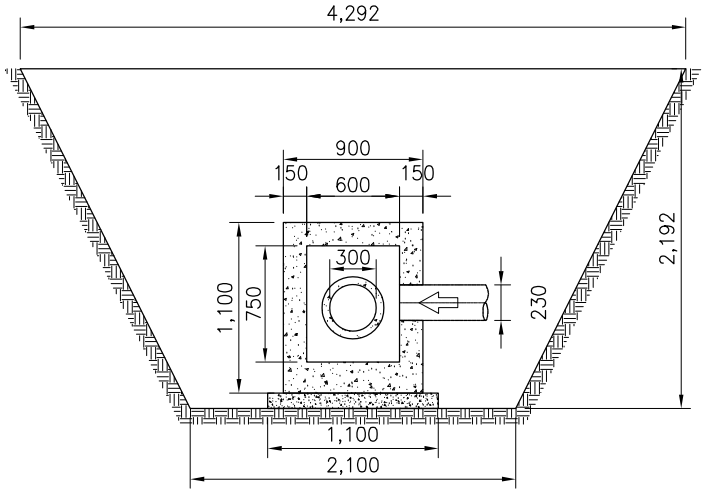


PARTIAL PLAN JUNCTION BOX
(JR 41.1)

1
SCALE C



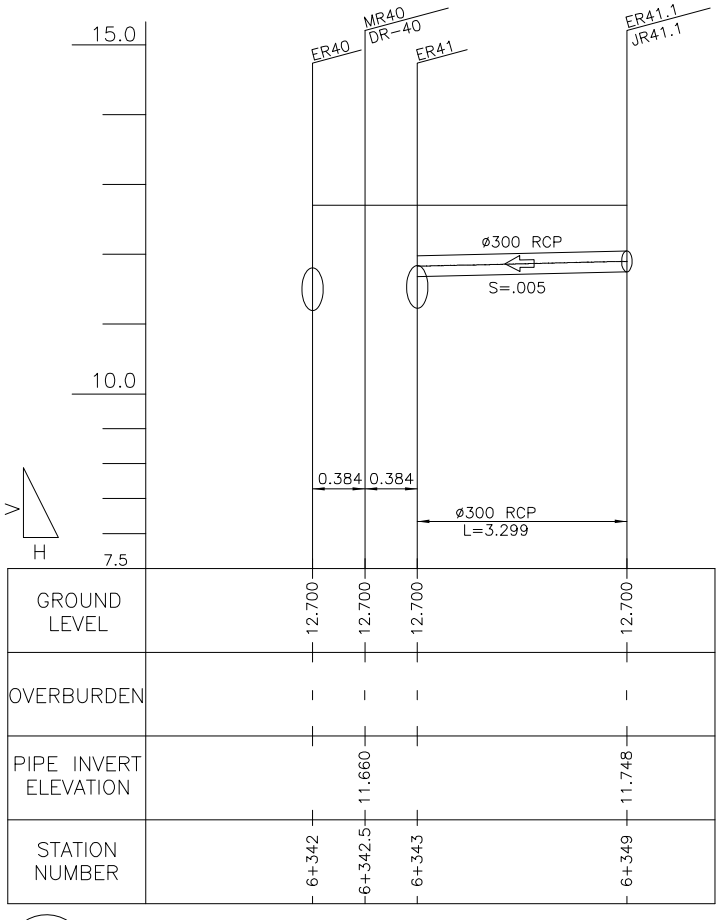
3 SECTION
SCALE C



2 SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.30		L=3.32	4	pc
2. Conc. Bedding	Dia=0.30	L=3.32	0.1	0.10	m^3
3. Conc. Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=3	0.07	m3
4. Formworks				1.19	m^3



2 PROFILE
SCALE B

Clearing (Manhole 40)

L1	1.7775	m	
W of Manhole	1.2	m	**A=27.52** m^2
L2	0.961	m	
W	5.933	m	

Clearing (Junction Manhole 41.1)

W	4.292	m	**A=18.42** m^2
L	4.292	m	

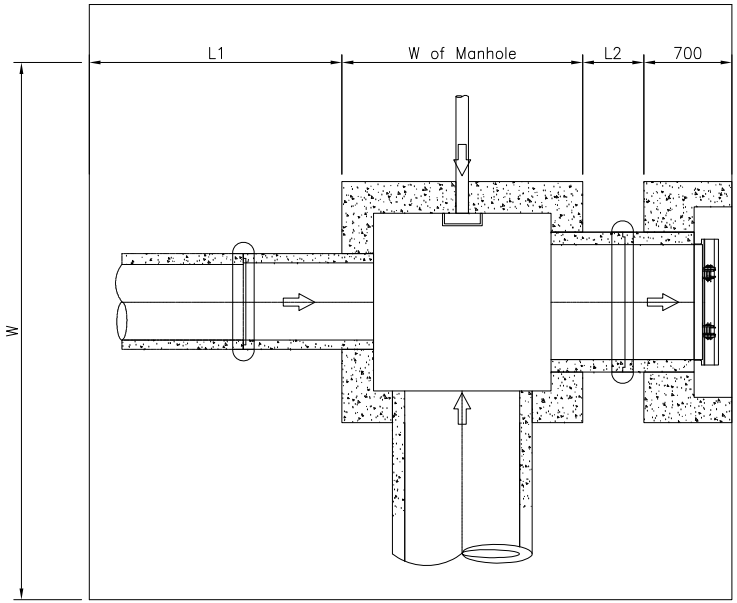
Clearing (Collector 41.1 - 41)

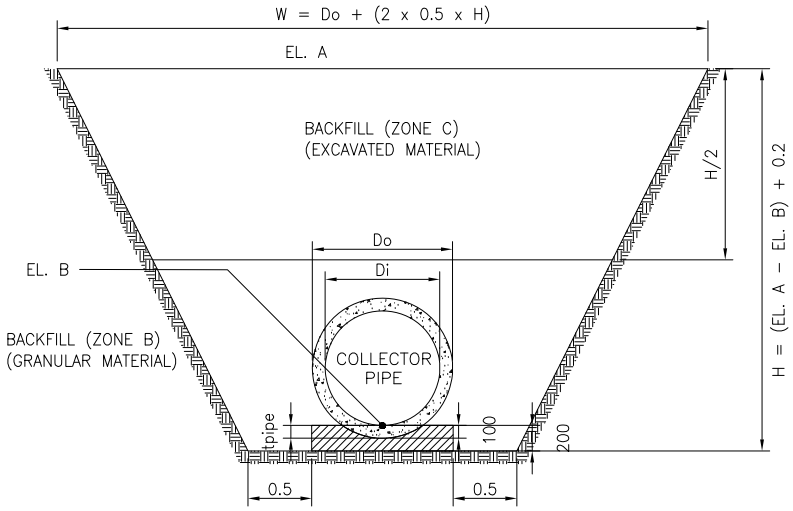
W	2.5605	m	**A=8.45** m^2
L	3.299	m	

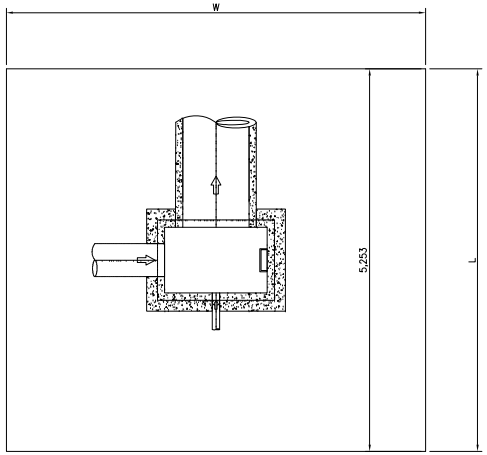
(Collector Pipe) Downstream	41.1 - 41		Excavation
Do	0.4	m	A=2.32 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=0.78 m^2
H	1.169	m	Backfill Zone C
EL. A	12.7	m	A=0.87 m^2
EL. B	11.731	m	
W	2.569	m	

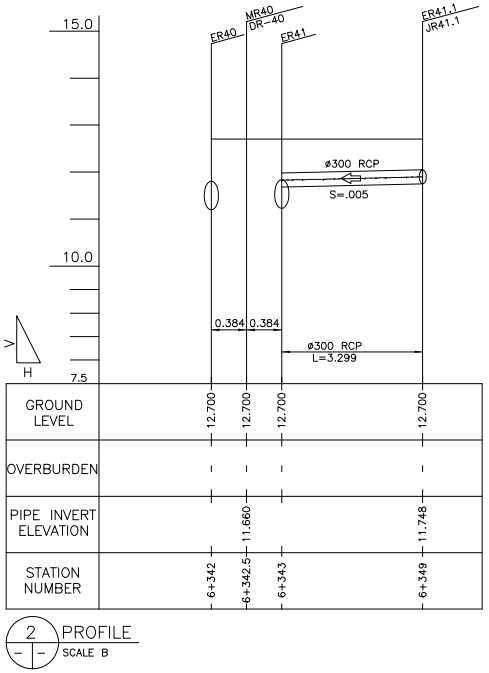
(Collector Pipe) Upstream			Excavation
Do	0.4	m	A=2.28 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=0.77 m^2
H	1.152	m	Backfill Zone C
EL. A	12.7	m	A=0.86 m^2
EL. B	11.748	m	
W	2.552	m	

Collector Pipe 41.1 - 41	Volume	
Excavation	**7.619393**	m^3
Backfill Zone B	**2.57**	m^3
Backfill Zone C	**2.87**	m^3









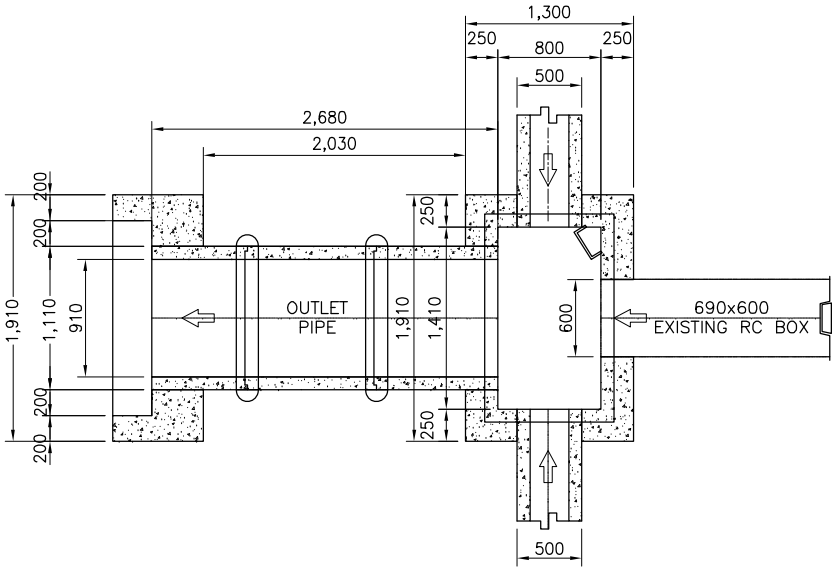
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

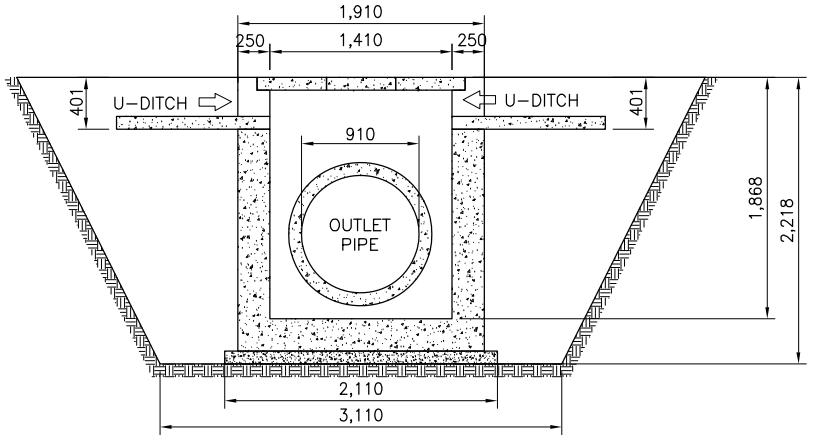
Manhole No.: MR 42

Location: 6 + 413

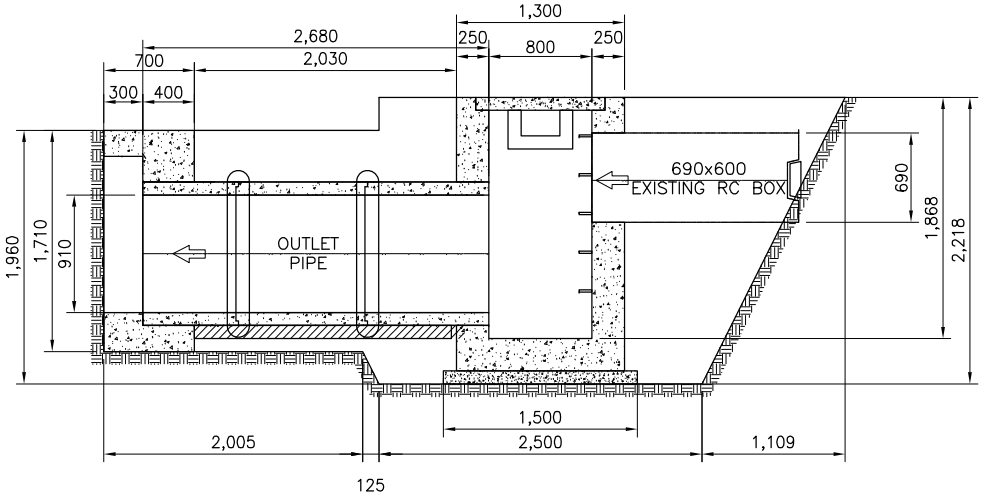
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.43	4.22	14.47	
		A2=0.23	4.22	0.97	
		A3=6.77	4.22	28.58	
				44.02	m^3
2. Lev. Concrete	W=1.50 L=2.11	3.17	0.1	**0.32**	m^3
3. Bottom Slab	W=1.30 L=1.91	2.48	0.25	**0.62**	m^3
4. Wall					
Entire Wall	Wout=1.30 Lout=1.91	Aout=2.48			
	Win=0.80 Lin=1.41	Ain=1.13	1.868	2.531	m^3
		Anet=1.36			
Minus					
D=0.41	W=0.50	0.21	0.25	0.05	
D=0.69	W=0.60	0.41	0.25	0.10	
D=0.41	W=0.50	0.21	0.25	0.05	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.08**	m^3
5. Conc. Cover	L=1.61 W=1.00	1.61	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.78		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=1.13		**0.12543**	m3
12. Backfill				**36.68**	m3



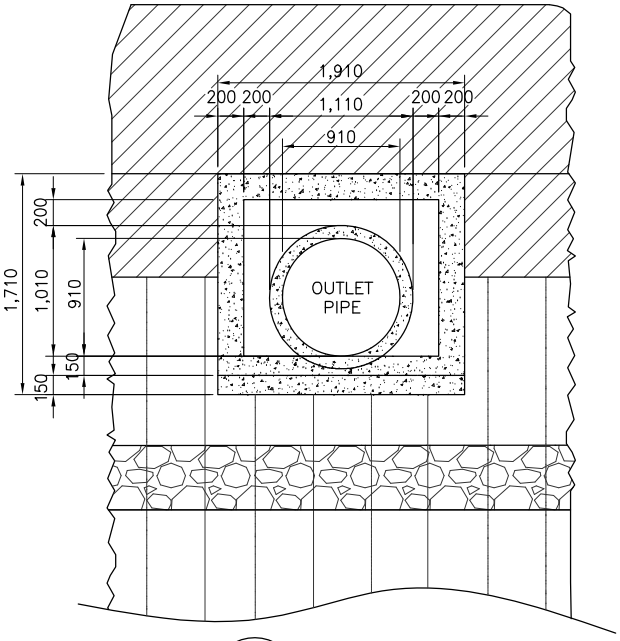
2 PLAN
SCALE B



4 SECTION (MH42)
SCALE B



3 SECTION
SCALE B



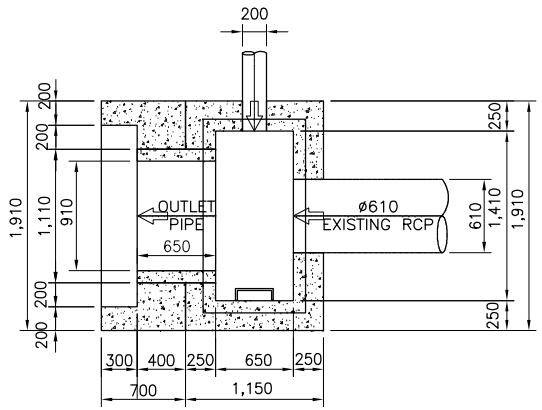
5 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

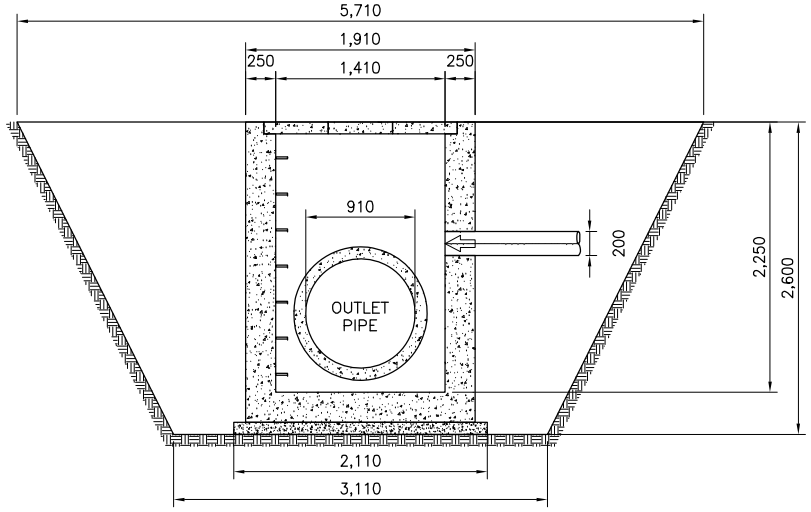
Manhole No.: MR 44

Location: 6 +455

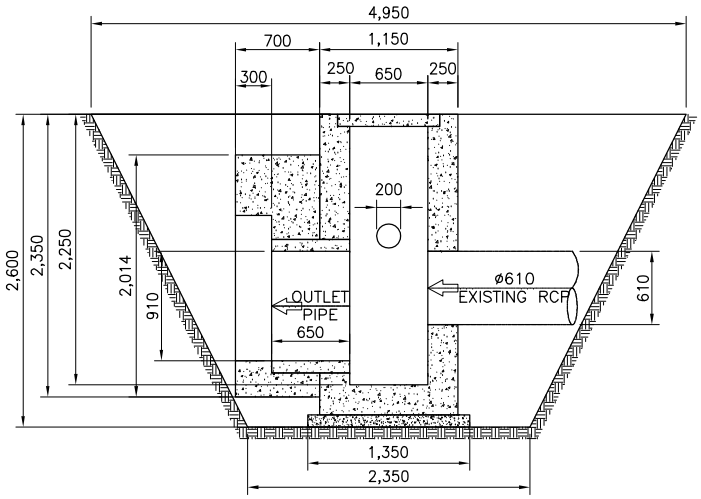
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=9.49	4.41	41.85	
				41.85	m^3
2. Lev. Concrete	W=1.35 L=2.11	2.85	0.1	**0.28**	m^3
3. Bottom Slab	W=1.15 L=1.91	2.20	0.25	**0.55**	m^3
4. Wall					
Entire Wall	Wout=1.15 Lout=1.91	Aout=2.20			
	Win=0.65 Lin=1.41	Ain=0.92	2.250	2.880	m^3
		Anet=1.28			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.03	0.25	0.01	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.52**	m^3
5. Conc. Cover	L=1.61 W=0.85	1.3685	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.01	Ain=3.85	0.7	2.69	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.76	m3
9. Outlet Pipe	Dia=.910m	L=0.65		**1**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=0	**0**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.910m	L=0.00		**0**	m3
12. Backfill				**34.88**	m3



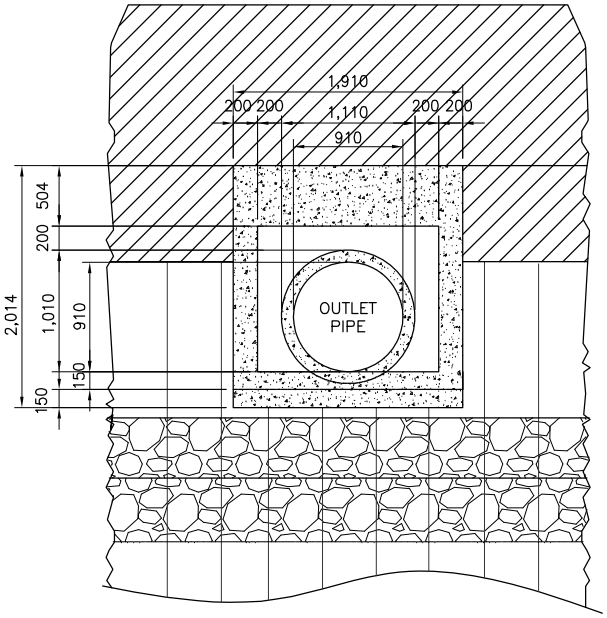
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



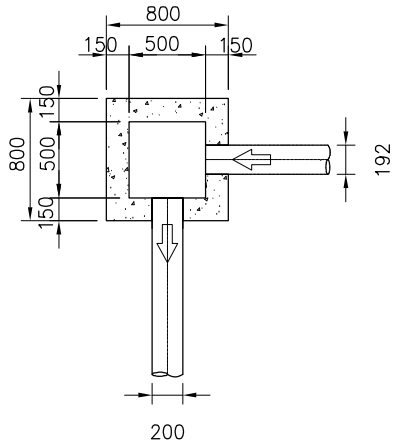
4 ELEVATION
SCALE A

QUANTITIES OF JUNCTION BOX

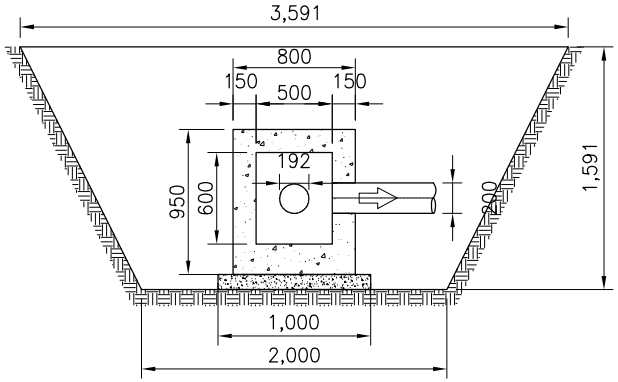
Junction Box No.: JB 43.3

Location: 6 + 453

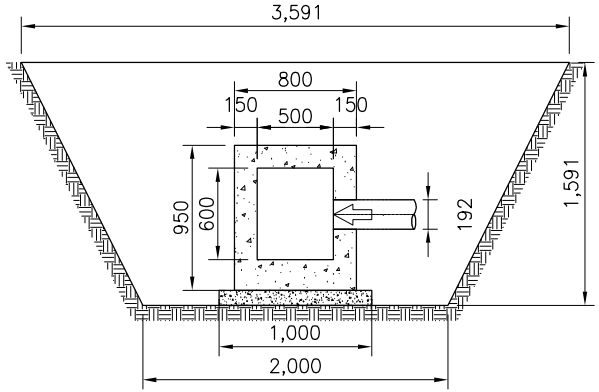
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=4.45	2.80	12.43 **12.43**	m^3
2. Lev. Concrete	W=1.00 L=1.00	1.00	0.1	**0.10**	m^3
3. Bottom Slab	W=0.80 L=0.80	0.64	0.2	**0.13**	m^3
4. Wall					
Entire Wall	Wout=0.80 Lout=.80 Win=0.50 Lin=.50	Aout=0.64 Ain=0.25 Anet=0.39	0.600	0.234	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.15	0.00	
Pipe hole on Wall A	DiaB=0.19	0.03	0.15	0.01	
Pipe hole on Wall C	DiaC=0.20	0.03	0.15	0.01	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.22**	m^3
5. Top Slab	L=0.80 W=0.80	0.64	0.15	**0.10**	m^3
6. Backfill				**10.36**	m3



1 — — PARTIAL PLAN JUNCTION BOX (JB 43.3)
SCALE C



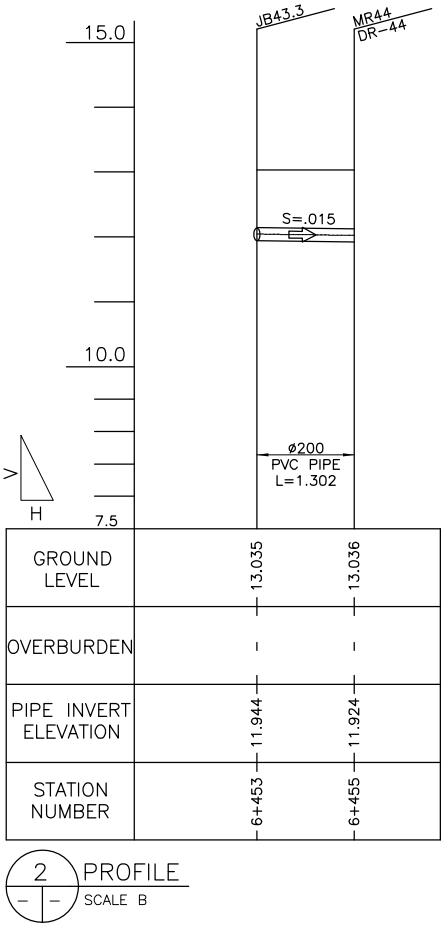
3 — — SECTION
SCALE C



2 — — SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.20		L=1.32	1	pc
2. PVC coupling	Dia=0.20			0	pc



2 PROFILE
SCALE B

Clearing (Manhole 44)

L	4.95	m	
W	5.71	m	**A=28.26** m^2

Clearing (Junction Box 43.3)

L	3.591	m	
W	3.591	m	**A=12.90** m^2

Clearing (Collector 43.3 - 44)

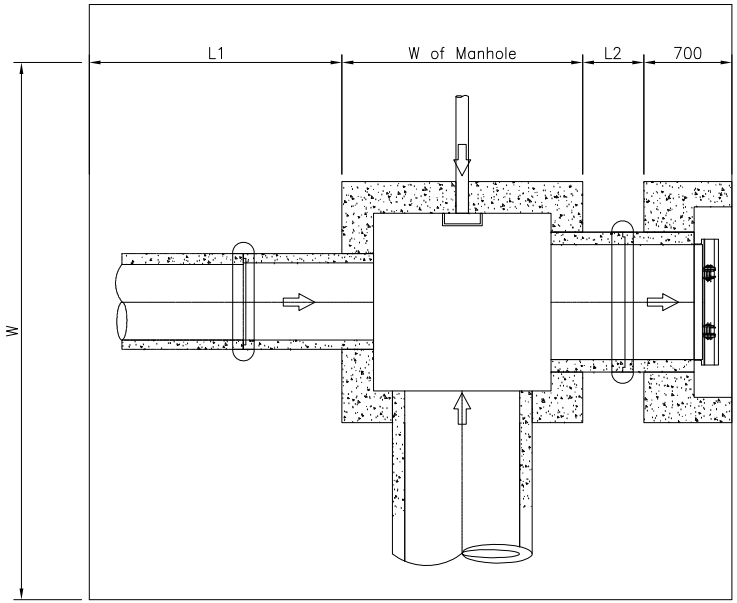
L	2.3015	m	
W	1.302	m	**A=3.00** m^2

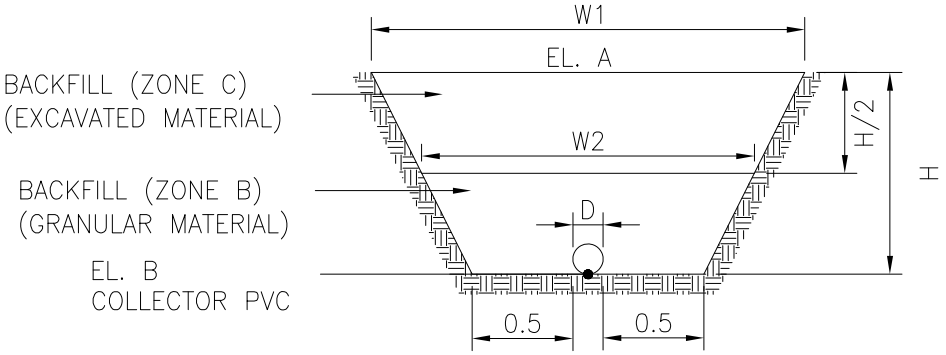
(Collector PVC) Downstream	43.3-44		
D	0.2	m	Excavation
W1	2.31	m	A=1.95 m^2
W2	1.76	m	Backfill Zone B
H	1.112	m	A=0.79 m^2
H/2	0.556	m	Backfill Zone C
EL. A	13.036	m	A=1.13 m^2
EL. B	11.924	m	

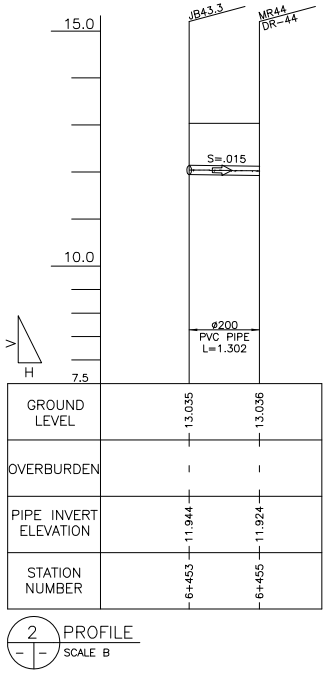
(Collector PVC) Upstream

D	0.2	m	Excavation
W1	2.29	m	A=1.90 m^2
W2	1.75	m	Backfill Zone B
H	1.091	m	A=0.77 m^2
H/2	0.5455	m	Backfill Zone C
EL. A	13.035	m	A=1.10 m^2
EL. B	11.944	m	

Collector PVC 43.3 - 44	Volume	
Excavation	**2.548579**	m^3
Backfill Zone B	**1.032327**	m^3
Backfill Zone C	**1.474735**	m^3


L1
W of Manhole
L2
700
W


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

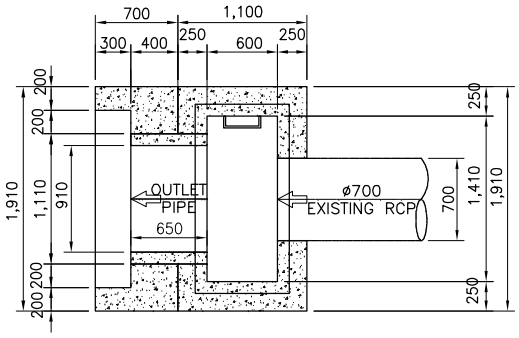

15.0
10.0
7.5
V
H
JB43.3
MR44
DR-44
S=.015
ø200
PVC PIPE
L=1.302
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.035
13.036
11.944
11.924
6+453
6+455
2
PROFILE
SCALE B

QUANTITIES OF MANHOLE

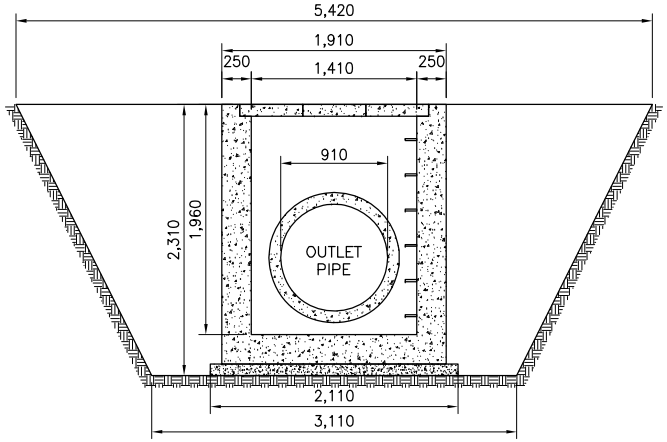
Manhole No.: MR 44.1

Location: 6 + 479

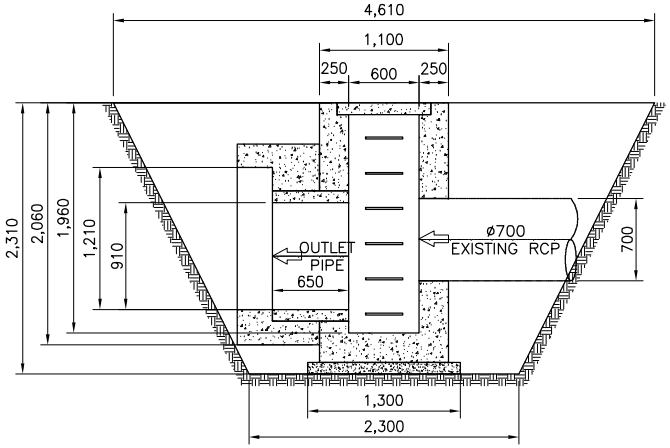
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=7.98	4.27	34.04	
				34.04	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	1.960	2.460	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.88	0.60	0.25	0.15	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.07**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=0.65		**1**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=0	**0**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=.910m	L=0.00		**0**	m3
12. Backfill				**28.37**	m3



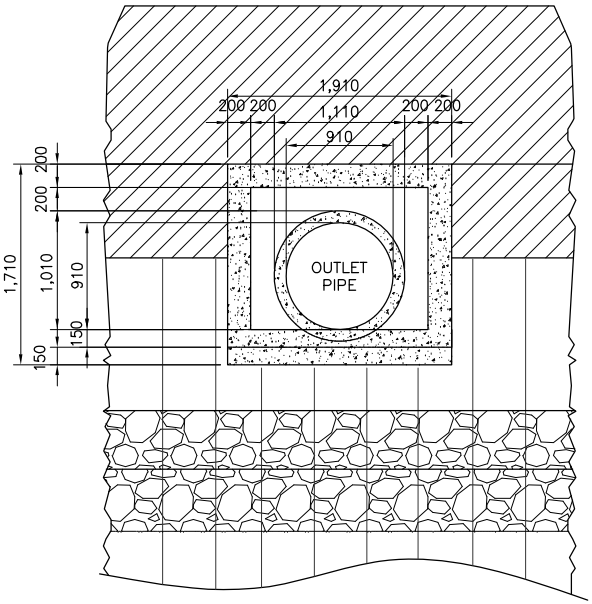
2 PLAN
– – SCALE B



4 SECTION
– – SCALE B



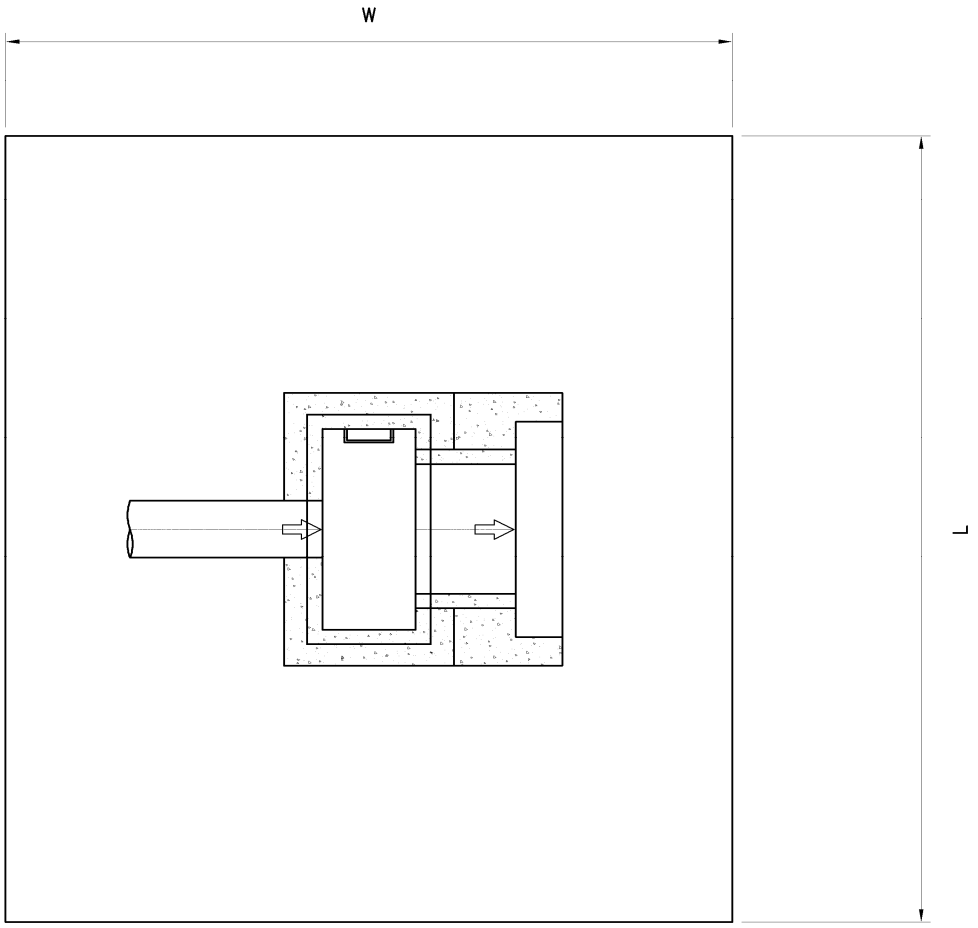
4 SECTION
– – SCALE B



5 ELEVATION
– – SCALE B

Clearing (Manhole 44.1)

W	4.61 m	**A=24.99**	m^2
L	5.42 m		

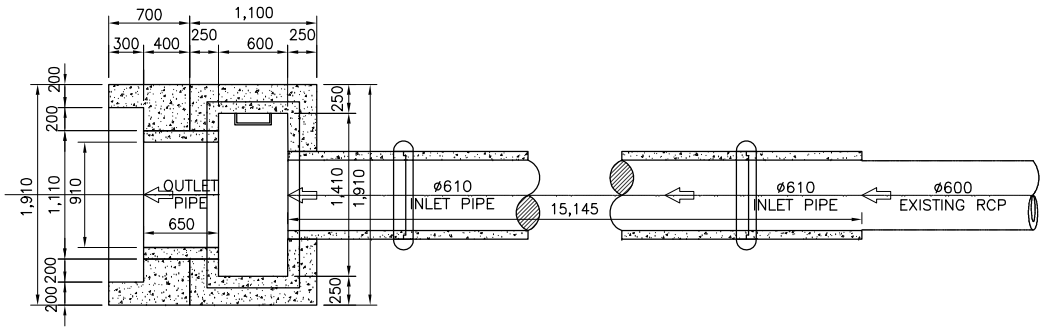


QUANTITIES OF MANHOLE

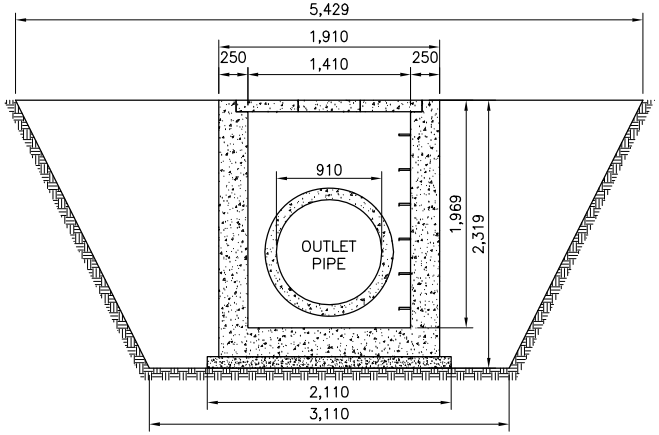
Manhole No.: MR 44.2

Location: 6 + 494

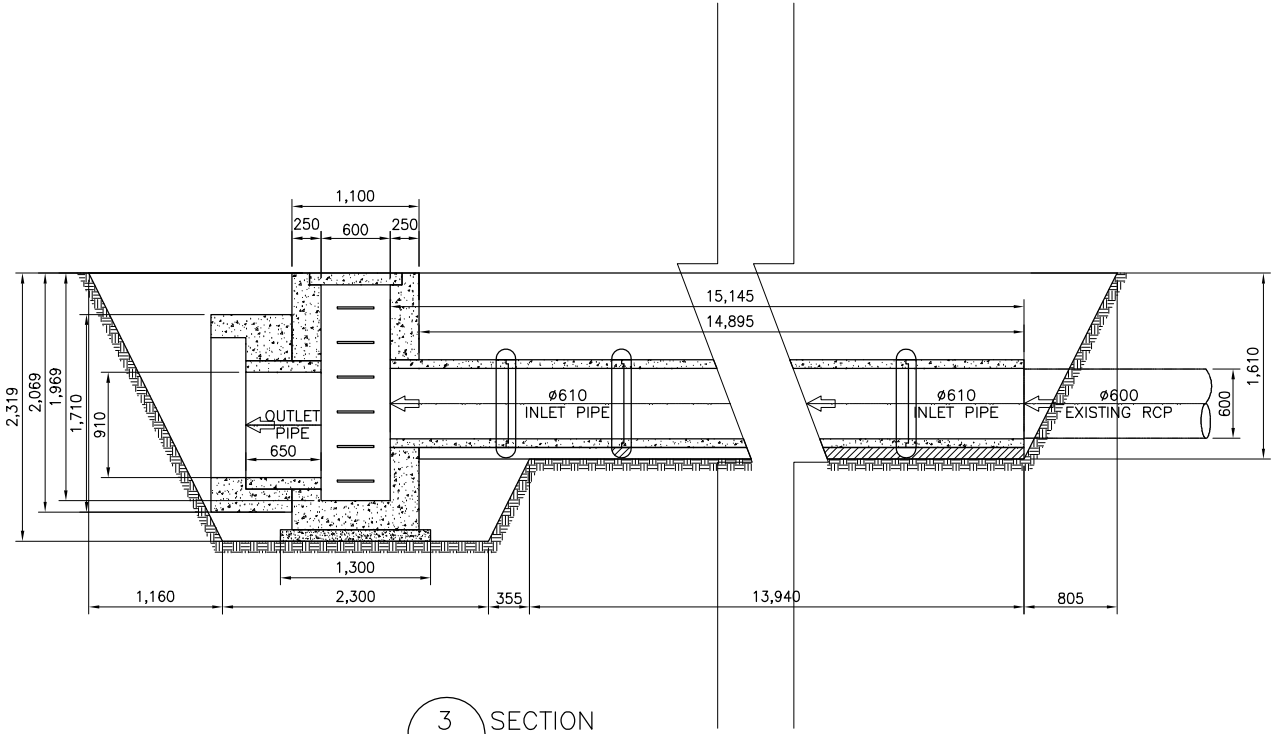
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=6.68	4.27	28.51	
		A2=0.70	4.27	2.98	
		A3=23.09	4.27	98.59	
				130.08	m^3
2. Lev. Concrete	W=1.70 L=2.11	3.59	0.1	**0.36**	m^3
3. Bottom Slab	W=1.50 L=1.91	2.87	0.25	**0.72**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.91	Aout=2.87			
	Win=1.00 Lin=1.41	Ain=1.41	1.818	2.645	m^3
		Anet=1.46			
Minus					
D=0.41	W=0.50	0.20	0.25	0.05	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
D=0.50	W=0.50	0.25	0.25	0.06	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.18**	m^3
5. Conc. Cover	L=1.61 W=1.20	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.84	Ain=3.52	0.7	2.46	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.53	m3
9. Outlet Pipe	Dia=.910m	L=14.35		**15**	pc
11. Concrete Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=14	**0.807514976**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=13.70		**1.520256**	m3
13. Backfill				**108.40**	m3



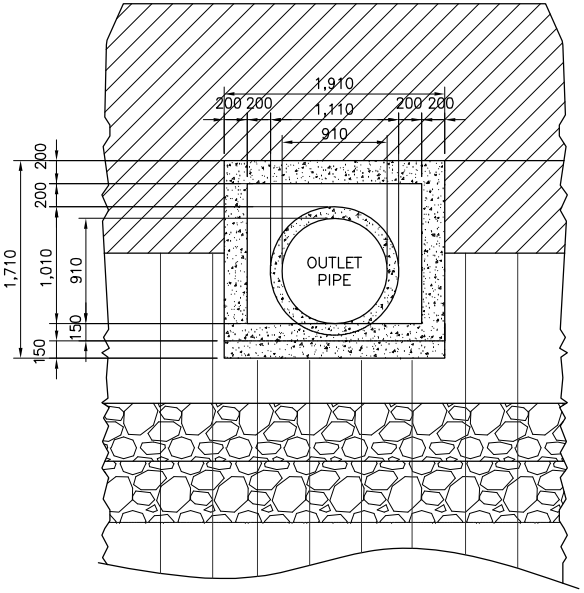
2 PLAN
SCALE B



4 SECTION
SCALE B



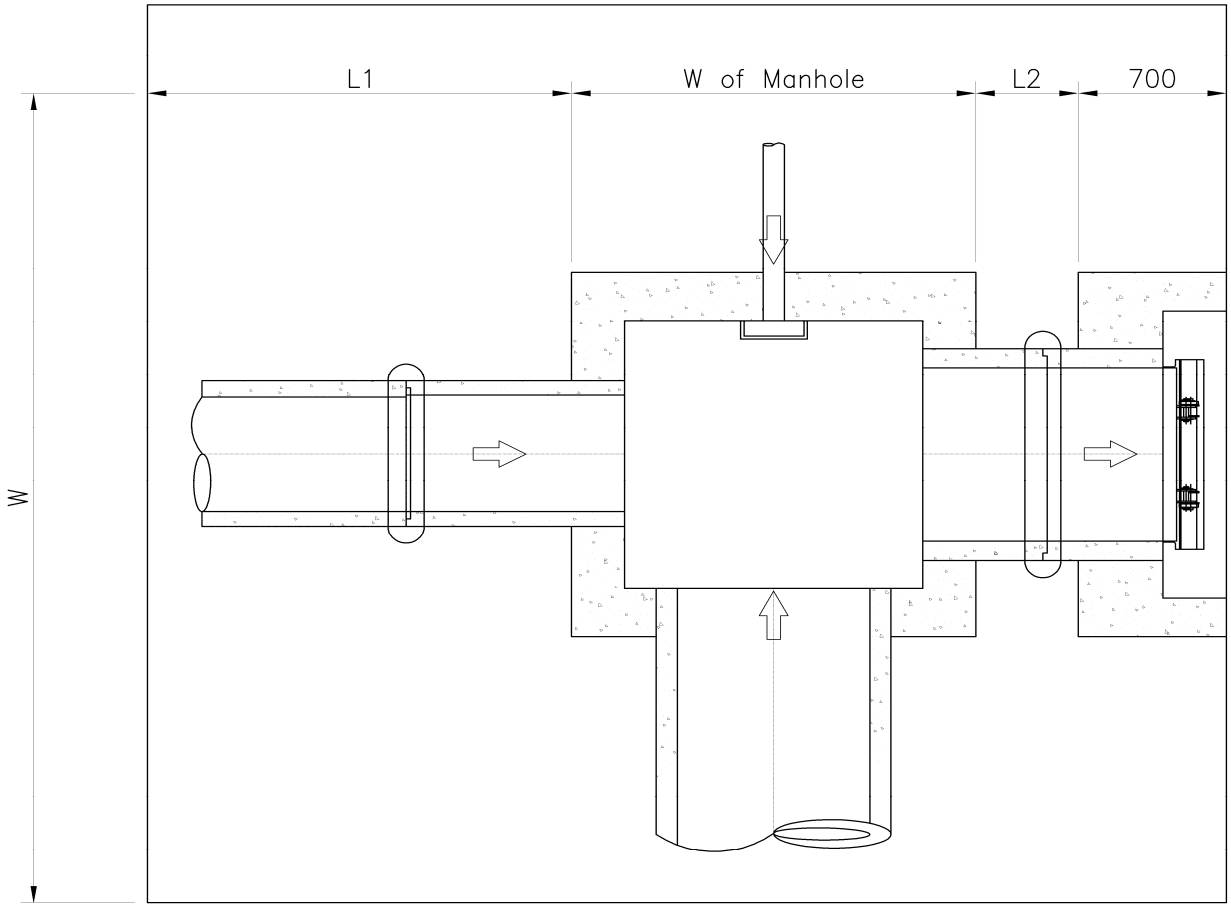
3 SECTION
SCALE B



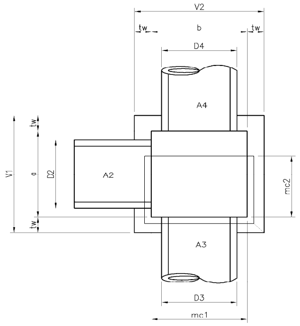
5 ELEVATION
SCALE B

Clearing (Manhole 44.2)

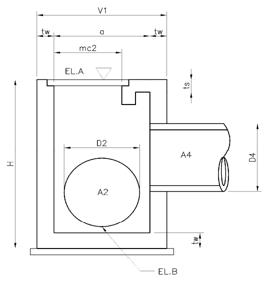
L1	0.805 m	
W of Manhole	1.1 m	**A=95.01** m^2
L2	14.895 m	
W	5.429 m	



QUANTITIES OF MANHOLE																	
Manhole No.	El. A	El. B	tw	ts	mc1	mc2	D2	D3	D4	V1	V2	A2	A3	A4	H	a	b
	m	m	m	m	m	m	m	m	m	m	m	m2	m2	m2	m	m	m
ML 135.11	14.19	11.88	0.25	0.00	1.00	0.90	0.59	0.00	0.00	1.40	1.50	0.27	0.00	0.00	2.76	0.90	1.00
ML 135.11	14.19	11.88	0.25	0.00	1.00	0.90	0.59	0.00	0.00	1.40	1.50	0.27	0.00	0.00	2.76	0.90	1.00
ML 135.11	14.19	11.88	0.25	0.00	1.00	0.90	0.59	0.00	0.00	1.40	1.50	0.27	0.00	0.00	2.76	0.90	1.00
ML 135.11	14.19	11.88	0.25	0.00	1.00	0.90	0.59	0.00	0.00	1.40	1.50	0.27	0.00	0.00	2.76	0.90	1.00
ML 37.5	12.31	9.99	0.25	0.20	1.00	1.41	1.11	1.11	1.11	1.91	1.91	0.97	0.97	0.97	2.78	1.41	1.41
ML 37.3	12.30	10.54	0.25	0.20	1.00	1.41	1.11	0.00	1.11	1.91	1.91	0.97	0.00	0.97	2.21	1.41	1.41
ML 37.6	12.31	9.99	0.25	0.20	1.00	1.41	1.11	1.11	1.11	1.91	1.91	0.97	0.97	0.97	2.78	1.41	1.41
ML 37.11	12.36	9.65	0.25	0.20	1.00	1.41	1.11	0.00	1.11	1.91	1.91	0.97	0.00	0.97	3.16	1.41	1.41
ML 37.12	12.37	9.99	0.25	0.20	1.00	1.41	1.11	1.11	0.00	1.91	1.91	0.97	0.97	0.00	2.83	1.41	1.41
ML 40	12.62	10.99	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	2.08	1.41	0.80
ML 41	12.66	10.81	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.30	1.41	0.60
ML 41.1	12.65	10.99	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.11	1.41	0.60
ML 42	12.64	10.76	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.33	1.41	0.60
ML 46	12.40	10.76	0.25	0.20	1.00	1.41	1.11	0.00	1.11	2.76	1.91	0.97	0.00	0.97	2.09	2.26	1.41
ML 48	12.40	10.94	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	1.91	1.41	0.60
ML 48.2	12.35	10.95	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	1.86	1.41	0.80
ML 50	12.40	10.67	0.25	0.00	0.60	1.69	1.11	0.00	0.00	2.19	1.10	0.97	0.00	0.00	2.18	1.69	0.60
ML 51	12.40	10.99	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	1.86	1.41	0.60
ML 52	12.40	10.67	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.18	1.41	0.60
ML 53	12.40	10.70	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.15	1.41	0.60
ML 54	12.28	10.66	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.07	1.41	0.60
ML 56	12.40	10.72	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.14	1.41	0.60
ML 57	12.40	10.61	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.24	1.41	0.60
ML 58	12.40	10.39	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.46	1.41	0.60
ML 59	12.35	10.84	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	1.96	1.41	0.80
ML 59.1	12.40	10.17	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.68	1.41	0.60
ML 59.2	12.40	10.70	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.15	1.41	0.60
ML 62A.6	12.60	11.19	0.25	0.00	0.95	1.41	1.11	1.11	0.00	1.91	1.45	0.97	0.97	0.00	1.86	1.41	0.95
ML 62A.9	13.57	10.53	0.30	0.20	1.00	1.00	1.82	0.00	0.00	1.60	2.72	2.60	0.00	0.00	3.54	1.00	2.12
ML HSP4	12.10	9.89	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	2.66	1.41	0.80
MR 35.1	12.31	11.42	0.25	0.00	0.60	0.70	0.40	0.00	0.00	1.20	1.10	0.13	0.00	0.00	1.34	0.70	0.60
MR 36.3	12.60	11.61	0.25	0.00	0.60	1.41	1.11	0.90	0.00	1.91	1.10	0.97	0.59	0.00	1.44	1.41	0.60
MR 37.40	12.24	10.96	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	1.73	1.41	0.80
MR 40	12.70	10.90	0.25	0.00	0.70	1.88	1.11	0.40	0.00	2.38	1.20	0.97	0.13	0.00	2.26	1.88	0.70
MR 42	12.96	11.29	0.25	0.00	0.80	1.41	1.11	0.00	0.00	1.91	1.30	0.97	0.00	0.00	2.12	1.41	0.80
MR 43	13.02	11.08	0.25	0.20	1.00	1.41	1.11	1.11	0.00	1.91	1.91	0.97	0.97	0.00	2.39	1.41	1.41
MR 44	13.04	10.99	0.25	0.00	0.65	1.41	1.11	0.00	0.00	1.91	1.15	0.97	0.00	0.00	2.50	1.41	0.65
MR 44.1	13.05	11.29	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.21	1.41	0.60
MR 44.2	13.06	11.29	0.25	0.00	0.60	1.41	1.11	0.76	0.00	1.91	1.10	0.97	0.45	0.00	2.22	1.41	0.60



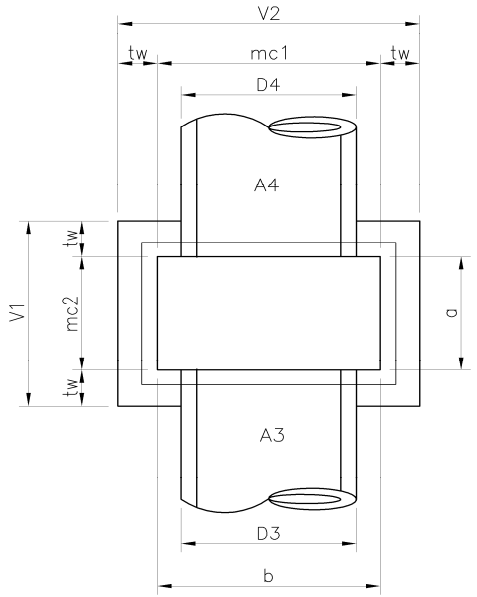
PLAN



SECTION

QUANTITIES OF MANHOLE												
Manhole No.	Area Outside Face			Area Inside Face		MANHOLE			LEVELING	COVER		
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Scaffolding	Area of Formworks	Area of Formworks	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	m2	m2	m2	m3	kg
ML 135.11	5.52	7.73	0.00	5.02	4.52	22.52	0.00	16.01	0.66	0.46	0.13	19.01
ML 135.11	5.52	7.73	0.00	5.02	4.52	22.52	0.00	16.01	0.66	0.46	0.13	19.01
ML 135.11	5.52	7.73	0.00	5.02	4.52	22.52	0.00	16.01	0.66	0.46	0.13	19.01
ML 135.11	5.52	7.73	0.00	5.02	4.52	22.52	0.00	16.01	0.66	0.46	0.13	19.01
ML 37.5	7.83	10.60	0.58	6.56	6.56	29.21	1.34	21.20	0.84	0.56	0.19	27.82
ML 37.3	6.23	8.44	0.58	4.96	4.96	23.24	1.02	16.88	0.84	0.56	0.19	27.82
ML 37.6	7.83	10.60	0.58	6.56	6.56	29.21	1.34	21.20	0.84	0.56	0.19	27.82
ML 37.11	8.91	12.07	0.58	7.64	7.64	34.91	1.57	24.14	0.84	0.56	0.19	27.82
ML 37.12	7.97	10.80	0.58	6.70	6.70	30.81	1.37	21.59	0.84	0.56	0.19	27.82
ML 40	3.33	7.95	0.00	2.93	5.17	18.41	0.00	13.37	0.72	0.52	0.16	23.18
ML 41	2.76	8.77	0.00	2.46	5.77	18.79	0.00	13.83	0.68	0.48	0.13	18.55
ML 41.1	2.53	8.06	0.00	2.23	5.25	17.10	0.00	12.70	0.68	0.48	0.13	18.55
ML 42	2.80	8.90	0.00	2.50	5.87	19.10	0.00	14.03	0.68	0.48	0.13	18.55
ML 46	5.88	11.51	1.78	4.61	7.39	29.25	1.52	19.48	1.01	0.56	0.19	27.82
ML 48	2.29	7.28	0.00	1.99	4.67	15.27	0.00	0.00	0.68	0.48	0.13	18.55
ML 48.2	2.97	7.09	0.00	2.57	4.53	16.18	0.00	0.00	0.72	0.52	0.16	23.18
ML 50	2.62	9.57	0.00	2.32	6.54	20.07	0.00	14.36	0.74	0.54	0.15	21.82
ML 51	2.23	7.11	0.00	1.93	4.54	14.84	0.00	0.00	0.68	0.48	0.13	18.55
ML 52	2.62	8.34	0.00	2.32	5.45	17.77	0.00	13.15	0.68	0.48	0.13	18.55
ML 53	2.58	8.22	0.00	2.28	5.36	17.48	0.00	12.96	0.68	0.48	0.13	18.55
ML 54	2.48	7.89	0.00	2.18	5.12	16.70	0.00	12.44	0.68	0.48	0.13	18.55
ML 56	2.56	8.16	0.00	2.26	5.32	17.33	0.00	12.85	0.68	0.48	0.13	18.55
ML 57	2.68	8.54	0.00	2.38	5.60	18.24	0.00	13.46	0.68	0.48	0.13	18.55
ML 58	2.95	9.40	0.00	2.65	6.24	20.27	0.00	14.82	0.68	0.48	0.13	18.55
ML 59	3.13	7.47	0.00	2.73	4.81	17.16	0.00	0.00	0.72	0.52	0.16	23.18
ML 59.1	3.22	10.25	0.00	2.92	6.86	22.27	0.00	16.15	0.68	0.48	0.13	18.55
ML 59.2	2.58	8.22	0.00	2.28	5.37	17.49	0.00	12.96	0.68	0.48	0.13	18.55
ML 62A.6	3.53	7.11	0.00	3.06	4.54	16.30	0.00	0.00	0.75	0.55	0.19	26.66
ML 62A.9	15.03	11.34	1.12	12.91	6.09	43.88	3.41	30.62	0.94	0.48	0.14	20.74
ML HSP4	4.26	10.16	0.00	3.86	6.80	24.10	0.00	17.08	0.72	0.52	0.16	23.18
MR 35.1	1.61	3.22	0.00	1.31	1.53	7.53	0.00	0.00	0.54	0.34	0.07	10.37
MR 36.3	1.73	5.51	0.00	1.43	3.36	10.48	0.00	0.00	0.68	0.48	0.13	18.55
MR 37.40	2.77	6.61	0.00	2.37	4.17	14.95	0.00	0.00	0.72	0.52	0.16	23.18
MR 40	3.16	10.72	0.00	2.81	7.53	23.13	0.00	16.14	0.80	0.60	0.19	26.93
MR 42	3.39	8.09	0.00	2.99	5.27	18.77	0.00	13.60	0.72	0.52	0.16	23.18
MR 43	6.75	9.14	0.58	5.48	5.48	25.48	1.12	18.27	0.84	0.56	0.19	27.82
MR 44	3.25	9.55	0.00	2.93	6.35	21.10	0.00	15.30	0.69	0.49	0.14	19.71
MR 44.1	2.65	8.44	0.00	2.35	5.53	18.01	0.00	13.30	0.68	0.48	0.13	18.55
MR 44.2	2.66	8.48	0.00	2.36	5.55	17.63	0.00	13.36	0.68	0.48	0.13	18.55

QUANTITIES OF JUNCTION MANHOLE															
Manhole No.	El. A	El. B	tw	ts	mc1	mc2	D3	D4	V1	V2	A3	A4	H	a	b
	m	m	m	m	m	m	m	m	m	m	m2	m2	m	m	m
ML 35.6	12.28	10.53	0.25	0.00	1.41	0.60	1.11	1.11	1.10	1.91	0.97	0.97	2.21	0.60	1.41
ML 36	12.30	10.59	0.25	0.00	1.41	0.90	1.11	1.11	1.40	1.91	0.97	0.97	2.16	0.90	1.41
ML 37	12.29	10.68	0.25	0.00	1.41	0.60	0.00	1.11	1.10	1.91	0.00	0.97	2.06	0.60	1.41
ML 37.1	12.28	10.67	0.25	0.00	1.41	0.70	1.11	0.00	1.20	1.91	0.97	0.00	2.06	0.70	1.41
ML 37.5	12.31	10.53	0.25	0.00	1.41	0.82	1.11	0.00	1.32	1.91	0.97	0.00	2.23	0.82	1.41
ML 37.9	12.34	10.73	0.25	0.00	1.41	0.60	0.00	1.11	1.10	1.91	0.00	0.97	2.06	0.60	1.41
ML 37.10	12.36	10.73	0.25	0.00	1.41	0.93	1.11	0.00	1.43	1.91	0.97	0.00	2.08	0.93	1.41
ML 37.16	12.36	10.52	0.25	0.00	1.41	0.90	1.11	0.00	1.40	1.91	0.97	0.00	2.30	0.90	1.41
ML 43	12.55	10.94	0.25	0.00	1.41	0.70	1.11	0.00	1.20	1.91	0.97	0.00	2.06	0.70	1.41
ML 45	12.43	10.86	0.25	0.00	1.41	0.80	1.11	1.11	1.30	1.91	0.97	0.97	2.02	0.80	1.41
MR 43.2	13.02	11.18	0.25	0.00	1.41	0.82	0.00	1.11	1.32	1.91	0.00	0.97	2.29	0.82	1.41



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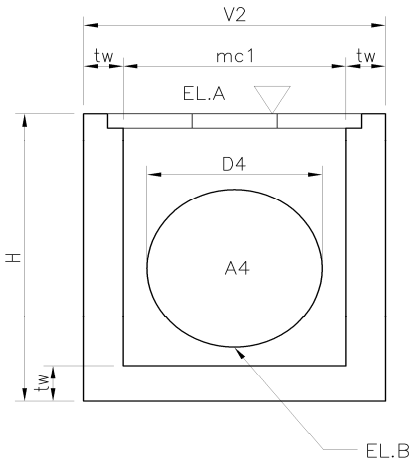
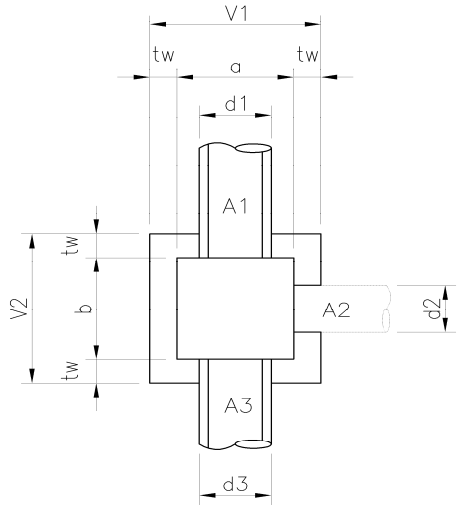


SECTION

QUANTITIES OF JUNCTION MANHOLE												
Manhole No.	Area Outside Face			Area Inside Face		MANHOLE			LEVELING	COVER		
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Scaffolding	Area of Formworks	Area of Formworks	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	m2	m2	m2	m3	kg
ML 35.6	8.42	4.85	0.00	5.51	2.35	19.20	0.00	13.27	0.68	0.48	0.13	18.55
ML 36	8.26	6.05	0.00	5.39	3.44	21.20	0.00	14.31	0.74	0.54	0.18	25.50
ML 37	7.87	4.53	0.00	5.10	2.17	18.71	0.00	12.40	0.68	0.48	0.13	18.55
ML 37.1	7.87	4.94	0.00	5.10	2.53	19.48	0.00	12.81	0.70	0.50	0.14	20.87
ML 37.5	8.52	5.89	0.00	5.58	3.25	22.27	0.00	14.41	0.73	0.53	0.16	23.65
ML 37.9	7.87	4.53	0.00	5.10	2.17	18.71	0.00	12.40	0.68	0.48	0.13	18.55
ML 37.10	7.95	5.95	0.00	5.16	3.41	21.50	0.00	13.90	0.75	0.55	0.18	26.20
ML 37.16	8.77	6.43	0.00	5.77	3.68	23.70	0.00	15.21	0.74	0.54	0.18	25.50
ML 43	7.87	4.94	0.00	5.10	2.53	19.48	0.00	12.81	0.70	0.50	0.14	20.87
ML 45	7.72	5.26	0.00	5.00	2.84	18.88	0.00	12.98	0.72	0.52	0.16	23.18
MR 43.2	8.76	6.05	0.00	5.76	3.35	22.96	0.00	14.81	0.73	0.53	0.16	23.65

QUANTITIES IN JUNCTION BOX													
Junction Box No.	d1	d2	d3	tw	tb	a	b	h	A1	A2	A3	V1	V2
	m	m	m	m	m	m	m	m	m2	m2	m2	m	m
JL 37.3	0.00	0.15	0.15	0.15	0.20	0.50	0.50	0.55	0.00	0.02	0.02	0.80	0.80
JR 41.1	0.40	0.23	0.00	0.15	0.20	0.60	0.60	0.75	0.13	0.04	0.00	0.90	0.90
JR 43.3	0.00	0.19	0.20	0.15	0.20	0.50	0.50	0.60	0.00	0.03	0.03	0.80	0.80



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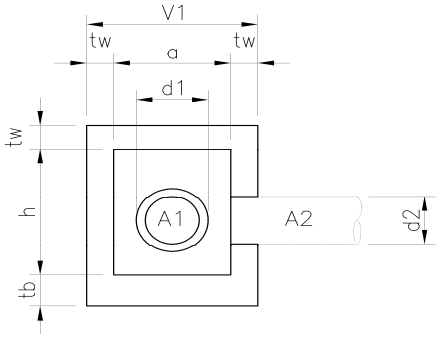
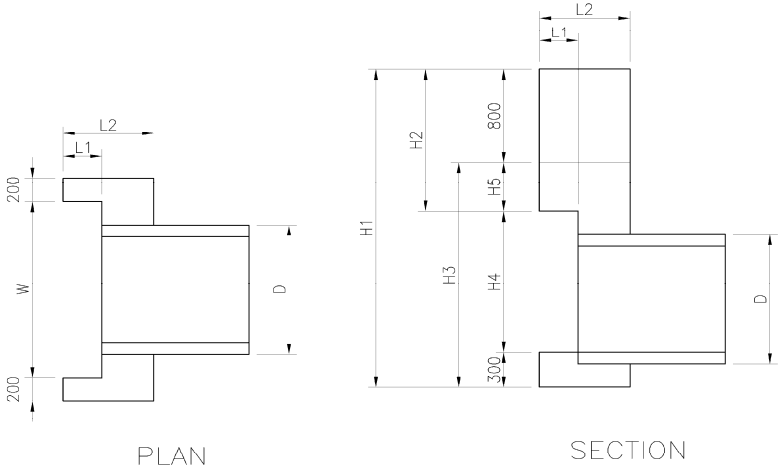


SECTION

3.200

QUANTITIES IN JUNCTION BOX								
Junction Box No.	Area Outside Face			Area Inside Face				Leveling
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Formworks
	m2	m2	m2	m2	m2	m2	m3	m2
JL 37.3	1.44	1.44	0.25	1.12	1.12	5.33	0.14	0.32
JR 41.1	1.98	1.98	0.36	1.62	1.62	7.39	0.27	0.36
JR 43.3	1.52	1.52	0.25	1.20	1.20	5.63	0.15	0.32

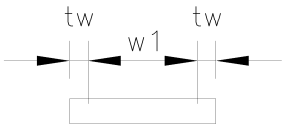
QUANTITIES OF OUTLETS										
Outlet No.	H1	H2	H3	H4	H5	L1	L2	W	D	Area of Pipe
	m	m	m	m	m	m	m	m	m	m2
DL 135.11	1.22	0.20	0.42	0.72	0.00	0.25	0.70	0.99	0.59	0.27
DL 135.11	1.22	0.20	0.42	0.72	0.00	0.25	0.70	0.99	0.59	0.27
DL 135.11	1.22	0.20	0.42	0.72	0.00	0.25	0.70	0.99	0.59	0.27
DL 135.11	1.22	0.20	0.42	0.72	0.00	0.25	0.70	0.99	0.59	0.27
DL 35.5	2.81	1.30	2.01	1.21	0.50	0.30	0.70	1.51	1.11	0.97
DL 37.3	2.16	0.65	1.36	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 37.6	2.71	1.20	1.91	1.21	0.40	0.30	0.70	1.51	1.11	0.97
DL 37.11	3.05	1.54	2.25	1.21	0.74	0.30	0.70	1.51	1.11	0.97
DL 37.12	2.71	1.20	1.91	1.21	0.40	0.30	0.70	1.51	1.11	0.97
DL 40	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 41	1.89	0.38	1.09	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 41.1	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 42	1.94	0.43	1.14	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 46	1.94	0.43	1.14	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 48	1.76	0.25	0.96	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 48.2	2.20	0.69	1.40	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 50	2.03	0.52	1.23	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 51	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 52	2.03	0.52	1.23	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 53	2.00	0.49	1.20	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 54	2.04	0.53	1.24	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 56	1.99	0.48	1.19	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 57	2.09	0.58	1.29	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 58	2.31	0.80	1.51	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 59	2.31	0.80	1.51	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 59.1	2.53	1.02	1.73	1.21	0.22	0.30	0.70	1.51	1.11	0.97
DL 59.2	2.00	0.49	1.20	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 62A.6	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DL 62A.9	2.37	0.20	1.57	1.87	0.00	0.30	0.70	2.22	1.82	2.60
DL HS P4	2.21	0.70	1.41	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 35.1	1.68	0.63	0.88	0.75	0.00	2.00	0.70	0.80	0.40	0.13
DR 36.3	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 36.9	2.49	1.09	1.69	1.10	0.29	0.30	1.00	0.99	0.59	0.27
DR 36.15	2.91	0.91	2.11	1.70	0.11	0.30	0.70	2.01	1.61	1.35
DR 36.20	2.04	0.64	1.24	1.10	0.00	0.30	1.00	1.26	0.66	0.35
DR 36.21	2.19	0.79	1.39	1.10	0.00	0.30	1.00	1.00	0.40	0.21
DR 36.23	2.19	0.79	1.39	1.10	0.00	0.30	1.00	1.00	0.40	0.24
DR 36.24	2.07	0.67	1.27	1.10	0.00	0.30	1.00	1.03	0.43	0.30
DR 37.40	1.94	0.43	1.14	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 40	2.11	0.60	1.31	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 42	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 43	1.92	0.41	1.12	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 44	2.10	0.50	1.30	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 44.1	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 44.2	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97



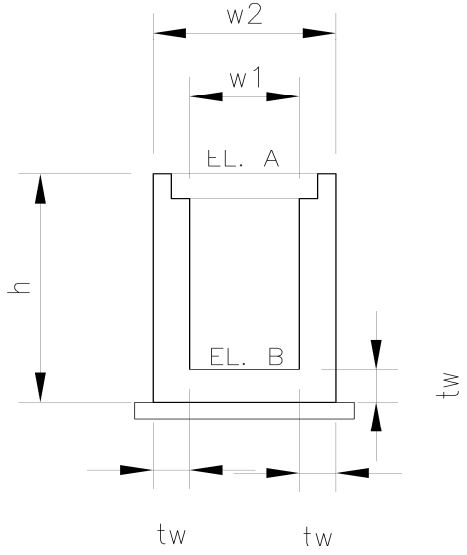
QUANTITIES OF OUTLETS									
Outlet No.	Outside Face			Inside face					
	Left & Right Side	Front side	Rear side	Front Side	Left & Right Side	Top Slab	Area of Formworks	Volume of Supporting	Area of Scaffolding
	m2	m2	m2	m2	m2	m2	m2	m3	m2
DL 135.11	0.00	0.39	0.39	0.00	0.00	0.25	0.25	0.18	0.00
DL 135.11	0.00	0.39	0.39	0.00	0.00	0.25	0.25	0.18	0.00
DL 135.11	0.00	0.39	0.39	0.00	0.00	0.25	0.25	0.18	0.00
DL 135.11	0.00	0.39	0.39	0.00	0.00	0.25	0.25	0.18	0.00
DL 35.5	2.81	1.36	4.39	0.86	0.73	0.45	10.60	0.55	10.72
DL 37.3	1.90	0.95	3.16	0.86	0.73	0.45	8.05	0.55	8.25
DL 37.6	2.68	1.30	4.21	0.86	0.73	0.45	10.23	0.55	10.36
DL 37.11	3.15	1.53	4.86	0.86	0.73	0.45	11.58	0.55	11.65
DL 37.12	2.67	1.29	4.20	0.86	0.73	0.45	10.20	0.55	10.34
DL 40	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DL 41	1.52	0.84	2.64	0.86	0.73	0.45	7.04	0.55	0.00
DL 41.1	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DL 42	1.60	0.87	2.74	0.86	0.73	0.45	7.24	0.55	0.00
DL 46	1.59	0.86	2.73	0.86	0.73	0.45	7.22	0.55	0.00
DL 48	1.34	0.79	2.39	0.86	0.73	0.45	6.56	0.55	0.00
DL 48.2	1.97	0.97	3.24	0.86	0.73	0.45	8.22	0.55	8.42
DL 50	1.72	0.90	2.91	0.86	0.73	0.45	7.57	0.55	7.75
DL 51	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DL 52	1.73	0.90	2.92	0.86	0.73	0.45	7.59	0.55	7.77
DL 53	1.68	0.89	2.86	0.86	0.73	0.45	7.47	0.55	7.65
DL 54	1.74	0.91	2.93	0.86	0.73	0.45	7.61	0.55	7.80
DL 56	1.66	0.88	2.82	0.86	0.73	0.45	7.41	0.55	0.00
DL 57	1.80	0.92	3.02	0.86	0.73	0.45	7.78	0.55	7.97
DL 58	2.12	1.01	3.45	0.86	0.73	0.45	8.61	0.55	8.83
DL 59	2.11	1.01	3.44	0.86	0.73	0.45	8.60	0.55	8.81
DL 59.1	2.42	1.17	3.87	0.86	0.73	0.45	9.50	0.55	9.67
DL 59.2	1.68	0.89	2.86	0.86	0.73	0.45	7.47	0.55	7.65
DL 62A.6	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DL 62A.9	2.20	1.04	3.61	1.55	1.12	0.67	10.18	1.25	12.42
DL HS P4	1.98	0.98	3.26	0.86	0.73	0.45	8.25	0.55	8.46
DR 35.1	1.23	1.27	1.89	0.47	3.00	1.60	9.47	1.20	0.00
DR 36.3	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 36.9	3.38	1.17	3.18	0.81	0.66	0.30	9.51	0.33	6.90
DR 36.15	2.96	1.29	5.66	2.06	1.02	0.60	13.59	1.03	14.03
DR 36.20	2.48	0.91	3.05	1.04	0.66	0.38	8.52	0.42	6.79
DR 36.21	2.78	0.97	2.85	0.89	0.66	0.30	8.45	0.33	6.13
DR 36.23	2.77	0.96	2.82	0.86	0.66	0.30	8.37	0.33	6.12
DR 36.24	2.54	0.92	2.66	0.83	0.66	0.31	7.91	0.34	5.92
DR 37.40	1.60	0.87	2.75	0.86	0.73	0.45	7.25	0.55	0.00
DR 40	1.83	0.93	3.05	0.86	0.73	0.45	7.85	0.55	8.04
DR 42	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 43	1.57	0.86	2.70	0.86	0.73	0.45	7.17	0.55	0.00
DR 44	1.83	0.93	3.05	0.86	0.73	0.45	7.85	0.55	8.04
DR 44.1	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 44.2	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00

QUANTITIES IN U - DITCH

Outlet No.	El. A	El. B	h	w1	tw	L	w2
	m	m	m	m	m	m	m
DL HSP4	12.10	11.52	0.68	0.30	0.10	52.18	0.50
DL 62A.6	12.64	11.75	0.99	0.30	0.10	13.54	0.50
DL 62A.9	13.75	13.40	0.45	0.30	0.10	9.99	0.50
DR 37.40	12.01	11.56	0.55	0.30	0.10	4.00	0.50



PRECAST CONCRETE
U – DITCH COVER



U DITCH TYPICAL SECTION

QUANTITIES IN U - DITCH										
Outlet No.	Outside Face		Inside Face	Area of Formworks			Cover		U- ditch	
	Left & Right	Front &Rear	Front &Rear	U - Ditch	Cover	Leveling	Concrete	Reinforcement	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	kg	m3	kg
DL HSP4	0.33	71.07	60.63	132.04	7.89	10.50	2.09	285.95	15.78	1025.67
DL 62A.6	0.46	26.80	24.09	51.35	2.09	2.77	0.54	74.18	5.77	374.81
DL 62A.9	0.24	8.99	6.99	16.22	1.56	2.06	0.40	54.75	2.10	136.36
DR 37.40	0.14	4.43	3.63	8.21	0.66	0.86	0.16	21.93	1.01	65.43

QUANTITIES IN PIPE BEDDING								
Outlet No.	Outlet Pipe		Inlet Pipe		Collector			
	L1	W1	L2	W2	L3	W3	Thickness	Area of Formworks
	m	m	m	m	m	m	m	m2
DL 135.11	0.70	0.59	0.00	0.00	0.00	0.00	0.10	0.26
DL 135.11	0.70	0.59	0.00	0.00	0.00	0.00	0.10	0.26
DL 135.11	0.70	0.59	0.00	0.00	0.00	0.00	0.10	0.26
DL 135.11	0.70	0.59	0.00	0.00	0.00	0.00	0.10	0.26
DL 35.5	1.08	1.11	0.00	0.00	51.88	1.11	0.10	11.04
DL 37.3	1.17	1.11	0.00	0.00	31.62	1.11	0.10	7.00
DL 37.6	1.17	1.11	0.00	0.00	28.43	1.11	0.10	6.36
DL 37.11	1.12	1.11	0.00	0.00	11.33	1.11	0.10	2.93
DL 37.12	1.12	1.11	0.00	0.00	13.41	1.11	0.10	3.35
DL 40	1.88	1.11	0.00	0.00	0.00	0.00	0.10	0.60
DL 41	0.86	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 41.1	0.89	1.11	0.00	0.00	0.00	0.00	0.10	0.40
DL 42	0.88	1.11	0.00	0.00	0.00	0.00	0.10	0.40
DL 46	0.00	0.00	0.00	0.00	19.18	0.00	0.10	3.84
DL 48	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 50	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 51	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 52	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 53	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 54	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 56	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 57	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 58	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 59	1.98	1.11	0.00	0.00	0.00	0.00	0.10	0.62
DL 59.1	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 59.2	0.84	1.11	0.00	0.00	0.00	0.00	0.10	0.39
DL 62A.6	0.00	0.00	1.10	1.11	0.00	0.00	0.10	0.44
DL 62A.9	1.16	1.82	0.00	0.00	0.00	0.00	0.10	0.60
DL HSP4	0.94	1.11	0.00	0.00	0.00	0.00	0.10	0.41
DR 35.1	1.17	1.11	0.00	0.00	0.00	0.00	0.10	0.46
DR 36.3	0.00	0.00	0.32	1.10	0.00	0.00	0.10	0.28
DR 36.9	0.00	0.00	0.17	0.53	0.00	0.00	0.10	0.14
DR 36.15	0.00	0.00	0.50	1.97	0.00	0.00	0.10	0.49
DR 36.20	0.00	0.00	0.17	0.64	0.00	0.00	0.10	0.16
DR 36.21	0.00	0.00	0.17	0.53	0.00	0.00	0.10	0.14
DR 36.23	0.00	0.00	0.17	0.53	0.00	0.00	0.10	0.14
DR 36.40	1.00	1.11	0.00	0.00	0.00	0.00	0.10	0.42
DR 40	0.96	1.11	0.00	0.00	3.30	0.40	0.10	1.15
DR 42	1.13	1.11	0.00	0.00	0.00	0.00	0.10	0.45
DR 43	0.00	0.00	0.00	0.00	12.86	1.11	0.10	2.79
DR 44.2	0.00	0.00	14.90	0.76	0.00	0.00	0.10	3.13
DR 44.2	0.00	0.00	14.90	0.76	0.00	0.00	0.10	3.13

Right Bank STA 8+242 - 9+947

BQ No.	Name of Item	Unit	Qty.
BILL No. 4 -EXCAVATION AND EARTH WORKS			
4.8/1	**Excavation for manholes and junction manholes**		
	Excavation	Cu.m	1,673.39
	Clearing and Grubbing	Sq.m.	2,359.48
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	1,408.36
	Clearing and Grubbing	Sq.m.	1,956.62
4.8/1-2	**Excavation for junction manholes (junction pits)**	Cu.m.	
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	265.03
	Clearing and Grubbing	Sq.m.	402.86
4.8/2	**Excavation for pipe culverts**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	2,673.80
	Clearing and Grubbing	Sq.m.	1,727.94
4.8/3	**Excavation for other structures**		
	Excavation, Small Amount: V<100 cu.m.	Cu.m.	11.99
	Clearing and Grubbing	Sq.m.	27.61
	Common/Random Backfill (with Excavated Material)	Cu.m.	69.38
4.16/1	**Random backfill**	Cu.m.	1,065.92
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,065.92
4.16/1-1	**Random backfill for manholes**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	906.90
4.16/1-2	**Random backfill for junction manholes (junction pits)**	Cu.m.	
	Common/Random Backfill (with Excavated Material)	Cu.m.	159.02
4.17/1	**Zone B pipe backfill**	Cu.m.	810.88
	Sand Fill, in Small Area: V<100 cu.m.	Cu.m.	810.88
4.17/2	**Zone C pipe backfill (excavated material)**	Cu.m.	1,149.34
	Common/Random Backfill (with Excavated Material)	Cu.m.	1,149.34
4.5/31-A	**Temporary Removal and reinstallation of existing fences**	L.m.	6.93
	Temporary removal of existing fences (for manhole)	L.m.	6.93
	Tempoary removal of existing fences (for collector pipe)	L.m.	0.00
	Reinstallation of existing fences (for manhole)	L.m.	0.00
	Reinstallation of existing fences (for collector pipe)	L.m.	0.00
4.5/48-A	**Demolition and removal of existing revetment**	L.m.	6.93
	Demolition and removal of existing revetment (for manhole)	L.m.	6.93
	Demolition and removal of existing revetment (for collector pipe)	L.m.	0.00
4.5/50-A	**Demolition and restoration of existing CHB wall**	L.m.	0.00
	Temporary removal of existing fences (for manhole)	L.m.	0.00
	Tempoary removal of existing fences (for collector pipe)	L.m.	0.00
4.5/51-A	**Temporary Removal and reinstallation of existing steel handrail**	L.m.	0.00
	Temporary removal of existing steel handrail (for manhole)	L.m.	0.00
	Tempoary removal of existing steel handrail (for collector pipe)	L.m.	0.00
	Reinstallation of existing steel handrail (for manhole)	L.m.	0.00
	Reinstallation of existing steel handrail (for collector pipe)	L.m.	0.00
4.5/52-A	**Restoration of existing revetment**	L.m.	0.00
	Temporary removal of existing revetment (for manhole)	L.m.	0.00
	Tempoary removal of existing revetment (for collector pipe)	L.m.	0.00
BILL No. 5 - CONCRETE			0.00
5.11/1	**Reinforcement Grade 275**	Ton	36.25
	Ladder Rung (16mm dia-Grade 40) in Manholes	Kg	500.96
	Ladder Rung (16mm dia-Grade 40) in Junction Manholes	Kg	155.31
	Reinforcement (16mm dia-Grade 275) in U - ditch	Kg	573.76
	Reinforcement (16mm dia-Grade 275) in box culvert	Kg	0.00
5.16/1	**Precast concrete manhole and junction boxes covers**	Cu.m.	13.91
	Formwork F2 (for Small Sized Structure)	Sq.m.	44.48
	Reinforcement	Ton	2.00
5.16/2	**Precast concrete U-ditch covers**	Cu.m.	1.73
	Formwork F2 (for Small Sized Structure)	Sq.m.	6.59
	Reinforcement	Ton	0.24
5.22/1	**Concrete in manholes, junction boxes and outlets**		389.10
5.22/1-1	**Concrete in manholes**	Cu.m.	
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	244.41
	Formwork F2 (for Small Sized Structure)	sq.m.	1,378.08
	Staging/Scaffolding Work	Sq.m.	973.40
	Supporting/Scaffolding Work	Cu.m.	39.19
5.22/1-2	**Concrete in junction manholes (junction pits)**	Cu.m.	
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	57.00
	Formwork F2 (for Small Sized Structure)	sq.m.	1,015.45
	Staging/Scaffolding Work	Sq.m.	456.66
	Supporting/Scaffolding Work	Cu.m.	1.69

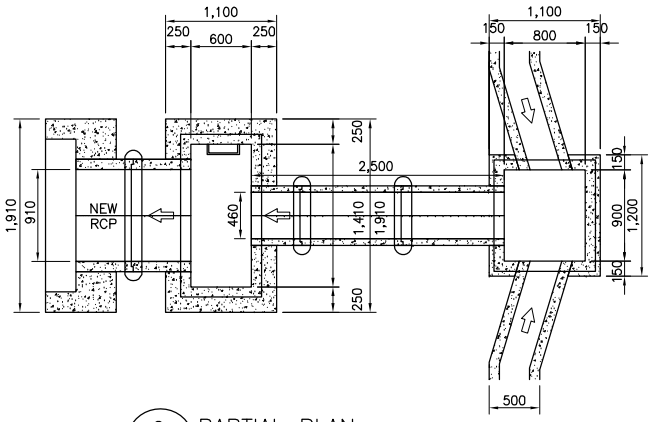
BQ No.	Name of Item	Unit	Qty.
5.22/1-3	**Concrete in outlets**	Cu.m.	
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	87.68
	Formwork F2 (for Small Sized Structure)	sq.m.	414.19
	Staging/Scaffolding Work	Sq.m.	359.19
	Supporting/Scaffolding Work	Cu.m.	29.00
5.22/16	**Concrete in U-Ditches**	Cu.m.	8.83
	Concrete Work for Reinforced Concrete, Class-A, Manpower Placing	Cu.m.	8.83
	Formwork F2 (for Small Sized Structure)	sq.m.	66.94
5.22/2	**Concrete for pipe bedding**	Cu.m.	22.17
	Concrete Work for Massive Concrete, Class-B, Manpower Placing	Cu.m.	22.17
	Formwork F2 (for Small Sized Structure)	sq.m.	80.46
5.23/1	**Levelling concrete**	Cu.m.	28.42
	Concrete Work for Leveling Concrete, Class-F, Concrete Pump Placing	Cu.m.	28.42
	Formwork for Leveling Concrete, Class-F	Sq.m.	77.85
BILL No. 8 - DRAINAGE			
8.4/9	**Unreinforced concfrete pipe - 200mm dia.**		
	Installation of CDP, 200mm (10") Dia.	L.m.	0.00
	Cement Mortar (1:2) for Joint Collar of CDP	Cu.m.	0.00
8.4/12	**Unreinforced concrete pipe - 250mm dia.**		
	Installation of CDP, 250mm (10") Dia.	L.m.	1.00
	Cement Mortar (1:2) for Joint Collar of CDP	Cu.m.	0.01
8.4/1	**Reinforced concrete pipe – 300 mm dia.**		
	Installation of RC Pipe Culvert, 300mm (12") Dia.	L.m.	24.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.47
8.4/2	**Reinforced concrete pipe – 460 mm dia.**		
	Installation of RC Pipe Culvert, 460mm (18") Dia.	L.m.	60.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	1.39
8.4/4	**Reinforced concrete pipe – 610 mm dia.**		
	Installation of RC Pipe Culvert, 610mm (24") Dia.	L.m.	8.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.19
8.4/5	**Reinforced concrete pipe – 760 mm dia.**		
	Installation of RC Pipe Culvert, 760mm (30") Dia.	L.m.	12.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	0.33
8.4/6	**Reinforced concrete pipe – 910 mm dia.**		
	Installation of RC Pipe Culvert, 910mm (36") Dia.	L.m.	257.00
	Cement Mortar (1:2) for Joint Collar of RC Pipe Culvert	Cu.m.	12.89
8.9/2	**PVC drainage pipes - 100mm dia.**		
	Installation of PVC Pipe, 100mm (4") Dia. X 6m	ea	20.00
	Coupling for PVC Joint	ea	8.00
8.9/3	**PVC drainage pipes - 150mm dia.**		
	Installation of PVC Pipe, 150mm (6") Dia. X 6m	ea	23.00
	Coupling for PVC Joint	ea	12.00
8.9/4	**PVC drainage pipes - 200mm dia.**		
	Installation of PVC Pipe, 200mm (8") Dia. X 6m	ea	19.00
	Coupling for PVC Joint	ea	13.00
8.9/5	**PVC drainage pipes - 250mm dia.**		
	Installation of PVC Pipe, 250mm (10") Dia. X 6m	ea	3.00
	Coupling for PVC Joint	ea	2.00
8.9/6	**PVC drainage pipes – 300 mm dia.**		
	Installation of PVC Pipe, 250mm (10") Dia. X 6m	ea	3.00
	Coupling for PVC Joint	ea	2.00
8.10/1	**Galvanised iron drainage pipes – 100 mm dia.**		
	Installation of Steel Pipe, 100mm Dia. X 6m	ea	1.00
8.10/2	**Galvanised iron drainage pipes – 150 mm dia.**		
	Installation of Steel Pipe, 150mm Dia. X 6m	ea	1.00
8.10/3	**Galvanised iron drainage pipes – 200 mm dia.**		
	Installation of Steel Pipe, 150mm Dia. X 6m	ea	0.00
8.10/4	**Galvanised iron drainage pipes – 300 mm dia.**		
	Installation of Steel Pipe, 200mm Dia. X 6m	ea	1.00
8.6/1	**FRP flap gate – 300 mm**	Set	
	Installation of Flap Gate for 300mm (12") Dia. Pipe	Set	1.00
8.6/2	**FRP flap gate – 910 mm**	Set	
	Installation of Flap Gate for 910mm (36") Dia. Pipe	Set	33.00

QUANTITIES OF MANHOLE

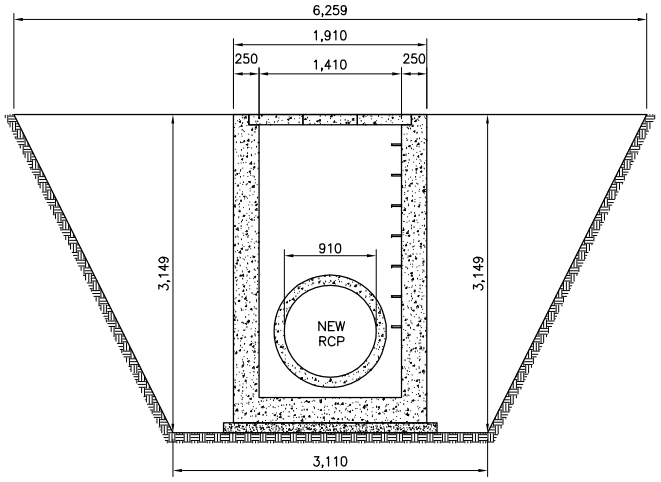
Manhole No.: MR 68

Location: 8 + 242

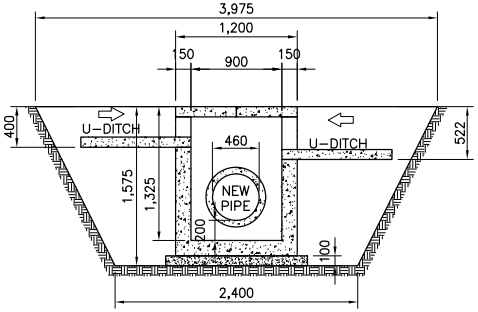
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=3.15 A2=14.65 A3=1.86 A4=4.44	4.68 4.68 3.19 3.19	14.73 68.64 5.93 14.16 **103.46**	20.09 m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Lev. Concrete (Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
4. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
3. Bottom Slab (Junction Box)	W=1.10 L=1.20	1.32	0.15	**0.20**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91 Win=0.60 Lin=1.41	Aout=2.10 Ain=0.85 Anet=1.26	2.799	3.513	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.71	0.25	0.18	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.09**	m^3
4. Wall					
Junction Box	Wout=1.10 Lout=1.20 Win=0.80 Lin=.90	Aout=1.32 Ain=0.72 Anet=0.60	1.325	0.795	m^3
Minus					
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.52	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.69**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
5. Conc. Cover (Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=9	0.000201062		0.000120637 0.95 **8.52**	m^3 kg/pc kg
6. Ladder Rung (Junction Box)	L=0.60 Dia=.016m Qty=4	0.000201062		0.000120637 0.95 **3.79**	m^3 kg/pc kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.08 Win=1.51 Lin=1.21 DiaD=1.11	Ain=3.98 Aout=1.83 Apipe=.97	0.7 0.3 0.4	2.79 0.55 0.39 **1.85**	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. New Pipe	Dia=.460m	L=2.50		**3**	pc
11. Conc. Collar (New Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=2	**0.064985729**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (New Pipe)	Dia=.590m	L=2.10		**0.1239**	m3
14. Backfill		3.209		**86.22**	m3



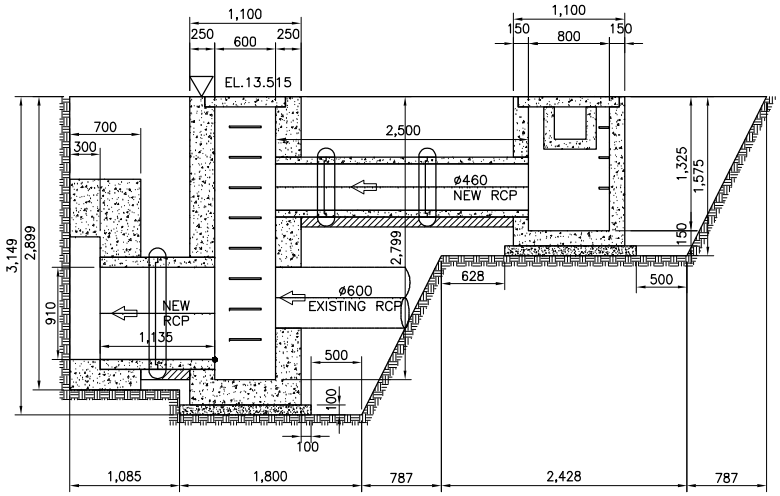
2 PARTIAL PLAN
SCALE B



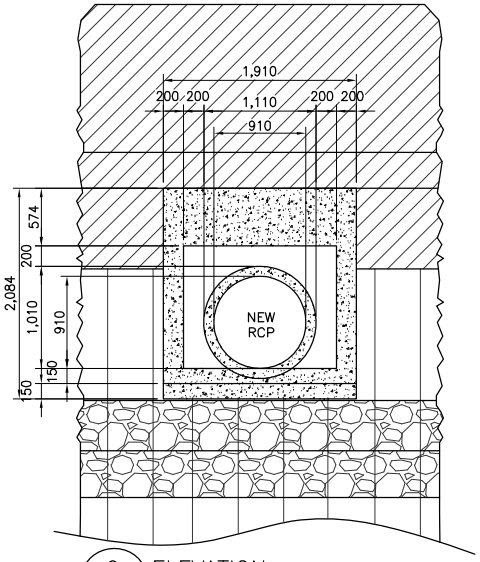
4 SECTION (MR68)
SCALE B



5 SECTION(JB68)
SCALE B



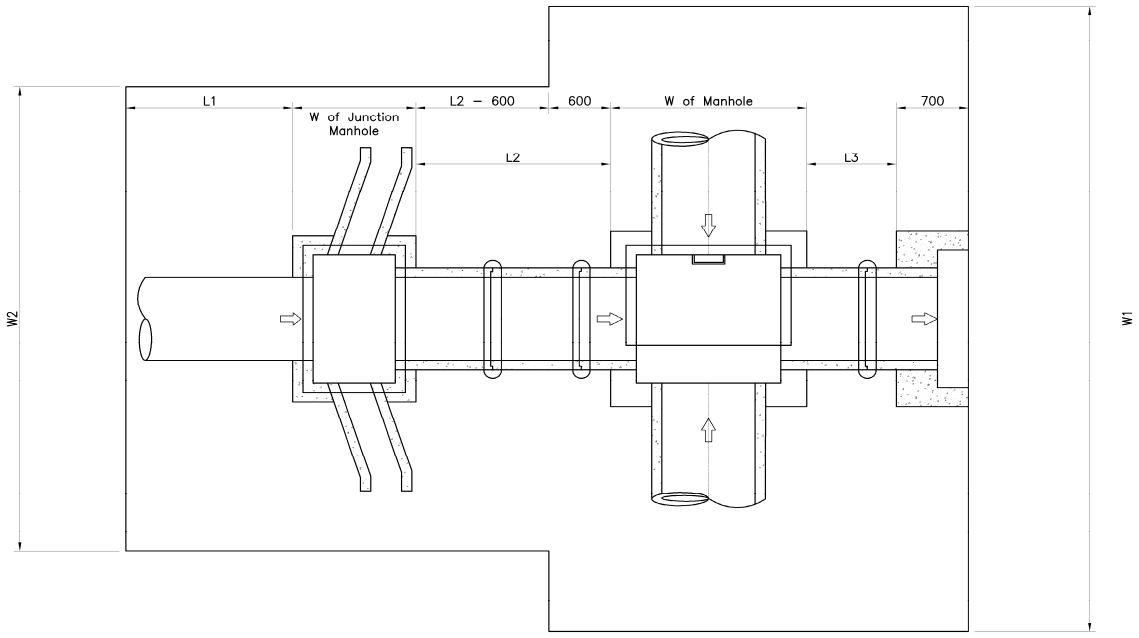
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 68)

L1	1.4125 m	
W of Junction Manhole	1.1 m	Am=18.06 m^2
L2	2.1 m	Ajb=16.15 m^2
W of Manhole	1.1 m	**At=34.21** m^2
L3	0.485 m	
W1	6.259 m	
W2	4.025 m	

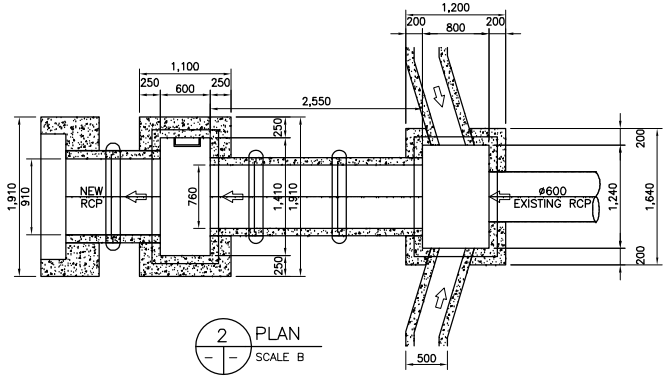


QUANTITIES OF MANHOLE

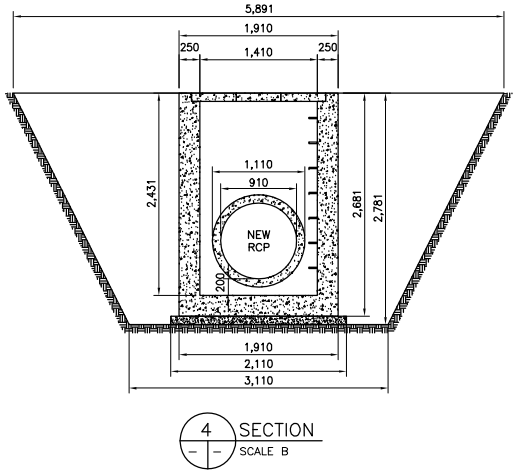
Manhole No.: MR 69

Location: 8 + 350

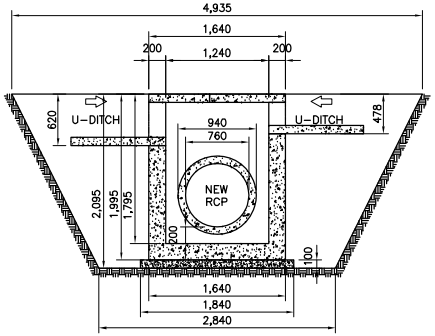
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=2.75 A2=5.01 A3=2.50 A4=5.08	4.47 4.47 3.89 3.89	12.27 22.37 9.71 19.74 **64.10**	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Lev. Concrete (Junction Box)	W=1.50 L=1.94	2.91	0.1	**0.29**	m^3
4. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
3. Bottom Slab (Junction Box)	W=1.30 L=1.74	2.26	0.25	**0.57**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91 Win=0.60 Lin=1.41	Aout=2.10 Ain=0.85 Anet=1.26	2.431	3.051	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.94	0.69	0.25	0.17	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.64**	m^3
4. Wall					
Junction Box	Wout=1.30 Lout=1.40 Win=0.80 Lin=.90	Aout=1.82 Ain=0.72 Anet=1.10	1.795	1.975	m^3
Minus					
Depth of Ditch=0.48	W=0.50	0.24	0.25	0.04	
Pipe hole on Wall B	DiaB=0.75	0.44	0.25	0.07	
Depth of Ditch=0.62	W=0.50	0.31	0.25	0.05	
Pipe hole on Wall D	DiaD=0.94	0.69	0.25	0.10	
Net Wall Vol.				**1.72**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
5. Conc. Cover (Junction Box)	L=1.44 W=1.00	1.44	0.1	**0.14**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=8	0.000201062		0.000120637 0.95 **7.58**	m^3 kg/pc kg
6. Ladder Rung (Junction Box)	L=0.60 Dia=.016m Qty=5	0.000201062		0.000120637 0.95 **4.74**	m^3 kg/pc kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71 Win=1.51 Lin=1.21 DiaD=1.11	Ain=3.27 Aout=1.83 Apipe=.97	0.7 0.3 0.4	2.29 0.55 0.39 **1.35**	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. New Pipe	Dia=.760m	L=2.60		**3**	pc
11. Conc. Collar (New Pipe)	D1=.936m D2=1.116m	A1=0.69 A2=0.98 Anet=0.29	0.17 Qty=2	**0.098632186**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (New Pipe)	Dia=.936m	L=2.10		**0.19656**	m3
14. Backfill		3.212		**53.42**	m3



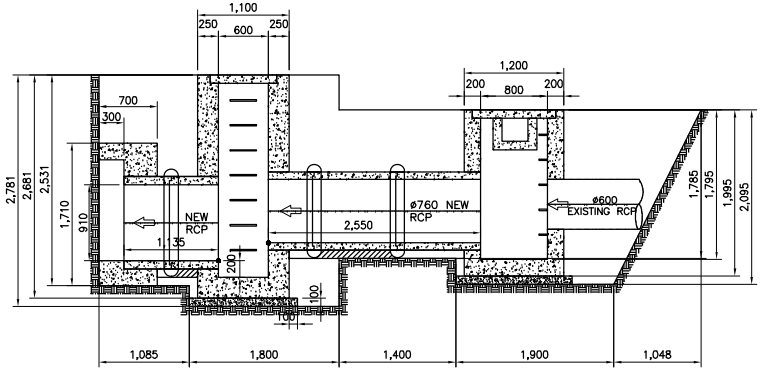
2 PLAN
SCALE B



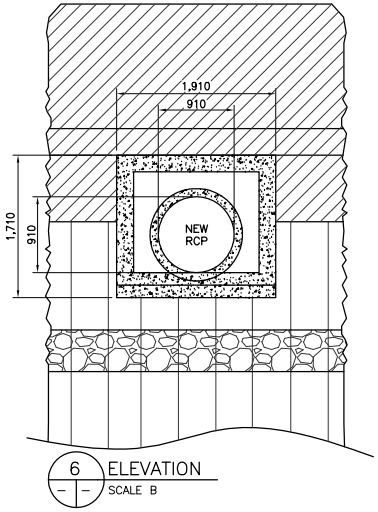
4 SECTION
SCALE B



5 SECTION(JB69)
SCALE A



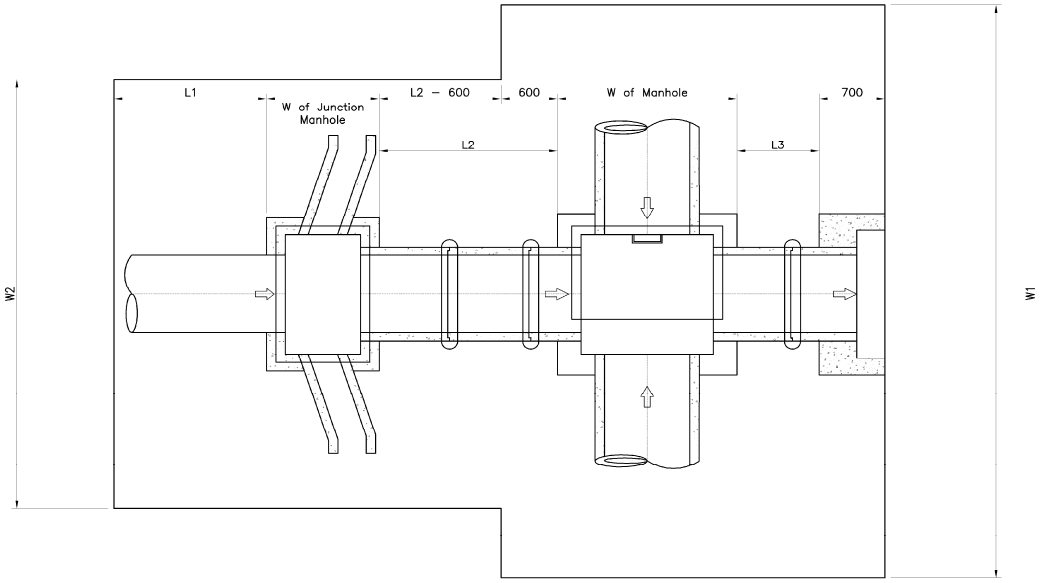
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 69)

L1	1.6725	m	
W of Junction Manhole	1.3	m	Am=17.00 m^2
L2	2.1	m	Ajb=22.30 m^2
W of Manhole	1.1	m	**At=39.29** m^2
L3	0.485	m	
W1	5.891	m	
W2	4.985	m	

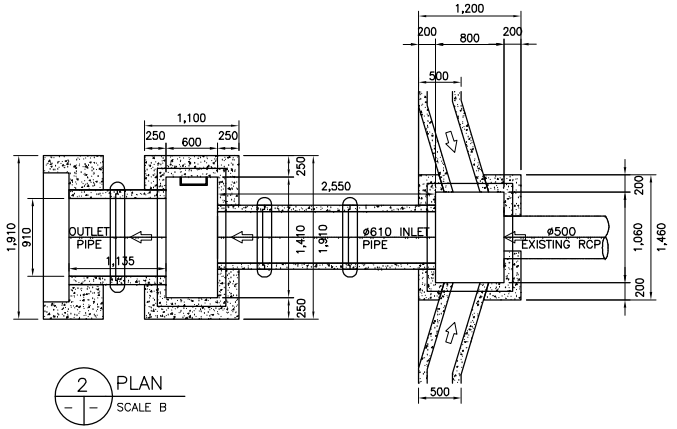


QUANTITIES OF MANHOLE

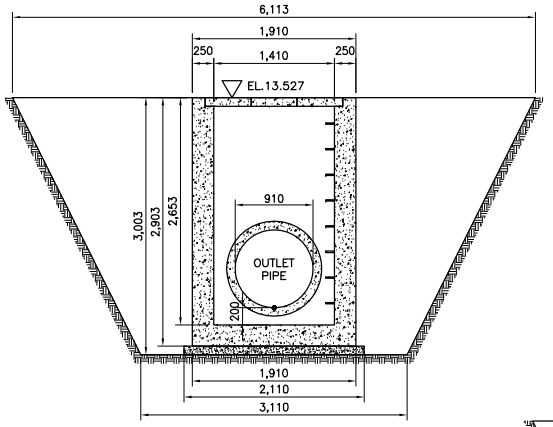
Manhole No.: MR 70

Location: 8 + 436

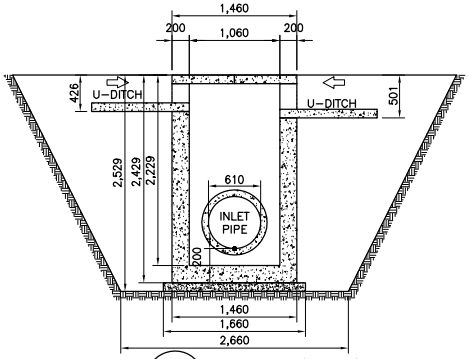
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.99	4.61	13.77	
		A2=5.23	4.61	24.10	
		A3=3.09	3.92	12.11	
		A4=6.40	3.92	25.14	
				75.12	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.50	2.64	0.1	**0.26**	m^3
	L=1.76				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.30	2.03	0.25	**0.51**	m^3
	L=1.56				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.653	3.330	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.97**	m^3
Junction Box	Wout=1.30	Aout=2.03			
	Lout=1.56				
	Win=0.80	Ain=0.85	2.229	2.630	m^3
	Lin=1.06				
		Anet=1.18			
Minus					
Depth of Ditch=0.43	W=0.50	0.21	0.20	0.03	
Pipe hole on Wall B	DiaB=0.64	0.32	0.20	0.05	
Depth of Ditch=0.50	W=0.50	0.25	0.20	0.04	
Pipe hole on Wall D	DiaD=0.76	0.45	0.20	0.07	
Net Wall Vol.				**2.44**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.26	1.26	0.1	**0.13**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.68	0.7	2.58	
	Lout=1.93				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.64	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.610m	L=2.60		**3**	pc
11. Conc. Collar	D1=.760m	A1=0.45	0.17		
(Inlet Pipe)	D2=.940m	A2=0.69		**0.081712825**	m3
		Anet=0.24	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.760m	L=2.10		**0.1596**	m3
(Inlet Pipe)					
14. Backfill		3.215		**62.60**	m3



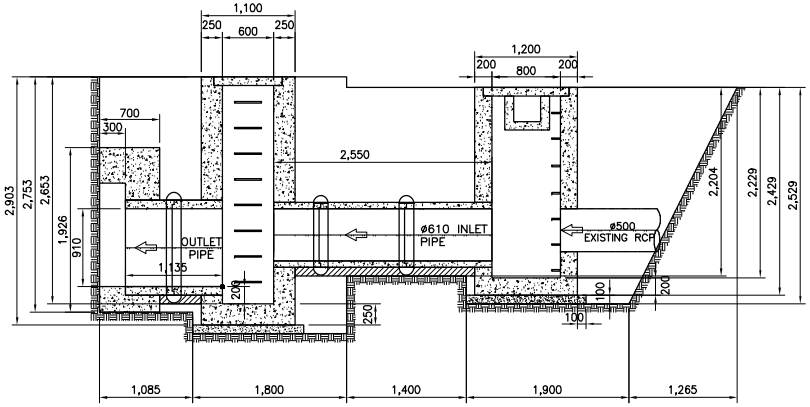
2 PLAN
SCALE B



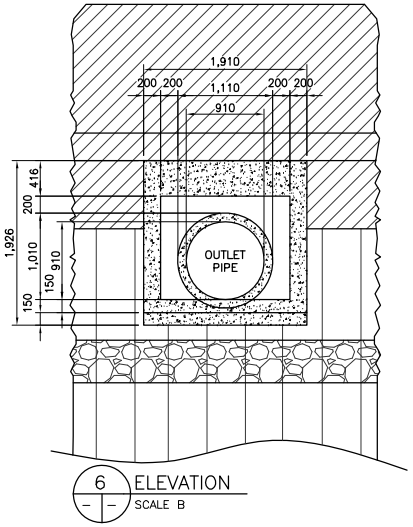
4 SECTION
SCALE B



5 SECTION (JB70)
SCALE B



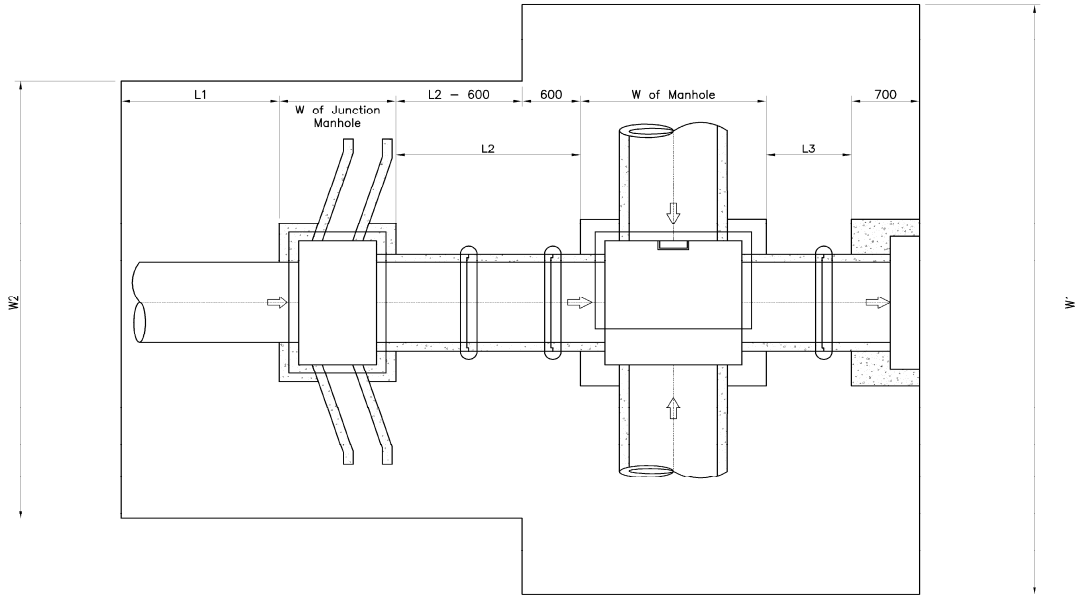
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 70)

L1	1.8895 m	
W of Junction Manhole	1.3 m	Am=17.64 m^2
L2	2.1 m	Ajb=24.57 m^2
W of Manhole	1.1 m	**At=42.20** m^2
L3	0.485 m	
W1	6.113 m	
W2	5.239 m	

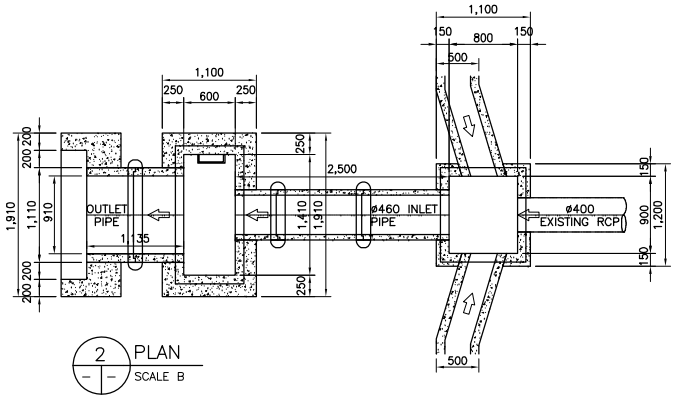


QUANTITIES OF MANHOLE

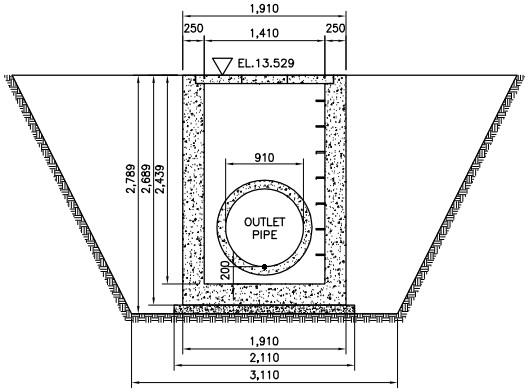
Manhole No.: MR 70A

Location: 8 + 487

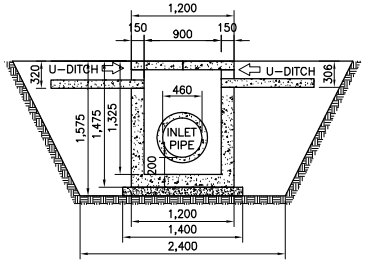
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.75	4.50	12.41	
		A2=5.02	4.50	22.61	
		A3=1.83	3.19	5.82	
		A4=3.46	3.19	11.01	
				51.86	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.439	3.061	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.75**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.325	0.795	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.31	W=0.50	0.15	0.15	0.02	
Pipe hole on Wall B	DiaB=0.53	0.22	0.15	0.03	
Depth of Ditch=0.32	W=0.50	0.16	0.15	0.02	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.67**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.460m	L=2.50		**3**	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=2	**0.064985729**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=2.50		**0.1475**	m3



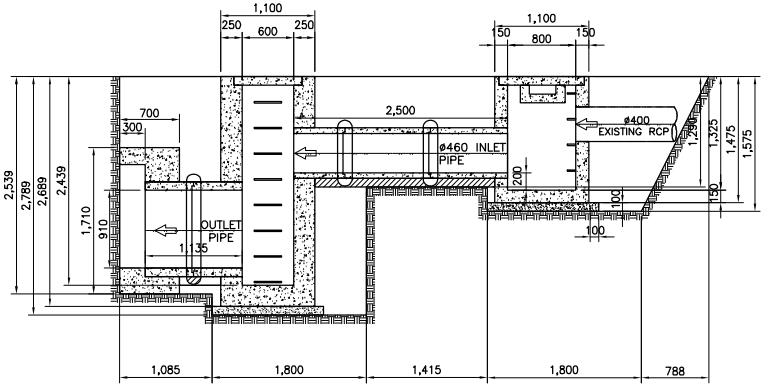
2 PLAN
SCALE B

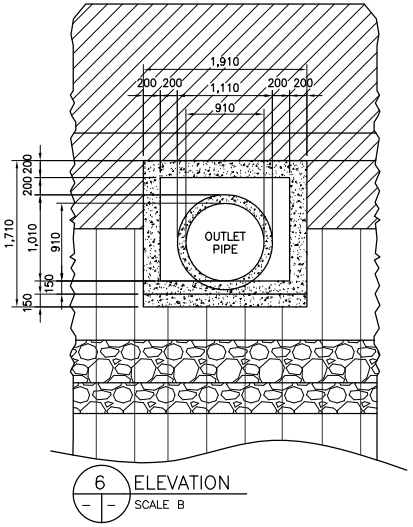


4 SECTION
SCALE B



5 SECTION (JB70A)
SCALE B

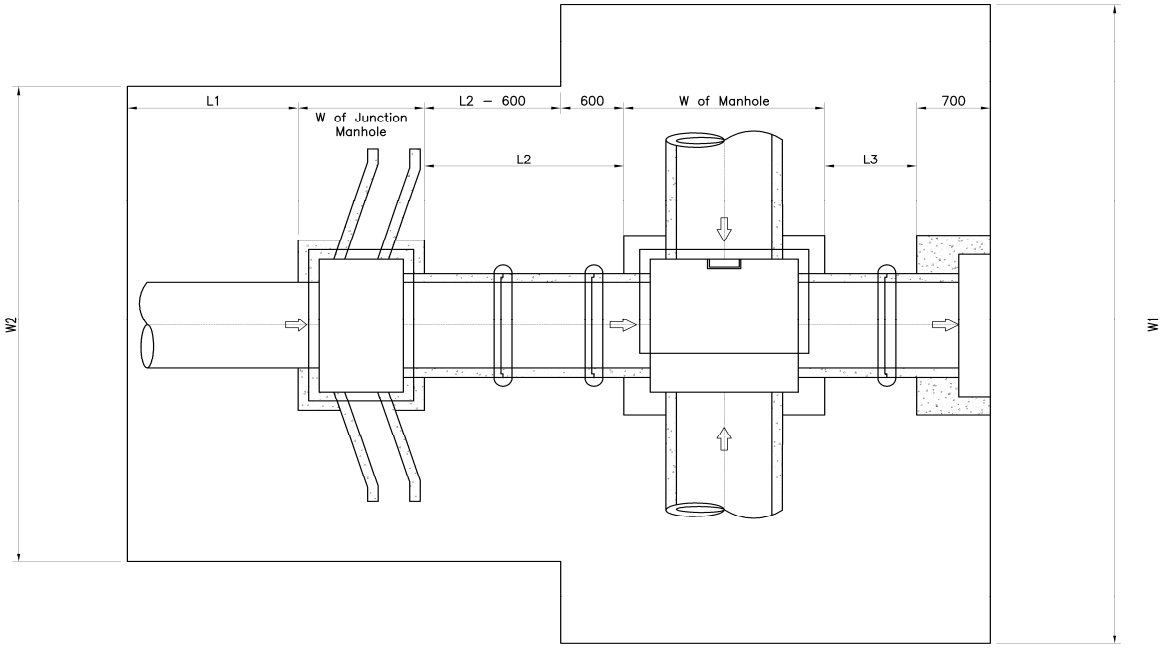




6 ELEVATION
SCALE B

Clearing (Manhole 70A)

L1	1.4125 m	
W of Junction Manhole	1.1 m	Am=17.02 m^2
L2	2.1 m	Ajb=16.15 m^2
W of Manhole	1.1 m	**At=33.17** m^2
L3	0.485 m	
W1	5.899 m	
W2	4.025 m	

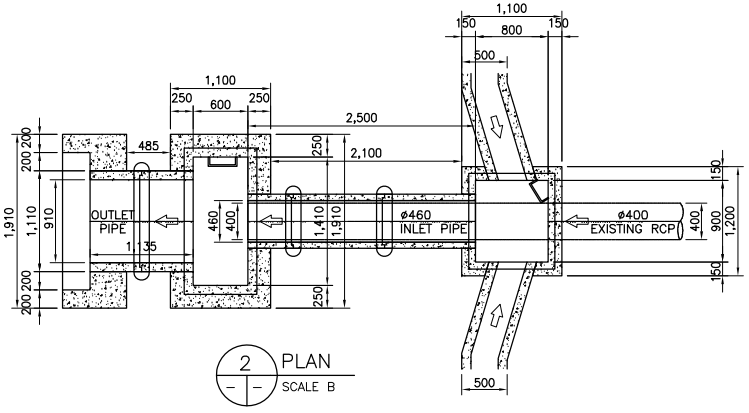


QUANTITIES OF MANHOLE

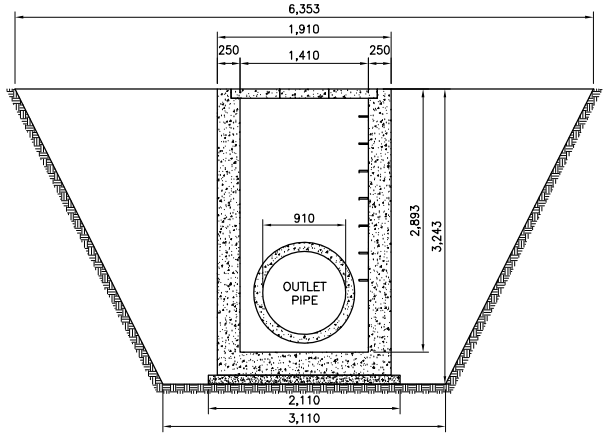
Manhole No.: MR 70A.2

Location: 8 + 528

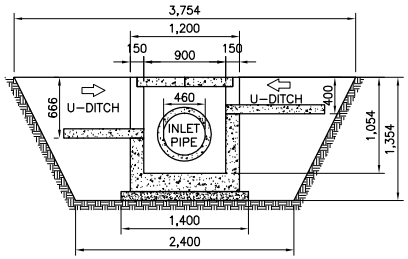
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.25	4.73	15.37	
		A2=5.84	4.73	27.62	
		A3=1.70	3.08	5.24	
		A4=3.74	3.08	11.50	
				59.72	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.893	3.631	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.40	0.25	0.10	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.29**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.054	0.632	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall B	DiaB=0.53	0.22	0.15	0.03	
Depth of Ditch=0.67	W=0.50	0.33	0.15	0.05	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.48**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.16	Ain=4.13	0.7	2.89	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.95	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.460m	L=2.50		**3**	pc
12. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=2	**0.064985729**	m3
13. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
14. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=2.10		**0.1239**	m3
15. Backfill				**49.77**	m3



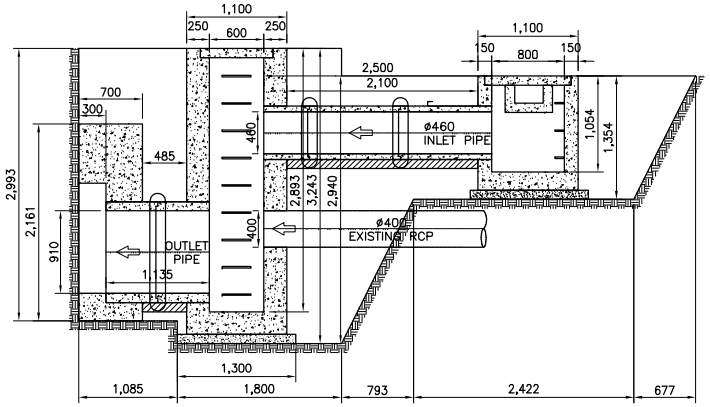
2 PLAN
SCALE B



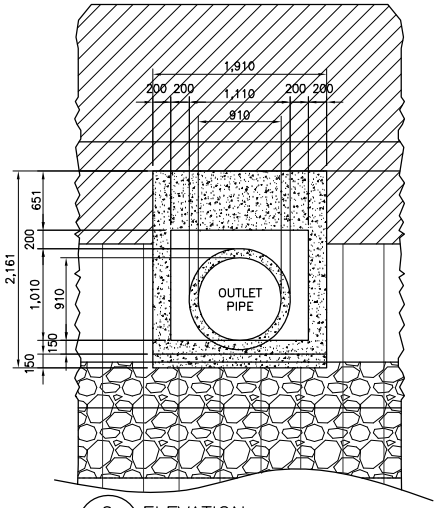
4 SECTION (MR70A.2)
SCALE B



5 SECTION (JB70A.2)
SCALE B



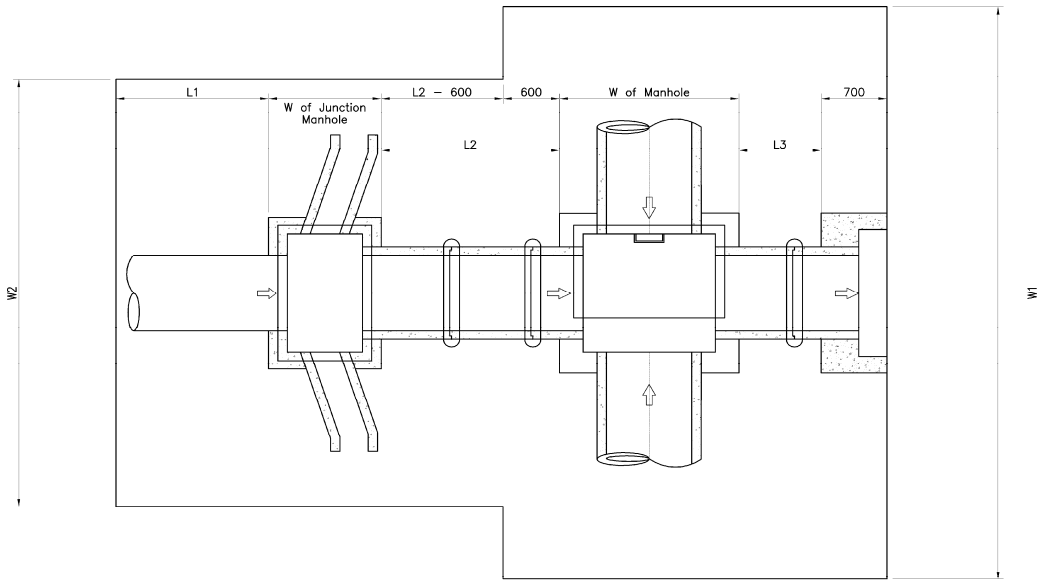
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 70A.2)

L1	1.277	m	
W of Junction Manhole	1.1	m	Am=18.33 m^2
L2	2.1	m	Ajb=14.55 m^2
W of Manhole	1.1	m	**At=32.88** m^2
L3	0.485	m	
W1	6.353	m	
W2	3.754	m	

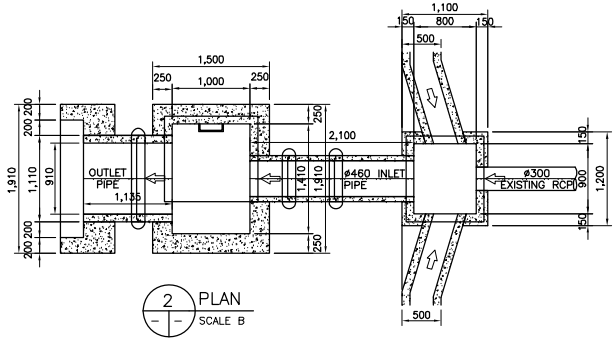


QUANTITIES OF MANHOLE

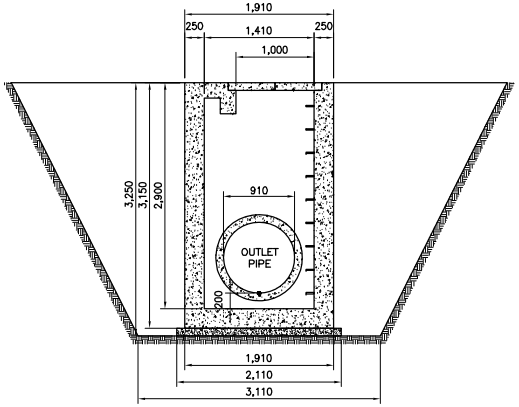
Manhole No.: MR 70C

Location: 11 + 138

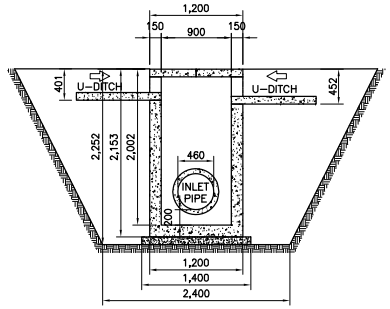
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=3.26 A2=7.15 A3=2.00 A4=5.32	4.74 4.74 3.53 3.53	15.41 33.86 7.04 18.76 **75.07**	m^3
2. Lev. Concrete (Manhole)	W=1.70 L=2.11	3.59	0.1	**0.36**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.50 L=1.91	2.87	0.25	**0.72**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.50 Lout=1.91 Win=1.00 Lin=1.41	Aout=2.87 Ain=1.41 Anet=1.46	2.900	4.220	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.91**	m^3
Junction Box	Wout=1.10 Lout=1.20 Win=0.80 Lin=.90	Aout=1.32 Ain=0.72 Anet=0.60	2.002	1.201	m^3
Minus					
Depth of Ditch=0.45	W=0.50	0.23	0.15	0.03	
Pipe hole on Wall B	DiaB=0.50	0.20	0.15	0.03	
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**1.07**	m^3
5. Conc. Cover (Manhole)	L=1.10 W=1.20	1.32	0.1	**0.13**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=9	0.000201062		0.000120637 0.95 **8.52**	m^3 kg/pc kg
(Junction Box)	L=0.60 Dia=.016m Qty=6	0.000201062		0.000120637 0.95 **5.68**	m^3 kg/pc kg
7. Flapgate				1	pc
8. Conc. Mouth	Wout=1.91 Lout=2.16 Win=1.51 Lin=1.21 DiaD=1.11	Ain=4.13 Aout=1.83 Apipe=.97	0.7 0.3 0.4	2.89 0.55 0.39 **1.95**	m3
9. Outlet Pipe	Dia=.910m	L=1.14		2	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	0.057679641	m3
11. Inlet Pipe	Dia=.460m	L=2.10		3	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=2	0.064985729	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		0.053835	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=1.70		0.1003	m3
14. Backfill		3.224		**62.56**	m3



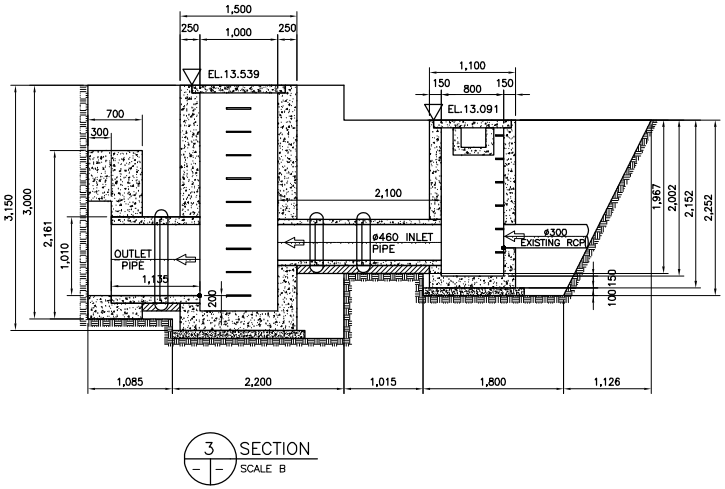
2 PLAN
SCALE B



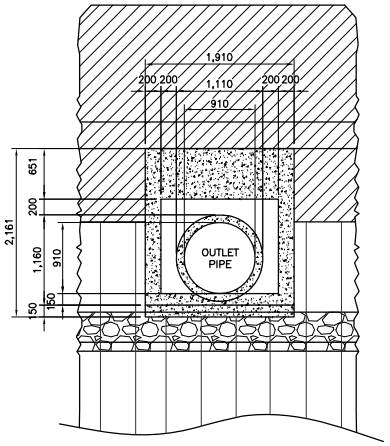
4 SECTION
SCALE B



5 SECTION (JB70C)
SCALE B



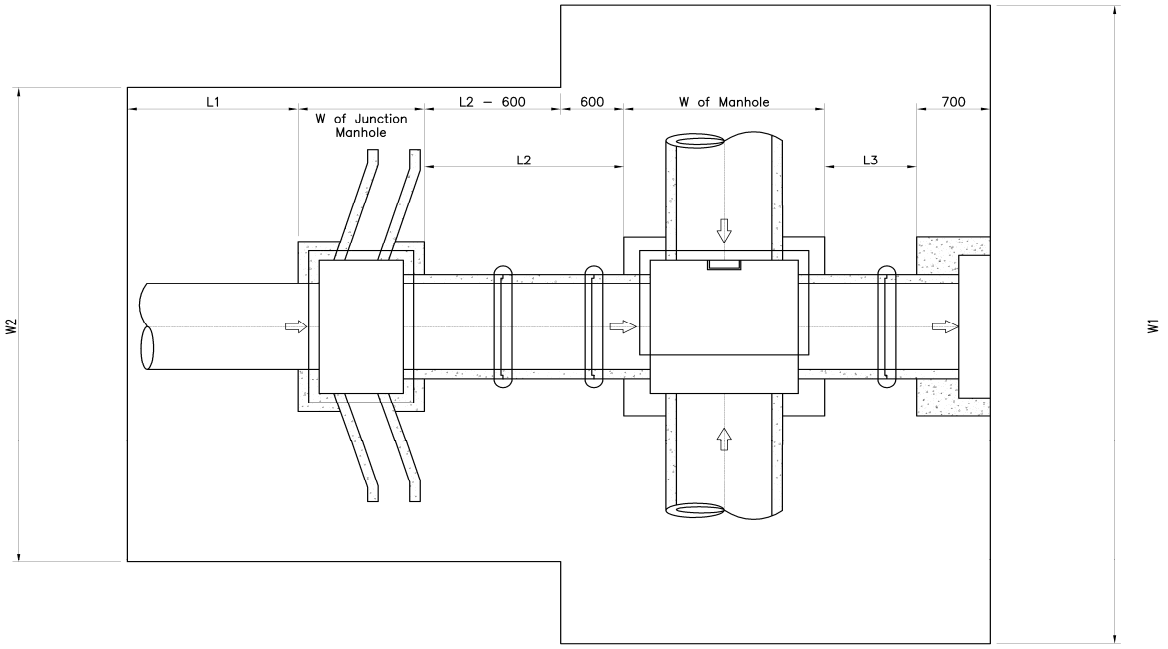
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 70C)

L1	1.751 m	
W of Junction Manhole	1.1 m	Am=20.89 m^2
L2	1.7 m	Ajb=18.58 m^2
W of Manhole	1.5 m	**At=39.47** m^2
L3	0.485 m	
W1	6.36 m	
W2	4.702 m	

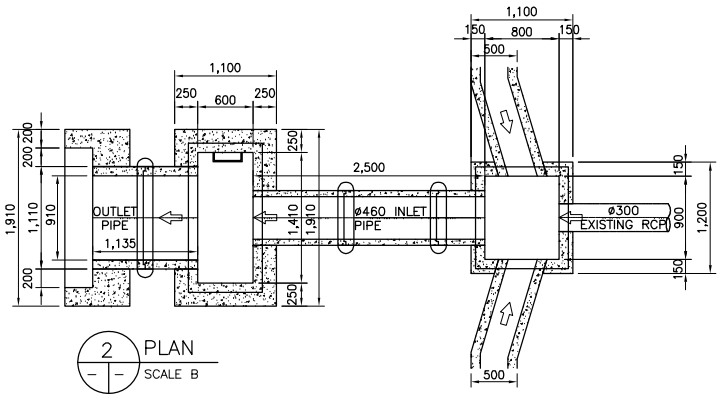


QUANTITIES OF MANHOLE

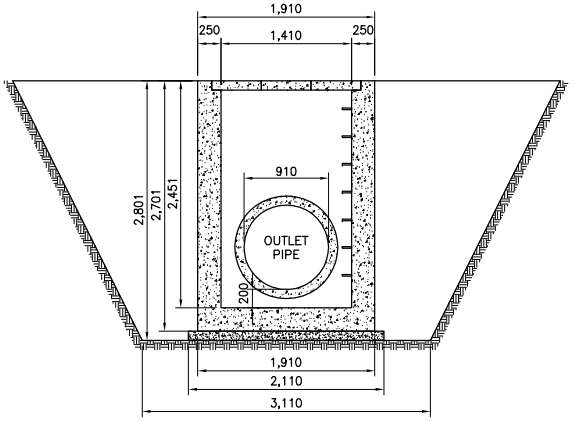
Manhole No.: MR 71

Location: 8 + 686

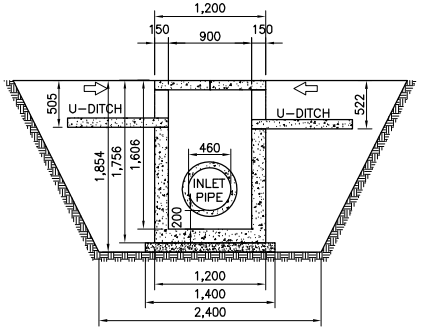
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=2.77 A2=5.04 A3=2.22 A4=4.20	4.51 4.51 3.33 3.33	12.48 22.74 7.39 13.96 **56.57**	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91 Win=0.60 Lin=1.41	Aout=2.10 Ain=0.85 Anet=1.26	2.451	3.076	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.77**	m^3
Junction Box	Wout=1.10 Lout=1.20 Win=0.80 Lin=.90	Aout=1.32 Ain=0.72 Anet=0.60	1.604	0.962	m^3
Minus					
Depth of Ditch=0.52	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall B	DiaB=0.50	0.20	0.15	0.03	
Depth of Ditch=0.51	W=0.50	0.25	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.82**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung (Manhole)	L=0.60 Dia=.016m Qty=8	0.000201062		0.000120637 0.95 **7.58**	m^3 kg/pc kg
(Junction Box)	L=0.60 Dia=.016m Qty=5	0.000201062		0.000120637 0.95 **4.74**	m^3 kg/pc kg
7. Flapgate				0	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71 Win=1.51 Lin=1.21 DiaD=1.11	Ain=3.27 Aout=1.83 Apipe=.97	0.7 0.3 0.4	2.29 0.55 0.39 **1.35**	m3
9. Outlet Pipe	Dia=.910m	L=1.14		2	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	0.057679641	m3
11. Inlet Pipe	Dia=.460m	L=2.50		3	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=2	0.064985729	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		0.053835	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=2.10		0.1239	m3
14. Backfill		~~3.227~~		**47.14**	m3



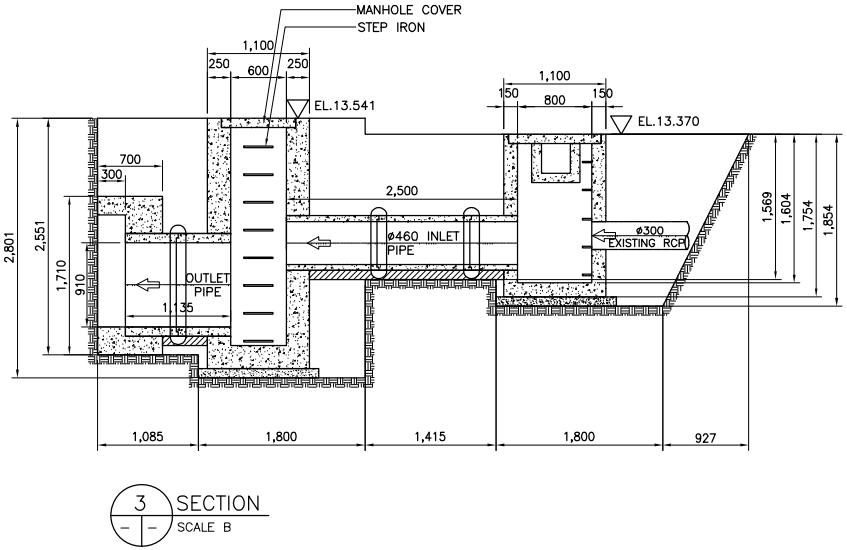
2 PLAN
SCALE B



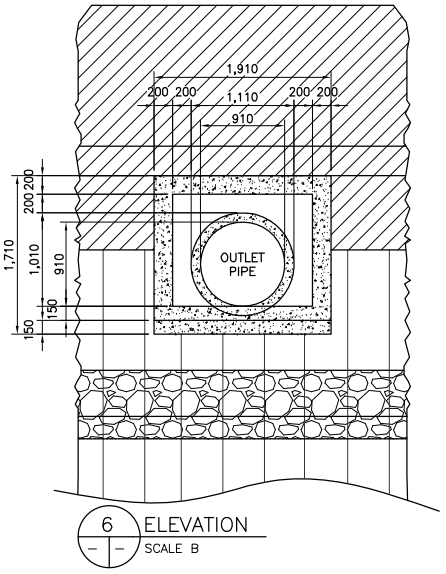
4 SECTION
SCALE B



5 SECTION(JB71)
SCALE B



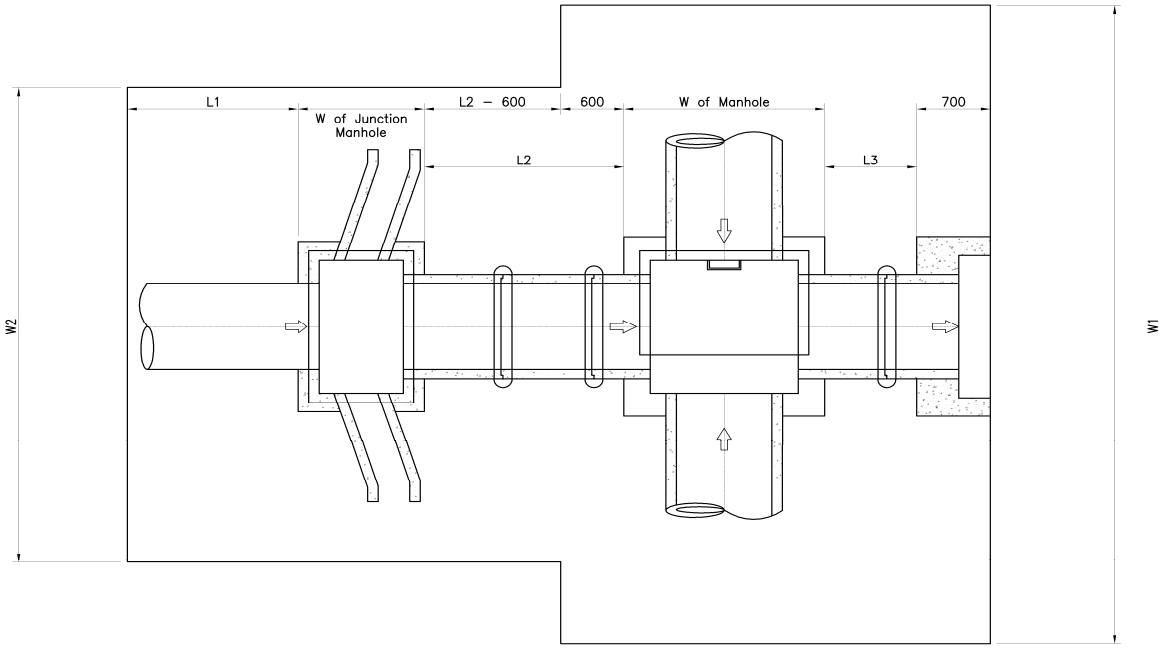
3 SECTION
SCALE B



6 ELEVATION
SCALE B

Clearing (Manhole 71)

L1	1.552 m	
W of Junction Manhole	1.1 m	Am=17.05 m^2
L2	2.1 m	Ajb=17.87 m^2
W of Manhole	1.1 m	**At=34.92** m^2
L3	0.485 m	
W1	5.911 m	
W2	4.304 m	

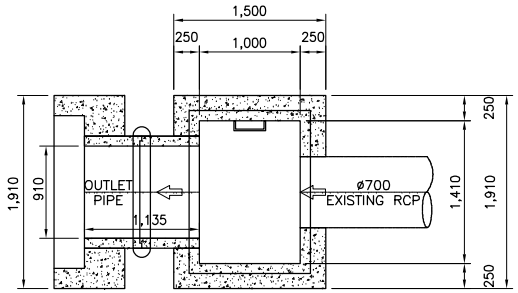


QUANTITIES OF MANHOLE

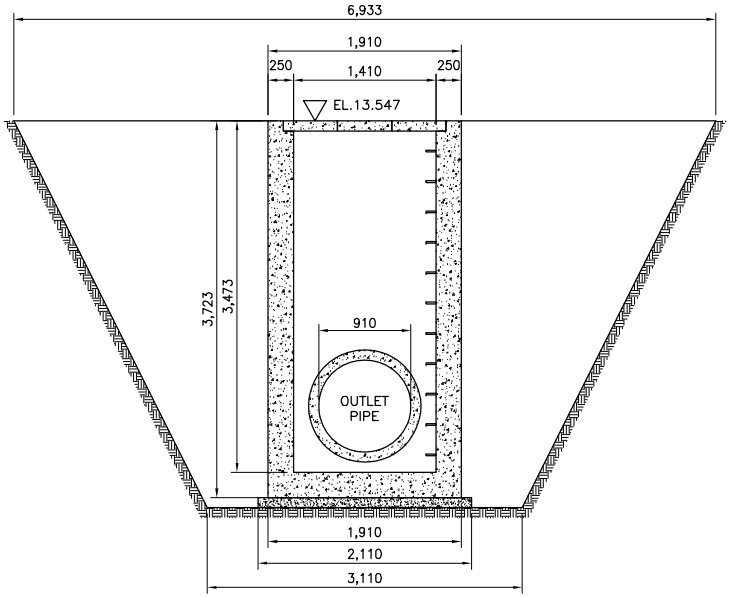
Manhole No.: MR 74A

Location: 8 + 776

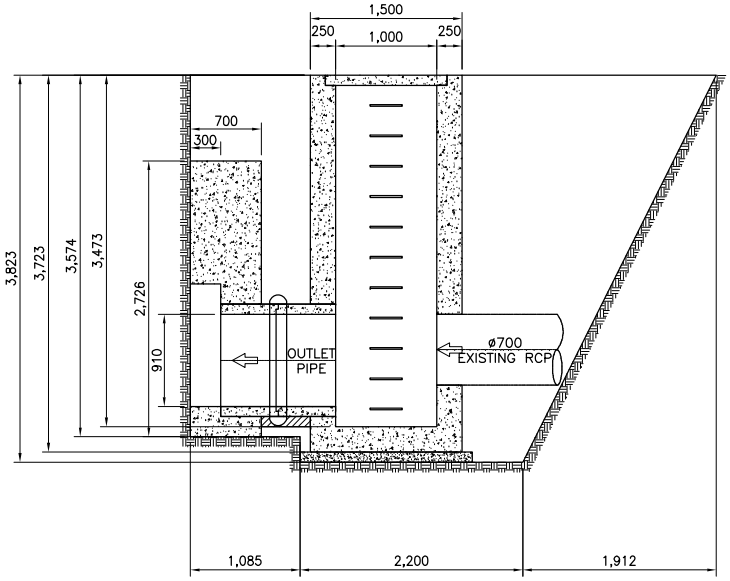
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.88	5.02	19.47	
		A2=8.41	5.02	42.23	
		A3=3.65	5.02	18.35	
				80.06	m^3
2. Lev. Concrete	W=1.70 L=2.11	3.59	0.1	**0.36**	m^3
3. Bottom Slab	W=1.50 L=1.91	2.87	0.25	**0.72**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.50 Win=1.00 Lin=1.41 .	Aout=2.25 Ain=1.41 Anet=0.84	3.473	2.917	m^3
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.88	0.60	0.25	0.15	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.52**	m^3
5. Conc. Cover	L=1.61 W=1.20	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=11			**10.42**	kg
7. Flapgate				0	pc
8. Conc. Mouth	Wout=1.91 Lout=2.73	Ain=5.21	0.7	3.64	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.71	m3
9. Outlet Pipe	Dia=.910m	L=1.14		2	pc
11. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	0.057679641	m3
12. Conc. Bedding	Dia=1.110m	L=0.49		0.053835	m3
13. Backfill				**66.72**	m3



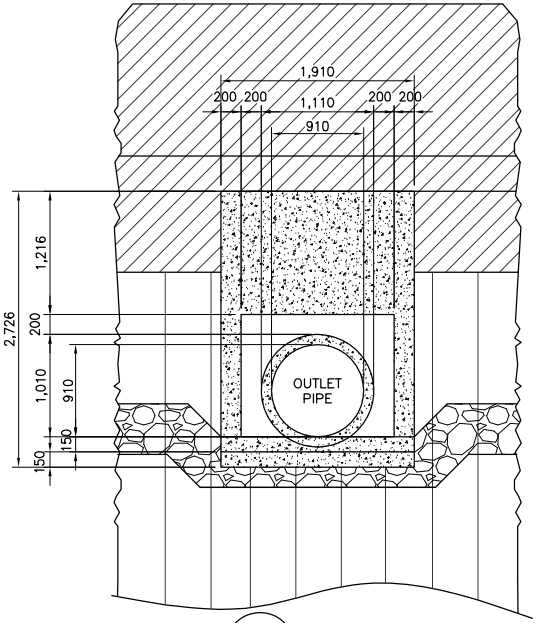
2 PLAN
SCALE B



4 SECTION
SCALE B



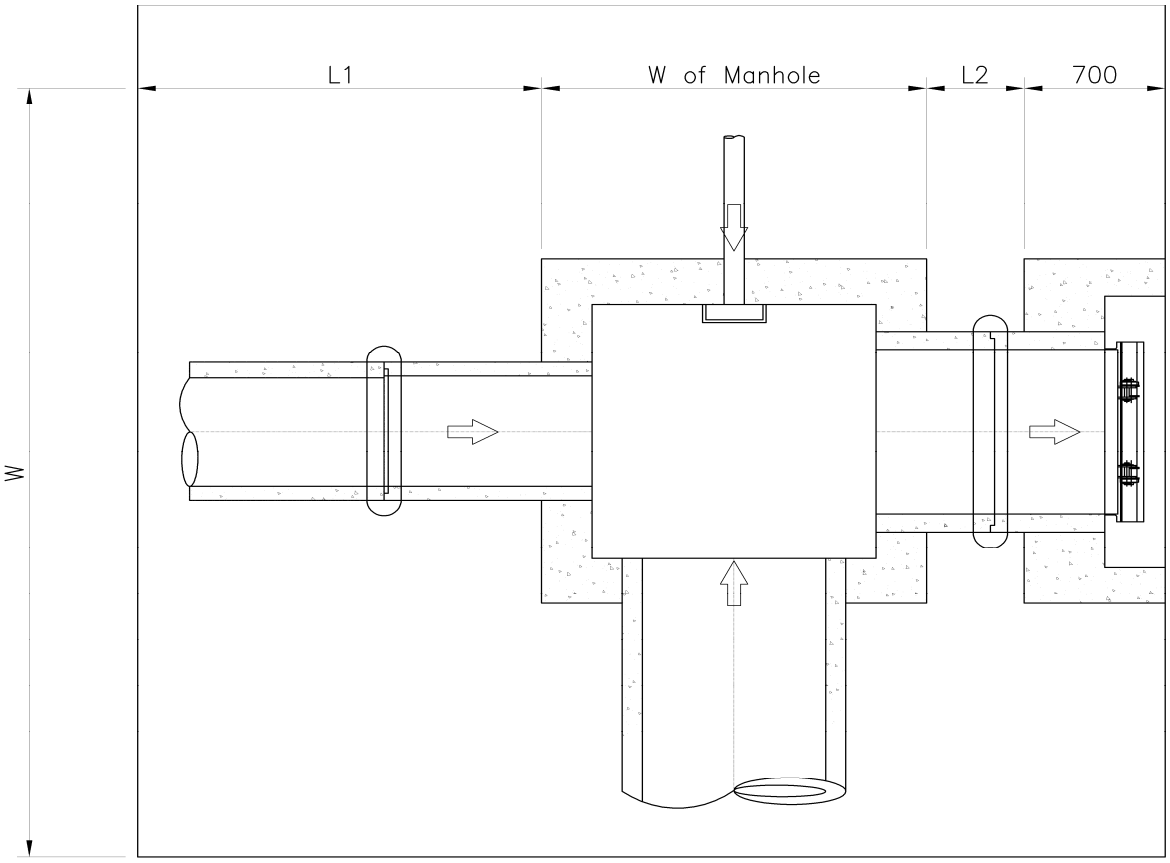
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 74A)

L1	2.5115	m	
W of Manhole	1.5	m	**A=36.03** m^2
L2	0.485	m	
W	6.933	m	

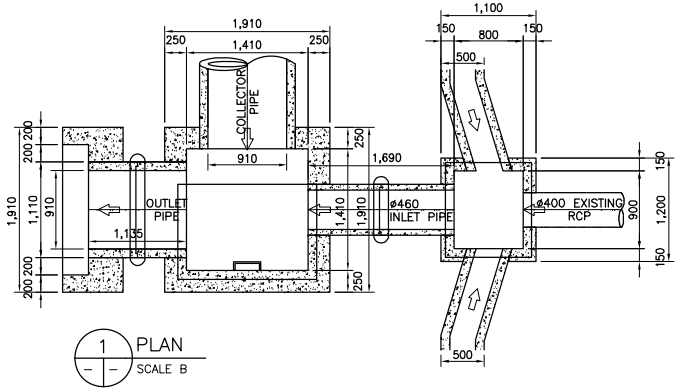


QUANTITIES OF MANHOLE

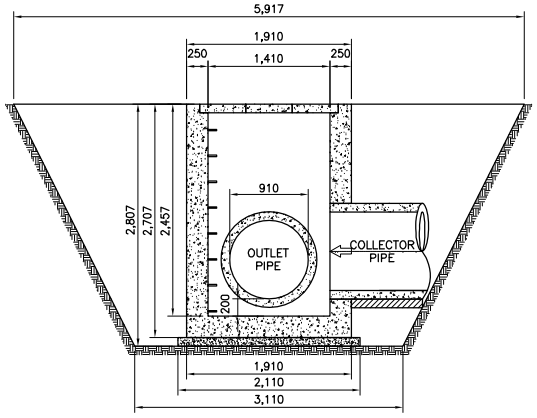
Manhole No.: MR 74A.2

Location: 8 + 805

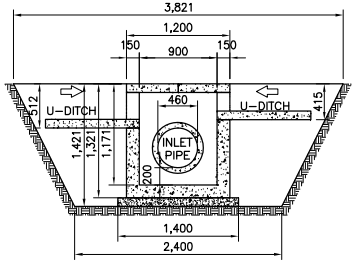
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.77	4.51	12.52	
		A2=7.33	4.51	33.07	
		A3=0.69	3.11	2.14	
		A4=3.05	3.11	9.47	
				57.20	m^3
2. Lev. Concrete (Manhole)	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.91 L=1.91	3.65	0.25	**0.91**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.91 Lout=1.91	Aout=3.65			
	Win=1.41 Lin=1.41	Ain=1.99	2.457	4.079	m^3
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.53**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.171	0.703	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.51	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall B	DiaB=0.50	0.20	0.15	0.03	
Depth of Ditch=0.42	W=0.50	0.21	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.56**	m^3
5. Conc. Cover (Manhole)	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91 Lout=1.71	Ain=3.27	0.7	2.29	
	Win=1.51 Lin=1.21	Aout=1.83	0.3	0.55	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=1	**0.032492864**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=2.10		**0.1239**	m3
14. Backfill				**47.67**	m3



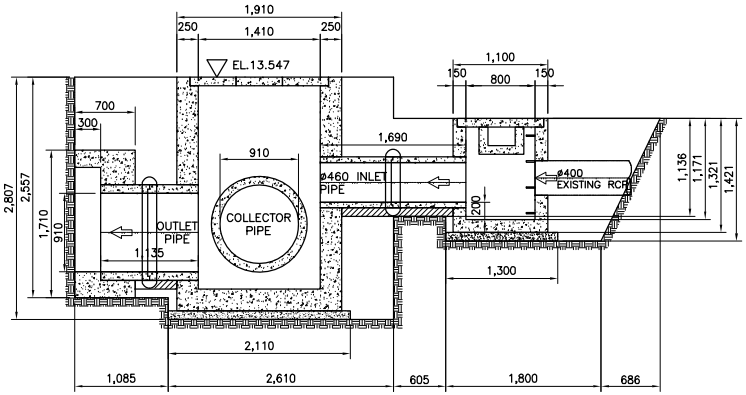
1 PLAN
SCALE B



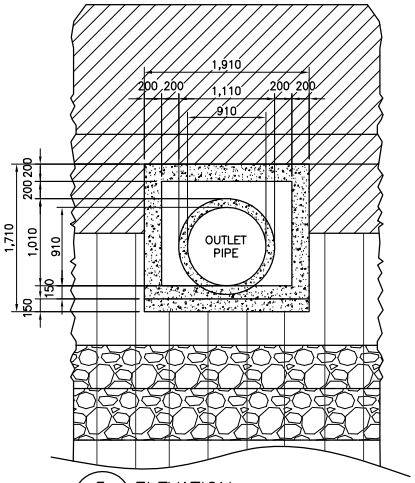
3 SECTION
SCALE A



4 SECTION(JB74A.2)
SCALE B



2 SECTION
SCALE A



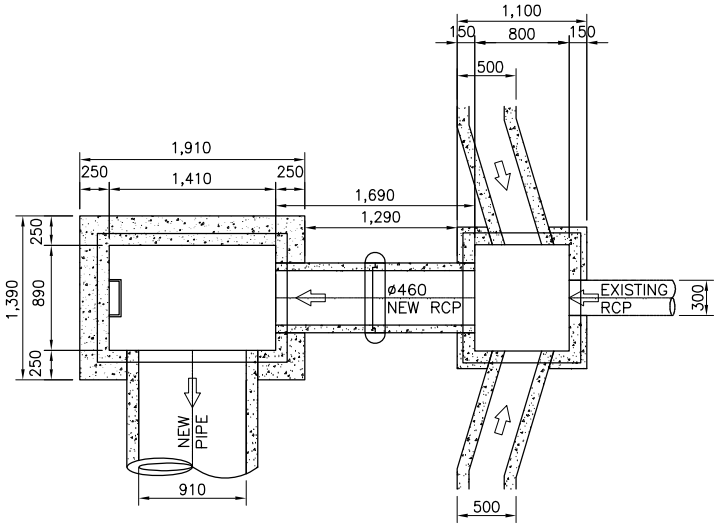
5 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

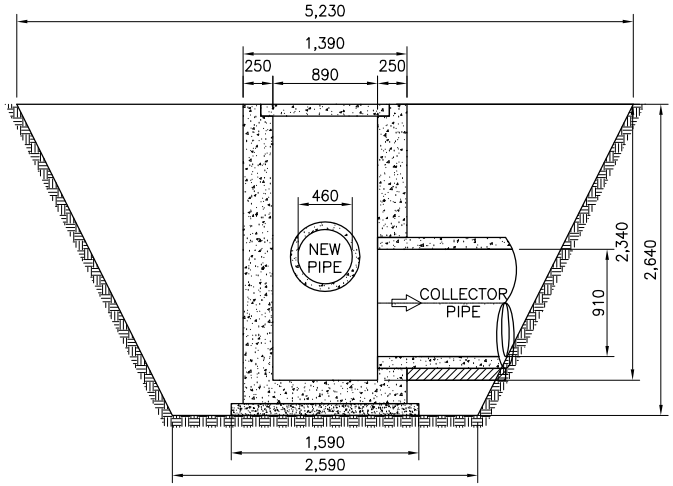
Manhole No.: MR 74A.1

Location: 8 + 758

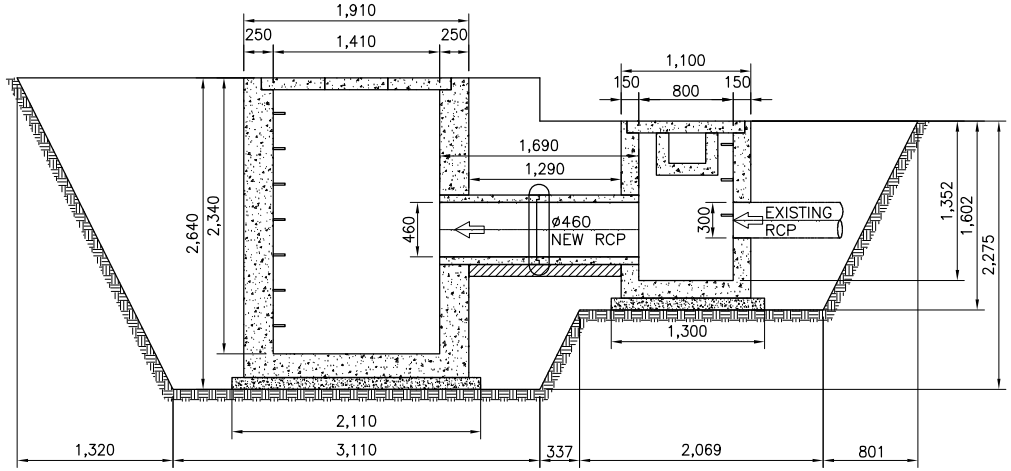
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=9.95	3.91	38.92	
		A2=0.65	3.20	2.09	
		A3=3.96	3.20	12.66	
				53.67	m^3
2. Lev. Concrete	W=2.11	3.35	0.1	**0.34**	m^3
(Manhole)	L=1.59				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	2.65	0.25	**0.66**	m^3
(Manhole)	L=1.39				
(Junction Box)	W=1.10	1.32	0.15	**0.20**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.91	Aout=2.65			
	Lout=1.39				
	Win=1.41	Ain=1.25	2.340	3.276	m^3
	Lin=.89				
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.97**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.352	0.811	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.46	W=0.50	0.23	0.15	0.03	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.69**	m^3
5. Conc. Cover	L=1.09	1.7549	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
8. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
9. Conc.Bedding	Dia=1.110m	L=1.29		**0.14319**	m3
(Inlet Pipe)					
10. Backfill				**44.73**	m3



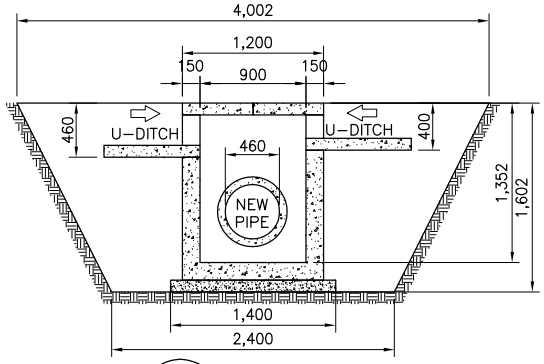
3 PARTIAL PLAN OF MANHOLE (MR74A.1)
SCALE C



5 SECTION
SCALE C



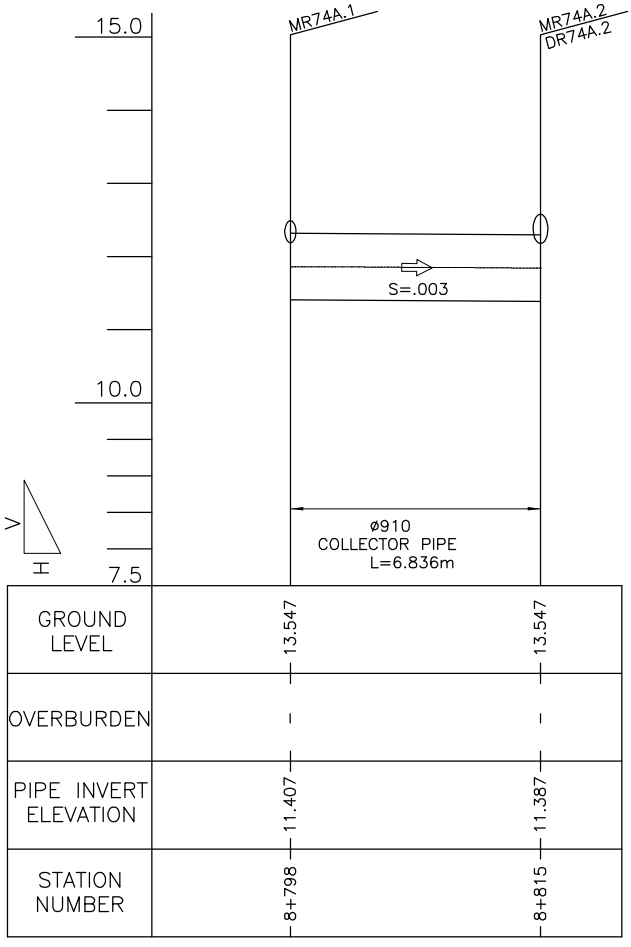
4 SECTION
SCALE C



6 SECTION(JB74A.1)
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (Rcp)	Dia=0.91		L=6.86	7	pc
2. Conc. Bedding	Dia=0.91	L=6.86	0.1	0.62	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=6	0.35	m3
4. Formworks				6.79	m^3



Clearing (Manhole 74A.2)

L1	1.3105	m	
W of Junction Manhole	1.1	m	Am=21.86 m^2
L2	1.29	m	Ajb=11.85 m^2
W of Manhole	1.91	m	**At=33.71** m^2
L3	0.485	m	
W1	5.917	m	
W2	3.821	m	

Clearing (Manhole 74A.1)

L4	1.7375	m	
W of Junction Manhole	1.1	m	Am=23.17 m^2
L5	1.29	m	Ajb=14.12 m^2
W of Manhole	1.91	m	**At=37.29** m^2
L6	1.92	m	
W3	5.23	m	
W4	4.002	m	

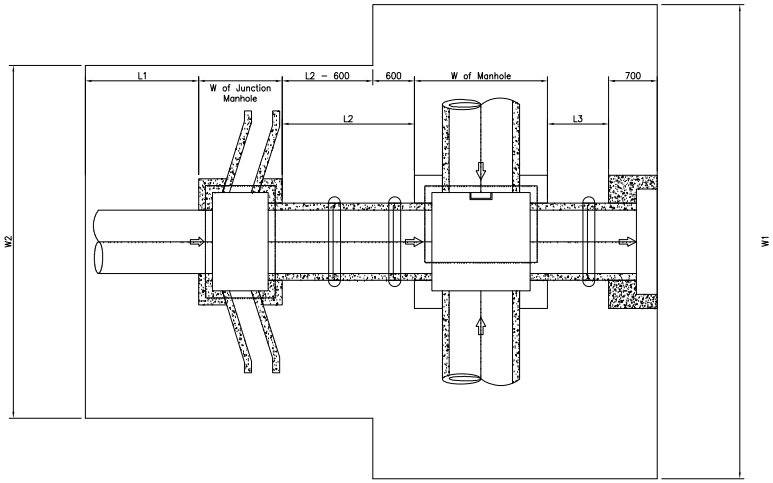
Clearing (Collector pipe 74A.1 - 74A.2)

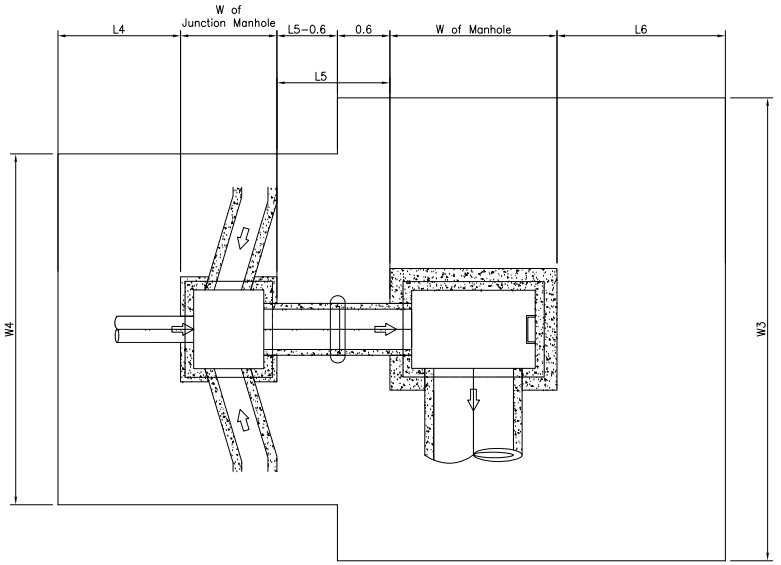
W	4.46	m	**A=30.49** m^2
L	6.836	m	

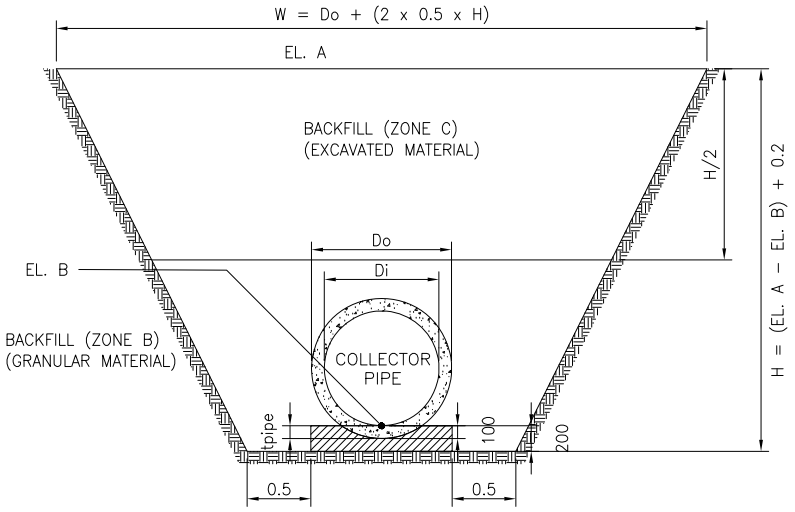
(Collector Pipe) Downstream			Excavation
Do	1.11	m	A=7.68 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.96 m^2
H	2.34	m	Backfill Zone C
EL. A	13.547	m	A=2.50 m^2
EL. B	11.407	m	
W	4.45	m	

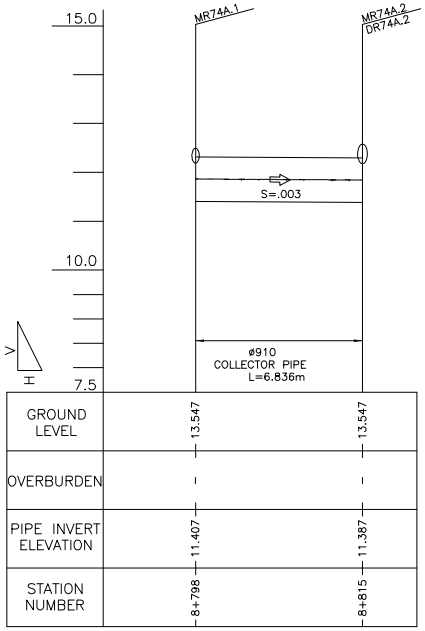
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=7.76 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.00 m^2
H	2.36	m	Backfill Zone C
EL. A	13.547	m	A=2.53 m^2
EL. B	11.387	m	
W	4.47	m	

Collector Pipe 74A.1 - 74A.2	Volume	
Excavation	**52.93087**	m^3
Backfill Zone B	**13.58**	m^3
Backfill Zone C	**17.26**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


W of Junction Manhole
L4
L5–0.6
0.6
W of Manhole
L6
L5
W4
W3


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
EL. B
Di
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
tpipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5

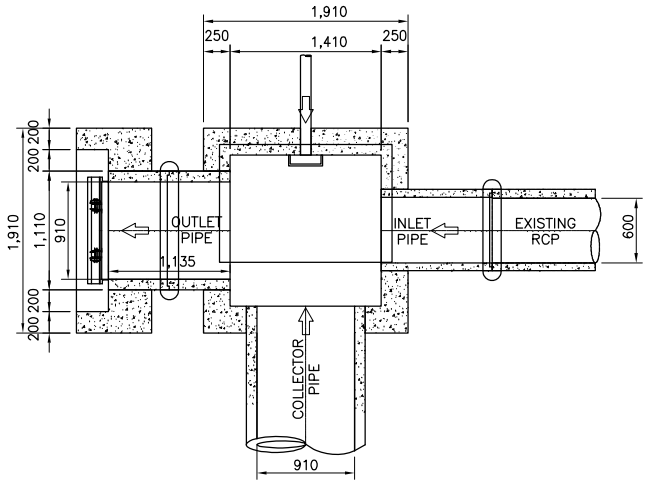

15.0
10.0
7.5
V
H
MR74A-1
MR74A-2
DR74A-2
S=.003
ø910
COLLECTOR PIPE
L=6.836m
GROUND LEVEL
13.547
13.547
OVERBURDEN
-
-
PIPE INVERT ELEVATION
11.407
11.387
STATION NUMBER
8+798
8+815

QUANTITIES OF MANHOLE

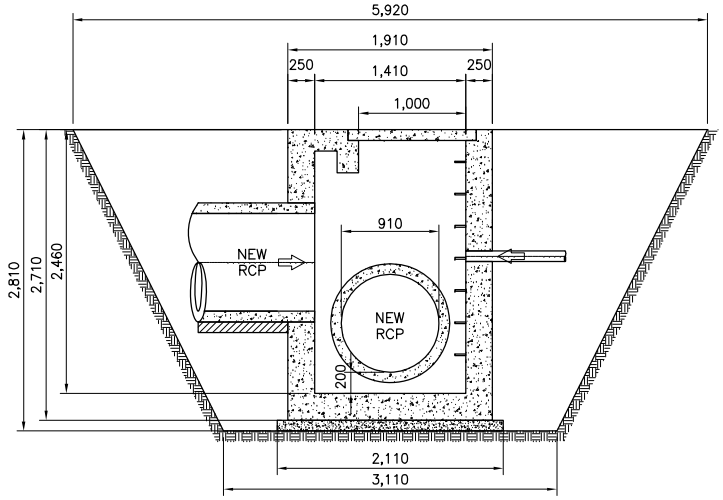
Manhole No.: MR 75

Location: 8 + 838

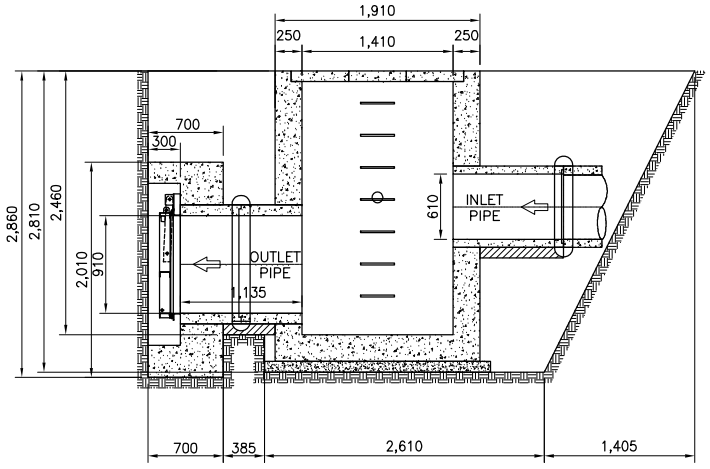
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.00	4.52	9.04	
		A2=0.95	4.52	4.28	
		A3=7.33	4.52	33.11	
		A4=1.97	4.52	8.91	
				55.34	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	3.65	0.25	**0.91**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.460	4.084	m^3
	Lin=1.41				
	.	Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.48**	m^3
5. Conc. Cover	L=1.61	1.771	0.1	**0.18**	m^3
	W=1.10				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.610m	L=1.30		**2**	pc
11. Conc. Collar	D1=.760m	A1=0.45	0.17		
(Inlet Pipe)	D2=.940m	A2=0.69		**0.040856412**	m3
		Anet=0.24	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.760m	L=0.78		**0.059432**	m3
(Inlet Pipe)					
14. Backfill				**46.12**	m3



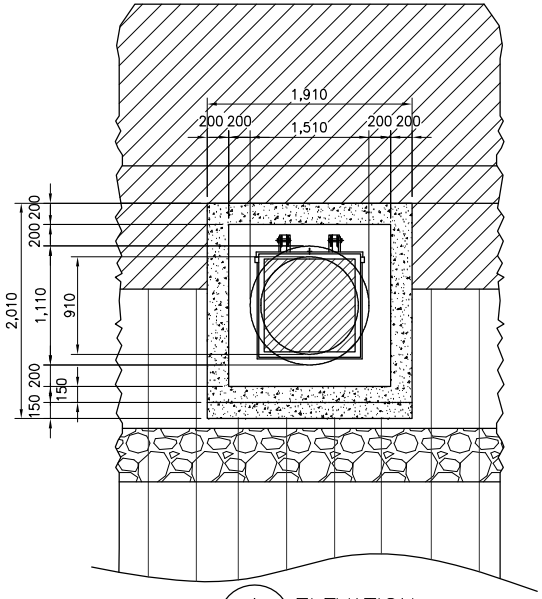
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



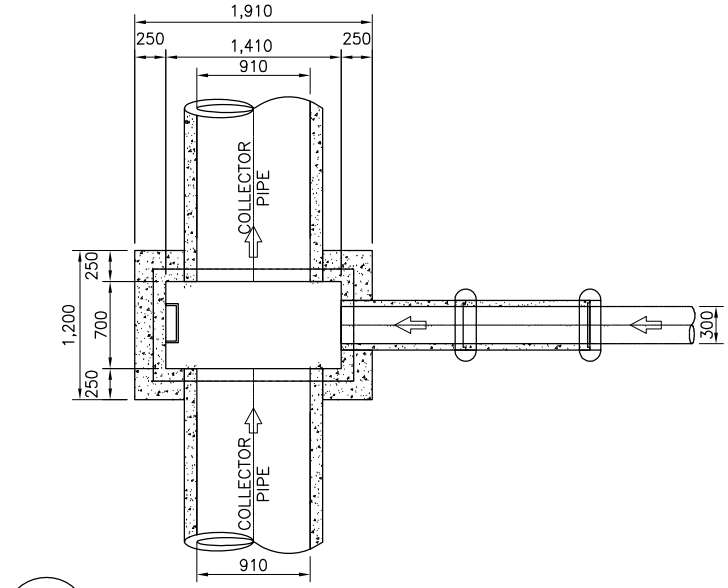
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

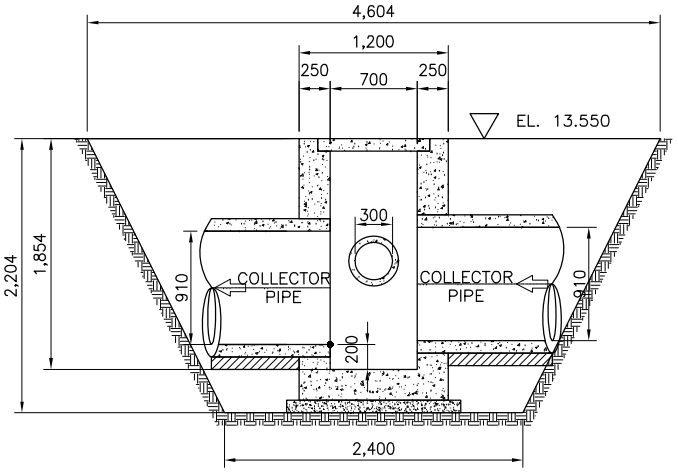
Manhole No.: MR 76

Location: 8 + 853

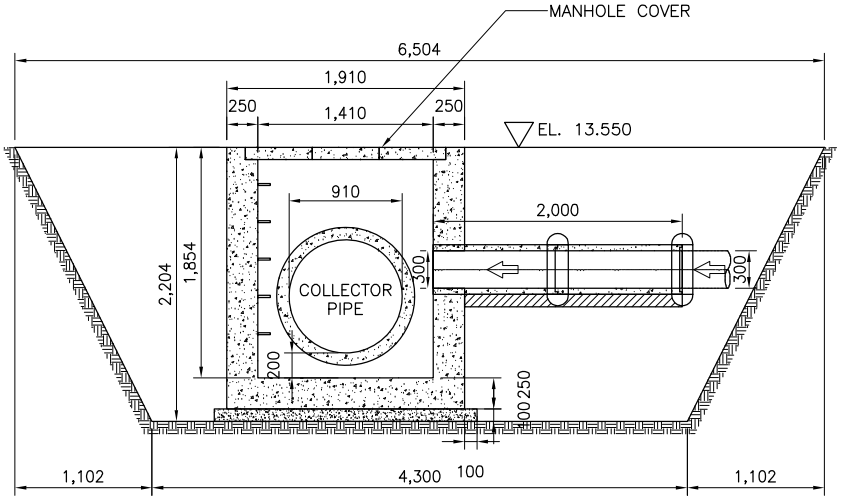
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=1.21	4.52	5.48	
		A2=9.48	4.52	42.79	
		A3=1.21	4.52	5.48	
				53.76	m^3
					m^3
2. Lev. Concrete	W=2.11	2.95	0.1	**0.30**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	2.29	0.25	**0.57**	m^3
	L=1.20				
4. Wall					
Entire Wall	Wout=1.91	Aout=2.29			
	Lout=1.20				
	Win=1.41	Ain=0.99	1.854	2.419	m^3
	Lin=.70				
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**1.90**	m^3
5. Conc. Cover	L=0.90	1.449	0.1	**0.14**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
7. Backfill				**44.80**	m3



1 PLAN OF MANHOLE 76
SCALE A



3 SECTION
SCALE A



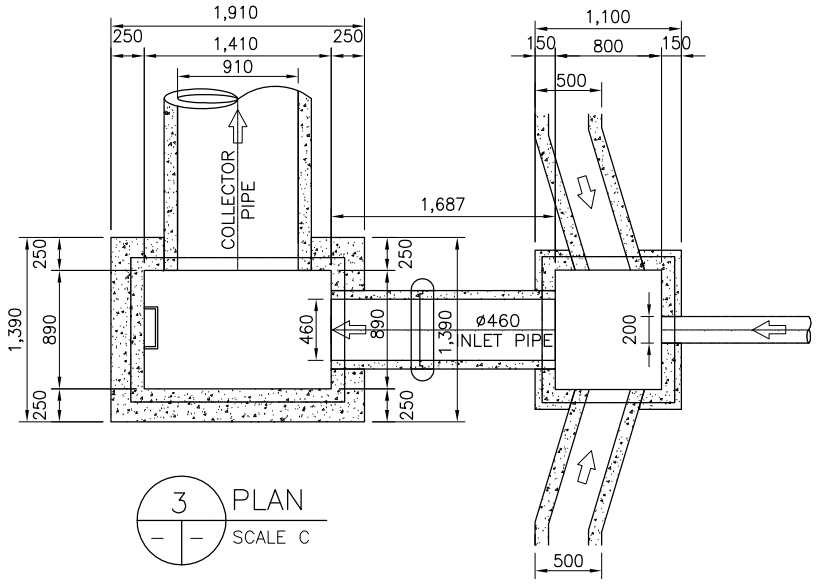
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

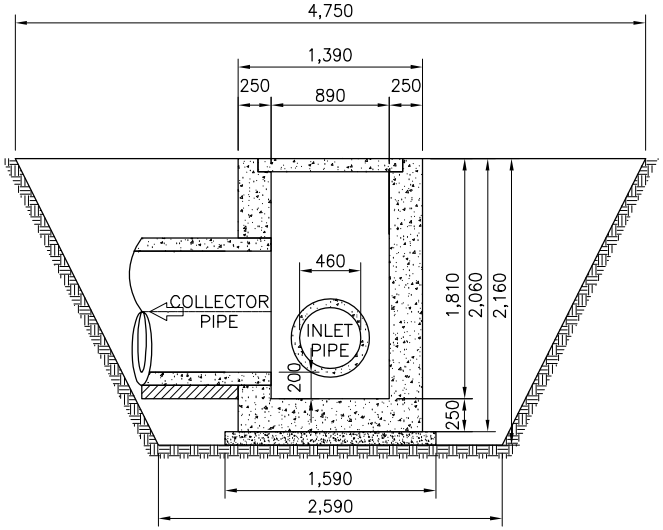
Manhole No.: MR 76.1

Location: 8 + 857

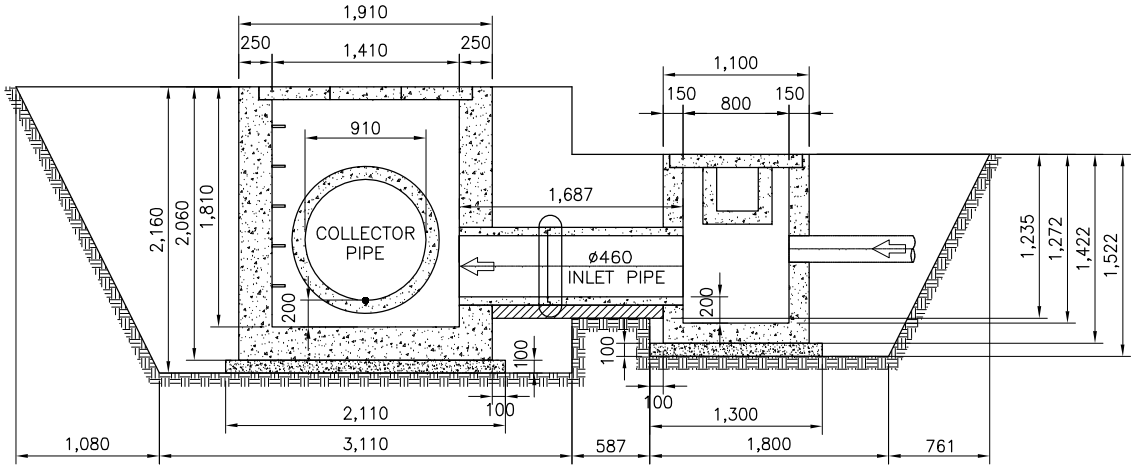
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=7.88	3.67	28.93	
		A2=0.72	3.16	2.29	
		A3=3.32	3.16	10.49	
				41.72	m^3
2. Lev. Concrete (Manhole)	W=2.11 L=1.59	3.35	0.1	**0.34**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.91 L=1.39	2.65	0.25	**0.66**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.91 Lout=1.39	Aout=2.65			
	Win=1.41 Lin=.89	Ain=1.25	1.810	2.534	m^3
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.22**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.272	0.763	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.53	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall B	DiaB=0.30	0.07	0.15	0.01	
Depth of Ditch=0.46	W=0.50	0.23	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.64**	m^3
5. Conc. Cover (Manhole)	L=1.09 W=1.61	1.7549	0.1	**0.18**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=6			**5.68**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
8. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=1	**0.032492864**	m3
9. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=1.29		**0.075933**	m3
10. Backfill				**34.77**	m3



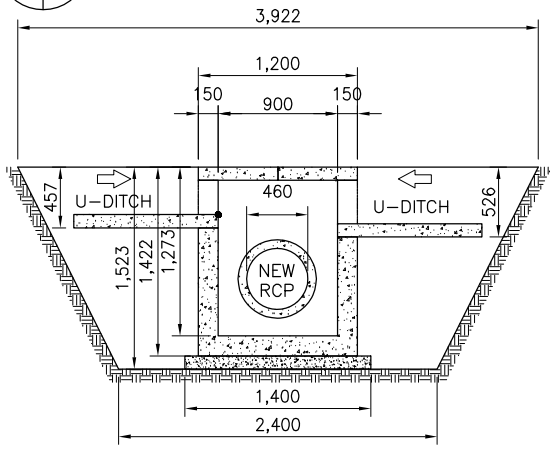
3 PLAN
SCALE C



5 SECTION
SCALE A



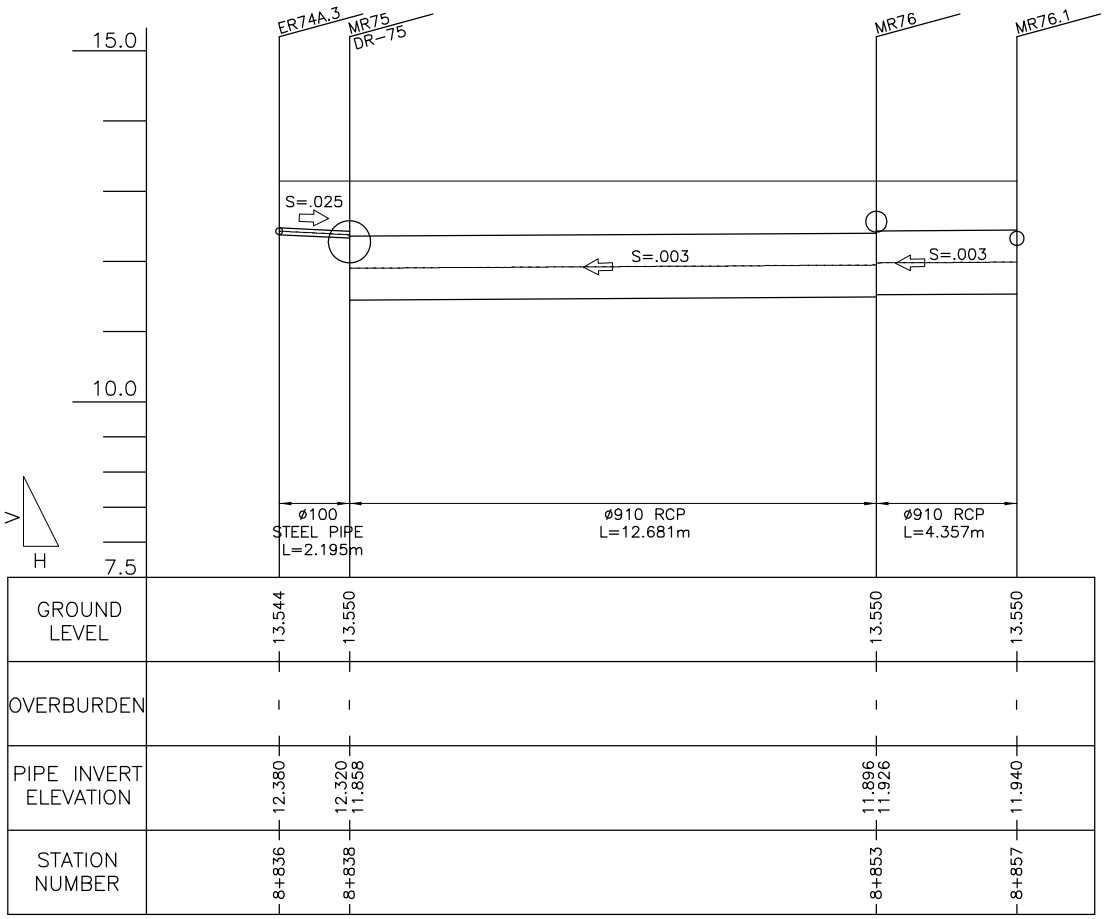
4 SECTION
SCALE C



6 SECTION (JB76.1)
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=17.09	18	pc
1.Collector Pipe (Steel)	Dia=0.10		L=2.20	1	pc
2. Conc. Bedding	Dia=0.91	L=17.09	0.1	1.56	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=17	0.98	m3
4. Formworks				17.75	m^3



Clearing (Manhole 75)

L1	2.005	m	
W of Manhole	1.91	m	**A=30.19** m^2
L2	0.485	m	
W	5.92	m	

Clearing (Manhole 76)

W	6.504	m	**A=29.94** m^2
L	4.604	m	

Clearing (Manhole 76.1)

L4	1.361	m	
W of Junction Manhole	1.1	m	Am=19.90 m^2
L5	1.287	m	Ajb=12.35 m^2
W of Manhole	1.91	m	**At=32.25** m^2
L6	1.68	m	
W3	4.75	m	
W4	3.923	m	

Clearing (Collector 76.1-76)

W	3.927	m	**A=17.11** m^2
L	4.357	m	

Clearing (Collector 76-75)

W	3.983	m	**A=50.51** m^2
L	12.681	m	

Clearing (Collector 74A.3-75)

W	2.297	m	**A=5.04** m^2
L	2.195	m	

(Collector Pipe) Downstream	76.1-76		Excavation
Do	1.11	m	A=5.51 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.15 m^2
H	1.824	m	Backfill Zone C
EL. A	13.55	m	A=1.83 m^2
EL. B	11.926	m	
W	3.934	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=5.46 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.13 m^2
H	1.81	m	Backfill Zone C
EL. A	13.55	m	A=1.82 m^2
EL. B	11.94	m	
W	3.92	m	

(Collector Pipe) Downstream	76-75		Excavation
Do	1.11	m	A=5.78 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.25 m^2
H	1.892	m	Backfill Zone C
EL. A	13.55	m	A=1.92 m^2
EL. B	11.858	m	
W	4.002	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=5.63 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.20 m^2
H	1.854	m	Backfill Zone C
EL. A	13.55	m	A=1.87 m^2
EL. B	11.896	m	
W	3.964	m	

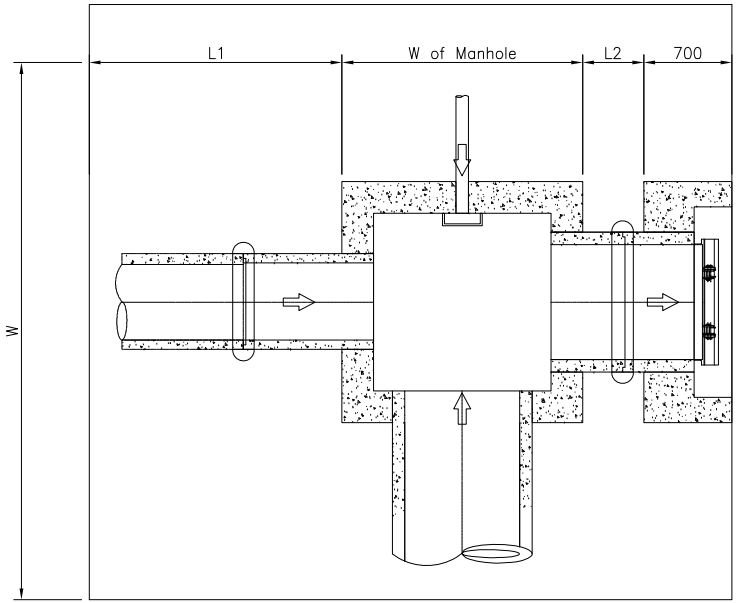
(Collector Steel) Downstream	74A.3-75		
D	0.1	m	Excavation
W1	2.33	m	A=2.11 m^2
W2	1.72	m	Backfill Zone B
H	1.23	m	A=0.86 m^2
H/2	0.615	m	Backfill Zone C
EL. A	13.55	m	A=1.24 m^2
EL. B	12.32	m	

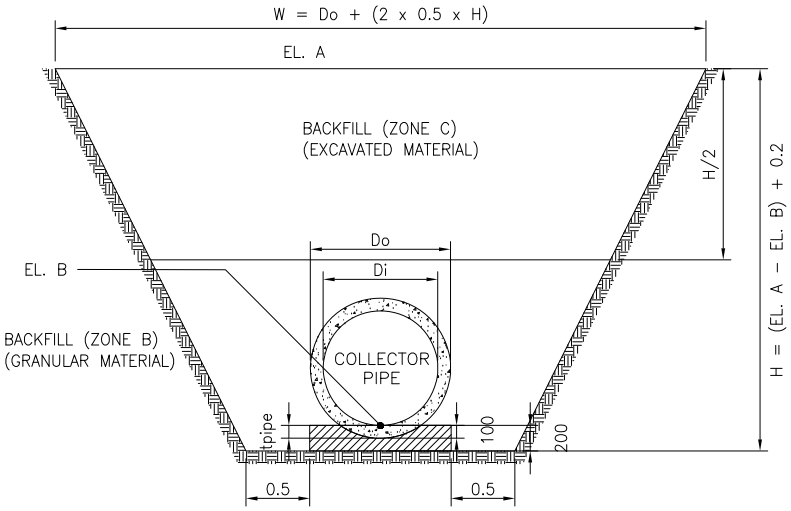
(Collector Steel) Upstream			
D	0.1	m	Excavation
W1	2.26	m	A=1.96 m^2
W2	1.68	m	Backfill Zone B
H	1.164	m	A=0.80 m^2
H/2	0.582	m	Backfill Zone C
EL. A	13.544	m	A=1.15 m^2
EL. B	12.38	m	

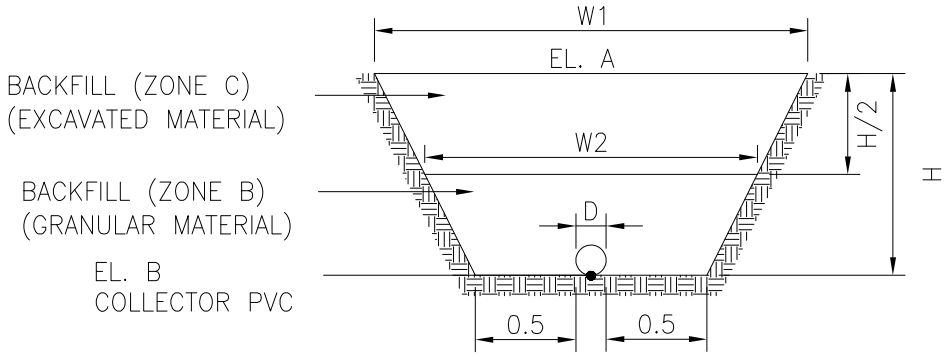
Collector Pipe 76.1-76	Volume	
Excavation	**23.96826**	m^3
Backfill Zone B	**4.981611**	m^3
Backfill Zone C	**7.97717**	m^3

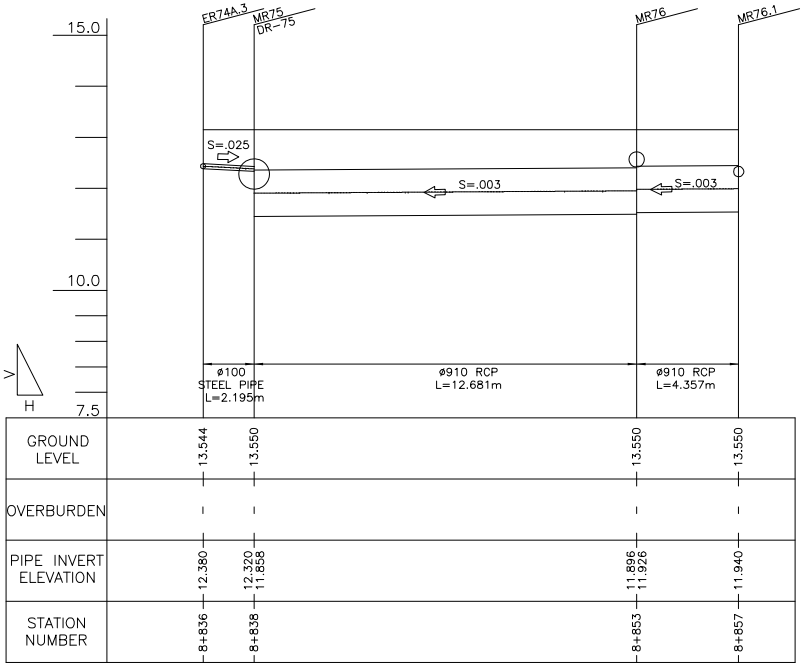
Collector Pipe 76-75	Volume	
Excavation	**72.57836**	m^3
Backfill Zone B	**15.57939**	m^3
Backfill Zone C	**24.10028**	m^3

Collector Steel 74A.3-75	Volume	
Excavation	**4.575456**	m^3
Backfill Zone B	**1.866796**	m^3
Backfill Zone C	**8.055805**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Ipipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
H/2
H
0.5
0.5

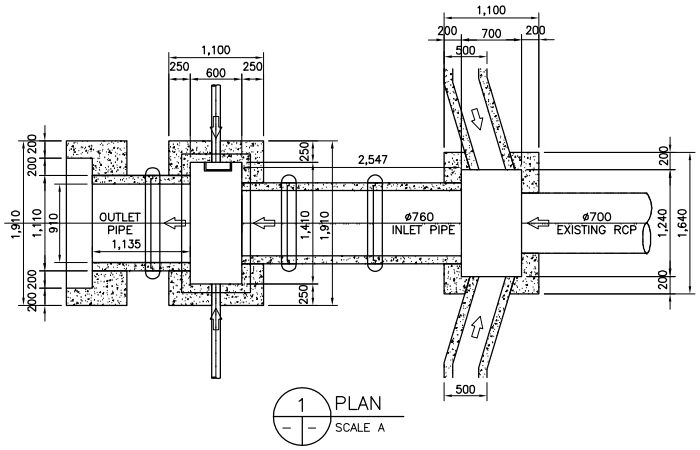

15.0
10.0
7.5
V
H
ER74A.3
MR75
DR-75
MR76
MR76.1
S=.025
S=.003
S=.003
ø100
STEEL PIPE
L=2.195m
ø910 RCP
L=12.681m
ø910 RCP
L=4.357m
GROUND LEVEL
13.544
13.550
13.550
13.550
OVERBURDEN
PIPE INVERT ELEVATION
12.380
12.320
11.858
11.896
11.926
11.940
STATION NUMBER
8+836
8+838
8+853
8+857

QUANTITIES OF MANHOLE

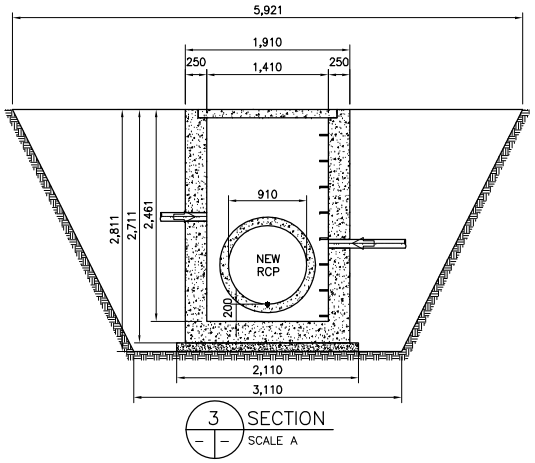
Manhole No.: MR 76A

Location: 8 + 874

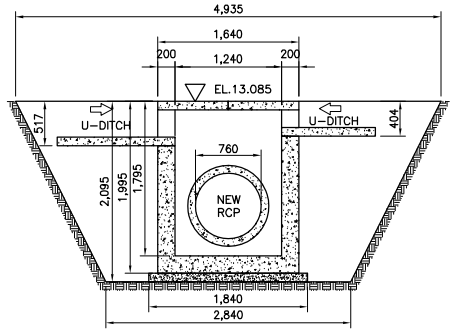
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.78	4.52	12.55	
		A2=5.06	4.52	22.85	
		A3=2.49	3.89	9.69	
		A4=4.87	3.89	18.93	
				64.02	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
(Junction Box)	W=1.40 L=1.94	2.72	0.1	**0.27**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
(Junction Box)	W=1.20 L=1.74	2.09	0.25	**0.52**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=1.91	Aout=2.10			
	Win=0.60 Lin=1.41	Ain=0.85	2.461	3.089	m^3
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.94	0.69	0.25	0.17	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.67**	m^3
Junction Box	Wout=1.20 Lout=1.74	Aout=2.09			
	Win=0.70 Lin=1.24	Ain=0.87	1.795	2.190	m^3
		Anet=1.22			
Minus					
Depth of Ditch=0.52	W=0.50	0.26	0.25	0.04	
Pipe hole on Wall B	DiaB=0.88	0.60	0.25	0.09	
Depth of Ditch=0.40	W=0.50	0.20	0.25	0.03	
Pipe hole on Wall D	DiaD=0.94	0.69	0.25	0.10	
Net Wall Vol.				**1.93**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
(Junction Box)	L=1.44 W=0.90	1.296	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.01	Ain=3.84	0.7	2.69	
	Win=1.51 Lin=1.51	Aout=2.28	0.3	0.68	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.760m	L=2.60		**3**	pc
11. Conc. Collar (Inlet Pipe)	D1=.936m D2=1.116m	A1=0.69 A2=0.98 Anet=0.29	0.17 Qty=1	**0.049316093**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.936m	L=2.10		**0.1962792**	m3
14. Backfill				**53.35**	m3



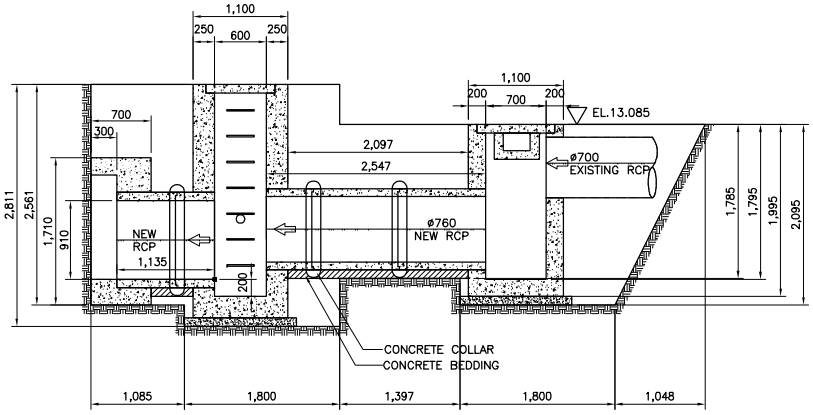
1 PLAN
SCALE A



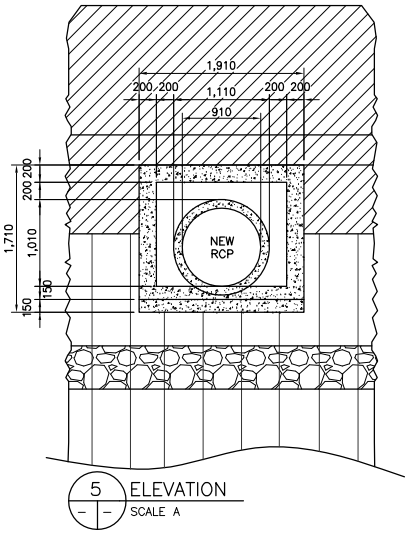
3 SECTION
SCALE A



4 SECTION (JB76A)
SCALE A



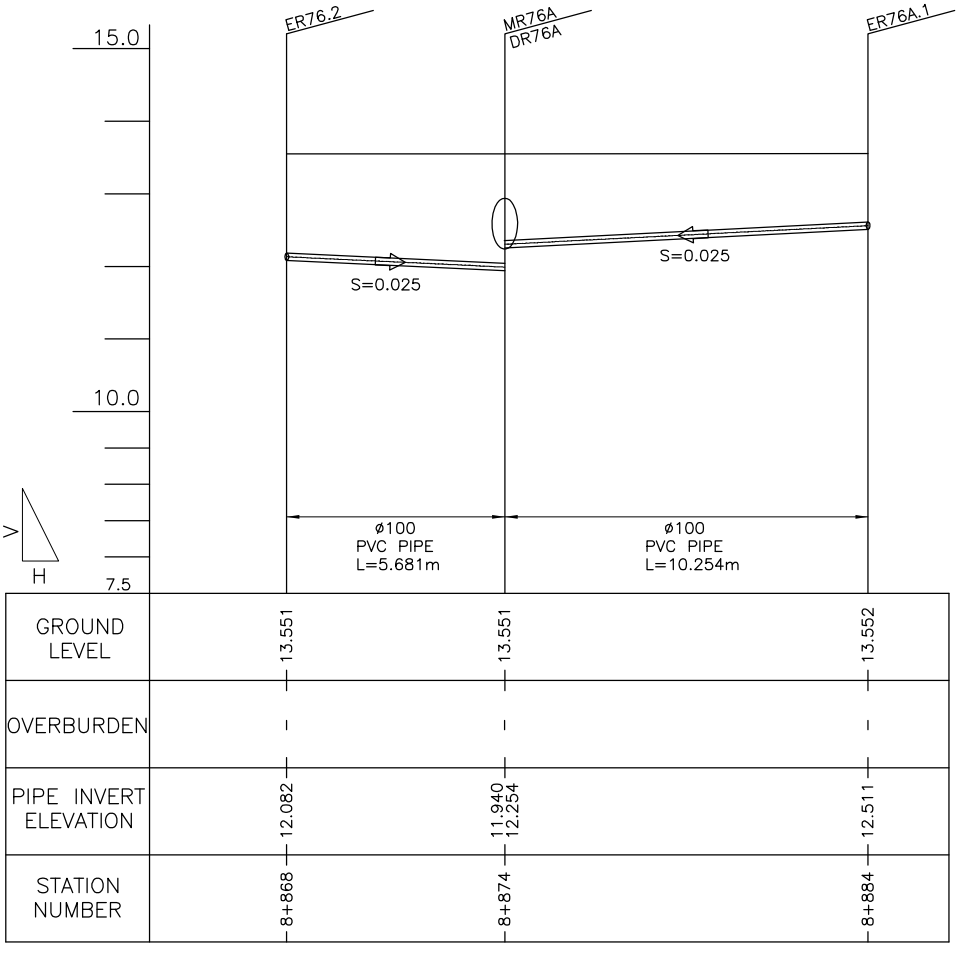
2 SECTION
SCALE A



5 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.10		L=16.33	3	pc
2. PVC coupling	Dia=0.10			1	pc



Clearing (Manhole 76A)

L1	1.6475	m	
W of Junction Manhole	1.1	m	Am=17.08 m^2
L2	2.097	m	Ajb=20.95 m^2
W of Manhole	1.1	m	**At=38.03** m^2
L3	0.485	m	
W1	5.921	m	
W2	4.935	m	

Clearing (Collector 76.2 - 76A)

W	2.64	m	**A=27.07** m^2
L	10.254	m	

Clearing (Collector 76A.1 - 76A)

W	2.269	m	**A=13.57** m^2
L	5.981	m	

(Collector PVC) Downstream 76.2-76A

D	0.1	m	Excavation
W1	2.71	m	A=3.07 m^2
W2	1.91	m	Backfill Zone B
H	1.611	m	A=1.20 m^2
H/2	0.8055	m	Backfill Zone C
EL. A	13.551	m	A=1.86 m^2
EL. B	11.94	m	

(Collector PVC) Upstream

D	0.1	m	Excavation
W1	2.57	m	A=2.69 m^2
W2	1.83	m	Backfill Zone B
H	1.469	m	A=1.07 m^2
H/2	0.7345	m	Backfill Zone C
EL. A	13.551	m	A=1.62 m^2
EL. B	12.082	m	

(Collector PVC) Downstream 76A.1-76A

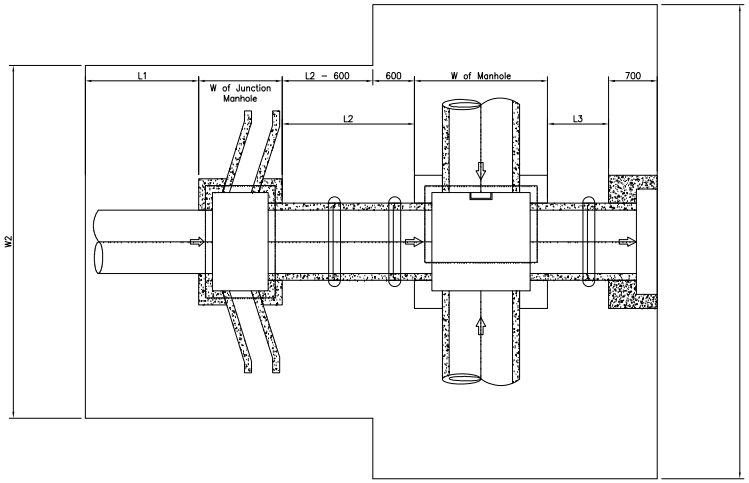
D	0.1	m	Excavation
W1	2.40	m	A=2.27 m^2
W2	1.75	m	Backfill Zone B
H	1.297	m	A=0.92 m^2
H/2	0.6485	m	Backfill Zone C
EL. A	13.551	m	A=1.34 m^2
EL. B	12.254	m	

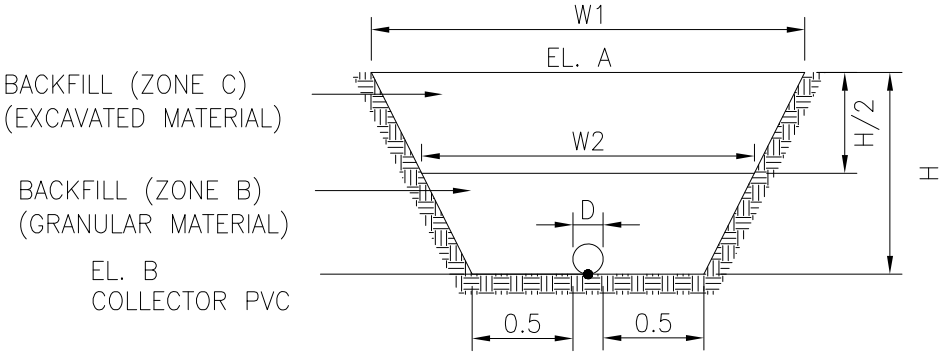
(Collector PVC) Upstream

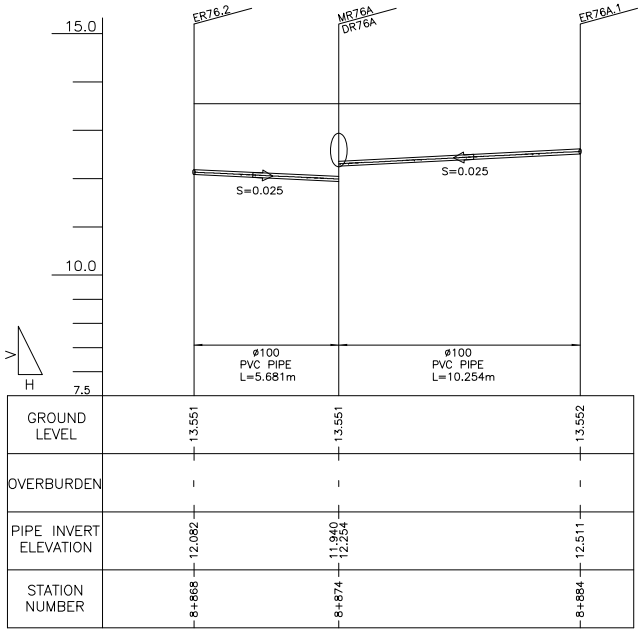
D	0.1	m	Excavation
W1	2.14	m	A=1.69 m^2
W2	1.62	m	Backfill Zone B
H	1.041	m	A=0.70 m^2
H/2	0.5205	m	Backfill Zone C
EL. A	13.552	m	A=0.98 m^2
EL. B	12.511	m	

Collector PVC 76.2-76A	Volume	
Excavation	**16.78382**	m^3
Backfill Zone B	**6.616273**	m^3
Backfill Zone C	**10.12182**	m^3

Collector PVC 76A-76A.1	Volume	
Excavation	**20.78288**	m^3
Backfill Zone B	**8.491986**	m^3
Backfill Zone C	**12.20834**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

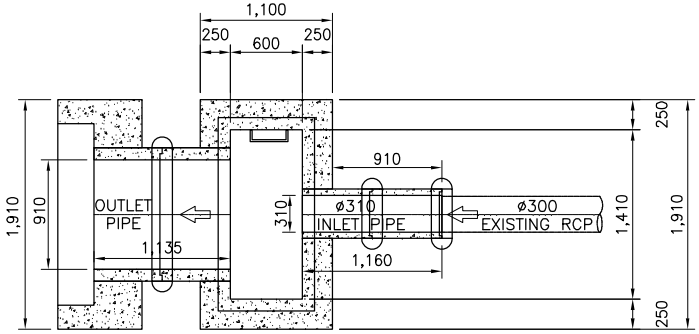

15.0
10.0
7.5
V
H
FR76.2
MR76A
DR76A
FR76A.1
S=0.025
S=0.025
ø100
PVC PIPE
L=5.681m
ø100
PVC PIPE
L=10.254m
GROUND LEVEL
13.551
13.551
13.552
OVERBURDEN
-
-
-
PIPE INVERT ELEVATION
12.082
11.940
12.254
12.511
STATION NUMBER
8+868
8+874
8+884

QUANTITIES OF MANHOLE

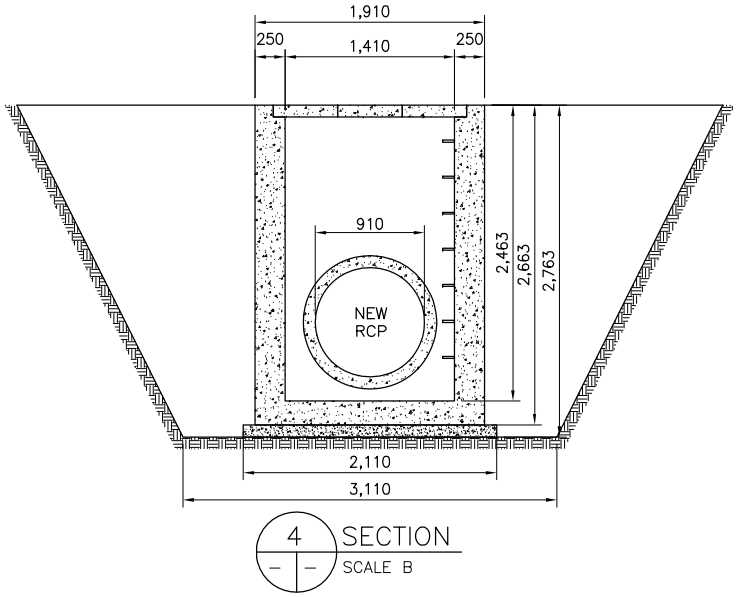
Manhole No.: MR 76A.2

Location: 8 + 903

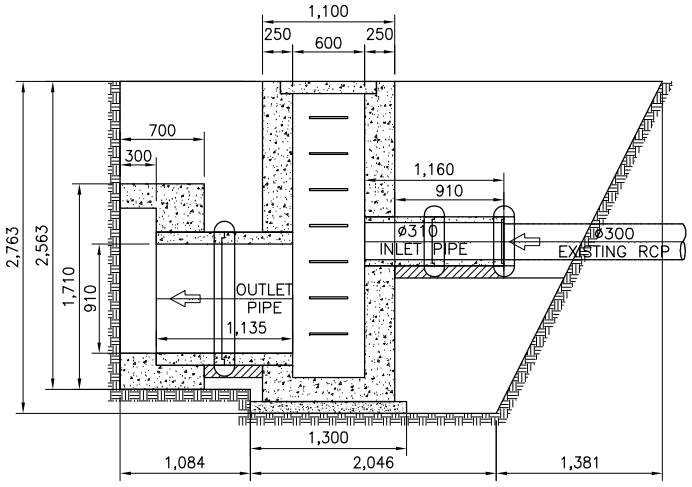
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.78	4.49	12.48	
		A2=7.56	4.49	33.96	
				46.44	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.463	3.091	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.82**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. New Pipe	Dia=.300m	L=1.16		**2**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
	D1=.410m	A1=0.13	0.17		
(New Pipe)	D2=.590m	A2=0.27		**0.048066368**	m3
		Anet=0.14	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
(New Pipe)	Dia=.400m	L=0.91		**0.0364**	m3
13. Backfill				**38.70**	m3



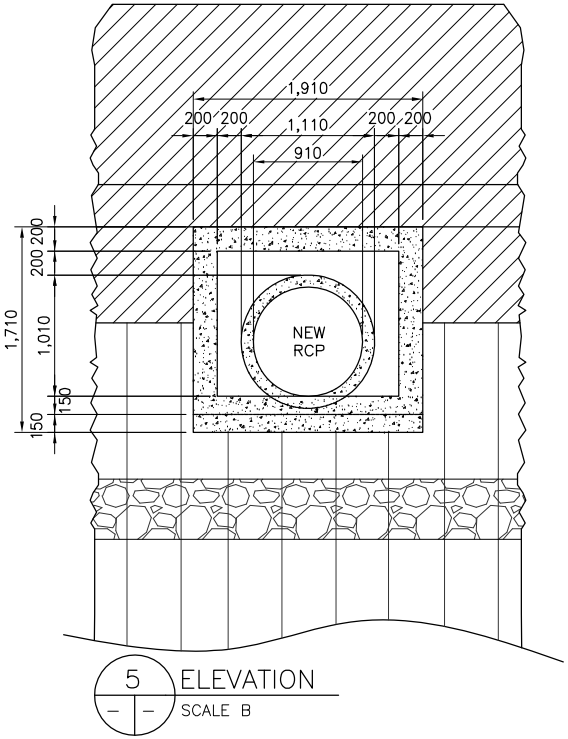
2 PLAN
SCALE B



4 SECTION
SCALE B



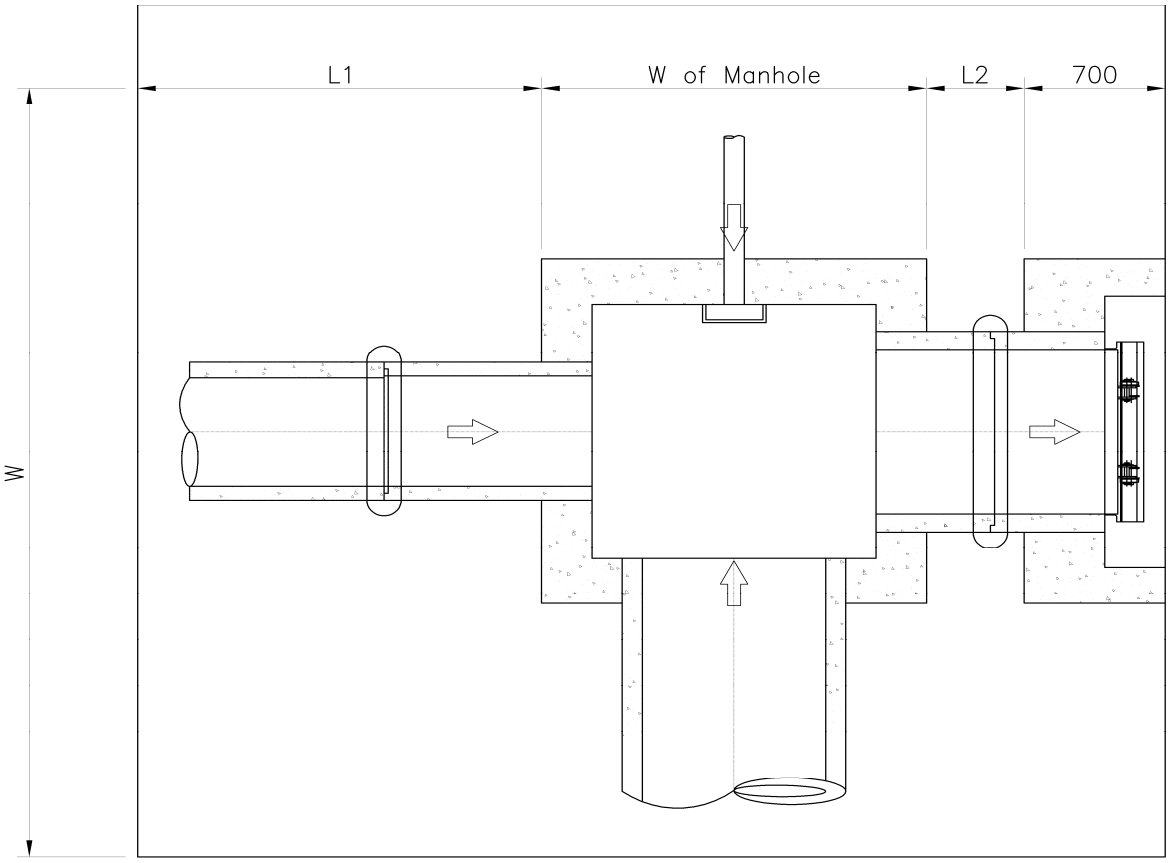
3 SECTION
SCALE A



5 ELEVATION
SCALE B

Clearing (Manhole 76A.2)

L1	2.0065	m	
W of Manhole	1.1	m	**A=25.42** m^2
L2	0.485	m	
W	5.923	m	

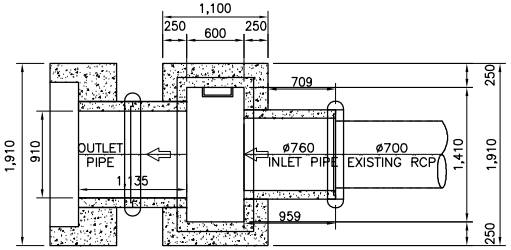


QUANTITIES OF MANHOLE

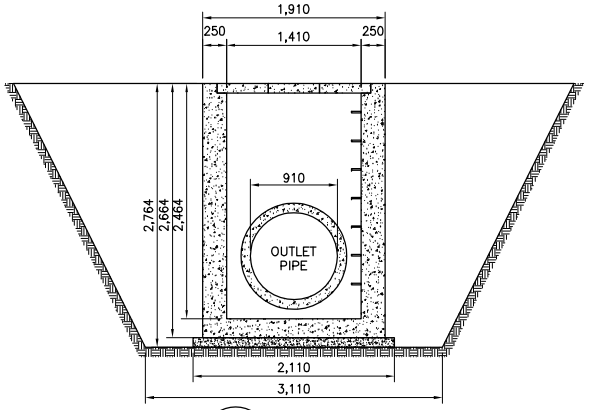
Manhole No.: MR 77A

Location: 8 + 914

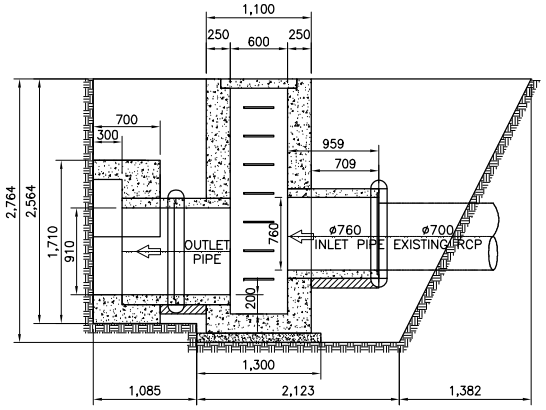
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.78	4.49	12.48	
		A2=7.56	4.49	33.96	
				46.44	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
	L=2.11				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.464	3.092	m^3
	Lout=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.94	0.69	0.25	0.17	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.68**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
	W=0.80				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. New Pipe	Dia=.760m	L=0.96		**1**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
	D1=.936m	A1=0.69	0.17		
(New Pipe)	D2=1.116m	A2=0.98		**0.049316093**	m3
		Anet=0.29	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
(New Pipe)	Dia=.936m	L=0.71		**0.0663624**	m3
13. Backfill				**38.70**	m3



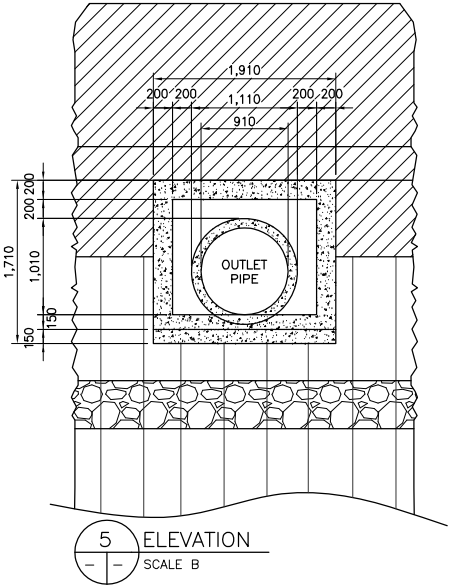
2 PLAN
SCALE B



4 SECTION
SCALE B



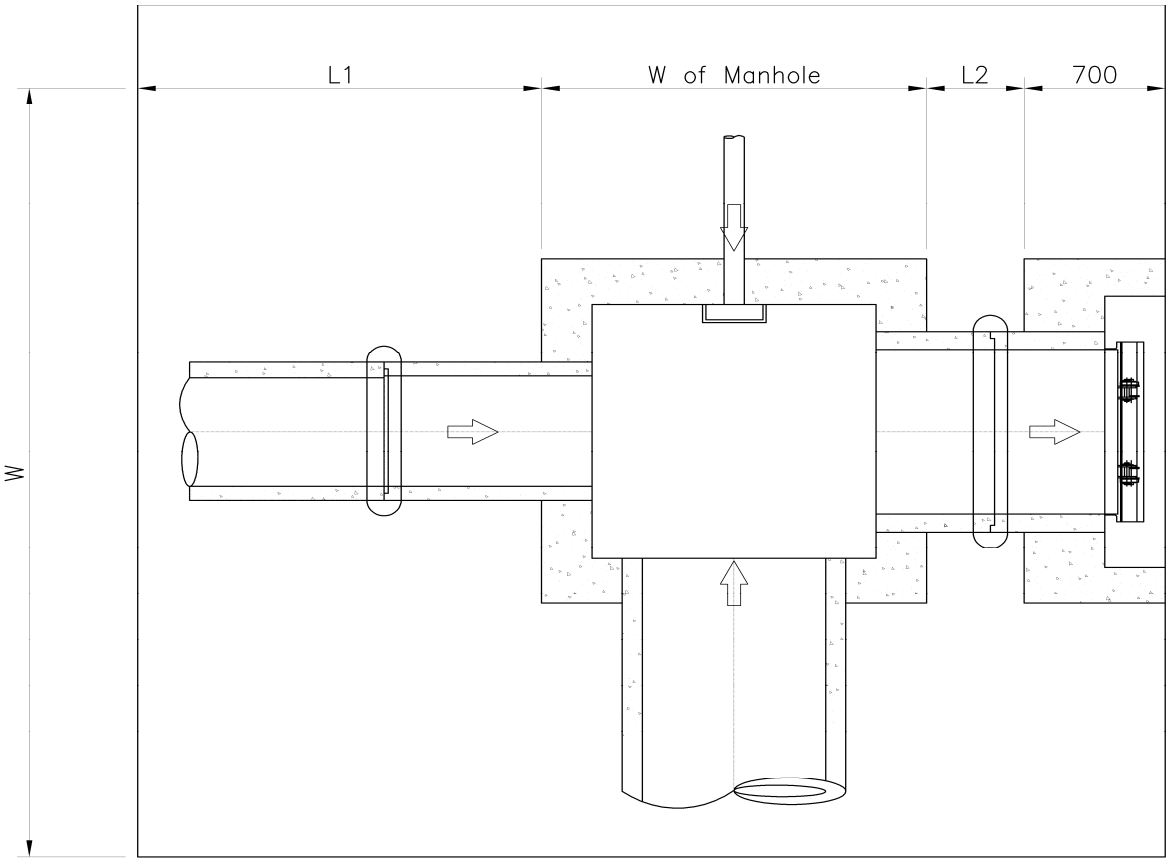
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 77A)

L1	2.007 m	
W of Manhole	1.1 m	**A=25.43** m^2
L2	0.485 m	
W	5.924 m	

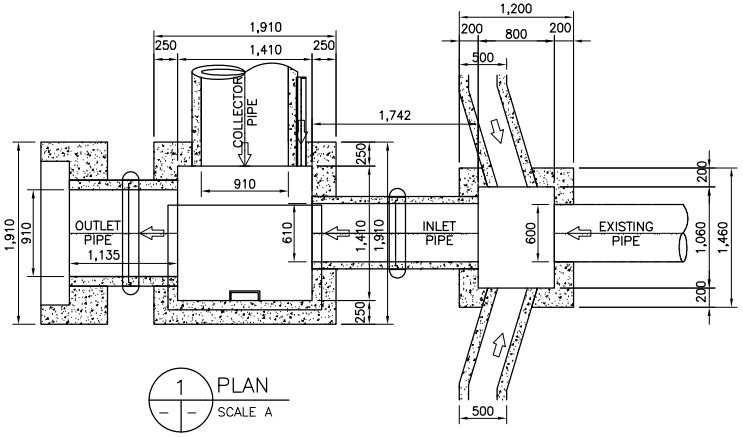


QUANTITIES OF MANHOLE

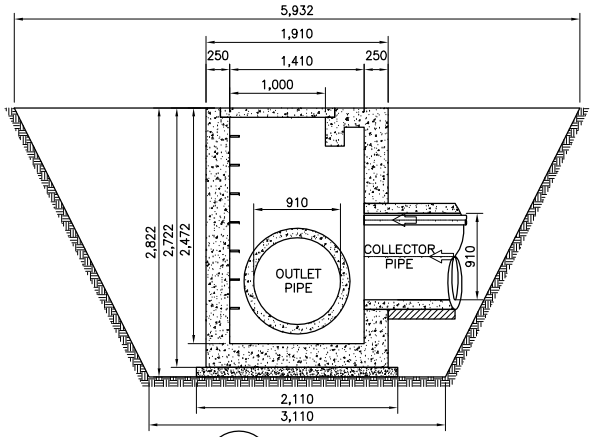
Manhole No.: MR 78

Location: 8 + 957

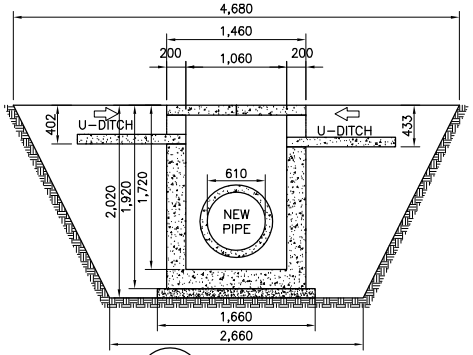
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.81	4.52	12.71	
		A2=7.37	4.52	33.30	
		A3=1.00	3.67	3.68	
		A4=4.86	3.67	17.83	
				67.53	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.50	2.64	0.1	**0.26**	m^3
	L=1.76				
3. Bottom Slab	W=1.91	3.65	0.25	**0.91**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.30	2.03	0.25	**0.51**	m^3
	L=1.56				
4. Wall					
Manhole	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.492	4.137	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.98	0.25	0.24	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.54**	m^3
Junction Box	Wout=1.20	Aout=2.09			
	Lout=1.74				
	Win=0.70	Ain=0.87	1.720	2.098	m^3
	Lin=1.24				
		Anet=1.22			
Minus					
Depth of Ditch=0.43	W=0.50	0.22	0.25	0.03	
Pipe hole on Wall B	DiaB=0.75	0.44	0.25	0.07	
Depth of Ditch=0.40	W=0.50	0.20	0.25	0.03	
Pipe hole on Wall D	DiaD=0.76	0.45	0.25	0.07	
Net Wall Vol.				**1.90**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.26	1.26	0.1	**0.13**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.89	0.7	2.72	
	Lout=2.04				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.65	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.610m	L=1.79		**2**	pc
11. Conc. Collar	D1=.760m	A1=0.45	0.17		
(Inlet Pipe)	D2=.940m	A2=0.69		**0.040856412**	m3
		Anet=0.24	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.760m	L=1.29		**0.098192**	m3
(Inlet Pipe)					
14. Backfill				**56.27**	m3



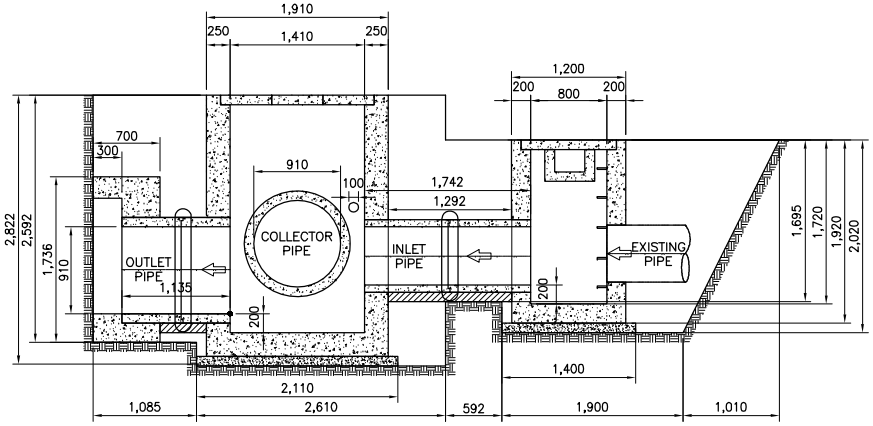
1 PLAN
SCALE A



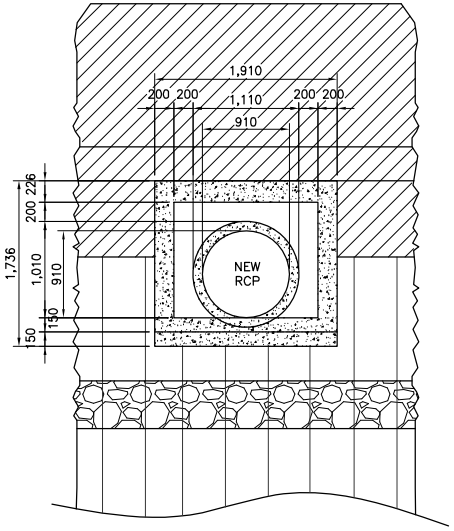
3 SECTION
SCALE A



4 SECTION(JB78)
SCALE A



2 SECTION
SCALE A



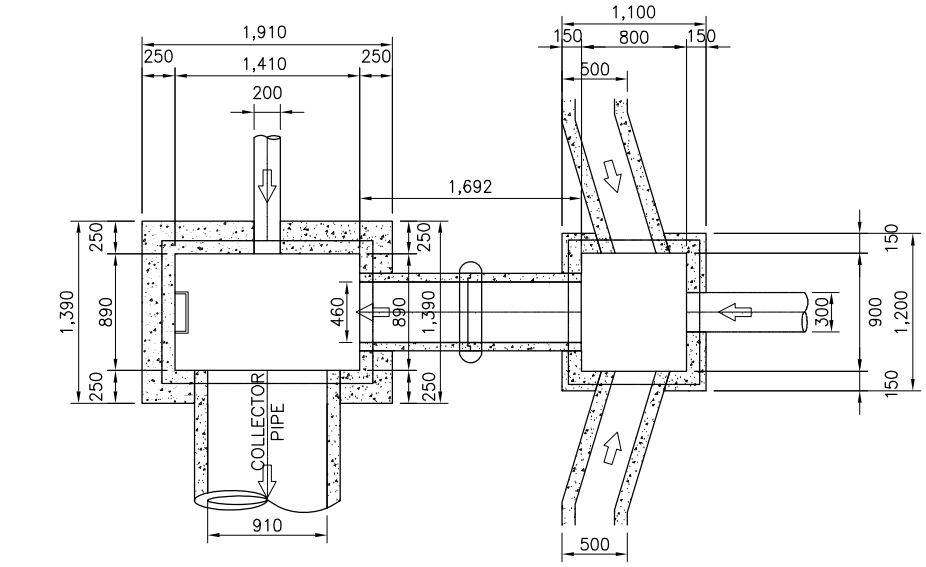
5 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

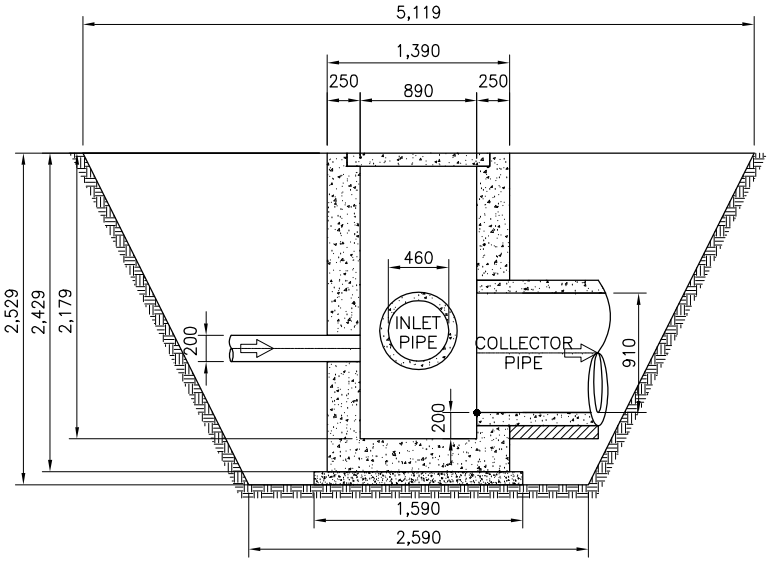
Manhole No.: MR 77A.3

Location: 8 + 947

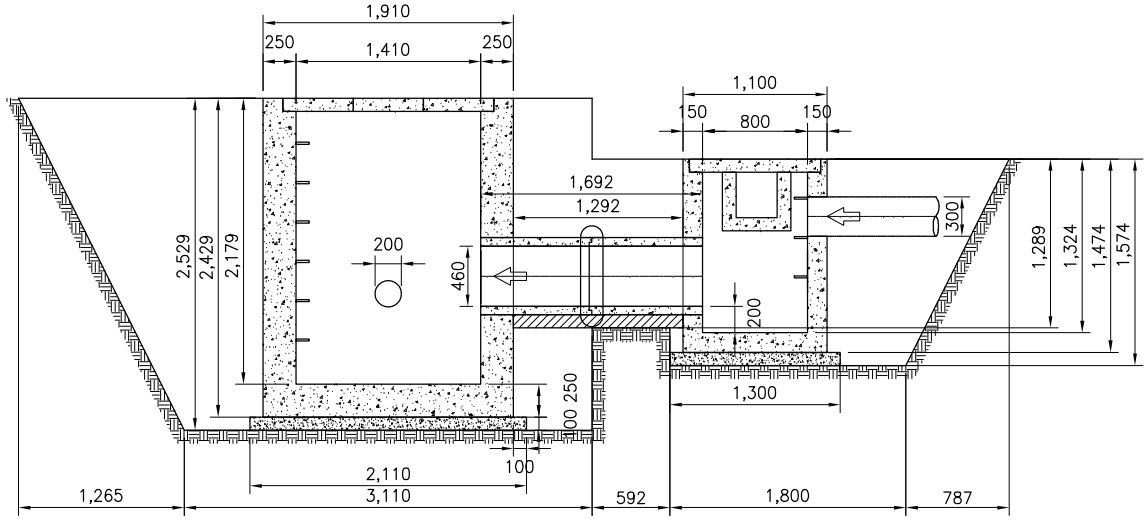
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=9.46	3.85	36.48	
		A2=0.76	3.19	2.43	
		A3=3.45	3.19	11.00	
				49.92	m^3
2. Lev. Concrete	W=2.11	3.35	0.1	**0.34**	m^3
(Manhole)	L=1.59				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	2.65	0.25	**0.66**	m^3
(Manhole)	L=1.39				
(Junction Box)	W=1.10	1.32	0.15	**0.20**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.91	Aout=2.65			
	Lout=1.39				
	Win=1.41	Ain=1.25	2.179	3.051	m^3
	Lin=.89				
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.03	0.25	0.01	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.73**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.324	0.794	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.55	W=0.50	0.27	0.15	0.04	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.66**	m^3
5. Conc. Cover	L=1.09	1.7549	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
8. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
9. Conc.Bedding	Dia=.590m	L=1.29		**0.076228**	m3
(Inlet Pipe)					
10. Backfill				**41.60**	m3



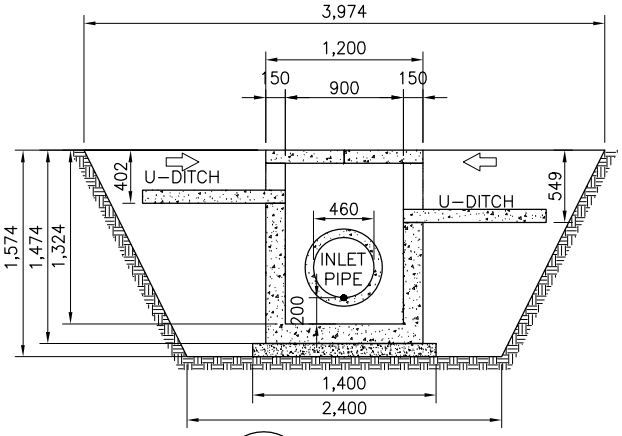
1 PARTIAL PLAN OF MANHOLE (MR77A.3)
SCALE A



3 SECTION
SCALE A



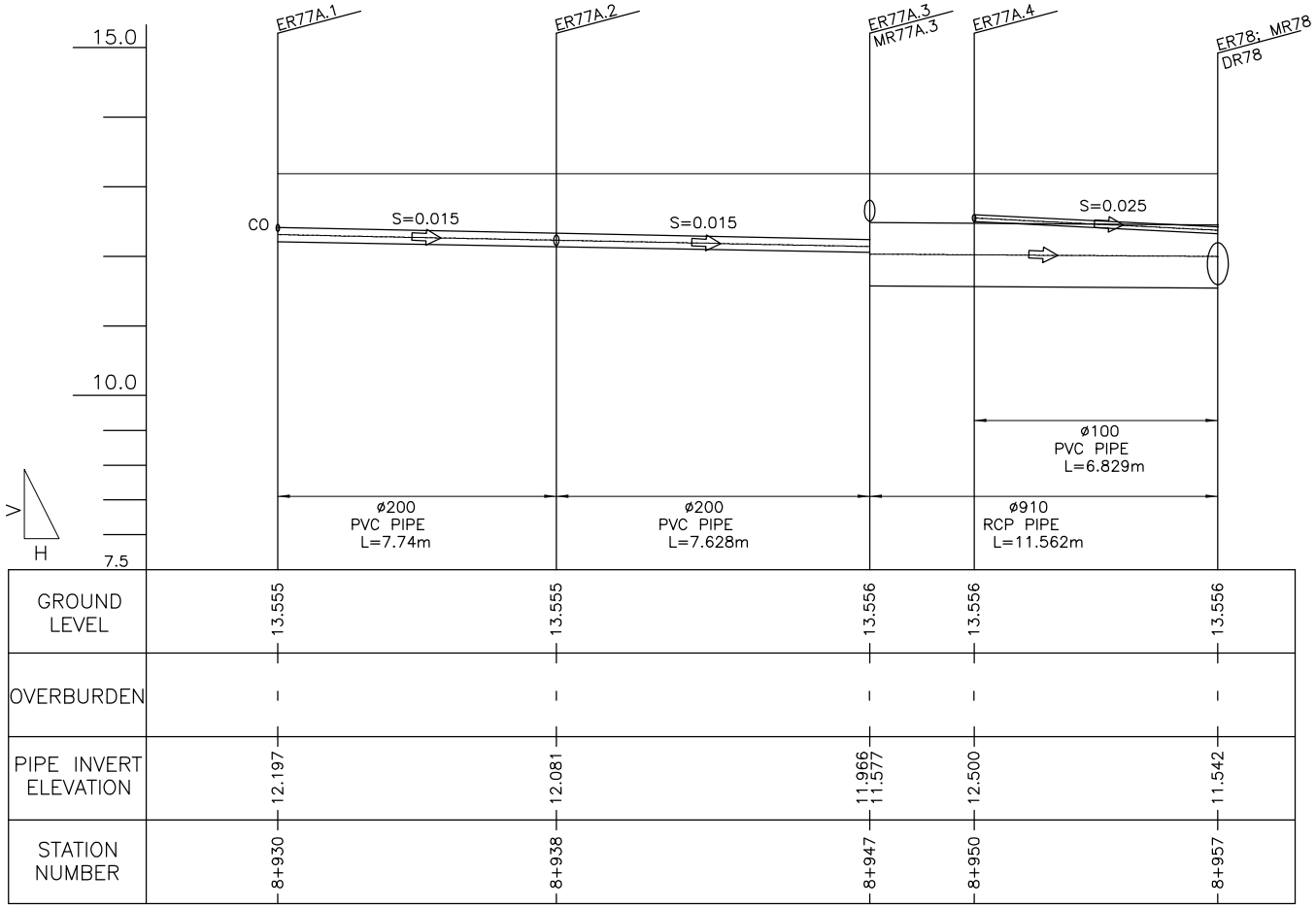
2 SECTION
SCALE A



4 SECTION (JB77A.3)
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=11.85	12	pc
Collector Pipe (PVC)	Dia=0.10		L=7.00	2	pc
Collector Pipe (PVC)	Dia=0.20		L=15.60	3	pc
2. Conc. Bedding	Dia=0.91	L=11.85	0.1	1.08	m^3
3. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=11	0.63	m3
3. PVC coupling	Dia=0.10			1	pc
PVC coupling	Dia=0.20			2	pc
4. Formworks				11.99	m^3



Clearing (Manhole 78)

L1	1.56	m	
W of Junction Manhole	1.2	m	Am=21.92 m^2
L2	1.292	m	Ajb=16.16 m^2
W of Manhole	1.91	m	**At=38.07** m^2
L3	0.485	m	
W1	5.932	m	
W2	4.68	m	

Clearing (Manhole 77A.3)

L4	1.387	m	
W of Junction Manhole	1.1	m	Am=22.39 m^2
L5	1.292	m	Ajb=12.63 m^2
W of Manhole	1.91	m	**At=35.03** m^2
L6	1.8645	m	
W3	5.119	m	
W4	3.974	m	

Clearing (Collector 77A.3 - 78)

W	3.845	m	**A=44.46** m^2
L	11.562	m	

Clearing (Collector 77A.1 - 77A.3)

W	2.674	m	**A=41.09** m^2
L	15.368	m	

(Collector Pipe) Downstream	77A.3-78		Excavation
Do	1.11	m	A=7.12 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.76 m^2
H	2.214	m	Backfill Zone C
EL. A	13.556	m	A=2.33 m^2
EL. B	11.542	m	
W	4.324	m	

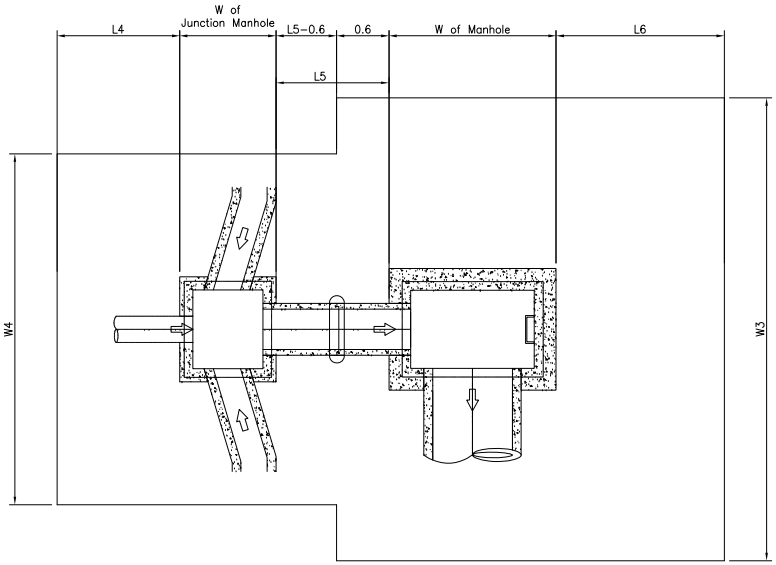
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=3.44 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=0.33 m^2
H	1.256	m	Backfill Zone C
EL. A	13.556	m	A=1.17 m^2
EL. B	12.5	m	
W	3.366	m	

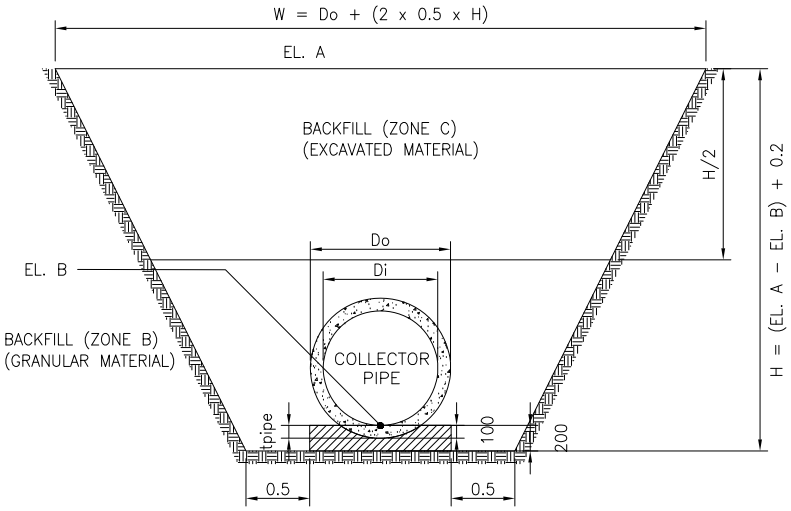
(Collector PVC) Downstream	77A.1-77A.3		
D	0.2	m	Excavation
W1	2.79	m	A=3.17 m^2
W2	2.00	m	Backfill Zone B
H	1.59	m	A=1.24 m^2
H/2	0.795	m	Backfill Zone C
EL. A	13.556	m	A=1.90 m^2
EL. B	11.966	m	

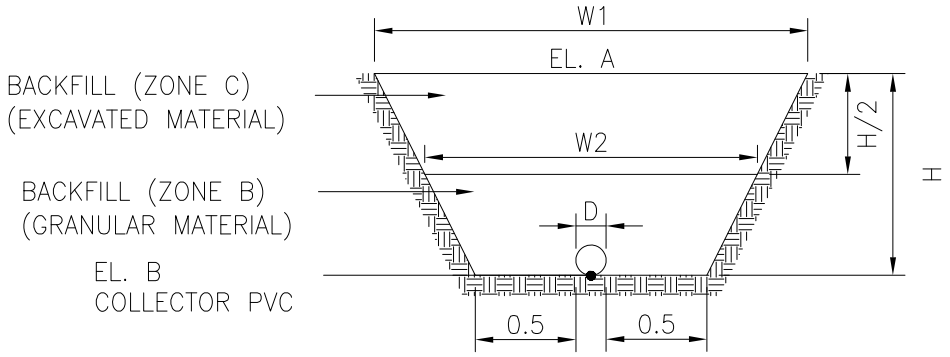
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	2.56	m	A=2.55 m^2
W2	1.88	m	Backfill Zone B
H	1.358	m	A=1.01 m^2
H/2	0.679	m	Backfill Zone C
EL. A	13.555	m	A=1.51 m^2
EL. B	12.197	m	

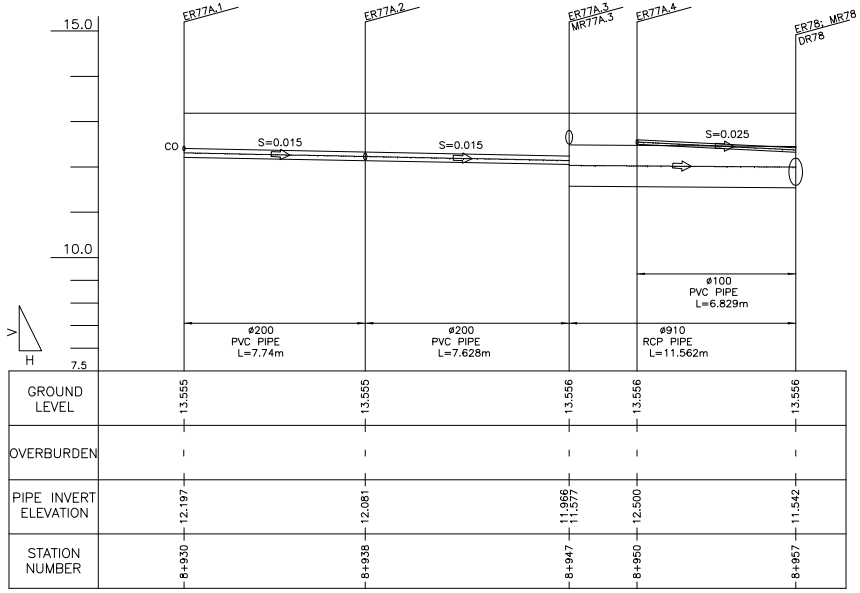
Collector Pipe 77A.3-78	Volume	
Excavation	**61.23842**	m^3
Backfill Zone B	**12.07161**	m^3
Backfill Zone C	**20.33967**	m^3

Collector Steel 77A.1-77A.3	Volume	
Excavation	**44.64087**	m^3
Backfill Zone B	**17.56784**	m^3
Backfill Zone C	**26.58299**	m^3


W of
Junction Manhole
L4
L5-0.6
0.6
W of Manhole
L6
L5
W4
W3


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5

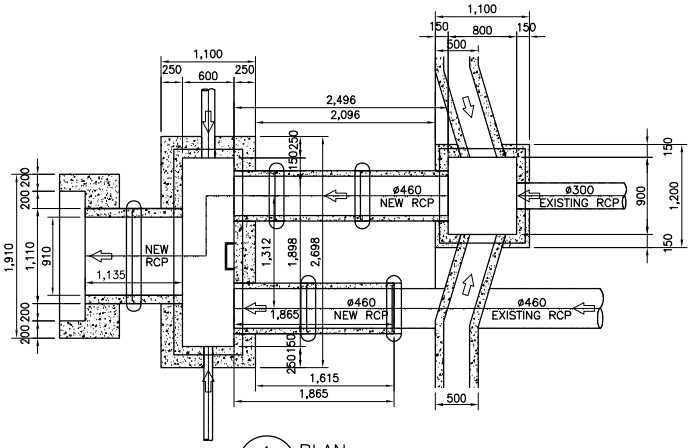

15.0
10.0
7.5
V
H
ER77A.1
ER77A.2
ER77A.3
MR77A.3
ER77A.4
ER78; MR78
DR78
CO
S=0.015
S=0.015
S=0.025
ø100
PVC PIPE
L=6.829m
ø200
PVC PIPE
L=7.74m
ø200
PVC PIPE
L=7.628m
ø910
RCP PIPE
L=11.562m
GROUND LEVEL
13.555
13.555
13.556
13.556
13.556
OVERBURDEN
PIPE INVERT ELEVATION
12.197
12.081
11.966
11.577
12.500
11.542
STATION NUMBER
8+930
8+938
8+947
8+950
8+957

QUANTITIES OF MANHOLE

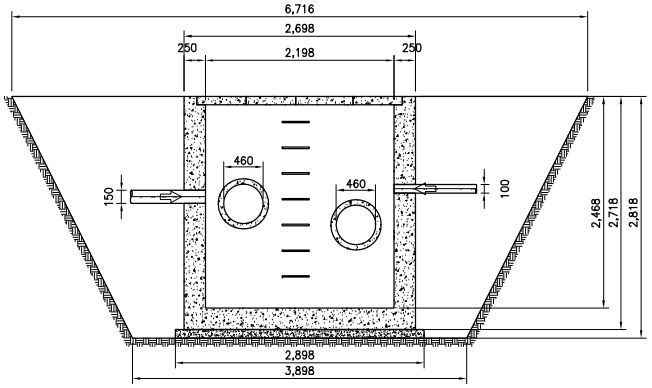
Manhole No.: MR 79A

Location: 8 + 977

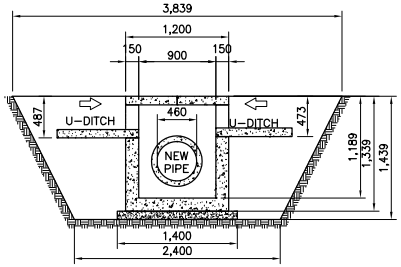
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.79	5.31	14.79	
		A2=5.07	5.31	26.92	
		A3=1.61	3.12	5.02	
		A4=3.11	3.12	9.70	
				56.42	m^3
2. Lev. Concrete (Manhole)	W=1.30 L=2.90	3.77	0.1	**0.38**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=1.10 L=2.70	2.97	0.25	**0.74**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.10 Lout=2.70	Aout=2.97			
	Win=0.60 Lin=2.20	Ain=1.32	2.468	4.070	m^3
		Anet=1.65			
Minus					
Pipe hole on Wall A	DiaA=0.15	0.02	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.54	0.25	0.13	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.69**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.189	0.713	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.47	W=0.50	0.24	0.15	0.04	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.49	W=0.50	0.24	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.58**	m^3
5. Conc. Cover (Manhole)	L=2.40 W=0.80	1.92	0.1	**0.19**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.01	Ain=3.84	0.7	2.69	
	Win=1.51 Lin=1.51	Aout=2.28	0.3	0.68	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.460m	L=4.36		**5**	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=4	**0.129971458**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=3.71		**0.218949**	m3
14. Backfill				**47.02**	m3



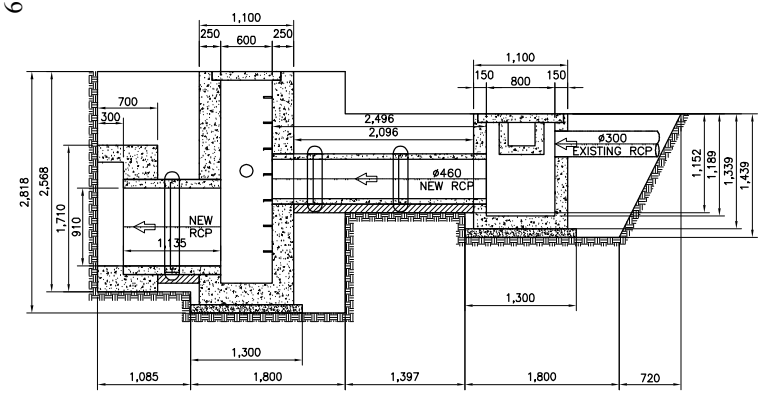
1 PLAN
SCALE A



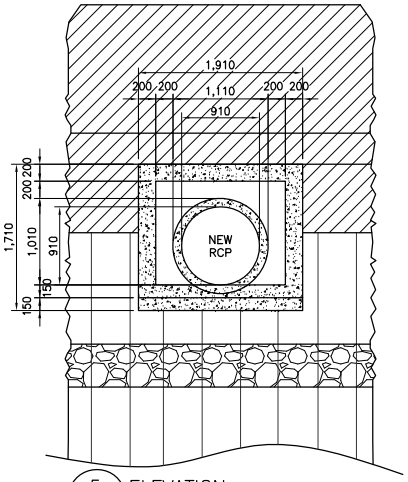
3 SECTION
SCALE A



4 SECTION (JB79A)
SCALE A



2 SECTION
SCALE A

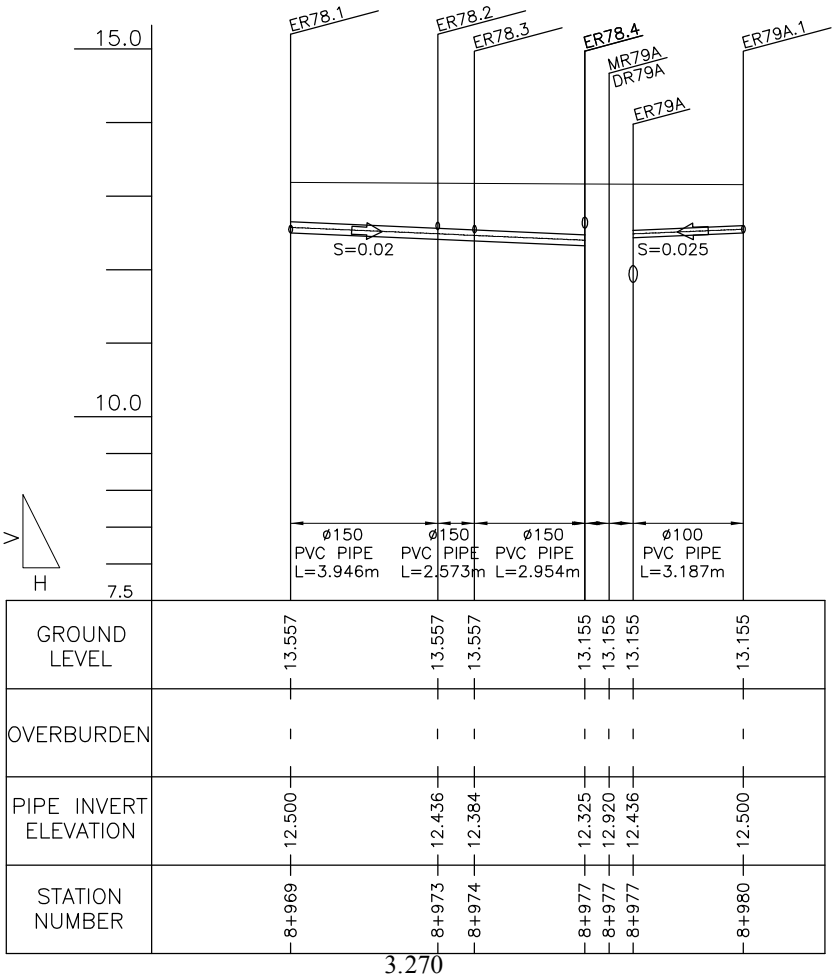


5 ELEVATION
SCALE A

3.269

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.15		L=9.66	2	pc
Collector Pipe (PVC)	Dia=0.10		L=3.27	1	pc
2. PVC coupling	Dia=0.15			1	pc



Clearing (Manhole 79A)

L1	1.3195	m	
W of Junction Manhole	1.1	m	A1=19.38 m^2
L2	2.096	m	A2=15.03 m^2
W of Manhole	1.1	m	**At=34.41** m^2
L3	0.485	m	
W1	6.716	m	
W2	3.839	m	

Clearing (Collector 78.1-78.4)

W	2.0935	m	**A=19.83** m^2
L	9.473	m	

Clearing (Collector 79A.1 - 79A)

W	1.787	m	**A=5.70** m^2
L	3.187	m	

(Collector PVC) Downstream	78.1-78.4		
D	0.15	m	Excavation
W1	1.98	m	A=1.30 m^2
W2	1.57	m	Backfill Zone B
H	0.83	m	A=0.55 m^2
H/2	0.415	m	Backfill Zone C
EL. A	13.155	m	A=0.74 m^2
EL. B	12.325	m	

(Collector PVC) Upstream

D	0.15	m	Excavation
W1	2.21	m	A=1.77 m^2
W2	1.68	m	Backfill Zone B
H	1.057	m	A=0.73 m^2
H/2	0.5285	m	Backfill Zone C
EL. A	13.557	m	A=1.03 m^2
EL. B	12.5	m	

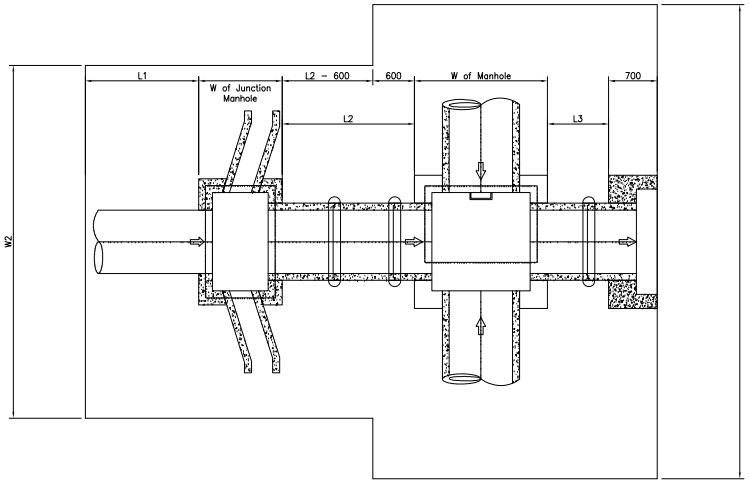
(Collector PVC) Downstream	79A.1-79A		
D	0.1	m	Excavation
W1	1.82	m	A=1.05 m^2
W2	1.46	m	Backfill Zone B
H	0.719	m	A=0.45 m^2
H/2	0.3595	m	Backfill Zone C
EL. A	13.155	m	A=0.59 m^2
EL. B	12.436	m	

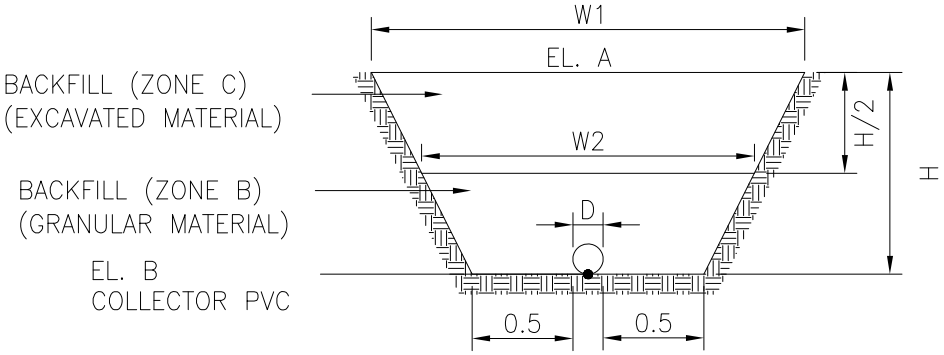
(Collector PVC) Upstream

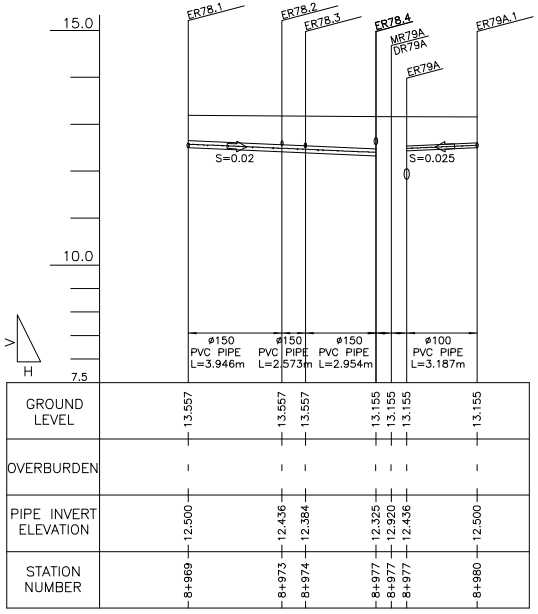
D	0.1	m	Excavation
W1	1.76	m	A=0.94 m^2
W2	1.43	m	Backfill Zone B
H	0.655	m	A=0.41 m^2
H/2	0.3275	m	Backfill Zone C
EL. A	13.155	m	A=0.52 m^2
EL. B	12.5	m	

Collector PVC 78.1-78.4	Volume	
Excavation	**14.84697**	m^3
Backfill Zone B	**6.161996**	m^3
Backfill Zone C	**8.514226**	m^3

Collector PVC 79A.1-79A	Volume	
Excavation	**3.241184**	m^3
Backfill Zone B	**1.401796**	m^3
Backfill Zone C	**1.813731**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

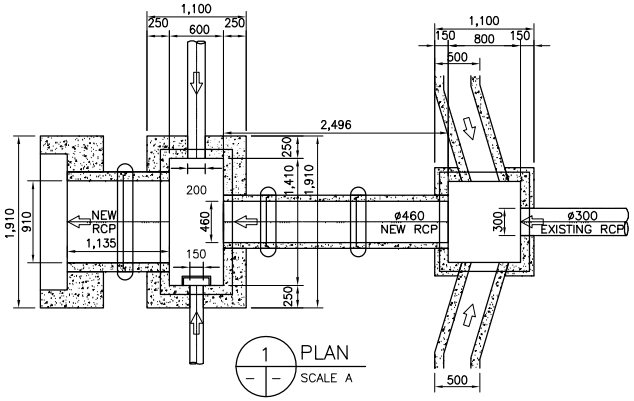

15.0
10.0
7.5
V
H
ER78.1
ER78.2
ER78.3
ER78.4
MR79A
OR79A
ER79A
ER79A.1
S=0.02
S=0.025
ø150 PVC PIPE L=3.946m
ø150 PVC PIPE L=2.573m
ø150 PVC PIPE L=2.954m
ø100 PVC PIPE L=3.187m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.557
13.557
13.557
13.155
13.155
13.155
13.155
12.500
12.436
12.384
12.325
12.920
12.436
12.500
8+969
8+973
8+974
8+977
8+977
8+977
8+980

QUANTITIES OF MANHOLE

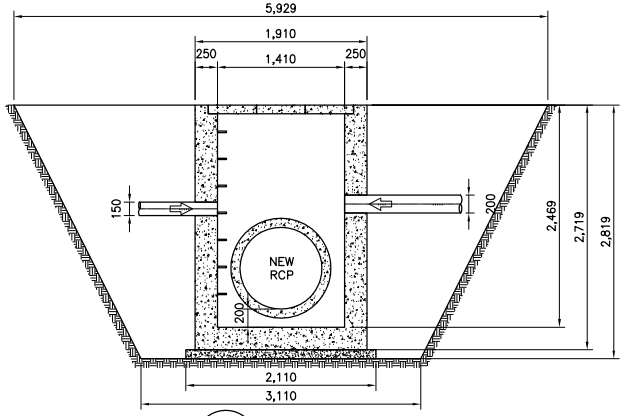
Manhole No.: MR 79A.5

Location: 8 + 993

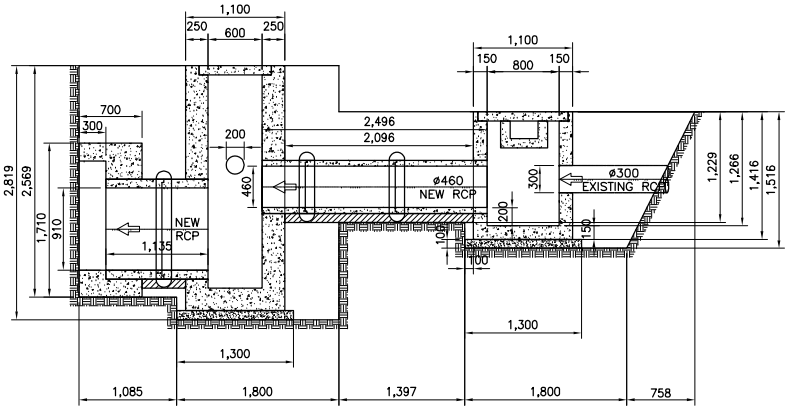
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.79	4.52	12.60	
		A2=5.07	4.52	22.93	
		A3=1.72	3.16	5.42	
		A4=3.30	3.16	10.43	
				51.38	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.469	3.099	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.03	0.25	0.01	
Pipe hole on Wall B	DiaB=0.59	0.54	0.25	0.13	
Pipe hole on Wall C	DiaC=0.15	0.02	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.71**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.266	0.760	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.45	W=0.50	0.23	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.64**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.50		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=2.10		**0.123664**	m3
(Inlet Pipe)					
14. Backfill				**42.82**	m3



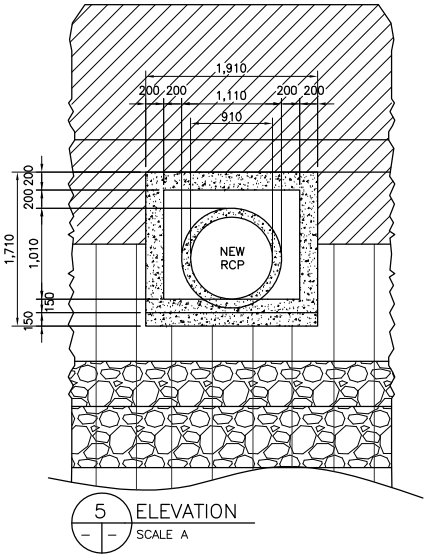
1 PLAN
SCALE A



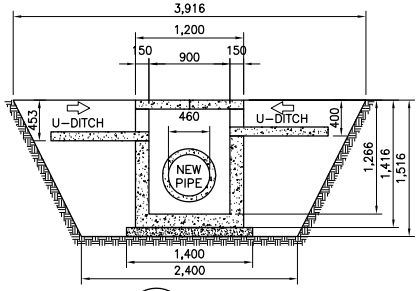
3 SECTION
SCALE A



2 SECTION
SCALE A



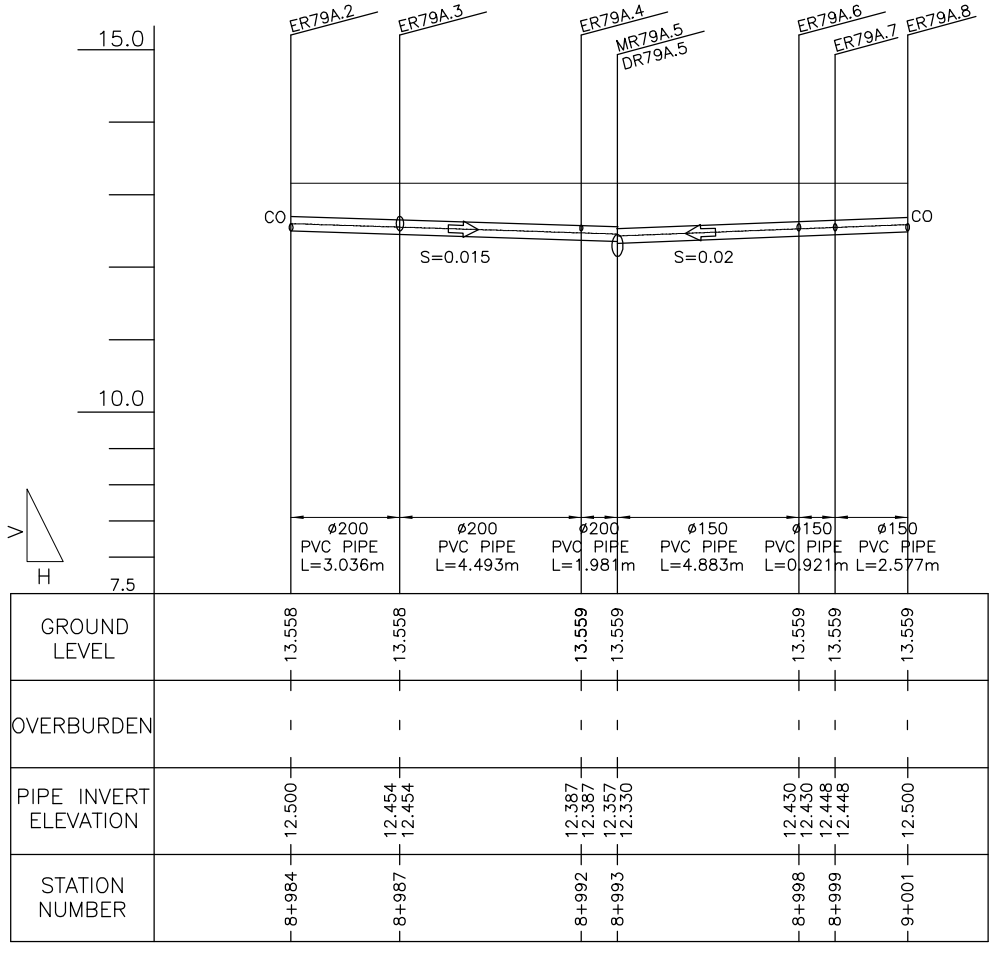
5 ELEVATION
SCALE A



4 SECTION (JB79A.5)
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.20		L=9.65	2	pc
Collector Pipe (PVC)	Dia=0.15		L=8.55	2	pc
2. PVC coupling	Dia=0.20			1	pc
2. PVC coupling	Dia=0.15			1	pc



Clearing (Manhole 79A.5)

L1	1.358	m	
W of Junction Manhole	1.1	m	A1=17.11 m^2
L2	2.096	m	A2=15.48 m^2
W of Manhole	1.1	m	**At=32.59** m^2
L3	0.485	m	
W1	5.929	m	
W2	3.916	m	

Clearing (Collector 79A.2 - 79A.5)

W	2.33	m	**A=22.16** m^2
L	9.51	m	

Clearing (Collector 79A.8 - 79A.5)

W	2.294	m	**A=19.23** m^2
L	8.381	m	

(Collector PVC) Downstream	79A.2-79A.5		
D	0.2	m	Excavation
W1	2.40	m	A=2.16 m^2
W2	1.80	m	Backfill Zone B
H	1.202	m	A=0.87 m^2
H/2	0.601	m	Backfill Zone C
EL. A	13.559	m	A=1.26 m^2
EL. B	12.357	m	

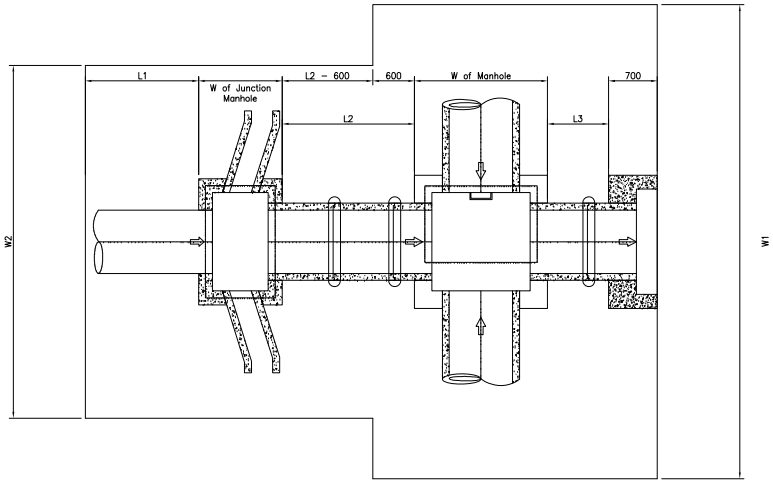
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	2.26	m	A=1.83 m^2
W2	1.73	m	Backfill Zone B
H	1.058	m	A=0.74 m^2
H/2	0.529	m	Backfill Zone C
EL. A	13.558	m	A=1.05 m^2
EL. B	12.5	m	

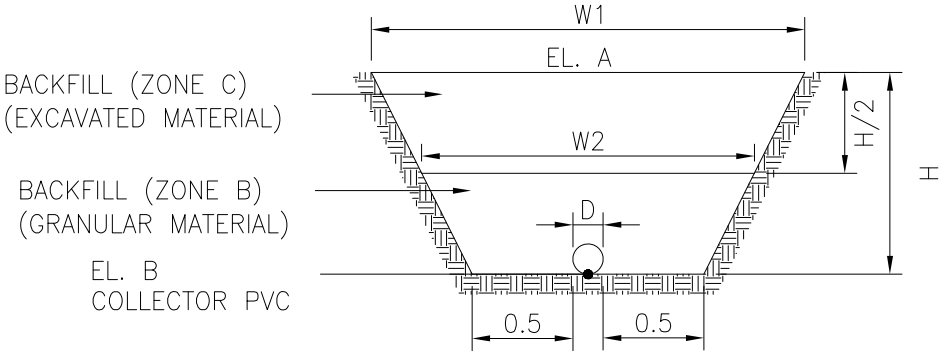
(Collector PVC) Downstream	79A.8-79A.5		
D	0.15	m	Excavation
W1	2.38	m	A=2.17 m^2
W2	1.76	m	Backfill Zone B
H	1.229	m	A=0.88 m^2
H/2	0.6145	m	Backfill Zone C
EL. A	13.559	m	A=1.27 m^2
EL. B	12.33	m	

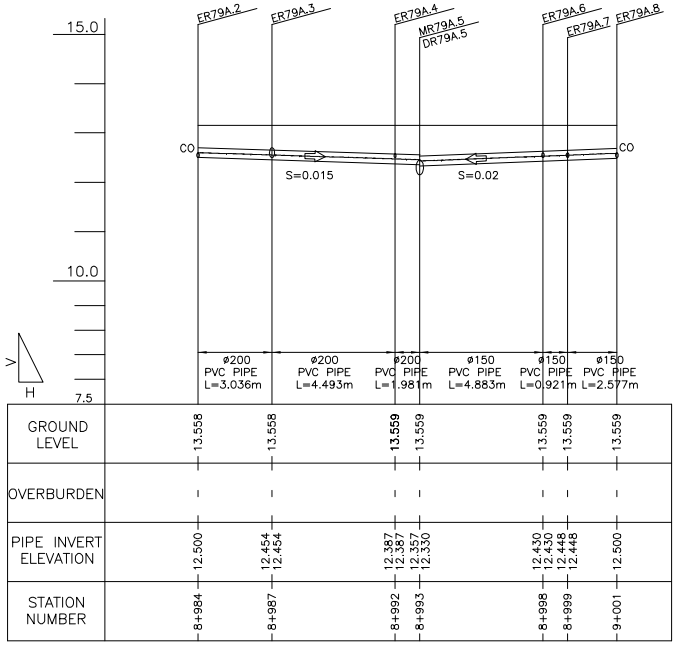
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	2.21	m	A=1.78 m^2
W2	1.68	m	Backfill Zone B
H	1.059	m	A=0.73 m^2
H/2	0.5295	m	Backfill Zone C
EL. A	13.559	m	A=1.03 m^2
EL. B	12.5	m	

Collector PVC 79A.2 - 79A.5	Volume	
Excavation	**19.27675**	m^3
Backfill Zone B	**7.788188**	m^3
Backfill Zone C	**11.18531**	m^3

Collector PVC 79A.8 - 79A.5	Volume	
Excavation	**16.87139**	m^3
Backfill Zone B	**6.878422**	m^3
Backfill Zone C	**9.841901**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5


15.0
10.0
7.5
V
H
ER79A.2
ER79A.3
ER79A.4
MR79A.5
DR79A.5
ER79A.6
ER79A.7
ER79A.8
CO
CO
S=0.015
S=0.02
ø200 PVC PIPE L=3.036m
ø200 PVC PIPE L=4.493m
ø200 PVC PIPE L=1.981m
ø150 PVC PIPE L=4.883m
ø150 PVC PIPE L=0.921m
ø150 PVC PIPE L=2.577m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.558
13.558
13.559
13.559
13.559
13.559
13.559
12.500
12.454
12.454
12.387
12.387
12.357
12.330
12.430
12.430
12.448
12.448
12.500
8+984
8+987
8+992
8+993
8+998
8+999
9+001

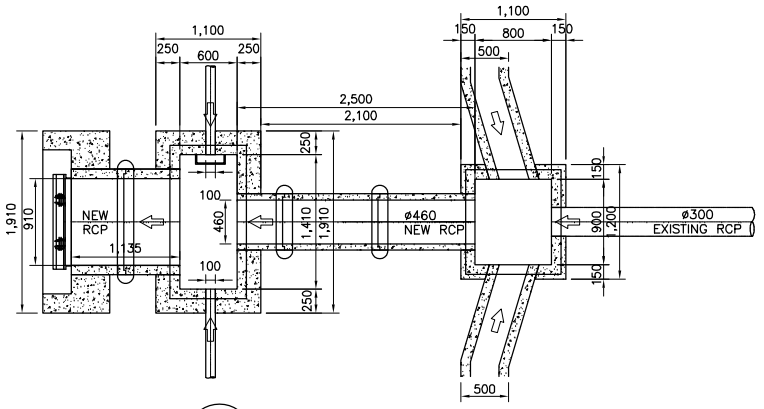
QUANTITIES OF MANHOLE

Manhole No.: MR 80

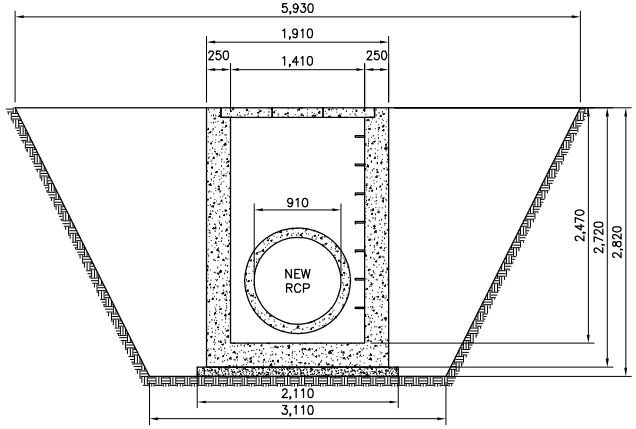
Location: 9 +009

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.01	4.52	9.08	
		A2=6.16	4.52	27.85	
		A3=2.39	3.34	7.99	
		A4=4.29	3.34	14.34	
				59.26	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.50	2.40	0.1	**0.24**	m^3
	L=1.60				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.30	1.82	0.25	**0.46**	m^3
	L=1.40				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.470	3.100	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.54	0.25	0.13	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.72**	m^3
Junction Box	Wout=1.30	Aout=1.82			
	Lout=1.40				
	Win=0.80	Ain=0.72	1.553	1.708	m^3
	Lin=.90				
		Anet=1.10			
Minus					
Depth of Ditch=0.41	W=0.50	0.20	0.25	0.03	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.02	
Depth of Ditch=0.47	W=0.50	0.24	0.25	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.25	0.04	
Net Wall Vol.				**1.58**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.60		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.760m	L=2.10		**0.1596**	m3
(Inlet Pipe)					
14. Backfill				**49.39**	m3

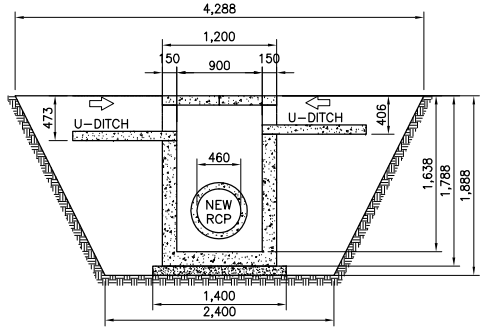
3.279



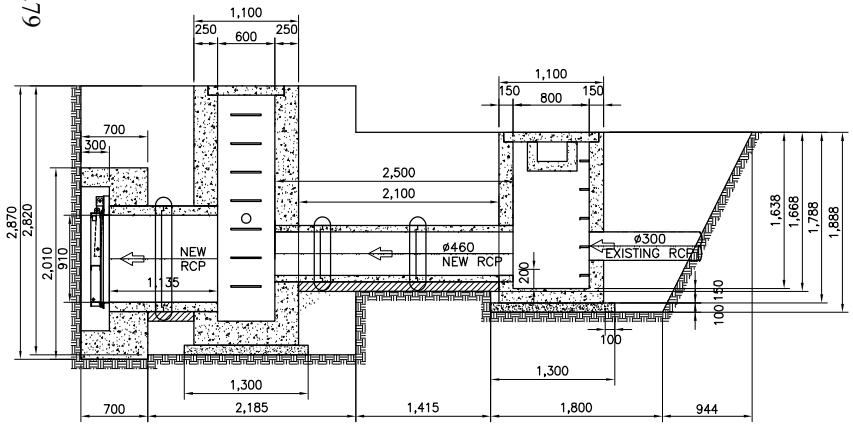
1 PLAN
SCALE B



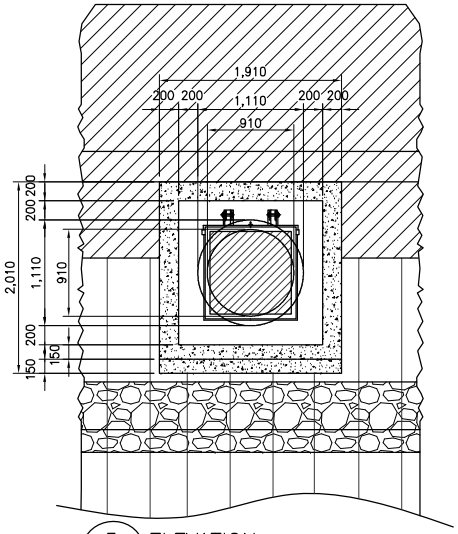
3 SECTION
SCALE B



4 SECTION(JB80)
SCALE B



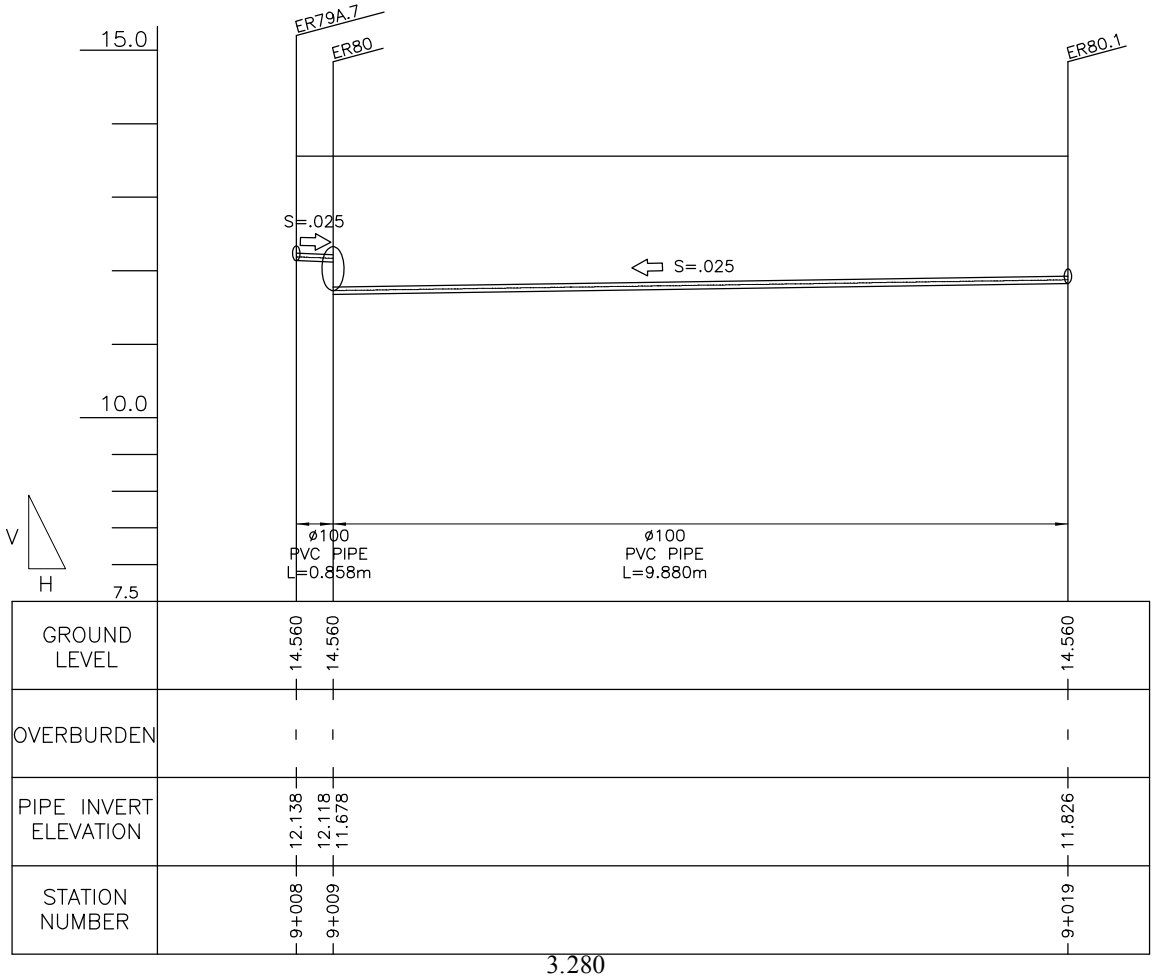
2 SECTION
SCALE B



5 ELEVATION
SCALE B

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.10		L=11.01	2	pc
2. PVC coupling	Dia=0.10			1	pc



Clearing (Manhole 80)

L1	1.544	m	
W of Junction Manhole	1.1	m	A1=17.11 m^2
L2	2.1	m	A2=17.77 m^2
W of Manhole	1.1	m	**At=34.88** m^2
L3	0.485	m	
W1	5.93	m	
W2	4.288	m	

Clearing (Collector 80.1 - 80)

W	3.908	m	**A=38.61** m^2
L	9.88	m	

Clearing (Collector 79A.7 - 80)

W	3.532	m	**A=3.03** m^2
L	0.858	m	

(Collector PVC) Downstream	80.1-80		
D	0.1	m	Excavation
W1	3.98	m	A=7.32 m^2
W2	2.54	m	Backfill Zone B
H	2.882	m	A=2.62 m^2
H/2	1.441	m	Backfill Zone C
EL. A	14.56	m	A=4.70 m^2
EL. B	11.678	m	

(Collector PVC) Upstream

D	0.1	m	Excavation
W1	3.83	m	A=6.74 m^2
W2	2.47	m	Backfill Zone B
H	2.734	m	A=2.43 m^2
H/2	1.367	m	Backfill Zone C
EL. A	14.56	m	A=4.31 m^2
EL. B	11.826	m	

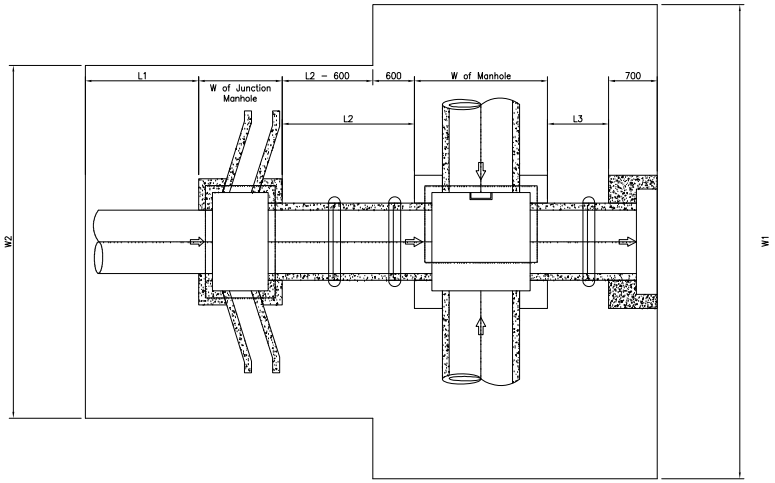
(Collector PVC) Downstream	79A.7-80		
D	0.1	m	Excavation
W1	3.54	m	A=5.67 m^2
W2	2.32	m	Backfill Zone B
H	2.442	m	A=2.08 m^2
H/2	1.221	m	Backfill Zone C
EL. A	14.56	m	A=3.58 m^2
EL. B	12.118	m	

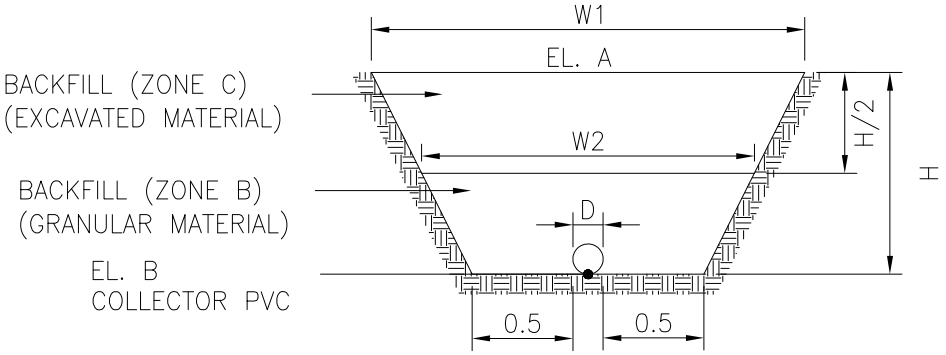
(Collector PVC) Upstream

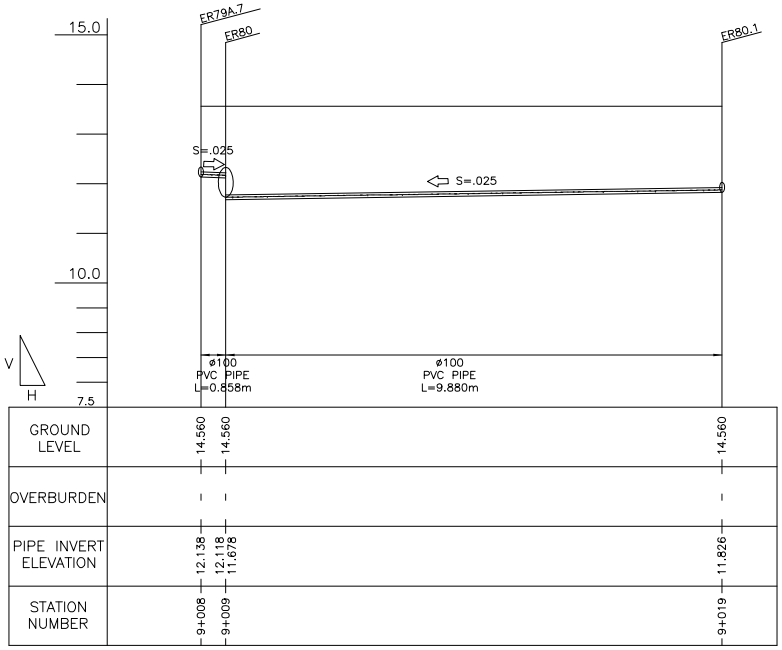
D	0.1	m	Excavation
W1	3.52	m	A=5.60 m^2
W2	2.31	m	Backfill Zone B
H	2.422	m	A=2.06 m^2
H/2	1.211	m	Backfill Zone C
EL. A	14.56	m	A=3.53 m^2
EL. B	12.138	m	

Collector PVC 78.1-78.4	Volume	
Excavation	**71.23301**	m^3
Backfill Zone B	**25.54879**	m^3
Backfill Zone C	**45.60469**	m^3

Collector PVC 79A.1-79A	Volume	
Excavation	**4.953557**	m^3
Backfill Zone B	**1.819658**	m^3
Backfill Zone C	**3.126991**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

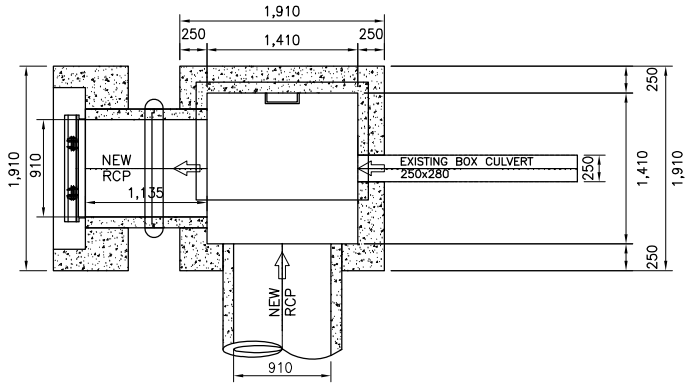

15.0
10.0
7.5
V
H
FR79A.7
FR80
FR80.1
S=.025
S=.025
ø100
PVC PIPE
L=0.858m
ø100
PVC PIPE
L=9.880m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
14.560
14.560
14.560
12.138
12.118
11.678
11.826
9+008
9+009
9+019

QUANTITIES OF MANHOLE

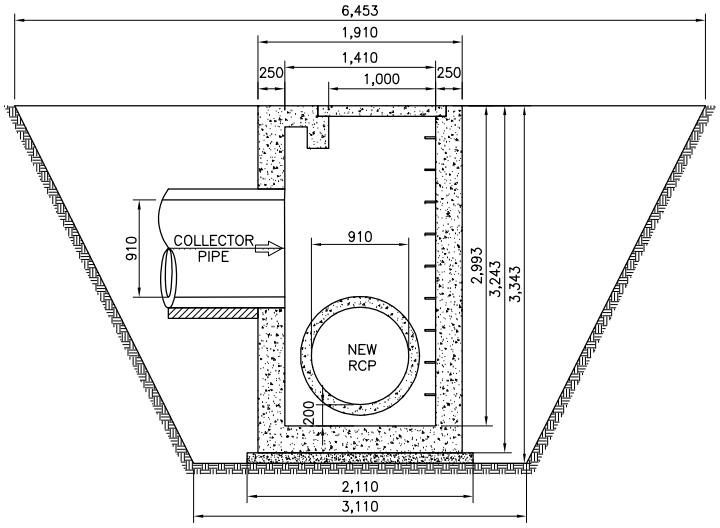
Manhole No.: MR 81

Location: 9 + 046

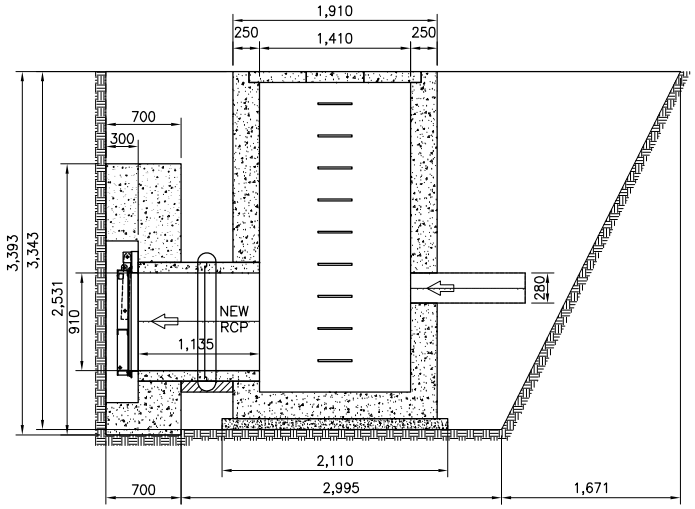
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.38	4.78	11.36	
		A2=10.01	4.78	47.87	
		A3=2.79	4.78	13.36	
				72.59	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	3.65	0.25	**0.91**	m^3
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91 Win=1.41	Ain=1.99	2.993	4.968	m^3
	Lin=1.41				
	.	Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
L=0.25	W=0.28	0.07	0.25	0.02	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.47**	m^3
5. Conc. Cover	L=1.61 W=1.10	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.53	Ain=4.83	0.7	3.38	
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.31	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**60.49**	m3



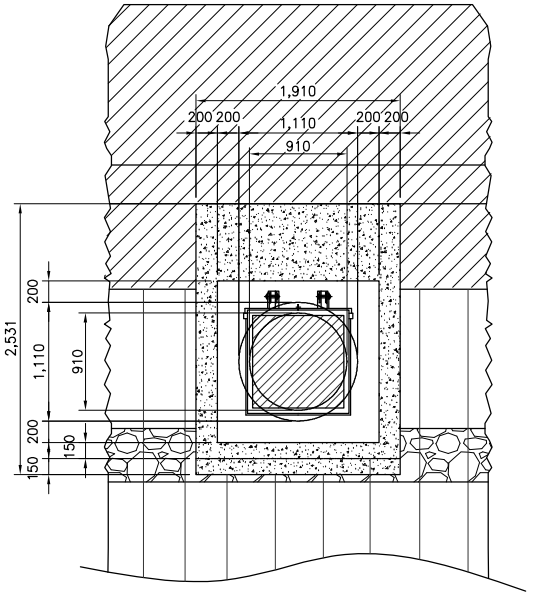
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



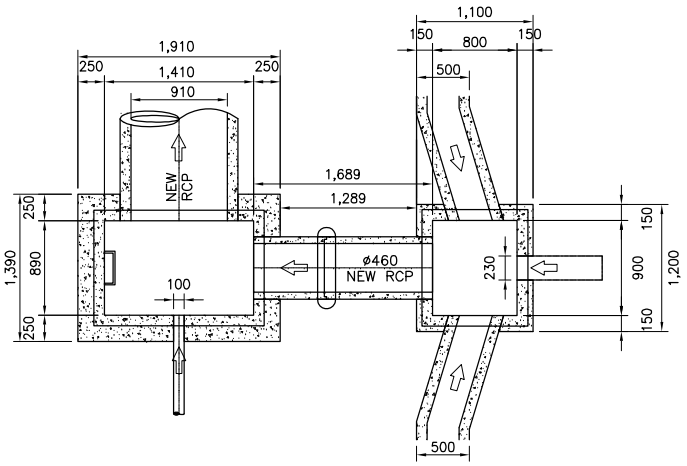
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

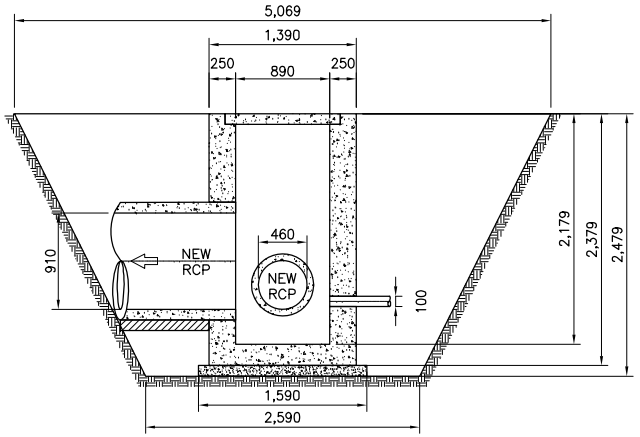
Manhole No.: MR 81.1

Location: 9 + 060

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=8.90	3.71	33.04	
		A2=0.97	3.36	3.26	
		A3=4.40	3.36	14.79	
				51.08	m^3
2. Lev. Concrete	W=2.11	3.35	0.1	**0.34**	m^3
(Manhole)	L=1.59				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	2.65	0.25	**0.66**	m^3
(Manhole)	L=1.39				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.91	Aout=2.65			
	Lout=1.39				
	Win=1.41	Ain=1.25	2.048	2.867	m^3
	Lin=.89				
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.56**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.677	1.006	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.63	W=0.50	0.32	0.15	0.05	
L=0.23	W=0.25	0.06	0.15	0.01	
Depth of Ditch=0.44	W=0.50	0.22	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.88**	m^3
5. Conc. Cover	L=1.09	1.7549	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
8. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
9. Conc.Bedding	Dia=.590m	L=1.29		**0.076051**	m3
(Inlet Pipe)					
10. Backfill				**42.57**	m3

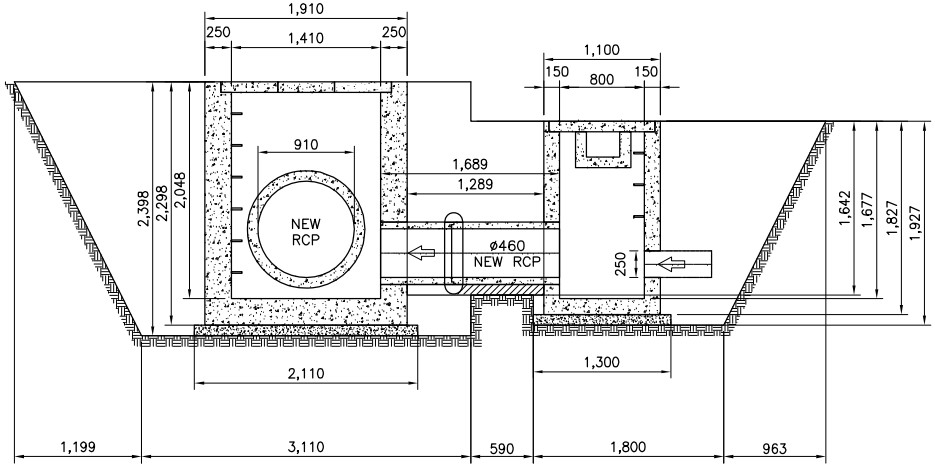


1 PARTIAL PLAN OF MANHOLE (MR81.1)
SCALE A

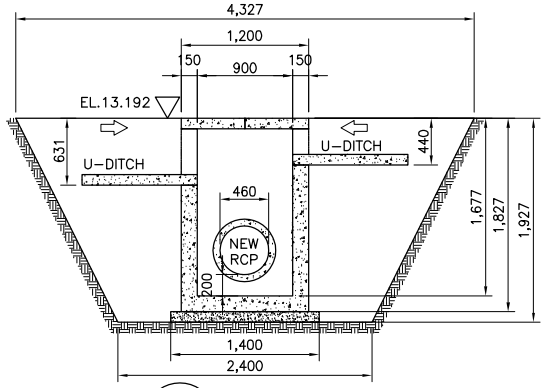


3 SECTION
SCALE A

STEP IRON



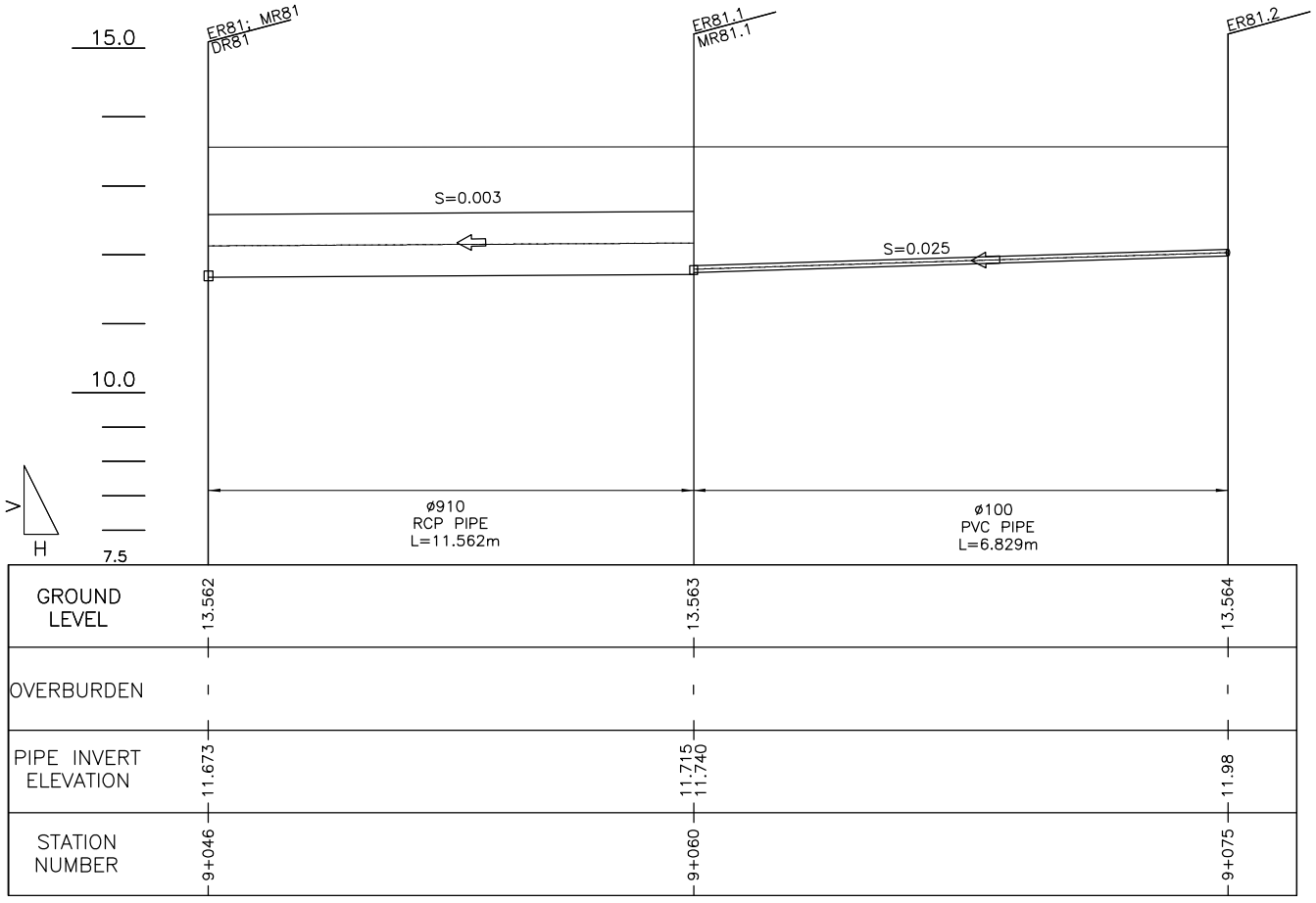
2 SECTION
SCALE A



4 SECTION (JB81.1)
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=11.60	12	pc
Collector Pipe (PVC)	Dia=0.10		L=7.00	2	pc
2. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=11	0.63	m3
3. Conc. Bedding	Dia=.910m	L=11.60		1.06	m3
4. PVC coupling	Dia=0.10			1	pc
5. Formworks				11.83	m3



Clearing (Manhole 81)

L1	2.2715	m	
W of Manhole	1.91	m	**At=34.63** m^2
L2	0.485	m	
W	6.453	m	

Clearing (Manhole 81.1)

L4	1.5635	m	
W of Junction Manhole	1.1	m	A1=21.84 m^2
L5	1.289	m	A2=14.51 m^2
W of Manhole	1.91	m	**At=36.35** m^2
L6	1.799	m	
W3	5.069	m	
W4	4.327	m	

Clearing (Collector 81.1 - 81)

W	4.1785	m	**A=48.31** m^2
L	11.562	m	

Clearing (Collector 81.2 - 81.1)

W	2.8035	m	**A=19.15** m^2
L	6.829	m	

(Collector Pipe) Downstream	81.1 - 81		Excavation
Do	1.11	m	A=6.59 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.56 m^2
H	2.089	m	Backfill Zone C
EL. A	13.562	m	A=2.17 m^2
EL. B	11.673	m	
W	4.199	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=6.42 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.50 m^2
H	2.048	m	Backfill Zone C
EL. A	13.563	m	A=2.12 m^2
EL. B	11.715	m	
W	4.158	m	

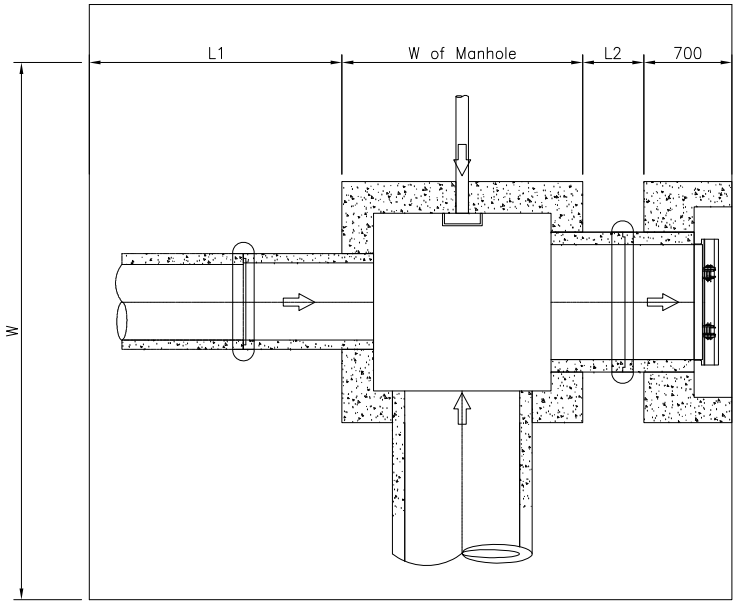
(Collector PVC) Downstream	81.2 - 81.1		
D	0.1	m	Excavation
W1	2.92	m	A=3.67 m^2
W2	2.01	m	Backfill Zone B
H	1.823	m	A=1.41 m^2
H/2	0.9115	m	Backfill Zone C
EL. A	13.563	m	A=2.25 m^2
EL. B	11.74	m	

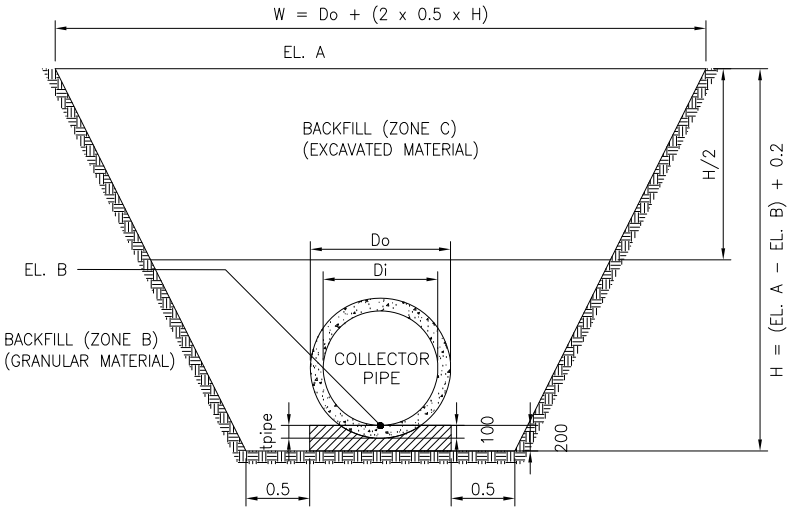
(Collector PVC) Upstream

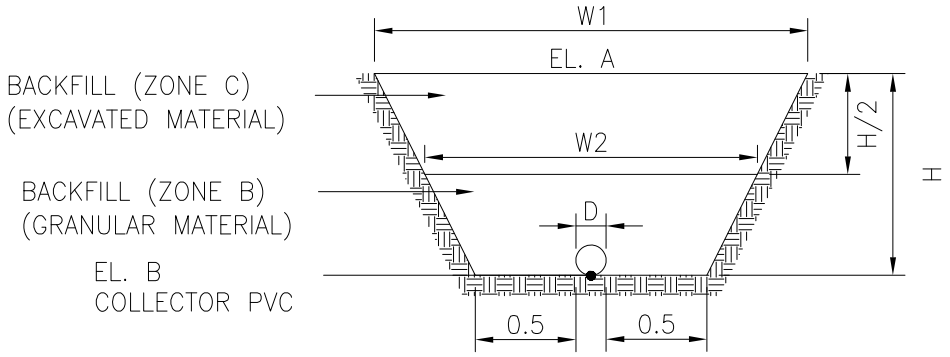
D	0.1	m	Excavation
W1	2.68	m	A=3.00 m^2
W2	1.89	m	Backfill Zone B
H	1.584	m	A=1.18 m^2
H/2	0.792	m	Backfill Zone C
EL. A	13.564	m	A=1.81 m^2
EL. B	11.98	m	

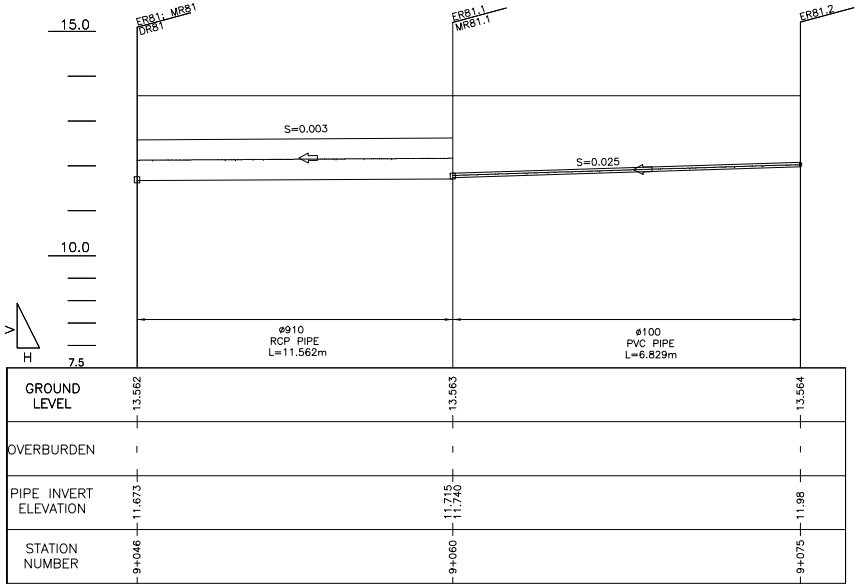
Collector Pipe 81.1 - 81	Volume	
Excavation	**75.4259**	m^3
Backfill Zone B	**17.71356**	m^3
Backfill Zone C	**24.85341**	m^3

Collector PVC 81.2 - 81.1	Volume	
Excavation	**23.32271**	m^3
Backfill Zone B	**9.05481**	m^3
Backfill Zone C	**14.21292**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5

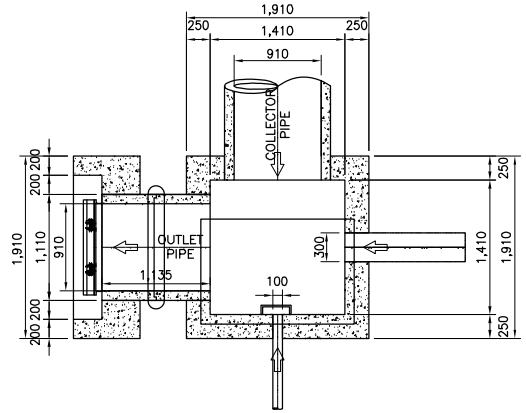

15.0
10.0
7.5
V
H
FR81; MR81
DR81
FR81.1
MR81.1
FR81.2
S=0.003
S=0.025
ø910
RCP PIPE
L=11.562m
ø100
PVC PIPE
L=6.829m
GROUND LEVEL
13.562
13.563
13.564
OVERBURDEN
PIPE INVERT ELEVATION
11.673
11.715
11.740
11.98
STATION NUMBER
9+046
9+060
9+075

QUANTITIES OF MANHOLE

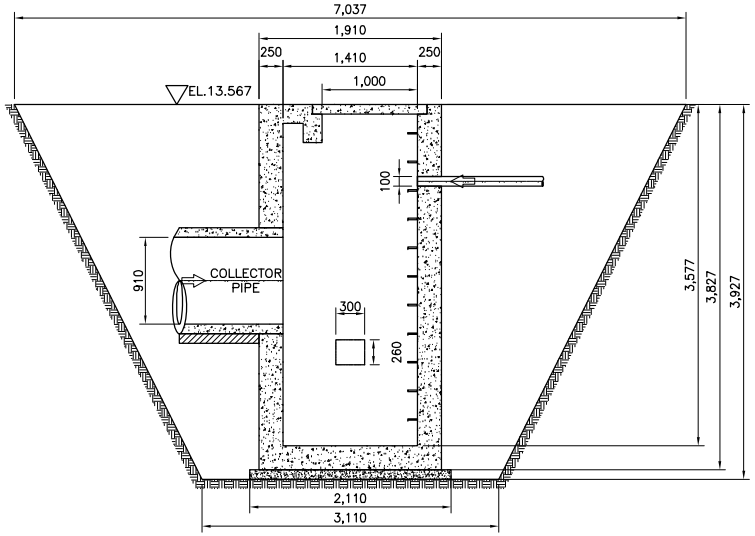
Manhole No.: MR 83.1

Location: 9 + 129

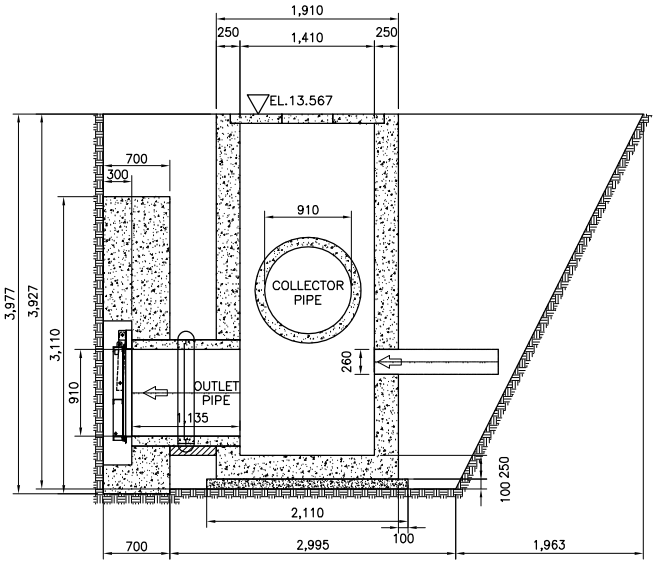
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.78	5.07	14.12	
		A2=11.76	5.07	59.67	
		A3=3.85	5.07	19.56	
				93.35	m^3
2. Lev. Concrete	W=2.21	4.88	0.1	**0.49**	m^3
	L=2.21				
3. Bottom Slab	W=2.01	4.67	0.3	**1.40**	m^3
	L=2.01				
4. Wall					
Entire Wall	Wout=2.01	Aout=4.04			
	Lout=2.01				
	Win=1.41	Ain=1.99	3.577	7.340	m^3
	Lin=1.41				
	.	Anet=2.05			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.30	0.24	
L=0.26	W=0.30	0.08	0.30	0.02	
Pipe hole on Wall C	DiaC=0.10	0.01	0.30	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.30	0.24	
Net Wall Vol.				**6.83**	m^3
5. Conc. Cover	L=1.61	1.771	0.1	**0.18**	m^3
	W=1.10				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=11			**10.42**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.94	0.7	4.16	
	Lout=3.11				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.09	m3
9. Outlet Pipe	Dia=.910m	L=1.19		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**77.79**	m3



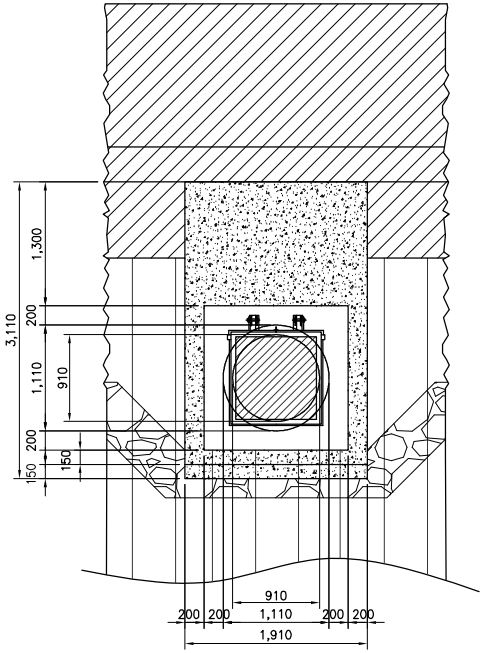
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



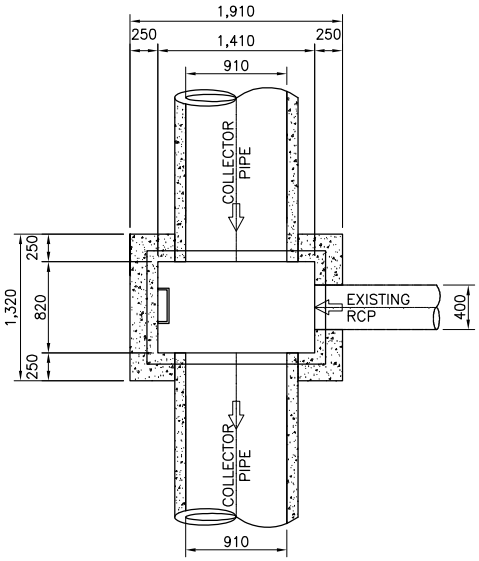
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

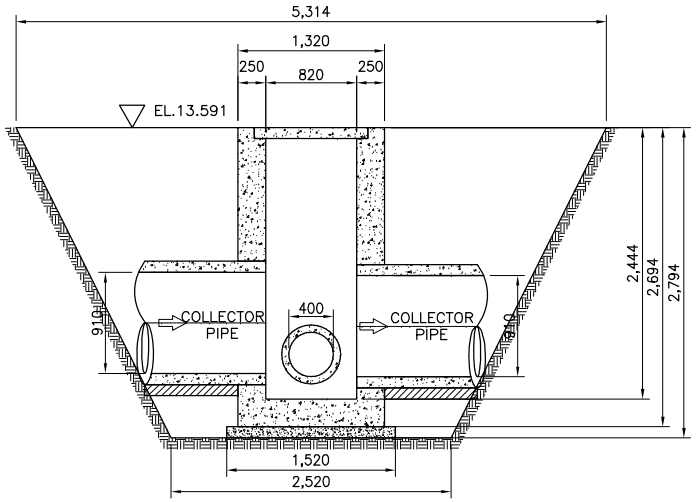
Manhole No.: MR 83

Location: 9 + 110

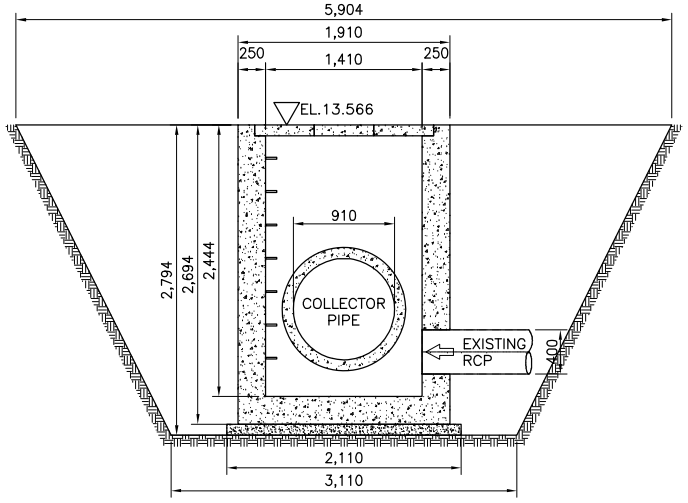
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=12.59	3.92	49.33	
				49.33	m^3
2. Lev. Concrete	W=2.11 L=1.52	3.21	0.1	**0.32**	m^3
3. Bottom Slab	W=1.91 L=1.32	2.52	0.25	**0.63**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.32	Aout=2.52			
	Win=1.41 Lin=.82	Ain=1.16	2.444	3.336	m^3
	.	Anet=1.37			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=1.66	2.16	0.25	0.54	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.31**	m^3
5. Conc. Cover	L=1.02 W=1.61	1.6422	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**41.10**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



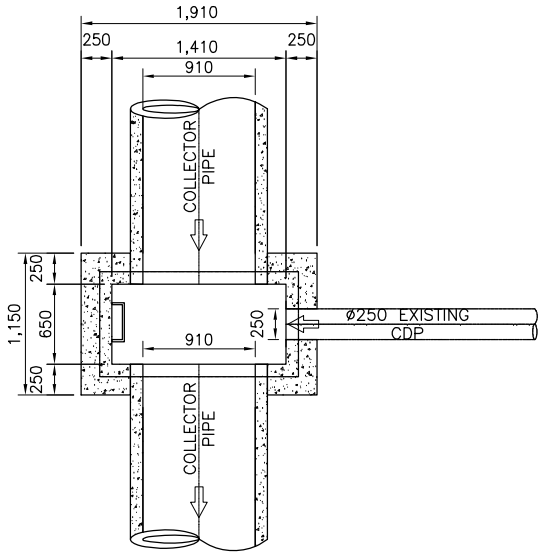
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

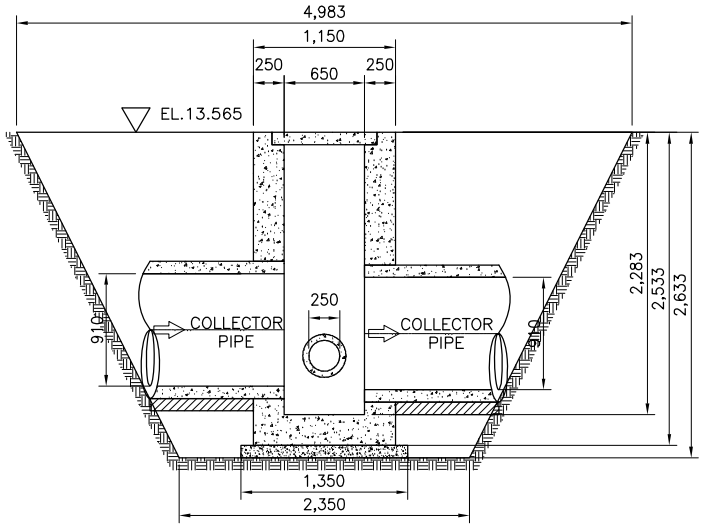
Manhole No.: MR 82.1

Location: 9 + 099

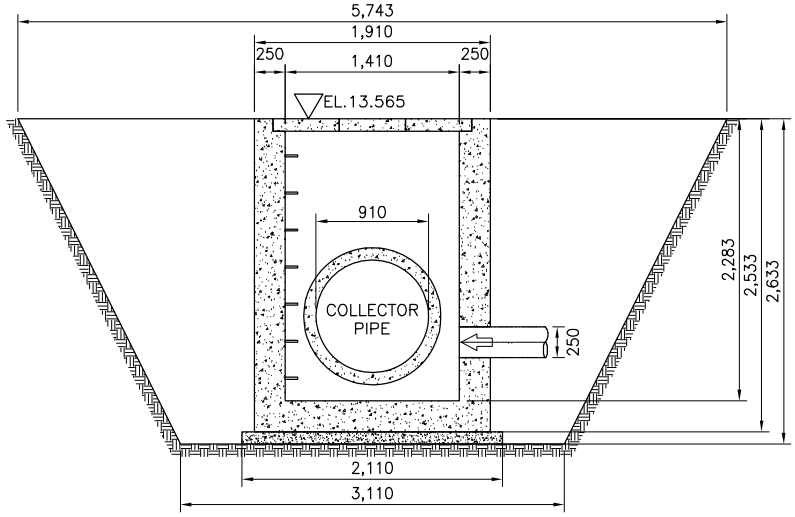
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A=11.65	3.67	42.73	
				42.73	m^3
2. Lev. Concrete	W=2.11 L=1.35	2.85	0.1	**0.28**	m^3
3. Bottom Slab	W=1.91 L=1.15	2.20	0.25	**0.55**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.15	Aout=2.20			
	Win=1.41 Lin=.65	Ain=0.92	2.283	2.922	m^3
	.	Anet=1.28			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=1.20	1.13	0.25	0.28	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.16**	m^3
5. Conc. Cover	L=0.85 W=1.61	1.3685	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**35.61**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



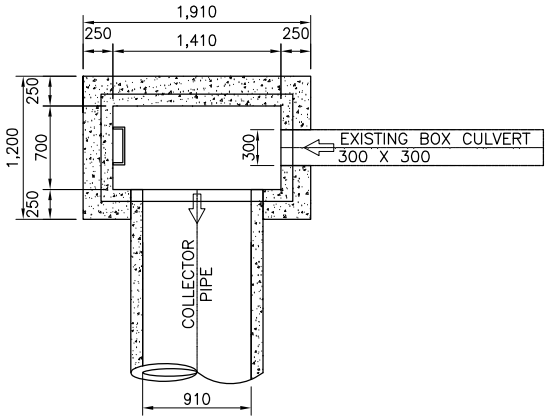
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

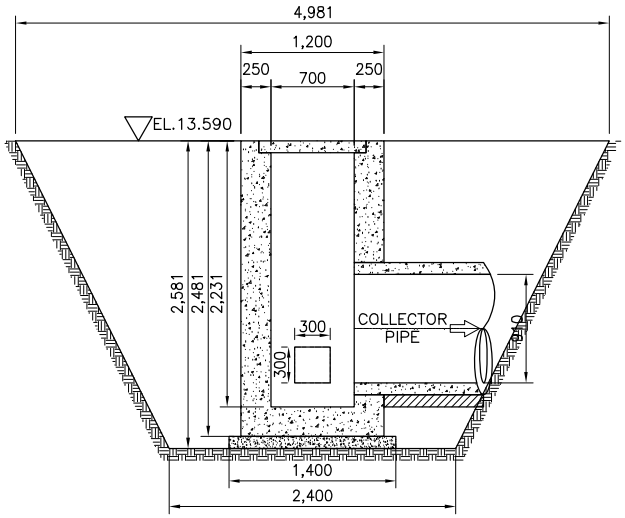
Manhole No.: MR 82

Location: 9 + 092

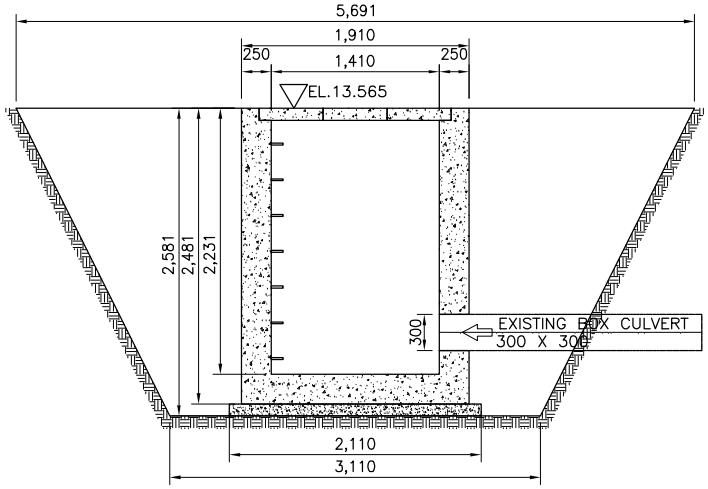
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.36	3.69	41.92	
				41.92	m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.1	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	2.231	2.911	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall A	DiaB=0.30	0.09	0.25	0.02	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.65**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**34.93**	m3



1 PLAN
SCALE A



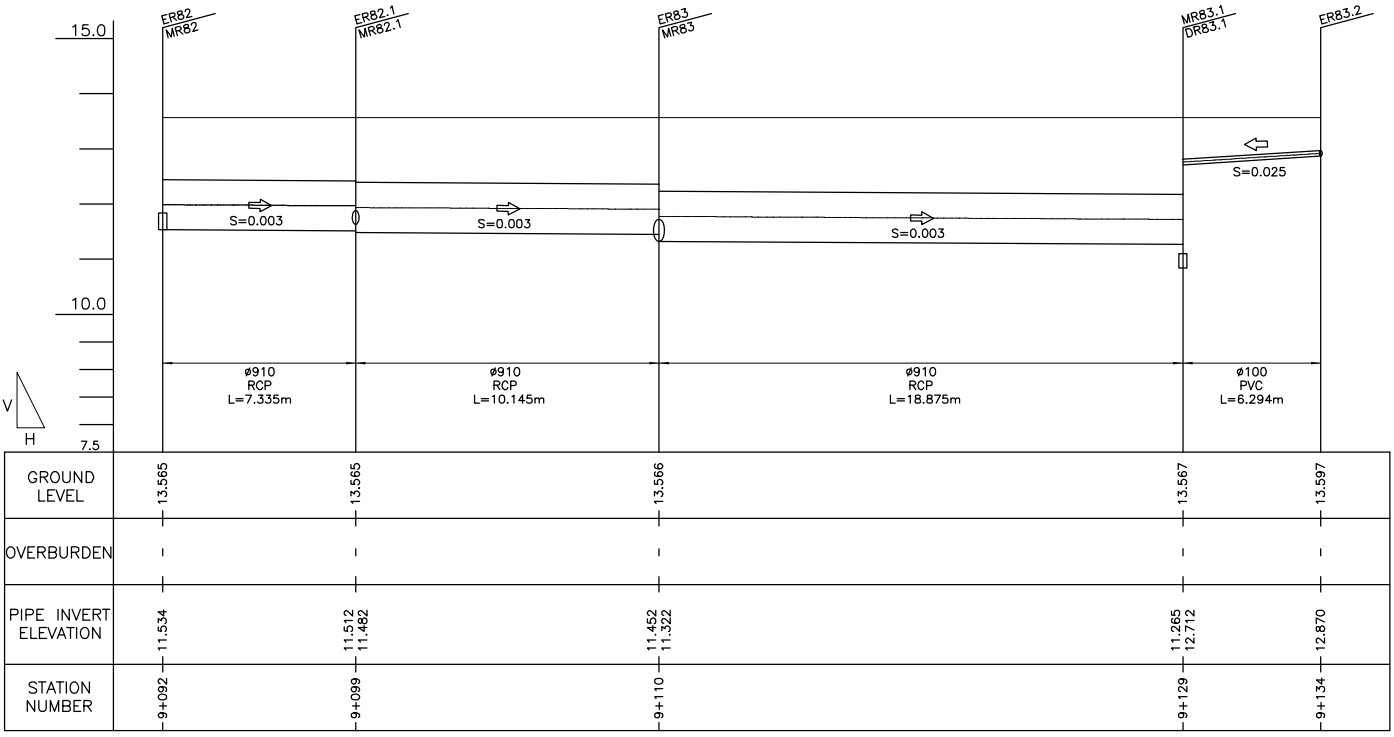
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=36.47	37	pc
Collector Pipe (PVC)	Dia=0.10		L=6.45	2	pc
2. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=36	2.08	m3
3. Conc. Bedding	Dia=.910m	L=36.47		3.32	m3
4. PVC coupling	Dia=0.10			1	pc
5. Formworks				37.76	m3



Clearing (Manhole 83.1)

L1	2.5635	m	
W of Manhole	1.91	m	**At=39.82** m^2
L2	0.485	m	
W	7.037	m	

Clearing (Manhole 83)

W	5.904	m	**A=31.37** m^2
L	5.314	m	

Clearing (Manhole 82.1)

W	5.743	m	**A=28.62** m^2
L	4.983	m	

Clearing (Manhole 82)

W	5.691	m	**A=28.35** m^2
L	4.981	m	

Clearing (Collector 82 - 82.1)

W	4.352	m	**A=31.92** m^2
L	7.335	m	

Clearing (Collector 82.1 - 83)

W	4.4085	m	**A=44.72** m^2
L	10.145	m	

Clearing (Collector 83 - 83.1)

W	4.583	m	**A=86.50** m^2
L	18.875	m	

Clearing (Collector 83.2 - 83.1)

W	1.891	m	**A=11.90** m^2
L	6.294	m	

(Collector Pipe) Downstream	82-82.1		Excavation
Do	1.11	m	A=7.29 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.82 m^2
H	2.253	m	Backfill Zone C
EL. A	13.565	m	A=2.39 m^2
EL. B	11.512	m	
W	4.363	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=7.20 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.79 m^2
H	2.231	m	Backfill Zone C
EL. A	13.565	m	A=2.36 m^2
EL. B	11.534	m	
W	4.341	m	

(Collector Pipe) Downstream	82.1-83		Excavation	
Do	1.11	m	A=7.56	m^2
Di	0.91	m	Backfill Zone B	
tpipe	0.1	m	A=1.92	m^2
H	2.314	m	Backfill Zone C	
EL. A	13.566	m	A=2.47	m^2
EL. B	11.452	m		
W	4.424	m		

(Collector Pipe) Upstream			Excavation	
Do	1.11	m	A=7.42	m^2
Di	0.91	m	Backfill Zone B	
tpipe	0.1	m	A=1.87	m^2
H	2.283	m	Backfill Zone C	
EL. A	13.565	m	A=2.43	m^2
EL. B	11.482	m		
W	4.393	m		

(Collector Pipe) Downstream	83-83.1		Excavation	
Do	1.11	m	A=8.41	m^2
Di	0.91	m	Backfill Zone B	
tpipe	0.1	m	A=2.23	m^2
H	2.502	m	Backfill Zone C	
EL. A	13.567	m	A=2.73	m^2
EL. B	11.265	m		
W	4.612	m		

(Collector Pipe) Upstream			Excavation	
Do	1.11	m	A=8.14	m^2
Di	0.91	m	Backfill Zone B	
tpipe	0.1	m	A=2.14	m^2
H	2.444	m	Backfill Zone C	
EL. A	13.566	m	A=2.65	m^2
EL. B	11.322	m		
W	4.554	m		

(Collector PVC) Downstream	83.2 - 83.1			
D	0.1	m	Excavation	
W1	1.96	m	A=1.31	m^2
W2	1.53	m	Backfill Zone B	
H	0.855	m	A=0.55	m^2
H/2	0.4275	m	Backfill Zone C	
EL. A	13.567	m	A=0.74	m^2
EL. B	12.712	m		

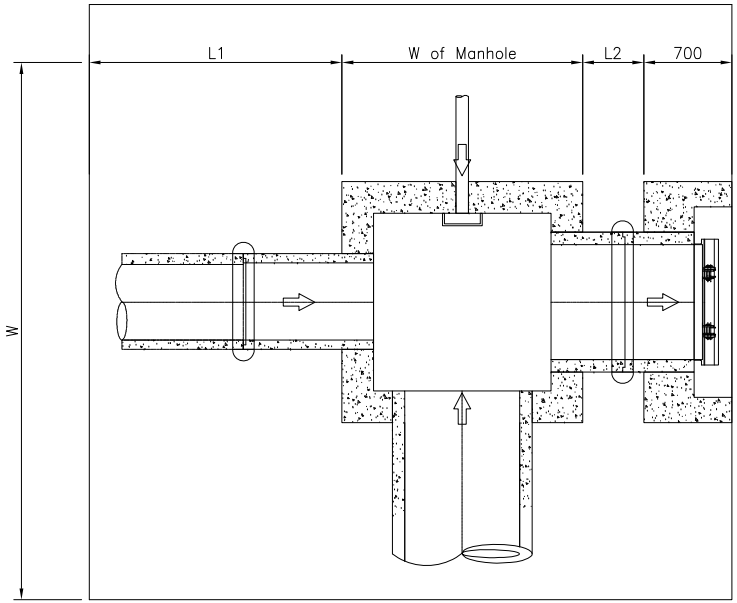
(Collector PVC) Upstream				
D	0.1	m	Excavation	
W1	1.83	m	A=1.06	m^2
W2	1.46	m	Backfill Zone B	
H	0.727	m	A=0.46	m^2
H/2	0.3635	m	Backfill Zone C	
EL. A	13.597	m	A=0.60	m^2
EL. B	12.87	m		

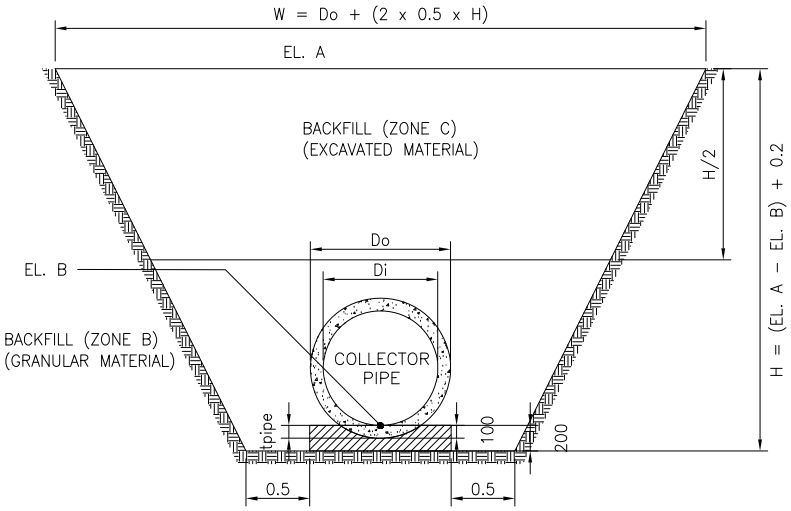
Collector Pipe 82-82.1	Volume	
Excavation	**53.29387**	m^3
Backfill Zone B	**13.27172**	m^3
Backfill Zone C	**17.44707**	m^3

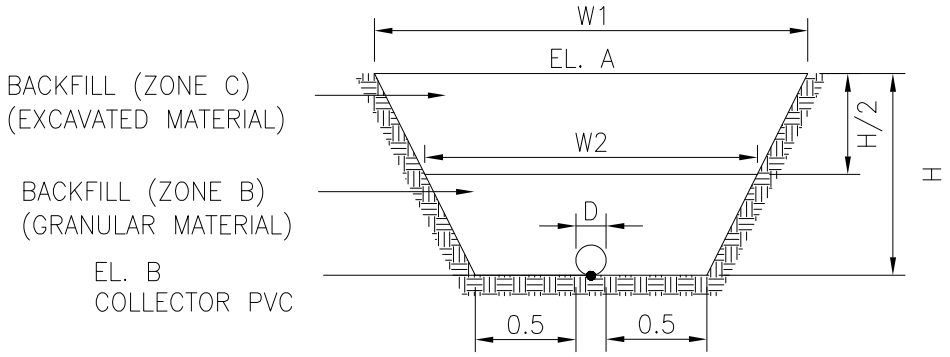
Collector Pipe 82.1-83	Volume	
Excavation	**76.22933**	m^3
Backfill Zone B	**19.28903**	m^3
Backfill Zone C	**24.90439**	m^3

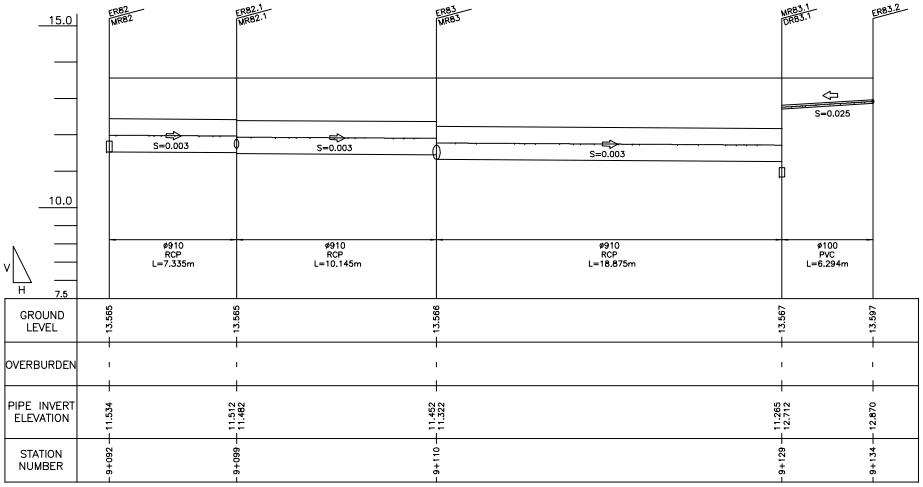
Collector Pipe 83-83.1	Volume	
Excavation	**156.6841**	m^3
Backfill Zone B	**41.34472**	m^3
Backfill Zone C	**50.8755**	m^3

Collector PVC 83.2-83.1	Volume	
Excavation	**7.644776**	m^3
Backfill Zone B	**3.263855**	m^3
Backfill Zone C	**4.330252**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
H/2
H
0.5
0.5

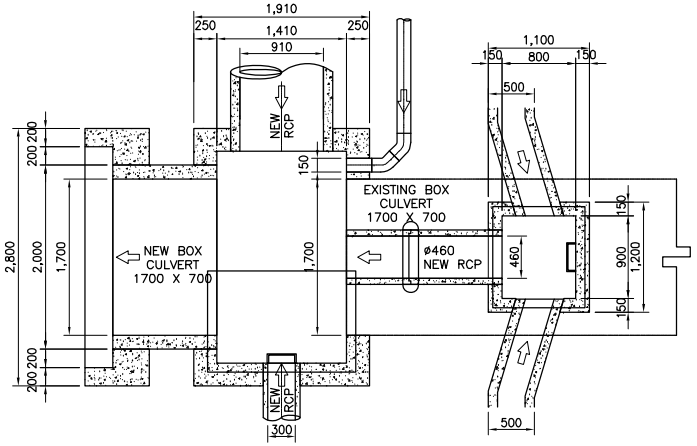

15.0
10.0
7.5
ERB2
MRB2
ERB2-1
MRB2-1
ERB3
MRB3
MRB3-1
CRB3-1
ERB3-2
S=0.003
S=0.003
S=0.003
S=0.025
ø910
RCP
L=7.335m
ø910
RCP
L=10.145m
ø910
RCP
L=18.875m
ø100
PVC
L=6.294m
GROUND LEVEL
13.565
13.565
13.566
13.567
13.597
OVERBURDEN
PIPE INVERT ELEVATION
11.534
11.512
11.482
11.452
11.322
11.265
12.712
12.870
STATION NUMBER
9+092
9+099
9+110
9+129
9+134

QUANTITIES OF MANHOLE

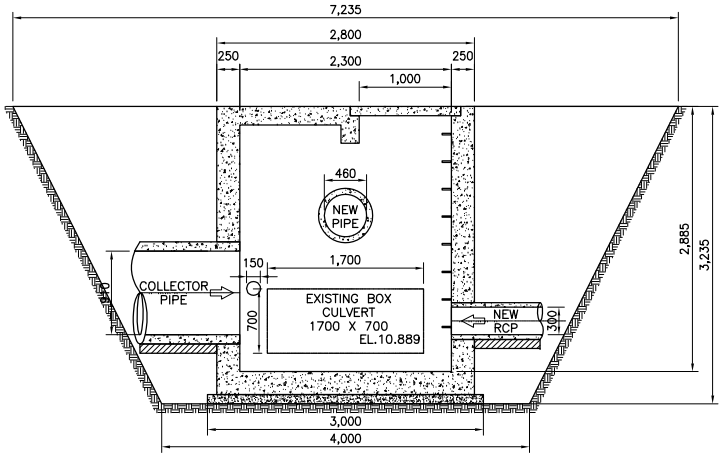
Manhole No.: MR 83.18

Location: 9 + 243

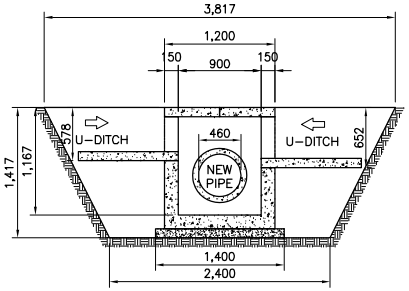
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.29	5.62	18.50	
		A2=8.44	5.62	47.43	
		A3=1.44	3.11	4.48	
		A4=2.92	3.11	9.07	
				79.48	m^3
2. Lev. Concrete (Manhole)	W=2.21 L=3.92	8.66	0.1	**0.87**	m^3
(Junction Box)	W=1.30 L=1.40	1.82	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=2.01 L=3.72	7.48	0.3	**2.24**	m^3
(Junction Box)	W=1.10 L=1.20	1.32	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=1.50 Lout=3.72	Aout=5.58			
	Win=1.41 Lin=3.12	Ain=4.40	3.095	3.655	m^3
		Anet=1.18			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.30	0.24	
Pipe hole on Wall B	DiaB=0.59	1.48	0.30	0.37	
Pipe hole on Wall C	DiaC=0.40	0.13	0.30	0.03	
Pipe hole on Wall A	DiaA=1.11	1.94	0.30	0.48	
Net Wall Vol.				**2.53**	m^3
Junction Box	Wout=1.10 Lout=1.20	Aout=1.32			
	Win=0.80 Lin=.90	Ain=0.72	1.167	0.700	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.58	W=0.50	0.29	0.15	0.04	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.65	W=0.50	0.33	0.15	0.05	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.55**	m^3
5. Conc. Cover (Manhole)	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
(Junction Box)	L=1.10 W=1.00	1.1	0.1	**0.11**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m Qty=10	0.000201062		0.95	kg/pc
				9.47	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m Qty=3	0.000201062		0.95	kg/pc
				2.84	kg
7. Flapgate				**2**	pc
8. Conc. Mouth	Wout=3.62 Lout=2.62	Ain=9.49	0.7	6.64	
	Win=3.22 Lin=1.51	Aout=4.86	0.3	1.46	
	DiaD=2.22	Apipe=3.87	0.4	1.55	
				3.63	m3
9. Outlet Pipe	Dia=1.110m	L=2.37		**3**	pc
10. Inlet Pipe	Dia=.460m	L=4.36		**5**	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=4	**0.129971458**	m3
11. Conc. Collar (Outlett Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=2	**0.115359282**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.10767**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=1.19		**0.070269**	m3
14. Backfill				**66.23**	m3



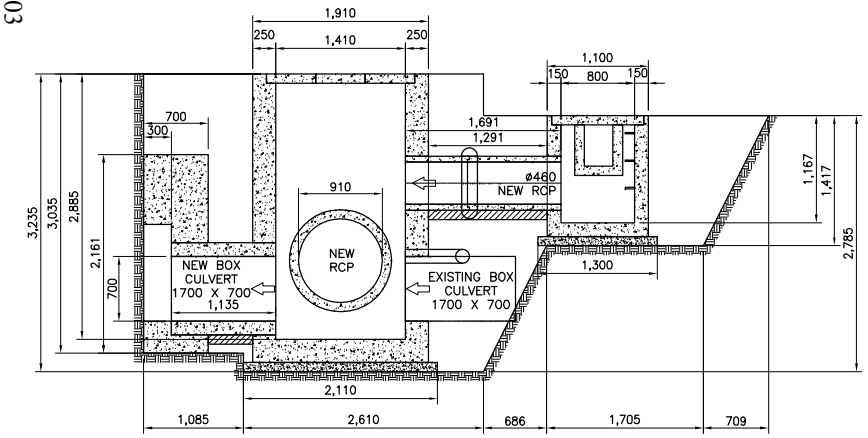
1 PLAN
SCALE A



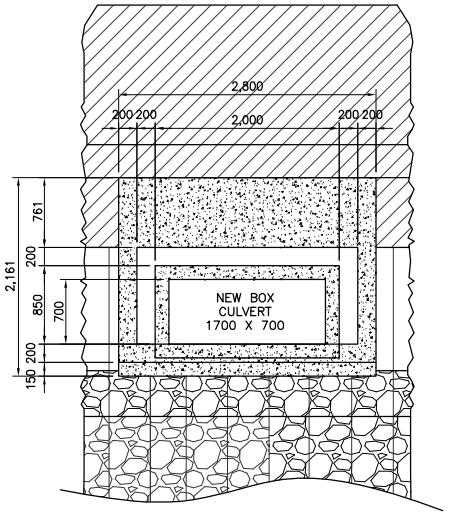
3 SECTION
SCALE A



4 SECTION (JB83.18)
SCALE A



2 SECTION
SCALE A



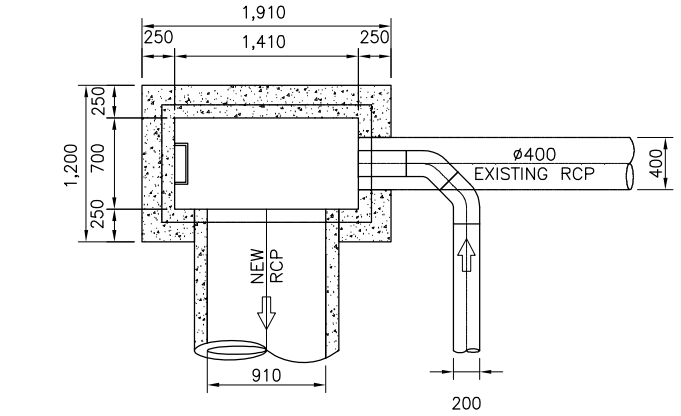
5 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

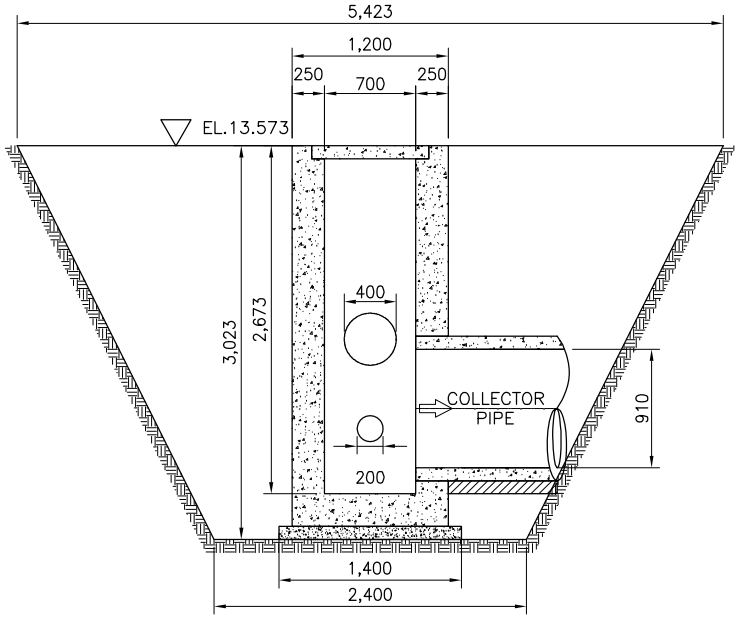
Manhole No.: MR 83.15

Location: 9 + 239

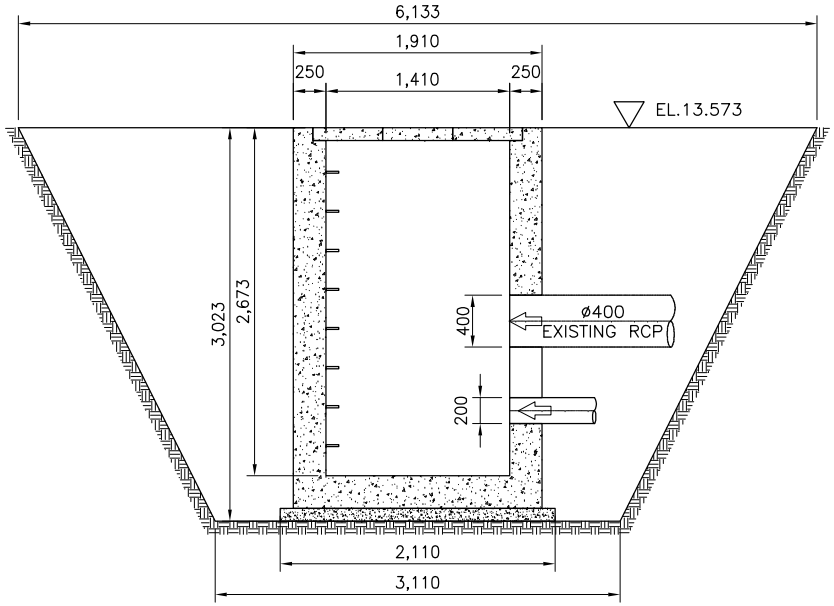
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.97	3.91	54.65	
				54.65	m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.1	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.673	3.355	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall A	DiaB=0.53	0.25	0.25	0.06	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.05**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**45.54**	m3



1 PARTIAL PLAN OF MANHOLE (MR83.15)
SCALE A



3 SECTION
SCALE A



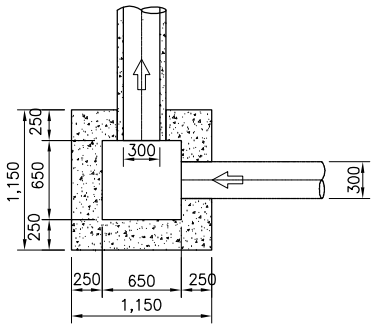
2 SECTION
SCALE A

QUANTITIES OF JUNCTION BOX

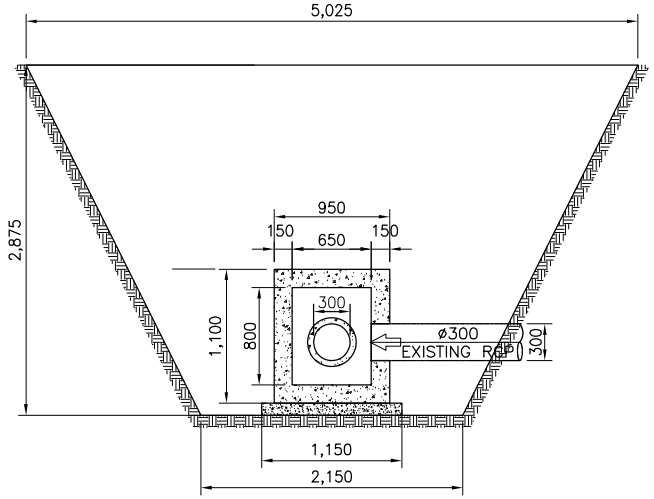
Junction Box No.: JB 83.19

Location: 9 +248

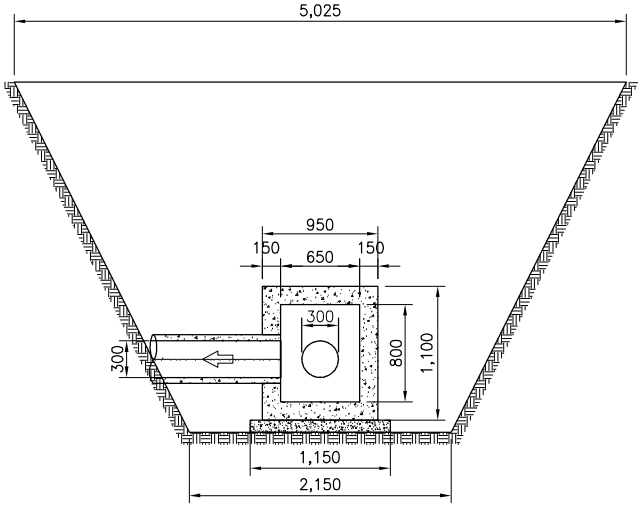
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=10.31	3.59	37.00	
				37.00	m^3
2. Lev. Concrete	W=1.15 L=1.15	1.32	0.1	**0.13**	m^3
3. Bottom Slab	W=0.95 L=0.95	0.90	0.2	**0.18**	m^3
4. Wall					
Entire Wall	Wout=0.95 Lout=.95	Aout=0.90			
	Win=0.65 Lin=.65	Ain=0.42	0.800	0.384	m^3
		Anet=0.48			
Minus					
Pipe hole on Wall A	DiaA=0.40	0.13	0.15	0.03	
Pipe hole on Wall A	DiaB=0.40	0.13	0.15	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.15	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.32**	m^3
5. Top Slab	L=0.95 W=0.95	0.90	0.15	**0.14**	m^3
6. Backfill				**30.84**	m3



5 PARTIAL PLAN JUNCTION BOX (JB 83.19)
SCALE A



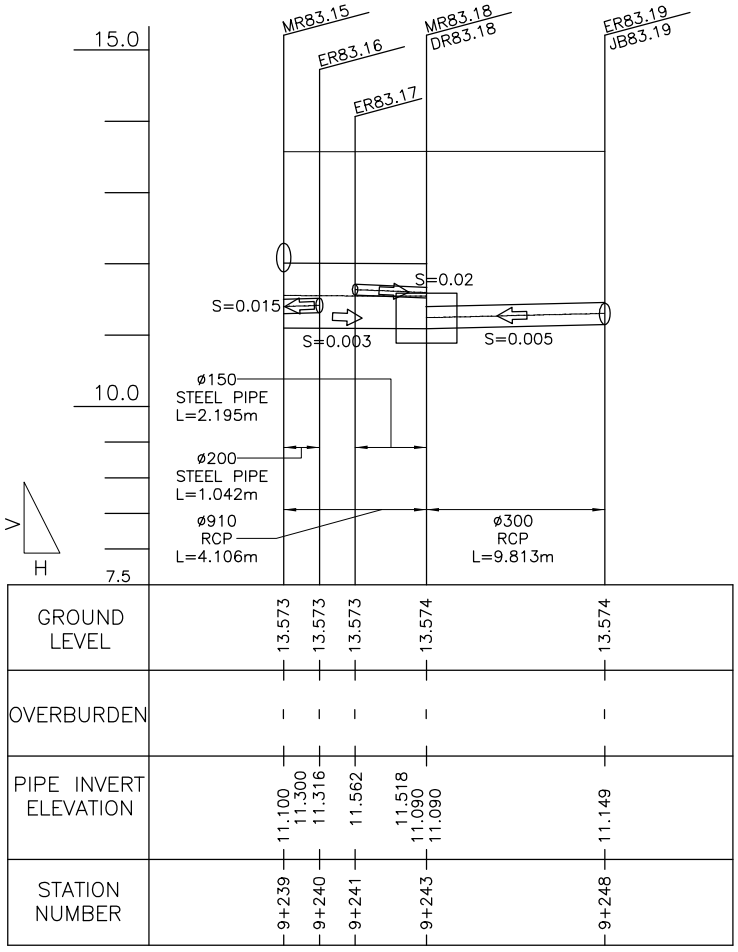
7 SECTION
SCALE A



6 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=4.12	5	pc
Collector Pipe (RCP)	Dia=0.30		L=9.86	10	pc
Collector Pipe (Steel)	Dia=0.20		L=1.04	1	pc
Collector Pipe (Steel)	Dia=0.15		L=2.20	1	pc
2 Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=4	0.23	m3
Conc. Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=9	0.21	m3
3. Conc. Bedding	Dia=.910m	L=4.12		0.37	m3
Conc. Bedding	Dia=.300m	L=9.86		0.30	m3
4. Formworks				7.79	m3



Clearing (Manhole 83.18)

L1	1.3085	m	
W of Junction Manhole	1.1	m	A1=26.73 m^2
L2	1.291	m	A2=11.83 m^2
W of Manhole	1.91	m	**At=38.56** m^2
L3	0.485	m	
W1	7.235	m	
W2	3.817	m	

Clearing (Manhole 83.15)

W	6.133	m	**A=33.26** m^2
L	5.423	m	

Clearing (Junction Manhole 83.19)

W	5.025	m	**A=25.25** m^2
L	5.025	m	

Clearing (Collector 83.15 - 83.18)

W	4.7885	m	**A=19.66** m^2
L	4.106	m	

Clearing (Collector 83.19 - 83.18)

W	4.4095	m	**A=43.27** m^2
L	9.813	m	

(Collector Pipe) Downstream	83.15-83.18		Excavation
Do	1.11	m	A=9.27 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.54 m^2
H	2.684	m	Backfill Zone C
EL. A	13.574	m	A=2.99 m^2
EL. B	11.09	m	
W	4.794	m	

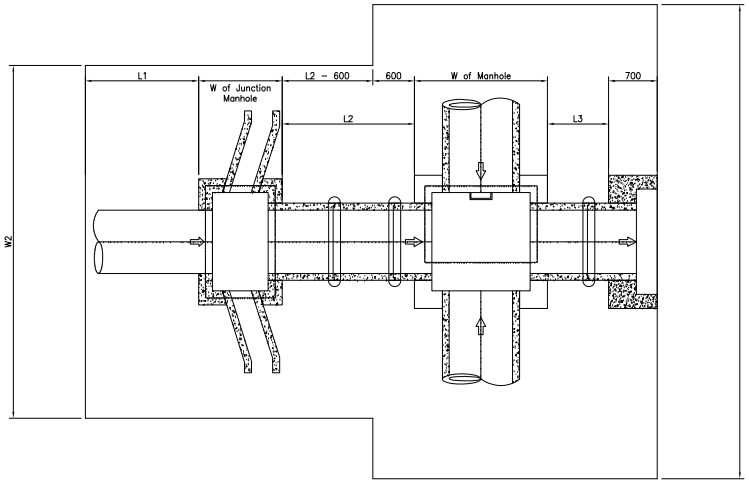
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=9.21 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.52 m^2
H	2.673	m	Backfill Zone C
EL. A	13.573	m	A=2.97 m^2
EL. B	11.1	m	
W	4.783	m	

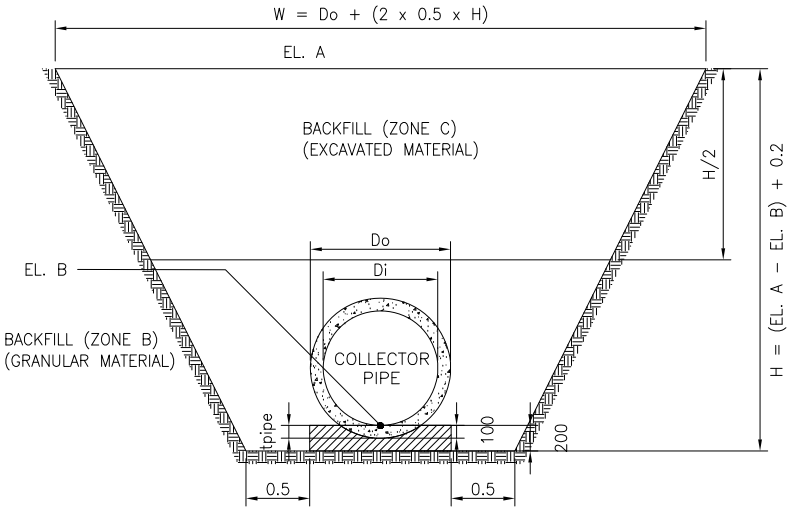
(Collector Pipe) Downstream	83.19-83.18		Excavation
Do	0.4	m	A=7.36 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=2.57 m^2
H	2.684	m	Backfill Zone C
EL. A	13.574	m	A=2.51 m^2
EL. B	11.09	m	
W	4.084	m	

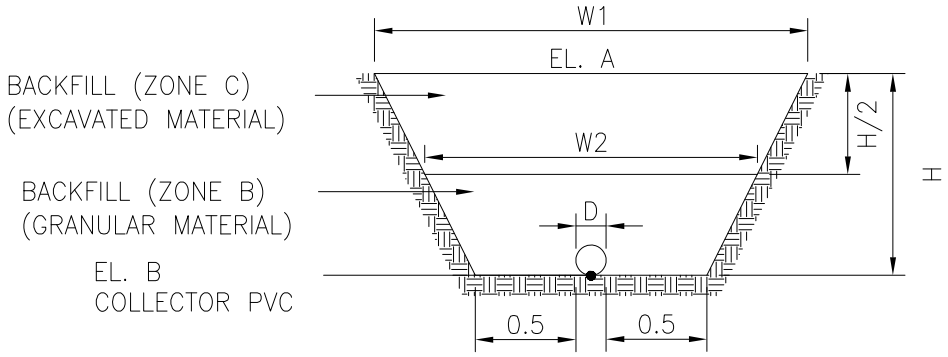
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=8.98 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.44 m^2
H	2.625	m	Backfill Zone C
EL. A	13.574	m	A=2.90 m^2
EL. B	11.149	m	
W	4.735	m	

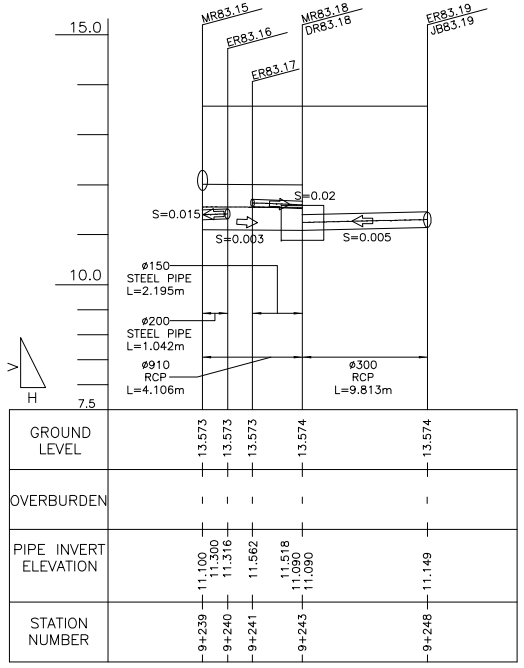
Collector Pipe 83.15-83.18	Volume	
Excavation	**38.04845**	m^3
Backfill Zone B	**10.35861**	m^3
Backfill Zone C	**12.26984**	m^3

Collector Pipe 83.19-83.18	Volume	
Excavation	**80.59078**	m^3
Backfill Zone B	**24.72732**	m^3
Backfill Zone C	**26.69241**	m^3


L1
W of Junction Manhole
L2 - 600
600
W of Manhole
700
L2
L3
W2
W1


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
H = (EL. A - EL. B) + 0.2
pipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
H
EL. B
COLLECTOR PVC
0.5
0.5

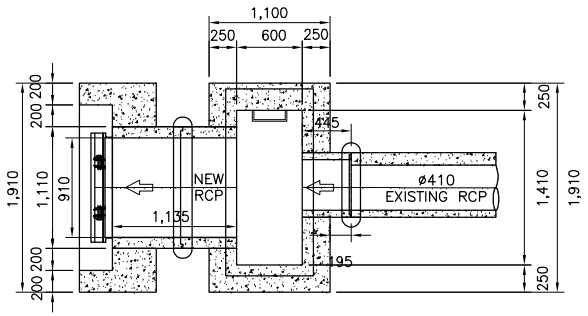

15.0
10.0
7.5
V
H
MR83.15
ER83.16
ER83.17
MR83.18
DR83.18
ER83.19
JB83.19
S=0.02
S=0.015
S=0.003
S=0.005
ø150
STEEL PIPE
L=2.195m
ø200
STEEL PIPE
L=1.042m
ø910
RCP
L=4.106m
ø300
RCP
L=9.813m
GROUND LEVEL
13.573
13.573
13.573
13.574
13.574
OVERBURDEN
PIPE INVERT ELEVATION
11.100
11.300
11.316
11.562
11.518
11.090
11.090
11.149
STATION NUMBER
9+239
9+240
9+241
9+243
9+248

QUANTITIES OF MANHOLE

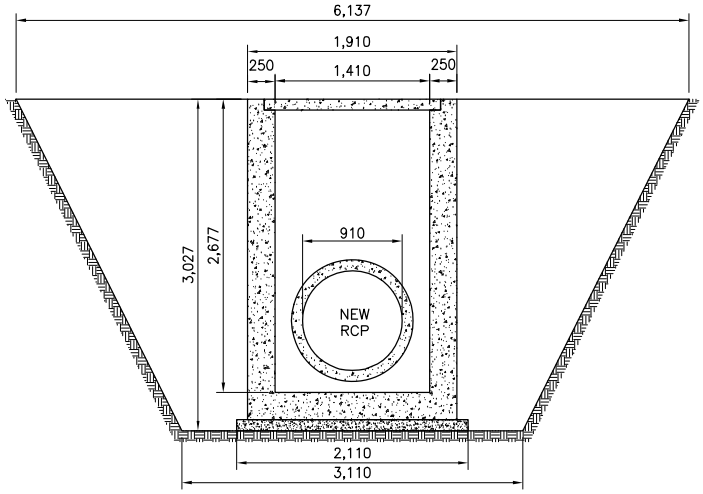
Manhole No.: MR 83.21

Location: 9 + 267

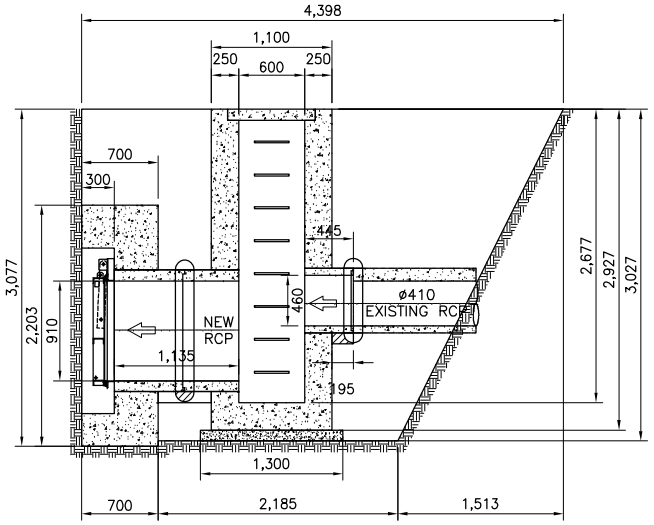
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.15	4.62	9.96	
		A2=8.90	4.62	41.17	
				51.13	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
	L=2.11				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.677	3.360	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.05**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
	W=0.80				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.21	0.7	2.95	
	Lout=2.20				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.87	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. New Pipe	Dia=.460m	L=0.45		**1**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
	D1=.586m	A1=0.27	0.17		
(New Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
12. Conc. Bedding	Dia=.930m	L=0.49		**0.045105**	m3
(Outlet Pipe)					
(New Pipe)	Dia=.590m	L=0.20		**0.011505**	m3
13. Backfill				**42.60**	m3



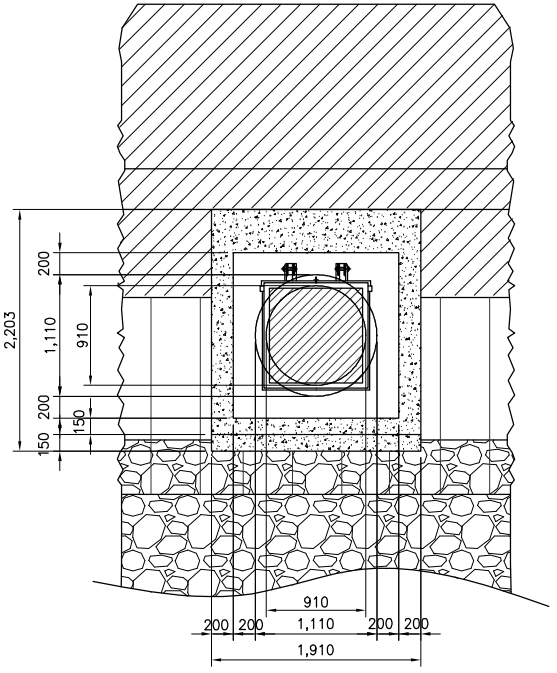
2 PLAN
SCALE A



4 SECTION
SCALE A



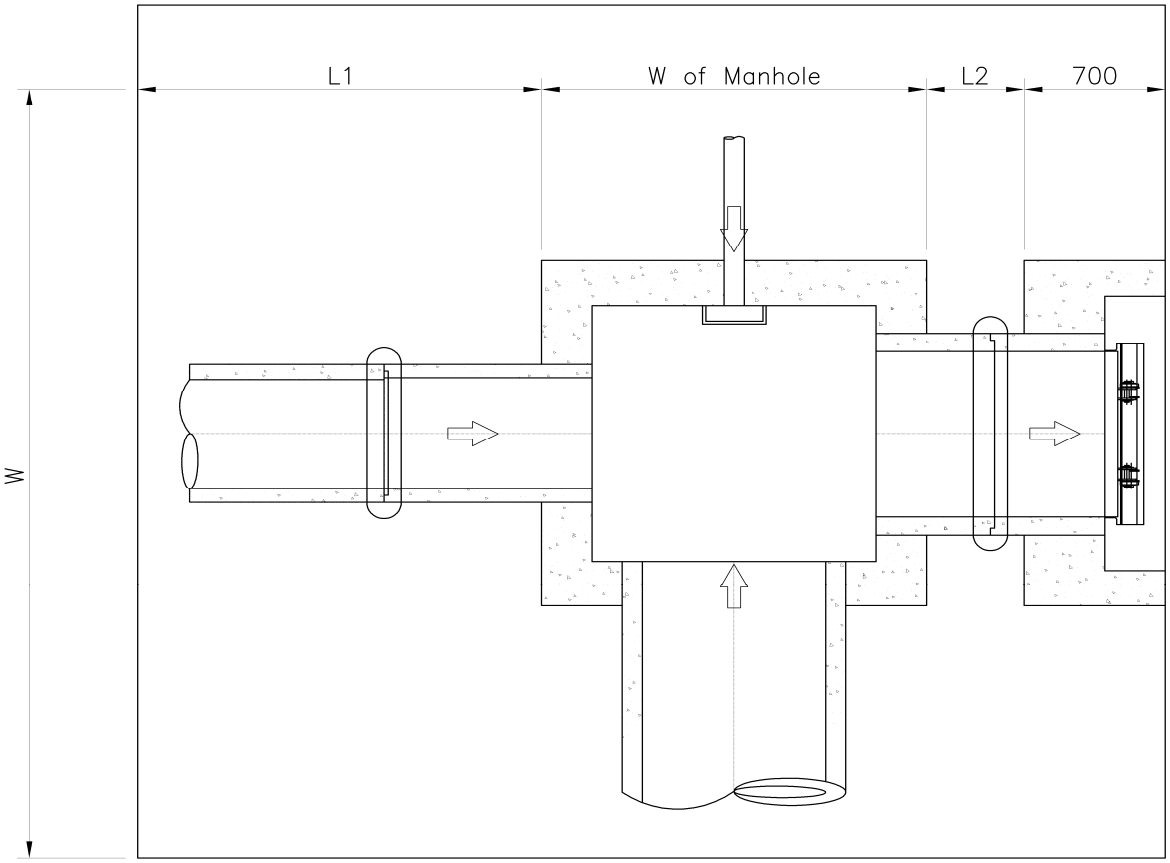
3 SECTION
SCALE A



5 ELEVATION
SCALE A

Clearing (Manhole 83.21)

L1	2.1135 m	
W of Manhole	1.1 m	**A=26.99** m^2
L2	0.485 m	
W	6.137 m	

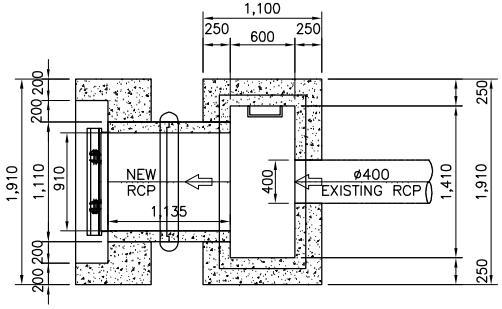


QUANTITIES OF MANHOLE

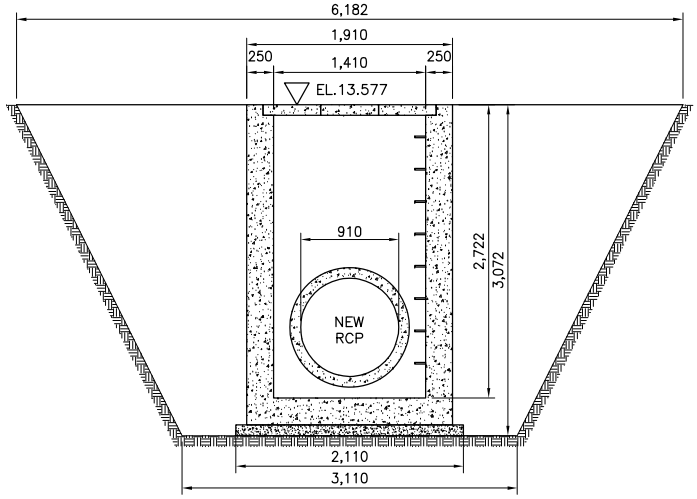
Manhole No.: MR 83.23

Location: 9 + 281

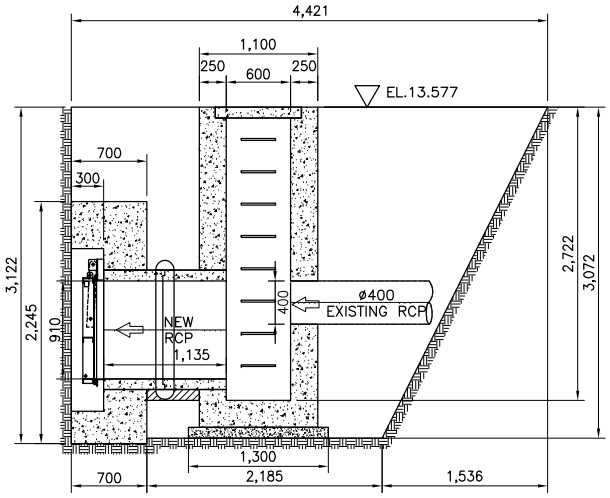
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.19	4.62	10.10	
		A2=8.94	4.62	41.33	
				51.43	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
	L=2.11				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.722	3.416	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.53	0.22	0.25	0.05	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.12**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
	W=0.80				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.29	0.7	3.00	
	Lout=2.25				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.93	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Backfill				**42.86**	m3



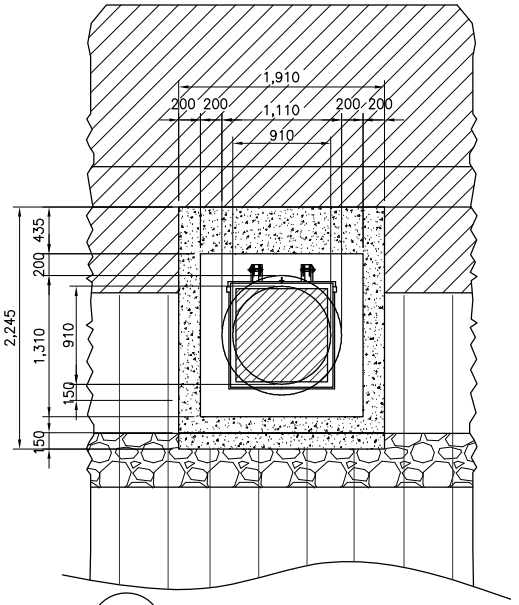
2 PLAN
SCALE B



4 SECTION
SCALE- B



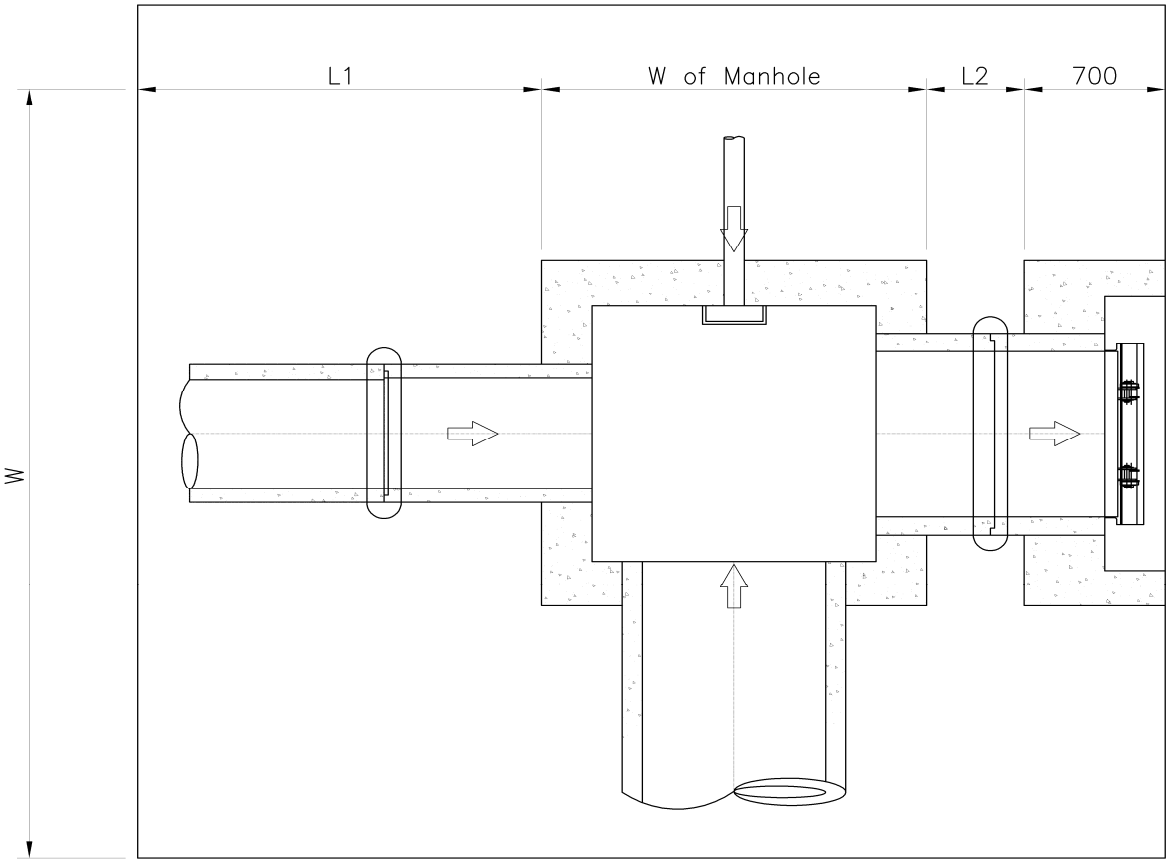
3 SECTION
SCALE B



5 ELEVATION
SCALE B

Clearing (Manhole 83.23)

L1	2.136 m	
W of Manhole	1.1 m	**A=27.33** m^2
L2	0.485 m	
W	6.182 m	

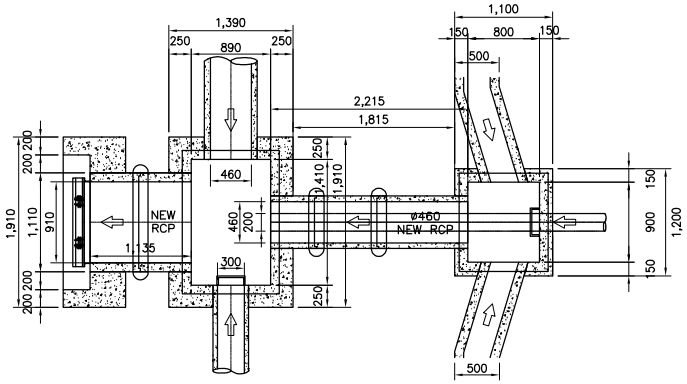


QUANTITIES OF MANHOLE

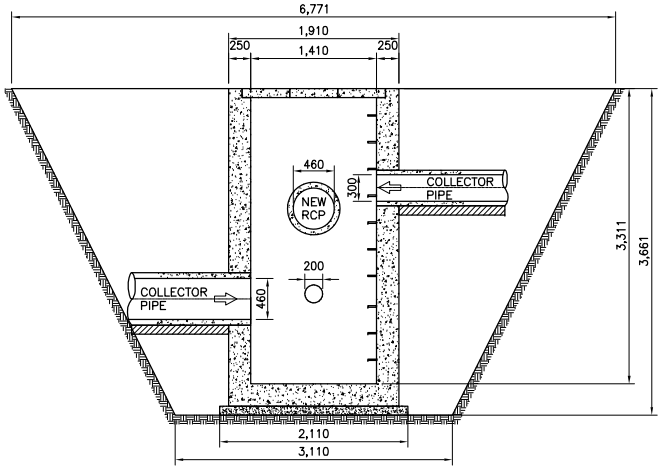
Manhole No.: MR 83.27

Location: 9 + 310

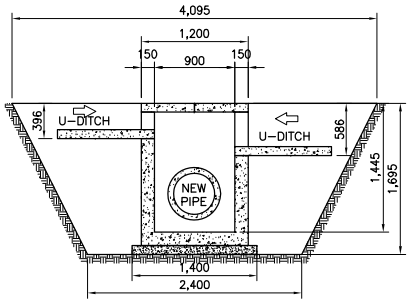
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.60	4.94	12.83	
		A2=9.06	4.94	44.77	
		A3=2.06	3.25	6.68	
		A4=4.27	3.25	13.88	
				78.15	m^3
2. Lev. Concrete	W=1.59	3.35	0.1	**0.34**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.39	2.65	0.25	**0.66**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.39	Aout=2.65			
	Lout=1.91				
	Win=0.89	Ain=1.25	3.311	4.635	m^3
	Lin=1.41				
		Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=1.72	2.32	0.25	0.58	
Pipe hole on Wall B	DiaB=0.59	0.30	0.25	0.08	
Pipe hole on Wall C	DiaC=0.40	0.13	0.25	0.03	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.71**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.445	0.867	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.59	W=0.50	0.29	0.15	0.04	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.40	W=0.50	0.20	0.15	0.03	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.75**	m^3
5. Conc. Cover	L=1.61	1.7549	0.1	**0.18**	m^3
(Manhole)	W=1.09				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=11			**10.42**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.41	0.7	3.79	
	Lout=2.83				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.72	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.22		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=1.82		**0.107085**	m3
(Inlet Pipe)					
14. Backfill				**65.13**	m3



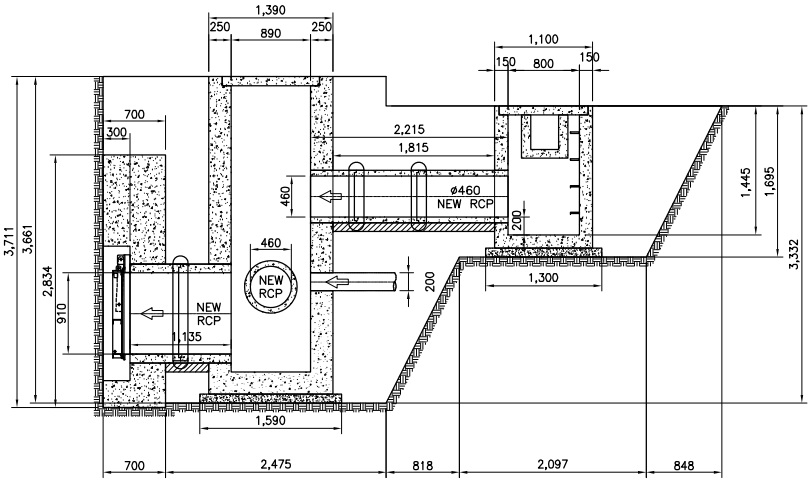
1 PLAN
SCALE A



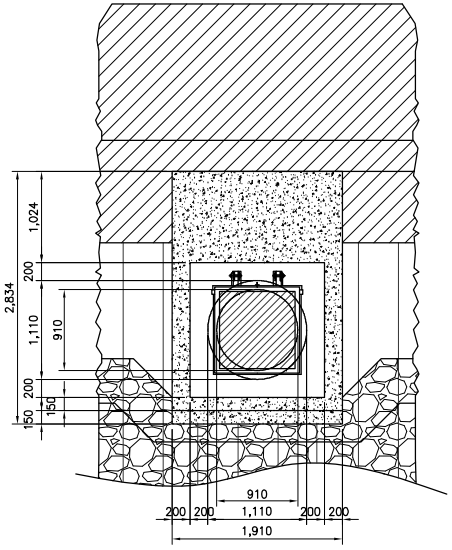
3 SECTION
SCALE A



4 SECTION (JB83.27)
SCALE A



2 SECTION
SCALE A



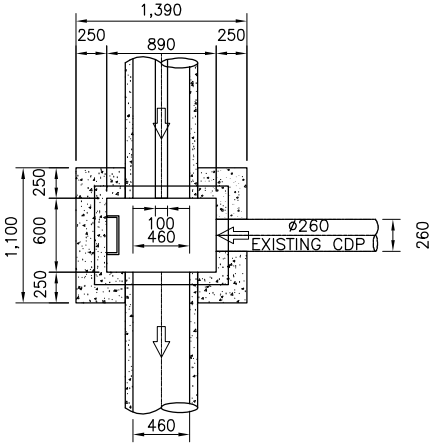
5 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

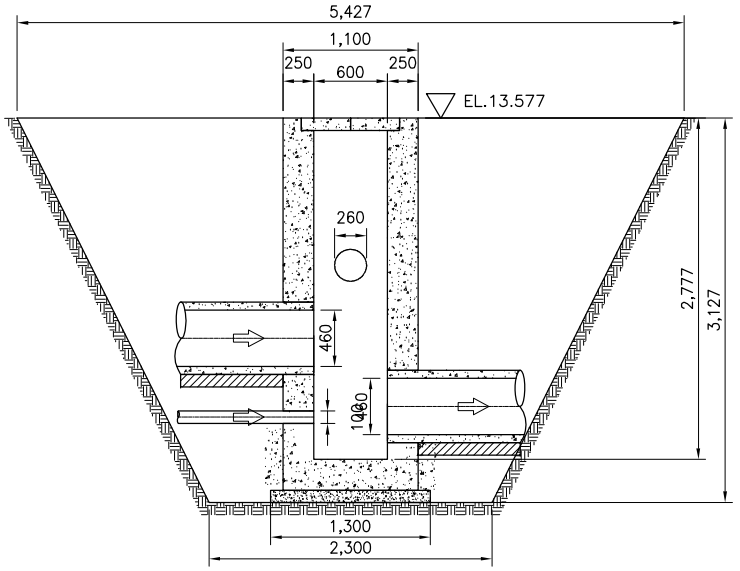
Manhole No.: MR 83.26

Location: 9 + 308

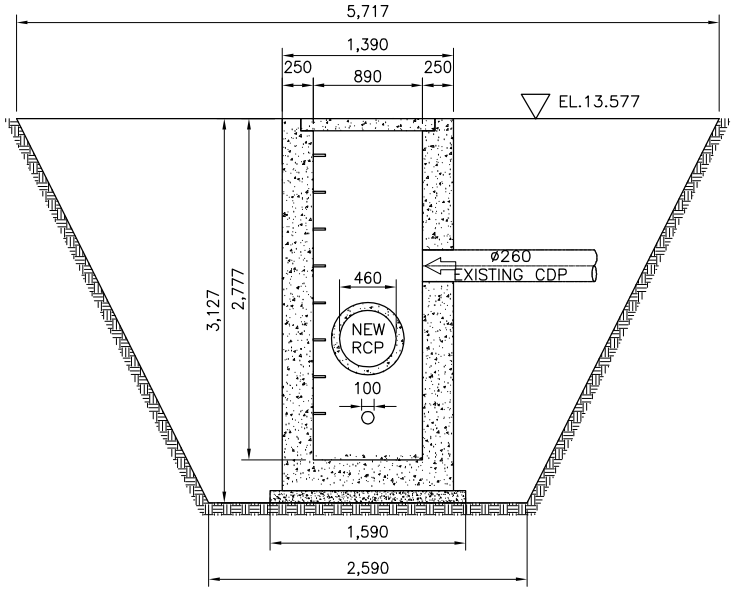
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=12.99	3.86	50.18	
				50.18	m^3
2. Lev. Concrete	W=1.59 L=1.30	2.07	0.1	**0.21**	m^3
3. Bottom Slab	W=1.39 L=1.10	1.53	0.25	**0.38**	m^3
4. Wall					
Entire Wall	Wout=1.39 Lout=1.10	Aout=1.53			
	Win=0.89 Lin=.60	Ain=0.53	2.777	2.763	m^3
	.	Anet=1.00			
Minus					
Pipe hole on Wall A	DiaA=0.59	0.28	0.25	0.07	
Pipe hole on Wall A	DiaB=0.26	0.05	0.25	0.01	
Pipe hole on Wall C	DiaC=0.59	0.27	0.25	0.07	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.61**	m^3
5. Conc. Cover	L=0.80 W=1.09	0.872	0.1	**0.09**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Backfill				**41.82**	m3



1 PLAN (MR 83.26)
SCALE A



3 SECTION
SCALE A



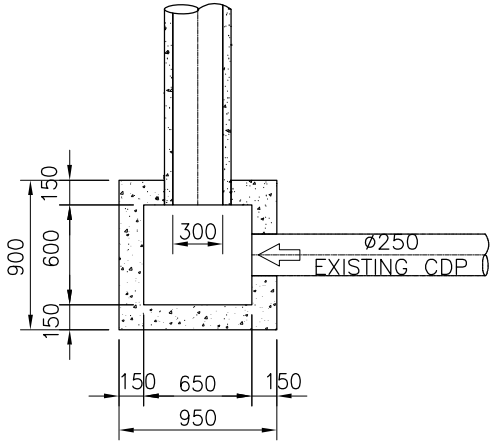
2 SECTION
SCALE A

QUANTITIES OF JUNCTION BOX

Junction Box No.: JB 83.28

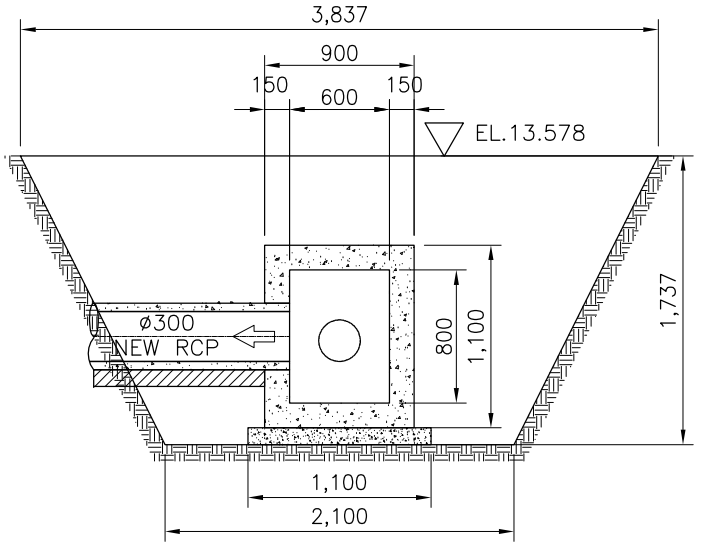
Location: 9 + 315

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=5.24	2.97	15.56	
				15.56	m^3
2. Lev. Concrete	W=1.15 L=1.10	1.27	0.1	**0.13**	m^3
3. Bottom Slab	W=0.95 L=0.90	0.86	0.2	**0.17**	m^3
4. Wall					
Entire Wall	Wout=0.95 Lout=.90	Aout=0.86			
	Win=0.65 Lin=.60	Ain=0.39	0.800	0.372	m^3
		Anet=0.47			
Minus					
Pipe hole on Wall A	DiaA=0.40	0.13	0.15	0.03	
Pipe hole on Wall A	DiaB=0.25	0.05	0.15	0.01	
Pipe hole on Wall C	DiaC=0.00	0.00	0.15	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.33**	m^3
5. Top Slab	L=0.90 W=0.95	0.855	0.15	**0.13**	m^3
6. Backfill				**12.97**	m3

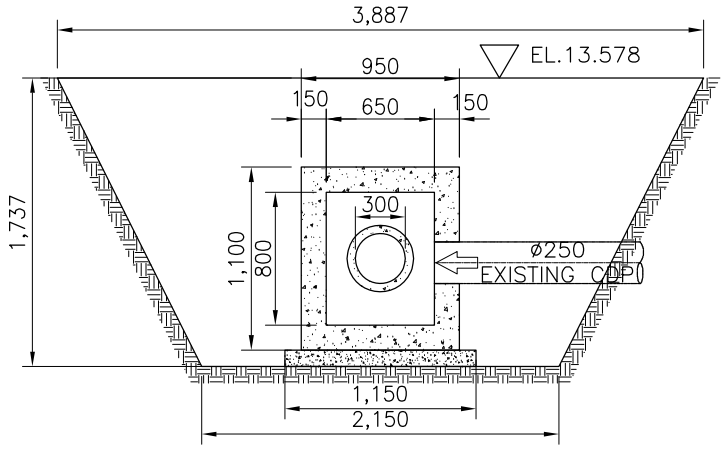


PARTIAL PLAN JUNCTION BOX
(JB 83.28)

1 — SCALE A



3 SECTION
SCALE A



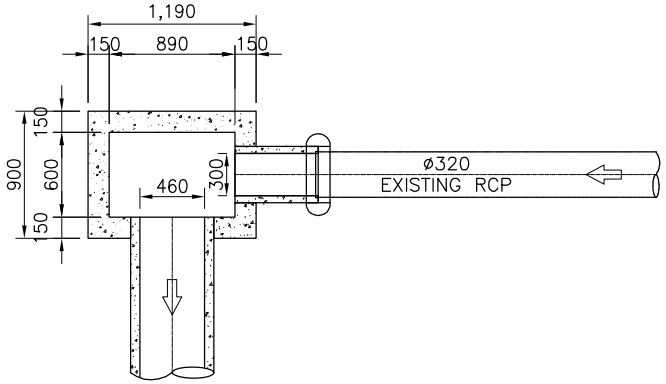
2 SECTION
SCALE A

QUANTITIES OF JUNCTION BOX

Junction Box No.: JB 83.24

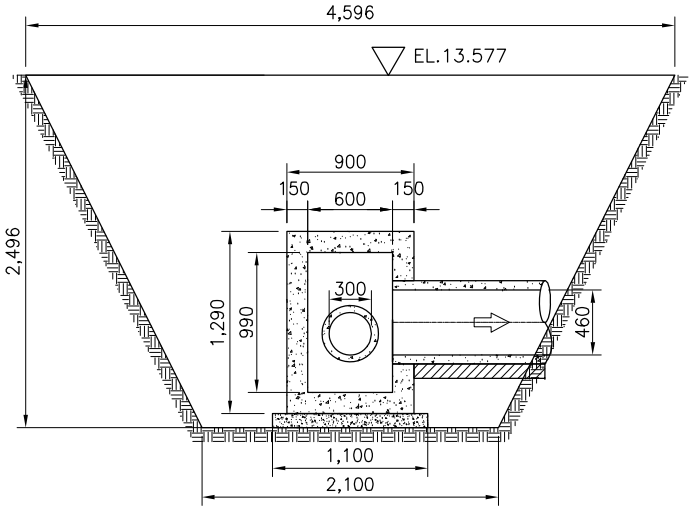
Location: 9 + 302

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=9.08	3.35	30.40	
				30.40	m^3
2. Lev. Concrete	W=1.39 L=1.10	1.53	0.1	**0.15**	m^3
3. Bottom Slab	W=1.19 L=0.90	1.07	0.15	**0.16**	m^3
4. Wall					
Entire Wall	Wout=1.19 Lout=.90	Aout=1.07			
	Win=0.89 Lin=.60	Ain=0.53	0.990	0.532	m^3
		Anet=0.54			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.01	0.15	0.00	
Pipe hole on Wall A	DiaB=0.40	0.13	0.15	0.03	
Pipe hole on Wall C	DiaC=0.59	0.27	0.15	0.07	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.43**	m^3
5. Top Slab	L=0.90 W=1.19	1.071	0.15	**0.16**	m^3
6. Conc.Bedding	Dia=.400m	L=0.59		0.02348	m3
7. Backfill				**25.33**	m3

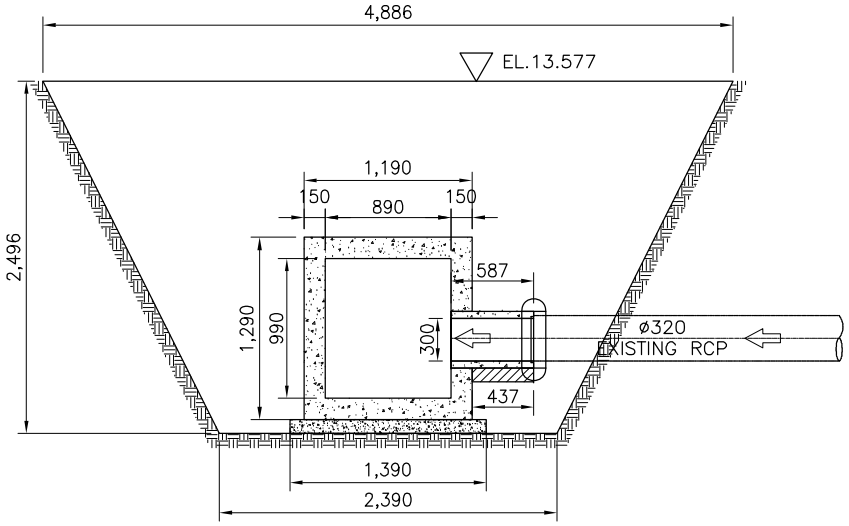


PARTIAL PLAN JUNCTION BOX
(JB 83.24)

4 — SCALE C



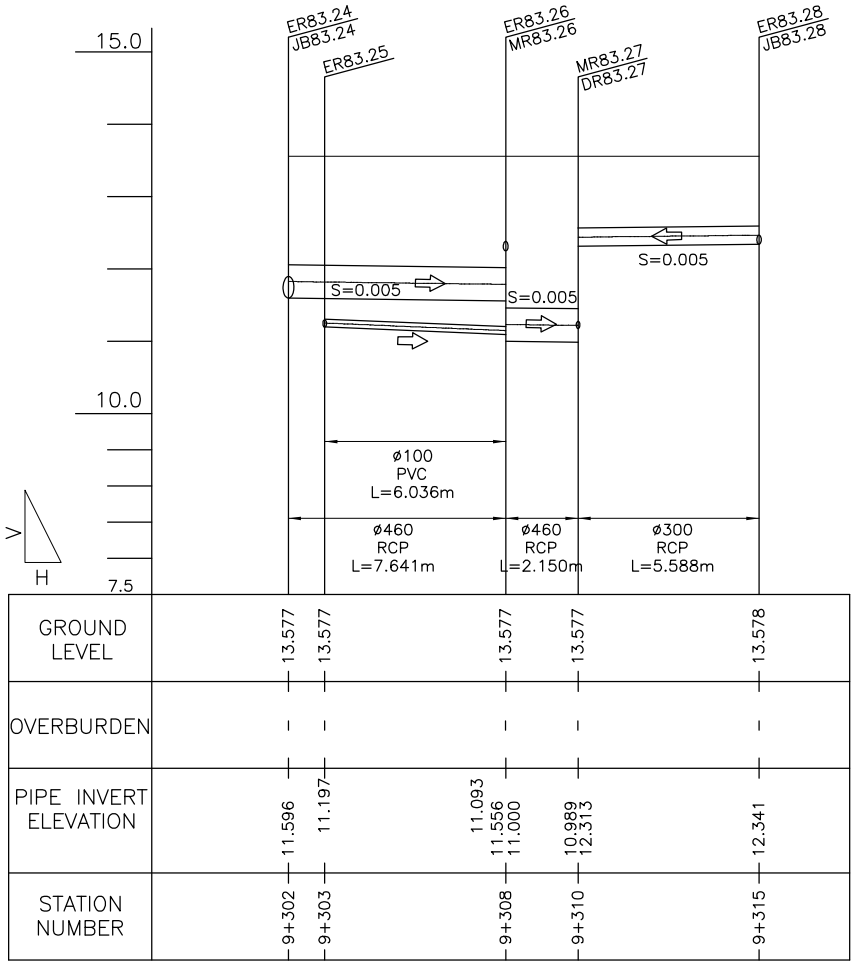
6 SECTION
SCALE C



5 SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.46		L=9.84	10	pc
Collector Pipe (RCP)	Dia=0.30		L=5.62	6	pc
Collector Pipe (PVC)	Dia=0.10		L=6.07	2	pc
2 Conc. Collar	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=9	0.29	m3
Conc. Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=5	0.12	m3
3. Conc. Bedding	Dia=.460m	L=9.84		0.45	m3
Conc. Bedding	Dia=.300m	L=5.62		0.17	m3
4. PVC Coupling	Dia=.300m	L=6.07		1	pc
5. Formworks				7.22	m3



Clearing (Manhole 83.27)

L1	1.4475 m	
W of Junction Manhole	1.1 m	A1=21.50 m^2
L2	1.815 m	A2=15.41 m^2
W of Manhole	1.39 m	**At=36.91** m^2
L3	0.485 m	
W1	6.771 m	
W2	4.095 m	

Clearing (Manhole 83.26)

W	5.717 m	**A=31.03** m^2
L	5.427 m	

Clearing (Junction Manhole 83.28)

W	3.887 m	**A=14.91** m^2
L	3.837 m	

Clearing (Junction Manhole 83.24)

W	4.886 m	**A=22.46** m^2
L	4.596 m	

Clearing (Collector 83.24 -83.25)

W	3.775 m	**A=6.06** m^2
L	1.605 m	

Clearing (Collector 83.26 - 83.27)

W	4.3685 m	**A=9.39** m^2
L	2.15 m	

Clearing (Collector 83.28 - 83.27)

W	2.8505 m	**A=15.93** m^2
L	5.588 m	

Clearing (Collector 83.25 - 83.26)

W	3.532 m	**A=21.32** m^2
L	6.036 m	

(Collector Pipe) Downstream	83.24-83.25	Excavation
Do	0.586 m	A=5.90 m^2
Di	0.46 m	Backfill Zone B
tpipe	0.063 m	A=1.96 m^2
H	2.197 m	Backfill Zone C
EL. A	13.577 m	A=2.02 m^2
EL. B	11.58 m	
W	3.783 m	

(Collector Pipe) Upstream		Excavation
Do	0.586 m	A=5.84 m^2
Di	0.46 m	Backfill Zone B
tpipe	0.063 m	A=1.94 m^2
H	2.181 m	Backfill Zone C
EL. A	13.577 m	A=2.00 m^2
EL. B	11.596 m	
W	3.767 m	

(Collector Pipe) Downstream	83.26-83.27	Excavation
Do	0.586 m	A=8.31 m^2
Di	0.46 m	Backfill Zone B
tpipe	0.063 m	A=2.80 m^2
H	2.788 m	Backfill Zone C
EL. A	13.577 m	A=2.77 m^2
EL. B	10.989 m	
W	4.374 m	

(Collector Pipe) Upstream		Excavation
Do	0.586 m	A=8.26 m^2
Di	0.46 m	Backfill Zone B
tpipe	0.063 m	A=2.78 m^2
H	2.777 m	Backfill Zone C
EL. A	13.577 m	A=2.76 m^2
EL. B	11 m	
W	4.363 m	

(Collector Pipe) Downstream	83.28-83.27		
Do	0.4	m	Excavation
Di	0.3	m	A=3.12 m^2
tpipe	0.05	m	Backfill Zone B
H	1.464	m	A=1.09 m^2
EL. A	13.577	m	Backfill Zone C
EL. B	12.313	m	A=1.15 m^2
W	2.864	m	

(Collector Pipe) Upstream			
Do	0.4	m	Excavation
Di	0.3	m	A=3.04 m^2
tpipe	0.05	m	Backfill Zone B
H	1.437	m	A=1.06 m^2
EL. A	13.578	m	Backfill Zone C
EL. B	12.341	m	A=1.12 m^2
W	2.837	m	

(Collector PVC) Downstream	83.25 - 83.26		
D	0.1	m	Excavation
W1	3.58	m	A=5.82 m^2
W2	2.34	m	Backfill Zone B
H	2.484	m	A=2.13 m^2
H/2	1.242	m	Backfill Zone C
EL. A	13.577	m	A=3.68 m^2
EL. B	11.093	m	

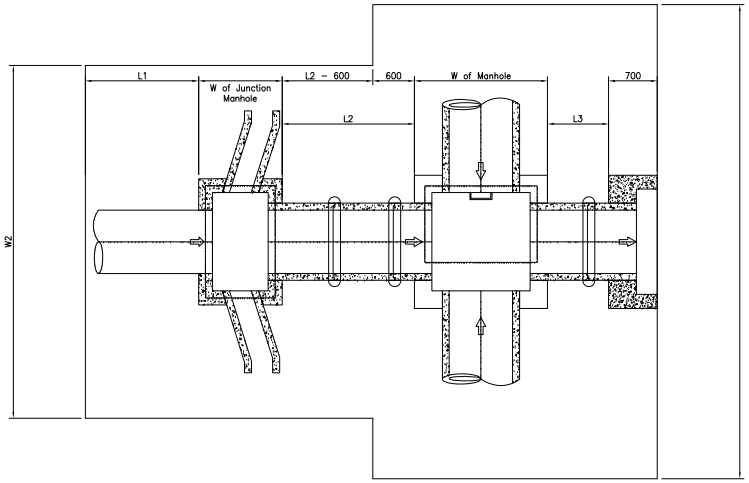
(Collector PVC) Upstream			
D	0.1	m	Excavation
W1	3.48	m	A=5.45 m^2
W2	2.29	m	Backfill Zone B
H	2.38	m	A=2.01 m^2
H/2	1.19	m	Backfill Zone C
EL. A	13.577	m	A=3.43 m^2
EL. B	11.197	m	

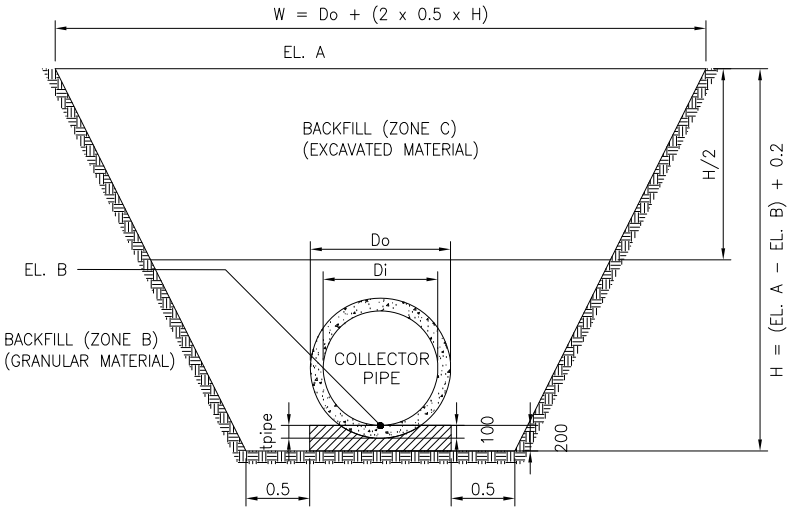
Collector Pipe 83.24-83.25	Volume	
Excavation	**9.46466**	m^3
Backfill Zone B	**3.142088**	m^3
Backfill Zone C	**3.248893**	m^3

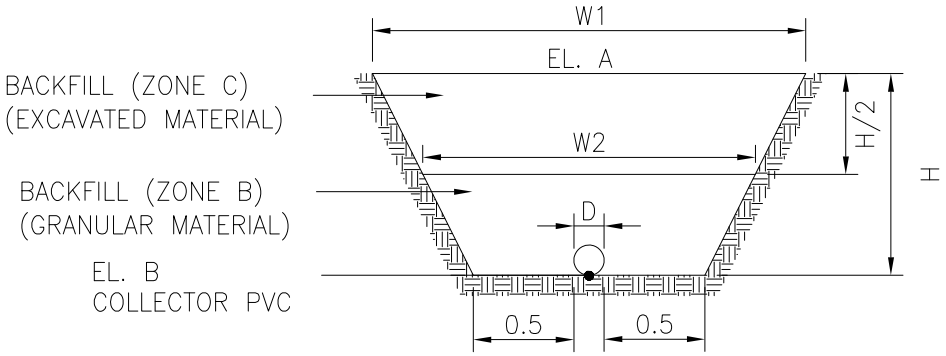
Collector Pipe 83.26-83.27	Volume	
Excavation	**17.90011**	m^3
Backfill Zone B	**6.0229**	m^3
Backfill Zone C	**5.9781**	m^3

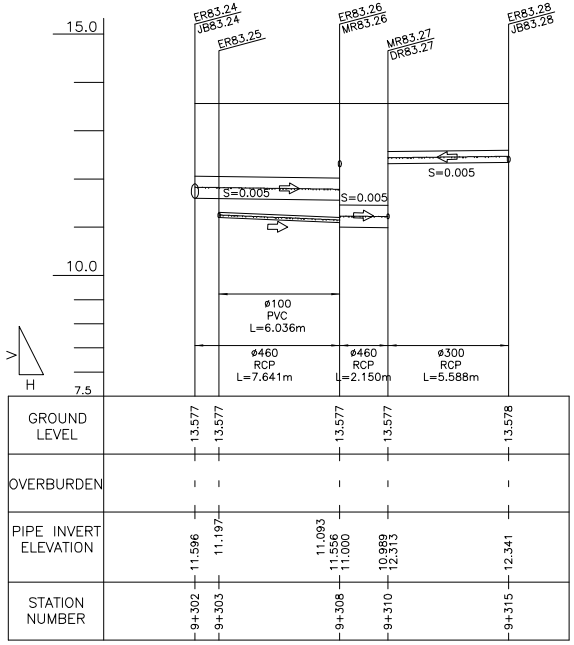
Collector Pipe 83.28-83.27	Volume	
Excavation	**17.31263**	m^3
Backfill Zone B	**6.024235**	m^3
Backfill Zone C	**6.364638**	m^3

Collector PVC 83.25 - 83.26	Volume	
Excavation	**34.85615**	m^3
Backfill Zone B	**6.711069**	m^3
Backfill Zone C	**22.00432**	m^3


L1
W of Junction Manhole
L2 - 600
600
W of Manhole
700
L2
L3
W2
W1


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
Dpipe
100
200
H = (EL. A - EL. B) + 0.2
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
H
EL. B
COLLECTOR PVC
0.5
0.5

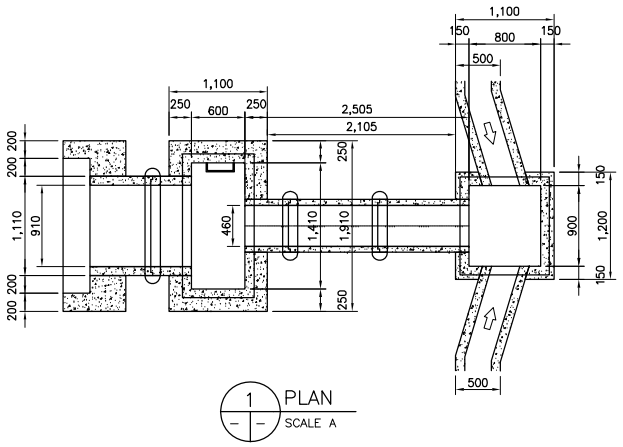

15.0
10.0
7.5
V
H
ER83.24
JB83.24
ER83.25
ER83.26
MR83.26
MR83.27
DR83.27
ER83.28
JB83.28
S=0.005
S=0.005
S=0.005
ø100
PVC
L=6.036m
ø460
RCP
L=7.641m
ø460
RCP
L=2.150m
ø300
RCP
L=5.588m
GROUND LEVEL
13.577
13.577
13.577
13.577
13.578
OVERBURDEN
PIPE INVERT ELEVATION
11.596
11.197
11.093
11.556
11.000
10.989
12.313
12.341
STATION NUMBER
9+302
9+303
9+308
9+310
9+315

QUANTITIES OF MANHOLE

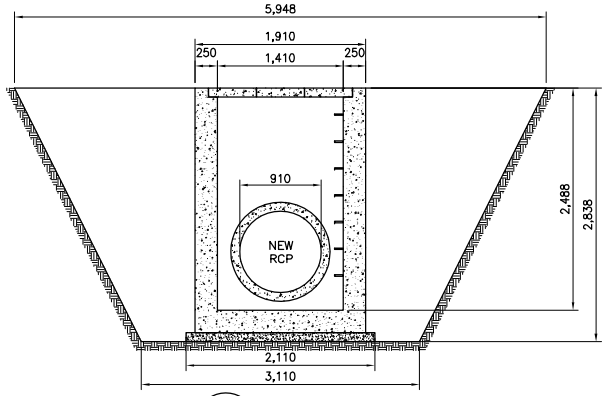
Manhole No.: MR 83.29

Location: 9 + 327

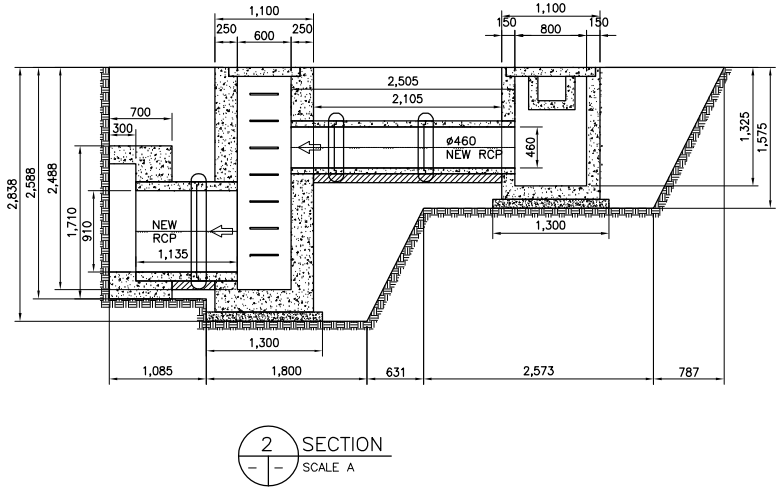
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.81	4.53	12.72	
		A2=5.11	4.53	23.14	
		A3=1.39	3.19	4.44	
		A4=4.67	3.19	14.89	
				55.18	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.488	3.122	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.30	0.25	0.08	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.81**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.325	0.795	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.47	W=0.50	0.24	0.15	0.04	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.47	W=0.50	0.24	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.68**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**0**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.27	0.7	2.29	
	Lout=1.71				
	Win=1.51	Aout=1.83	0.3	0.55	
	Lin=1.21				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.35	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.51		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=2.11		**0.124195**	m3
(Inlet Pipe)					
14. Backfill				**45.99**	m3



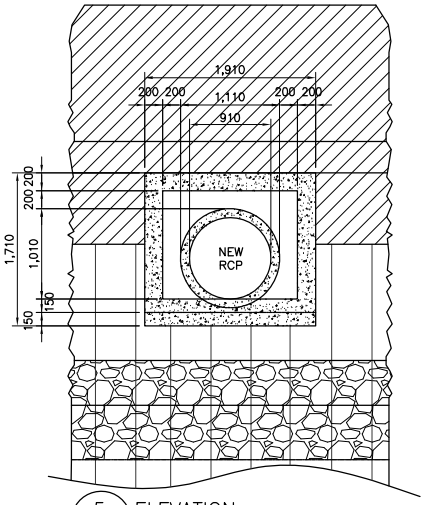
1 PLAN
SCALE A



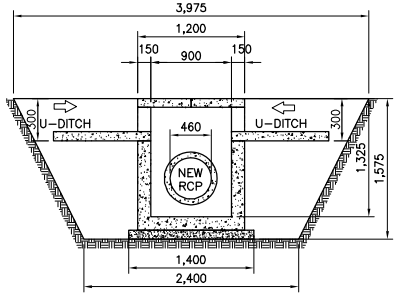
3 SECTION
SCALE A



2 SECTION
SCALE A

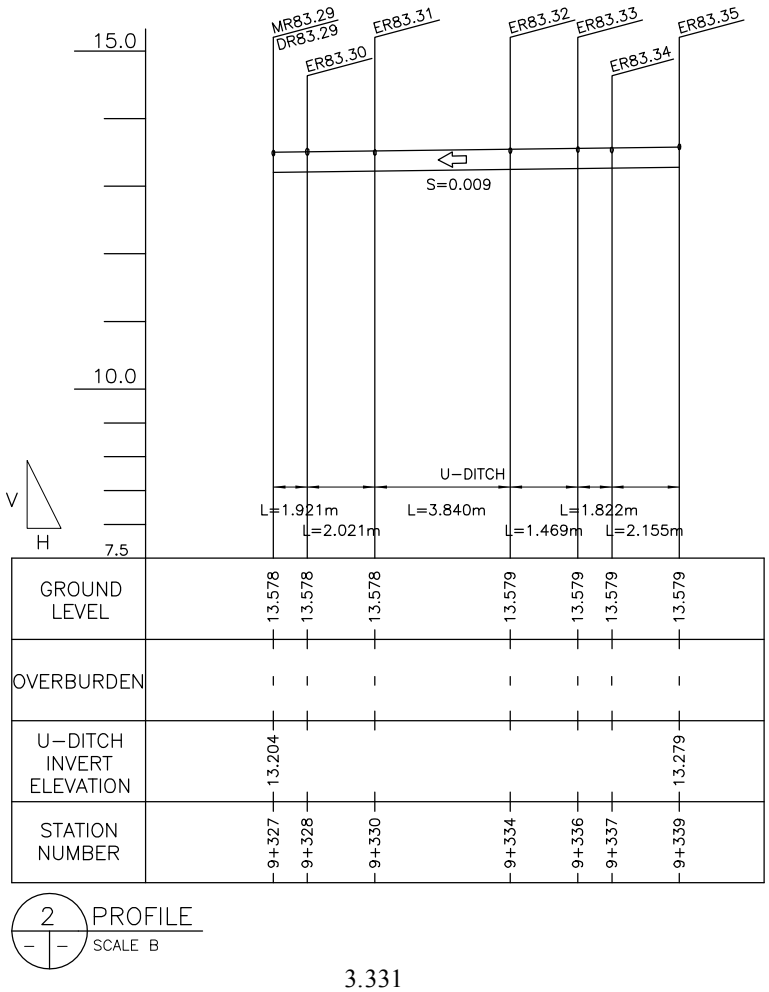


5 ELEVATION
SCALE A



QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. U - Ditch					
Bottom	W=.500m L=.100m	0.05	13.228	0.66	m^3
Wall	W=.100m L=.100m	0.02	13.228	0.26	m^3
Top	W=.500m L=.100m	0.05	13.228	0.66	m^3
2. Formworks				11.11	m3



2 PROFILE
SCALE B

Clearing (Manhole 83.29)

L1	1.3875	m	
W of Junction Manhole	1.1	m	Am=17.16 m^2
L2	2.105	m	Ajb=15.87 m^2
W of Manhole	1.1	m	**At=33.03** m^2
L3	0.485	m	
W1	5.948	m	
W2	3.975	m	

Clearing (U - Ditch 83.35 - 83.29)

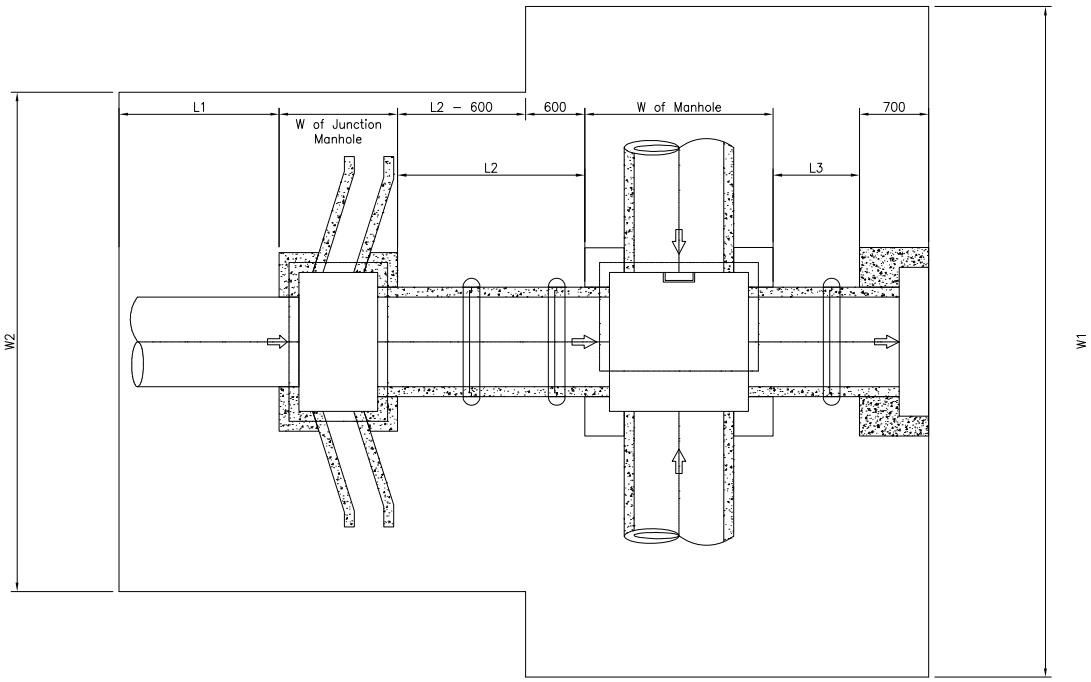
W	2.087	m	**A=27.61** m^2
L	13.228	m	

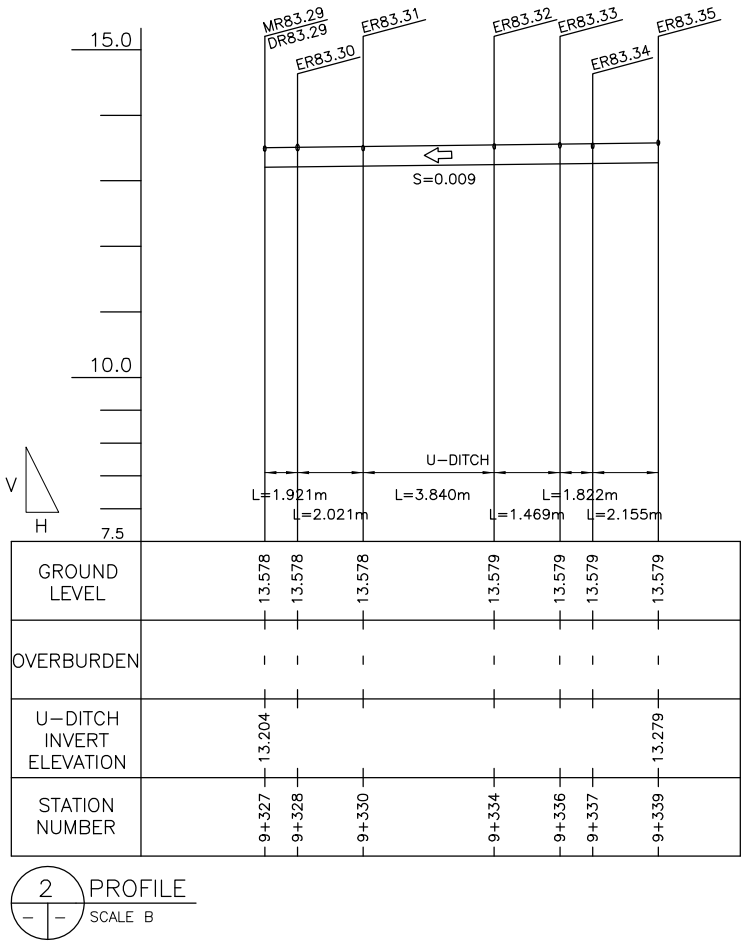
(U - Ditch) Downsteram	83.35 - 83.29		
d	0.374	m	Excavation
D	0.524	m	A=0.98 m^2
D/2	0.262	m	Backfill Zone B
W1	2.124	m	A=0.32 m^2
W2	1.862	m	Backfill Zone C
EL. A	13.578	m	A=0.39 m^2
EL. B	13.204	m	

(U - Ditch) Upstream			
d	0.3	m	Excavation
D	0.45	m	A=0.82 m^2
D/2	0.225	m	Backfill Zone B
W1	2.05	m	A=0.27 m^2
W2	1.825	m	Backfill Zone C
EL. A	13.579	m	A=0.32 m^2
EL. B	13.279	m	

U - Ditch 83.35 - 83.29

Excavation	**11.99191**	m^3
Backfill Zone B	**3.906245**	m^3
Backfill Zone C	**4.768925**	m^3





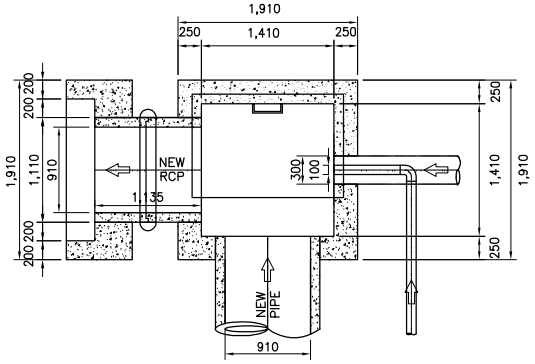
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

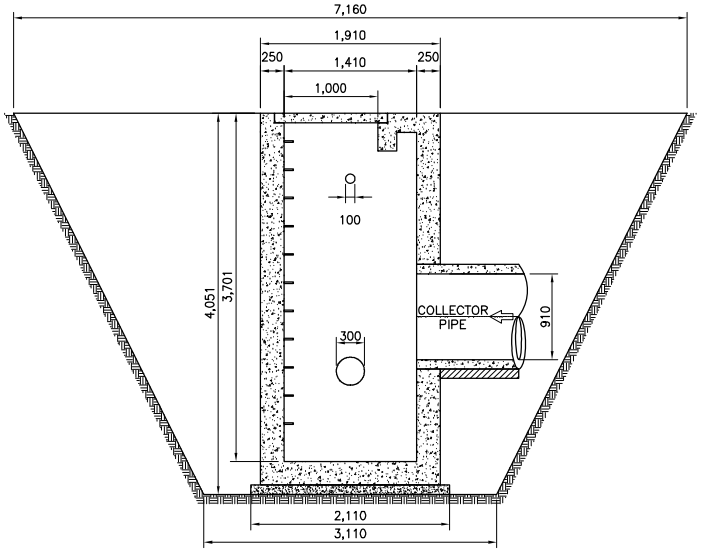
Manhole No.: MR 83.36

Location: 9 + 429

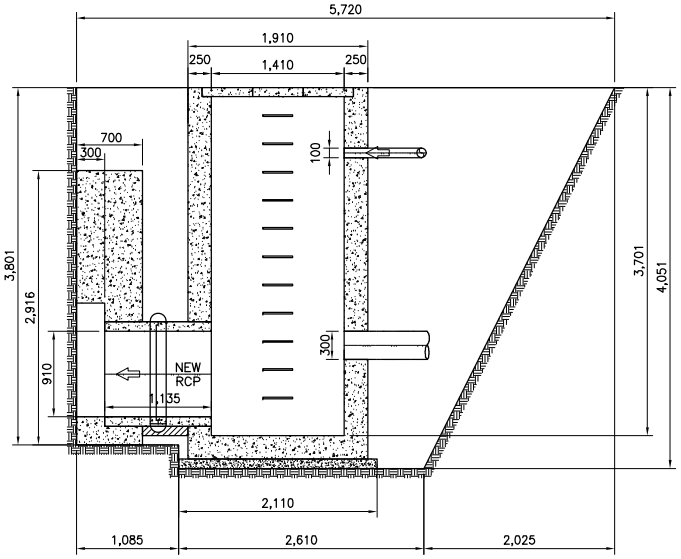
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=4.12	5.14	21.18	
		A2=14.67	5.14	75.36	
				96.54	m^3
2. Lev. Concrete	W=2.21	4.88	0.1	**0.49**	m^3
	L=2.21				
3. Bottom Slab	W=2.01	4.67	0.3	**1.40**	m^3
	L=2.01				
4. Wall					
Entire Wall	Wout=2.01	Aout=4.04			
	Lout=2.01				
	Win=1.41	Ain=1.99	3.701	7.594	m^3
	Lin=1.41				
		Anet=2.05			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.30	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.30	0.03	
Pipe hole on Wall C	DiaC=1.11	0.97	0.30	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.30	0.24	
Net Wall Vol.				**7.08**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=12			**11.36**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=6.14	0.7	4.30	
	Lout=3.22				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.23	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Backfill				**80.45**	m3



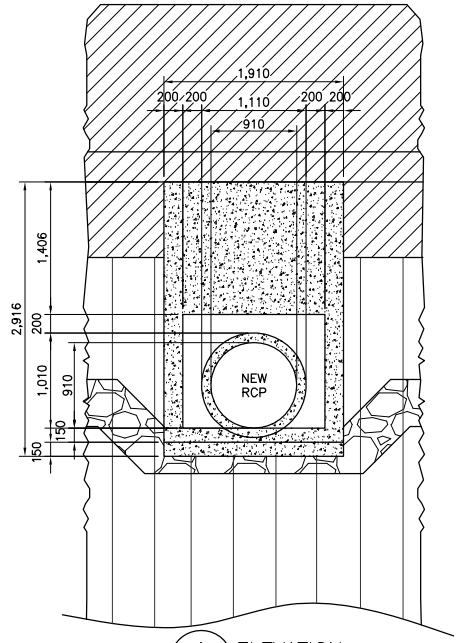
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



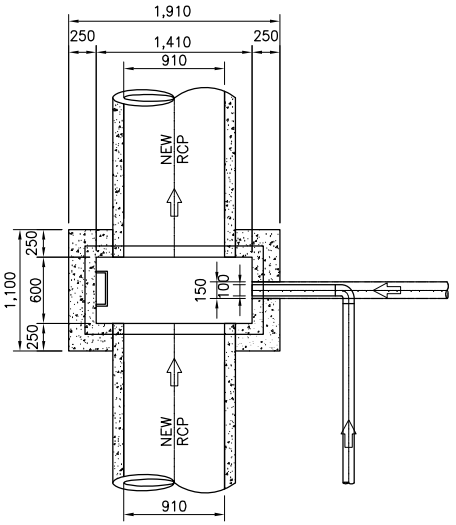
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

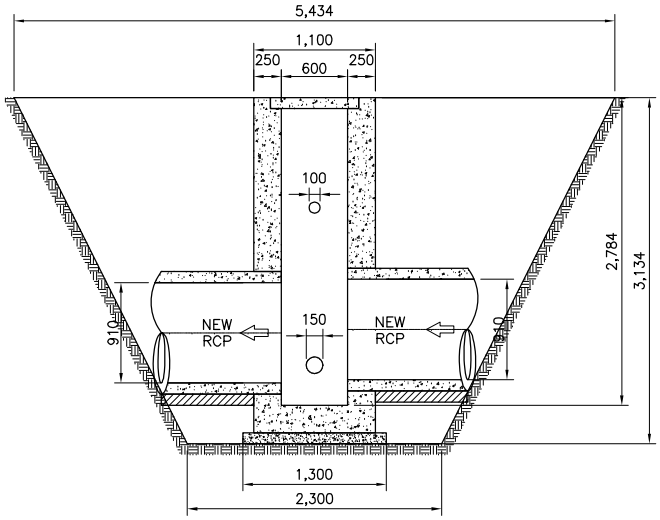
Manhole No.: MR 83.38

Location: 8 + 653

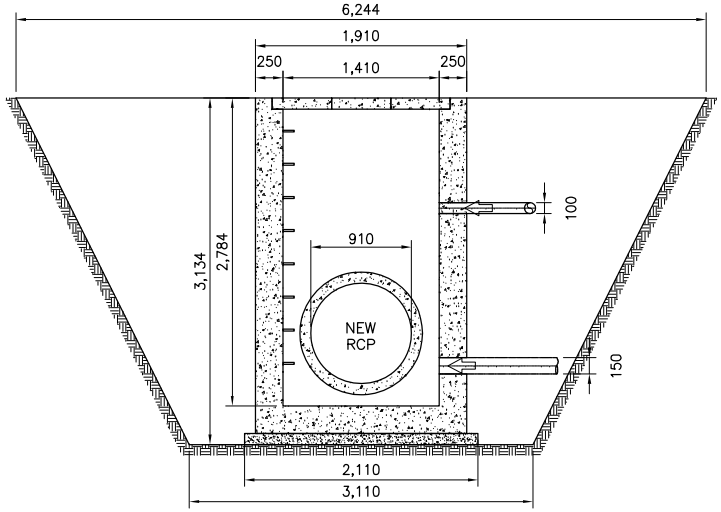
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=14.66	3.87	56.68	
				56.68	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.784	3.494	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.98	0.25	0.24	
Pipe hole on Wall A	DiaB=0.15	0.03	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.00**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Backfill				**47.23**	m3



1 PLAN OF MANHOLE (MR83.38)
SCALE A



3 SECTION
SCALE A



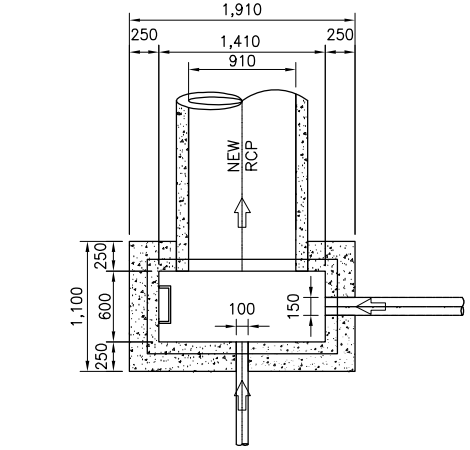
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

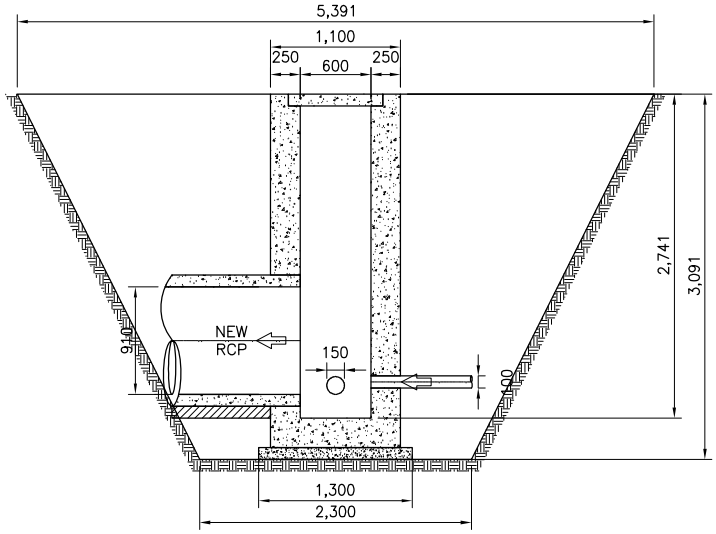
Manhole No.: MR 83.40

Location: 9 + 441

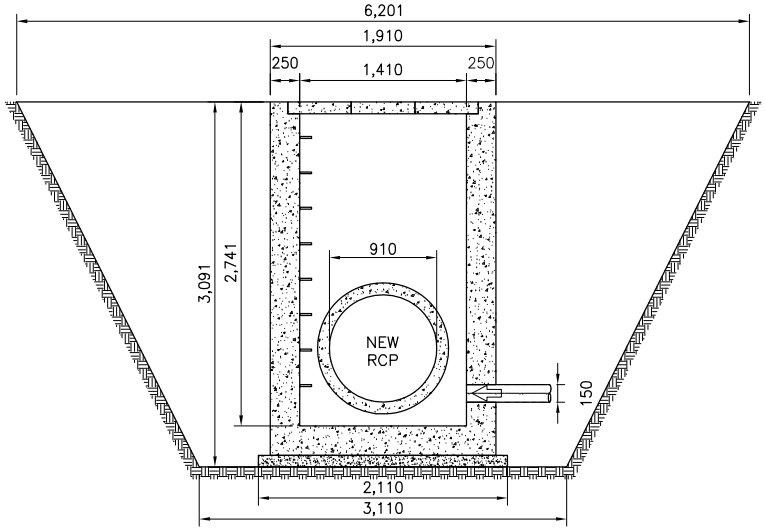
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=14.39	3.85	55.34	
				55.34	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.741	3.440	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.98	0.25	0.24	
Pipe hole on Wall A	DiaB=0.15	0.02	0.25	0.00	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.19**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Backfill				**46.11**	m3



3 PLAN OF MANHOLE (MR83.40)
SCALE C



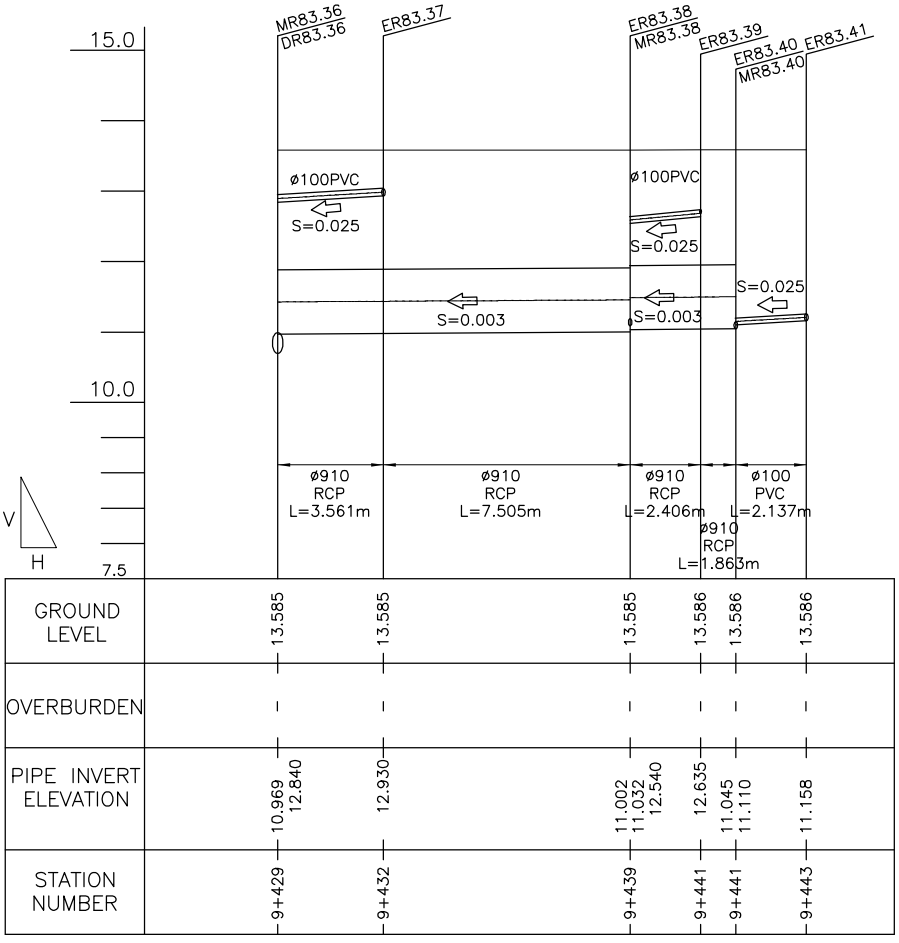
5 SECTION
SCALE C



4 SECTION
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1. Collector Pipe (PVC)	Dia=0.91		L=15.47	16	pc
Collector Pipe (PVC)	Dia=0.10		L=8.18	2	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=15	0.87	m3
3. Conc. Bedding	Dia=.910m	L=15.47		1.41	m3
4. PVC coupling	Dia=0.10			1	pc
5. Formworks				15.91	m3



Clearing (Manhole 83.36)

L1	2.6255	m	
W of Manhole	1.91	m	**A=40.96** m^2
L2	0.485	m	
W	7.161	m	

Clearing (Manhole 83.38)

W	6.244	m	**A=33.93** m^2
L	5.434	m	

Clearing (Manhole 83.40)

W	6.201	m	**A=33.43** m^2
L	5.391	m	

Clearing (Collector 83.40 - 83.38)

W	4.8575	m	**A=20.74** m^2
L	4.269	m	

Clearing (Collector 83.38 - 83.36)

W	4.9095	m	**A=54.33** m^2
L	11.066	m	

Clearing (Manhole 83.41 - 83.40)

W	3.557	m	**A=7.60** m^2
L	2.137	m	

(Collector Pipe) Downstream	83.40-83.38		Excavation
Do	1.11	m	A=9.60 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.66 m^2
H	2.754	m	Backfill Zone C
EL. A	13.586	m	A=3.09 m^2
EL. B	11.032	m	
W	4.864	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=9.54 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.64 m^2
H	2.741	m	Backfill Zone C
EL. A	13.586	m	A=3.07 m^2
EL. B	11.045	m	
W	4.851	m	

(Collector Pipe) Downstream	83.38-83.36		Excavation
Do	1.11	m	A=9.91 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.77 m^2
H	2.816	m	Backfill Zone C
EL. A	13.585	m	A=3.18 m^2
EL. B	10.969	m	
W	4.926	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=9.74 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.71 m^2
H	2.783	m	Backfill Zone C
EL. A	13.585	m	A=3.13 m^2
EL. B	11.002	m	
W	4.893	m	

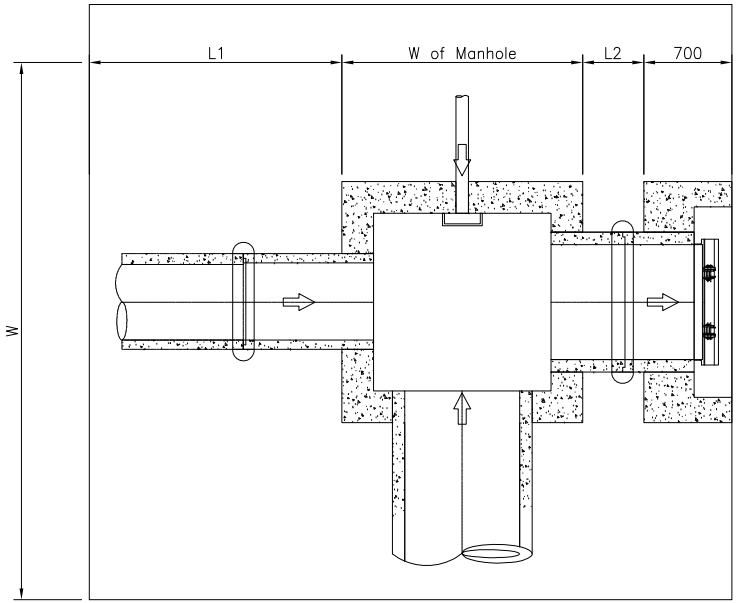
(Collector PVC) Downstream	83.41-83.40		
D	0.1	m	Excavation
W1	3.59	m	A=5.82 m^2
W2	2.34	m	Backfill Zone B
H	2.486	m	A=2.13 m^2
H/2	1.243	m	Backfill Zone C
EL. A	13.586	m	A=3.68 m^2
EL. B	11.1	m	

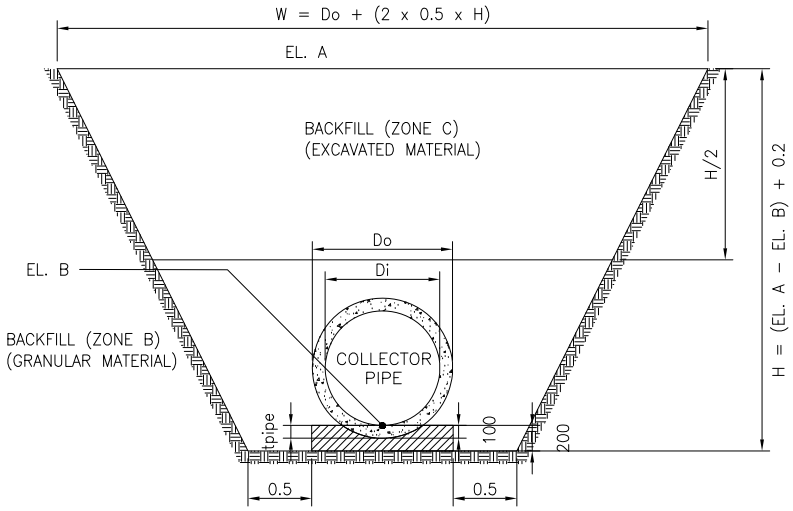
(Collector PVC) Upstream			
D	0.1	m	Excavation
W1	3.53	m	A=5.62 m^2
W2	2.31	m	Backfill Zone B
H	2.428	m	A=2.06 m^2
H/2	1.214	m	Backfill Zone C
EL. A	13.586	m	A=3.55 m^2
EL. B	11.158	m	

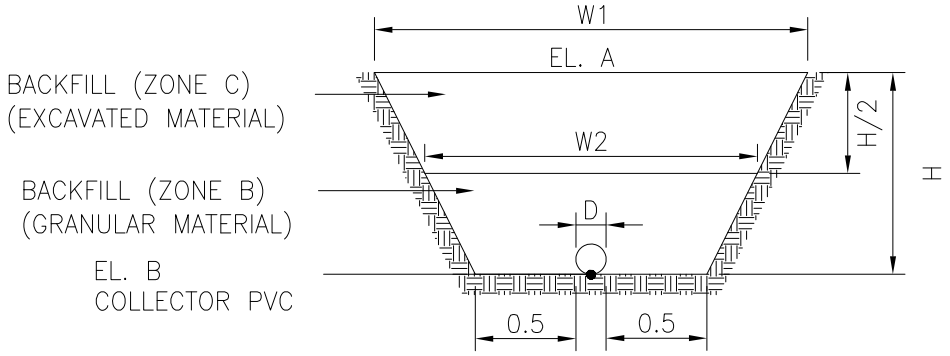
Collector Pipe 83.39-83.38	Volume	
Excavation	**40.98385**	m^3
Backfill Zone B	**11.35759**	m^3
Backfill Zone C	**13.18703**	m^3

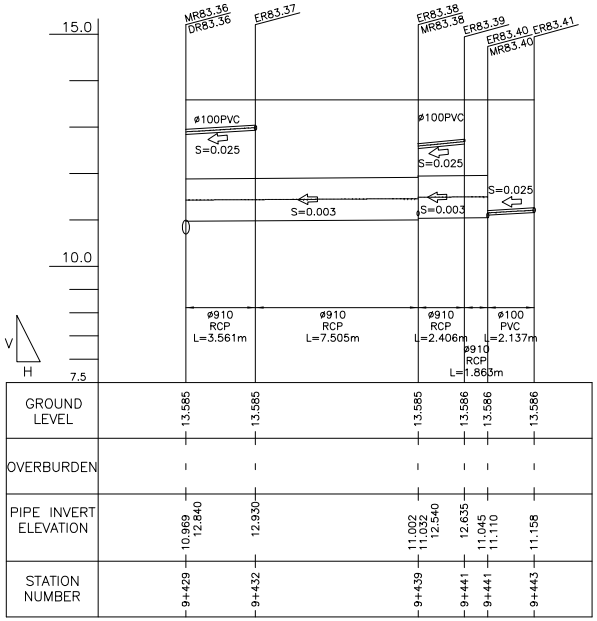
Collector Pipe 83.38-83.36	Volume	
Excavation	**109.0572**	m^3
Backfill Zone B	**30.43092**	m^3
Backfill Zone C	**35.00368**	m^3

Collector PVC 83.41-83.40	Volume	
Excavation	**12.53262**	m^3
Backfill Zone B	**4.595966**	m^3
Backfill Zone C	**7.919446**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
H/2
H
0.5
0.5

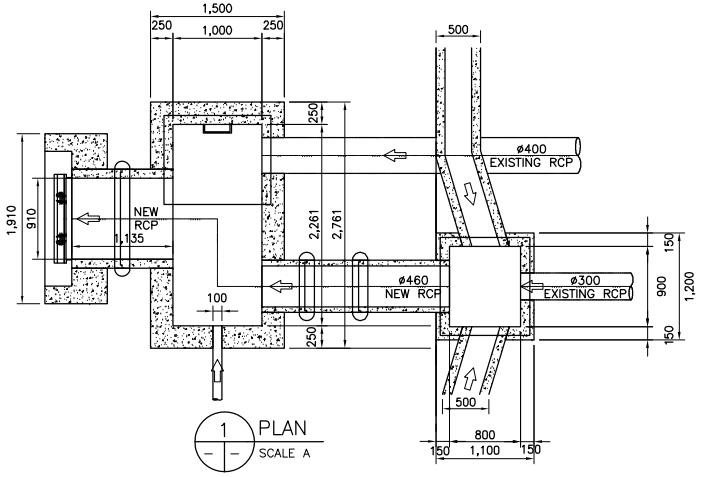

15.0
10.0
7.5
V
H
MR83.36
DR83.36
ER83.37
ER83.38
MR83.38
ER83.39
ER83.40
MR83.40
ER83.41
ø100PVC
S=0.025
ø100PVC
S=0.025
S=0.025
S=0.003
S=0.003
ø910
RCP
L=3.561m
ø910
RCP
L=7.505m
ø910
RCP
L=2.406m
ø100
PVC
L=2.137m
ø910
RCP
L=1.865m
GROUND LEVEL
13.585
13.585
13.585
13.586
13.586
13.586
OVERBURDEN
PIPE INVERT ELEVATION
10.969
12.840
12.930
11.002
11.032
12.540
12.635
11.045
11.110
11.158
STATION NUMBER
9+429
9+432
9+439
9+441
9+441
9+443

QUANTITIES OF MANHOLE

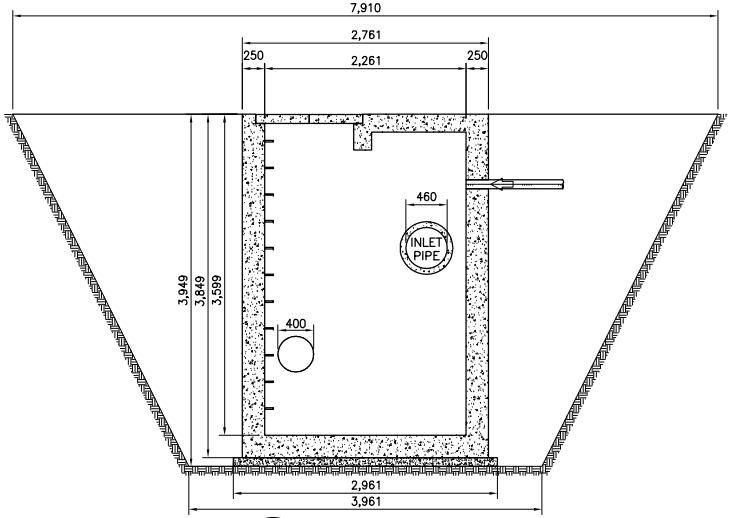
Manhole No.: MR 83.4

Location: 9 + 149

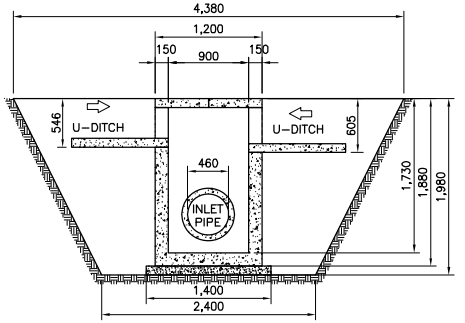
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.80	5.94	16.62	
		A2=10.21	5.94	60.59	
		A3=2.46	3.39	8.34	
		A4=4.78	3.39	16.19	
				101.73	m^3
2. Lev. Concrete	W=1.80	5.51	0.1	**0.55**	m^3
(Manhole)	L=3.06				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.60	5.21	0.3	**1.56**	m^3
(Manhole)	L=2.86				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.60	Aout=4.58			
	Lout=2.86				
	Win=1.00	Ain=2.26	3.599	8.337	m^3
	Lin=2.26				
		Anet=2.32			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.30	0.00	
Pipe hole on Wall B	DiaB=0.59	0.40	0.30	0.10	
Pipe hole on Wall C	DiaC=0.10	0.01	0.30	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.30	0.24	
Net Wall Vol.				**7.99**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.730	1.038	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.55	W=0.50	0.27	0.15	0.04	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.61	W=0.50	0.30	0.15	0.05	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.89**	m^3
5. Conc. Cover	L=1.00	1.2	0.1	**0.12**	m^3
(Manhole)	W=1.20				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=11			**10.42**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.98	0.7	4.19	
	Lout=3.13				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.12	m3
9. Outlet Pipe	Dia=.910m	L=1.19		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.05		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=1.60		**0.094518**	m3
(Inlet Pipe)					
14. Backfill				**84.78**	m3



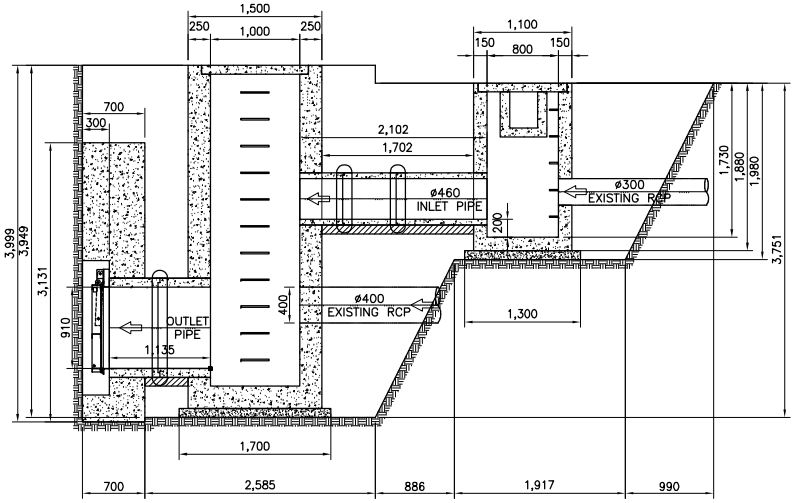
1 PLAN
SCALE A



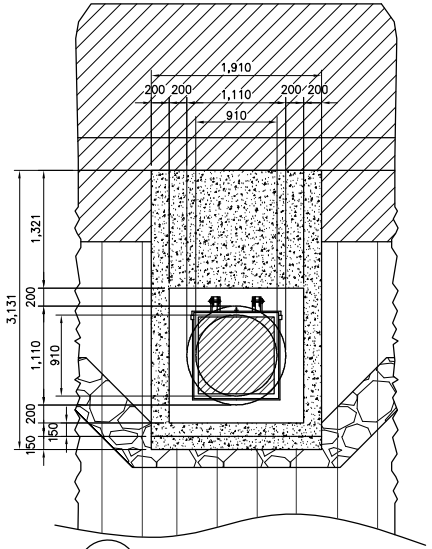
3 SECTION
SCALE A



4 SECTION (JB83.4)
SCALE A



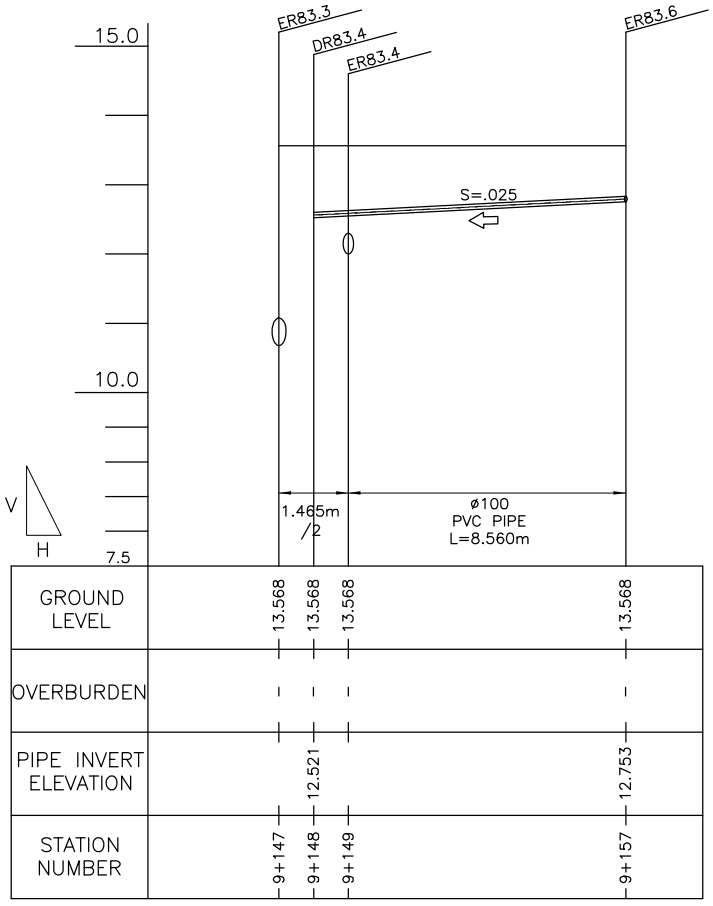
2 SECTION
SCALE A



5 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
Collector Pipe (PVC)	Dia=0.10		L=8.77	2	pc
2. PVC coupling	Dia=0.10			1	pc



Clearing (Manhole 83.4)

L1	1.59	m	
W of Junction Manhole	1.1	m	A1=25.98 m^2
L2	1.702	m	A2=16.61 m^2
W of Manhole	1.5	m	**At=42.59** m^2
L3	0.485	m	
W1	7.91	m	
W2	4.38	m	

Clearing (Collector 83.6 - 83.4)

W	2.031	m	**A=18.87** m^2
L	9.2925	m	

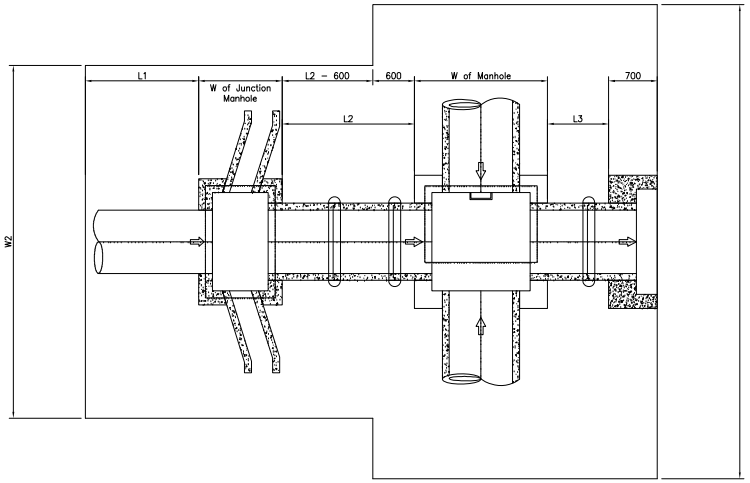
(Collector PVC) Downstream 83.6-83.4

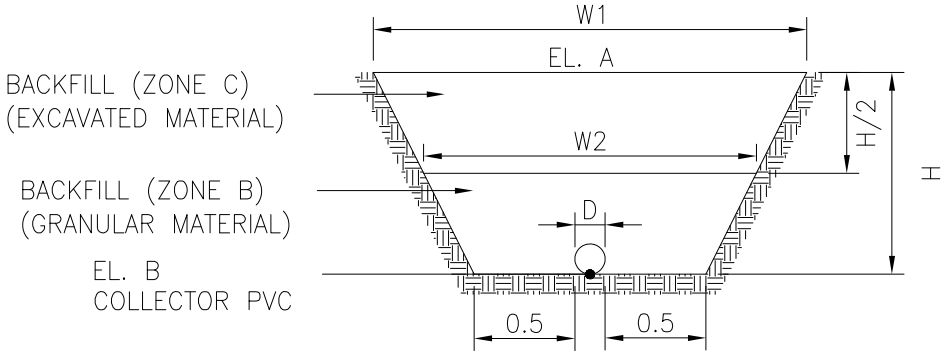
D	0.1	m	Excavation
W1	2.15	m	A=1.70 m^2
W2	1.62	m	Backfill Zone B
H	1.047	m	A=0.71 m^2
H/2	0.5235	m	Backfill Zone C
EL. A	13.568	m	A=0.99 m^2
EL. B	12.521	m	

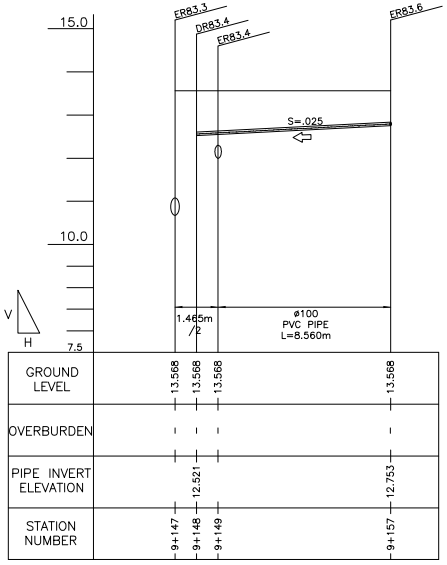
(Collector PVC) Upstream

D	0.1	m	Excavation
W1	1.92	m	A=1.23 m^2
W2	1.51	m	Backfill Zone B
H	0.815	m	A=0.52 m^2
H/2	0.4075	m	Backfill Zone C
EL. A	13.568	m	A=0.70 m^2
EL. B	12.753	m	

Collector PVC 133C.6-134	Volume	
Excavation	**13.94631**	m^3
Backfill Zone B	**5.85036**	m^3
Backfill Zone C	**8.021143**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

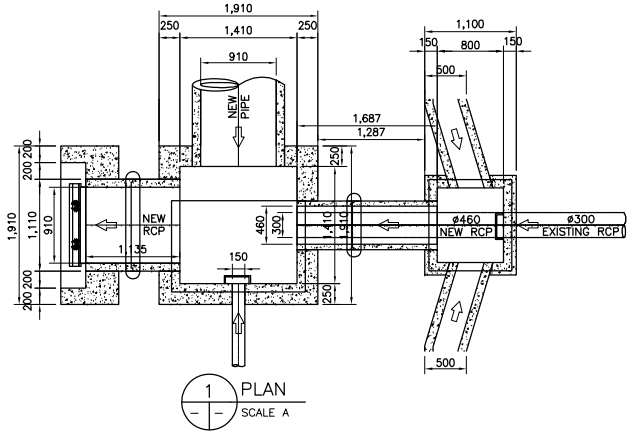

15.0
10.0
7.5
V
H
ER83.3
DR83.4
ER83.4
ER83.6
S=.025
1.465m /2
ø100 PVC PIPE L=8.560m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.568
13.568
13.568
13.568
12.521
12.753
9+147
9+148
9+149
9+157

QUANTITIES OF MANHOLE

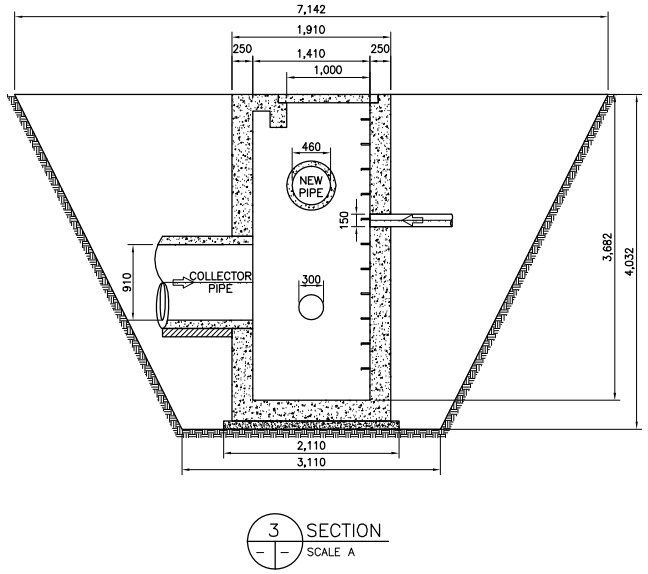
Manhole No.: MR 83.46

Location: 9 + 455

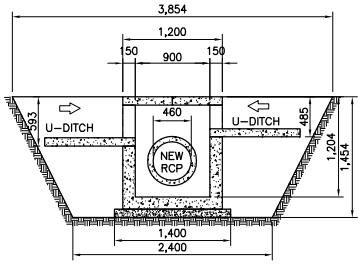
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.86	5.13	14.65	
		A2=12.08	5.13	61.90	
		A3=2.91	3.13	9.11	
		A4=2.36	3.13	7.38	
				93.03	m^3
2. Lev. Concrete	W=2.21	4.88	0.1	**0.49**	m^3
(Manhole)	L=2.21				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=2.01	4.67	0.3	**1.40**	m^3
(Manhole)	L=2.01				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=2.01	Aout=4.04			
	Lout=2.01				
	Win=1.41	Ain=1.99	3.682	7.555	m^3
	Lin=1.41				
		Anet=2.05			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.30	0.24	
Pipe hole on Wall B	DiaB=0.59	0.34	0.30	0.09	
Pipe hole on Wall C	DiaC=0.15	0.02	0.30	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.30	0.24	
Net Wall Vol.				**6.98**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.204	0.722	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.59	W=0.50	0.30	0.15	0.04	
Pipe hole on Wall B	DiaB=0.40	0.13	0.15	0.02	
Depth of Ditch=0.49	W=0.50	0.24	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.58**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=12			**11.36**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=6.10	0.7	4.27	
	Lout=3.20				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.20	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=1.74		**2**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=1.29		**0.075933**	m3
(Inlet Pipe)					
14. Backfill				**77.53**	m3



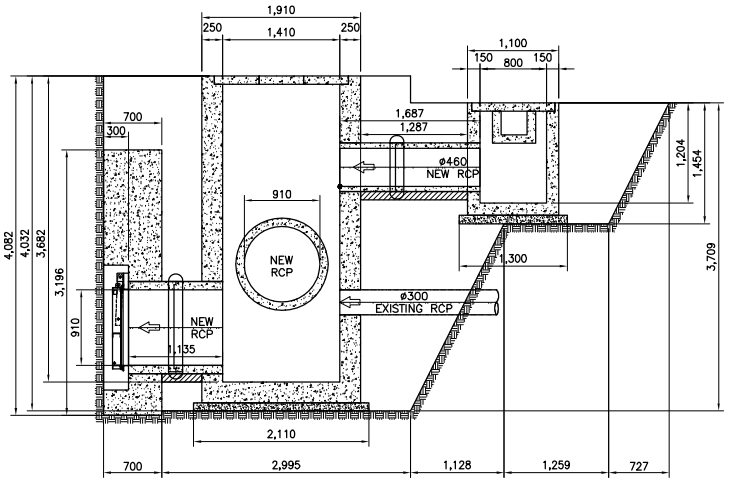
1 PLAN
SCALE A



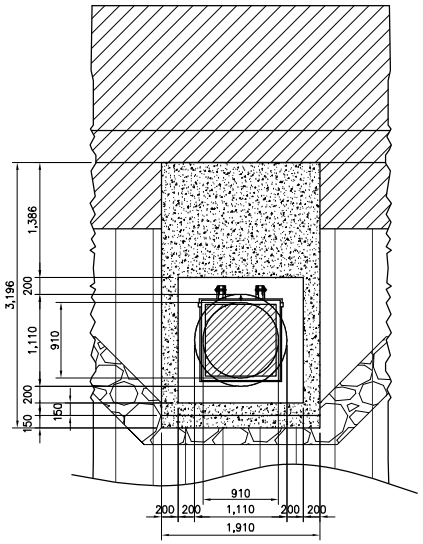
3 SECTION
SCALE A



4 SECTION (JB83.46)
SCALE A



2 SECTION
SCALE A



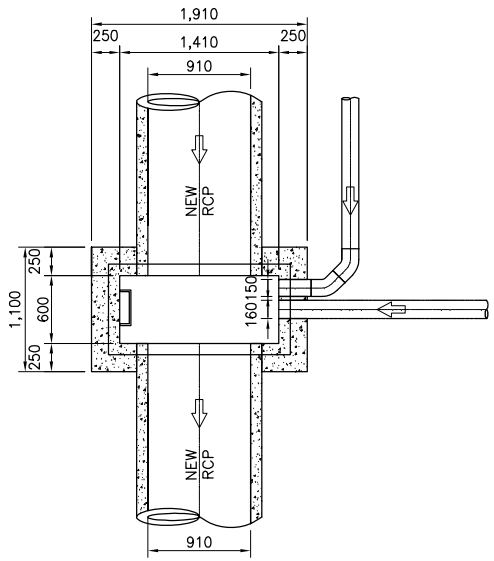
5 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

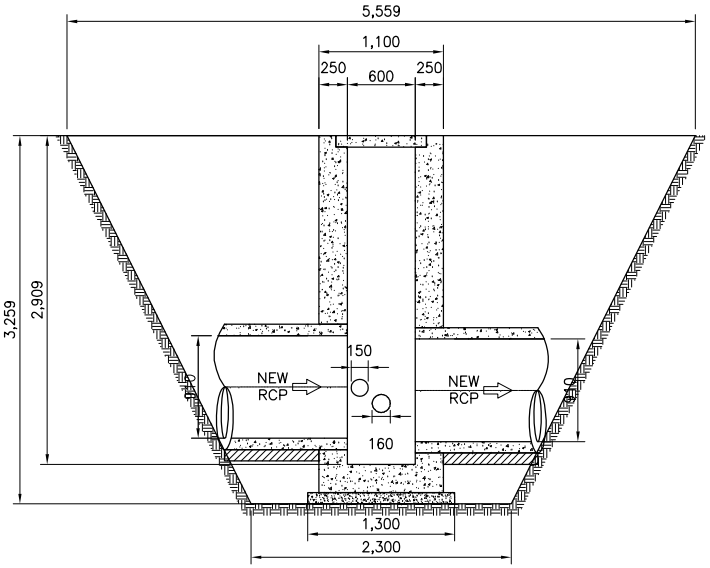
Manhole No.: MR 83.44

Location: 9 + 454

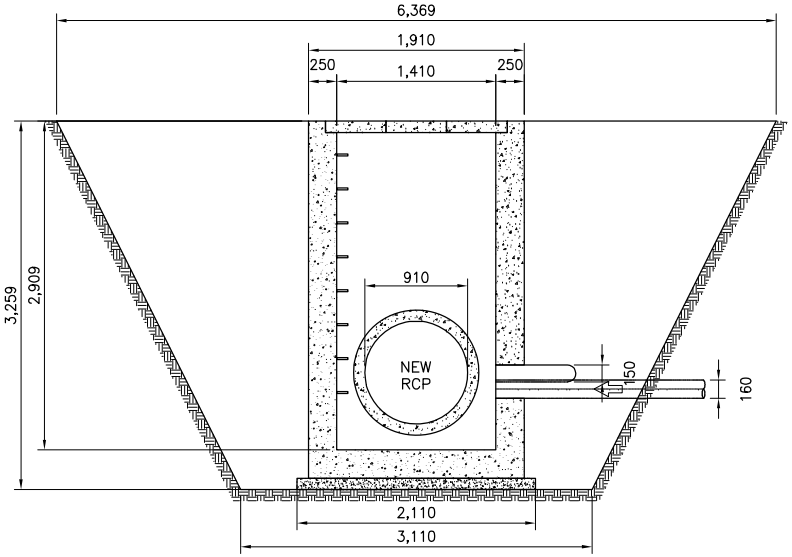
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=15.45	3.93	60.70	
				60.70	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.909	3.651	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.98	0.25	0.24	
Pipe hole on Wall A	DiaB=0.16	0.04	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.16**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Backfill				**50.58**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



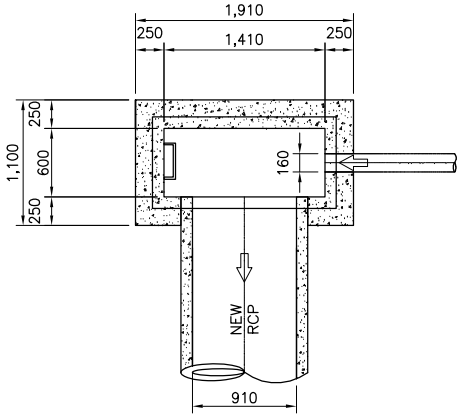
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

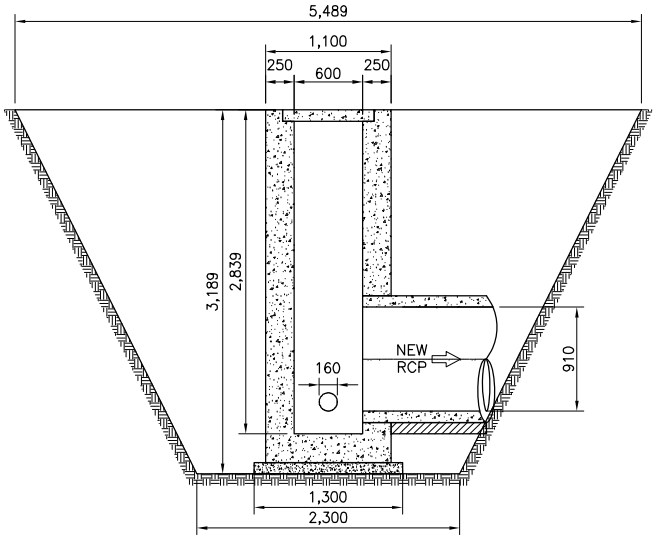
Manhole No.: MR 83.41

Location: 9 + 444

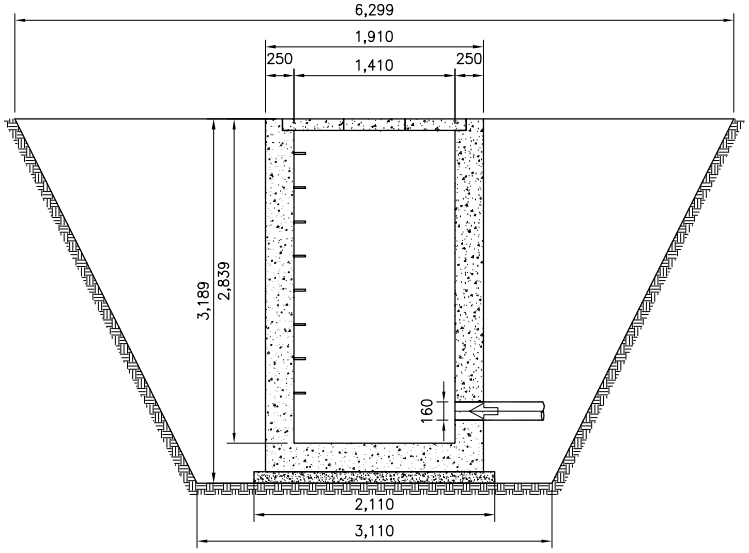
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=15.00	3.89	58.43	
				58.43	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.839	3.563	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.01	0.25	0.00	
Pipe hole on Wall A	DiaB=0.16	0.02	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.31**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Backfill				**48.69**	m3



1 PLAN
SCALE A



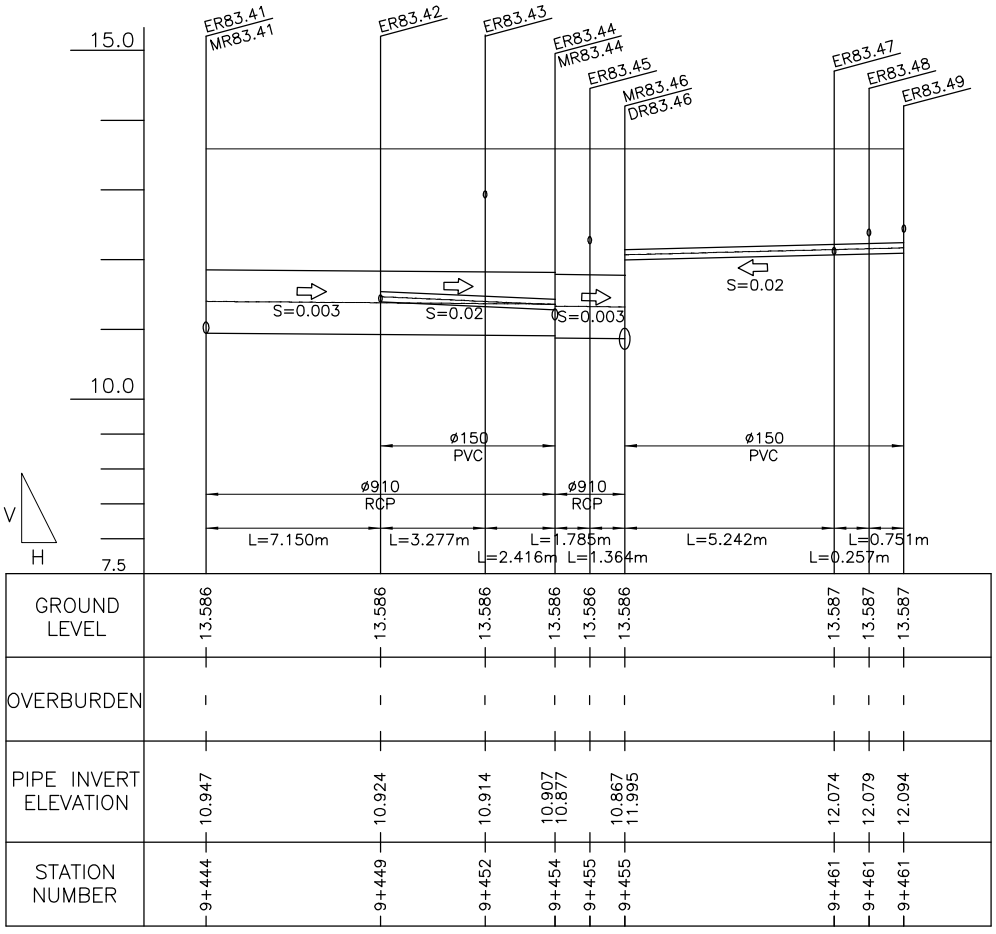
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.91		L=16.47	17	pc
Collector Pipe (PVC)	Dia=0.15		L=12.18	3	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=16	0.92	m3
3. Conc. Bedding	Dia=.910m	L=16.47		1.50	m3
4. PVC coupling	Dia=0.15			2	pc
5. Formworks				16.95	m3



Clearing (Manhole 83.46)

L1	1.327	m	
W of Junction Manhole	1.1	m	A1=26.39 m^2
L2	1.287	m	A2=12.00 m^2
W of Manhole	1.91	m	**At=38.39** m^2
L3	0.485	m	
W1	7.142	m	
W2	3.854	m	

Clearing (Manhole 83.44)

W	6.369	m	**A=35.41** m^2
L	5.559	m	

Clearing (Manhole 83.41)

W	6.299	m	**A=34.58** m^2
L	5.489	m	

Clearing (Clearing 83.41 - 83.44)

W	4.969	m	**A=63.82** m^2
L	12.843	m	

Clearing (Clearing 83.42 - 83.46)

W	3.424	m	**A=10.78** m^2
L	3.149	m	

Clearing (Clearing 83.49 - 83.46)

W	2.692	m	**A=16.83** m^2
L	6.25	m	

(Collector Pipe) Downstream	83.41-83.44		Excavation
Do	1.11	m	A=10.22 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.88 m^2
H	2.879	m	Backfill Zone C
EL. A	13.586	m	A=3.27 m^2
EL. B	10.907	m	
W	4.989	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=10.02 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.81 m^2
H	2.839	m	Backfill Zone C
EL. A	13.586	m	A=3.21 m^2
EL. B	10.947	m	
W	4.949	m	

(Collector PVC) Downstream	83.42-83.46		
D	0.15	m	Excavation
W1	3.46	m	A=5.31 m^2
W2	2.30	m	Backfill Zone B
H	2.306	m	A=1.97 m^2
H/2	1.153	m	Backfill Zone C
EL. A	13.586	m	A=3.32 m^2
EL. B	11.28	m	

(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	3.39	m	A=5.03 m^2
W2	2.30	m	Backfill Zone B
H	2.192	m	A=1.88 m^2
H/2	1.096	m	Backfill Zone C
EL. A	13.586	m	A=3.12 m^2
EL. B	11.394	m	

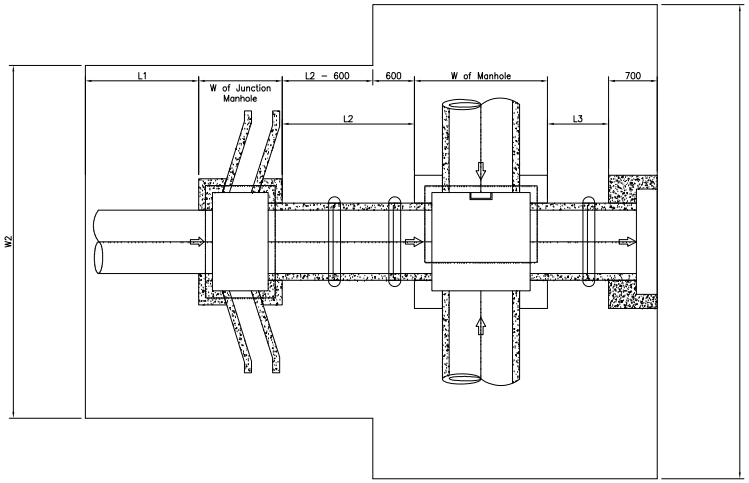
(Collector PVC) Downstream	83.49-83.46		
D	0.15	m	Excavation
W1	2.74	m	A=3.10 m^2
W2	1.95	m	Backfill Zone B
H	1.591	m	A=1.21 m^2
H/2	0.7955	m	Backfill Zone C
EL. A	13.586	m	A=1.86 m^2
EL. B	11.995	m	

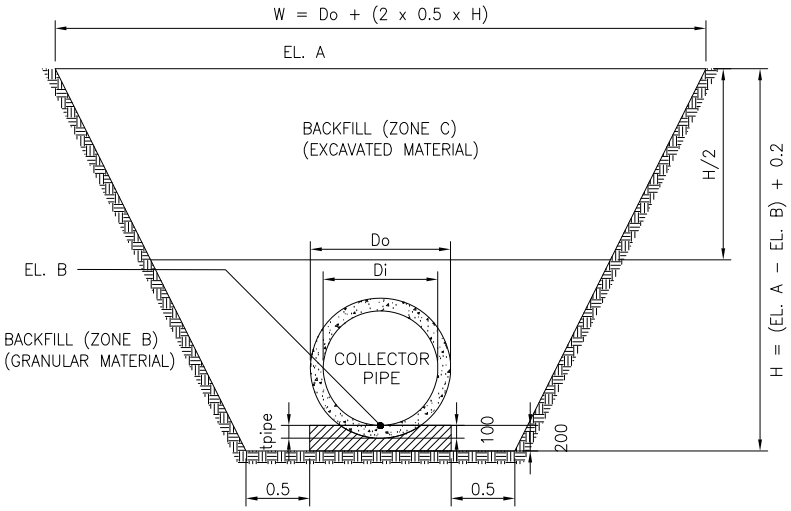
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	2.64	m	A=2.83 m^2
W2	1.90	m	Backfill Zone B
H	1.493	m	A=1.12 m^2
H/2	0.7465	m	Backfill Zone C
EL. A	13.587	m	A=1.69 m^2
EL. B	12.094	m	

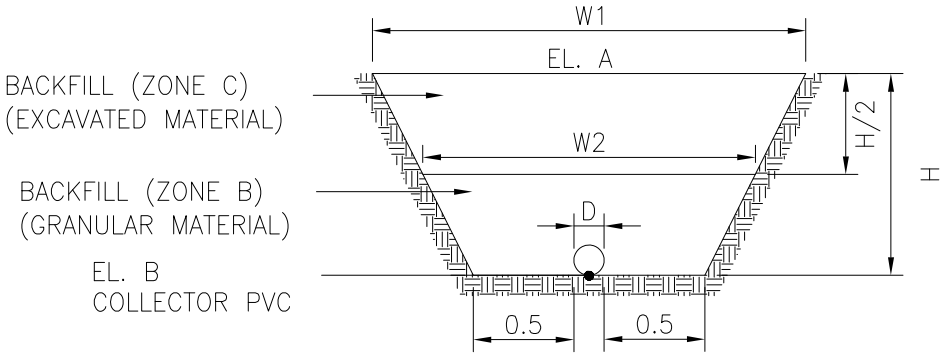
Collector Pipe 83.41-83.44	Volume	
Excavation	**130.3563**	m^3
Backfill Zone B	**36.58837**	m^3
Backfill Zone C	**41.79615**	m^3

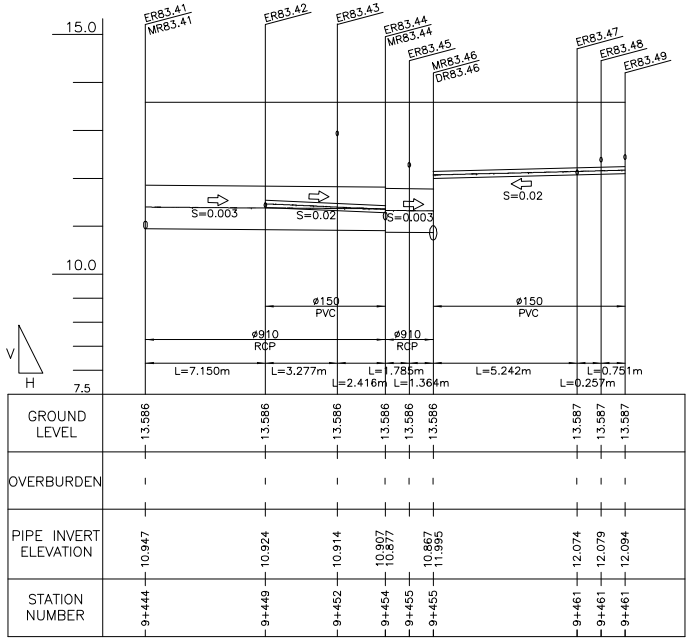
Collector PVC 83.42-83.46	Volume	
Excavation	**30.03177**	m^3
Backfill Zone B	**11.19962**	m^3
Backfill Zone C	**18.68963**	m^3

Collector PVC 77A.1-77A.3	Volume	
Excavation	**18.89156**	m^3
Backfill Zone B	**7.436432**	m^3
Backfill Zone C	**11.34248**	m^3









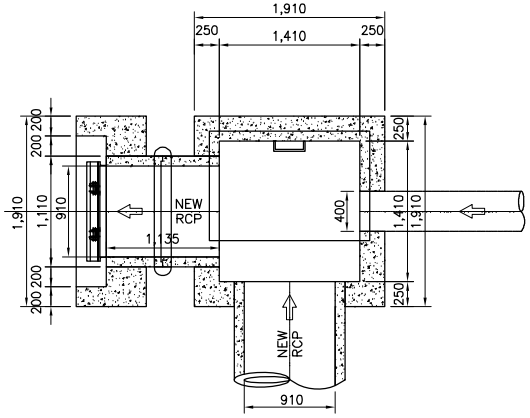
GROUND LEVEL	13.586	13.586	13.586	13.586	13.586	13.586	13.587	13.587	13.587
OVERBURDEN	-	-	-	-	-	-	-	-	-
PIPE INVERT ELEVATION	10.947	10.924	10.914	10.907 10.877	10.867 11.995		12.074	12.079	12.094
STATION NUMBER	9+444	9+449	9+452	9+454	9+455	9+455	9+461	9+461	9+461

QUANTITIES OF MANHOLE

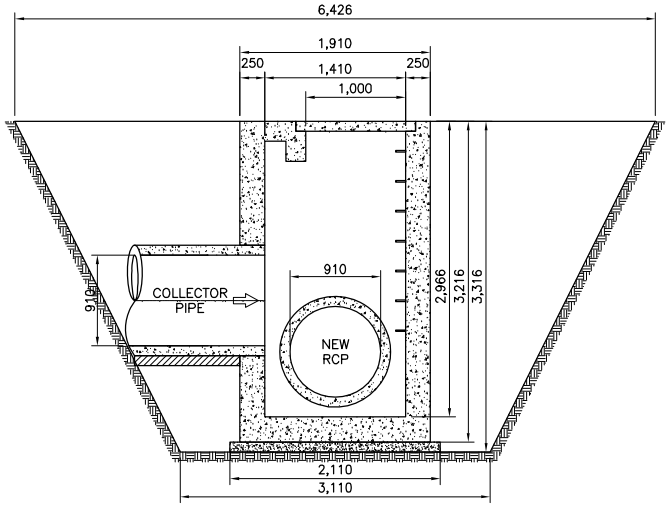
Manhole No.: MR 83.5

Location: 9 + 193

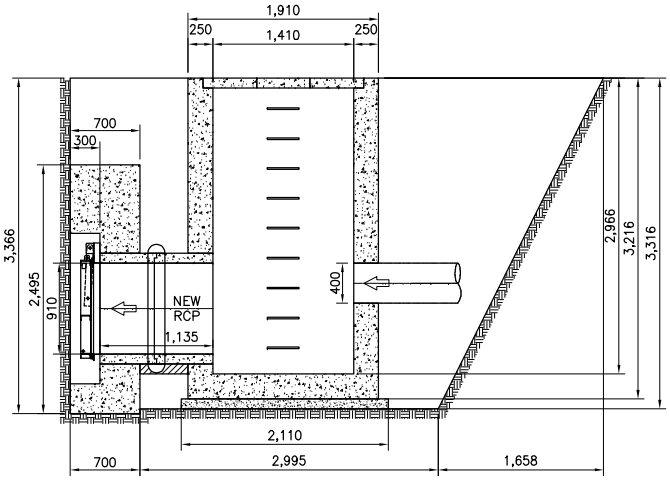
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.36	4.77	11.23	
		A2=12.68	4.77	60.46	
				71.69	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.966	4.924	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.53	0.22	0.25	0.05	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.39**	m^3
5. Conc. Cover	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.77	0.7	3.34	
	Lout=2.50				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.26	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
12. Backfill				**59.75**	m3



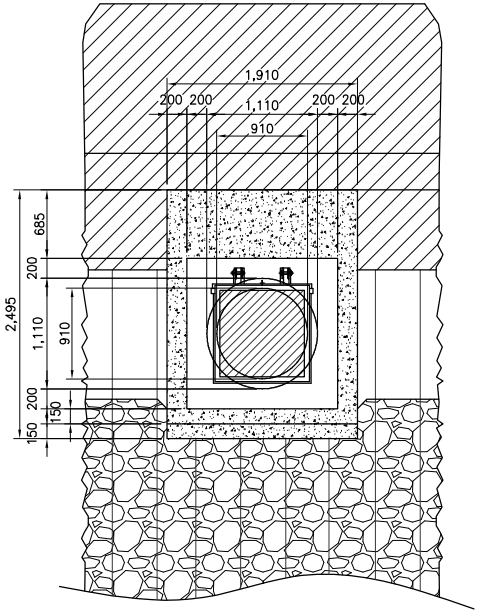
1 PLAN
SCALE B



3 SECTION
SCALE A



2 SECTION
SCALE A



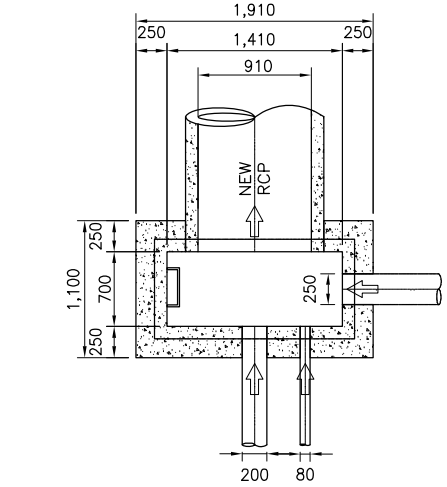
4 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

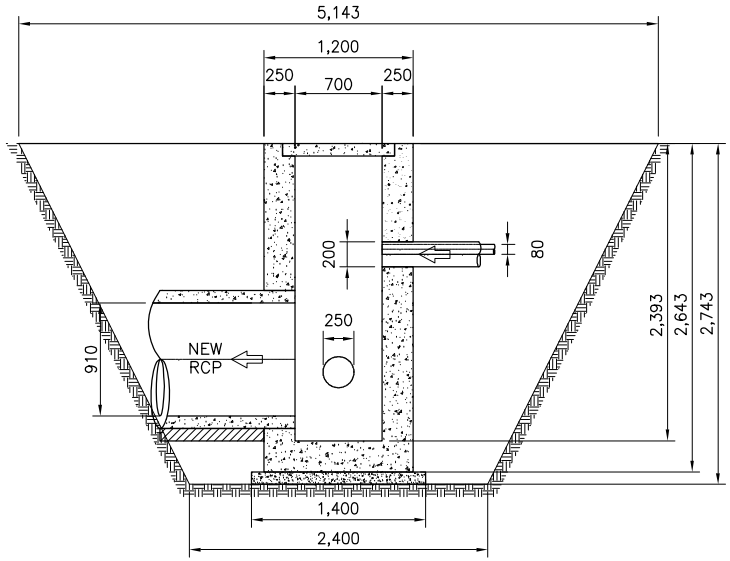
Manhole No.: MR 83.7

Location: 9 + 209

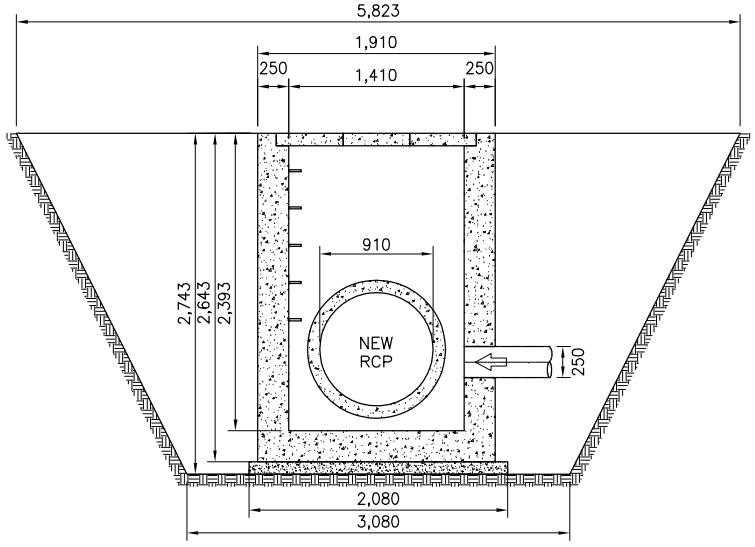
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=12.21	3.77	46.05	
				46.05	m^3
2. Lev. Concrete	W=2.08 L=1.40	2.91	0.1	**0.29**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	2.393	3.123	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=0.25	0.05	0.25	0.01	
Pipe hole on Wall C	DiaC=0.20	0.04	0.25	0.01	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.86**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**38.38**	m3



6 PARTIAL PLAN OF MANHOLE (MR83.7)
SCALE A



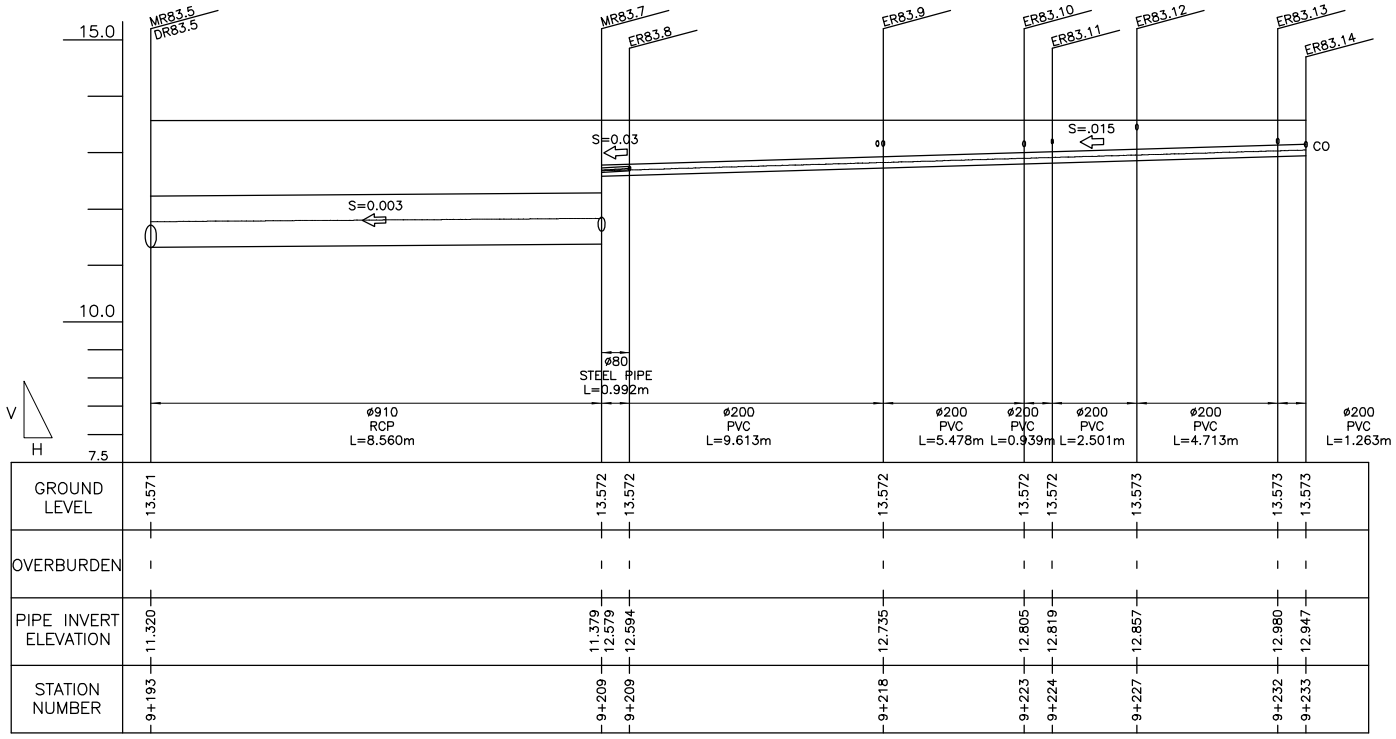
8 SECTION
SCALE A



7 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=8.59	9	pc
Collector Pipe (PVC)	Dia=0.20		L=24.87	5	pc
Collector Pipe (Steel)	Dia=0.08		L=0.99	1	pc
2. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=8	0.46	m3
3. Conc. Bedding	Dia=.910m	L=8.59		0.78	m3
4. PVC coupling	Dia=0.10			4	pc
5. Formworks				8.70	m3



Clearing (Manhole 83.5)

L1	2.258	m	
W of Manhole	1.91	m	**At=34.40** m^2
L2	0.485	m	
W	6.426	m	

Clearing (Manhole 83.7)

W	5.823	m	**A=29.95** m^2
L	5.143	m	

Clearing (Collector 83.7 - 83.5)

W	4.532	m	**A=38.79** m^2
L	8.56	m	

Clearing (Collector 83.14 - 83.7)

W	2.0095	m	**A=45.19** m^2
L	22.489	m	

(Collector Pipe) Downstream	83.7-83.5		Excavation
Do	1.11	m	A=8.18 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.15 m^2
H	2.451	m	Backfill Zone C
EL. A	13.571	m	A=2.66 m^2
EL. B	11.32	m	
W	4.561	m	

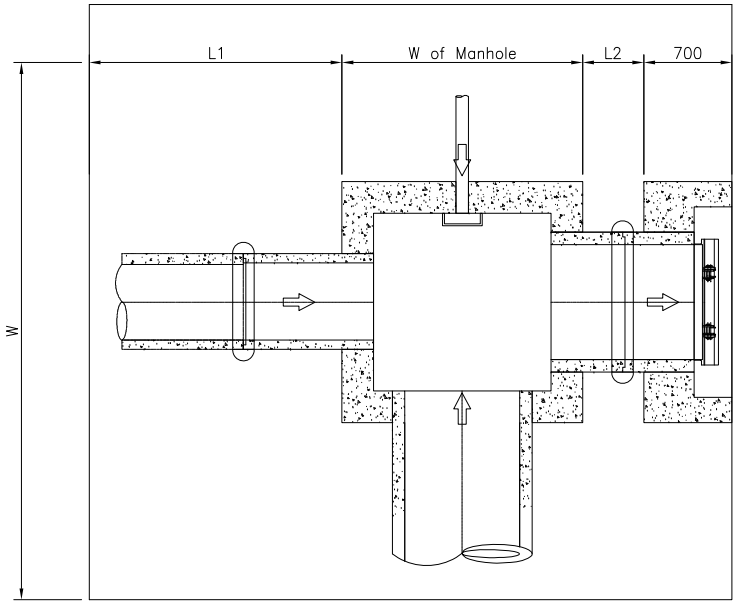
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=7.91 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.05 m^2
H	2.393	m	Backfill Zone C
EL. A	13.572	m	A=2.58 m^2
EL. B	11.379	m	
W	4.503	m	

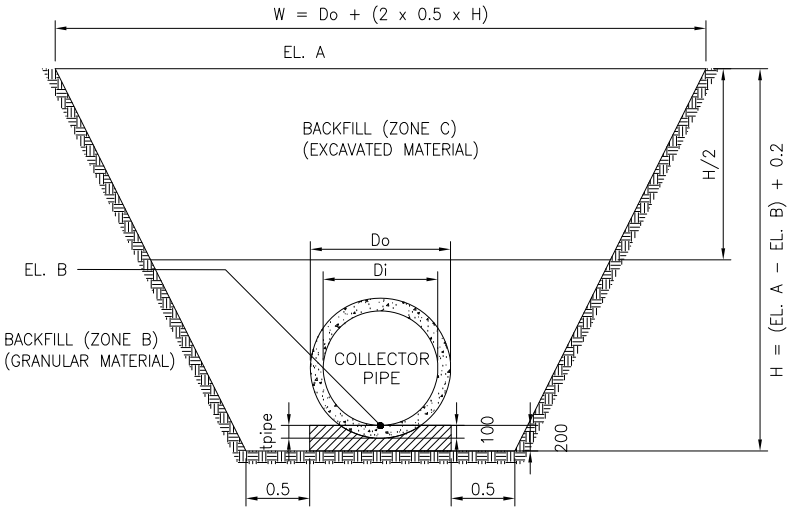
(Collector PVC) Downstream	83.14-83.7		
D	0.2	m	Excavation
W1	2.19	m	A=1.68 m^2
W2	1.70	m	Backfill Zone B
H	0.993	m	A=0.69 m^2
H/2	0.4965	m	Backfill Zone C
EL. A	13.572	m	A=0.97 m^2
EL. B	12.579	m	

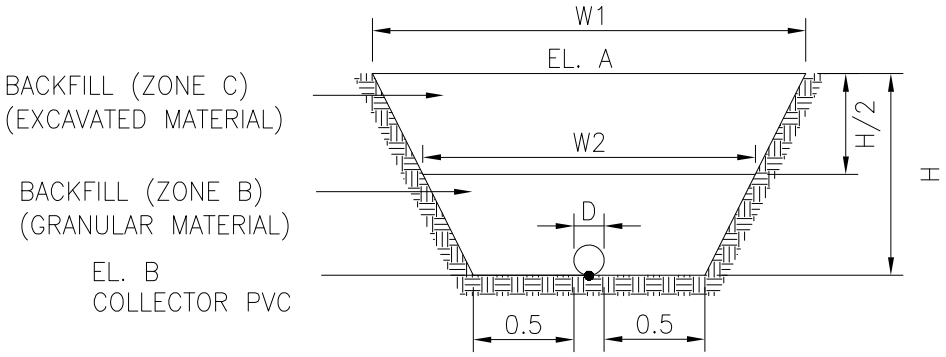
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	1.83	m	A=0.95 m^2
W2	1.51	m	Backfill Zone B
H	0.626	m	A=0.39 m^2
H/2	0.313	m	Backfill Zone C
EL. A	13.573	m	A=0.52 m^2
EL. B	12.947	m	

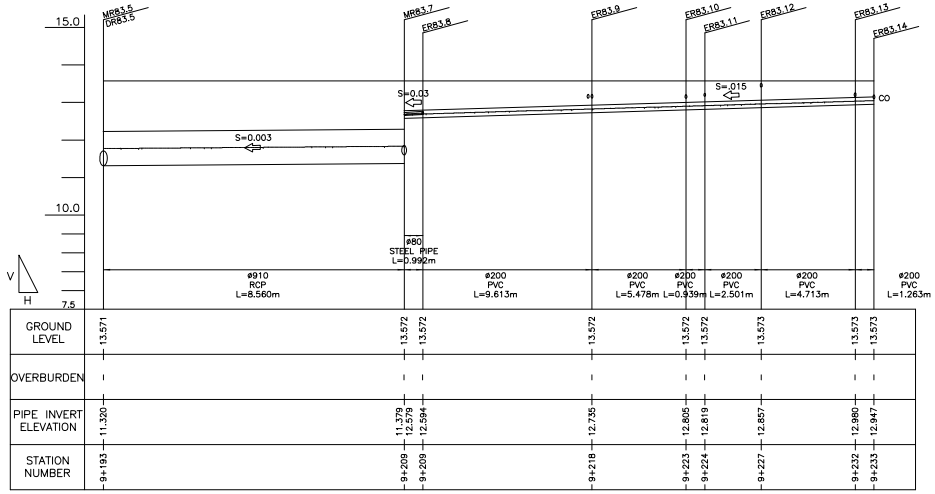
Collector Pipe 83.7 - 83.5	Volume	
Excavation	**69.0622**	m^3
Backfill Zone B	**18.02037**	m^3
Backfill Zone C	**22.46418**	m^3

Collector PVC 83.14 - 83.7	Volume	
Excavation	**34.05696**	m^3
Backfill Zone B	**13.98133**	m^3
Backfill Zone C	**19.2574**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
H/2
H
0.5
0.5

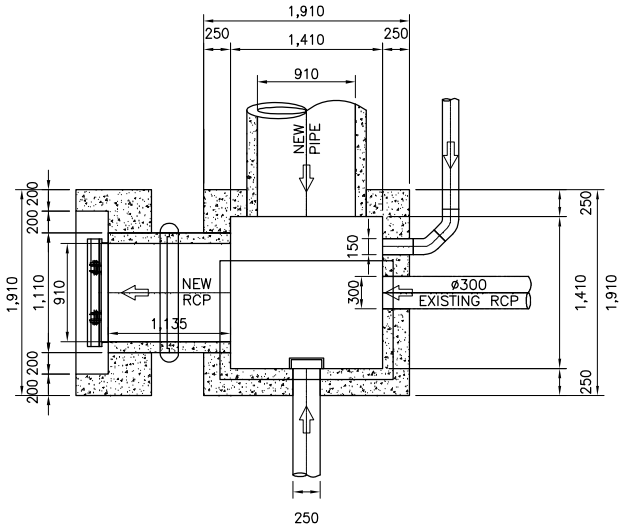

15.0
10.0
7.5
V
H
MR83.5
DRB3.5
MR83.7
ER83.8
ER83.9
ER83.10
ER83.11
ER83.12
ER83.13
ER83.14
S=0.03
S=.015
S=0.003
CO
ø80
STEEL PIPE
L=0.992m
ø910
RCP
L=8.560m
ø200
PVC
L=9.613m
ø200
PVC
L=5.478m
ø200
PVC
L=0.939m
ø200
PVC
L=2.501m
ø200
PVC
L=4.713m
ø200
PVC
L=1.263m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.571
13.572
13.572
13.572
13.572
13.572
13.573
13.573
13.573
11.320
11.379
12.579
12.594
12.735
12.805
12.819
12.857
12.980
12.947
9+193
9+209
9+209
9+218
9+223
9+224
9+227
9+232
9+233

QUANTITIES OF MANHOLE

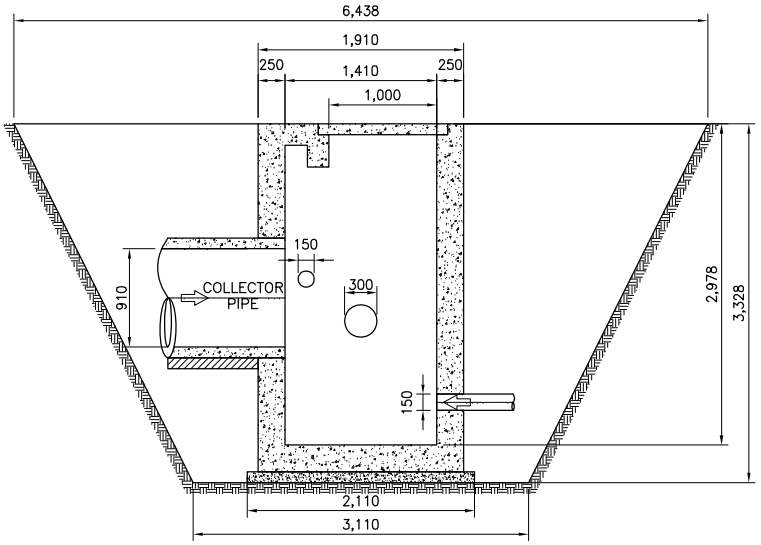
Manhole No.: MR 85

Location: 9 + 482

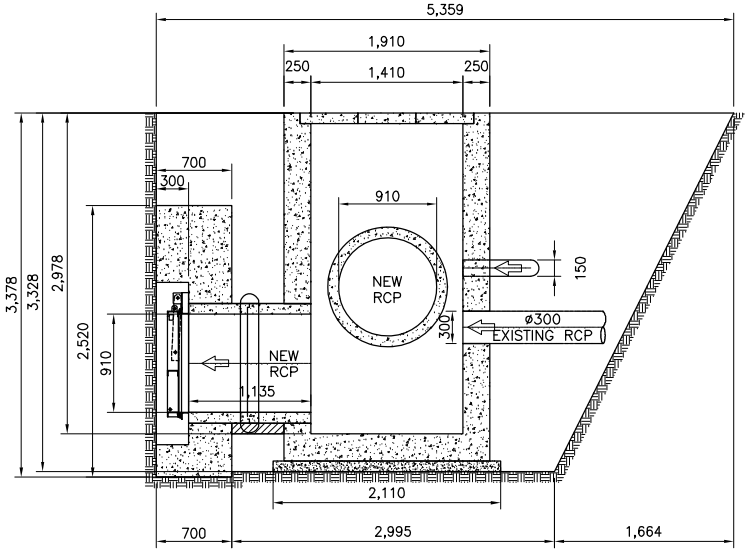
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.36	4.77	11.29	
		A2=12.74	4.77	60.80	
				72.09	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.978	4.943	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.40	0.14	0.25	0.04	
Pipe hole on Wall C	DiaC=0.25	0.05	0.25	0.01	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.41**	m^3
5. Conc. Cover	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.81	0.7	3.37	
	Lout=2.52				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.30	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**60.08**	m3



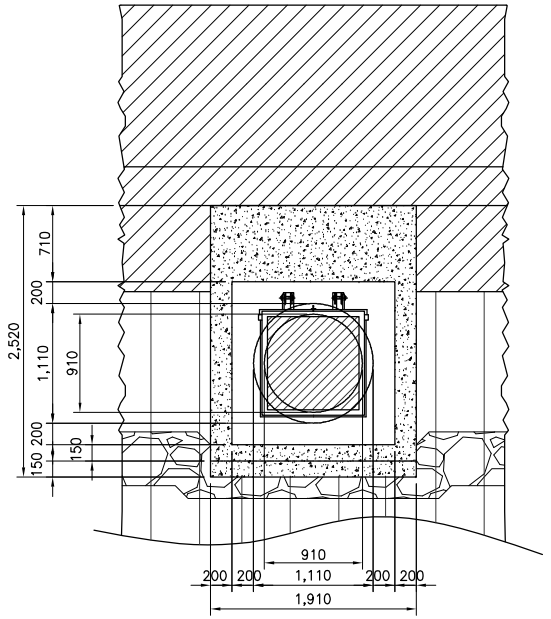
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



4 ELEVATION
SCALE A

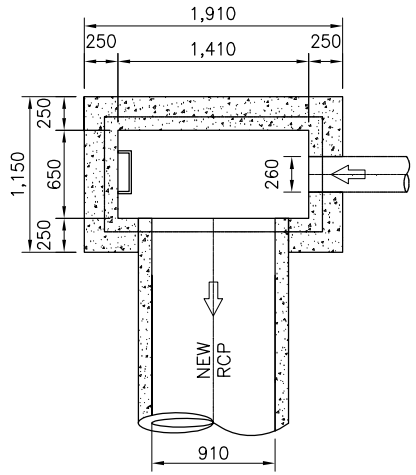
3.366

QUANTITIES OF MANHOLE

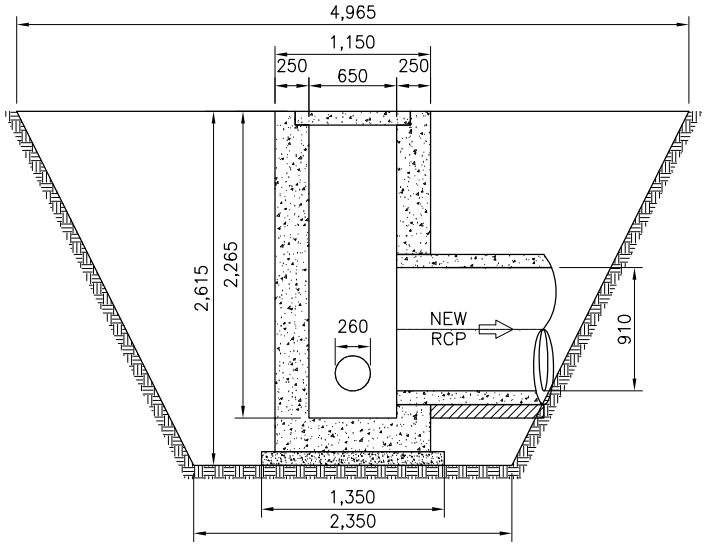
Manhole No.: MR 84

Location: 9 + 472

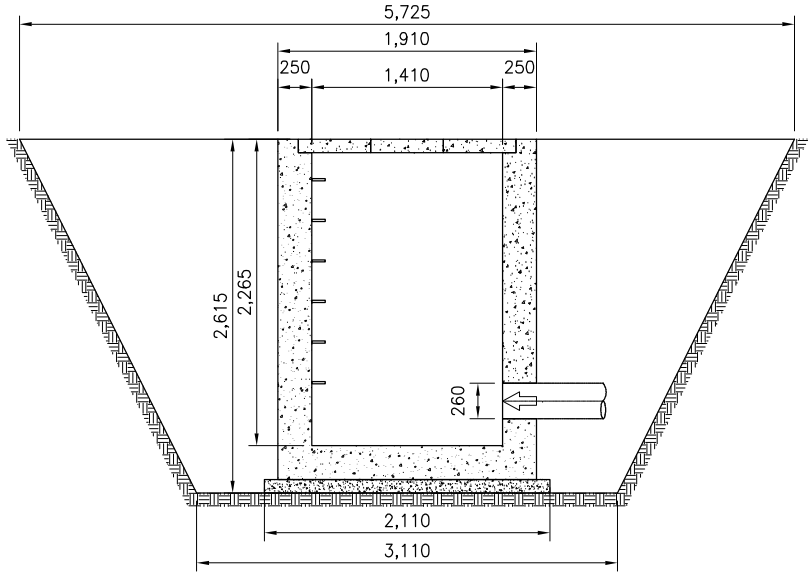
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.55	3.66	42.25	
				42.25	m^3
2. Lev. Concrete	W=2.11 L=1.35	2.85	0.1	**0.28**	m^3
3. Bottom Slab	W=1.91 L=1.15	2.20	0.25	**0.55**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.15	Aout=2.20			
	Win=1.41 Lin=.65	Ain=0.92	2.265	2.899	m^3
	.	Anet=1.28			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.01	0.25	0.00	
Pipe hole on Wall A	DiaB=0.26	0.05	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.64**	m^3
5. Conc. Cover	L=0.85 W=1.61	1.3685	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**35.21**	m3



1 PLAN
SCALE A



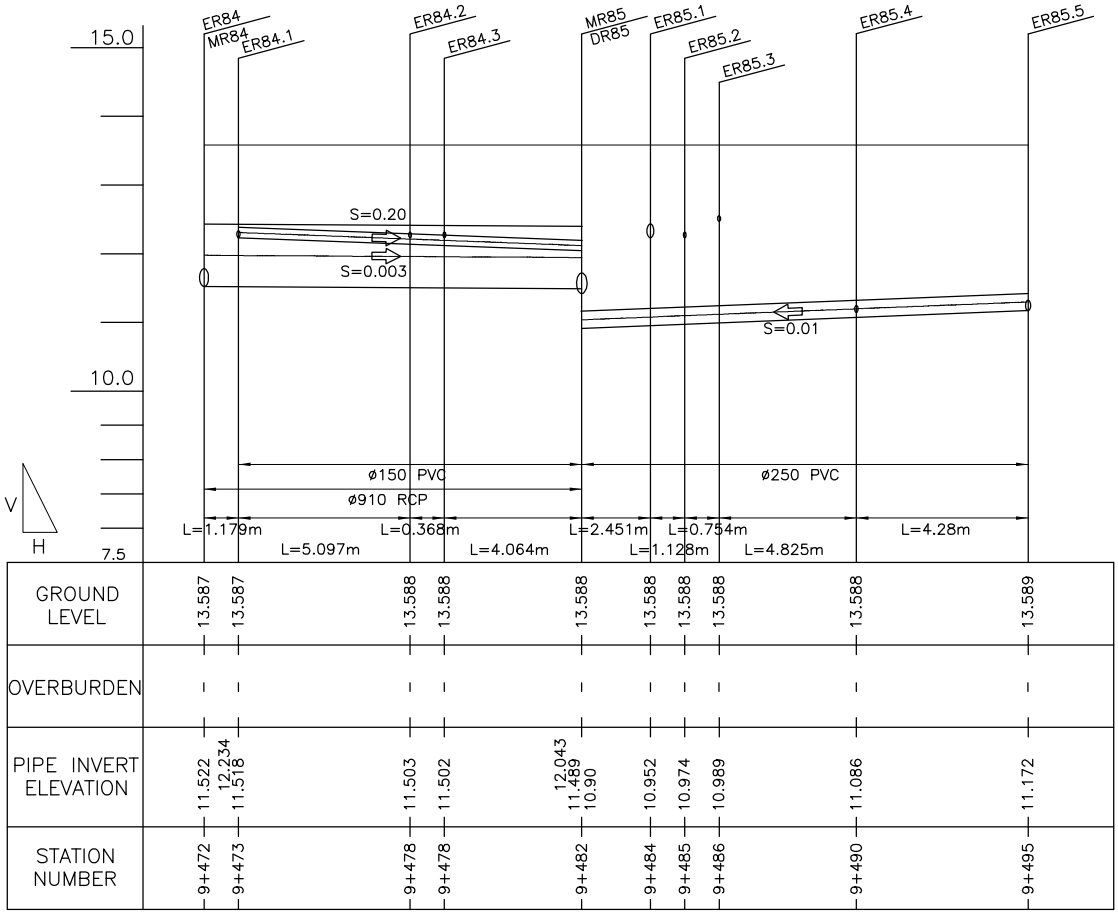
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.91		L=10.74	11	pc
Collector Pipe (PVC)	Dia=0.15		L=10.92	2	pc
Collector Pipe (PVC)	Dia=0.25		L=13.57	5	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=10	0.58	m3
3. Conc. Bedding	Dia=.910m	L=10.74		0.98	m3
4. PVC Coupling	Dia=0.15			1	pc
4. PVC Coupling	Dia=0.25			4	pc
5. Formworks				10.88	m3



Clearing (Manhole 85)

L1	2.264 m	
W of Manhole	1.91 m	**A=34.50** m^2
L2	0.485 m	
W	6.438 m	

Clearing (Manhole 84)

W	5.725 m	**A=28.42** m^2
L	4.965 m	

Clearing (Collector 84 - 85)

W	4.392 m	**A=47.03** m^2
L	10.708 m	

Clearing (Collector 85.5 - 85)

W	3.8025 m	**A=51.10** m^2
L	13.438 m	

(Collector Pipe) Downstream	84-85	Excavation
Do	1.11 m	A=7.49 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.90 m^2
H	2.299 m	Backfill Zone C
EL. A	13.588 m	A=2.45 m^2
EL. B	11.489 m	
W	4.409 m	

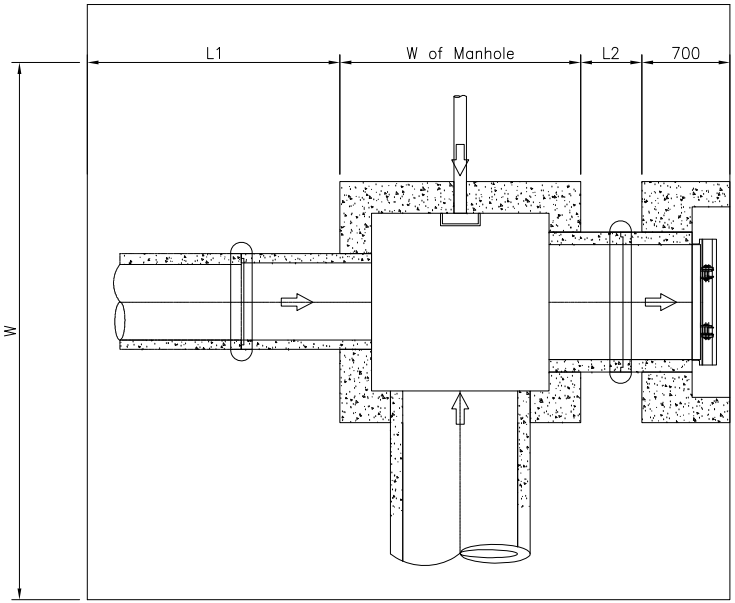
(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=7.34 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.84 m^2
H	2.265 m	Backfill Zone C
EL. A	13.587 m	A=2.40 m^2
EL. B	11.522 m	
W	4.375 m	

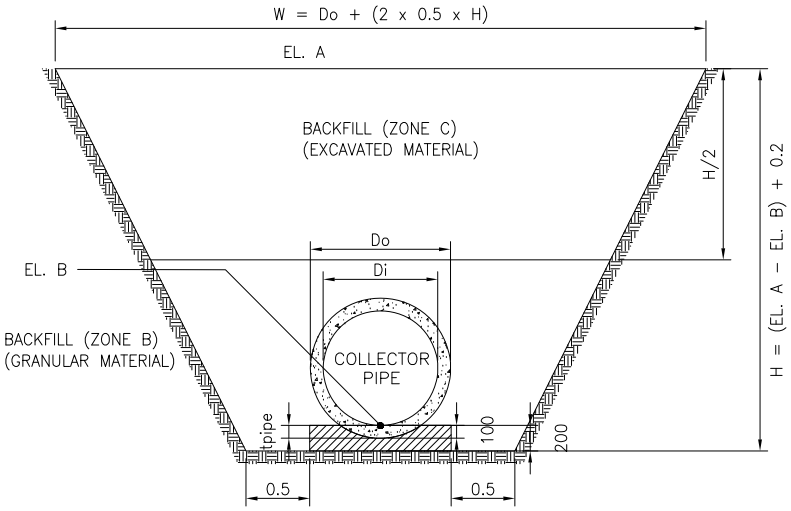
(Collector PVC) Downstream	85.5-85	
D	0.25 m	Excavation
W1	3.94 m	A=6.97 m^2
W2	2.59 m	Backfill Zone B
H	2.688 m	A=2.53 m^2
H/2	1.344 m	Backfill Zone C
EL. A	13.588 m	A=4.39 m^2
EL. B	10.9 m	

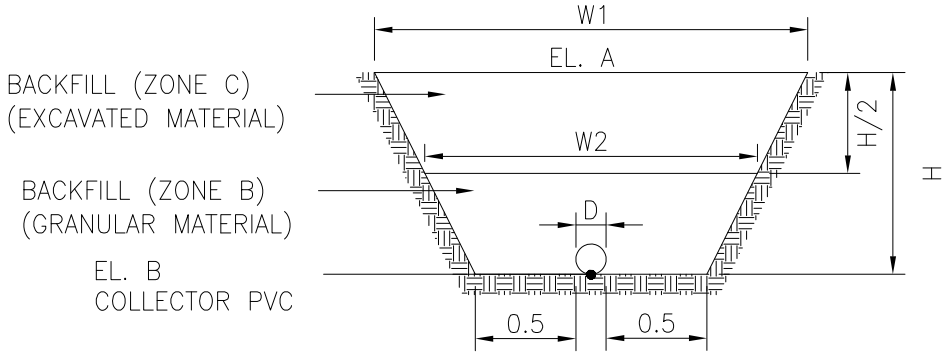
(Collector PVC) Upstream		
D	0.25 m	Excavation
W1	3.67 m	A=5.94 m^2
W2	2.46 m	Backfill Zone B
H	2.417 m	A=2.19 m^2
H/2	1.2085 m	Backfill Zone C
EL. A	13.589 m	A=3.70 m^2
EL. B	11.172 m	

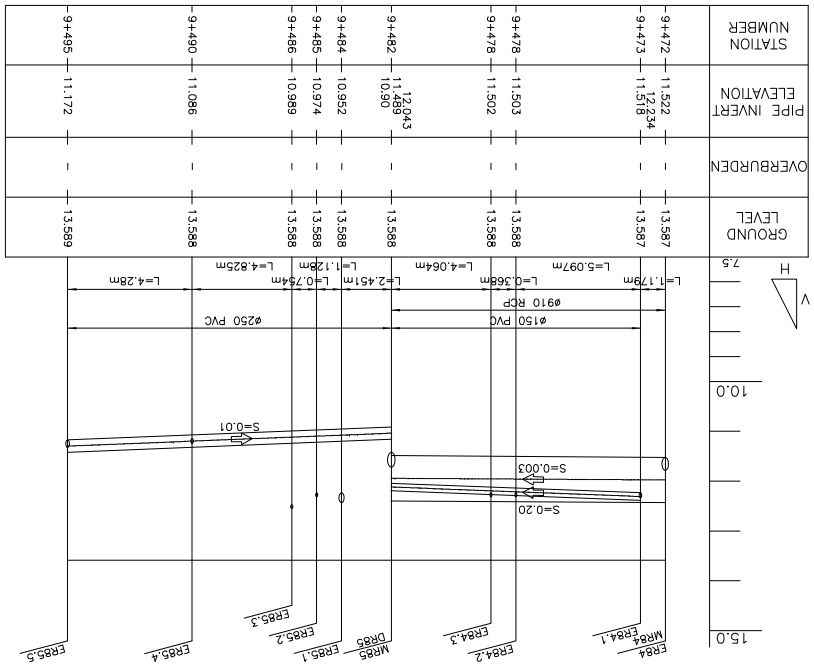
Collector Pipe 84 - 85	Volume
Excavation	**79.68019** m^3
Backfill Zone B	**19.89936** m^3
Backfill Zone C	**26.04729** m^3

Collector PVC 85.5 - 85	Volume
Excavation	**87.64274** m^3
Backfill Zone B	**32.07055** m^3
Backfill Zone C	**54.90596** m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
H = (EL. A – EL. B) + 0.2
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
H
EL. B
COLLECTOR PVC
0.5
0.5

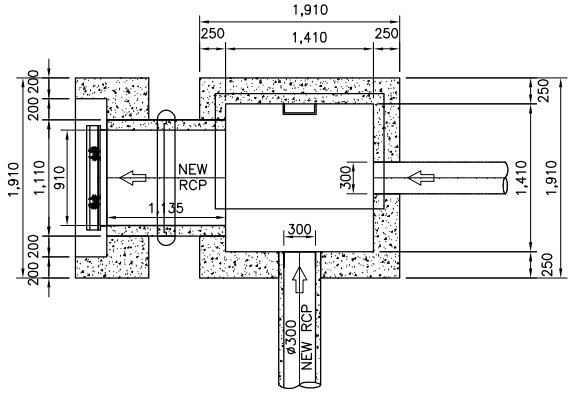

STATION NUMBER
PIPE INVERT ELEVATION
OVERBURDEN
GROUND LEVEL
9+495
9+490
9+486
9+485
9+484
9+482
9+478
9+478
9+473
9+472
11.172
11.086
10.989
10.974
10.952
11.489
10.90
12.043
11.502
11.503
11.518
12.234
11.522
13.589
13.588
13.588
13.588
13.588
13.588
13.588
13.588
13.587
13.587
L=4.28m
L=4.825m
L=1.28m
L=0.754m
L=2.451m
L=4.064m
L=5.097m
L=0.568m
L=1.179m
ø250 PVC
ø150 PVC
ø910 RCP
S=0.01
S=0.003
S=0.20
ER85.5
ER85.4
ER85.3
ER85.2
ER85.1
DR85
MR85
ER84.3
ER84.2
MR84
ER84.1
ER84
7.5
10.0
15.0
H
V

QUANTITIES OF MANHOLE

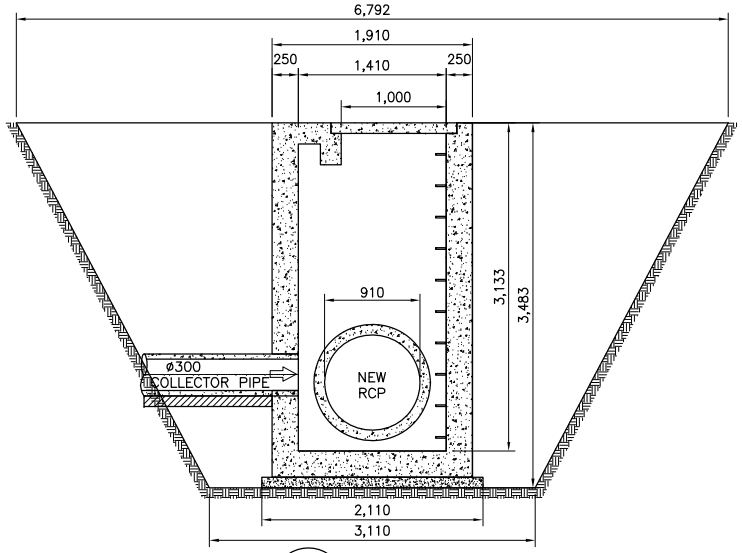
Manhole No.: MR 86

Location: 9 + 498

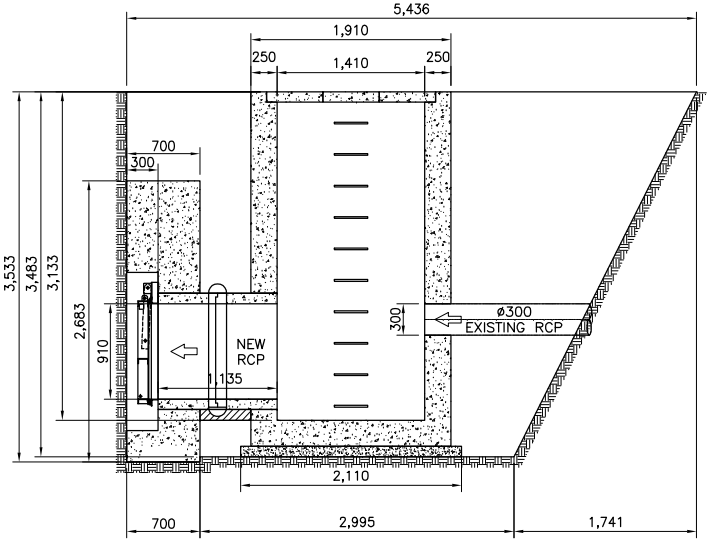
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.47	4.85	12.00	
		A2=13.46	4.85	65.32	
				77.32	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	4.28	0.25	**1.07**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	3.133	5.201	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.40	0.13	0.25	0.03	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.90**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=10			**9.47**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.12	0.7	3.59	
	Lout=2.68				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.52	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Backfill				**64.43**	m3



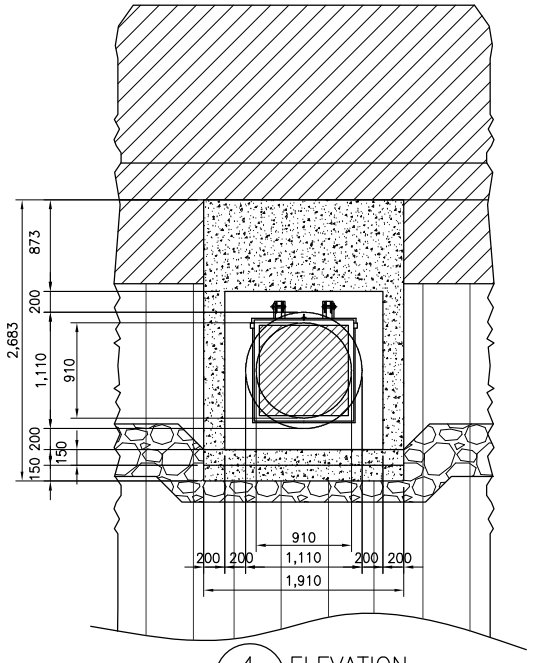
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



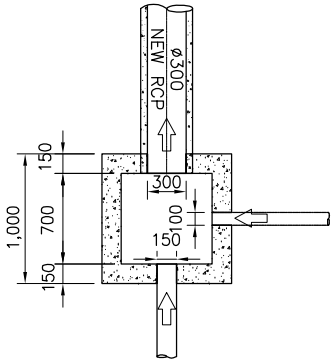
4 ELEVATION
SCALE A

QUANTITIES OF JUNCTION BOX

Junction Box No.: JB 86.1

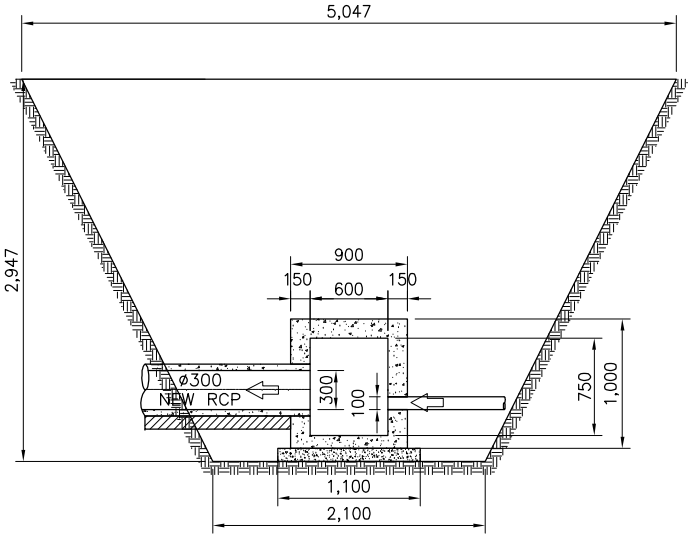
Location: 9 + 501

Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.23	3.57	40.15 **40.15**	m^3
2. Lev. Concrete	W=1.25 L=1.10	1.38	0.1	**0.14**	m^3
3. Bottom Slab	W=1.05 L=0.90	0.95	0.2	**0.19**	m^3
4. Wall					
Entire Wall	Wout=1.05 Lout=.90 Win=0.75 Lin=.60	Aout=0.95 Ain=0.45 Anet=0.50	0.750	0.371	m^3
Minus					
Pipe hole on Wall A	DiaA=0.40	0.13	0.15	0.03	
Pipe hole on Wall A	DiaB=0.10	0.01	0.15	0.00	
Pipe hole on Wall C	DiaC=0.25	0.05	0.15	0.01	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.32**	m^3
5. Top Slab	L=0.90 W=1.05	0.945	0.15	**0.14**	m^3
6. Backfill				**33.45**	m3

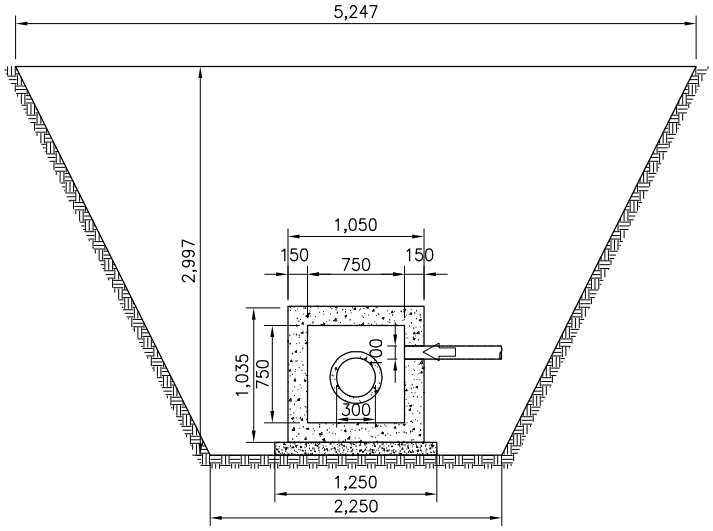


PARTIAL PLAN JUNCTION BOX
(JB 86.1)

1 — SCALE A



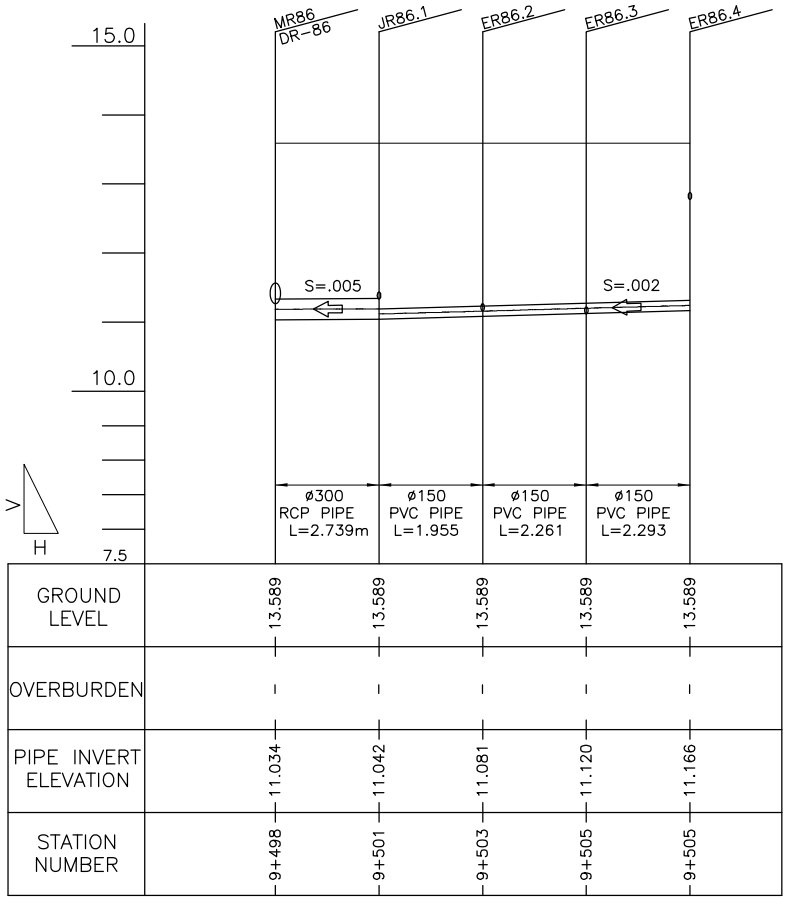
6 SECTION
SCALE C



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.30		L=2.75	3	pc
Collector Pipe (PVC)	Dia=0.15		L=6.52	2	pc
2. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=2	0.05	m3
3. Conc. Bedding	Dia=.300m	L=2.75		0.08	m3
4. PVC Coupling	Dia=0.15			1	pc
5. Formworks				0.91	m3



Clearing (Manhole 86)

L1	2.3415	m	
W of Manhole	1.91	m	**At=35.84** m^2
L2	0.485	m	
W	6.593	m	

Clearing (Junction Manhole 86.1)

W	5.247	m	**A=26.48** m^2
L	5.047	m	

Clearing (Collector 86.1 - 86)

W	4.151	m	**A=11.37** m^2
L	2.739	m	

Clearing (Collector 86.4 - 86.1)

W	3.635	m	**A=23.66** m^2
L	6.509	m	

(Collector Pipe) Downstream	86.1-86		Excavation
Do	0.4	m	A=7.65 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=2.67 m^2
H	2.755	m	Backfill Zone C
EL. A	13.589	m	A=2.60 m^2
EL. B	11.034	m	
W	4.155	m	

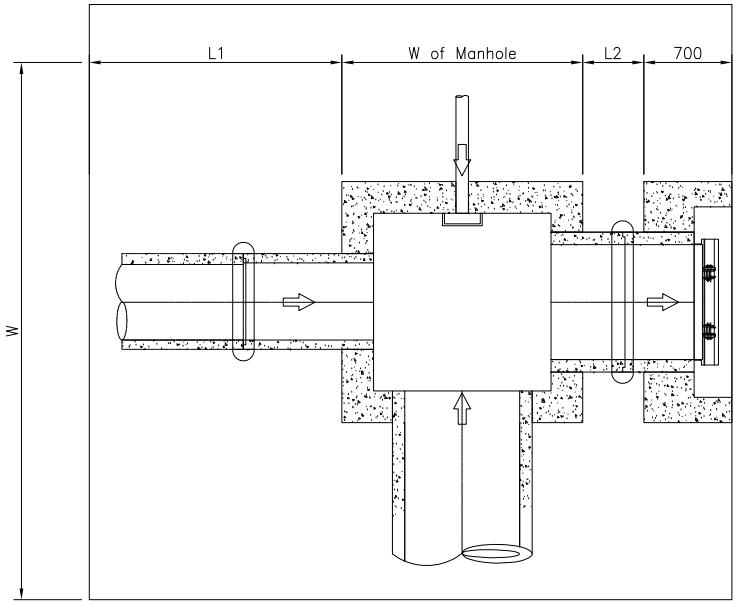
(Collector Pipe) Upstream			Excavation
Do	0.4	m	A=7.62 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=2.66 m^2
H	2.747	m	Backfill Zone C
EL. A	13.589	m	A=2.59 m^2
EL. B	11.042	m	
W	4.147	m	

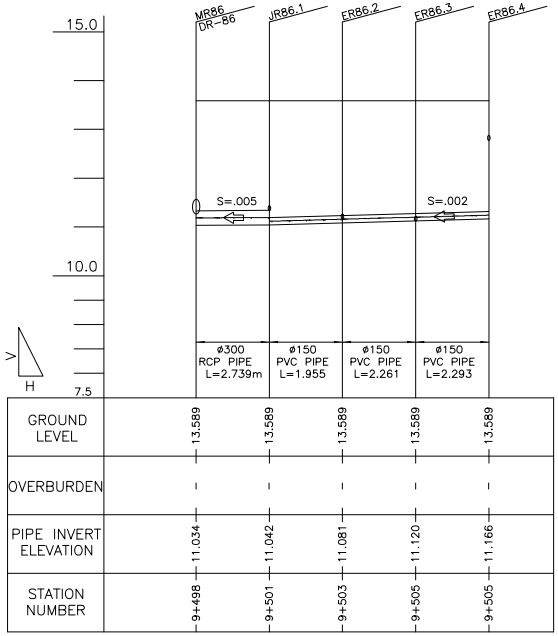
(Collector PVC) Downstream	86.4-86.1		
D	0.15	m	Excavation
W1	3.70	m	A=6.17 m^2
W2	2.42	m	Backfill Zone B
H	2.547	m	A=2.26 m^2
H/2	1.2735	m	Backfill Zone C
EL. A	13.589	m	A=3.90 m^2
EL. B	11.042	m	

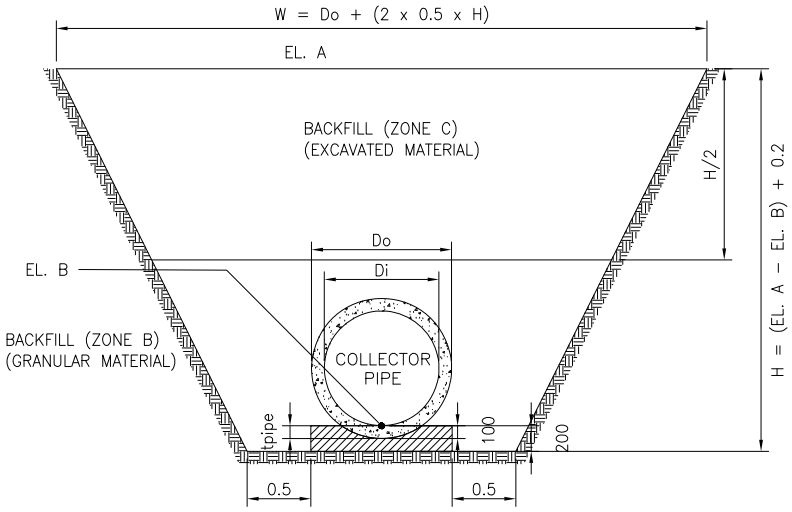
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	3.57	m	A=5.72 m^2
W2	2.36	m	Backfill Zone B
H	2.423	m	A=2.11 m^2
H/2	1.2115	m	Backfill Zone C
EL. A	13.589	m	A=3.59 m^2
EL. B	11.166	m	

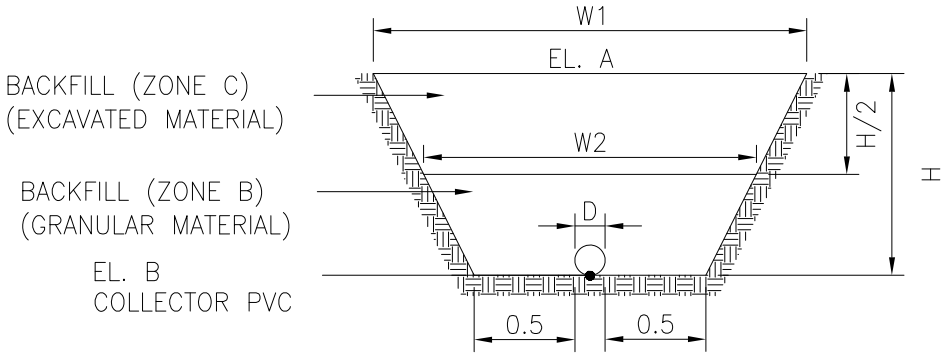
Collector Pipe	Volume	
Excavation	**21.01795**	m^3
Backfill Zone B	**7.338791**	m^3
Backfill Zone C	**7.147654**	m^3

Collector PVC	Volume	
Excavation	**38.7883**	m^3
Backfill Zone B	**14.24139**	m^3
Backfill Zone C	**24.43165**	m^3


L1
W of Manhole
L2
700
W


15.0
10.0
7.5
V
H
MR86
DR-86
JR86.1
ER86.2
ER86.3
ER86.4
S=.005
S=.002
ø300 RCP PIPE L=2.739m
ø150 PVC PIPE L=1.955
ø150 PVC PIPE L=2.261
ø150 PVC PIPE L=2.293
GROUND LEVEL
13.589
13.589
13.589
13.589
13.589
OVERBURDEN
PIPE INVERT ELEVATION
11.034
11.042
11.081
11.120
11.166
STATION NUMBER
9+498
9+501
9+503
9+505
9+505


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
EL. B
Di
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
H = (EL. A – EL. B) + 0.2
pipe
100
200
0.5
0.5

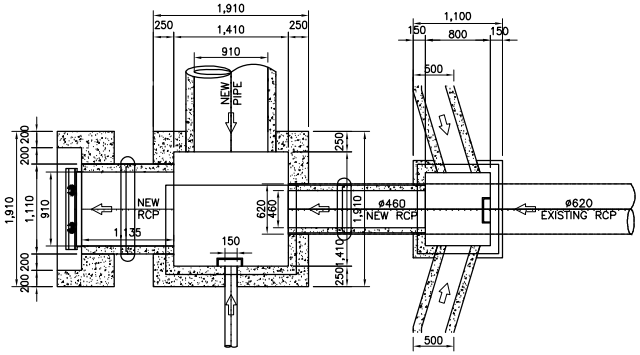

BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

QUANTITIES OF MANHOLE

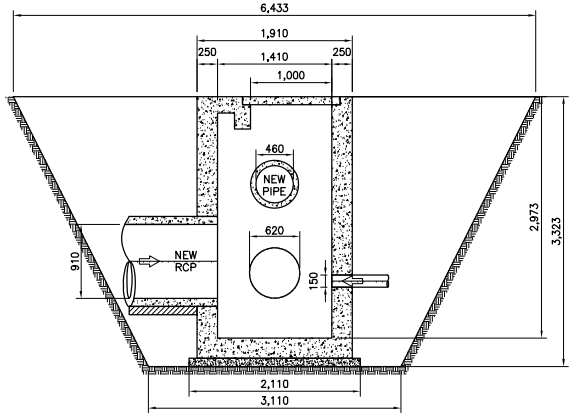
Manhole No.: MR 90

Location: 9 + 544

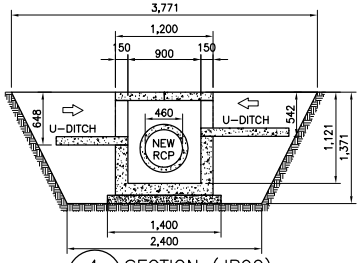
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.36	4.77	11.27	
		A2=9.95	4.77	47.49	
		A3=1.68	3.09	5.19	
		A4=2.67	3.09	8.25	
				72.19	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	4.28	0.25	**1.07**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.973	4.935	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.74	0.25	0.18	
Pipe hole on Wall C	DiaC=0.15	0.02	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.26**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.121	0.673	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.54	W=0.50	0.27	0.15	0.04	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.65	W=0.50	0.32	0.15	0.05	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.54**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.74	0.7	3.32	
	Lout=2.48				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.25	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=1.29		**0.076051**	m3
(Inlet Pipe)					
14. Backfill				**60.16**	m3



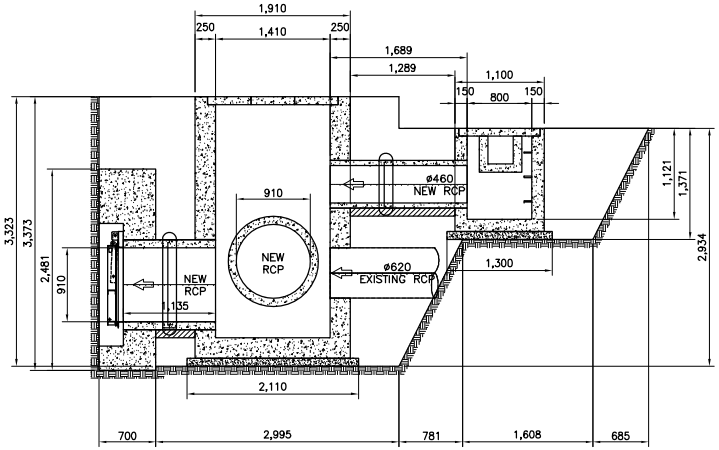
1 PLAN
SCALE A



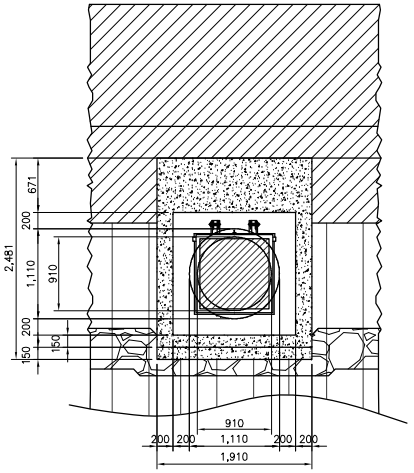
3 SECTION
SCALE A



4 SECTION (JB90)
SCALE A



2 SECTION
SCALE A



5 ELEVATION
SCALE A

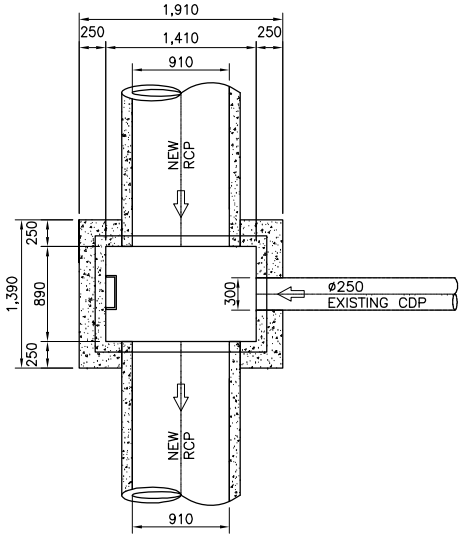
3.380

QUANTITIES OF MANHOLE

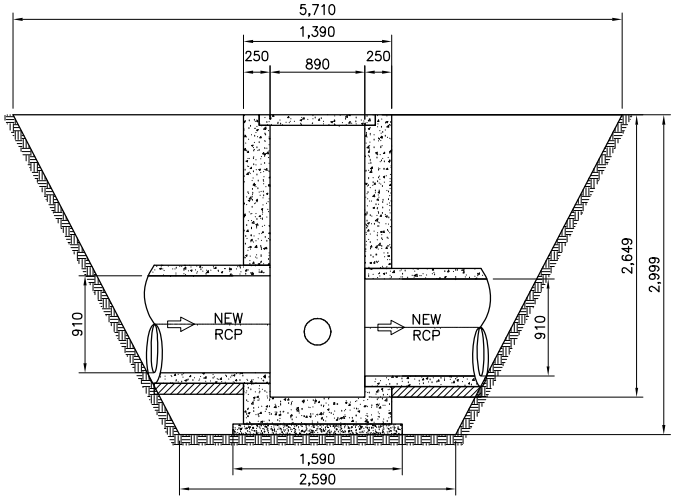
Manhole No.: MR 89

Location: 9 + 532

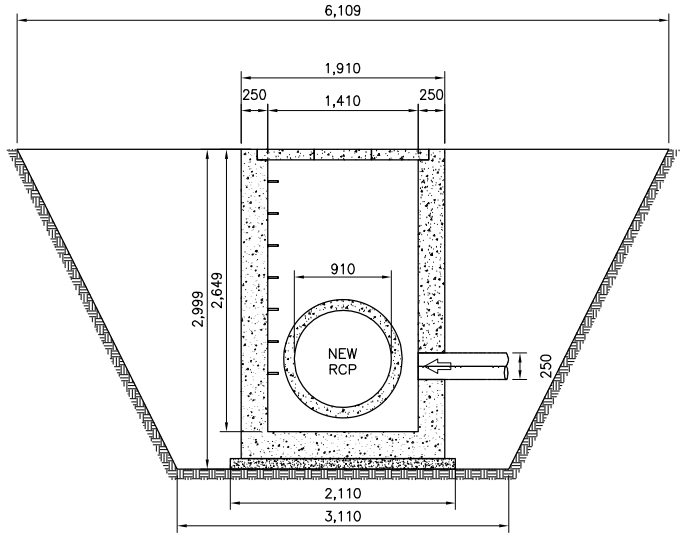
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.82	4.09	56.53	
				56.53	m^3
2. Lev. Concrete	W=2.11 L=1.59	3.35	0.1	**0.34**	m^3
3. Bottom Slab	W=1.91 L=1.39	2.65	0.25	**0.66**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.39	Aout=2.65			
	Win=1.41 Lin=.89	Ain=1.25	2.649	3.709	m^3
	.	Anet=1.40			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=0.25	0.05	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.21**	m^3
5. Conc. Cover	L=1.09 W=1.61	1.75	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**47.11**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



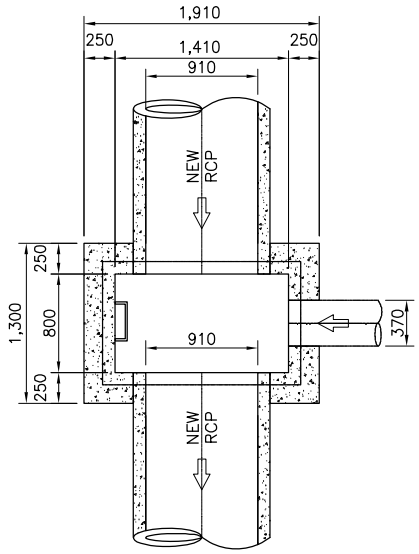
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

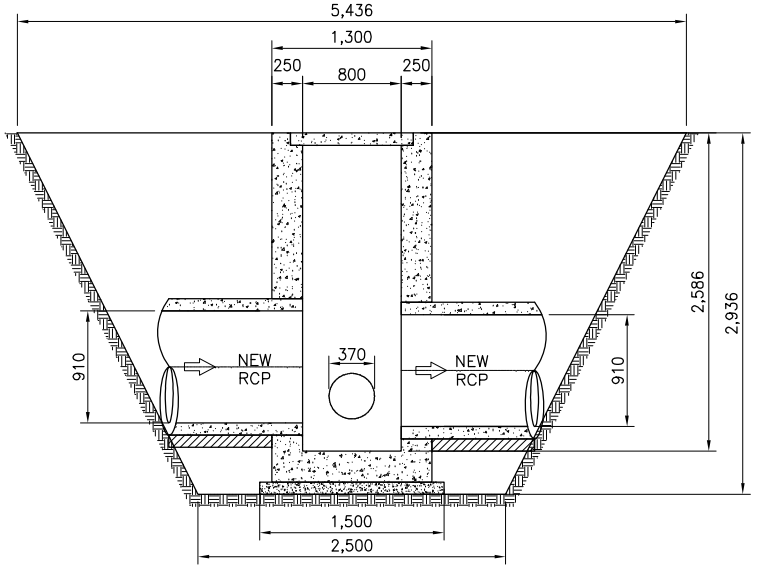
Manhole No.: MR 88

Location: 9 + 522

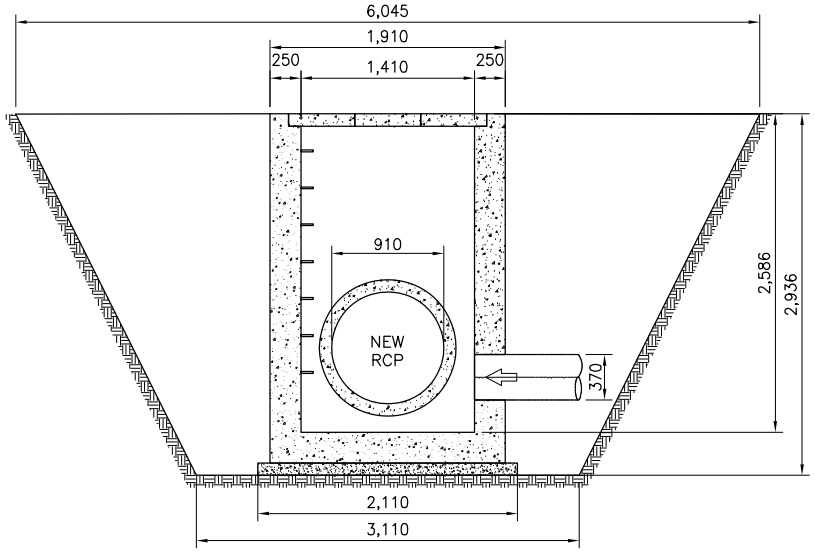
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.44	3.97	53.33	
				53.33	m^3
2. Lev. Concrete	W=2.11 L=1.50	3.17	0.1	**0.32**	m^3
3. Bottom Slab	W=1.91 L=1.30	2.48	0.25	**0.62**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.30	Aout=2.48			
	Win=1.41 Lin=.80	Ain=1.13	2.586	3.504	m^3
	.	Anet=1.36			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall A	DiaB=0.47	0.17	0.25	0.04	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.98**	m^3
5. Conc. Cover	L=1.00 W=1.61	1.61	0.1	**0.16**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**44.44**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A



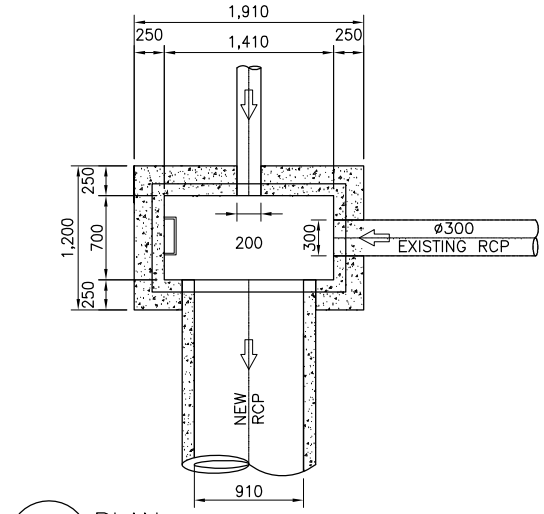
2 SECTION
SCALE A

QUANTITIES OF MANHOLE

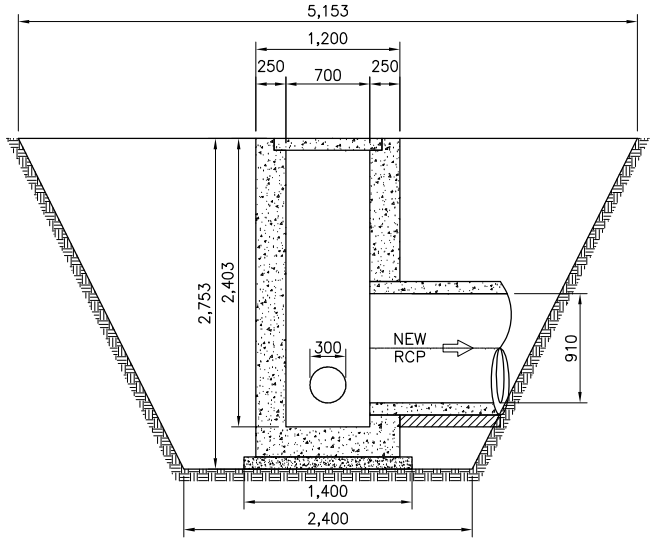
Manhole No.: MR 87

Location: 9 + 521

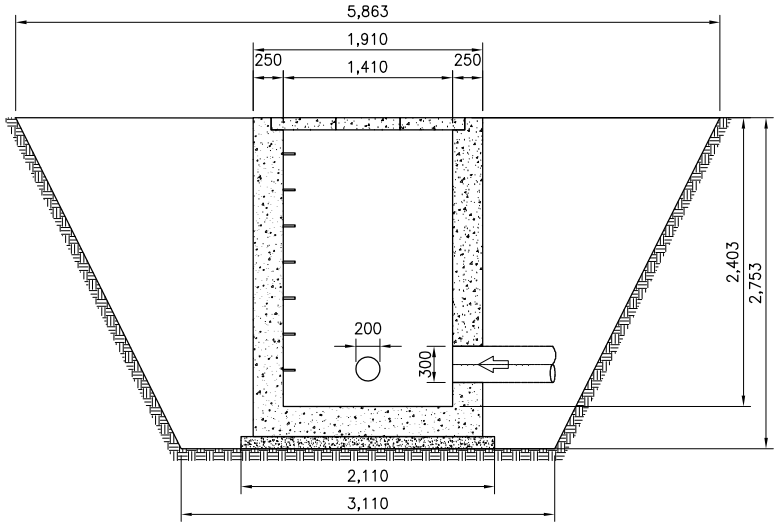
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=12.35	3.78	46.64	
				46.64	m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.1	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	2.403	3.136	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.03	0.25	0.01	
Pipe hole on Wall A	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.85**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**38.87**	m3



1 PLAN
SCALE A



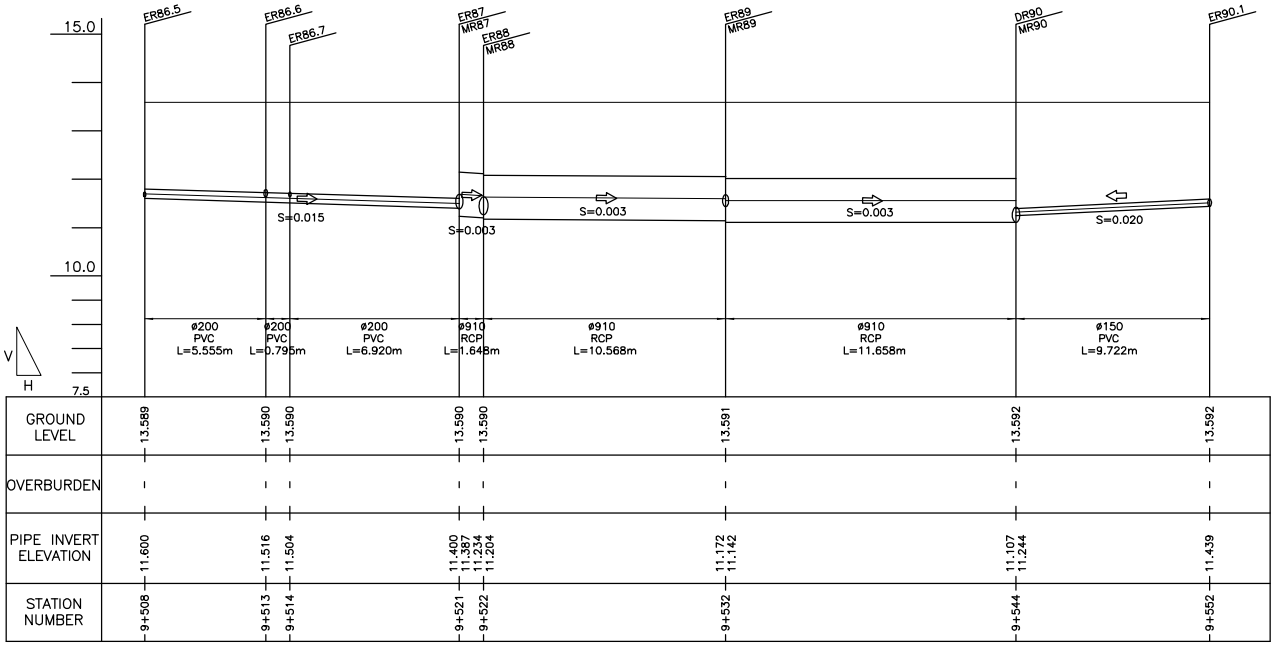
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.91		L=23.95	24	pc
Collector Pipe (PVC)	Dia=0.20		L=13.47	3	pc
Collector Pipe (PVC)	Dia=0.15		L=9.92	2	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=23	1.33	m3
3. Conc. Bedding	Dia=.910m	L=23.95		2.18	m3
4. PVC Coupling	Dia=0.20			2	pc
4. PVC Coupling	Dia=0.15			1	pc
5. Formworks				24.54	m3



Clearing (Manhole 90)

L1	1.2855 m		
W of Junction Manhole	1.1 m	A1=23.77	m^2
L2	1.289 m	A2=11.59	m^2
W of Manhole	1.91 m	**At=35.36**	m^2
L3	0.485 m		
W1	6.433 m		
W2	3.771 m		

Clearing (Manhole 89)

W	6.109 m	**A=34.88** m^2
L	5.71 m	

Clearing (Manhole 88)

W	6.045 m	**A=32.86** m^2
L	5.436 m	

Clearing (Manhole 87)

W	5.863 m	**A=30.21** m^2
L	5.153 m	

Clearing (Collector 87 - 88)

W	4.5895 m	**A=7.56** m^2
L	1.648 m	

Clearing (Collector 88 - 90)

W	4.7455 m	**A=105.47** m^2
L	22.226 m	

Clearing (Collector 86.5 - 87)

W	3.2395 m	**A=42.99** m^2
L	13.27 m	

Clearing (Collector 90.1 - 90)

W	3.4005 m	**A=33.06** m^2
L	9.722 m	

(Collector Pipe) Downstream	87-88	Excavation
Do	1.11 m	A=8.66 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=2.32 m^2
H	2.556 m	Backfill Zone C
EL. A	13.59 m	A=2.80 m^2
EL. B	11.234 m	
W	4.666 m	

(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=7.96 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=2.07 m^2
H	2.403 m	Backfill Zone C
EL. A	13.59 m	A=2.59 m^2
EL. B	11.387 m	
W	4.513 m	

(Collector Pipe) Downstream	88-90		Excavation
Do	1.11	m	A=9.27 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.54 m^2
H	2.685	m	Backfill Zone C
EL. A	13.592	m	A=2.99 m^2
EL. B	11.107	m	
W	4.795	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=8.80 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=2.37 m^2
H	2.586	m	Backfill Zone C
EL. A	13.59	m	A=2.85 m^2
EL. B	11.204	m	
W	4.696	m	

(Collector PVC) Downstream	86.5-87		Excavation
D	0.2	m	A=5.03 m^2
W1	3.39	m	Backfill Zone B
W2	2.30	m	A=1.88 m^2
H	2.19	m	Backfill Zone C
H/2	1.095	m	A=3.11 m^2
EL. A	13.59	m	
EL. B	11.4	m	

(Collector PVC) Upstream			Excavation
D	0.1	m	A=4.17 m^2
W1	3.09	m	Backfill Zone B
W2	2.09	m	A=1.58 m^2
H	1.989	m	Backfill Zone C
H/2	0.9945	m	A=2.58 m^2
EL. A	13.589	m	
EL. B	11.6	m	

(Collector PVC) Downstream	90.1-90		
D	0.15	m	Excavation
W1	3.50	m	A=5.46 m^2
W2	2.32	m	Backfill Zone B
H	2.348	m	A=2.02 m^2
H/2	1.174	m	Backfill Zone C
EL. A	13.592	m	A=3.42 m^2
EL. B	11.244	m	

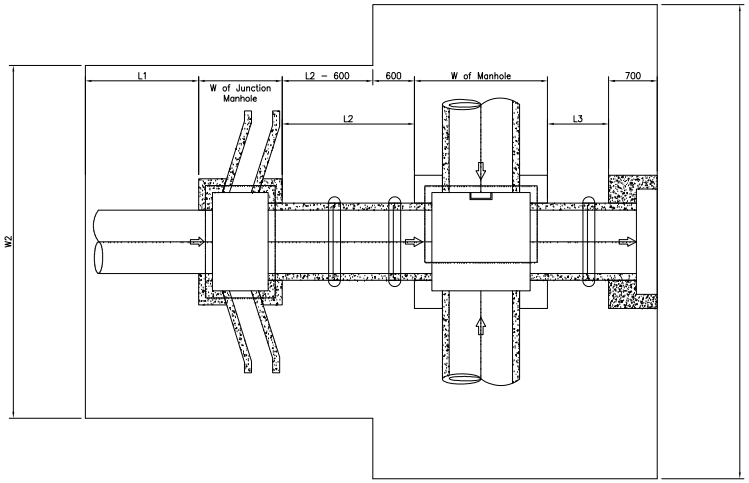
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	3.30	m	A=4.79 m^2
W2	2.23	m	Backfill Zone B
H	2.153	m	A=1.80 m^2
H/2	1.0765	m	Backfill Zone C
EL. A	13.592	m	A=2.98 m^2
EL. B	11.439	m	

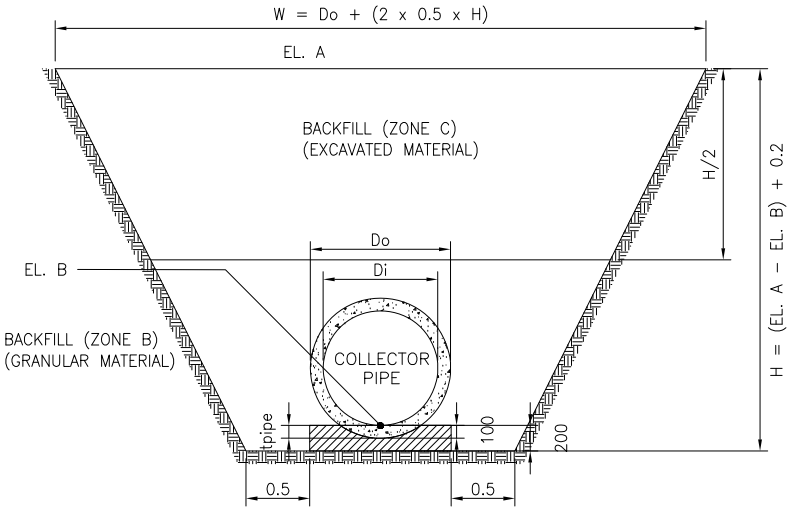
Collector Pipe 87-88	Volume	
Excavation	**13.7337**	m^3
Backfill Zone B	**3.628881**	m^3
Backfill Zone C	**4.458044**	m^3

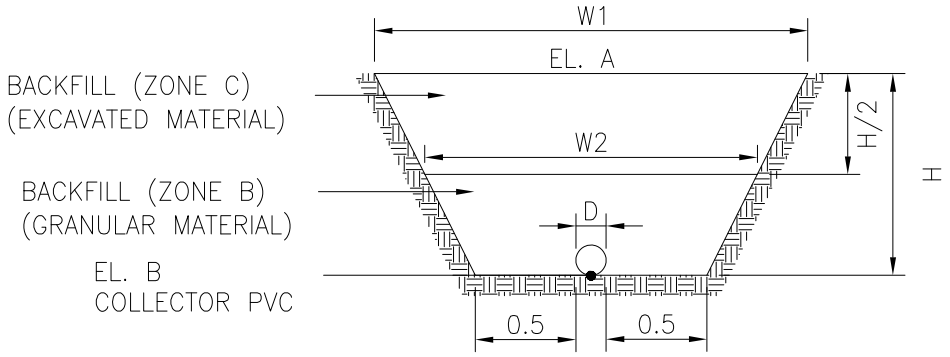
Collector Pipe 88-90	Volume	
Excavation	**201.4157**	m^3
Backfill Zone B	**54.82443**	m^3
Backfill Zone C	**65.04201**	m^3

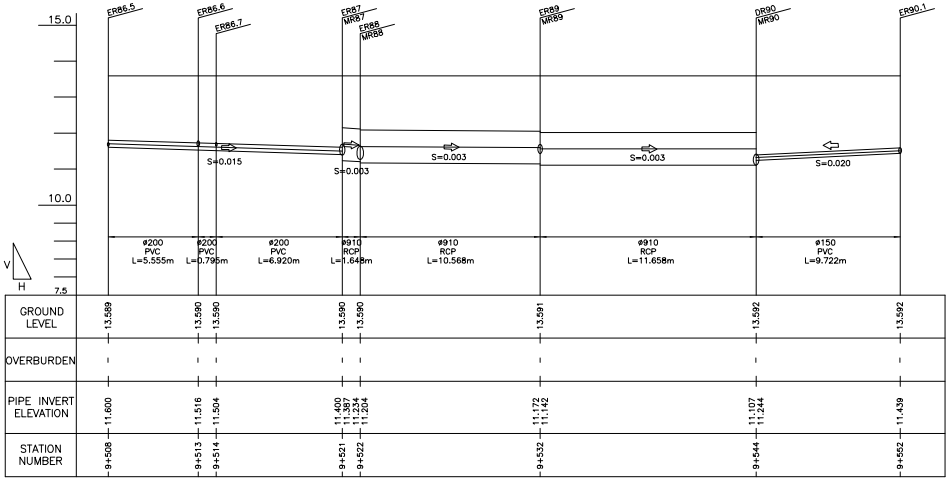
Collector PVC 86.5-87	Volume	
Excavation	**61.90382**	m^3
Backfill Zone B	**23.31969**	m^3
Backfill Zone C	**38.31967**	m^3

Collector PVC 90.1-90	Volume	
Excavation	**50.82377**	m^3
Backfill Zone B	**18.94683**	m^3
Backfill Zone C	**31.70171**	m^3


L1
W of Junction Manhole
L2 - 600
600
W of Manhole
700
L2
L3
W2
W1


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
Dpipe
100
200
H = (EL. A - EL. B) + 0.2
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
H/2
H
D
EL. B
COLLECTOR PVC
0.5
0.5

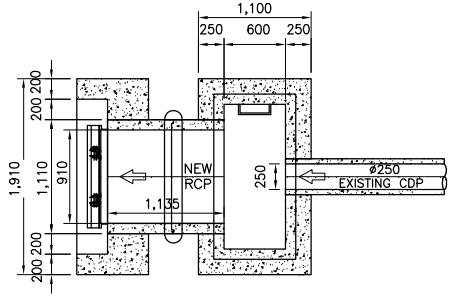

15.0
10.0
7.5
V
H
ER86.5
ER86.6
ER86.7
ER87
MR87
ER88
MR88
ER89
MR89
OR90
MR90
ER90.1
S=0.015
S=0.003
S=0.003
S=0.003
S=0.020
ø200 PVC L=5.555m
ø200 PVC L=0.795m
ø200 PVC L=6.920m
ø910 RCP L=1.648m
ø910 RCP L=10.568m
ø910 RCP L=11.658m
ø150 PVC L=9.722m
GROUND LEVEL
13.589
13.590
13.590
13.590
13.590
13.591
13.592
13.592
OVERBURDEN
PIPE INVERT ELEVATION
11.600
11.516
11.504
11.400
11.387
11.214
11.204
11.172
11.142
11.107
11.244
11.439
STATION NUMBER
9+508
9+513
9+514
9+521
9+522
9+532
9+544
9+552

QUANTITIES OF MANHOLE

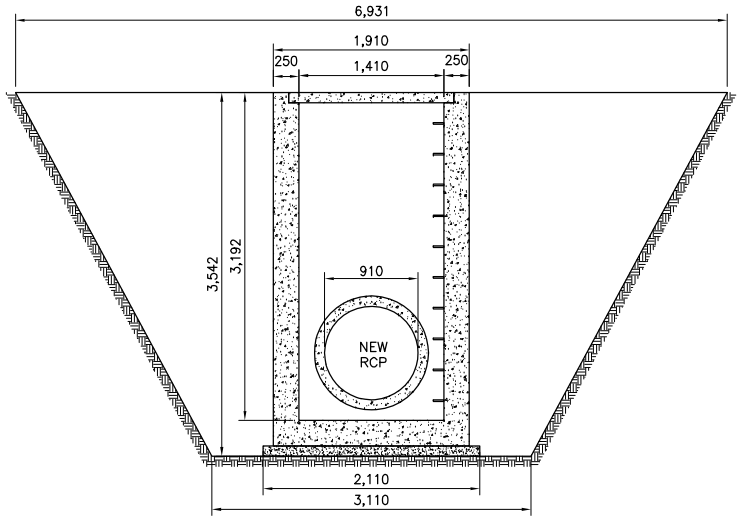
Manhole No.: MR 90.2

Location: 9 + 564

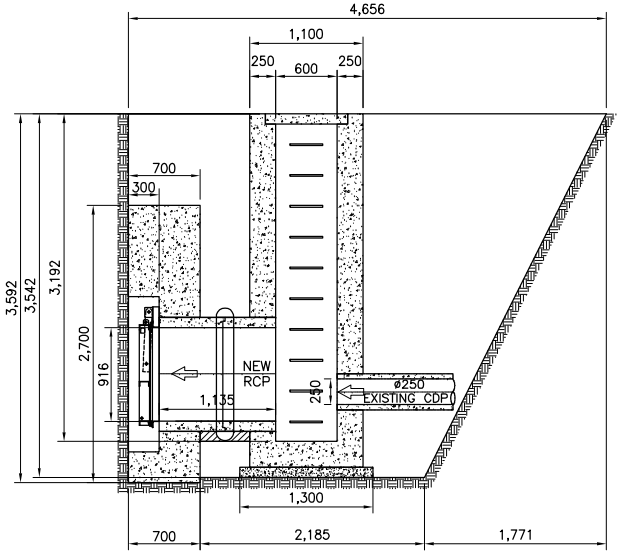
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.51	4.88	12.27	
		A2=10.88	4.88	53.08	
				65.36	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
	L=2.11				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	3.192	4.006	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.35	0.10	0.25	0.02	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.74**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
	W=0.80				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=10			**9.47**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.16	0.7	3.61	
	Lout=2.70				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.54	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
11. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Backfill				**54.46**	m3



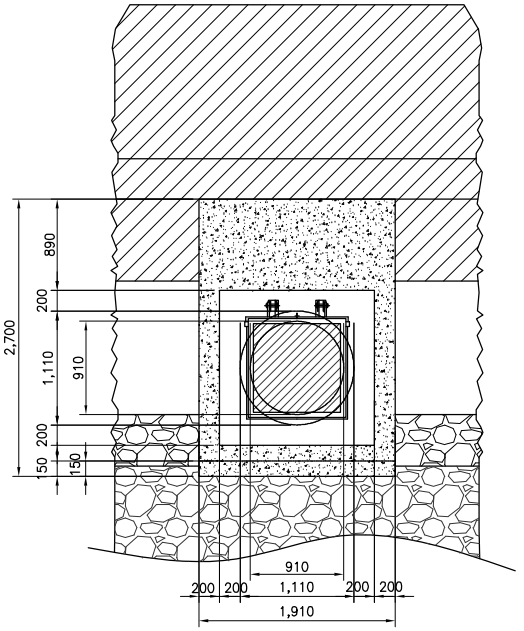
2 PLAN
SCALE A



4 SECTION
SCALE A



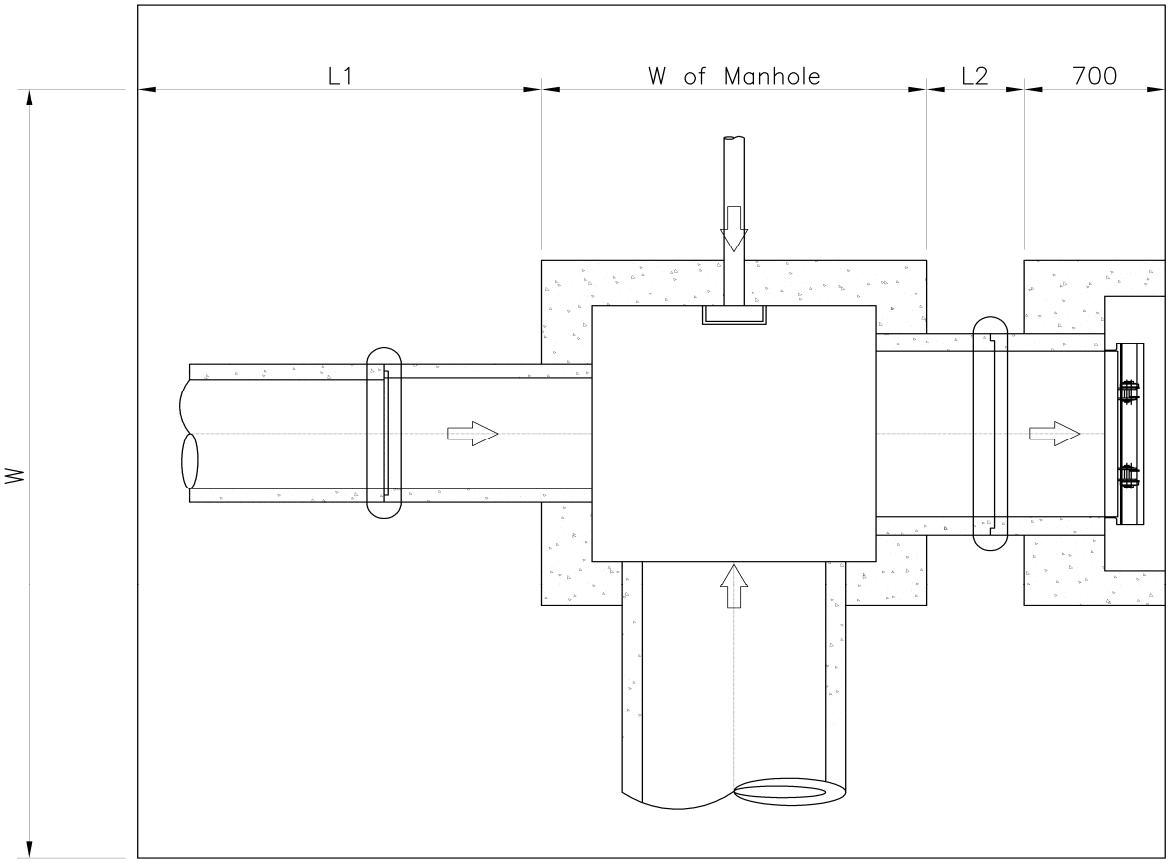
3 SECTION
SCALE A



5 ELEVATION
SCALE A

Clearing (Manhole 90.2)

L1	2.371 m	
W of Manhole	1.1 m	**A=30.97** m^2
L2	0.485 m	
W	6.652 m	

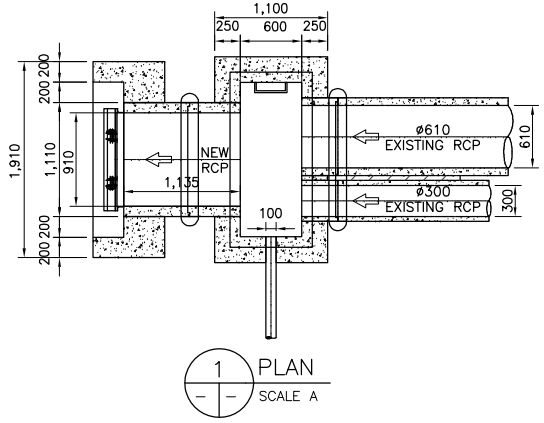


QUANTITIES OF MANHOLE

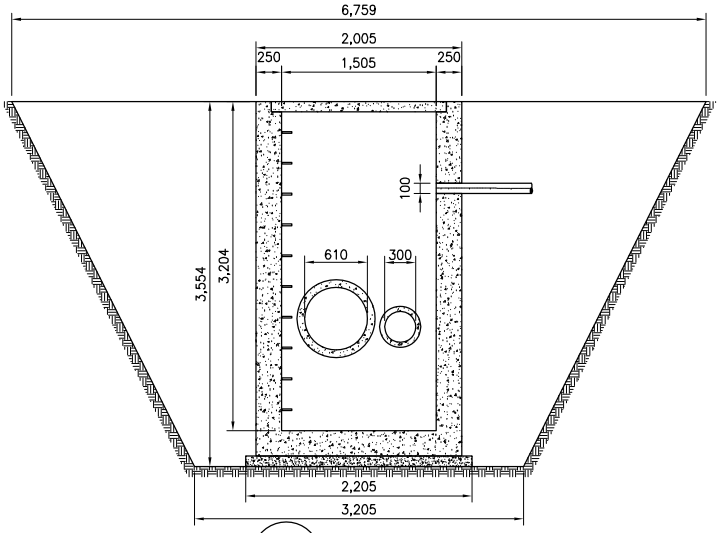
Manhole No.: MR 92A

Location: 9 + 589

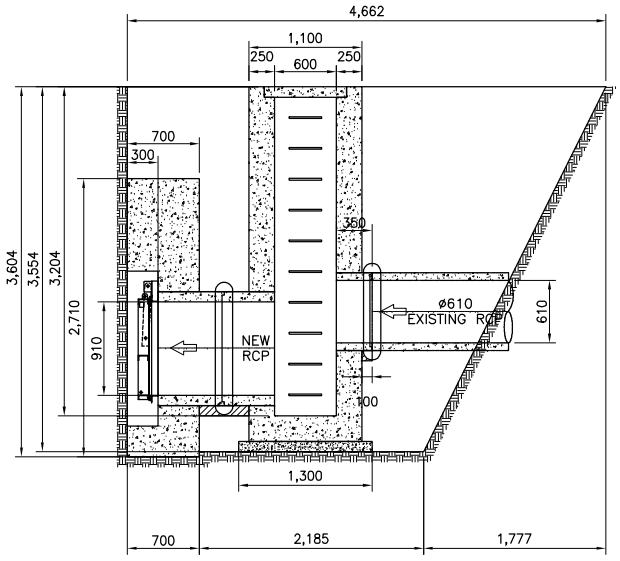
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.52	4.98	12.57	
		A2=10.92	4.98	54.42	
				66.99	m^3
2. Lev. Concrete	W=1.30	2.87	0.1	**0.29**	m^3
	L=2.21				
3. Bottom Slab	W=1.10	2.21	0.25	**0.55**	m^3
	L=2.01				
4. Wall					
Entire Wall	Wout=1.10	Aout=2.21			
	Lout=2.01				
	Win=0.60	Ain=0.90	3.204	4.173	m^3
	Lin=1.51				
		Anet=1.30			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.76	0.58	0.25	0.14	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.78**	m^3
5. Conc. Cover	L=1.71	1.364	0.1	**0.14**	m^3
	W=0.80				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=10			**9.47**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.18	0.7	3.62	
	Lout=2.71				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.55	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Inlet Pipe	Dia=.610m	L=0.35		**1**	pc
13. Conc. Collar	D1=.760m	A1=0.45	0.17		
(Inlet Pipe)	D2=.940m	A2=0.69		**0.040856412**	m3
		Anet=0.24	Qty=1		
14. Conc.Bedding (Inlet Pipe)	Dia=.760m	L=0.10		**0.0076**	m3
15. Inlet Pipe	Dia=.300m	L=0.35		**1**	pc
16. Conc. Collar	D1=.400m	A1=0.13	0.17		
(Inlet Pipe)	D2=.580m	A2=0.26		**0.02355252**	m3
		Anet=0.14	Qty=1		
17. Conc.Bedding (Inlet Pipe)	Dia=.400m	L=0.10		**0.004**	m3
18. Backfill				**55.82**	m3



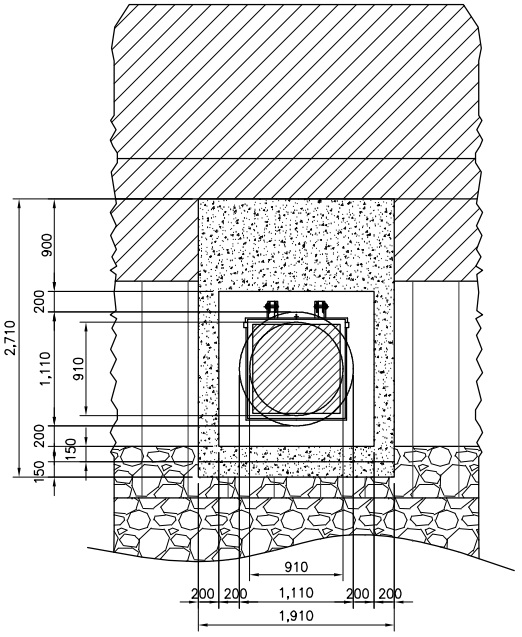
1 PLAN
SCALE A



3 SECTION
SCALE A



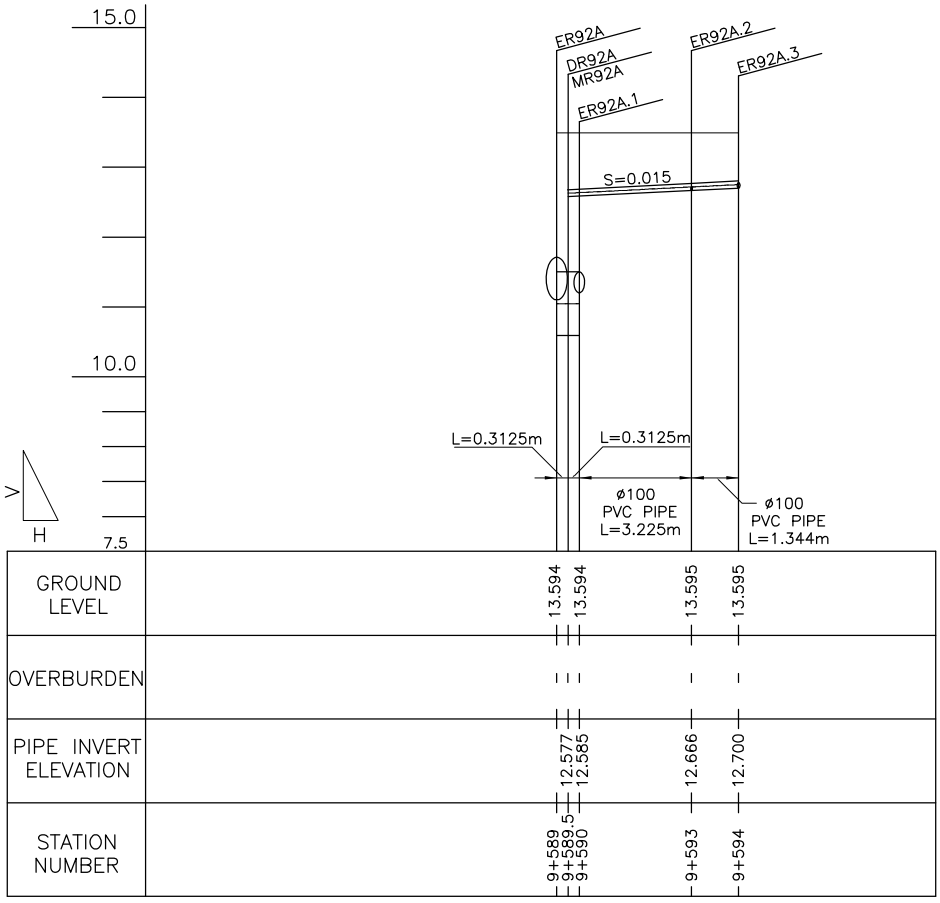
2 SECTION
SCALE A



4 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.10		L=4.64	1	pc
4. PVC Coupling	Dia=0.15			0	pc



Clearing (Manhole 92A)

L1	2.377	m	
W of Manhole	1.1	m	**A=31.51** m^2
L2	0.485	m	
W	6.759	m	

Clearing (Collector 92A.3 - 92A)

W	2.056	m	**A=10.04** m^2
L	4.8815	m	

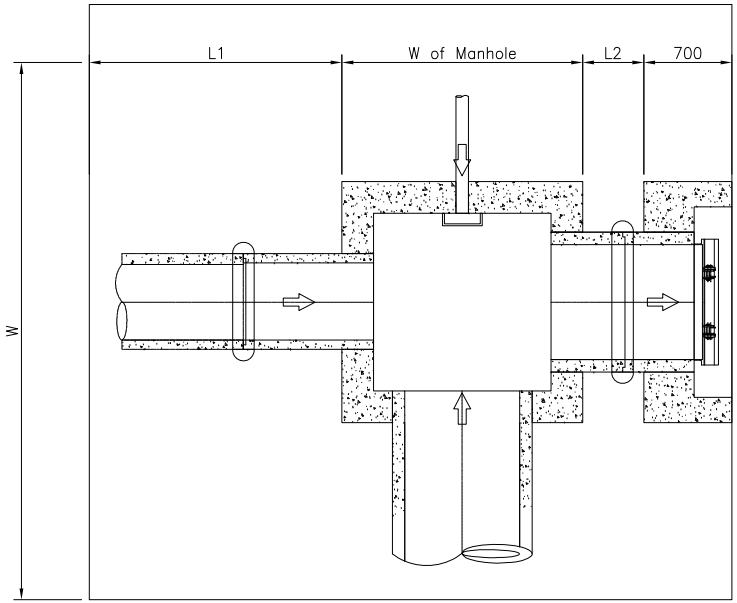
(Collector PVC) Downstream 92A.3-92A

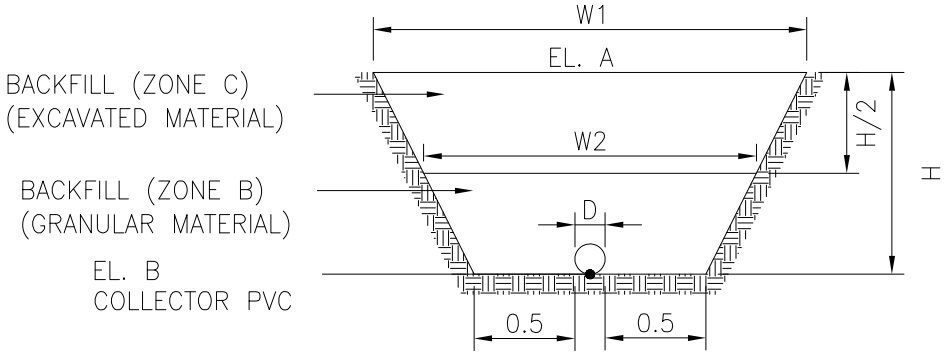
D	0.1	m	Excavation
W1	2.12	m	A=1.64 m^2
W2	1.61	m	Backfill Zone B
H	1.017	m	A=0.68 m^2
H/2	0.5085	m	Backfill Zone C
EL. A	13.594	m	A=0.95 m^2
EL. B	12.577	m	

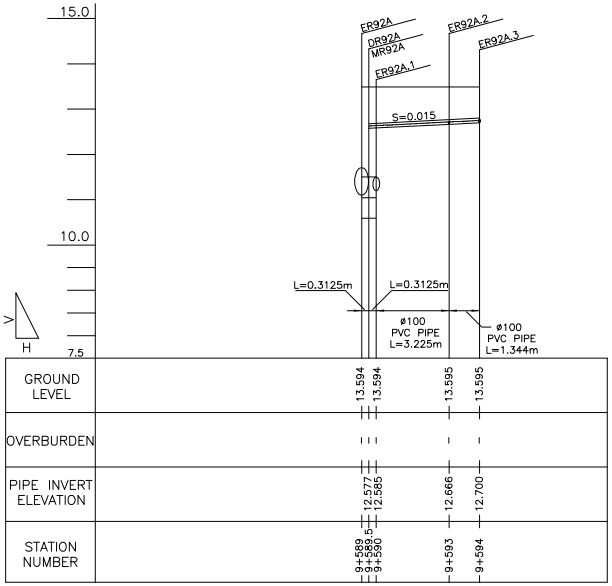
(Collector PVC) Upstream

D	0.1	m	Excavation
W1	2.00	m	A=1.39 m^2
W2	1.55	m	Backfill Zone B
H	0.895	m	A=0.58 m^2
H/2	0.4475	m	Backfill Zone C
EL. A	13.595	m	A=0.79 m^2
EL. B	12.7	m	

Collector PVC 133C.6-134	Volume	
Excavation	**7.483754**	m^3
Backfill Zone B	**3.134621**	m^3
Backfill Zone C	**4.310219**	m^3


L1
W of Manhole
L2
700
W


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5

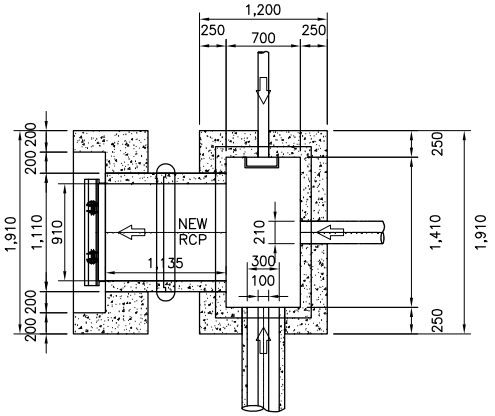

15.0
10.0
7.5
V
H
ER92A
DR92A
MR92A
ER92A.1
ER92A.2
ER92A.3
S=0.015
L=0.3125m
L=0.3125m
ø100
PVC PIPE
L=3.225m
ø100
PVC PIPE
L=1.344m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.594
13.594
13.595
13.595
12.577
12.585
12.666
12.700
9+589
9+589.5
9+590
9+593
9+594

QUANTITIES OF MANHOLE

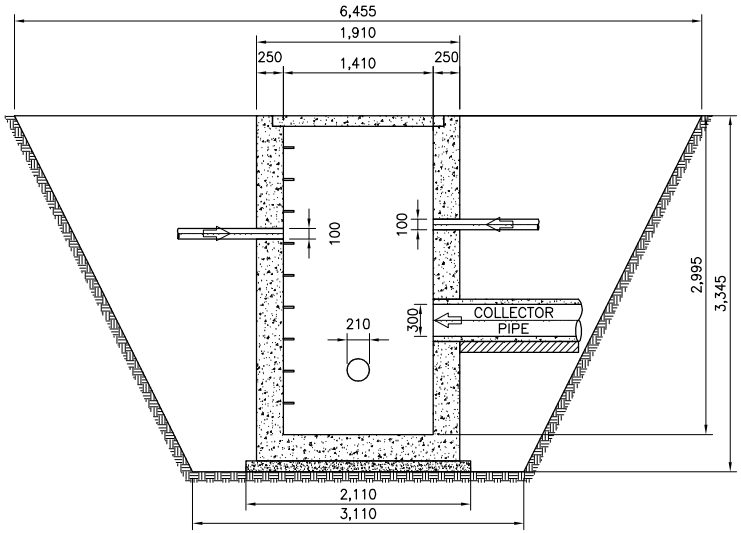
Manhole No.: MR 92A.5

Location: 9 + 601

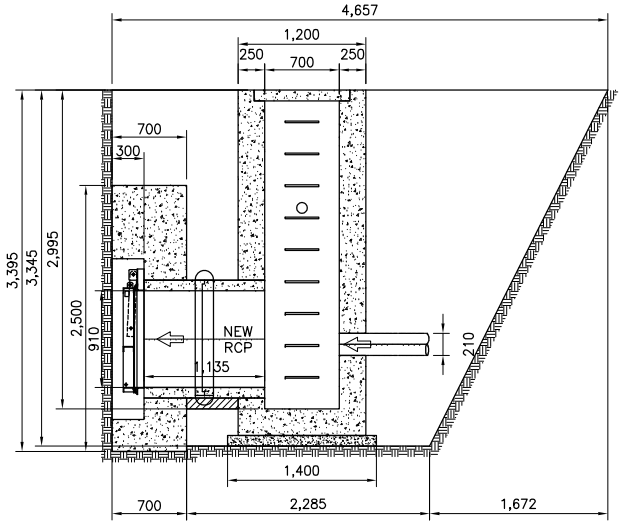
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.38	4.78	11.37	
		A2=10.44	4.78	49.93	
				61.29	m^3
2. Lev. Concrete	W=1.40	2.95	0.1	**0.30**	m^3
	L=2.11				
3. Bottom Slab	W=1.20	2.29	0.25	**0.57**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.20	Aout=2.29			
	Lout=1.91				
	Win=0.70	Ain=0.99	2.995	3.908	m^3
	Lin=1.41				
		Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.21	0.03	0.25	0.01	
Pipe hole on Wall C	DiaC=0.40	0.13	0.25	0.03	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.62**	m^3
5. Conc. Cover	L=1.61	1.449	0.1	**0.14**	m^3
	W=0.90				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.78	0.7	3.34	
	Lout=2.50				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.27	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**51.08**	m3



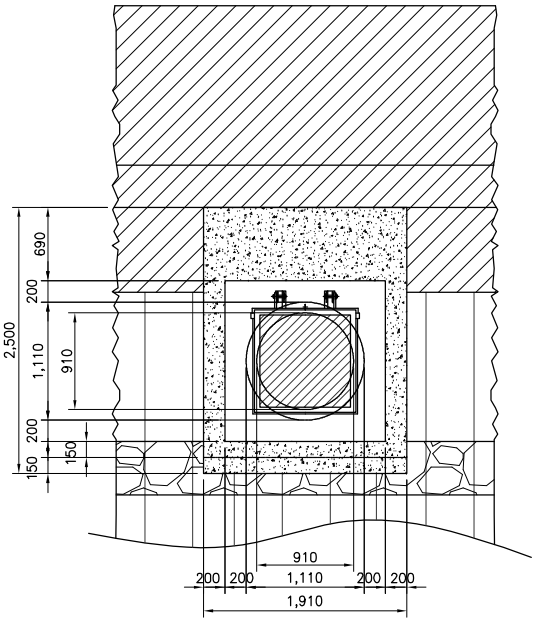
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



4 ELEVATION
SCALE A

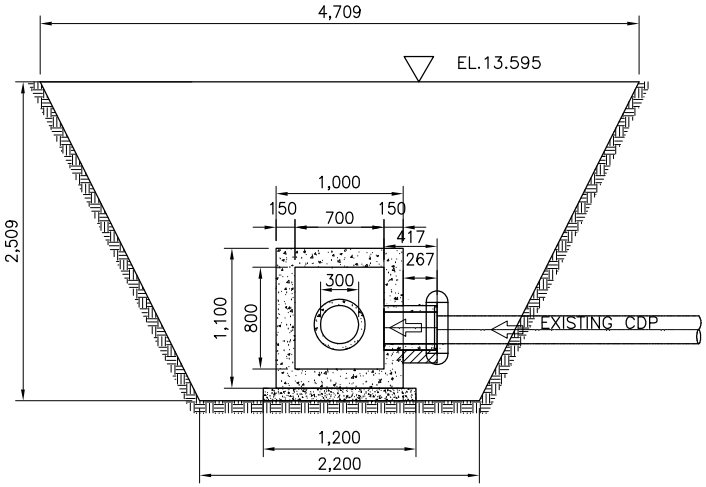
3.400

QUANTITIES OF JUNCTION BOX

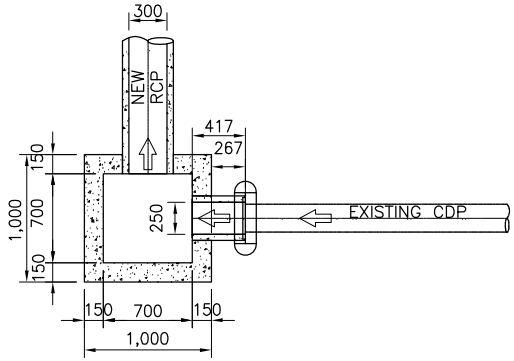
Junction Box No.: JB 92A.7

Location: 9 + 602

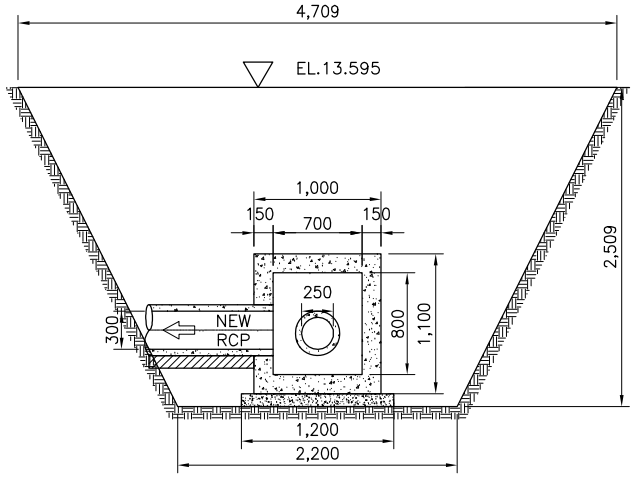
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=8.67	3.45	29.94	
				29.94	m^3
2. Lev. Concrete	W=1.20 L=1.20	1.44	0.1	**0.14**	m^3
3. Bottom Slab	W=1.00 L=1.00	1.00	0.2	**0.20**	m^3
4. Wall					
Entire Wall	Wout=1.00 Lout=1.00	Aout=1.00			
	Win=0.70 Lin=.70	Ain=0.49	0.800	0.408	m^3
		Anet=0.51			
Minus					
Pipe hole on Wall A	DiaA=0.40	0.13	0.15	0.03	
Pipe hole on Wall A	DiaB=0.35	0.10	0.15	0.02	
Pipe hole on Wall C	DiaC=0.00	0.00	0.15	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.15	0.00	
Net Wall Vol.				**0.35**	m^3
5. Top Slab	L=1.00 W=1.00	1.00	0.15	**0.15**	m^3
6. Inlet Pipe	Dia=.250m	L=0.42		**1**	pc
7. Conc. Collar (Inlet Pipe)	D1=.350m D2=.430m	A1=0.10 A2=0.15 Anet=0.05	0.17 Qty=1	**0.008331504**	m3
8. Conc.Bedding (Inlet Pipe)	Dia=.350m	L=0.27		**0.009345**	m3
9. Backfill				**24.95**	m3



6 SECTION
SCALE A



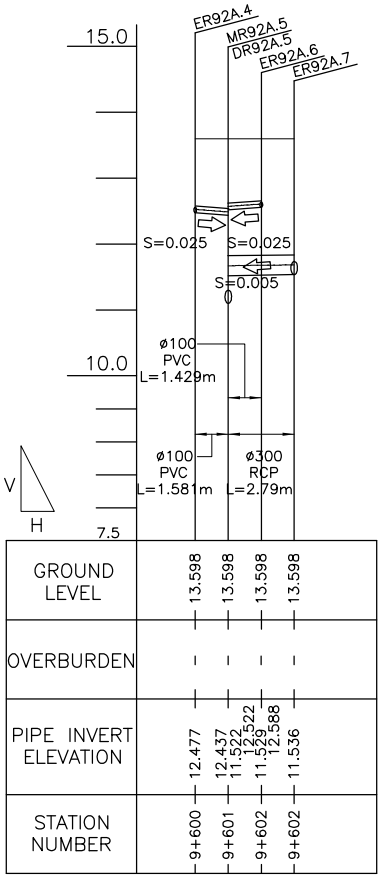
5 PLAN JB92A.7
SCALE A



7 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.30		L=2.80	3	pc
Collector Pipe (PVC)	Dia=0.10		L=3.09	1	pc
2. Concrete Collar	D1=.400m D2=.580m	A1=0.13 A2=0.26 Anet=0.14	0.17 Qty=2	0.05	m3
3. Conc. Bedding	Dia=.300m	L=2.80		0.08	m3
4. PVC Coupling	Dia=0.10			0	pc
5. Formworks				0.92	m3



Clearing (Manhole 92A.5)

L1	2.2725	m	
W of Manhole	1.2	m	**A=30.06** m^2
L2	0.485	m	
W	6.455	m	

Clearing (Junction Manhole 92A.6)

W	4.709	m	**A=22.17** m^2
L	4.709	m	

Clearing (Collector 92A.7 - 92A.5)

W	3.669	m	**A=10.24** m^2
L	2.79	m	

Clearing (Collector 92A.4 - 92A.5)

W	2.241	m	**A=3.54** m^2
L	1.581	m	

(Collector Pipe) Downstream	92A.7-92A.5		Excavation
Do	0.4	m	A=5.78 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=2.04 m^2
H	2.276	m	Backfill Zone C
EL. A	13.598	m	A=2.01 m^2
EL. B	11.522	m	
W	3.676	m	

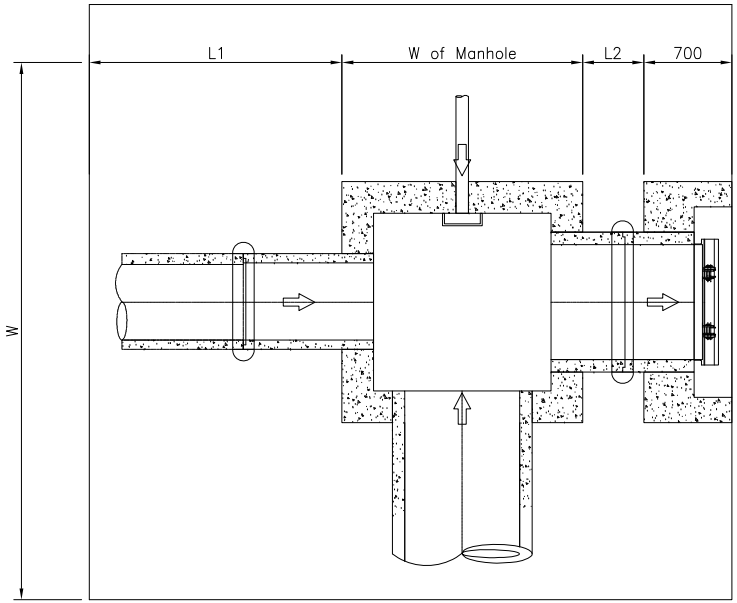
(Collector Pipe) Upstream			Excavation
Do	0.4	m	A=5.73 m^2
Di	0.3	m	Backfill Zone B
tpipe	0.05	m	A=2.02 m^2
H	2.262	m	Backfill Zone C
EL. A	13.598	m	A=2.00 m^2
EL. B	11.536	m	
W	3.662	m	

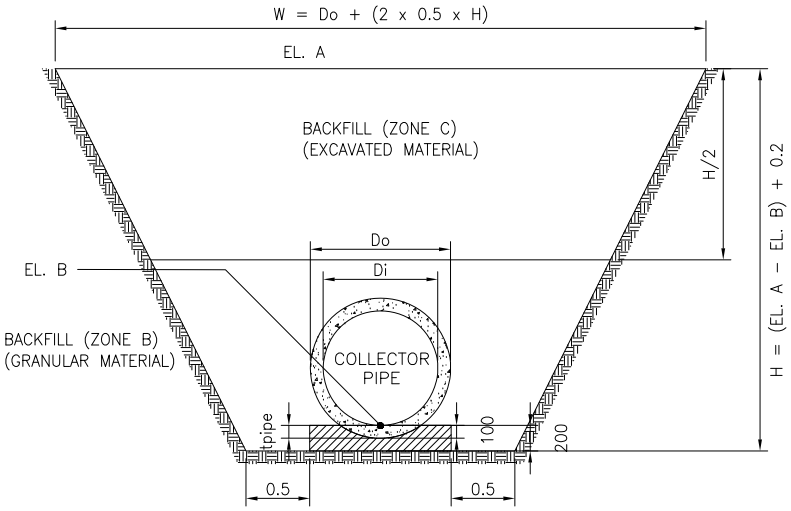
(Collector PVC) Downstream	92A.4-92A.5		
D	0.1	m	Excavation
W1	2.26	m	A=1.95 m^2
W2	1.68	m	Backfill Zone B
H	1.161	m	A=0.80 m^2
H/2	0.5805	m	Backfill Zone C
EL. A	13.598	m	A=1.14 m^2
EL. B	12.437	m	

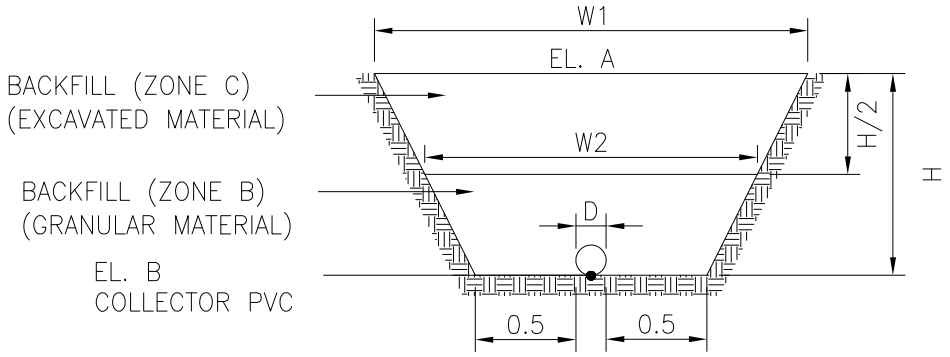
(Collector PVC) Upstream			
D	0.1	m	Excavation
W1	2.22	m	A=1.86 m^2
W2	1.66	m	Backfill Zone B
H	1.121	m	A=0.77 m^2
H/2	0.5605	m	Backfill Zone C
EL. A	13.598	m	A=1.09 m^2
EL. B	12.477	m	

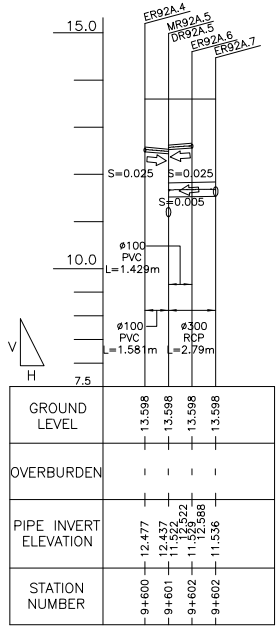
Collector Pipe 92A.7-92A.5	Volume	
Excavation	**16.12497**	m^3
Backfill Zone B	**5.681329**	m^3
Backfill Zone C	**5.613733**	m^3

Collector PVC 92A.4-92A.5	Volume	
Excavation	**3.08911**	m^3
Backfill Zone B	**1.26803**	m^3
Backfill Zone C	**1.808353**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Ipipe
100
200
H = (EL. A – EL. B) + 0.2
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
H
EL. B
COLLECTOR PVC
0.5
0.5

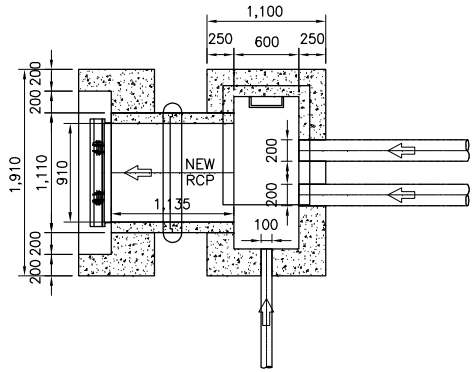

15.0
10.0
7.5
ER92A.4
MR92A.5
DR92A.5
ER92A.6
ER92A.7
S=0.025
S=0.025
S=0.005
ø100
PVC
L=1.429m
ø100
PVC
L=1.581m
ø300
RCP
L=2.79m
V
H
GROUND LEVEL
13.598
13.598
13.598
13.598
OVERBURDEN
PIPE INVERT ELEVATION
12.477
12.437
11.522
11.529
12.588
11.536
STATION NUMBER
9+600
9+601
9+602
9+602

QUANTITIES OF MANHOLE

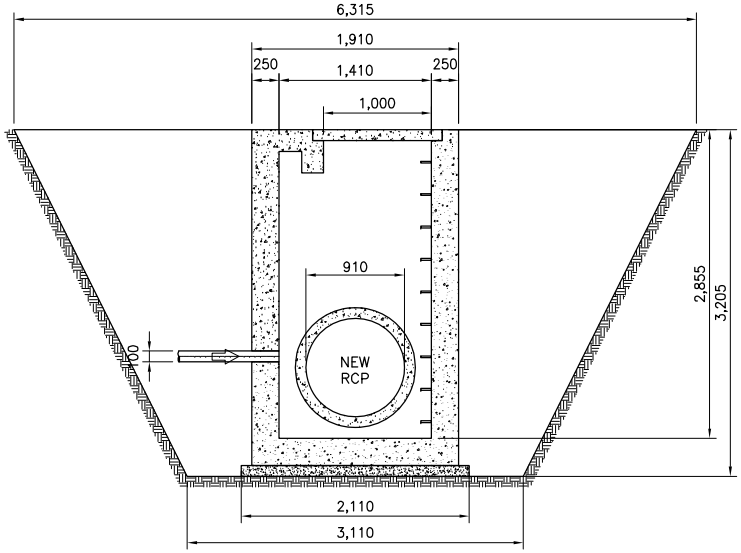
Manhole No.: MR 93

Location: 9 + 608

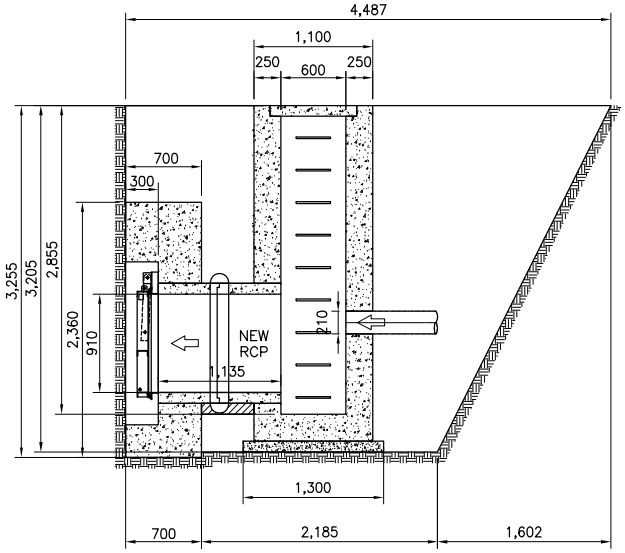
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.28	4.71	10.74	
		A2=9.57	4.71	45.10	
				55.84	m^3
2. Lev. Concrete	W=1.70	3.59	0.1	**0.36**	m^3
	L=2.11				
3. Bottom Slab	W=1.50	2.87	0.25	**0.72**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.50	Aout=2.87			
	Lout=1.91				
	Win=1.00	Ain=1.41	2.855	4.154	m^3
	Lin=1.41				
		Anet=1.46			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.20	0.06	0.25	0.02	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.89**	m^3
5. Conc. Cover	L=1.61	1.932	0.1	**0.19**	m^3
	W=1.20				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=9			**8.52**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.51	0.7	3.16	
	Lout=2.36				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.08	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**46.53**	m3



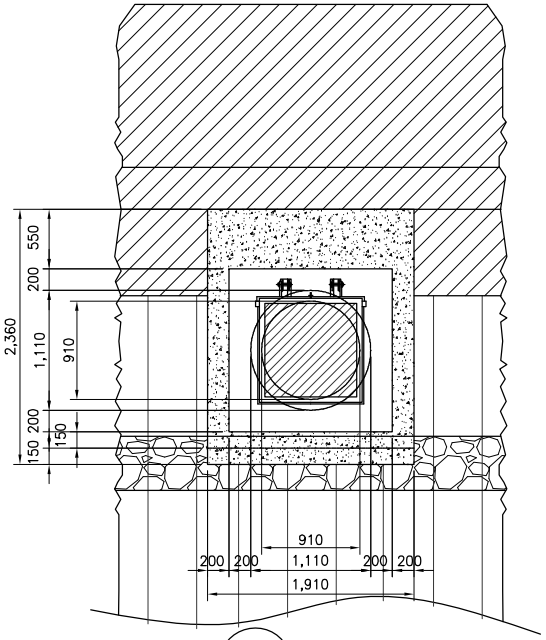
1 PARTIAL PLAN OF MANHOLE (MR93)
SCALE A



3 SECTION
SCALE A



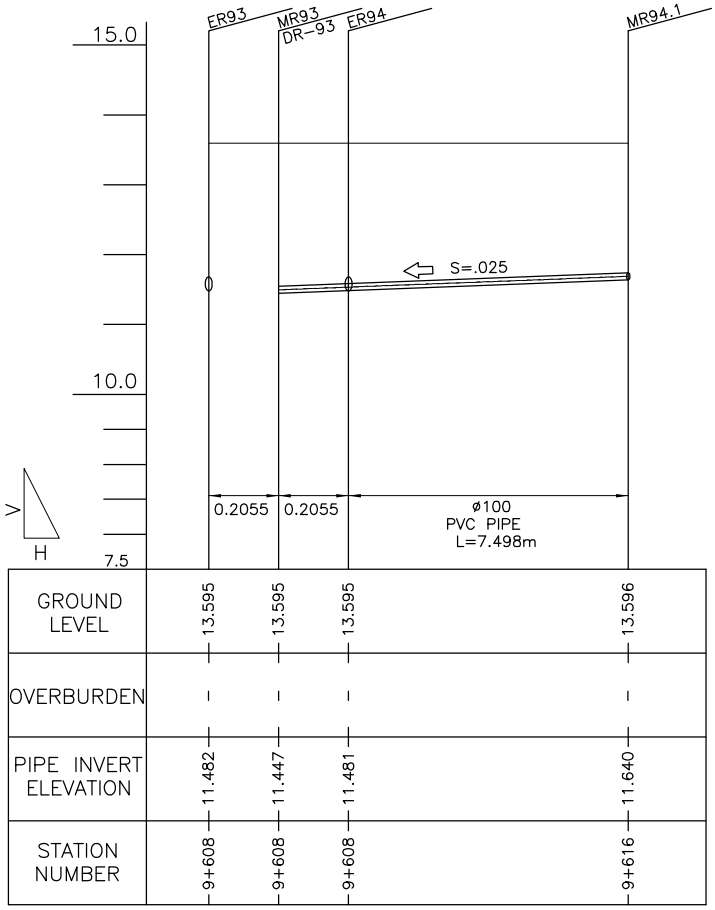
4 SECTION
SCALE A



4 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.10		L=7.69	2	pc
4. PVC Coupling	Dia=0.10			1	pc



Clearing (Manhole 93)

L1	2.2025	m	
W of Manhole	1.1	m	**A=28.34** m^2
L2	0.485	m	
W	6.315	m	

Clearing (Collector 94.1 - 93)

W	3.152	m	**A=24.28** m^2
L	7.7035	m	

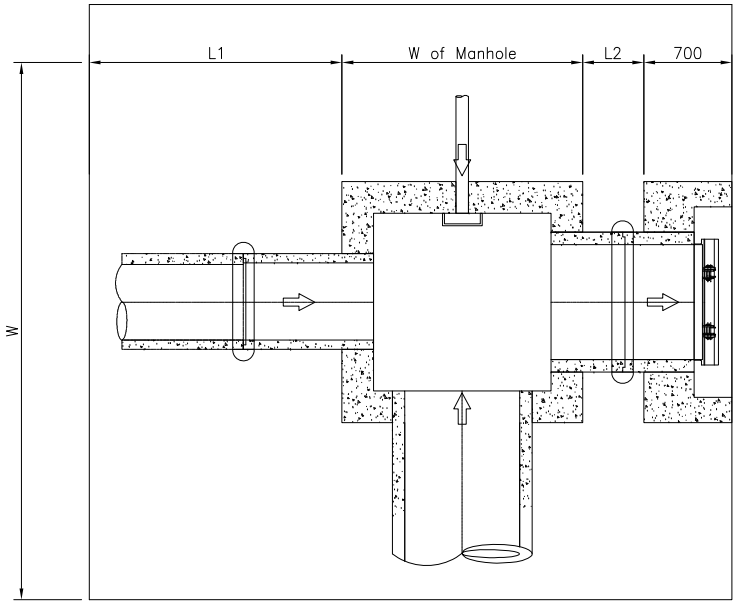
(Collector PVC) Downstream 94.1-93

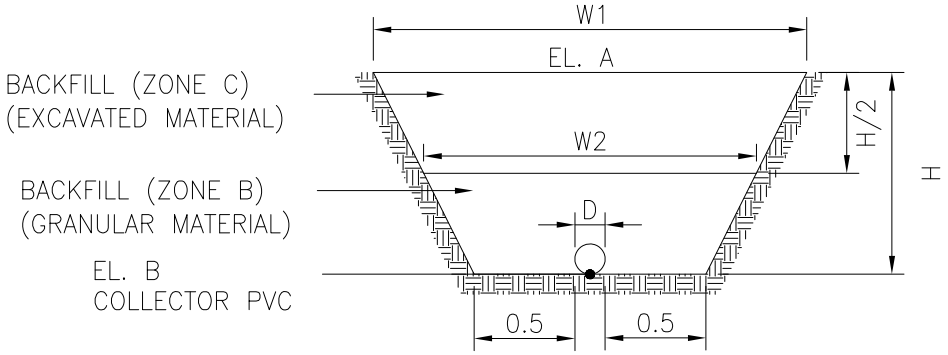
D	0.1	m	Excavation
W1	3.25	m	A=4.67 m^2
W2	2.17	m	Backfill Zone B
H	2.148	m	A=1.75 m^2
H/2	1.074	m	Backfill Zone C
EL. A	13.595	m	A=2.91 m^2
EL. B	11.447	m	

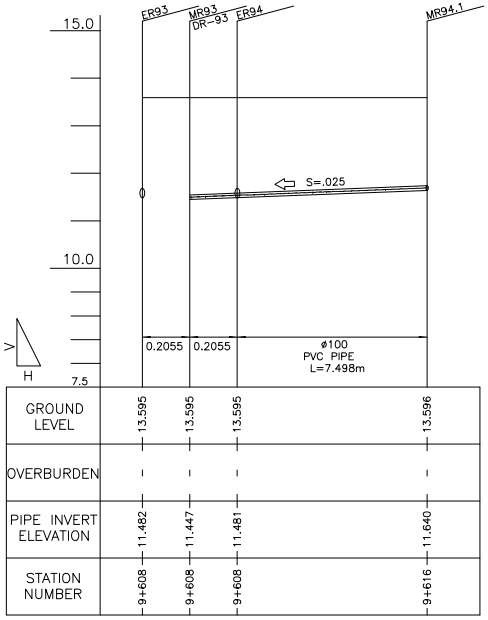
(Collector PVC) Upstream

D	0.1	m	Excavation
W1	3.06	m	A=4.06 m^2
W2	2.08	m	Backfill Zone B
H	1.956	m	A=1.55 m^2
H/2	0.978	m	Backfill Zone C
EL. A	13.596	m	A=2.51 m^2
EL. B	11.64	m	

Collector PVC 94.1 - 93	Volume
Excavation	**34.48348** m^3
Backfill Zone B	**13.01462** m^3
Backfill Zone C	**21.40685** m^3


L1
W of Manhole
L2
700
W


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

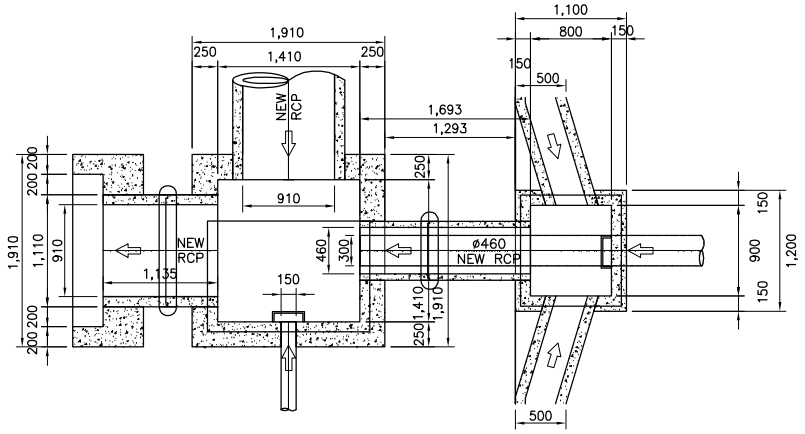

15.0
10.0
7.5
V
H
FR93
MR93
DR-93
FR94
MR94.1
S=.025
0.2055
0.2055
ø100
PVC PIPE
L=7.498m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.595
13.595
13.595
13.596
11.482
11.447
11.481
11.640
9+608
9+608
9+608
9+616

QUANTITIES OF MANHOLE

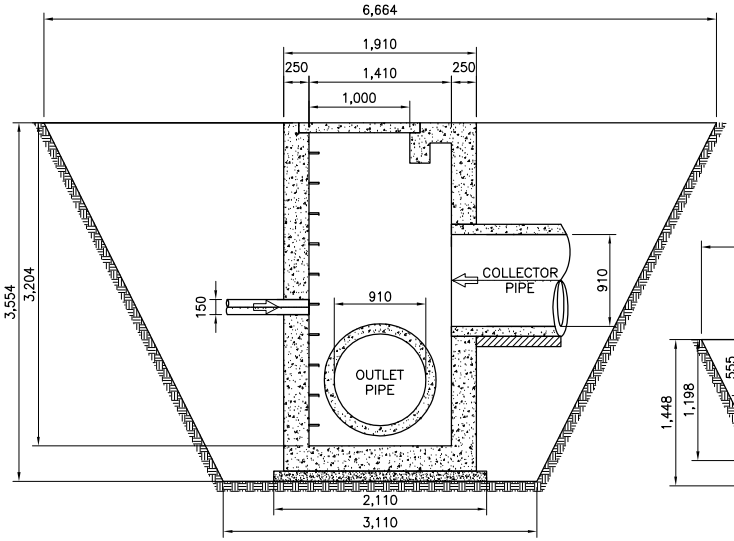
Manhole No.: MR 95

Location: 9 + 637

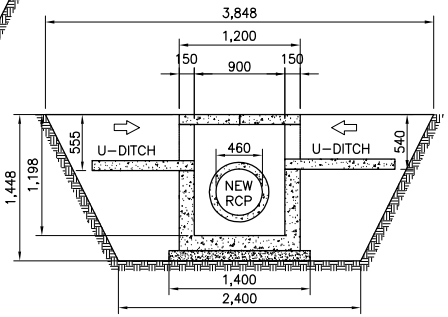
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=3.58	4.89	17.52	
		A2=9.28	4.89	45.33	
		A3=1.99	3.12	6.21	
		A4=2.74	3.12	8.57	
				77.63	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.91	3.65	0.25	**0.91**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	3.204	5.319	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.59	0.40	0.25	0.10	
Pipe hole on Wall C	DiaC=0.15	0.02	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**4.73**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.198	0.719	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.56	W=0.50	0.28	0.15	0.04	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.54	W=0.50	0.27	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.60**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=10			**9.47**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.17	0.7	3.62	
	Lout=2.71				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.55	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=1.69		**2**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=1.29		**0.076287**	m3
(Inlet Pipe)					
14. Backfill				**64.69**	m3



1 PLAN
SCALE A

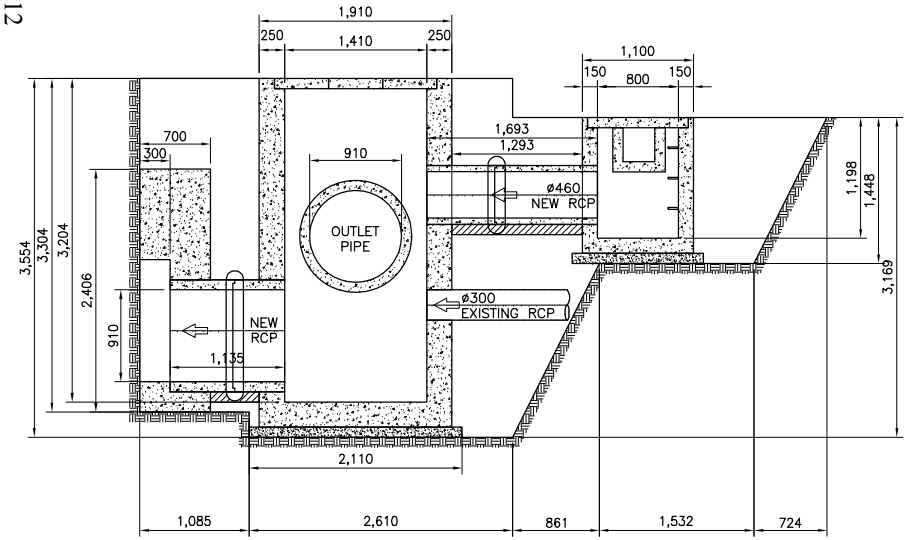


3 SECTION
SCALE A

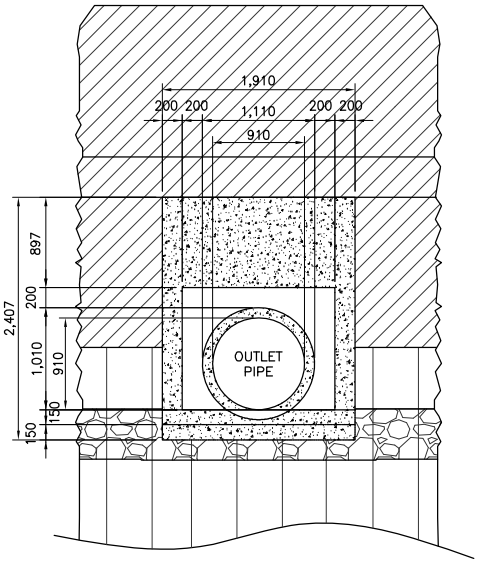


4 SECTION (JB95)
SCALE A

3.412



2 SECTION
SCALE A



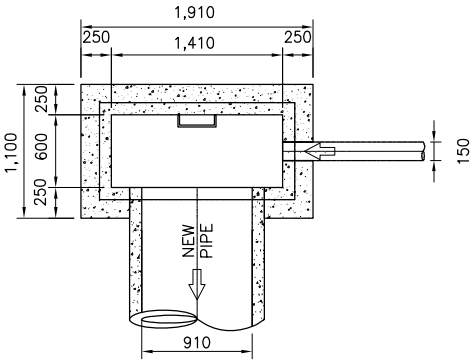
5 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

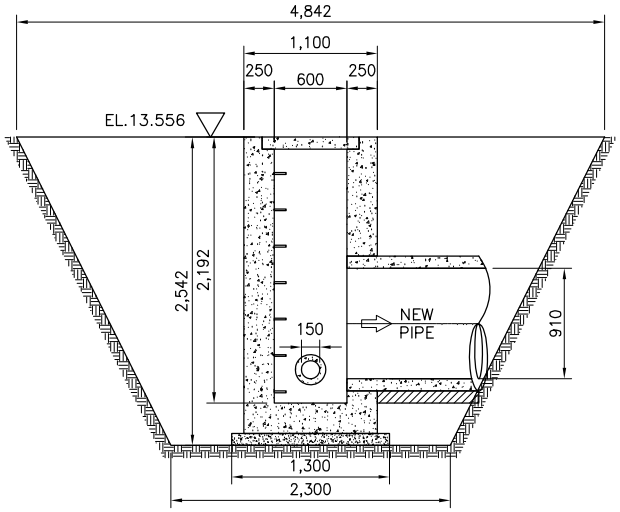
Manhole No.: MR 94.2

Location: 9 + 628

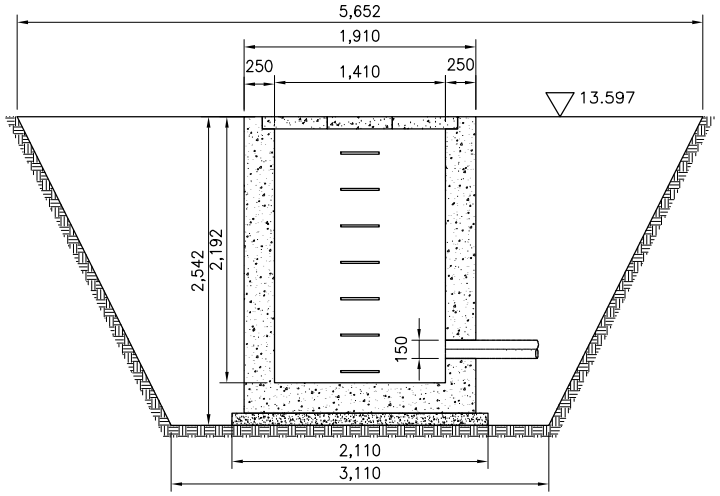
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.14	3.57	39.77	
				39.77	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.192	2.751	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.01	0.25	0.00	
Pipe hole on Wall A	DiaB=0.15	0.02	0.25	0.00	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.50**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**33.14**	m3



1 PARTIAL PLAN OF MANHOLE (MR94.2)



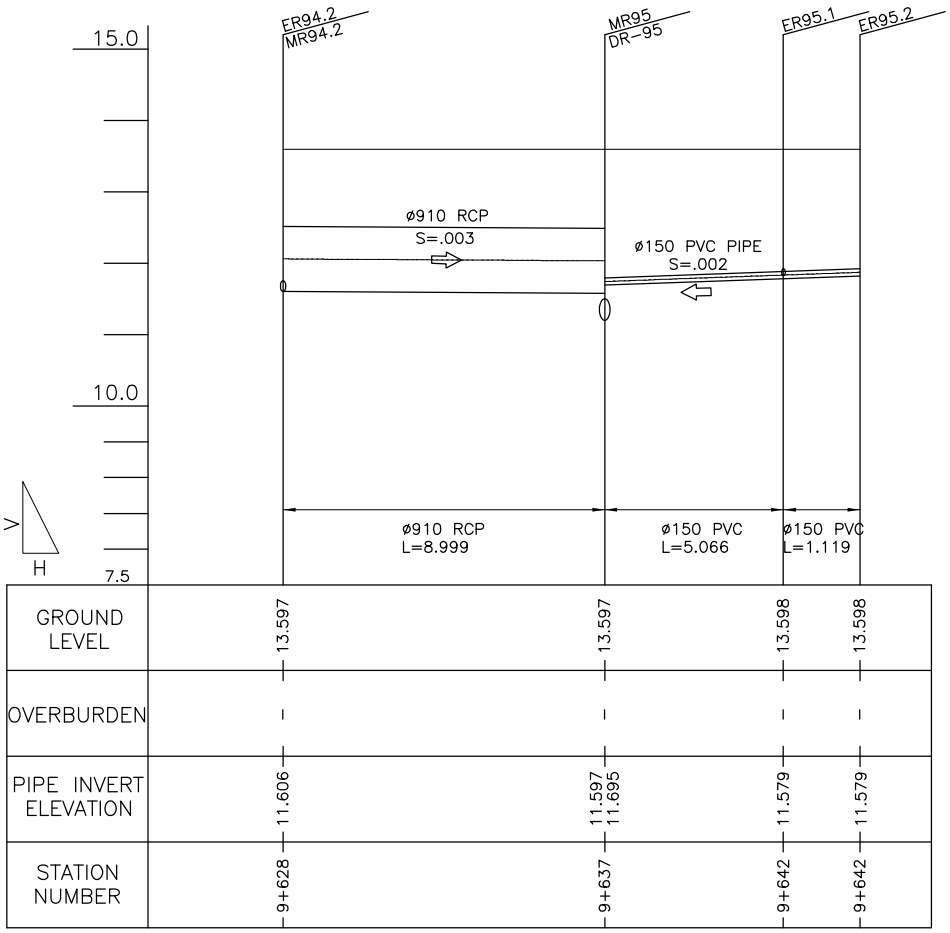
3 SECTION



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=9.03	10	pc
Collector Pipe (PVC)	Dia=0.15		L=6.20	2	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=9	0.51911677	m3
3. Conc. Bedding	Dia=.910m	L=9.03		0.82	m3
4. PVC Coupling	Dia=.150m			1	pc
5. Formworks				9.38	m3



Clearing (Manhole 95)

L1	1.324	m	
W of Junction Manhole	1.1	m	A1=24.62 m^2
L2	1.293	m	A2=11.99 m^2
W of Manhole	1.91	m	**At=36.62** m^2
L3	0.485	m	
W1	6.664	m	
W2	3.848	m	

Clearing (Junction Manhole 94.2)

W	5.652	m	**A=27.37** m^2
L	4.842	m	

Clearing (Collector 94.2 - 95)

W	4.3055	m	**A=38.75** m^2
L	8.999	m	

Clearing (Collector 95.2 - 95)

W	3.1105	m	**A=19.24** m^2
L	6.185	m	

(Collector Pipe) Downstream	94.2-95		Excavation
Do	1.11	m	A=7.06 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.74 m^2
H	2.2	m	Backfill Zone C
EL. A	13.597	m	A=2.32 m^2
EL. B	11.597	m	
W	4.31	m	

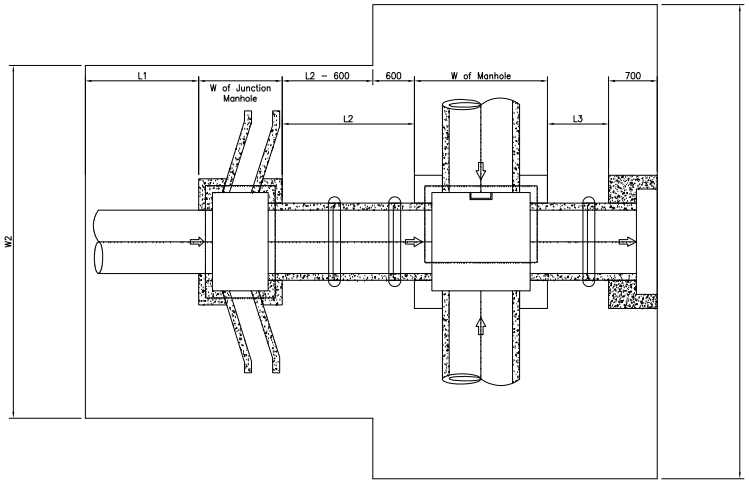
(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=7.02 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.72 m^2
H	2.191	m	Backfill Zone C
EL. A	13.597	m	A=2.30 m^2
EL. B	11.606	m	
W	4.301	m	

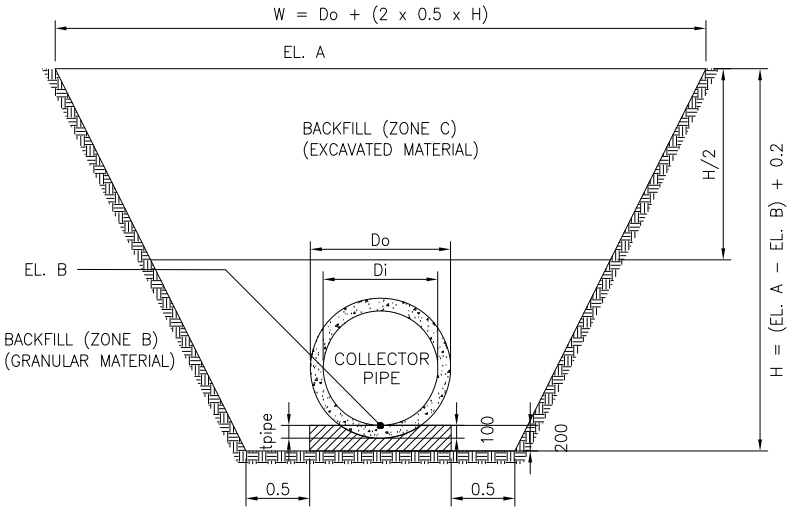
(Collector PVC) Downstream	95.2-95		
D	0.15	m	Excavation
W1	3.05	m	A=4.00 m^2
W2	2.10	m	Backfill Zone B
H	1.902	m	A=1.53 m^2
H/2	0.951	m	Backfill Zone C
EL. A	13.597	m	A=2.45 m^2
EL. B	11.695	m	

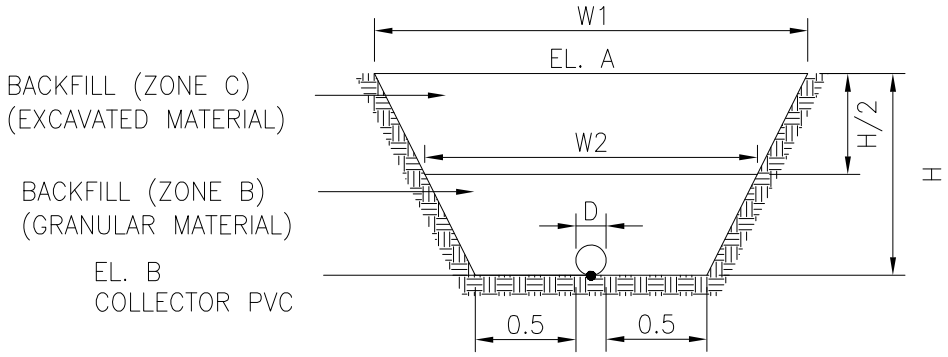
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	3.17	m	A=4.36 m^2
W2	2.16	m	Backfill Zone B
H	2.019	m	A=1.65 m^2
H/2	1.0095	m	Backfill Zone C
EL. A	13.598	m	A=2.69 m^2
EL. B	11.579	m	

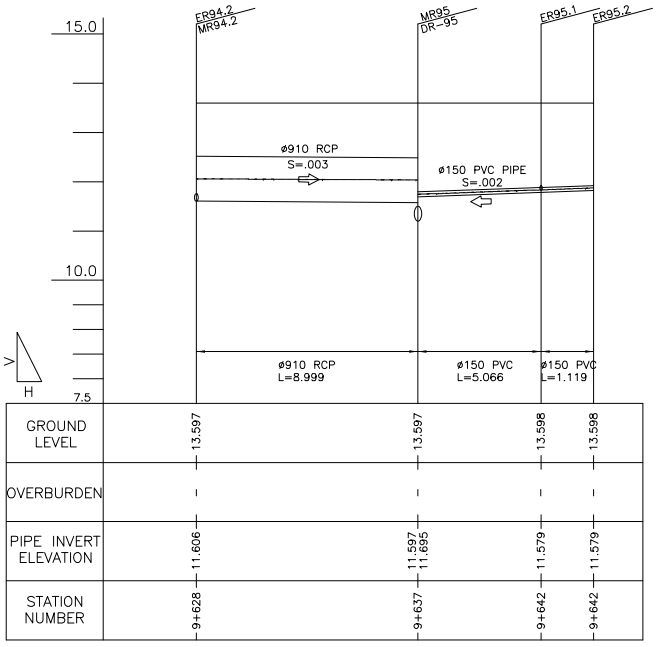
Collector Pipe 94.2-95	Volume	
Excavation	**63.56671**	m^3
Backfill Zone B	**15.60679**	m^3
Backfill Zone C	**20.84582**	m^3

Collector PVC 95.2-95	Volume	
Excavation	**25.89302**	m^3
Backfill Zone B	**9.856848**	m^3
Backfill Zone C	**15.92666**	m^3


L1
W of Junction Manhole
L2 - 600
600
W of Manhole
700
L2
L3
W2
W1


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR PIPE
H = (EL. A - EL. B) + 0.2
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
H
EL. B
COLLECTOR PVC
0.5
0.5

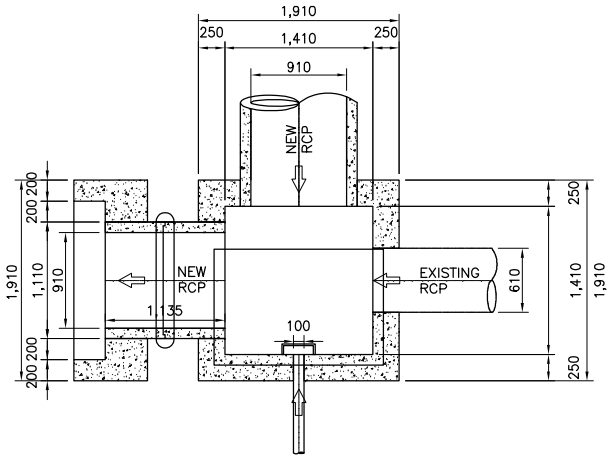

15.0
10.0
7.5
V
H
ER94.2
MR94.2
MR95
DR-95
ER95.1
ER95.2
ø910 RCP
S=.003
ø150 PVC PIPE
S=.002
ø910 RCP
L=8.999
ø150 PVC
L=5.066
ø150 PVC
L=1.119
GROUND LEVEL
13.597
13.597
13.598
13.598
OVERBURDEN
-
-
-
-
PIPE INVERT ELEVATION
11.606
11.597
11.695
11.579
11.579
STATION NUMBER
9+628
9+637
9+642
9+642

QUANTITIES OF MANHOLE

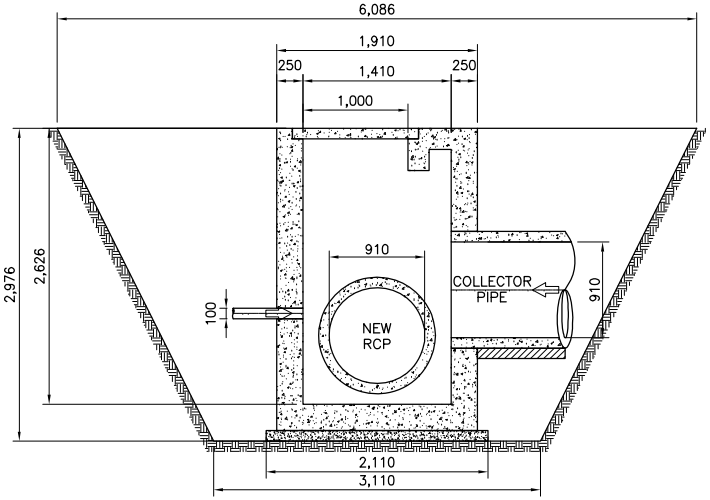
Manhole No.: MR 97

Location: 9 + 664

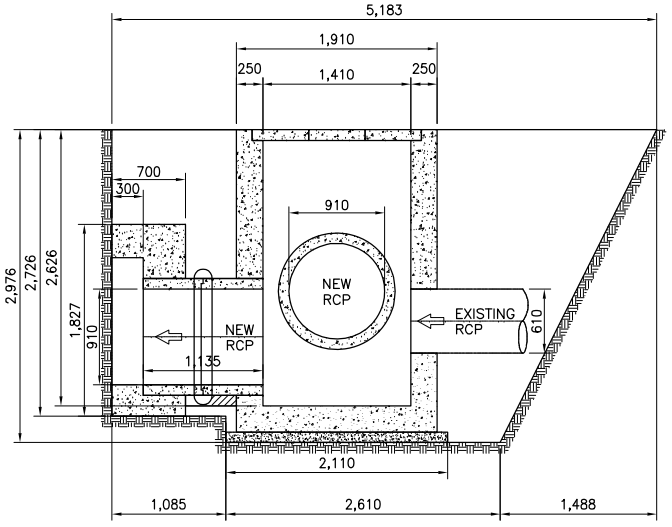
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.96	4.60	13.60	
		A2=9.98	4.60	45.89	
				59.49	m^3
2. Lev. Concrete	W=2.11	4.45	0.1	**0.45**	m^3
	L=2.11				
3. Bottom Slab	W=1.91	4.28	0.25	**1.07**	m^3
	L=1.91				
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.625	4.358	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.76**	m^3
5. Conc. Cover	L=1.10	1.771	0.1	**0.18**	m^3
	W=1.61				
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.06	0.7	2.84	
	Lout=2.13				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.77	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**49.58**	m3



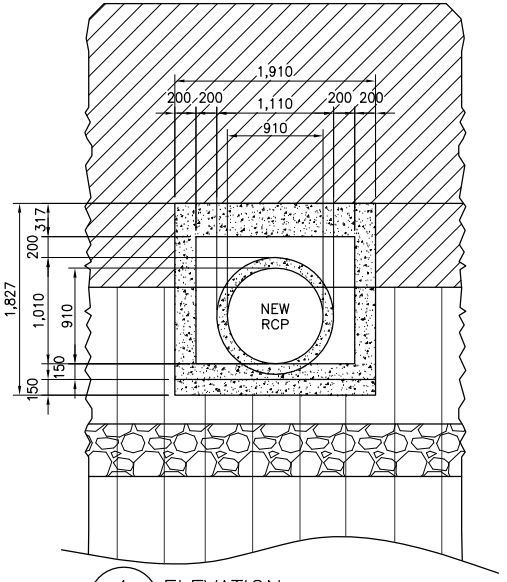
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



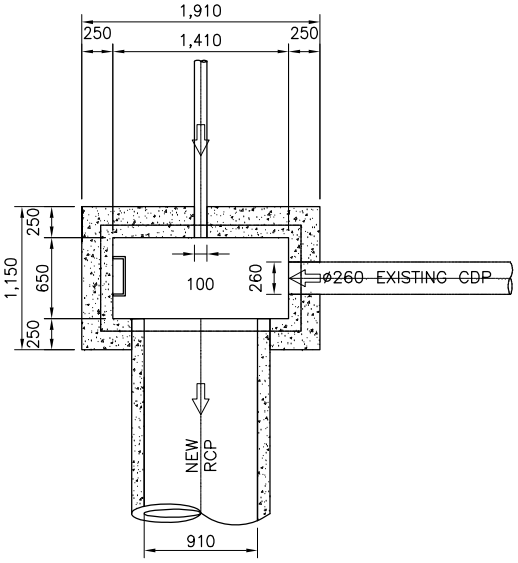
4 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

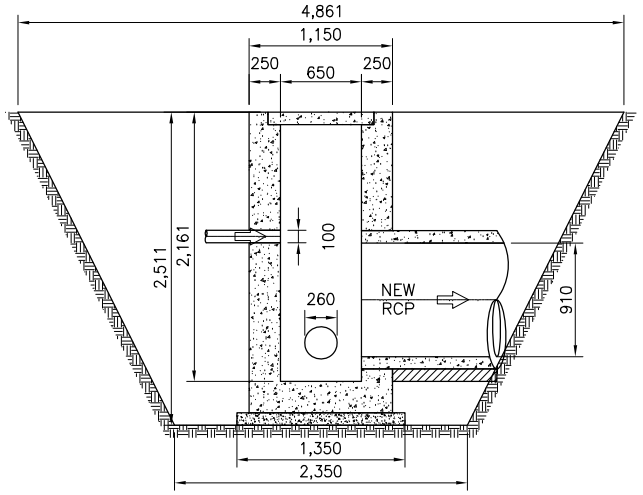
Manhole No.: MR 96

Location: 9 + 654

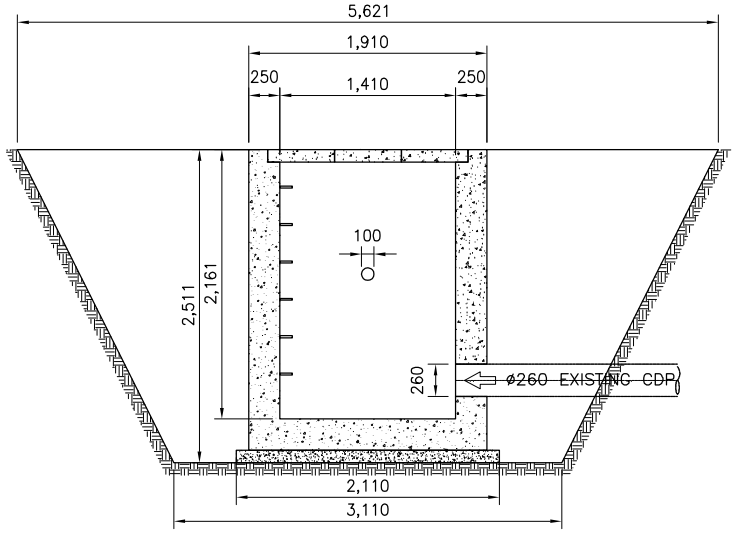
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=10.96	3.61	39.52	
				39.52	m^3
2. Lev. Concrete	W=2.11 L=1.35	2.85	0.1	**0.28**	m^3
3. Bottom Slab	W=1.91 L=1.15	2.20	0.25	**0.55**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.15	Aout=2.20			
	Win=1.41 Lin=.65	Ain=0.92	2.161	2.766	m^3
	.	Anet=1.28			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.26	0.05	0.25	0.01	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.51**	m^3
5. Conc. Cover	L=0.85 W=1.61	1.3685	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**32.94**	m3



1 PLAN
SCALE A



3 SECTION
SCALE A

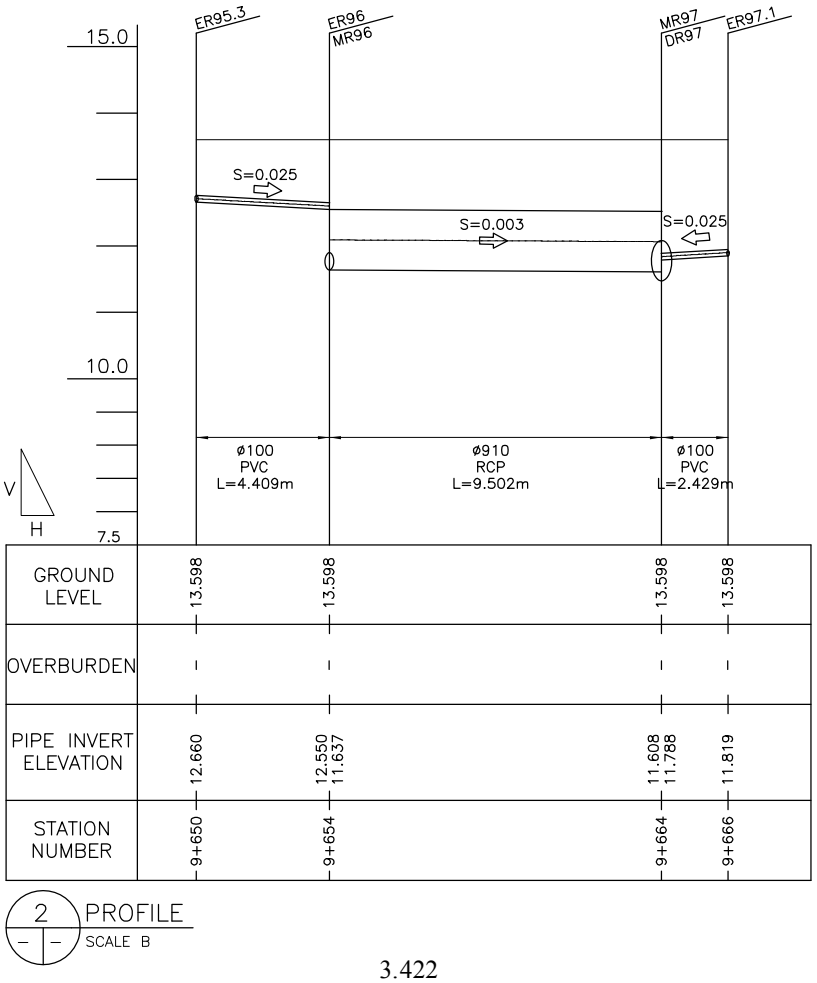


2 SECTION
SCALE A

3.421

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=9.53	10	pc
Collector Pipe (PVC)	Dia=0.15		L=7.01	2	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=9	0.51911677	m3
3. Conc. Bedding	Dia=.910m	L=9.53		0.87	m3
4. PVC Coupling	Dia=.150m			1	pc
5. Formworks				9.70	m3



2 PROFILE
SCALE B

Clearing (Manhole 97)

L1	2.088 m	
W of Manhole	1.91 m	**At=31.54** m^2
L2	0.485 m	
W	6.086 m	

Clearing (Manhole 96)

W	5.621 m	**A=27.32** m^2
L	4.861 m	

Clearing (Collector 96 - 97)

W	4.2855 m	**A=40.72** m^2
L	9.502 m	

Clearing (Collector 95.3 - 96)

W	2.093 m	**A=9.23** m^2
L	4.409 m	

Clearing (Collector 97.1 - 97)

W	2.8945 m	**A=7.03** m^2
L	2.429 m	

(Collector Pipe) Downstream	96-97	Excavation
Do	1.11 m	A=7.02 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.72 m^2
H	2.19 m	Backfill Zone C
EL. A	13.598 m	A=2.30 m^2
EL. B	11.608 m	
W	4.3 m	

(Collector Pipe) Upstream		Excavation
Do	1.11 m	A=6.89 m^2
Di	0.91 m	Backfill Zone B
tpipe	0.1 m	A=1.67 m^2
H	2.161 m	Backfill Zone C
EL. A	13.598 m	A=2.26 m^2
EL. B	11.637 m	
W	4.271 m	

(Collector PVC) Downstream	95.3-96	
D	0.1 m	Excavation
W1	2.15 m	A=1.70 m^2
W2	1.62 m	Backfill Zone B
H	1.048 m	A=0.71 m^2
H/2	0.524 m	Backfill Zone C
EL. A	13.598 m	A=0.99 m^2
EL. B	12.55 m	

(Collector PVC) Upstream

D	0.1 m	Excavation
W1	2.04 m	A=1.47 m^2
W2	1.57 m	Backfill Zone B
H	0.938 m	A=0.62 m^2
H/2	0.469 m	Backfill Zone C
EL. A	13.598 m	A=0.85 m^2
EL. B	12.66 m	

(Collector PVC) Downstream	97.1-97	
D	0.1 m	Excavation
W1	2.91 m	A=3.63 m^2
W2	2.01 m	Backfill Zone B
H	1.81 m	A=1.40 m^2
H/2	0.905 m	Backfill Zone C
EL. A	13.598 m	A=2.22 m^2
EL. B	11.788 m	

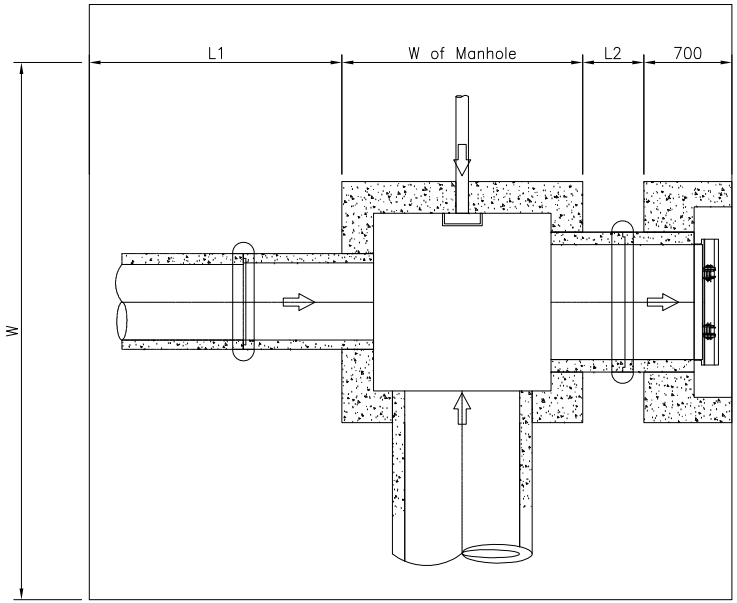
(Collector PVC) Upstream

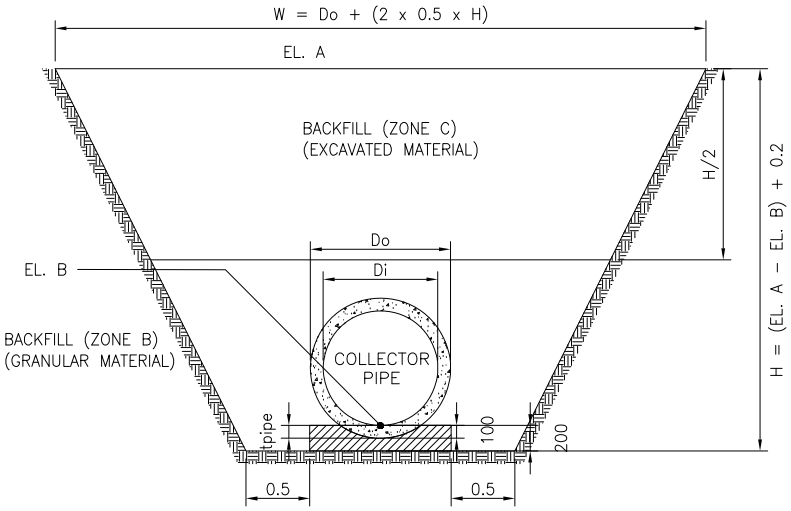
D	0.1 m	Excavation
W1	2.88 m	A=3.54 m^2
W2	1.99 m	Backfill Zone B
H	1.779 m	A=1.37 m^2
H/2	0.8895 m	Backfill Zone C
EL. A	13.598 m	A=2.17 m^2
EL. B	11.819 m	

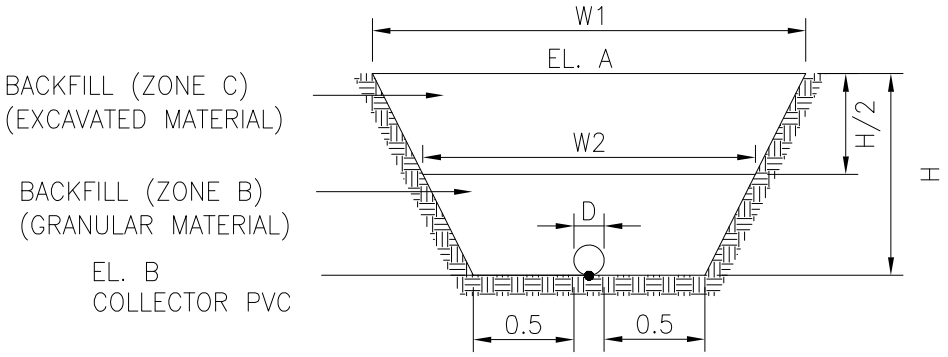
Collector Pipe 96-97	Volume
Excavation	**66.30192** m^3
Backfill Zone B	**16.17412** m^3
Backfill Zone C	**21.75888** m^3

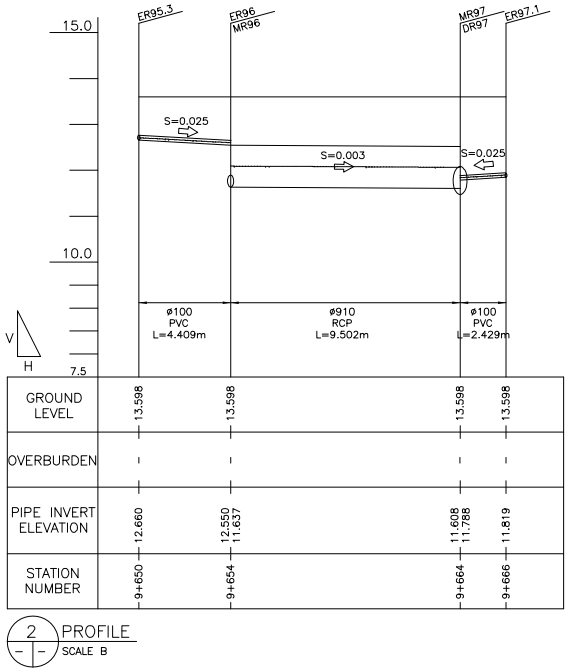
Collector PVC 95.3-96	Volume
Excavation	**7.171273** m^3
Backfill Zone B	**2.991412** m^3
Backfill Zone C	**4.144368** m^3

Collector PVC 97.1-97	Volume
Excavation	**8.923636** m^3
Backfill Zone B	**3.440003** m^3
Backfill Zone C	**5.464079** m^3









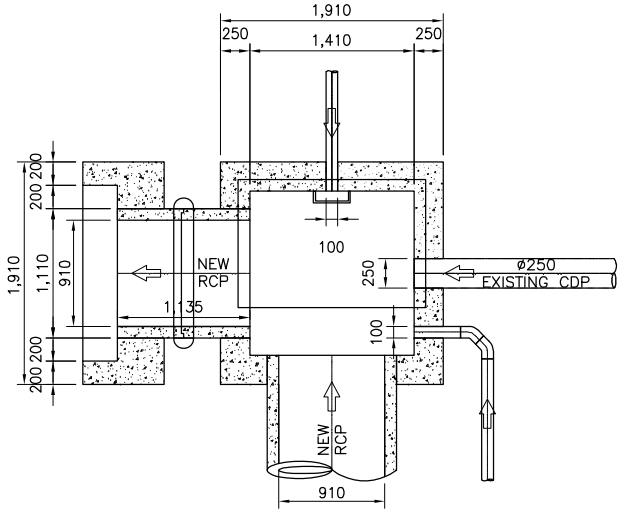
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

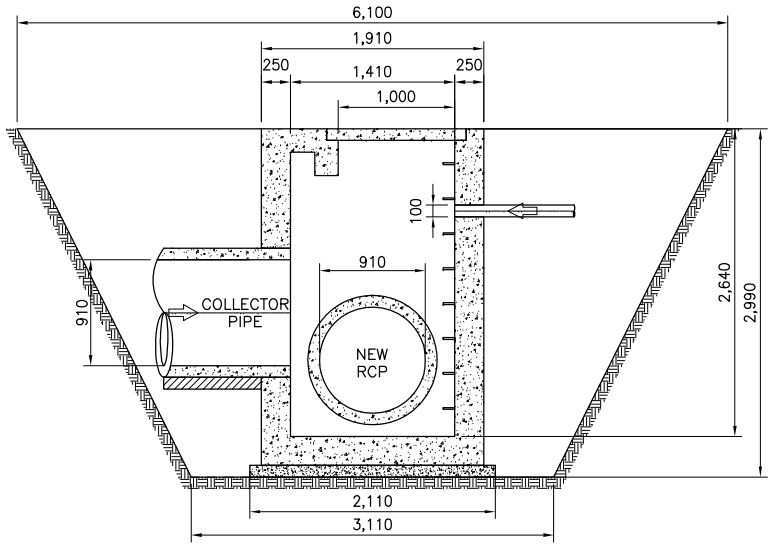
Manhole No.: MR 98

Location: 9 + 678

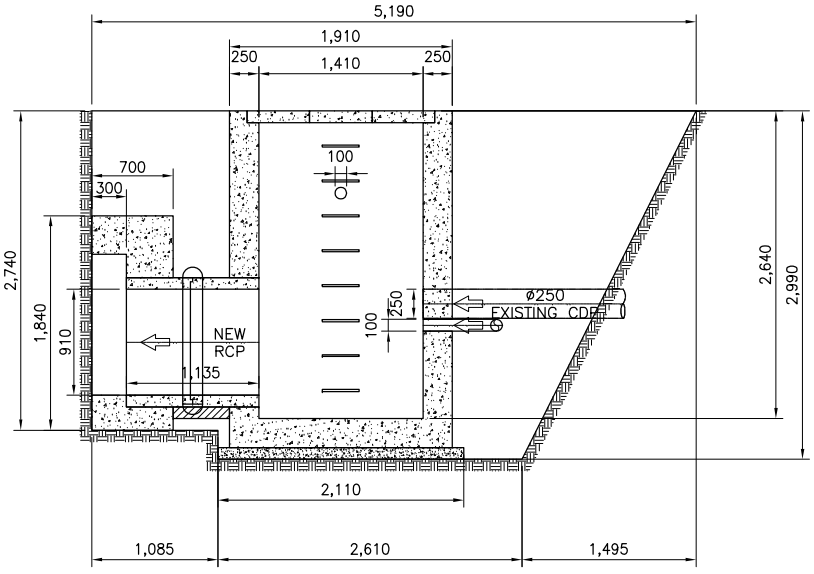
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.97	4.61	13.69	
		A2=10.04	4.61	46.23	
				59.92	m^3
2. Lev. Concrete	W=2.11 L=2.11	4.45	0.1	**0.45**	m^3
3. Bottom Slab	W=1.91 L=1.91	4.28	0.25	**1.07**	m^3
4. Wall					
Entire Wall	Wout=1.91	Aout=3.65			
	Lout=1.91				
	Win=1.41	Ain=1.99	2.640	4.382	m^3
	Lin=1.41				
		Anet=1.66			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.35	0.10	0.25	0.03	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.87**	m^3
5. Conc. Cover	L=1.10 W=1.61	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=4.09	0.7	2.86	
	Lout=2.14				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.79	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**49.93**	m3



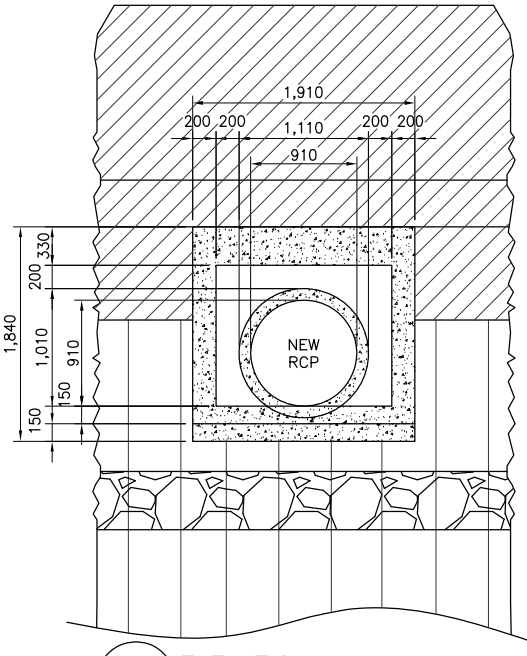
1 PLAN
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



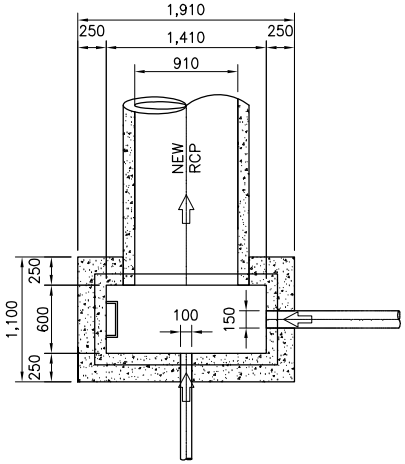
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

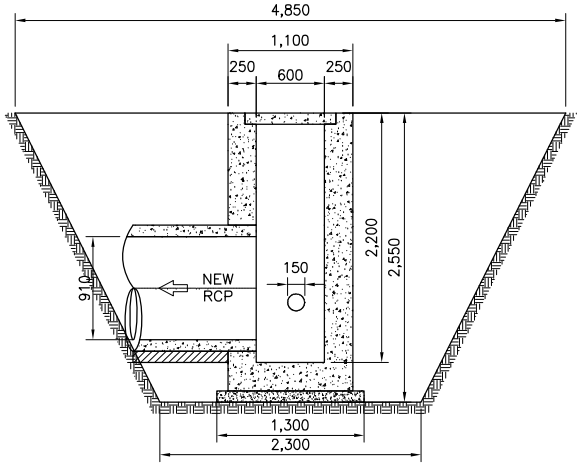
Manhole No.: MR 98.3

Location: 9 + 687

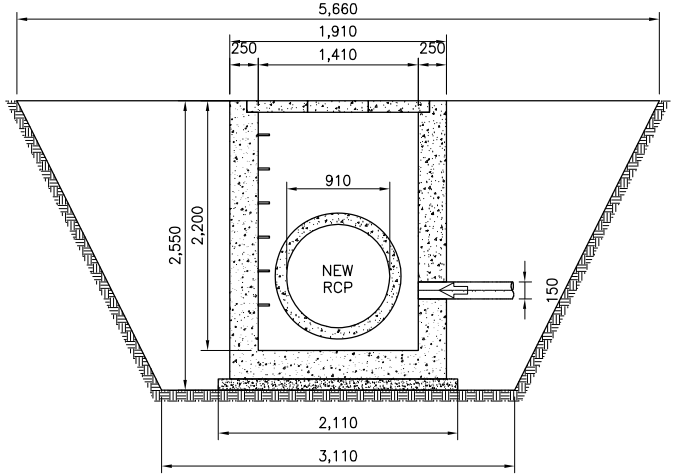
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=11.18	3.58	39.97	
				39.97	m^3
2. Lev. Concrete	W=2.11 L=1.30	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.91 L=1.10	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.10	Aout=2.10			
	Win=1.41 Lin=.60	Ain=0.85	2.200	2.761	m^3
	.	Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.15	0.02	0.25	0.00	
Pipe hole on Wall C	DiaC=0.10	0.01	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**2.51**	m^3
5. Conc. Cover	L=0.80 W=1.61	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=7			**6.63**	kg
7. Backfill				**33.31**	m3



1 PLAN
SCALE A



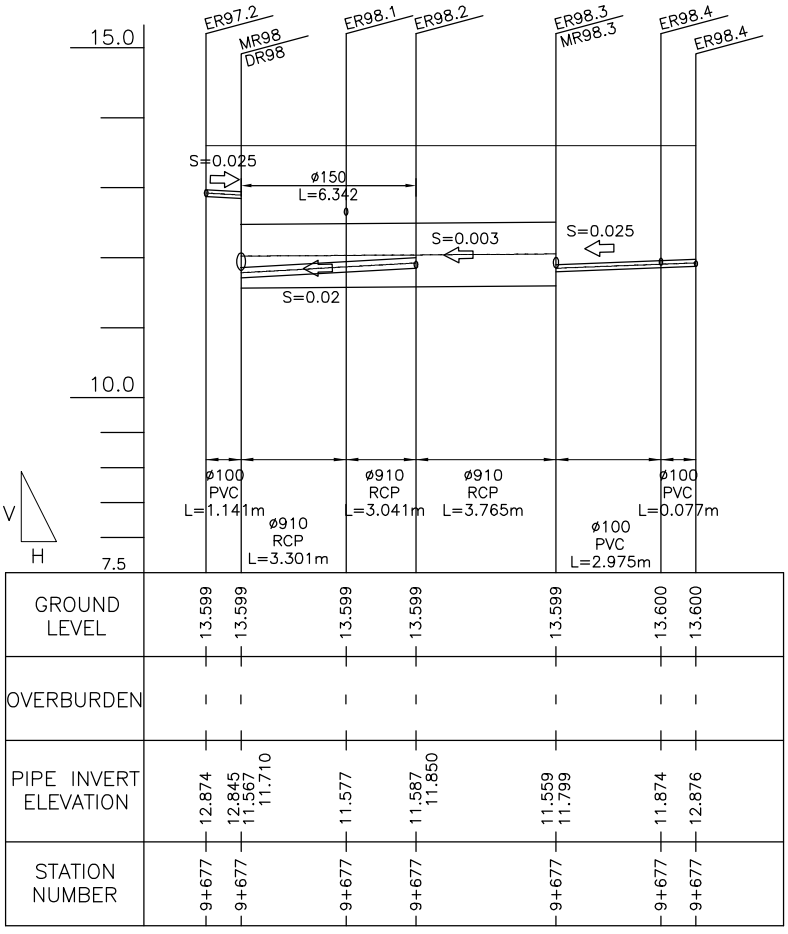
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=10.14	11	pc
Collector Pipe (PVC)	Dia=0.15		L=6.47	2	pc
Collector Pipe (PVC)	Dia=0.10		L=1.25	1	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=10	0.576796411	m3
3. Conc. Bedding	Dia=.910m	L=10.14		0.92	m3
4. PVC Coupling	Dia=.150m			1	pc
PVC Coupling	Dia=.100m			0	pc
5. Formworks				10.50	m3



Clearing (Manhole 98)

L1	2.095	m	
W of Manhole	1.91	m	**A=31.66** m^2
L2	0.485	m	
W	6.1	m	

Clearing (Manhole 98.3)

W	5.66	m	**A=27.45** m^2
L	4.85	m	

Clearing (Collector 98.3 - 98)

W	4.346	m	**A=43.93** m^2
L	10.107	m	

Clearing (Collector 98.5 - 98.3)

W	2.362	m	**A=7.21** m^2
L	3.052	m	

Clearing (Collector 97.2 - 98)

W	1.8395	m	**A=2.10** m^2
L	1.141	m	

(Collector Pipe) Downstream	98.3-98		Excavation
Do	1.11	m	A=7.20 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.79 m^2
H	2.232	m	Backfill Zone C
EL. A	13.599	m	A=2.36 m^2
EL. B	11.567	m	
W	4.342	m	

(Collector Pipe) Upstream			Excavation
Do	1.11	m	A=7.24 m^2
Di	0.91	m	Backfill Zone B
tpipe	0.1	m	A=1.80 m^2
H	2.24	m	Backfill Zone C
EL. A	13.599	m	A=2.37 m^2
EL. B	11.559	m	
W	4.35	m	

(Collector PVC) Downstream	98.5-98.3		
D	0.1	m	Excavation
W1	2.90	m	A=3.60 m^2
W2	2.00	m	Backfill Zone B
H	1.8	m	A=1.39 m^2
H/2	0.9	m	Backfill Zone C
EL. A	13.599	m	A=2.21 m^2
EL. B	11.799	m	

(Collector PVC) Upstream

D	0.1	m	Excavation
W1	1.82	m	A=1.06 m^2
W2	1.46	m	Backfill Zone B
H	0.724	m	A=0.46 m^2
H/2	0.362	m	Backfill Zone C
EL. A	13.6	m	A=0.59 m^2
EL. B	12.876	m	

(Collector PVC) Downstream	97.2-98		
D	0.1	m	Excavation
W1	1.85	m	A=1.11 m^2
W2	1.48	m	Backfill Zone B
H	0.754	m	A=0.48 m^2
H/2	0.377	m	Backfill Zone C
EL. A	13.599	m	A=0.63 m^2
EL. B	12.845	m	

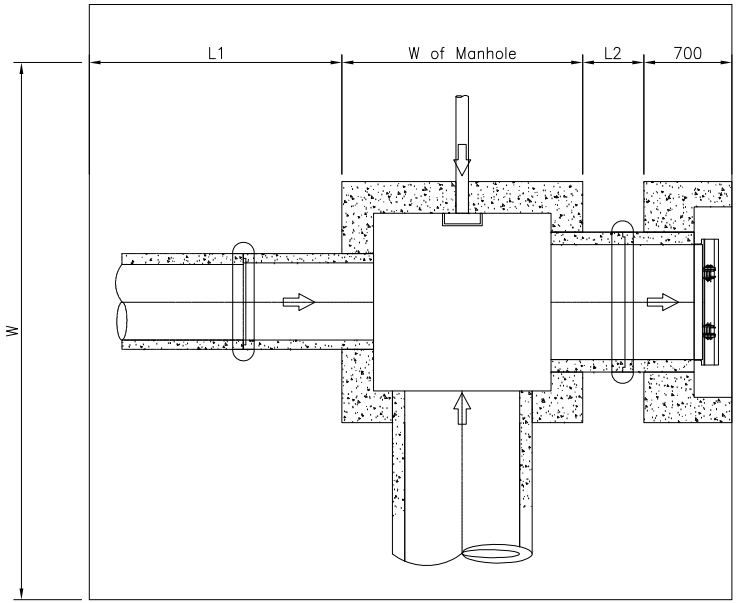
(Collector PVC) Upstream

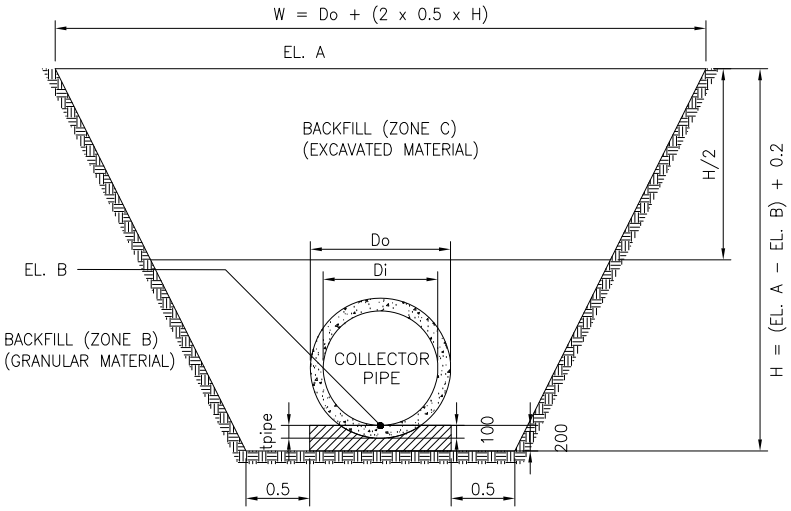
D	0.1	m	Excavation
W1	1.83	m	A=1.06 m^2
W2	1.46	m	Backfill Zone B
H	0.725	m	A=0.46 m^2
H/2	0.3625	m	Backfill Zone C
EL. A	13.599	m	A=0.60 m^2
EL. B	12.874	m	

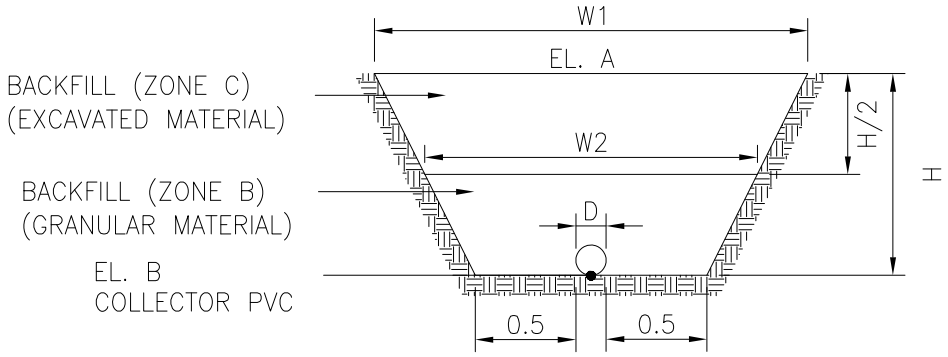
Collector Pipe 98.3-98	Volume	
Excavation	**73.16932**	m^3
Backfill Zone B	**18.18894**	m^3
Backfill Zone C	**23.95909**	m^3

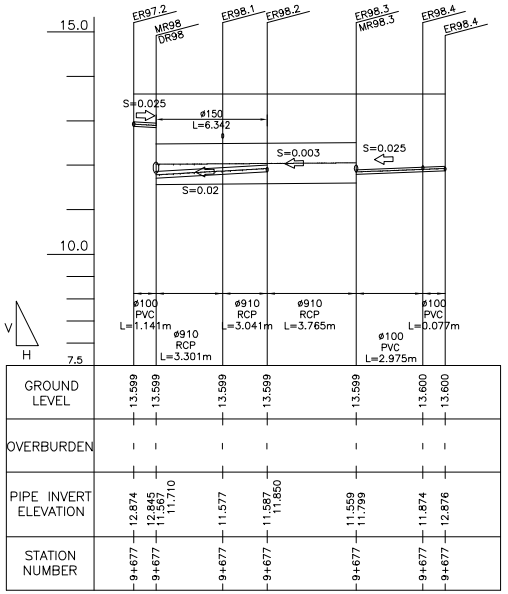
Collector PVC 98.5-98.3	Volume	
Excavation	**7.286574**	m^3
Backfill Zone B	**2.88275**	m^3
Backfill Zone C	**4.379254**	m^3

Collector PVC 97.2-98	Volume	
Excavation	**1.271256**	m^3
Backfill Zone B	**0.546466**	m^3
Backfill Zone C	**0.715605**	m^3


L1
W of Manhole
L2
700
W


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
H = (EL. A – EL. B) + 0.2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
Dpipe
100
200
0.5
0.5


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5

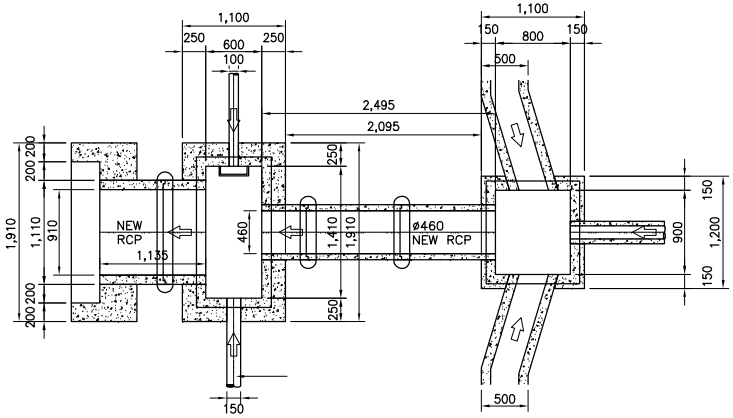

15.0
10.0
7.5
V
H
ER97.2
MR98
DR98
ER98.1
ER98.2
ER98.3
MR98.5
ER98.4
ER98.4
S=0.025
ø150
L=6.342
S=0.003
S=0.025
S=0.02
ø100
PVC
L=1.141m
ø910
RCP
L=3.301m
ø910
RCP
L=3.041m
ø910
RCP
L=3.765m
ø100
PVC
L=0.077m
ø100
PVC
L=2.975m
GROUND LEVEL
13.599
13.599
13.599
13.599
13.599
13.600
13.600
OVERBURDEN
PIPE INVERT ELEVATION
12.874
12.845
11.567
11.710
11.577
11.587
11.850
11.559
11.799
11.874
12.876
STATION NUMBER
9+677
9+677
9+677
9+677
9+677
9+677
9+677

QUANTITIES OF MANHOLE

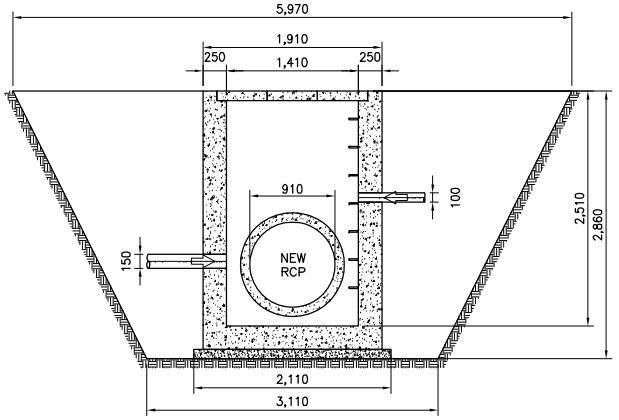
Manhole No.: MR 98.7

Location: 9 + 697

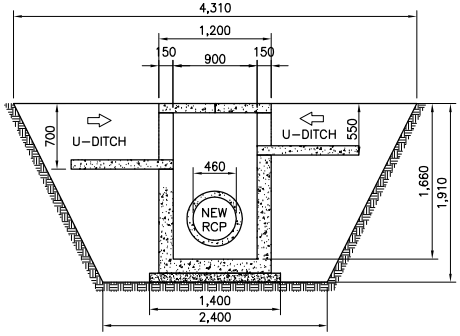
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.83	4.54	12.86	
		A2=5.15	4.54	23.37	
		A3=0.60	3.36	2.02	
		A4=6.52	3.36	21.87	
				60.12	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.510	3.150	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.10	0.01	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.15	0.02	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.83**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.660	0.996	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.55	W=0.50	0.28	0.15	0.04	
Pipe hole on Wall B	DiaB=0.24	0.05	0.15	0.01	
Depth of Ditch=0.70	W=0.50	0.35	0.15	0.05	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.86**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.50		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=2.10		**0.123605**	m3
(Inlet Pipe)					
14. Backfill				**50.10**	m3



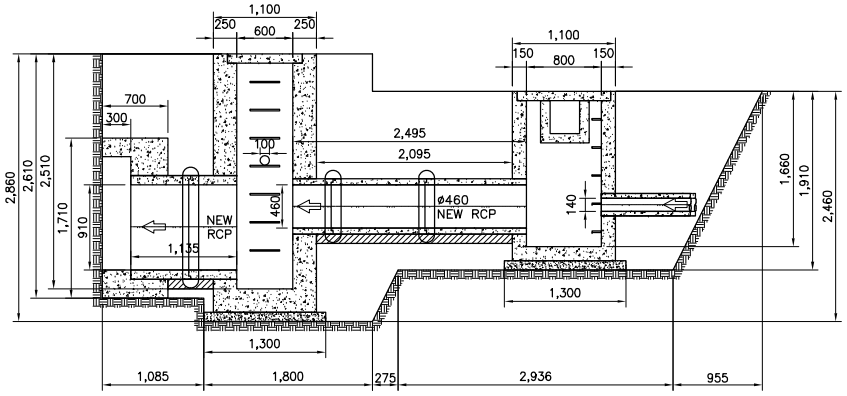
1 PLAN
SCALE A



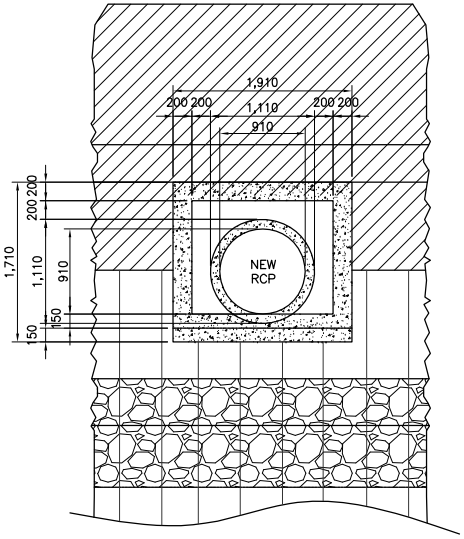
3 SECTION
SCALE A



4 SECTION (JB98.7)
SCALE A



2 SECTION
SCALE A

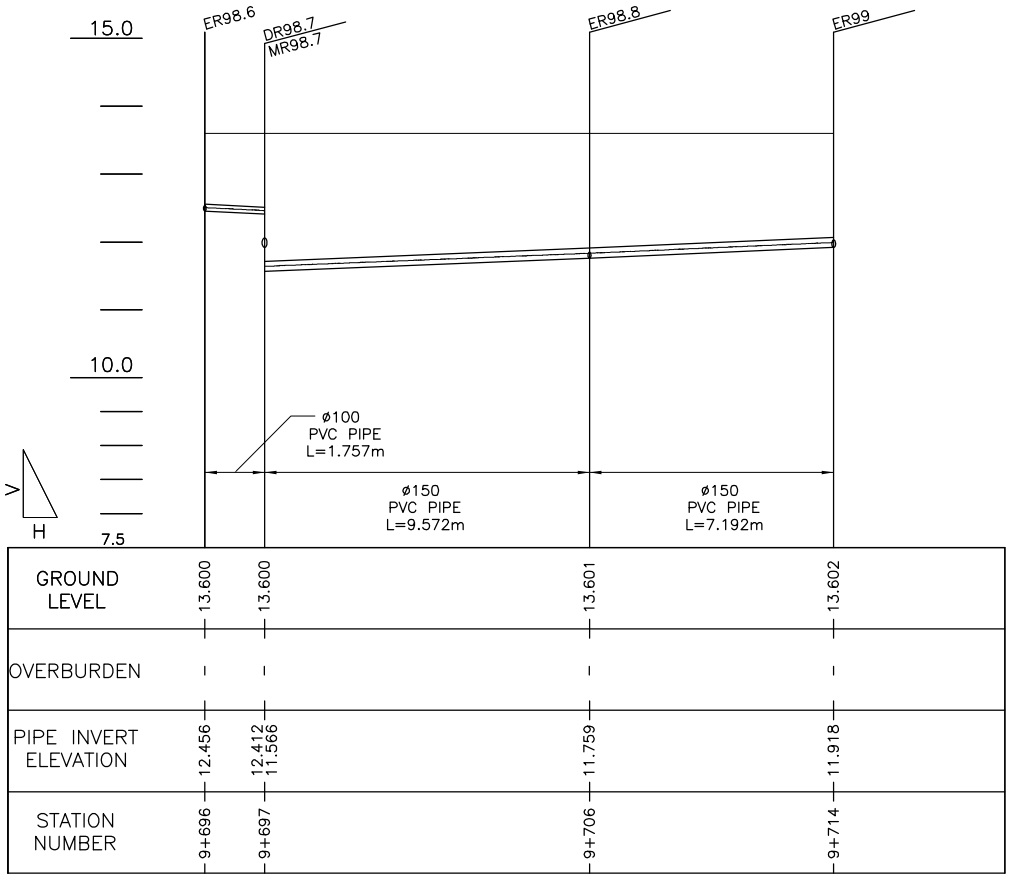


5 ELEVATION
SCALE A

3.433

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.15		L=17.10	3	pc
Collector Pipe (PVC)	Dia=0.10		L=1.80	1	pc
2. PVC Coupling	Dia=.150m			2	pc
PVC Coupling	Dia=.100m			0	pc



Clearing (Manhole 98.7)

L1	1.555	m	
W of Junction Manhole	1.1	m	A1=17.22 m^2
L2	2.095	m	A2=17.89 m^2
W of Manhole	1.1	m	**A=35.11** m^2
L3	0.485	m	
W1	5.97	m	
W2	4.31	m	

Clearing (Collector 99 - 98.7)

W	3.009	m	**A=50.44** m^2
L	16.764	m	

Clearing (Collector 98.6 - 98.7)

W	2.266	m	**A=3.98** m^2
L	1.757	m	

(Collector PVC) Downstream	99-98.7		
D	0.15	m	Excavation
W1	3.18	m	A=4.41 m^2
W2	2.17	m	Backfill Zone B
H	2.034	m	A=1.67 m^2
H/2	1.017	m	Backfill Zone C
EL. A	13.6	m	A=2.72 m^2
EL. B	11.566	m	

(Collector PVC) Upstream

D	0.15	m	Excavation
W1	2.83	m	A=3.35 m^2
W2	1.99	m	Backfill Zone B
H	1.684	m	A=1.31 m^2
H/2	0.842	m	Backfill Zone C
EL. A	13.602	m	A=2.03 m^2
EL. B	11.918	m	

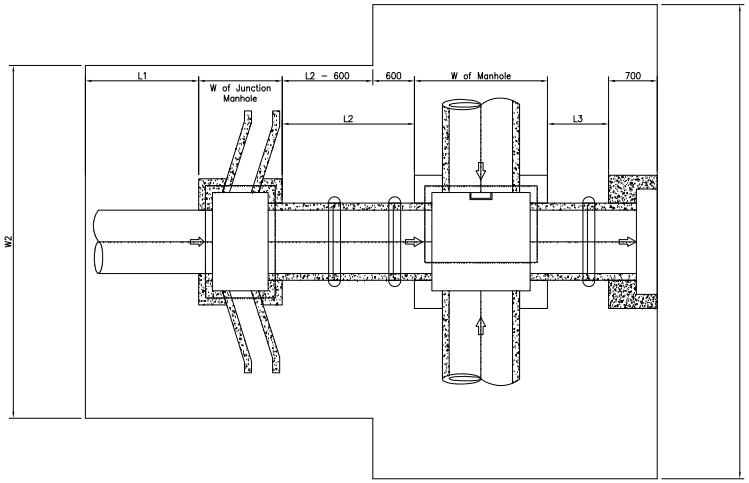
(Collector PVC) Downstream	98.6-98.7		
D	0.1	m	Excavation
W1	2.29	m	A=2.01 m^2
W2	1.69	m	Backfill Zone B
H	1.188	m	A=0.82 m^2
H/2	0.594	m	Backfill Zone C
EL. A	13.6	m	A=1.18 m^2
EL. B	12.412	m	

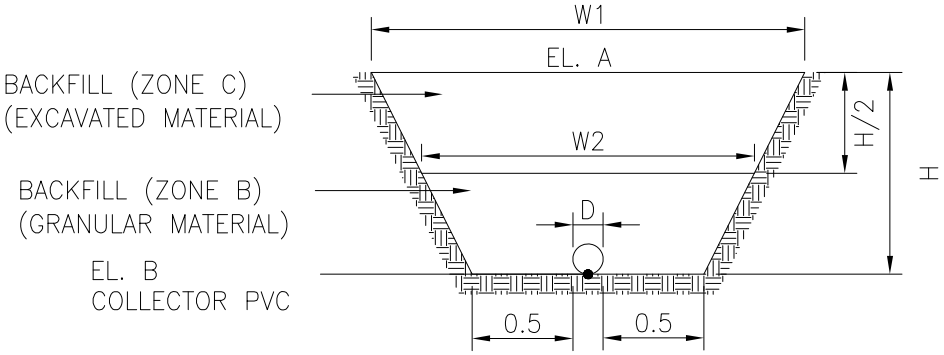
(Collector PVC) Upstream

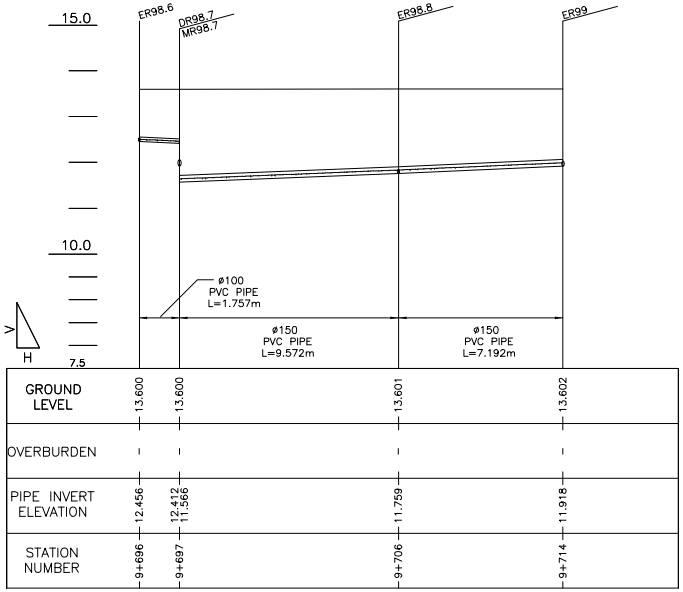
D	0.1	m	Excavation
W1	2.24	m	A=1.91 m^2
W2	1.67	m	Backfill Zone B
H	1.144	m	A=0.78 m^2
H/2	0.572	m	Backfill Zone C
EL. A	13.6	m	A=1.12 m^2
EL. B	12.456	m	

Collector PVC 99-98.7	Volume	
Excavation	**66.36407**	m^3
Backfill Zone B	**25.42777**	m^3
Backfill Zone C	**40.63413**	m^3

Collector PVC 98.6-98.7	Volume	
Excavation	**3.534531**	m^3
Backfill Zone B	**1.446955**	m^3
Backfill Zone C	**2.073432**	m^3


L1
W of Junction Manhole
L2 – 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

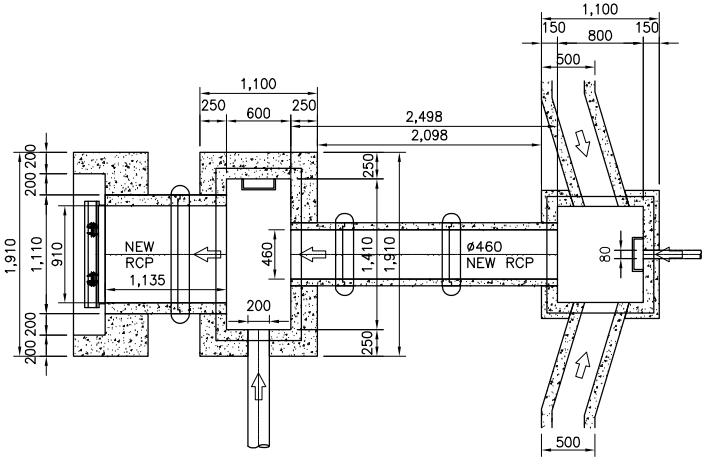

15.0
10.0
7.5
V
H
ER98.6
DR98.7
MR98.7
ER98.8
ER99
ø100
PVC PIPE
L=1.757m
ø150
PVC PIPE
L=9.572m
ø150
PVC PIPE
L=7.192m
GROUND LEVEL
13.600
13.600
13.601
13.602
OVERBURDEN
PIPE INVERT ELEVATION
12.456
12.412
11.368
11.759
11.918
STATION NUMBER
9+696
9+697
9+706
9+714

QUANTITIES OF MANHOLE

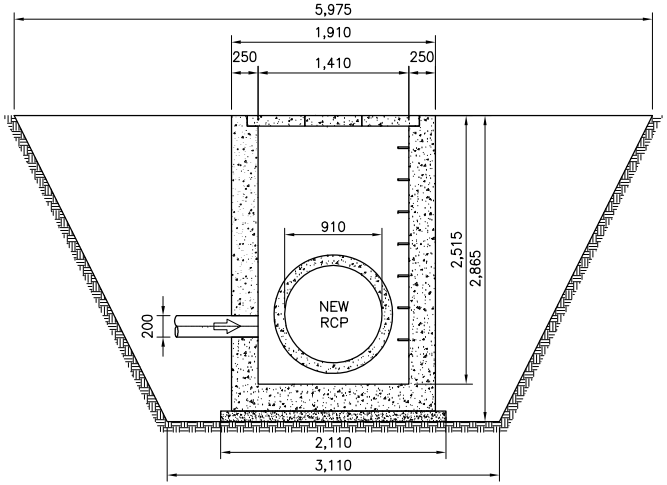
Manhole No.: MR 99.1

Location: 9 + 756

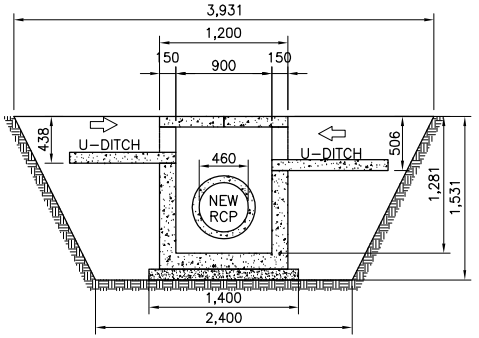
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.04	4.54	9.27	
		A2=6.26	4.54	28.44	
		A3=0.53	3.17	1.69	
		A4=5.04	3.17	15.94	
				55.33	m^3
2. Lev. Concrete	W=1.30	2.74	0.1	**0.27**	m^3
(Manhole)	L=2.11				
(Junction Box)	W=1.30	1.82	0.1	**0.18**	m^3
	L=1.40				
3. Bottom Slab	W=1.10	2.10	0.25	**0.53**	m^3
(Manhole)	L=1.91				
(Junction Box)	W=1.10	1.32	0.2	**0.26**	m^3
	L=1.20				
4. Wall					
Manhole	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.515	3.156	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.59	0.27	0.25	0.07	
Pipe hole on Wall C	DiaC=0.20	0.03	0.25	0.01	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.84**	m^3
Junction Box	Wout=1.10	Aout=1.32			
	Lout=1.20				
	Win=0.80	Ain=0.72	1.281	0.769	m^3
	Lin=.90				
		Anet=0.60			
Minus					
Depth of Ditch=0.44	W=0.50	0.22	0.15	0.03	
Pipe hole on Wall B	DiaB=0.08	0.01	0.15	0.00	
Depth of Ditch=0.51	W=0.50	0.25	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.66**	m^3
5. Conc. Cover	L=1.61	1.288	0.1	**0.13**	m^3
(Manhole)	W=0.80				
(Junction Box)	L=1.10	1.1	0.1	**0.11**	m^3
	W=1.00				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=4			**3.79**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Conc. Collar	D1=1.110m	A1=0.97	0.17		
(Outlet Pipe)	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Inlet Pipe	Dia=.460m	L=2.50		**3**	pc
11. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.064985729**	m3
		Anet=0.19	Qty=2		
12. Conc. Bedding	Dia=1.110m	L=0.49		**0.053835**	m3
(Outlet Pipe)					
13. Conc.Bedding	Dia=.590m	L=2.10		**0.123782**	m3
(Inlet Pipe)					
14. Backfill				**46.11**	m3



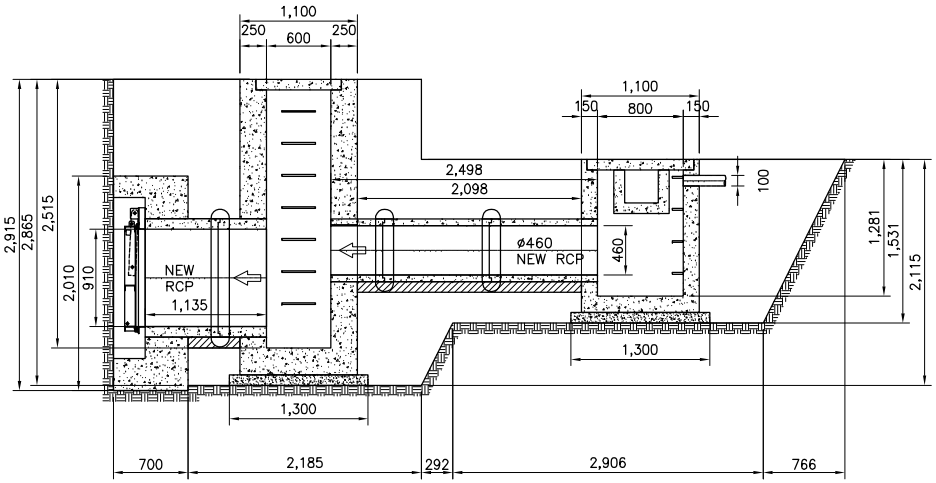
1 PLAN
SCALE A



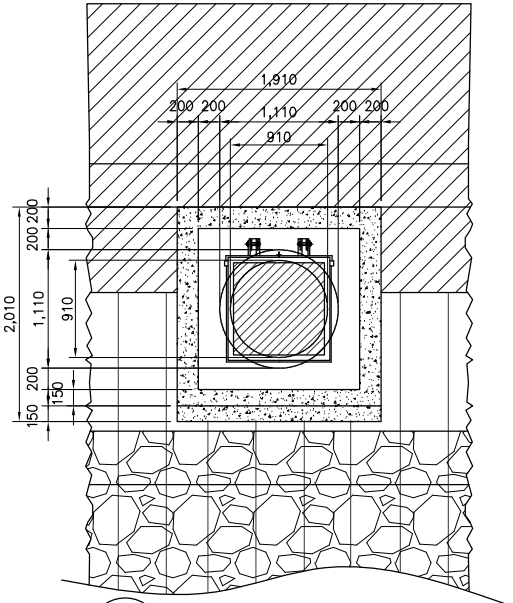
3 SECTION
SCALE A



4 SECTION (JB 99.1)
SCALE A



2 SECTION
SCALE A

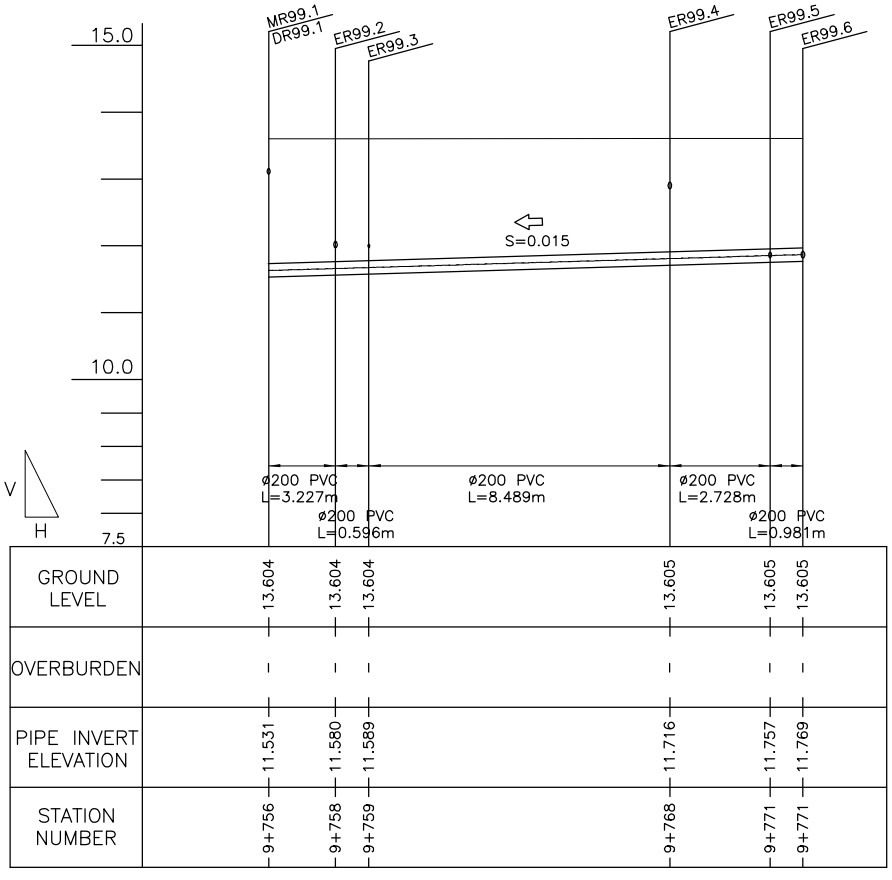


5 ELEVATION
SCALE B

3.438

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.20		L=16.26	3	pc
2. PVC Coupling	Dia=.200m			2	pc



Clearing (Manhole 99.6)

L1	1.3655	m	
W of Junction Manhole	1.1	m	A1=17.24 m^2
L2	2.098	m	A2=15.58 m^2
W of Manhole	1.1	m	**A=32.82** m^2
L3	0.485	m	
W1	5.975	m	
W2	3.931	m	

Clearing (Clearing 99.6 - 99.1)

W	3.1545	m	**A=50.54** m^2
L	16.021	m	

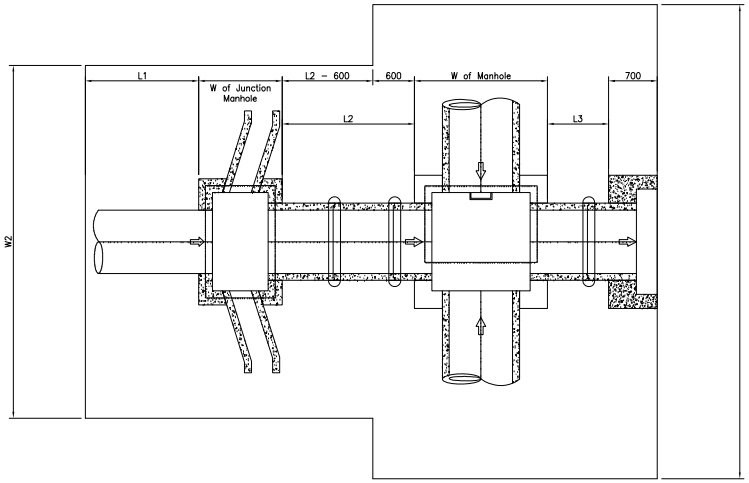
(Collector PVC) Downstream 99.6-99.1

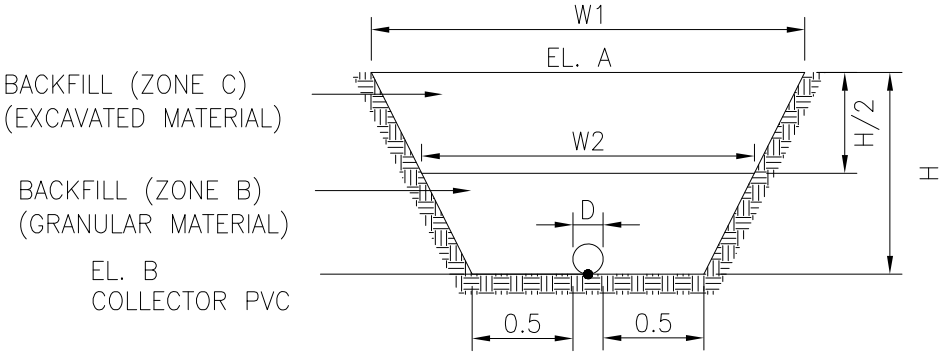
D	0.2	m	Excavation
W1	3.27	m	A=4.64 m^2
W2	2.24	m	Backfill Zone B
H	2.073	m	A=1.75 m^2
H/2	1.0365	m	Backfill Zone C
EL. A	13.604	m	A=2.86 m^2
EL. B	11.531	m	

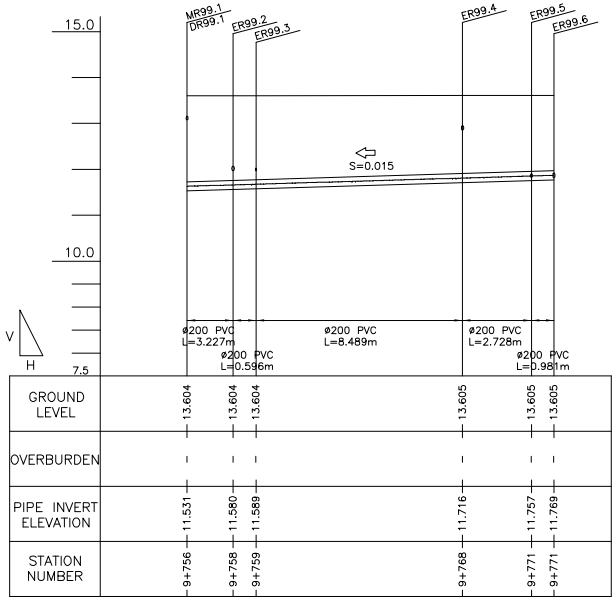
(Collector PVC) Upstream

D	0.2	m	Excavation
W1	3.04	m	A=3.89 m^2
W2	2.12	m	Backfill Zone B
H	1.836	m	A=1.49 m^2
H/2	0.918	m	Backfill Zone C
EL. A	13.605	m	A=2.37 m^2
EL. B	11.769	m	

Collector PVC 133C.6-134	Volume
Excavation	**69.31314** m^3
Backfill Zone B	**26.35224** m^3
Backfill Zone C	**42.45004** m^3


L1
W of Junction Manhole
L2 - 600
600
W of Manhole
700
L2
L3
W2
W1


BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
EL. B
COLLECTOR PVC
W1
EL. A
W2
H/2
H
D
0.5
0.5

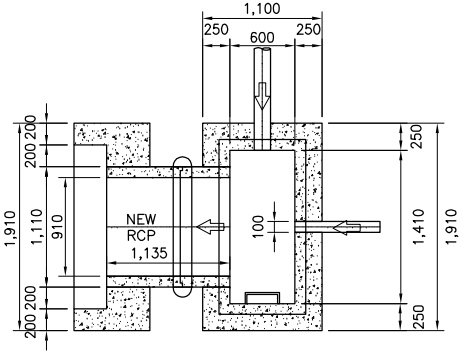

15.0
10.0
7.5
V
H
MR99.1
DR99.1
ER99.2
ER99.3
ER99.4
ER99.5
ER99.6
S=0.015
ø200 PVC L=3.227m
ø200 PVC L=0.596m
ø200 PVC L=8.489m
ø200 PVC L=2.728m
ø200 PVC L=0.981m
GROUND LEVEL
13.604
13.604
13.604
13.605
13.605
13.605
OVERBURDEN
PIPE INVERT ELEVATION
11.531
11.580
11.589
11.716
11.757
11.769
STATION NUMBER
9+756
9+758
9+759
9+768
9+771
9+771

QUANTITIES OF MANHOLE

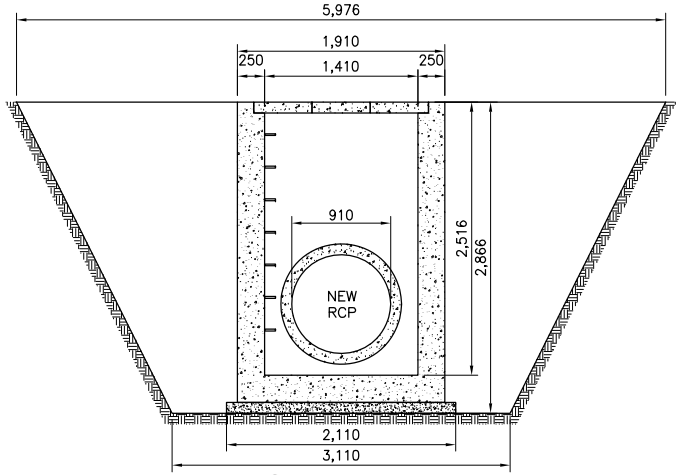
Manhole No.: MR 99.9

Location: 9 + 781

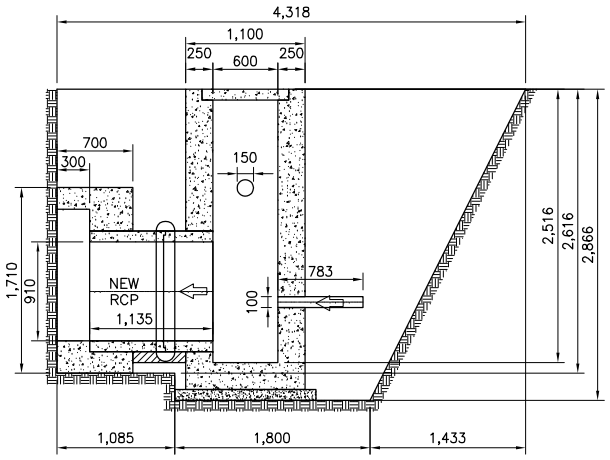
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.84	4.54	12.89	
		A2=7.21	4.54	32.77	
				45.66	m^3
2. Lev. Concrete	W=1.30 L=2.11	2.74	0.1	**0.27**	m^3
3. Bottom Slab	W=1.10 L=1.91	2.10	0.25	**0.53**	m^3
4. Wall					
Entire Wall	Wout=1.10	Aout=2.10			
	Lout=1.91				
	Win=0.60	Ain=0.85	2.516	3.158	m^3
	Lin=1.41				
		Anet=1.26			
Minus					
Pipe hole on Wall A	DiaA=0.15	0.02	0.25	0.00	
Pipe hole on Wall B	DiaB=0.10	0.01	0.25	0.00	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**2.91**	m^3
5. Conc. Cover	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=3.84	0.7	2.69	
	Lout=2.01				
	Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				1.62	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**38.05**	m3



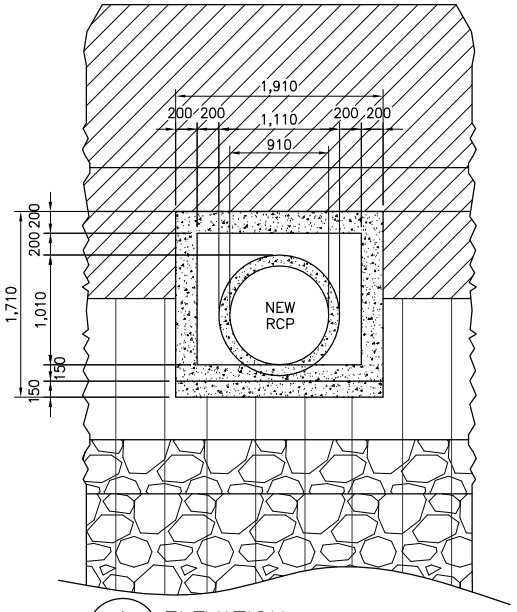
2 PLAN
SCALE A



3 SECTION
SCALE A



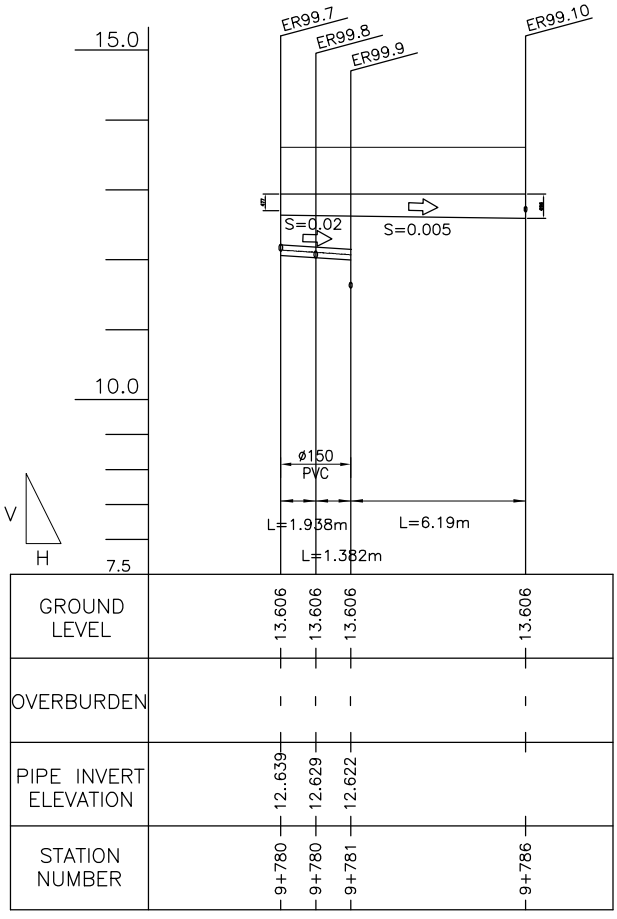
2 SECTION
SCALE A



4 ELEVATION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.15		L=3.39	1	pc
2. PVC Coupling	Dia=.150m			0	pc
3. U - Ditch					
Bottom	W=0.50 L=0.10	0.05	9.56	0.48	m^3
Wall	W=0.59 L=9.51	5.58	0.1	0.56	m^3
Top	W=0.50 L=0.10	0.05	9.51	0.48	m^3
4. Formworks				10.58	m3



Clearing (Manhole 99.9)

L1	2.033	m	
W of Manhole	1.1	m	**A=25.80** m^2
L2	0.485	m	
W	5.976	m	

Clearing (Collector 99.7 - 99.9)

W	2.726	m	**A=9.05** m^2
L	3.32	m	

Clearing (U - Ditch 99.9 - 99.10)

W	2.746	m	**A=17.00** m^2
L	6.19	m	

(Collector PVC) Downstream	99.7-99.9		
D	0.15	m	Excavation
W1	2.76	m	A=3.14 m^2
W2	1.95	m	Backfill Zone B
H	1.609	m	A=0.95 m^2
H/2	0.8045	m	Backfill Zone C
EL. A	13.606	m	A=1.90 m^2
EL. B	11.997	m	

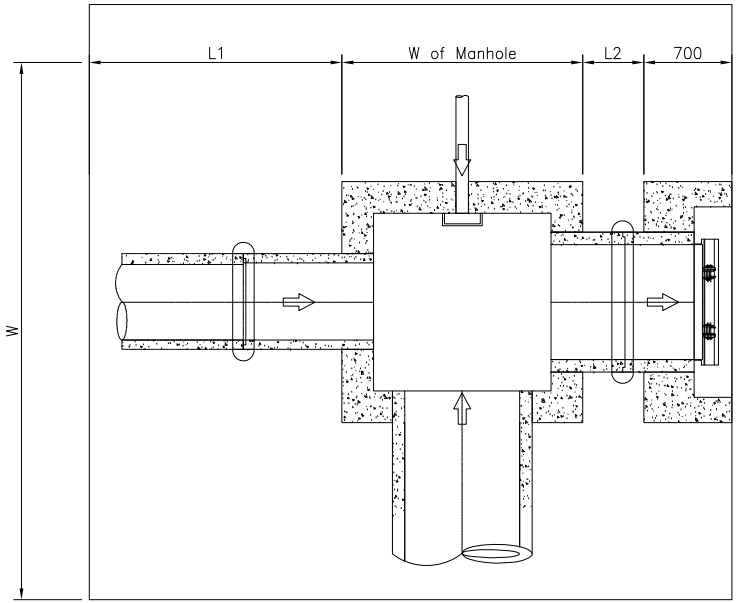
(Collector PVC) Upstream			
D	0.15	m	Excavation
W1	2.69	m	A=2.96 m^2
W2	1.92	m	Backfill Zone B
H	1.543	m	A=0.90 m^2
H/2	0.7715	m	Backfill Zone C
EL. A	13.606	m	A=1.78 m^2
EL. B	12.063	m	

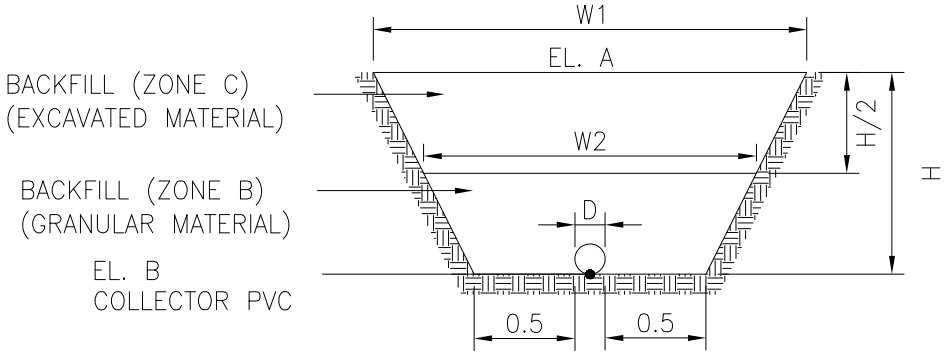
(U - Ditch) Downsteram	99.9 - 99.10		
d	1.015	m	Excavation
D	1.165	m	A=2.54 m^2
D/2	0.5825	m	Backfill Zone B
W1	2.765	m	A=0.81 m^2
W2	2.1825	m	Backfill Zone C
EL. A	13.606	m	A=1.15 m^2
EL. B	12.591	m	

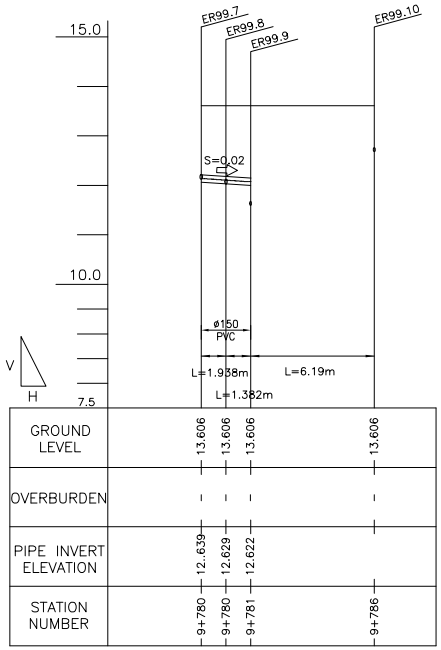
(U - Ditch) Upstream			
d	0.977	m	Excavation
D	1.127	m	A=2.44 m^2
D/2	0.5635	m	Backfill Zone B
W1	2.727	m	A=0.77 m^2
W2	2.1635	m	Backfill Zone C
EL. A	13.606	m	A=1.10 m^2
EL. B	12.629	m	

Collector PVC 99.7 -99.9	Volume	
Excavation	**10.34488**	m^3
Backfill Zone B	**3.137116**	m^3
Backfill Zone C	**6.224286**	m^3

U - Ditch 99.9 - 99.10		
Excavation	**15.49289**	m^3
Backfill Zone B	**4.9115**	m^3
Backfill Zone C	**6.985684**	m^3


L1
W of Manhole
L2
700
W


W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5

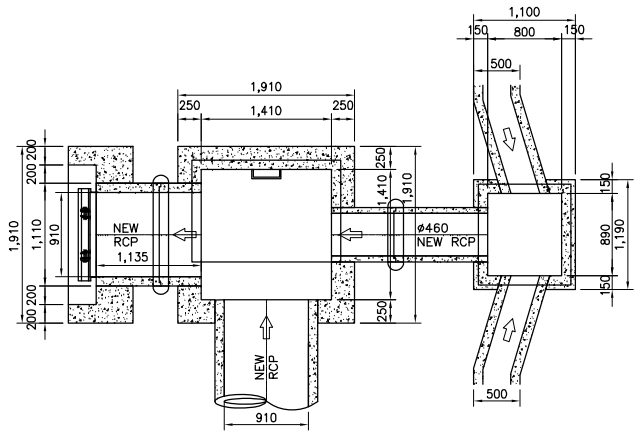

15.0
10.0
7.5
V
H
ER99.7
ER99.8
ER99.9
ER99.10
S=0.02
ø150
PVC
L=1.938m
L=6.19m
L=1.382m
GROUND LEVEL
13.606
13.606
13.606
13.606
OVERBURDEN
PIPE INVERT ELEVATION
12.639
12.629
12.622
STATION NUMBER
9+780
9+780
9+781
9+786

QUANTITIES OF MANHOLE

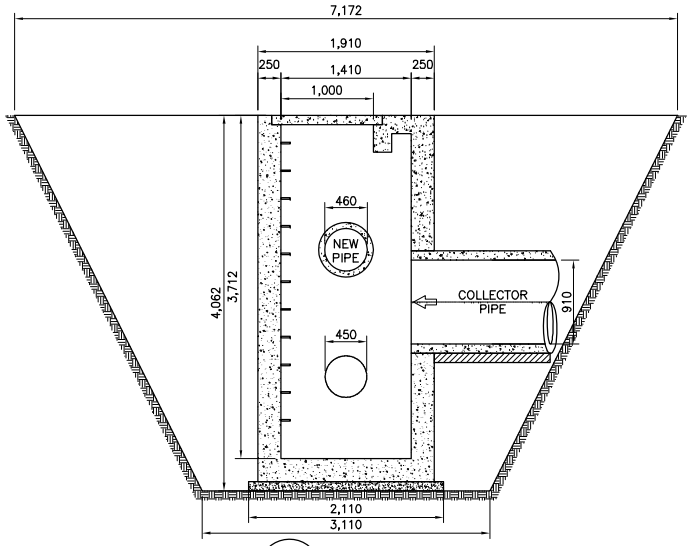
Manhole No.: MR 100

Location: 9 + 831

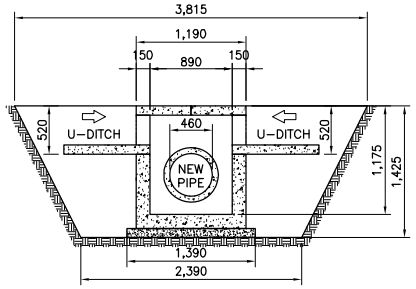
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.88	5.14	14.80	
		A2=12.17	5.14	62.54	
		A3=2.30	3.11	7.17	
		A4=2.56	3.11	7.97	
				92.48	m^3
2. Lev. Concrete (Manhole)	W=2.21 L=2.21	4.88	0.1	**0.49**	m^3
(Junction Box)	W=1.30 L=1.39	1.81	0.1	**0.18**	m^3
3. Bottom Slab (Manhole)	W=2.01 L=2.01	4.67	0.3	**1.40**	m^3
(Junction Box)	W=1.10 L=1.19	1.31	0.2	**0.26**	m^3
4. Wall					
Manhole	Wout=2.01 Lout=2.01	Aout=4.04			
	Win=1.41 Lin=1.41	Ain=1.99	3.712	7.617	m^3
		Anet=2.05			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.30	0.00	
Pipe hole on Wall B	DiaB=0.59	0.53	0.30	0.13	
Pipe hole on Wall C	DiaC=1.11	0.97	0.30	0.24	
Pipe hole on Wall D	DiaD=1.11	0.97	0.30	0.24	
Net Wall Vol.				**7.00**	m^3
Junction Box	Wout=1.10 Lout=1.19	Aout=1.31			
	Win=0.80 Lin=.89	Ain=0.71	1.175	0.701	m^3
		Anet=0.60			
Minus					
Depth of Ditch=0.52	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall B	DiaB=0.00	0.00	0.15	0.00	
Depth of Ditch=0.52	W=0.50	0.26	0.15	0.04	
Pipe hole on Wall D	DiaD=0.59	0.27	0.15	0.04	
Net Wall Vol.				**0.58**	m^3
5. Conc. Cover (Manhole)	L=1.61 W=0.80	1.288	0.1	**0.13**	m^3
(Junction Box)	L=1.19 W=1.00	1.19	0.1	**0.12**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=12			**11.36**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=3			**2.84**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91 Lout=3.21	Ain=6.13	0.7	4.29	
	Win=1.51 Lin=1.51	Aout=2.28	0.3	0.68	
	DiaD=1.11	Apipe=.97	0.4	0.39	
				3.22	m3
9. Outlet Pipe	Dia=.910m	L=1.14		2	pc
10. Conc. Collar (Outlet Pipe)	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Inlet Pipe	Dia=.460m	L=1.64		**2**	pc
11. Conc. Collar (Inlet Pipe)	D1=.586m D2=.766m	A1=0.27 A2=0.46 Anet=0.19	0.17 Qty=1	**0.032492864**	m3
12. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
13. Conc.Bedding (Inlet Pipe)	Dia=.590m	L=1.19		**0.070151**	m3
14. Backfill				**77.06**	m3



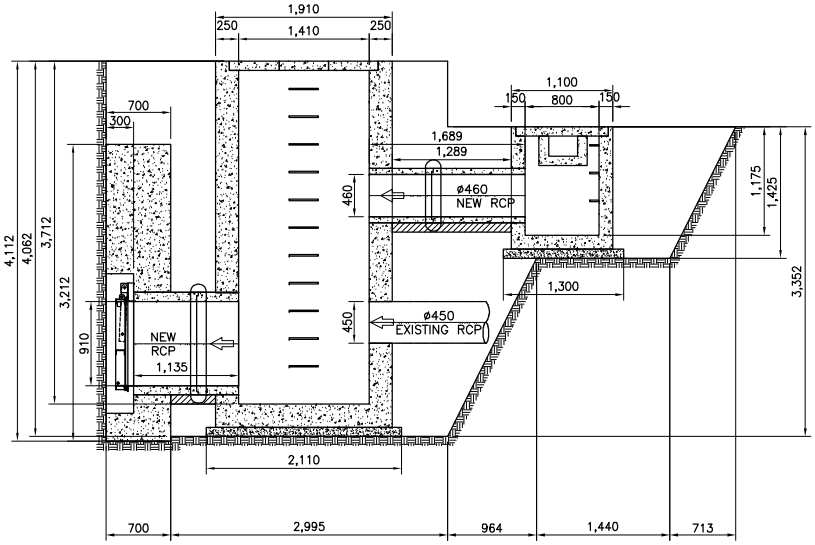
1 PLAN
SCALE A



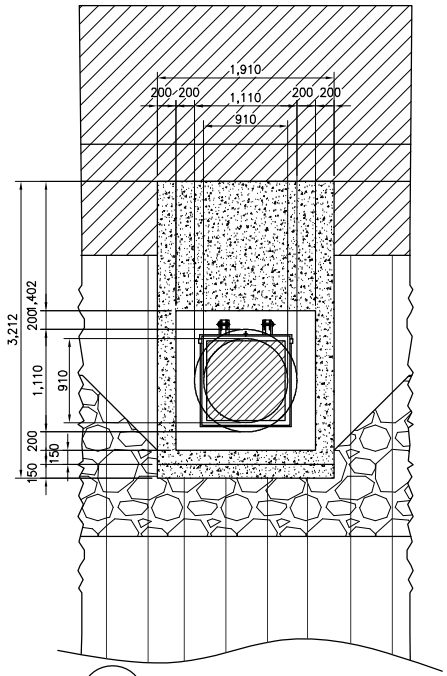
3 SECTION
SCALE A



4 SECTION (JB100)
SCALE B



2 SECTION
SCALE A



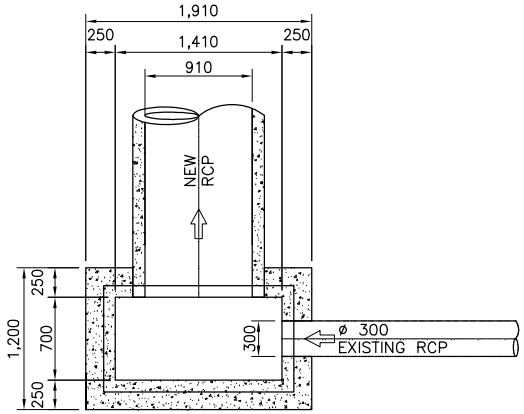
5 ELEVATION
SCALE B

QUANTITIES OF MANHOLE

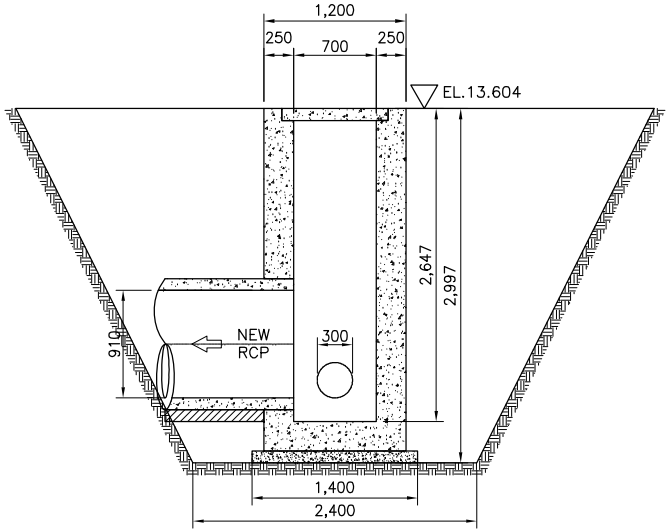
Manhole No.: MR 101

Location: 9 + 838

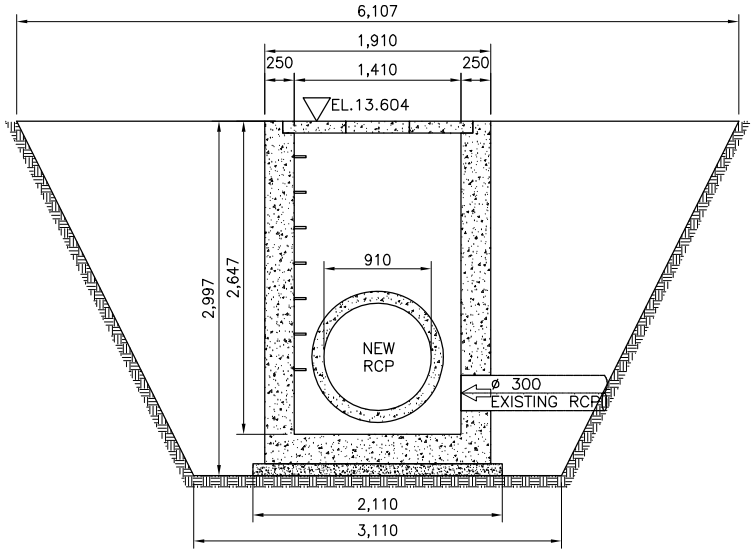
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation		A1=13.81	3.80	52.46	
				52.46	m^3
2. Lev. Concrete	W=2.11 L=1.40	2.95	0.1	**0.30**	m^3
3. Bottom Slab	W=1.91 L=1.20	2.29	0.25	**0.57**	m^3
4. Wall					
Entire Wall	Wout=1.91 Lout=1.20	Aout=2.29			
	Win=1.41 Lin=.70	Ain=0.99	2.647	3.454	m^3
	.	Anet=1.31			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.40	0.13	0.25	0.03	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.18**	m^3
5. Conc. Cover	L=0.90 W=1.61	1.449	0.1	**0.14**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Backfill				**43.72**	m3



1 PLAN
SCALE A



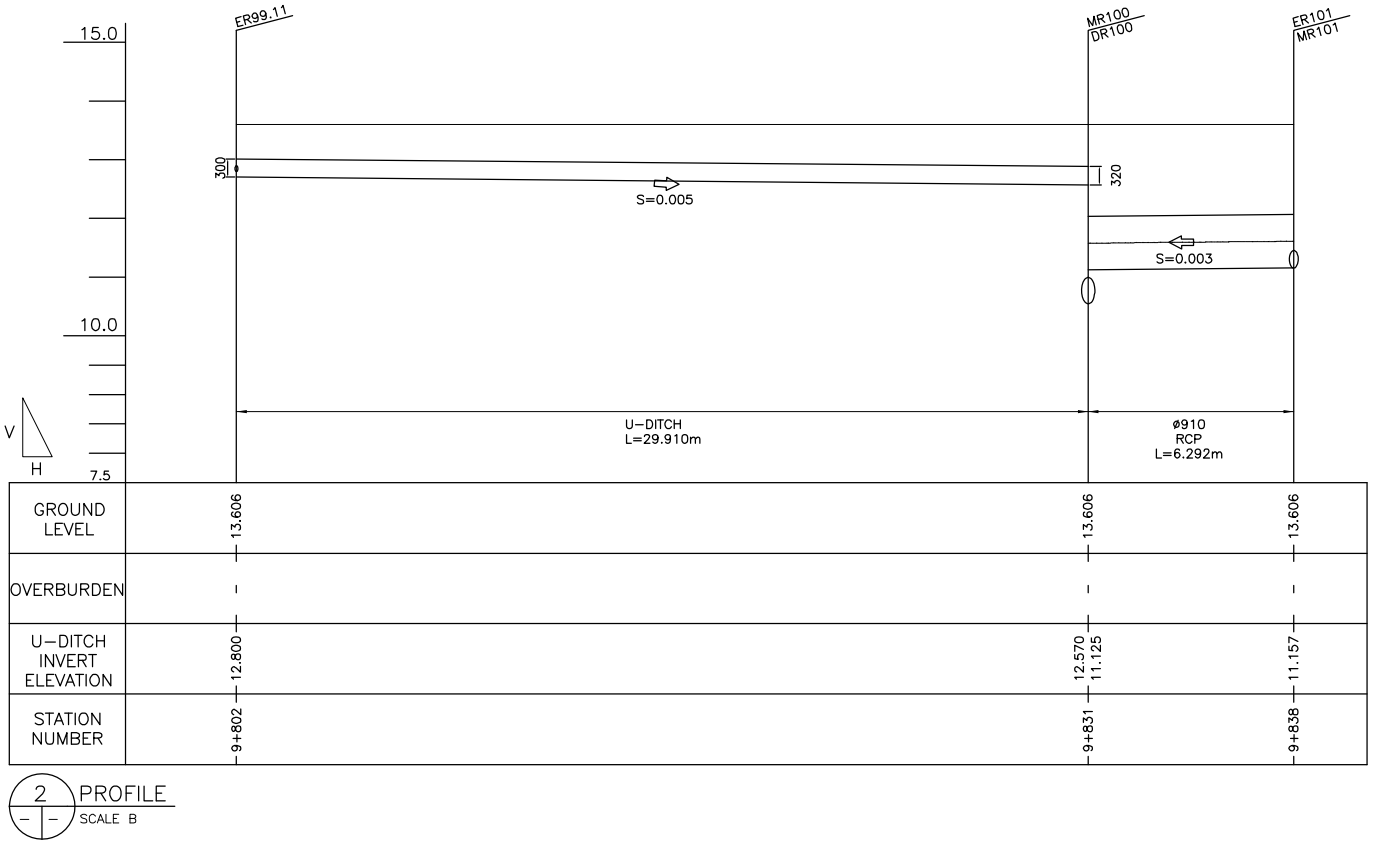
3 SECTION
SCALE A



2 SECTION
SCALE A

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=6.31	7	pc
2. Conc. Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=6	0.35	m3
3. Conc. Bedding	Dia=.910m	L=6.31		0.57	m3
4. U - Ditch					
Bottom	W=0.50 L=0.10	0.05	30.06	1.50	m^3
Wall	W=0.31 L=29.91	9.27	0.1	0.93	m^3
Top	W=0.50 L=0.10	0.05	30.06	1.50	m^3
5. Formworks				33.97	m3



2 PROFILE
SCALE B

Clearing (Manhole 100)

L1	1.3125	m	
W of Junction Manhole	1.1	m	Am=21.48 m^2
L2	1.289	m	Ajb=11.83 m^2
W of Manhole	1.91	m	**At=33.31** m^2
L3	0.485	m	
W1	7.172	m	
W2	3.815	m	

Clearing (Manhole 101)

W	6.107	m	**A=32.96** m^2
L	5.397	m	

Clearing (Collector 101 - 100)

W	4.775	m	**A=30.04** m^2
L	6.292	m	

Clearing (U - Ditch 99.11 - 100)

W	2.746	m	**A=82.13** m^2
L	29.91	m	

(Collector Pipe) Downstream	101 - 100		
Do	1.11	m	Excavation
Di	0.91	m	A=9.25 m^2
tpipe	0.1	m	Backfill Zone B
H	2.681	m	A=2.54 m^2
EL. A	13.606	m	Backfill Zone C
EL. B	11.125	m	A=2.98 m^2
W	4.791	m	

(Collector Pipe) Upstream

Do	1.11	m	Excavation
Di	0.91	m	A=9.10 m^2
tpipe	0.1	m	Backfill Zone B
H	2.649	m	A=2.48 m^2
EL. A	13.606	m	Backfill Zone C
EL. B	11.157	m	A=2.94 m^2
W	4.759	m	

(U - Ditch) Downsteram	99.11 - 100		
d	1.015	m	Excavation
D	1.165	m	A=2.54 m^2
D/2	0.5825	m	Backfill Zone B
W1	2.765	m	A=0.81 m^2
W2	2.1825	m	Backfill Zone C
EL. A	13.606	m	A=1.15 m^2
EL. B	12.591	m	

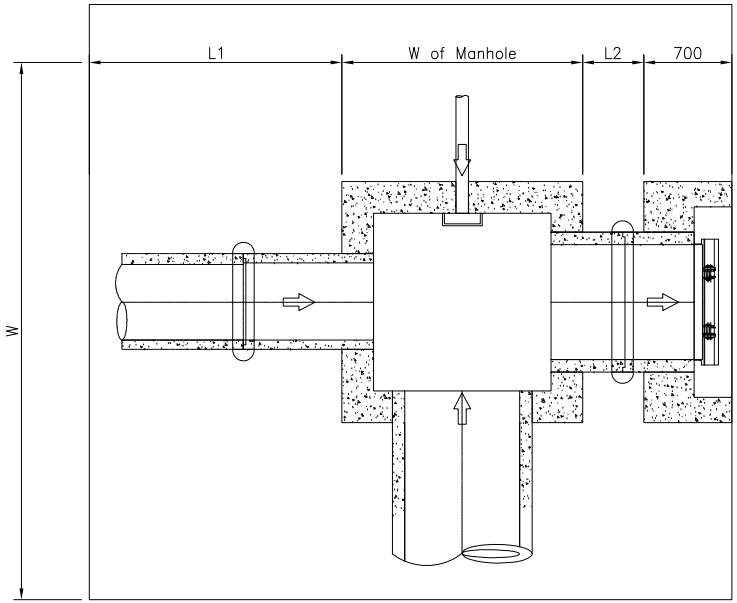
(U - Ditch) Upstream

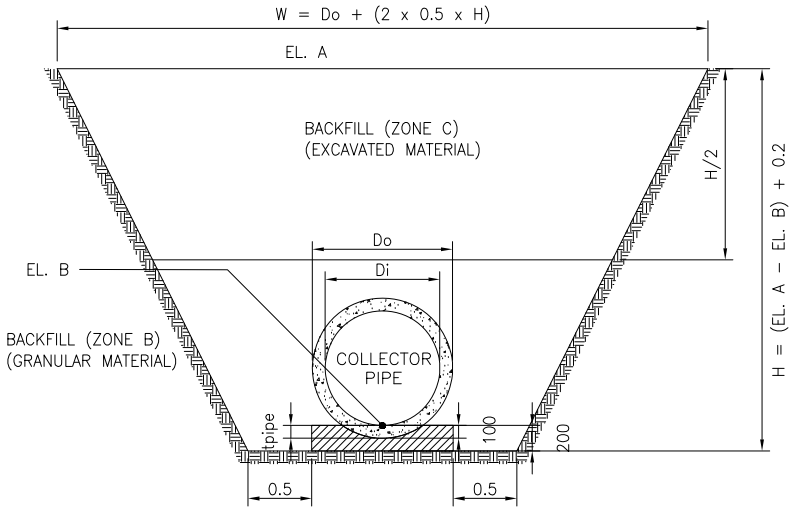
d	0.977	m	Excavation
D	1.127	m	A=2.44 m^2
D/2	0.5635	m	Backfill Zone B
W1	2.727	m	A=0.77 m^2
W2	2.1635	m	Backfill Zone C
EL. A	13.606	m	A=1.10 m^2
EL. B	12.629	m	

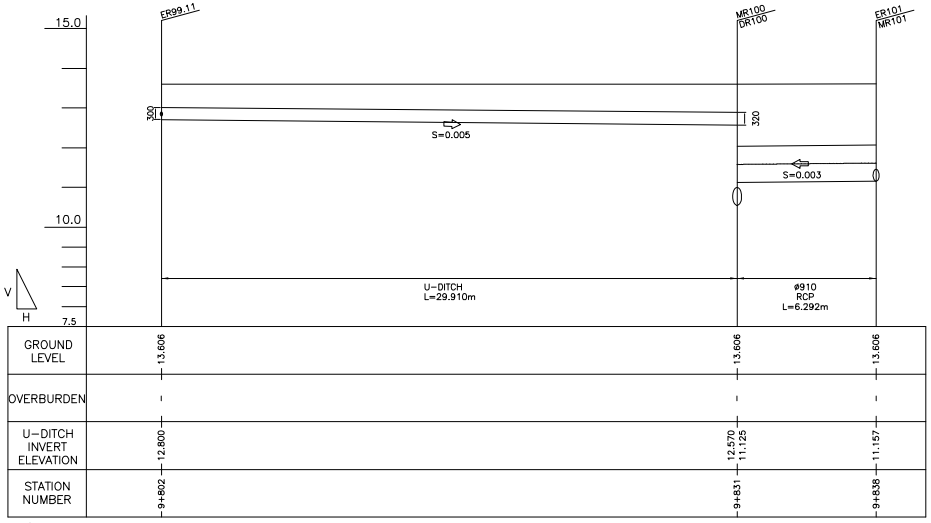
Collector Pipe 101 - 100	Volume	
Excavation	**57.89844**	m^3
Backfill Zone B	**15.83838**	m^3
Backfill Zone C	**18.67923**	m^3

U - Ditch 99.11 - 100

Excavation	**74.86146**	m^3
Backfill Zone B	**23.7323**	m^3
Backfill Zone C	**33.75474**	m^3







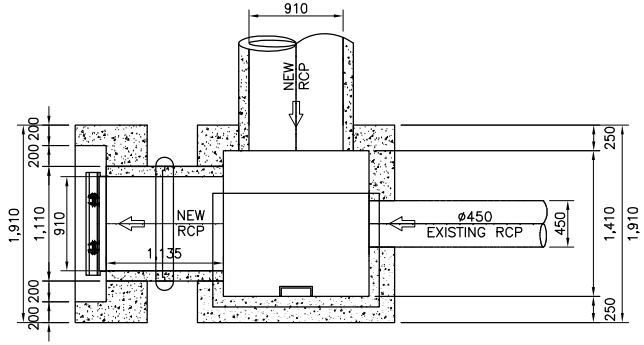
2 PROFILE
SCALE B

QUANTITIES OF MANHOLE

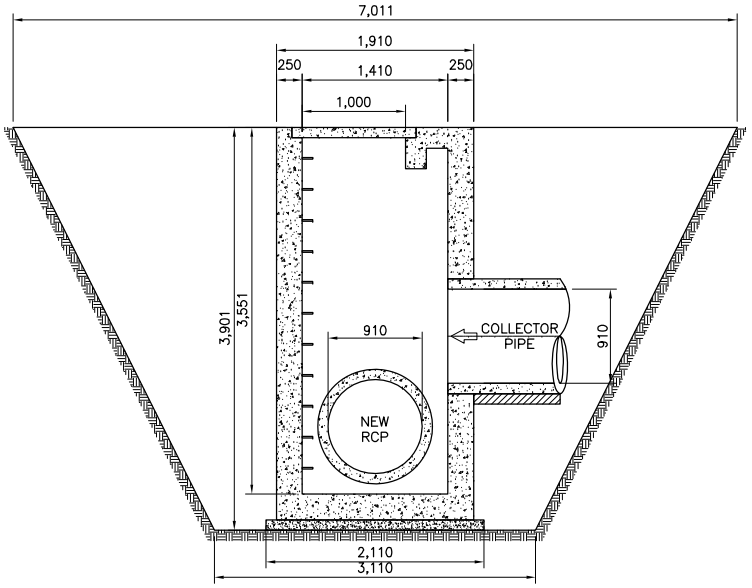
Manhole No.: MR 102.1

Location: 9 + 881

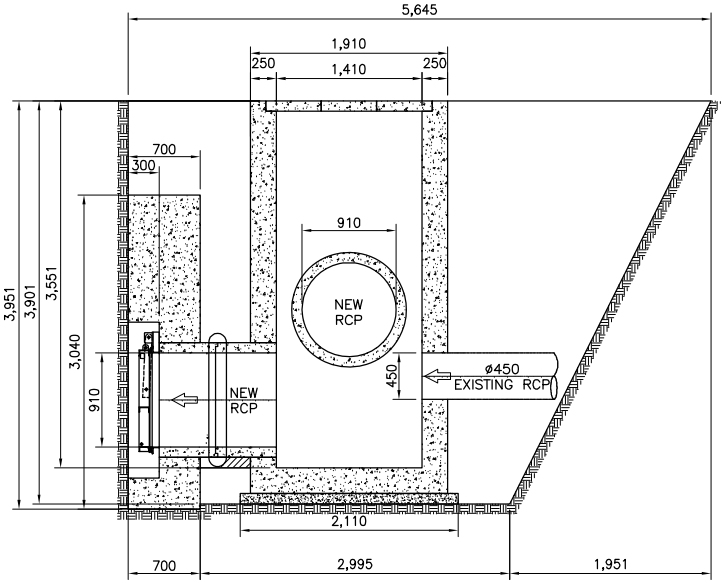
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.84	4.55	12.93	
		A2=7.21	4.55	32.76	
				45.69	m^3
2. Lev. Concrete	W=2.21 L=2.21	4.88	0.1	**0.49**	m^3
3. Bottom Slab	W=2.01 L=2.01	4.67	0.3	**1.40**	m^3
4. Wall					
Entire Wall	Wout=2.01	Aout=4.04			
	Lout=2.01 Win=1.41	Ain=1.99	3.551	7.287	m^3
	Lin=1.41				
		Anet=2.05			
Minus					
Pipe hole on Wall A	DiaA=1.11	0.97	0.25	0.24	
Pipe hole on Wall B	DiaB=0.58	0.26	0.25	0.07	
Pipe hole on Wall C	DiaC=0.00	0.00	0.25	0.00	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**6.74**	m^3
5. Conc. Cover	L=1.61 W=1.10	1.771	0.1	**0.18**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=11			**10.42**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91	Ain=5.81	0.7	4.06	
	Lout=3.04 Win=1.51	Aout=2.28	0.3	0.68	
	Lin=1.51				
	DiaD=1.11	Apipe=.97	0.4	0.39	
				2.99	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m	A1=0.97	0.17		
	D2=1.290m	A2=1.31		**0.057679641**	m3
		Anet=0.34	Qty=1		
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**38.08**	m3



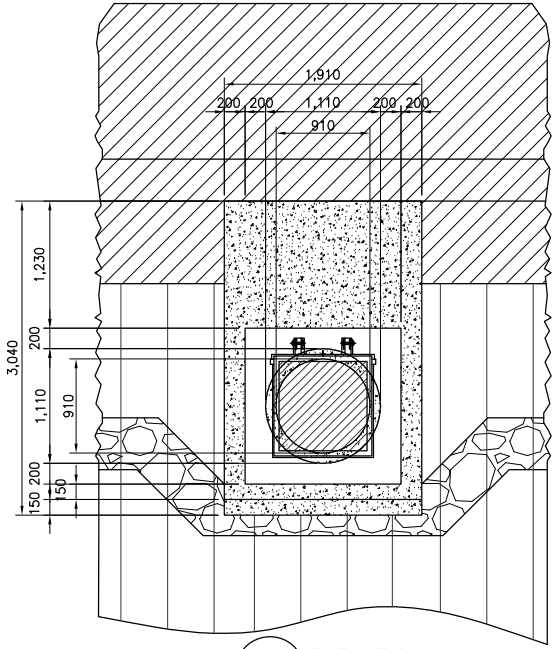
1 PARTIAL PLAN OF MANHOLE (MR102.1)
SCALE A



3 SECTION
SCALE A



2 SECTION
SCALE A



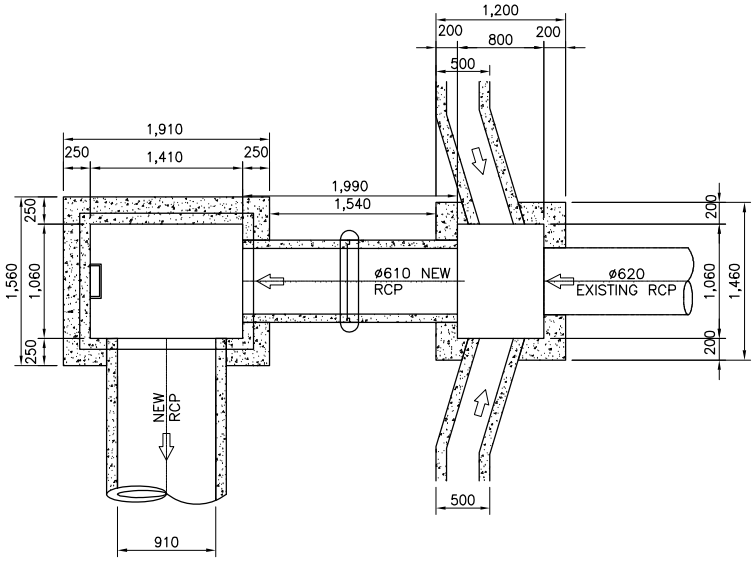
4 ELEVATION
SCALE A

QUANTITIES OF MANHOLE

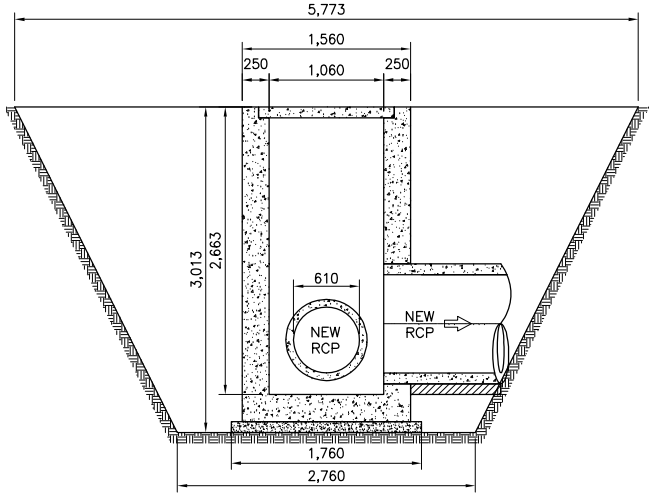
Manhole No.: MR 102

Location: 9 + 876

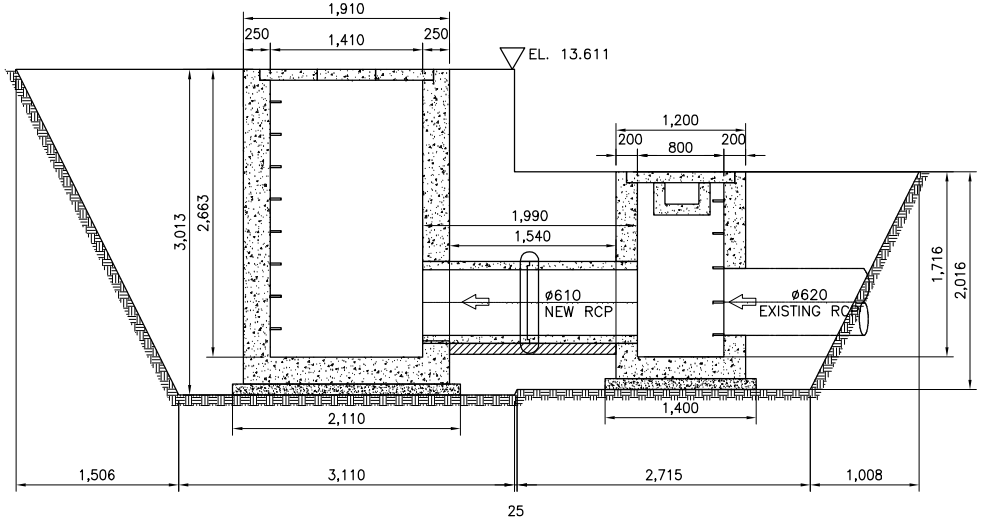
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=11.64	4.27	49.66	
		A2=0.06	3.67	0.23	
		A3=6.34	3.67	23.25	
				73.14	m^3
2. Lev. Concrete	W=2.11	3.71	0.1	**0.37**	m^3
(Manhole)	L=1.76				
(Junction Box)	W=1.50	2.64	0.1	**0.26**	m^3
	L=1.76				
3. Bottom Slab	W=1.91	2.98	0.25	**0.74**	m^3
(Manhole)	L=1.56				
(Junction Box)	W=1.30	2.03	0.25	**0.51**	m^3
	L=1.56				
4. Wall					
Manhole	Wout=1.91	Aout=2.98			
	Lout=1.56				
	Win=1.41	Ain=1.49	2.663	3.955	m^3
	Lin=1.06				
		Anet=1.49			
Minus					
Pipe hole on Wall A	DiaA=0.00	0.00	0.25	0.00	
Pipe hole on Wall B	DiaB=0.76	0.45	0.25	0.11	
Pipe hole on Wall C	DiaC=1.11	0.97	0.25	0.24	
Pipe hole on Wall D	DiaD=0.00	0.00	0.25	0.00	
Net Wall Vol.				**3.60**	m^3
Junction Box	Wout=1.30	Aout=2.03			
	Lout=1.56				
	Win=0.80	Ain=0.85	1.716	2.025	m^3
	Lin=1.06				
		Anet=1.18			
Minus					
Depth of Ditch=0.83	W=0.50	0.42	0.25	0.06	
Pipe hole on Wall B	DiaB=0.77	0.47	0.25	0.07	
Depth of Ditch=0.40	W=0.50	0.20	0.25	0.03	
Pipe hole on Wall D	DiaD=0.76	0.45	0.25	0.07	
Net Wall Vol.				**1.79**	m^3
5. Conc. Cover	L=1.26	2.0286	0.1	**0.20**	m^3
(Manhole)	W=1.61				
(Junction Box)	L=1.00	1.26	0.1	**0.13**	m^3
	W=1.26				
6. Ladder Rung	L=0.60			0.000120637	m^3
(Manhole)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
	L=0.60			0.000120637	m^3
(Junction Box)	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=5			**4.74**	kg
7. Inlet Pipe	Dia=.610m	L=2.04		**3**	pc
8. Conc. Collar	D1=.586m	A1=0.27	0.17		
(Inlet Pipe)	D2=.766m	A2=0.46		**0.032492864**	m3
		Anet=0.19	Qty=1		
9. Conc.Bedding	Dia=.760m	L=1.54		**0.11704**	m3
(Inlet Pipe)					
10. Backfill				**60.95**	m3



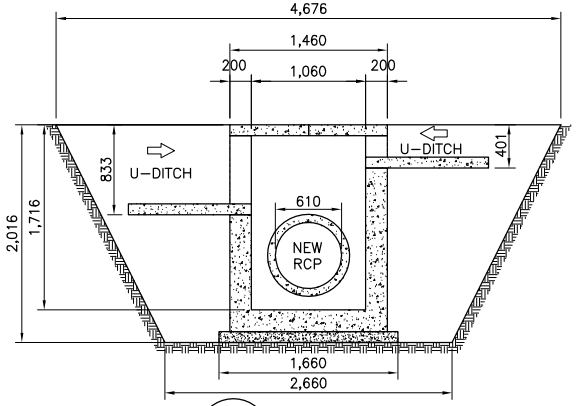
3 PLAN (MANHOLE 102)
SCALE C



5 SECTION
SCALE C



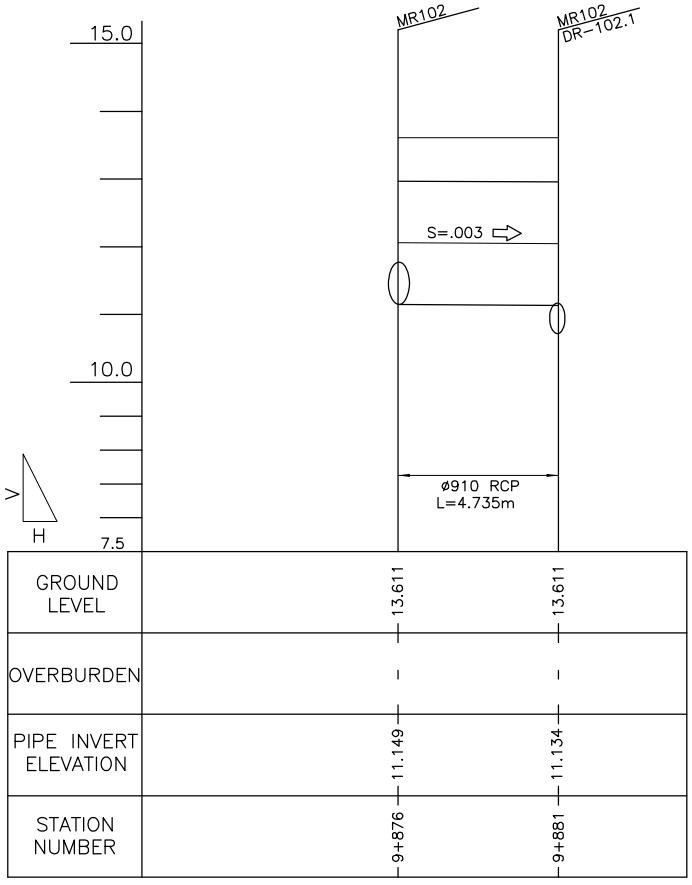
4 SECTION
SCALE C



6 SECTION(JB102)
SCALE C

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (RCP)	Dia=0.91		L=4.75	5	pc
2. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=4	0.230718564	m3
3. Conc. Bedding	Dia=.910m	L=4.75		0.43	m3
4. Formworks				4.64	m3



Clearing (Manhole 102.1)

L1	2.5505	m	
W of Manhole	1.91	m	**A=39.58** m^2
L2	0.485	m	
W	7.011	m	

Clearing (Manhole 102)

L4	1.653	m	
W of Junction Manhole	1.2	m	A1=26.65 m^2
L5	1.54	m	A2=17.74 m^2
W of Manhole	1.91	m	**At=44.39** m^2
L6	2.1065	m	
W3	5.773	m	
W4	4.676	m	

Clearing (Collector 102 - 102.1)

W	4.7795	m	**A=22.63** m^2
L	4.735	m	

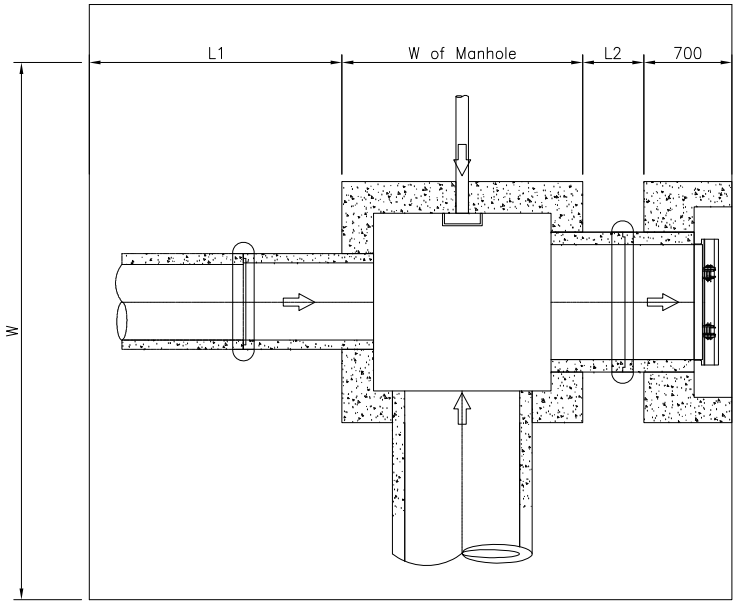
(Collector Pipe) Downstream

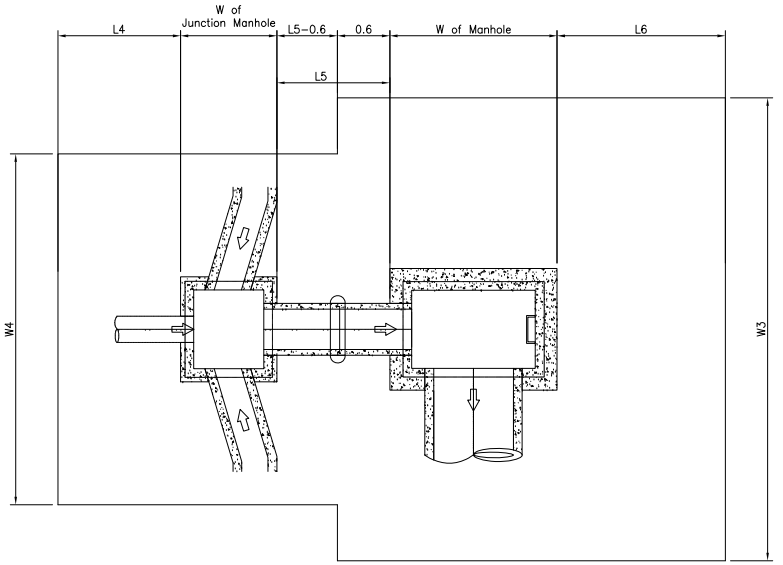
Do	1.11	m	Excavation
Di	0.91	m	A=9.23 m^2
tpipe	0.1	m	Backfill Zone B
H	2.677	m	A=2.53 m^2
EL. A	13.611	m	Backfill Zone C
EL. B	11.134	m	A=2.98 m^2
W	4.787	m	

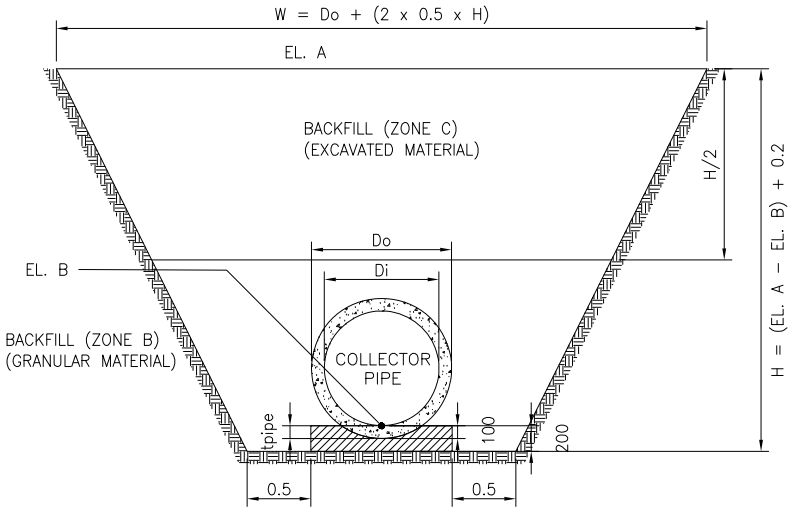
(Collector Pipe) Upstream

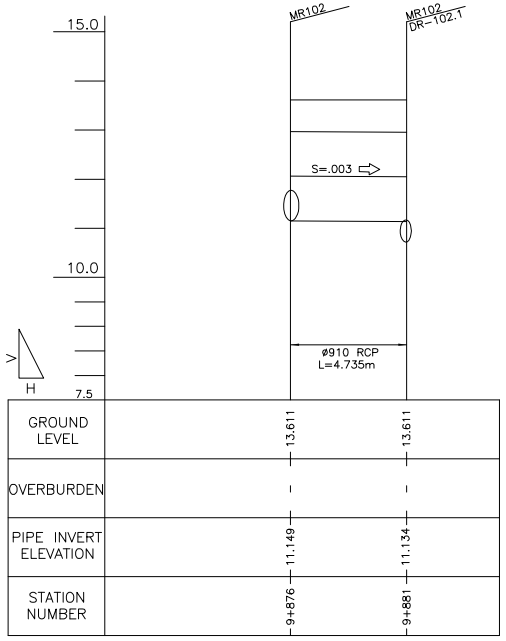
Do	1.11	m	Excavation
Di	0.91	m	A=9.16 m^2
tpipe	0.1	m	Backfill Zone B
H	2.662	m	A=2.50 m^2
EL. A	13.611	m	Backfill Zone C
EL. B	11.149	m	A=2.96 m^2
W	4.772	m	

Collector Pipe	Volume	
Excavation	**43.67268**	m^3
Backfill Zone B	**11.96**	m^3
Backfill Zone C	**14.09**	m^3


L1
W of Manhole
L2
700
W


W of
Junction Manhole
L4
L5-0.6
0.6
W of Manhole
L6
L5
W4
W3


W = Do + (2 x 0.5 x H)
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
H/2
Do
Di
EL. B
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
COLLECTOR
PIPE
tpipe
100
200
H = (EL. A - EL. B) + 0.2
0.5
0.5

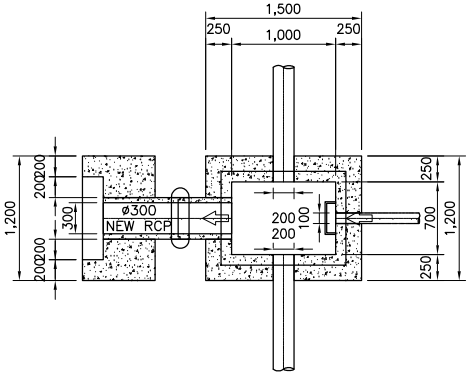

15.0
10.0
7.5
V
H
MR102
MR102
DR-102.1
S=.003
ø910 RCP
L=4.735m
GROUND LEVEL
13.611
13.611
OVERBURDEN
-
-
PIPE INVERT ELEVATION
11.149
11.134
STATION NUMBER
9+876
9+881

QUANTITIES OF MANHOLE

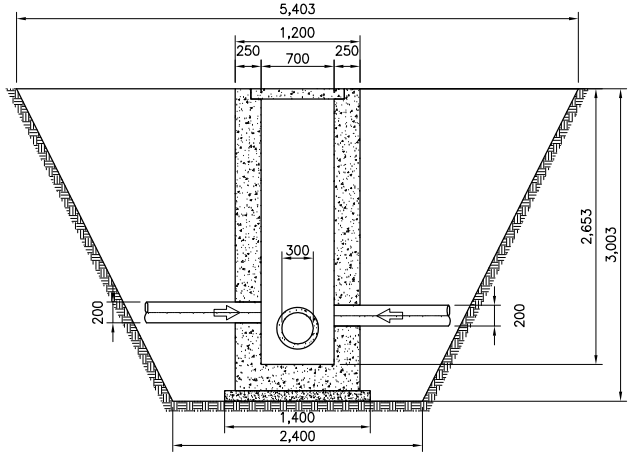
Manhole No.: MR 102.6

Location: 9 + 895

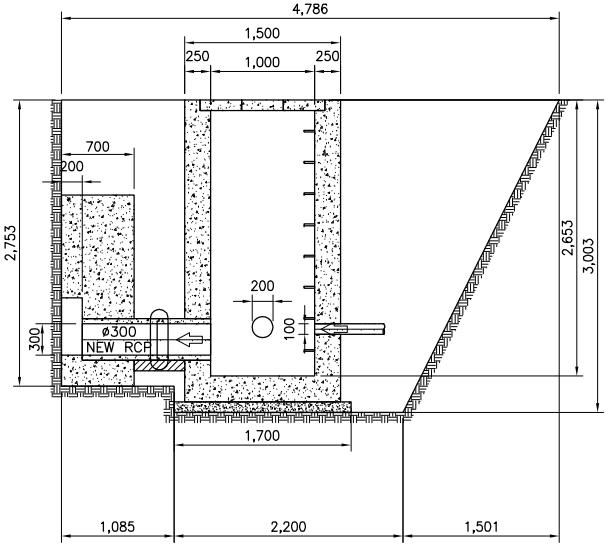
Item	W or L	Area	Thkness/Ht	Vol./Wt.	Unit
1. Excavation					
		A1=2.99	3.90	11.65	
		A2=8.86	3.90	34.57	
				46.22	m^3
2. Lev. Concrete	W=1.70 L=2.11	3.59	0.1	**0.36**	m^3
3. Bottom Slab	W=1.50 L=1.91	2.87	0.25	**0.72**	m^3
4. Wall					
Entire Wall	Wout=1.50 Lout=1.91	Aout=2.87			
	Win=1.00 Lin=1.41	Ain=1.41	2.653	3.860	m^3
		Anet=1.46			
Minus					
Pipe hole on Wall A	DiaA=0.20	0.03	0.25	0.01	
Pipe hole on Wall B	DiaB=0.10	0.01	0.25	0.00	
Pipe hole on Wall C	DiaC=0.20	0.03	0.25	0.01	
Pipe hole on Wall D	DiaD=1.11	0.97	0.25	0.24	
Net Wall Vol.				**3.60**	m^3
5. Conc. Cover	L=1.61 W=1.20	1.932	0.1	**0.19**	m^3
6. Ladder Rung	L=0.60			0.000120637	m^3
	Dia=.016m	0.000201062		0.95	kg/pc
	Qty=8			**7.58**	kg
7. Flapgate				**1**	pc
8. Conc. Mouth	Wout=1.91 Lout=2.14	Ain=4.09	0.7	2.86	
	Win=1.51 Lin=1.51	Aout=2.28	0.2	0.46	
	DiaD=1.11	Apipe=.97	0.5	0.48	
				1.92	m3
9. Outlet Pipe	Dia=.910m	L=1.14		**2**	pc
10. Concrete Collar	D1=1.110m D2=1.290m	A1=0.97 A2=1.31 Anet=0.34	0.17 Qty=1	**0.057679641**	m3
11. Conc. Bedding (Outlet Pipe)	Dia=1.110m	L=0.49		**0.053835**	m3
12. Backfill				**38.52**	m3



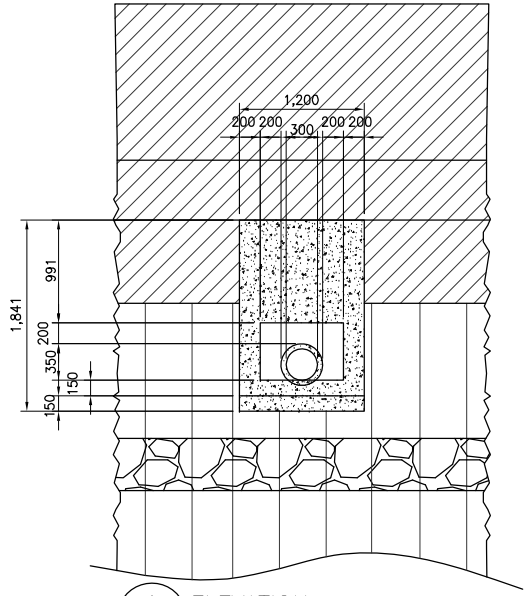
1 PLAN
SCALE A



3 SECTION
SCALE A



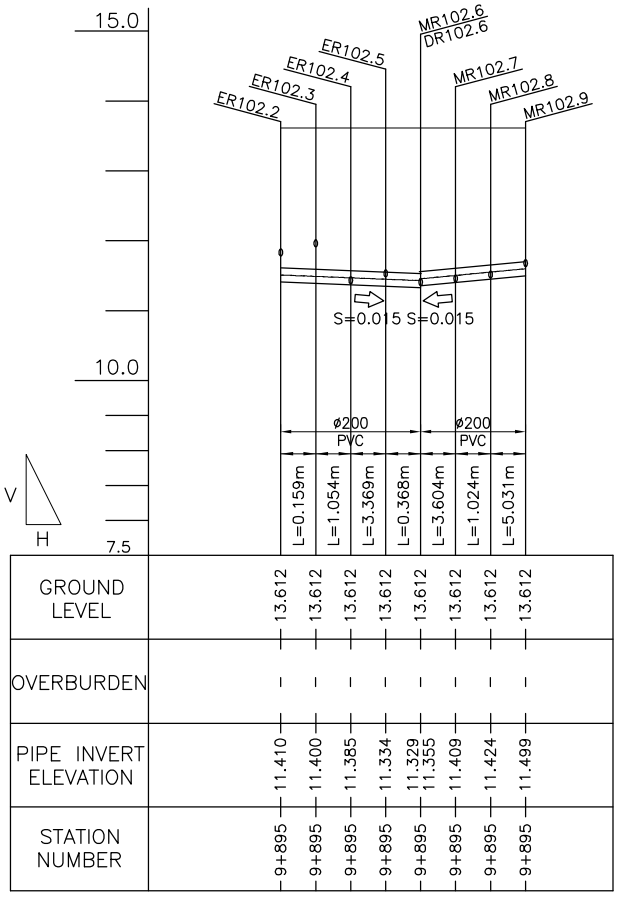
2 SECTION
SCALE A



4 ELEVATION
SCALE B

QUANTITIES

Item	W or L	Area	Thkness/Length	Vol./Quantity	Unit
1.Collector Pipe (PVC)	Dia=0.20		L=14.83	3	pc
2. PVC Coupling	Dia=0.20			2	



Clearing (Manhole 102.6)

L1	2.1015	m	
W of Manhole	1.5	m	**A=25.86** m^2
L2	0.485	m	
W	5.403	m	

Clearing (Clearing 102.2 - 102.6)

W	3.4425	m	**A=17.04** m^2
L	4.95	m	

Clearing (Clearing 102.9 - 102.6)

W	3.385	m	**A=32.70** m^2
L	9.659	m	

(Collector PVC) Downstream	102.2-102.6		
D	0.2	m	Excavation
W1	3.48	m	A=5.35 m^2
W2	2.34	m	Backfill Zone B
H	2.283	m	A=1.99 m^2
H/2	1.1415	m	Backfill Zone C
EL. A	13.612	m	A=3.32 m^2
EL. B	11.329	m	

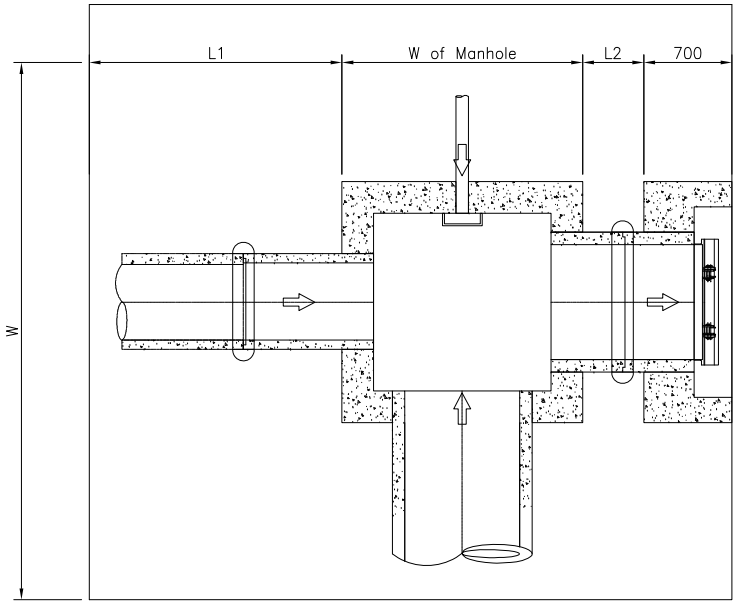
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	3.40	m	A=5.07 m^2
W2	2.30	m	Backfill Zone B
H	2.202	m	A=1.90 m^2
H/2	1.101	m	Backfill Zone C
EL. A	13.612	m	A=3.14 m^2
EL. B	11.41	m	

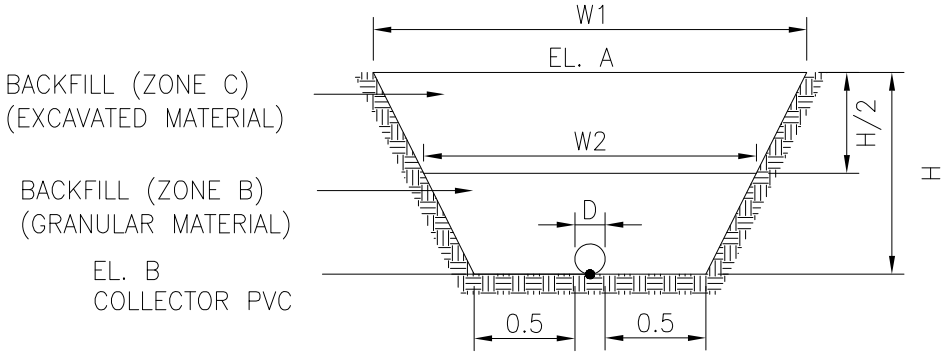
(Collector PVC) Downstream	102.9-102.6		
D	0.2	m	Excavation
W1	3.46	m	A=5.26 m^2
W2	2.33	m	Backfill Zone B
H	2.257	m	A=1.96 m^2
H/2	1.1285	m	Backfill Zone C
EL. A	13.612	m	A=3.26 m^2
EL. B	11.355	m	

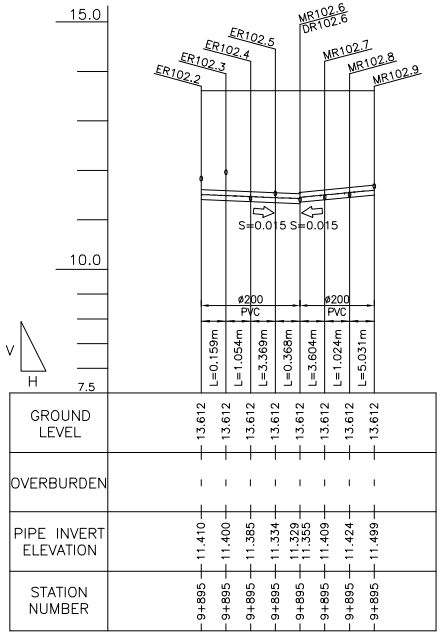
(Collector PVC) Upstream			
D	0.2	m	Excavation
W1	3.31	m	A=4.77 m^2
W2	2.26	m	Backfill Zone B
H	2.113	m	A=1.79 m^2
H/2	1.0565	m	Backfill Zone C
EL. A	13.612	m	A=2.94 m^2
EL. B	11.499	m	

Collector PVC 102.2-102.6	Volume
Excavation	**26.15737** m^3
Backfill Zone B	**9.761565** m^3
Backfill Zone C	**16.23796** m^3

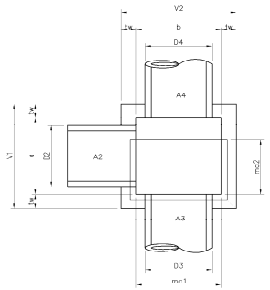
Collector PVC 102.9-102.6	Volume
Excavation	**49.13417** m^3
Backfill Zone B	**18.40199** m^3
Backfill Zone C	**30.42418** m^3


L1
W of Manhole
L2
700
W

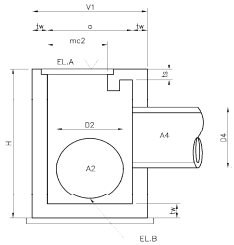

W1
EL. A
BACKFILL (ZONE C)
(EXCAVATED MATERIAL)
W2
H/2
H
BACKFILL (ZONE B)
(GRANULAR MATERIAL)
D
EL. B
COLLECTOR PVC
0.5
0.5


15.0
10.0
7.5
V
H
ER102.2
ER102.3
ER102.4
ER102.5
MR102.6
DR102.6
MR102.7
MR102.8
MR102.9
S=0.015
S=0.015
ø200 PVC
ø200 PVC
L=0.159m
L=1.054m
L=3.369m
L=0.368m
L=3.604m
L=1.024m
L=5.031m
GROUND LEVEL
OVERBURDEN
PIPE INVERT ELEVATION
STATION NUMBER
13.612
11.410
11.400
11.385
11.334
11.329
11.355
11.409
11.424
11.499
9+895

QUANTITIES OF MANHOLE																		
Manhole No.	El. A	El. B	tw	ts	mc1	mc2	D2	D3	D4	V1	V2	A2	A3	A4	H	a	b
	m	m	m	m	m	m	m	m	m	m	m	m2	m2	m2	m	m	m
MR 68	13.52	10.92	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	3.05	1.41	0.60
MR 69	13.52	11.29	0.25	0.00	0.60	1.41	1.11	0.94	0.00	1.91	1.10	0.97	0.69	0.00	2.68	1.41	0.60
MR 70	13.53	11.07	0.25	0.00	0.60	1.41	1.11	0.76	0.00	1.91	1.10	0.97	0.45	0.00	2.90	1.41	0.60
MR 70A	13.53	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.69	1.41	0.60
MR 70A.2	13.53	10.84	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	3.14	1.41	0.60
MR 70C	13.54	10.84	0.25	0.20	1.00	1.00	1.11	0.59	0.00	1.50	1.91	0.97	0.27	0.00	3.15	1.00	1.41
MR 71	13.54	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.70	1.41	0.60
MR 74A	13.55	10.27	0.25	0.00	1.00	1.41	1.11	0.00	0.00	1.91	1.50	0.97	0.00	0.00	3.72	1.41	1.00
MR 74A.2	13.55	11.29	0.25	0.20	1.00	1.41	1.11	0.59	1.11	1.91	1.91	0.97	0.27	0.97	2.71	1.41	1.41
MR 75	13.55	11.29	0.25	0.20	1.00	1.41	1.11	1.11	0.76	1.91	1.91	0.97	0.97	0.45	2.71	1.41	1.41
MR 76A	13.55	11.29	0.25	0.00	0.60	1.41	1.11	0.94	0.00	1.91	1.10	0.97	0.69	0.00	2.71	1.41	0.60
MR 76A.2	13.55	11.29	0.25	0.00	0.60	1.41	1.11	0.40	0.00	1.91	1.10	0.97	0.13	0.00	2.71	1.41	0.60
MR 77A	13.55	11.29	0.25	0.00	0.60	1.41	1.11	0.94	0.00	1.91	1.10	0.97	0.69	0.00	2.71	1.41	0.60
MR 78	13.56	11.26	0.25	0.20	1.00	1.41	1.11	0.76	1.11	1.91	1.91	0.97	0.45	0.97	2.74	1.41	1.41
MR 79A	13.56	11.29	0.25	0.00	0.60	2.20	1.11	0.59	0.00	2.70	1.10	0.97	0.54	0.00	2.72	2.20	0.60
MR 79A.5	13.56	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.72	1.41	0.60
MR 80	13.56	11.29	0.25	0.00	0.60	1.41	1.11	0.76	0.00	1.91	1.10	0.97	0.45	0.00	2.72	1.41	0.60
MR 81	13.56	10.77	0.25	0.20	1.00	1.41	1.11	1.11	0.00	1.91	1.91	0.97	0.97	0.00	3.24	1.41	1.41
MR 83.1	13.57	10.19	0.30	0.20	1.00	1.41	1.11	0.00	1.11	2.01	2.01	0.97	0.00	0.97	3.88	1.41	1.41
MR 83.4	13.57	11.29	0.30	0.20	1.00	1.00	1.11	0.59	0.00	1.60	2.86	0.97	0.27	0.00	2.78	1.00	2.26
MR 83.5	13.57	10.81	0.25	0.20	1.00	1.41	1.11	1.11	0.00	1.91	1.91	0.97	0.97	0.00	3.22	1.41	1.41
MR 83.18	13.57	10.68	0.30	0.20	1.00	1.41	1.11	0.40	1.11	2.01	3.72	1.94	0.40	0.97	3.40	1.41	3.12
MR 83.21	13.57	11.10	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.93	1.41	0.60
MR 83.23	13.58	11.06	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.97	1.41	0.60
MR 83.27	13.58	10.47	0.25	0.00	0.89	1.41	1.11	0.40	0.59	1.91	1.39	0.97	0.13	0.54	3.56	1.41	0.89
MR 83.29	13.58	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.74	1.41	0.60
MR 83.36	13.59	10.08	0.30	0.20	1.00	1.41	1.11	1.11	0.00	2.01	2.01	0.97	0.97	0.00	4.00	1.41	1.41
MR 83.46	13.59	10.10	0.30	0.20	1.00	1.41	1.11	0.59	1.11	2.01	2.01	0.97	0.27	0.97	3.98	1.41	1.41
MR 85	13.56	10.78	0.25	0.20	1.00	1.41	1.11	0.00	1.11	1.91	1.91	0.97	0.00	0.97	3.23	1.41	1.41
MR 86	13.59	10.66	0.25	0.20	1.00	1.41	1.11	0.40	0.00	1.91	1.91	0.97	0.13	0.00	3.38	1.41	1.41
MR 90	13.59	10.82	0.25	0.20	1.00	1.41	1.11	0.59	1.11	1.91	1.91	0.97	0.27	0.97	3.22	1.41	1.41
MR 90.2	13.59	10.60	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	3.44	1.41	0.60
MR 92A	13.59	10.59	0.25	0.00	0.60	1.51	1.11	0.40	0.76	2.01	1.10	0.97	0.13	0.45	3.45	1.51	0.60
MR 92A.5	13.60	10.80	0.25	0.00	0.70	1.41	1.11	0.40	0.00	1.91	1.20	0.97	0.13	0.00	3.25	1.41	0.70
MR 93	13.60	10.94	0.25	0.00	1.00	1.41	1.11	0.00	0.00	1.91	1.50	0.97	0.00	0.00	3.11	1.41	1.00
MR 95	13.60	10.59	0.25	0.20	1.00	1.41	1.11	0.59	1.11	1.91	1.91	0.97	0.27	0.97	3.45	1.41	1.41
MR 97	13.60	11.17	0.25	0.20	1.00	1.41	1.11	0.00	1.11	1.91	1.91	0.97	0.00	0.97	2.88	1.41	1.41
MR 98	13.60	11.16	0.25	0.20	1.00	1.41	1.11	1.11	0.00	1.91	1.91	0.97	0.97	0.00	2.89	1.41	1.41
MR 98.7	13.60	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.76	1.41	0.60
MR 99.1	13.61	11.29	0.25	0.00	0.60	1.41	1.11	0.59	0.00	1.91	1.10	0.97	0.27	0.00	2.77	1.41	0.60
MR 99.9	13.61	11.29	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.77	1.41	0.60
MR 100	13.60	10.09	0.30	0.20	1.00	1.41	1.11	1.11	0.59	2.01	2.01	0.97	0.97	0.27	4.01	1.41	1.41
MR 102.1	13.61	10.26	0.30	0.20	1.00	1.41	1.11	0.00	1.11	2.01	2.01	0.97	0.00	0.97	3.85	1.41	1.41
MR 102.6	13.61	11.16	0.25	0.00	1.00	0.70	0.40	0.00	0.00	1.50	1.20	0.13	0.00	0.00	2.90	1.00	0.70
MR 103	13.61	11.29	0.25	0.00	0.60	1.41	1.11	0.00	0.00	1.91	1.10	0.97	0.00	0.00	2.77	1.41	0.60



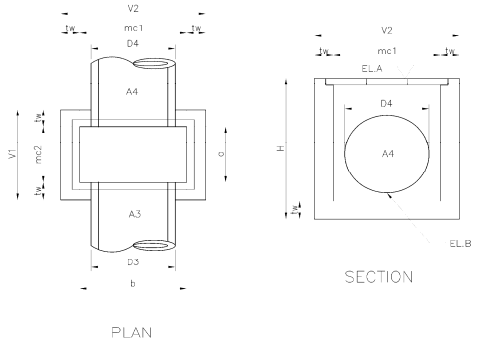
PLAN



SECTION

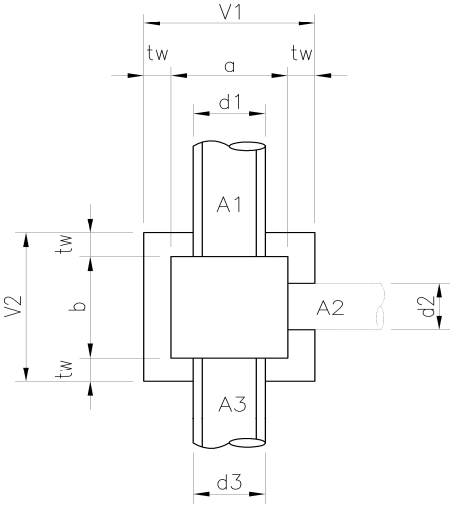
QUANTITIES OF MANHOLE												
Manhole No.	Area Outside Face			Area Inside Face		MANHOLE			LEVELING	COVER		
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Scaffolding	Area of Formworks	Area of Formworks	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	m2	m2	m2	m3	kg
MR 68	3.66	11.65	0.00	3.36	7.89	25.32	0.00	18.35	0.68	0.48	0.13	18.55
MR 69	3.22	10.24	0.00	2.92	6.86	21.58	0.00	16.14	0.68	0.48	0.13	18.55
MR 70	3.48	11.09	0.00	3.18	7.48	23.82	0.00	17.48	0.68	0.48	0.13	18.55
MR 70A	3.23	10.27	0.00	2.93	6.88	22.07	0.00	16.19	0.68	0.48	0.13	18.55
MR 70A.2	3.77	12.01	0.00	3.47	8.16	26.17	0.00	18.92	0.68	0.48	0.13	18.55
MR 70C	8.88	9.45	0.41	7.61	5.40	30.52	1.11	21.48	0.76	0.48	0.14	20.74
MR 71	3.24	10.32	0.00	2.94	6.91	22.17	0.00	16.26	0.68	0.48	0.13	18.55
MR 74A	7.45	14.22	0.00	6.95	9.79	37.44	0.00	25.39	0.76	0.56	0.19	27.82
MR 74A.2	7.63	10.34	0.58	6.36	6.36	29.08	1.30	20.68	0.84	0.56	0.19	27.82
MR 75	7.64	10.35	0.58	6.37	6.37	28.93	1.31	20.70	0.84	0.56	0.19	27.82
MR 76A	3.25	10.36	0.00	2.95	6.94	21.85	0.00	16.32	0.68	0.48	0.13	18.55
MR 76A.2	3.26	10.36	0.00	2.96	6.95	22.43	0.00	16.33	0.68	0.48	0.13	18.55
MR 77A	3.26	10.37	0.00	2.96	6.95	21.87	0.00	16.34	0.68	0.48	0.13	18.55
MR 78	7.73	10.47	0.58	6.46	6.46	29.32	1.33	20.95	0.84	0.56	0.19	27.82
MR 79A	3.26	14.67	0.00	2.96	10.85	30.23	0.00	20.65	0.84	0.64	0.19	27.62
MR 79A.5	3.26	10.39	0.00	2.96	6.96	22.34	0.00	16.37	0.68	0.48	0.13	18.55
MR 80	3.26	10.39	0.00	2.96	6.97	22.16	0.00	16.37	0.68	0.48	0.13	18.55
MR 81	9.15	12.39	0.58	7.88	7.88	35.93	1.61	24.78	0.84	0.56	0.19	27.82
MR 83.1	10.93	15.59	0.58	9.52	9.52	44.21	1.95	31.17	0.88	0.56	0.19	27.82
MR 83.4	12.56	8.89	1.26	10.30	4.56	36.33	2.87	24.79	0.97	0.48	0.14	20.74
MR 83.5	9.07	12.29	0.58	7.80	7.80	35.60	1.60	24.57	0.84	0.56	0.19	27.82
MR 83.18	21.18	13.65	2.99	18.06	8.16	60.75	8.65	38.91	1.23	0.56	0.19	27.82
MR 83.21	3.51	11.18	0.00	3.21	7.55	24.22	0.00	17.62	0.68	0.48	0.13	18.55
MR 83.23	3.57	11.35	0.00	3.27	7.68	24.62	0.00	17.89	0.68	0.48	0.13	18.55
MR 83.27	6.34	13.60	0.00	5.89	9.34	33.54	0.00	23.50	0.74	0.54	0.18	25.27
MR 83.29	3.29	10.46	0.00	2.99	7.02	22.51	0.00	16.48	0.68	0.48	0.13	18.55
MR 83.36	11.28	16.08	0.58	9.87	9.87	45.76	2.02	32.17	0.88	0.56	0.19	27.82
MR 83.46	11.23	16.01	0.58	9.82	9.82	45.25	2.01	32.02	0.88	0.56	0.19	27.82
MR 85	9.10	12.33	0.58	7.83	7.83	35.74	1.61	24.66	0.84	0.56	0.19	27.82
MR 86	9.54	12.92	0.58	8.27	8.27	38.49	1.70	25.85	0.84	0.56	0.19	27.82
MR 90	9.09	12.31	0.58	7.82	7.82	35.41	1.60	24.62	0.84	0.56	0.19	27.82
MR 90.2	4.13	13.15	0.00	3.83	9.00	29.14	0.00	20.72	0.68	0.48	0.13	18.55
MR 92A	4.14	13.85	0.00	3.84	9.64	29.94	0.00	21.45	0.70	0.50	0.14	19.64
MR 92A.5	4.54	12.40	0.00	4.19	8.45	28.48	0.00	20.18	0.70	0.50	0.14	20.87
MR 93	6.21	11.86	0.00	5.71	8.05	30.86	0.00	21.18	0.76	0.56	0.19	27.82
MR 95	9.74	13.19	0.58	8.47	8.47	38.25	1.74	26.39	0.84	0.56	0.19	27.82
MR 97	8.11	10.98	0.58	6.84	6.84	31.41	1.40	21.97	0.84	0.56	0.19	27.82
MR 98	8.15	11.04	0.58	6.88	6.88	31.58	1.41	22.07	0.84	0.56	0.19	27.82
MR 98.7	3.31	10.54	0.00	3.01	7.08	22.71	0.00	16.62	0.68	0.48	0.13	18.55
MR 99.1	3.32	10.56	0.00	3.02	7.09	22.75	0.00	16.65	0.68	0.48	0.13	18.55
MR 99.9	3.32	10.57	0.00	3.02	7.10	23.03	0.00	16.65	0.68	0.48	0.13	18.55
MR 100	11.31	16.13	0.58	9.90	9.90	45.62	2.03	32.26	0.88	0.56	0.19	27.82
MR 102.1	10.86	15.48	0.58	9.45	9.45	43.88	1.94	30.96	0.88	0.56	0.19	27.82
MR 102.6	4.06	8.71	0.00	3.71	5.31	21.67	0.00	15.68	0.62	0.42	0.11	15.55
MR 103	3.33	10.59	0.00	3.03	7.11	23.09	0.00	16.69	0.68	0.48	0.13	18.55

QUANTITIES OF JUNCTION MANHOLE															
Manhole No.	El. A	El. B	tw	ts	mc1	mc2	D3	D4	V1	V2	A3	A4	H	a	b
	m	m	m	m	m	m	m	m	m	m	m2	m2	m	m	m
MR 74A.1	13.55	11.41	0.25	0.00	1.41	0.89	1.11	0.59	1.39	1.91	0.97	0.27	2.59	0.89	1.41
MR 76	13.55	11.90	0.25	0.00	1.41	0.70	1.11	1.11	1.20	1.91	0.97	0.97	2.10	0.70	1.41
MR 76.1	13.55	11.94	0.25	0.00	1.41	0.89	0.59	1.11	1.39	1.91	0.27	0.97	2.06	0.89	1.41
MR 77A.3	13.56	11.56	0.25	0.00	1.41	0.89	1.11	0.59	1.39	1.91	0.97	0.27	2.45	0.89	1.41
MR 81.1	13.56	11.72	0.25	0.00	1.41	0.89	0.59	1.11	1.39	1.91	0.27	0.97	2.30	0.89	1.41
MR 82	13.57	11.53	0.25	0.00	1.41	0.70	1.11	0.00	1.20	1.91	0.97	0.00	2.48	0.70	1.41
MR 82.1	13.57	11.48	0.25	0.00	1.41	0.65	1.11	1.11	1.15	1.91	0.97	0.97	2.53	0.65	1.41
MR 83	13.57	11.32	0.25	0.00	1.41	0.82	1.11	1.11	1.32	1.91	0.97	0.97	2.69	0.82	1.41
MR 83.7	13.57	11.38	0.25	0.00	1.41	0.70	0.00	1.11	1.20	1.91	0.00	0.97	2.64	0.70	1.41
MR 83.15	13.57	11.10	0.25	0.00	1.41	0.70	1.11	0.00	1.20	1.91	0.97	0.00	2.92	0.70	1.41
MR 83.27	13.58	11.00	0.25	0.00	0.89	0.60	0.59	0.59	1.10	1.39	0.27	0.27	3.03	0.60	0.89
MR 83.38	13.59	11.00	0.25	0.00	1.41	0.60	1.11	1.11	1.10	1.91	0.97	0.97	3.03	0.60	1.41
MR 83.40	13.59	11.05	0.25	0.00	1.41	0.60	0.00	1.11	1.10	1.91	0.00	0.97	2.99	0.60	1.41
MR 83.41	13.59	10.95	0.25	0.00	1.41	0.60	1.11	0.00	1.10	1.91	0.97	0.00	3.09	0.60	1.41
MR 83.44	13.59	10.91	0.25	0.00	1.41	0.60	1.11	1.11	1.10	1.91	0.97	0.97	3.13	0.60	1.41
MR 84	13.59	11.52	0.25	0.00	1.41	0.65	1.11	0.00	1.15	1.91	0.97	0.00	2.52	0.65	1.41
MR 87	13.59	11.39	0.25	0.00	1.41	0.70	1.11	0.00	1.20	1.91	0.97	0.00	2.65	0.70	1.41
MR 88	13.59	11.23	0.25	0.00	1.41	0.80	1.11	1.11	1.30	1.91	0.97	0.97	2.81	0.80	1.41
MR 89	13.59	11.17	0.25	0.00	1.41	0.89	1.11	1.11	1.39	1.91	0.97	0.97	2.87	0.89	1.41
MR 94.2	13.60	11.61	0.25	0.00	1.41	0.60	1.11	0.00	1.10	1.91	0.97	0.00	2.44	0.60	1.41
MR 96	13.60	11.64	0.25	0.00	1.41	0.65	1.11	0.00	1.15	1.91	0.97	0.00	2.41	0.65	1.41
MR 98.3	13.60	11.60	0.25	0.00	1.41	0.60	0.00	1.11	1.10	1.91	0.00	0.97	2.45	0.60	1.41
MR 101	13.60	11.16	0.25	0.00	1.41	0.70	0.00	1.11	1.20	1.91	0.00	0.97	2.90	0.70	1.41
MR 102	13.61	11.15	0.25	0.00	1.41	1.06	1.11	0.59	1.56	1.91	0.97	0.27	2.91	1.06	1.41
JR 68	13.52	12.39	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.53	0.90	0.80
JR 69	13.10	11.51	0.25	0.00	0.80	1.24	0.94	0.75	1.74	1.30	0.69	0.44	2.05	1.24	0.80
JR 70	13.40	11.37	0.25	0.00	0.80	1.06	0.76	0.64	1.56	1.30	0.45	0.32	2.48	1.06	0.80
JR 70A	13.53	12.40	0.15	0.00	0.80	0.90	0.59	0.53	1.20	1.10	0.27	0.22	1.53	0.90	0.80
JR 70A.2	13.53	12.38	0.15	0.00	0.80	0.90	0.59	0.53	1.20	1.10	0.27	0.22	1.56	0.90	0.80
JR 70C	13.09	11.29	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	2.20	0.90	0.80
JR 71	13.37	12.22	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	1.55	0.90	0.80
JR 74A.1	13.18	12.03	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	1.55	0.90	0.80
JR 74A.2	13.07	12.10	0.15	0.00	0.80	0.90	0.59	0.53	1.20	1.10	0.27	0.22	1.37	0.90	0.80
JR 76.1	13.04	11.97	0.15	0.00	0.80	0.90	0.59	0.20	1.20	1.10	0.27	0.03	1.47	0.90	0.80
JR 76A	13.09	11.49	0.25	0.00	0.70	1.24	0.94	0.88	1.74	1.20	0.69	0.60	2.05	1.24	0.70
JR 77A.3	13.09	11.97	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	1.52	0.90	0.80
JR 78	13.08	11.56	0.25	0.00	0.80	1.06	0.76	0.75	1.56	1.30	0.45	0.44	1.97	1.06	0.80
JR 79A	13.06	12.08	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	1.39	0.90	0.80
JR 79A.5	13.05	11.98	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	1.46	0.90	0.80
JR 80	13.07	11.72	0.25	0.00	0.80	1.06	0.76	0.75	1.56	1.30	0.45	0.44	1.80	1.06	0.80
JR 81.1	13.19	11.72	0.15	0.00	0.80	0.90	0.59	0.23	1.20	1.10	0.27	0.06	1.88	0.90	0.80
JR 83.4	13.57	11.84	0.15	0.00	0.80	0.90	0.59	0.40	1.20	1.10	0.27	0.13	2.13	0.90	0.80
JR 83.18	13.12	12.16	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.37	0.90	0.80
JR 83.27	13.25	12.00	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.65	0.90	0.80
JR 83.29	13.58	12.45	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.53	0.90	0.80
JR 83.46	13.26	12.26	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.40	0.90	0.80
JR 90	13.20	12.28	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.32	0.90	0.80
JR 95	13.60	12.21	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.78	0.90	0.80
JR 98.7	13.20	11.74	0.15	0.00	0.80	0.90	0.59	0.14	1.20	1.10	0.27	0.02	1.86	0.90	0.80
JR 99.1	12.86	11.77	0.15	0.00	0.80	0.90	0.59	0.10	1.20	1.10	0.27	0.01	1.48	0.90	0.80
JR 100	12.89	11.92	0.15	0.00	0.80	0.90	0.59	0.00	1.20	1.10	0.27	0.00	1.38	0.90	0.80
JR 102.1	12.67	11.15	0.25	0.00	0.80	1.06	0.76	0.77	1.56	1.30	0.45	0.47	1.97	1.06	0.80



QUANTITIES OF JUNCTION MANHOLE													
Manhole No.	Area Outside Face			Area Inside Face		MANHOLE			LEVELING	COVER			
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Scaffolding	Area of Formworks	Area of Formworks	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	m2	m2	m2	m3	kg
MR 74A.1	9.89	7.20	0.00	6.60	4.17	26.62	0.00	17.09	0.74	0.54	0.18	25.27
MR 76	8.04	5.05	0.00	5.23	2.60	18.98	0.00	13.09	0.70	0.50	0.14	20.87
MR 76.1	7.87	5.73	0.00	5.10	3.22	20.68	0.00	13.60	0.74	0.54	0.18	25.27
MR 77A.3	9.36	6.81	0.00	6.20	3.91	25.04	0.00	16.16	0.74	0.54	0.18	25.27
MR 81.1	8.78	6.39	0.00	5.78	3.65	23.35	0.00	15.17	0.74	0.54	0.18	25.27
MR 82	9.48	5.95	0.00	6.29	3.12	23.88	0.00	15.43	0.70	0.50	0.14	20.87
MR 82.1	9.68	5.83	0.00	6.44	2.97	22.97	0.00	15.50	0.69	0.49	0.14	19.71
MR 83	10.29	7.11	0.00	6.89	4.01	26.36	0.00	17.40	0.73	0.53	0.16	23.65
MR 83.7	10.10	6.34	0.00	6.75	3.35	25.57	0.00	16.44	0.70	0.50	0.14	20.87
MR 83.15	11.17	7.02	0.00	7.54	3.74	28.49	0.00	18.18	0.70	0.50	0.14	20.87
MR 83.27	8.42	6.66	0.00	4.94	3.33	22.81	0.00	15.07	0.58	0.38	0.09	12.56
MR 83.38	11.59	6.67	0.00	7.85	3.34	27.51	0.00	18.26	0.68	0.48	0.13	18.55
MR 83.40	11.43	6.58	0.00	7.73	3.29	28.06	0.00	18.01	0.68	0.48	0.13	18.55
MR 83.41	11.80	6.80	0.00	8.01	3.41	29.04	0.00	18.60	0.68	0.48	0.13	18.55
MR 83.44	11.95	6.88	0.00	8.12	3.45	28.47	0.00	18.84	0.68	0.48	0.13	18.55
MR 84	9.61	5.78	0.00	6.39	2.94	23.76	0.00	15.39	0.69	0.49	0.14	19.71
MR 87	10.13	6.37	0.00	6.78	3.36	25.67	0.00	16.50	0.70	0.50	0.14	20.87
MR 88	10.72	7.30	0.00	7.21	4.09	27.38	0.00	18.01	0.72	0.52	0.16	23.18
MR 89	10.96	7.98	0.00	7.39	4.66	29.05	0.00	18.94	0.74	0.54	0.18	25.27
MR 94.2	9.32	5.37	0.00	6.18	2.63	22.53	0.00	14.69	0.68	0.48	0.13	18.55
MR 96	9.21	5.55	0.00	6.09	2.81	22.69	0.00	14.76	0.69	0.49	0.14	19.71
MR 98.3	9.36	5.39	0.00	6.20	2.64	22.63	0.00	14.75	0.68	0.48	0.13	18.55
MR 101	11.07	6.95	0.00	7.46	3.71	28.22	0.00	18.02	0.70	0.50	0.14	20.87
MR 102	11.12	9.09	0.00	7.51	5.64	32.12	0.00	20.21	0.77	0.57	0.20	29.21
JR 68	3.36	3.66	0.00	2.20	2.48	11.43	0.00	0.00	0.54	0.32	0.11	15.84
JR 69	5.32	7.12	0.00	2.87	4.45	18.63	0.00	12.43	0.69	0.37	0.14	20.74
JR 70	6.45	7.73	0.00	3.57	4.73	21.70	0.00	14.18	0.65	0.34	0.13	18.14
JR 70A	3.36	3.66	0.00	2.20	2.48	11.22	0.00	0.00	0.54	0.32	0.11	15.84
JR 70A.2	3.43	3.74	0.00	2.25	2.53	11.46	0.00	0.00	0.54	0.32	0.11	15.84
JR 70C	4.84	5.28	0.00	3.28	3.69	16.71	0.00	10.13	0.54	0.32	0.11	15.84
JR 71	3.42	3.73	0.00	2.25	2.53	11.53	0.00	0.00	0.54	0.32	0.11	15.84
JR 74A.1	3.41	3.72	0.00	2.24	2.52	11.51	0.00	0.00	0.54	0.32	0.11	15.84
JR 74A.2	3.02	3.29	0.00	1.95	2.20	9.97	0.00	0.00	0.54	0.32	0.11	15.84
JR 76.1	3.24	3.53	0.00	2.12	2.38	10.96	0.00	0.00	0.54	0.32	0.11	15.84
JR 76A	4.91	7.12	0.00	2.51	4.45	17.70	0.00	12.02	0.67	0.35	0.13	18.66
JR 77A.3	3.35	3.66	0.00	2.20	2.47	11.29	0.00	0.00	0.54	0.32	0.11	15.84
JR 78	5.12	6.15	0.00	2.75	3.65	16.77	0.00	0.00	0.65	0.34	0.13	18.14
JR 79A	3.06	3.33	0.00	1.98	2.23	10.21	0.00	0.00	0.54	0.32	0.11	15.84
JR 79A.5	3.22	3.51	0.00	2.10	2.37	10.81	0.00	0.00	0.54	0.32	0.11	15.84
JR 80	4.69	5.63	0.00	2.48	3.29	15.19	0.00	0.00	0.65	0.34	0.13	18.14
JR 81.1	4.13	4.50	0.00	2.76	3.11	14.18	0.00	0.00	0.54	0.32	0.11	15.84
JR 83.4	4.68	5.11	0.00	3.16	3.56	16.12	0.00	9.79	0.54	0.32	0.11	15.84
JR 83.18	3.01	3.28	0.00	1.95	2.19	10.16	0.00	0.00	0.54	0.32	0.11	15.84
JR 83.27	3.62	3.95	0.00	2.39	2.69	12.38	0.00	0.00	0.54	0.32	0.11	15.84
JR 83.29	3.36	3.66	0.00	2.20	2.48	11.42	0.00	0.00	0.54	0.32	0.11	15.84
JR 83.46	3.09	3.37	0.00	2.01	2.26	10.45	0.00	0.00	0.54	0.32	0.11	15.84
JR 90	2.91	3.17	0.00	1.87	2.11	9.79	0.00	0.00	0.54	0.32	0.11	15.84
JR 95	3.92	4.28	0.00	2.61	2.94	13.49	0.00	0.00	0.54	0.32	0.11	15.84
JR 98.7	4.09	4.46	0.00	2.74	3.08	14.08	0.00	0.00	0.54	0.32	0.11	15.84
JR 99.1	3.26	3.55	0.00	2.13	2.40	11.06	0.00	0.00	0.54	0.32	0.11	15.84
JR 100	3.03	3.30	0.00	1.96	2.21	10.22	0.00	0.00	0.54	0.32	0.11	15.84
JR 102.1	5.11	6.13	0.00	2.75	3.64	16.71	0.00	0.00	0.65	0.34	0.13	18.14

QUANTITIES IN JUNCTION BOX													
Junction Box No.	d1	d2	d3	tw	tb	a	b	h	A1	A2	A3	V1	V2
	m	m	m	m	m	m	m	m	m2	m2	m2	m	m
JR 83.19	0.40	0.40	0.00	0.15	0.20	0.65	0.65	0.80	0.13	0.13	0.00	0.95	0.95
JR 83.24	0.00	0.40	0.59	0.15	0.20	0.89	0.60	0.99	0.00	0.13	0.27	1.19	0.90
JR 83.28	0.40	0.25	0.00	0.15	0.20	0.95	0.60	0.80	0.13	0.05	0.00	1.25	0.90
JR 86.1	0.40	0.10	0.15	0.15	0.20	0.70	0.70	0.75	0.13	0.01	0.02	1.00	1.00



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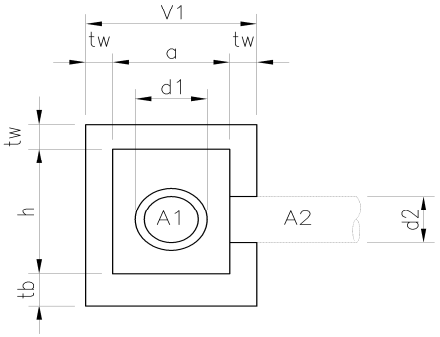
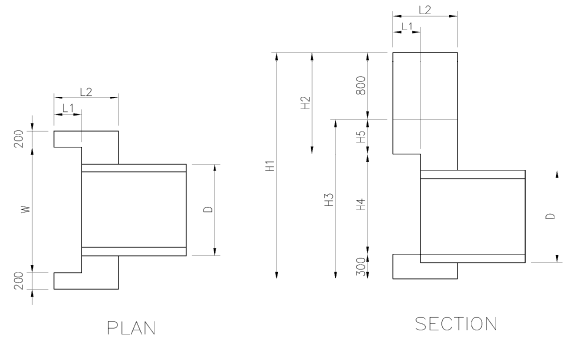


SECTION

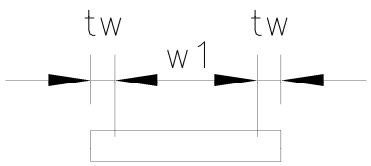
QUANTITIES IN JUNCTION BOX								
Junction Box No.	Area Outside Face			Area Inside Face				Leveling
	Front and Rear slab	Left and Right slab	Top Slab	Front and Rear slab	Left and Right slab	Area of Formworks	Volume of Supporting	Area of Formworks
	m2	m2	m2	m2	m2	m2	m3	m2
JR 83.19	2.19	2.19	0.42	1.81	1.81	8.15	0.34	0.38
JR 83.24	2.41	3.19	0.53	2.05	2.71	10.51	0.53	0.42
JR 83.28	2.07	2.88	0.57	1.71	2.38	9.43	0.46	0.43
JR 86.1	2.20	2.20	0.49	1.80	1.80	8.34	0.37	0.40

QUANTITIES OF OUTLETS										
Outlet No.	H1	H2	H3	H4	H5	L1	L2	W	D	Area of Pipe
	m	m	m	m	m	m	m	m	m	m2
DR 68	2.08	0.57	1.28	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 69	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 70	1.93	0.42	1.13	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 70A	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 70A.2	2.16	0.65	1.36	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 70C	2.46	0.65	1.66	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 71	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 74A	2.73	1.22	1.93	1.21	0.42	0.30	0.70	1.51	1.11	0.97
DR 74A.2	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 75	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 76A	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 76A.2	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 77A	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 78	2.04	0.23	1.24	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 79A	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 79A.5	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 80	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 81	2.53	0.72	1.73	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 83.1	3.11	1.30	2.31	1.51	0.50	0.30	0.70	1.51	1.11	0.97
DR 83.4	3.13	1.32	2.33	1.51	0.52	0.30	0.70	1.51	1.11	0.97
DR 83.5	2.50	0.69	1.70	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 83.18	2.62	0.81	1.82	1.51	0.01	0.30	0.70	1.51	1.11	0.97
DR 83.21	2.20	0.39	1.40	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 83.23	2.83	1.02	2.03	1.51	0.22	0.30	0.70	1.51	1.11	0.97
DR 83.29	1.71	0.20	0.91	1.21	0.00	0.30	0.70	1.51	1.11	0.97
DR 83.36	3.22	1.41	2.42	1.51	0.61	0.30	0.70	1.51	1.11	0.97
DR 83.46	3.20	1.39	2.40	1.51	0.59	0.30	0.70	1.51	1.11	0.97
DR 85	2.52	0.71	1.72	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 86	2.68	0.87	1.88	1.51	0.07	0.30	0.70	1.51	1.11	0.97
DR 90	2.48	0.67	1.68	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 90.2	2.70	0.89	1.90	1.51	0.09	0.30	0.70	1.51	1.11	0.97
DR 92A	2.71	0.90	1.91	1.51	0.10	0.30	0.70	1.51	1.11	0.97
DR 92A.5	2.50	0.69	1.70	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 93	2.36	0.55	1.56	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 95	2.71	0.90	1.91	1.51	0.10	0.30	0.70	1.51	1.11	0.97
DR 97	2.13	0.32	1.33	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 98	2.14	0.33	1.34	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 98.7	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 99.1	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 99.9	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97
DR 100	3.21	1.40	2.41	1.51	0.60	0.30	0.70	1.51	1.11	0.97
DR 102.1	3.04	1.23	2.24	1.51	0.43	0.30	0.70	1.51	1.11	0.97
DR 102.6	2.09	0.99	1.29	0.80	0.19	0.20	0.70	0.80	0.40	0.13
DR 103	2.01	0.20	1.21	1.51	0.00	0.30	0.70	1.51	1.11	0.97

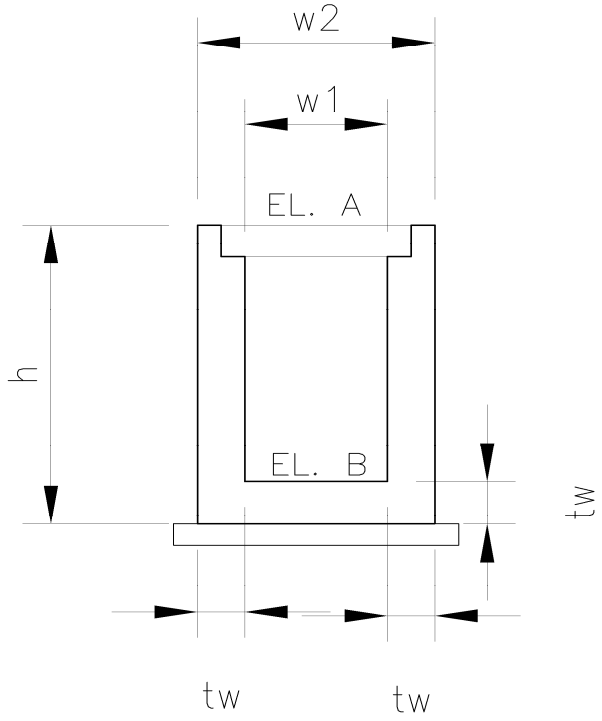


QUANTITIES OF OUTLETS									
Outlet No.	Outside Face			Inside face					
	Left & Right Side	Front side	Rear side	Front Side	Left & Right Side	Top Slab	Area of Formworks	Volume of Supporting	Area of Scaffolding
	m2	m2	m2	m2	m2	m2	m2	m3	m2
DR 68	1.80	0.92	3.01	0.86	0.73	0.45	7.77	0.55	7.96
DR 69	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 70	1.58	0.86	2.71	0.86	0.73	0.45	7.19	0.55	0.00
DR 70A	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 70A.2	1.91	0.95	3.16	0.86	0.73	0.45	8.06	0.55	8.26
DR 70C	2.33	1.07	3.73	1.31	0.91	0.45	9.80	0.68	9.40
DR 71	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 74A	2.70	1.31	4.24	0.86	0.73	0.45	10.28	0.55	10.41
DR 74A.2	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 75	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 76A	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 76A.2	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 77A	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 78	1.73	0.90	2.92	1.31	0.91	0.45	8.23	0.68	7.78
DR 79A	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 79A.5	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 80	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 81	2.42	1.10	3.87	1.31	0.91	0.45	10.06	0.68	9.67
DR 83.1	3.23	1.48	4.97	1.31	0.91	0.45	12.36	0.68	11.88
DR 83.4	3.26	1.50	5.01	1.31	0.91	0.45	12.45	0.68	11.96
DR 83.5	2.37	1.09	3.80	1.31	0.91	0.45	9.93	0.68	9.53
DR 83.18	2.55	1.14	4.04	1.31	0.91	0.45	20.80	1.37	20.02
DR 83.21	1.96	0.97	3.24	1.31	0.91	0.45	8.85	0.68	8.42
DR 83.23	2.85	1.29	4.45	1.31	0.91	0.45	11.26	0.68	10.83
DR 83.29	1.27	0.77	2.30	0.86	0.73	0.45	6.38	0.55	0.00
DR 83.36	3.38	1.56	5.17	1.31	0.91	0.45	12.79	0.68	12.29
DR 83.46	3.35	1.54	5.14	1.31	0.91	0.45	12.71	0.68	12.21
DR 85	2.41	1.10	3.85	1.31	0.91	0.45	10.02	0.68	9.63
DR 86	2.64	1.19	4.16	1.31	0.91	0.45	10.65	0.68	10.25
DR 90	2.35	1.08	3.77	1.31	0.91	0.45	9.88	0.68	9.48
DR 90.2	2.66	1.20	4.19	1.31	0.91	0.45	10.72	0.68	10.31
DR 92A	2.67	1.20	4.21	1.31	0.91	0.45	10.76	0.68	10.35
DR 92A.5	2.38	1.09	3.81	1.31	0.91	0.45	9.95	0.68	9.55
DR 93	2.18	1.03	3.54	1.31	0.91	0.45	9.43	0.68	9.02
DR 95	2.67	1.20	4.20	1.31	0.91	0.45	10.75	0.68	10.34
DR 97	1.86	0.94	3.09	1.31	0.91	0.45	8.56	0.68	8.13
DR 98	1.88	0.95	3.12	1.31	0.91	0.45	8.61	0.68	8.17
DR 98.7	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 99.1	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 99.9	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68
DR 100	3.38	1.56	5.17	1.31	0.91	0.45	12.77	0.68	12.27
DR 102.1	3.14	1.44	4.84	1.31	0.91	0.45	12.08	0.68	11.61
DR 102.6	1.81	0.93	2.38	0.51	0.32	0.16	6.12	0.13	5.02
DR 103	1.69	0.89	2.87	1.31	0.91	0.45	8.13	0.68	7.68

QUANTITIES IN U - DITCH							
Outlet No.	El. A	El. B	h	w1	tw	L	w2
	m	m	m	m	m	m	m
DR 83.29	13.58	13.20	0.47	0.30	0.10	13.23	0.50
DR 100	12.89	12.57	0.42	0.30	0.10	29.91	0.50



PRECAST CONCRETE
U – DITCH COVER



U DITCH TYPICAL SECTION

QUANTITIES IN U - DITCH										
Outlet No.	Outside Face		Inside Face	Area of Formworks			Cover		U- ditch	
	Left & Right	Front &Rear	Front &Rear	U - Ditch	Cover	Leveling	Concrete	Reinforcement	Concrete	Reinforcement
	m2	m2	m2	m2	m2	m2	m3	kg	m3	kg
DR 83.29	0.12	12.54	9.89	22.56	2.04	2.71	0.53	72.49	2.90	188.82
DR 100	0.11	25.12	19.14	44.38	4.55	6.04	1.20	163.91	5.92	384.94

QUANTITIES IN PIPE BEDDING								
Outlet No.	Outlet Pipe		Inlet Pipe		Collector			
	L1	W1	L2	W2	L3	W3	Thickness	Area of Formworks
	m	m	m	m	m	m	m	m2
DR 68	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 69	0.49	1.11	2.10	0.94	0.00	0.00	0.10	0.93
DR 70	0.49	1.11	2.10	0.76	0.00	0.00	0.10	0.89
DR 70A	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 70A.2	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 70C	0.49	1.11	1.70	0.59	0.00	0.00	0.10	0.78
DR 71	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 74A	0.49	1.11	0.00	0.00	0.00	0.00	0.10	0.32
DR 74A.2	0.49	1.11	2.10	0.59	6.84	1.11	0.10	2.98
DR 75	0.49	1.11	2.53	0.58	17.04	1.11	0.10	4.57
DR 76A	0.49	1.11	2.10	0.94	0.00	0.00	0.10	0.93
DR 76A.2	0.49	1.11	0.91	0.40	0.00	0.00	0.10	0.58
DR 77A	0.49	1.11	0.71	0.94	0.00	0.00	0.10	0.65
DR 78	0.49	1.11	2.58	0.66	11.56	1.11	0.10	3.50
DR 79A	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 79A.5	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 80	0.49	1.11	2.10	0.76	0.00	0.00	0.10	0.89
DR 81	0.49	1.11	1.29	0.59	14.07	1.11	0.10	3.73
DR 83.1	0.49	1.11	0.00	0.00	36.36	1.11	0.10	7.81
DR 83.4	0.49	1.11	1.60	0.59	0.00	0.00	0.10	0.76
DR 83.5	0.49	1.11	0.00	0.00	8.56	1.11	0.10	2.25
DR 83.18	0.97	2.22	1.19	0.59	13.92	0.94	0.10	3.96
DR 83.21	0.49	1.11	0.20	0.59	0.00	0.00	0.10	0.48
DR 83.23	0.49	1.11	0.62	0.59	0.00	0.00	0.10	0.56
DR 83.27	0.49	1.11	1.82	0.59	15.20	0.60	0.10	3.96
DR 83.29	0.49	1.11	2.11	0.59	0.00	0.00	0.10	0.86
DR 83.36	0.49	1.11	0.00	0.00	15.34	1.11	0.10	3.61
DR 83.46	0.49	1.11	1.29	0.59	15.99	1.11	0.10	4.11
DR 85	0.49	1.11	0.00	0.00	10.71	1.11	0.10	2.68
DR 86	0.49	1.11	0.00	0.00	2.74	0.40	0.10	0.95
DR 90	0.49	1.11	1.29	0.59	33.60	1.11	0.10	7.64
DR 90.2	0.49	1.11	0.00	0.00	0.00	0.00	0.10	0.32
DR 92A	0.49	1.11	0.10	0.76	0.00	0.00	0.10	0.49
DR 92A.5	0.49	1.11	0.00	0.00	2.79	0.40	0.10	0.96
DR 93	0.49	1.11	0.00	0.00	0.00	0.00	0.10	0.32
DR 95	0.49	1.11	1.29	0.59	9.00	1.11	0.10	2.72
DR 97	0.49	1.11	0.00	0.00	9.50	1.11	0.10	2.44
DR 98	0.49	1.11	0.00	0.00	10.11	1.11	0.10	2.56
DR 98.7	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 99.1	0.49	1.11	2.10	0.59	0.00	0.00	0.10	0.86
DR 99.9	0.49	1.11	0.00	0.00	0.00	0.00	0.10	0.32
DR 100	0.49	1.11	1.19	0.59	0.00	0.00	0.10	0.67
DR 102.1	0.49	1.11	1.54	0.76	4.74	1.11	0.10	1.95
DR 102.6	0.49	0.40	0.00	0.00	0.00	0.00	0.10	0.18
DR 103	0.49	1.11	0.00	0.00	0.00	0.00	0.10	0.32

QUANTITY FOR DEMOLITION AND RESTORATION

OUTLET NO.		LENGTH OF DEMOLITION				LENGTH OF RESTORATION				LENGTH OF TEMPORARY WALL
		REVETMENT	FENCE	WALL & FENCE	WALL/HANDRAIL	REVETMENT	FENCE	WALL &FENCE	WALL/HANDRAIL	
LOWER PASIG RIVER RIGHT BANK										
DR 35.1 STA. 3 + 658	MR 35.1	3.8			3.8	3.8			3.8	
DR 36.3 STA. 5 + 061	MR 36.3	5.1	5.1			5.1	5.1			
	COLLECTOR PIPE	6.3	6.3			6.3	6.3			
DR 36.9 STA. 5 + 150	MR 36.9	4.3			4.3	4.3		4.3		4.3
	COLLECTOR PIPE	21.5			21.5	21.5		21.5		21.5
DR 36.15 STA. 5 + 192	MR 36.15	5.7			5.7	5.7			**5.7**	5.7
	COLLECTOR PIPE	26.3			26.3	26.3			26.3	26.3
DR 40 STA. 6 + 342	MR 40	5.8			5.8	5.8			5.8	
	JR 41.1	2.9			2.9	2.9			2.9	
DR 42 STA. 6 + 413	MR 42	5.3			5.3				5.3	
DR 44 STA. 6 + 455	MR 44	2.9		2.9				2.9		
	JR 43.3	1.8		1.8				1.8		
DR 44.1 STA. 6 + 479	MR 44.1	5.4		5.4				5.4		
DR 44.2 STA. 6 + 494	MR 44.2	5.4			5.4				5.4	
DR 74 A STA. 8+776	MR 74A	6.9	6.9						-	
Subtotal	COLLECTOR PIPE	54.1	6.3	0.0	47.8	54.1	6.3	21.5	26.3	47.8
	MANHOLE	55.4	12.0	10.1	33.3	27.6	5.1	14.4	29.0	10.0
Total		**109.5**	**18.3**	**10.1**	**81.1**	**81.7**	**11.3**	**35.9**	**55.3**	**57.8**

OUTLET NO.	MANHOLE NO.	LENGTH OF DEMOLITION				LENGTH OF RESTORATION				LENGTH OF TEMPORARY WALL
		REVETMENT	FENCE	WALL & FENCE	WALL/HANDRAIL	REVETMENT	FENCE	WALL &FENCE	WALL/HANDRAIL	
LOWER PASIG LEFT BANK										
DL 35.5 STA. 2 + 424	ML 35.5	6.0			6.0	6.0			6.0	
	ML 35.6	4.6			4.6	4.6			4.6	
	ML 36	4.6			4.6	4.6			4.6	
	ML 37	4.5			4.5	4.5			4.5	
	COLLECTOR PIPE	37.5			37.5	37.5			37.5	
DL 37.3 STA. 2 + 539	ML 37.3	5.4			5.4	5.4			5.4	
	ML 37.1	4.6			4.6	4.6			4.6	
	COLLECTOR PIPE	28.2			28.2	28.2			28.2	
DL 37.6 STA. 2 + 552	ML 37.6	6.0			6.0	6.0			6.0	
	ML 37.5	4.9			4.9	4.9			4.9	
	ML 37.9	4.5			4.5	4.5			4.5	
	COLLECTOR PIPE	20.8			20.8	20.8			20.8	
DL 37.11 STA. 2 + 605	ML 37.11	6.4			6.4	6.4			6.4	
	ML 37.10	4.8			4.8	4.8			4.8	
	COLLECTOR PIPE	5.7			5.7	5.7			5.7	
DL 37.12 STA. 2 + 608	ML 37.12	6.0			6.0	6.0			6.0	
	ML 37.16	4.8			4.8	4.8			4.8	
	COLLECTOR PIPE	26.9			26.9	26.9			26.9	
DL 40 STA. 2 + 858	ML 40	4.4			4.4					4.4
DL 41 STA. 2 + 871	ML 41	5.5								5.5
DL 41.1 STA. 2 + 888	ML 41.1	5.3			5.3					5.3
DL 42 STA. 2 898	ML 42	5.5			5.5					5.5
DL 46 STA. 2 + 932	ML 43	4.8			4.8					4.8
	ML 46	5.0			5.0					5.0
	ML 45	4.5			4.5					4.5
	COLLECTOR PIPE	10.4			10.4					10.4
DL 48 STA. 2 + 946	ML 48	5.1			5.1					5.1
DL 48.2 STA. 2 + 955	ML 48.2	5.6			5.6					5.6
DL 50 STA. 2 + 960	ML 50	5.7			5.7					5.7
DL 51 STA. 2 + 978	ML 51	5.1			5.1					5.1
DL 52 STA. 2 + 991	ML 52	5.4			5.4					5.4
DL 53 STA. 2 + 998	ML 53	5.4			5.4					5.4
DL 53 STA. 2 + 998	ML 54	5.2			5.2					5.2
DL 56 STA. 3 + 007	ML 56	5.3			5.3					5.3
DL 57 STA. 3 + 026	ML 57	5.4			5.4					5.4
DL 58 STA. 3 + 031	ML 58	5.7			5.7					5.7
DL 59 STA. 3 + 048	ML 59	4.4								4.4
DL 59.1 STA. 3 + 053	ML 59.1	5.9								5.9
DL 59.2 STA. 3 + 063	ML 59.2	5.4								5.4
DL 62A.6 STA. 6 + 159	ML 62A.6	5.1			5.1	5.1			5.1	
	COLLECTOR PIPE	26.5			26.5	26.5			26.5	
DL 62A.9 STA. 6 + 247	ML 62A.9	7.7			7.7	7.7			7.7	
	COLLECTOR PIPE	6.1			6.1	6.1			6.1	
DL HSP4 STA. 3 + 216	ML HSP4	5.9		5.9		5.9		5.9		
	COLLECTOR PIPE	49.2		49.2		49.2		49.2		
Subtotal	COLLECTOR PIPE	211.4	0.0	49.2	162.2	201.0	0.0	49.2	151.8	10.4
	MANHOLE	190.1	0.0	5.9	163.1	85.5	0.0	5.9	79.7	104.5
Total		**401.5**	**0.0**	**55.1**	**325.3**	**286.6**	**0.0**	**55.1**	**231.5**	**114.9**