Annex B
Revised Sewerage Impact Assessment

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

Sewerage Impact Assessment Report

183437/LILY/003/Issue 5

Binnies Hong Kong Limited
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Hong Kong

October 2026

DOCUMENT CONTROL			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	No:	183437/LILY/003
AMENDMENT RECORD				Prepared by:	Binnies
Sewerage Impact Assessment Report				Initial:	WKC
				Date:	October 2026

Pages	Date	Issue No	Description	Initials
All	November 2023	1	For Section 16 Application	WKC
All	January 2024	2	For Section 16 Application	WKC
All	June 2024	3	For Section 16 Application	WKC
All	February 2026	4	For Section 16 Application	WKC
All	October 2026	5	For Section 16 Application	WKC

*The Registered Recipient is responsible for destroying or marking as 'superseded' all superseded documents.

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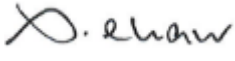
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Reviewed	Sylvia CHAN		October 2026

1. INTRODUCTION

1.1 Binnies Hong Kong Limited (Binnies) has been commissioned to carry out sewerage impact assessment to support a Section 16 planning application for layout plan submission and proposed minor relaxation of building height restriction for permitted flat use (Proposed Development) at 131 Pok Fuk Lam Road, Hong Kong, RBL 136RP (Application Site). This report presents the findings of the sewerage impact assessment for the Proposed Development at the Application Site.

1.2 The Application Site is currently the Ebenezer School and Home for the Visually Impaired. Access to the Application Site is via Pok Fu Lam Road as shown in ***Drawing No. LILY16/LP/001***.

1.3 The Proposed Development consists of residential flats, clubhouse facilities and carpark area. The Application Site occupies an area of approximately 0.65 ha.

1.4 The Proposed Development consists of four residential blocks with 10-11 residential storeys including one level of lobby, car parking facilities and 4 club houses. The Proposed Development layout is shown in ***Drawing No. LILY16/MLP/001***. A summary of key information of the Proposed Development is shown below in ***Table 1***.

Table 1--- Development Schedule

	Proposed Development
Site Area	About 6,460 m^2
Plot Ratio	Not more than 1.941 (including Bonus PR: 0.041)
No. of Storey	T1 – T3: 11 storeys (incl. lobby / clubhouse at LG/F) T4: 10 storeys (incl. Lobby / clubhouse at UG/F)
Total Domestic Gross Floor Area (GFA)	About 12,536.5 m^2 (including Bonus GFA: About 262.5 m^2)
No. of Residential Units	135
Recreational Facilities (Clubhouse) GFA	Not more than 614 m^2
Design Population	392
Population Intake Year	2034

1.5 This SIA report comprises the following sections after this introduction:

- ***Section 2*** discusses the sewage flow under the existing conditions;
- ***Section 3*** presents the estimation of sewage generated from the Proposed Development;

- ***Section 4*** assesses the potential impacts arising from the Proposed Development and proposed mitigation measures;

- ***Section 5*** evaluates the impact arising from the construction of the proposed sewerage works; and

- ***Section 6*** provides conclusion and recommendation of the SIA report.

2. ESTIMATION OF SEWAGE FLOW UNDER THE EXISTING CONDITIONS

Existing Sewerage and Sewage Treatment Facilities

2.1 According to the latest Drainage Record Plan from Drainage Services Department (DSD), there are 300 mm dia. sewers at Pok Fu Lam Road in the vicinity of the Application Site.

2.2 The Application Site is located within the sewage catchment of Sandy Bay Preliminary Treatment Works (SBPTW). Sewage generated from the Application Site is currently collected and conveyed through the existing sewer along Pok Fu Lam Road, Sasoon Road and Victoria Road to SBPTW for treatment and disposal. The existing public sewerage system is shown in ***Drawing No. LILY16/SIA/001***.

2.3 The capacity of the SBPTW has been upgraded to 34,560 m^3/day (ADWF) in 2018 under Contract No. DC/2009/24 - Upgrading of Preliminary Treatment Works at Sandy Bay, Cyberport, Wah Fu, Aberdeen and Ap Lei Chau under Harbour Area Treatment Scheme (HATS) Stage 2A according to the Project Profile for HATS Stage 2A prepared by DSD.

Existing Sewage Flow

2.4 The 300 mm dia. sewers at Pok Fu Lam Road serve the Application Site, which is currently the Ebenezer School and Home for the Visually Impaired. The existing sewage flow from the Application Site was estimated by the number of students, teacher and staff as shown in ***Table 2***.

Table 2 --- Number of Students, Teacher and Specialist Staff

	No. of Students	No. of Teacher and Staff
Ebenezer School	59	105
New Hope School	66	102
Child Care Centre	50	30
Resource Support Programme to visually impaired students	322	32
TOTAL	**497**	**269**

2.5 The existing Average Dry Weather Flow (ADWF) was estimated by referencing to the "*Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (Version 1.0)" (GESF)* published by Environmental Protection Department (EPD) in 2005. Sewage flow is estimated by the following equations:

Average Dry Weather Flow (ADWF) = Population × Unit Flow Factor × Catchment Inflow Factor

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
Staff for Swimming Pool (J11)	2	0.280 m^3/day/employee	0.56 m^3/day
		Catchment Inflow Factor	1.00
		TOTAL	95.76 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	6 hrs
Surface Loading Rate of Filter	20 $m^3/m^2/hr$
Filter Areas Required	169 / 6 / 20 = 1.41 m^2
Backwash Duration	3 min /day
Backwash Flow Rate	30 $m^3/m^2/hr$
Design Flow for Swimming Pool Backwashing	30 x 1.41 x 3 /60 = 2.11 m^3/day (0.0245 l/s)
Maximum Backwash Flow Rate	2.11 x 1000 / (3 x 60) = 11.74 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

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
10,000 – 50,000	4	3
> 50,000	Max (7.3 / $N^{0.15}$, 2.4)	Max (6 / $N^{0.175}$, 1.6)
(b) Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations		
<10,000	4	3
10,000 – 25,000	3.5	2.5
25,000 – 50,000	3	2
> 50,000	Max (3.9 / $N^{0.065}$, 2.4)	Max (2.6 / $N^{0.065}$, 1.6)
Note: N is the contributing population in thousands		

2.8 In view that there is existing upstream sewerage, peaking factor (including stormwater allowance) of 8 (contributing population = (95.20 / 0.27 = 353) will be adopted. The existing total design sewage flow generated is summarized in ***Table 6***.

Table 6 --- Existing Total Sewage Flow of Existing Condition

Item	Units	ADWF	Peaking Factor	Swimming Pool	Peak Flow
Total Design Sewage Flow (Assume that the swimming pools undergo backwashing during off-peak hours)	m^3/day	95.76	8	0	766.08
	l/s	1.11	8	0	8.87
Total Design Sewage Flow (Assume that the swimming pools undergo backwashing during peak hours)	l/s	1.11	8	11.71	20.58

3. ESTIMATION OF SEWAGE FLOW FOR THE PROPOSED DEVELOPMENT

Population Forecast

3.1 A population forecast was undertaken to identify the design population of the Proposed Development. The design residential population is estimated by the following equation:

Design Residential Population = Number of Residential Unit x Person-Per-Unit Ratio

3.2 As a conservative estimation, Person-Per-Unit Ratio of 3.7 was adopted, which was estimated based on the average domestic household size in Tertiary Planning Unit 171 in 2021 published by Census and Statistics Department.

3.3 Based on the above assumption, the design residential population is summarized in ***Table 7*** below:

Table 7 --- Estimation of Residential Population

No. of Residential Units	135
Person-Per-Unit Ratio	3.7
Design Population *Residential* *Management Staff (J11)** *Staff for Clubhouse (J11)*** *Staff for Swimming Pool (J11)****	 500 25 21 2
Remark: - *assume no. management staff = 5% of no. of residents **assume 3.3 staff/100 m² of clubhouse ***2 lifesaving attendants for one swimming pool	

Estimation of Sewage Flow of the Proposed Development

3.4 The Average Dry Weather Flow (ADWF) of the Proposed Development was estimated by referencing to the GESF.

3.5 The Proposed Development is shown on ***Drawing No. LILY16/MLP/001*** and the design assumptions are summarized in ***Table 8***.

Table 8 --- Estimation of Sewage Flow for Proposed Development

	No.	Unit Flow	ADWF
Residential	500	0.370 m^3/day/employee	185.00 m^3/day
Management Staff (I11)	48	0.280 m^3/day/person	13.44 m^3/day
		Catchment Inflow Factor	1.00
		TOTAL	198.44 m^3/day

3.6 For the swimming pool in the Proposed Development, the estimation of backwash flow from the swimming pool is summarized in ***Table 9***.

Table 9 --- Estimation of Sewage Flow from Proposed Swimming Pool

Pool Area	25 m x 6 m
Pool Depth	1.3 m
Pool Volume	195 m^3
Turnover Rate	6 hrs
Surface Loading Rate of Filter	20 $m^3/m^2/hr$
Filter Areas Required	195 / 6 / 20 = 1.63 m^2
Backwash Duration	3 min /day
Backwash Flow Rate	30 $m^3/m^2/hr$
Design Flow for Swimming Pool Backwashing	30 x 1.63 x 3 /60 = 2.44 m^3/day (0.028 l/s)
Maximum Backwash Flow Rate	2.44 x 1000 / (3 x 60) = 13.54 l/s

3.7 Similar with existing condition, peaking factors (including stormwater allowance) of 8 (contributing population = 192 / 0.27 = 711) will be adopted. The design total sewage flow generated from the Proposed Development is summarized in ***Table 10***.

Table 10 --- Design Total Sewage Flow of the Proposed Development

Item	Units	ADWF	Peaking Factor	Swimming Pool	Peak Flow
Total Design Sewage Flow (Assume that the swimming pools undergo backwashing during off-peak hours)	m^3/day	198.44	8	0	1,587.52
	l/s	2.30	8	0	18.37
Total Design Sewage Flow (Assume that the swimming pools undergo backwashing during peak hours)	l/s	2.3	8	13.54	31.91

4. POTENTIAL IMPACTS ON SEWERAGE NETWORKS & PROPOSED MITIGATION MEASURES

4.1 The peak flow increased from the Application Site is approximately 5% 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 198.44 m^3/day (ADWF), with a total peak discharge flow rate of 18.37 l/s. Should backwashing of the proposed swimming pool take place during peak hours, the total peak discharge would increase to 31.91 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 has been constructed at rural building lot no. 925 under application no. A/H10/94. The estimation of existing sewage flow at Pok Fu Lam Road have been assessed and presented in ***Appendix A***. Assuming that only the largest swimming pool located within Catchment A undergoes backwashing during peak hours while the remaining swimming pools within the concerned catchments undergo backwashing during off-peak hours, six sewers along Pok Fu Lam Road (from FMH7022550 to FMH7022569) are found to have insufficient capacity. Even when all swimming pools within the concerned catchments are assumed to undergo backwashing during off-peak hours, one sewer along Pok Fu Lam Road (from FMH7022538 to FMH7022536) is still found to have insufficient 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 67 % if the largest swimming pool located within Catchment A undergoes backwashing during peak hours).

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 1.5 m (W) x 1.0 m (L) x 1.5 m (D)) and sewage pump (with pump rate of 81,823 l/h or 0.02273 m^3/s if the backwashing of the proposed swimming pool take place during peak hours) 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 Assuming that only the largest swimming pool located within Catchment A undergoes backwashing during peak hours while the remaining swimming pools within the concerned catchments undergo backwashing during off-peak hours, five sewers (between manholes FMH7022444 and FMH7022410) appear to be under-capacity. Even when all swimming pools within the concerned catchments are assumed to undergo backwashing during off-peak hours, the five sewers (between manholes FMH7022444 and FMH7022410) appear to be under-capacity.

4.7 A preliminary freeboard assessment has been undertaken for the following two scenarios with results presented in **Appendix C**: (1) backwashing of only the largest swimming pool within Catchment A during peak hours; and (2) backwashing of all swimming pools within the relevant catchments during off-peak hours. Under Scenario 1, the freeboard at manhole FMH7022444 is 0.68 m and 0.55 m under existing conditions and post-development conditions respectively, while that at FMH7022432 is 0.99 m and 0.91 m respectively. Both manholes therefore have freeboard below the 1.0 m criterion whereas all other concerned manholes have adequate freeboard. As the freeboard at both FMH7022444 and FMH7022432 is already below the 1.0 m criterion under existing condition and the first population intake of this proposed development is anticipated in 2034, it is anticipated that the sewer between manholes FMH7022444 and FMH7022445 will have been upgraded by 2034 to accommodate flows arising from other planned development within the catchment. Under Scenario 2, all concerned manholes maintain freeboard exceeding 1.0 m under existing conditions and post-development conditions. Based on the above assessment, it is reasonable to conclude that the future peak flow can be accommodated within the public sewerage system without causing unacceptable impacts or necessitating significant upgrading subject to the anticipated sewer upgrading between manholes FMH7022444 and FMH7022445 being completed before the first population intake in 2034.

4.8 Regular maintenance on sewers and manholes should be implemented to maintain their optimal condition, such as monitoring the capacity of the system and restoring the flow capacity by removal of excessive accumulation of silt and grease, and thereby mitigate any negative impacts on surcharge conditions.

5. EVALUATION OF THE STRATEGY AND RECOMMENDATIONS

Land matters

5.1 The proposed sewerage work will be within the area of the Application Site. No requisition of extra land is envisaged.

Construction

5.2 Construction of the connection from the Application Site to the existing public sewers would mainly involve conventional technology such as cut and cover techniques. There is no significant constraint in terms of complexity by a general civil works contractor.

6. CONCLUSION

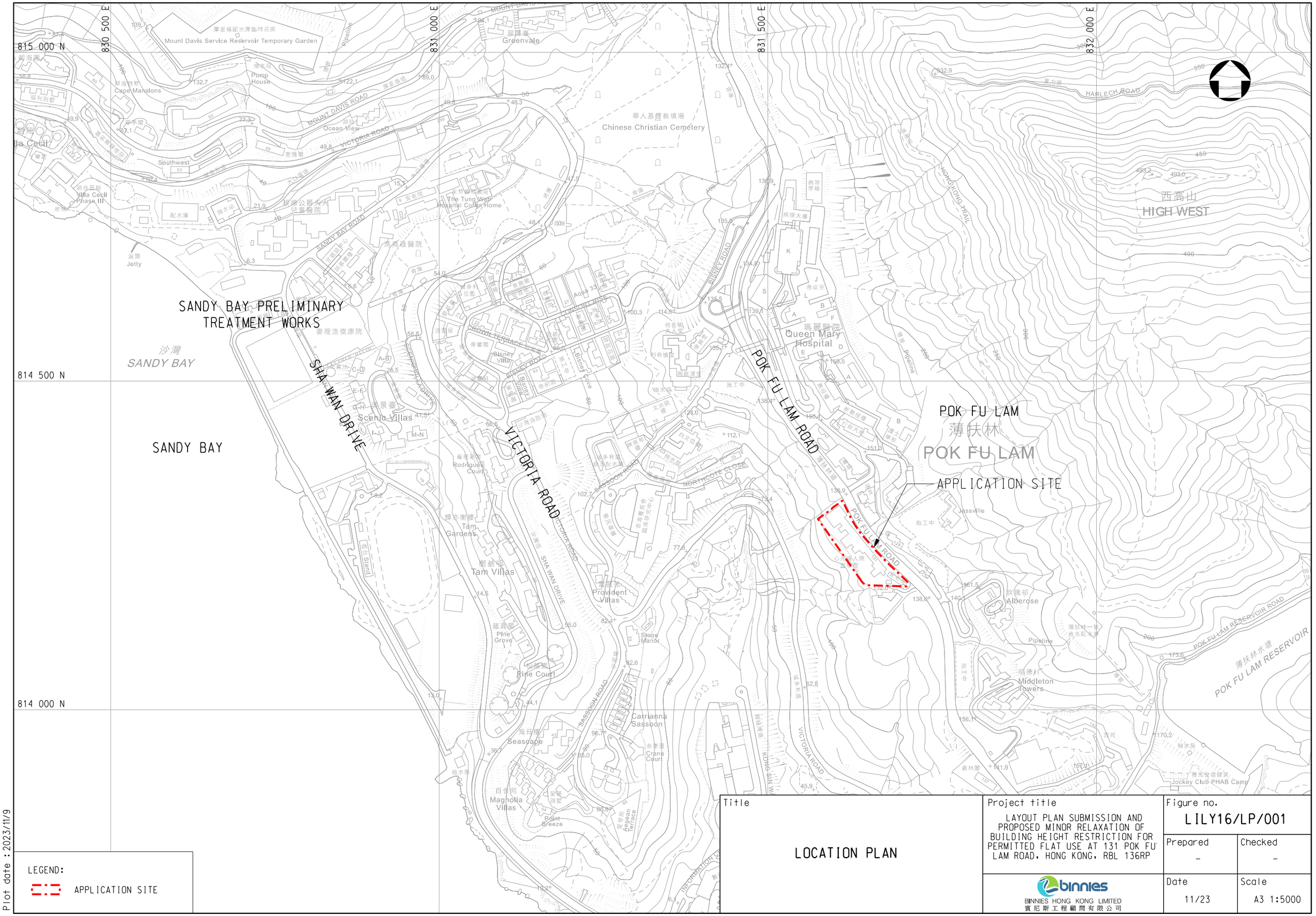
6.1 The existing sewage flow within the Application Site is approximately 95.76 m^3/day (ADWF) and 11.71 l/s design flow for swimming pool backwashing, with total peak discharge of 20.58 l/s. The estimated sewage to be generated from the Proposed Development is approximately 198.44 m^3/day (ADWF) and 13.54 l/s design flow for swimming pool backwashing, with total peak discharge of 31.91 l/s.

6.2 Sewage generated from the Proposed Development would be conveyed to the public sewerage networks by pumping within the Application Site, leading to the SBPTW. The treatment capacity of SBPTW is considered sufficient to handle the flow from the Application Site.

6.3 The proposed strategy is considered feasible in terms of regional sewerage strategy, land and construction considerations. The Proposed Development is considered sustainable in terms of sewerage.

END OF TEXT

Drawings



LEGEND:

APPLICATION SITE

Title: LOCATION PLAN	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/LP/001	
		Prepared: -	Checked: -
	BINNIES HONG KONG LIMITED 賓尼斯工程顧問有限公司	Date: 11/23	Scale: A3 1:5000

Plot date : 2023/11/9

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N

Radcliffe

Dor Fook Mansion

POK FU LAM ROAD

14.05M

10M

14M

10M

14.05M

new fence wall for layby footpath

2.5mW. Maintenance walkway below at +135.7

5.4M

MIN. 2M

MIN. 2.75M

MIN. 2M

BUS LAYBY

MIN. 2M

Run in/out

EXISTING FOOTPATH TO BE MAINTAINED

2.5mW. Maintenance walkway below at +135.7

Proposed Green Wall (16m x 2.3mH.)

+138.6

+138.95

+138.95

+136.80

+134.00

+131.20

+128.40

+125.60

+122.80

+121.70

Planter

RAMP DN

EVA / Driveway

Planter

+139.20

+139.20

Residential Shuttle Lift Lobby

+144.50

Planter

approx. 8M

EVA / Driveway

Ramp Up 1:6

Ramp Up 1:8.5

6M

20M

+138

+137

+136

+135

+134

+133

+132

+131

+130.5

Ramp Up 1:8

Planter +138.65 T.S +137.15

Planter +141.65 T.S +140.15

+135

+135.9

+135.9

+135.2

+134

+132.9

Footpath required under Lease

Ramp Up 1:10.5

MIN. 20M

T4

(9/s)

+125.10

LANDSCAPED AREA +125.25

+129

1:10

EVA / Driveway Ramp Up 1:7

1:8

+129

+129

L/W

L/W

L/W

T1

T2 +122

(10/s)

T3

(10/s)

EVA +121.85 Hard paved

Outdoor Pool (6 x 25m)

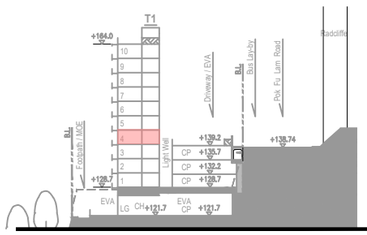
Planter

OPEN PASSAGE FOR MEANS OF ESCAPE

+121.55

+124.95

EBENEZER NEW HOPE SCHOOL



Floor	Nos. of Carparks		
	L/UL for M/HGV	Private Car	Motorcycle
5/F	4	-	-
3/F	-	25	-
2/F	-	34	-
1/F	-	38	-
G/F	-	15	1
Total	4	112	1

LEGEND
- FIXED GLAZING (1-10/F)
- ACOUSTIC FIN (2-10/F)

Handi Architects Limited

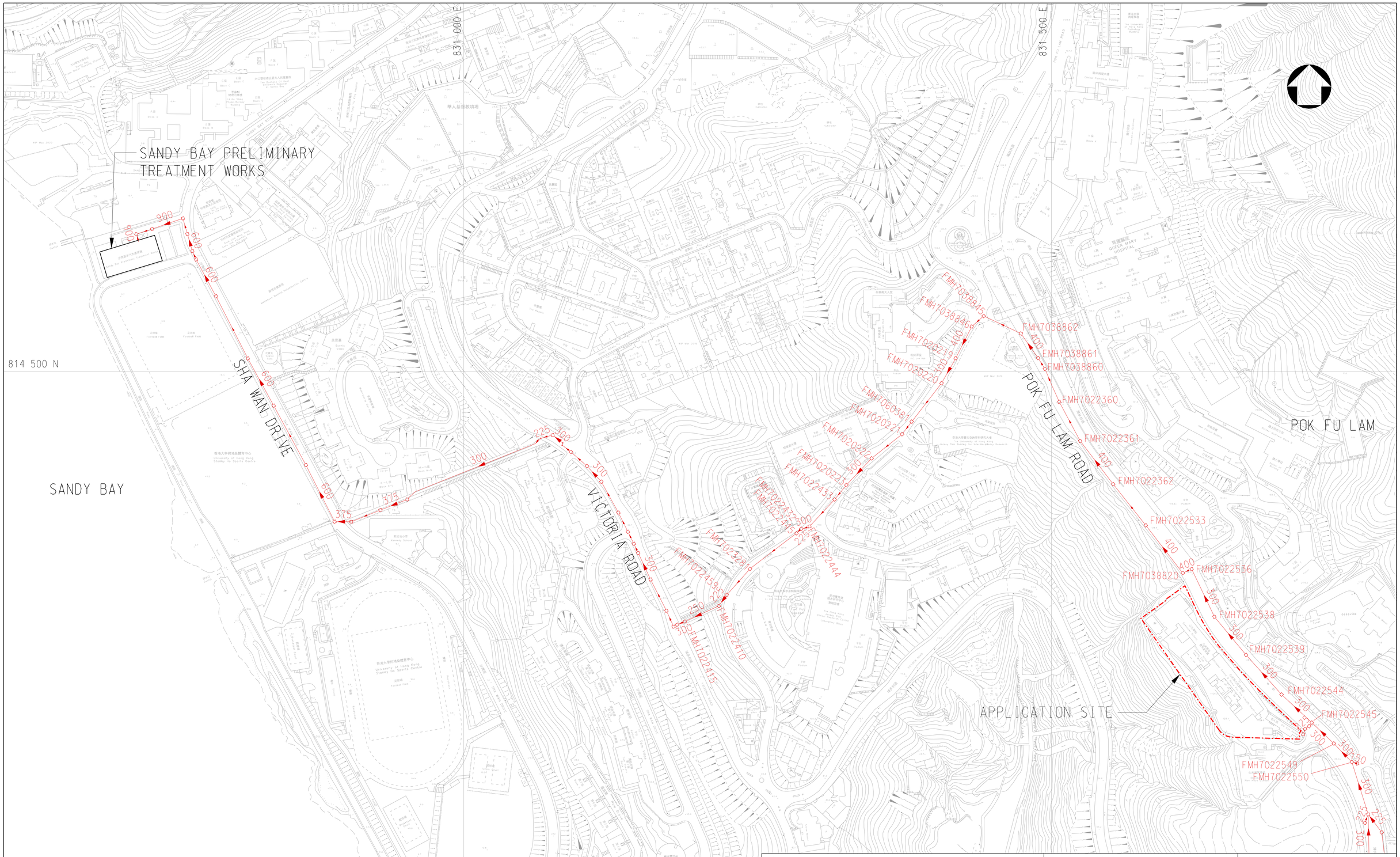
UNIT 2010, 20/F, TOWER 1, GRAND CENTURY PLACE, 193 PRINCE EDWARD ROAD WEST, KOWLOON

T: 2547 1267
F: 2875 1467

PROJECT TITLE
Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Submission of Layout Plan and Proposed Minor Relaxation of Building Height Restriction for Permitted Flat at "Residential (Group C)7" zone at the Ebenezer School and Home for the Visually Impaired, 131 Pok Fu Lam Road, Pok Fu Lam, Hong Kong

DRAWING TITLE
LAYOUT PLAN - 4/F
SECTION 16 SUBMISSION (2ND) - SCHEME 27

DRAWING NO.	SCALE	REV. NO.	DATE / REVISION NO.	APPROVAL BY
A-01	1:500	A	OCT 2026	DATE OF APPROVAL



Plot date : 2024/1/4

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Title

EXISTING PUBLIC SEWERAGE SYSTEM

Project title

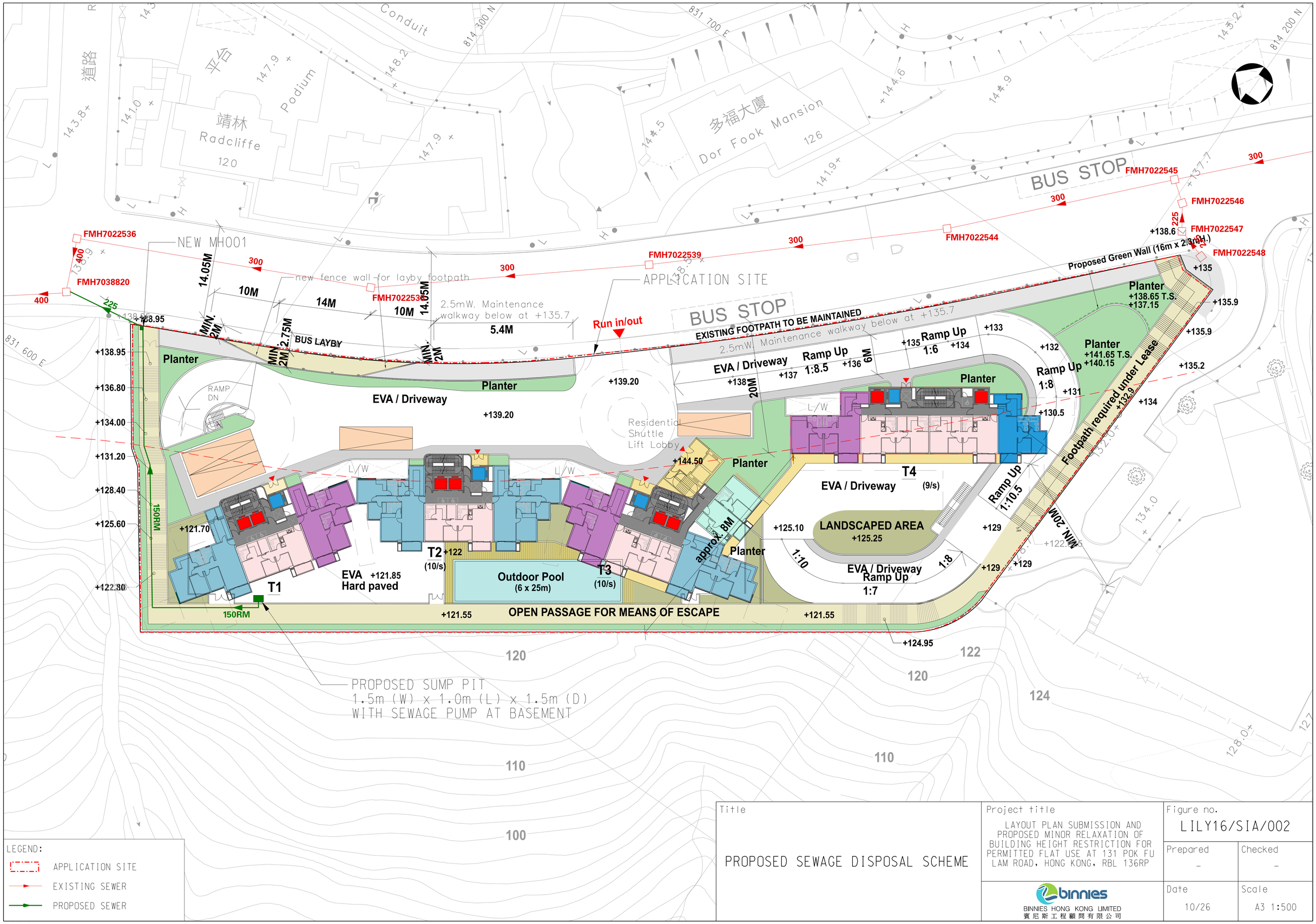
LAYOUT PLAN SUBMISSION AND PROPOSED MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FOR PERMITTED FLAT USE AT 131 POK FU LAM ROAD, HONG KONG, RBL 136RP

BINNIES HONG KONG LIMITED
賓尼斯工程顧問有限公司

Figure no.
LILY16/SIA/001

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Date	Scale
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LEGEND:

- APPLICATION SITE
- EXISTING SEWER
- PROPOSED SEWER

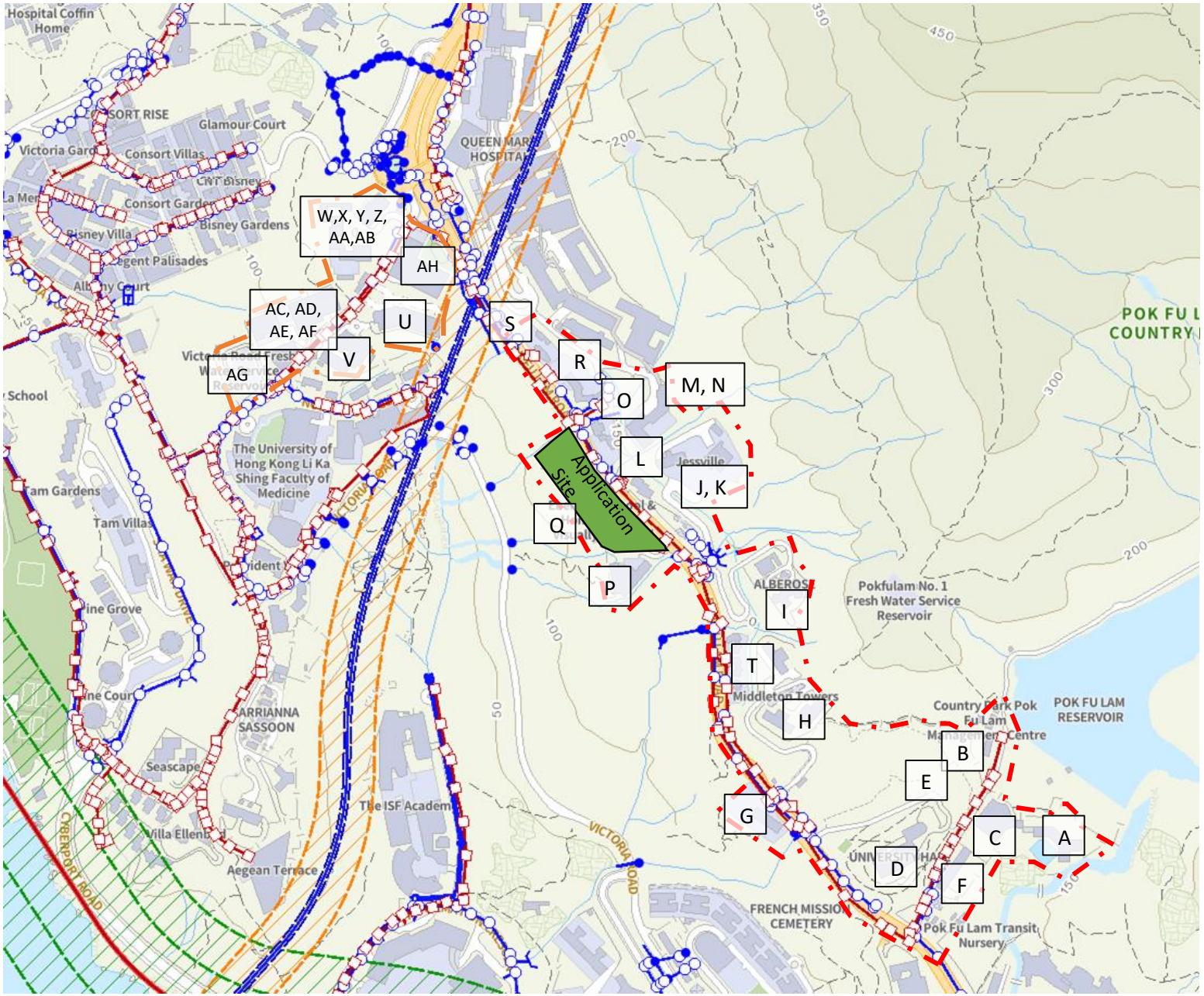
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Title: PROPOSED SEWAGE DISPOSAL SCHEME	Project title: LAYOUT PLAN SUBMISSION AND PROPOSED MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FOR PERMITTED FLAT USE AT 131 POK FU LAM ROAD, HONG KONG, RBL 136RP	Figure no.: LILY16/SIA/002
		Prepared: _ / Checked: _
	BINNIES HONG KONG LIMITED 賓尼斯工程顧問有限公司	Date: 10/26 / Scale: A3 1:500

Appendix A

Hydraulic Calculation of Sewage Flow at Existing Condition


W,X, Y, Z, AA,AB
AH
AC, AD, AE, AF
U
S
V
AG
R
M, N
O
L
J, K
Application Site
Q
P
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T
H
B
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G
C
A
D
F
Sewerage Catchment Area at Pok Fu Lam Road
Sewerage Catchment Area at Sassoon Road

Binnies Hong Kong Limited

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: Table A1: Estimation of Existing Sewage Flow at Pok Fu Lam Road (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre										
	Park Personnel	J11	5	0.28	1.4	1.4	5	1.62E-05	8	0.00013	Estimated Population
	Swimming Pool (515m^2)**				4017.00			0.046493		0.04662	
B	WSD Staff Quarters	Insitutional	46	0.19	8.74	10.14	38	0.000101	8	0.04743	12Units x 3.7PPF, say
C	HKJC PHAB Camp										
	Campers	Insitutional	160	0.19	30.4	40.54	150	0.000352	8	0.05025	According to the official website of Hong Kong PHAB Association (https://hkphab.org.hk/en-gb/jockey-club-phab-camp-en), the camp has 124 residential campers and 160 day campers. 160 day campers will be used for sewage estimation.
	Management Staff	J11	8	0.28	2.24	42.78	158	2.59E-05	8	0.05045	Assume no. management staff = 5% of no. of residents
D	University Hall	Insitutional	110	0.19	20.9	63.68	236	0.000242	8	0.05239	Data from website
E	Residential Institution (Student Hostel)	Insitutional									
	Hostel Place	Insitutional	938	0.19	178.22	241.90	896	0.002063	8	0.06889	According to MPC Paper No. A/H10/94, not more than 938 hostel places are provided for students
	Management Staff	J11	30	0.28	8.4	250.30	927	9.72E-05	8	0.06967	According to MPC Paper No. A/H10/94, there are 30 accommodations for management staff
F	HKJC Riding School	J11			97.53	347.83	1288	0.001129	6	0.07065	Sewage flow provided by EPD via. email (comments on SIA Report Rev. 1) on 20 Dec 2023
G	Woodbury Court										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	377.80	1399	0.000347	6	0.07273	
	Management Staff	J11	8	0.28	2.24	380.04	1408	2.59E-05	6	0.07288	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.07288	
H	Middleton Towers										70 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	259	0.27	69.93	449.97	1667	0.000809	6	0.07774	
	Management Staff	J11	13	0.28	3.64	453.61	1680	4.21E-05	6	0.07799	Assume no. management staff = 5% of no. of residents
T	138 Pok Fu Lam Road (RBL 757)										
	Residents	R3	3	0.37	1.11	454.72	1684	1.28E-05	6	0.07807	3 Units from the replies to initial written questions raised by Finance Committee Members in examining the Estimated of Expenditure 2021-22 published by DevB, average occupancy 3.7 PPF
	Management Staff	J11	1	0.28	0.28	455.00	1685	3.24E-06	6	0.07809	Assume no. management staff = 5% of no. of residents
I	Alberose	R3	8	0.37	2.96	457.96	1696	3.43E-05	6	0.07830	1 Units from Centadata (https://hk.centanet.com/estate/en/Alberose/2-TINLZHNHHT) (2 units are assumed for old and new Alberose), average occupancy 3.7 PPF
J	Jessville Manor										4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	462.01	1711	4.69E-05	6	0.07858	
	Management Staff	J11	1	0.28	0.28	462.29	1712	3.24E-06	6	0.07860	Assume no. management staff = 5% of no. of residents
K	Jessville Tower										28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	490.37	1816	0.000325	6	0.08055	
	Management Staff	J11	8	0.28	2.24	492.61	1824	2.59E-05	6	0.08070	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (240m^2)**				0.00			0		0.08070	
P	Ebenezer New Hope School										Data from Ebenezer
	Student	Student	66	0.04	2.64	495.25	1834	3.06E-05	6	0.08089	
	Teacher & Staff	J11	102	0.28	28.56	523.81	1940	0.000331	6	0.08287	
Q	Ebenezer School & Home for the Visually Impairer										
	Student	Student	431	0.04	17.24	541.05	2004	0.0002	6	0.08407	
	Teacher & Staff	J11	167	0.28	46.76	587.81	2177	0.000541	6	0.08731	
	Lifesaving Attendants for Swimming Pool	J11	2	0.28	0.56	588.37	2179	6.48E-06	6	0.08735	
	Swimming Pool (130m^2)**				0.00			0		0.08735	
L	Dor Fook Mansion										25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	613.48	2272	0.000291	6	0.08910	
	Management Staff	J11	5	0.28	1.4	614.88	2277	1.62E-05	6	0.08919	Assume no. management staff = 5% of no. of residents
M	Government Quarters										
	Residents	R2	592	0.27	159.84	774.72	2869	0.00185	6	0.10029	Estimated population (20 floors x 8 flats/floor = 160 Units), 3.7 PPF
	Management Staff	J11	30	0.28	8.4	783.12	2900	9.72E-05	6	0.10088	Assume no. management staff = 5% of no. of residents
N	Hospital Authority	J11	126	0.28	35.28	818.40	3031	0.000408	6	0.10333	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	828.39	3068	0.000116	6	0.10402	
	Management Staff	J11	4	0.28	1.12	829.51	3072	1.3E-05	6	0.10410	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (290m^2)**				0.00			0		0.10410	
R	Royalton										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	859.48	3183	0.000347	6	0.10618	
	Management Staff	J11	8	0.28	2.24	861.72	3192	2.59E-05	6	0.10633	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (70m^2)**				0.00			0		0.10633	
S	Royalton II										17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	878.73	3255	0.000197	6	0.10752	
	Management Staff	J11	6	0.28	1.68	880.41	3261	1.94E-05	6	0.10763	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.10763	
AH	No. 3 Sassoon Road Academic Building										

Binnies Hong Kong Limited

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: Table A1: Estimation of Existing Sewage Flow at Pok Fu Lam Road (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
	Student	Student	2905	0.04	116.2	996.61	3691	0.001345	6	0.11570	According to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong, the projected populations for the new academic building on the strip of land within the Green Belt zone adjoining the planned academic building at No. 3 Sassoon Road comprise 2,905 students, 1,190 staff members, and 77 kitchen staff. For the purpose of assessing the population attributable to the academic building at No. 3 Sassoon Road, 50% of each population category is assumed.
	Teacher & Staff	J11	1169	0.28	327.32	1323.93	4903	0.003788	6	0.13843	
	Kitchen	J10	77	1.58	121.66	1445.59	5354	0.001408	5	0.13015	
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research										
	Student	Student	1260	0.04	50.4	1495.99	5541	0.000583	5	0.13307	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	540	0.28	151.2	1647.19	6101	0.00175	5	0.14182	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)										
	Student	Student	522	0.04	20.88	1668.07	6178	0.000242	6	0.16233	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	224	0.28	62.72	1730.79	6410	0.000726	6	0.16669	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	2015.79	7466	0.003299	5	0.16315	Sewage flow provided by EPD via. email on 28 Dec 2023
X	Wei Lun Hall	Insitutional			72.6	2088.39	7735	0.00084	5	0.16735	Sewage flow provided by EPD via. email on 28 Dec 2023
Y	Lee Hysan Hall	Insitutional			72.6	2160.99	8004	0.00084	5	0.17155	Sewage flow provided by EPD via. email on 28 Dec 2023
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	2233.59	8273	0.00084	5	0.17575	Sewage flow provided by EPD via. email on 28 Dec 2023
AA	Bay View Restaurant	J10			75.5	2309.09	8552	0.000874	5	0.18012	Sewage flow provided by EPD via. email on 28 Dec 2023
AB	Madam S.H. Ho Residence for Medical Student	Insitutional			55.3	2364.39	8757	0.00064	5	0.18332	Sewage flow provided by EPD via. email on 28 Dec 2023
AC	Dexter H.C Man Building	J11	107	0.28	29.96	2394.35	8868	0.000347	5	0.18505	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	2413.67	8940	0.000224	5	0.18617	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	2442.51	9046	0.000334	5	0.18784	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AF	Pauline Chan Building										
	Student	Student	162	0.04	6.48	2448.99	9070	0.000075	5	0.18822	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	402	0.28	112.56	2561.55	9487	0.001303	5	0.19473	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Kitchen	J10	18	1.58	28.44	2589.99	9593	0.000329	5	0.19638	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	2590.83	9596	9.72E-06	5	0.19643	Assumed 3 staffs
	Total Flow				6607.8						Inflow Factor = 1.00 GESF Table T-4
	Average Flow (l/s)				76.48						

**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.*
*** Only one swimming pool undergoes backwashing during peak hours. The largest swimming pool at catchment A will be considered*

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

Turnover Rate	6 hr
Surface Loading Rate of Filter	20 m3/m2/hr
Backwash Duration	3 min /day
Backwash Flow Rate	30 m3/m2/hr

Binnies Hong Kong Limited

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: Table A2: Estimation of Sewage Flow at Pok Fu Lam Road (Existing Scenario) (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

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	0.058	0.08070	138.63%	Existing Flow from Source A to K
FMH7022549	FMH7022545	138.62	138.62	137.22	137.07	24.3	300	162.0	0.069	0.08735	126.23%	Connection Point from P(Ebenezer New Hope School), Q(Ebenezer School & Home for the Visually Impairer)
FMH7022545	FMH7022544	138.74	138.74	137.07	136.89	33.6	300	186.7	0.064	0.08735	135.50%	
FMH7022544	FMH7022539	138.89	138.89	136.89	136.74	44.3	300	295.3	0.051	0.08919	174.04%	Connection Point from L (Dor Fook Mansion)
FMH7022539	FMH7022538	139.02	139.02	136.74	136.52	41.5	300	188.6	0.064	0.08919	139.09%	
FMH7022538	FMH7022536	138.98	138.98	136.52	136.35	42.7	300	251.2	0.056	0.10410	187.32%	Connection Point from A to O (Radcliffe)
FMH7022536	FMH7038820	138.71	138.71	136.33	136.26	7.7	400	110.0	0.181	0.10410	57.58%	
FMH7038820	FMH7022533	138.37	138.37	136.25	135.91	50.6	400	148.8	0.155	0.10410	66.98%	
FMH7022533	FMH7022362	138.00	138.00	135.89	135.55	42.7	400	125.6	0.169	0.10633	62.85%	Connection Point from R (Royalton)
FMH7022362	FMH7022361	138.40	138.40	135.54	135.26	45	400	160.7	0.150	0.10763	71.97%	Connection Point from S (Royalton II)
FMH7022361	FMH7022360	138.43	138.43	135.54	134.65	36.9	400	41.5	0.294	0.10763	36.55%	
FMH7022360	FMH7038860	138.24	138.24	134.65	134.11	29.4	400	54.4	0.257	0.10763	41.89%	
FMH7038860	FMH7038861	137.63	137.63	134.11	133.63	10.5	400	21.9	0.405	0.10763	26.55%	
FMH7038861	FMH7038862	135.42	135.42	133.63	133.00	24.3	400	38.6	0.305	0.10763	35.25%	
FMH7038862	FMH7038845	135.42	135.34	133.00	132.50	34.7	400	69.4	0.228	0.10763	47.29%	
FMH7038845	FMH7038846	135.34	134.18	132.50	131.76	13.5	400	18.2	0.444	0.10763	24.25%	
FMH7038846	FMH7020219	134.18	131.89	131.76	129.79	29.7	400	15.1	0.488	0.10763	22.04%	
FMH7020219	FMH7020220	131.89	130.45	129.79	128.35	24.1	300	16.7	0.215	0.10763	49.99%	
FMH7020220	FMH7060381	130.45	126.53	128.35	124.46	41.6	300	10.7	0.269	0.13015	48.32%	Connection Point from AH (No. 3 Sassoon Road Academic Building)
FMH7060381	FMH7020221	126.53	124.48	124.46	122.68	13.1	300	7.4	0.325	0.14182	43.68%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research)
FMH7020221	FMH7020222	124.48	119.51	122.68	117.41	32.7	300	6.2	0.354	0.16669	47.14%	Connection Point from V (Patrick Manson Building (North Wing))
FMH7020222	FMH7020223	119.51	115.59	117.41	112.89	31.3	300	6.9	0.335	0.16669	49.80%	
FMH7020223	FMH7022433	115.59	113.59	112.89	110.99	15.7	300	8.3	0.306	0.16669	54.40%	
FMH7022433	FMH7022444	113.59	109.95	110.99	108.21	30.1	300	10.8	0.268	0.16669	62.27%	
FMH7022444	FMH7022432*	109.95	110.04	108.21	108.08	6	300	46.2	0.130	0.16669	128.57%	
FMH7022432*	FMH7022445	110.04	109.47	108.08	107.98	4.7	225	47.0	0.060	0.19643	329.90%	Connection Point from W to AG (Victoria Road Fresh Water Service Reservoir)
FMH7022445	FMH7023281	109.47	104.54	107.98	101.96	48.2	225	8.0	0.144	0.19643	136.16%	
FMH7023281	FMH7022459	104.54	101.40	101.96	99.27	29.8	225	11.1	0.123	0.19643	160.16%	
FMH7022459	FMH7022410	101.40	99.20	99.27	98.20	12	225	11.2	0.122	0.19643	161.14%	
FMH7022410	FMH7022415	99.20	77.70	98.00	73.83	32	250	1.3	0.470	0.19643	41.76%	

Surface roughness k_s 3 mm

kinematic viscosity v 1.14 mm^2/s

Mean velocity (Colebrook-White) $\bar{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$

Capacity provided Q = V x 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

Binnies Hong Kong Limited

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: Table A3: Estimation of Existing Sewage Flow at Pok Fu Lam Road (Swimming Pools Undergo Backwashing during Off-peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre										
	Park Personnel	J11	5	0.28	1.4	1.4	5	1.62E-05	8	0.00013	Estimated Population
	Swimming Pool (515m^2)**				0.00			0		0.00013	
B	WSD Staff Quarters	Insitutional	46	0.19	8.74	10.14	38	0.000101	8	0.00094	12Units x 3.7PPF, say
C	HKJC PHAB Camp										
	Campers	Insitutional	160	0.19	30.4	40.54	150	0.000352	8	0.00375	According to the official website of Hong Kong PHAB Association (https://hkphab.org.hk/en-gb/jockey-club-phab-camp-en), the camp has 124 residential campers and 160 day campers. 160 day campers will be used for sewage estimation.
	Management Staff	J11	8	0.28	2.24	42.78	158	2.59E-05	8	0.00396	Assume no. management staff = 5% of no. of residents
D	University Hall	Insitutional	110	0.19	20.9	63.68	236	0.000242	8	0.00590	Data from website
E	Residential Institution (Student Hostel)	Insitutional									
	Hostel Place	Insitutional	938	0.19	178.22	241.90	896	0.002063	8	0.02240	According to MPC Paper No. A/H10/94, not more than 938 hostel places are provided for students
	Management Staff	J11	30	0.28	8.4	250.30	927	9.72E-05	8	0.02318	According to MPC Paper No. A/H10/94, there are 30 accommodations for management staff
F	HKJC Riding School	J11			97.53	347.83	1288	0.001129	6	0.02415	Sewage flow provided by EPD via. email (comments on SIA Report Rev. 1) on 20 Dec 2023
G	Woodbury Court										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	377.80	1399	0.000347	6	0.02624	
	Management Staff	J11	8	0.28	2.24	380.04	1408	2.59E-05	6	0.02639	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.02639	
H	Middleton Towers										70 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	259	0.27	69.93	449.97	1667	0.000809	6	0.03125	
	Management Staff	J11	13	0.28	3.64	453.61	1680	4.21E-05	6	0.03150	Assume no. management staff = 5% of no. of residents
T	138 Pok Fu Lam Road (RBL 757)										
	Residents	R3	3	0.37	1.11	454.72	1684	1.28E-05	6	0.03158	3 Units from the replies to initial written questions raised by Finance Committee Members in examining the Estimated of Expenditure 2021-22 published by DevB, average occupancy 3.7 PPF
	Management Staff	J11	1	0.28	0.28	455.00	1685	3.24E-06	6	0.03160	Assume no. management staff = 5% of no. of residents
I	Alberose	R3	8	0.37	2.96	457.96	1696	3.43E-05	6	0.03180	1 Units from Centadata (https://hk.centanet.com/estate/en/Alberose/2-TINLZHNHHT) (2 units are assumed for old and new Alberose), average occupancy 3.7 PPF
J	Jessville Manor										4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	462.01	1711	4.69E-05	6	0.03208	
	Management Staff	J11	1	0.28	0.28	462.29	1712	3.24E-06	6	0.03210	Assume no. management staff = 5% of no. of residents
K	Jessville Tower										28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	490.37	1816	0.000325	6	0.03405	
	Management Staff	J11	8	0.28	2.24	492.61	1824	2.59E-05	6	0.03421	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (240m^2)**				0.00			0		0.03421	
P	Ebenezer New Hope School										Data from Ebenezer
	Student	Student	66	0.04	2.64	495.25	1834	3.06E-05	6	0.03439	
	Teacher & Staff	J11	102	0.28	28.56	523.81	1940	0.000331	6	0.03638	
Q	Ebenezer School & Home for the Visually Impairer										
	Student	Student	431	0.04	17.24	541.05	2004	0.0002	6	0.03757	
	Teacher & Staff	J11	167	0.28	46.76	587.81	2177	0.000541	6	0.04082	
	Lifesaving Attendants for Swimming Pool	J11	2	0.28	0.56	588.37	2179	6.48E-06	6	0.04086	
	Swimming Pool (130m^2)**				0.00			0		0.04086	
L	Dor Fook Mansion										25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	613.48	2272	0.000291	6	0.04260	
	Management Staff	J11	5	0.28	1.4	614.88	2277	1.62E-05	6	0.04270	Assume no. management staff = 5% of no. of residents
M	Government Quarters										
	Residents	R2	592	0.27	159.84	774.72	2869	0.00185	6	0.05380	Estimated population (20 floors x 8 flats/floor = 160 Units), 3.7 PPF
	Management Staff	J11	30	0.28	8.4	783.12	2900	9.72E-05	6	0.05438	Assume no. management staff = 5% of no. of residents
N	Hospital Authority	J11	126	0.28	35.28	818.40	3031	0.000408	6	0.05683	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	828.39	3068	0.000116	6	0.05753	
	Management Staff	J11	4	0.28	1.12	829.51	3072	1.3E-05	6	0.05760	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (290m^2)**				0.00			0		0.05760	
R	Royalton										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	859.48	3183	0.000347	6	0.05969	
	Management Staff	J11	8	0.28	2.24	861.72	3192	2.59E-05	6	0.05984	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (70m^2)**				0.00			0		0.05984	
S	Royalton II										17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	878.73	3255	0.000197	6	0.06102	
	Management Staff	J11	6	0.28	1.68	880.41	3261	1.94E-05	6	0.06114	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.06114	
AH	No. 3 Sassoon Road Academic Building										

Binnies Hong Kong Limited

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: Table A3: Estimation of Existing Sewage Flow at Pok Fu Lam Road (Swimming Pools Undergo Backwashing during Off-peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
	Student	Student	2905	0.04	116.2	996.61	3691	0.001345	6	0.06921	According to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong, the projected populations for the new academic building on the strip of land within the Green Belt zone adjoining the planned academic building at No. 3 Sassoon Road comprise 2,905 students, 1,190 staff members, and 77 kitchen staff. For the purpose of assessing the population attributable to the academic building at No. 3 Sassoon Road, 50% of each population category is assumed.
	Teacher & Staff	J11	1169	0.28	327.32	1323.93	4903	0.003788	6	0.09194	
	Kitchen	J10	77	1.58	121.66	1445.59	5354	0.001408	5	0.08366	
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research										
	Student	Student	1260	0.04	50.4	1495.99	5541	0.000583	5	0.08657	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	540	0.28	151.2	1647.19	6101	0.00175	5	0.09532	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)										
	Student	Student	522	0.04	20.88	1668.07	6178	0.000242	6	0.11584	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	224	0.28	62.72	1730.79	6410	0.000726	6	0.12019	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	2015.79	7466	0.003299	5	0.11665	Sewage flow provided by EPD via. email on 28 Dec 2023
X	Wei Lun Hall	Insitutional			72.6	2088.39	7735	0.00084	5	0.12086	Sewage flow provided by EPD via. email on 28 Dec 2023
Y	Lee Hysan Hall	Insitutional			72.6	2160.99	8004	0.00084	5	0.12506	Sewage flow provided by EPD via. email on 28 Dec 2023
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	2233.59	8273	0.00084	5	0.12926	Sewage flow provided by EPD via. email on 28 Dec 2023
AA	Bay View Restaurant	J10			75.5	2309.09	8552	0.000874	5	0.13363	Sewage flow provided by EPD via. email on 28 Dec 2023
AB	Madam S.H. Ho Residence for Medical Student	Insitutional			55.3	2364.39	8757	0.00064	5	0.13683	Sewage flow provided by EPD via. email on 28 Dec 2023
AC	Dexter H.C Man Building	J11	107	0.28	29.96	2394.35	8868	0.000347	5	0.13856	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	2413.67	8940	0.000224	5	0.13968	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	2442.51	9046	0.000334	5	0.14135	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AF	Pauline Chan Building										
	Student	Student	162	0.04	6.48	2448.99	9070	0.000075	5	0.14172	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	402	0.28	112.56	2561.55	9487	0.001303	5	0.14824	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Kitchen	J10	18	1.58	28.44	2589.99	9593	0.000329	5	0.14988	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	2590.83	9596	9.72E-06	5	0.14993	Assumed 3 staffs
	Total Flow				2590.8						Inflow Factor = 1.00 GESF Table T-4
	Average Flow (l/s)				29.99						

**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.*
*** Swimming pool undergo backwashing during off-peak hours.*

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

Turnover Rate	6 hr
Surface Loading Rate of Filter	20 m3/m2/hr
Backwash Duration	3 min /day
Backwash Flow Rate	30 m3/m2/hr

Binnies Hong Kong Limited

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: Table A4: Estimation of Sewage Flow at Pok Fu Lam Road (Existing Scenario) (Swimming Pools Undergo Backwashing during Off-peak Hours)

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	0.058	0.03421	58.76%	Existing Flow from Source A to K
FMH7022549	FMH7022545	138.62	138.62	137.22	137.07	24.3	300	162.0	0.069	0.04086	59.05%	Connection Point from P(Ebenezer New Hope School), Q(Ebenezer School & Home for the Visually Impairer)
FMH7022545	FMH7022544	138.74	138.74	137.07	136.89	33.6	300	186.7	0.064	0.04086	63.38%	
FMH7022544	FMH7022539	138.89	138.89	136.89	136.74	44.3	300	295.3	0.051	0.04270	83.32%	Connection Point from L (Dor Fook Mansion)
FMH7022539	FMH7022538	139.02	139.02	136.74	136.52	41.5	300	188.6	0.064	0.04270	66.59%	
FMH7022538	FMH7022536	138.98	138.98	136.52	136.35	42.7	300	251.2	0.056	0.05760	103.66%	Connection Point from A to O (Radcliffe)
FMH7022536	FMH7038820	138.71	138.71	136.33	136.26	7.7	400	110.0	0.181	0.05760	31.86%	
FMH7038820	FMH7022533	138.37	138.37	136.25	135.91	50.6	400	148.8	0.155	0.05760	37.06%	
FMH7022533	FMH7022362	138.00	138.00	135.89	135.55	42.7	400	125.6	0.169	0.05984	35.37%	Connection Point from R (Royalton)
FMH7022362	FMH7022361	138.40	138.40	135.54	135.26	45	400	160.7	0.150	0.06114	40.88%	Connection Point from S (Royalton II)
FMH7022361	FMH7022360	138.43	138.43	135.54	134.65	36.9	400	41.5	0.294	0.06114	20.76%	
FMH7022360	FMH7038860	138.24	138.24	134.65	134.11	29.4	400	54.4	0.257	0.06114	23.79%	
FMH7038860	FMH7038861	137.63	137.63	134.11	133.63	10.5	400	21.9	0.405	0.06114	15.08%	
FMH7038861	FMH7038862	135.42	135.42	133.63	133.00	24.3	400	38.6	0.305	0.06114	20.03%	
FMH7038862	FMH7038845	135.42	135.34	133.00	132.50	34.7	400	69.4	0.228	0.06114	26.86%	
FMH7038845	FMH7038846	135.34	134.18	132.50	131.76	13.5	400	18.2	0.444	0.06114	13.77%	
FMH7038846	FMH7020219	134.18	131.89	131.76	129.79	29.7	400	15.1	0.488	0.06114	12.52%	
FMH7020219	FMH7020220	131.89	130.45	129.79	128.35	24.1	300	16.7	0.215	0.06114	28.40%	
FMH7020220	FMH7060381	130.45	126.53	128.35	124.46	41.6	300	10.7	0.269	0.08366	31.06%	Connection Point from AH (No. 3 Sassoon Road Academic Building)
FMH7060381	FMH7020221	126.53	124.48	124.46	122.68	13.1	300	7.4	0.325	0.09532	29.36%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research)
FMH7020221	FMH7020222	124.48	119.51	122.68	117.41	32.7	300	6.2	0.354	0.12019	33.99%	Connection Point from V (Patrick Manson Building (North Wing))
FMH7020222	FMH7020223	119.51	115.59	117.41	112.89	31.3	300	6.9	0.335	0.12019	35.91%	
FMH7020223	FMH7022433	115.59	113.59	112.89	110.99	15.7	300	8.3	0.306	0.12019	39.23%	
FMH7022433	FMH7022444	113.59	109.95	110.99	108.21	30.1	300	10.8	0.268	0.12019	44.90%	
FMH7022444	FMH7022432*	109.95	110.04	108.21	108.08	6	300	46.2	0.130	0.12019	92.71%	
FMH7022432*	FMH7022445	110.04	109.47	108.08	107.98	4.7	225	47.0	0.060	0.14993	251.81%	Connection Point from W to AG (Victoria Road Fresh Water Service Reservoir)
FMH7022445	FMH7023281	109.47	104.54	107.98	101.96	48.2	225	8.0	0.144	0.14993	103.93%	
FMH7023281	FMH7022459	104.54	101.40	101.96	99.27	29.8	225	11.1	0.123	0.14993	122.25%	
FMH7022459	FMH7022410	101.40	99.20	99.27	98.20	12	225	11.2	0.122	0.14993	123.00%	
FMH7022410	FMH7022415	99.20	77.70	98.00	73.83	32	250	1.3	0.470	0.14993	31.88%	

Surface roughness k_s 3 mm

kinematic viscosity v 1.14 mm^2/s

Mean velocity (Colebrook-White) $\bar{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$

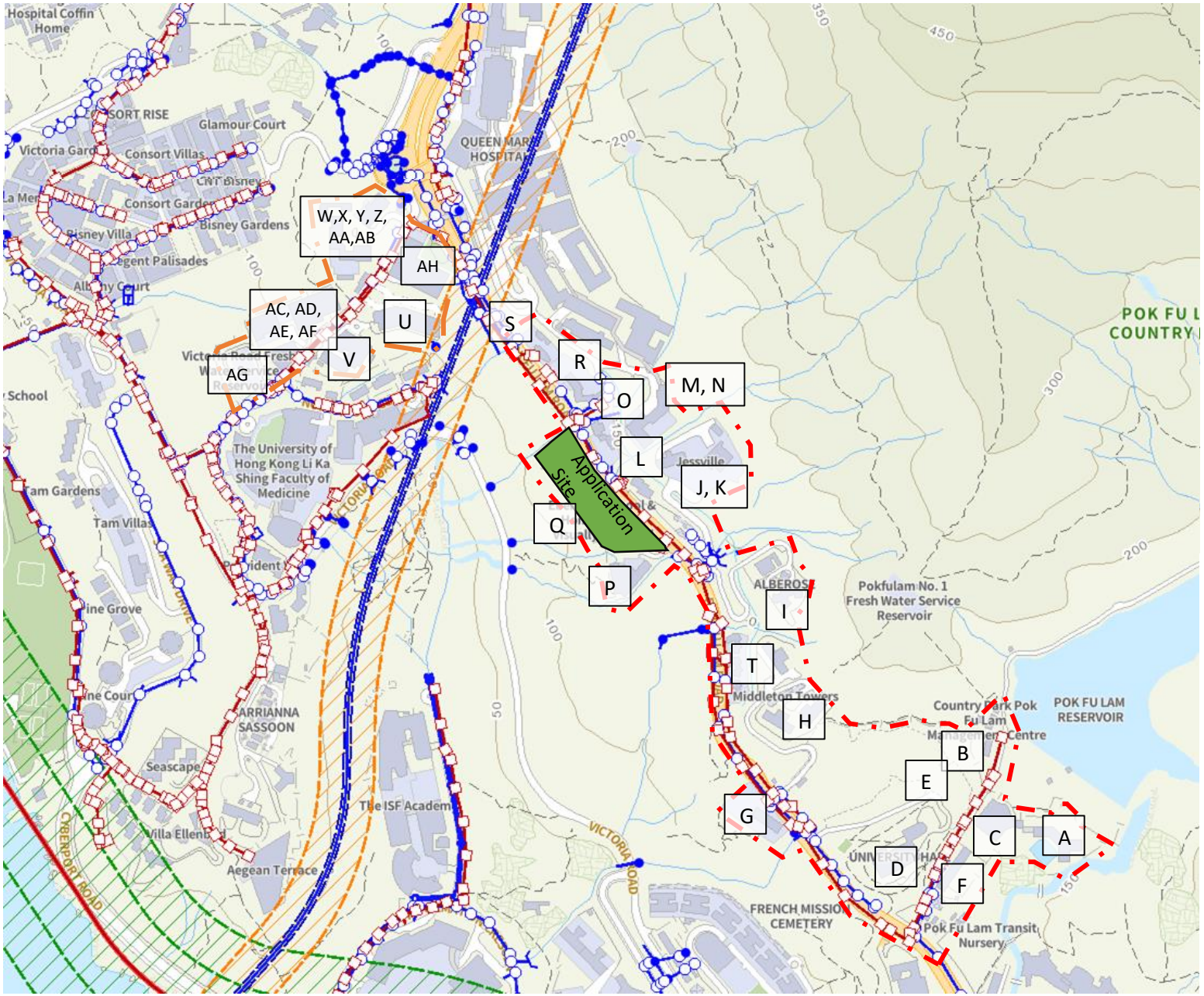
Capacity provided Q = V x Cross Section Area of Drain

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


W,X, Y, Z, AA,AB
AH
AC, AD, AE, AF
U
S
V
AG
R
M, N
O
L
J, K
Application Site
Q
P
I
T
H
B
E
G
C
A
D
F
Sewerage Catchment Area at Pok Fu Lam Road
Sewerage Catchment Area at Sassoon Road

Binnies Hong Kong Limited

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: Table B1: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre										
	Park Personnel	J11	5	0.28	1.4	1.4	5	1.62E-05	8	0.00013	Estimated Population
	Swimming Pool (515m^2)**				4017.00			0.046493		0.04662	
B	WSD Staff Quarters	Insitutional	46	0.19	8.74	10.14	38	0.000101	8	0.04743	12Units x 3.7PPF, say
C	HKJC PHAB Camp										
	Campers	Insitutional	160	0.19	30.4	40.54	150	0.000352	8	0.05025	According to the official website of Hong Kong PHAB Association (https://hkphab.org.hk/en-gb/jockey-club-phab-camp-en), the camp has 124 residential campers and 160 day campers. 160 day campers will be used for sewage estimation.
	Management Staff	J11	8	0.28	2.24	42.78	158	2.59E-05	8	0.05045	Assume no. management staff = 5% of no. of residents
D	University Hall	Insitutional	110	0.19	20.9	63.68	236	0.000242	8	0.05239	Data from website
E	Residential Institution (Student Hostel)										Flow provided by EPD
	Hostel Place	Insitutional	938	0.19	178.22	241.90	896	0.002063	6	0.06329	According to MPC Paper No. A/H10/94, not more than 938 hostel places are provided for students
	Management Staff	J11	30	0.28	8.4	250.30	927	9.72E-05	6	0.06388	According to MPC Paper No. A/H10/94, there are 30 accommodations for management staff
F	HKJC Riding School	J11			97.53	347.83	1288	0.001129	6	0.07065	Sewage flow provided by EPD via. email (comments on SIA Report Rev. 1) on 20 Dec 2023
G	Woodbury Court										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	377.80	1399	0.000347	6	0.07273	
	Management Staff	J11	8	0.28	2.24	380.04	1408	2.59E-05	6	0.07288	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.07288	
H	Residential Institution (Student Hostel) under S.16 Application A/H10/98A										
	Hostel Place	Insitutional	900	0.19	171	551.04	2041	0.001979	6	0.08476	According to MPC Paper No. A/H10/98A, about 900 bed spaces are provided for students
	Management Staff	J11	30	0.28	8.4	559.44	2072	9.72E-05	6	0.08534	The same number of staff as Catchment E is assumed, as both catchments provide a similar number of bed spaces.
T	138 Pok Fu Lam Road (RBL 757)										
	Residents	R3	12	0.37	4.44	563.88	2088	5.14E-05	6	0.08565	3 Units from the replies to initial written questions raised by Finance Committee Members in examining the Estimated of Expenditure 2021-22 published by DevB, average occupancy 3.7 PPF
	Management Staff	J11	1	0.28	0.28	564.16	2089	3.24E-06	6	0.08567	Assume no. management staff = 5% of no. of residents
I	Alberose (Old Alberose and New Alberose)	R3	8	0.37	2.96	567.12	2100	3.43E-05	6	0.08588	1 Units from Centadata (https://hk.centanet.com/estate/en/Alberose/2-TINLZHNHHT) (2 units are assumed for old and new Alberose), average occupancy 3.7 PPF
J	Jessville Manor					567.12	2100				4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	571.17	2115	4.69E-05	6	0.08616	
	Management Staff	J11	1	0.28	0.28	571.45	2116	3.24E-06	6	0.08618	Assume no. management staff = 5% of no. of residents
K	Jessville Tower					571.45	2116				28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	599.53	2220	0.000325	6	0.08813	
	Management Staff	J11	8	0.28	2.24	601.77	2229	2.59E-05	6	0.08828	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (240m^2)**				0.00			0		0.08828	
L	Dor Fook Mansion										25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	626.88	2322	0.000291	6	0.09003	
	Management Staff	J11	5	0.28	1.4	628.28	2327	1.62E-05	6	0.09012	Assume no. management staff = 5% of no. of residents
M	Government Quarters					628.28					
	Residents	R2	592	0.27	159.84	788.12	2919	0.00185	6	0.10122	Estimated population (20 floors x 8 flats/floor = 160 Units), 3.7 PPF
	Management Staff	J11	30	0.28	8.4	796.52	2950	9.72E-05	6	0.10181	Assume no. management staff = 5% of no. of residents
N	Hospital Authority	J11	126	0.28	35.28	831.80	3081	0.000408	6	0.10426	Building Area 1.907m2 x 2 floors = 3.814m2
O	Radcliffe					831.80					10 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	37	0.27	9.99	841.79	3118	0.000116	6	0.10495	
	Management Staff	J11	4	0.28	1.12	842.91	3122	1.3E-05	6	0.10503	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (290m^2)**				0.00			0		0.10503	
P	**Existing Facilities (to be relocated)**										
	Student	**Student**	**0**	**0.04**	**0**	842.91	3122		6	0.10503	**Proposed Development**
	Teacher & Staff	**J11**	**0**	**0.28**	**0**	842.91	3122		6	0.10503	
Q	**Proposed Development**										
	Residents	**R3**	**500**	**0.37**	**185**	1027.91	3807	0.002141	6	0.11788	
	Management Staff*	**J11**	**48**	**0.28**	**13.44**	1041.35	3857	0.000156	6	0.11881	
	Swimming Pool (150m^2)**				**0.00**			0		0.11881	
R	Royalton										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	1071.32	3968	0.000347	6	0.12089	
	Management Staff	J11	8	0.28	2.24	1073.56	3976	2.59E-05	6	0.12105	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (70m^2)**				0.00			0		0.12105	
S	Royalton II										17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	1090.57	4039	0.000197	6	0.12223	
	Management Staff	J11	4	0.28	1.12	1091.69	4043	1.3E-05	6	0.12230	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.12230	
AH	No. 3 Sassoon Road Academic Building										

Binnies Hong Kong Limited

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: Table B1: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
	Student	Student	2905	0.04	116.2	1207.89	4474	0.001345	6	0.13037	According to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong, the projected populations for the new academic building on the strip of land within the Green Belt zone adjoining the planned academic building at No. 3 Sassoon Road comprise 2,905 students, 1,190 staff members, and 77 kitchen staff. For the purpose of assessing the population attributable to the academic building at No. 3 Sassoon Road, 50% of each population category is assumed.
	Teacher & Staff	J11	1169	0.28	327.32	1535.21	5686	0.003788	6	0.15310	
	Kitchen	J10	77	1.58	121.66	1656.87	6137	0.001408	6	0.16155	
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research										
	Student	Student	1260	0.04	50.4	1707.27	6323	0.000583	5	0.14529	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	540	0.28	151.2	1858.47	6883	0.00175	5	0.15404	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)										
	Student	Student	521	0.04	20.84	1879.31	6960	0.000241	5	0.15525	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	224	0.28	62.72	1942.03	7193	0.000726	5	0.15888	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	2227.03	8248	0.003299	5	0.17537	Sewage flow provided by EPD via. email on 28 Dec 2023
X	Wei Lun Hall	Insitutional			72.6	2299.63	8517	0.00084	5	0.17957	Sewage flow provided by EPD via. email on 28 Dec 2023
Y	Lee Hysan Hall	Insitutional			72.6	2372.23	8786	0.00084	5	0.18377	Sewage flow provided by EPD via. email on 28 Dec 2023
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	2444.83	9055	0.00084	5	0.18798	Sewage flow provided by EPD via. email on 28 Dec 2023
AA	Bay View Restaurant	J10			75.5	2520.33	9335	0.000874	5	0.19235	Sewage flow provided by EPD via. email on 28 Dec 2023
AC	Dexter H.C Man Building	J11	107	0.28	29.96	2550.29	9446	0.000347	5	0.19408	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	2569.61	9517	0.000224	5	0.19520	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	2598.45	9624	0.000334	5	0.19687	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AF	Pauline Chan Building										
	Student	Student	162	0.04	6.48	2604.93	9648	0.000075	5	0.19724	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	402	0.28	112.56	2717.49	10065	0.001303	5	0.20376	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Kitchen	J10	18	1.58	28.44	2745.93	10170	0.000329	5	0.20540	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	2746.77	10173	9.72E-06	5	0.20545	Assumed 3 staffs
	Total Flow				6763.8						Inflow Factor = 1.00 GESF Table T-4
	Average Flow (l/s)				78.28						

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

*** Only one swimming pool undergoes backwashing during peak hours. The largest swimming pool at catchment A will be considered*

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

Turnover Rate	6 hr
Surface Loading Rate of Filter	20 m3/m2/hr
Backwash Duration	3 min /day
Backwash Flow Rate	30 m3/m2/hr

Binnies Hong Kong Limited

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: Table B2: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

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	67.5	0.050	-	-	0.03192	64.24%	Connection Point from Proposed Development. [2]
FMH7038820	FMH7022533	138.71	138.37	136.25	135.91	50.6	400	148.8	0.155	0.10410	66.98%	0.11881	76.44%	Existing Flow from Source A to O, Q and T
FMH7022533	FMH7022362	138.37	138.00	135.89	135.55	42.7	400	125.6	0.169	0.10633	62.85%	0.12105	71.54%	Connection Point from R (Royalton)
FMH7022362	FMH7022361	138.00	138.40	135.54	135.26	45	400	160.7	0.150	0.10763	71.97%	0.12230	81.78%	Connection Point from S (Royalton II)
FMH7022361	FMH7022360	138.40	138.43	135.54	134.65	36.9	400	41.5	0.294	0.10763	36.55%	0.12230	41.53%	
FMH7022360	FMH7038860	138.43	138.24	134.65	134.11	29.4	400	54.4	0.257	0.10763	41.89%	0.12230	47.60%	
FMH7038860	FMH7038861	138.24	137.63	134.11	133.63	10.5	400	21.9	0.405	0.10763	26.55%	0.12230	30.17%	
FMH7038861	FMH7038862	137.63	135.42	133.63	133.00	24.3	400	38.6	0.305	0.10763	35.25%	0.12230	40.06%	
FMH7038862	FMH7038845	135.42	135.34	133.00	132.50	34.7	400	69.4	0.228	0.10763	47.29%	0.12230	53.74%	
FMH7038845	FMH7038846	135.34	134.18	132.50	131.76	13.5	400	18.2	0.444	0.10763	24.25%	0.12230	27.55%	
FMH7038846	FMH7020219	134.18	131.89	131.76	129.79	29.7	400	15.1	0.488	0.10763	22.04%	0.12230	25.05%	
FMH7020219	FMH7020220	131.89	130.45	129.79	128.35	24.1	300	16.7	0.215	0.10763	49.99%	0.12230	56.80%	
FMH7020220	FMH7060381	130.45	126.53	128.35	124.46	41.6	300	10.7	0.269	0.13015	48.32%	0.16155	59.98%	Connection Point from AH (No. 3 Sassoon Road Academic Building)
FMH7060381	FMH7020221	126.53	124.48	124.46	122.68	13.1	300	7.4	0.325	0.14182	43.68%	0.15404	47.44%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research)
FMH7020221	FMH7020222	124.48	119.51	122.68	117.41	32.7	300	6.2	0.354	0.16669	47.14%	0.15888	44.93%	Connection Point from V (Patrick Manson Building (North Wing))
FMH7020222	FMH7020223	119.51	115.59	117.41	112.89	31.3	300	6.9	0.335	0.16669	49.80%	0.17537	52.39%	
FMH7020223	FMH7022433	115.59	113.59	112.89	110.99	15.7	300	8.3	0.306	0.16669	54.40%	0.17957	58.60%	
FMH7022433	FMH7022444	113.59	109.95	110.99	108.21	30.1	300	10.8	0.268	0.16669	62.27%	0.18377	68.65%	
FMH7022444	FMH7022432*	109.95	110.04	108.21	108.08	6	300	46.2	0.130	0.16669	128.57%	0.18798	144.99%	
FMH7022432*	FMH7022445	110.04	109.47	108.08	107.98	4.7	225	47.0	0.060	0.19643	329.90%	0.20545	345.05%	Connection Point from W to AG (Victoria Road Fresh Water Service Reservoir)
FMH7022445	FMH7023281	109.47	104.54	107.98	101.96	48.2	225	8.0	0.144	0.19643	136.16%	0.20545	142.41%	
FMH7023281	FMH7022459	104.54	101.40	101.96	99.27	29.8	225	11.1	0.123	0.19643	160.16%	0.20545	167.52%	
FMH7022459	FMH7022410	101.40	99.20	99.27	98.20	12	225	11.2	0.122	0.19643	161.14%	0.20545	168.55%	
FMH7022410	FMH7022415	99.20	77.70	98.00	73.83	32	250	1.3	0.470	0.19643	41.76%	0.20545	43.68%	

Surface roughness k_s 3 mm

kinematic viscosity v 1.14 mm^2/s

Mean velocity (Colebrook-White) $\bar{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$

Capacity provided Q = V x 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. Although this is new sewer proposed to connect to public sewerage system from the Proposed Development, peaking factor (including stormwater allowance) of 8 has been applied for conservative assessment. In addition, the backwashing discharge from the proposed swimming pool of this development has been taken into account in assessing the proposed sewer capacity
3. Drainage record plan refers to Drawing No. LILY16/SIA/001

* Assume mid-way between upstream and downstream manholes

Binnies Hong Kong Limited

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: Table B3: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Swimming Pools Undergo Backwashing During Off-peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
A	Pok Fu Lam Park Management Centre										
	Park Personnel	J11	5	0.28	1.4	1.4	5	1.62E-05	8	0.00013	Estimated Population
	Swimming Pool (515m^2)**				0.00			0		0.00013	
B	WSD Staff Quarters	Insitutional	46	0.19	8.74	10.14	38	0.000101	8	0.00094	12Units x 3.7PPF, say
C	HKJC PHAB Camp										
	Campers	Insitutional	160	0.19	30.4	40.54	150	0.000352	8	0.00375	According to the official website of Hong Kong PHAB Association (https://hkphab.org.hk/en-gb/jockey-club-phab-camp-en), the camp has 124 residential campers and 160 day campers. 160 day campers will be used for sewage estimation.
	Management Staff	J11	8	0.28	2.24	42.78	158	2.59E-05	8	0.00396	Assume no. management staff = 5% of no. of residents
D	University Hall	Insitutional	110	0.19	20.9	63.68	236	0.000242	8	0.00590	Data from website
E	Residential Institution (Student Hostel)										Flow provided by EPD
	Hostel Place	Insitutional	938	0.19	178.22	241.90	896	0.002063	6	0.01680	According to MPC Paper No. A/H10/94, not more than 938 hostel places are provided for students
	Management Staff	J11	30	0.28	8.4	250.30	927	9.72E-05	6	0.01738	According to MPC Paper No. A/H10/94, there are 30 accommodations for management staff
F	HKJC Riding School	J11			97.53	347.83	1288	0.001129	6	0.02415	Sewage flow provided by EPD via. email (comments on SIA Report Rev. 1) on 20 Dec 2023
G	Woodbury Court										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	377.80	1399	0.000347	6	0.02624	
	Management Staff	J11	8	0.28	2.24	380.04	1408	2.59E-05	6	0.02639	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.02639	
H	Residential Institution (Student Hostel) under S.16 Application A/H10/98A										
	Hostel Place	Insitutional	900	0.19	171	551.04	2041	0.001979	6	0.03827	According to MPC Paper No. A/H10/98A, about 900 bed spaces are provided for students
	Management Staff	J11	30	0.28	8.4	559.44	2072	9.72E-05	6	0.03885	The same number of staff as Catchment E is assumed, as both catchments provide a similar number of bed spaces.
T	138 Pok Fu Lam Road (RBL 757)										
	Residents	R3	12	0.37	4.44	563.88	2088	5.14E-05	6	0.03916	3 Units from the replies to initial written questions raised by Finance Committee Members in examining the Estimated of Expenditure 2021-22 published by DevB, average occupancy 3.7 PPF
	Management Staff	J11	1	0.28	0.28	564.16	2089	3.24E-06	6	0.03918	Assume no. management staff = 5% of no. of residents
I	Alberose (Old Alberose and New Alberose)	R3	8	0.37	2.96	567.12	2100	3.43E-05	6	0.03938	1 Units from Centadata (https://hk.centanet.com/estate/en/Alberose/2-TINLZHNHHT) (2 units are assumed for old and new Alberose), average occupancy 3.7 PPF
J	Jessville Manor					567.12	2100				4 Units from website, average occupancy 3.7 PPF
	Residents	R2	15	0.27	4.05	571.17	2115	4.69E-05	6	0.03966	
	Management Staff	J11	1	0.28	0.28	571.45	2116	3.24E-06	6	0.03968	Assume no. management staff = 5% of no. of residents
K	Jessville Tower					571.45	2116				28 Units from website, average occupancy 3.7 PPF
	Residents	R2	104	0.27	28.08	599.53	2220	0.000325	6	0.04163	
	Management Staff	J11	8	0.28	2.24	601.77	2229	2.59E-05	6	0.04179	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (240m^2)**				0.00			0		0.04179	
L	Dor Fook Mansion										25 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	93	0.27	25.11	626.88	2322	0.000291	6	0.04353	
	Management Staff	J11	5	0.28	1.4	628.28	2327	1.62E-05	6	0.04363	Assume no. management staff = 5% of no. of residents
M	Government Quarters					628.28					
	Residents	R2	592	0.27	159.84	788.12	2919	0.00185	6	0.05473	Estimated population (20 floors x 8 flats/floor = 160 Units), 3.7 PPF
	Management Staff	J11	30	0.28	8.4	796.52	2950	9.72E-05	6	0.05531	Assume no. management staff = 5% of no. of residents
N	Hospital Authority	J11	126	0.28	35.28	831.80	3081	0.000408	6	0.05776	Building Area 1.907m2 x 2 floors = 3.814m2
O	Radcliffe					831.80					10 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	37	0.27	9.99	841.79	3118	0.000116	6	0.05846	
	Management Staff	J11	4	0.28	1.12	842.91	3122	1.3E-05	6	0.05854	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (290m^2)**				0.00			0		0.05854	
P	**Existing Facilities (to be relocated)**										
	Student	**Student**	**0**	**0.04**	**0**	842.91	3122		6	0.05854	**Proposed Development**
	Teacher & Staff	**J11**	**0**	**0.28**	**0**	842.91	3122		6	0.05854	
Q	**Proposed Development**										
	Residents	**R3**	**500**	**0.37**	**185**	1027.91	3807	0.002141	6	0.07138	
	Management Staff*	**J11**	**48**	**0.28**	**13.44**	1041.35	3857	0.000156	6	0.07232	
	Swimming Pool (150m^2)**				**0.00**			0		0.07232	
R	Royalton										30 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	111	0.27	29.97	1071.32	3968	0.000347	6	0.07440	
	Management Staff	J11	8	0.28	2.24	1073.56	3976	2.59E-05	6	0.07455	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (70m^2)**				0.00			0		0.07455	
S	Royalton II										17 Units from Centadata, average occupancy 3.7 PPF
	Residents	R2	63	0.27	17.01	1090.57	4039	0.000197	6	0.07573	
	Management Staff	J11	4	0.28	1.12	1091.69	4043	1.3E-05	6	0.07581	Assume no. management staff = 5% of no. of residents + 2 additional staff for swimming pool
	Swimming Pool (105m^2)**				0.00			0		0.07581	
AH	No. 3 Sassoon Road Academic Building										

Binnies Hong Kong Limited

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: Table B3: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Swimming Pools Undergo Backwashing During Off-peak Hours)

Sewerage Catchment (From FMH7022574 to FMH7022415)

	Source	Category	Population	Unit Flow (m3/h/d)	Daily Flow (m3/d)	Cumulative Daily Flow (excluding pools) (m3/d)	Cumulative population	Daily Flow (m3/s)	Peaking Factor	Culmulative Peak Flow (m3/s)	Remark
	Student	Student	2905	0.04	116.2	1207.89	4474	0.001345	6	0.08388	According to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong, the projected populations for the new academic building on the strip of land within the Green Belt zone adjoining the planned academic building at No. 3 Sassoon Road comprise 2,905 students, 1,190 staff members, and 77 kitchen staff. For the purpose of assessing the population attributable to the academic building at No. 3 Sassoon Road, 50% of each population category is assumed.
	Teacher & Staff	J11	1169	0.28	327.32	1535.21	5686	0.003788	6	0.10661	
	Kitchen	J10	77	1.58	121.66	1656.87	6137	0.001408	6	0.11506	
U	No.5 Sassoon Road HKU HKJC Building for Interdisciplinary Research										
	Student	Student	1260	0.04	50.4	1707.27	6323	0.000583	5	0.09880	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	540	0.28	151.2	1858.47	6883	0.00175	5	0.10755	
V	No.7 Sassoon Road Patrick Manson Building (North Wing)										
	Student	Student	521	0.04	20.84	1879.31	6960	0.000241	5	0.10876	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	224	0.28	62.72	1942.03	7193	0.000726	5	0.11239	
W	Proposed Development at No. 6 Sassoon Road	Insitutional			285	2227.03	8248	0.003299	5	0.12888	Sewage flow provided by EPD via. email on 28 Dec 2023
X	Wei Lun Hall	Insitutional			72.6	2299.63	8517	0.00084	5	0.13308	Sewage flow provided by EPD via. email on 28 Dec 2023
Y	Lee Hysan Hall	Insitutional			72.6	2372.23	8786	0.00084	5	0.13728	Sewage flow provided by EPD via. email on 28 Dec 2023
Z	The University of Hong Kong R.C. Lee Hall	Insitutional			72.6	2444.83	9055	0.00084	5	0.14148	Sewage flow provided by EPD via. email on 28 Dec 2023
AA	Bay View Restaurant	J10			75.5	2520.33	9335	0.000874	5	0.14585	Sewage flow provided by EPD via. email on 28 Dec 2023
AC	Dexter H.C Man Building	J11	107	0.28	29.96	2550.29	9446	0.000347	5	0.14759	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AD	The University of Hong Kong Institute of Molecular Biology	J11	69	0.28	19.32	2569.61	9517	0.000224	5	0.14870	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AE	The University of Hong Kong Estates Building	J11	103	0.28	28.84	2598.45	9624	0.000334	5	0.15037	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AF	Pauline Chan Building										
	Student	Student	162	0.04	6.48	2604.93	9648	0.000075	5	0.15075	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Teacher & Staff	J11	402	0.28	112.56	2717.49	10065	0.001303	5	0.15726	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
	Kitchen	J10	18	1.58	28.44	2745.93	10170	0.000329	5	0.15891	Population refer to the Sewerage Impact Assessment Report prepared in July 2019 under the Planning Consultancy Service for Sassoon Road Campus Expansion for the University of Hong Kong.
AG	Victoria Road Fresh Water Service Reservoir	J11	3	0.28	0.84	2746.77	10173	9.72E-06	5	0.15896	Assumed 3 staffs
	Total Flow				2746.8						Inflow Factor = 1.00 GESF Table T-4
	Average Flow (l/s)				31.79						

**assume no. management staff = 5% of no. of residents*
*** Swimming pool undergoes backwashing during off-peak hours.*

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

Turnover Rate	6	hr
Surface Loading Rate of Filter	20	m3/m2/hr
Backwash Duration	3	min /day
Backwash Flow Rate	30	m3/m2/hr

Binnies Hong Kong Limited

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

Table B4: Estimation of Sewage Flow at Pok Fu Lam Road (After Development) (Swimming Pools Undergo Backwashing during Off-peak Hours)

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	67.5	0.050	-	-	0.03192	64.24%	Connection Point from Proposed Development. [2]
FMH7038820	FMH7022533	138.71	138.37	136.25	135.91	50.6	400	148.8	0.155	0.05760	37.06%	0.07232	46.53%	Existing Flow from Source A to O, Q and T
FMH7022533	FMH7022362	138.37	138.00	135.89	135.55	42.7	400	125.6	0.169	0.05984	35.37%	0.07455	44.06%	Connection Point from R (Royalton)
FMH7022362	FMH7022361	138.00	138.40	135.54	135.26	45	400	160.7	0.150	0.06114	40.88%	0.07581	50.69%	Connection Point from S (Royalton II)
FMH7022361	FMH7022360	138.40	138.43	135.54	134.65	36.9	400	41.5	0.294	0.06114	20.76%	0.07581	25.75%	
FMH7022360	FMH7038860	138.43	138.24	134.65	134.11	29.4	400	54.4	0.257	0.06114	23.79%	0.07581	29.50%	
FMH7038860	FMH7038861	138.24	137.63	134.11	133.63	10.5	400	21.9	0.405	0.06114	15.08%	0.07581	18.70%	
FMH7038861	FMH7038862	137.63	135.42	133.63	133.00	24.3	400	38.6	0.305	0.06114	20.03%	0.07581	24.83%	
FMH7038862	FMH7038845	135.42	135.34	133.00	132.50	34.7	400	69.4	0.228	0.06114	26.86%	0.07581	33.31%	
FMH7038845	FMH7038846	135.34	134.18	132.50	131.76	13.5	400	18.2	0.444	0.06114	13.77%	0.07581	17.08%	
FMH7038846	FMH7020219	134.18	131.89	131.76	129.79	29.7	400	15.1	0.488	0.06114	12.52%	0.07581	15.52%	
FMH7020219	FMH7020220	131.89	130.45	129.79	128.35	24.1	300	16.7	0.215	0.06114	28.40%	0.07581	35.21%	
FMH7020220	FMH7060381	130.45	126.53	128.35	124.46	41.6	300	10.7	0.269	0.08366	31.06%	0.11506	42.72%	Connection Point from AH (No. 3 Sassoon Road Academic Building)
FMH7060381	FMH7020221	126.53	124.48	124.46	122.68	13.1	300	7.4	0.325	0.09532	29.36%	0.10755	33.12%	Connection Point from U (HKU HKJC Building for Interdisciplinary Research)
FMH7020221	FMH7020222	124.48	119.51	122.68	117.41	32.7	300	6.2	0.354	0.12019	33.99%	0.11239	31.78%	Connection Point from V (Patrick Manson Building (North Wing))
FMH7020222	FMH7020223	119.51	115.59	117.41	112.89	31.3	300	6.9	0.335	0.12019	35.91%	0.12888	38.50%	
FMH7020223	FMH7022433	115.59	113.59	112.89	110.99	15.7	300	8.3	0.306	0.12019	39.23%	0.13308	43.43%	
FMH7022433	FMH7022444	113.59	109.95	110.99	108.21	30.1	300	10.8	0.268	0.12019	44.90%	0.13728	51.28%	
FMH7022444	FMH7022432*	109.95	110.04	108.21	108.08	6	300	46.2	0.130	0.12019	92.71%	0.14148	109.13%	
FMH7022432*	FMH7022445	110.04	109.47	108.08	107.98	4.7	225	47.0	0.060	0.14993	251.81%	0.15896	266.97%	Connection Point from W to AG (Victoria Road Fresh Water Service Reservoir)
FMH7022445	FMH7023281	109.47	104.54	107.98	101.96	48.2	225	8.0	0.144	0.14993	103.93%	0.15896	110.18%	
FMH7023281	FMH7022459	104.54	101.40	101.96	99.27	29.8	225	11.1	0.123	0.14993	122.25%	0.15896	129.61%	
FMH7022459	FMH7022410	101.40	99.20	99.27	98.20	12	225	11.2	0.122	0.14993	123.00%	0.15896	130.41%	
FMH7022410	FMH7022415	99.20	77.70	98.00	73.83	32	250	1.3	0.470	0.14993	31.88%	0.15896	33.80%	

Surface roughness k_s 3 mm

kinematic viscosity v 1.14 mm^2/s

Mean velocity (Colebrook-White) $\bar{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R}+\frac{1.255v}{R\sqrt{(32gRS_f)}}\right]$

Capacity provided Q = V x 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. Although this is new sewer proposed to connect to public sewerage system from the Proposed Development, peaking factor (including stormwater allowance) of 8 has been applied for conservative assessment. In addition, the backwashing discharge from the proposed swimming pool of this development has been taken into account in assessing the proposed sewer capacity
3. Drainage record plan refers to Drawing No. LILY16/SIA/001

* Assume mid-way between upstream and downstream manholes

Binnies Hong Kong Limited

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 Proposed Sewerage Works for Application Site

Capacity Check

ADWF		=	0.01584	m^3/s	(Assume Swimming Pool Undergoes Backwashing During Peak Hours)
Peak Flow (Sewer)		=	0.03192	m^3/s	
Peak Flow (Pumping Station)		=	0.02273	m^3/s	

Pumped Mains to FMH7038820

Capacity of Pipe

Velocity (Assumed)	*v*	=	1.000	m/s	
Cross Section Area of Drain		=	Q / *v*		
		=	0.02273	m^2	
Min. Pipe Size		=	170.1149	mm	
Design for Pipe Size		<	170.1149	= 150 mm	
				OK	

Sump pit

Volume of Pit

Pump Capacity	q	=	0.02273	m^3/s	
Cycle Time	T	=	360	s 10	time start/stop per hour

Minimum Volume

$$V_{min} = \frac{T_{min} q}{4}$$

= 2.045583 m^3

Volume of pit	V	=	2.25	m^3	(1.5(L)x1(W)x1.5(D))
					OK

Appendix C

Preliminary Freeboard Check for FMH7022432

Binnies Hong Kong Limited

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: Table C1: Preliminary Freeboard Check for FMH7022433 to FMH7022459 - Existing Condition (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Reference

1. Sewerage Manual Part 1
2. Guidelines for Estimaing Sewage Flows for Sewage Infrastructure Planning (Report No.: EPD/TP 1/05)
3. Charts for the Hydraulic Design of Channels and Pipes, Hydraulic Research Paper No.2 by Hydraulic Research Station.

Assumption adopted in Hydraulic Analysis

1. Colebrook-White Equation is adopted for the calculation of the fullbore velocity.
2. For pipe size <= 600mm
   Ks is assumed to be 3.00 mm
3. For pipe size > 600mm
   Ks is assumed to be 3.00 mm
4. Minimum free board 1.0 m
5. Assume that the sewers at all downstream manholes are flowing under full-bore conditions.

Preliminary Freeboard Check

Note: refer to DSD drianage record plan for manhole references

	Manhole No.								Pipe Capacity (Full bore)				Ground Level		Crown Level		Invert Level		Cover		Backwater Effect									
	U/S	D/S	Diameter [b]	Length	Gradient	Peak Flow * 1.15 FOS [I/s]	Accumulative	Roughness	Design Velocity,V	Velocity Capacity,Vo	Flow Capacity,Qo	Flow Capacity Utilization (%)	U/S	D/S	U/S	D/S	U/S	D/S [a]	U/S	D/S	Reynolds	Friction	Pipe Headloss [d]	Local * Headloss [e]	D/S W.L. at Manhole if full capacity [c] = [a] + [b]/1000	U/S W.L. at Manhole if Downstream Manhole at Full Capacity [f] = [c] + [d] + [e]	Adopted D/S W.L. for Estimating the U/S Max. W.L. ** [g] = Max ([c], [h] in the next row)	U/S Max. W.L. based on Adopted D/S W.L. [h] = [g] + [d] + [e]	Available Freeboard	*Overflow?*	*Freeboard > 1m?*
			mm	m	1 in	Incoming		Ks, mm	m/s	m/s	l/s		mPD	mPD	mPD	mPD	mPD	mPD	m	m	number, Re	Factor, f	Loss (m)	Losses (m)	(mPD)	(mPD)	(mPD)	(mPD)	m		
	FMH7022433	FMH7022444	300	30.1	11	191.69	191.69	3	2.71	3.78	268	71.66%	113.59	109.95	111.29	108.51	110.990	108.210	2.30	1.44	813557	0.011	0.7706	0.1874	108.510	109.468	109.273	110.231	3.36	*No*	*Yes*
	FMH7022444	FMH7022432	300	6	46	0.00	191.69	3	2.71	1.83	129	148.06%	109.95	110.04	108.51	108.38	108.210	108.080	1.44	1.66	813557	0.011	0.0360	0.1874	108.380	108.603	109.050	109.273	0.68	*No*	*Not Good*
	FMH7022432	FMH7022445	225	4.7	47	34.20	225.89	3	5.68	1.49	59	380.04%	110.04	109.47	108.31	108.21	108.080	107.980	1.74	1.27	1278271	0.009	0.0224	0.8225	108.205	109.050	108.205	109.050	0.99	*No*	*Not Good*
	FMH7022445	FMH7023281	225	48.2	8	0.00	225.89	3	5.68	3.63	144	156.69%	109.47	104.54	108.21	102.19	107.980	101.960	1.27	2.36	1278271	0.009	1.3489	0.8225	102.185	104.356	102.185	104.356	5.11	*No*	*Yes*
	FMH7023281	FMH7022459	225	29.8	11	0.00	225.89	3	5.68	3.08	123	184.34%	104.54	101.40	102.19	99.50	101.960	99.270	2.36	1.91	1278271	0.009	0.6026	0.8225	99.495	100.920	99.495	100.920	3.62	*No*	*Yes*
	FMH7022459	FMH7022410	225	12	11	0.00	225.89	3	5.68	3.06	122	185.47%	101.40	99.20	99.50	98.43	99.270	98.200	1.91	0.78	1278271	0.009	0.2397	0.8225	98.425	99.487	98.425	99.487	1.91	*No*	*Yes*

* Head losses corfficient, K, is determined using Table 7 of DSD's SM Part 1 2013.

** The adopted downstream water level for calculating the maximum upstream water level shall be taken as the higher of the following two values: -

1. The water level at the downstream manhole, assuming the outlet pipe is flowing at full capacity [c], i.e. the outlet invert level plus the outlet pipe diameter.
2. The maximum upstream water level calculated for the next downstream manhole [h], taking into account the pipe headlosses between the two manholes.

The higher of these two values shall be adopted as the downstream water level for the subsequent calculation.

Binnies Hong Kong Limited

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: Table C2: Preliminary Freeboard Check for FMH7022433 to FMH7022459 - Proposed Condition (Only One Swimming Pool Undergoes Backwashing During Peak Hours)

Reference

1. Sewerage Manual Part 1
2. Guidelines for Estimaing Sewage Flows for Sewage Infrastructure Planning (Report No.: EPD/TP 1/05)
3. Charts for the Hydraulic Design of Channels and Pipes, Hydraulic Research Paper No.2 by Hydraulic Research Station.

Assumption adopted in Hydraulic Analysis

1. Colebrook-White Equation is adopted for the calculation of the fullbore velocity.
2. For pipe size <= 600mm
   Ks is assumed to be 3.00 mm
3. For pipe size > 600mm
   Ks is assumed to be 3.00 mm
4. Minimum free board 1.0 m
5. Assume that the sewers at all downstream manholes are flowing under full-bore conditions.

Preliminary Freeboard Check

Note: refer to DSD drianage record plan for manhole references

	Manhole No.								Pipe Capacity (Full bore)				Ground Level		Crown Level		Invert Level		Cover		Backwater Effect									
	U/S	D/S	Diameter [b]	Length	Gradient	Peak Flow * 1.15 FOS [I/s]	Accumulative	Roughness	Design Velocity,V	Velocity Capacity,Vo	Flow Capacity,Qo	Flow Capacity Utilization (%)	U/S	D/S	U/S	D/S	U/S	D/S [a]	U/S	D/S	Reynolds	Friction	Pipe Headloss [d]	Local * Headloss [e]	D/S W.L. at Manhole if full capacity [c] = [a] + [b]/1000	U/S W.L. at Manhole if Downstream Manhole at Full Capacity [f] = [c] + [d] + [e]	Adopted D/S W.L. for Estimating the U/S Max. W.L. ** [g] = Max ([c], [h] in the next row)	U/S Max. W.L. based on Adopted D/S W.L. [h] = [g] + [d] + [e]	Available Freeboard	*Overflow?*	*Freeboard > 1m?*
			mm	m	1 in	Incoming		Ks, mm	m/s	m/s	l/s		mPD	mPD	mPD	mPD	mPD	mPD	m	m	number, Re	Factor, f	Loss (m)	Losses (m)	(mPD)	(mPD)	(mPD)	(mPD)	m		
	FMH7022433	FMH7022444	300	30.1	11	211.34	211.34	3	2.99	3.78	268	79.00%	113.59	109.95	111.29	108.51	110.990	108.210	2.30	1.44	896960	0.010	0.7520	0.2278	108.510	109.490	109.400	110.380	3.21	*No*	*Yes*
	FMH7022444	FMH7022432	300	6	46	4.83	216.17	3	3.06	1.83	129	166.97%	109.95	110.04	108.51	108.38	108.210	108.080	1.44	1.66	917465	0.010	0.0349	0.2383	108.380	108.653	109.127	109.400	0.55	*No*	*Not Good*
	FMH7022432	FMH7022445	225	4.7	47	20.09	236.27	3	5.94	1.49	59	397.50%	110.04	109.47	108.31	108.21	108.080	107.980	1.74	1.27	1336998	0.009	0.0221	0.8998	108.205	109.127	108.205	109.127	0.91	*No*	*Not Good*
	FMH7022445	FMH7023281	225	48.2	8	0.00	236.27	3	5.94	3.63	144	163.89%	109.47	104.54	108.21	102.19	107.980	101.960	1.27	2.36	1336998	0.009	1.3339	0.8998	102.185	104.419	102.185	104.419	5.05	*No*	*Yes*
	FMH7023281	FMH7022459	225	29.8	11	0.00	236.27	3	5.94	3.08	123	192.80%	104.54	101.40	102.19	99.50	101.960	99.270	2.36	1.91	1336998	0.009	0.5959	0.8998	99.495	100.991	99.562	101.058	3.48	*No*	*Yes*
	FMH7022459	FMH7022410	225	12	11	0.00	236.27	3	5.94	3.06	122	193.99%	101.40	99.20	99.50	98.43	99.270	98.200	1.91	0.78	1336998	0.009	0.2370	0.8998	98.425	99.562	98.425	99.562	1.84	*No*	*Yes*

* Head losses corfficient, K, is determined using Table 7 of DSD's SM Part 1 2013.

** The adopted downstream water level for calculating the maximum upstream water level shall be taken as the higher of the following two values: -

1. The water level at the downstream manhole, assuming the outlet pipe is flowing at full capacity [c], i.e. the outlet invert level plus the outlet pipe diameter.
2. The maximum upstream water level calculated for the next downstream manhole [h], taking into account the pipe headlosses between the two manholes.

The higher of these two values shall be adopted as the downstream water level for the subsequent calculation.

Binnies Hong Kong Limited

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: Table C3: Preliminary Freeboard Check for FMH7022433 to FMH7022459 - Existing Condition (Swimming Pools Undergo Backwashing during Off-peak Hours)

Reference

1. Sewerage Manual Part 1
2. Guidelines for Estimaing Sewage Flows for Sewage Infrastructure Planning (Report No.: EPD/TP 1/05)
3. Charts for the Hydraulic Design of Channels and Pipes, Hydraulic Research Paper No.2 by Hydraulic Research Station.

Assumption adopted in Hydraulic Analysis

1. Colebrook-White Equation is adopted for the calculation of the fullbore velocity.
2. For pipe size <= 600mm
   Ks is assumed to be 3.00 mm
3. For pipe size > 600mm
   Ks is assumed to be 3.00 mm
4. Minimum free board 1.0 m
5. Assume that the sewers at all downstream manholes are flowing under full-bore conditions.

Preliminary Freeboard Check

Note: refer to DSD drianage record plan for manhole references

	Manhole No.								Pipe Capacity (Full bore)				Ground Level		Crown Level		Invert Level		Cover		Backwater Effect										
	U/S	D/S	Diameter [b]	Length	Gradient	Peak Flow * 1.15 FOS [l/s]		Roughness	Design Velocity,V	Velocity Capacity,Vo	Flow Capacity,Qo	Flow Capacity Utilization (%)	U/S	D/S	U/S	D/S	U/S	D/S [a]	U/S	D/S	Reynolds	Friction	Pipe Headloss [d]	Local * Headloss [e]	D/S W.L. at Manhole if full capacity [c] = [a] + [b]/1000	U/S W.L. at Manhole if Downstream Manhole at Full Capacity [f] = [c] + [d] + [e]	Adopted D/S W.L. for Estimating the U/S Max. W.L. ** [g] = Max ([c], [h] in the next row)	U/S Max. W.L. based on Adopted D/S W.L. [h] = [g] + [d] + [e]	U/S Max. W.L. [5]	Available Freeboard	*Overflow?*	*Freeboard > 1m?*
			mm	m	1 in	Incoming	Accumulative	Ks, mm	m/s	m/s	l/s		mPD	mPD	mPD	mPD	mPD	mPD	m	m	number, Re	Factor, f	Loss (m)	Losses (m)	(mPD)	(mPD)	(mPD)	(mPD)	(mPD)	m		
	FMH7022433	FMH7022444	300	30.1	11	138.22	138.22	3	1.96	3.78	268	51.67%	113.59	109.95	111.29	108.51	110.990	108.210	2.30	1.44	586636	0.011	0.8363	0.0974	108.510	109.444	108.845	109.778	109.444	3.81	*No*	Yes
	FMH7022444	FMH7022432	300	6	46	0.00	138.22	3	1.96	1.83	129	106.76%	109.95	110.04	108.51	108.38	108.210	108.080	1.44	1.66	586636	0.011	0.0390	0.0974	108.380	108.516	108.708	108.845	108.516	1.11	*No*	Yes
	FMH7022432	FMH7022445	225	4.7	47	34.20	172.42	3	4.34	1.49	59	290.08%	110.04	109.47	108.31	108.21	108.080	107.980	1.74	1.27	975710	0.010	0.0239	0.4792	108.205	108.708	108.205	108.708	108.708	1.33	*No*	Yes
	FMH7022445	FMH7023281	225	48.2	8	0.00	172.42	3	4.34	3.63	144	119.60%	109.47	104.54	108.21	102.19	107.980	101.960	1.27	2.36	975710	0.010	1.4431	0.4792	102.185	104.107	102.185	104.107	104.107	5.36	*No*	Yes
	FMH7023281	FMH7022459	225	29.8	11	0.00	172.42	3	4.34	3.08	123	140.70%	104.54	101.40	102.19	99.50	101.960	99.270	2.36	1.91	975710	0.010	0.6447	0.4792	99.495	100.619	99.495	100.619	100.619	3.92	*No*	Yes
	FMH7022459	FMH7022410	225	12	11	0.00	172.42	3	4.34	3.06	122	141.57%	101.40	99.20	99.50	98.43	99.270	98.200	1.91	0.78	975710	0.010	0.2564	0.4792	98.425	99.161	98.425	99.161	99.161	2.24	*No*	Yes

* Head losses corffiicient, K, is determined using Table 7 of DSD's SM Part 1 2013.
** The adopted downstream water level for calculating the maximum upstream water level shall be taken as the higher of the following two values: -
1. The water level at the downstream manhole, assuming the outlet pipe is flowing at full capacity [c], i.e. the outlet invert level plus the outlet pipe diameter.
2. The maximum upstream water level calculated for the next downstream manhole [h], taking into account the pipe headlosses between the two manholes.
The higher of these two values shall be adopted as the downstream water level for the subsequent calculation.

Binnies Hong Kong Limited

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: Table C4: Preliminary Freeboard Check for FMH7022433 to FMH7022459 - Proposed Condition (Swimming Pools Undergo Backwashing during Off-peak Hours)

Reference

1. Sewerage Manual Part 1
2. Guidelines for Estimaing Sewage Flows for Sewage Infrastructure Planning (Report No.: EPD/TP 1/05)
3. Charts for the Hydraulic Design of Channels and Pipes, Hydraulic Research Paper No.2 by Hydraulic Research Station.

Assumption adopted in Hydraulic Analysis

1. Colebrook-White Equation is adopted for the calculation of the fullbore velocity.
2. For pipe size <= 600mm
   Ks is assumed to be 3.00 mm
3. For pipe size > 600mm
   Ks is assumed to be 3.00 mm
4. Minimum free board 1.0 m
5. Assume that the sewers at all downstream manholes are flowing under full-bore conditions.

Preliminary Freeboard Check

Note: refer to DSD drianage record plan for manhole references

	Manhole No.								Pipe Capacity (Full bore)				Ground Level		Crown Level		Invert Level		Cover		Backwater Effect										
	U/S	D/S	Diameter [b]	Length	Gradient	Peak Flow * 1.15 FOS [l/s]		Roughness	Design Velocity,V	Velocity Capacity,Vo	Flow Capacity,Qo	Flow Capacity Utilization (%)	U/S	D/S	U/S	D/S	U/S	D/S [a]	U/S	D/S	Reynolds	Friction	Pipe Headloss [d]	Local * Headloss [e]	D/S W.L. at Manhole if full capacity [c] = [a] + [b]/1000	U/S W.L. at Manhole if Downstream Manhole at Full Capacity [f] = [c] + [d] + [e]	Adopted D/S W.L. for Estimating the U/S Max. W.L. ** [g] = Max ([c], [h] in the next row)	U/S Max. W.L. based on Adopted D/S W.L. [h] = [g] + [d] + [e]	U/S Max. W.L. [5]	Available Freeboard	*Overflow?*	*Freeboard > 1m?*
			mm	m	1 in	Incoming	Accumulative	Ks, mm	m/s	m/s	l/s		mPD	mPD	mPD	mPD	mPD	mPD	m	m	number, Re	Factor, f	Loss (m)	Losses (m)	(mPD)	(mPD)	(mPD)	(mPD)	(mPD)	m		
	FMH7022433	FMH7022444	300	30.1	11	157.87	157.87	3	2.23	3.78	268	59.02%	113.59	109.95	111.29	108.51	110.990	108.210	2.30	1.44	670039	0.011	0.8089	0.1271	108.510	109.446	108.940	109.876	109.446	3.71	*No*	*Yes*
	FMH7022444	FMH7022432	300	6	46	4.83	162.71	3	2.30	1.83	129	125.67%	109.95	110.04	108.51	108.38	108.210	108.080	1.44	1.66	690544	0.011	0.0375	0.1350	108.380	108.553	108.767	108.940	108.553	1.01	*No*	*Yes*
	FMH7022432	FMH7022445	225	4.7	47	20.09	182.80	3	4.60	1.49	59	307.54%	110.04	109.47	108.31	108.21	108.080	107.980	1.74	1.27	1034437	0.010	0.0236	0.5387	108.205	108.767	108.205	108.767	108.767	1.27	*No*	*Yes*
	FMH7022445	FMH7023281	225	48.2	8	0.00	182.80	3	4.60	3.63	144	126.80%	109.47	104.54	108.21	102.19	107.980	101.960	1.27	2.36	1034437	0.010	1.4222	0.5387	102.185	104.146	102.185	104.146	104.146	5.32	*No*	*Yes*
	FMH7023281	FMH7022459	225	29.8	11	0.00	182.80	3	4.60	3.08	123	149.17%	104.54	101.40	102.19	99.50	101.960	99.270	2.36	1.91	1034437	0.010	0.6353	0.5387	99.495	100.669	99.495	100.669	100.669	3.87	*No*	*Yes*
	FMH7022459	FMH7022410	225	12	11	0.00	182.80	3	4.60	3.06	122	150.09%	101.40	99.20	99.50	98.43	99.270	98.200	1.91	0.78	1034437	0.010	0.2527	0.5387	98.425	99.216	98.425	99.216	99.216	2.18	*No*	*Yes*

* Head losses corfficient, K, is determined using Table 7 of DSD's SM Part 1 2013.

** The adopted downstream water level for calculating the maximum upstream water level shall be taken as the higher of the following two values: -

1. The water level at the downstream manhole, assuming the outlet pipe is flowing at full capacity [c], i.e. the outlet invert level plus the outlet pipe diameter.
2. The maximum upstream water level calculated for the next downstream manhole [h], taking into account the pipe headlosses between the two manholes.

The higher of these two values shall be adopted as the downstream water level for the subsequent calculation.