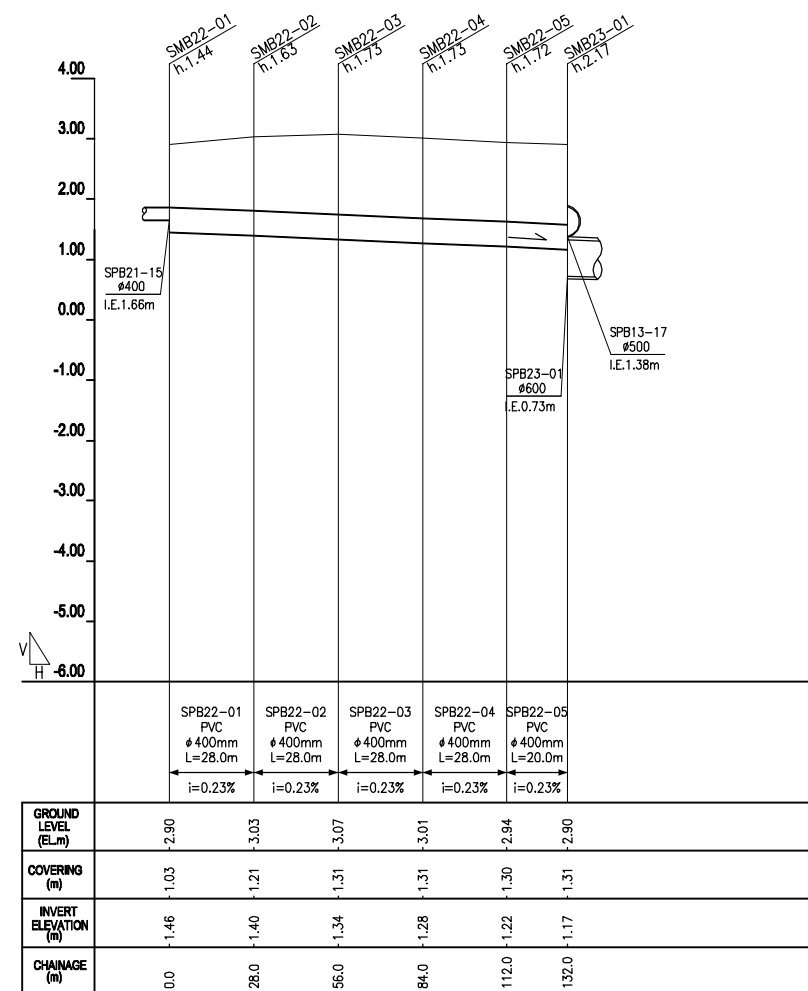
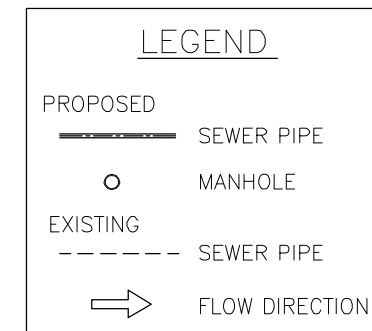
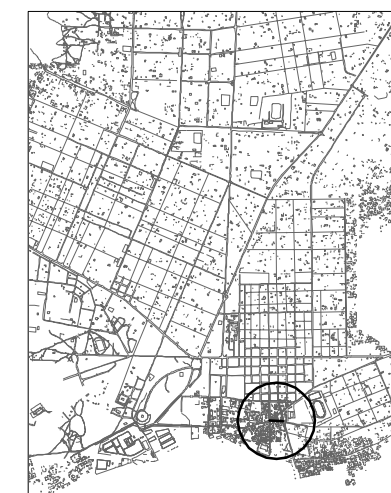


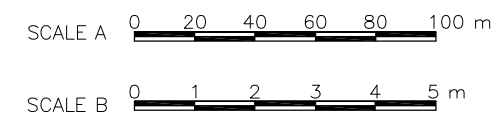
PLAN
SCALE A

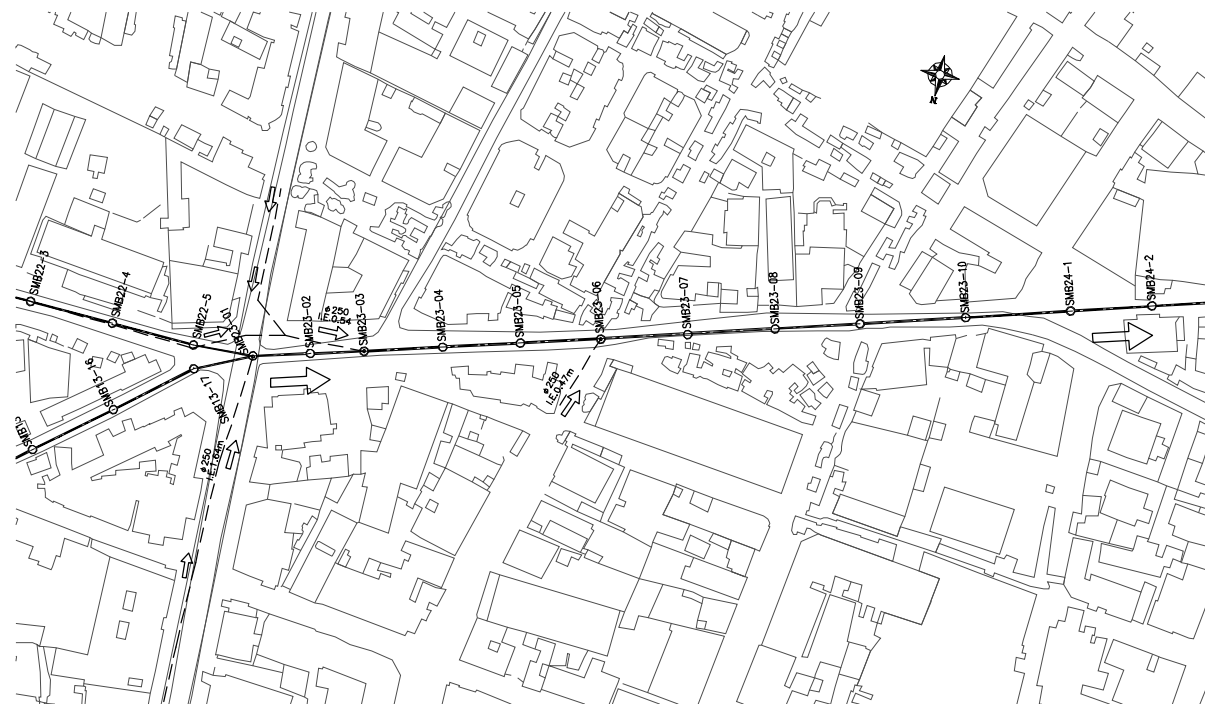


PROFILE
H: SCALE A V: SCALE B

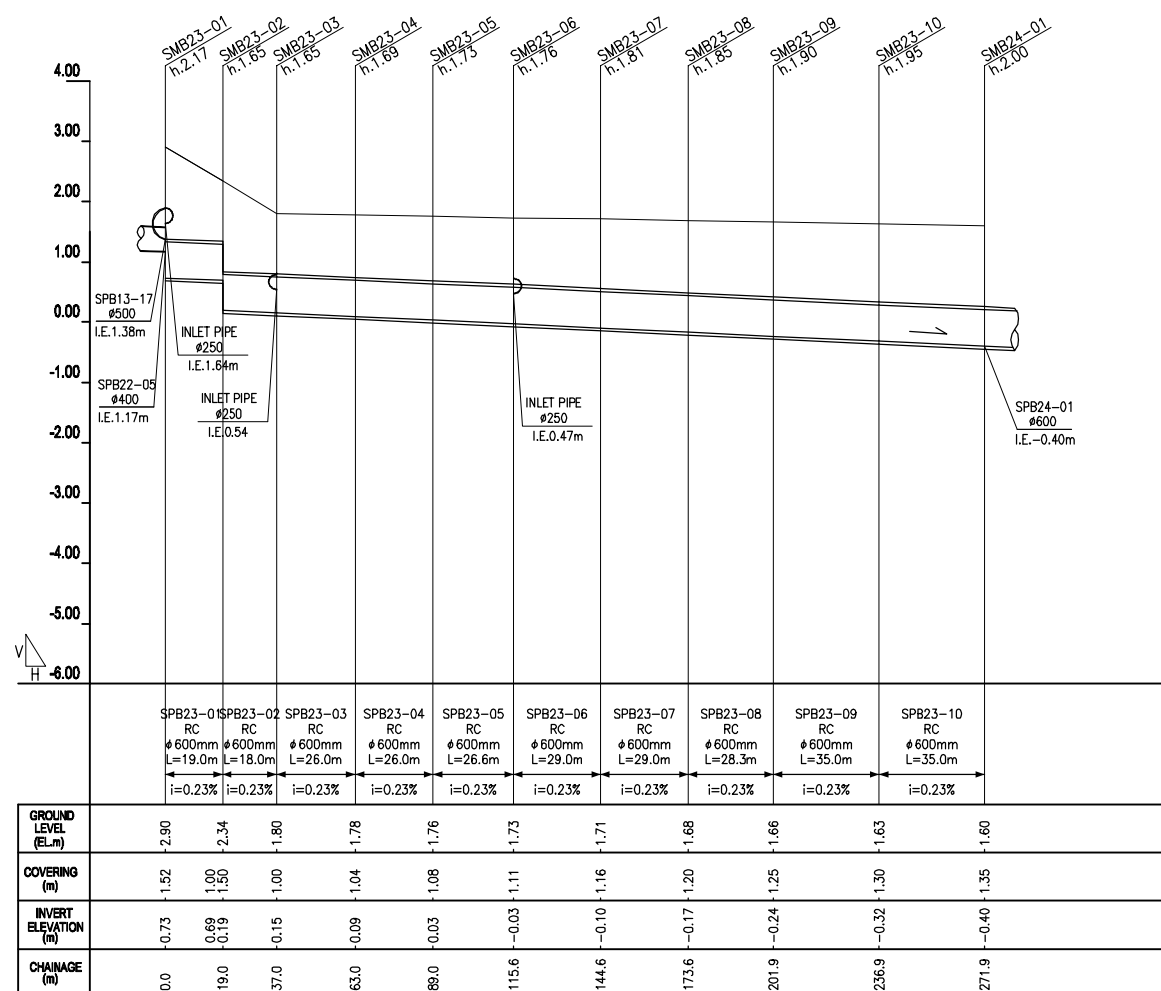
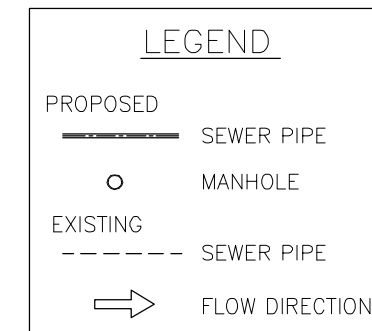


KEY PLAN

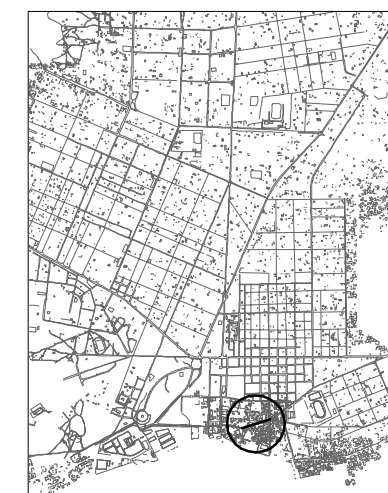




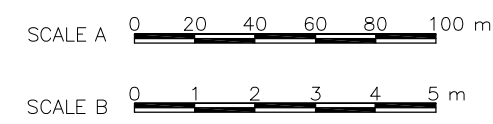
PLAN
SCALE A

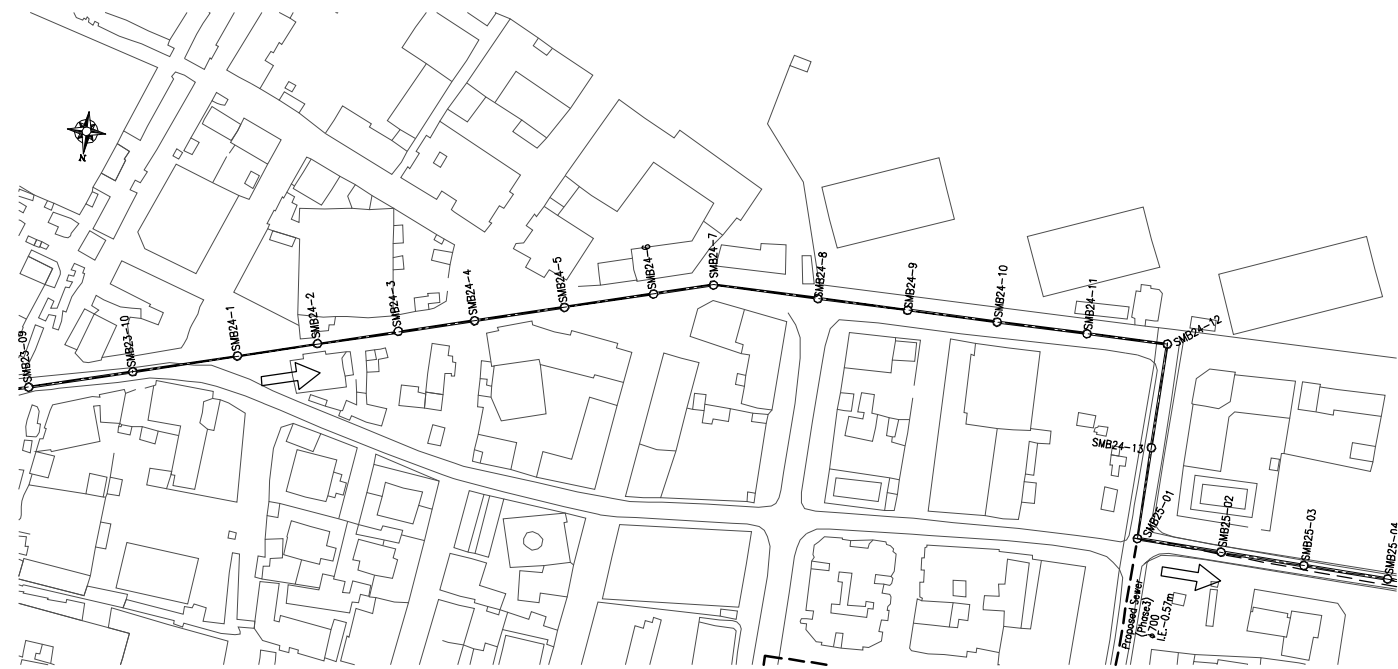


PROFILE
H: SCALE A V: SCALE B



KEY PLAN



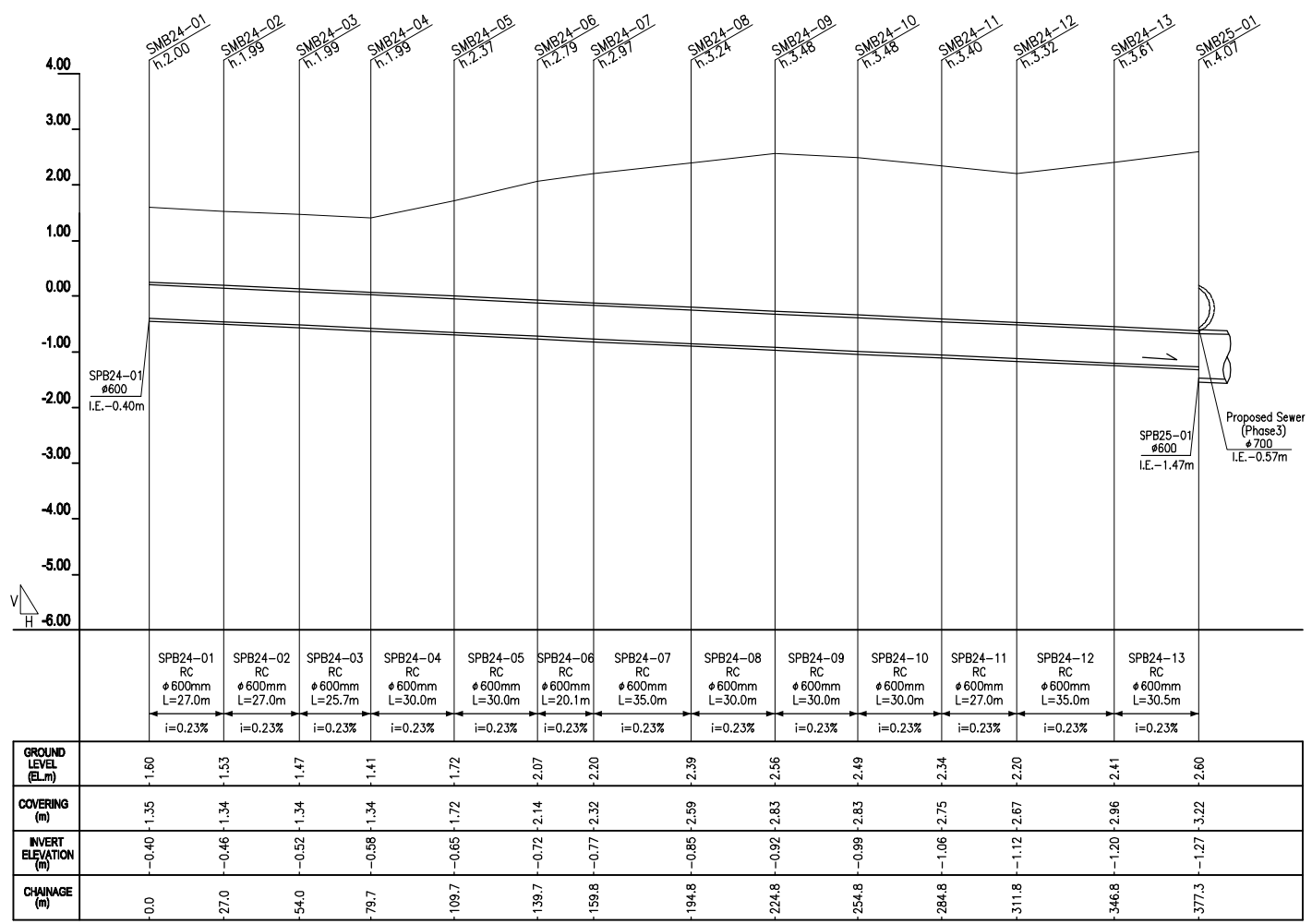


LEGEND

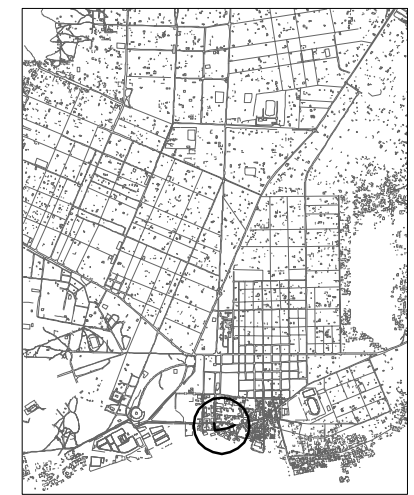
PROPOSED
 — SEWER PIPE
 ○ MANHOLE

EXISTING
 - - - SEWER PIPE
 → FLOW DIRECTION

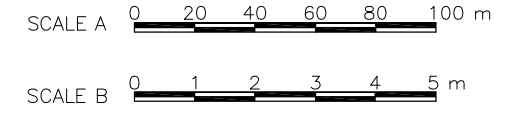
PLAN
SCALE A

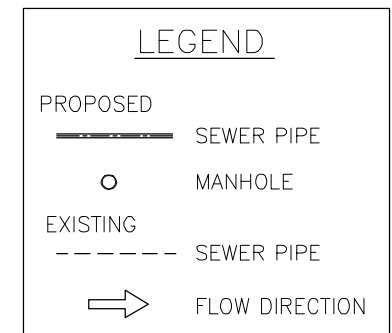
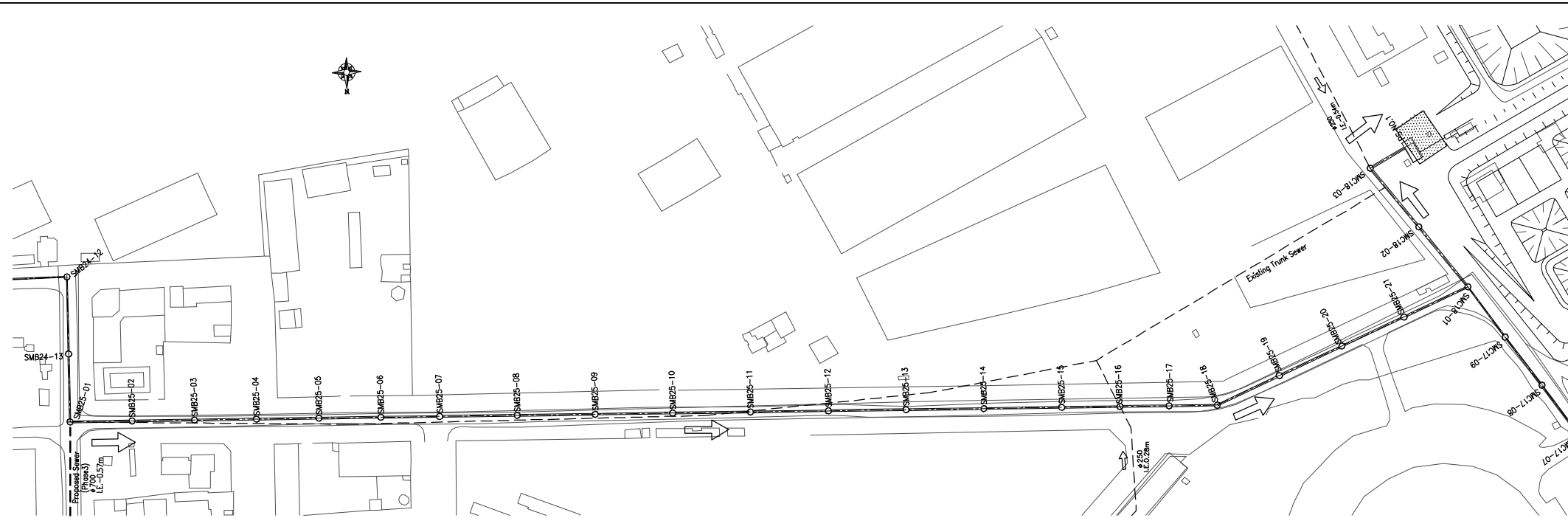


PROFILE
H: SCALE A V: SCALE B

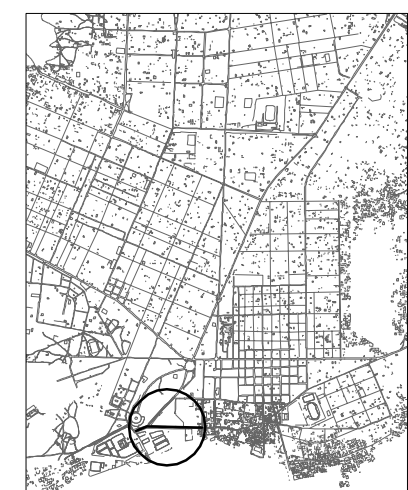
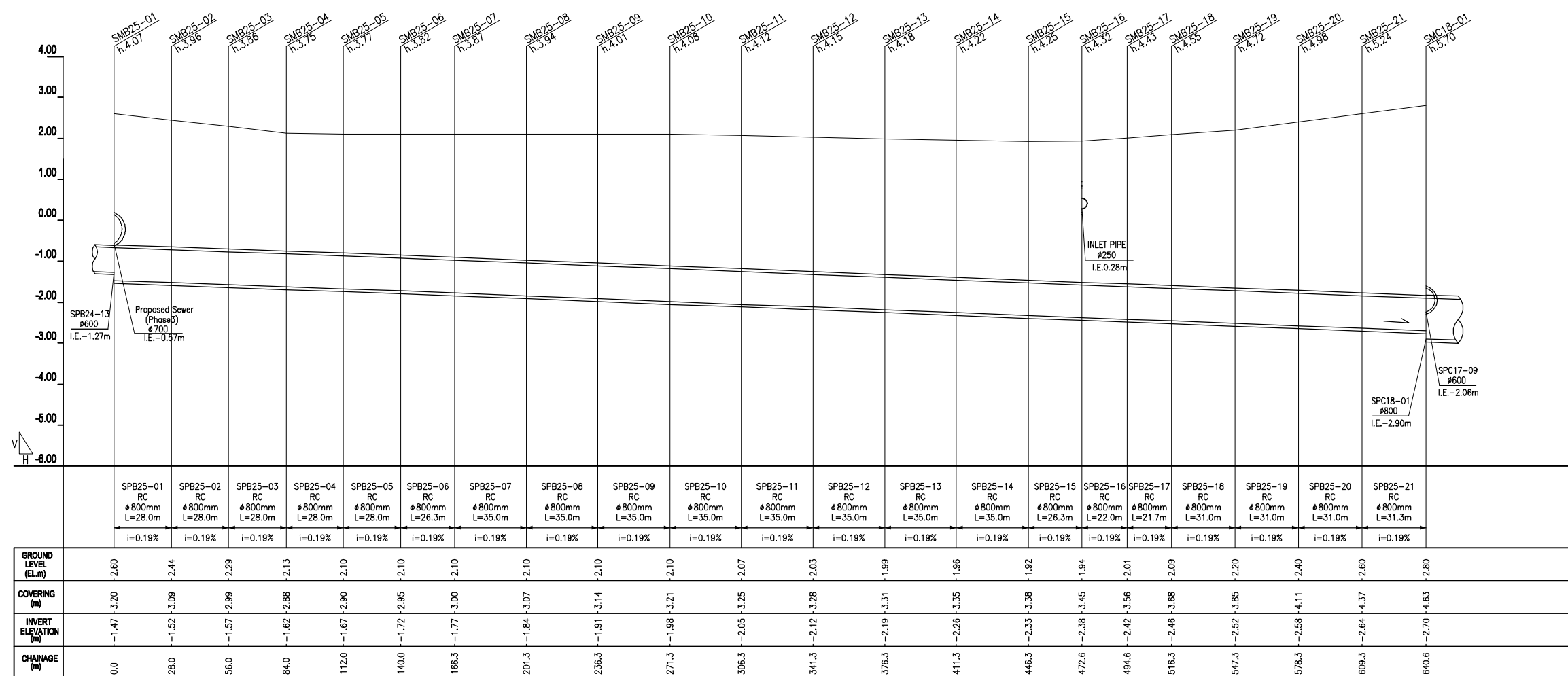


KEY PLAN

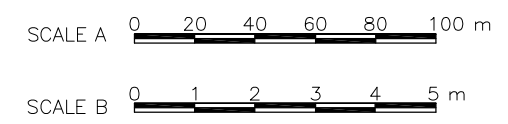




PLAN
SCALE A



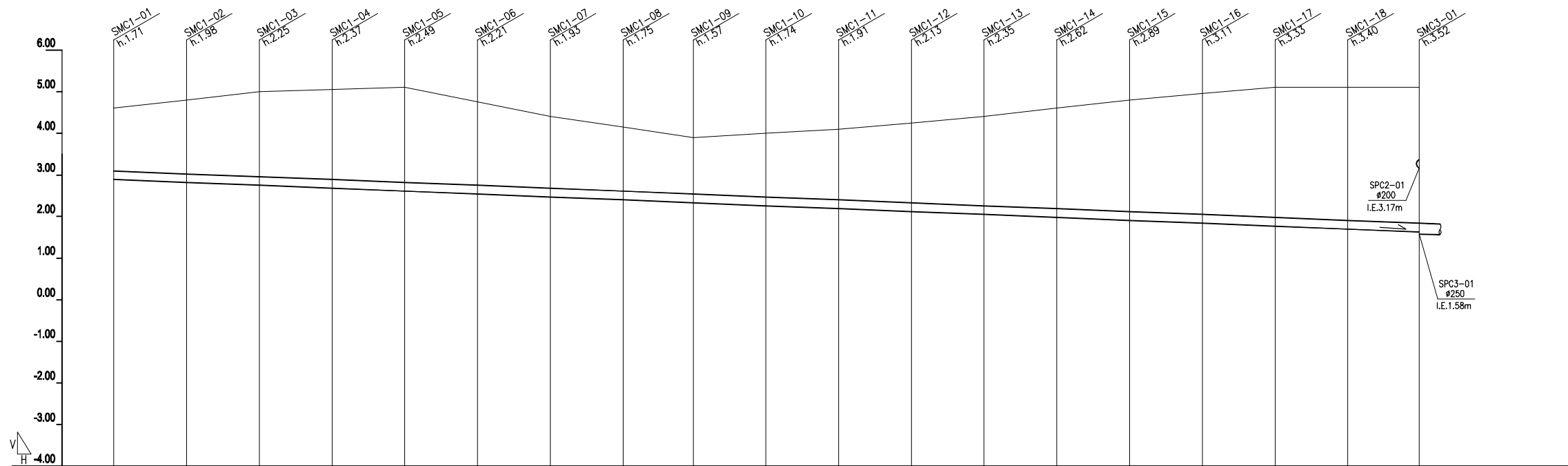
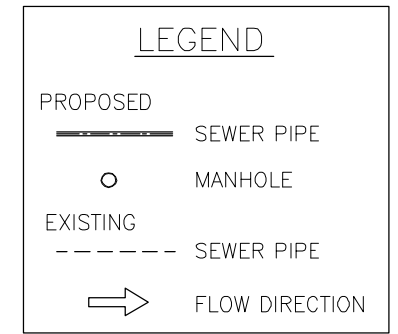
KEY PLAN



PROFILE
H: SCALE A V: SCALE B

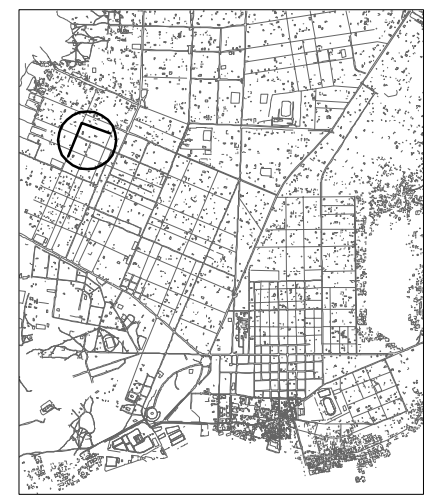


PLAN
SCALE A

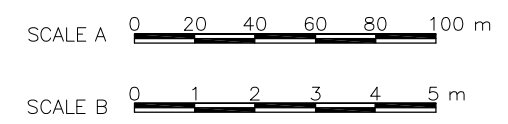


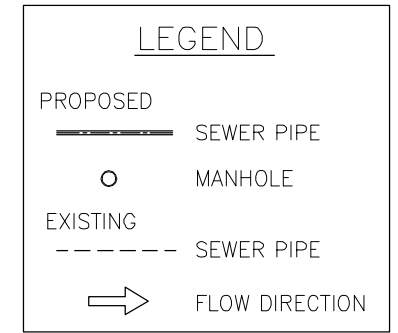
	SMC1-01	SMC1-02	SMC1-03	SMC1-04	SMC1-05	SMC1-06	SMC1-07	SMC1-08	SMC1-09	SMC1-10	SMC1-11	SMC1-12	SMC1-13	SMC1-14	SMC1-15	SMC1-16	SMC1-17	SMC1-18	SMC1-01	
h. (m)	1.71	1.98	2.25	2.37	2.49	2.21	1.93	1.75	1.57	1.74	1.91	2.13	2.33	2.62	2.89	3.11	3.33	3.40	3.52	
SPC1-01	SPC1-02	SPC1-03	SPC1-04	SPC1-05	SPC1-06	SPC1-07	SPC1-08	SPC1-09	SPC1-10	SPC1-11	SPC1-12	SPC1-13	SPC1-14	SPC1-15	SPC1-16	SPC1-17	SPC1-18			
PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC		
φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm	φ200mm		
L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=33.7m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=35.0m	L=34.4m		
i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%	i=0.20%		
GROUND LEVEL (E _m)	-4.60	-4.80	-5.00	-5.05	-5.10	-4.75	-4.40	-4.15	-3.90	-4.00	-4.10	-4.25	-4.40	-4.60	-4.80	-4.95	-5.10	-5.10	-5.10	
COVERING (m)	1.50	1.77	2.04	2.16	2.28	2.00	1.72	1.54	1.36	1.53	1.70	1.92	2.14	2.41	2.68	2.90	3.12	3.19	3.26	
INVERT ELEVATION (m)	-2.89	-2.82	-2.75	-2.68	-2.61	-2.54	-2.47	-2.40	-2.33	-2.26	-2.19	-2.12	-2.05	-1.98	-1.91	-1.84	-1.77	-1.70	-1.63	
CHANGE (m)	-0.0	-35.0	-70.0	-105.0	-140.0	-175.0	-210.0	-245.0	-278.7	-313.7	-348.7	-383.7	-418.7	-453.7	-488.7	-523.7	-558.7	-593.7	-628.1	

PROFILE
H: SCALE A V: SCALE B

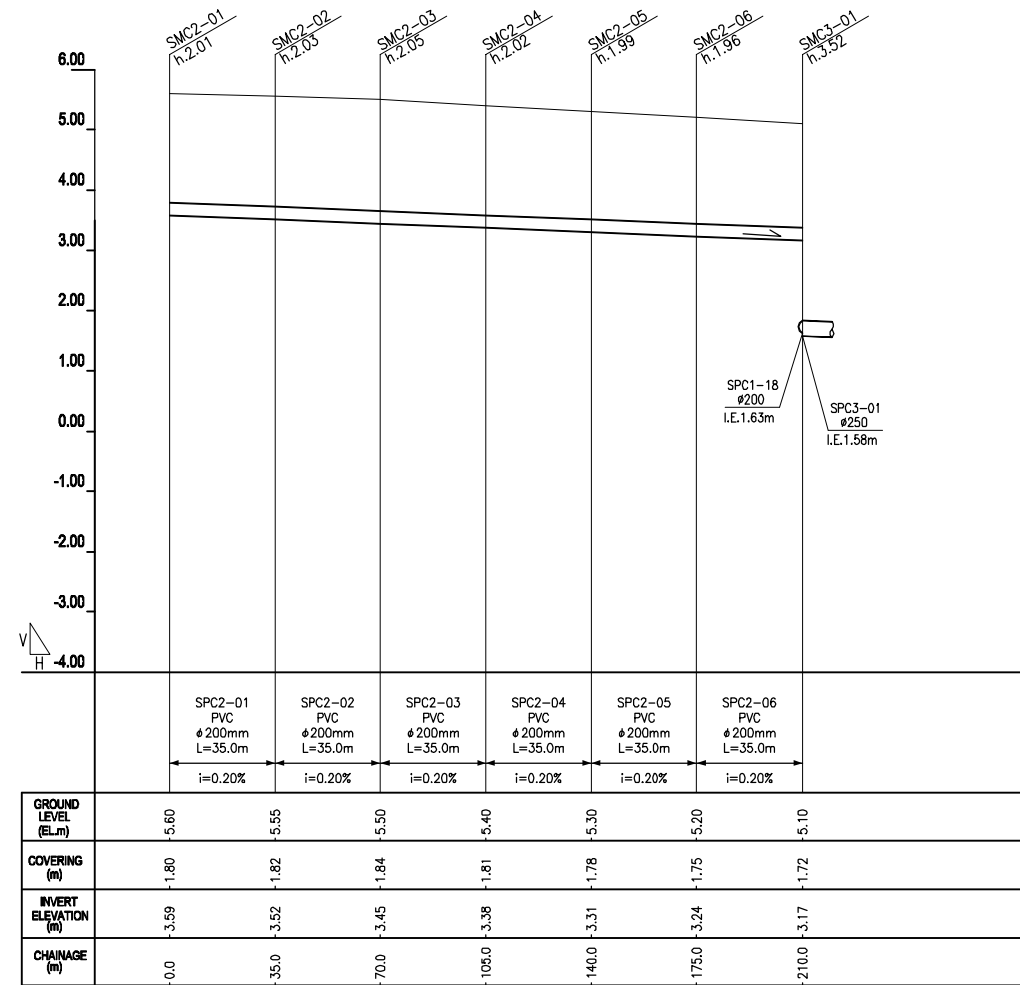


KEY PLAN

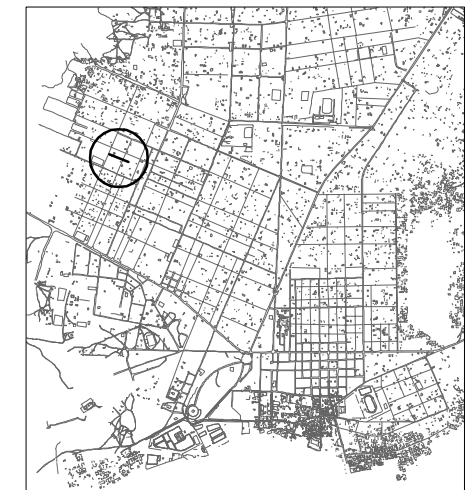




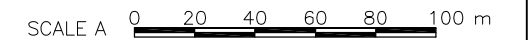
PLAN
SCALE A



PROFILE
H: SCALE A V: SCALE B

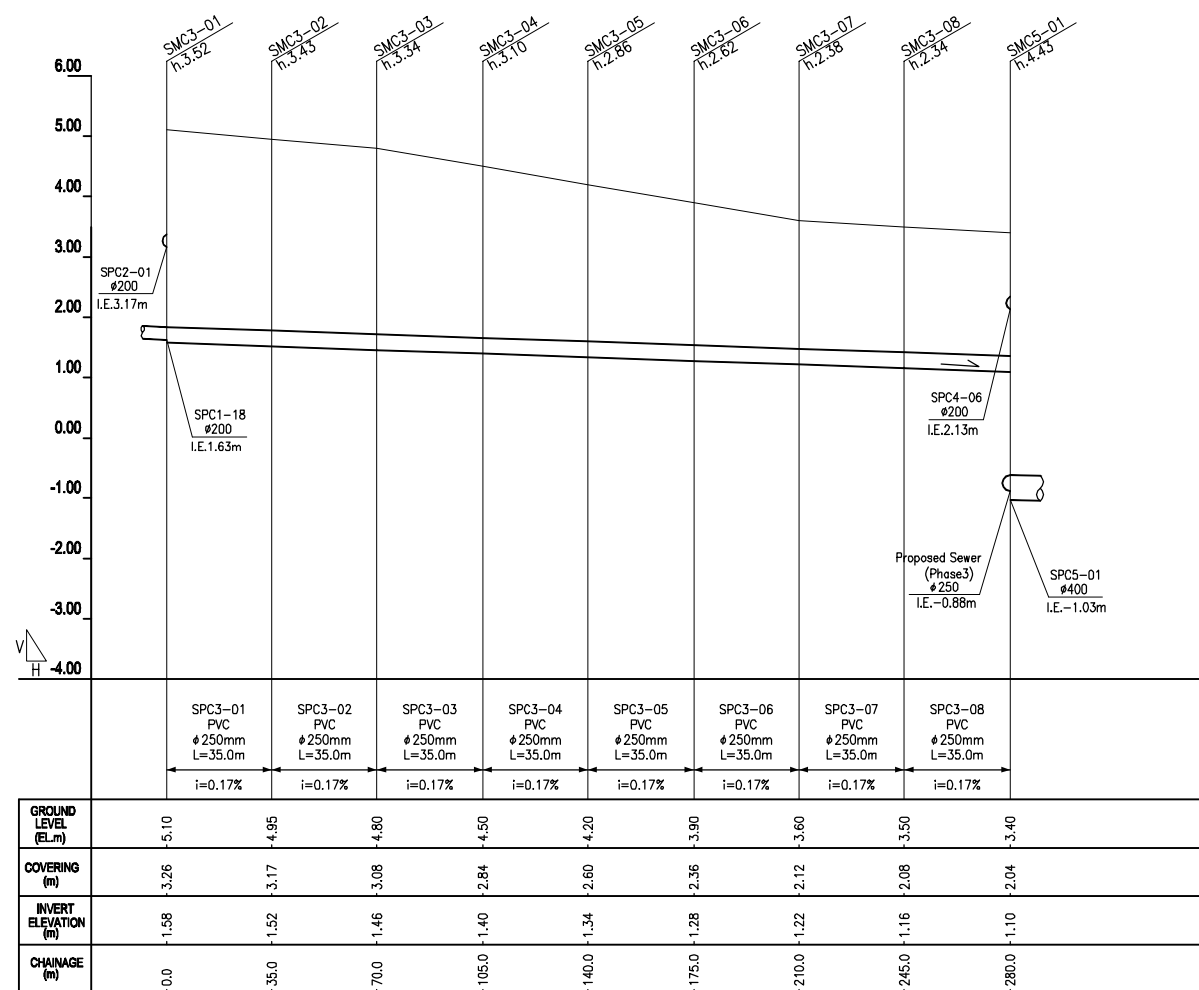
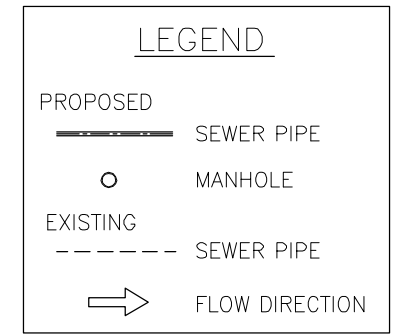


KEY PLAN

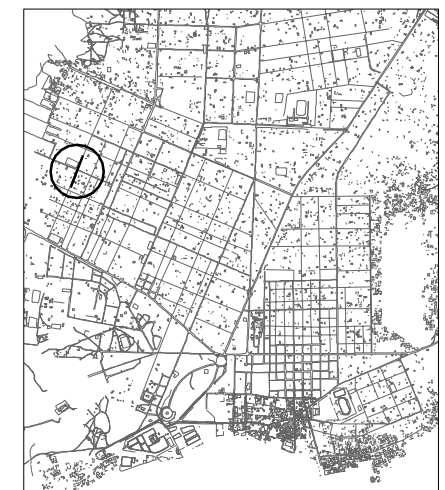




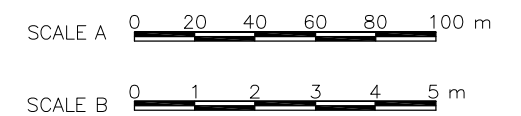
PLAN
SCALE A

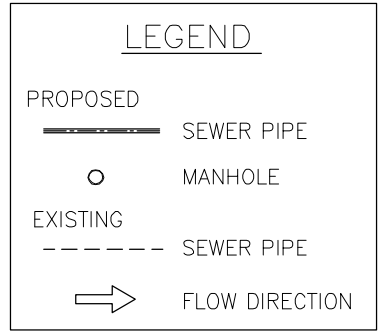
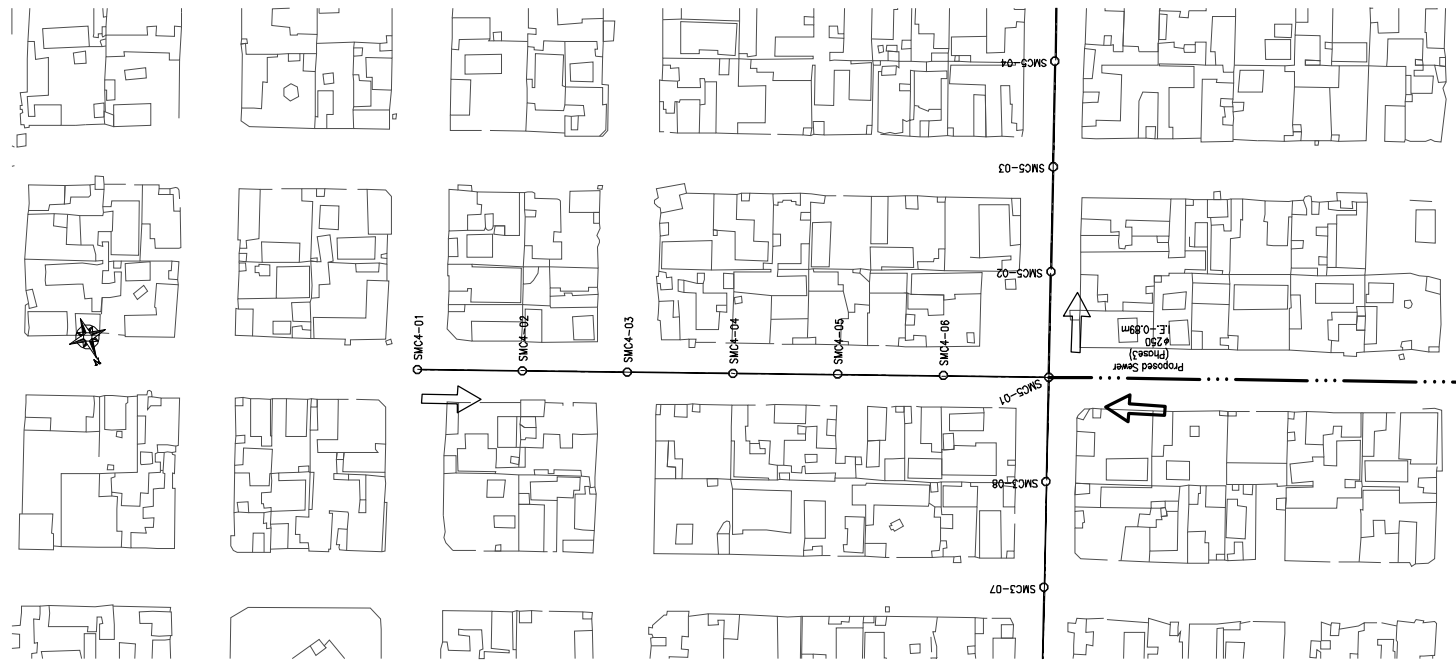


PROFILE
H: SCALE A V: SCALE B

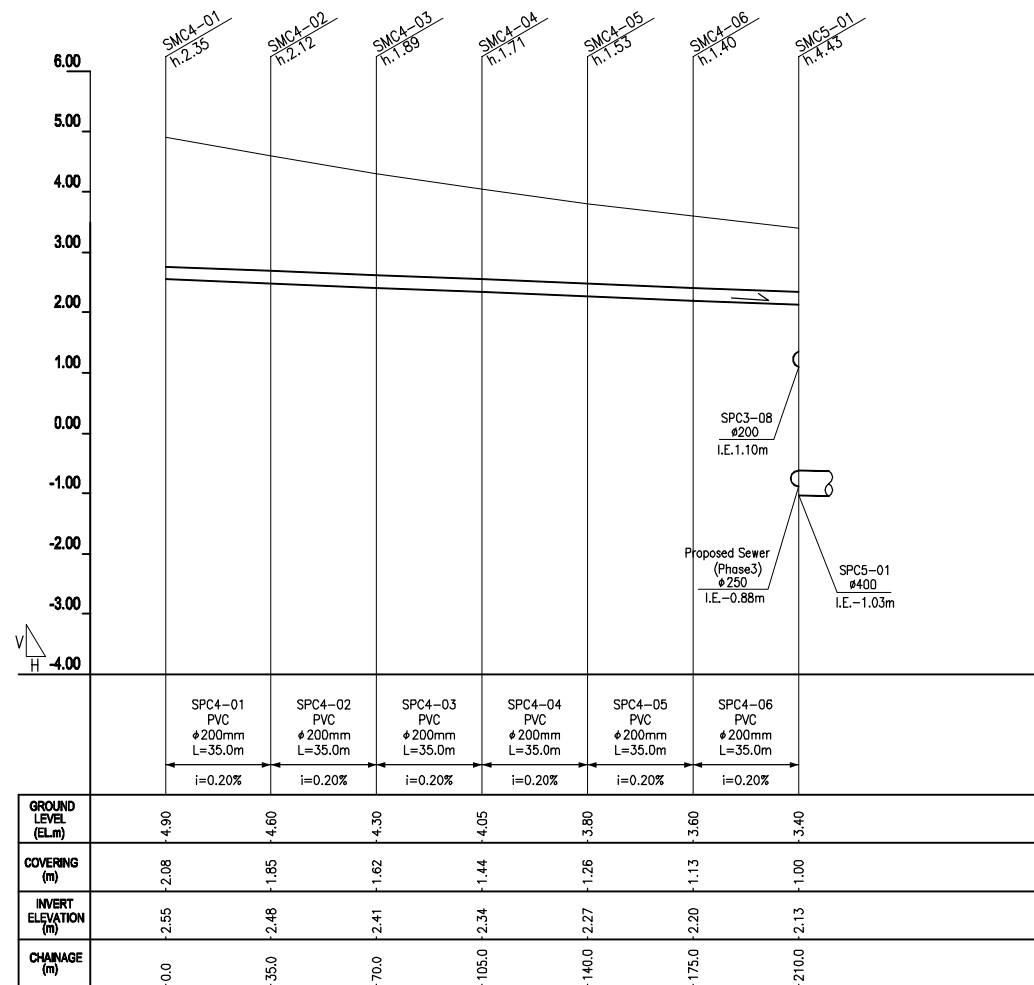


KEY PLAN

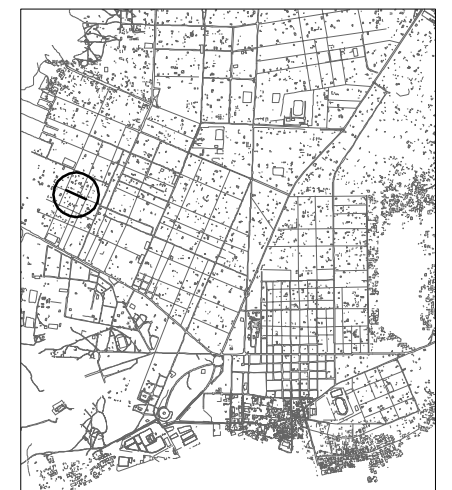




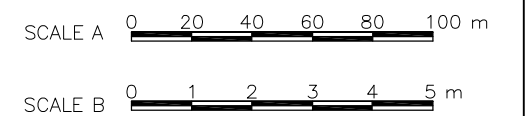
PLAN
SCALE A

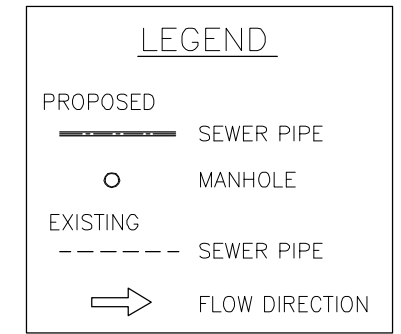


PROFILE
H: SCALE A V: SCALE B

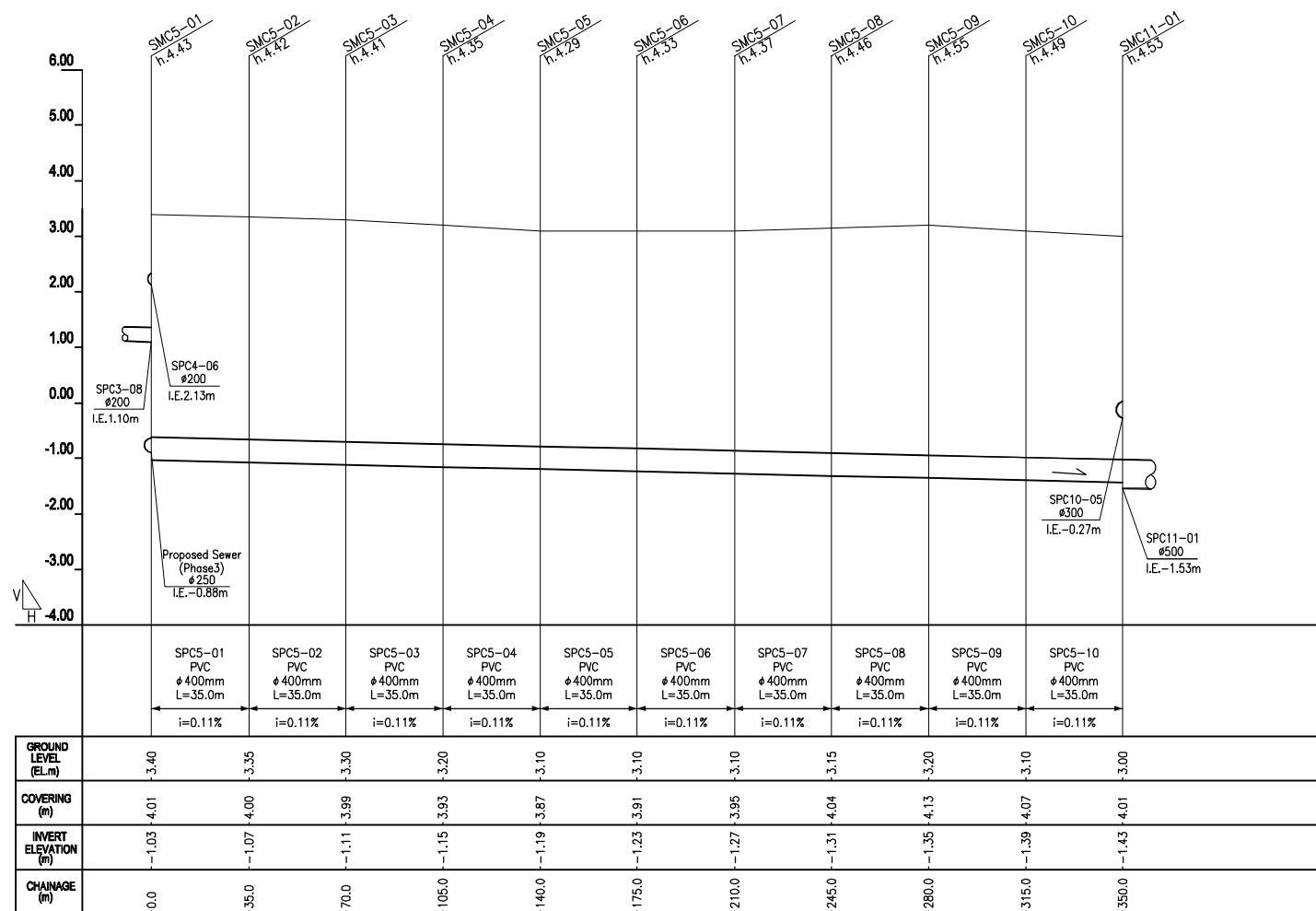


KEY PLAN

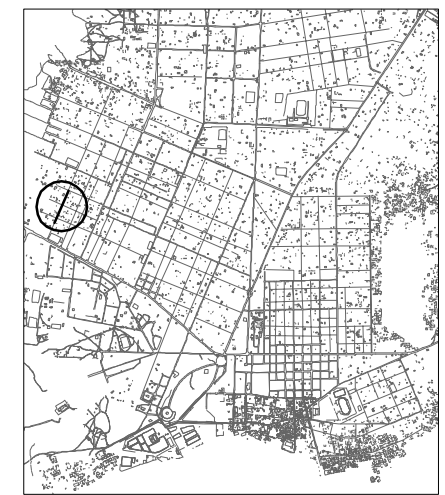




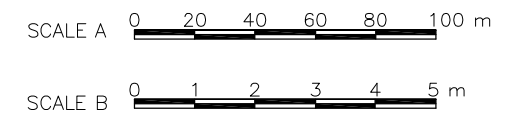
PLAN
SCALE A

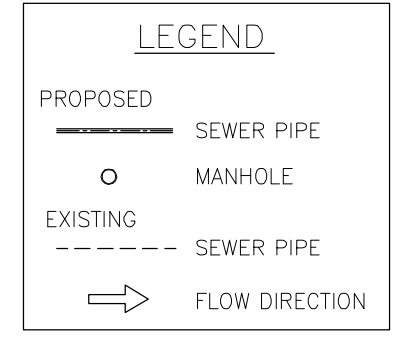


PROFILE
H: SCALE A V: SCALE B

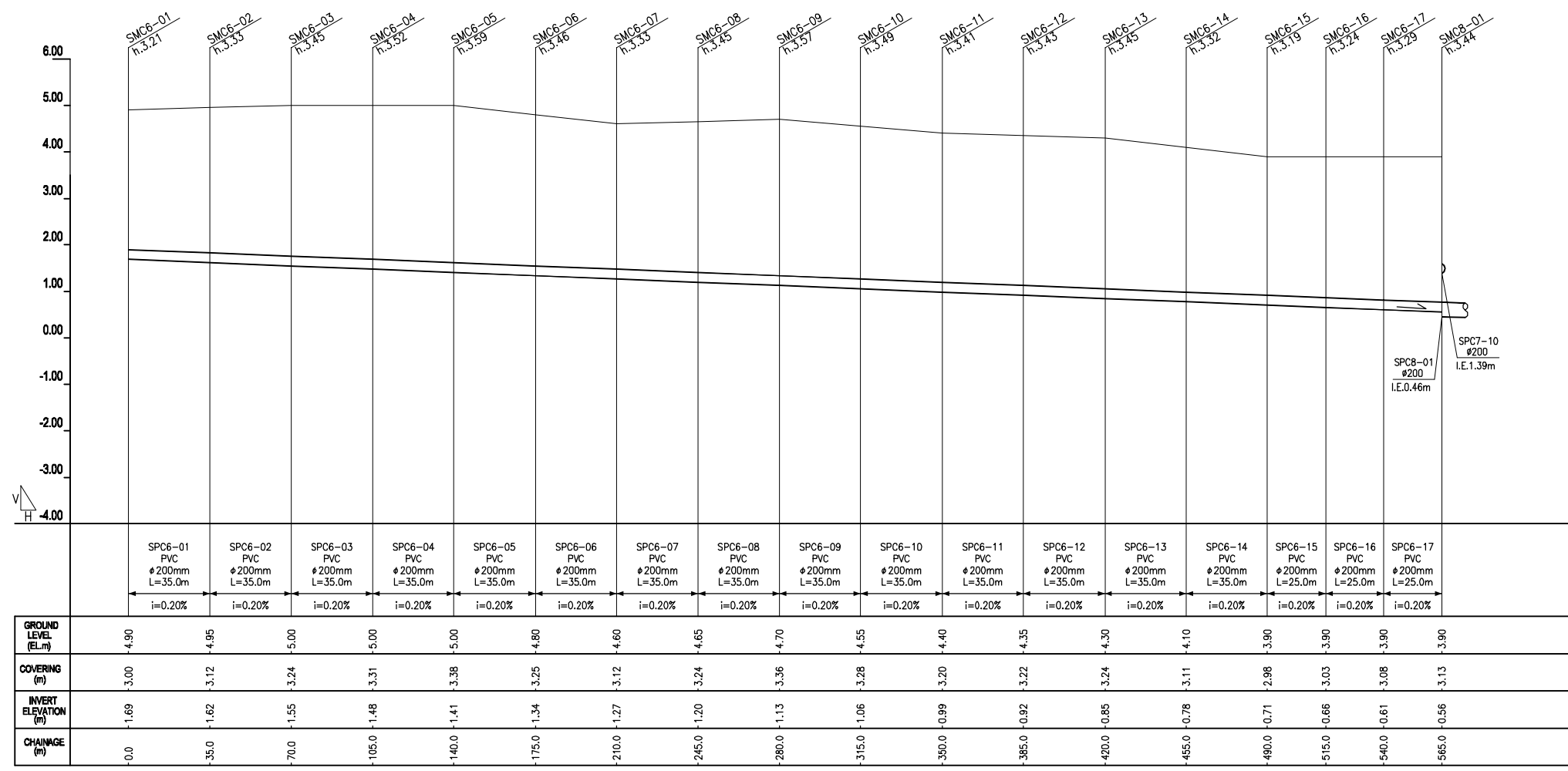


KEY PLAN

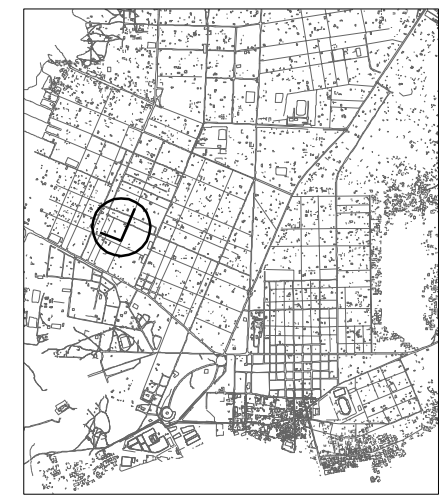




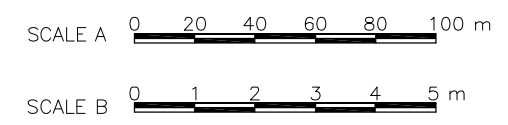
PLAN
SCALE A

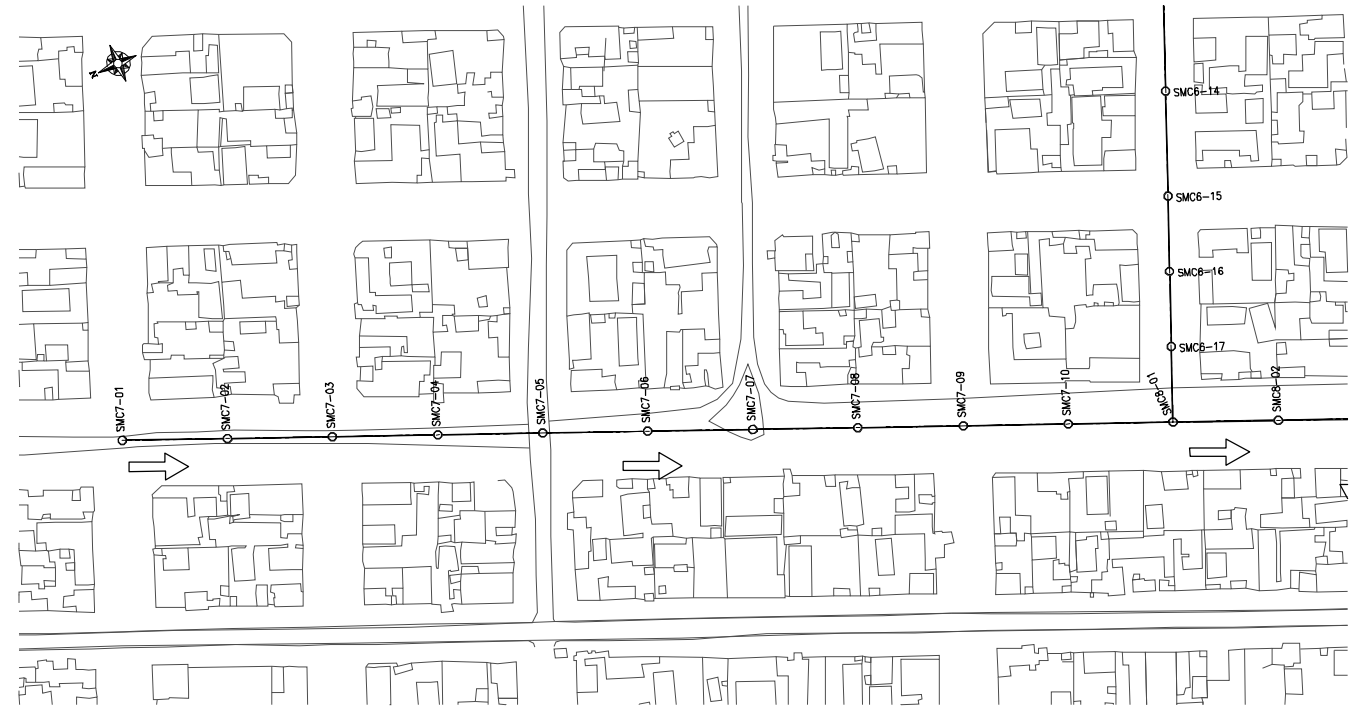


PROFILE
H: SCALE A V: SCALE B

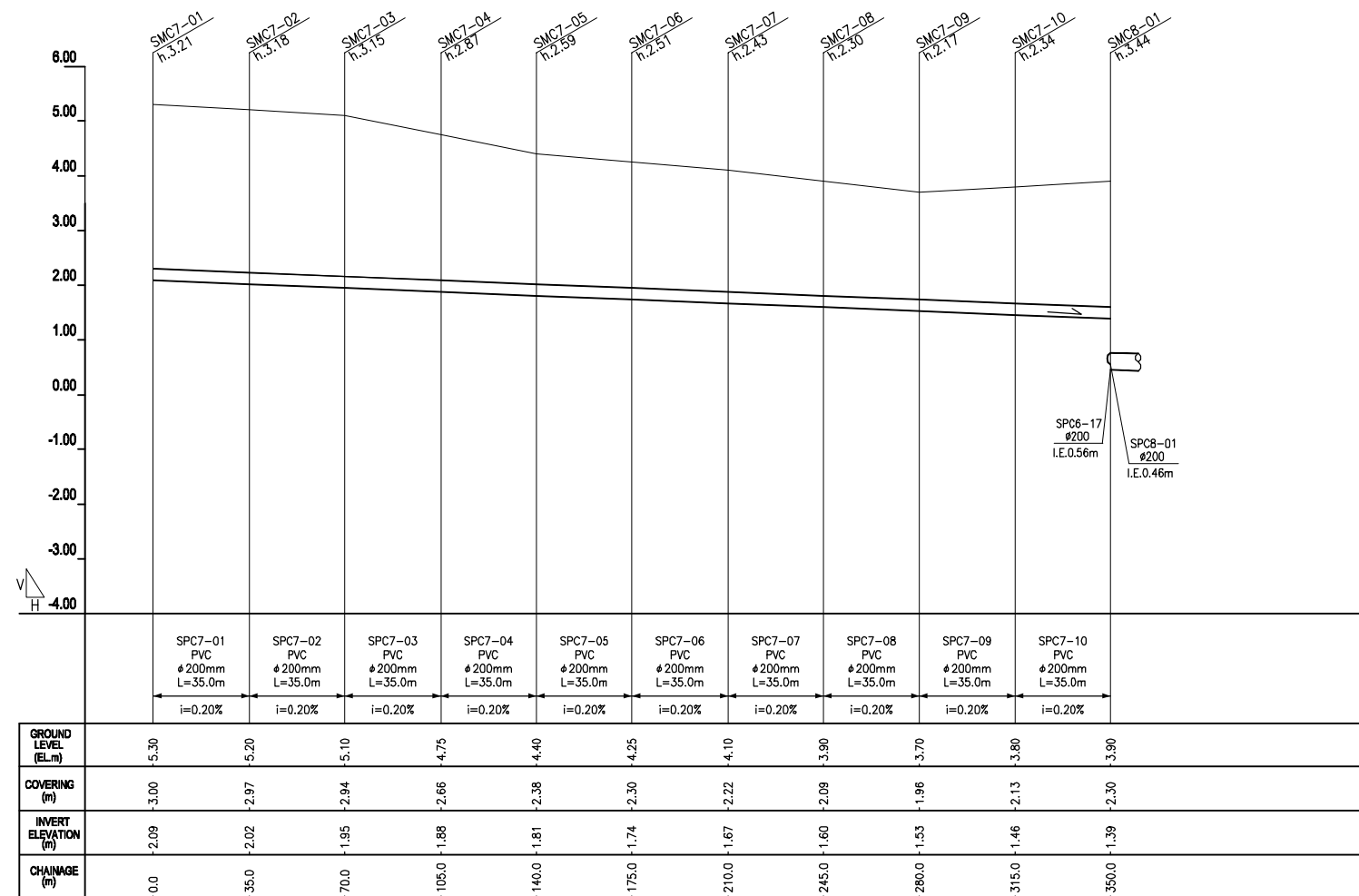
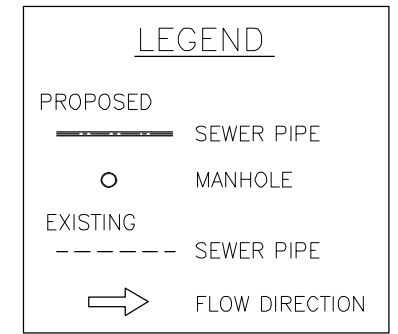


KEY PLAN

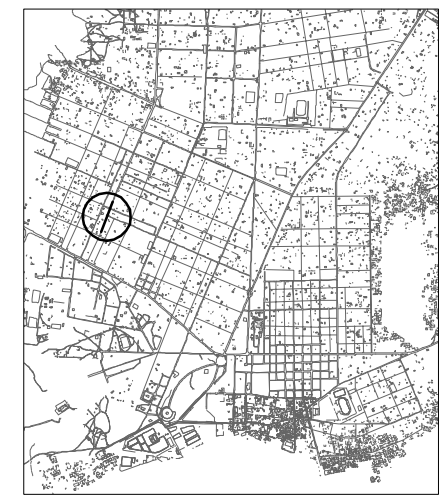




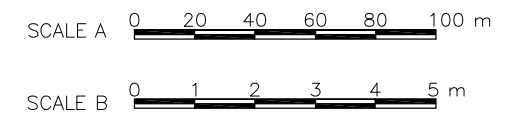
PLAN
SCALE A



PROFILE
H: SCALE A V: SCALE B



KEY PLAN





LEGEND

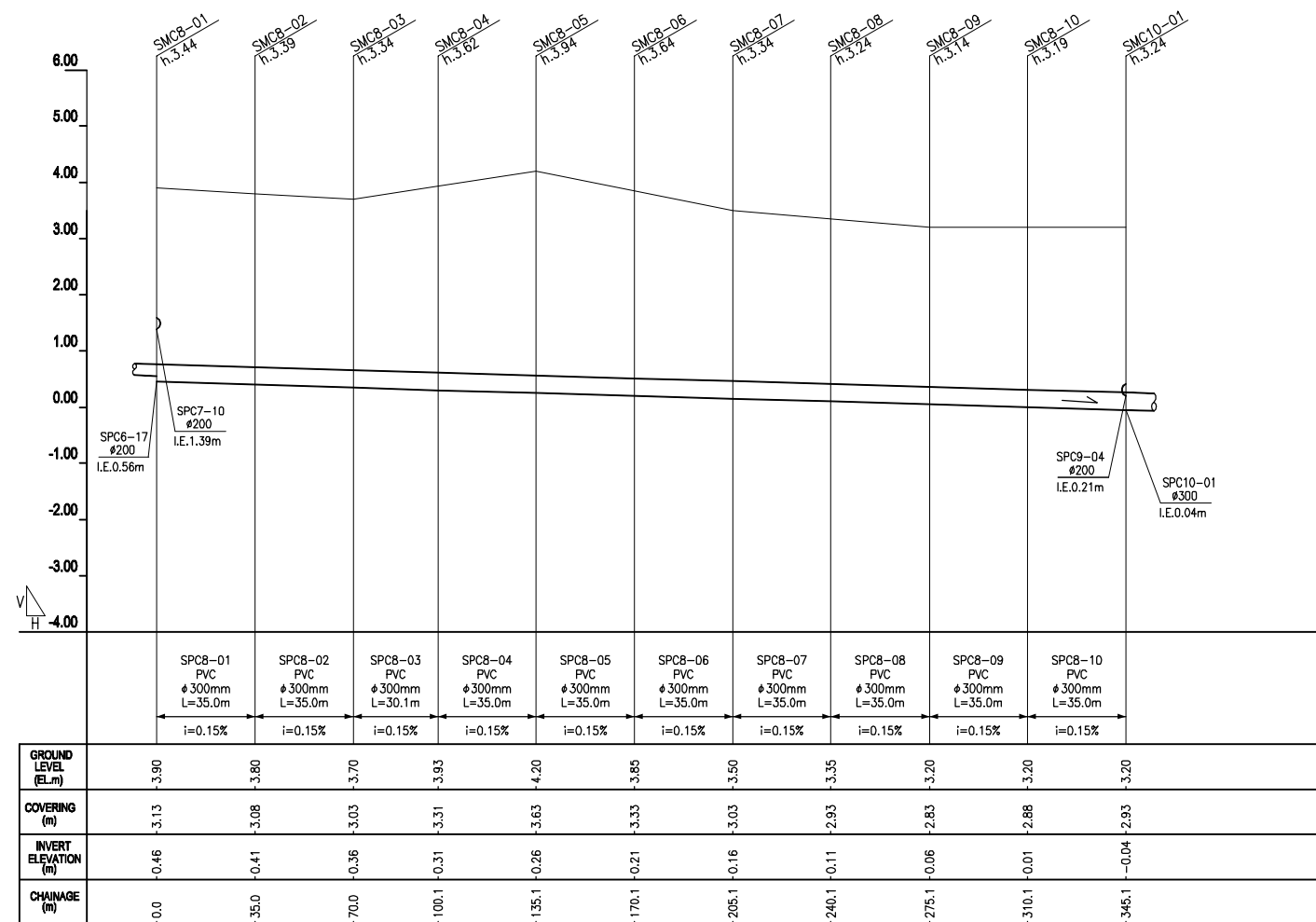
PROPOSED

- SEWER PIPE
- MANHOLE

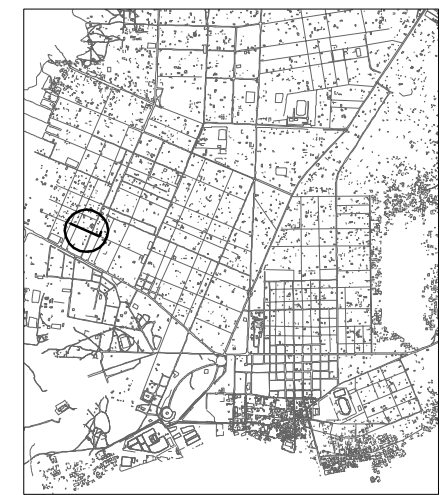
EXISTING

- - - SEWER PIPE
- ➔ FLOW DIRECTION

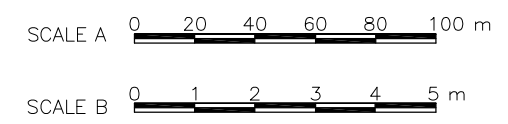
PLAN
SCALE A

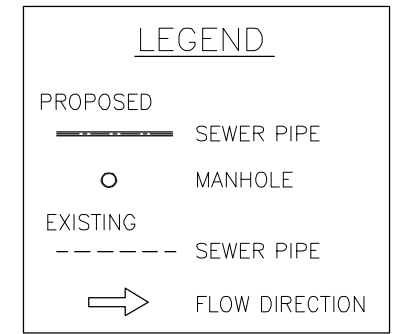
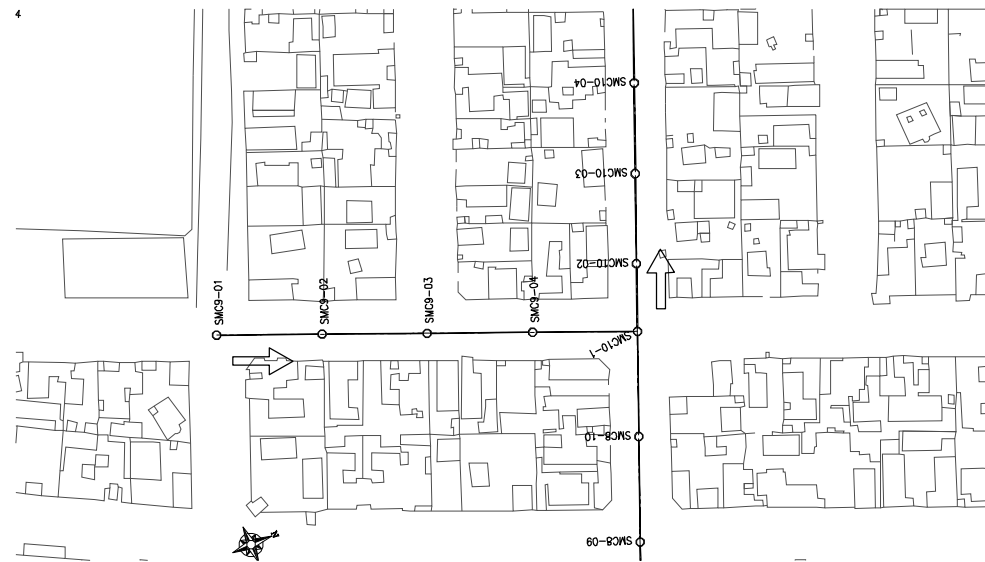


PROFILE
H: SCALE A V: SCALE B

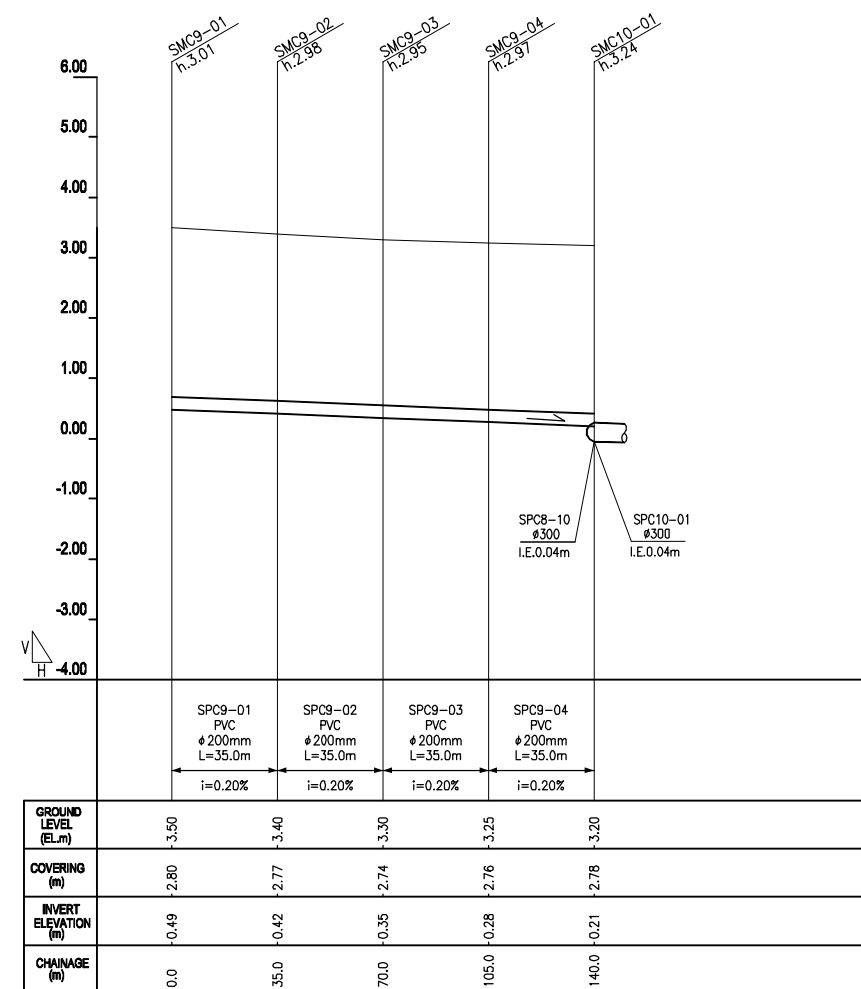


KEY PLAN

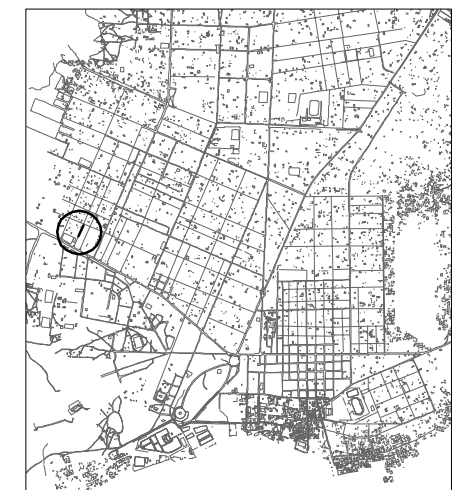




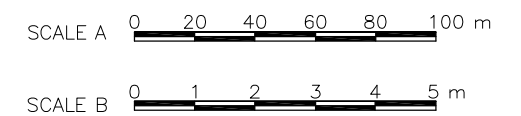
PLAN
SCALE A

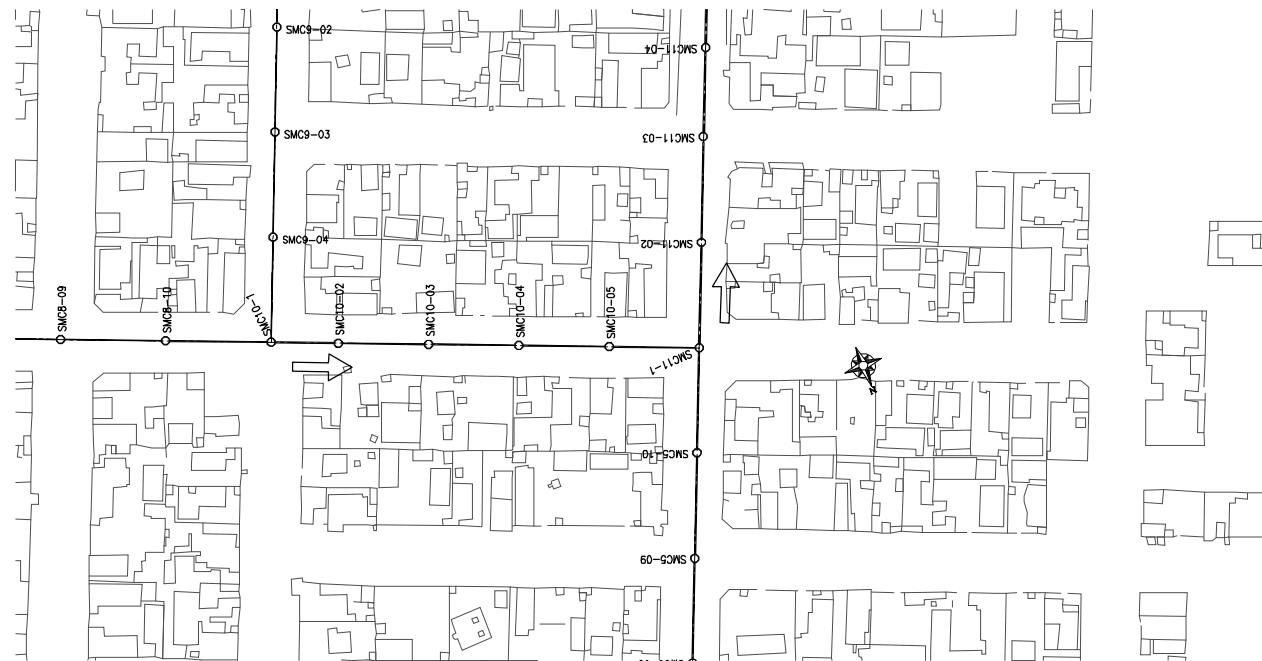


PROFILE
H: SCALE A V: SCALE B



KEY PLAN





LEGEND

PROPOSED

— SEWER PIPE

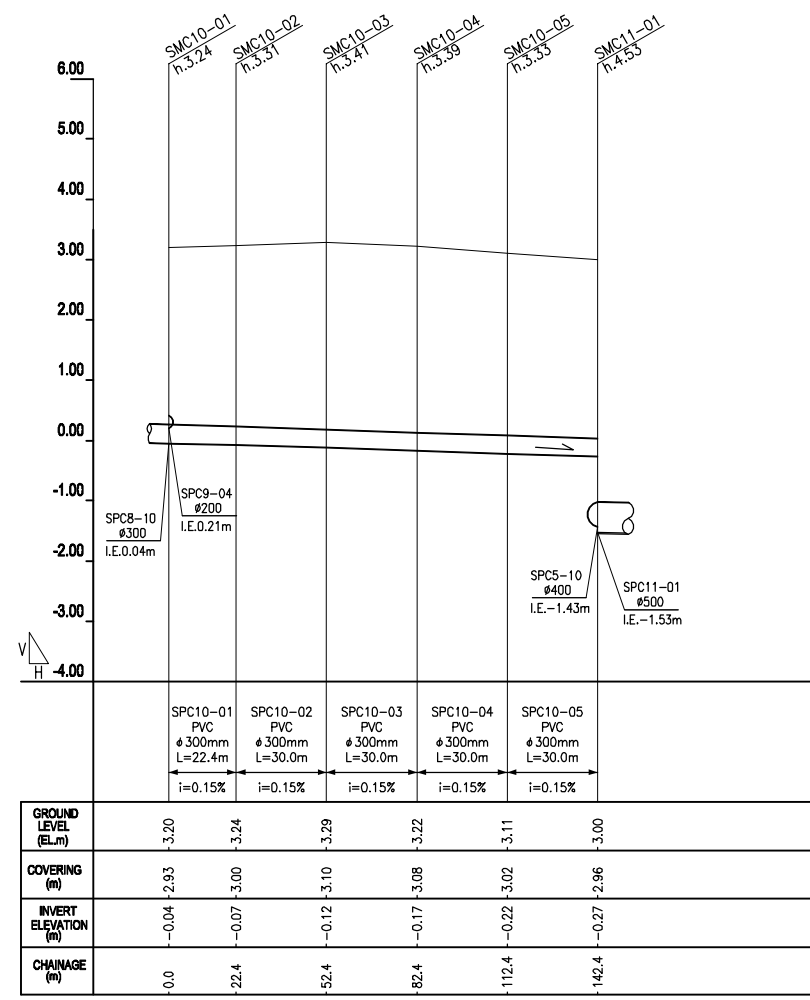
○ MANHOLE

EXISTING

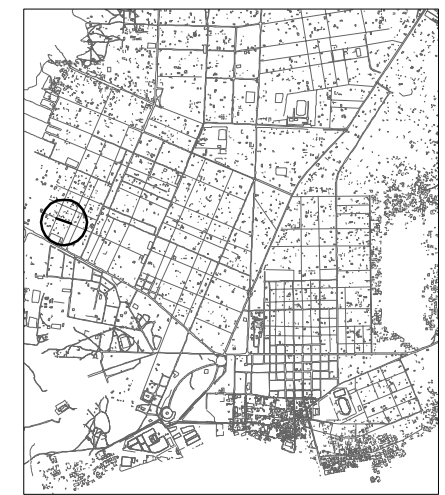
- - - SEWER PIPE

➔ FLOW DIRECTION

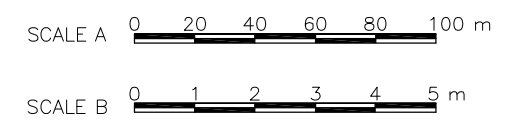
PLAN
SCALE A

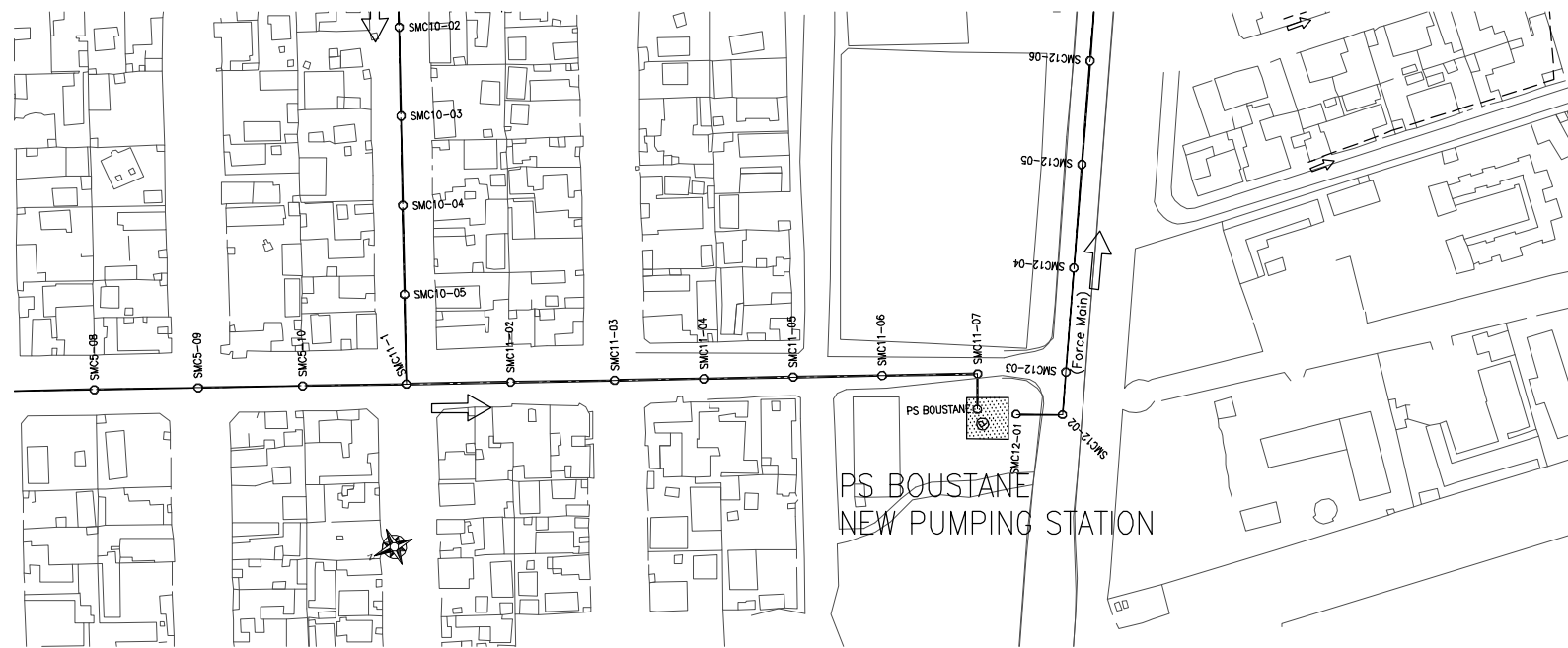


PROFILE
H: SCALE A V: SCALE B

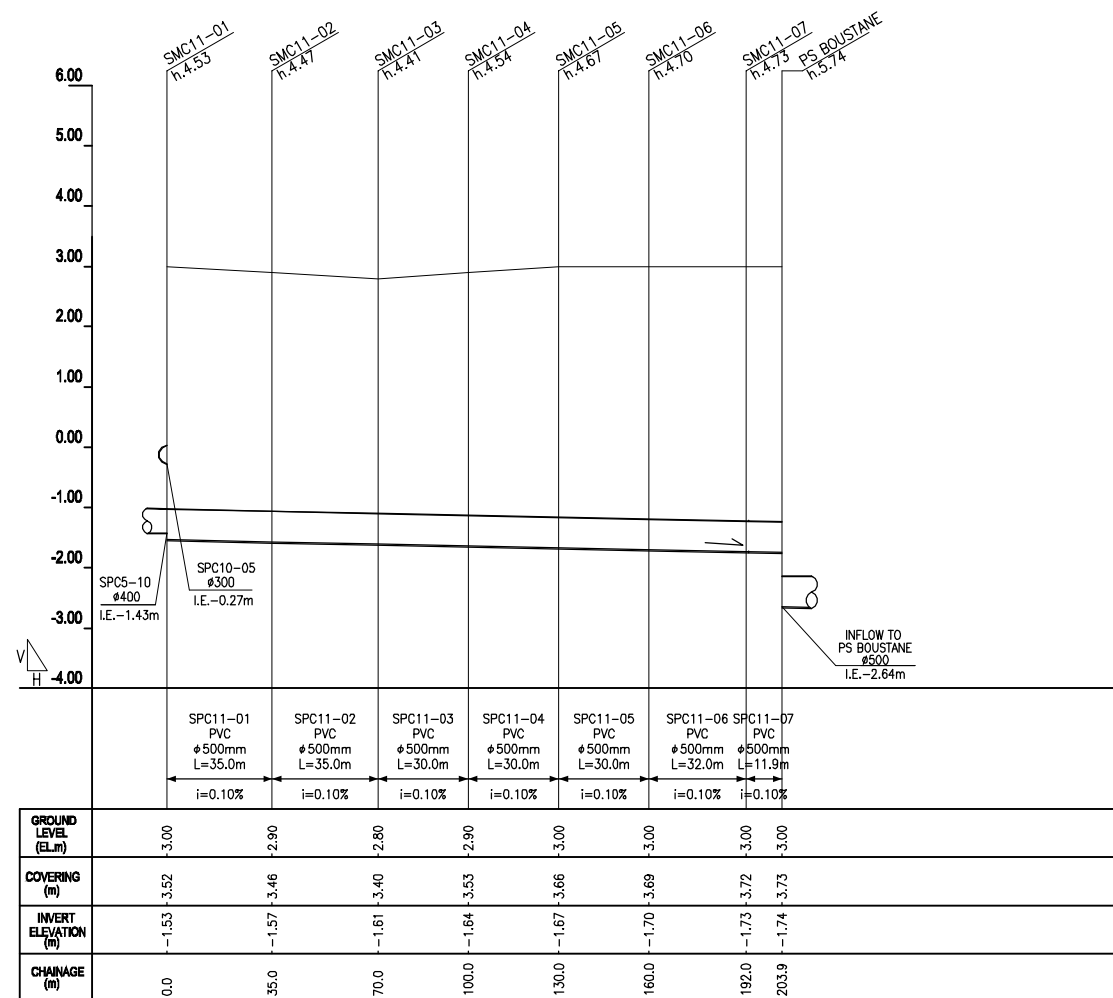


KEY PLAN

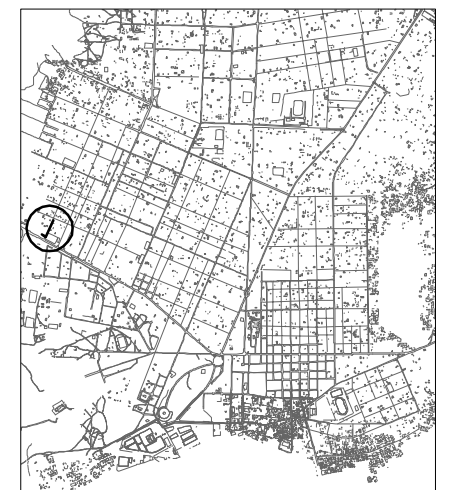




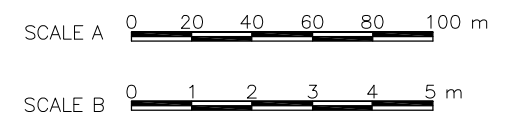
PLAN
SCALE A



PROFILE
H: SCALE A V: SCALE B

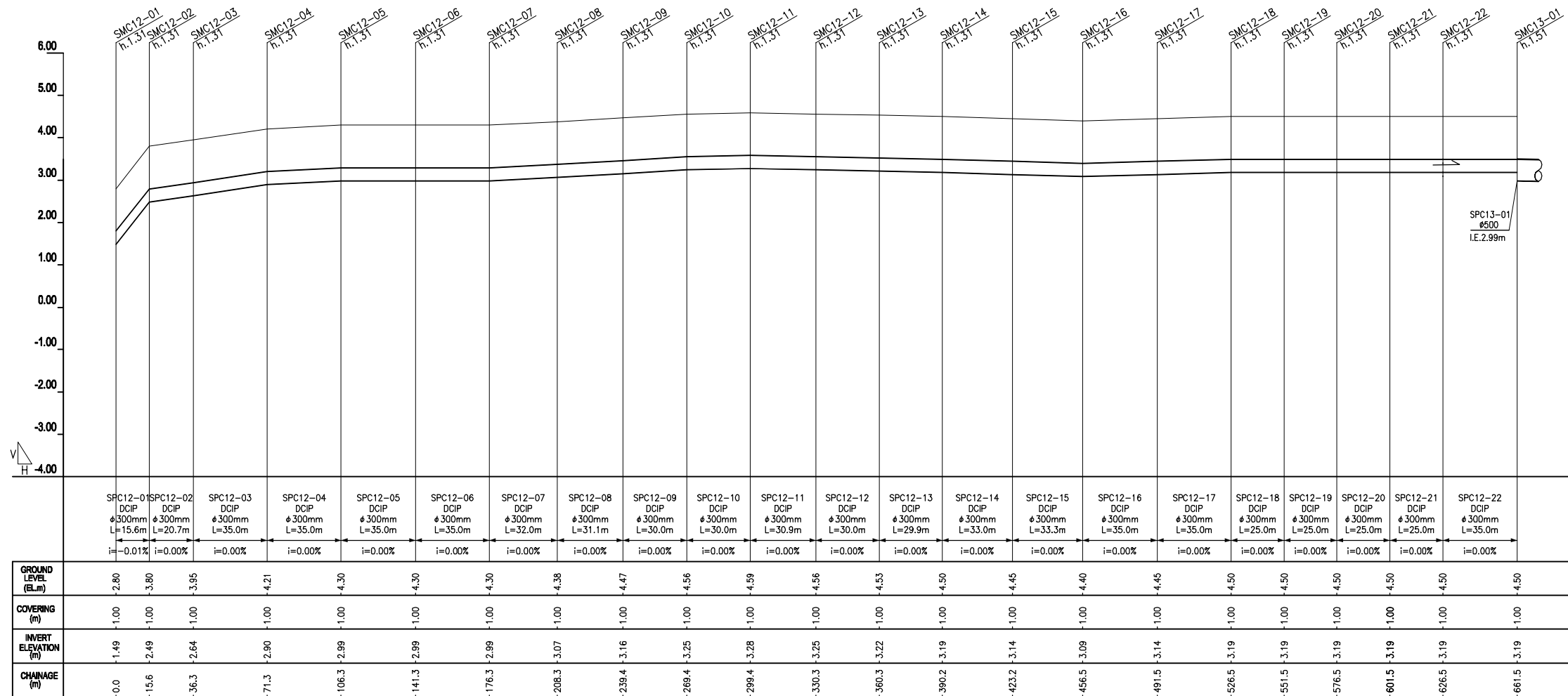


KEY PLAN

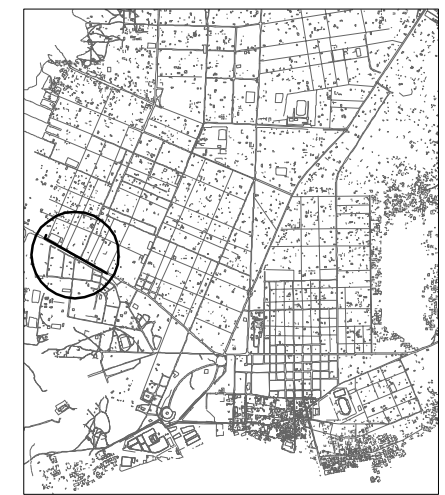




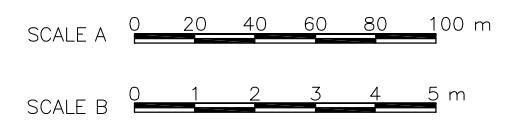
PLAN
SCALE A

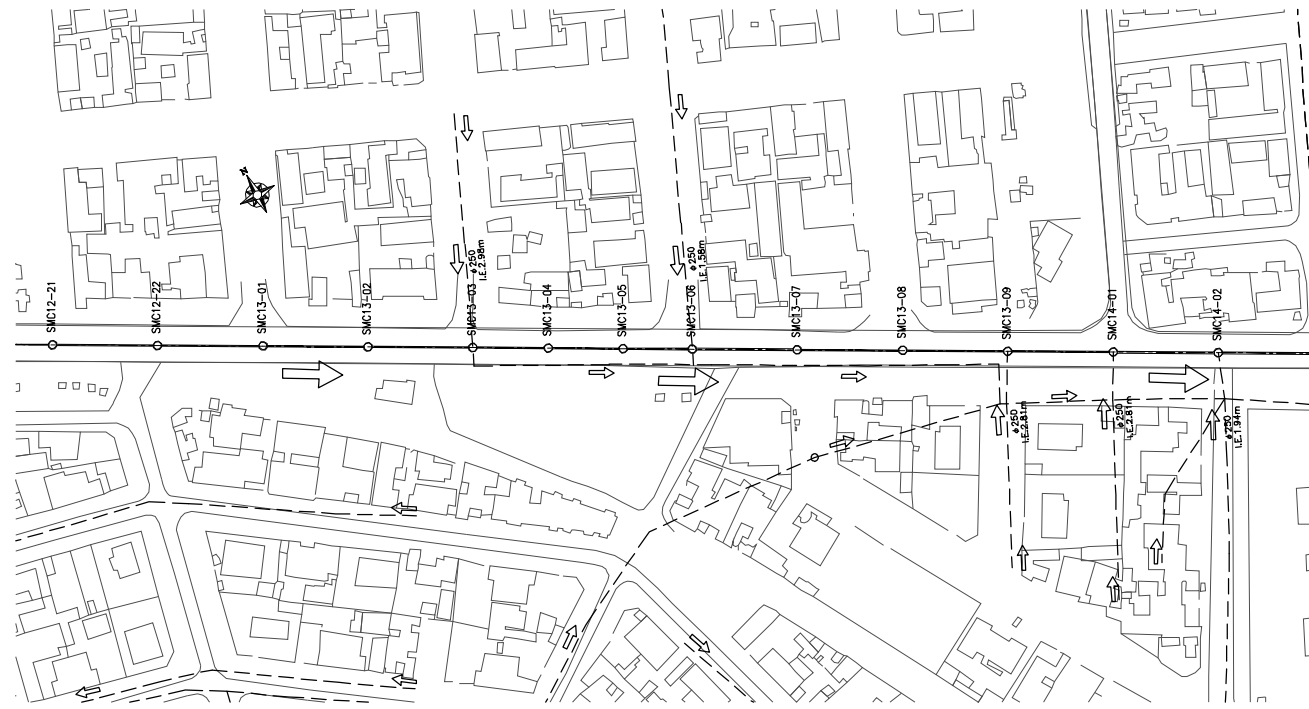


PROFILE
H: SCALE A V: SCALE B



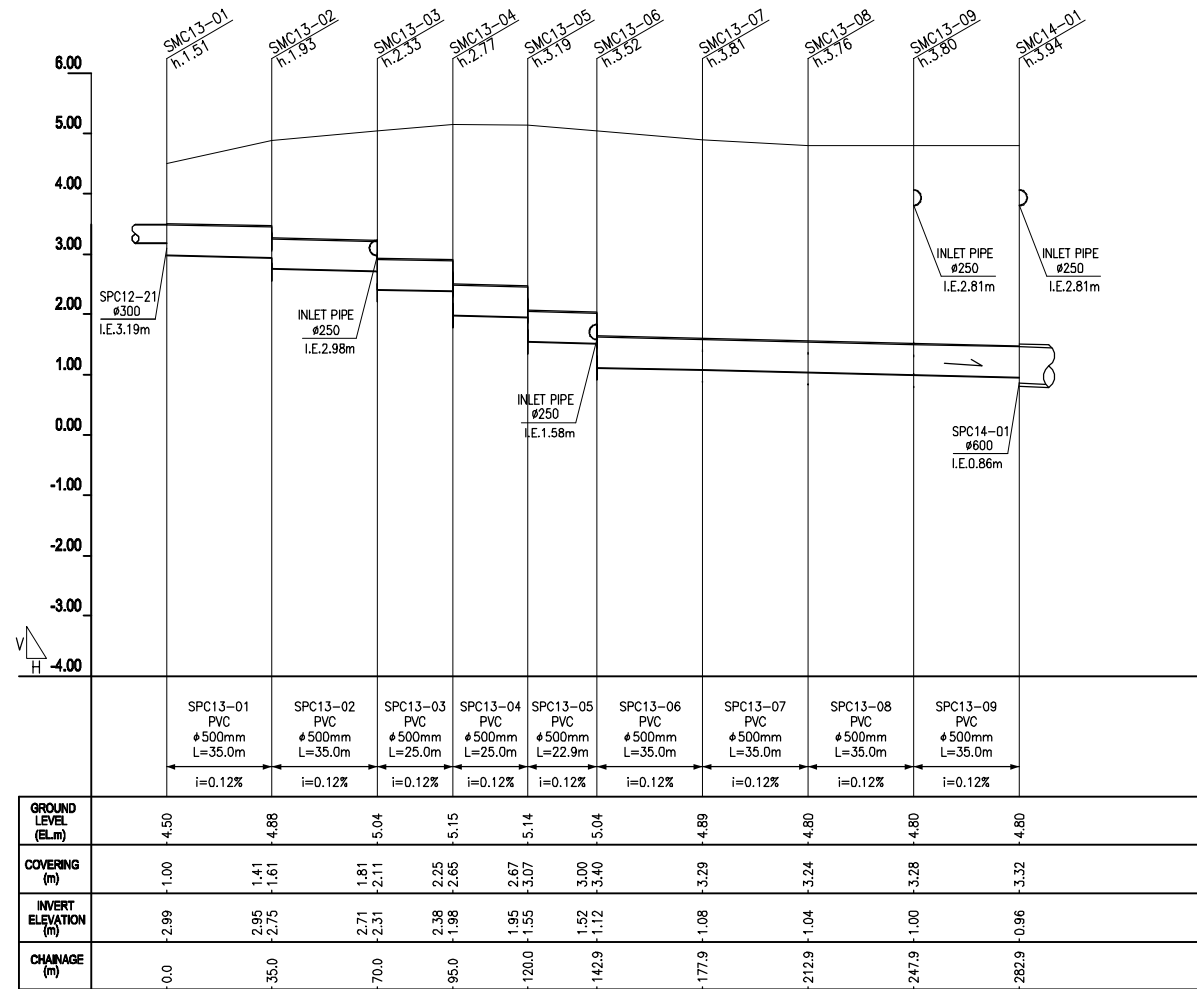
KEY PLAN



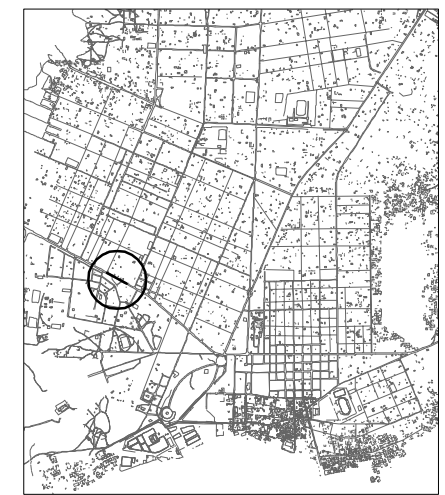


LEGEND	
PROPOSED	SEWER PIPE
○	MANHOLE
EXISTING	SEWER PIPE
➔	FLOW DIRECTION

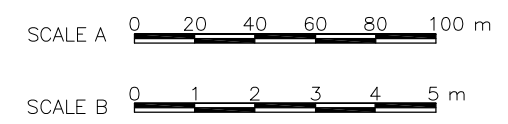
PLAN
SCALE A

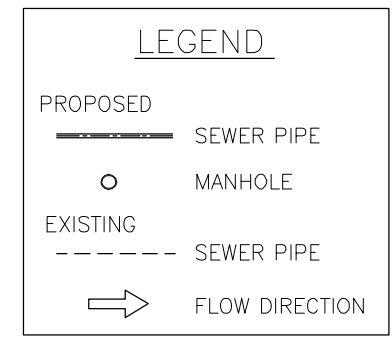
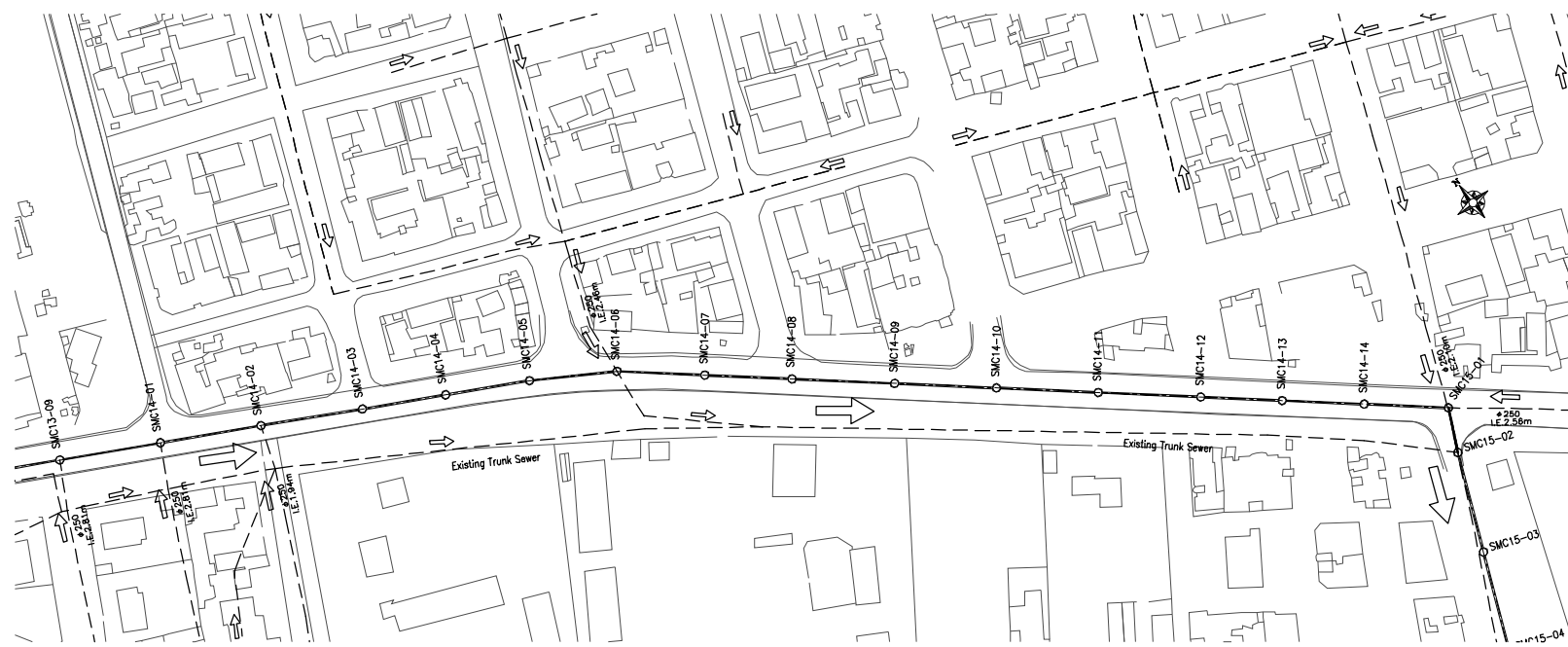


PROFILE
H: SCALE A V: SCALE B

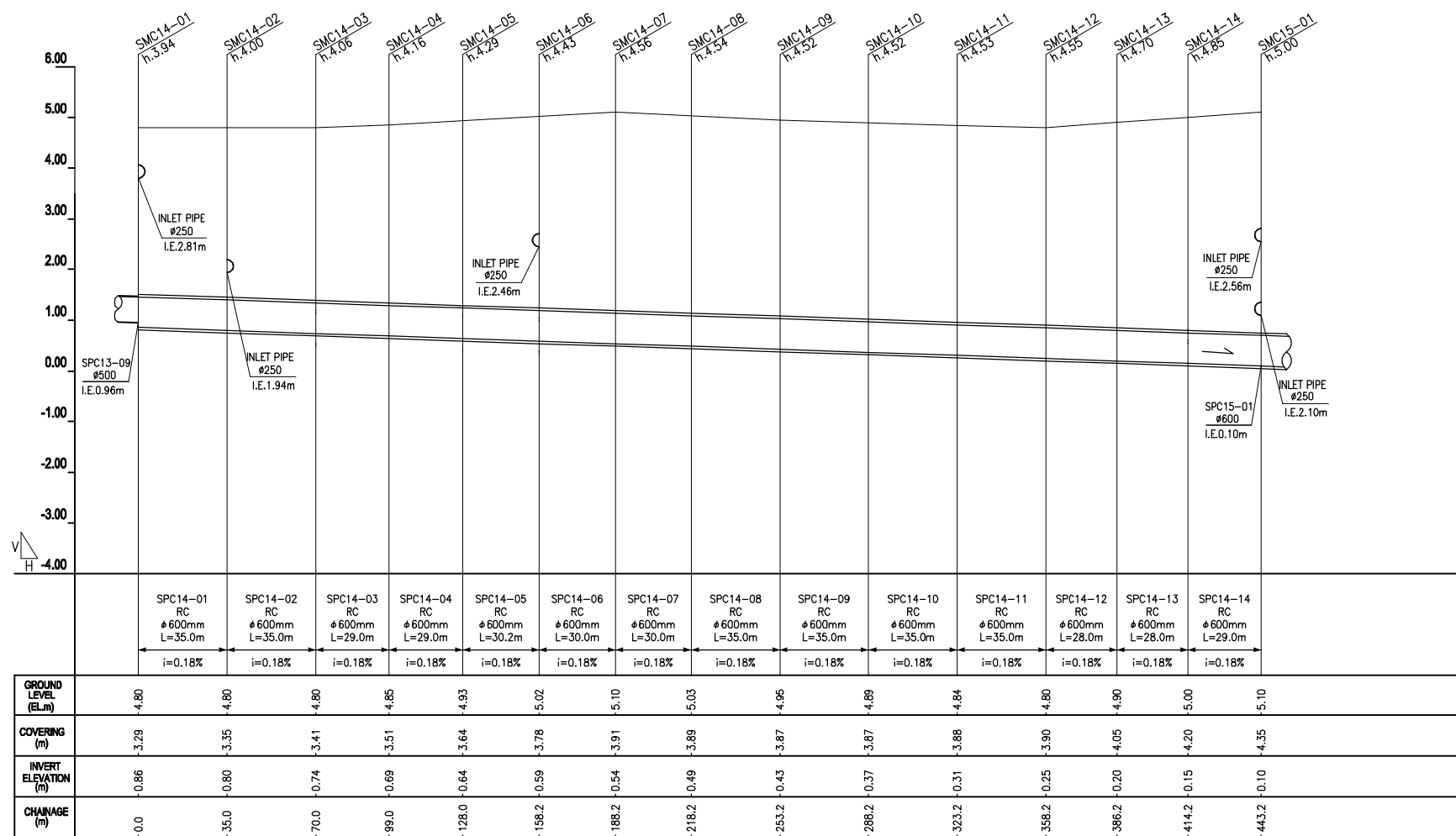


KEY PLAN

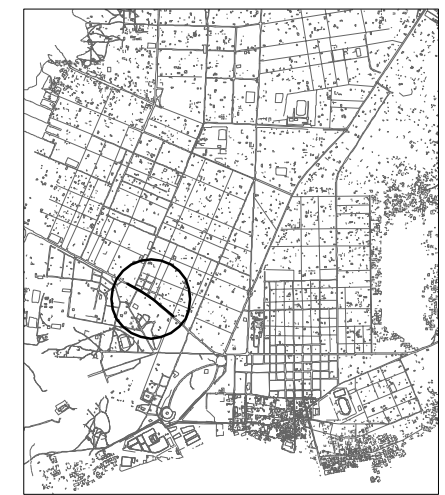




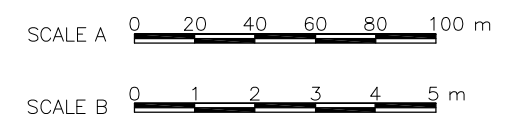
PLAN
SCALE A

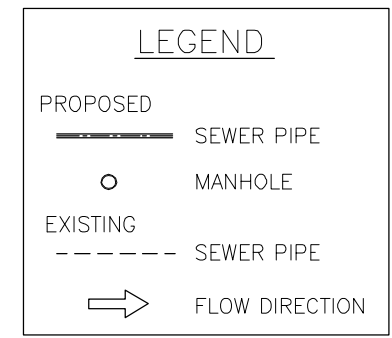
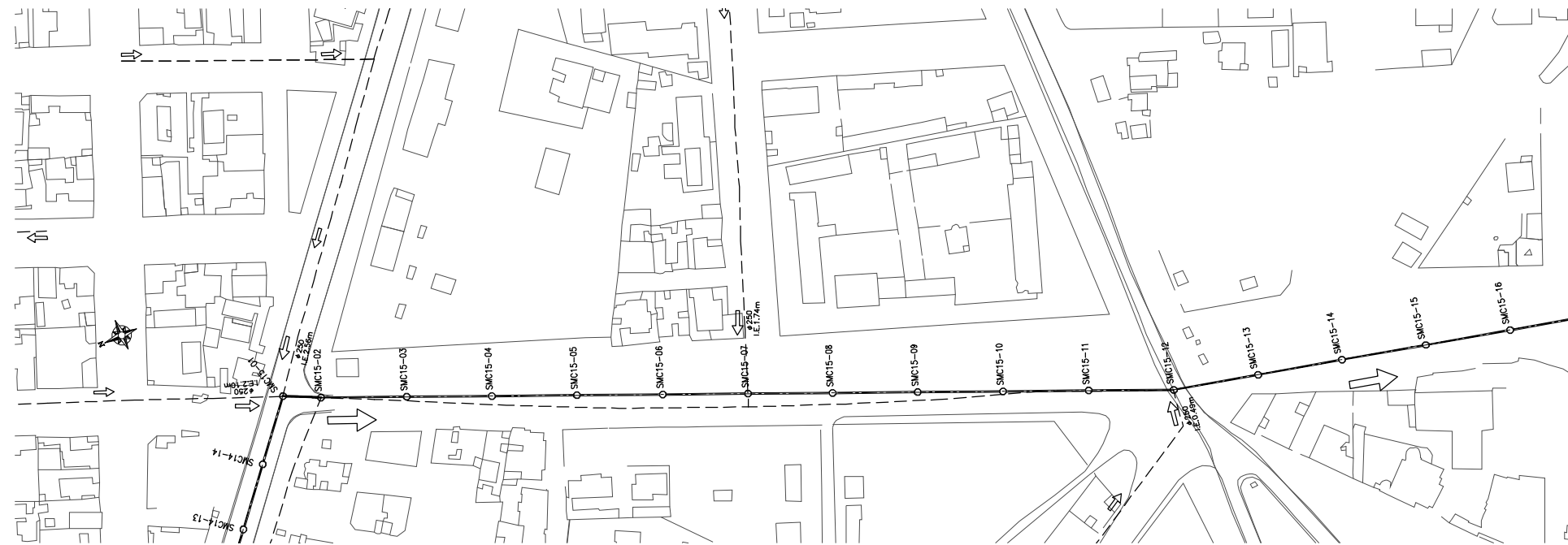


PROFILE
H: SCALE A V: SCALE B

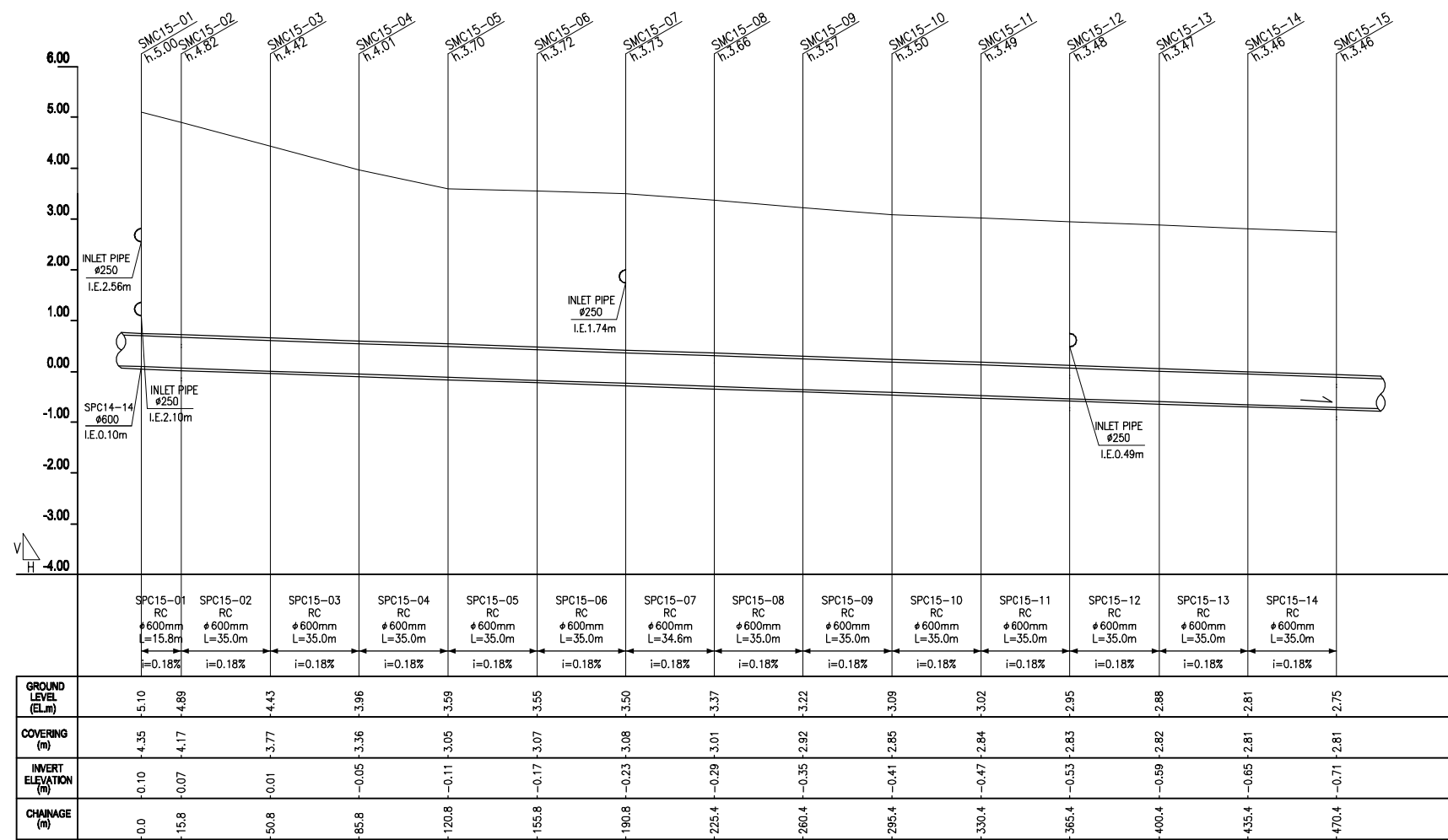


KEY PLAN

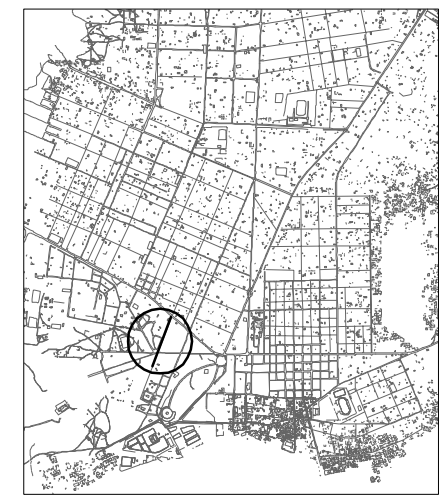




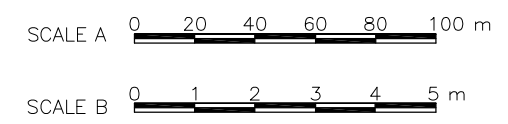
PLAN
SCALE A

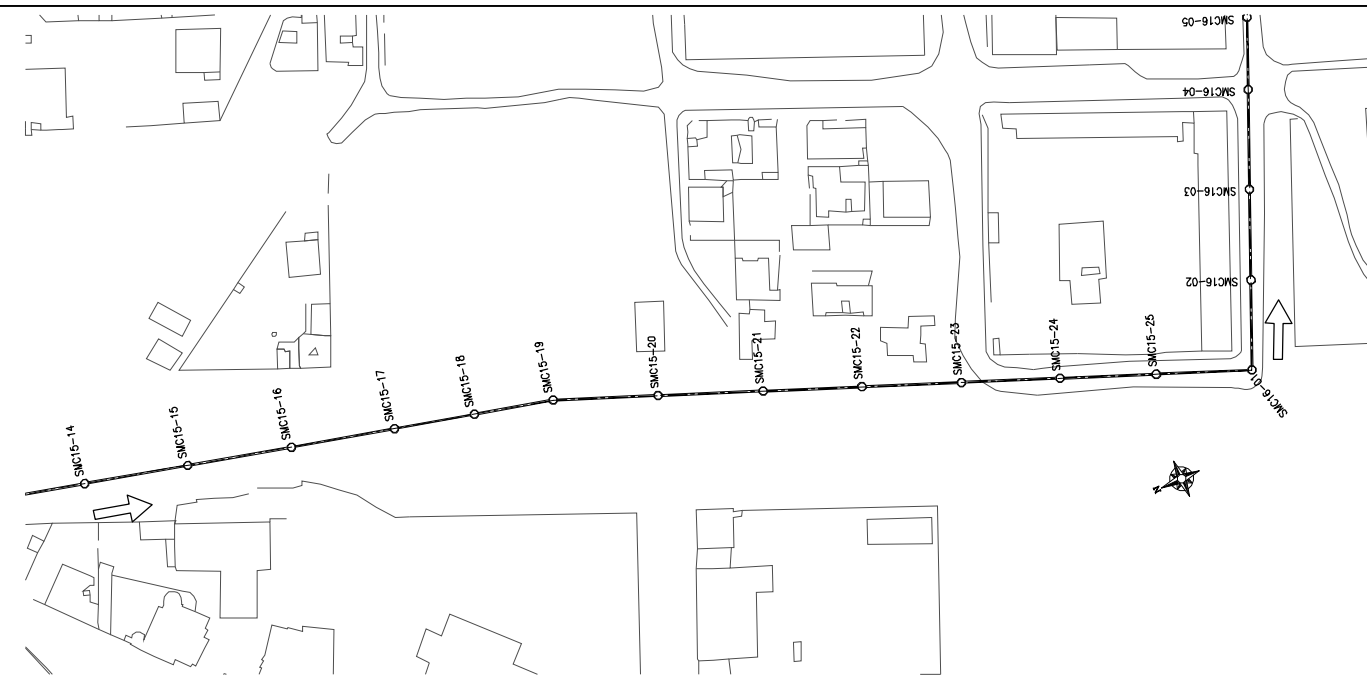


PROFILE
H: SCALE A V: SCALE B



KEY PLAN



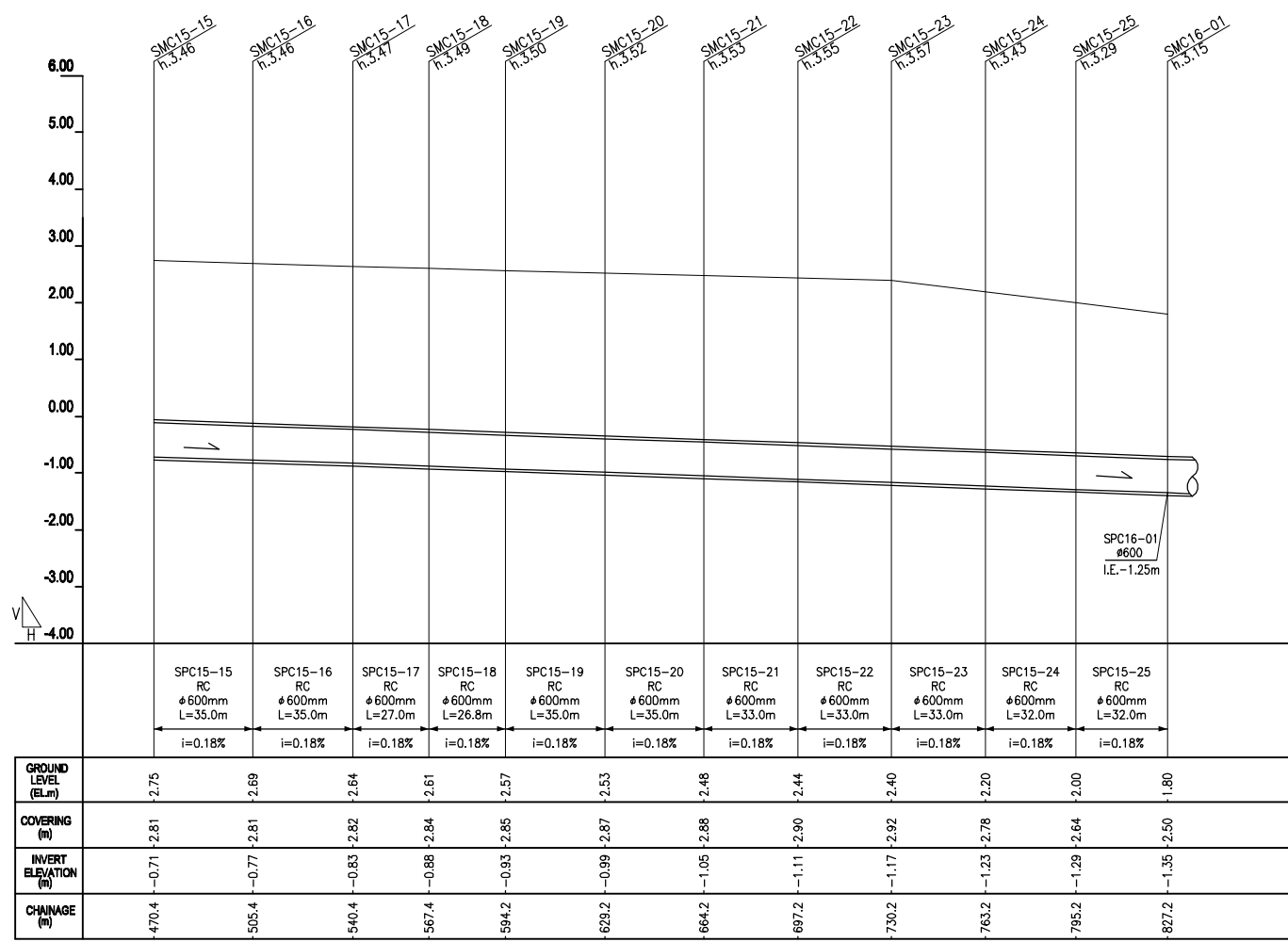


LEGEND

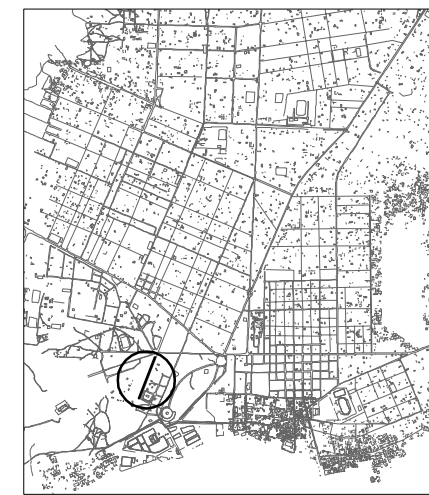
PROPOSED
 — SEWER PIPE
 ○ MANHOLE

EXISTING
 - - - SEWER PIPE
 → FLOW DIRECTION

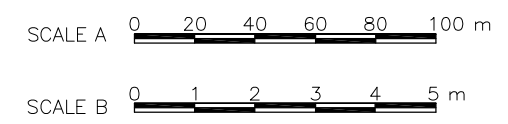
PLAN
SCALE A

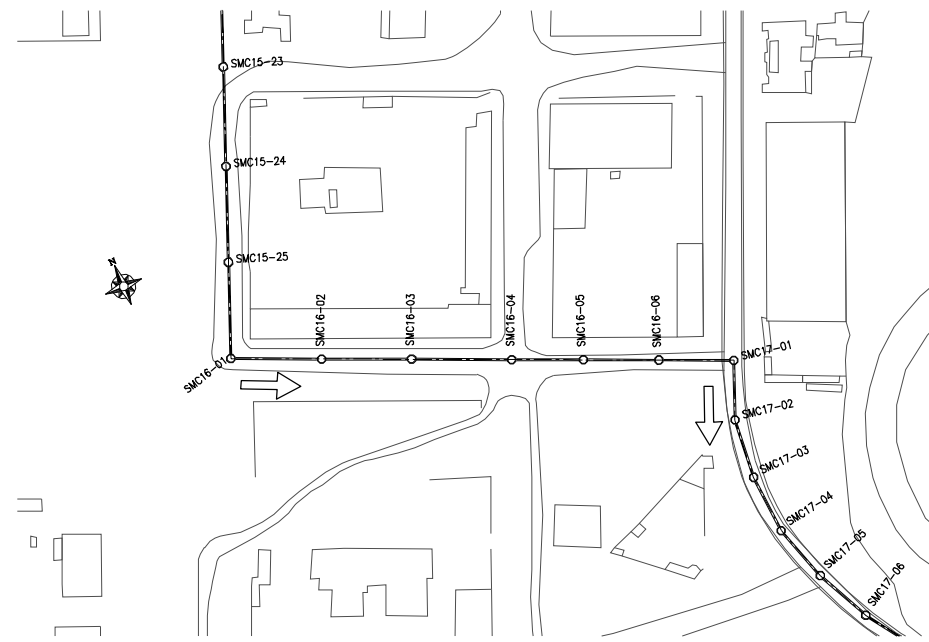


PROFILE
H: SCALE A V: SCALE B

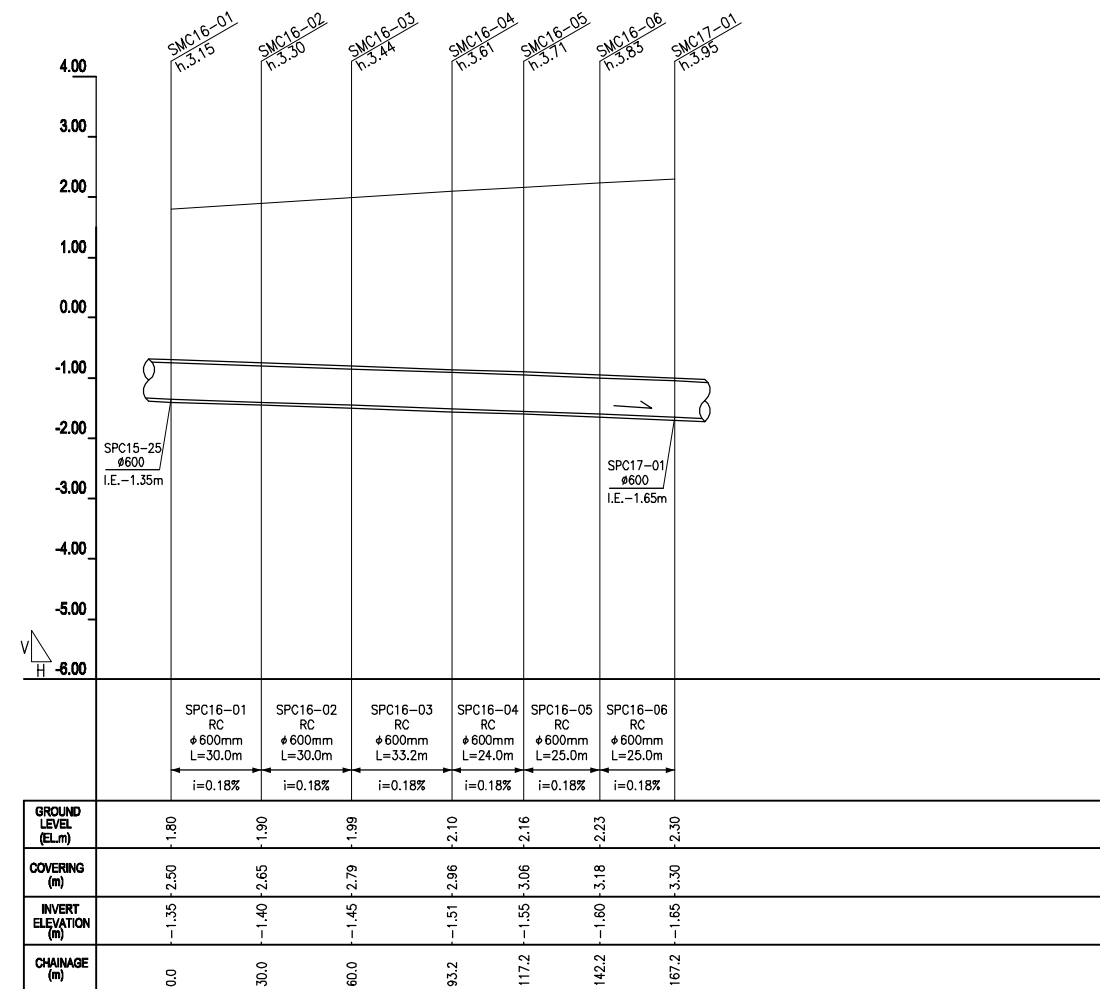
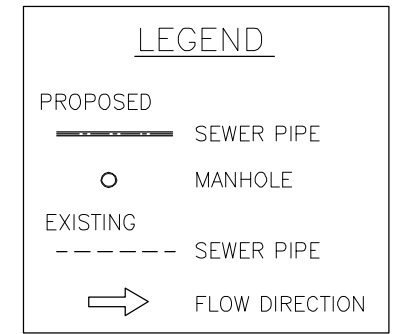


KEY PLAN

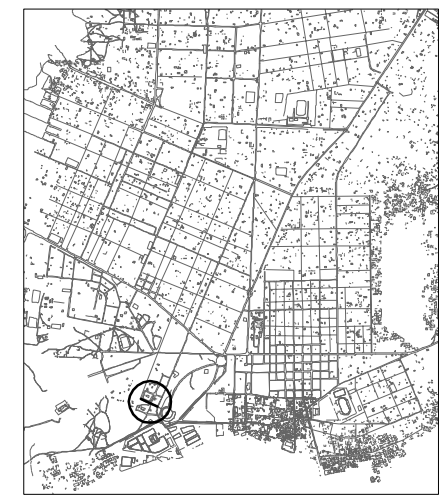




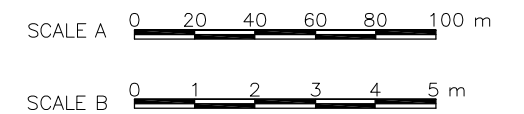
PLAN
SCALE A

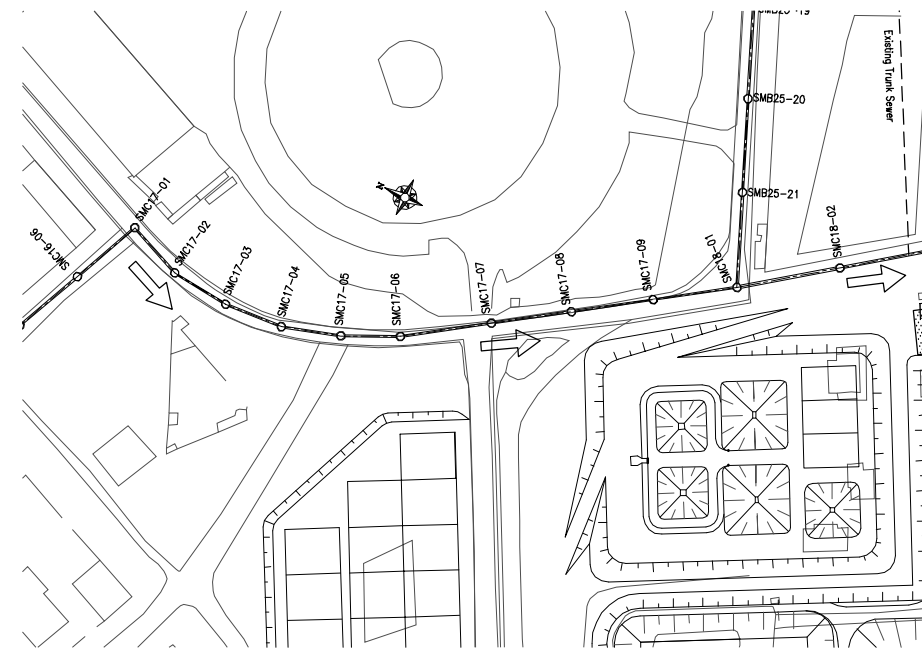


PROFILE
H: SCALE A V: SCALE B

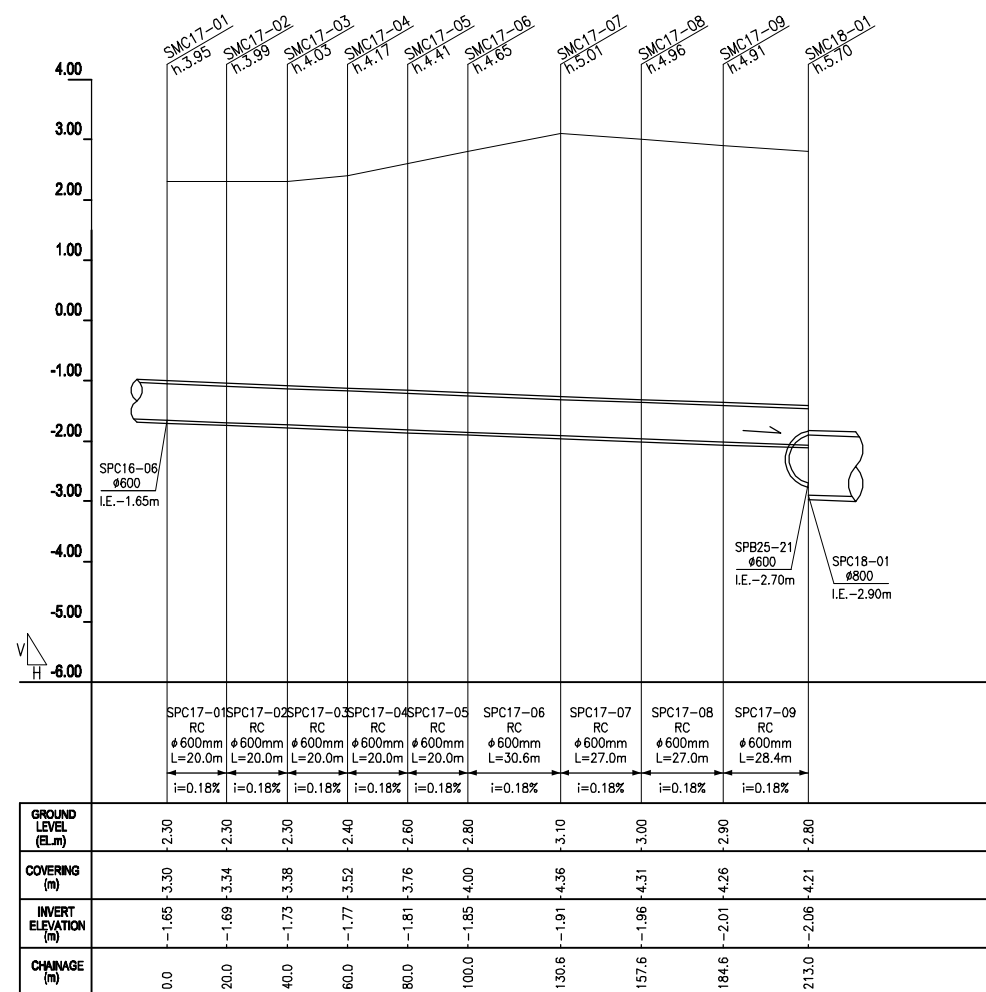
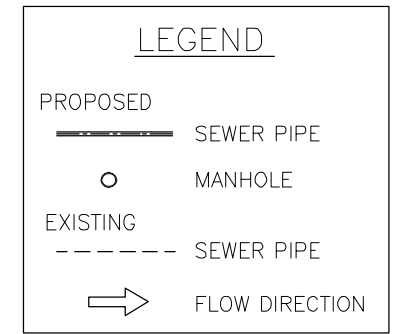


KEY PLAN

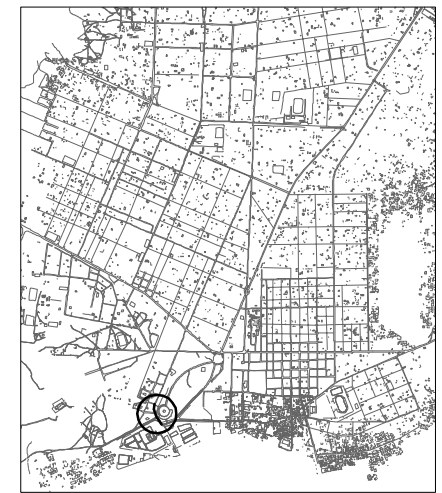




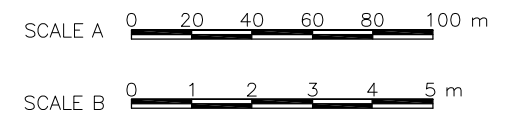
PLAN
SCALE A

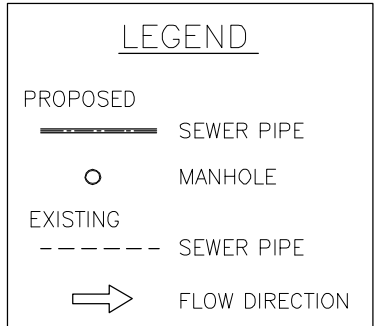
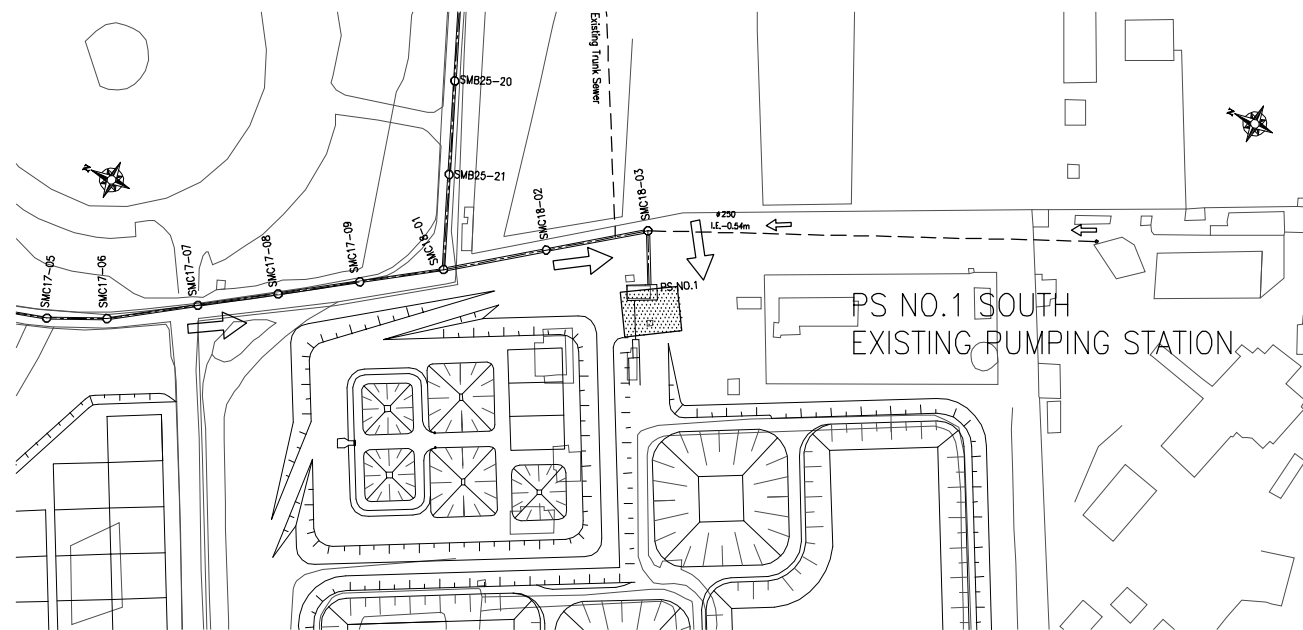


PROFILE
H: SCALE A V: SCALE B

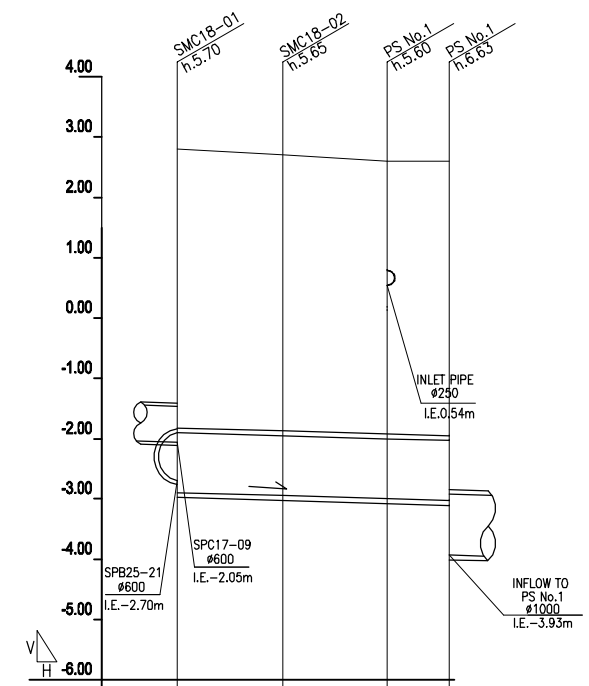


KEY PLAN



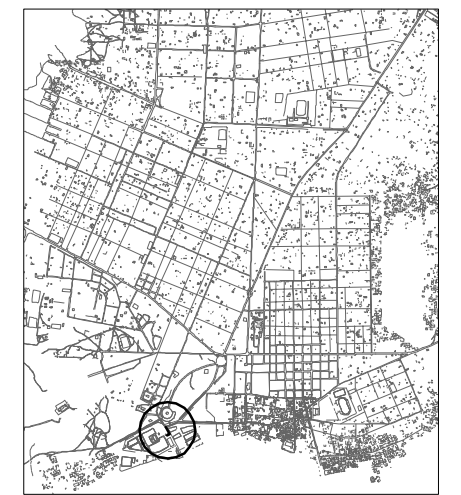


PLAN
SCALE A

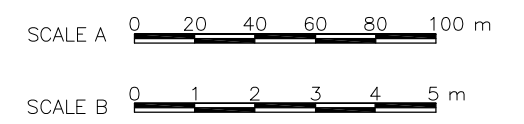


	SMC18-01 n.5.70	SMC18-02 n.5.65	PS No.1 n.5.80	PS No.1 n.6.63
	INLET PIPE ø250 I.E.0.54m			
	SPC17-09 ø600 I.E.-2.05m			
	SPB25-21 ø600 I.E.-2.70m			
	INFLOW TO PS No.1 ø1000 I.E.-3.93m			
	SPC18-01 RC ø1000mm L=35.0m i=0.15%	SPC18-02 RC ø1000mm L=34.6m i=0.15%	SPC18-03 RC ø1000mm L=20.5m i=0.15%	
GROUND LEVEL (EL.m)	2.80	2.70	2.60	2.60
COVERING (m)	4.61	4.56	4.51	4.54
INVERT ELEVATION (m)	-2.90	-2.95	-3.00	-3.03
CHAINAGE (m)	0.0	35.0	69.6	90.1

PROFILE
H: SCALE A V: SCALE B

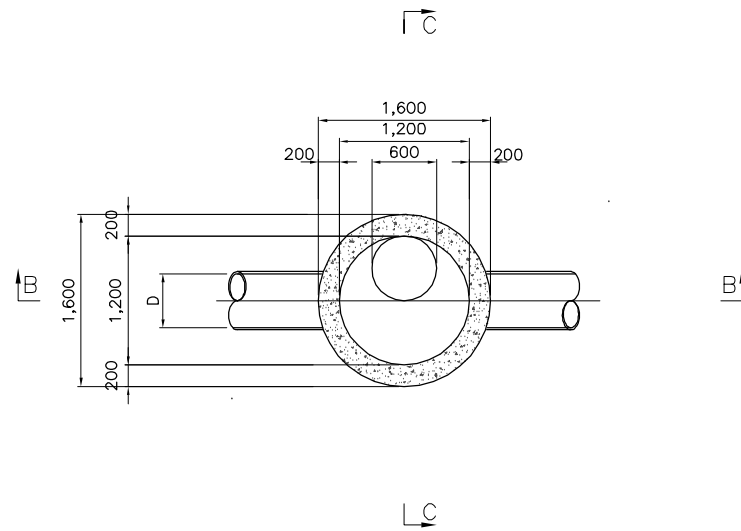


KEY PLAN

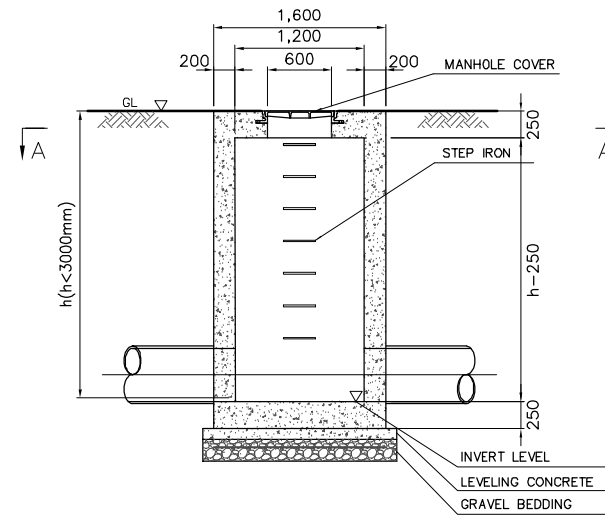


DETAIL OF MANHOLE

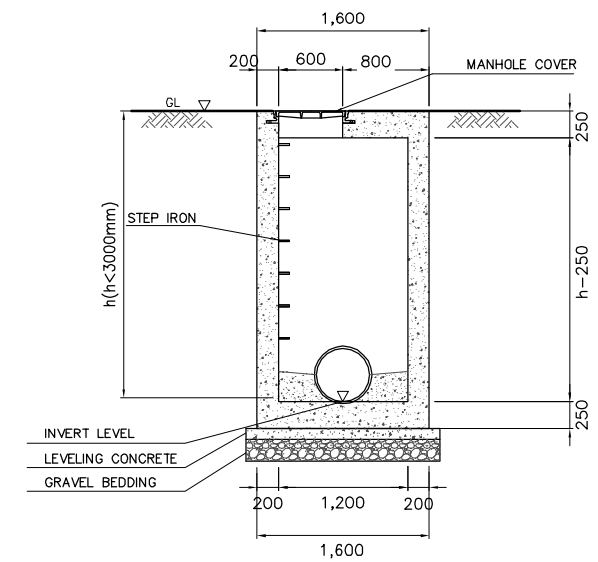
TYPE 1 MANHOLE DEPTH(h) < 3,000mm



PLAN (SECTION A-A)

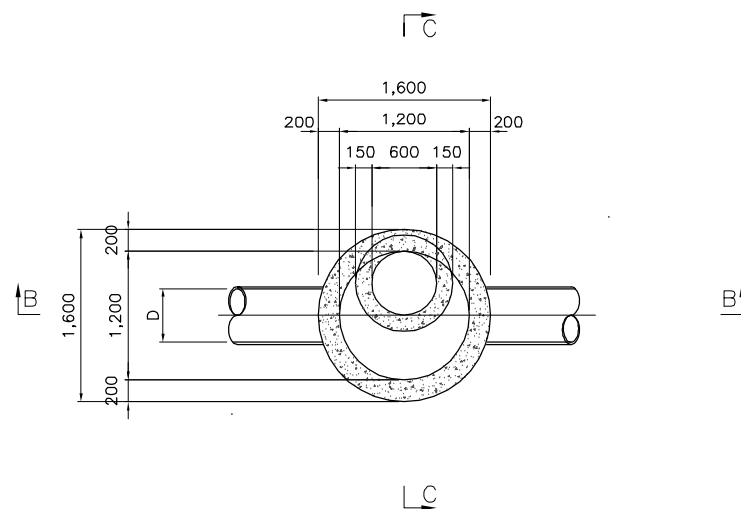


SECTION B-B

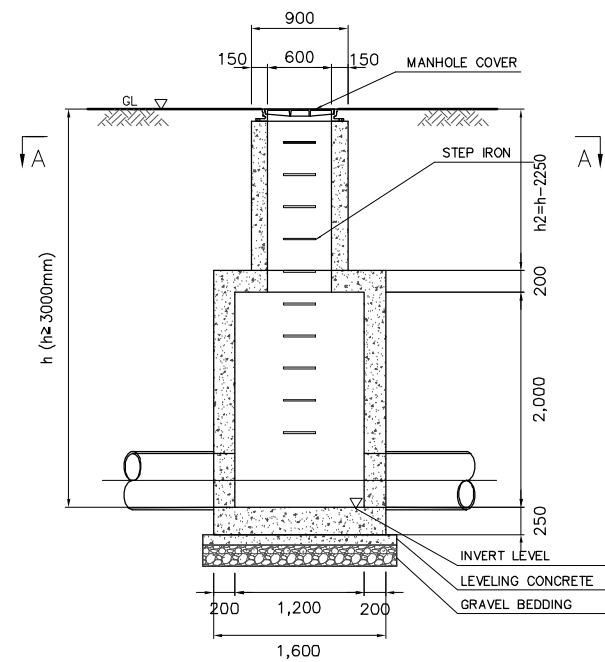


SECTION C-C

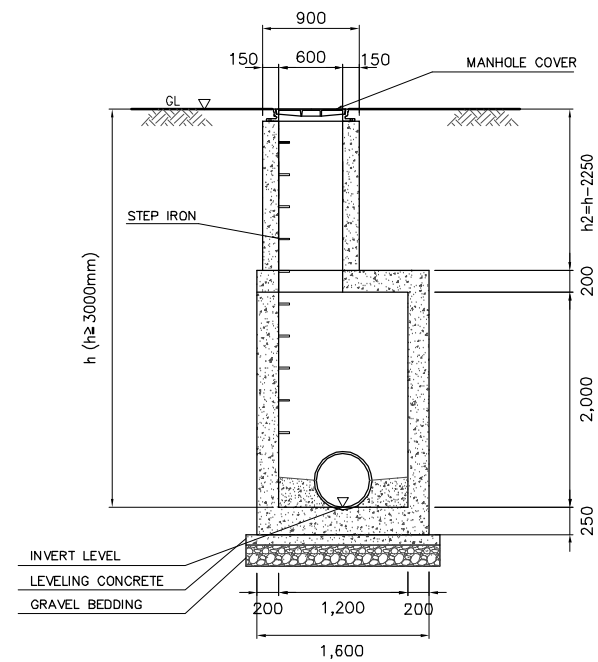
TYPE 2 MANHOLE DEPTH(h) ≥ 3,000mm



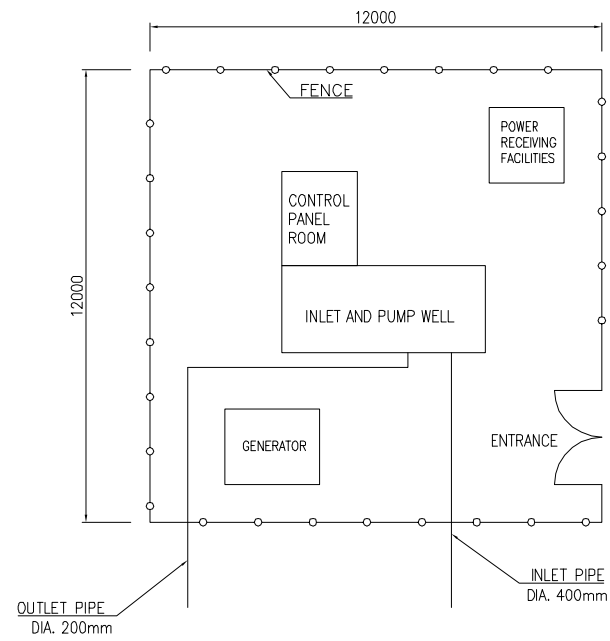
PLAN (SECTION A-A)



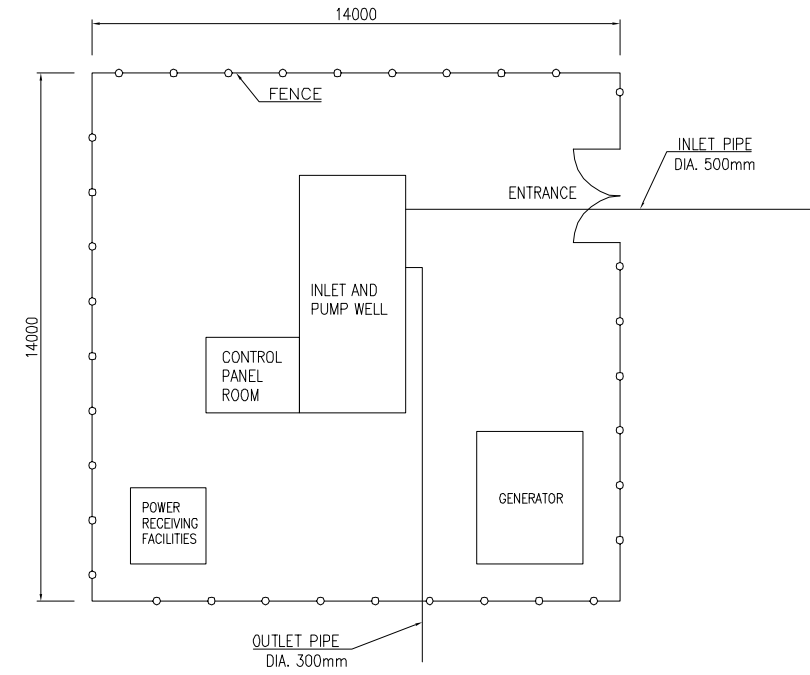
SECTION B-B



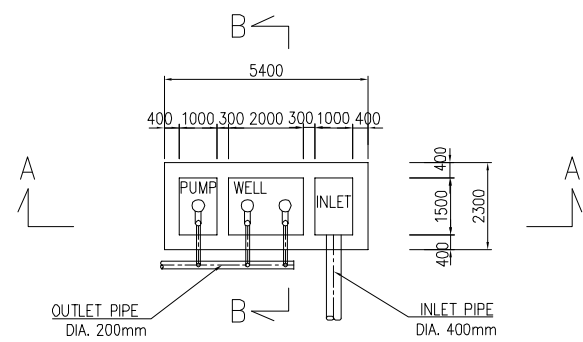
SECTION C-C



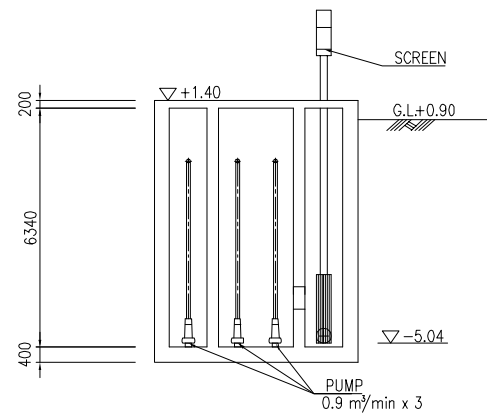
GENERAL LAYOUT PLAN



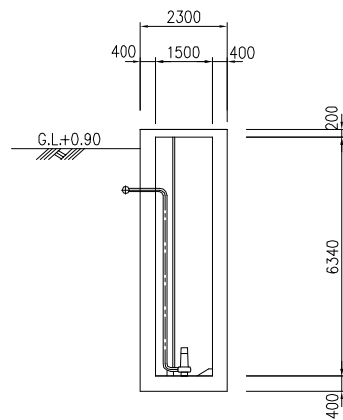
GENERAL LAYOUT PLAN



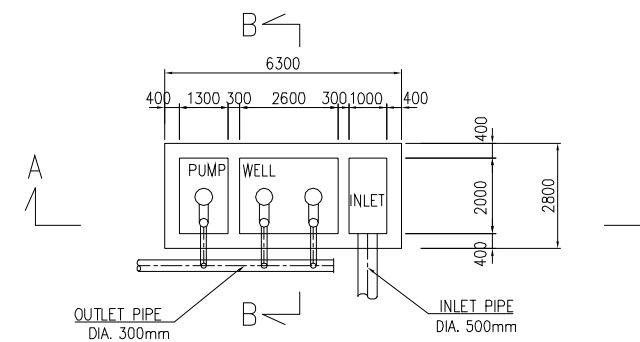
PLAN



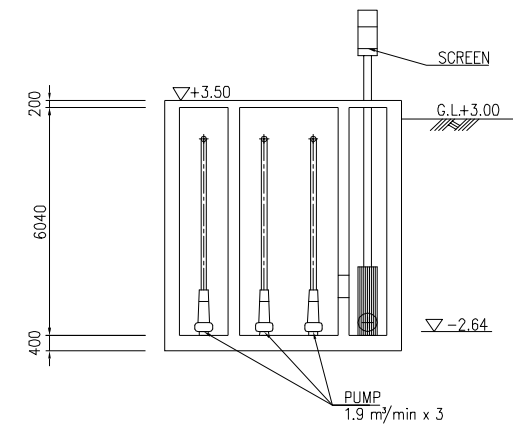
SECTION A-A



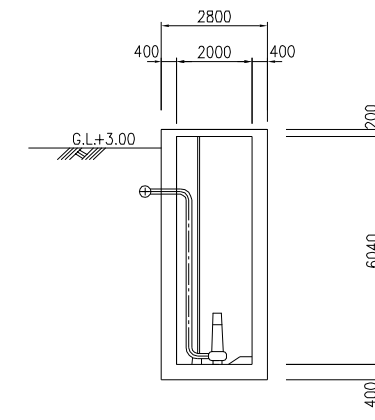
SECTION B-B



PLAN



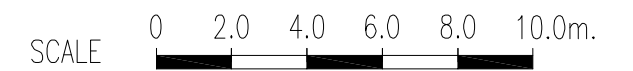
SECTION A-A



SECTION B-B

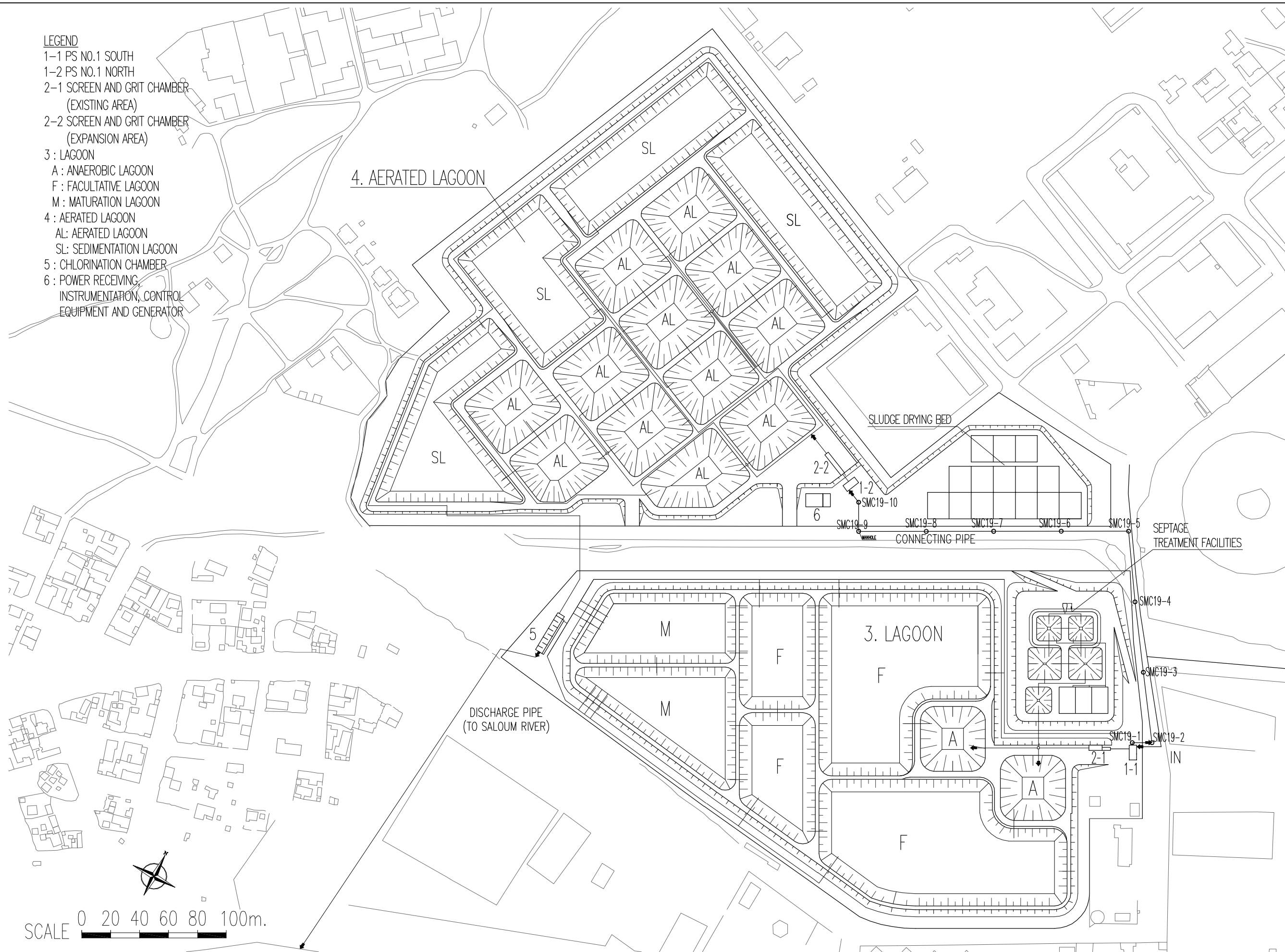
PS DAROU SALAM NDANGANE

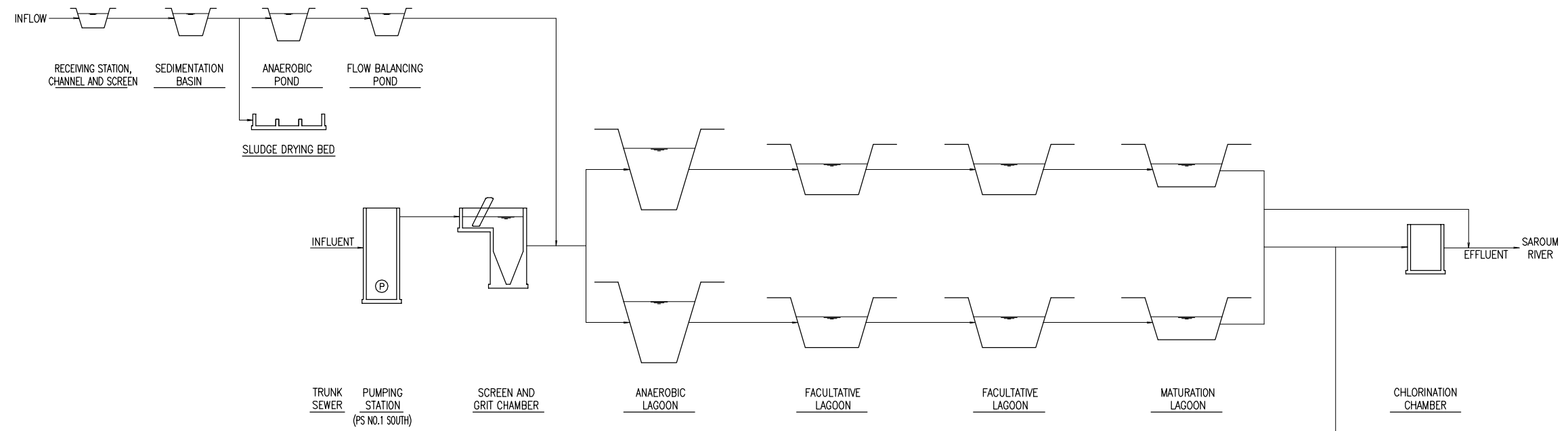
PS BOUSTANE



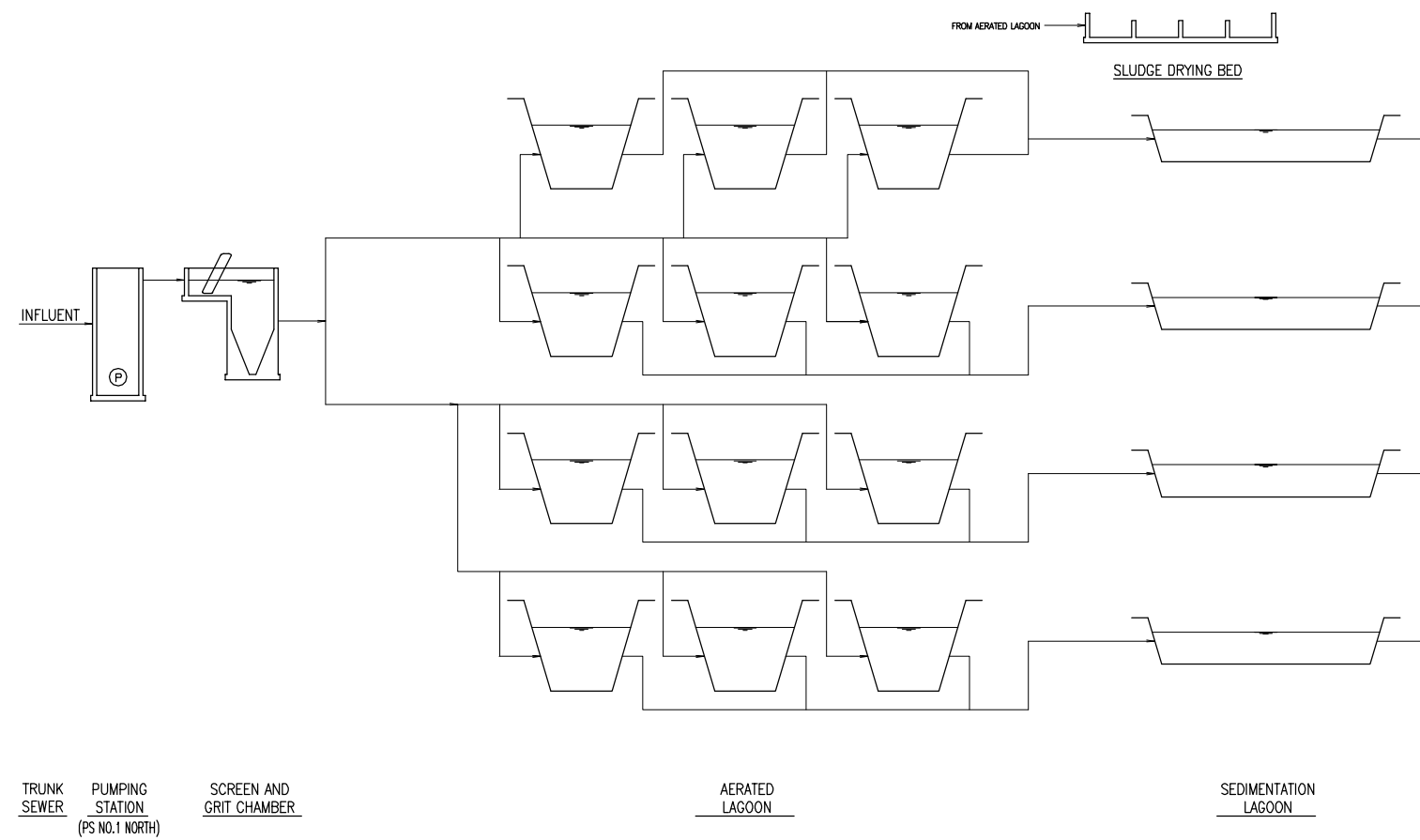
LEGEND

- 1-1 PS NO.1 SOUTH
- 1-2 PS NO.1 NORTH
- 2-1 SCREEN AND GRIT CHAMBER
(EXISTING AREA)
- 2-2 SCREEN AND GRIT CHAMBER
(EXPANSION AREA)
- 3 : LAGOON
 - A : ANAEROBIC LAGOON
 - F : FACULTATIVE LAGOON
 - M : MATURATION LAGOON
- 4 : AERATED LAGOON
 - AL : AERATED LAGOON
 - SL : SEDIMENTATION LAGOON
- 5 : CHLORINATION CHAMBER
- 6 : POWER RECEIVING,
INSTRUMENTATION, CONTROL
EQUIPMENT AND GENERATOR

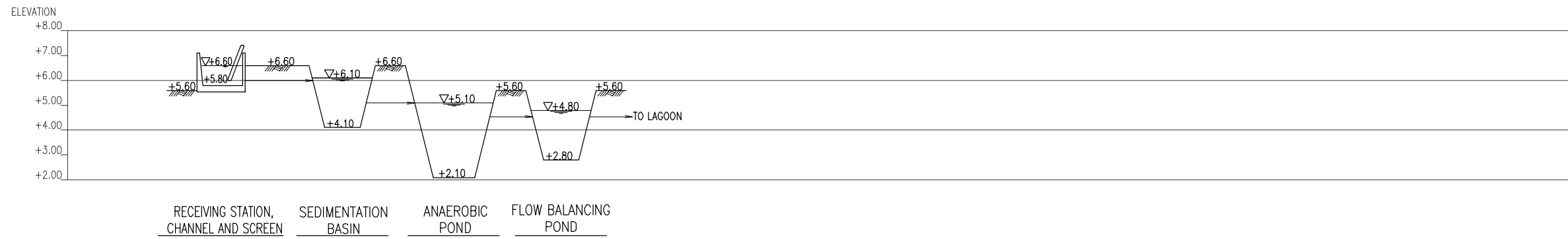




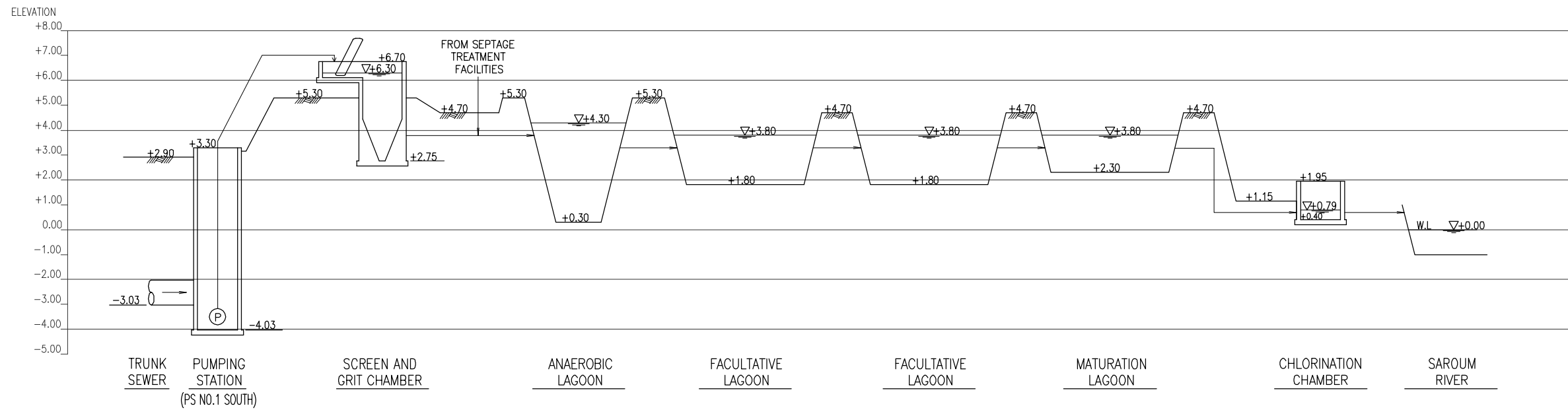
SEPTAGE TREATMENT FACILITIES AND LAGOON



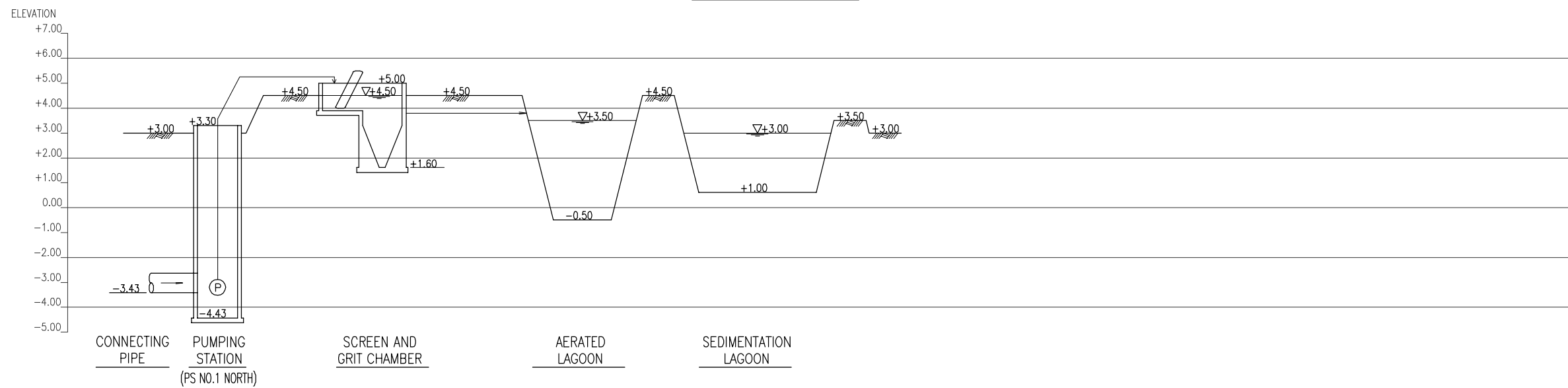
AERATED LAGOON



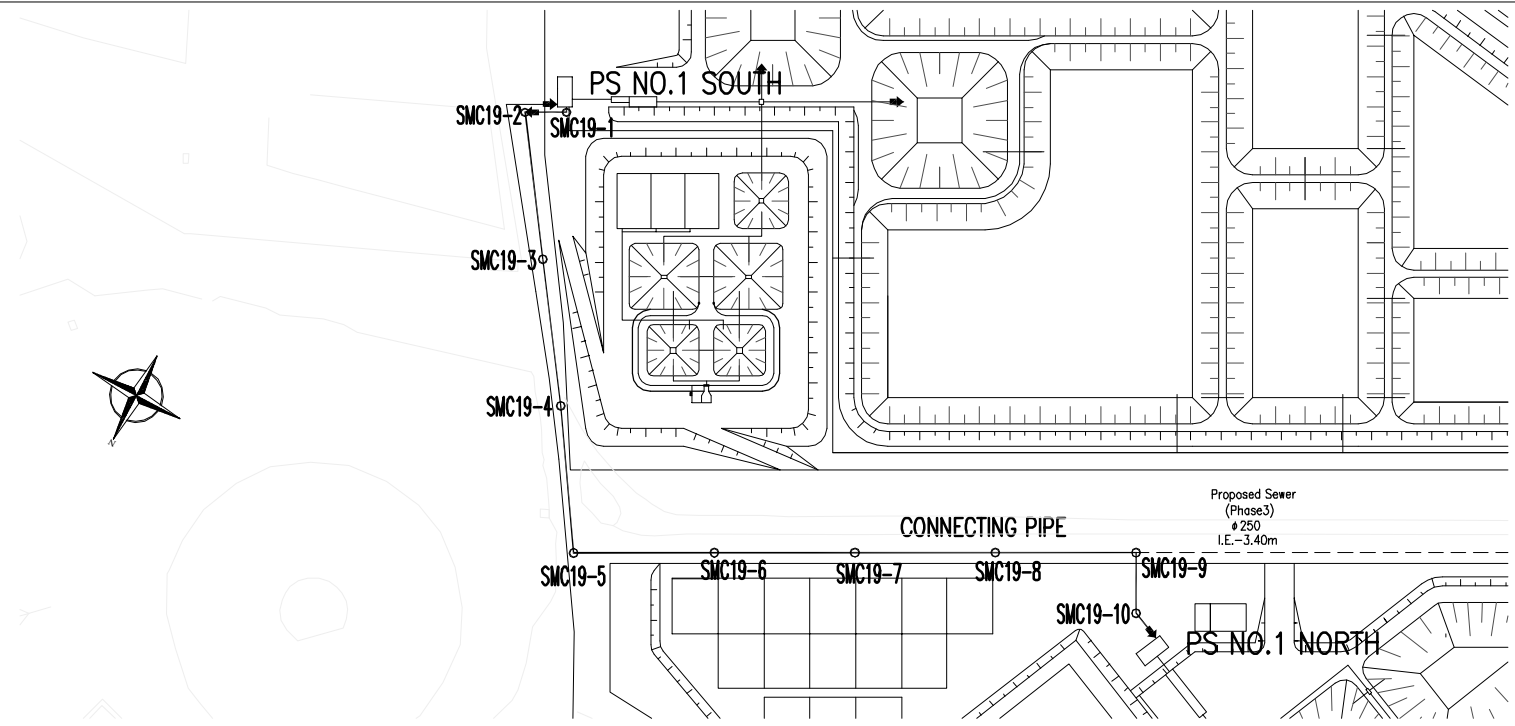
SEPTAGE TREATMENT FACILITIES



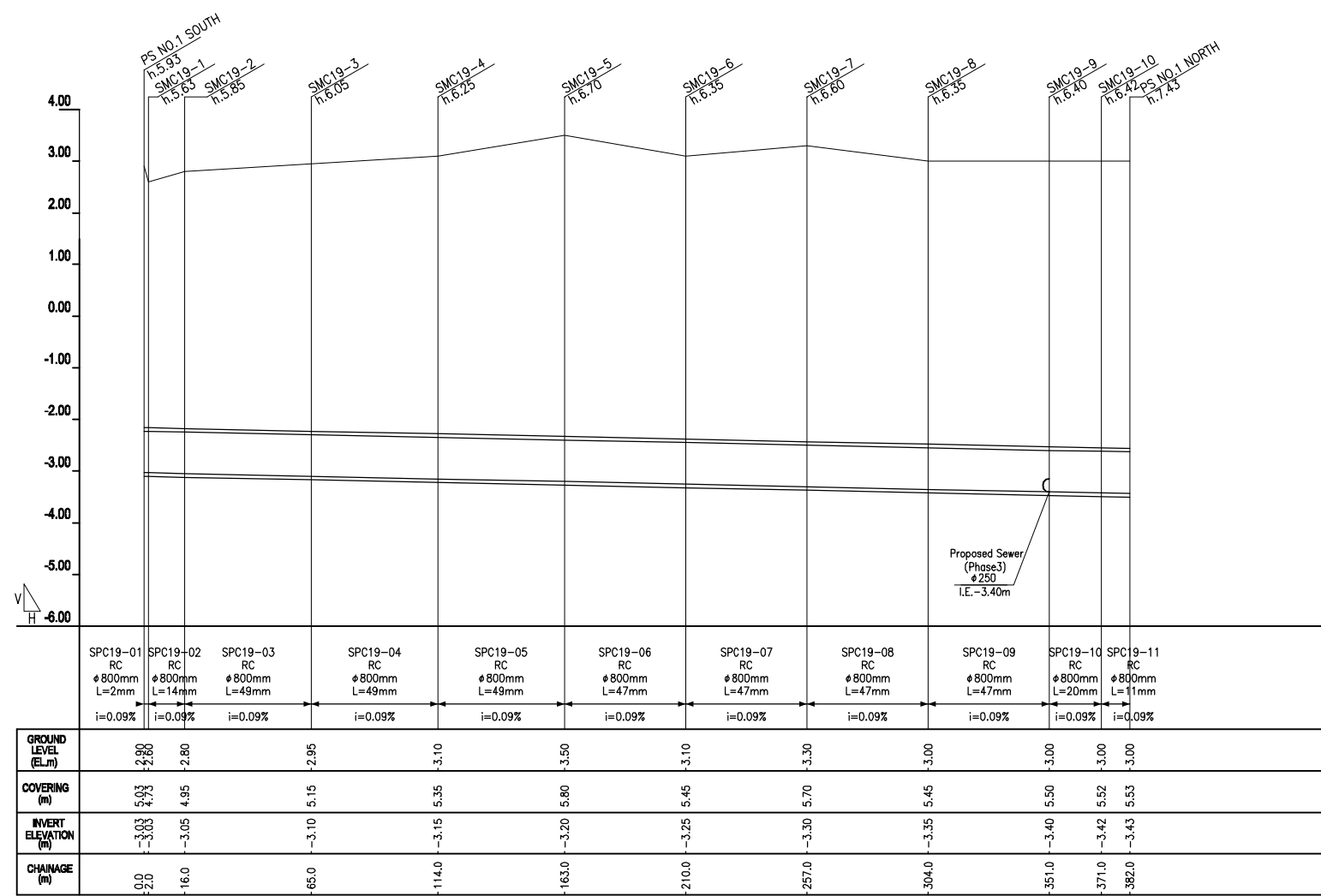
LAGOON



AERATED LAGOON

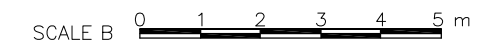
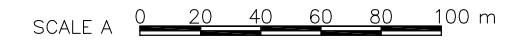


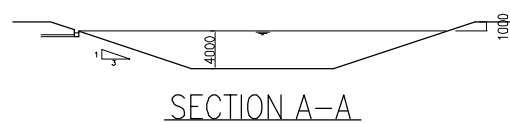
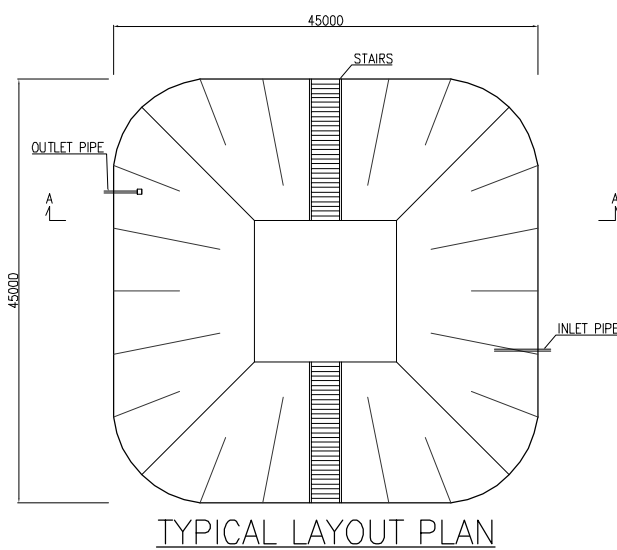
PLAN
SCALE A



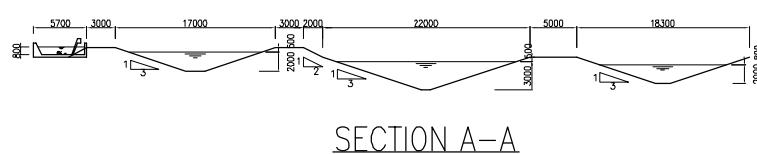
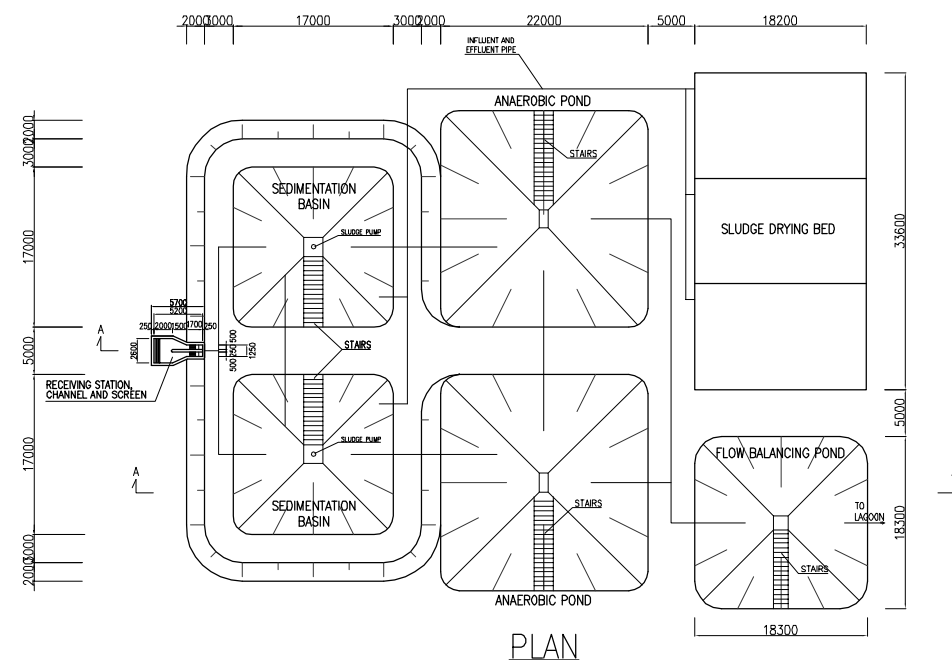
PROFILE

H: SCALE A V: SCALE B

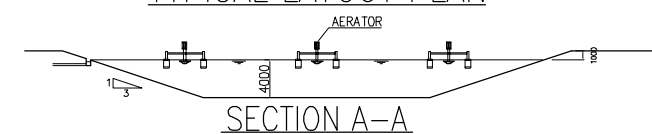
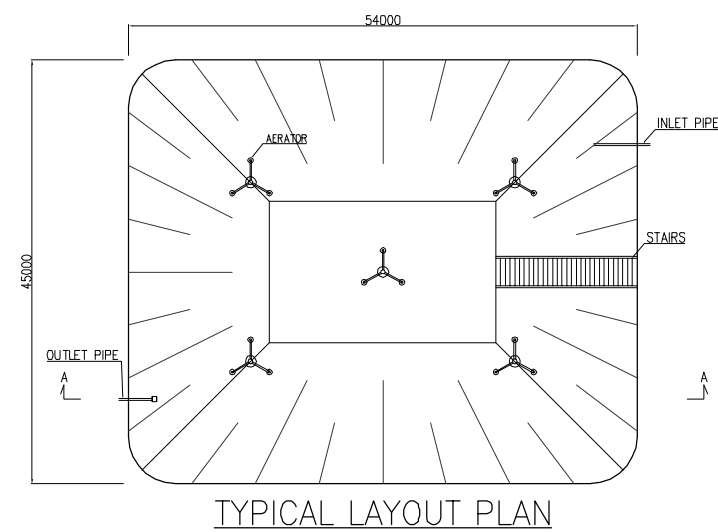




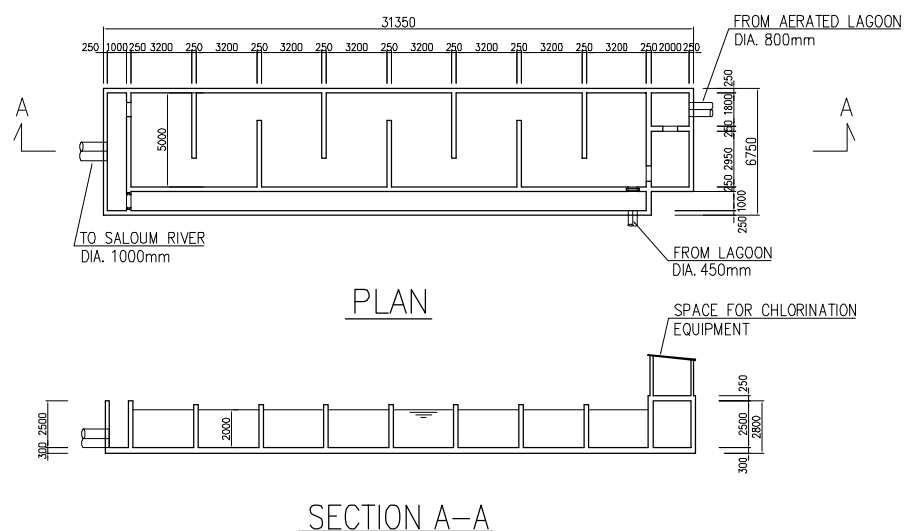
ANAEROBIC LAGOON
SCALE A



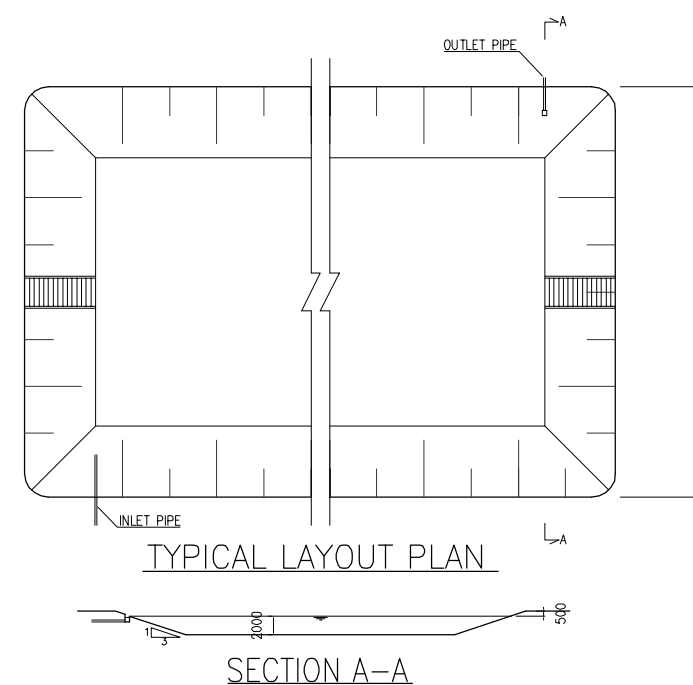
SEPTAGE TREATMENT FACILITIES
SCALE A



AERATED LAGOON
SCALE A



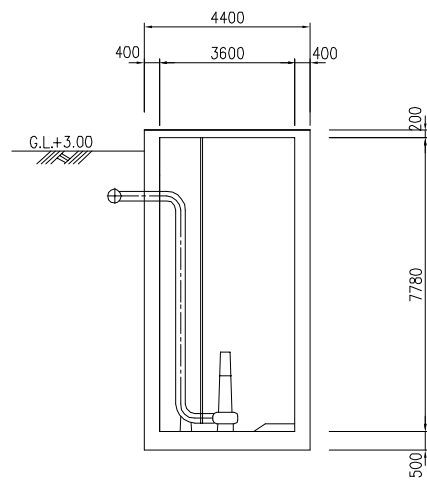
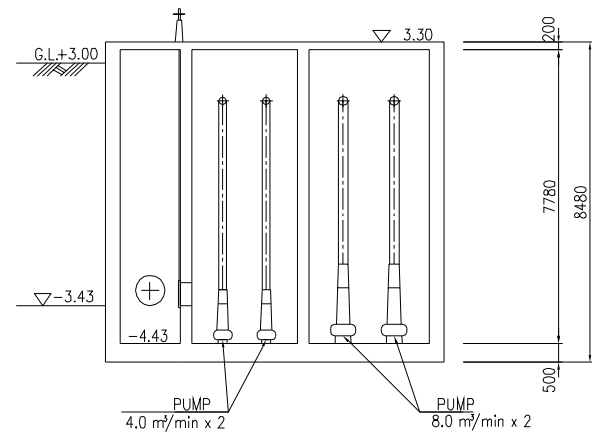
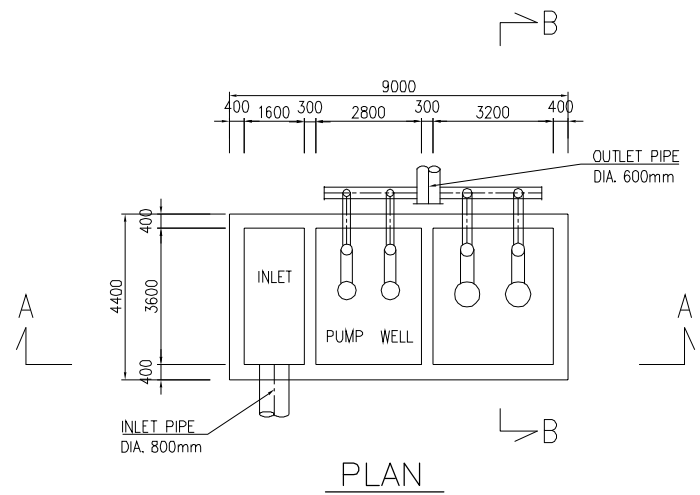
CHLORINATION CHAMBER
SCALE B



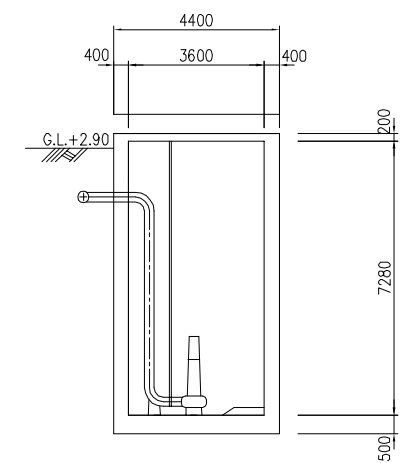
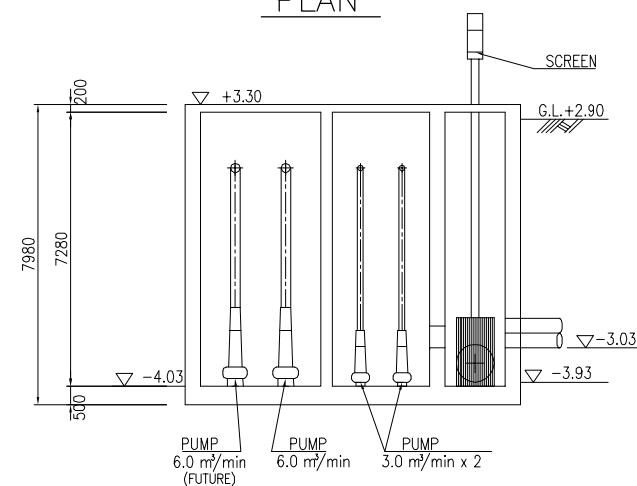
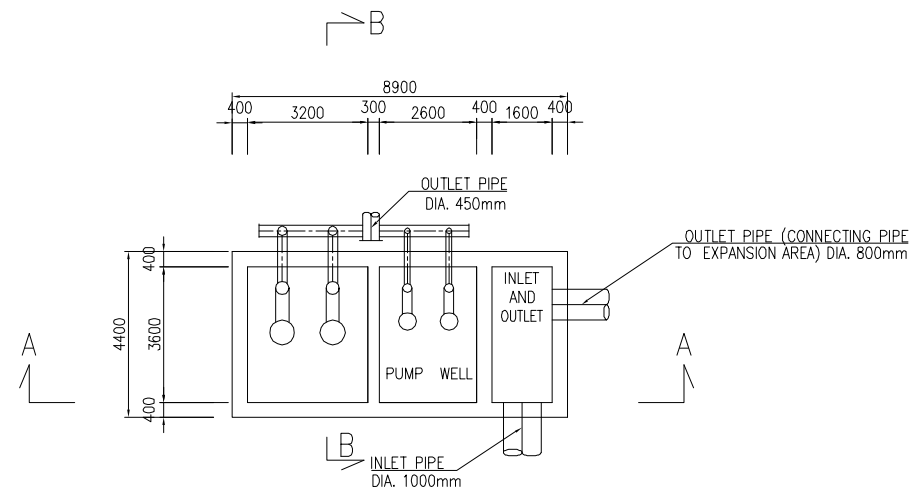
SEDIMENTATION LAGOON
SCALE A

SCALE A 0 4.0 8.0 12.0 16.0 20.0m.

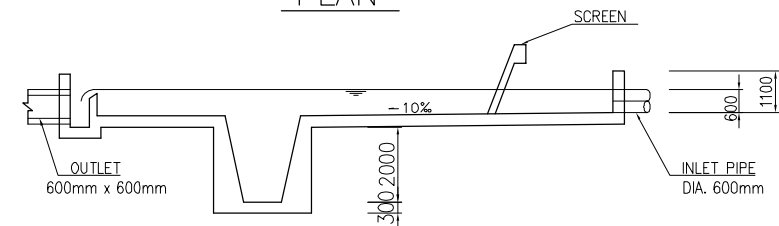
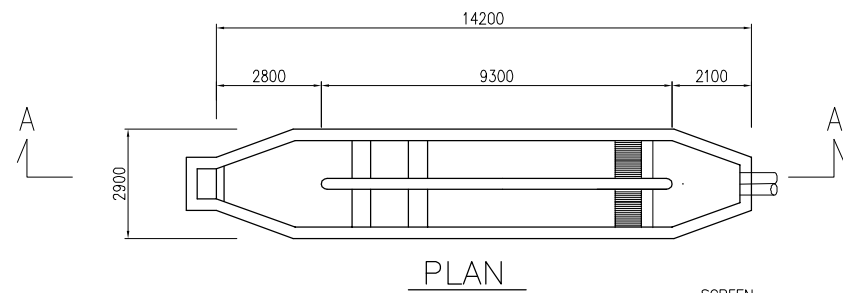
SCALE B 0 2.0 4.0 6.0 8.0 10.0m.



PS NO.1 NORTH

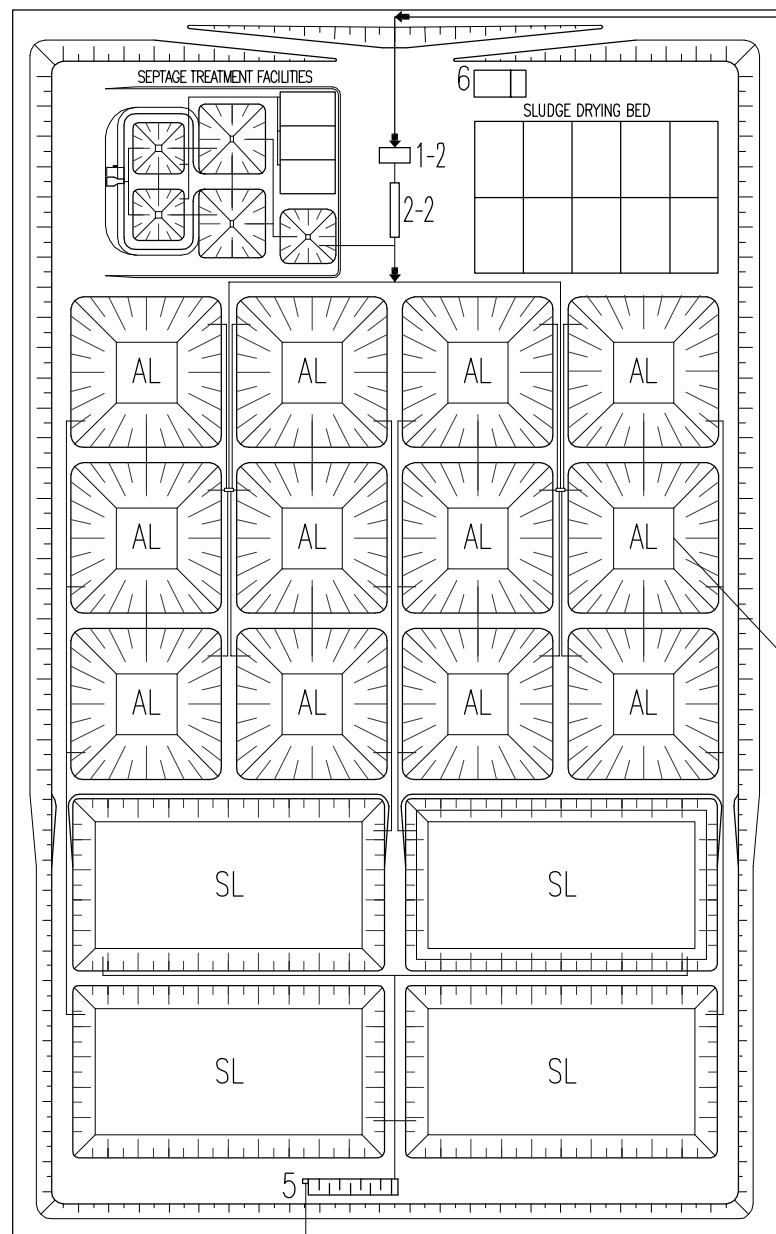


PS NO.1 SOUTH

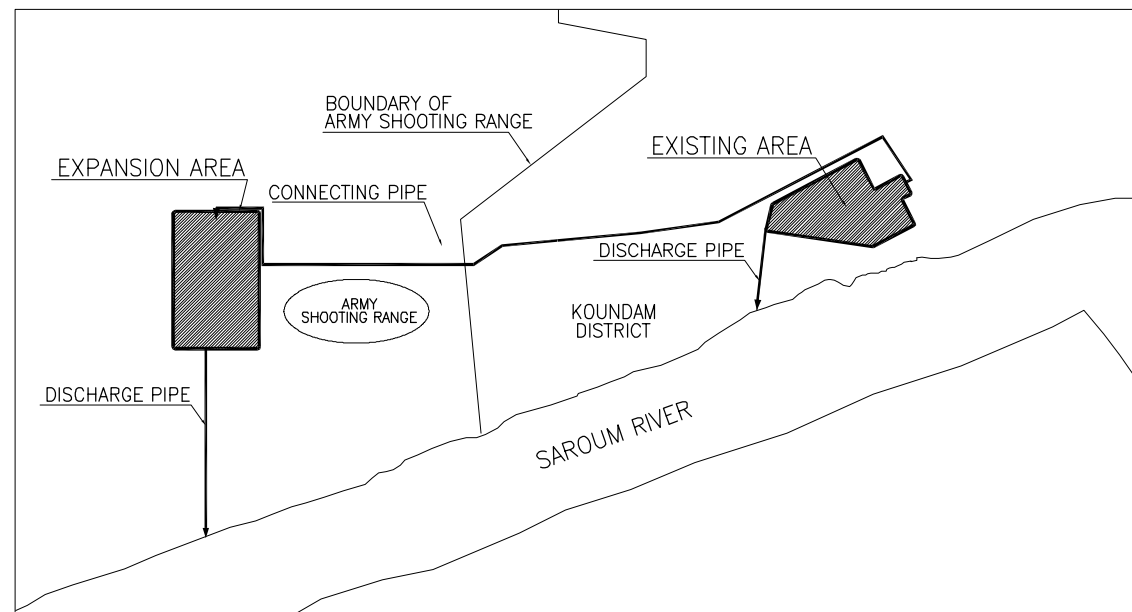


SCREEN AND GRIT CHAMBER
(EXPANSION AREA)



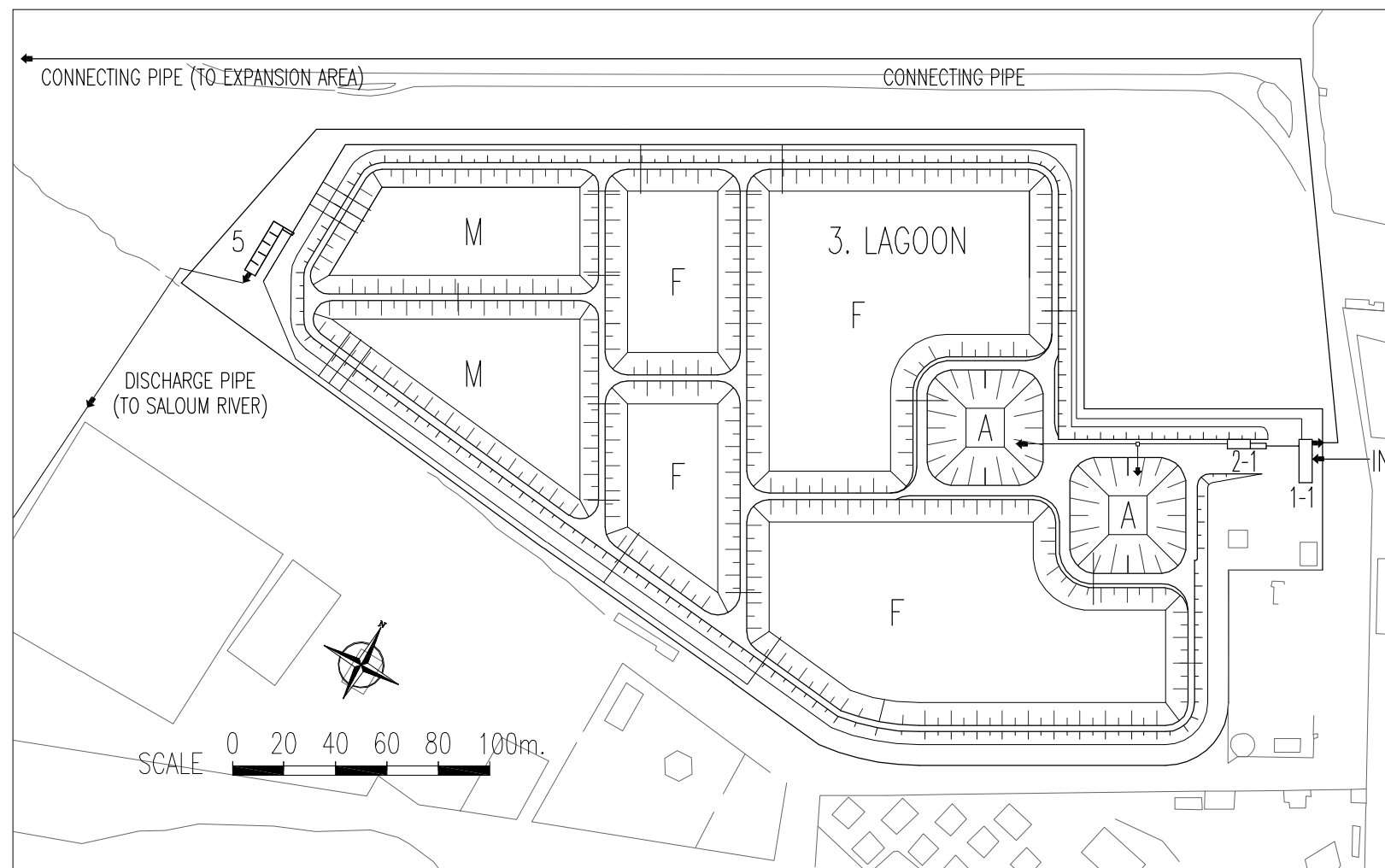


EXPANSION AREA



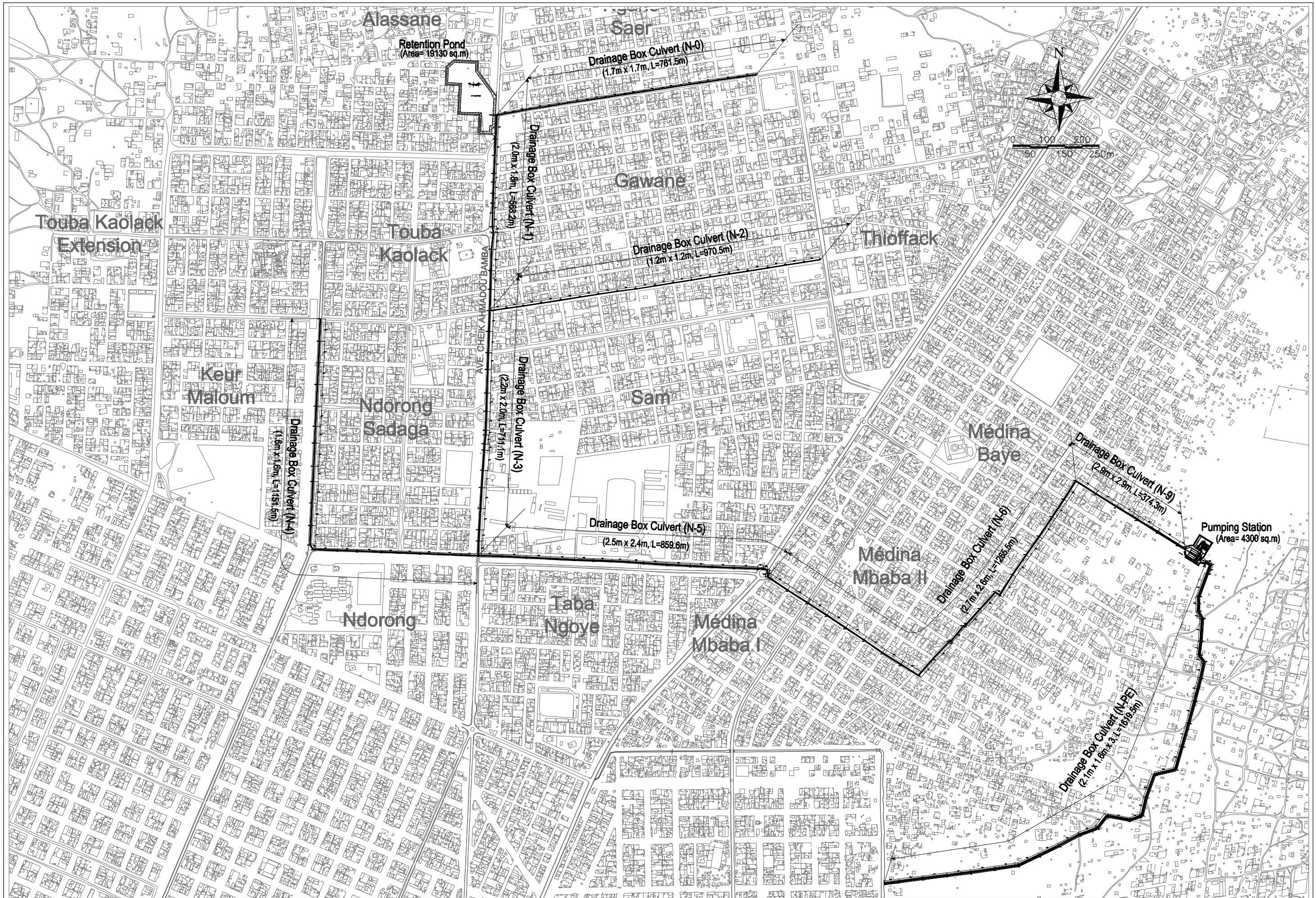
KEY PLAN

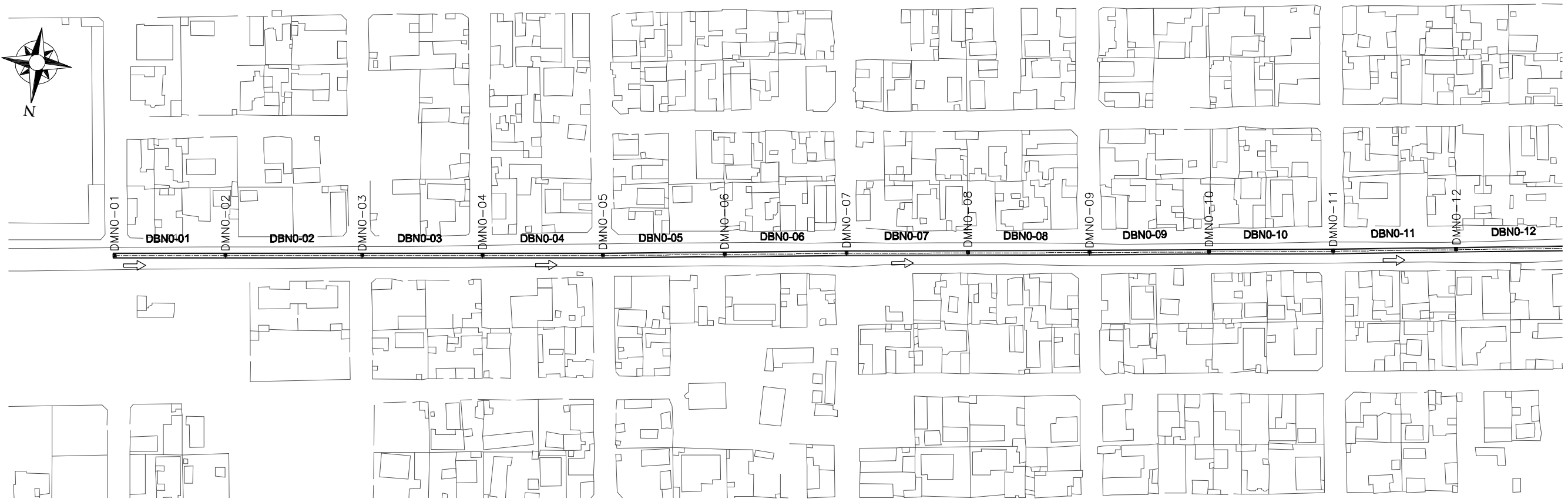
- LEGEND**
- 1-1 PS NO.1 SOUTH
 - 1-2 PS NO.1 NORTH
 - 2-1 SCREEN AND GRIT CHAMBER (EXISTING AREA)
 - 2-2 SCREEN AND GRIT CHAMBER (EXPANSION AREA)
 - 3: LAGOON
 - A : ANAEROBIC LAGOON
 - F : FACULTATIVE LAGOON
 - M : MATURATION LAGOON
 - 4: AERATED LAGOON
 - AL: AERATED LAGOON
 - SL: SEDIMENTATION LAGOON
 - 5: CHLORINATION CHAMBER
 - 6: POWER RECEIVING, INSTRUMENTATION, CONTROL EQUIPMENT AND GENERATOR



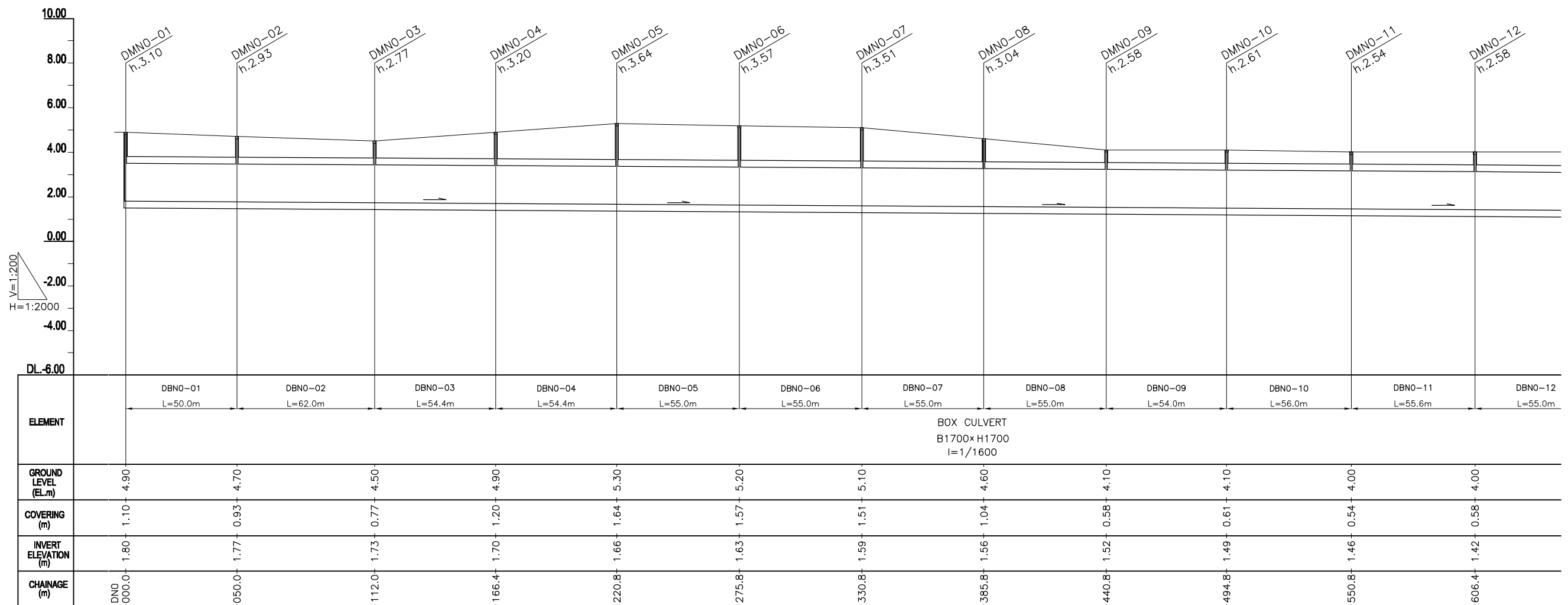
EXISTING AREA
(EXISTING SEWAGE TREATMENT PLANT)

STORMWATER DRAINAGE FACILITIES





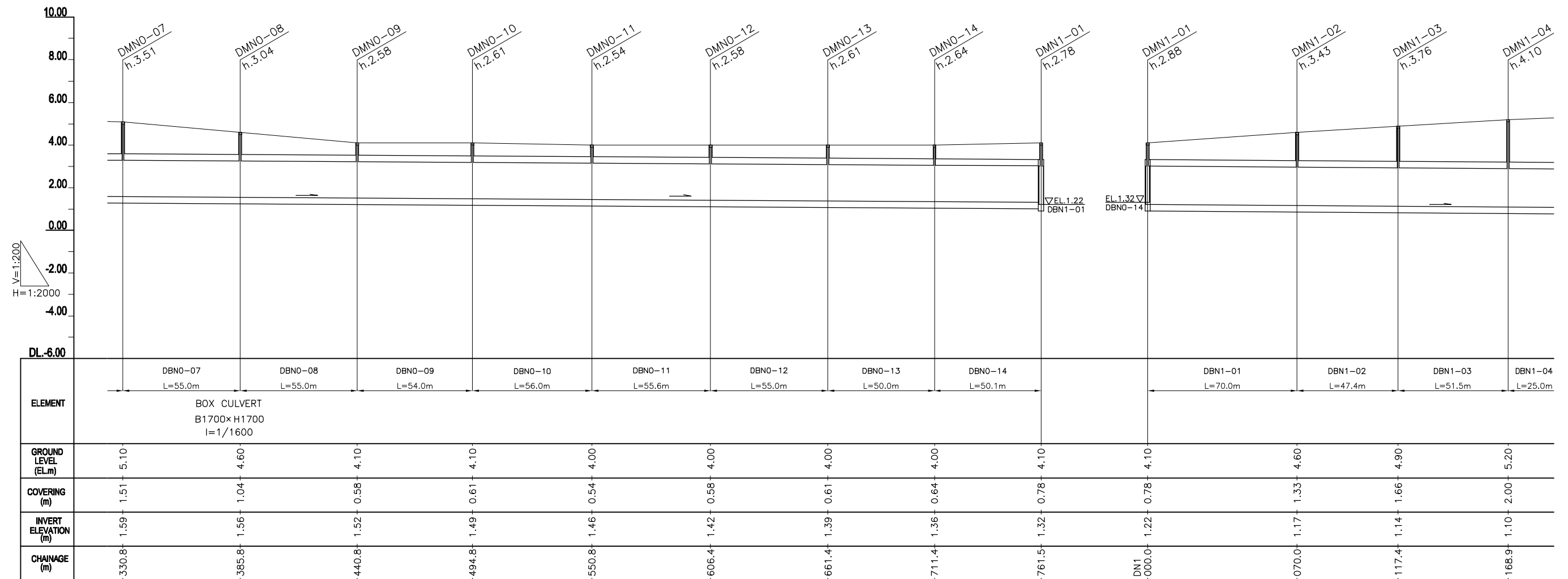
PLAN SCALE = 1:2000



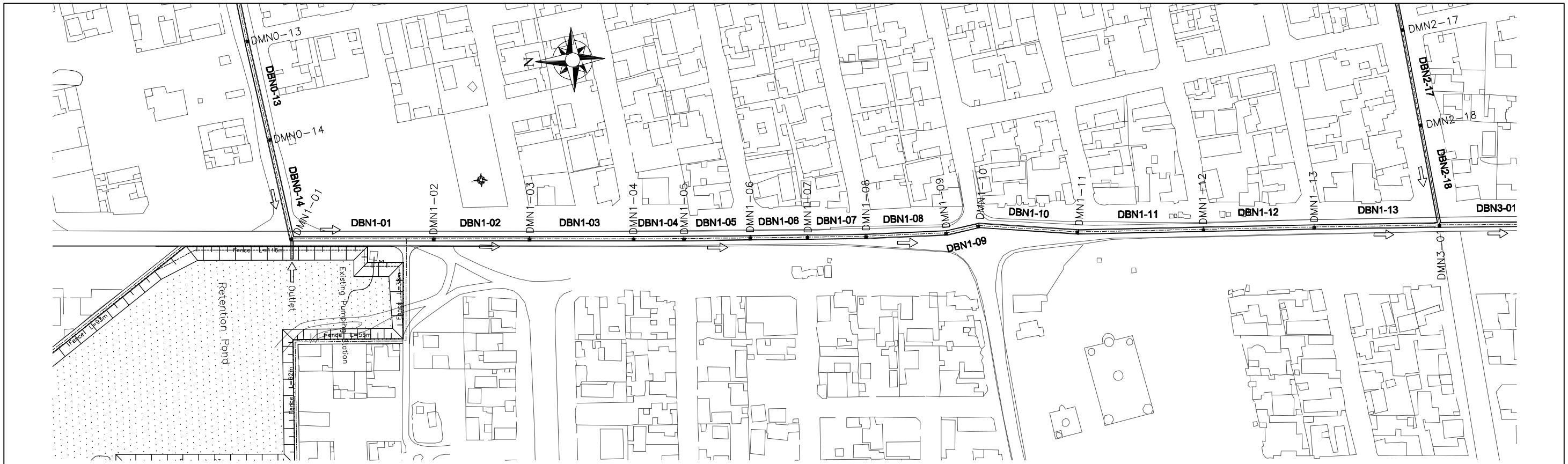
PROFILE SCALE H=1:2000 SCALE V=1:200



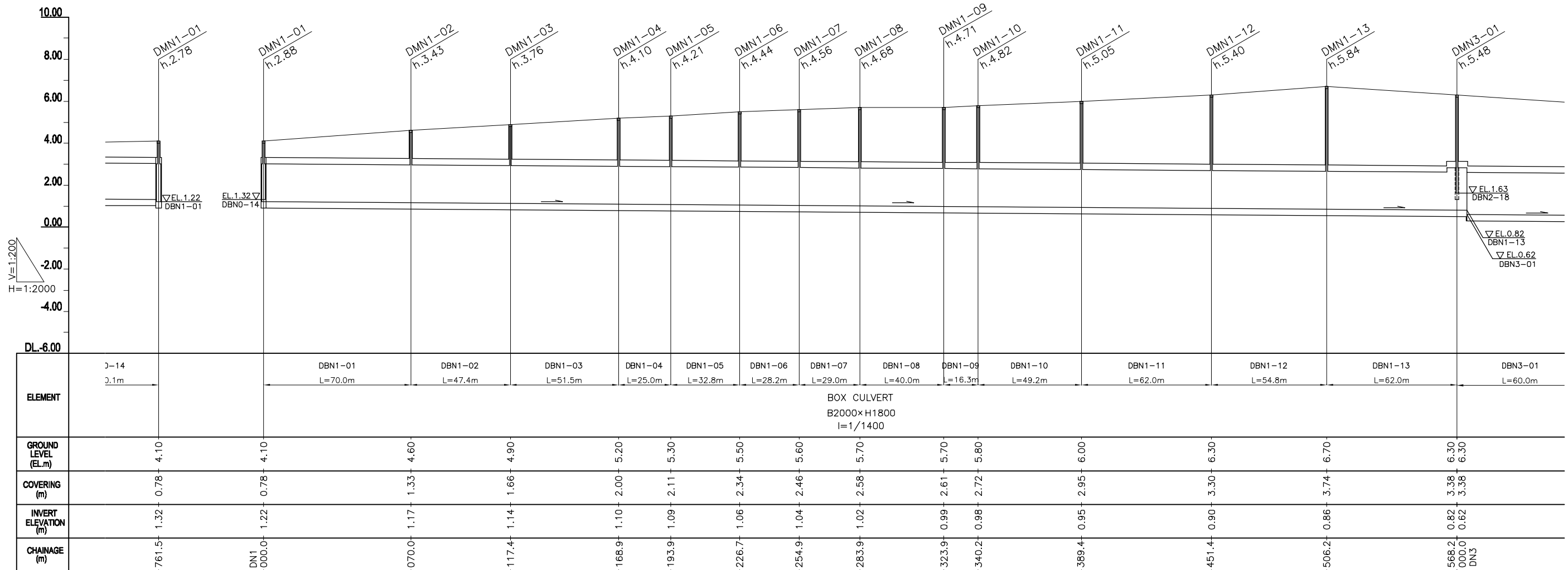
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



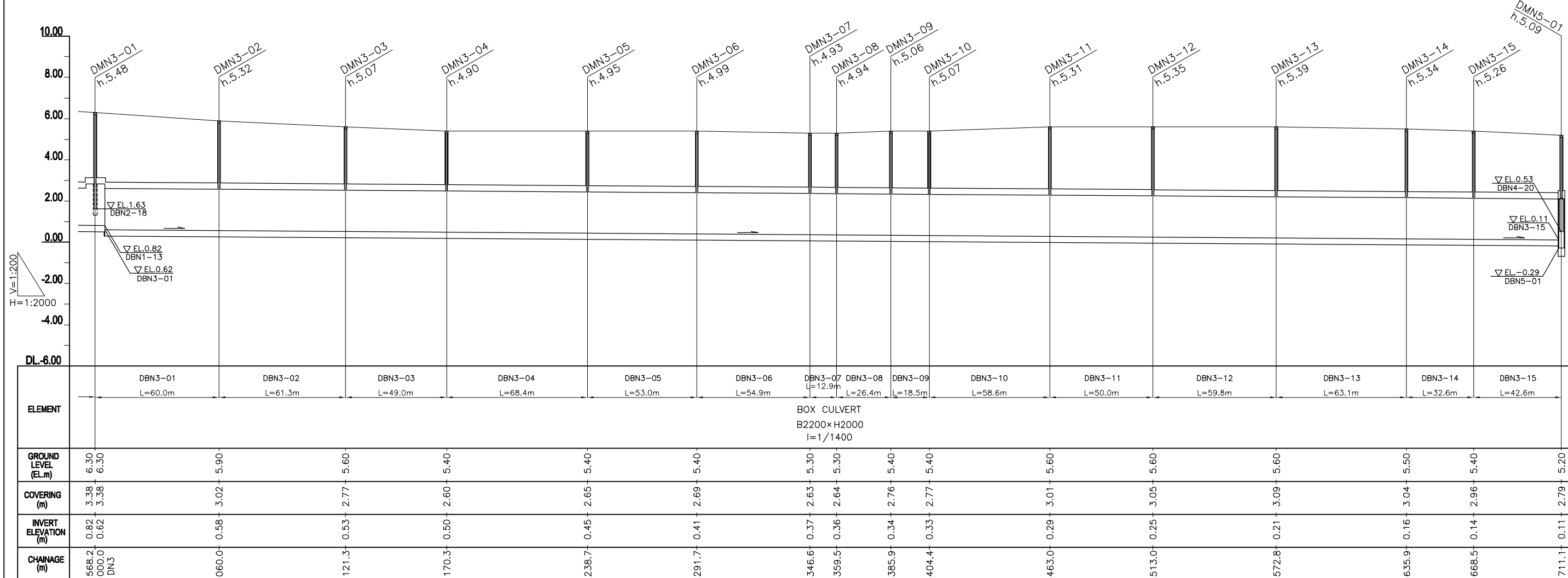
PLAN SCALE = 1:2000



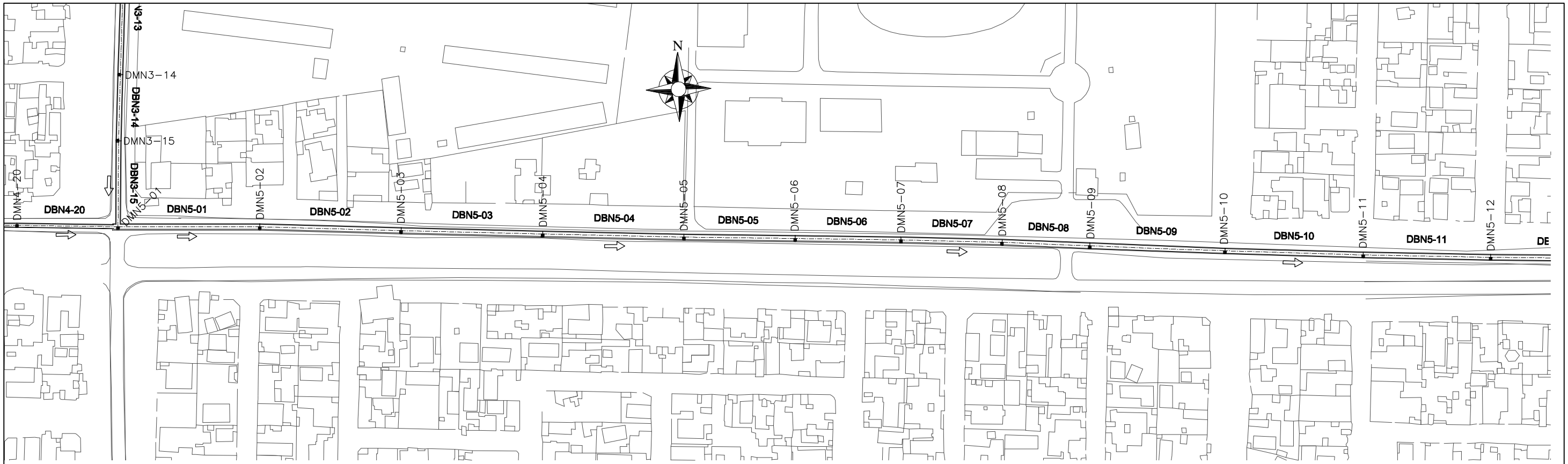
PROFILE SCALE H=1:2000 SCALE V=1:200



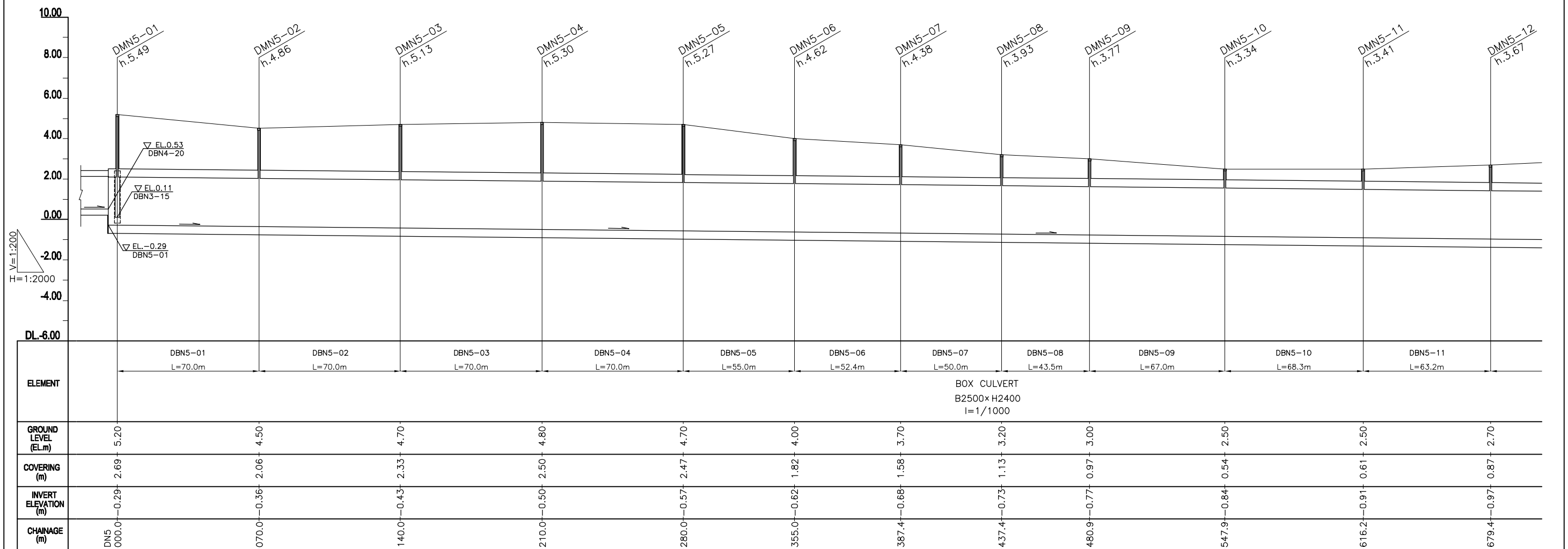
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



PLAN SCALE = 1:2000

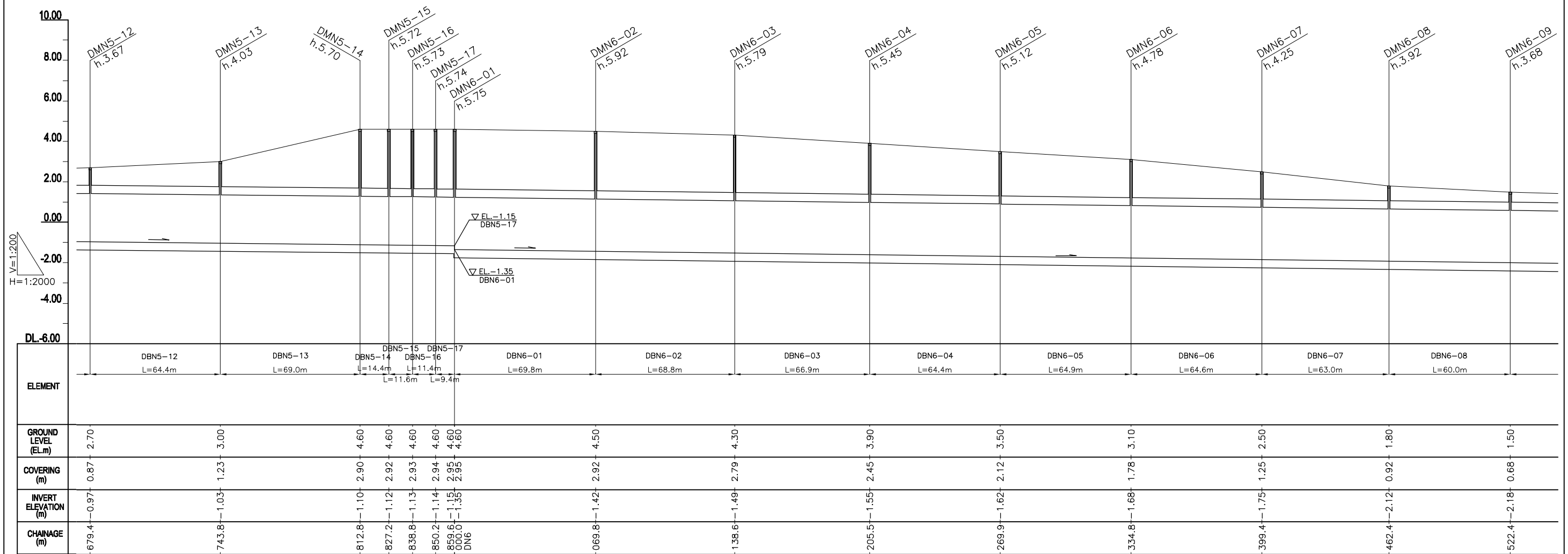


PROFILE SCALE H=1:2000 SCALE V=1:200

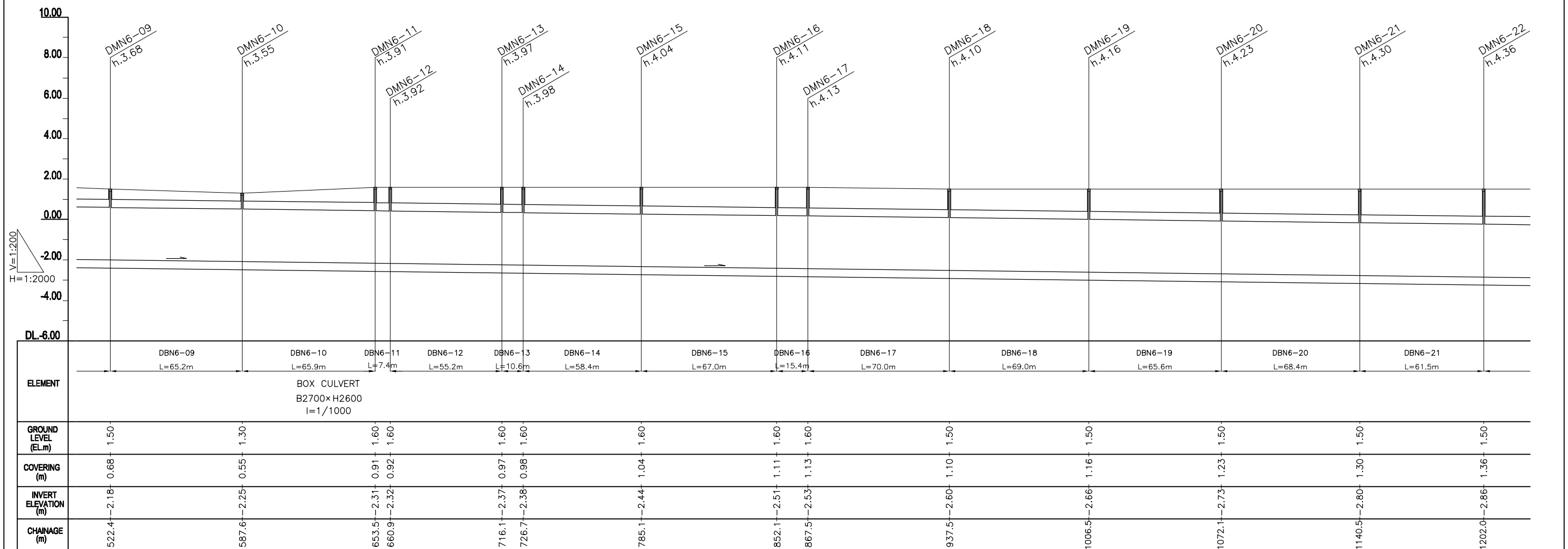
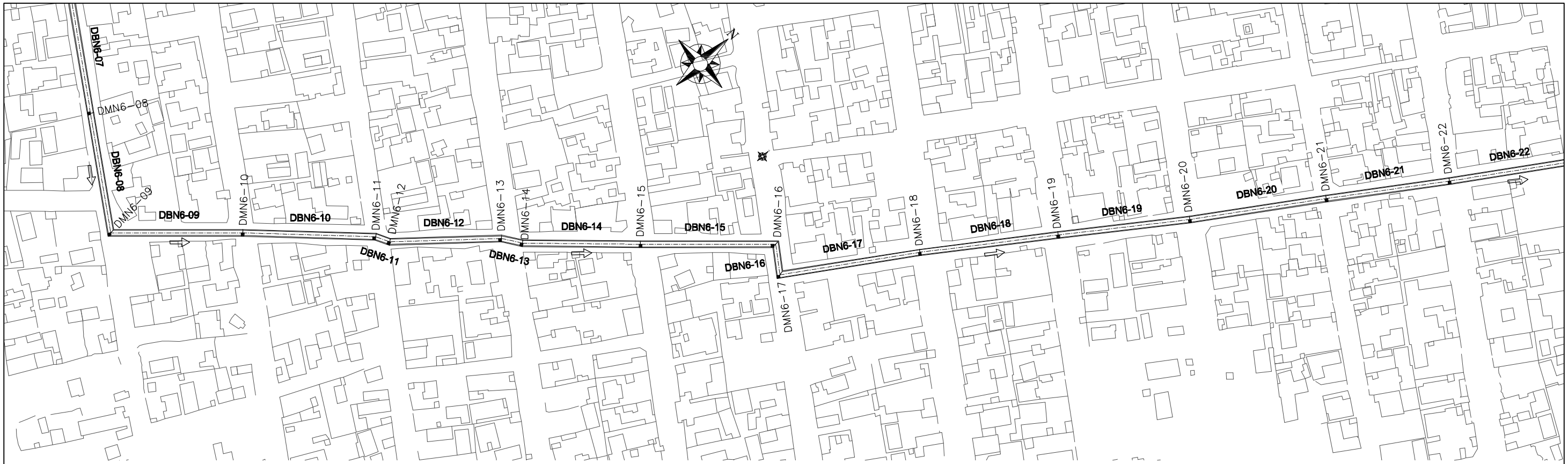
BOX CULVERT
B2500xH2400
I=1/1000



PLAN SCALE = 1:2000

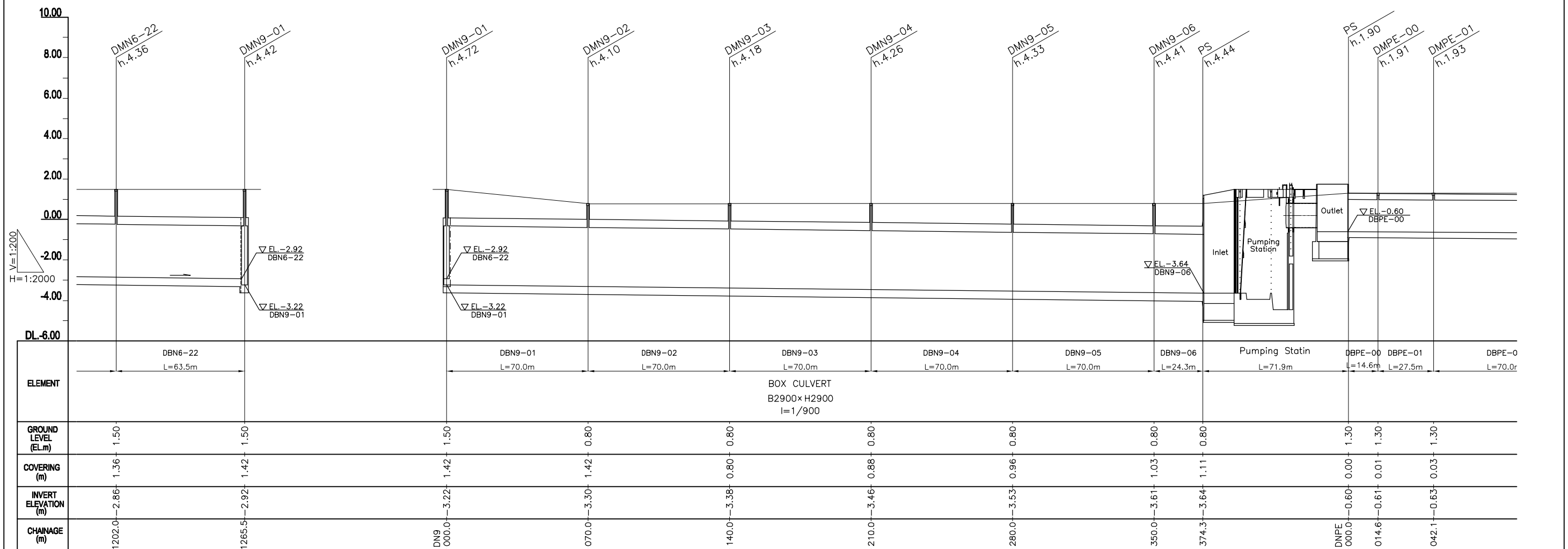


PROFILE SCALE H=1:2000 SCALE V=1:200

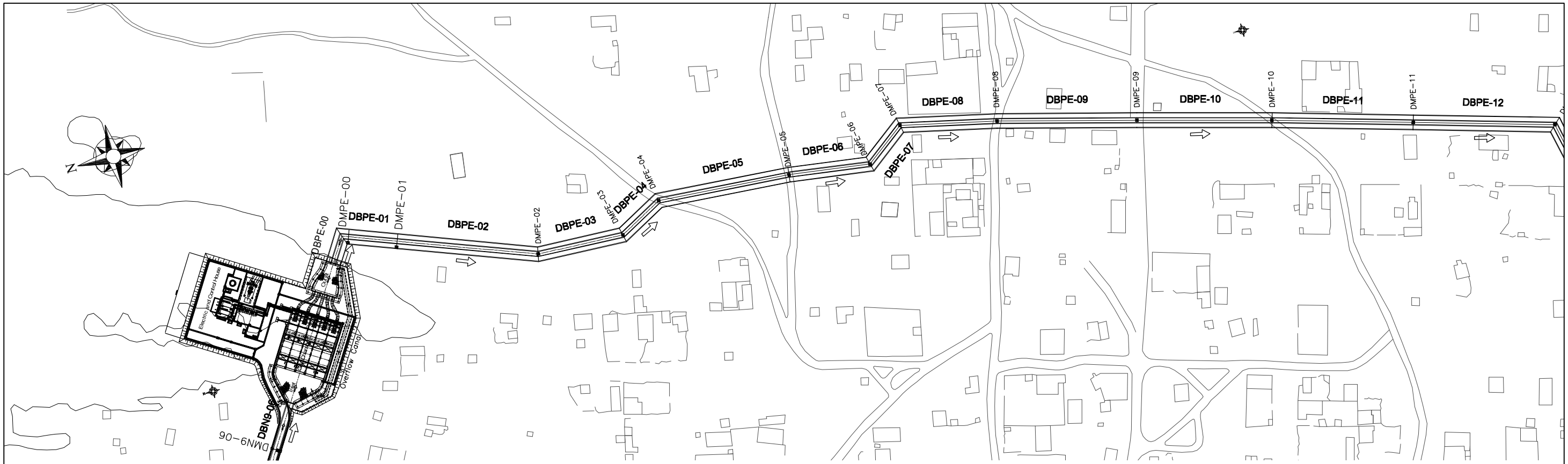




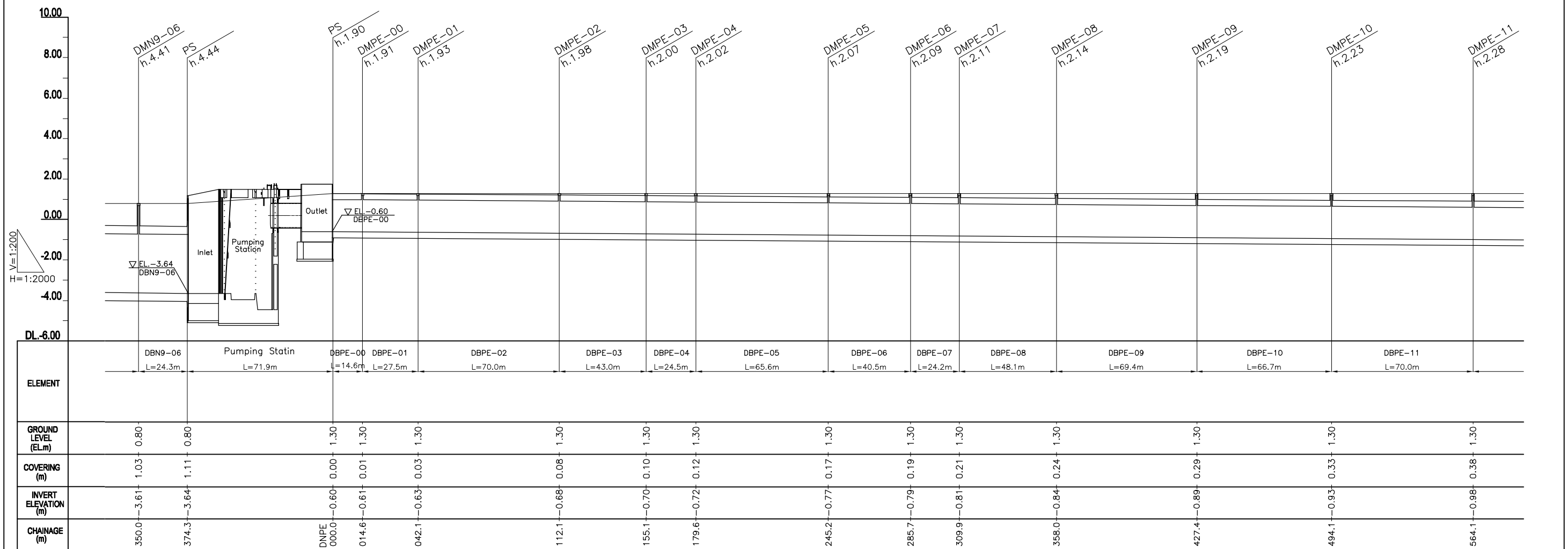
PLAN SCALE = 1:2000



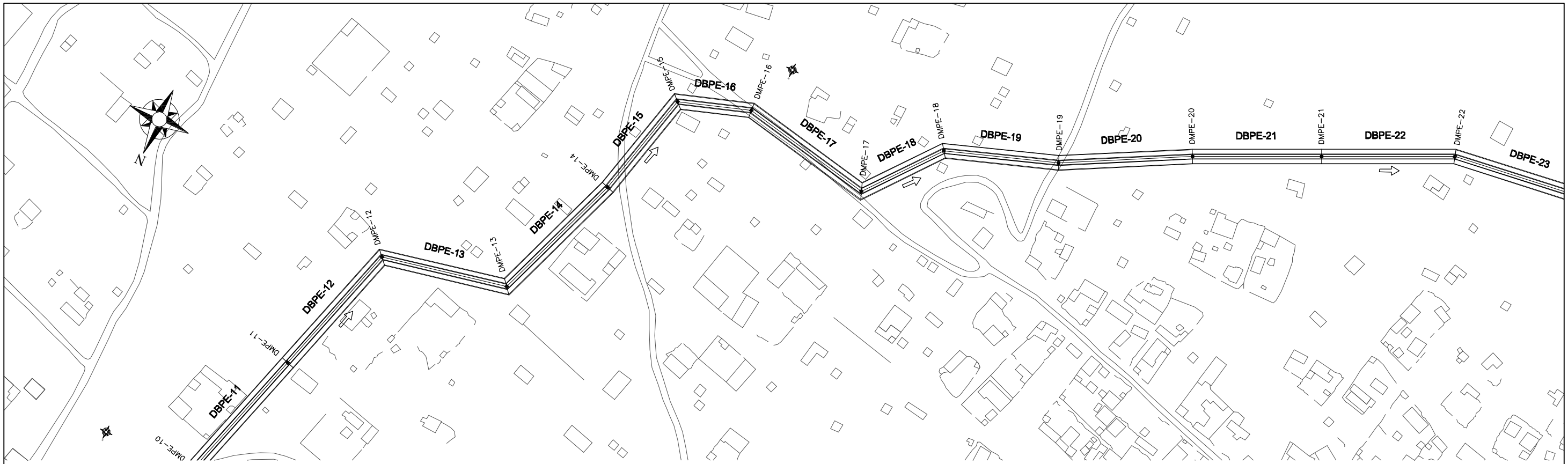
PROFILE SCALE H=1:2000 SCALE V=1:200



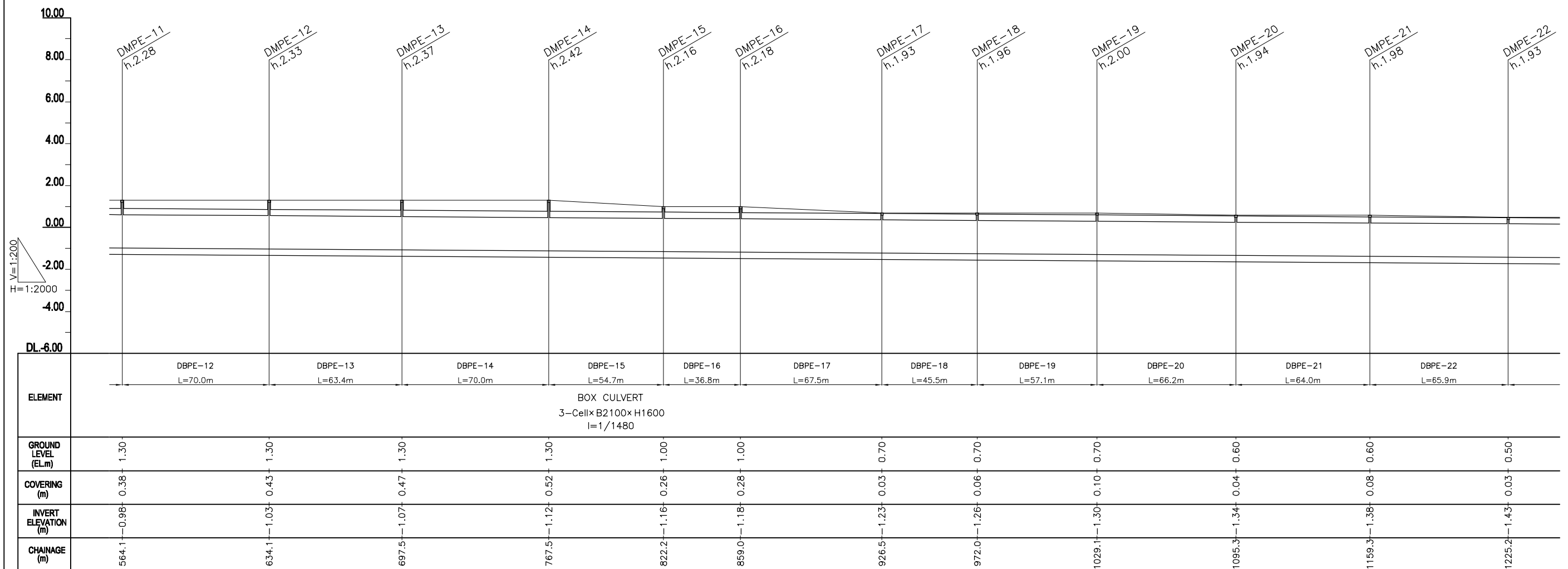
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



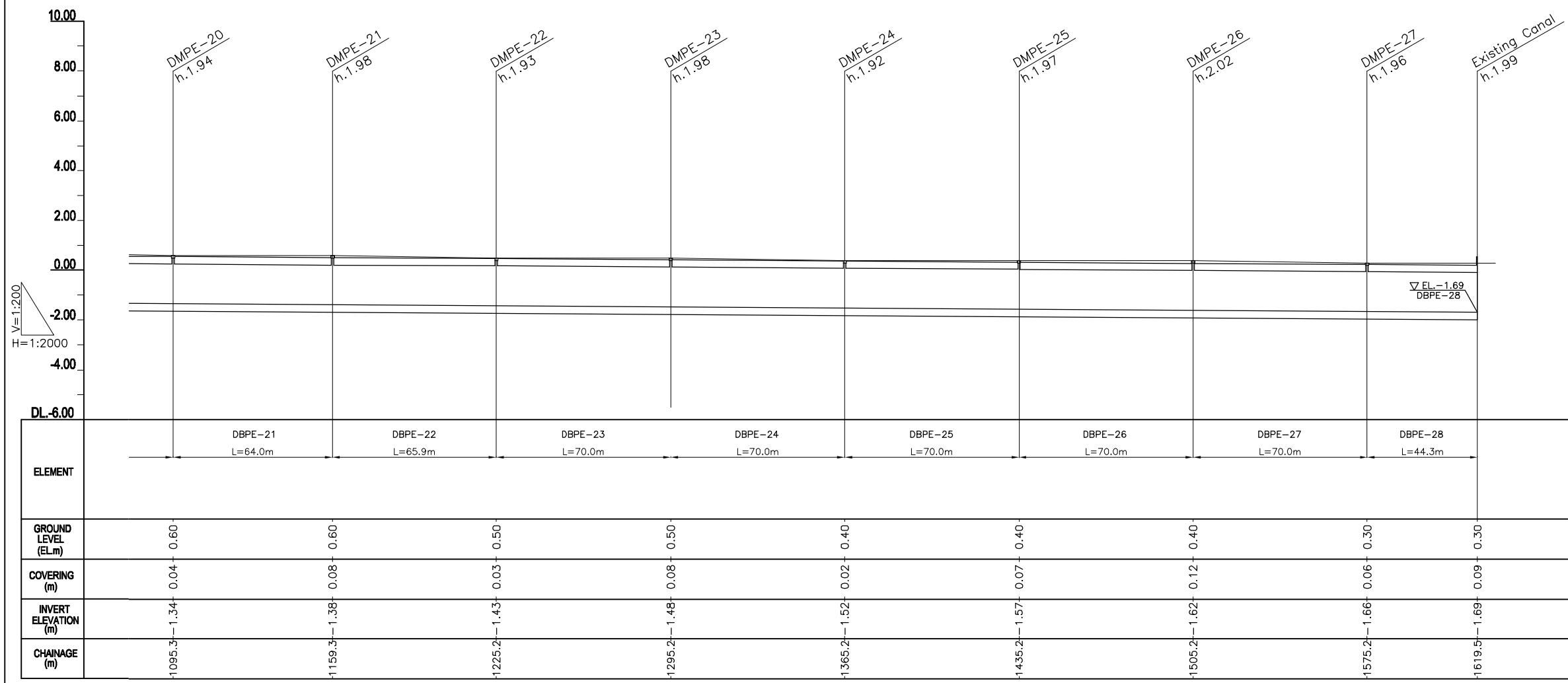
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



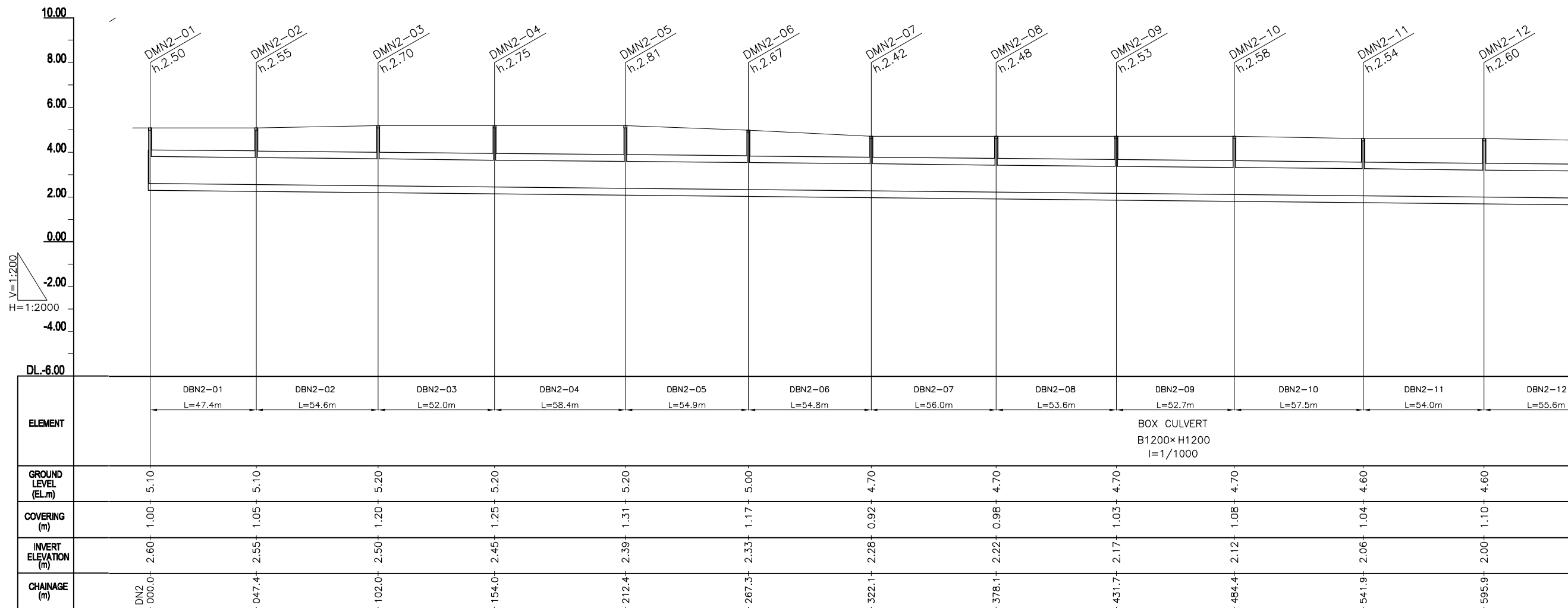
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



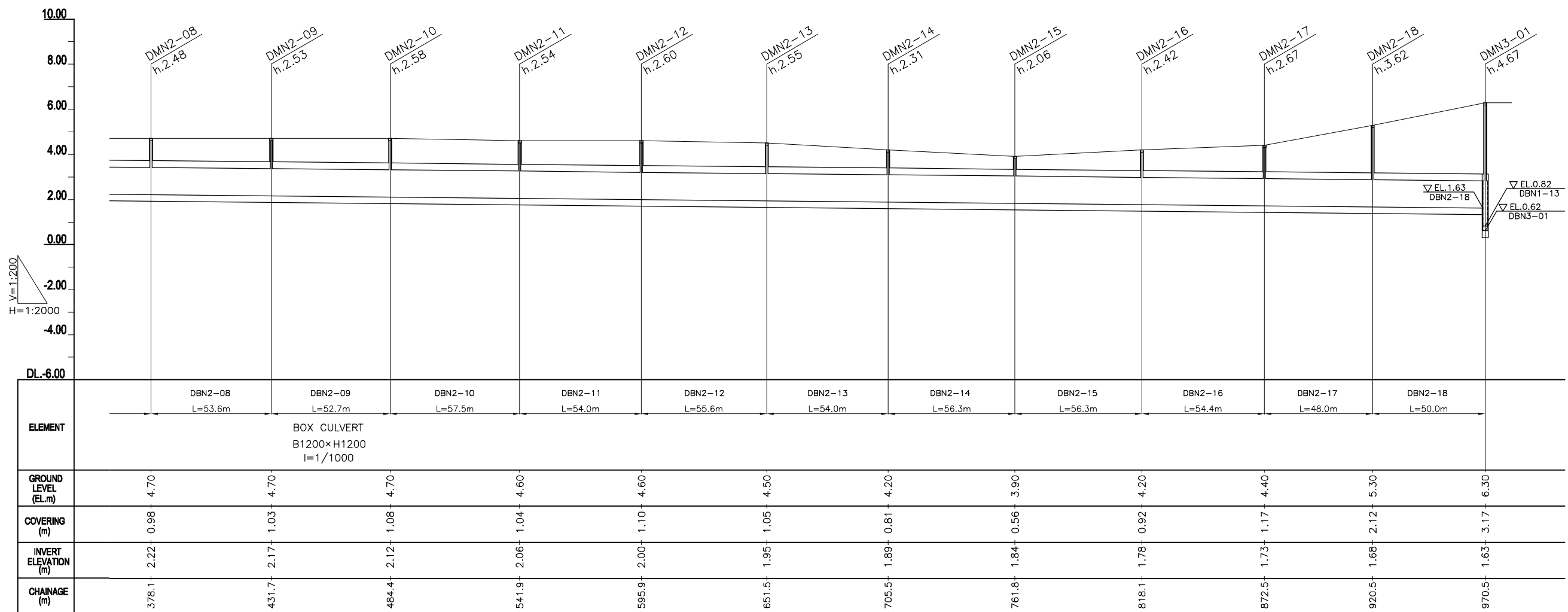
PLAN SCALE = 1:2000



PROFILE SCALE H=1:2000 SCALE V=1:200



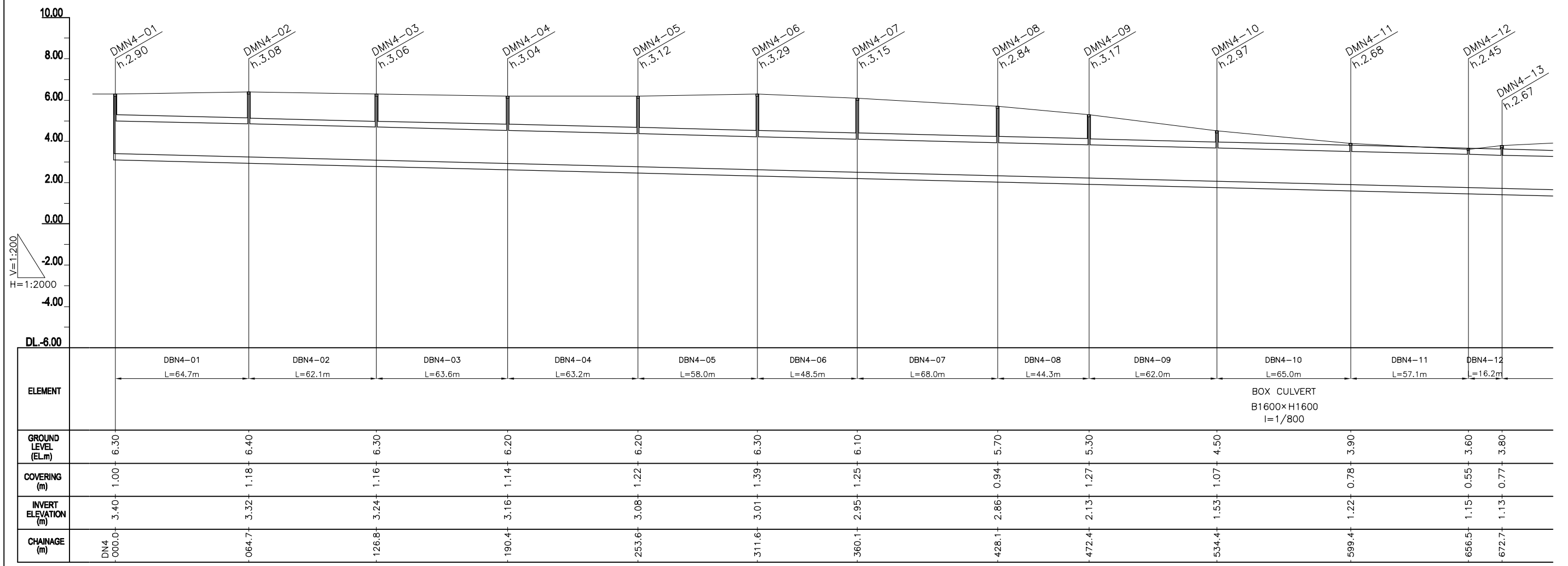
PLAN SCALE = 1:2000



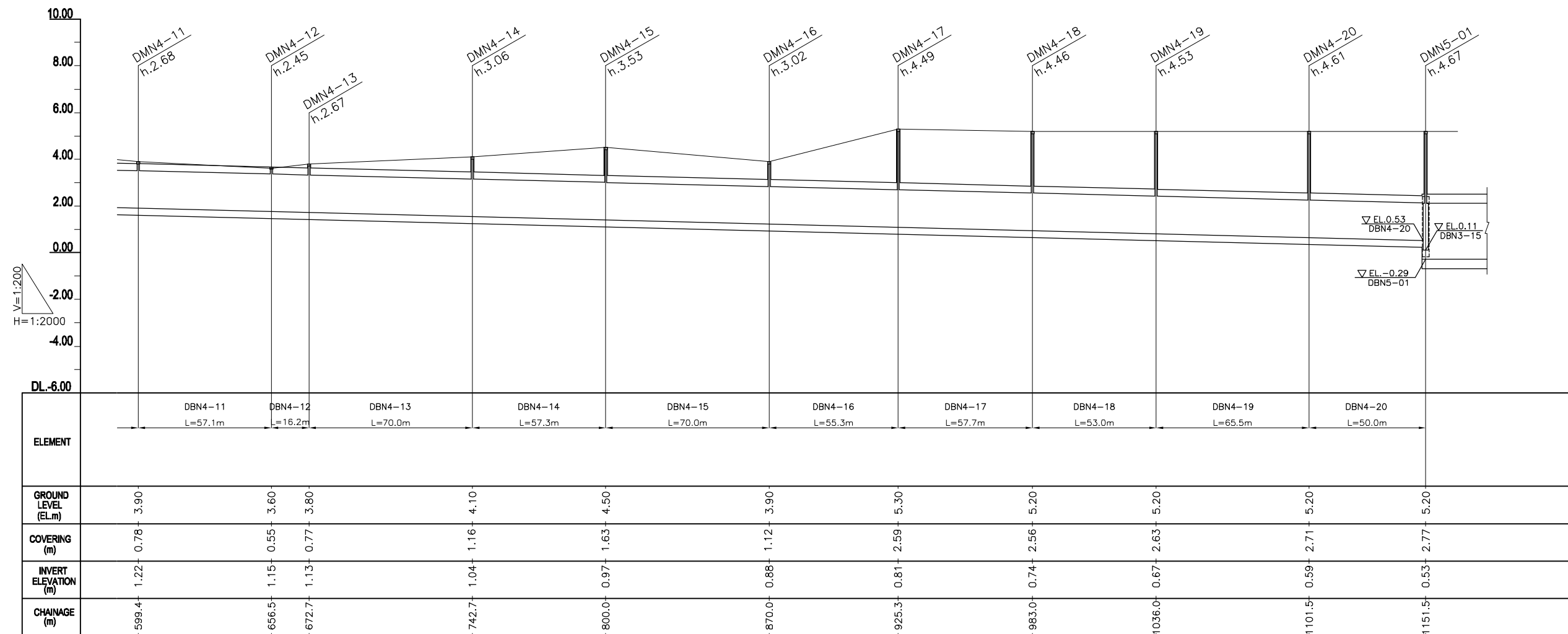
PROFILE SCALE H=1:2000 SCALE V=1:200



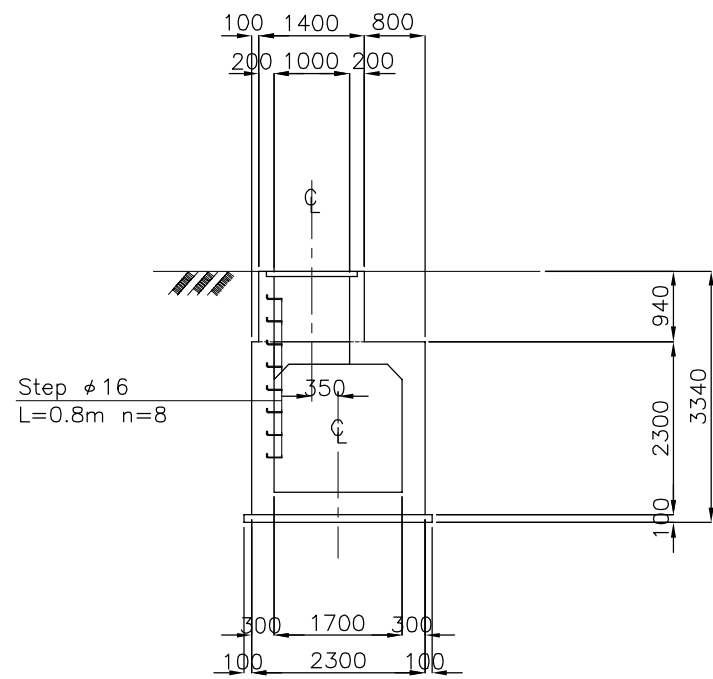
PLAN SCALE = 1:2000



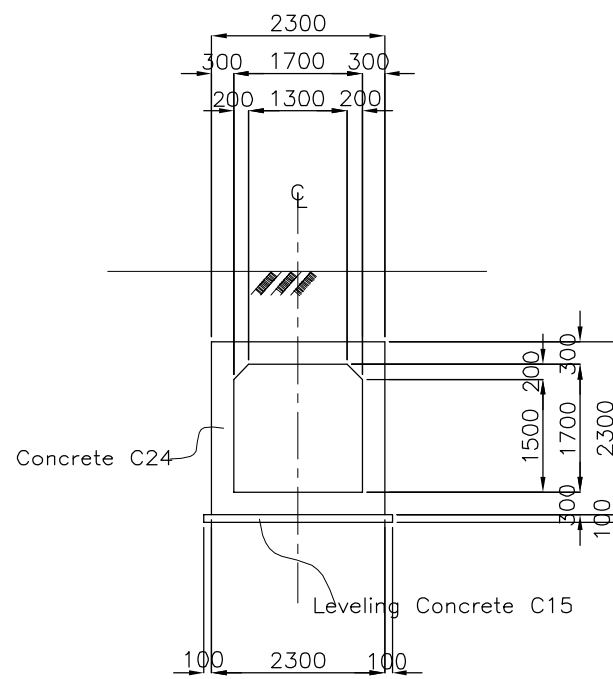
PROFILE SCALE H=1:2000 SCALE V=1:200



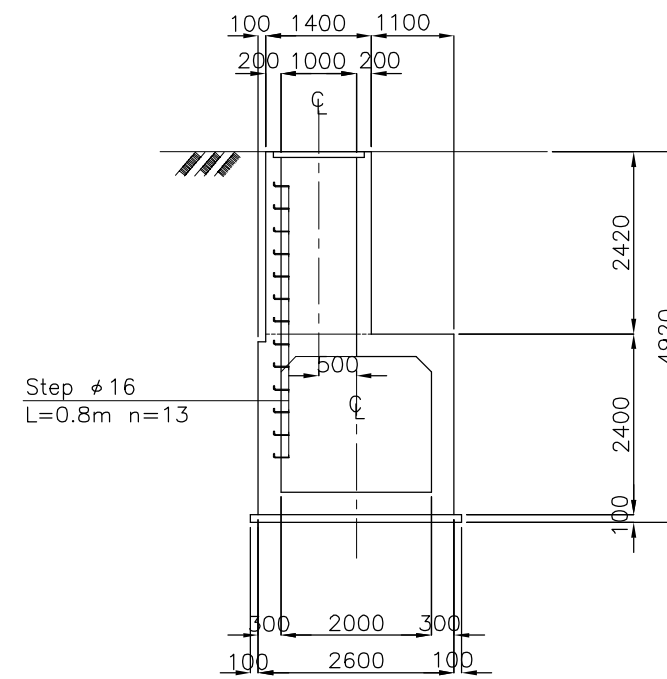
PROFILE SCALE H=1:2000 SCALE V=1:200



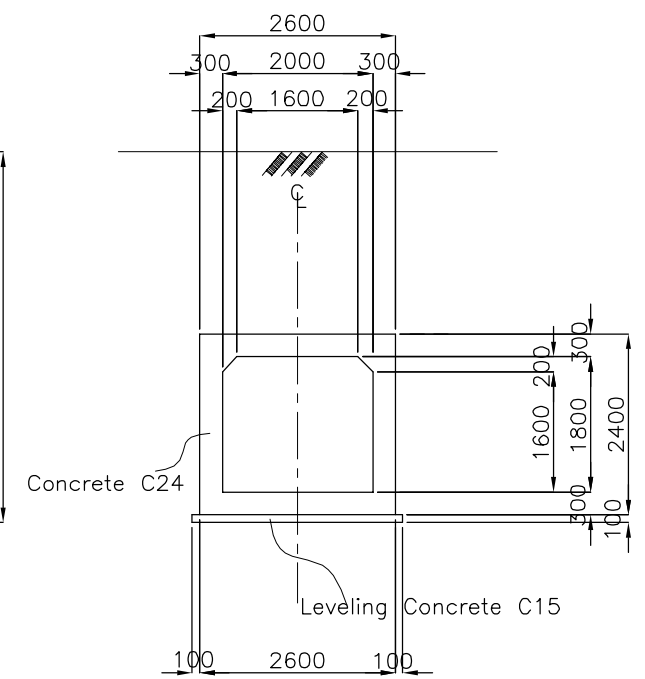
SECTION 2-2



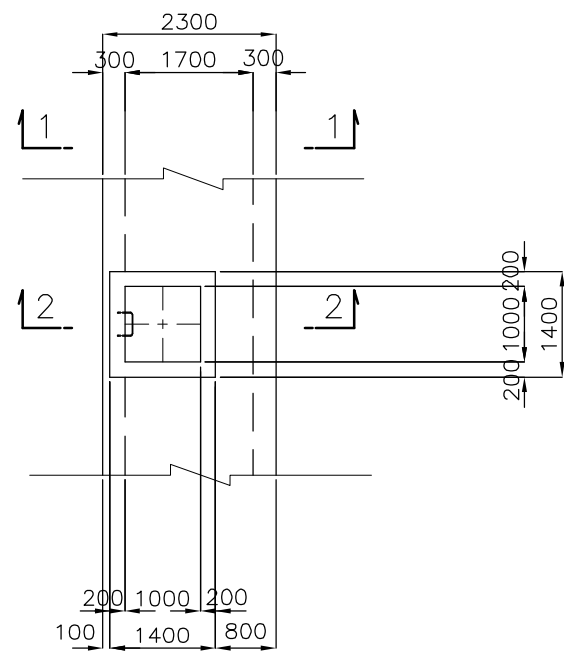
SECTION 1-1



SECTION 1-1

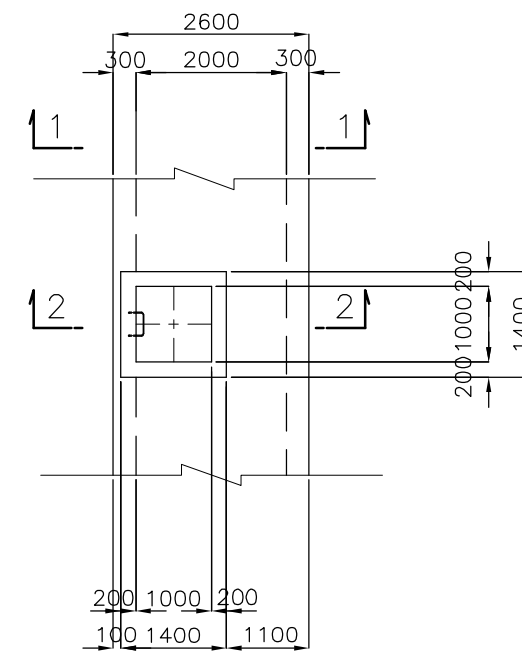


SECTION 2-2



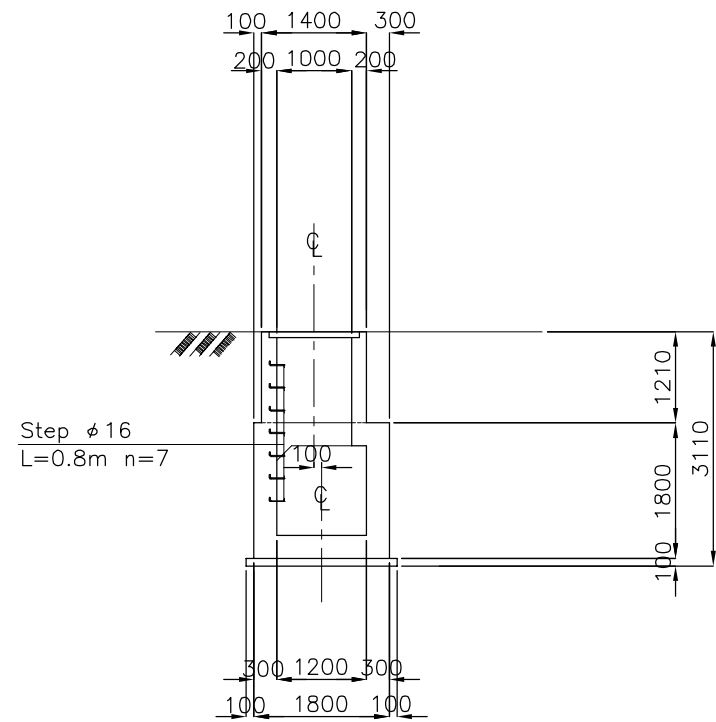
PLAN

DETAILED OF N-0 BOX CULVERT 1.7*1.7 S=1:200

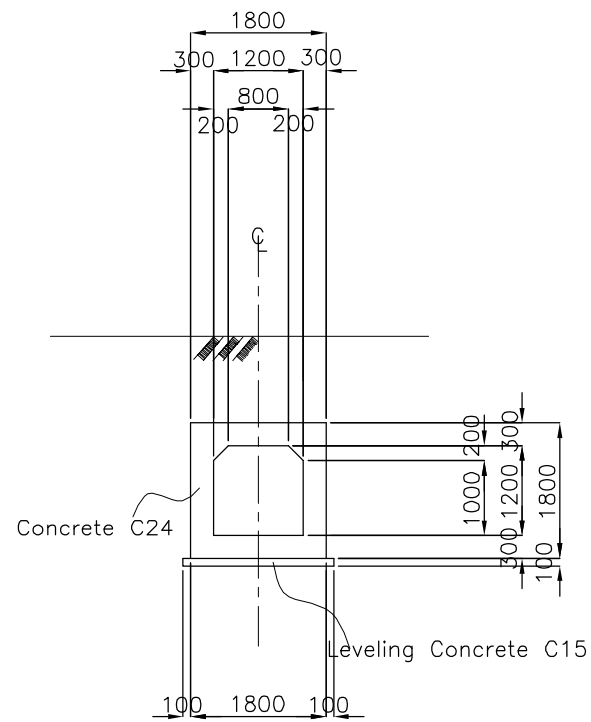


PLAN

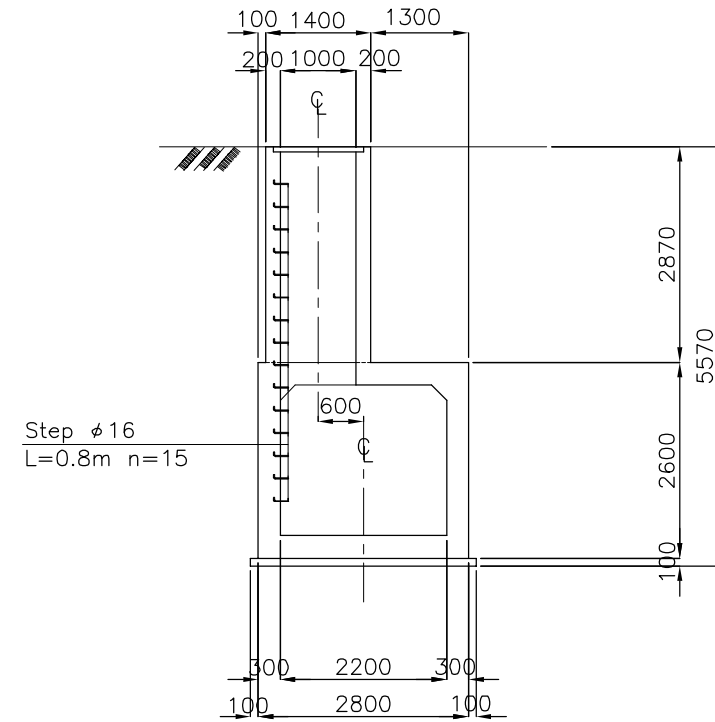
DETAILED OF N-1 BOX CULVERT 2.0*1.8 S=1:200



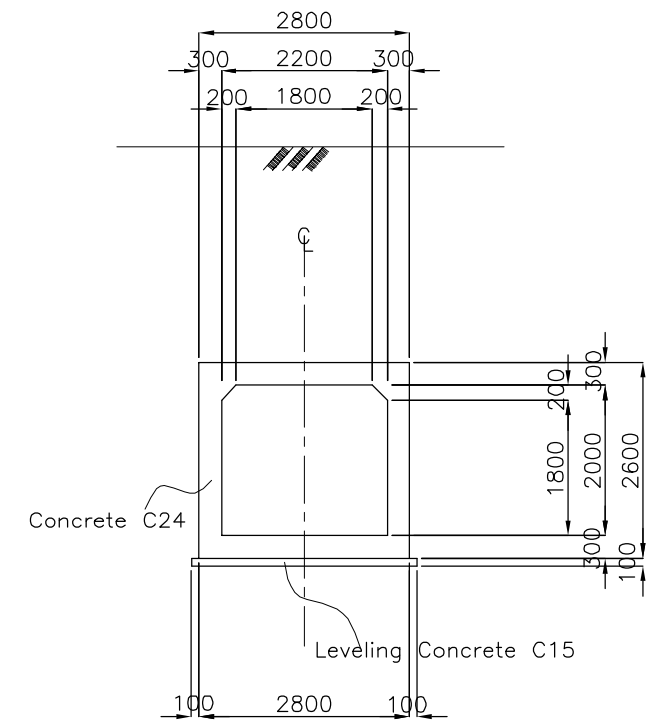
SECTION 2-2



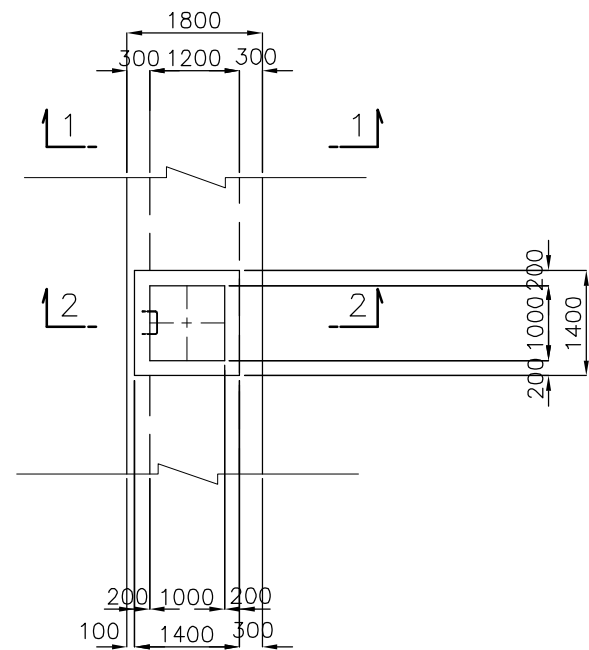
SECTION 1-1



SECTION 1-1

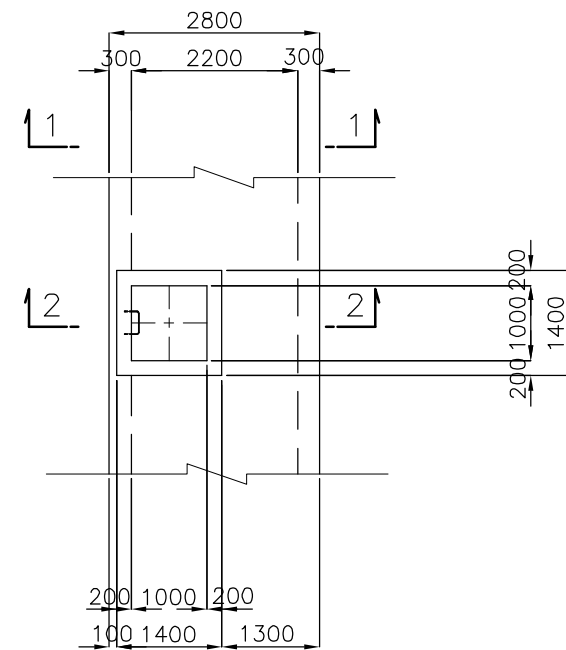


SECTION 2-2



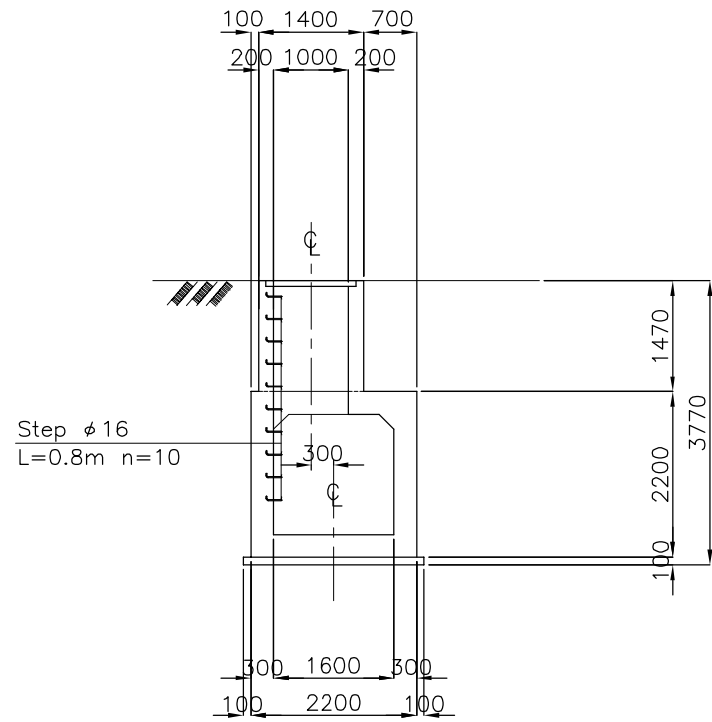
PLAN

DETAILED OF N-2 BOX CULVERT 1.2*1.2 S=1:200

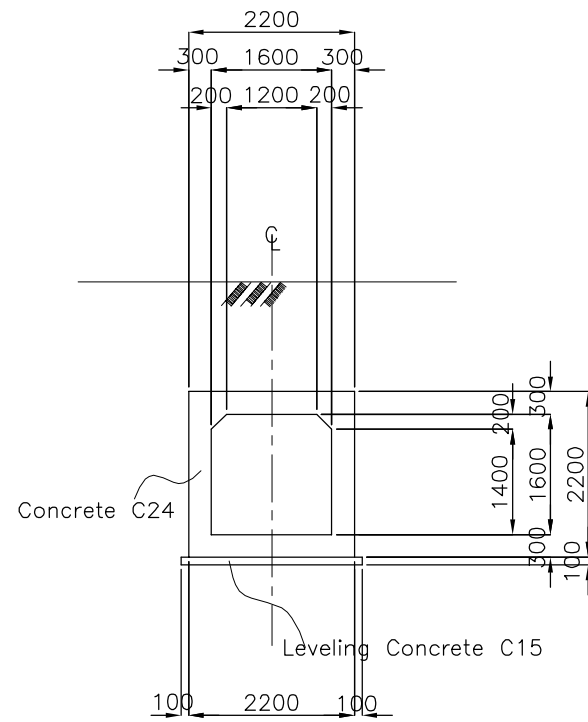


PLAN

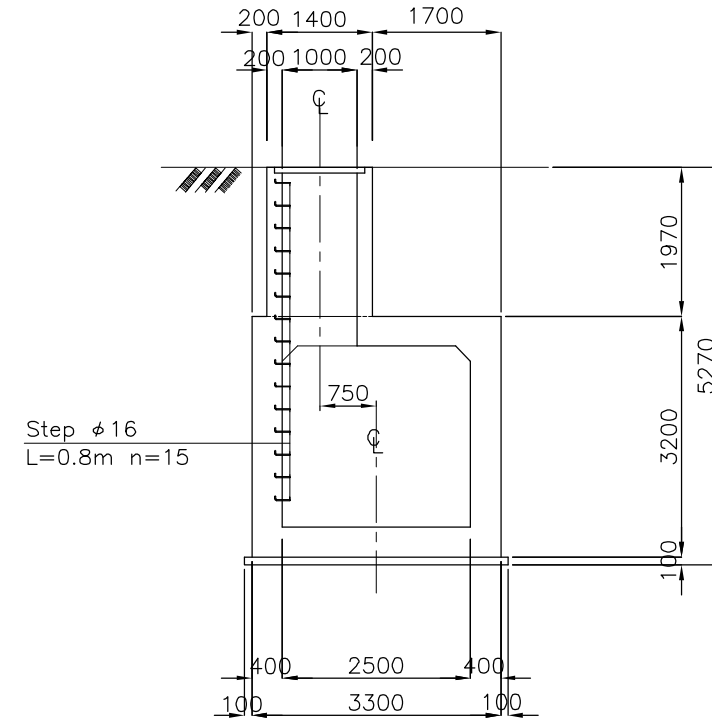
DETAILED OF N-3 BOX CULVERT 2.2*2.0 S=1:200



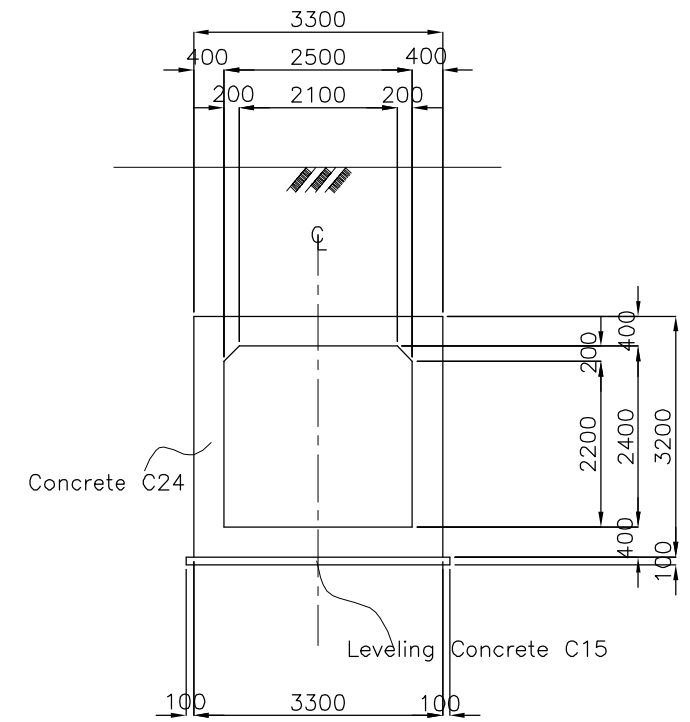
SECTION 2-2



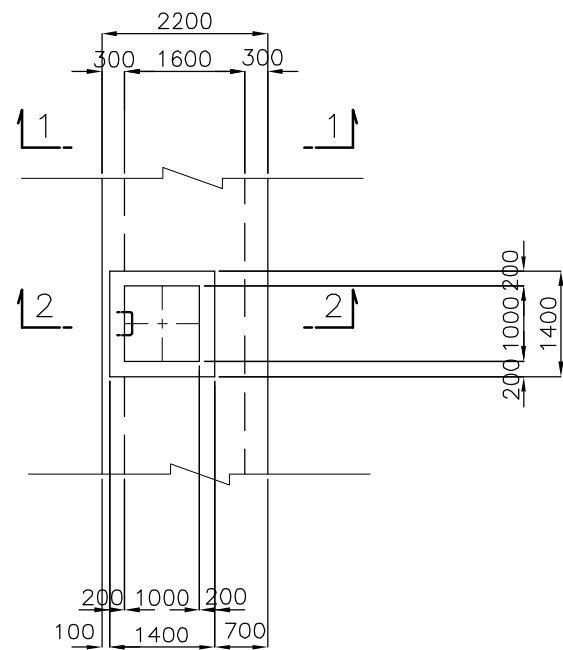
SECTION 1-1



SECTION 2-2

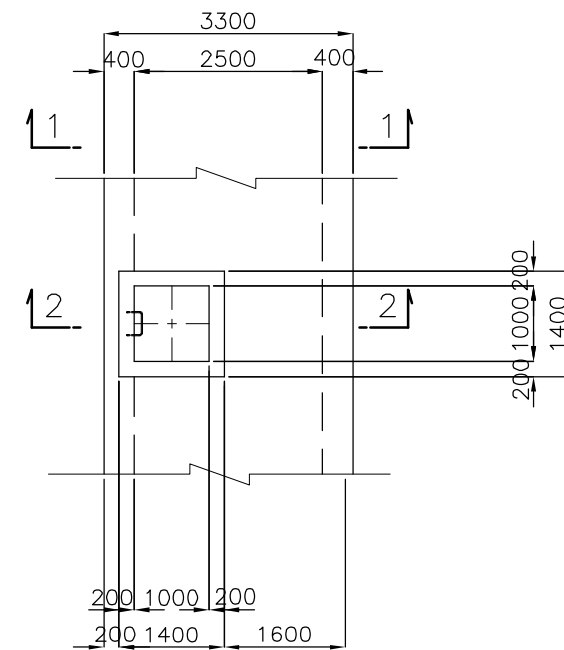


SECTION 1-1



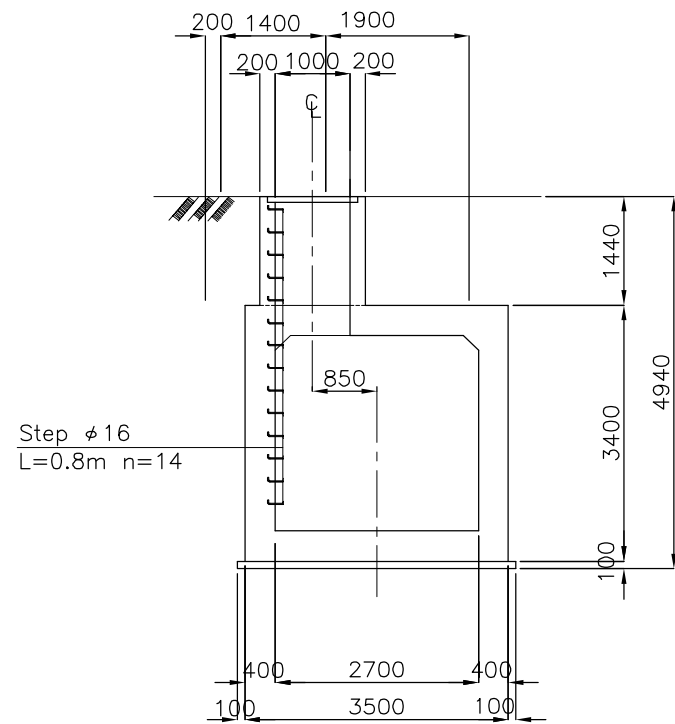
PLAN

DETAILED OF N-4 BOX CULVERT 1.6*1.6 S=1:200

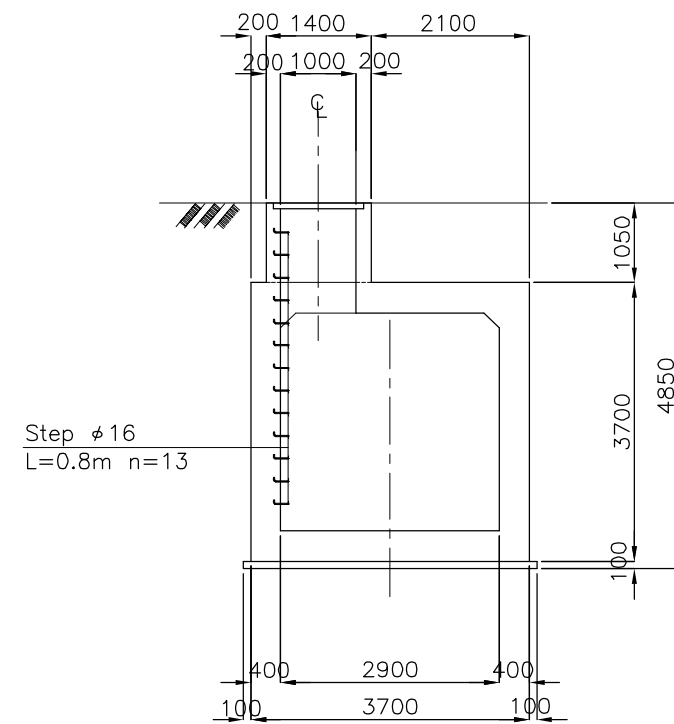
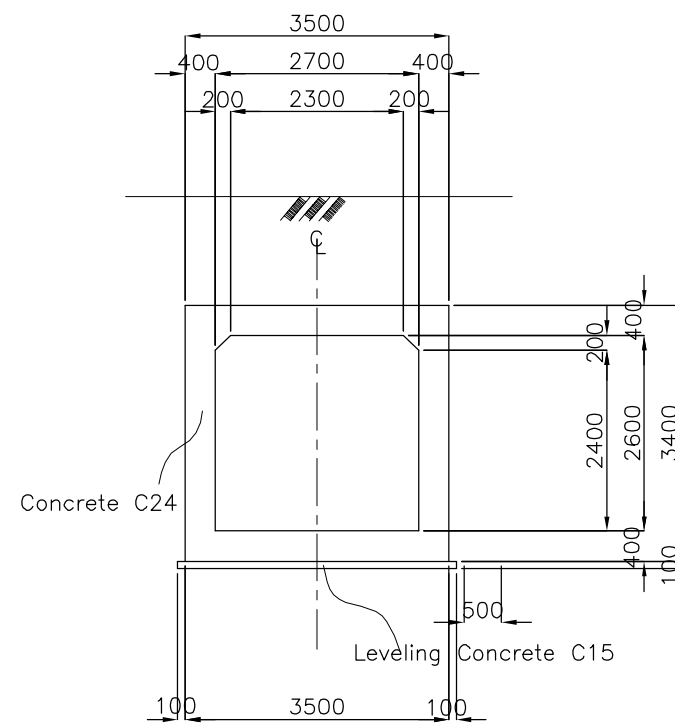


PLAN

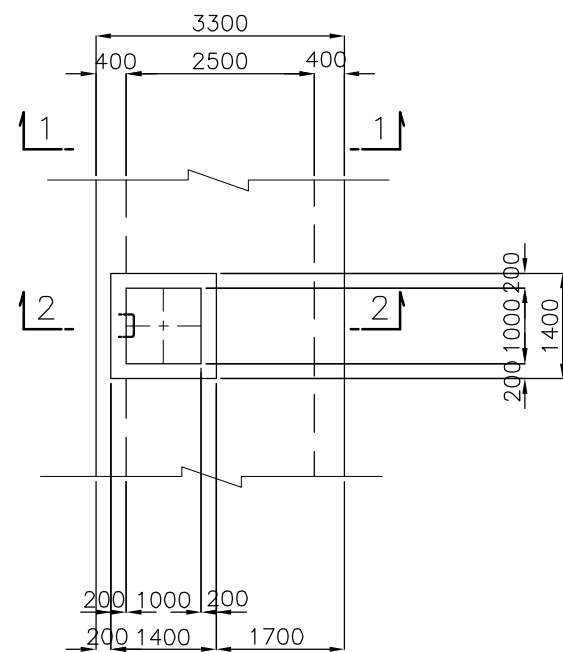
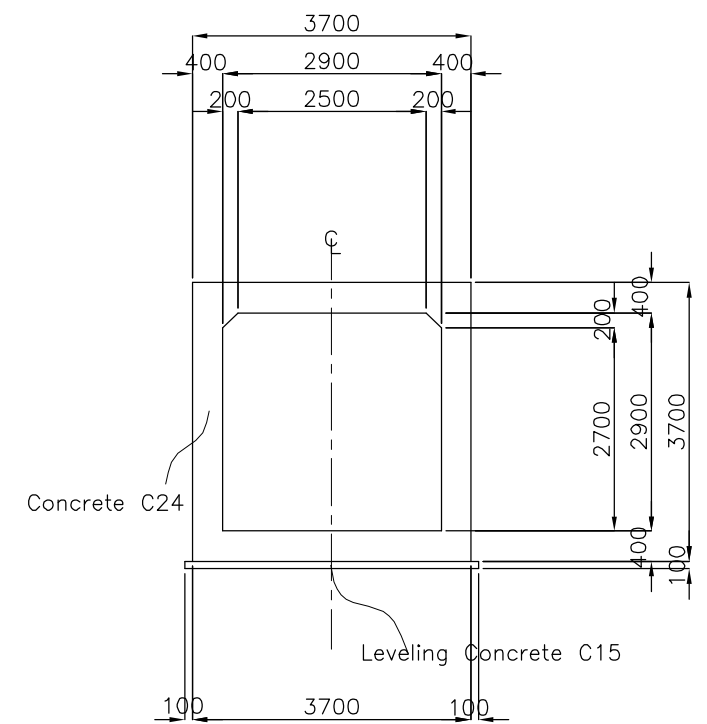
DETAILED OF N-5 BOX CULVERT 2.5*2.4 S=1:200



SECTION 2-2

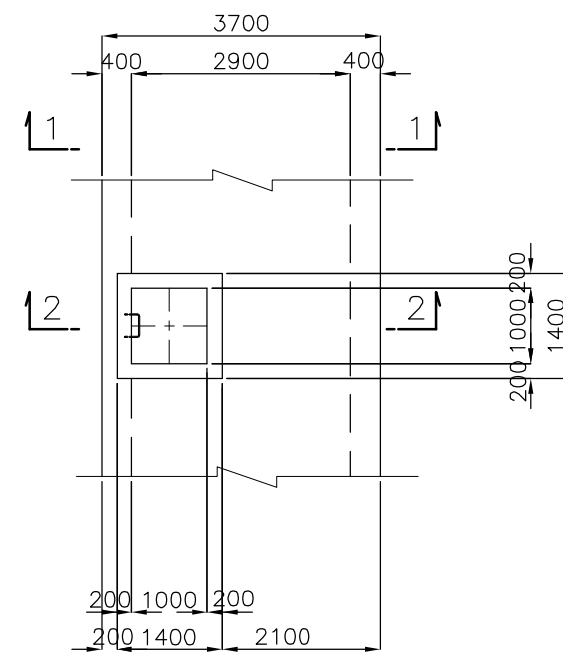


SECTION 2-2



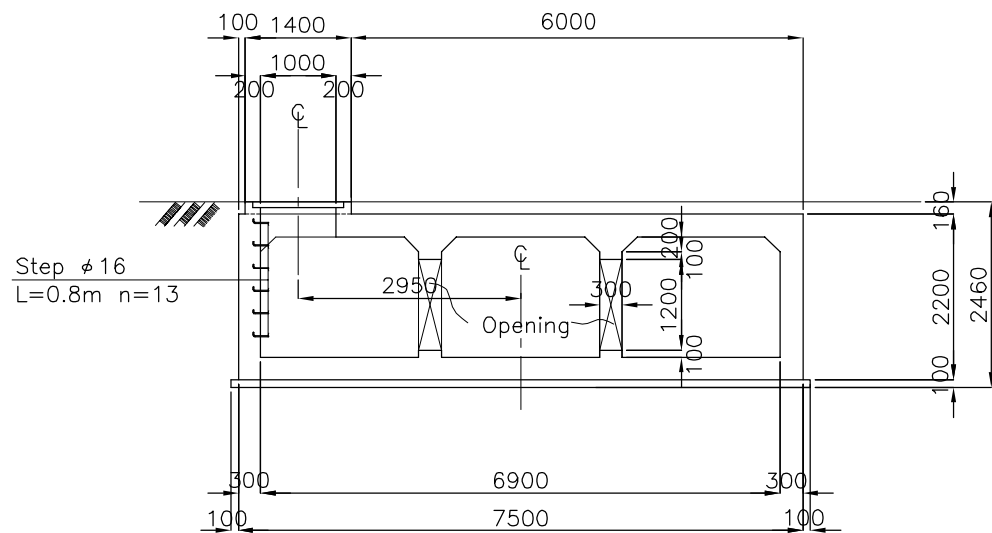
PLAN

DETAILED OF N-6 BOX CULVERT 2.7*2.6 S=1:200

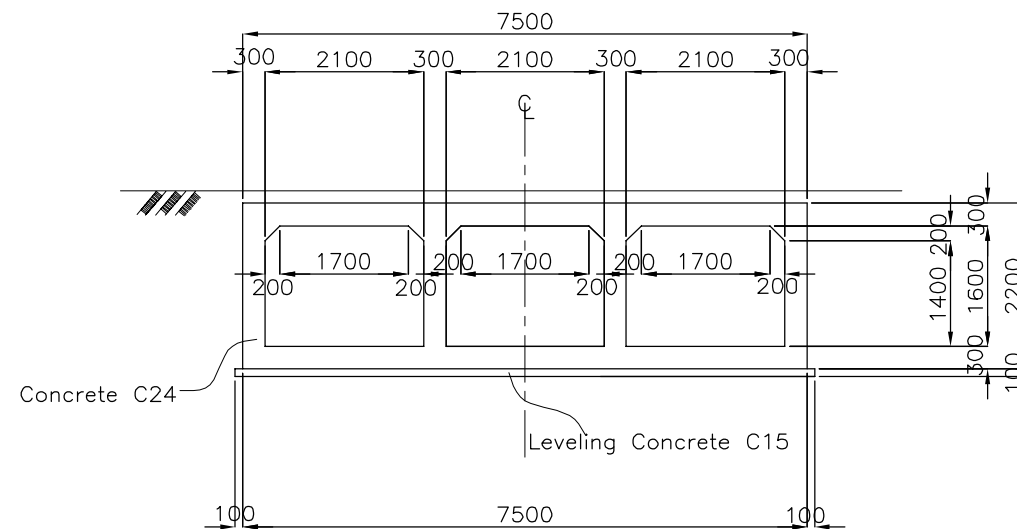


PLAN

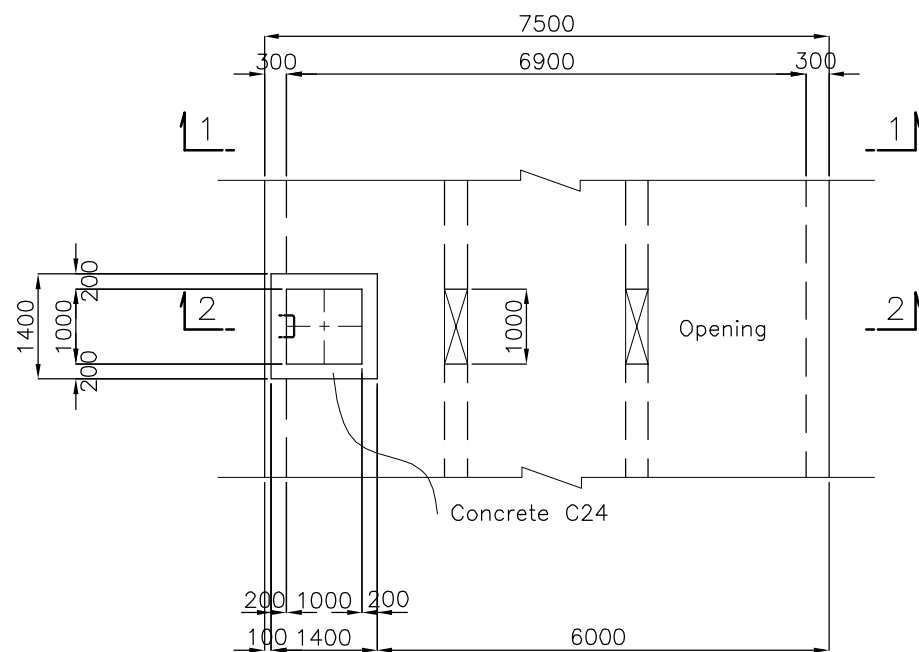
DETAILED OF N-9 BOX CULVERT 2.9*2.9 S=1:200



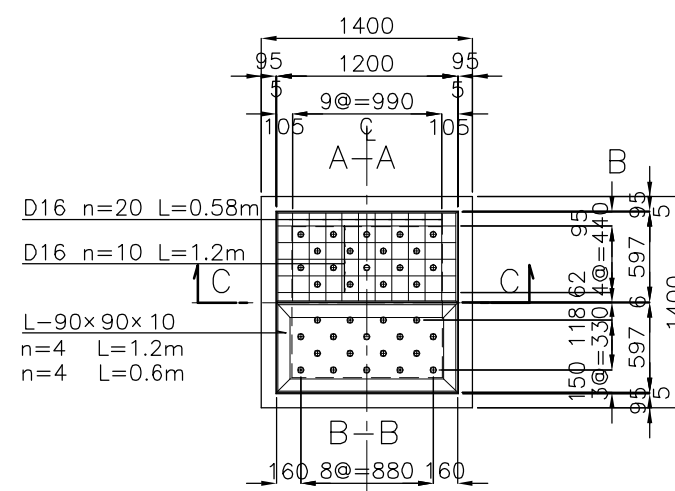
SECTION 2-2



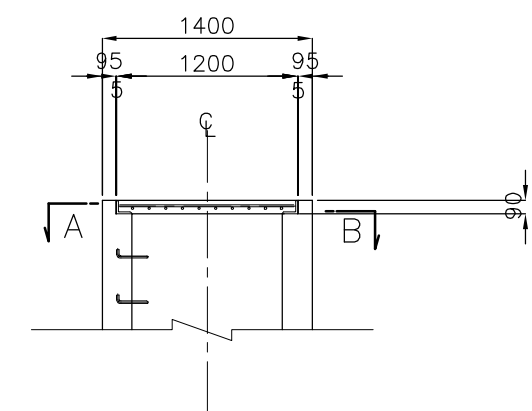
SECTION 1-1



PLAN



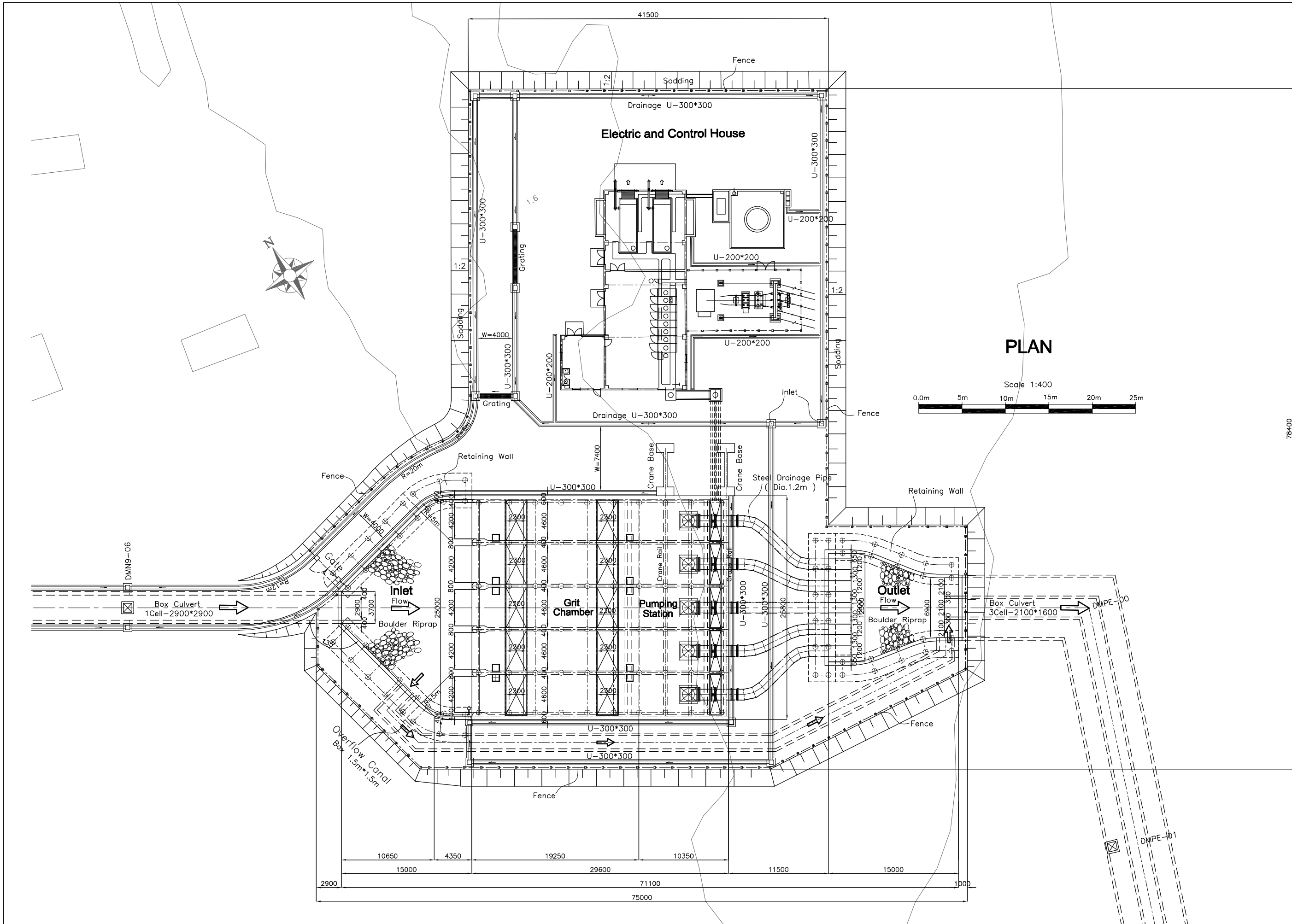
PLAN

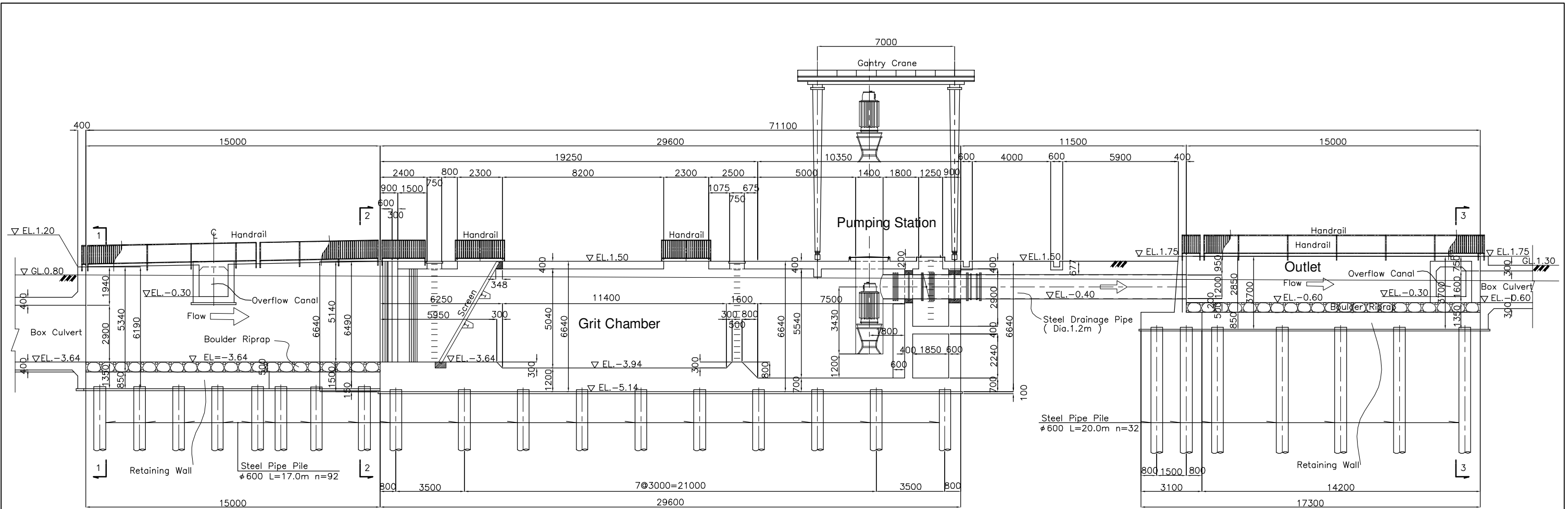


SECTION C-C

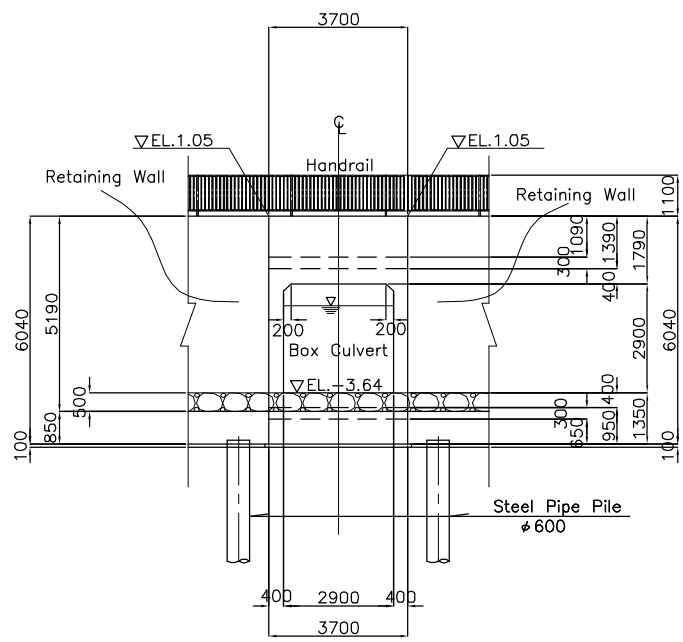
DETAILED OF N-PE BOX CULVERT 3@2.1*1.6 S=1:200

DETAILED OF MANHOLE COVER S=1:50

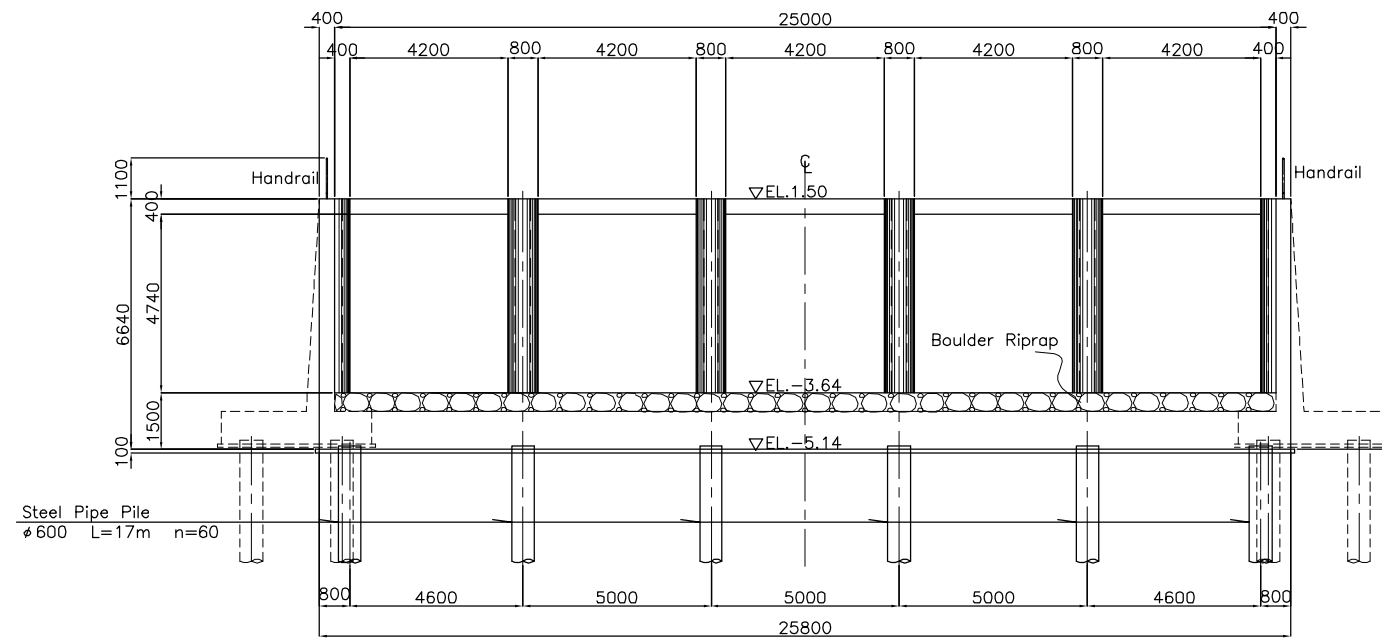




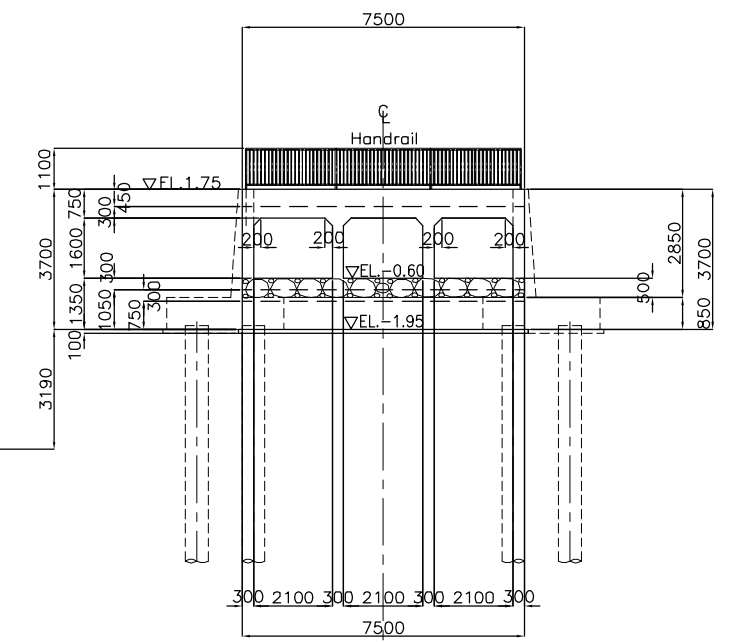
PROFILE S=1:200



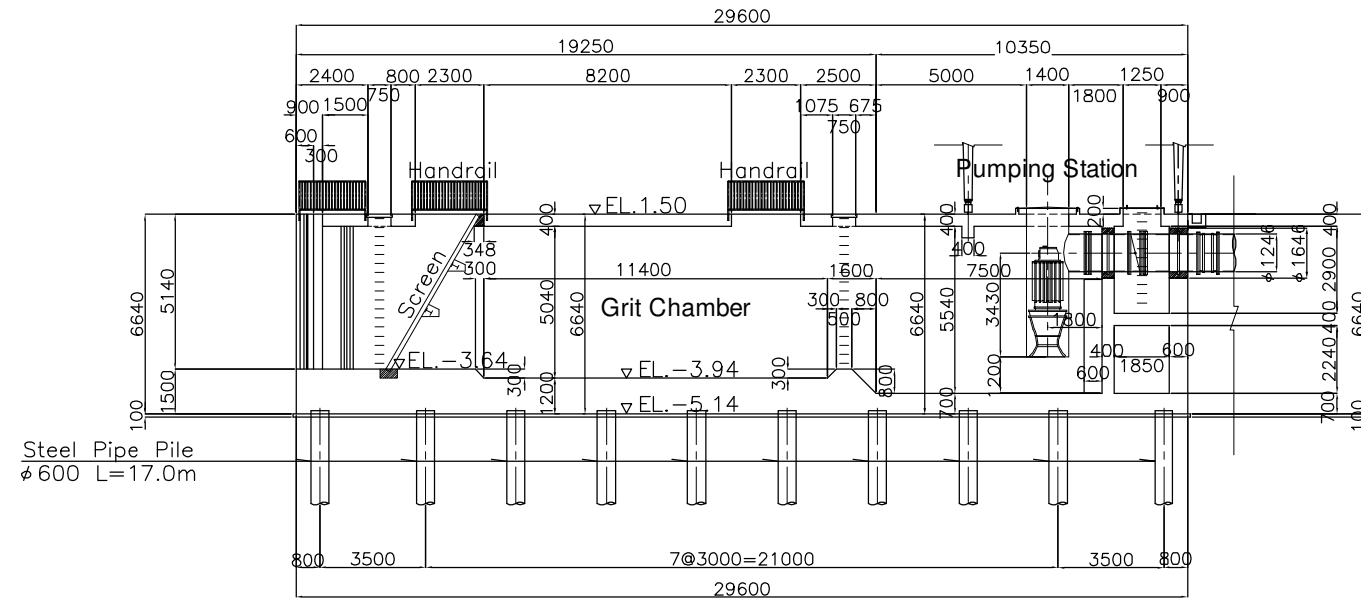
SECTION 1-1
INLET S=1:200



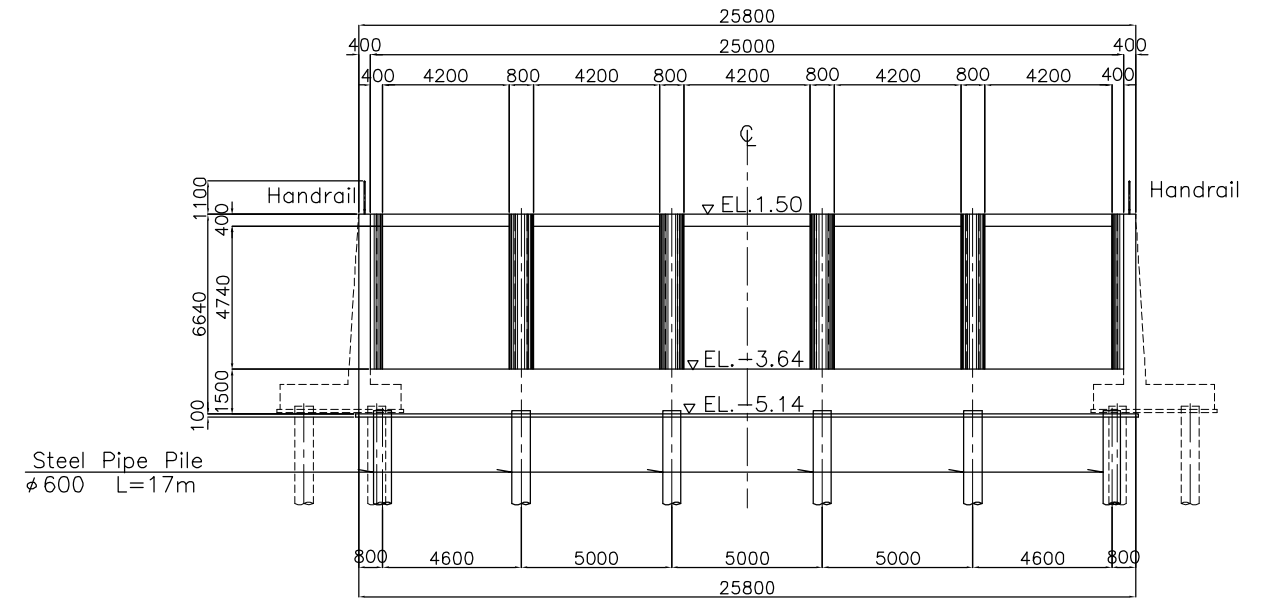
SECTION 2-2
PUMPING STATION S=1:200



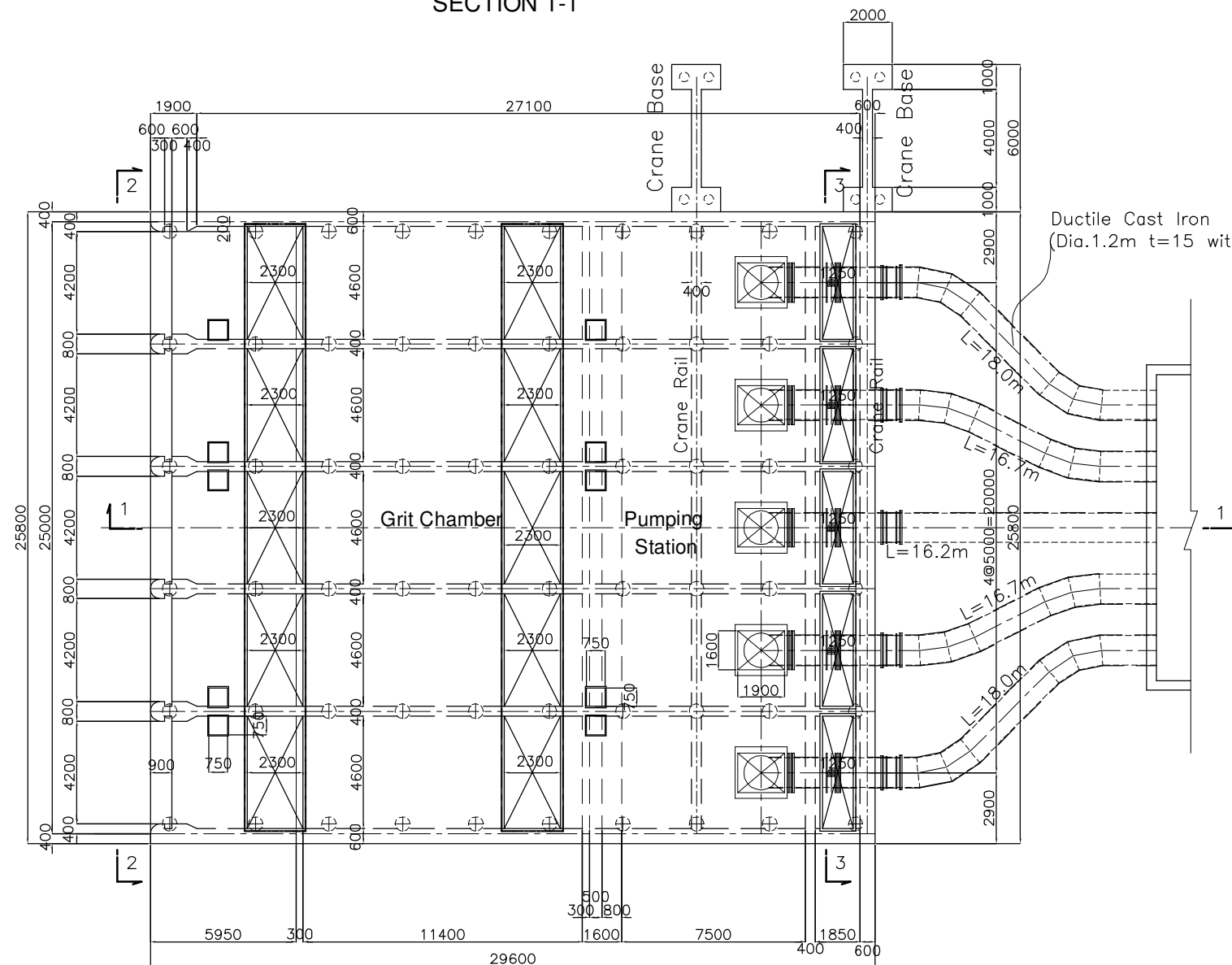
SECTION 3-3
OUTLET S=1:200



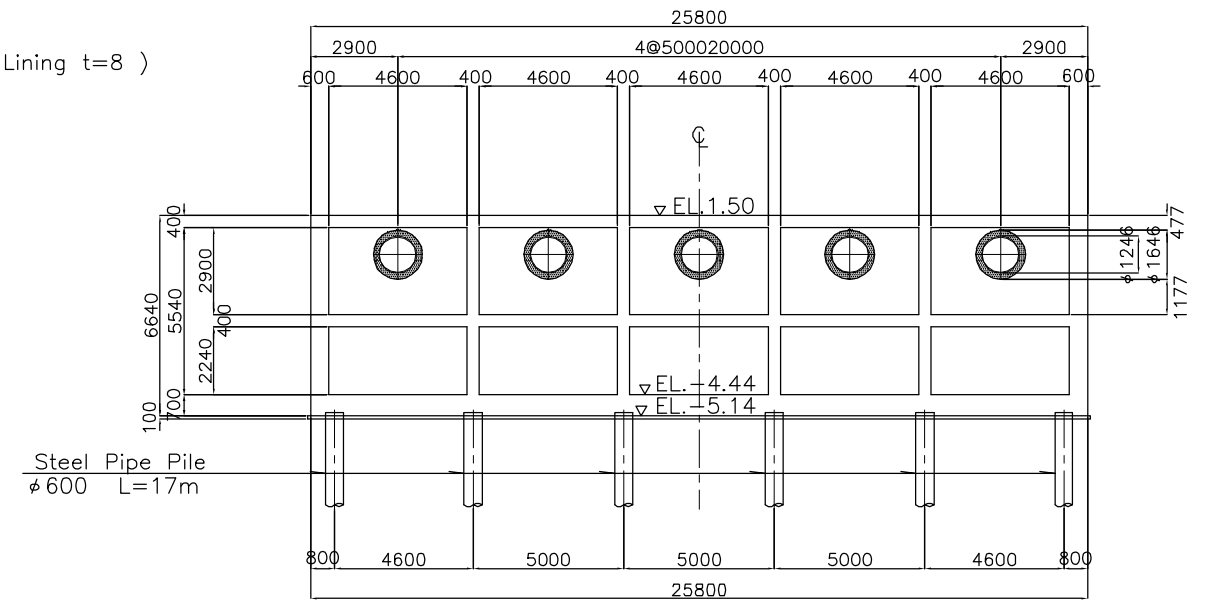
SECTION 1-1



SECTION 2-2



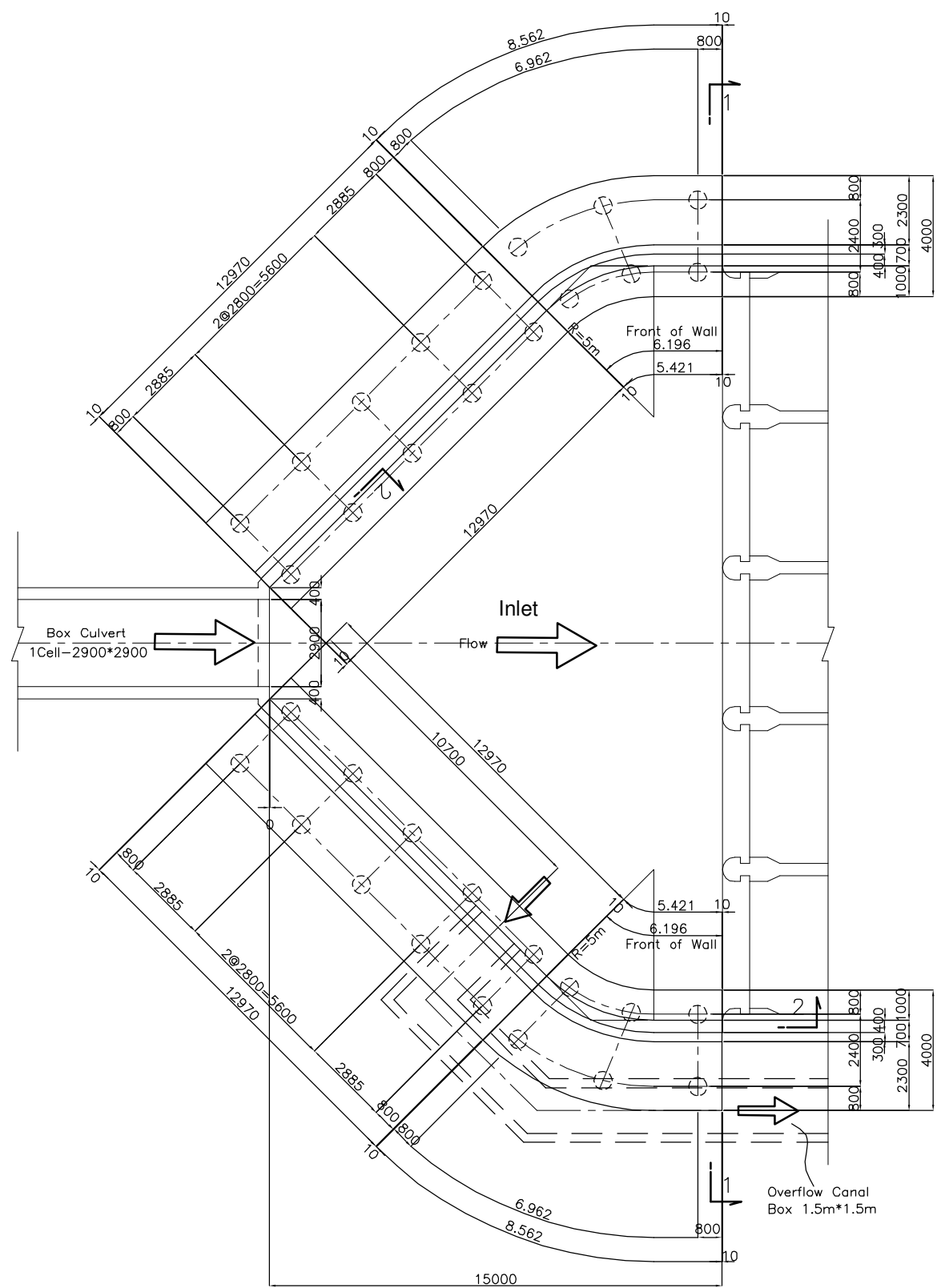
PLAN



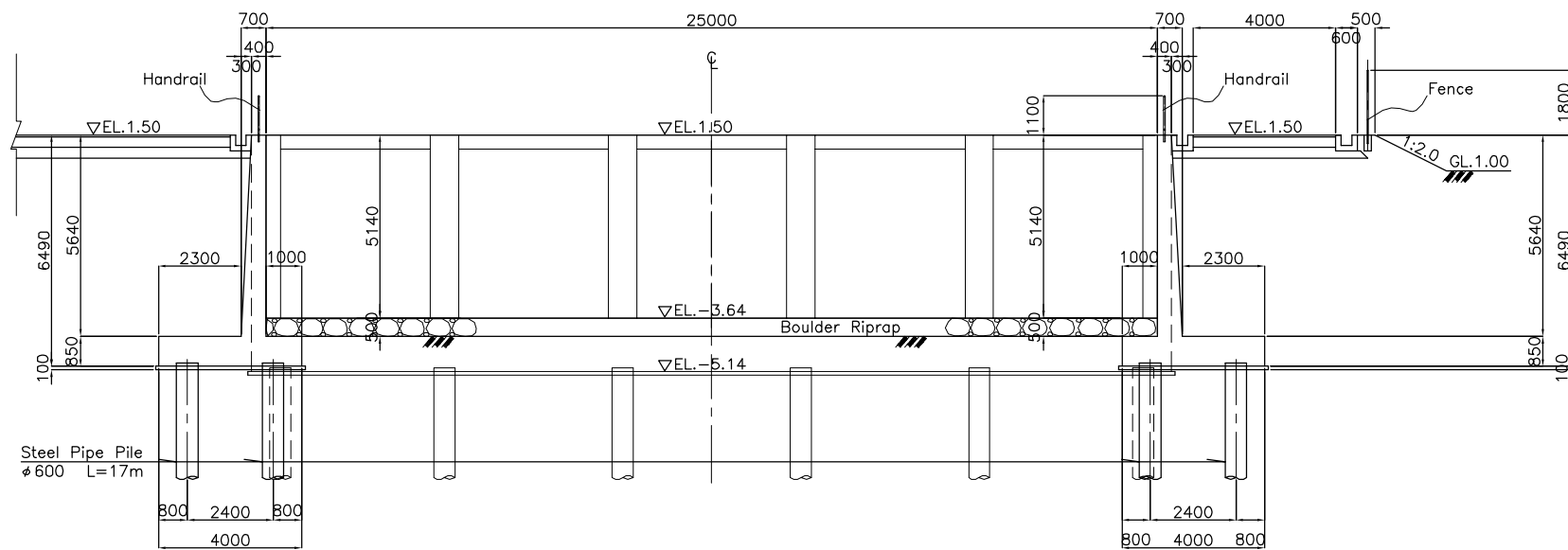
SECTION 3-3

DETAILS OF PUMPING STATION S=1:250

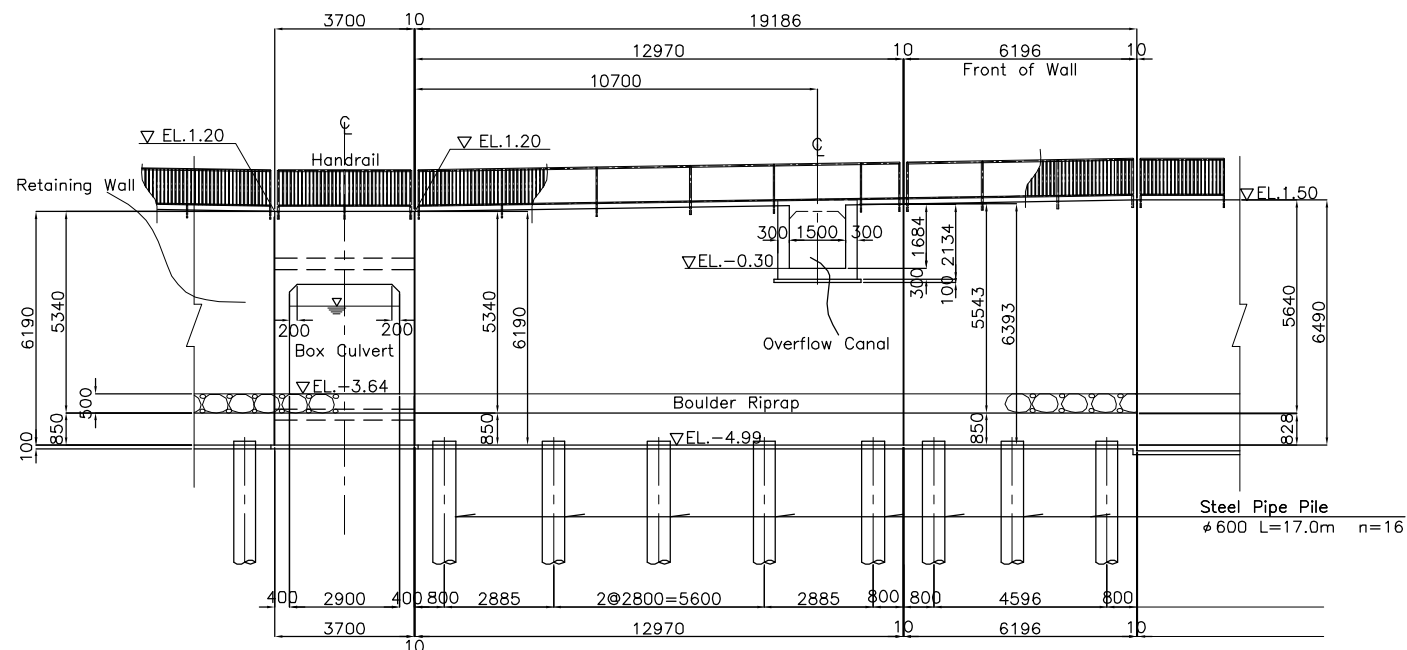
LEFT SIDE RETAINING WALL



RIGHT SIDE RETAINING WALL
PLAN

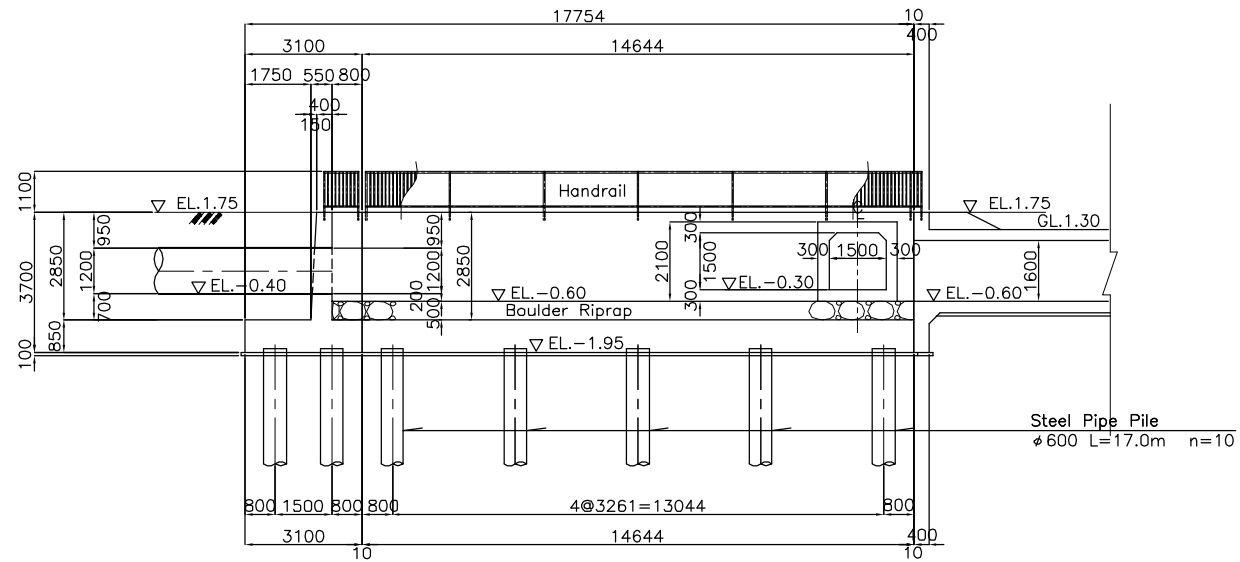


SECTION 1-1

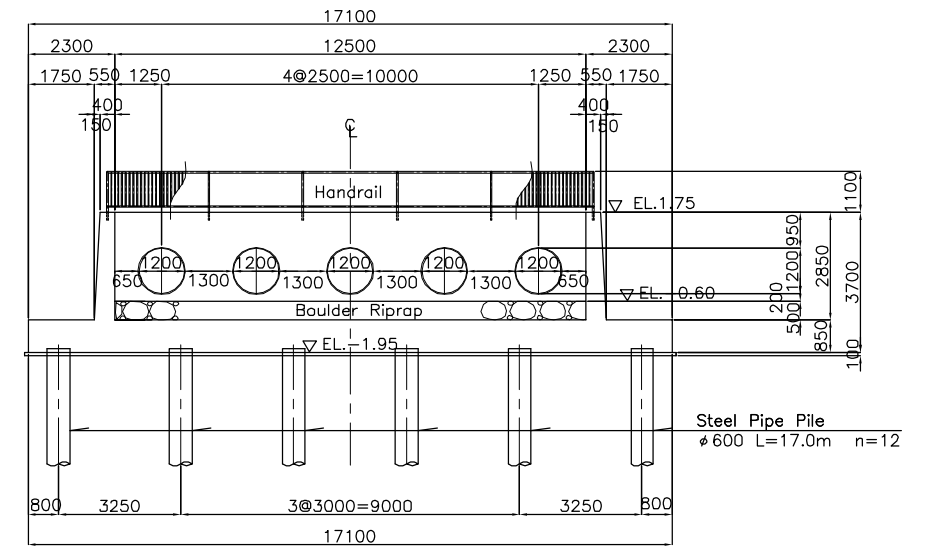


SECTION 2-2

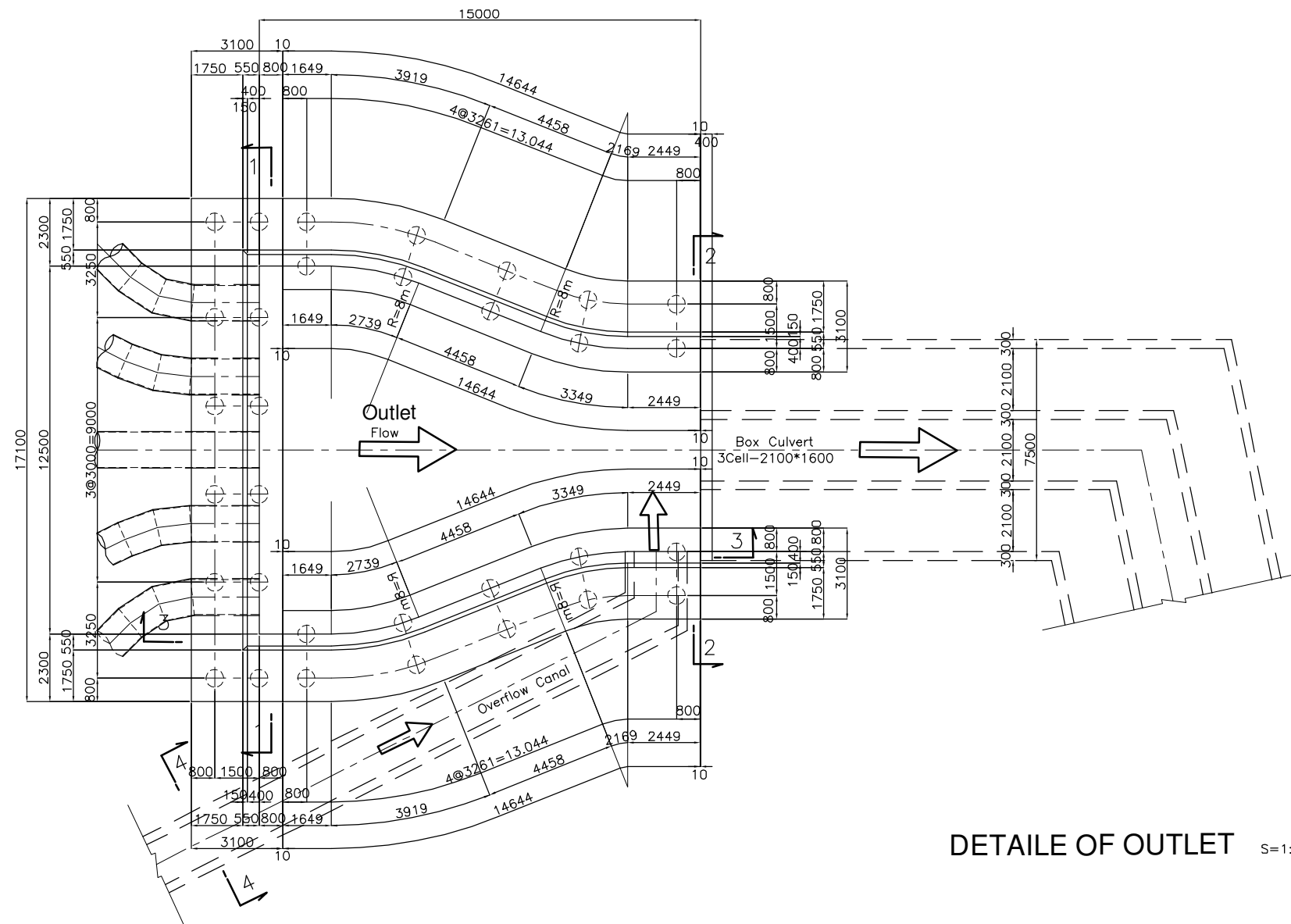
DETAIL OF INLET S=1:200



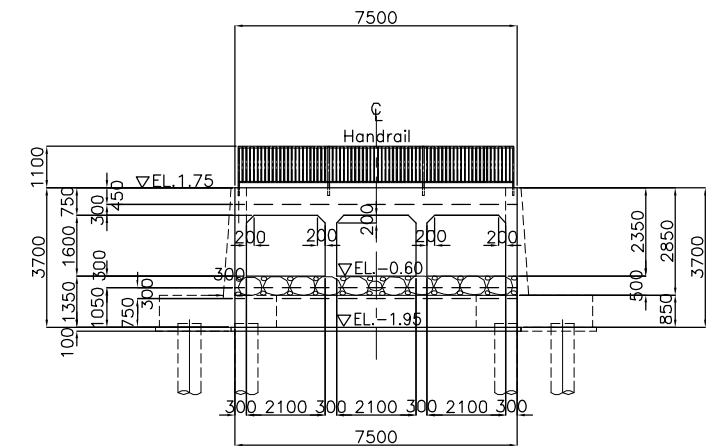
SECTION 3-3



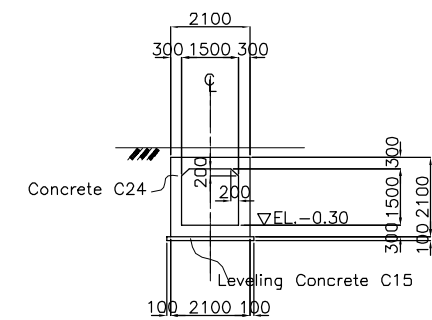
SECTION 1-1



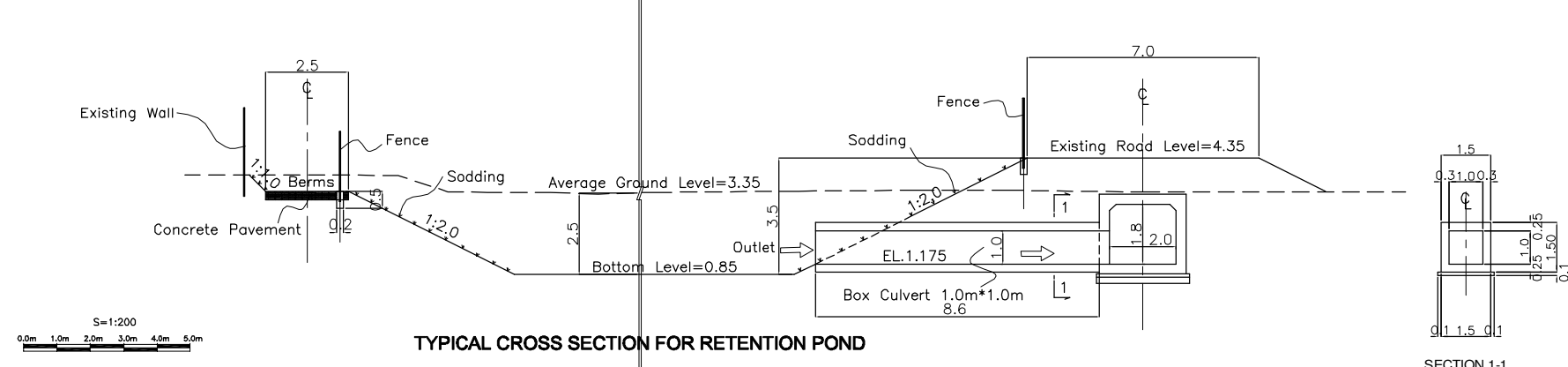
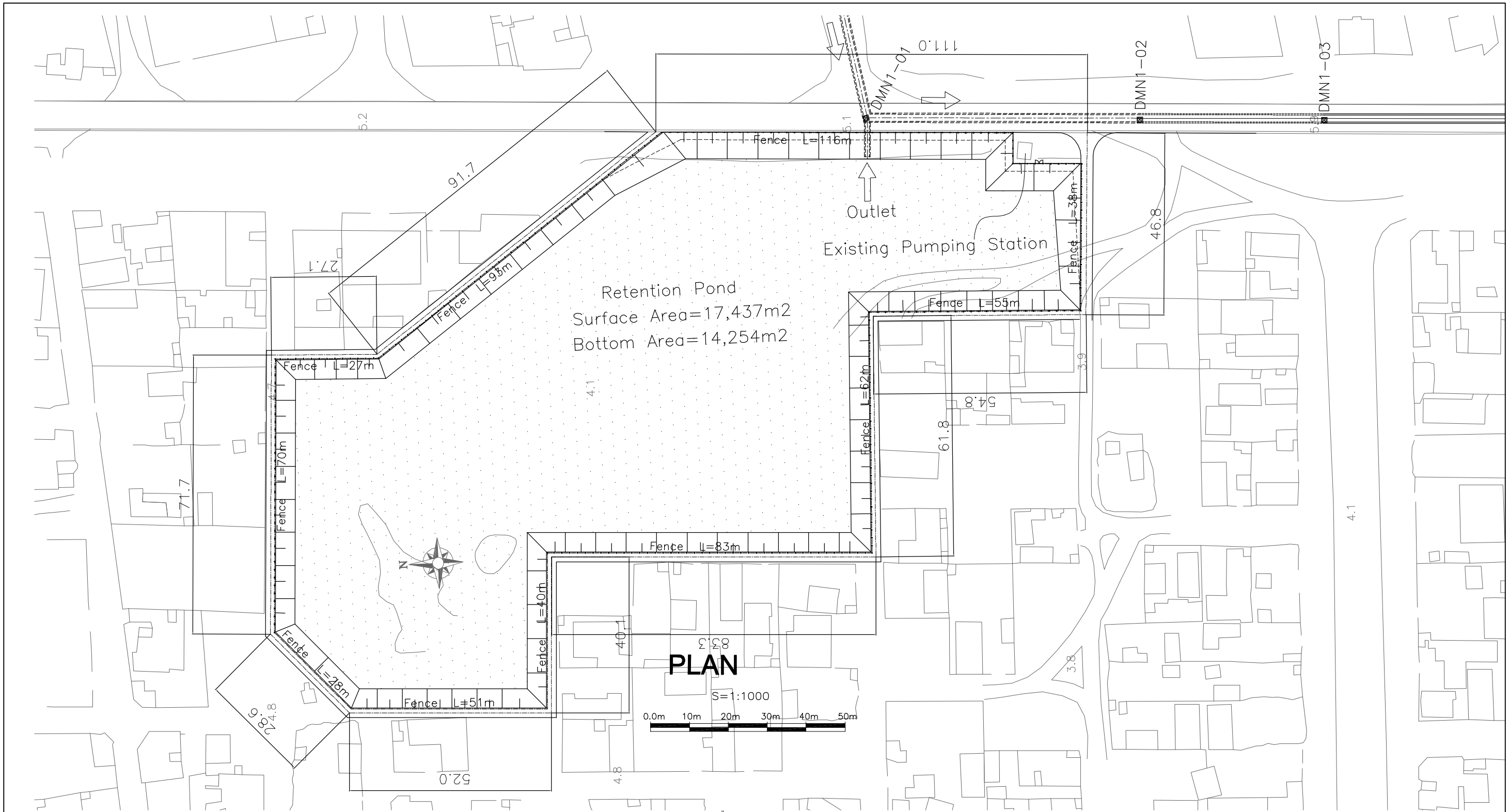
DETAIL OF OUTLET S=1:200

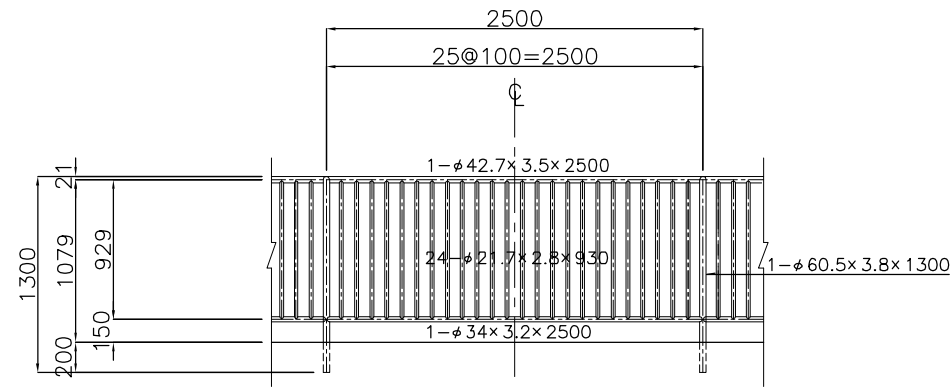


SECTION 2-2

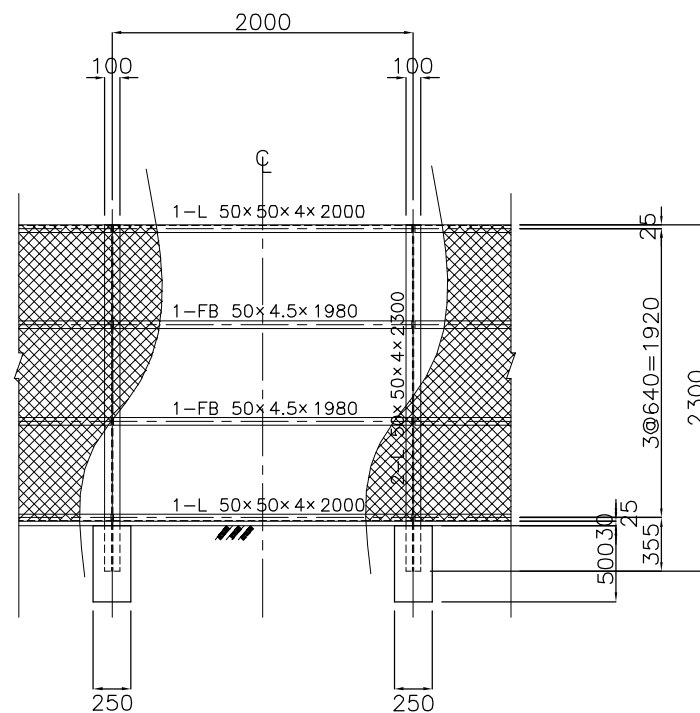


SECTION 4-4
Overflow Canal

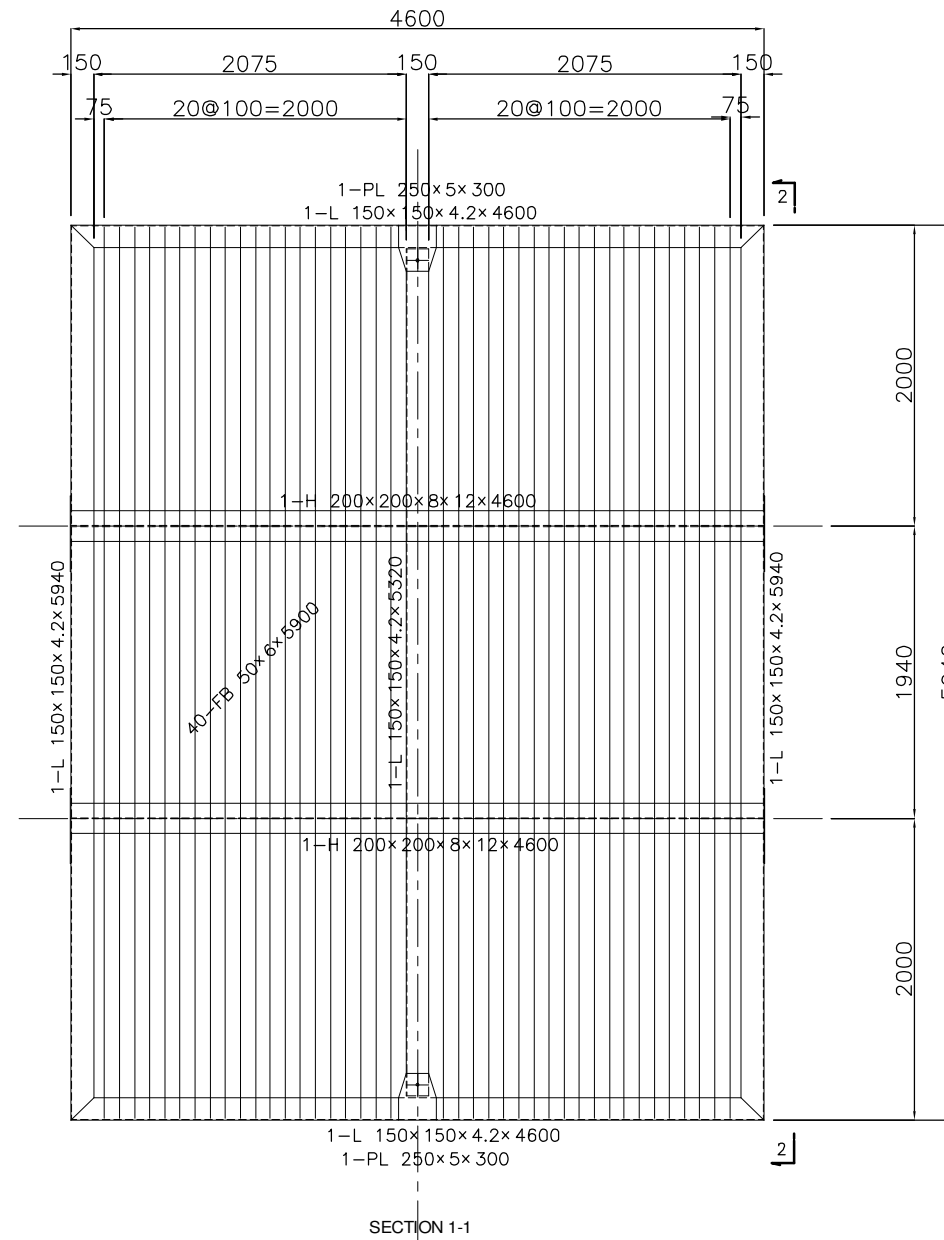




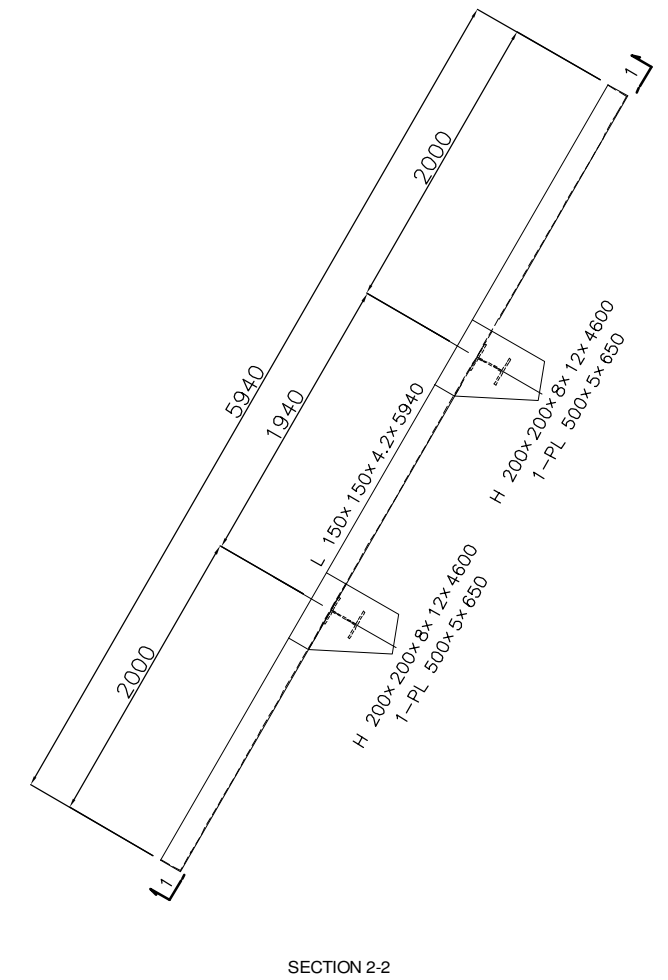
DETAILED OF HANDRAIL S=1:50



DETAILED OF FENCE S=1:50



DETAILED OF SCREEN S=1:50



SECTION 2-2

DESIGN NOTES

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
A-1																							
SPA1-01	SPA1-02	SMA1-01	SMA1-02	32.0	32.0	0.001	NEW	200	PVC	GRAVITY	2.50	4.39	4.31	6.60	6.65	2.00	2.13	2.21	2.34	1.00	0.68	0.022	2100
SPA1-02	SPA1-03	SMA1-02	SMA1-03	31.0	63.0	0.001	NEW	200	PVC	GRAVITY	2.50	4.31	4.23	6.65	6.70	2.13	2.26	2.34	2.47	1.00	0.68	0.022	2100
SPA1-03	SPA1-04	SMA1-03	SMA1-04	28.9	91.9	0.002	NEW	200	PVC	GRAVITY	2.50	4.23	4.16	6.70	6.59	2.26	2.22	2.47	2.43	1.00	0.68	0.022	1000
SPA1-04	SPA1-05	SMA1-04	SMA1-05	29.0	120.9	0.002	NEW	200	PVC	GRAVITY	2.50	4.16	4.09	6.59	6.48	2.22	2.18	2.43	2.39	1.00	0.68	0.022	1000
SPA1-05	SPA1-06	SMA1-05	SMA1-06	29.0	149.9	0.003	NEW	200	PVC	GRAVITY	2.50	4.09	4.02	6.48	6.37	2.18	2.14	2.39	2.35	1.00	0.68	0.022	634
SPA1-06	SPA1-07	SMA1-06	SMA1-07	29.0	178.9	0.003	NEW	200	PVC	GRAVITY	2.50	4.02	3.95	6.37	6.25	2.14	2.09	2.35	2.30	1.00	0.68	0.022	634
SPA1-07	SPA1-08	SMA1-07	SMA1-08	35.0	213.9	0.004	NEW	200	PVC	GRAVITY	2.50	3.95	3.86	6.25	6.16	2.09	2.09	2.30	2.30	1.00	0.68	0.022	450
SPA1-08	SPA1-09	SMA1-08	SMA1-09	35.0	248.9	0.004	NEW	200	PVC	GRAVITY	2.50	3.86	3.77	6.16	6.09	2.09	2.11	2.30	2.32	1.00	0.68	0.022	450
SPA1-09	SPA1-10	SMA1-09	SMA1-10	35.0	283.9	0.005	NEW	200	PVC	GRAVITY	2.50	3.77	3.68	6.09	6.01	2.11	2.12	2.32	2.33	1.00	0.68	0.022	340
SPA1-10	SPA1-11	SMA1-10	SMA1-11	22.0	305.9	0.005	NEW	200	PVC	GRAVITY	2.50	3.68	3.62	6.01	5.84	2.12	2.01	2.33	2.22	1.00	0.68	0.022	340
SPA1-11	SPA1-12	SMA1-11	SMA1-12	25.0	330.9	0.005	NEW	200	PVC	GRAVITY	2.50	3.62	3.56	5.84	5.57	2.01	1.80	2.22	2.01	1.00	0.68	0.022	340
SPA1-12	SPA1-13	SMA1-12	SMA1-13	25.0	355.9	0.006	NEW	200	PVC	GRAVITY	2.50	3.56	3.50	5.57	5.31	1.80	1.60	2.01	1.81	1.00	0.68	0.022	267
SPA1-13	SPA1-14	SMA1-13	SMA1-14	17.0	372.9	0.006	NEW	200	PVC	GRAVITY	2.50	3.50	3.46	5.31	5.13	1.60	1.46	1.81	1.67	1.00	0.68	0.022	267
SPA1-14	SPA1-15	SMA1-14	SMA1-15	21.0	393.9	0.006	NEW	200	PVC	GRAVITY	2.50	3.46	3.41	5.13	4.90	1.46	1.28	1.67	1.49	1.00	0.68	0.022	267
SPA1-15	SPA1-16	SMA1-15	SMA1-16	21.0	414.9	0.007	NEW	200	PVC	GRAVITY	2.50	3.41	3.36	4.90	4.84	1.28	1.27	1.49	1.48	1.00	0.68	0.022	215
SPA1-16	SPA1-17	SMA1-16	SMA1-17	24.0	438.9	0.007	NEW	200	PVC	GRAVITY	2.50	3.36	3.30	4.84	4.77	1.27	1.26	1.48	1.47	1.00	0.68	0.022	215
SPA1-17	SPA1-18	SMA1-17	SMA1-18	35.0	473.9	0.008	NEW	200	PVC	GRAVITY	2.50	3.30	3.21	4.77	4.66	1.26	1.24	1.47	1.45	1.00	0.68	0.022	175
SPA1-18	SPA1-19	SMA1-18	SMA1-19	35.0	508.9	0.008	NEW	200	PVC	GRAVITY	2.50	3.21	3.12	4.66	4.54	1.24	1.21	1.45	1.42	1.00	0.68	0.022	175
SPA1-19	SPA3-01	SMA1-19	SMA3-01	35.0	543.9	0.009	NEW	200	PVC	GRAVITY	2.50	3.12	3.03	4.54	4.40	1.21	1.16	1.42	1.61	1.00	0.68	0.022	145
A-2																							
SPA2-01	SPA2-02	SMA2-01	SMA2-02	30.0	30.0	0.001	NEW	200	PVC	GRAVITY	2.50	3.39	3.31	5.00	5.14	1.40	1.62	1.61	1.83	1.00	0.68	0.022	2100
SPA2-02	SPA2-03	SMA2-02	SMA2-03	35.0	65.0	0.002	NEW	200	PVC	GRAVITY	2.50	3.31	3.22	5.14	5.30	1.62	1.87	1.83	2.08	1.00	0.68	0.022	1000
SPA2-03	SPA2-04	SMA2-03	SMA2-04	35.0	100.0	0.002	NEW	200	PVC	GRAVITY	2.50	3.22	3.13	5.30	5.19	1.87	1.85	2.08	2.06	1.00	0.68	0.022	1000
SPA2-04	SPA2-05	SMA2-04	SMA2-05	30.0	130.0	0.003	NEW	200	PVC	GRAVITY	2.50	3.13	3.05	5.19	5.10	1.85	1.84	2.06	2.05	1.00	0.68	0.022	634
SPA2-05	SPA2-06	SMA2-05	SMA2-06	31.0	161.0	0.003	NEW	200	PVC	GRAVITY	2.50	3.05	2.97	5.10	5.15	1.84	1.97	2.05	2.18	1.00	0.68	0.022	634
SPA2-06	SPA2-07	SMA2-06	SMA2-07	31.0	192.0	0.004	NEW	200	PVC	GRAVITY	2.50	2.97	2.89	5.15	5.20	1.97	2.10	2.18	2.31	1.00	0.68	0.022	450
SPA2-07	SPA2-08	SMA2-07	SMA2-08	25.0	217.0	0.004	NEW	200	PVC	GRAVITY	2.50	2.89	2.83	5.20	5.10	2.10	2.06	2.31	2.27	1.00	0.68	0.022	450
SPA2-08	SPA2-09	SMA2-08	SMA2-09	35.0	252.0	0.005	NEW	200	PVC	GRAVITY	2.50	2.83	2.74	5.10	4.95	2.06	2.00	2.27	2.21	1.00	0.68	0.022	340
SPA2-09	SPA2-10	SMA2-09	SMA2-10	35.0	287.0	0.005	NEW	200	PVC	GRAVITY	2.50	2.74	2.65	4.95	4.80	2.00	1.94	2.21	2.15	1.00	0.68	0.022	340
SPA2-10	SPA2-11	SMA2-10	SMA2-11	25.0	312.0	0.006	NEW	200	PVC	GRAVITY	2.50	2.65	2.59	4.80	4.70	1.94	1.90	2.15	2.11	1.00	0.68	0.022	267
SPA2-11	SPA2-12	SMA2-11	SMA2-12	35.0	347.0	0.006	NEW	200	PVC	GRAVITY	2.50	2.59	2.50	4.70	4.55	1.90	1.84	2.11	2.05	1.00	0.68	0.022	267
SPA2-12	SPA3-01	SMA2-12	SMA3-01	34.0	381.0	0.007	NEW	200	PVC	GRAVITY	2.50	2.50	2.41	4.55	4.40	1.84	1.78	2.05	2.09	1.00	0.68	0.022	215

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
A-3																							
SPA3-01	SPA3-02	SMA3-01	SMA3-02	24.0	24.0	0.015	NEW	300	PVC	GRAVITY	1.90	2.31	2.26	4.40	4.30	1.78	1.73	2.09	2.04	1.00	0.78	0.056	274
SPA3-02	SPA3-03	SMA3-02	SMA3-03	24.0	48.0	0.016	NEW	300	PVC	GRAVITY	1.90	2.26	2.21	4.30	4.20	1.73	1.68	2.04	1.99	1.00	0.78	0.056	250
SPA3-03	SPA3-04	SMA3-03	SMA3-04	34.0	82.0	0.016	NEW	300	PVC	GRAVITY	1.90	2.21	2.15	4.20	4.17	1.68	1.71	1.99	2.02	1.00	0.78	0.056	250
SPA3-04	SPA3-05	SMA3-04	SMA3-05	35.0	117.0	0.016	NEW	300	PVC	GRAVITY	1.90	2.15	2.08	4.17	4.13	1.71	1.74	2.02	2.05	1.00	0.78	0.056	250
SPA3-05	SPA3-06	SMA3-05	SMA3-06	35.0	152.0	0.016	NEW	300	PVC	GRAVITY	1.90	2.08	2.01	4.13	4.10	1.74	1.78	2.05	2.09	1.00	0.78	0.056	250
SPA3-06	SPA3-07	SMA3-06	SMA3-07	35.0	187.0	0.017	NEW	300	PVC	GRAVITY	1.90	2.01	1.94	4.10	3.98	1.78	1.73	2.09	2.04	1.00	0.78	0.056	230
SPA3-07	SPA3-08	SMA3-07	SMA3-08	35.0	222.0	0.017	NEW	300	PVC	GRAVITY	1.90	1.94	1.87	3.98	3.86	1.73	1.68	2.04	1.99	1.00	0.78	0.056	230
SPA3-08	SPA3-09	SMA3-08	SMA3-09	35.0	257.0	0.017	NEW	300	PVC	GRAVITY	1.90	1.87	1.80	3.86	3.74	1.68	1.63	1.99	1.94	1.00	0.78	0.056	230
SPA3-09	SPA3-10	SMA3-09	SMA3-10	35.0	292.0	0.018	NEW	300	PVC	GRAVITY	1.90	1.80	1.73	3.74	3.70	1.63	1.66	1.94	1.97	1.00	0.78	0.056	212
SPA3-10	SPA3-11	SMA3-10	SMA3-11	35.0	327.0	0.018	NEW	300	PVC	GRAVITY	1.90	1.73	1.66	3.70	3.68	1.66	1.71	1.97	2.02	1.00	0.78	0.056	212
SPA3-11	SPA3-12	SMA3-11	SMA3-12	35.0	362.0	0.018	NEW	300	PVC	GRAVITY	1.90	1.66	1.59	3.68	3.59	1.71	1.69	2.02	2.00	1.00	0.78	0.056	212
SPA3-12	SPA4-01	SMA3-12	SMA4-01	35.0	397.0	0.019	NEW	300	PVC	GRAVITY	1.90	1.59	1.52	3.59	3.50	1.69	1.67	2.00	1.98	1.00	0.78	0.056	195
A-4																							
SPA4-01	SPA4-02	SMA4-01	SMA4-02	35.0	35.0	0.019	NEW	300	PVC	GRAVITY	1.90	1.52	1.45	3.50	3.40	1.67	1.64	1.98	1.95	1.00	0.78	0.056	195
SPA4-02	SPA4-03	SMA4-02	SMA4-03	35.0	70.0	0.019	NEW	300	PVC	GRAVITY	1.90	1.45	1.38	3.40	3.30	1.64	1.61	1.95	1.92	1.00	0.78	0.056	195
SPA4-03	SPA4-04	SMA4-03	SMA4-04	35.0	105.0	0.019	NEW	300	PVC	GRAVITY	1.90	1.38	1.31	3.30	3.05	1.61	1.43	1.92	1.74	1.00	0.78	0.056	195
SPA4-04	SPA4-05	SMA4-04	SMA4-05	35.0	140.0	0.020	NEW	300	PVC	GRAVITY	1.90	1.31	1.24	3.05	2.80	1.43	1.25	1.74	1.56	1.00	0.78	0.056	180
SPA4-05	SPA4-06	SMA4-05	SMA4-06	35.0	175.0	0.020	NEW	300	PVC	GRAVITY	1.90	1.24	1.17	2.80	2.70	1.25	1.22	1.56	1.53	1.00	0.78	0.056	180
SPA4-06	SPA4-07	SMA4-06	SMA4-07	35.0	210.0	0.020	NEW	300	PVC	GRAVITY	1.90	1.17	1.10	2.70	2.60	1.22	1.19	1.53	1.50	1.00	0.78	0.056	180
SPA4-07	SPA4-08	SMA4-07	SMA4-08	35.0	245.0	0.020	NEW	300	PVC	GRAVITY	1.90	1.10	1.03	2.60	2.50	1.19	1.16	1.50	1.47	1.00	0.78	0.056	180
SPA4-08	SPA4-09	SMA4-08	SMA4-09	35.0	280.0	0.020	NEW	300	PVC	GRAVITY	1.90	1.03	0.96	2.50	2.40	1.16	1.13	1.47	1.44	1.00	0.78	0.056	180
SPA4-09	SPA4-10	SMA4-09	SMA4-10	35.0	315.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.96	0.89	2.40	2.40	1.13	1.20	1.44	1.51	1.00	0.78	0.056	167
SPA4-10	SPA4-11	SMA4-10	SMA4-11	35.0	350.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.89	0.82	2.40	2.40	1.20	1.27	1.51	1.58	1.00	0.78	0.056	167
SPA4-11	SPA4-12	SMA4-11	SMA4-12	35.0	385.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.82	0.75	2.40	2.58	1.27	1.52	1.58	1.83	1.00	0.78	0.056	167
SPA4-12	SPA4-13	SMA4-12	SMA4-13	35.0	420.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.75	0.68	2.58	2.76	1.52	1.77	1.83	2.08	1.00	0.78	0.056	167
SPA4-13	SPA4-14	SMA4-13	SMA4-14	25.0	445.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.68	0.63	2.76	2.89	1.77	1.95	2.08	2.26	1.00	0.78	0.056	167
SPA4-14	SPA4-15	SMA4-14	SMA4-15	25.0	470.0	0.021	NEW	300	PVC	GRAVITY	1.90	0.63	0.58	2.89	3.01	1.95	2.12	2.26	2.43	1.00	0.78	0.056	167
SPA4-15	SPA6-01	SMA4-15	SMA6-01	24.7	494.7	0.022	NEW	300	PVC	GRAVITY	1.90	0.58	0.53	3.01	3.14	2.12	2.30	2.43	3.31	1.00	0.78	0.056	155

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
A-5																							
SPA5-01	SPA5-02	SMA5-01	SMA5-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.59	1.52	2.90	2.80	1.10	1.07	1.31	1.28	1.00	0.61	0.020	1900
SPA5-02	SPA5-03	SMA5-02	SMA5-03	35.0	70.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.52	1.45	2.80	2.70	1.07	1.04	1.28	1.25	1.00	0.61	0.020	1900
SPA5-03	SPA5-04	SMA5-03	SMA5-04	25.0	95.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.45	1.40	2.70	2.99	1.04	1.38	1.25	1.59	1.00	0.61	0.020	1900
SPA5-04	SPA5-05	SMA5-04	SMA5-05	26.0	121.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.40	1.35	2.99	3.30	1.38	1.74	1.59	1.95	1.00	0.61	0.020	900
SPA5-05	SPA5-06	SMA5-05	SMA5-06	26.0	147.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.35	1.30	3.30	3.60	1.74	2.09	1.95	2.30	1.00	0.61	0.020	900
SPA5-06	SPA5-07	SMA5-06	SMA5-07	20.0	167.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.30	1.26	3.60	3.54	2.09	2.07	2.30	2.28	1.00	0.61	0.020	900
SPA5-07	SPA5-08	SMA5-07	SMA5-08	35.0	202.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.26	1.19	3.54	3.43	2.07	2.03	2.28	2.24	1.00	0.61	0.020	900
SPA5-08	SPA5-09	SMA5-08	SMA5-09	35.0	237.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.19	1.12	3.43	3.33	2.03	2.00	2.24	2.21	1.00	0.61	0.020	900
SPA5-09	SPA5-10	SMA5-09	SMA5-10	35.0	272.0	0.003	NEW	200	PVC	GRAVITY	2.00	1.12	1.05	3.33	3.23	2.00	1.97	2.21	2.18	1.00	0.61	0.020	567
SPA5-10	SPA6-01	SMA5-10	SMA6-01	34.5	306.5	0.003	NEW	200	PVC	GRAVITY	2.00	1.05	0.98	3.23	3.14	1.97	1.95	2.18	3.17	1.00	0.61	0.020	567
A-6																							
SPA6-01	SPA6-02	SMA6-01	SMA6-02	35.0	35.0	0.024	NEW	300	PVC	GRAVITY	1.90	-0.03	-0.10	3.14	3.06	2.86	2.85	3.17	3.16	1.00	0.78	0.056	134
SPA6-02	SPA6-03	SMA6-02	SMA6-03	35.0	70.0	0.024	NEW	300	PVC	GRAVITY	1.90	-0.10	-0.17	3.06	2.97	2.85	2.83	3.16	3.14	1.00	0.78	0.056	134
SPA6-03	SPA6-04	SMA6-03	SMA6-04	35.0	105.0	0.024	NEW	300	PVC	GRAVITY	1.90	-0.17	-0.24	2.97	2.89	2.83	2.82	3.14	3.13	1.00	0.78	0.056	134
SPA6-04	SPA7-01	SMA6-04	SMA7-01	34.6	139.6	0.024	NEW	300	PVC	GRAVITY	1.90	-0.24	-0.31	2.89	2.80	2.82	2.80	3.13	3.11	1.00	0.78	0.056	134
A-7																							
SPA7-01	SPA7-02	SMA7-01	SMA7-02	14.3	14.3	0.025	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.51	-0.53	2.80	2.40	2.79	2.41	3.31	2.93	1.00	0.91	0.179	616
SPA7-02	SPA7-03	SMA7-02	SMA7-03	28.0	42.3	0.026	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.53	-0.57	2.40	2.30	2.41	2.35	2.93	2.87	1.00	0.91	0.179	589
SPA7-03	SPA7-04	SMA7-03	SMA7-04	27.6	69.9	0.028	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.57	-0.61	2.30	2.20	2.35	2.29	2.87	2.81	1.00	0.91	0.179	540
SPA7-04	SPA7-05	SMA7-04	SMA7-05	35.0	104.9	0.030	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.61	-0.66	2.20	2.45	2.29	2.59	2.81	3.11	1.00	0.91	0.179	497
SPA7-05	SPA7-06	SMA7-05	SMA7-06	35.0	139.9	0.032	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.66	-0.71	2.45	2.70	2.59	2.89	3.11	3.41	1.00	0.91	0.179	460
SPA7-06	SPA7-07	SMA7-06	SMA7-07	35.0	174.9	0.034	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.71	-0.76	2.70	2.45	2.89	2.69	3.41	3.21	1.00	0.91	0.179	427
SPA7-07	SPA7-08	SMA7-07	SMA7-08	34.6	209.5	0.036	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.76	-0.80	2.45	2.20	2.69	2.48	3.21	3.00	1.00	0.91	0.179	398
SPA7-08	SPA7-09	SMA7-08	SMA7-09	35.0	244.5	0.038	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.80	-0.85	2.20	2.30	2.48	2.63	3.00	3.15	1.00	0.91	0.179	372
SPA7-09	SPA7-10	SMA7-09	SMA7-10	33.7	278.2	0.040	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.85	-0.89	2.30	2.40	2.63	2.77	3.15	3.29	1.00	0.91	0.179	348
SPA7-10	SPA7-11	SMA7-10	SMA7-11	35.0	313.2	0.042	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.89	-0.94	2.40	2.30	2.77	2.72	3.29	3.24	1.00	0.91	0.179	327
SPA7-11	SPA7-12	SMA7-11	SMA7-12	35.0	348.2	0.044	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.94	-0.99	2.30	2.20	2.72	2.67	3.24	3.19	1.00	0.91	0.179	307
SPA7-12	SPA7-13	SMA7-12	SMA7-13	35.0	383.2	0.046	REPLACEMENT	500	PVC	GRAVITY	1.30	-0.99	-1.04	2.20	2.20	2.67	2.72	3.19	3.24	1.00	0.91	0.179	290
SPA7-13	SPA7-14	SMA7-13	SMA7-14	35.0	418.2	0.048	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.04	-1.09	2.20	2.20	2.72	2.77	3.24	3.29	1.00	0.91	0.179	273
SPA7-14	SPA7-15	SMA7-14	SMA7-15	35.0	453.2	0.050	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.09	-1.14	2.20	2.25	2.77	2.87	3.29	3.39	1.00	0.91	0.179	258
SPA7-15	SPA7-16	SMA7-15	SMA7-16	31.7	484.9	0.052	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.14	-1.18	2.25	2.30	2.87	2.96	3.39	3.48	1.00	0.91	0.179	245
SPA7-16	SPA7-17	SMA7-16	SMA7-17	35.0	519.9	0.054	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.18	-1.23	2.30	2.30	2.96	3.01	3.48	3.53	1.00	0.91	0.179	232
SPA7-17	SPA7-18	SMA7-17	SMA7-18	32.9	552.8	0.056	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.23	-1.27	2.30	2.30	3.01	3.05	3.53	3.57	1.00	0.91	0.179	220
SPA7-18	SPA7-19	SMA7-18	SMA7-19	35.0	587.8	0.058	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.27	-1.32	2.30	2.30	3.05	3.10	3.57	3.62	1.00	0.91	0.179	209
SPA7-19	SPA7-20	SMA7-19	SMA7-20	20.8	608.6	0.059	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.32	-1.35	2.30	2.30	3.10	3.13	3.62	3.65	1.00	0.91	0.179	204
SPA7-20	SPA8-01	SMA7-20	SMA8-01	20.0	628.6	0.060	REPLACEMENT	500	PVC	GRAVITY	1.30	-1.35	-1.38	2.30	2.30	3.13	3.16	3.65	3.88	1.00	0.91	0.179	199
INFLOW FROM PROPOSED SEWER (Phase 3) TO SPA8-01 VALUM : 0.064m ³ /s. Pipi : φ500mm. INVERT LEVEL : -0.78m																							

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
A-8																							
SPA8-01	SPA8-02	SMA8-01	SMA8-02	25.0	25.0	0.125	REPLACEMENT	700	RC	GRAVITY	2.00	-1.58	-1.63	2.30	2.30	3.12	3.17	3.88	3.93	1.00	1.08	0.416	233
SPA8-02	SPA8-03	SMA8-02	SMA8-03	24.6	49.6	0.126	REPLACEMENT	700	RC	GRAVITY	2.00	-1.63	-1.68	2.30	2.30	3.17	3.22	3.93	3.98	1.00	1.08	0.416	231
SPA8-03	SPA8-04	SMA8-03	SMA8-04	30.0	79.6	0.127	REPLACEMENT	700	RC	GRAVITY	2.00	-1.68	-1.74	2.30	2.30	3.22	3.28	3.98	4.04	1.00	1.08	0.416	228
SPA8-04	SPA8-05	SMA8-04	SMA8-05	30.0	109.6	0.128	REPLACEMENT	700	RC	GRAVITY	2.00	-1.74	-1.80	2.30	2.27	3.28	3.31	4.04	4.07	1.00	1.08	0.416	225
SPA8-05	SPA8-06	SMA8-05	SMA8-06	30.0	139.6	0.129	REPLACEMENT	700	RC	GRAVITY	2.00	-1.80	-1.86	2.27	2.23	3.31	3.33	4.07	4.09	1.00	1.08	0.416	223
SPA8-06	SPA8-07	SMA8-06	SMA8-07	27.3	166.9	0.130	REPLACEMENT	700	RC	GRAVITY	2.00	-1.86	-1.91	2.23	2.20	3.33	3.35	4.09	4.11	1.00	1.08	0.416	220
SPA8-07	SPA8-08	SMA8-07	SMA8-08	21.2	188.1	0.131	REPLACEMENT	700	RC	GRAVITY	2.00	-1.91	-1.95	2.20	2.00	3.35	3.19	4.11	3.95	1.00	1.08	0.416	218
SPA8-08	SPA8-09	SMA8-08	SMA8-09	30.0	218.1	0.132	REPLACEMENT	700	RC	GRAVITY	2.00	-1.95	-2.01	2.00	1.96	3.19	3.21	3.95	3.97	1.00	1.08	0.416	216
SPA8-09	SPA8-10	SMA8-09	SMA8-10	30.0	248.1	0.133	REPLACEMENT	700	RC	GRAVITY	2.00	-2.01	-2.07	1.96	1.93	3.21	3.24	3.97	4.00	1.00	1.08	0.416	213
SPA8-10	SPA8-11	SMA8-10	SMA8-11	25.1	273.2	0.134	REPLACEMENT	700	RC	GRAVITY	2.00	-2.07	-2.12	1.93	1.90	3.24	3.26	4.00	4.02	1.00	1.08	0.416	211
SPA8-11	SPA8-12	SMA8-11	SMA8-12	30.0	303.2	0.135	REPLACEMENT	700	RC	GRAVITY	2.00	-2.12	-2.18	1.90	1.86	3.26	3.28	4.02	4.04	1.00	1.08	0.416	209
SPA8-12	SPA8-13	SMA8-12	SMA8-13	27.6	330.8	0.136	REPLACEMENT	700	RC	GRAVITY	2.00	-2.18	-2.24	1.86	1.83	3.28	3.31	4.04	4.07	1.00	1.08	0.416	206
SPA8-13	SPA8-14	SMA8-13	SMA8-14	26.8	357.6	0.137	REPLACEMENT	700	RC	GRAVITY	2.00	-2.24	-2.29	1.83	1.80	3.31	3.33	4.07	4.09	1.00	1.08	0.416	204
SPA8-14	SPA8-15	SMA8-14	SMA8-15	35.0	392.6	0.138	REPLACEMENT	700	RC	GRAVITY	2.00	-2.29	-2.36	1.80	1.75	3.33	3.35	4.09	4.11	1.00	1.08	0.416	202
SPA8-15	SPA8-16	SMA8-15	SMA8-16	35.0	427.6	0.139	REPLACEMENT	700	RC	GRAVITY	2.00	-2.36	-2.43	1.75	1.70	3.35	3.37	4.11	4.13	1.00	1.08	0.416	200
SPA8-16	SPA8-17	SMA8-16	SMA8-17	35.0	462.6	0.141	REPLACEMENT	700	RC	GRAVITY	2.00	-2.43	-2.50	1.70	1.74	3.37	3.48	4.13	4.24	1.00	1.08	0.416	196
SPA8-17	SPA8-18	SMA8-17	SMA8-18	35.0	497.6	0.142	REPLACEMENT	700	RC	GRAVITY	2.00	-2.50	-2.57	1.74	1.77	3.48	3.58	4.24	4.34	1.00	1.08	0.416	193
SPA8-18	SPA8-19	SMA8-18	SMA8-19	30.0	527.6	0.143	REPLACEMENT	700	RC	GRAVITY	2.00	-2.57	-2.63	1.77	1.80	3.58	3.67	4.34	4.43	1.00	1.08	0.416	191
SPA8-19	SPA8-20	SMA8-19	SMA8-20	35.0	562.6	0.144	REPLACEMENT	700	RC	GRAVITY	2.00	-2.63	-2.70	1.80	1.59	3.67	3.53	4.43	4.29	1.00	1.08	0.416	189
SPA8-20		SMA8-20	PS NO.2	14.2	576.8	0.145	REPLACEMENT	700	RC	GRAVITY	2.00	-2.70	-2.73	1.59	1.50	3.53	3.47	4.29	4.23	1.00	1.08	0.416	187
INFLOW FROM SPA8-20 TO PS NO.2																							
INFLOW FROM PROPOSED SEWER (Phase 3) TO PS NO.2																							
VALUM : 0.036m ³ /s. Pipe : ϕ 400mm. INVERT LEVEL : -1.91m																							

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-1																							
SPB1-01	SPB1-02	SMB1-01	SMB1-02	25.0	25.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.43	1.38	2.90	2.82	1.26	1.23	1.47	1.44	1.00	0.61	0.020	1900
SPB1-02	SPB1-03	SMB1-02	SMB1-03	30.0	55.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.38	1.32	2.82	2.72	1.23	1.19	1.44	1.40	1.00	0.61	0.020	1900
SPB1-03	SPB1-04	SMB1-03	SMB1-04	30.0	85.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.32	1.26	2.72	2.63	1.19	1.16	1.40	1.37	1.00	0.61	0.020	900
SPB1-04	SPB1-05	SMB1-04	SMB1-05	35.0	120.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.26	1.19	2.63	2.51	1.16	1.11	1.37	1.32	1.00	0.61	0.020	900
SPB1-05	SPB2-01	SMB1-05	SMB2-01	35.0	155.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.19	1.12	2.51	2.40	1.11	1.07	1.32	1.28	1.00	0.61	0.020	900
B-2																							
SPB2-01	SPB2-02	SMB2-01	SMB2-02	30.0	771.0	0.009	NEW	200	PVC	GRAVITY	2.00	1.12	1.06	2.40	2.69	1.07	1.42	1.28	1.63	1.00	0.61	0.020	123
SPB2-02	SPB2-03	SMB2-02	SMB2-03	30.0	801.0	0.009	NEW	200	PVC	GRAVITY	2.00	1.06	1.00	2.69	2.98	1.42	1.77	1.63	1.98	1.00	0.61	0.020	123
SPB2-03	SPB2-04	SMB2-03	SMB2-04	32.8	833.8	0.010	NEW	200	PVC	GRAVITY	2.00	1.00	0.93	2.98	3.30	1.77	2.16	1.98	2.37	1.00	0.61	0.020	100
SPB2-04	SPB2-05	SMB2-04	SMB2-05	32.0	865.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.93	0.87	3.30	3.14	2.16	2.06	2.37	2.27	1.00	0.61	0.020	100
SPB2-05	SPB2-06	SMB2-05	SMB2-06	32.0	897.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.87	0.81	3.14	2.97	2.06	1.95	2.27	2.16	1.00	0.61	0.020	100
SPB2-06	SPB2-07	SMB2-06	SMB2-07	32.0	929.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.81	0.75	2.97	2.81	1.95	1.85	2.16	2.06	1.00	0.61	0.020	100
SPB2-07	SPB2-08	SMB2-07	SMB2-08	32.0	961.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.75	0.69	2.81	2.65	1.85	1.75	2.06	1.96	1.00	0.61	0.020	100
SPB2-08	SPB2-09	SMB2-08	SMB2-09	32.0	993.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.69	0.63	2.65	2.49	1.75	1.65	1.96	1.86	1.00	0.61	0.020	100
SPB2-09	SPB2-10	SMB2-09	SMB2-10	31.0	1,024.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.63	0.57	2.49	2.33	1.65	1.55	1.86	1.76	1.00	0.61	0.020	100
SPB2-10	SPB2-11	SMB2-10	SMB2-11	31.0	1,055.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.57	0.51	2.33	2.17	1.55	1.45	1.76	1.66	1.00	0.61	0.020	100
SPB2-11	SPB2-12	SMB2-11	SMB2-12	31.0	1,086.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.51	0.45	2.17	2.01	1.45	1.35	1.66	1.56	1.00	0.61	0.020	100
SPB2-12	SPB2-13	SMB2-12	SMB2-13	31.0	1,117.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.45	0.39	2.01	1.86	1.35	1.26	1.56	1.47	1.00	0.61	0.020	100
SPB2-13	SPB3-01	SMB2-13	SMB3-01	31.0	1,148.8	0.010	NEW	200	PVC	GRAVITY	2.00	0.39	0.33	1.86	1.70	1.26	1.16	1.47	2.58	1.00	0.61	0.020	100
INFLOW FROM PROPOSED SEWER (Phase 3) TO SPB3-01 VALUM : 0.009m ³ /s, Pipi : ϕ200mm, INVERT LEVEL : -0.78m																							
B-3																							
SPB3-01	SPB3-02	SMB3-01	SMB3-02	27.0	2,226.8	0.019	NEW	300	PVC	GRAVITY	1.30	-0.88	-0.92	1.70	1.74	2.27	2.35	2.58	2.66	1.00	0.65	0.046	143
SPB3-02	SPB3-03	SMB3-02	SMB3-03	27.0	2,253.8	0.020	NEW	300	PVC	GRAVITY	1.30	-0.92	-0.96	1.74	1.78	2.35	2.43	2.66	2.74	1.00	0.65	0.046	130
SPB3-03	SPB3-04	SMB3-03	SMB3-04	26.0	2,279.8	0.020	NEW	300	PVC	GRAVITY	1.30	-0.96	-0.99	1.78	1.82	2.43	2.50	2.74	2.81	1.00	0.65	0.046	130
SPB3-04	SPB3-05	SMB3-04	SMB3-05	29.0	2,308.8	0.020	NEW	300	PVC	GRAVITY	1.30	-0.99	-1.03	1.82	1.86	2.50	2.58	2.81	2.89	1.00	0.65	0.046	130
SPB3-05	SPB3-06	SMB3-05	SMB3-06	28.0	2,336.8	0.020	NEW	300	PVC	GRAVITY	1.30	-1.03	-1.07	1.86	1.90	2.58	2.66	2.89	2.97	1.00	0.65	0.046	130
SPB3-06	SPB4-01	SMB3-06	SMB4-01	28.0	2,364.8	0.021	NEW	300	PVC	GRAVITY	1.30	-1.07	-1.11	1.90	1.92	2.66	2.72	2.97	3.13	1.00	0.65	0.046	120

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-4																							
SPB4-01	SPB4-02	SMB4-01	SMB4-02	35.0	2,399.8	0.021	NEW	400	PVC	GRAVITY	1.00	-1.21	-1.25	1.92	1.94	2.71	2.77	3.13	3.19	1.00	0.69	0.087	315
SPB4-02	SPB4-03	SMB4-02	SMB4-03	35.0	2,434.8	0.022	NEW	400	PVC	GRAVITY	1.00	-1.25	-1.29	1.94	1.96	2.77	2.83	3.19	3.25	1.00	0.69	0.087	296
SPB4-03	SPB4-04	SMB4-03	SMB4-04	35.0	2,469.8	0.022	NEW	400	PVC	GRAVITY	1.00	-1.29	-1.33	1.96	1.98	2.83	2.89	3.25	3.31	1.00	0.69	0.087	296
SPB4-04	SPB4-05	SMB4-04	SMB4-05	31.0	2,500.8	0.023	NEW	400	PVC	GRAVITY	1.00	-1.33	-1.36	1.98	2.00	2.89	2.94	3.31	3.36	1.00	0.69	0.087	279
SPB4-05	SPB4-06	SMB4-05	SMB4-06	27.0	2,527.8	0.023	NEW	400	PVC	GRAVITY	1.00	-1.36	-1.39	2.00	2.01	2.94	2.98	3.36	3.40	1.00	0.69	0.087	279
SPB4-06	SPB4-07	SMB4-06	SMB4-07	27.0	2,554.8	0.023	NEW	400	PVC	GRAVITY	1.00	-1.39	-1.42	2.01	2.03	2.98	3.03	3.40	3.45	1.00	0.69	0.087	279
SPB4-07	SPB4-08	SMB4-07	SMB4-08	28.0	2,582.8	0.024	NEW	400	PVC	GRAVITY	1.00	-1.42	-1.45	2.03	2.04	3.03	3.07	3.45	3.49	1.00	0.69	0.087	263
SPB4-08	SPB4-09	SMB4-08	SMB4-09	27.0	2,609.8	0.024	NEW	400	PVC	GRAVITY	1.00	-1.45	-1.48	2.04	2.05	3.07	3.11	3.49	3.53	1.00	0.69	0.087	263
SPB4-09	SPB4-10	SMB4-09	SMB4-10	27.0	2,636.8	0.025	NEW	400	PVC	GRAVITY	1.00	-1.48	-1.51	2.05	2.07	3.11	3.16	3.53	3.58	1.00	0.69	0.087	248
SPB4-10	SPB4-11	SMB4-10	SMB4-11	27.0	2,663.8	0.025	NEW	400	PVC	GRAVITY	1.00	-1.51	-1.54	2.07	2.08	3.16	3.20	3.58	3.62	1.00	0.69	0.087	248
SPB4-11	SPB4-12	SMB4-11	SMB4-12	25.0	2,688.8	0.025	NEW	400	PVC	GRAVITY	1.00	-1.54	-1.57	2.08	2.09	3.20	3.24	3.62	3.66	1.00	0.69	0.087	248
SPB4-12	SPB4-13	SMB4-12	SMB4-13	25.0	2,713.8	0.026	NEW	400	PVC	GRAVITY	1.00	-1.57	-1.60	2.09	2.10	3.24	3.28	3.66	3.70	1.00	0.69	0.087	235
SPB4-13	SPB4-14	SMB4-13	SMB4-14	25.0	2,738.8	0.026	NEW	400	PVC	GRAVITY	1.00	-1.60	-1.63	2.10	2.08	3.28	3.29	3.70	3.71	1.00	0.69	0.087	235
SPB4-14	SPB4-15	SMB4-14	SMB4-15	27.0	2,765.8	0.027	NEW	400	PVC	GRAVITY	1.00	-1.63	-1.66	2.08	2.07	3.29	3.31	3.71	3.73	1.00	0.69	0.087	223
SPB4-15	SPB4-16	SMB4-15	SMB4-16	27.0	2,792.8	0.027	NEW	400	PVC	GRAVITY	1.00	-1.66	-1.69	2.07	2.05	3.31	3.32	3.73	3.74	1.00	0.69	0.087	223
SPB4-16	SPB4-17	SMB4-16	SMB4-17	27.0	2,819.8	0.027	NEW	400	PVC	GRAVITY	1.00	-1.69	-1.72	2.05	2.04	3.32	3.34	3.74	3.76	1.00	0.69	0.087	223
SPB4-17	SPB4-18	SMB4-17	SMB4-18	25.0	2,844.8	0.028	NEW	400	PVC	GRAVITY	1.00	-1.72	-1.75	2.04	2.03	3.34	3.36	3.76	3.78	1.00	0.69	0.087	211
SPB4-18	SPB4-19	SMB4-18	SMB4-19	25.0	2,869.8	0.028	NEW	400	PVC	GRAVITY	1.00	-1.75	-1.78	2.03	2.01	3.36	3.37	3.78	3.79	1.00	0.69	0.087	211
SPB4-19	SPB4-20	SMB4-19	SMB4-20	25.0	2,894.8	0.028	NEW	400	PVC	GRAVITY	1.00	-1.78	-1.81	2.01	2.00	3.37	3.39	3.79	3.81	1.00	0.69	0.087	211
SPB4-20	SPB4-21	SMB4-20	SMB4-21	35.0	2,929.8	0.029	NEW	400	PVC	GRAVITY	1.00	-1.81	-1.85	2.00	1.98	3.39	3.41	3.81	3.83	1.00	0.69	0.087	200
SPB4-21	SPB4-22	SMB4-21	SMB4-22	30.0	2,959.8	0.029	NEW	400	PVC	GRAVITY	1.00	-1.85	-1.88	1.98	1.96	3.41	3.42	3.83	3.84	1.00	0.69	0.087	200
SPB4-22	SPB4-23	SMB4-22	SMB4-23	30.0	2,989.8	0.030	NEW	400	PVC	GRAVITY	1.00	-1.88	-1.91	1.96	1.94	3.42	3.43	3.84	3.85	1.00	0.69	0.087	190
SPB4-23	SPB4-24	SMB4-23	SMB4-24	30.0	3,019.8	0.030	NEW	400	PVC	GRAVITY	1.00	-1.91	-1.94	1.94	1.92	3.43	3.44	3.85	3.86	1.00	0.69	0.087	190
SPB4-24	SPB6-01	SMB4-24	SMB6-01	30.3	3,050.1	0.031	NEW	400	PVC	GRAVITY	1.00	-1.94	-1.97	1.92	1.90	3.44	3.45	3.86	3.87	1.00	0.69	0.087	181

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-5																							
SPB5-01	SPB5-02	SMB5-01	SMB5-02	26.0	26.0	0.001	NEW	200	PVC	GRAVITY	2.00	0.79	0.74	2.70	2.90	1.70	1.95	1.91	2.16	1.00	0.61	0.020	1900
SPB5-02	SPB5-03	SMB5-02	SMB5-03	27.0	53.0	0.001	NEW	200	PVC	GRAVITY	2.00	0.74	0.69	2.90	3.10	1.95	2.20	2.16	2.41	1.00	0.61	0.020	1900
SPB5-03	SPB5-04	SMB5-03	SMB5-04	27.0	80.0	0.001	NEW	200	PVC	GRAVITY	2.00	0.69	0.64	3.10	3.30	2.20	2.45	2.41	2.66	1.00	0.61	0.020	1900
SPB5-04	SPB5-05	SMB5-04	SMB5-05	26.0	106.0	0.001	NEW	200	PVC	GRAVITY	2.00	0.64	0.59	3.30	2.93	2.45	2.13	2.66	2.34	1.00	0.61	0.020	1900
SPB5-05	SPB5-06	SMB5-05	SMB5-06	26.0	132.0	0.002	NEW	200	PVC	GRAVITY	2.00	0.59	0.54	2.93	2.57	2.13	1.82	2.34	2.03	1.00	0.61	0.020	900
SPB5-06	SPB5-07	SMB5-06	SMB5-07	26.0	158.0	0.002	NEW	200	PVC	GRAVITY	2.00	0.54	0.49	2.57	2.20	1.82	1.50	2.03	1.71	1.00	0.61	0.020	900
SPB5-07	SPB5-08	SMB5-07	SMB5-08	27.0	185.0	0.002	NEW	200	PVC	GRAVITY	2.00	0.49	0.44	2.20	2.17	1.50	1.52	1.71	1.73	1.00	0.61	0.020	900
SPB5-08	SPB5-09	SMB5-08	SMB5-09	27.0	212.0	0.002	NEW	200	PVC	GRAVITY	2.00	0.44	0.39	2.17	2.13	1.52	1.53	1.73	1.74	1.00	0.61	0.020	900
SPB5-09	SPB5-10	SMB5-09	SMB5-10	26.0	238.0	0.003	NEW	200	PVC	GRAVITY	2.00	0.39	0.34	2.13	2.10	1.53	1.55	1.74	1.76	1.00	0.61	0.020	567
SPB5-10	SPB5-11	SMB5-10	SMB5-11	27.0	265.0	0.003	NEW	200	PVC	GRAVITY	2.00	0.34	0.29	2.10	2.03	1.55	1.53	1.76	1.74	1.00	0.61	0.020	567
SPB5-11	SPB5-12	SMB5-11	SMB5-12	27.0	292.0	0.003	NEW	200	PVC	GRAVITY	2.00	0.29	0.24	2.03	1.97	1.53	1.52	1.74	1.73	1.00	0.61	0.020	567
SPB5-12	SPB5-13	SMB5-12	SMB5-13	26.0	318.0	0.003	NEW	200	PVC	GRAVITY	2.00	0.24	0.19	1.97	1.90	1.52	1.50	1.73	1.71	1.00	0.61	0.020	567
SPB5-13	SPB5-14	SMB5-13	SMB5-14	27.0	345.0	0.004	NEW	200	PVC	GRAVITY	2.00	0.19	0.14	1.90	1.90	1.50	1.55	1.71	1.76	1.00	0.61	0.020	400
SPB5-14	SPB5-15	SMB5-14	SMB5-15	27.0	372.0	0.004	NEW	200	PVC	GRAVITY	2.00	0.14	0.09	1.90	1.90	1.55	1.60	1.76	1.81	1.00	0.61	0.020	400
SPB5-15	SPB6-01	SMB5-15	SMB6-01	26.0	398.0	0.004	NEW	200	PVC	GRAVITY	2.00	0.09	0.04	1.90	1.90	1.60	1.65	1.81	3.87	1.00	0.61	0.020	400
B-6																							
SPB6-01	SPB6-02	SMB6-01	SMB6-02	32.0	3.480.1	0.035	NEW	400	PVC	GRAVITY	1.00	-1.97	-2.00	1.90	1.96	3.45	3.54	3.87	3.96	1.00	0.69	0.087	149
SPB6-02	SPB6-03	SMB6-02	SMB6-03	32.0	3.512.1	0.035	NEW	400	PVC	GRAVITY	1.00	-2.00	-2.03	1.96	2.02	3.54	3.63	3.96	4.05	1.00	0.69	0.087	149
SPB6-03	SPB6-04	SMB6-03	SMB6-04	32.0	3.544.1	0.035	NEW	400	PVC	GRAVITY	1.00	-2.03	-2.06	2.02	2.08	3.63	3.72	4.05	4.14	1.00	0.69	0.087	149
SPB6-04	SPB6-05	SMB6-04	SMB6-05	32.0	3.576.1	0.035	NEW	400	PVC	GRAVITY	1.00	-2.06	-2.09	2.08	2.05	3.72	3.72	4.14	4.14	1.00	0.69	0.087	149
SPB6-05	SPB6-06	SMB6-05	SMB6-06	32.0	3.608.1	0.035	NEW	400	PVC	GRAVITY	1.00	-2.09	-2.12	2.05	1.98	3.72	3.68	4.14	4.10	1.00	0.69	0.087	149
SPB6-06	SPB6-07	SMB6-06	SMB6-07	30.0	3.638.1	0.036	NEW	400	PVC	GRAVITY	1.00	-2.12	-2.15	1.98	1.90	3.68	3.63	4.10	4.05	1.00	0.69	0.087	142
SPB6-07	SPB6-08	SMB6-07	SMB6-08	32.0	3.670.1	0.036	NEW	400	PVC	GRAVITY	1.00	-2.15	-2.18	1.90	1.86	3.63	3.62	4.05	4.04	1.00	0.69	0.087	142
SPB6-08	SPB6-09	SMB6-08	SMB6-09	32.0	3.702.1	0.036	NEW	400	PVC	GRAVITY	1.00	-2.18	-2.21	1.86	1.82	3.62	3.61	4.04	4.03	1.00	0.69	0.087	142
SPB6-09	SPB6-10	SMB6-09	SMB6-10	32.0	3.734.1	0.036	NEW	400	PVC	GRAVITY	1.00	-2.21	-2.24	1.82	1.78	3.61	3.60	4.03	4.02	1.00	0.69	0.087	142
SPB6-10	SPB6-11	SMB6-10	SMB6-11	32.0	3.766.1	0.037	NEW	400	PVC	GRAVITY	1.00	-2.24	-2.27	1.78	1.74	3.60	3.59	4.02	4.01	1.00	0.69	0.087	136
SPB6-11	SPB8-01	SMB6-11	SMB8-01	34.3	3.800.4	0.037	NEW	400	PVC	GRAVITY	1.00	-2.27	-2.30	1.74	1.70	3.59	3.58	4.01	4.00	1.00	0.69	0.087	136

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-7																							
SPB7-01	SPB7-02	SMB7-01	SMB7-02	27.0	27.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.29	1.22	3.70	3.23	2.20	1.80	2.41	2.01	1.00	0.68	0.022	2100
SPB7-02	SPB7-03	SMB7-02	SMB7-03	27.0	54.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.22	1.15	3.23	2.76	3.20	1.40	2.01	1.61	1.00	0.68	0.022	2100
SPB7-03	SPB7-04	SMB7-03	SMB7-04	26.0	80.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.15	1.08	2.76	2.30	4.20	1.01	1.61	1.22	1.00	0.68	0.022	2100
SPB7-04	SPB7-05	SMB7-04	SMB7-05	27.0	107.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.08	1.01	2.30	2.27	5.20	1.05	1.22	1.26	1.00	0.68	0.022	2100
SPB7-05	SPB7-06	SMB7-05	SMB7-06	27.0	134.0	0.002	NEW	200	PVC	GRAVITY	2.50	1.01	0.94	2.27	2.23	6.20	1.08	1.26	1.29	1.00	0.68	0.022	1000
SPB7-06	SPB7-07	SMB7-06	SMB7-07	26.0	160.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.94	0.87	2.23	2.20	7.20	1.12	1.29	1.33	1.00	0.68	0.022	1000
SPB7-07	SPB7-08	SMB7-07	SMB7-08	27.0	187.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.87	0.80	2.20	2.10	8.20	1.09	1.33	1.30	1.00	0.68	0.022	1000
SPB7-08	SPB7-09	SMB7-08	SMB7-09	27.0	214.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.80	0.73	2.10	2.00	9.20	1.06	1.30	1.27	1.00	0.68	0.022	1000
SPB7-09	SPB7-10	SMB7-09	SMB7-10	26.0	240.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.73	0.66	2.00	1.90	10.20	1.03	1.27	1.24	1.00	0.68	0.022	1000
SPB7-10	SPB7-11	SMB7-10	SMB7-11	27.0	267.0	0.003	NEW	200	PVC	GRAVITY	2.50	0.66	0.59	1.90	1.83	11.20	1.03	1.24	1.24	1.00	0.68	0.022	634
SPB7-11	SPB7-12	SMB7-11	SMB7-12	27.0	294.0	0.003	NEW	200	PVC	GRAVITY	2.50	0.59	0.52	1.83	1.77	12.20	1.04	1.24	1.25	1.00	0.68	0.022	634
SPB7-12	SPB8-01	SMB7-12	SMB8-01	26.0	320.0	0.003	NEW	200	PVC	GRAVITY	2.50	0.52	0.45	1.77	1.70	13.20	1.04	1.25	4.00	1.00	0.68	0.022	634
B-8																							
SPB8-01	SPB8-02	SMB8-01	SMB8-02	33.0	4.153.4	0.040	NEW	400	PVC	GRAVITY	1.00	-2.30	-2.33	1.70	1.70	3.58	3.61	4.00	4.03	1.00	0.69	0.087	118
SPB8-02	SPB8-03	SMB8-02	SMB8-03	33.0	4.186.4	0.040	NEW	400	PVC	GRAVITY	1.00	-2.33	-2.36	1.70	1.70	3.61	3.64	4.03	4.06	1.00	0.69	0.087	118
SPB8-03	SPB8-04	SMB8-03	SMB8-04	33.0	4.219.4	0.040	NEW	400	PVC	GRAVITY	1.00	-2.36	-2.39	1.70	1.72	3.64	3.69	4.06	4.11	1.00	0.69	0.087	118
SPB8-04	SPB8-05	SMB8-04	SMB8-05	33.0	4.252.4	0.040	NEW	400	PVC	GRAVITY	1.00	-2.39	-2.42	1.72	1.76	3.69	3.76	4.11	4.18	1.00	0.69	0.087	118
SPB8-05	SPB8-06	SMB8-05	SMB8-06	31.4	4.283.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.42	-2.45	1.76	1.80	3.76	3.83	4.18	4.25	1.00	0.69	0.087	113
SPB8-06	SPB8-07	SMB8-06	SMB8-07	30.0	4.313.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.45	-2.48	1.80	1.73	3.83	3.79	4.25	4.21	1.00	0.69	0.087	113
SPB8-07	SPB8-08	SMB8-07	SMB8-08	30.0	4.343.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.48	-2.51	1.73	1.65	3.79	3.74	4.21	4.16	1.00	0.69	0.087	113
SPB8-08	SPB8-09	SMB8-08	SMB8-09	20.0	4.363.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.51	-2.53	1.65	1.60	3.74	3.71	4.16	4.13	1.00	0.69	0.087	113
SPB8-09	SPB8-10	SMB8-09	SMB8-10	25.0	4.388.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.53	-2.56	1.60	1.58	3.71	3.72	4.13	4.14	1.00	0.69	0.087	113
SPB8-10	SPB8-11	SMB8-10	SMB8-11	20.0	4.408.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.56	-2.58	1.58	1.56	3.72	3.72	4.14	4.14	1.00	0.69	0.087	113
SPB8-11	SPB8-12	SMB8-11	SMB8-12	20.0	4.428.8	0.041	NEW	400	PVC	GRAVITY	1.00	-2.58	-2.60	1.56	1.54	3.72	3.72	4.14	4.14	1.00	0.69	0.087	113
SPB8-12	SPB8-13	SMB8-12	SMB8-13	35.0	4.463.8	0.042	NEW	400	PVC	GRAVITY	1.00	-2.60	-2.64	1.54	1.50	3.72	3.72	4.14	4.14	1.00	0.69	0.087	108
SPB8-13	SPB8-14	SMB8-13	SMB8-14	35.0	4.498.8	0.042	NEW	400	PVC	GRAVITY	1.00	-2.64	-2.68	1.50	1.57	3.72	3.83	4.14	4.25	1.00	0.69	0.087	108
SPB8-14	SPB8-15	SMB8-14	SMB8-15	35.0	4.533.8	0.042	NEW	400	PVC	GRAVITY	1.00	-2.68	-2.72	1.57	1.64	3.83	3.94	4.25	4.36	1.00	0.69	0.087	108
SPB8-15	SPB10-01	SMB8-15	SMB10-01	31.0	4.564.8	0.042	NEW	400	PVC	GRAVITY	1.00	-2.72	-2.75	1.64	1.70	3.94	4.03	4.36	4.45	1.00	0.69	0.087	108
B-9																							
SPB9-01	SPB9-02	SMB9-01	SMB9-02	30.0	30.0	0.002	REPLACEMENT	250	PVC	GRAVITY	1.50	-1.76	-1.81	2.00	1.95	3.50	3.50	3.76	3.76	1.00	0.62	0.031	1450
SPB9-02	SPB9-03	SMB9-02	SMB9-03	30.0	60.0	0.003	REPLACEMENT	250	PVC	GRAVITY	1.50	-1.81	-1.86	1.95	1.90	3.50	3.50	3.76	3.76	1.00	0.62	0.031	934
SPB9-03	SPB9-04	SMB9-03	SMB9-04	30.0	90.0	0.004	REPLACEMENT	250	PVC	GRAVITY	1.50	-1.86	-1.91	1.90	1.85	3.50	3.50	3.76	3.76	1.00	0.62	0.031	675
SPB9-04	SPB9-05	SMB9-04	SMB9-05	30.0	120.0	0.005	REPLACEMENT	250	PVC	GRAVITY	1.50	-1.91	-1.96	1.85	1.80	3.50	3.50	3.76	3.76	1.00	0.62	0.031	520
SPB9-05	SPB9-06	SMB9-05	SMB9-06	30.0	150.0	0.006	REPLACEMENT	250	PVC	GRAVITY	1.50	-1.96	-2.01	1.80	1.75	3.50	3.50	3.76	3.76	1.00	0.62	0.031	417
SPB9-06	SPB10-01	SMB9-06	SMB10-01	30.0	180.0	0.008	REPLACEMENT	250	PVC	GRAVITY	1.50	-2.01	-2.06	1.75	1.70	3.50	3.50	3.76	4.55	1.00	0.62	0.031	288

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-10																							
SPB10-01	SPB10-02	SMB10-01	SMB10-02	24.0	4.768.8	0.050	REPLACEMENT	500	PVC	GRAVITY	1.00	-2.85	-2.87	1.70	1.57	4.03	3.92	4.55	4.44	1.00	0.80	0.158	216
SPB10-02	SPB10-03	SMB10-02	SMB10-03	24.0	4.792.8	0.050	REPLACEMENT	500	PVC	GRAVITY	1.00	-2.87	-2.89	1.57	1.43	3.92	3.80	4.44	4.32	1.00	0.80	0.158	216
SPB10-03		SMB10-03	PS NO.3	15.0	4.807.8	0.050	REPLACEMENT	500	PVC	GRAVITY	1.00	-2.89	-2.91	1.43	1.35	3.80	3.74	4.32	4.26	1.00	0.80	0.158	216
INFLOW FROM SPB10-03 TO PS NO.3																							
B-11																							
SPB11-01	SPB11-02	SMB11-01	SMB11-02	30.0	30.0	0.009	NEW	300	PVC	GRAVITY	1.90	-2.77	-2.83	1.30	1.30	3.76	3.82	4.07	4.13	1.00	0.78	0.056	523
SPB11-02	SPB11-03	SMB11-02	SMB11-03	25.0	55.0	0.016	NEW	300	PVC	GRAVITY	1.90	-2.83	-2.88	1.30	1.33	3.82	3.90	4.13	4.21	1.00	0.78	0.056	250
SPB11-03		SMB11-03	PS NO.3	15.0	70.0	0.020	NEW	300	PVC	GRAVITY	1.90	-2.88	-2.91	1.33	1.35	3.90	3.95	4.21	4.26	1.00	0.78	0.056	180
INFLOW FROM SPB11-03 TO PS NO.3																							
B-12																							
SPB12-01	SPB12-03	SMB12-01	SMB12-03	22.8	4.900.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	0.00	-0.01	-0.01	1.30	1.30	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-02	SPB12-03	SMB12-02	SMB12-03	35.0	4.935.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	0.00	-0.01	-0.01	1.30	1.30	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-03	SPB12-04	SMB12-03	SMB12-04	35.0	4.970.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	0.00	-0.01	-0.01	1.30	1.30	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-04	SPB12-05	SMB12-04	SMB12-05	35.0	5.005.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.90	-0.01	0.09	1.30	1.40	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-05	SPB12-06	SMB12-05	SMB12-06	35.0	5.040.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.90	0.09	0.19	1.40	1.50	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-06	SPB12-07	SMB12-06	SMB12-07	30.0	5.070.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.70	0.19	0.27	1.50	1.58	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-07	SPB12-08	SMB12-07	SMB12-08	25.0	5.095.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-3.20	0.27	0.35	1.58	1.66	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-08	SPB12-09	SMB12-08	SMB12-09	25.0	5.120.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.80	0.35	0.42	1.66	1.73	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-09	SPB12-10	SMB12-09	SMB12-10	25.0	5.145.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.80	0.42	0.49	1.73	1.80	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-10	SPB12-11	SMB12-10	SMB12-11	24.0	5.169.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.90	0.49	0.56	1.80	1.87	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-11	SPB12-12	SMB12-11	SMB12-12	24.0	5.193.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.50	0.56	0.62	1.87	1.93	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-12	SPB12-13	SMB12-12	SMB12-13	25.0	5.218.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.80	0.62	0.69	1.93	2.00	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-13	SPB12-14	SMB12-13	SMB12-14	25.0	5.243.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.40	0.69	0.75	2.00	2.06	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-14	SPB12-15	SMB12-14	SMB12-15	25.0	5.268.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.80	0.75	0.82	2.06	2.13	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-15	SPB12-16	SMB12-15	SMB12-16	28.0	5.296.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-2.50	0.82	0.89	2.13	2.20	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-16	SPB12-17	SMB12-16	SMB12-17	27.0	5.323.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-10.70	0.89	1.18	2.20	2.49	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-17	SPB12-18	SMB12-17	SMB12-18	28.0	5.351.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-11.40	1.18	1.50	2.49	2.81	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-18	SPB12-19	SMB12-18	SMB12-19	28.0	5.379.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-11.10	1.50	1.81	2.81	3.12	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-19	SPB12-20	SMB12-19	SMB12-20	29.0	5.408.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-20.70	1.81	2.41	3.12	3.72	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-20	SPB12-21	SMB12-20	SMB12-21	28.0	5.436.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-23.60	2.41	3.07	3.72	4.38	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-21	SPB12-22	SMB12-21	SMB12-22	28.0	5.464.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-23.60	3.07	3.73	4.38	5.04	1.00	1.00	1.31	1.31	1.00	0.97	0.069	-
SPB12-22	SPB13-01	SMB12-22	SMB13-01	28.0	5.492.6	0.069	REPLACEMENT	300	DCIP	FORCE MAIN	-20.00	3.73	4.29	5.04	5.70	1.00	1.10	1.31	1.61	1.00	0.97	0.069	-

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-13																							
SPB13-01	SPB13-02	SMB13-01	SMB13-02	35.0	5.527.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	4.09	4.05	5.70	5.59	1.09	1.02	1.61	1.54	1.00	0.80	0.158	129
SPB13-02	SPB13-03	SMB13-02	SMB13-03	35.0	5.562.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	4.05	3.97	5.59	5.49	1.02	1.00	1.54	1.52	1.00	0.80	0.158	129
SPB13-03	SPB13-04	SMB13-03	SMB13-04	35.0	5.597.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	3.76	3.72	5.49	5.37	1.21	1.13	1.73	1.65	1.00	0.80	0.158	129
SPB13-04	SPB13-05	SMB13-04	SMB13-05	35.0	5.632.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	3.72	3.68	5.37	5.20	1.13	1.00	1.65	1.52	1.00	0.80	0.158	129
SPB13-05	SPB13-06	SMB13-05	SMB13-06	35.0	5.667.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	3.30	3.26	5.20	5.04	1.38	1.26	1.90	1.78	1.00	0.80	0.158	129
SPB13-06	SPB13-07	SMB13-06	SMB13-07	30.0	5.697.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	3.26	3.23	5.04	4.90	1.26	1.15	1.78	1.67	1.00	0.80	0.158	129
SPB13-07	SPB13-08	SMB13-07	SMB13-08	29.0	5.726.6	0.069	REPLACEMENT	500	PVC	GRAVITY	1.00	3.23	3.20	4.90	4.72	1.15	1.00	1.67	1.52	1.00	0.80	0.158	129
SPB13-08	SPB13-09	SMB13-08	SMB13-09	29.0	5.755.6	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.93	2.90	4.72	4.54	1.27	1.12	1.79	1.64	1.00	0.80	0.158	126
SPB13-09	SPB13-10	SMB13-09	SMB13-10	29.0	5.784.6	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.90	2.87	4.54	4.39	1.12	1.00	1.64	1.52	1.00	0.80	0.158	126
SPB13-10	SPB13-11	SMB13-10	SMB13-11	29.0	5.813.6	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.62	2.59	4.39	4.36	1.25	1.25	1.77	1.77	1.00	0.80	0.158	126
SPB13-11	SPB13-12	SMB13-11	SMB13-12	29.0	5.842.6	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.59	2.56	4.36	4.33	1.25	1.25	1.77	1.77	1.00	0.80	0.158	126
SPB13-12	SPB13-13	SMB13-12	SMB13-13	28.0	5.870.6	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.56	2.53	4.33	4.29	1.25	1.24	1.77	1.76	1.00	0.80	0.158	126
SPB13-13	SPB13-14	SMB13-13	SMB13-14	26.4	5.897.0	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	2.53	2.50	4.29	4.02	1.24	1.00	1.76	1.52	1.00	0.80	0.158	126
SPB13-14	SPB13-15	SMB13-14	SMB13-15	30.0	5.927.0	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	1.95	1.92	4.02	3.72	1.55	1.28	2.07	1.80	1.00	0.80	0.158	126
SPB13-15	SPB13-16	SMB13-15	SMB13-16	30.0	5.957.0	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	1.92	1.89	3.72	3.41	1.28	1.00	1.80	1.52	1.00	0.80	0.158	126
SPB13-16	SPB13-17	SMB13-16	SMB13-17	30.0	5.987.0	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	1.43	1.40	3.41	3.10	1.46	1.18	1.98	1.70	1.00	0.80	0.158	126
SPB13-17	SPB23-01	SMB13-17	SMB23-01	20.0	6.007.0	0.070	REPLACEMENT	500	PVC	GRAVITY	1.00	1.40	1.38	3.10	2.90	1.18	1.00	1.70	2.17	1.00	0.80	0.158	126
B-14																							
SPB14-01	SPB14-02	SMB14-01	SMB14-02	35.0	35.0	0.001	NEW	250	PVC	GRAVITY	1.50	-1.96	-2.01	0.50	0.56	2.20	2.31	2.46	2.57	1.00	0.62	0.031	3000
SPB14-02	SPB14-03	SMB14-02	SMB14-03	22.0	57.0	0.001	NEW	250	PVC	GRAVITY	1.50	-2.01	-2.04	0.56	0.60	2.31	2.38	2.57	2.64	1.00	0.62	0.031	3000
SPB14-03	SPB14-04	SMB14-03	SMB14-04	22.0	79.0	0.001	NEW	250	PVC	GRAVITY	1.50	-2.04	-2.07	0.60	0.64	2.38	2.45	2.64	2.71	1.00	0.62	0.031	3000
SPB14-04	SPB14-05	SMB14-04	SMB14-05	30.0	109.0	0.002	NEW	250	PVC	GRAVITY	1.50	-2.07	-2.12	0.64	0.70	2.45	2.56	2.71	2.82	1.00	0.62	0.031	1450
SPB14-05	SPB14-06	SMB14-05	SMB14-06	25.0	134.0	0.002	NEW	250	PVC	GRAVITY	1.50	-2.12	-2.16	0.70	0.74	2.56	2.64	2.82	2.90	1.00	0.62	0.031	1450
SPB14-06	SPB14-07	SMB14-06	SMB14-07	20.0	154.0	0.002	NEW	250	PVC	GRAVITY	1.50	-2.16	-2.19	0.74	0.77	2.64	2.70	2.90	2.96	1.00	0.62	0.031	1450
SPB14-07	SPB14-08	SMB14-07	SMB14-08	35.0	189.0	0.003	NEW	250	PVC	GRAVITY	1.50	-2.19	-2.24	0.77	0.85	2.70	2.83	2.96	3.09	1.00	0.62	0.031	934
SPB14-08	SPB14-09	SMB14-08	SMB14-09	31.4	220.4	0.003	NEW	250	PVC	GRAVITY	1.50	-2.24	-2.29	0.85	0.97	2.83	3.00	3.09	3.26	1.00	0.62	0.031	934
SPB14-09	SPB14-10	SMB14-09	SMB14-10	35.0	255.4	0.003	NEW	250	PVC	GRAVITY	1.50	-2.29	-2.34	0.97	1.10	3.00	3.18	3.26	3.44	1.00	0.62	0.031	934
SPB14-10	SPB14-11	SMB14-10	SMB14-11	22.0	277.4	0.004	NEW	250	PVC	GRAVITY	1.50	-2.34	-2.37	1.10	1.10	3.18	3.21	3.44	3.47	1.00	0.62	0.031	675
SPB14-11	SPB14-12	SMB14-11	SMB14-12	33.0	310.4	0.004	NEW	250	PVC	GRAVITY	1.50	-2.37	-2.42	1.10	1.10	3.21	3.26	3.47	3.52	1.00	0.62	0.031	675
SPB14-12	SPB14-13	SMB14-12	SMB14-13	33.0	343.4	0.004	NEW	250	PVC	GRAVITY	1.50	-2.42	-2.47	1.10	1.10	3.26	3.31	3.52	3.57	1.00	0.62	0.031	675
SPB14-13	SPB14-14	SMB14-13	SMB14-14	35.0	378.4	0.005	NEW	250	PVC	GRAVITY	1.50	-2.47	-2.52	1.10	0.98	3.31	3.24	3.57	3.50	1.00	0.62	0.031	520
SPB14-14	SPB14-15	SMB14-14	SMB14-15	35.0	413.4	0.005	NEW	250	PVC	GRAVITY	1.50	-2.52	-2.57	0.98	0.86	3.24	3.17	3.50	3.43	1.00	0.62	0.031	520
SPB14-15	SPB14-16	SMB14-15	SMB14-16	32.2	445.6	0.006	NEW	250	PVC	GRAVITY	1.50	-2.57	-2.62	0.86	0.75	3.17	3.11	3.43	3.37	1.00	0.62	0.031	417
SPB14-16	SPB14-17	SMB14-16	SMB14-17	30.0	475.6	0.006	NEW	250	PVC	GRAVITY	1.50	-2.62	-2.67	0.75	0.83	3.11	3.24	3.37	3.50	1.00	0.62	0.031	417
SPB14-17	SPB14-18	SMB14-17	SMB14-18	30.0	505.6	0.006	NEW	250	PVC	GRAVITY	1.50	-2.67	-2.72	0.83	0.90	3.24	3.36	3.50	3.62	1.00	0.62	0.031	417
SPB14-18	SPB14-19	SMB14-18	SMB14-19	31.0	536.6	0.007	NEW	250	PVC	GRAVITY	1.50	-2.72	-2.77	0.90	0.98	3.36	3.49	3.62	3.75	1.00	0.62	0.031	343
SPB14-19	SPB14-20	SMB14-19	SMB14-20	31.0	567.6	0.007	NEW	250	PVC	GRAVITY	1.50	-2.77	-2.82	0.98	1.06	3.49	3.62	3.75	3.88	1.00	0.62	0.031	343

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
SPB14-20	SPB14-21	SMB14-20	SMB14-21	31.0	598.6	0.007	NEW	250	PVC	GRAVITY	1.50	-2.82	-2.87	1.06	1.12	3.62	3.73	3.88	3.99	1.00	0.62	0.031	343
SPB14-21	SPB14-22	SMB14-21	SMB14-22	33.0	631.6	0.008	NEW	250	PVC	GRAVITY	1.50	-2.87	-2.92	1.12	1.17	3.73	3.83	3.99	4.09	1.00	0.62	0.031	288
SPB14-22	SPB14-23	SMB14-22	SMB14-23	20.0	651.6	0.008	NEW	250	PVC	GRAVITY	1.50	-2.92	-2.95	1.17	1.20	3.83	3.89	4.09	4.15	1.00	0.62	0.031	288
SPB14-23	SPB14-24	SMB14-23	SMB14-24	33.0	684.6	0.008	NEW	250	PVC	GRAVITY	1.50	-2.95	-3.00	1.20	1.15	3.89	3.89	4.15	4.15	1.00	0.62	0.031	288
SPB14-24	SPB14-25	SMB14-24	SMB14-25	33.0	717.6	0.009	NEW	250	PVC	GRAVITY	1.50	-3.00	-3.05	1.15	1.10	3.89	3.89	4.15	4.15	1.00	0.62	0.031	245
SPB14-25	SPB14-26	SMB14-25	SMB14-26	34.0	751.6	0.009	NEW	250	PVC	GRAVITY	1.50	-3.05	-3.10	1.10	0.97	3.89	3.81	4.15	4.07	1.00	0.62	0.031	245
SPB14-26	SPB14-27	SMB14-26	SMB14-27	34.0	785.6	0.009	NEW	250	PVC	GRAVITY	1.50	-3.10	-3.15	0.97	0.83	3.81	3.72	4.07	3.98	1.00	0.62	0.031	245
SPB14-27	SPB14-28	SMB14-27	SMB14-28	34.0	819.6	0.010	NEW	250	PVC	GRAVITY	1.50	-3.15	-3.20	0.83	0.70	3.72	3.64	3.98	3.90	1.00	0.62	0.031	210
SPB14-28	SPB14-29	SMB14-28	SMB14-29	31.0	850.6	0.010	NEW	250	PVC	GRAVITY	1.50	-3.20	-3.25	0.70	0.75	3.64	3.74	3.90	4.00	1.00	0.62	0.031	210
SPB14-29	SPB14-30	SMB14-29	SMB14-30	31.0	881.6	0.011	NEW	250	PVC	GRAVITY	1.50	-3.25	-3.30	0.75	0.80	3.74	3.84	4.00	4.10	1.00	0.62	0.031	182
SPB14-30	SPB14-31	SMB14-30	SMB14-31	28.0	909.6	0.011	NEW	250	PVC	GRAVITY	1.50	-3.30	-3.34	0.80	0.82	3.84	3.90	4.10	4.16	1.00	0.62	0.031	182
SPB14-31	SPB14-32	SMB14-31	SMB14-32	28.0	937.6	0.011	NEW	250	PVC	GRAVITY	1.50	-3.34	-3.38	0.82	0.85	3.90	3.97	4.16	4.23	1.00	0.62	0.031	182
SPB14-32	SPB14-33	SMB14-32	SMB14-33	28.0	965.6	0.012	NEW	250	PVC	GRAVITY	1.50	-3.38	-3.42	0.85	0.87	3.97	4.03	4.23	4.29	1.00	0.62	0.031	159
SPB14-33	SPB14-34	SMB14-33	SMB14-34	30.0	995.6	0.012	NEW	250	PVC	GRAVITY	1.50	-3.42	-3.47	0.87	0.90	4.03	4.11	4.29	4.37	1.00	0.62	0.031	159
SPB14-34	SPB14-35	SMB14-34	SMB14-35	31.0	1,026.6	0.012	NEW	250	PVC	GRAVITY	1.50	-3.47	-3.52	0.90	0.95	4.11	4.21	4.37	4.47	1.00	0.62	0.031	159
SPB14-35	SPB14-36	SMB14-35	SMB14-36	31.0	1,057.6	0.013	NEW	250	PVC	GRAVITY	1.50	-3.52	-3.57	0.95	1.00	4.21	4.31	4.47	4.57	1.00	0.62	0.031	139
SPB14-36	SPB14-37	SMB14-36	SMB14-37	33.0	1,090.6	0.013	NEW	250	PVC	GRAVITY	1.50	-3.57	-3.62	1.00	0.96	4.31	4.32	4.57	4.58	1.00	0.62	0.031	139
SPB14-37	SPB14-38	SMB14-37	SMB14-38	30.0	1,120.6	0.013	NEW	250	PVC	GRAVITY	1.50	-3.62	-3.67	0.96	0.93	4.32	4.34	4.58	4.60	1.00	0.62	0.031	139
SPB14-38	SPB14-39	SMB14-38	SMB14-39	30.0	1,150.6	0.014	NEW	250	PVC	GRAVITY	1.50	-3.67	-3.72	0.93	0.90	4.34	4.36	4.60	4.62	1.00	0.62	0.031	122
SPB14-39	SPB14-40	SMB14-39	SMB14-40	30.0	1,180.6	0.014	NEW	250	PVC	GRAVITY	1.50	-3.72	-3.77	0.90	0.90	4.36	4.41	4.62	4.67	1.00	0.62	0.031	122
SPB14-40	SPB14-41	SMB14-40	SMB14-41	29.0	1,209.6	0.014	NEW	250	PVC	GRAVITY	1.50	-3.77	-3.81	0.90	0.90	4.41	4.45	4.67	4.71	1.00	0.62	0.031	122
SPB14-41	SPB14-42	SMB14-41	SMB14-42	35.0	1,244.6	0.015	NEW	250	PVC	GRAVITY	1.50	-3.81	-3.86	0.90	0.90	4.45	4.50	4.71	4.76	1.00	0.62	0.031	107
SPB14-42	SPB14-43	SMB14-42	SMB14-43	22.2	1,266.8	0.015	NEW	250	PVC	GRAVITY	1.50	-3.86	-3.89	0.90	0.90	4.50	4.53	4.76	4.79	1.00	0.62	0.031	107
SPB14-43	SPB18-01	SMB14-43	SMB18-01	22.2	1,289.0	0.015	NEW	250	PVC	GRAVITY	1.50	-3.89	-3.92	0.90	0.90	4.53	4.56	4.79	4.82	1.00	0.62	0.031	107
B-15											2.50												
SPB15-01	SPB15-02	SMB15-01	SMB15-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.46	1.37	3.20	2.95	1.53	1.37	1.74	1.58	1.00	0.68	0.022	2100
SPB15-02	SPB15-03	SMB15-02	SMB15-03	35.0	70.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.37	1.28	2.95	2.70	1.37	1.21	1.58	1.42	1.00	0.68	0.022	2100
SPB15-03	SPB15-04	SMB15-03	SMB15-04	35.0	105.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.28	1.19	2.70	2.55	1.21	1.15	1.42	1.36	1.00	0.68	0.022	2100
SPB15-04	SPB15-05	SMB15-04	SMB15-05	27.0	132.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.19	1.12	2.55	2.44	1.15	1.11	1.36	1.32	1.00	0.68	0.022	2100
SPB15-05	SPB15-06	SMB15-05	SMB15-06	32.0	164.0	0.001	NEW	200	PVC	GRAVITY	2.50	1.12	1.04	2.44	2.30	1.11	1.05	1.32	1.26	1.00	0.68	0.022	2100
SPB15-06	SPB17-01	SMB15-06	SMB17-01	32.0	196.0	0.002	NEW	200	PVC	GRAVITY	2.50	1.04	0.96	2.30	2.17	1.05	1.00	1.26	2.34	1.00	0.68	0.022	1000

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-16																							
SPB16-01	SPB16-02	SMB16-01	SMB16-02	31.0	31.0	0.001	NEW	200	PVC	GRAVITY	2.50	0.49	0.41	3.30	3.11	2.60	2.69	2.81	2.70	1.00	0.68	0.022	2100
SPB16-02	SPB16-03	SMB16-02	SMB16-03	31.0	62.0	0.001	NEW	200	PVC	GRAVITY	2.50	0.41	0.33	3.11	2.93	2.49	2.39	2.70	2.60	1.00	0.68	0.022	2100
SPB16-03	SPB16-04	SMB16-03	SMB16-04	31.0	93.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.33	0.25	2.93	2.74	2.39	2.28	2.60	2.49	1.00	0.68	0.022	1000
SPB16-04	SPB16-05	SMB16-04	SMB16-05	31.0	124.0	0.002	NEW	200	PVC	GRAVITY	2.50	0.25	0.17	2.74	2.56	2.28	2.18	2.49	2.39	1.00	0.68	0.022	1000
SPB16-05	SPB16-06	SMB16-05	SMB16-06	31.0	155.0	0.003	NEW	200	PVC	GRAVITY	2.50	0.17	0.09	2.56	2.37	2.18	2.07	2.39	2.28	1.00	0.68	0.022	634
SPB16-06	SPB16-07	SMB16-06	SMB16-07	30.0	185.0	0.003	NEW	200	PVC	GRAVITY	2.50	0.09	0.01	2.37	2.19	2.07	1.97	2.28	2.18	1.00	0.68	0.022	634
SPB16-07	SPB16-08	SMB16-07	SMB16-08	15.4	200.4	0.003	NEW	200	PVC	GRAVITY	2.50	0.01	-0.03	2.19	2.10	1.97	1.92	2.18	2.13	1.00	0.68	0.022	634
SPB16-08	SPB16-09	SMB16-08	SMB16-09	28.0	228.4	0.004	NEW	200	PVC	GRAVITY	2.50	-0.03	-0.10	2.10	2.05	1.92	1.94	2.13	2.15	1.00	0.68	0.022	450
SPB16-09	SPB17-01	SMB16-09	SMB17-01	28.0	256.4	0.004	NEW	200	PVC	GRAVITY	2.50	-0.10	-0.17	2.05	2.17	2.60	2.13	2.15	2.34	1.00	0.68	0.022	450
B-17																							
SPB17-01	SPB17-02	SMB17-01	SMB17-02	35.0	487.4	0.006	NEW	200	PVC	GRAVITY	2.50	-0.17	-0.26	2.17	1.86	2.13	1.91	2.34	2.12	1.00	0.68	0.022	267
SPB17-02	SPB17-03	SMB17-02	SMB17-03	35.0	522.4	0.006	NEW	200	PVC	GRAVITY	2.50	-0.26	-0.35	1.86	1.55	1.91	1.69	2.12	1.90	1.00	0.68	0.022	267
SPB17-03	SPB17-04	SMB17-03	SMB17-04	35.0	557.4	0.007	NEW	200	PVC	GRAVITY	2.50	-0.35	-0.44	1.55	1.25	1.69	1.48	1.90	1.69	1.00	0.68	0.022	215
SPB17-04	SPB17-05	SMB17-04	SMB17-05	35.0	592.4	0.007	NEW	200	PVC	GRAVITY	2.50	-0.44	-0.53	1.25	1.17	1.48	1.49	1.69	1.70	1.00	0.68	0.022	215
SPB17-05	SPB17-06	SMB17-05	SMB17-06	33.0	625.4	0.008	NEW	200	PVC	GRAVITY	2.50	-0.53	-0.61	1.17	1.13	1.49	1.53	1.70	1.74	1.00	0.68	0.022	175
SPB17-06	SPB17-07	SMB17-06	SMB17-07	33.0	658.4	0.008	NEW	200	PVC	GRAVITY	2.50	-0.61	-0.69	1.13	1.07	1.53	1.55	1.74	1.76	1.00	0.68	0.022	175
SPB17-07	SPB17-08	SMB17-07	SMB17-08	33.0	691.4	0.008	NEW	200	PVC	GRAVITY	2.50	-0.69	-0.77	1.07	0.99	1.55	1.55	1.76	1.76	1.00	0.68	0.022	175
SPB17-08	SPB18-01	SMB17-08	SMB18-01	32.2	723.6	0.009	NEW	200	PVC	GRAVITY	2.50	-0.77	-0.85	0.99	0.90	1.55	1.54	1.76	1.75	1.00	0.68	0.022	145
B-18																							
SPB18-01	SPB20-01	SMB18-01	SMB20-01	27.3	27.3	0.024	NEW	300	PVC	GRAVITY	1.90	-3.97	-4.02	0.90	0.90	4.56	4.61	4.87	5.02	1.00	0.78	0.056	134

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-19																							
SPB19-01	SPB19-02	SMB19-01	SMB19-02	33.0	33.0	0.001	NEW	200	PVC	GRAVITY	2.50	-0.61	-0.69	0.60	0.63	1.00	1.11	1.21	1.32	1.00	0.68	0.022	2100
SPB19-02	SPB19-03	SMB19-02	SMB19-03	35.0	68.0	0.001	NEW	200	PVC	GRAVITY	2.50	-0.69	-0.78	0.63	0.67	1.11	1.24	1.32	1.45	1.00	0.68	0.022	2100
SPB19-03	SPB19-04	SMB19-03	SMB19-04	30.0	98.0	0.001	NEW	200	PVC	GRAVITY	2.50	-0.78	-0.86	0.67	0.70	1.24	1.35	1.45	1.56	1.00	0.68	0.022	2100
SPB19-04	SPB19-05	SMB19-04	SMB19-05	30.0	128.0	0.002	NEW	200	PVC	GRAVITY	2.50	-0.86	-0.94	0.70	0.88	1.35	1.61	1.56	1.82	1.00	0.68	0.022	1000
SPB19-05	SPB19-06	SMB19-05	SMB19-06	30.0	158.0	0.002	NEW	200	PVC	GRAVITY	2.50	-0.94	-1.02	0.88	1.07	1.61	1.88	1.82	2.09	1.00	0.68	0.022	1000
SPB19-06	SPB19-07	SMB19-06	SMB19-07	20.0	178.0	0.002	NEW	200	PVC	GRAVITY	2.50	-1.02	-1.07	1.07	1.19	1.88	2.05	2.09	2.26	1.00	0.68	0.022	1000
SPB19-07	SPB19-08	SMB19-07	SMB19-08	15.0	193.0	0.002	NEW	200	PVC	GRAVITY	2.50	-1.07	-1.11	1.19	1.28	2.05	2.18	2.26	2.39	1.00	0.68	0.022	1000
SPB19-08	SPB19-09	SMB19-08	SMB19-09	20.0	213.0	0.003	NEW	200	PVC	GRAVITY	2.50	-1.11	-1.16	1.28	1.40	2.18	2.35	2.39	2.56	1.00	0.68	0.022	634
SPB19-09	SPB19-10	SMB19-09	SMB19-10	30.0	243.0	0.003	NEW	200	PVC	GRAVITY	2.50	-1.16	-1.24	1.40	1.60	2.35	2.63	2.56	2.84	1.00	0.68	0.022	634
SPB19-10	SPB19-11	SMB19-10	SMB19-11	30.0	273.0	0.003	NEW	200	PVC	GRAVITY	2.50	-1.24	-1.32	1.60	1.80	2.63	2.91	2.84	3.12	1.00	0.68	0.022	634
SPB19-11	SPB19-12	SMB19-11	SMB19-12	30.0	303.0	0.004	NEW	200	PVC	GRAVITY	2.50	-1.32	-1.40	1.80	1.69	2.91	2.88	3.12	3.09	1.00	0.68	0.022	450
SPB19-12	SPB19-13	SMB19-12	SMB19-13	27.5	330.5	0.004	NEW	200	PVC	GRAVITY	2.50	-1.40	-1.47	1.69	1.59	2.88	2.85	3.09	3.06	1.00	0.68	0.022	450
SPB19-13	SPB19-14	SMB19-13	SMB19-14	25.0	355.5	0.004	NEW	200	PVC	GRAVITY	2.50	-1.47	-1.53	1.59	1.49	2.85	2.81	3.06	3.02	1.00	0.68	0.022	450
SPB19-14	SPB19-15	SMB19-14	SMB19-15	25.0	380.5	0.004	NEW	200	PVC	GRAVITY	2.50	-1.53	-1.59	1.49	1.40	2.81	2.78	3.02	2.99	1.00	0.68	0.022	450
SPB19-15	SPB19-16	SMB19-15	SMB19-16	25.0	405.5	0.005	NEW	200	PVC	GRAVITY	2.50	-1.59	-1.65	1.40	1.54	2.78	2.98	2.99	3.19	1.00	0.68	0.022	340
SPB19-16	SPB19-17	SMB19-16	SMB19-17	33.0	438.5	0.005	NEW	200	PVC	GRAVITY	2.50	-1.65	-1.73	1.54	1.71	2.98	3.23	3.19	3.44	1.00	0.68	0.022	340
SPB19-17	SPB19-18	SMB19-17	SMB19-18	32.7	471.2	0.005	NEW	200	PVC	GRAVITY	2.50	-1.73	-1.81	1.71	1.89	3.23	3.49	3.44	3.70	1.00	0.68	0.022	340
SPB19-18	SPB19-19	SMB19-18	SMB19-19	20.0	491.2	0.006	NEW	200	PVC	GRAVITY	2.50	-1.81	-1.86	1.89	2.00	3.49	3.65	3.70	3.86	1.00	0.68	0.022	267
SPB19-19	SPB19-20	SMB19-19	SMB19-20	35.0	526.2	0.006	NEW	200	PVC	GRAVITY	2.50	-1.86	-1.95	2.00	1.56	3.65	3.30	3.86	3.51	1.00	0.68	0.022	267
SPB19-20	SPB19-21	SMB19-20	SMB19-21	35.0	561.2	0.006	NEW	200	PVC	GRAVITY	2.50	-1.95	-2.04	1.56	1.11	3.30	2.94	3.51	3.15	1.00	0.68	0.022	267
SPB19-21	SPB19-22	SMB19-21	SMB19-22	35.0	596.2	0.007	NEW	200	PVC	GRAVITY	2.50	-2.04	-2.13	1.11	0.90	2.94	2.82	3.15	3.03	1.00	0.68	0.022	215
SPB19-22	SPB20-01	SMB19-22	SMB20-01	30.6	626.8	0.007	NEW	200	PVC	GRAVITY	2.50	-2.13	-2.21	0.90	0.90	2.82	2.90	3.03	3.11	1.00	0.68	0.022	215
B-20																							
SPB20-01		SMB20-01	PS DAROU SALAM NDANGANE	9.6	627	0.030	NEW	400	PVC	GRAVITY	1.60	-4.12	-4.14	0.90	0.90	4.61	4.62	5.02	5.04	1.00	0.87	0.110	267
INFLOW FROM SPB20-01 TO PS DAROU SALAM NDANGANE																							

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-21																							
SPB21-01	SPB21-02	SMB21-01	SMB21-02	8.8	635.6	0.030	NEW	200	DCIP	FORCE MAIN	-8.00	-0.31	-0.24	0.90	0.97	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-02	SPB21-03	SMB21-02	SMB21-03	25.1	660.7	0.030	NEW	200	DCIP	FORCE MAIN	-7.60	-0.24	-0.05	0.97	1.16	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-03	SPB21-04	SMB21-03	SMB21-04	35.0	695.7	0.030	NEW	200	DCIP	FORCE MAIN	-7.70	-0.05	0.22	1.16	1.43	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-04	SPB21-05	SMB21-04	SMB21-05	35.0	730.7	0.030	NEW	200	DCIP	FORCE MAIN	-7.70	0.22	0.49	1.43	1.70	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-05	SPB21-06	SMB21-05	SMB21-06	35.0	765.7	0.030	NEW	200	DCIP	FORCE MAIN	-7.70	0.49	0.76	1.70	1.97	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-06	SPB21-07	SMB21-06	SMB21-07	35.0	800.7	0.030	NEW	200	DCIP	FORCE MAIN	-2.90	0.76	0.86	1.97	2.07	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-07	SPB21-08	SMB21-07	SMB21-08	35.0	835.7	0.030	NEW	200	DCIP	FORCE MAIN	-2.30	0.86	0.94	2.07	2.15	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-08	SPB21-09	SMB21-08	SMB21-09	35.0	870.7	0.030	NEW	200	DCIP	FORCE MAIN	-3.40	0.94	1.06	2.15	2.27	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-09	SPB21-10	SMB21-09	SMB21-10	25.0	895.7	0.030	NEW	200	DCIP	FORCE MAIN	-6.80	1.06	1.23	2.27	2.44	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-10	SPB21-11	SMB21-10	SMB21-11	25.0	920.7	0.030	NEW	200	DCIP	FORCE MAIN	-6.80	1.23	1.40	2.44	2.61	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-11	SPB21-12	SMB21-11	SMB21-12	25.0	945.7	0.030	NEW	200	DCIP	FORCE MAIN	-6.40	1.40	1.56	2.61	2.77	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-12	SPB21-13	SMB21-12	SMB21-13	26.0	971.7	0.030	NEW	200	DCIP	FORCE MAIN	-1.90	1.56	1.61	2.77	2.82	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-13	SPB21-14	SMB21-13	SMB21-14	26.0	997.7	0.030	NEW	200	DCIP	FORCE MAIN	-1.20	1.61	1.64	2.82	2.85	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-14	SPB21-15	SMB21-14	SMB21-15	26.0	1,023.7	0.030	NEW	200	DCIP	FORCE MAIN	-0.80	1.64	1.66	2.85	2.87	1.00	1.00	1.21	1.21	1.00	0.94	0.030	-
SPB21-15	SPB22-01	SMB21-15	SMB22-01	28.0	1,051.7	0.030	NEW	200	DCIP	FORCE MAIN	0.00	1.66	1.66	2.87	2.90	1.00	1.03	1.21	1.44	1.00	0.94	0.030	-
B-22																							
SPB22-01	SPB22-02	SMB22-01	SMB22-02	28.0	1,079.7	0.030	NEW	400	PVC	GRAVITY	2.30	1.46	1.40	2.90	3.03	1.03	1.21	1.44	1.63	1.00	1.04	0.131	337
SPB22-02	SPB22-03	SMB22-02	SMB22-03	28.0	1,107.7	0.030	NEW	400	PVC	GRAVITY	2.30	1.40	1.34	3.03	3.07	1.21	1.31	1.63	1.73	1.00	1.04	0.131	337
SPB22-03	SPB22-04	SMB22-03	SMB22-04	28.0	1,135.7	0.030	NEW	400	PVC	GRAVITY	2.30	1.34	1.28	3.07	3.01	1.31	1.31	1.73	1.73	1.00	1.04	0.131	337
SPB22-04	SPB22-05	SMB22-04	SMB22-05	28.0	1,163.7	0.030	NEW	400	PVC	GRAVITY	2.30	1.28	1.22	3.01	2.94	1.31	1.30	1.73	1.72	1.00	1.04	0.131	337
SPB22-05	SPB23-01	SMB22-05	SMB23-01	20.0	1,183.7	0.030	NEW	400	PVC	GRAVITY	2.30	1.22	1.17	2.94	2.90	1.30	1.31	1.72	2.17	1.00	1.04	0.131	337
B-23																							
SPB23-01	SPB23-02	SMB23-01	SMB23-02	19.0	7,209.7	0.100	REPLACEMENT	600	RC	GRAVITY	2.30	0.73	0.69	2.90	2.34	1.52	1.00	2.17	1.65	1.00	1.05	0.297	197
SPB23-02	SPB23-03	SMB23-02	SMB23-03	18.0	7,227.7	0.100	REPLACEMENT	600	RC	GRAVITY	2.30	0.19	0.15	2.34	1.80	1.50	1.00	2.15	1.65	1.00	1.05	0.297	197
SPB23-03	SPB23-04	SMB23-03	SMB23-04	26.0	7,253.7	0.101	REPLACEMENT	600	RC	GRAVITY	2.30	0.15	0.09	1.80	1.78	1.00	1.04	1.65	1.69	1.00	1.05	0.297	195
SPB23-04	SPB23-05	SMB23-04	SMB23-05	26.0	7,279.7	0.101	REPLACEMENT	600	RC	GRAVITY	2.30	0.09	0.03	1.78	1.76	1.04	1.08	1.69	1.73	1.00	1.05	0.297	195
SPB23-05	SPB23-06	SMB23-05	SMB23-06	26.6	7,306.3	0.101	REPLACEMENT	600	RC	GRAVITY	2.30	0.03	-0.03	1.76	1.73	1.08	1.11	1.73	1.76	1.00	1.05	0.297	195
SPB23-06	SPB23-07	SMB23-06	SMB23-07	29.0	7,335.3	0.102	REPLACEMENT	600	RC	GRAVITY	2.30	-0.03	-0.10	1.73	1.71	1.11	1.16	1.76	1.81	1.00	1.05	0.297	192
SPB23-07	SPB23-08	SMB23-07	SMB23-08	29.0	7,364.3	0.102	REPLACEMENT	600	RC	GRAVITY	2.30	-0.10	-0.17	1.71	1.68	1.16	1.20	1.81	1.85	1.00	1.05	0.297	192
SPB23-08	SPB23-09	SMB23-08	SMB23-09	28.3	7,392.6	0.102	REPLACEMENT	600	RC	GRAVITY	2.30	-0.17	-0.24	1.68	1.66	1.20	1.25	1.85	1.90	1.00	1.05	0.297	192
SPB23-09	SPB23-10	SMB23-09	SMB23-10	35.0	7,427.6	0.103	REPLACEMENT	600	RC	GRAVITY	2.30	-0.24	-0.32	1.66	1.63	1.25	1.30	1.90	1.95	1.00	1.05	0.297	189
SPB23-10	SPB24-01	SMB23-10	SMB24-01	35.0	7,462.6	0.103	REPLACEMENT	600	RC	GRAVITY	2.30	-0.32	-0.40	1.63	1.60	1.30	1.35	1.95	2.00	1.00	1.05	0.297	189

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
B-24																							
SPB24-01	SPB24-02	SMB24-01	SMB24-02	27.0	7,489.6	0.103	REPLACEMENT	600	RC	GRAVITY	2.30	-0.40	-0.46	1.60	1.53	1.35	1.34	2.00	1.99	1.00	1.05	0.297	189
SPB24-02	SPB24-03	SMB24-02	SMB24-03	27.0	7,516.6	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.46	-0.52	1.53	1.47	1.34	1.34	1.99	1.99	1.00	1.05	0.297	186
SPB24-03	SPB24-04	SMB24-03	SMB24-04	25.7	7,542.3	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.52	-0.58	1.47	1.41	1.34	1.34	1.99	1.99	1.00	1.05	0.297	186
SPB24-04	SPB24-05	SMB24-04	SMB24-05	30.0	7,572.3	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.58	-0.65	1.41	1.72	1.34	1.72	1.99	2.37	1.00	1.05	0.297	186
SPB24-05	SPB24-06	SMB24-05	SMB24-06	30.0	7,602.3	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.65	-0.72	1.72	2.07	1.72	2.14	2.37	2.79	1.00	1.05	0.297	186
SPB24-06	SPB24-07	SMB24-06	SMB24-07	20.1	7,622.4	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.72	-0.77	2.07	2.20	2.14	2.32	2.79	2.97	1.00	1.05	0.297	186
SPB24-07	SPB24-08	SMB24-07	SMB24-08	35.0	7,657.4	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.77	-0.85	2.20	2.39	2.32	2.59	2.97	3.24	1.00	1.05	0.297	186
SPB24-08	SPB24-09	SMB24-08	SMB24-09	30.0	7,687.4	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.85	-0.92	2.39	2.56	2.59	2.83	3.24	3.48	1.00	1.05	0.297	186
SPB24-09	SPB24-10	SMB24-09	SMB24-10	30.0	7,717.4	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.92	-0.99	2.56	2.49	2.83	2.83	3.48	3.48	1.00	1.05	0.297	186
SPB24-10	SPB24-11	SMB24-10	SMB24-11	30.0	7,747.4	0.104	REPLACEMENT	600	RC	GRAVITY	2.30	-0.99	-1.06	2.49	2.34	2.83	2.75	3.48	3.40	1.00	1.05	0.297	186
SPB24-11	SPB24-12	SMB24-11	SMB24-12	27.0	7,774.4	0.105	REPLACEMENT	600	RC	GRAVITY	2.30	-1.06	-1.12	2.34	2.20	2.75	2.67	3.40	3.32	1.00	1.05	0.297	183
SPB24-12	SPB24-13	SMB24-12	SMB24-13	35.0	7,809.4	0.105	REPLACEMENT	600	RC	GRAVITY	2.30	-1.12	-1.20	2.20	2.41	2.67	2.96	3.32	3.61	1.00	1.05	0.297	183
SPB24-13	SPB25-01	SMB24-13	SMB25-01	30.5	7,839.9	0.105	REPLACEMENT	600	RC	GRAVITY	2.30	-1.20	-1.27	2.41	2.60	2.96	3.22	3.61	4.07	1.00	1.05	0.297	183
INFLOW FROM PROPOSED SEWER (Phase 3) TO SPB25-01 VALUM : 0.014m ³ /s. Pipi : ϕ250mm. INVERT LEVEL : -0.57m																							
B-25																							
SPB25-01	SPB25-02	SMB25-01	SMB25-02	28.0	18,835.9	0.335	REPLACEMENT	800	RC	GRAVITY	1.90	-1.47	-1.52	2.60	2.44	3.20	3.09	4.07	3.96	1.00	1.15	0.579	73
SPB25-02	SPB25-03	SMB25-02	SMB25-03	28.0	18,863.9	0.335	REPLACEMENT	800	RC	GRAVITY	1.90	-1.52	-1.57	2.44	2.29	3.09	2.99	3.96	3.86	1.00	1.15	0.579	73
SPB25-03	SPB25-04	SMB25-03	SMB25-04	28.0	18,891.9	0.335	REPLACEMENT	800	RC	GRAVITY	1.90	-1.57	-1.62	2.29	2.13	2.99	2.88	3.86	3.75	1.00	1.15	0.579	73
SPB25-04	SPB25-05	SMB25-04	SMB25-05	28.0	18,919.9	0.336	REPLACEMENT	800	RC	GRAVITY	1.90	-1.62	-1.67	2.13	2.10	2.88	2.90	3.75	3.77	1.00	1.15	0.579	73
SPB25-05	SPB25-06	SMB25-05	SMB25-06	28.0	18,947.9	0.336	REPLACEMENT	800	RC	GRAVITY	1.90	-1.67	-1.72	2.10	2.10	2.90	2.95	3.77	3.82	1.00	1.15	0.579	73
SPB25-06	SPB25-07	SMB25-06	SMB25-07	26.3	18,974.2	0.336	REPLACEMENT	800	RC	GRAVITY	1.90	-1.72	-1.77	2.10	2.10	2.95	3.00	3.82	3.87	1.00	1.15	0.579	73
SPB25-07	SPB25-08	SMB25-07	SMB25-08	35.0	19,009.2	0.337	REPLACEMENT	800	RC	GRAVITY	1.90	-1.77	-1.84	2.10	2.10	3.00	3.07	3.87	3.94	1.00	1.15	0.579	72
SPB25-08	SPB25-09	SMB25-08	SMB25-09	35.0	19,044.2	0.337	REPLACEMENT	800	RC	GRAVITY	1.90	-1.84	-1.91	2.10	2.10	3.07	3.14	3.94	4.01	1.00	1.15	0.579	72
SPB25-09	SPB25-10	SMB25-09	SMB25-10	35.0	19,079.2	0.337	REPLACEMENT	800	RC	GRAVITY	1.90	-1.91	-1.98	2.10	2.10	3.14	3.21	4.01	4.08	1.00	1.15	0.579	72
SPB25-10	SPB25-11	SMB25-10	SMB25-11	35.0	19,114.2	0.338	REPLACEMENT	800	RC	GRAVITY	1.90	-1.98	-2.05	2.10	2.07	3.21	3.25	4.08	4.12	1.00	1.15	0.579	72
SPB25-11	SPB25-12	SMB25-11	SMB25-12	35.0	19,149.2	0.338	REPLACEMENT	800	RC	GRAVITY	1.90	-2.05	-2.12	2.07	2.03	3.25	3.28	4.12	4.15	1.00	1.15	0.579	72
SPB25-12	SPB25-13	SMB25-12	SMB25-13	35.0	19,184.2	0.338	REPLACEMENT	800	RC	GRAVITY	1.90	-2.12	-2.19	2.03	1.99	3.28	3.31	4.15	4.18	1.00	1.15	0.579	72
SPB25-13	SPB25-14	SMB25-13	SMB25-14	35.0	19,219.2	0.339	REPLACEMENT	800	RC	GRAVITY	1.90	-2.19	-2.26	1.99	1.96	3.31	3.35	4.18	4.22	1.00	1.15	0.579	71
SPB25-14	SPB25-15	SMB25-14	SMB25-15	35.0	19,254.2	0.339	REPLACEMENT	800	RC	GRAVITY	1.90	-2.26	-2.33	1.96	1.92	3.35	3.38	4.22	4.25	1.00	1.15	0.579	71
SPB25-15	SPB25-16	SMB25-15	SMB25-16	26.3	19,245.5	0.339	REPLACEMENT	800	RC	GRAVITY	1.90	-2.33	-2.38	1.92	1.94	3.38	3.45	4.25	4.32	1.00	1.15	0.579	71
SPB25-16	SPB25-17	SMB25-16	SMB25-17	22.0	19,276.2	0.339	REPLACEMENT	800	RC	GRAVITY	1.90	-2.38	-2.42	1.94	2.01	3.45	3.56	4.32	4.43	1.00	1.15	0.579	71
SPB25-17	SPB25-18	SMB25-17	SMB25-18	21.7	19,297.9	0.340	REPLACEMENT	800	RC	GRAVITY	1.90	-2.42	-2.46	2.01	2.09	3.56	3.68	4.43	4.55	1.00	1.15	0.579	71
SPB25-18	SPB25-19	SMB25-18	SMB25-19	31.0	19,328.9	0.340	REPLACEMENT	800	RC	GRAVITY	1.90	-2.46	-2.52	2.09	2.20	3.68	3.85	4.55	4.72	1.00	1.15	0.579	71
SPB25-19	SPB25-20	SMB25-19	SMB25-20	31.0	19,359.9	0.340	REPLACEMENT	800	RC	GRAVITY	1.90	-2.52	-2.58	2.20	2.40	3.85	4.11	4.72	4.98	1.00	1.15	0.579	71
SPB25-20	SPB25-21	SMB25-20	SMB25-21	31.0	19,390.9	0.340	REPLACEMENT	800	RC	GRAVITY	1.90	-2.58	-2.64	2.40	2.60	4.11	4.37	4.98	5.24	1.00	1.15	0.579	71
SPB25-21	SPC18-01	SMB25-21	SMC18-01	31.3	19,422.2	0.341	REPLACEMENT	800	RC	GRAVITY	1.90	-2.64	-2.70	2.60	2.80	4.37	4.63	5.24	5.70	1.00	1.15	0.579	70
INFLOW TO SPC18-01																							

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-1																							
SPC1-01	SPC1-02	SMC1-01	SMC1-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	2.89	2.82	4.60	4.80	1.50	1.77	1.71	1.98	1.00	0.61	0.020	1900
SPC1-02	SPC1-03	SMC1-02	SMC1-03	35.0	70.0	0.001	NEW	200	PVC	GRAVITY	2.00	2.82	2.75	4.80	5.00	1.77	2.04	1.98	2.25	1.00	0.61	0.020	1900
SPC1-03	SPC1-04	SMC1-03	SMC1-04	35.0	105.0	0.002	NEW	200	PVC	GRAVITY	2.00	2.75	2.68	5.00	5.05	2.04	2.16	2.25	2.37	1.00	0.61	0.020	900
SPC1-04	SPC1-05	SMC1-04	SMC1-05	35.0	140.0	0.002	NEW	200	PVC	GRAVITY	2.00	2.68	2.61	5.05	5.10	2.16	2.28	2.37	2.49	1.00	0.61	0.020	900
SPC1-05	SPC1-06	SMC1-05	SMC1-06	35.0	175.0	0.003	NEW	200	PVC	GRAVITY	2.00	2.61	2.54	5.10	4.75	2.28	2.00	2.49	2.21	1.00	0.61	0.020	567
SPC1-06	SPC1-07	SMC1-06	SMC1-07	35.0	210.0	0.003	NEW	200	PVC	GRAVITY	2.00	2.54	2.47	4.75	4.40	2.00	1.72	2.21	1.93	1.00	0.61	0.020	567
SPC1-07	SPC1-08	SMC1-07	SMC1-08	35.0	245.0	0.003	NEW	200	PVC	GRAVITY	2.00	2.47	2.40	4.40	4.15	1.72	1.54	1.93	1.75	1.00	0.61	0.020	567
SPC1-08	SPC1-09	SMC1-08	SMC1-09	33.7	278.7	0.004	NEW	200	PVC	GRAVITY	2.00	2.40	2.33	4.15	3.90	1.54	1.36	1.75	1.57	1.00	0.61	0.020	400
SPC1-09	SPC1-10	SMC1-09	SMC1-10	35.0	313.7	0.004	NEW	200	PVC	GRAVITY	2.00	2.33	2.26	3.90	4.00	1.36	1.53	1.57	1.74	1.00	0.61	0.020	400
SPC1-10	SPC1-11	SMC1-10	SMC1-11	35.0	348.7	0.005	NEW	200	PVC	GRAVITY	2.00	2.26	2.19	4.00	4.10	1.53	1.70	1.74	1.91	1.00	0.61	0.020	300
SPC1-11	SPC1-12	SMC1-11	SMC1-12	35.0	383.7	0.005	NEW	200	PVC	GRAVITY	2.00	2.19	2.12	4.10	4.25	1.70	1.92	1.91	2.13	1.00	0.61	0.020	300
SPC1-12	SPC1-13	SMC1-12	SMC1-13	35.0	418.7	0.006	NEW	200	PVC	GRAVITY	2.00	2.12	2.05	4.25	4.40	1.92	2.14	2.13	2.35	1.00	0.61	0.020	234
SPC1-13	SPC1-14	SMC1-13	SMC1-14	35.0	453.7	0.006	NEW	200	PVC	GRAVITY	2.00	2.05	1.98	4.40	4.60	2.14	2.41	2.35	2.62	1.00	0.61	0.020	234
SPC1-14	SPC1-15	SMC1-14	SMC1-15	35.0	488.7	0.006	NEW	200	PVC	GRAVITY	2.00	1.98	1.91	4.60	4.80	2.41	2.68	2.62	2.89	1.00	0.61	0.020	234
SPC1-15	SPC1-16	SMC1-15	SMC1-16	35.0	523.7	0.007	NEW	200	PVC	GRAVITY	2.00	1.91	1.84	4.80	4.95	2.68	2.90	2.89	3.11	1.00	0.61	0.020	186
SPC1-16	SPC1-17	SMC1-16	SMC1-17	35.0	558.7	0.007	NEW	200	PVC	GRAVITY	2.00	1.84	1.77	4.95	5.10	2.90	3.12	3.11	3.33	1.00	0.61	0.020	186
SPC1-17	SPC1-18	SMC1-17	SMC1-18	35.0	593.7	0.008	NEW	200	PVC	GRAVITY	2.00	1.77	1.70	5.10	5.10	3.12	3.19	3.33	3.40	1.00	0.61	0.020	150
SPC1-18	SPC3-01	SMC1-18	SMC3-01	34.4	628.1	0.008	NEW	200	PVC	GRAVITY	2.00	1.70	1.63	5.10	5.10	3.19	3.26	3.40	3.52	1.00	0.61	0.020	150
C-2																							
SPC2-01	SPC2-02	SMC2-01	SMC2-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	3.59	3.52	5.60	5.55	1.80	1.82	2.01	2.03	1.00	0.61	0.020	1900
SPC2-02	SPC2-03	SMC2-02	SMC2-03	35.0	70.0	0.001	NEW	200	PVC	GRAVITY	2.00	3.52	3.45	5.55	5.50	1.82	1.84	2.03	2.05	1.00	0.61	0.020	1900
SPC2-03	SPC2-04	SMC2-03	SMC2-04	35.0	105.0	0.002	NEW	200	PVC	GRAVITY	2.00	3.45	3.38	5.50	5.40	1.84	1.81	2.05	2.02	1.00	0.61	0.020	900
SPC2-04	SPC2-05	SMC2-04	SMC2-05	35.0	140.0	0.002	NEW	200	PVC	GRAVITY	2.00	3.38	3.31	5.40	5.30	1.81	1.78	2.02	1.99	1.00	0.61	0.020	900
SPC2-05	SPC2-06	SMC2-05	SMC2-06	35.0	175.0	0.003	NEW	200	PVC	GRAVITY	2.00	3.31	3.24	5.30	5.20	1.78	1.75	1.99	1.96	1.00	0.61	0.020	567
SPC2-06	SPC3-01	SMC2-06	SMC3-01	35.0	210.0	0.003	NEW	200	PVC	GRAVITY	2.00	3.24	3.17	5.20	5.10	1.75	1.72	1.96	3.52	1.00	0.61	0.020	567
C-3																							
SPC3-01	SPC3-02	SMC3-01	SMC3-02	35.0	105.0	0.011	NEW	250	PVC	GRAVITY	1.70	1.58	1.52	5.10	4.95	3.26	3.17	3.52	3.43	1.00	0.66	0.033	200
SPC3-02	SPC3-03	SMC3-02	SMC3-03	35.0	140.0	0.011	NEW	250	PVC	GRAVITY	1.70	1.52	1.46	4.95	4.80	3.17	3.08	3.43	3.34	1.00	0.66	0.033	200
SPC3-03	SPC3-04	SMC3-03	SMC3-04	35.0	175.0	0.011	NEW	250	PVC	GRAVITY	1.70	1.46	1.40	4.80	4.50	3.08	2.84	3.34	3.10	1.00	0.66	0.033	200
SPC3-04	SPC3-05	SMC3-04	SMC3-05	35.0	210.0	0.012	NEW	250	PVC	GRAVITY	1.70	1.40	1.34	4.50	4.20	2.84	2.60	3.10	2.86	1.00	0.66	0.033	175
SPC3-05	SPC3-06	SMC3-05	SMC3-06	35.0	245.0	0.012	NEW	250	PVC	GRAVITY	1.70	1.34	1.28	4.20	3.90	2.60	2.36	2.86	2.62	1.00	0.66	0.033	175
SPC3-06	SPC3-07	SMC3-06	SMC3-07	35.0	280.0	0.012	NEW	250	PVC	GRAVITY	1.70	1.28	1.22	3.90	3.60	2.36	2.12	2.62	2.38	1.00	0.66	0.033	175
SPC3-07	SPC3-08	SMC3-07	SMC3-08	35.0	315.0	0.012	NEW	250	PVC	GRAVITY	1.70	1.22	1.16	3.60	3.50	2.12	2.08	2.38	2.34	1.00	0.66	0.033	175
SPC3-08	SPC5-01	SMC3-08	SMC5-01	35.0	350.0	0.013	NEW	250	PVC	GRAVITY	1.70	1.16	1.10	3.50	3.40	2.08	2.04	2.34	4.43	1.00	0.66	0.033	154

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-4																							
SPC4-01	SPC4-02	SMC4-01	SMC4-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	2.55	2.48	4.90	4.60	2.08	1.85	2.35	2.12	1.00	0.61	0.020	1900
SPC4-02	SPC4-03	SMC4-02	SMC4-03	35.0	70.0	0.002	NEW	200	PVC	GRAVITY	2.00	2.48	2.41	4.60	4.30	1.85	1.62	2.12	1.89	1.00	0.61	0.020	900
SPC4-03	SPC4-04	SMC4-03	SMC4-04	35.0	105.0	0.002	NEW	200	PVC	GRAVITY	2.00	2.41	2.34	4.30	4.05	1.62	1.44	1.89	1.71	1.00	0.61	0.020	900
SPC4-04	SPC4-05	SMC4-04	SMC4-05	35.0	140.0	0.003	NEW	200	PVC	GRAVITY	2.00	2.34	2.27	4.05	3.80	1.44	1.26	1.71	1.53	1.00	0.61	0.020	567
SPC4-05	SPC4-06	SMC4-05	SMC4-06	35.0	175.0	0.004	NEW	200	PVC	GRAVITY	2.00	2.27	2.20	3.80	3.60	1.26	1.13	1.53	1.40	1.00	0.61	0.020	400
SPC4-06	SPC5-01	SMC4-06	SMC5-01	35.0	210.0	0.004	NEW	200	PVC	GRAVITY	2.00	2.20	2.13	3.60	3.40	1.13	1.00	1.40	4.43	1.00	0.61	0.020	400
INFLOW FROM PROPOSED SEWER (Phase 3) TO SPC5-01 VALUM : 0.0140m ³ /s, Pipi : ϕ250mm, INVERT LEVEL : -0.88m																							
C-5																							
SPC5-01	SPC5-02	SMC5-01	SMC5-02	35.0	1.365.0	0.030	NEW	400	PVC	GRAVITY	1.10	-1.03	-1.07	3.40	3.35	4.01	4.00	4.43	4.42	1.00	0.72	0.091	204
SPC5-02	SPC5-03	SMC5-02	SMC5-03	35.0	1.400.0	0.031	NEW	400	PVC	GRAVITY	1.10	-1.07	-1.11	3.35	3.30	4.00	3.99	4.42	4.41	1.00	0.72	0.091	194
SPC5-03	SPC5-04	SMC5-03	SMC5-04	35.0	1.435.0	0.031	NEW	400	PVC	GRAVITY	1.10	-1.11	-1.15	3.30	3.20	3.99	3.93	4.41	4.35	1.00	0.72	0.091	194
SPC5-04	SPC5-05	SMC5-04	SMC5-05	35.0	1.470.0	0.032	NEW	400	PVC	GRAVITY	1.10	-1.15	-1.19	3.20	3.10	3.93	3.87	4.35	4.29	1.00	0.72	0.091	185
SPC5-05	SPC5-06	SMC5-05	SMC5-06	35.0	1.505.0	0.033	NEW	400	PVC	GRAVITY	1.10	-1.19	-1.23	3.10	3.10	3.87	3.91	4.29	4.33	1.00	0.72	0.091	176
SPC5-06	SPC5-07	SMC5-06	SMC5-07	35.0	1.540.0	0.033	NEW	400	PVC	GRAVITY	1.10	-1.23	-1.27	3.10	3.10	3.91	3.95	4.33	4.37	1.00	0.72	0.091	176
SPC5-07	SPC5-08	SMC5-07	SMC5-08	35.0	1.575.0	0.034	NEW	400	PVC	GRAVITY	1.10	-1.27	-1.31	3.10	3.15	3.95	4.04	4.37	4.46	1.00	0.72	0.091	168
SPC5-08	SPC5-09	SMC5-08	SMC5-09	35.0	1.610.0	0.034	NEW	400	PVC	GRAVITY	1.10	-1.31	-1.35	3.15	3.20	4.04	4.13	4.46	4.55	1.00	0.72	0.091	168
SPC5-09	SPC5-10	SMC5-09	SMC5-10	35.0	1.645.0	0.035	NEW	400	PVC	GRAVITY	1.10	-1.35	-1.39	3.20	3.10	4.13	4.07	4.55	4.49	1.00	0.72	0.091	160
SPC5-10	SPC11-01	SMC5-10	SMC11-01	35.0	1.680.0	0.036	NEW	400	PVC	GRAVITY	1.10	-1.39	-1.43	3.10	3.00	4.07	4.01	4.49	4.53	1.00	0.72	0.091	153
C-6																							
SPC6-01	SPC6-02	SMC6-01	SMC6-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	1.69	1.62	4.90	4.95	3.00	3.12	3.21	3.33	1.00	0.61	0.020	1900
SPC6-02	SPC6-03	SMC6-02	SMC6-03	35.0	70.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.62	1.55	4.95	5.00	3.12	3.24	3.33	3.45	1.00	0.61	0.020	900
SPC6-03	SPC6-04	SMC6-03	SMC6-04	35.0	105.0	0.002	NEW	200	PVC	GRAVITY	2.00	1.55	1.48	5.00	5.00	3.24	3.31	3.45	3.52	1.00	0.61	0.020	900
SPC6-04	SPC6-05	SMC6-04	SMC6-05	35.0	140.0	0.003	NEW	200	PVC	GRAVITY	2.00	1.48	1.41	5.00	5.00	3.31	3.38	3.52	3.59	1.00	0.61	0.020	567
SPC6-05	SPC6-06	SMC6-05	SMC6-06	35.0	175.0	0.004	NEW	200	PVC	GRAVITY	2.00	1.41	1.34	5.00	4.80	3.38	3.25	3.59	3.46	1.00	0.61	0.020	400
SPC6-06	SPC6-07	SMC6-06	SMC6-07	35.0	210.0	0.004	NEW	200	PVC	GRAVITY	2.00	1.34	1.27	4.80	4.60	3.25	3.12	3.46	3.33	1.00	0.61	0.020	400
SPC6-07	SPC6-08	SMC6-07	SMC6-08	35.0	245.0	0.005	NEW	200	PVC	GRAVITY	2.00	1.27	1.20	4.60	4.65	3.12	3.24	3.33	3.45	1.00	0.61	0.020	300
SPC6-08	SPC6-09	SMC6-08	SMC6-09	35.0	280.0	0.005	NEW	200	PVC	GRAVITY	2.00	1.20	1.13	4.65	4.70	3.24	3.36	3.45	3.57	1.00	0.61	0.020	300
SPC6-09	SPC6-10	SMC6-09	SMC6-10	35.0	315.0	0.006	NEW	200	PVC	GRAVITY	2.00	1.13	1.06	4.70	4.55	3.36	3.28	3.57	3.49	1.00	0.61	0.020	234
SPC6-10	SPC6-11	SMC6-10	SMC6-11	35.0	350.0	0.007	NEW	200	PVC	GRAVITY	2.00	1.06	0.99	4.55	4.40	3.28	3.20	3.49	3.41	1.00	0.61	0.020	186
SPC6-11	SPC6-12	SMC6-11	SMC6-12	35.0	385.0	0.007	NEW	200	PVC	GRAVITY	2.00	0.99	0.92	4.40	4.35	3.20	3.22	3.41	3.43	1.00	0.61	0.020	186
SPC6-12	SPC6-13	SMC6-12	SMC6-13	35.0	420.0	0.008	NEW	200	PVC	GRAVITY	2.00	0.92	0.85	4.35	4.30	3.22	3.24	3.43	3.45	1.00	0.61	0.020	150
SPC6-13	SPC6-14	SMC6-13	SMC6-14	35.0	455.0	0.008	NEW	200	PVC	GRAVITY	2.00	0.85	0.78	4.30	4.10	3.24	3.11	3.45	3.32	1.00	0.61	0.020	150
SPC6-14	SPC6-15	SMC6-14	SMC6-15	35.0	490.0	0.009	NEW	200	PVC	GRAVITY	2.00	0.78	0.71	4.10	3.90	3.11	2.98	3.32	3.19	1.00	0.61	0.020	123
SPC6-15	SPC6-16	SMC6-15	SMC6-16	25.0	515.0	0.009	NEW	200	PVC	GRAVITY	2.00	0.71	0.66	3.90	3.90	2.98	3.03	3.19	3.24	1.00	0.61	0.020	123
SPC6-16	SPC6-17	SMC6-16	SMC6-17	25.0	540.0	0.010	NEW	200	PVC	GRAVITY	2.00	0.66	0.61	3.90	3.90	3.03	3.08	3.24	3.29	1.00	0.61	0.020	100
SPC6-17	SPC8-01	SMC6-17	SMC8-01	25.0	565.0	0.010	NEW	200	PVC	GRAVITY	2.00	0.61	0.56	3.90	3.90	3.08	3.13	3.29	3.44	1.00	0.61	0.020	100

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-7																							
SPC7-01	SPC7-02	SMC7-01	SMC7-02	35.0	35.0	0.001	NEW	200	PVC	GRAVITY	2.00	2.09	2.02	5.30	5.20	3.00	2.97	3.21	3.18	1.00	0.61	0.020	1900
SPC7-02	SPC7-03	SMC7-02	SMC7-03	35.0	70.0	0.002	NEW	200	PVC	GRAVITY	2.00	2.02	1.95	5.20	5.10	2.97	2.94	3.18	3.15	1.00	0.61	0.020	900
SPC7-03	SPC7-04	SMC7-03	SMC7-04	35.0	105.0	0.003	NEW	200	PVC	GRAVITY	2.00	1.95	1.88	5.10	4.75	2.94	2.66	3.15	2.87	1.00	0.61	0.020	567
SPC7-04	SPC7-05	SMC7-04	SMC7-05	35.0	140.0	0.003	NEW	200	PVC	GRAVITY	2.00	1.88	1.81	4.75	4.40	2.66	2.38	2.87	2.59	1.00	0.61	0.020	567
SPC7-05	SPC7-06	SMC7-05	SMC7-06	35.0	175.0	0.004	NEW	200	PVC	GRAVITY	2.00	1.81	1.74	4.40	4.25	2.38	2.30	2.59	2.51	1.00	0.61	0.020	400
SPC7-06	SPC7-07	SMC7-06	SMC7-07	35.0	210.0	0.005	NEW	200	PVC	GRAVITY	2.00	1.74	1.67	4.25	4.10	2.30	2.22	2.51	2.43	1.00	0.61	0.020	300
SPC7-07	SPC7-08	SMC7-07	SMC7-08	35.0	245.0	0.005	NEW	200	PVC	GRAVITY	2.00	1.67	1.60	4.10	3.90	2.22	2.09	2.43	2.30	1.00	0.61	0.020	300
SPC7-08	SPC7-09	SMC7-08	SMC7-09	35.0	280.0	0.006	NEW	200	PVC	GRAVITY	2.00	1.60	1.53	3.90	3.70	2.09	1.96	2.30	2.17	1.00	0.61	0.020	234
SPC7-09	SPC7-10	SMC7-09	SMC7-10	35.0	315.0	0.007	NEW	200	PVC	GRAVITY	2.00	1.53	1.46	3.70	3.80	1.96	2.13	2.17	2.34	1.00	0.61	0.020	186
SPC7-10	SPC8-01	SMC7-10	SMC8-01	35.0	350.0	0.007	NEW	200	PVC	GRAVITY	2.00	1.46	1.39	3.80	3.90	2.13	2.30	2.34	3.44	1.00	0.61	0.020	186
C-8																							
SPC8-01	SPC8-02	SMC8-01	SMC8-02	35.0	105.0	0.018	NEW	300	PVC	GRAVITY	1.50	0.46	0.41	3.90	3.80	3.13	3.08	3.44	3.39	1.00	0.69	0.049	173
SPC8-02	SPC8-03	SMC8-02	SMC8-03	35.0	140.0	0.018	NEW	300	PVC	GRAVITY	1.50	0.41	0.36	3.80	3.70	3.08	3.03	3.39	3.34	1.00	0.69	0.049	173
SPC8-03	SPC8-04	SMC8-03	SMC8-04	30.1	170.1	0.018	NEW	300	PVC	GRAVITY	1.50	0.36	0.31	3.70	3.93	3.03	3.31	3.34	3.62	1.00	0.69	0.049	173
SPC8-04	SPC8-05	SMC8-04	SMC8-05	35.0	205.1	0.019	NEW	300	PVC	GRAVITY	1.50	0.31	0.26	3.93	4.20	3.31	3.63	3.62	3.94	1.00	0.69	0.049	158
SPC8-05	SPC8-06	SMC8-05	SMC8-06	35.0	240.1	0.019	NEW	300	PVC	GRAVITY	1.50	0.26	0.21	4.20	3.85	3.63	3.33	3.94	3.64	1.00	0.69	0.049	158
SPC8-06	SPC8-07	SMC8-06	SMC8-07	35.0	275.1	0.020	NEW	300	PVC	GRAVITY	1.50	0.21	0.16	3.85	3.50	3.33	3.03	3.64	3.34	1.00	0.69	0.049	145
SPC8-07	SPC8-08	SMC8-07	SMC8-08	35.0	310.1	0.020	NEW	300	PVC	GRAVITY	1.50	0.16	0.11	3.50	3.35	3.03	2.93	3.34	3.24	1.00	0.69	0.049	145
SPC8-08	SPC8-09	SMC8-08	SMC8-09	35.0	345.1	0.021	NEW	300	PVC	GRAVITY	1.50	0.11	0.06	3.35	3.20	2.93	2.83	3.24	3.14	1.00	0.69	0.049	134
SPC8-09	SPC8-10	SMC8-09	SMC8-10	35.0	380.1	0.021	NEW	300	PVC	GRAVITY	1.50	0.06	0.01	3.20	3.20	2.83	2.88	3.14	3.19	1.00	0.69	0.049	134
SPC8-10	SPC10-01	SMC8-10	SMC10-01	35.0	415.1	0.022	NEW	300	PVC	GRAVITY	1.50	0.01	-0.04	3.20	3.20	2.88	2.93	3.19	3.24	1.00	0.69	0.049	123
C-9																							
SPC9-01	SPC9-02	SMC9-01	SMC9-02	35.0	35.0	0.002	NEW	200	PVC	GRAVITY	2.00	0.49	0.42	3.50	3.40	2.80	2.77	3.01	2.98	1.00	0.61	0.020	900
SPC9-02	SPC9-03	SMC9-02	SMC9-03	35.0	70.0	0.003	NEW	200	PVC	GRAVITY	2.00	0.42	0.35	3.40	3.30	2.77	2.74	2.98	2.95	1.00	0.61	0.020	567
SPC9-03	SPC9-04	SMC9-03	SMC9-04	35.0	105.0	0.004	NEW	200	PVC	GRAVITY	2.00	0.35	0.28	3.30	3.25	2.74	2.76	2.95	2.97	1.00	0.61	0.020	400
SPC9-04	SPC10-01	SMC9-04	SMC10-01	35.0	140.0	0.005	NEW	200	PVC	GRAVITY	2.00	0.28	0.21	3.25	3.20	2.76	2.78	2.97	3.24	1.00	0.61	0.020	300
C-10																							
SPC10-01	SPC10-02	SMC10-01	SMC10-02	22.4	162.4	0.027	NEW	300	PVC	GRAVITY	1.50	-0.04	-0.07	3.20	3.24	2.93	3.00	3.24	3.31	1.00	0.69	0.049	82
SPC10-02	SPC10-03	SMC10-02	SMC10-03	30.0	192.4	0.027	NEW	300	PVC	GRAVITY	1.50	-0.07	-0.12	3.24	3.29	3.00	3.10	3.31	3.41	1.00	0.69	0.049	82
SPC10-03	SPC10-04	SMC10-03	SMC10-04	30.0	222.4	0.027	NEW	300	PVC	GRAVITY	1.50	-0.12	-0.17	3.29	3.22	3.10	3.08	3.41	3.39	1.00	0.69	0.049	82
SPC10-04	SPC10-05	SMC10-04	SMC10-05	30.0	252.4	0.027	NEW	300	PVC	GRAVITY	1.50	-0.17	-0.22	3.22	3.11	3.08	3.02	3.39	3.33	1.00	0.69	0.049	82
SPC10-05	SPC11-01	SMC10-05	SMC11-01	30.0	282.4	0.027	NEW	300	PVC	GRAVITY	1.50	-0.22	-0.27	3.11	3.00	3.02	2.96	3.33	4.53	1.00	0.69	0.049	82

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-11																							
SPC11-01	SPC11-02	SMC11-01	SMC11-02	35.0	1,562.4	0.063	NEW	500	PVC	GRAVITY	1.00	-1.53	-1.57	3.00	2.90	3.52	3.46	4.53	4.47	1.00	0.80	0.158	151
SPC11-02	SPC11-03	SMC11-02	SMC11-03	35.0	1,597.4	0.063	NEW	500	PVC	GRAVITY	1.00	-1.57	-1.61	2.90	2.80	3.46	3.40	4.47	4.41	1.00	0.80	0.158	151
SPC11-03	SPC11-04	SMC11-03	SMC11-04	30.0	1,627.4	0.064	NEW	500	PVC	GRAVITY	1.00	-1.61	-1.64	2.80	2.90	3.40	3.53	4.41	4.54	1.00	0.80	0.158	147
SPC11-04	SPC11-05	SMC11-04	SMC11-05	30.0	1,657.4	0.064	NEW	500	PVC	GRAVITY	1.00	-1.64	-1.67	2.90	3.00	3.53	3.66	4.54	4.67	1.00	0.80	0.158	147
SPC11-05	SPC11-06	SMC11-05	SMC11-06	30.0	1,687.4	0.065	NEW	500	PVC	GRAVITY	1.00	-1.67	-1.70	3.00	3.00	3.66	3.69	4.67	4.70	1.00	0.80	0.158	144
SPC11-06	SPC11-07	SMC11-06	SMC11-07	32.0	1,719.4	0.066	NEW	500	PVC	GRAVITY	1.00	-1.70	-1.73	3.00	3.00	3.69	3.72	4.70	4.73	1.00	0.80	0.158	140
SPC11-07		SMC11-07	PS BOUSTANE	11.9	1,731.3	0.066	NEW	500	PVC	GRAVITY	1.00	-1.73	-1.74	3.00	3.00	3.72	3.73	4.73	4.74	1.00	0.80	0.158	140
INFLOW FROM C-11 TO PS BOUSTANE																							
C-12																							
SPC12-01	SPC12-02	SMC12-01	SMC12-02	15.6	1,578.0	0.066	NEW	300	DCIP	FORCE MAIN	-0.06	1.49	2.49	2.80	3.80	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-02	SPC12-03	SMC12-02	SMC12-03	20.7	1,598.7	0.066	NEW	300	DCIP	FORCE MAIN	-0.01	2.49	2.64	3.80	3.95	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-03	SPC12-04	SMC12-03	SMC12-04	35.0	1,633.7	0.066	NEW	300	DCIP	FORCE MAIN	-0.01	2.64	2.90	3.95	4.21	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-04	SPC12-05	SMC12-04	SMC12-05	35.0	1,668.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	2.90	2.99	4.21	4.30	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-05	SPC12-06	SMC12-05	SMC12-06	35.0	1,703.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	2.99	2.99	4.30	4.30	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-06	SPC12-07	SMC12-06	SMC12-07	35.0	1,738.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	2.99	2.99	4.30	4.30	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-07	SPC12-08	SMC12-07	SMC12-08	32.0	1,770.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	2.99	3.07	4.30	4.38	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-08	SPC12-09	SMC12-08	SMC12-09	31.1	1,801.8	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.07	3.16	4.38	4.47	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-09	SPC12-10	SMC12-09	SMC12-10	30.0	1,831.8	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.16	3.25	4.47	4.56	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-10	SPC12-11	SMC12-10	SMC12-11	30.0	1,861.8	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.25	3.28	4.56	4.59	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-11	SPC12-12	SMC12-11	SMC12-12	30.9	1,892.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.28	3.25	4.59	4.56	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-12	SPC12-13	SMC12-12	SMC12-13	30.0	1,922.7	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.25	3.22	4.56	4.53	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-13	SPC12-14	SMC12-13	SMC12-14	29.9	1,952.6	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.22	3.19	4.53	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-14	SPC12-15	SMC12-14	SMC12-15	33.0	1,985.6	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.14	4.50	4.45	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-15	SPC12-16	SMC12-15	SMC12-16	33.3	2,018.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.14	3.09	4.45	4.40	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-16	SPC12-17	SMC12-16	SMC12-17	35.0	2,053.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.09	3.14	4.40	4.45	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-17	SPC12-18	SMC12-17	SMC12-18	35.0	2,088.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.14	3.19	4.45	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-18	SPC12-19	SMC12-18	SMC12-19	25.0	2,113.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.19	4.50	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-19	SPC12-20	SMC12-19	SMC12-20	25.0	2,138.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.19	4.50	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-20	SPC12-21	SMC12-20	SMC12-21	25.0	2,163.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.19	4.50	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-21	SPC12-22	SMC12-21	SMC12-22	25.0	2,188.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.19	4.50	4.50	1.00	1.00	1.31	1.31	1.00	0.94	0.067	-
SPC12-22	SPC13-01	SMC12-22	SMC13-01	35.0	2,223.9	0.066	NEW	300	DCIP	FORCE MAIN	0.00	3.19	3.19	4.50	4.50	1.00	1.00	1.31	1.51	1.00	0.94	0.067	-

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-13																							
SPC13-01	SPC13-02	SMC13-01	SMC13-02	35.0	1.613.0	0.067	NEW	500	PVC	GRAVITY	1.20	2.99	2.95	4.50	4.88	1.00	1.41	1.51	1.93	1.00	0.87	0.171	156
SPC13-02	SPC13-03	SMC13-02	SMC13-03	35.0	1.648.0	0.067	NEW	500	PVC	GRAVITY	1.20	2.75	2.71	4.88	5.04	1.61	1.81	2.13	2.33	1.00	0.87	0.171	156
SPC13-03	SPC13-04	SMC13-03	SMC13-04	25.0	1.673.0	0.068	NEW	500	PVC	GRAVITY	1.20	2.41	2.38	5.04	5.15	2.11	2.25	2.63	2.77	1.00	0.87	0.171	152
SPC13-04	SPC13-05	SMC13-04	SMC13-05	25.0	1.698.0	0.068	NEW	500	PVC	GRAVITY	1.20	1.98	1.95	5.15	5.14	2.65	2.67	3.17	3.19	1.00	0.87	0.171	152
SPC13-05	SPC13-06	SMC13-05	SMC13-06	22.9	1.720.9	0.069	NEW	500	PVC	GRAVITY	1.20	1.55	1.52	5.14	5.04	3.07	3.00	3.59	3.52	1.00	0.87	0.171	148
SPC13-06	SPC13-07	SMC13-06	SMC13-07	35.0	1.755.9	0.070	NEW	500	PVC	GRAVITY	1.20	1.12	1.08	5.04	4.89	3.40	3.29	3.92	3.81	1.00	0.87	0.171	145
SPC13-07	SPC13-08	SMC13-07	SMC13-08	35.0	1.790.9	0.071	NEW	500	PVC	GRAVITY	1.20	1.08	1.04	4.89	4.80	3.29	3.24	3.81	3.76	1.00	0.87	0.171	141
SPC13-08	SPC13-09	SMC13-08	SMC13-09	35.0	1.825.9	0.071	NEW	500	PVC	GRAVITY	1.20	1.04	1.00	4.80	4.80	3.24	3.28	3.76	3.80	1.00	0.87	0.171	141
SPC13-09	SPC14-01	SMC13-09	SMC14-01	35.0	1.860.9	0.072	NEW	500	PVC	GRAVITY	1.20	1.00	0.96	4.80	4.80	3.28	3.32	3.80	3.94	1.00	0.87	0.171	138
C-14																							
SPC14-01	SPC14-02	SMC14-01	SMC14-02	35.0	1.648.0	0.074	REPLACEMENT	600	RC	GRAVITY	1.80	0.86	0.80	4.80	4.80	3.29	3.35	3.94	4.00	1.00	0.93	0.263	256
SPC14-02	SPC14-03	SMC14-02	SMC14-03	35.0	1.683.0	0.076	REPLACEMENT	600	RC	GRAVITY	1.80	0.80	0.74	4.80	4.80	3.35	3.41	4.00	4.06	1.00	0.93	0.263	247
SPC14-03	SPC14-04	SMC14-03	SMC14-04	29.0	1.712.0	0.078	REPLACEMENT	600	RC	GRAVITY	1.80	0.74	0.69	4.80	4.85	3.41	3.51	4.06	4.16	1.00	0.93	0.263	238
SPC14-04	SPC14-05	SMC14-04	SMC14-05	29.0	1.741.0	0.080	REPLACEMENT	600	RC	GRAVITY	1.80	0.69	0.64	4.85	4.93	3.51	3.64	4.16	4.29	1.00	0.93	0.263	229
SPC14-05	SPC14-06	SMC14-05	SMC14-06	30.2	1.771.2	0.082	REPLACEMENT	600	RC	GRAVITY	1.80	0.64	0.59	4.93	5.02	3.64	3.78	4.29	4.43	1.00	0.93	0.263	221
SPC14-06	SPC14-07	SMC14-06	SMC14-07	30.0	1.801.2	0.084	REPLACEMENT	600	RC	GRAVITY	1.80	0.59	0.54	5.02	5.10	3.78	3.91	4.43	4.56	1.00	0.93	0.263	214
SPC14-07	SPC14-08	SMC14-07	SMC14-08	30.0	1.831.2	0.086	REPLACEMENT	600	RC	GRAVITY	1.80	0.54	0.49	5.10	5.03	3.91	3.89	4.56	4.54	1.00	0.93	0.263	206
SPC14-08	SPC14-09	SMC14-08	SMC14-09	35.0	1.866.2	0.088	REPLACEMENT	600	RC	GRAVITY	1.80	0.49	0.43	5.03	4.95	3.89	3.87	4.54	4.52	1.00	0.93	0.263	199
SPC14-09	SPC14-10	SMC14-09	SMC14-10	35.0	1.901.2	0.090	REPLACEMENT	600	RC	GRAVITY	1.80	0.43	0.37	4.95	4.89	3.87	3.87	4.52	4.52	1.00	0.93	0.263	193
SPC14-10	SPC14-11	SMC14-10	SMC14-11	35.0	1.936.2	0.092	REPLACEMENT	600	RC	GRAVITY	1.80	0.37	0.31	4.89	4.84	3.87	3.88	4.52	4.53	1.00	0.93	0.263	186
SPC14-11	SPC14-12	SMC14-11	SMC14-12	35.0	1.971.2	0.094	REPLACEMENT	600	RC	GRAVITY	1.80	0.31	0.25	4.84	4.80	3.88	3.90	4.53	4.55	1.00	0.93	0.263	180
SPC14-12	SPC14-13	SMC14-12	SMC14-13	28.0	1.999.2	0.096	REPLACEMENT	600	RC	GRAVITY	1.80	0.25	0.20	4.80	4.90	3.90	4.05	4.55	4.70	1.00	0.93	0.263	174
SPC14-13	SPC14-14	SMC14-13	SMC14-14	28.0	2.027.2	0.098	REPLACEMENT	600	RC	GRAVITY	1.80	0.20	0.15	4.90	5.00	4.05	4.20	4.70	4.85	1.00	0.93	0.263	169
SPC14-14	SPC15-01	SMC14-14	SMC15-01	29.0	2.056.2	0.100	REPLACEMENT	600	RC	GRAVITY	1.80	0.15	0.10	5.00	5.10	4.20	4.35	4.85	5.00	1.00	0.93	0.263	163

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	comulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-15																							
SPC15-01	SPC15-02	SMC15-01	SMC15-02	15.8	1.663.8	0.100	REPLACEMENT	600	RC	GRAVITY	1.80	0.10	0.07	5.10	4.89	4.35	4.17	5.00	4.82	1.00	0.93	0.263	163
SPC15-02	SPC15-03	SMC15-02	SMC15-03	35.0	1.698.8	0.100	REPLACEMENT	600	RC	GRAVITY	1.80	0.07	0.01	4.89	4.43	4.17	3.77	4.82	4.42	1.00	0.93	0.263	163
SPC15-03	SPC15-04	SMC15-03	SMC15-04	35.0	1.733.8	0.100	REPLACEMENT	600	RC	GRAVITY	1.80	0.01	-0.05	4.43	3.96	3.77	3.36	4.42	4.01	1.00	0.93	0.263	163
SPC15-04	SPC15-05	SMC15-04	SMC15-05	35.0	1.768.8	0.101	REPLACEMENT	600	RC	GRAVITY	1.80	-0.05	-0.11	3.96	3.59	3.36	3.05	4.01	3.70	1.00	0.93	0.263	161
SPC15-05	SPC15-06	SMC15-05	SMC15-06	35.0	1.803.8	0.101	REPLACEMENT	600	RC	GRAVITY	1.80	-0.11	-0.17	3.59	3.55	3.05	3.07	3.70	3.72	1.00	0.93	0.263	161
SPC15-06	SPC15-07	SMC15-06	SMC15-07	35.0	1.838.8	0.101	REPLACEMENT	600	RC	GRAVITY	1.80	-0.17	-0.23	3.55	3.50	3.07	3.08	3.72	3.73	1.00	0.93	0.263	161
SPC15-07	SPC15-08	SMC15-07	SMC15-08	34.6	1.873.4	0.102	REPLACEMENT	600	RC	GRAVITY	1.80	-0.23	-0.29	3.50	3.37	3.08	3.01	3.73	3.66	1.00	0.93	0.263	158
SPC15-08	SPC15-09	SMC15-08	SMC15-09	35.0	1.908.4	0.102	REPLACEMENT	600	RC	GRAVITY	1.80	-0.29	-0.35	3.37	3.22	3.01	2.92	3.66	3.57	1.00	0.93	0.263	158
SPC15-09	SPC15-10	SMC15-09	SMC15-10	35.0	1.943.4	0.102	REPLACEMENT	600	RC	GRAVITY	1.80	-0.35	-0.41	3.22	3.09	2.92	2.85	3.57	3.50	1.00	0.93	0.263	158
SPC15-10	SPC15-11	SMC15-10	SMC15-11	35.0	1.978.4	0.102	REPLACEMENT	600	RC	GRAVITY	1.80	-0.41	-0.47	3.09	3.02	2.85	2.84	3.50	3.49	1.00	0.93	0.263	158
SPC15-11	SPC15-12	SMC15-11	SMC15-12	35.0	2.013.4	0.103	REPLACEMENT	600	RC	GRAVITY	1.80	-0.47	-0.53	3.02	2.95	2.84	2.83	3.49	3.48	1.00	0.93	0.263	156
SPC15-12	SPC15-13	SMC15-12	SMC15-13	35.0	2.048.4	0.103	REPLACEMENT	600	RC	GRAVITY	1.80	-0.53	-0.59	2.95	2.88	2.83	2.82	3.48	3.47	1.00	0.93	0.263	156
SPC15-13	SPC15-14	SMC15-13	SMC15-14	35.0	2.083.4	0.103	REPLACEMENT	600	RC	GRAVITY	1.80	-0.59	-0.65	2.88	2.81	2.82	2.81	3.47	3.46	1.00	0.93	0.263	156
SPC15-14	SPC15-15	SMC15-14	SMC15-15	35.0	2.118.4	0.103	REPLACEMENT	600	RC	GRAVITY	1.80	-0.65	-0.71	2.81	2.75	2.81	2.81	3.46	3.46	1.00	0.93	0.263	156
SPC15-15	SPC15-16	SMC15-15	SMC15-16	35.0	2.153.4	0.104	REPLACEMENT	600	RC	GRAVITY	1.80	-0.71	-0.77	2.75	2.69	2.81	2.81	3.46	3.46	1.00	0.93	0.263	153
SPC15-16	SPC15-17	SMC15-16	SMC15-17	35.0	2.188.4	0.104	REPLACEMENT	600	RC	GRAVITY	1.80	-0.77	-0.83	2.69	2.64	2.81	2.82	3.46	3.47	1.00	0.93	0.263	153
SPC15-17	SPC15-18	SMC15-17	SMC15-18	27.0	2.215.4	0.104	REPLACEMENT	600	RC	GRAVITY	1.80	-0.83	-0.88	2.64	2.61	2.82	2.84	3.47	3.49	1.00	0.93	0.263	153
SPC15-18	SPC15-19	SMC15-18	SMC15-19	26.8	2.242.2	0.104	REPLACEMENT	600	RC	GRAVITY	1.80	-0.88	-0.93	2.61	2.57	2.84	2.85	3.49	3.50	1.00	0.93	0.263	153
SPC15-19	SPC15-20	SMC15-19	SMC15-20	35.0	2.277.2	0.105	REPLACEMENT	600	RC	GRAVITY	1.80	-0.93	-0.99	2.57	2.53	2.85	2.87	3.50	3.52	1.00	0.93	0.263	151
SPC15-20	SPC15-21	SMC15-20	SMC15-21	35.0	2.312.2	0.105	REPLACEMENT	600	RC	GRAVITY	1.80	-0.99	-1.05	2.53	2.48	2.87	2.88	3.52	3.53	1.00	0.93	0.263	151
SPC15-21	SPC15-22	SMC15-21	SMC15-22	33.0	2.345.2	0.105	REPLACEMENT	600	RC	GRAVITY	1.80	-1.05	-1.11	2.48	2.44	2.88	2.90	3.53	3.55	1.00	0.93	0.263	151
SPC15-22	SPC15-23	SMC15-22	SMC15-23	33.0	2.378.2	0.106	REPLACEMENT	600	RC	GRAVITY	1.80	-1.11	-1.17	2.44	2.40	2.90	2.92	3.55	3.57	1.00	0.93	0.263	149
SPC15-23	SPC15-24	SMC15-23	SMC15-24	33.0	2.411.2	0.106	REPLACEMENT	600	RC	GRAVITY	1.80	-1.17	-1.23	2.40	2.20	2.92	2.78	3.57	3.43	1.00	0.93	0.263	149
SPC15-24	SPC15-25	SMC15-24	SMC15-25	32.0	2.443.2	0.106	REPLACEMENT	600	RC	GRAVITY	1.80	-1.23	-1.29	2.20	2.00	2.78	2.64	3.43	3.29	1.00	0.93	0.263	149
SPC15-25	SPC16-01	SMC15-25	SMC16-01	32.0	2.475.2	0.106	REPLACEMENT	600	RC	GRAVITY	1.80	-1.29	-1.35	2.00	1.80	2.64	2.50	3.29	3.15	1.00	0.93	0.263	149
C-16																							
SPC16-01	SPC16-02	SMC16-01	SMC16-02	30.0	1.693.8	0.107	REPLACEMENT	600	RC	GRAVITY	1.80	-1.35	-1.40	1.80	1.90	2.50	2.65	3.15	3.30	1.00	0.93	0.263	146
SPC16-02	SPC16-03	SMC16-02	SMC16-03	30.0	1.723.8	0.107	REPLACEMENT	600	RC	GRAVITY	1.80	-1.40	-1.45	1.90	1.99	2.65	2.79	3.30	3.44	1.00	0.93	0.263	146
SPC16-03	SPC16-04	SMC16-03	SMC16-04	33.2	1.757.0	0.107	REPLACEMENT	600	RC	GRAVITY	1.80	-1.45	-1.51	1.99	2.10	2.79	2.96	3.44	3.61	1.00	0.93	0.263	146
SPC16-04	SPC16-05	SMC16-04	SMC16-05	24.0	1.781.0	0.108	REPLACEMENT	600	RC	GRAVITY	1.80	-1.51	-1.55	2.10	2.16	2.96	3.06	3.61	3.71	1.00	0.93	0.263	144
SPC16-05	SPC16-06	SMC16-05	SMC16-06	25.0	1.806.0	0.108	REPLACEMENT	600	RC	GRAVITY	1.80	-1.55	-1.60	2.16	2.23	3.06	3.18	3.71	3.83	1.00	0.93	0.263	144
SPC16-06	SPC17-01	SMC16-06	SMC17-01	25.0	1.831.0	0.108	REPLACEMENT	600	RC	GRAVITY	1.80	-1.60	-1.65	2.23	2.30	3.18	3.30	3.83	3.95	1.00	0.93	0.263	144

HYDRAULIC ANALYSIS FOR SEWER NETWORK

As of 2030, connection rate: 100%
Peak Flow : 158 l/day

Roughness	
PVC	0.010
RC	0.013

Pipe No.		Manhole No.		length (m)		Design Flow (m ³ /s)	Project Component	Diameter	Pipe Material	Types of Flow	Gradient (%)	Invert Level(m)		Ground Level(m)		Covering (m)		Manhole Depth		Design Capacity			Allowance (%)
u/s	d/s	u/s	d/s	Each	cumulative							u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	Depth Ratio d/df	
C-17																							
SPC17-01	SPC17-02	SMC17-01	SMC17-02	20.0	20.0	0.109	REPLACEMENT	600	RC	GRAVITY	1.80	-1.65	-1.69	2.30	2.30	3.30	3.34	3.95	3.99	1.00	0.93	0.263	142
SPC17-02	SPC17-03	SMC17-02	SMC17-03	20.0	40.0	0.109	REPLACEMENT	600	RC	GRAVITY	1.80	-1.69	-1.73	2.30	2.30	3.34	3.38	3.99	4.03	1.00	0.93	0.263	142
SPC17-03	SPC17-04	SMC17-03	SMC17-04	20.0	60.0	0.109	REPLACEMENT	600	RC	GRAVITY	1.80	-1.73	-1.77	2.30	2.40	3.38	3.52	4.03	4.17	1.00	0.93	0.263	142
SPC17-04	SPC17-05	SMC17-04	SMC17-05	20.0	80.0	0.109	REPLACEMENT	600	RC	GRAVITY	1.80	-1.77	-1.81	2.40	2.60	3.52	3.76	4.17	4.41	1.00	0.93	0.263	142
SPC17-05	SPC17-06	SMC17-05	SMC17-06	20.0	100.0	0.109	REPLACEMENT	600	RC	GRAVITY	1.80	-1.81	-1.85	2.60	2.80	3.76	4.00	4.41	4.65	1.00	0.93	0.263	142
SPC17-06	SPC17-07	SMC17-06	SMC17-07	30.6	130.6	0.110	REPLACEMENT	600	RC	GRAVITY	1.80	-1.85	-1.91	2.80	3.10	4.00	4.36	4.65	5.01	1.00	0.93	0.263	140
SPC17-07	SPC17-08	SMC17-07	SMC17-08	27.0	157.6	0.110	REPLACEMENT	600	RC	GRAVITY	1.80	-1.91	-1.96	3.10	3.00	4.36	4.31	5.01	4.96	1.00	0.93	0.263	140
SPC17-08	SPC17-09	SMC17-08	SMC17-09	27.0	184.6	0.110	REPLACEMENT	600	RC	GRAVITY	1.80	-1.96	-2.01	3.00	2.90	4.31	4.26	4.96	4.91	1.00	0.93	0.263	140
SPC17-09	SPC18-01	SMC17-09	SMC18-01	28.4	213.0	0.110	REPLACEMENT	600	RC	GRAVITY	1.80	-2.01	-2.06	2.90	2.80	4.26	4.21	4.91	5.70	1.00	0.93	0.263	140
C-18																							
SPC18-01	SPC18-02	SMC18-01	SMC18-02	35.0	35.0	0.451	REPLACEMENT	1,000	RC	GRAVITY	1.50	-2.90	-2.95	2.80	2.70	4.61	4.56	5.70	5.65	1.00	1.19	0.935	108
SPC18-02	SPC18-03	SMC18-02	SMC18-03	34.6	69.6	0.451	REPLACEMENT	1,000	RC	GRAVITY	1.50	-2.95	-3.00	2.70	2.60	4.56	4.51	5.65	5.60	1.00	1.19	0.935	108
SPC18-03		SMC18-03	PS NO.1 SOUTH	20.5	90.1	0.451	REPLACEMENT	1,000	RC	GRAVITY	1.50	-3.00	-3.03	2.60	2.60	4.51	4.54	5.60	5.63	1.00	1.19	0.935	108
INFLOW TO PS NO.1 SOUTH																							
C-19																							
SPC19-01	SPC19-02	PS NO.1 SOUTH	SMC19-1	2.0	2.0	0.265	New	800	RC	Gravity	0.90	-3.03	-3.03	2.90	2.60	5.03	4.73	5.93	5.63	1.00	0.80	0.403	53
SPC19-02	SPC19-03	SMC19-1	SMC19-2	14.0	16.0	0.265	New	800	RC	Gravity	0.90	-3.03	-3.05	2.60	2.80	4.73	4.95	5.63	5.85	1.00	0.80	0.403	53
SPC19-03	SPC19-04	SMC19-2	SMC19-3	49.0	65.0	0.265	New	800	RC	Gravity	0.90	-3.05	-3.10	2.80	2.95	4.95	5.15	5.85	6.05	1.00	0.80	0.403	53
SPC19-04	SPC19-05	SMC19-3	SMC19-4	49.0	114.0	0.265	New	800	RC	Gravity	0.90	-3.10	-3.15	2.95	3.10	5.15	5.35	6.05	6.25	1.00	0.80	0.403	53
SPC19-05	SPC19-06	SMC19-4	SMC19-5	49.0	163.0	0.265	New	800	RC	Gravity	0.90	-3.15	-3.20	3.10	3.50	5.35	5.80	6.25	6.70	1.00	0.80	0.403	53
SPC19-06	SPC19-07	SMC19-5	SMC19-6	47.0	210.0	0.265	New	800	RC	Gravity	0.90	-3.20	-3.25	3.50	3.10	5.80	5.45	6.70	6.35	1.00	0.80	0.403	53
SPC19-07	SPC19-08	SMC19-6	SMC19-7	47.0	257.0	0.265	New	800	RC	Gravity	0.90	-3.25	-3.30	3.10	3.30	5.45	5.70	6.35	6.60	1.00	0.80	0.403	53
SPC19-08	SPC19-09	SMC19-7	SMC19-8	47.0	304.0	0.265	New	800	RC	Gravity	0.90	-3.30	-3.35	3.30	3.00	5.70	5.45	6.60	6.35	1.00	0.80	0.403	53
SPC19-09	SPC19-10	SMC19-8	SMC19-9	47.0	351.0	0.265	New	800	RC	Gravity	0.90	-3.35	-3.40	3.00	3.00	5.45	5.50	6.35	6.40	1.00	0.80	0.403	53
SPC19-10	SPC19-11	SMC19-9	SMC19-10	20.0	371.0	0.265	New	800	RC	Gravity	0.90	-3.40	-3.42	3.00	3.00	5.50	5.52	6.40	6.42	1.00	0.80	0.403	53
SPC19-11		SMC19-10	PS NO.1 NORTH	11.0	382.0	0.265	New	800	RC	Gravity	0.90	-3.42	-3.43	3.00	3.00	5.52	5.53	6.42	6.43	1.00	0.80	0.403	53
INFLOW TO PS NO.1 NORTH																							

HYDRAULIC ANALYSIS FOR STORMWATER DRAINAGE

DRAIN DESIGNATION			Proposed Drainage														
			Size		Length	Gradient	Invert Level		Ground Level		Excavation Depth		Covering		Velocity	Discharge	
			B m	H m	L m	I	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	V m/s	Q m ³ /s	
Box Culvert No.	Manhole No.																
	u/s	d/s															
N-0					761.5												
DBN0-01	DMN0-01	DMN0-02	1.70	1.70	50.0	1600	1.80	1.77	4.90	4.70	3.10	2.93	1.10	0.93	1.11	2.90	
DBN0-02	DMN0-02	DMN0-03	1.70	1.70	62.0	1600	1.77	1.73	4.70	4.50	2.93	2.77	0.93	0.77	1.11	2.90	
DBN0-03	DMN0-03	DMN0-04	1.70	1.70	54.4	1600	1.73	1.70	4.50	4.90	2.77	3.20	0.77	1.20	1.11	2.90	
DBN0-04	DMN0-04	DMN0-05	1.70	1.70	54.4	1600	1.70	1.66	4.90	5.30	3.20	3.64	1.20	1.64	1.11	2.90	
DBN0-05	DMN0-05	DMN0-06	1.70	1.70	55.0	1600	1.66	1.63	5.30	5.20	3.64	3.57	1.64	1.57	1.11	2.90	
DBN0-06	DMN0-06	DMN0-07	1.70	1.70	55.0	1600	1.63	1.59	5.20	5.10	3.57	3.51	1.57	1.51	1.11	2.90	
DBN0-07	DMN0-07	DMN0-08	1.70	1.70	55.0	1600	1.59	1.56	5.10	4.60	3.51	3.04	1.51	1.04	1.11	2.90	
DBN0-08	DMN0-08	DMN0-09	1.70	1.70	55.0	1600	1.56	1.52	4.60	4.10	3.04	2.58	1.04	0.58	1.11	2.90	
DBN0-09	DMN0-09	DMN0-10	1.70	1.70	54.0	1600	1.52	1.49	4.10	4.10	2.58	2.61	0.58	0.61	1.11	2.90	
DBN0-10	DMN0-10	DMN0-11	1.70	1.70	56.0	1600	1.49	1.46	4.10	4.00	2.61	2.54	0.61	0.54	1.11	2.90	
DBN0-11	DMN0-11	DMN0-12	1.70	1.70	55.6	1600	1.46	1.42	4.00	4.00	2.54	2.58	0.54	0.58	1.11	2.90	
DBN0-12	DMN0-12	DMN0-13	1.70	1.70	55.0	1600	1.42	1.39	4.00	4.00	2.58	2.61	0.58	0.61	1.11	2.90	
DBN0-13	DMN0-13	DMN0-14	1.70	1.70	50.0	1600	1.39	1.36	4.00	4.00	2.61	2.64	0.61	0.64	1.11	2.90	
DBN0-14	DMN0-14	DMN1-01	1.70	1.70	50.1	1600	1.36	1.32	4.00	4.10	2.64	2.78	0.64	0.78	1.11	2.90	
N-1					568.2												
DBN1-01	DMN1-01	DMN1-02	2.00	1.80	70.0	1400	1.22	1.17	4.10	4.60	2.88	3.43	0.78	1.33	1.29	4.19	
DBN1-02	DMN1-02	DMN1-03	2.00	1.80	47.4	1400	1.17	1.14	4.60	4.90	3.43	3.76	1.33	1.66	1.29	4.19	
DBN1-03	DMN1-03	DMN1-04	2.00	1.80	51.5	1400	1.14	1.10	4.90	5.20	3.76	4.10	1.66	2.00	1.29	4.19	
DBN1-04	DMN1-04	DMN1-05	2.00	1.80	25.0	1400	1.10	1.09	5.20	5.30	4.10	4.21	2.00	2.11	1.29	4.19	
DBN1-05	DMN1-05	DMN1-06	2.00	1.80	32.8	1400	1.09	1.06	5.30	5.50	4.21	4.44	2.11	2.34	1.29	4.19	
DBN1-06	DMN1-06	DMN1-07	2.00	1.80	28.2	1400	1.06	1.04	5.50	5.60	4.44	4.56	2.34	2.46	1.29	4.19	
DBN1-07	DMN1-07	DMN1-08	2.00	1.80	29.0	1400	1.04	1.02	5.60	5.70	4.56	4.68	2.46	2.58	1.29	4.19	
DBN1-08	DMN1-08	DMN1-09	2.00	1.80	40.0	1400	1.02	0.99	5.70	5.70	4.68	4.71	2.58	2.61	1.29	4.19	
DBN1-09	DMN1-09	DMN1-10	2.00	1.80	16.3	1400	0.99	0.98	5.70	5.80	4.71	4.82	2.61	2.72	1.29	4.19	
DBN1-10	DMN1-10	DMN1-11	2.00	1.80	49.2	1400	0.98	0.95	5.80	6.00	4.82	5.05	2.72	2.95	1.29	4.19	
DBN1-11	DMN1-11	DMN1-12	2.00	1.80	62.0	1400	0.95	0.90	6.00	6.30	5.05	5.40	2.95	3.30	1.29	4.19	
DBN1-12	DMN1-12	DMN1-13	2.00	1.80	54.8	1400	0.90	0.86	6.30	6.70	5.40	5.84	3.30	3.74	1.29	4.19	
DBN1-13	DMN1-13	DMN3-01	2.00	1.80	62.0	1400	0.86	0.82	6.70	6.30	5.84	5.48	3.74	3.38	1.29	4.19	
N-2					970.5												
DBN2-01	DMN2-01	DMN2-02	1.20	1.20	47.4	1000	2.60	2.55	5.10	5.10	2.50	2.55	1.00	1.05	1.12	1.45	
DBN2-02	DMN2-02	DMN2-03	1.20	1.20	54.6	1000	2.55	2.50	5.10	5.20	2.55	2.70	1.05	1.20	1.12	1.45	
DBN2-03	DMN2-03	DMN2-04	1.20	1.20	52.0	1000	2.50	2.45	5.20	5.20	2.70	2.75	1.20	1.25	1.12	1.45	
DBN2-04	DMN2-04	DMN2-05	1.20	1.20	58.4	1000	2.45	2.39	5.20	5.20	2.75	2.81	1.25	1.31	1.12	1.45	
DBN2-05	DMN2-05	DMN2-06	1.20	1.20	54.9	1000	2.39	2.33	5.20	5.00	2.81	2.67	1.31	1.17	1.12	1.45	
DBN2-06	DMN2-06	DMN2-07	1.20	1.20	54.8	1000	2.33	2.28	5.00	4.70	2.67	2.42	1.17	0.92	1.12	1.45	
DBN2-07	DMN2-07	DMN2-08	1.20	1.20	56.0	1000	2.28	2.22	4.70	4.70	2.42	2.48	0.92	0.98	1.12	1.45	
DBN2-08	DMN2-08	DMN2-09	1.20	1.20	53.6	1000	2.22	2.17	4.70	4.70	2.48	2.53	0.98	1.03	1.12	1.45	
DBN2-09	DMN2-09	DMN2-10	1.20	1.20	52.7	1000	2.17	2.12	4.70	4.70	2.53	2.58	1.03	1.08	1.12	1.45	
DBN2-10	DMN2-10	DMN2-11	1.20	1.20	57.5	1000	2.12	2.06	4.70	4.60	2.58	2.54	1.08	1.04	1.12	1.45	
DBN2-11	DMN2-11	DMN2-12	1.20	1.20	54.0	1000	2.06	2.00	4.60	4.60	2.54	2.60	1.04	1.10	1.12	1.45	
DBN2-12	DMN2-12	DMN2-13	1.20	1.20	55.6	1000	2.00	1.95	4.60	4.50	2.60	2.55	1.10	1.05	1.12	1.45	
DBN2-13	DMN2-13	DMN2-14	1.20	1.20	54.0	1000	1.95	1.89	4.50	4.20	2.55	2.31	1.05	0.81	1.12	1.45	
DBN2-14	DMN2-14	DMN2-15	1.20	1.20	56.3	1000	1.89	1.84	4.20	3.90	2.31	2.06	0.81	0.56	1.12	1.45	
DBN2-15	DMN2-15	DMN2-16	1.20	1.20	56.3	1000	1.84	1.78	3.90	4.20	2.06	2.42	0.56	0.92	1.12	1.45	
DBN2-16	DMN2-16	DMN2-17	1.20	1.20	54.4	1000	1.78	1.73	4.20	4.40	2.42	2.67	0.92	1.17	1.12	1.45	
DBN2-17	DMN2-17	DMN2-18	1.20	1.20	48.0	1000	1.73	1.68	4.40	5.30	2.67	3.62	1.17	2.12	1.12	1.45	
DBN2-18	DMN2-18	DMN3-01	1.20	1.20	50.0	1000	1.68	1.63	5.30	6.30	3.62	4.67	2.12	3.17	1.12	1.45	

HYDRAULIC ANALYSIS FOR STORMWATER DRAINAGE

DRAIN DESIGNATION			Proposed Drainage														
			Size		Length	Gradient	Invert Level		Ground Level		Excavation Depth		Covering		Velocity	Discharge	
			B m	H m	L m	I	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	V m/s	Q m ³ /s	
Box Culvert No.	Manhole No.																
	u/s	d/s															
N-6					1265.5												
DBN6-01	DMN6-01	DMN6-02	2.70	2.60	69.8	1000	-1.35	-1.42	4.60	4.50	5.95	5.92	2.95	2.92	1.90	12.01	
DBN6-02	DMN6-02	DMN6-03	2.70	2.60	68.8	1000	-1.42	-1.49	4.50	4.30	5.92	5.79	2.92	2.79	1.90	12.01	
DBN6-03	DMN6-03	DMN6-04	2.70	2.60	66.9	1000	-1.49	-1.55	4.30	3.90	5.79	5.45	2.79	2.45	1.90	12.01	
DBN6-04	DMN6-04	DMN6-05	2.70	2.60	64.4	1000	-1.55	-1.62	3.90	3.50	5.45	5.12	2.45	2.12	1.90	12.01	
DBN6-05	DMN6-05	DMN6-06	2.70	2.60	64.9	1000	-1.62	-1.68	3.50	3.10	5.12	4.78	2.12	1.78	1.90	12.01	
DBN6-06	DMN6-06	DMN6-07	2.70	2.60	64.6	1000	-1.68	-1.75	3.10	2.50	4.78	4.25	1.78	1.25	1.90	12.01	
DBN6-07	DMN6-07	DMN6-08	2.70	2.60	63.0	1000	-1.75	-1.81	2.50	1.80	4.25	3.61	1.25	0.61	1.90	12.01	
DBN6-08	DMN6-08	DMN6-09	2.70	2.60	60.0	1000	-2.12	-2.18	1.80	1.50	3.92	3.68	0.92	0.68	1.90	12.01	
DBN6-09	DMN6-09	DMN6-10	2.70	2.60	65.2	1000	-2.18	-2.25	1.50	1.30	3.68	3.55	0.68	0.55	1.90	12.01	
DBN6-10	DMN6-10	DMN6-11	2.70	2.60	65.9	1000	-2.25	-2.31	1.30	1.60	3.55	3.91	0.55	0.91	1.90	12.01	
DBN6-11	DMN6-11	DMN6-12	2.70	2.60	7.4	1000	-2.31	-2.32	1.60	1.60	3.91	3.92	0.91	0.92	1.90	12.01	
DBN6-12	DMN6-12	DMN6-13	2.70	2.60	55.2	1000	-2.32	-2.37	1.60	1.60	3.92	3.97	0.92	0.97	1.90	12.01	
DBN6-13	DMN6-13	DMN6-14	2.70	2.60	10.6	1000	-2.37	-2.38	1.60	1.60	3.97	3.98	0.97	0.98	1.90	12.01	
DBN6-14	DMN6-14	DMN6-15	2.70	2.60	58.4	1000	-2.38	-2.44	1.60	1.60	3.98	4.04	0.98	1.04	1.90	12.01	
DBN6-15	DMN6-15	DMN6-16	2.70	2.60	67.0	1000	-2.44	-2.51	1.60	1.60	4.04	4.11	1.04	1.11	1.90	12.01	
DBN6-16	DMN6-16	DMN6-17	2.70	2.60	15.4	1000	-2.51	-2.53	1.60	1.60	4.11	4.13	1.11	1.13	1.90	12.01	
DBN6-17	DMN6-17	DMN6-18	2.70	2.60	70.0	1000	-2.53	-2.60	1.60	1.50	4.13	4.10	1.13	1.10	1.90	12.01	
DBN6-18	DMN6-18	DMN6-19	2.70	2.60	69.0	1000	-2.60	-2.66	1.50	1.50	4.10	4.16	1.10	1.16	1.90	12.01	
DBN6-19	DMN6-19	DMN6-20	2.70	2.60	65.6	1000	-2.66	-2.73	1.50	1.50	4.16	4.23	1.16	1.23	1.90	12.01	
DBN6-20	DMN6-20	DMN6-21	2.70	2.60	68.4	1000	-2.73	-2.80	1.50	1.50	4.23	4.30	1.23	1.30	1.90	12.01	
DBN6-21	DMN6-21	DMN6-22	2.70	2.60	61.5	1000	-2.80	-2.86	1.50	1.50	4.30	4.36	1.30	1.36	1.90	12.01	
DBN6-22	DMN6-22	DMN9-01	2.70	2.60	63.5	1000	-2.86	-2.92	1.50	1.50	4.36	4.42	1.36	1.42	1.90	12.01	
N-9					374.3												
DBN9-01	DMN9-01	DMN9-02	2.90	2.90	70.0	900	-3.22	-3.30	1.50	0.80	4.72	4.10	1.42	0.80	2.12	16.05	
DBN9-02	DMN9-02	DMN9-03	2.90	2.90	70.0	900	-3.30	-3.38	0.80	0.80	4.10	4.18	0.80	0.88	2.12	16.05	
DBN9-03	DMN9-03	DMN9-04	2.90	2.90	70.0	900	-3.38	-3.46	0.80	0.80	4.18	4.26	0.88	0.96	2.12	16.05	
DBN9-04	DMN9-04	DMN9-05	2.90	2.90	70.0	900	-3.46	-3.53	0.80	0.80	4.26	4.33	0.96	1.03	2.12	16.05	
DBN9-05	DMN9-05	DMN9-06	2.90	2.90	70.0	900	-3.53	-3.61	0.80	0.80	4.33	4.41	1.03	1.11	2.12	16.05	
DBN9-05	DMN9-06	PS	2.90	2.90	24.3	900	-3.61	-3.64	0.80	0.80	4.41	4.44	1.11	1.14	2.12	16.05	

HYDRAULIC ANALYSIS FOR STORMWATER DRAINAGE

DRAIN DESIGNATION			Proposed Drainage													
			Size		Length	Gradient	Invert Level		Ground Level		Excavation Depth		Covering		Velocity	Discharge
			B m	H m	L m	I	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	u/s m	d/s m	V m/s	Q m ³ /s
Box Culvert No.	Manhole No.															
	u/s	d/s														
N-PE					1619.5											
DBPE-00	PS	DMPE-00	6.30	1.60	14.6	1480	-0.60	-0.61	1.30	1.30	1.90	1.91	0.00	0.01	1.72	15.60
DBPE-01		DMPE-01	6.30	1.60	27.5	1480	-0.61	-0.63	1.30	1.30	1.91	1.93	0.01	0.03	1.72	15.60
DBPE-02		DMPE-02	6.30	1.60	70.0	1480	-0.63	-0.68	1.30	1.30	1.93	1.98	0.03	0.08	1.72	15.60
DBPE-03		DMPE-03	6.30	1.60	43.0	1480	-0.68	-0.70	1.30	1.30	1.98	2.00	0.08	0.10	1.72	15.60
DBPE-04		DMPE-04	6.30	1.60	24.5	1480	-0.70	-0.72	1.30	1.30	2.00	2.02	0.10	0.12	1.72	15.60
DBPE-05		DMPE-05	6.30	1.60	65.6	1480	-0.72	-0.77	1.30	1.30	2.02	2.07	0.12	0.17	1.72	15.60
DBPE-06		DMPE-06	6.30	1.60	40.5	1480	-0.77	-0.79	1.30	1.30	2.07	2.09	0.17	0.19	1.72	15.60
DBPE-07		DMPE-07	6.30	1.60	24.2	1480	-0.79	-0.81	1.30	1.30	2.09	2.11	0.19	0.21	1.72	15.60
DBPE-08		DMPE-08	6.30	1.60	48.1	1480	-0.81	-0.84	1.30	1.30	2.11	2.14	0.21	0.24	1.72	15.60
DBPE-09		DMPE-09	6.30	1.60	69.4	1480	-0.84	-0.89	1.30	1.30	2.14	2.19	0.24	0.29	1.72	15.60
DBPE-10		DMPE-10	6.30	1.60	66.7	1480	-0.89	-0.93	1.30	1.30	2.19	2.23	0.29	0.33	1.72	15.60
DBPE-11		DMPE-11	6.30	1.60	70.0	1480	-0.93	-0.98	1.30	1.30	2.23	2.28	0.33	0.38	1.72	15.60
DBPE-12		DMPE-12	6.30	1.60	70.0	1480	-0.98	-1.03	1.30	1.30	2.28	2.33	0.38	0.43	1.72	15.60
DBPE-13		DMPE-13	6.30	1.60	63.4	1480	-1.03	-1.07	1.30	1.30	2.33	2.37	0.43	0.47	1.72	15.60
DBPE-14		DMPE-14	6.30	1.60	70.0	1480	-1.07	-1.12	1.30	1.30	2.37	2.42	0.47	0.52	1.72	15.60
DBPE-15		DMPE-15	6.30	1.60	54.7	1480	-1.12	-1.16	1.30	1.00	2.42	2.16	0.52	0.26	1.72	15.60
DBPE-16		DMPE-16	6.30	1.60	36.8	1480	-1.16	-1.18	1.00	1.00	2.16	2.18	0.26	0.28	1.72	15.60
DBPE-17		DMPE-17	6.30	1.60	67.5	1480	-1.18	-1.23	1.00	0.70	2.18	1.93	0.28	0.03	1.72	15.60
DBPE-18		DMPE-18	6.30	1.60	45.5	1480	-1.23	-1.26	0.70	0.70	1.93	1.96	0.03	0.06	1.72	15.60
DBPE-19		DMPE-19	6.30	1.60	57.1	1480	-1.26	-1.30	0.70	0.70	1.96	2.00	0.06	0.10	1.72	15.60
DBPE-20		DMPE-20	6.30	1.60	66.2	1480	-1.30	-1.34	0.70	0.60	2.00	1.94	0.10	0.04	1.72	15.60
DBPE-21		DMPE-21	6.30	1.60	64.0	1480	-1.34	-1.38	0.60	0.60	1.94	1.98	0.04	0.08	1.72	15.60
DBPE-22		DMPE-22	6.30	1.60	65.9	1480	-1.38	-1.43	0.60	0.50	1.98	1.93	0.08	0.03	1.72	15.60
DBPE-23		DMPE-23	6.30	1.60	70.0	1480	-1.43	-1.48	0.50	0.50	1.93	1.98	0.03	0.08	1.72	15.60
DBPE-24		DMPE-24	6.30	1.60	70.0	1480	-1.48	-1.52	0.50	0.40	1.98	1.92	0.08	0.02	1.72	15.60
DBPE-25		DMPE-25	6.30	1.60	70.0	1480	-1.52	-1.57	0.40	0.40	1.92	1.97	0.02	0.07	1.72	15.60
DBPE-26		DMPE-26	6.30	1.60	70.0	1480	-1.57	-1.62	0.40	0.40	1.97	2.02	0.07	0.12	1.72	15.60
DBPE-27		DMPE-27	6.30	1.60	70.0	1480	-1.62	-1.66	0.40	0.40	2.02	2.06	0.12	0.16	1.72	15.60
DBPE-28		Existing Canal	6.30	1.60	44.3	1480	-1.66	-1.69	0.30	0.30	1.96	1.99	0.06	0.09	1.72	15.60

DESIGN CALCULATION (STP)

Lagoon

Item	Calculation	Remarks										
1. Fundamentals												
1.1 Inflow (Qi)	$\frac{3,000 \text{ (sewage from service area)} + 70 \text{ (from septage facilities)}}{70} = 3,070 \text{ m}^3/\text{daily average (Total)}$											
1.2 Influent Quality	<table> <tr> <td>BOD (sewage from service area)</td> <td>485 mg/l</td> </tr> <tr> <td>(from septage facilities)</td> <td>640 mg/l</td> </tr> </table> <table> <tr> <td>BOD (Li)</td> <td>489 mg/l (total)</td> </tr> <tr> <td>SS (ss)</td> <td>611 mg/l (BOD x 1.25)</td> </tr> <tr> <td>Fecal coli.</td> <td>1.0E+07 MPN/100ml</td> </tr> </table>	BOD (sewage from service area)	485 mg/l	(from septage facilities)	640 mg/l	BOD (Li)	489 mg/l (total)	SS (ss)	611 mg/l (BOD x 1.25)	Fecal coli.	1.0E+07 MPN/100ml	
BOD (sewage from service area)	485 mg/l											
(from septage facilities)	640 mg/l											
BOD (Li)	489 mg/l (total)											
SS (ss)	611 mg/l (BOD x 1.25)											
Fecal coli.	1.0E+07 MPN/100ml											
Effluent Quality (Criteria)	<table> <tr> <td>BOD</td> <td>40 mg/l</td> </tr> <tr> <td>SS</td> <td>50 mg/l</td> </tr> <tr> <td>Fecal coli.</td> <td>2.0E+03 MPN/100ml</td> </tr> </table>	BOD	40 mg/l	SS	50 mg/l	Fecal coli.	2.0E+03 MPN/100ml					
BOD	40 mg/l											
SS	50 mg/l											
Fecal coli.	2.0E+03 MPN/100ml											
1.3 Evaporation rate	e= 5 mm/day (assumed)											
1.4 Temperature	25.0 Degree, celcius											
1.5 Latitude (L)	14 Degree-north											
2. Anearobic Lagoon												
Permissible volumetric loading	<table> <tr> <td>$\lambda_v=100$</td> <td>T less than 10°C</td> </tr> <tr> <td>$\lambda_v=20T-100$</td> <td>T=10°C to 20°C</td> </tr> <tr> <td>$\lambda_v=10T+100$</td> <td>T=20°C to 25°C</td> </tr> <tr> <td>$\lambda_v=350$</td> <td>T more than 25°C</td> </tr> </table>	$\lambda_v=100$	T less than 10°C	$\lambda_v=20T-100$	T=10°C to 20°C	$\lambda_v=10T+100$	T=20°C to 25°C	$\lambda_v=350$	T more than 25°C			
$\lambda_v=100$	T less than 10°C											
$\lambda_v=20T-100$	T=10°C to 20°C											
$\lambda_v=10T+100$	T=20°C to 25°C											
$\lambda_v=350$	T more than 25°C											
Volume (Va)	$V_a = \frac{L_i \times Q_i}{\lambda_v} = \frac{489 \times 3,070}{350} = 4,289 \text{ m}^3$											
Allowance for sludge volume (S)	1.00 m											
Dimension	Width 30 m x Length 30 m x Depth 3.00 m x Pond 1 x 2 Series											
Area	Aa= 1,800 m ²											
Volume	Va= 5,400 m ³											
HRT (Rta)	1.8 days											
Design value for percentage BOD removal	<table> <tr> <td>= 40%</td> <td>T less than 10°C</td> </tr> <tr> <td>= (2T + 20)</td> <td>T=10°C to 25°C</td> </tr> <tr> <td>= 70%</td> <td>70% T more than 25°C</td> </tr> </table>	= 40%	T less than 10°C	= (2T + 20)	T=10°C to 25°C	= 70%	70% T more than 25°C					
= 40%	T less than 10°C											
= (2T + 20)	T=10°C to 25°C											
= 70%	70% T more than 25°C											
BOD effluent	$L_{ca} = L_{ia} \times (1 - \% \text{BOD removal})$ $= 489 \times (1 - 0.70)$ $= 147 \text{ mg/l}$											

Item	Calculation	Remarks																				
1. Facultative Lagoon																						
Inflow	Q= 3,070 m ³ /daily average																					
Effluent flow	$Q_e = Q_i - 0.001 e A_f$ $= 3,070 - 0.001 \times 5 \times 24,960$ $= 2,945 \text{ m}^3/\text{daily average}$																					
(Qi+Qe)/2	3,008 m ³ /daily average																					
Surface loading	$\lambda_s = 350 \times (1.107 - 0.002T)^{T-25} \text{ kg/ha day} = 350$ $\lambda_s = 375 - 6.25L \text{ kg/ha day} = 288$ <p>Adopted surface loading kg/ha day= 288</p>																					
Dimension																						
Area (A _f)	<table> <tr> <td>F1=</td> <td>9,500 m² x 2.00 m, depth</td> </tr> <tr> <td>F2=</td> <td>9,870 m² x 2.00 m, depth</td> </tr> <tr> <td>F3=</td> <td>2,820 m² x 2.00 m, depth</td> </tr> <tr> <td>F4=</td> <td>2,770 m² x 2.00 m, depth</td> </tr> <tr> <td>Total=</td> <td>24,960 m²</td> </tr> </table> <table> <tr> <td>Average of F1 and F2=</td> <td>9,685 m²</td> </tr> <tr> <td>Average of F3 and F4=</td> <td>2,795 m²</td> </tr> </table>	F1=	9,500 m ² x 2.00 m, depth	F2=	9,870 m ² x 2.00 m, depth	F3=	2,820 m ² x 2.00 m, depth	F4=	2,770 m ² x 2.00 m, depth	Total=	24,960 m ²	Average of F1 and F2=	9,685 m ²	Average of F3 and F4=	2,795 m ²							
F1=	9,500 m ² x 2.00 m, depth																					
F2=	9,870 m ² x 2.00 m, depth																					
F3=	2,820 m ² x 2.00 m, depth																					
F4=	2,770 m ² x 2.00 m, depth																					
Total=	24,960 m ²																					
Average of F1 and F2=	9,685 m ²																					
Average of F3 and F4=	2,795 m ²																					
Volume (V _f)	<table> <tr> <td>F1=</td> <td>19,000 m³</td> <td>A+C=</td> <td>24,640 m³</td> </tr> <tr> <td>F2=</td> <td>19,740 m³</td> <td>B+D=</td> <td>25,280 m³</td> </tr> <tr> <td>F3=</td> <td>5,640 m³</td> <td></td> <td></td> </tr> <tr> <td>F4=</td> <td>5,540 m³</td> <td></td> <td></td> </tr> <tr> <td>Total=</td> <td>49,920 m³</td> <td></td> <td></td> </tr> </table>	F1=	19,000 m ³	A+C=	24,640 m ³	F2=	19,740 m ³	B+D=	25,280 m ³	F3=	5,640 m ³			F4=	5,540 m ³			Total=	49,920 m ³			
F1=	19,000 m ³	A+C=	24,640 m ³																			
F2=	19,740 m ³	B+D=	25,280 m ³																			
F3=	5,640 m ³																					
F4=	5,540 m ³																					
Total=	49,920 m ³																					
Inflow	<table> <tr> <td>Series Lagoon F1-F</td> <td>1,504 m³/daily average</td> </tr> <tr> <td>Series Lagoon F2-F</td> <td>1,504 m³/daily average</td> </tr> </table>	Series Lagoon F1-F	1,504 m ³ /daily average	Series Lagoon F2-F	1,504 m ³ /daily average																	
Series Lagoon F1-F	1,504 m ³ /daily average																					
Series Lagoon F2-F	1,504 m ³ /daily average																					
HRT (R _{ft})	<table> <tr> <td>16.4 days</td> <td>(Series Pond A-C)</td> </tr> <tr> <td>16.8 days</td> <td>(Series Pond B-D)</td> </tr> <tr> <td>Avg=</td> <td>16.6</td> </tr> </table>	16.4 days	(Series Pond A-C)	16.8 days	(Series Pond B-D)	Avg=	16.6															
16.4 days	(Series Pond A-C)																					
16.8 days	(Series Pond B-D)																					
Avg=	16.6																					
Check surface loading	180 kg/ha day																					
First order rate constant for BOD removal	$k_{1(T)} = k_{1(20)} \times 1.05^{(T-20)}$ $= 0.1 \times 1.05^5$ $= 0.13$ <p>k₁₍₂₀₎ = 0.1 For secondary facultative pond</p>																					
Effluent unfiltered BOD	$L_e' = \frac{L_i}{1 + k_1 \cdot R_{ft}} = \frac{147}{1 + 0.13 \times 16.6} = 46.9 \text{ mg/l}$																					
Effluent filtered BOD (L _e)	$L_e \text{ (filtered)} = F_{na} [L_e \text{ (unfiltered)}]$ $F_{na} = 0.3$ $L_e \text{ (filtered)} : 14.1 \text{ mg/l}$																					

DESIGN CALCULATION (STP)

Item	Calculation	Remarks
3. Maturation Lagoon		
Inflow	$Q_i = 2,945 \text{ m}^3/\text{daily average}$	
HRT (R_{tf})	16.6 days	
Max permissible loading on M1 (L_{max})	216 kg/ha day (Max = 75% facultative pond loading)	
First order rate constant	$k_t = 2.6 (1.19)^{T-20}$ = 6.20	
Preliminary HRT (R_{tm})	3.0 days	
Select number of ponds	n = 1	
Number of Fecal coli.	$N_e = \frac{N_i}{(1 + k_t R_{ta}) \times (1 + k_t R_{tf}) \times (1 + k_t R_{tm})}$ $= \frac{1.0E+07}{(1+6.20 \times 1.8) \times (1+6.20 \times 16.6) (1+6.20 \times 3.0)}^{-1}$ = 4.0E+02 MPN/100ml	
Area (A_m)	Lagoon M1 = $3,560 \text{ m}^2 \times 1.50 \text{ m, depth}$ Lagoon M2 = $4,060 \text{ m}^2 \times 1.50 \text{ m, depth}$ Total = $7,620 \text{ m}^2$ Average of M1 and M2 = $3,810 \text{ m}^2$	
Volume (V_m)	Lagoon M1 = $5,340 \text{ m}^3$ Lagoon M2 = $6,090 \text{ m}^3$ Total = $11,430 \text{ m}^3$	
Effluent flow	$Q_e = Q_i - 0.001 e A_f$ = $2,945 - 0.001 \times 5 \times 7,620$ = $2,907 \text{ m}^3/\text{daily average}$	
$(Q_i + Q_e)/2$	$2,926 \text{ m}^3/\text{daily average}$	
Inflow	Lagoon M1 = Lagoon M2 = $1,463 \text{ m}^3/\text{daily average}$	
HRT (R_{tm})	3.7 days (Lagoon M1) 4.2 days (Lagoon M2) Avg = 4.0	OK
Check surface loading	$\lambda_s = 10 \cdot L_i \cdot D_m / R_{tm}$ = $10 \times 46.9 \times 1.50 / 4.0$ = 176 kg/ha day	OK
Effluent unfiltered BOD	25 % of each maturation pond $46.9 \text{ mg/l} \times 0.75^{-1}$ = 35.2 mg/l or $Le' = \frac{L_i}{1 + k_t \cdot R_{tf}} = \frac{46.9}{1 + 0.05 \times 4.0} = 39.1 \text{ mg/l}$	

Reference: Domestic Wastewater Treatment in Developing Countries, Duncan Mara
 Wastewater Stabilization Ponds, Principles of Planning & Practice, WHO

DESIGN CALCULATION (STP)

Aerated Lagoon

Item	Calculation	Remarks
1. Fundamentals		
1.1 Inflow	12,000 m ³ /daily average	
1.2 Influent Quality	BOD (Li) 485 mg/l SS (ss) 606 mg/l	
2. Aerated Lagoon		
Wastewater Temperature(Tw)	25 Degrees C (Coldest month)	
Latitude (L)	14 Degree-north	
First Order Rate Constant (K)	$2.5 \times (1.06)^{(25 - 20)}$ = 3.35	
Dimension	Area Depth Pond 972 m ² × 4.00 m × 12	
Area	A _a = 11,664 m ²	
Volume	V _a = 46,656 m ³	
Volume reduction for gantry of aerator	5 %	
	V _{actual} = 44,323 m ³	
HRT (R _t) =SRT	3.7 days	
Effluent BOD (Le)	$Le = \frac{L_i}{1 + K \cdot R_t} = \frac{485}{1 + 3.35 \times 3.7}$ = 36.2 mg/l	
Soluble effluent BOD	$S = \frac{K_s(1 + kd \cdot SRT)}{SRT(Yk - kd) - 1}$ $= \frac{100(1 + 0.07 \times 3.7)}{3.7 \times (0.65 \times 6.0 - 0.07) - 1}$ = 9.6 mg/l	
	SRT= 3.7 day Y: 0.65 g/g Ks: 100 g/m ³ k: 6.0 g/g·d kd: 0.07 g/g·d	

Item	Calculation	Remarks
Check energy requirement for mixing		
	a. Power requirement (maximum) Power requirement for mixing 8 kW/1,000 m (maximum)	
	Lagoon volume 44,323 m ³	
	Power requirement (maximum) = 44,323 m ³ × 8 kW/1,000 m ³ = 355 kW	
3. Sedimentation Lagoon		
Retention Time	1.5 days (1 to 2 days)	
Depth	1.0 m	
Sludge allowance	1.0 m	
Total depth	2.0 m	
Area required	18,000 m ²	
Volume required	18,000 m ² × 1.0 m = 18,000 m ³	
Check	Area No. of Lagoon 4,570 m ² × 1 4,540 m ² × 1 4,650 m ² × 1 4,520 m ² × 1 <hr/> Total 18,280 m ² Area average 4,570 m ²	

Reference: Domestic Wastewater Treatment in Developing Countries, Duncan Mara
Wastewater Engineering, Treatment and Reuse, Metcalf & Eddy