

**Attachment 6: Replacement Pages of Sewerage Impact
Assessment**

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APPENDICES

Appendix A	Hydraulic Calculation of Sewage Flow at Existing Condition
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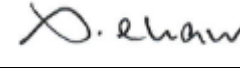
	Name	Signature	Date
Prepared	Vicky CHEUNG		January 2024
Checked	Kenneth CHAN		January 2024
Reviewed	Sylvia CHAN		January 2024

Table 3 --- Estimation of Existing Sewage Flow

	No.	Unit Flow	ADWF
Community, Social & Personal Services (J11)	269	0.280 m ³ /day/employee	75.32 m ³ /day
School student	497	0.040 m ³ /day/person	19.88 m ³ /day
Catchment Inflow Factor			1.00
TOTAL			95.20 m ³ /day

2.6 For the existing swimming pool in the Application site, the estimation of backwash flow is summarized in **Table 4**.

Table 4 --- Estimation of Sewage Flow from Existing Swimming Pool

Pool Area	130 m ²
Pool Depth	1.3 m
Pool Volume	169 m ³
Turnover Rate	4 hrs
Surface Loading Rate of Filter	20 m ³ /m ² /hr
Filter Areas Required	169 / 4 / 20 = 2.11 m ²
Backwash Duration	3 min /day
Backwash Flow Rate	30 m ³ /m ² /hr
Design Flow for Swimming Pool Backwashing	30 x 2.11 x 3 /60 = 3.17 m ³ /day (0.037 l/s)

2.7 Peak flows are estimated by multiplying the average dry weather flows by appropriate peaking factors. The peaking factors established in the GESF are adopted to assess the performance of the sewerage systems. The peaking factors used in this SIA are reproduced in **Table 5**.

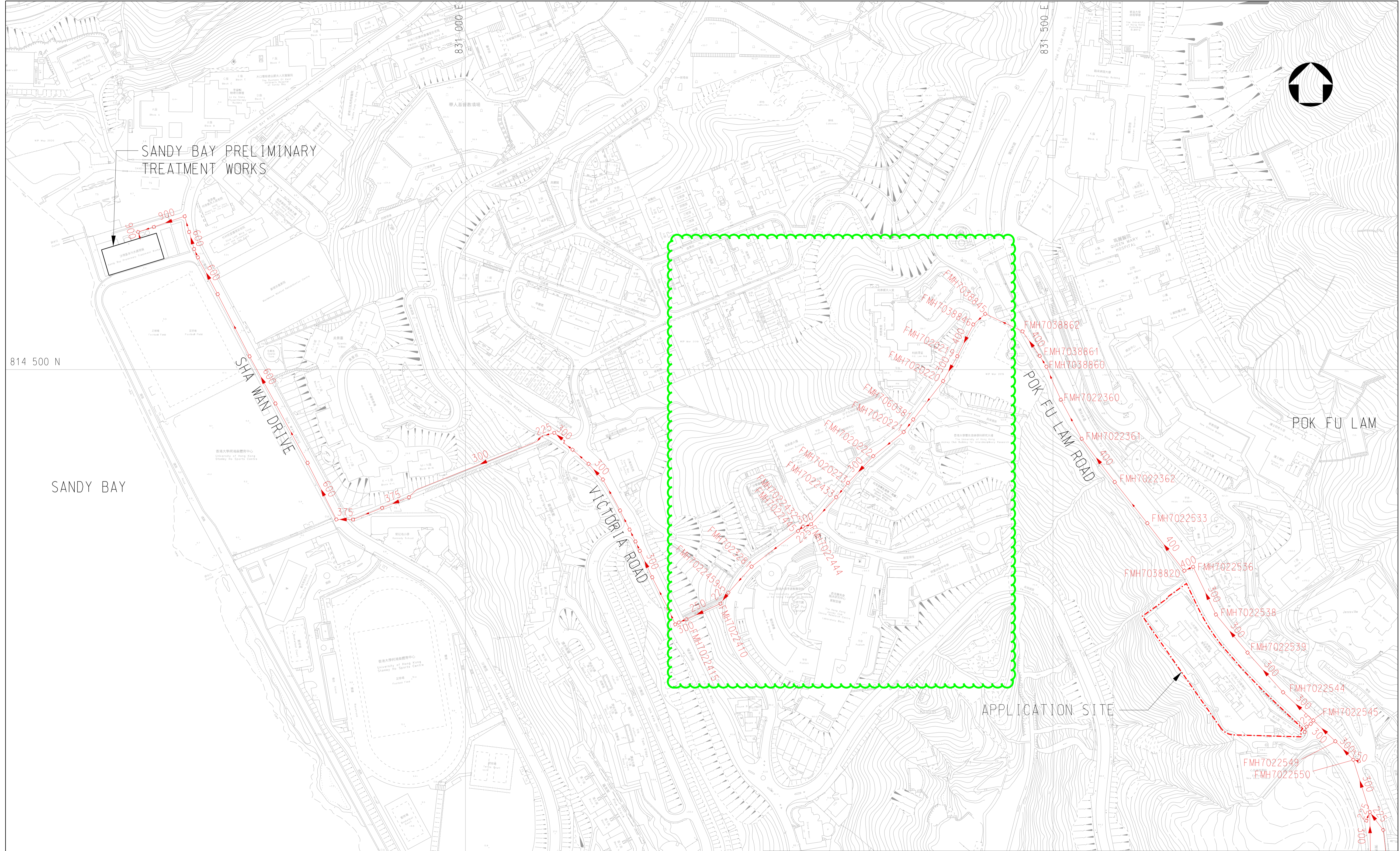
Table 5 --- Adopted Peaking Factors

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
(a) For sewers		
< 1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3
> 50,000	Max (7.3 / N ^{0.15} , 2.4)	Max (6 / N ^{0.175} , 1.6)

4. POTENTIAL IMPACTS ON SEWERAGE NETWORKS & PROPOSED MITIGATION MEASURES

- 4.1 The peak flow increased from the Application Site is approximately 2% of the capacity of SBPTW. It is expected that the SBPTW will be able to handle the increased sewage flow from the Application Site.
- 4.2 The sewage generated from the Proposed Development is estimated to be 192 m³/day (ADWF) and 3.66 m³/day design flow for swimming pool backwashing, with total peak discharge of 17.82 l/s. It is proposed to discharge the sewage flow to the public sewerage system at Pok Fu Lam Road.
- 4.3 It is understood that a student hostel is constructing at rural building lot no. 925 under application no. A/H10/94 now. The estimation of existing sewage flow at Pok Fu Lam Road have been assessed and presented in **Appendix A**. It is observed that two sewers at Pok Fu Lam Road (from manhole no. FMH7022544 to FMH7022539, and from FMH7022538 to FMH7022536) do not have adequate capacity.
- 4.4 To minimize the impact to the public sewer, the sewage generated from the Proposed Development will be discharged to further downstream (manhole no. FMH7038820), which has spare capacity (Current utilization is approximately 57%).
- 4.5 As the proposed formation level of the Application Site (approximately +120 mPD) is located below the level of the existing public sewerage system at Pok Fu Lam Road. A sump pit (with size 0.5m x 1m x 1.5m) and sewage pump (with pump rate of 24,804 l/h or 0.00689 m³/s) are proposed to pump the sewage generated from the Proposed Development to a new manhole (MH001) and further discharge to manhole no. FMH7038820 via a new 225 mm dia. sewer. **Drawing No. LILY16/SIA/002** shows the proposed sewage disposal scheme. The estimation of proposed sewage flows at Pok Fu Lam Road as well as calculation of sump pit size and sewer size is enclosed in **Appendix B**.
- 4.6 One sewer (FWD702447 between manholes FMH7022432 and FMH7022445) appears to be under-capacity (future flow represents nearly 200% of capacity), although it is noted that there is missing level information for the upstream manhole and the sewer is very short (only 4.7m in length). For the purposes of this assessment, it has been necessary to calculate the missing invert level, based on adjacent manhole data, although it is noted that the resultant gradient and capacity are incongruous with the rest of the local sewerage system. A preliminary freeboard check enclosed in **Appendix C** indicates that undesirable surcharging may occur under peak flow conditions. The sewers in Sassoon Road are mostly significantly deeper than 1m, so there would probably be more than 1m freeboard under surcharged conditions. It is therefore reasonable to conclude that the future peak flow can be accommodated in the existing public sewerage system, without unacceptable impacts or the need for significant upgrading.

Drawings



814 500 N

814 000 N

SANDY BAY PRELIMINARY TREATMENT WORKS

SANDY BAY

POK FU LAM

APPLICATION SITE

LEGEND:

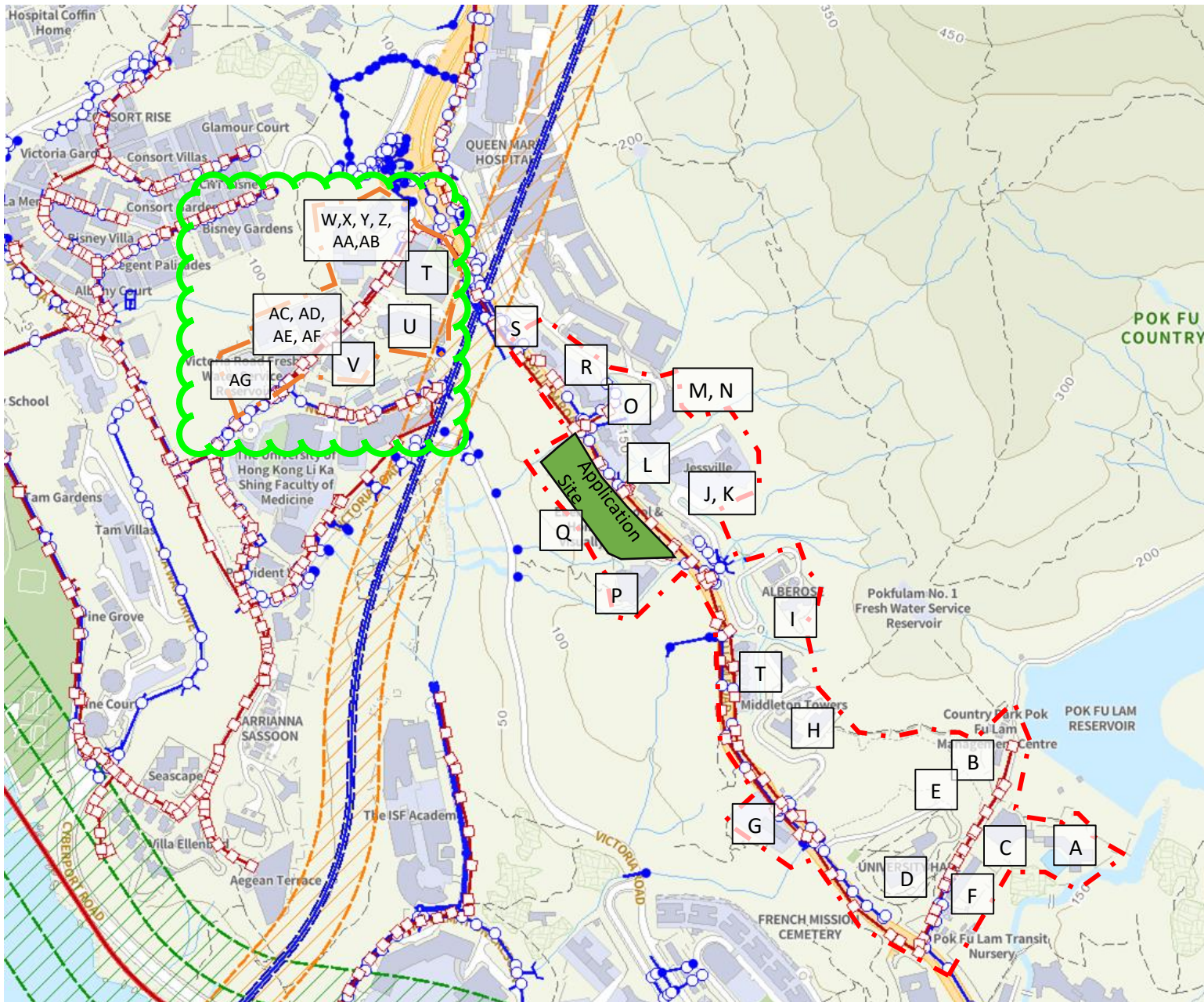
	APPLICATION SITE
	EXISTING SEWER

Title EXISTING PUBLIC SEWERAGE SYSTEM	Project title LAYOUT PLAN SUBMISSION AND PROPOSED MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FOR PERMITTED FLAT USE AT 131 POK FU LAM ROAD, HONG KONG, RBL 136RP	Figure no. LILY16/SIA/001	
	 BINNIES HONG KONG LIMITED 賓尼士工程顧問有限公司	Prepared -	Checked -
		Date 01/24	Scale A3 1:3000

Plot date : 2024/1/4

Appendix A

Hydraulic Calculation of Sewage Flow at Existing Condition



- - - Sewerage Catchment
- - - Area at Pok Fu Lam Road
- - - Sewerage Catchment
- - - Area at Sassoon Road

Project

Layout Plan Submission and Proposed Minor Relaxation of Building Height Restriction for Permitted Flat Use At 131 Pok Fu Lam Road, Hong Kong, RBL 136RP

Subject

Estimation of Existing Sewage Flow at Pok Fu Lam Road

Sewerage Catchment (From FMH7022574 to FMH7038862)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Peaking Factor	Cumulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre							
	Park Personnel	J11	5	0.28	1.4	8	0.00013	Estimated Population
	Swimming Pool (515m2)				12.55		0.00027	
B	WSD Staff Quarters	Insitutional	24	0.19	4.56	8	0.00070	12Units x 2PPF, say
C	HKJC PHAB Camp	Insitutional	124	0.19	23.56	8	0.00288	Data from website
D	University Hall	Insitutional	110	0.19	20.9	8	0.00481	Data from website
E	Planned Development A/H10/94-1*	Insitutional			461.2	6	0.03684	Flow provided by EPD
F	HKJC Riding School	J11			97.53	6	0.04361	Flow provided by EPD
G	Woodbury Court							30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	6	0.04570	
	Management Staff	J11	6	0.28	1.68	6	0.04581	
	Swimming Pool (105m2)				2.56		0.04584	
H	Middleton Towers							70 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	259	0.27	69.93	6	0.05070	
	Management Staff	J11	13	0.28	3.64	6	0.05095	
I	Alberose	R3	4	0.37	1.48	6	0.05105	1 Units from Centadata, average occupancy 3.7 PPF
J	Jessville Manor							4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	6	0.05134	
	Management Staff	J11	1	0.28	0.28	6	0.05135	
K	Jessville Tower							28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	6	0.05330	
	Management Staff	J11	6	0.28	1.68	6	0.05342	
	Swimming Pool (240m2)				5.85		0.05349	
P	Ebenezer New Hope School							
	Student	Student	66	0.04	2.64	6	0.05367	
	Teacher & Staff	J11	102	0.28	28.56	6	0.05566	
Q	Ebenezer School & Home for the Visually Impaired							Data from Ebenezer
	Student	Student	431	0.04	17.24	6	0.05685	
	Teacher & Staff	J11	167	0.28	46.76	6	0.06010	
	Swimming Pool (130m2)				3.17		0.06014	
L	Dor Fook Mansion							25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	6	0.06188	
	Management Staff	J11	5	0.28	1.4	6	0.06198	
M	Government Quarters							
	Residents	R2	592	0.27	159.84	6	0.07308	Estimated population (20 floors x 8 flats/floor = 160 Units)
	Management Staff	J11	30	0.28	8.4	6	0.07366	
N	Hospital Authority	J11	126	0.28	35.28	6	0.07611	Building Area 1.907m2 x 2 floors = 3.814m2
O	Radcliffe							10 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	37	0.27	9.99	6	0.07680	
	Management Staff	J11	2	0.28	0.56	6	0.07684	
	Swimming Pool (290m2)				7.07		0.07693	
R	Royalton							30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	6	0.07901	
	Management Staff	J11	6	0.28	1.68	6	0.07912	
	Swimming Pool (70m2)				1.71		0.07914	
S	Royalton II							17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	6	0.08032	
	Management Staff	J11	4	0.28	1.12	6	0.08040	
	Swimming Pool (105m2)				2.56		0.08043	
T	No. 3 Sassoon Road Academic Building							
	Student	Student	960	0.04	38.4	6	0.08310	Data from HKU
	Teacher & Staff	J11	44	0.28	12.32	6	0.08395	Data from HKU
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research							
	Student**	Student	1728	0.04	69.12	6	0.08875	Data from HKU, total population 1,800 persons. Estimated Staff are 4% of Overall Population
	Teacher & Staff**	J11	72	0.28	20.16	6	0.09015	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)							
	Student**	Student	522	0.04	20.88	6	0.09160	Data from HKU, total population 745 persons. Estimated Staff are 4% of Overall Population
	Teacher & Staff**	J11	30	0.28	8.4	6	0.09219	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	5	0.10868	Flow provided by EPD
X	Wei Lun Hall	Insitutional			72.6	5	0.11288	Flow provided by EPD
Y	Lee Hysan Hall	Insitutional			72.6	5	0.11708	Flow provided by EPD
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	5	0.12128	Flow provided by EPD
AA	Bay View Restaurant	J10			75.5	5	0.12565	Flow provided by EPD
AB	Madam S.H. Ho Residence for Medical Student	Insitutional			55.3	5	0.12885	Flow provided by EPD
AC	Dexter H.C Man Building	J11	107	0.28	29.96	5	0.13059	Data from HKU
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	5	0.13171	Data from HKU

AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	5	0.13337	Data from HKU
AF	Pauline Chan Building							
	Student	Student	162	0.04	6.48	5	0.13375	Data from HKU
	Teacher & Staff	J11	402	0.28	112.56	5	0.14026	Data from HKU
	Kitchen	J10	18	1.58	28.44	5	0.14191	Data from HKU
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	5	0.14196	Estimated Population
	Total Flow						1171.0	Inflow Factor = 1.00 GESF Table T-4
	Average Flow (l/s)						13.55	
	Since the PI							

*Estimated sewage flow of Planned Development A/H10/94-1 is being incorporated into the existing estimation of sewage flow as it is under construction.
** With reference to Source T (No. 3 Sasson Road Academic Building), the population of teacher & staff is approximately 4% of the total population

The estimation of backwash flow from swimming pool is based on following assumption

Turnover Rate	4 hr
Surface Loading Rate of Filter	20 m ³ /m ² /hr
Backwash Duration	3 min /day
Backwash Flow Rate	30 m ³ /m ² /hr

From Manhole No.	To Manhole No.	Upstream CL (mPD)	Downstream CL (mPD)	Upstream I.L. (mPD) ¹	Downstream I.L. (mPD) ¹	Distance (m)	Diameter (mm)	Gradient (1 in)	Capacity (m ³ /s)	Peak Discharge (existing) (m ³ /s)	% of Capacity (existing)	Remark
FMH7022550	FMH7022549	139.22	138.78	137.32	137.23	20.6	300	228.9	0.074	0.05349	72.25%	Existing Flow from Source A to K
FMH7022549	FMH7022545	138.62	138.62	137.22	137.07	24.3	300	162.0	0.088	0.06014	68.33%	Connection Point from P (Ebenezer New Hope School), O (Ebenezer School & Home for the Visually Impaired)
FMH7022545	FMH7022544	138.74	138.74	137.07	136.89	33.6	300	186.7	0.082	0.06014	73.35%	
FMH7022544	FMH7022539	138.89	138.89	136.89	136.74	44.3	300	295.3	0.065	0.06198	95.10%	Connection Point from L (Dor Fook Mansion)
FMH7022539	FMH7022538	139.02	139.02	136.74	136.52	41.5	300	188.6	0.082	0.06198	76.00%	
FMH7022538	FMH7022536	138.98	138.98	136.52	136.35	42.7	300	251.2	0.071	0.07693	108.85%	Connection Point from O (Radcliffe), M (Government Quarters), N (Hospital Authority)
FMH7022536	FMH7038820	138.71	138.71	136.33	136.26	7.7	400	110.0	0.228	0.07693	33.79%	
FMH7038820	FMH7022533	138.37	138.37	136.25	135.91	50.6	400	148.8	0.196	0.07693	39.31%	
FMH7022533	FMH7022362	138.00	138.00	135.89	135.55	42.7	400	125.6	0.213	0.07914	37.15%	Connection Point from R (Royalton)
FMH7022362	FMH7022361	138.40	138.40	135.54	135.26	45	400	160.7	0.188	0.08043	42.71%	Connection Point from S (Royalton II)
FMH7022361	FMH7022360	138.43	138.43	135.54	134.65	36.9	400	41.5	0.371	0.08043	21.69%	
FMH7022360	FMH7038860	138.24	138.24	134.65	134.11	29.4	400	54.4	0.324	0.08043	24.85%	
FMH7038860	FMH7038861	137.63	137.63	134.11	133.63	10.5	400	21.9	0.511	0.08043	15.75%	
FMH7038861	FMH7038862	135.42	135.42	133.63	133.00	24.3	400	38.6	0.364	0.08043	20.92%	
FMH7038862	FMH7038845	135.42	135.34	133.00	132.50	34.7	400	69.4	0.287	0.08043	28.06%	
FMH7038845	FMH7038846	135.34	134.18	132.50	131.76	13.5	400	18.2	0.559	0.08043	14.39%	
FMH7038846	FMH7020219	134.18	131.89	131.76	129.79	29.7	400	15.1	0.615	0.08043	13.08%	
FMH7020219	FMH7020220	131.89	130.45	129.79	128.35	24.1	300	16.7	0.274	0.08043	29.37%	
FMH7020220	FMH7060381	130.45	126.53	128.35	124.46	41.6	300	10.7	0.343	0.08395	24.50%	Connection Point from T (No. 3 Sassoon Road Academic Building)
FMH7060381	FMH7020221	126.53	124.46	124.46	122.68	13.1	300	7.4	0.413	0.09015	21.83%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research)
FMH7020221	FMH7020222	124.46	119.51	122.68	117.41	32.7	300	6.2	0.450	0.09219	20.49%	Connection Point from V (Patrick Manson Building (North Wing))
FMH7020222	FMH7020223	119.51	115.59	117.41	112.89	31.3	300	6.9	0.426	0.09219	21.65%	
FMH7020223	FMH7022433	115.59	113.59	112.89	110.99	15.7	300	8.3	0.390	0.09219	23.65%	
FMH7022433	FMH7022444	113.59	109.95	110.99	108.21	30.1	300	10.6	0.341	0.09219	27.07%	
FMH7022444	FMH7022432	109.95	110.04	108.21	108.08	6	300	48.2	0.165	0.09219	55.90%	
FMH7022432	FMH7022445	110.04	109.47	108.08	107.98	4.7	225	47.0	0.077	0.14196	185.42%	Connection Point from AG (Victoria Road Fresh Water Service Reservoir)
FMH7022445	FMH7023281	109.47	104.54	107.98	101.96	48.2	225	8.0	0.186	0.14196	76.52%	
FMH7023281	FMH7022459	104.54	101.40	101.96	99.27	29.8	225	11.1	0.158	0.14196	90.01%	
FMH7022459	FMH7022410	101.40	99.20	99.27	98.20	12	225	11.2	0.157	0.14196	90.56%	
FMH7022410	FMH7022415	99.20	77.70	98.00	73.83	32	250	1.3	0.602	0.14196	23.57%	

Surface roughness k_s 0.6 mm (Slimed sewers - Clayware in poor condition)
 kinematic viscosity ν 1.14 mm²/s

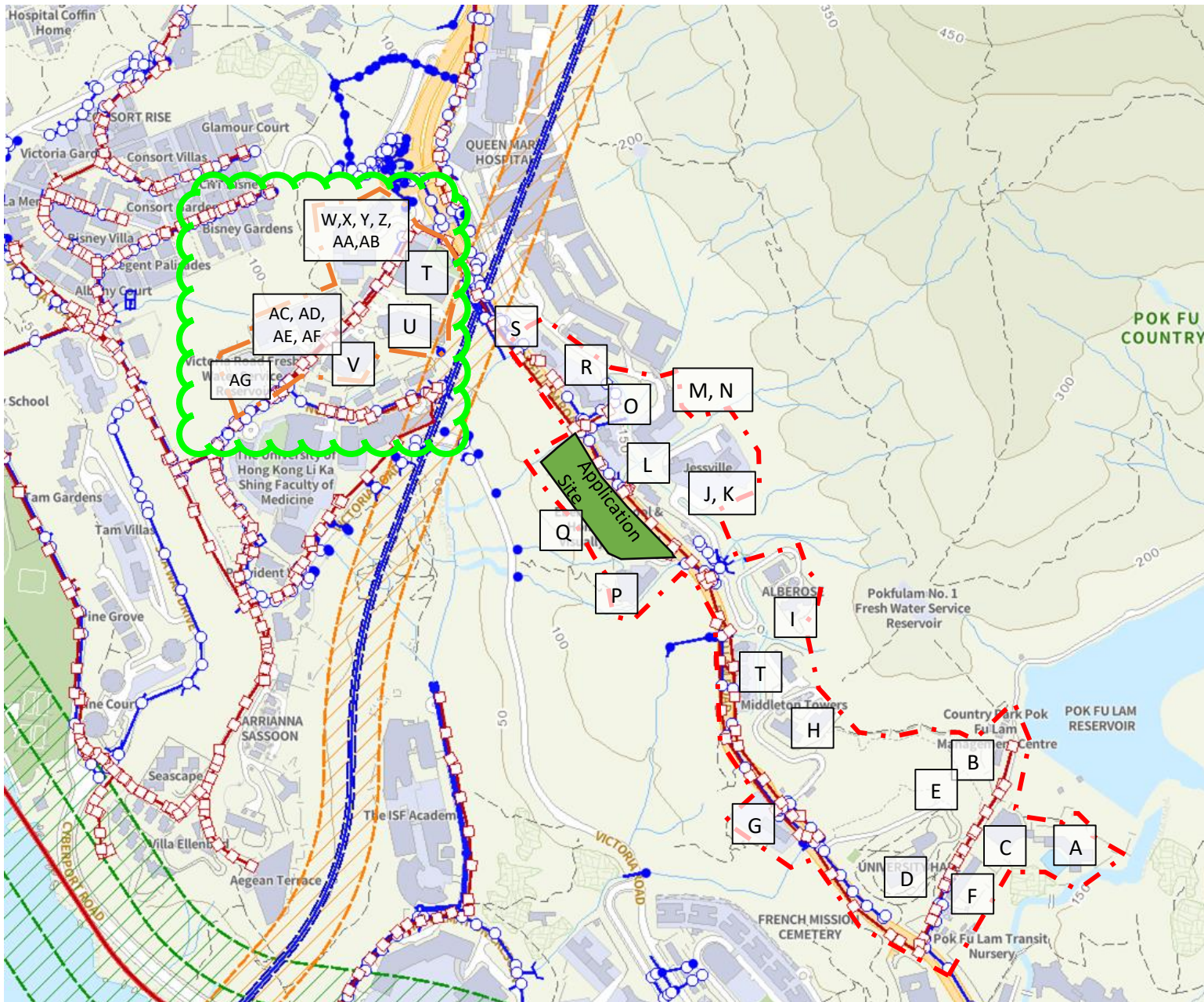
Mean velocity (Colebrook-White)

Capacity provided $Q = V \times \text{Cross Section Area of Drain}$

1. All invert levels are extracted from GEOINFO MAP and only the invert levels of the main alignment are presented.
 2. Drainage record plan refers to Drawing No. LILY16/SIA/001
 * Assume mid-way between upstream and downstream manholes

Appendix B

Hydraulic Calculation of Sewage Flow of Proposed Development



- - - Sewerage Catchment
- - - Area at Pok Fu Lam Road
- - - Sewerage Catchment
- - - Area at Sassoon Road

Project

Layout Plan Submission and Proposed Minor Relaxation of Building Height Restriction for Permitted Flat Use At 131 Pok Fu Lam Road, Hong Kong, RBL 136RP

Subject

Estimation of Sewage Flow at Pok Fu Lam Road (After Development)

Sewerage Catchment (From FMH7022574 to FMH7038862)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Peaking Factor	Cumulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre							
	Park Personnel	J11	5	0.28	1.4	8	0.00013	Estimated Population
	Swimming Pool (515m2)				12.55		0.00027	
B	WSD Staff Quarters	Insitutional	24	0.19	4.56	8	0.00070	12Units x 2PPF, say
C	HKJC PHAB Camp	Insitutional	124	0.19	23.56	8	0.00288	Data from website
D	University Hall	Insitutional	110	0.19	20.9	8	0.00481	Data from website
E	Planned Development A/H10/94-1	Insitutional			461.2	6	0.03684	Flow provided by EPD
F	HKJC Riding School	J11			97.53	6	0.04361	Flow provided by EPD
G	Woodbury Court							30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	6	0.04570	
	Management Staff	J11	6	0.28	1.68	6	0.04581	
	Swimming Pool (105m2)				2.56		0.04584	
H	Middleton Towers							70 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	259	0.27	69.93	6	0.05070	
	Management Staff	J11	13	0.28	3.64	6	0.05095	
T	Planned Development Lot No. RBL 757							
	Residents	R3	12	0.37	4.44	6	0.05126	3 Units from Midland Realty data, average occupancy 3.7 PPF
	Management Staff	J11	1	0.28	0.28	6	0.05128	
I	Alberose	R3	4	0.37	1.48	6	0.05138	1 Units from Centadata, average occupancy 3.7 PPF
J	Jessville Manor							4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	6	0.05166	
	Management Staff	J11	1	0.28	0.28	6	0.05168	
K	Jessville Tower							28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	6	0.05363	
	Management Staff	J11	6	0.28	1.68	6	0.05375	
	Swimming Pool (240m2)				5.85		0.05382	
L	Dor Fook Mansion							25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	6	0.05556	
	Management Staff	J11	5	0.28	1.4	6	0.05566	
M	Government Quarters							
	Residents	R2	592	0.27	159.84	6	0.06676	Estimated population (20 floors x 8 flats/floor = 160 Units)
	Management Staff	J11	30	0.28	8.4	6	0.06734	
N	Hospital Authority	J11	126	0.28	35.28	6	0.06979	Building Area 1.907m2 x 2 floors = 3.814m2
O	Radcliffe							10 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	37	0.27	9.99	6	0.07048	
	Management Staff	J11	2	0.28	0.56	6	0.07052	
	Swimming Pool (290m2)				7.07		0.07061	
P	Existing Facilities (to be relocated)							Proposed Development
	Student	Student	0	0.04	0	6	0.07061	
	Teacher & Staff	J11	0	0.28	0	6	0.07061	
Q	Proposed Development							
	Residents	R3	500	0.37	185	6	0.08345	
	Management Staff*	J11	25	0.28	7	6	0.08394	
	Swimming Pool (150m2)				3.66		0.08398	
R	Royalton							30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	6	0.08606	
	Management Staff	J11	6	0.28	1.68	6	0.08618	
	Swimming Pool (70m2)				1.71		0.08620	
S	Royalton II							17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	6	0.08738	
	Management Staff	J11	4	0.28	1.12	6	0.08746	
	Swimming Pool (105m2)				2.56		0.08749	
T	No. 3 Sassoon Road Academic Building							
	Student	Student	960	0.04	38.4	6	0.09015	Data from HKU
	Teacher & Staff	J11	44	0.28	12.32	6	0.09101	Data from HKU
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research							
	Student**	Student	1728	0.04	69.12	5	0.09501	Data from HKU, total population 1,800 persons. Estimated Staff are 4% of Overall Population
	Teacher & Staff**	J11	72	0.28	20.16	5	0.09618	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)							
	Student**	Student	715	0.04	28.6	5	0.09783	Data from HKU, total population 745 persons. Estimated Staff are 4% of Overall Population
	Teacher & Staff**	J11	30	0.28	8.4	5	0.09832	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	5	0.11481	Flow provided by EPD
X	Wei Lun Hall	Insitutional			72.6	5	0.11901	Flow provided by EPD
Y	Lee Hysan Hall	Insitutional			72.6	5	0.12321	Flow provided by EPD
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	5	0.12741	Flow provided by EPD
AA	Bay View Restaurant	J10			75.5	5	0.13178	Flow provided by EPD

AB	Madam S.H. Ho Residence for Medical Student	Institutional			55.3	5	0.13498	Flow provided by EPD
AC	Dexter H.C Man Building	J11	107	0.28	29.96	5	0.13672	Data from HKU
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	5	0.13784	Data from HKU
AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	5	0.13951	Data from HKU
AF	Pauline Chan Building							
	Student	Student	162	0.04	6.48	5	0.13988	Data from HKU
	Teacher & Staff	J11	402	0.28	112.56	5	0.14639	Data from HKU
	Kitchen	J10	18	1.58	28.44	5	0.14804	Data from HKU
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	5	0.14809	Estimated Population

Total Flow
Average Flow (l/s)

1273.0
14.73

Inflow Factor = 1.00 GESF Table T-4

*assume no. management staff = 5% of no. of residents

** With reference to Source T (No. 3 Sasson Road Academic Building), the population of teacher & staff is approximately 4% of the total population

The estimation of backwash flow from swimming pool is based on following assumption

Turnover Rate	4 hr
Surface Loading Rate of Filter	20 m ³ /m ² /hr
Backwash Duration	3 min /day
Backwash Flow Rate	30 m ³ /m ² /hr

Project

Layout Plan Submission and Proposed Minor Relaxation of Building Height Restriction for Permitted Flat Use At 131 Pok Fu Lam Road, Hong Kong, RBL 136RP

Subject

Estimation of Sewage Flow at Pok Fu Lam Road (After Development)

From Manhole No.	To Manhole No.	Upstream CL (mPD)	Downstream CL (mPD)	Upstream I.L. (mPD) ¹	Downstream I.L. (mPD) ¹	Distance (m)	Diameter (mm)	Gradient (1 in)	Capacity (m ³ /s)	Peak Discharge (existing) (m ³ /s)	% of Capacity (existing)	Peak Discharge (future) (m ³ /s)	% of Capacity (future)	Remark
New MH001	FMH7038820	138.95	138.71	137.00	136.80	13.5	225	87.5	0.064	0.07893	39.31%	0.01829	28.63%	Connection Point from Proposed Development.
FMH7038820	FMH7022533	138.71	138.37	136.25	135.91	50.6	400	148.8	0.198	0.07814	37.15%	0.08398	42.91%	Existing Flow from Source A to Q and T.
FMH7022533	FMH7022362	138.37	138.00	135.85	135.55	42.7	400	125.5	0.213	0.08043	42.71%	0.08749	49.45%	Connection Point from R (Royalton).
FMH7022362	FMH7022361	138.00	138.40	138.54	138.26	45	400	169.7	0.189	0.08043	21.69%	0.08749	23.53%	Connection Point from S (Royalton II).
FMH7022361	FMH7022380	138.40	138.43	138.54	138.55	36.9	400	41.5	0.371	0.08043	24.85%	0.08749	27.03%	
FMH7022380	FMH7038860	138.43	138.24	134.65	134.11	29.4	400	54.4	0.324	0.08043	15.75%	0.08749	17.13%	
FMH7038860	FMH7038861	138.24	137.63	134.11	133.63	10.5	400	21.9	0.511	0.08043	20.92%	0.08749	22.75%	
FMH7038861	FMH7038862	137.63	135.42	133.63	133.00	24.3	400	38.6	0.384	0.08043	28.06%	0.08749	30.52%	
FMH7038862	FMH7038845	135.42	135.34	133.00	131.76	13.5	400	18.2	0.558	0.08043	14.39%	0.08749	15.65%	
FMH7038845	FMH7038846	135.34	134.18	132.50	129.79	29.7	400	15.1	0.615	0.08043	13.08%	0.08749	14.22%	
FMH7038846	FMH7020219	134.18	131.89	131.76	128.35	24.1	300	16.7	0.274	0.08043	29.37%	0.08749	31.94%	
FMH7020219	FMH7020220	131.89	130.45	128.35	124.46	41.6	300	10.7	0.343	0.08395	24.50%	0.09101	26.56%	Connection Point from T (No. 3 Sassoon Road Academic Building).
FMH7020220	FMH7060381	130.45	126.53	126.35	122.68	13.1	300	7.4	0.413	0.09015	21.83%	0.09618	23.29%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research).
FMH7060381	FMH7020221	126.53	124.48	124.46	117.41	32.7	300	6.2	0.450	0.09219	20.49%	0.09832	21.86%	Connection Point from V (Patrick Manson Building (North Wing)).
FMH7020221	FMH7020222	124.48	119.51	122.68	112.89	31.3	300	6.9	0.426	0.09219	21.85%	0.11481	26.96%	
FMH7020222	FMH7020223	119.51	115.59	117.41	110.99	15.7	300	8.3	0.390	0.09219	23.65%	0.11901	30.53%	
FMH7020223	FMH7022433	115.59	109.95	110.98	108.21	30.1	300	10.8	0.341	0.09219	27.07%	0.12321	36.18%	
FMH7022433	FMH7022444	109.95	110.04	108.21	107.98	4.7	225	47.0	0.077	0.14196	185.42%	0.14809	193.43%	Connection Point from AG (Victoria Road Fresh Water Service Reservoir).
FMH7022444	FMH7022445	110.04	109.47	108.08	101.96	48.2	225	8.0	0.186	0.14196	76.52%	0.14809	79.82%	
FMH7022445	FMH7023281	109.47	104.54	107.98	99.27	29.8	225	11.1	0.158	0.14196	90.01%	0.14809	93.89%	
FMH7023281	FMH7022459	104.54	99.20	101.96	98.20	12	225	11.2	0.157	0.14196	90.56%	0.14809	94.47%	
FMH7022459	FMH7022410	101.40	99.20	98.00	93.83	32	250	1.3	0.602	0.14196	23.57%	0.14809	24.58%	
FMH7022410	FMH7022415	99.20	77.70	98.00										

Surface roughness n_s 0.6 mm (Slimed sewers - Clayware in poor condition)
 kinematic viscosity ν 1.14 mm²/s

Mean velocity (Colebrook-White)

Capacity provided $Q = V \times \text{Cross Section Area of Drain}$

1. All invert levels are extracted from GEONFO MAP and only the invert levels of the main alignment are presented.
 2. As this is new sewer proposed to connect to public sewerage system from the Proposed Development, peaking factor (excluding stormwater allowance) of 8 has been applied.
 3. Drainage record plan refers to Drawing No. LILY16/SIA/001
 * Assume mid-way between upstream and downstream manholes

Appendix C

Preliminary Freeboard Check for FMH7022432

Project

Layout Plan Submission and Proposed Minor Relaxation of Building Height Restriction for Permitted Flat Use At 131 Pok Fu Lam Road, Hong Kong, RBL 136RP

Subject

Preliminary Freeboard Check for FMH7022432

Capacity, Q	0.165 m³/s	(Peak Flow from FMH7022444 to FMH7022432)
A=	0.04 m²	
v= Q/A=	4.15 m/s	
Headlosses and Levels		
Water Level at Exit = 0.938 D + IL		(flow will pass through Critical Depth at discharge into downstream manhole)
Invert Level at Exit =	107.98 mPD	
Critical Depth = 0.938D	0.28	
Water Level at Exit/Discharge	108.26 mPD	
Length of Sewer	4.7 m	
Fall over length, h	0.10 m	
Entry loss @ 0.5v²/2g	0.44 m	
Total Headloss	0.54 m	
D/S Water Level	108.26 mPD	
U/S Water Level	108.80 mPD	
U/S Ground Level	110.04 mPD	(Assumed same ground level with adjacent manhole SMH7023829)
Freeboard	1.24 m (>1.0m)	