Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	E1-1	0.56																				
	E1-2	44.60																				
	E1-3	295.31																				
FMH_KTN_01001.1			340.47	1261.02	6.00	23.64	185.10	225	0.06	50.00	0.59	1.45	57.63	0.41	FMH_KTN_01001	FMH_KTN_01001a	31.00	27.00	29.30	25.60	1.48	1.18
	FMH_KTN_01001.1	340.47																				
	E1-4	70.96																				
FMH_KTN_01001a.1			411.43	1523.83	6.00	28.57	121.40	225	0.06	50.00	0.59	1.45	57.63	0.50	FMH_KTN_01001a	FMH_KTN_01002	27.00	24.50	25.60	23.17	1.18	1.11
	FMH_KTN_01001a.1	411.43																				
	E1-5	5.60																				
FMH_KTN_01002.1			417.03	1544.57	6.00	28.96	272.00	225	0.06	50.00	0.59	1.45	57.63	0.50	FMH_KTN_01002	FMH_KTN_01003	24.50	19.00	23.17	17.73	1.11	1.05
	FMH_KTN_01002.1	417.03																				
	E1-6	28.00																				
	E1-7	0.56																				
FMH_KTN_01003.1			445.59	1650.35	6.00	30.94	174.80	300	0.08	150.00	0.40	1.01	71.73	0.43	FMH_KTN_01003	FMH_KTN_03001	19.00	18.00	17.66	16.49	1.05	1.21
	D1-12	50.00																				
FMH_KTN_02001.1			50.00	185.20	8.00	4.63	126.60	300	0.08	150.00	0.40	1.01	71.73	0.06	FMH_KTN_02001	FMH_KTN_02001a	24.50	25.00	22.90	22.06	1.30	2.64
	FMH_KTN_02001.1	50.00																				
	D1-13	70.20																				
FMH_KTN_02001a.1			120.20	445.19	8.00	11.13	185.60	300	0.08	50.00	0.69	1.76	124.38	0.09	FMH_KTN_02001a	FMH_KTN_02002	25.00	20.00	22.06	18.34	2.64	1.36
	FMH_KTN_02001a.1	120.20																				
	D1-14	117.32																				
FMH_KTN_02002.1			237.52	879.70	8.00	21.99	85.40	300	0.08	50.00	0.69	1.76	124.38	0.18	FMH_KTN_02002	FMH_KTN_03001	20.00	18.00	18.34	16.64	1.36	1.06
	FMH_KTN_01003.1	445.59																				
	FMH_KTN_02002.1	237.52																				
	G1-1	75.64																				
	G1-2	8.36																				
FMH_KTN_03001.1			767.11	2841.16	6.00	53.27	142.60	375	0.09	29.00	1.01	2.68	296.23	0.18	FMH_KTN_03001	FMH_KTN_03001a	18.00	13.00	16.41	11.50	1.21	1.13

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_03001.1	767.11																				
	F1-3	1141.25																				
FMH_KTN_03001a.1			1908.36	7068.01	5.00	110.44	388.20	375	0.09	75.00	0.63	1.67	184.09	0.60	FMH_KTN_03001a	FMH_KTN_03002	13.00	8.00	11.50	6.32	1.13	1.30
	F1-4	9.50																				
FMH_KTN_27001.1			9.50	35.19	8.00	0.88	264.70	225	0.06	22.00	0.90	2.19	86.93	0.01	FMH_KTN_27001	FMH_KTN_03002	20.00	8.00	18.50	6.47	1.28	1.31
	FMH_KTN_03001a.1	1908.36																				
	FMH_KTN_27001.1	9.50																				
	F1-1	2.80																				
FMH_KTN_03002.1			1920.66	7113.57	5.00	111.15	26.20	375	0.09	50.00	0.77	2.04	225.53	0.49	FMH_KTN_03002	FMH_KTN_03003	8.00	8.00	6.32	5.79	1.31	1.83
	FMH_KTN_03002.1	1920.66																				
FMH_KTN_03003.1			1920.66	7113.57	4.00	88.92	SPS								FMH_KTN_03003	FMH_KTN_03003a	8.00	8.00	5.79	6.75	1.96	1.00
	FMH_KTN_03003.1	1920.66																				
FMH_KTN_03003a.1			1920.66	7113.57	4.00	88.92	29.40	250				1.81			FMH_KTN_03003a	FMH_KTN_03003b	8.00	8.00	6.75	6.75	1.00	1.00
	FMH_KTN_03003a.1	1920.66																				
FMH_KTN_03003b.1			1920.66	7113.57	4.00	88.92	520.30	250				1.81			FMH_KTN_03003b	FMH_KTN_03003c	8.00	17.50	6.75	16.25	1.00	1.00
	FMH_KTN_03003b.1	1920.66																				
FMH_KTN_03003c.1			1920.66	7113.57	4.00	88.92	346.10	250				1.81			FMH_KTN_03003c	FMH_KTN_03003d	17.50	25.00	16.25	23.75	1.00	1.00
	FMH_KTN_03003c.1	1920.66																				
FMH_KTN_03003d.1			1920.66	7113.57	4.00	88.92	165.40	250				1.81			FMH_KTN_03003d	FMH_KTN_03004	25.00	22.50	23.75	21.25	1.00	1.00

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_03003d.1	1920.66																				
	D1-11	1351.41																				
FMH_KTN_03004.1			3272.08	12118.81	4.00	151.49	396.80	375	0.09	44.00	0.82	2.18	240.44	0.63	FMH_KTN_03004	FMH_KTN_03005	22.50	13.00	20.58	11.56	1.55	1.07
	FMH_KTN_03004.1	3272.08																				
	D1-7	1916.53																				
FMH_KTN_03005.1			5188.61	19217.06	4.00	240.21	425.20	450	0.11	75.00	0.69	1.88	299.08	0.80	FMH_KTN_03005	FMH_KTN_03006	13.00	7.50	11.48	5.81	1.07	1.24
	FMH_KTN_03005.1	5188.61																				
FMH_KTN_03006.1			5188.61	19217.06	4.00	240.21	97.90	600	0.15	350.00	0.37	1.05	296.81	0.81	FMH_KTN_03006	FMH_KTN_24001	7.50	7.50	5.66	5.38	1.24	1.52
	A3-2	70.96																				
FMH_KTN_07001.1			70.96	262.81	8.00	6.57	112.00	300	0.08	150.00	0.40	1.01	71.73	0.09	FMH_KTN_07001	FMH_KTN_08001	20.50	23.50	19.00	18.25	1.20	4.95
	FMH_KTN_07001.1	70.96																				
	A3-1	44.60																				
FMH_KTN_08001.1			115.56	428.00	8.00	10.70	191.20	450	0.11	90.00	0.63	1.72	272.98	0.04	FMH_KTN_08001	FMH_KTN_08002	23.50	17.50	18.10	15.98	4.95	1.07
	FMH_KTN_08001.1	115.56																				
	A3-3	4558.62																				
FMH_KTN_08002.1			4674.18	17311.78	4.00	216.40	301.80	450	0.11	60.00	0.77	2.10	334.43	0.65	FMH_KTN_08002	FMH_KTN_08002a	17.50	12.50	15.98	10.95	1.07	1.10
	FMH_KTN_08002.1	4674.18																				
FMH_KTN_08002a.1			4674.18	17311.78	4.00	216.40	65.10	450	0.11	70.00	0.71	1.95	309.59	0.70	FMH_KTN_08002a	FMH_KTN_10001	12.50	11.50	10.95	10.02	1.10	1.03
	A3-7	19.13																				
FMH_KTN_09001.1			19.13	70.85	8.00	1.77	85.60	225	0.06	35.00	0.71	1.73	68.90	0.03	FMH_KTN_09001	FMH_KTN_09001a	21.00	18.50	19.40	16.95	1.38	1.32

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_09001.1	19.13																				
	A3-4	44.60																				
	A3-6	1057.53																				
FMH_KTN_09001a.1			1121.26	4152.82	6.00	77.87	235.60	300	0.08	35.00	0.82	2.10	148.70	0.52	FMH_KTN_09001a	FMH_KTN_10001	18.50	11.50	16.88	10.15	1.32	1.05
	FMH_KTN_08002a.1	4674.18																				
	FMH_KTN_09001a.1	1121.26																				
FMH_KTN_10001.1			5795.44	21464.60	4.00	268.31	132.30	525	0.13	90.00	0.68	1.90	411.18	0.65	FMH_KTN_10001	FMH_KTN_12001	11.50	10.00	9.92	8.45	1.05	1.02
	A2-13	70.96																				
FMH_KTN_11001.1			70.96	262.81	8.00	6.57	86.80	300	0.08	150.00	0.40	1.01	71.73	0.09	FMH_KTN_11001	FMH_KTN_11002	11.00	10.50	9.50	8.92	1.20	1.28
	FMH_KTN_11001.1	70.96																				
	A2-12	44.60																				
FMH_KTN_11002.1			115.56	428.00	8.00	10.70	106.70	300	0.08	150.00	0.40	1.01	71.73	0.15	FMH_KTN_11002	FMH_KTN_12001	10.50	10.00	8.92	8.21	1.28	1.49
	FMH_KTN_10001.1	5795.44																				
	FMH_KTN_11002.1	115.56																				
	A2-11	44.60																				
FMH_KTN_12001.1			5955.60	22057.79	4.00	275.72	124.90	600	0.15	300.00	0.40	1.13	320.65	0.86	FMH_KTN_12001	FMH_KTN_14001	10.00	9.50	7.91	7.49	1.49	1.41
	A2-4	1024.20																				
FMH_KTN_13001.1			1024.20	3793.32	6.00	71.12	156.40	375	0.09	100.00	0.54	1.44	159.39	0.45	FMH_KTN_13001	FMH_KTN_13002	16.50	15.00	15.00	13.44	1.13	1.19
	FMH_KTN_13001.1	1024.20																				
	A2-5	549.30																				
	A2-7	1416.18																				
FMH_KTN_13002.1			2989.67	11072.86	4.00	138.41	268.50	375	0.09	50.00	0.77	2.04	225.53	0.61	FMH_KTN_13002	FMH_KTN_14001	15.00	9.50	13.44	8.07	1.19	1.06
	FMH_KTN_12001.1	5955.60																				
	FMH_KTN_13002.1	2989.67																				
	A2-9	1390.60																				
FMH_KTN_14001.1			10335.87	38281.01	4.00	478.51	256.80	750	0.19	300.00	0.44	1.31	579.26	0.83	FMH_KTN_14001	FMH_KTN_16001	9.50	8.50	7.34	6.49	1.41	1.26

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	A1-6	1139.15																				
FMH_KTN_15001.1			1139.15	4219.08	6.00	79.11	176.30	375	0.09	35.00	0.92	2.44	269.62	0.29	FMH_KTN_15001	FMH_KTN_15002	16.50	11.50	15.00	9.96	1.13	1.16
	FMH_KTN_15001.1	1139.15																				
	A1-8	1016.32																				
FMH_KTN_15002.1			2155.47	7983.24	5.00	124.74	90.30	375	0.09	30.00	0.99	2.64	291.25	0.43	FMH_KTN_15002	FMH_KTN_16001	11.50	8.50	9.96	6.95	1.16	1.17
	FMH_KTN_14001.1	10335.87																				
	FMH_KTN_15002.1	2155.47																				
FMH_KTN_16001.1			12491.35	46264.25	4.00	578.30	219.10	900	0.23	500.00	0.38	1.14	726.46	0.80	FMH_KTN_16001	FMH_KTN_23001	8.50	8.00	6.34	5.90	1.26	1.20
	FMH_KTN_16001.1	12491.35																				
	A1-9	1543.03																				
FMH_KTN_23001.1			14034.38	51979.18	4.04	655.58	129.90	900	0.23	500.00	0.38	1.14	726.46	0.90	FMH_KTN_23001	FMH_KTN_23002	8.00	8.00	5.90	5.64	1.20	1.46
	FMH_KTN_23001.1	14034.38																				
FMH_KTN_23002.1			14034.38	51979.18	4.04	655.58	139.40	900	0.23	500.00	0.38	1.14	726.46	0.90	FMH_KTN_23002	FMH_KTN_24001	8.00	7.50	5.64	5.36	1.46	1.24
	FMH_KTN_03006.1	5188.61																				
	FMH_KTN_23002.1	14034.38																				
FMH_KTN_24001.1			19222.98	71196.24	3.85	856.57	78.10	1050	0.26	500.00	0.41	1.26	1091.74	0.78	FMH_KTN_24001	FMH_KTN_24002	7.50	7.50	4.93	4.78	1.52	1.67
	FMH_KTN_24001.1	19222.98																				
FMH_KTN_24002.1			19222.98	71196.24	3.85	856.57	56.30	1050	0.26	500.00	0.41	1.26	1091.74	0.78	FMH_KTN_24002	FMH_KTN_25001	7.50	7.50	4.78	4.66	1.67	1.79
	C2-2	8.10																				
	D1-5	43.96																				
	D1-9	603.61																				
	G1-6	8.40																				
	G1-7	8.40																				
FMH_KTN_04001.1	G1-8	427.92	1100.39	4075.51	6.00	76.42	129.70	375	0.09	200.00	0.38	1.02	112.62	0.68	FMH_KTN_04001	FMH_KTN_25001	7.50	7.50	6.10	5.45	1.03	1.67

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_24002.1	19222.98																				
	FMH_KTN_04001.1	1100.39																				
FMH_KTN_25001.1			20323.37	75271.75	3.82	898.07	99.10	1050	0.26	500.00	0.41	1.26	1091.74	0.82	FMH_KTN_25001	FMH_KTN_25001a	7.50	7.50	4.66	4.47	1.79	1.98
	A2-2	3563.86																				
	A1-10	0.56																				
FMH_KTN_18001.1			3564.42	13201.56	4.00	165.02	120.90	450	0.11	70.00	0.71	1.95	309.59	0.53	FMH_KTN_18001	FMH_KTN_18001a	20.50	19.00	19.00	17.27	1.05	1.28
	FMH_KTN_18001.1	3564.42																				
FMH_KTN_18001a.1			3564.42	13201.56	4.00	165.02	217.60	525	0.13	90.00	0.68	1.90	411.18	0.40	FMH_KTN_18001a	FMH_KTN_18002	19.00	16.50	17.20	14.78	1.28	1.19
	FMH_KTN_18001a.1	3564.42																				
FMH_KTN_18002.1			3564.42	13201.56	4.00	165.02	166.30	525	0.13	300.00	0.37	1.04	224.95	0.73	FMH_KTN_18002	FMH_KTN_20001	16.50	17.00	14.78	14.23	1.19	2.25
	B1-7	61.30																				
FMH_KTN_19001.1			61.30	227.04	8.00	5.68	182.70	375	0.09	150.00	0.44	1.18	130.09	0.04	FMH_KTN_19001	FMH_KTN_19001a	20.00	21.50	18.50	17.28	1.13	3.84
	FMH_KTN_19001.1	61.30																				
	A1-2	1675.94																				
FMH_KTN_19001a.1			1737.24	6434.22	5.00	100.53	222.00	450	0.11	200.00	0.42	1.15	182.98	0.55	FMH_KTN_19001a	FMH_KTN_19002	21.50	18.00	17.21	16.10	3.84	1.45
	FMH_KTN_19001a.1	1737.24																				
	A1-4	506.70																				
	B2-5	44.60																				
FMH_KTN_19002.1			2288.54	8476.07	5.00	132.44	164.70	525	0.13	300.00	0.37	1.04	224.95	0.59	FMH_KTN_19002	FMH_KTN_19003	18.00	17.00	16.02	15.47	1.45	1.00
	FMH_KTN_19002.1	2288.54																				
	A1-5	1761.14																				
	B2-7	44.60																				
FMH_KTN_19003.1			4094.28	15164.00	4.00	189.55	103.00	525	0.13	300.00	0.37	1.04	224.95	0.84	FMH_KTN_19003	FMH_KTN_20001	17.00	17.00	15.47	15.13	1.00	1.35

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_18002.1	3564.42																				
	FMH_KTN_19003.1	4094.28																				
FMH_KTN_20001.1			7658.70	28365.56	4.00	354.57	200.90	600	0.15	60.00	0.89	2.54	717.93	0.49	FMH_KTN_20001	FMH_KTN_22001	17.00	12.50	14.15	10.80	2.25	1.10
	B2-2	722.68																				
FMH_KTN_21001.1			722.68	2676.59	6.00	50.19	227.40	450	0.11	250.00	0.38	1.03	163.62	0.31	FMH_KTN_21001	FMH_KTN_21002	12.50	12.00	11.00	10.09	1.05	1.46
	FMH_KTN_21001.1	722.68																				
	B2-6	70.96																				
FMH_KTN_21002.1			793.64	2939.41	6.00	55.11	169.70	450	0.11	250.00	0.38	1.03	163.62	0.34	FMH_KTN_21002	FMH_KTN_22001	12.00	12.50	10.09	9.41	1.46	2.64
	FMH_KTN_20001.1	7658.70																				
	FMH_KTN_21002.1	793.64																				
	B2-8	22.40																				
FMH_KTN_22001.1			8474.74	31387.93	4.00	392.35	160.80	675	0.17	150.00	0.59	1.73	620.09	0.63	FMH_KTN_22001	FMH_KTN_22002	12.50	10.00	9.19	8.11	2.64	1.21
	FMH_KTN_22001.1	8474.74																				
	B2-10	800.09																				
FMH_KTN_22002.1			9274.83	34351.23	4.00	429.39	138.50	675	0.17	150.00	0.59	1.73	620.09	0.69	FMH_KTN_22002	FMH_KTN_22003	10.00	9.00	8.11	7.19	1.21	1.13
	FMH_KTN_22002.1	9274.83																				
	B2-12	677.52																				
FMH_KTN_22003.1			9952.35	36860.57	4.00	460.76	302.60	750	0.19	150.00	0.63	1.86	819.68	0.56	FMH_KTN_22003	FMH_KTN_22004	9.00	7.50	7.12	5.10	1.13	1.65
	FMH_KTN_22003.1	9952.35																				
	B3-2	1070.23																				
FMH_KTN_22004.1			11022.58	40824.38	4.00	510.30	144.50	750	0.19	300.00	0.44	1.31	579.26	0.88	FMH_KTN_22004	FMH_KTN_22005	7.50	7.50	5.10	4.62	1.65	2.13
	FMH_KTN_22004.1	11022.58																				
	B3-5	709.61																				
FMH_KTN_22005.1			11732.19	43452.57	4.00	543.16	276.70	900	0.23	500.00	0.38	1.14	726.46	0.75	FMH_KTN_22005	FMH_KTN_22005a	7.50	7.50	4.47	3.91	2.13	2.69

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_22005.1	11732.19																				
	B3-8	197.09																				
FMH_KTN_22005a.1			11929.28	44182.53	4.00	552.28	124.00	900	0.23	500.00	0.38	1.14	726.46	0.76	FMH_KTN_22005a	FMH_KTN_22005b	7.50	7.50	3.91	3.67	2.69	2.93
	FMH_KTN_22005a.1	11929.28																				
FMH_KTN_22005b.1			11929.28	44182.53	4.00	552.28	27.20	900	0.23	500.00	0.38	1.14	726.46	0.76	FMH_KTN_22005b	FMH_KTN_25001a	7.50	7.50	3.67	3.61	2.93	2.99
	FMH_KTN_25001.1	20323.37																				
	FMH_KTN_22005b.1	11929.28																				
	B3-16	16.80																				
FMH_KTN_25001a.1			32269.46	119516.50	3.56	1330.41	28.80	1050	0.26	100.00	0.91	2.82	2444.04	0.54	FMH_KTN_25001a	FMH_KTN_25002	7.50	7.50	3.46	3.17	2.99	3.28
	FMH_KTN_25001a.1	32269.46																				
FMH_KTN_25002.1			32269.46	119516.50	2.86	1067.36	SPS								FMH_KTN_25002	FMH_KTN_25002a	7.50	7.50	3.17	5.60	3.43	1.00
	FMH_KTN_25002.1	32269.46																				
FMH_KTN_25002a.1			32269.46	119516.50	2.86	1067.36	16.10	900				1.68			FMH_KTN_25002a	FMH_KTN_25002aa	7.50	7.50	5.60	5.60	1.00	1.00
	FMH_KTN_25002a.1	32269.46																				
FMH_KTN_25002aa.1			32269.46	119516.50	2.86	1067.36	126.70	900				1.68			FMH_KTN_25002aa	FMH_KTN_25002b	7.50	7.00	5.60	5.10	1.00	1.00
	FMH_KTN_25002aa.1	32269.46																				
FMH_KTN_25002b.1			32269.46	119516.50	2.86	1067.36	801.40	900				1.68			FMH_KTN_25002b	FMH_KTN_25002c	7.00	7.90	5.10	6.00	1.00	1.00
	FMH_KTN_25002b.1	32269.46																				
																					Pipe Bridge	
FMH_KTN_25002c.1			32269.46	119516.50	2.86	1067.36	81.20	900				1.68			FMH_KTN_25002c	FMH_KTN_25002d	7.90	8.80	6.00	6.90	1.00	1.00

Design of Gravity Sewers for Kwu Tung North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 1E-06

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_KTN_25002c.1	32269.46																				
FMH_KTN_25002d.1			32269.46	119516.50	2.86	1067.36	379.80	900				1.68			FMH_KTN_25002d	FMH_KTN_25002e	8.80	6.30	6.90	4.40	1.00	1.00
	FMH_KTN_25002d.1	32269.46																				
FMH_KTN_25002e.1			32269.46	119516.50	2.86	1067.36	164.50	900				1.68			FMH_KTN_25002e	FMH_KTN_25002f	6.30	6.40	4.40	4.50	1.00	1.00
	FMH_KTN_25002e.1	32269.46																				
																			Pipe Jacking			
FMH_KTN_25002f.1			32269.46	119516.50	2.86	1067.36	208.10	900				1.68			FMH_KTN_25002f	FMH_KTN_25002g	6.40	6.90	-4.00	-4.00	9.50	10.00
	FMH_KTN_25002f.1	32269.46																				
FMH_KTN_25002g.1			32269.46	119516.50	2.86	1067.36	12.10	900				1.68			FMH_KTN_25002g	SWH_STW_1	6.90	6.90	5.00	5.00	1.00	1.00
	B3-12	1169.56																				
	B3-15	5.32																				
	C1-11	56.00																				
FMH_KTN_28001.1			1230.88	4558.81	6.00	85.48	109.20	450	0.11	150.00	0.49	1.33	211.36	0.40	FMH_KTN_28001	FMH1021540	10.00	10.55	8.50	7.77	1.05	2.33
	FMH_KTN_28001.1	1230.88																				
FMH1021540.1			1230.88	4558.81	6.00	85.48	17.60	600	0.15	110.00	0.65	1.87	530.03	0.16	FMH1021540	FMH1021541	10.55	10.41	7.56	7.40	2.39	2.41
	C1-3	52.31																				
	C1-4	117.37																				
	C1-6	10.80																				
	C1-9	41.20																				
FMH1028480.1			221.68	821.04	8.00	20.53	29.90	300	0.08	213.57	0.33	0.85	60.09	0.34	FMH1028480	FMH1028481	9.07	8.86	5.09	4.95	3.68	3.61

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	D1-6	280.00																				
FMH_FLN_03001.1			280.00	1037.04	6.00	19.44	111.60	300	0.08	150.00	0.40	1.01	71.73	0.27	FMH_FLN_03001	FMH_FLN_03001b	11.50	11.50	10.10	9.36	1.10	1.84
	D2-15	41.72																				
	D2-16	11.20																				
FMH_FLN_03001a.1			52.92	196.00	8.00	4.90	107.60	300	0.08	150.00	0.40	1.01	71.73	0.07	FMH_FLN_03001a	FMH_FLN_03001b	11.50	11.50	10.10	9.38	1.10	1.82
	FMH_FLN_03001.1	280.00																				
	FMH_FLN_03001a.1	52.92																				
	D2-14	49.28																				
FMH_FLN_03001b.1			382.20	1415.56	6.00	26.54	157.20	375	0.09	210.00	0.37	1.00	109.90	0.24	FMH_FLN_03001b	FMH_FLN_03001c	11.50	11.50	9.28	8.53	1.84	2.59
	FMH_FLN_03001b.1	382.20																				
FMH_FLN_03001c.1			382.20	1415.56	6.00	26.54	167.20	375	0.09	210.00	0.37	1.00	109.90	0.24	FMH_FLN_03001c	FMH_FLN_04001	11.50	11.60	8.53	7.74	2.59	3.49
	FMH_FLN_03001c.1	382.20																				
	D2-12	599.44																				
FMH_FLN_04001.1			981.64	3635.71	6.00	68.17	191.30	450	0.11	250.00	0.38	1.03	163.62	0.42	FMH_FLN_04001	FMH_FLN_05001	11.60	10.00	7.66	6.90	3.49	2.65
	D2-9	2857.99																				
FMH_FLN_02001.1			2857.99	10585.13	4.00	132.31	112.50	450	0.11	250.00	0.38	1.03	163.62	0.81	FMH_FLN_02001	FMH_FLN_05001	9.00	10.00	7.50	7.05	1.05	2.50
	FMH_FLN_04001.1	981.64																				
	FMH_FLN_02001.1	2857.99																				
FMH_FLN_05001.1			3839.63	14220.84	4.00	177.76	185.60	600	0.15	350.00	0.37	1.05	296.81	0.60	FMH_FLN_05001	FMH_FLN_05002	10.00	9.50	6.75	6.22	2.65	2.68

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_05001.1	3839.63																				
	D3-7	555.28																				
FMH_FLN_05002.1			4394.91	16277.43	4.00	203.47	159.80	600	0.15	350.00	0.37	1.05	296.81	0.69	FMH_FLN_05002	FMH_FLN_07001	9.50	9.50	6.22	5.76	2.68	3.14
	D2-6	617.08																				
	D3-4	612.33																				
FMH_FLN_01001.1			1229.41	4553.38	6.00	85.38	124.30	525	0.13	300.00	0.37	1.04	224.95	0.38	FMH_FLN_01001	FMH_FLN_01002	7.50	8.00	5.90	5.49	1.08	1.99
	FMH_FLN_01001.1	1229.41																				
	D2-4	809.01																				
	D3-3	443.72																				
FMH_FLN_01002.1			2482.14	9193.12	5.00	143.64	113.60	525	0.13	300.00	0.37	1.04	224.95	0.64	FMH_FLN_01002	FMH_FLN_07001	8.00	9.50	5.49	5.11	1.99	3.87
	D3-12	44.32																				
FMH_FLN_06001.1			44.32	164.15	8.00	4.10	62.20	375	0.09	210.00	0.37	1.00	109.90	0.04	FMH_FLN_06001	FMH_FLN_06001a	10.00	10.00	8.50	8.20	1.13	1.42
	FMH_FLN_06001.1	44.32																				
	D3-11	69.28																				
FMH_FLN_06001a.1			113.60	420.74	8.00	10.52	69.60	375	0.09	210.00	0.37	1.00	109.90	0.10	FMH_FLN_06001a	FMH_FLN_06001b	10.00	10.00	8.20	7.87	1.42	1.75
	FMH_FLN_06001a.1	113.60																				
	D3-8	1143.00																				
FMH_FLN_06001b.1			1256.60	4654.08	6.00	87.26	142.60	450	0.11	260.00	0.37	1.01	160.43	0.54	FMH_FLN_06001b	FMH_FLN_06002	10.00	10.50	7.80	7.25	1.75	2.80
	FMH_FLN_06001b.1	1256.60																				
	D3-1c	701.65																				
FMH_FLN_06002.1			1958.25	7252.79	5.00	113.32	134.50	525	0.13	300.00	0.37	1.04	224.95	0.50	FMH_FLN_06002	FMH_FLN_07001	10.50	9.50	7.17	6.73	2.80	2.25

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_05002.1	4394.91																				
	FMH_FLN_01002.1	2482.14																				
	FMH_FLN_06002.1	1958.25																				
	D2-2	707.05																				
	D3-1b	654.07																				
FMH_FLN_07001.1	D3-6	606.08	10802.50	40009.26	4.00	500.12	304.60	900	0.23	500.00	0.38	1.14	726.46	0.69	FMH_FLN_07001	FMH_FLN_09001	9.50	9.50	4.73	4.12	3.87	4.48
	FMH_FLN_07001.1	10802.50																				
	C2-9	69.28																				
	D3-1a	388.84																				
FMH_FLN_09001.1			11260.62	41705.99	4.00	521.32	132.70	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09001	FMH_FLN_09001a	9.50	9.50	4.12	3.86	4.48	4.74
	FMH_FLN_09001.1	11260.62																				
	C2-7	44.88																				
	C2-8	0.56																				
FMH_FLN_09001a.1			11306.06	41874.29	4.00	523.43	136.40	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09001a	FMH_FLN_09002	9.50	9.00	3.86	3.58	4.74	4.52
	FMH_FLN_09001a.1	11306.06																				
	C2-6	14.00																				
FMH_FLN_09002.1			11320.06	41926.14	4.00	524.08	142.20	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09002	FMH_FLN_09003	9.00	9.00	3.58	3.30	4.52	4.80
	FMH_FLN_09002.1	11320.06																				
	C2-5	16.80																				
FMH_FLN_09003.1			11336.86	41988.36	4.00	524.85	28.60	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09003	FMH_FLN_09004	9.00	9.00	3.30	3.24	4.80	4.86
	FMH_FLN_09003.1	11336.86																				
FMH_FLN_09004.1			11336.86	41988.36	3.00	393.64	SPS								FMH_FLN_09004	FMH_FLN_09004a	9.00	9.00	3.24	7.10	4.86	1.00
	FMH_FLN_09004.1	11336.86																				
FMH_FLN_09004a.1			11336.86	41988.36	4.00	524.85	27.30	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09004a	FMH_FLN_09004b	9.00	9.00	6.55	6.50	1.55	1.60

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_09004a.1	11336.86																				
FMH_FLN_09004b.1			11336.86	41988.36	4.00	524.85	135.00	900	0.23	500.00	0.38	1.14	726.46	0.72	FMH_FLN_09004b	FMH_FLN_09005	9.00	9.00	6.50	6.23	1.60	1.87
	FMH_FLN_09004b.1	11336.86																				
	B3-12	44.32																				
FMH_FLN_09005.1			11381.18	42152.51	4.00	526.91	154.00	900	0.23	500.00	0.38	1.14	726.46	0.73	FMH_FLN_09005	FMH_FLN_09006	9.00	9.00	6.23	5.92	1.87	2.18
	FMH_FLN_09005.1	11381.18																				
	B3-10	69.28																				
FMH_FLN_09006.1			11450.46	42409.11	4.00	530.11	75.70	900	0.23	500.00	0.38	1.14	726.46	0.73	FMH_FLN_09006	FMH_FLN_09007	9.00	8.50	5.92	5.77	2.18	1.83
	FMH_FLN_09006.1	11450.46																				
	B3-9	319.33																				
FMH_FLN_09007.1			11769.79	43591.81	4.00	544.90	122.70	900	0.23	500.00	0.38	1.14	726.46	0.75	FMH_FLN_09007	FMH_FLN_09008	8.50	8.50	5.77	5.52	1.83	2.08
	FMH_FLN_09007.1	11769.79																				
	B3-6	334.70																				
FMH_FLN_09008.1			12104.49	44831.44	4.00	560.39	76.10	900	0.23	500.00	0.38	1.14	726.46	0.77	FMH_FLN_09008	FMH_FLN_09009	8.50	8.50	5.52	5.37	2.08	2.23
	B3-7	316.24																				
FMH_FLN_20001.1			316.24	1171.27	6.00	21.96	120.40	375	0.09	210.00	0.37	1.00	109.90	0.20	FMH_FLN_20001	FMH_FLN_09009	8.50	8.50	6.00	5.43	2.13	2.70
	FMH_FLN_09008.1	12104.49																				
	FMH_FLN_20001.1	316.24																				
	B3-5	44.32																				
FMH_FLN_09009.1			12465.05	46166.86	4.00	577.09	136.90	900	0.23	500.00	0.38	1.14	726.46	0.79	FMH_FLN_09009	FMH_FLN_11001	8.50	8.50	4.90	4.63	2.70	2.97

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	B1-8	8.88																				
	B1-9	160.90																				
FMH_FLN_10001.1			169.78	628.80	8.00	15.72	133.20	375	0.09	30.00	0.99	2.64	291.25	0.05	FMH_FLN_10001	FMH_FLN_10001a	14.50	10.60	13.00	8.56	1.13	1.67
	FMH_FLN_10001.1	169.78																				
	B1-7	561.29																				
FMH_FLN_10001a.1			731.07	2707.66	6.00	50.77	35.10	375	0.09	30.00	0.99	2.64	291.25	0.17	FMH_FLN_10001a	FMH_FLN_10001b	10.60	9.20	8.56	7.39	1.67	1.44
	FMH_FLN_10001a.1	731.07																				
FMH_FLN_10001b.1			731.07	2707.66	6.00	50.77	35.80	375	0.09	40.00	0.86	2.28	252.19	0.20	FMH_FLN_10001b	FMH_FLN_10002	9.20	8.00	7.39	6.50	1.44	1.13
	FMH_FLN_10001b.1	731.07																				
FMH_FLN_10002.1			731.07	2707.66	6.00	50.77	18.50	375	0.09	40.00	0.86	2.28	252.19	0.20	FMH_FLN_10002	FMH_FLN_10002a	8.00	7.50	6.50	6.03	1.13	1.09
	FMH_FLN_10002.1	731.07																				
FMH_FLN_10002a.1			731.07	2707.66	6.00	50.77	41.20	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002a	FMH_FLN_10002b	7.50	7.50	5.96	5.80	1.09	1.25
	FMH_FLN_10002a.1	731.07																				
FMH_FLN_10002b.1			731.07	2707.66	6.00	50.77	53.80	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002b	FMH_FLN_10002c	7.50	7.50	5.80	5.59	1.25	1.46
	FMH_FLN_10002b.1	731.07																				
FMH_FLN_10002c.1			731.07	2707.66	6.00	50.77	63.30	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002c	FMH_FLN_10002d	7.50	7.50	5.59	5.35	1.46	1.70

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_10002c.1	731.07																				
FMH_FLN_10002d.1			731.07	2707.66	6.00	50.77	56.80	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002d	FMH_FLN_10002e	7.50	7.50	5.35	5.13	1.70	1.92
	FMH_FLN_10002d.1	731.07																				
FMH_FLN_10002e.1			731.07	2707.66	6.00	50.77	39.10	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002e	FMH_FLN_10002f	7.50	7.50	5.13	4.98	1.92	2.07
	FMH_FLN_10002e.1	731.07																				
FMH_FLN_10002f.1			731.07	2707.66	6.00	50.77	23.20	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002f	FMH_FLN_10002g	7.50	7.50	4.98	4.89	2.07	2.16
	FMH_FLN_10002f.1	731.07																				
FMH_FLN_10002g.1			731.07	2707.66	6.00	50.77	22.80	450	0.11	260.00	0.37	1.01	160.43	0.32	FMH_FLN_10002g	FMH_FLN_10003	7.50	7.50	4.89	4.80	2.16	2.25
	FMH_FLN_10002g.1	731.07																				
FMH_FLN_10003.1			731.07	2707.66	4.00	33.85	SPS								FMH_FLN_10003	FMH_FLN_10003a	7.50	7.50	4.80	6.35	2.55	1.00
	FMH_FLN_10003.1	731.07																				
FMH_FLN_10003a.1			731.07	2707.66	4.00	33.85	26.50	150				1.92			FMH_FLN_10003a	FMH_FLN_10003b	7.50	7.50	6.35	6.35	1.00	1.00
	FMH_FLN_10003a.1	731.07																				
																			Pipe Jacking			
FMH_FLN_10003b.1			731.07	2707.66	4.00	33.85	118.00	150				1.92			FMH_FLN_10003b	FMH_FLN_10003c	7.50	7.50	-2.15	-2.15	9.50	9.50

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_10003b.1	731.07																				
	B3-2	368.85																				
FMH_FLN_10003c.1			1099.92	4073.78	6.00	76.38	96.20	600	0.15	350.00	0.37	1.05	296.81	0.26	FMH_FLN_10003c	FMH_FLN_10004	7.50	8.00	5.35	5.08	1.55	2.32
	FMH_FLN_10003c.1	1099.92																				
	B3-3	611.92																				
FMH_FLN_10004.1			1711.84	6340.16	5.00	99.06	111.10	600	0.15	350.00	0.37	1.05	296.81	0.33	FMH_FLN_10004	FMH_FLN_11001	8.00	8.50	5.08	4.76	2.32	3.14
	FMH_FLN_09009.1	12465.05																				
	FMH_FLN_10004.1	1711.84																				
	B3-4	44.32																				
FMH_FLN_11001.1			14221.22	52671.17	4.03	662.99	173.70	900	0.23	400.00	0.42	1.28	812.41	0.82	FMH_FLN_11001	FMH_FLN_13001	8.50	8.50	4.46	4.02	3.14	3.58
	B2-11	816.90																				
FMH_FLN_12001.1			816.90	3025.55	6.00	56.73	153.30	300	0.08	100.00	0.49	1.24	87.90	0.65	FMH_FLN_12001	FMH_FLN_13001	8.00	8.50	6.00	4.47	1.70	3.73
	FMH_FLN_11001.1	14221.22																				
	FMH_FLN_12001.1	816.90																				
	B2-12	761.39																				
FMH_FLN_13001.1			15799.51	58516.69	3.96	725.04	171.90	900	0.23	400.00	0.42	1.28	812.41	0.89	FMH_FLN_13001	FMH_FLN_15001	8.50	7.50	3.87	3.44	3.73	3.16
	B2-4	219.52																				
	B2-6	822.95																				
FMH_FLN_14001.1			1042.47	3861.00	6.00	72.39	108.30	300	0.08	50.00	0.69	1.76	124.38	0.58	FMH_FLN_14001	FMH_FLN_15001	8.00	7.50	6.00	3.83	1.70	3.37
	FMH_FLN_13001.1	15799.51																				
	FMH_FLN_14001.1	1042.47																				
	B2-7	813.56																				
FMH_FLN_15001.1			17655.54	65390.87	3.90	796.82	123.30	900	0.23	300.00	0.49	1.47	938.35	0.85	FMH_FLN_15001	FMH_FLN_15002	7.50	6.50	3.23	2.82	3.37	2.78

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_15001.1	17655.54																				
FMH_FLN_15002.1			17655.54	65390.87	3.90	796.82	28.80	900	0.23	300.00	0.49	1.47	938.35	0.85	FMH_FLN_15002	FMH_FLN_15003	6.50	6.50	2.82	2.73	2.78	2.87
	A1-3	21.06																				
FMH_FLN_16001.1			21.06	78.00	8.00	1.95	162.10	300	0.08	150.00	0.40	1.01	71.73	0.03	FMH_FLN_16001	FMH_FLN_16002	7.50	7.50	6.10	5.02	1.10	2.18
	FMH_FLN_16001.1	21.06																				
FMH_FLN_16002.1			21.06	78.00	8.00	1.95	64.30	300	0.08	150.00	0.40	1.01	71.73	0.03	FMH_FLN_16002	FMH_FLN_16003	7.50	7.50	5.02	4.59	2.18	2.61
	FMH_FLN_16002.1	21.06																				
FMH_FLN_16003.1			21.06	78.00	8.00	1.95	25.40	300	0.08	150.00	0.40	1.01	71.73	0.03	FMH_FLN_16003	FMH_FLN_18001	7.50	7.50	4.59	4.42	2.61	2.78
	A1-11	25.20																				
FMH_FLN_17001.1			25.20	93.33	8.00	2.33	64.50	300	0.08	150.00	0.40	1.01	71.73	0.03	FMH_FLN_17001	FMH_FLN_17002	9.00	9.00	7.00	6.57	1.70	2.13
	FMH_FLN_17001.1	25.20																				
	FCA(Partial)	2500.00																				
	A1-8	20.44																				
FMH_FLN_17002.1			2545.64	9428.30	5.00	147.32	88.60	525	0.13	300.00	0.37	1.04	224.95	0.65	FMH_FLN_17002	FMH_FLN_17003	9.00	8.00	6.35	6.05	2.13	1.43
	FMH_FLN_17002.1	2545.64																				
FMH_FLN_17003.1			2545.64	9428.30	5.00	147.32	96.40	525	0.13	300.00	0.37	1.04	224.95	0.65	FMH_FLN_17003	FMH_FLN_17004	8.00	7.50	6.05	5.73	1.43	1.25

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)

2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_17003.1	2545.64																				
FMH_FLN_17004.1			2545.64	9428.30	5.00	147.32	21.40	525	0.13	300.00	0.37	1.04	224.95	0.65	FMH_FLN_17004	FMH_FLN_18001	7.50	7.50	5.73	5.66	1.25	1.32
	FMH_FLN_16003.1	21.06																				
	FMH_FLN_17004.1	2545.64																				
FMH_FLN_18001.1			2566.70	9506.30	4.00	118.83	SPS								FMH_FLN_18001	FMH_FLN_18001a	7.50	7.50	4.42	6.20	2.78	1.00
	FMH_FLN_18001.1	2566.70																				
FMH_FLN_18001a.1			2566.70	9506.30	4.00	118.83	11.60	300				1.68			FMH_FLN_18001a	FMH_FLN_18001b	7.50	7.50	6.20	6.20	1.00	1.00
	FMH_FLN_18001a.1	2566.70																				
FMH_FLN_18001b.1			2566.70	9506.30	4.00	118.83	85.40	300				1.68			FMH_FLN_18001b	FMH_FLN_18001c	7.50	7.50	6.20	6.20	1.00	1.00
	FMH_FLN_18001b.1	2566.70																				
FMH_FLN_18001c.1			2566.70	9506.30	4.00	118.83	79.80	300				1.68			FMH_FLN_18001c	FMH_FLN_18001d	7.50	7.50	6.20	6.20	1.00	1.00
	FMH_FLN_18001c.1	2566.70																				
FMH_FLN_18001d.1			2566.70	9506.30	4.00	118.83	43.50	300				1.68			FMH_FLN_18001d	FMH_FLN_18001e	7.50	8.00	6.20	6.70	1.00	1.00
	FMH_FLN_18001d.1	2566.70																				
FMH_FLN_18001e.1			2566.70	9506.30	4.00	118.83	31.60	300				1.68			FMH_FLN_18001e	FMH_FLN_18001f	8.00	8.00	6.70	6.70	1.00	1.00

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000
6.0	for population	1000	5000
5.0	for population	5000	10000
4.0	for population	10000	50000
Max (7.3/N^0.15, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000
3.5	for population	10000	25000
3.0	for population	25000	50000
Max (3.9/N^0.065, 2.4)	for population	50000	where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_18001e.1	2566.70																				
																			Pipe Jacking			
FMH_FLN_18001f.1			2566.70	9506.30	4.00	118.83	102.60	300				1.68			FMH_FLN_18001f	FMH_FLN_18002	8.00	8.00	-1.80	-1.80	9.50	9.50
	FMH_FLN_18001f.1	2566.70																				
FMH_FLN_18002.1			2566.70	9506.30	5.00	148.54	88.90	450	0.11	200.00	0.42	1.15	182.98	0.81	FMH_FLN_18002	FMH_FLN_18003	8.00	7.50	6.00	5.56	1.55	1.49
	FMH_FLN_18002.1	2566.70																				
	B2-2	56.84																				
FMH_FLN_18003.1			2623.54	9716.81	5.00	151.83	94.30	450	0.11	200.00	0.42	1.15	182.98	0.83	FMH_FLN_18003	FMH_FLN_18004	7.50	7.00	5.56	5.08	1.49	1.47
	FMH_FLN_18003.1	2623.54																				
FMH_FLN_18004.1			2623.54	9716.81	5.00	151.83	27.80	450	0.11	200.00	0.42	1.15	182.98	0.83	FMH_FLN_18004	FMH_FLN_15003	7.00	6.50	5.08	4.95	1.47	1.11
	FMH_FLN_15002.1	17655.54																				
	FMH_FLN_18004.1	2623.54																				
FMH_FLN_15003.1			20279.08	75107.69	2.95	691.32	SPS								FMH_FLN_15003	FMH_FLN_15003a	6.50	6.50	2.73	4.75	3.02	1.00
	FMH_FLN_15003.1	20279.08																				
FMH_FLN_15003a.1			20279.08	75107.69	2.95	691.32	28.70	750				1.56			FMH_FLN_15003a	FMH_FLN_19001	6.50	6.50	4.75	4.75	1.00	1.00
	FMH_FLN_15003a.1	20279.08																				
FMH_FLN_19001.1			20279.08	75107.69	2.95	691.32	95.00	750				1.56			FMH_FLN_19001	FMH_FLN_19002	6.50	6.50	4.75	4.75	1.00	1.00

Design of Gravity Sewers for Fanling North NDA

Design Criteria:

1. Unit flow factors based on EPD's Guidelines for Estimating Sewage Flows (GESF)
2. a) Peaking factor for sewers =

8.0	for population	0	1000	
6.0	for population	1000	5000	
5.0	for population	5000	10000	
4.0	for population	10000	50000	
Max (7.3/N^0.15, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

b) Peaking factor for SPSs and rising mains =

4.0	for population	0	10000	
3.5	for population	10000	25000	
3.0	for population	25000	50000	
Max (3.9/N^0.065, 2.4)	for population	50000		where N is contributing population in thousand, N = total AWF/0.27

(In reference to Table T-5, EPD's Guidelines for Estimating Sewage Flows)

3. Pipe hydraulics is based on Colebrook-White Equation with ks = 3mm and v = 0.000001m²/s.
(In reference to Table 5, DSD's Sewerage Manual Part 1)

ks = 3.00 v = 0.000001

Sewer Ref.	Average Flow and Peak Flow						Sewer Size and Capacity								Manholes Arrangement							
	Contributing Zones	Section AWF m³/d	Total AWF m³/d	Comtributing Population	Peaking Factor	Peak Flow l/s	Length m	Dia mm	R=A/P m	Gradient 1 in	32gRS)^0.5	Full Flow Velocity m/s	Capacity l/s	% Full Flow	USMH	DSMH	USGL	DSGL	USIL	DSIL	US Cover (m)	DS Cover (m)
	FMH_FLN_19001.1	20279.08																				
FMH_FLN_19002.1			20279.08	75107.69	2.95	691.32	103.10	750				1.56			FMH_FLN_19002	FMH_FLN_19003	6.50	8.05	4.75	6.30	1.00	1.00
	FMH_FLN_19002.1	20279.08																				
FMH_FLN_19003.1			20279.08	75107.69	2.95	691.32	98.40	750				1.56			FMH_FLN_19003	FMH_FLN_19004	8.05	8.25	6.30	6.50	1.00	1.00
	FMH_FLN_19003.1	20279.08																				
FMH_FLN_19004.1			20279.08	75107.69	2.95	691.32	199.40	750				1.56			FMH_FLN_19004	FMH_FLN_19005	8.25	7.90	6.50	6.15	1.00	1.00
	FMH_FLN_19004.1	20279.08																				
FMH_FLN_19005.1			20279.08	75107.69	2.95	691.32	218.90	750				1.56			FMH_FLN_19005	FMH_FLN_19006	7.90	7.77	6.15	6.02	1.00	1.00
	FMH_FLN_19005.1	20279.08																				
FMH_FLN_19006.1			20279.08	75107.69	2.95	691.32	49.30	750				1.56			FMH_FLN_19006	FMH_FLN_19007	7.77	8.17	6.02	6.42	1.00	1.00
	FMH_FLN_19006.1	20279.08																				
																				Pipe Jacking		
FMH_FLN_19007.1			20279.08	75107.69	2.95	691.32	51.10	750				1.56			FMH_FLN_19007	FMH_FLN_19008	8.17	9.10	-2.08	-1.15	9.50	9.50
	FMH_FLN_19007.1	20279.08																				
FMH_FLN_19008.1			20279.08	75107.69	2.95	691.32	735.20	750				1.56			FMH_FLN_19008	FMH_FLN_19009	9.10	6.90	7.35	5.15	1.00	1.00
	FMH_FLN_19008.1	20279.08																				
FMH_FLN_19009.1			20279.08	75107.69	2.95	691.32	14.70	750				1.56			FMH_FLN_19009	SWH_STW_1	6.90	6.90	5.15	5.15	1.00	1.00