Appendix B

Sewerage Impact Assessment

Proposed Hotel Development at 14-16 Lee Chung Street, Chai Wan, Hong Kong

Sewerage Impact Assessment

For: Fortune Creation Development Limited

Job No:	1044815
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Project Name:	Proposed Hotel Development at 14-16 Lee Chung Street, Chai Wan, Hong Kong
Client:	Fortune Creation Development Limited
Report Title:	Sewerage Impact Assessment
Job Number:	1044815

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
-	01/08/2025	Initial Issue
A	19/08/2025	Updated as per LD comment
B	20/08/2025	Updated as per Hanison comment
C	22/08/2025	Updated as per NF comment

Document Validation (latest issue)

Revision	Issue Date	Purpose of issue / description of revision / version			
C	22/08/2025	Updated as per NF comment			
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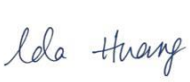
		Signature			

Executive Summary

A Sewerage Impact Assessment (SIA) has been conducted to evaluate the possible impacts on the local sewerage network as a result of the Proposed Hotel Development at 14-16 Lee Chung Street, Chai Wan, Hong Kong (the “proposed development”). The assessment has based on the latest proposed floor uses and site surveys and shall serve to:

- assess the potential sewerage impacts arising from the proposed development
- recommend measures to mitigate unacceptable sewerage impacts, if any.

In conclusion, the results of the sewerage impact reveal that the existing sewage capacity is sufficient to cater the cumulative peak discharge arising from the proposed development and development in the vicinity along 12-18 Lee Chung Street.

Contents

1. Introduction

1.1 Site Description

The proposed development is located at 14-16 Lee Chung Street, Chai Wan, Hong Kong (Chai Wan Inland Lots No. 12 & 43) (hereinafter refer to as the “project site”), as shown in Plate 1 below.

Plate 1 Site Location Plan

The proposed hotel development will comprise 363 hotel rooms from 4/F to 30/F (excluding refuge floor), while the remaining areas comprise hotel ancillary uses which will serve for F&B, retail, or other supporting services, lobbies, hotel BoH, E&M, and carpark. The maximum GFA is 14,068.8 m^2.

1.2 Existing Sewerage Network

The relevant drainage record plans “11-SE-19A” were reviewed to gather the background information of the existing sewerage infrastructure in the area. Based on the desktop review of drainage record plan and drainage survey, the sewage from the proposed development is expected to be discharged to the manhole no. FMH7035727 through terminal manhole. The sewage will then be diverted to an existing 300mm dia. sewer along Lee Chung Street.

1.3 Objectives

The assessment has based on the latest proposed floor uses and site surveys and shall serve to:

- assess the potential sewerage impacts arising from the proposed development
- recommend measures to mitigate unacceptable sewerage impacts, if any.

2. Design Assumptions and Criteria

2.1 General Assumptions and Criteria

This SIA has been prepared in accordance with the below guidelines and reference:

- Sewerage Manual ("*SM*") published by the Drainage Services Department ("DSD") in 2013.
- Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0 ("GESF") published by the Environmental Protection Department ("EPD") in 2005.
- Corresponding Drainage Record Plans published by the Drainage Services Department.
- Commercial and Industrial Floor Space Utilization Survey (CIFSUS) published by the Planning Department.

2.2 Population

The proposed development consists of hotel rooms, hotel BoH, and the hotel's ancillary facilities, which will serve for retail, F&B, or other supporting services in the future. To ensure flexibility in the design of retail, F&B, and other support services, all ancillary hotel areas are conservatively assumed to be "F&B"; hence, the population in the proposed development will be dominated by hotel, F&B, and office activities. The population for each activity is summarized in *Table 1* below.

Since the capacity of proposed development is independent to population growth, the annual growth in population has not been considered in this study. Please refer to the table below and **Appendix A** for a summary of the estimated population at the proposed development and detailed estimation of population per catchment respectively. Area schedule of the proposed development is enclosed in Appendix C for reference.

Type of Population	Estimated Population	Data Source
Proposed Development		
Hotel Employee	291	3.2 person per 100 m^2 of utilized GFA (Saleable Floor Area (SFA) which is greater than the GFA is adopted hereby) in accordance with The Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for "Hotels and Boarding Houses".
Office Employee	39	5.5 person per 100 m^2 of utilized GFA in accordance with The Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for "Finance, Insurance, Real Estates and Business Services".
F&B Employee	48	5.1 person per 100 m^2 of utilized GFA in accordance with The Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for "Restaurants".

Table 1 Population of Proposed Development

2.3 Unit Flow Factors

The unit flow factors tabulated below have been adopted in the calculation of sewerage impact.

Type of Population	Unit Flow Factor (m^3/day/person)	Data Source
Proposed Development		
Hotel Employee	1.58	GESF – J10 Restaurant & Hotels (p.s., the flows of customers and/or tenants are considered)
Office Employee	0.08	GESF – J6 Finance, Insurance, Real Estates and Business Services
F&B Employee	1.58	GESF – J10 Restaurant & Hotels (p.s., the flows of customers and/or tenants are considered)
Other Development in the Vicinity		
Industrial Employee	0.33	GESF – J1 Manufacturing in Hong Kong Island (except Aberdeen & Ap Lei Chau), San Po Kong
Office Employee	0.08	GESF – J6 Finance, Insurance, Real Estates and Business Services
F&B Employee	1.58	GESF – J10 Restaurant & Hotels (p.s., the flows of customers and/or tenants are considered)
Residents - Residential (PR/R1)	0.19	GESF - UFF of Public Rental/ R1 Private Development

Table 2 Unit Flow Factors

2.4 Peaking Factors

The peaking factors adopted for peak discharge calculation has made reference to Table T-5 of the *GESF* as extracted below. Peaking factors (including stormwater allowance) from the guidelines have been adopted based on the corresponding population range being served by the sewers throughout the study.

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
<1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
>50,000	Max($\frac{7.3}{N^{0.15}}$,2.4)	Max($\frac{6}{N^{0.175}}$,1.6)

Note: N is the contributing population in thousands.

Table 3 Peaking Factor for Sewers

2.5 Hydraulic Equation

The Colebrook-White equation can be applied to analyse flow conditions of circular pipes and hence has been adopted for hydraulic analysis of the sewerage system. In this study, conservative values have been adopted for long-term and permanent design. For the existing sewer pipes, a roughness coefficient, *ks*, for slimed sewers of concrete at "Poor" condition of 6.0mm, 3.0mm, or the interpolated values for velocities between 0.75 m/s and 1.2 m/s have been adopted depending on their velocities. For the proposed 300mm dia. sewer connecting the terminal manhole with the manhole FMH7035727, *ks*, for slimed sewers of uPVC at "Poor" condition of 0.3mm has been adopted.

2.6 Catchment Inflow Factor

A catchment inflow means the net overall ingress of water or wastewater to the sewerage system. Since the proposed development and development in the vicinity are located in Chai Wan, a catchment inflow factor of 1.1 has been adopted by making reference to Table T-4 of the *GESF*.

2.7 Calculation Assumptions

The following assumptions were made for assessing the sewerage impact:

1. The following sites are expected to reach the manholes downstream, as annotated in Figure 1:

    a. Minico Building (Catchment A) – diverted to FMH7035728. Extract of the Minico Building SIA is enclosed in Appendix D for reference.

    b. Chai Wan Industrial Centre (Catchment B) – diverted to FMH7035726.

    c. Shell Industrial Building (Catchment C1) – diverted to FMH7034985.

    d. Glory Industrial Building, E-Trade Plaza, Hong Kong (Chai Wan) Industrial Building (Catchment C2) – diverted to FMH7034985.

    e. Upstream of Northwest portion of Lee Chung Street, assume full capacity (Catchment D) – diverted to FMH7034984

    f. Hop Shi Factory Building, Tak King Industrial Building, Cheung Tat Centre, Wah Ha Estate (Catchment E) - diverted to FMH7034991

    g. Downstream of Southwest portion of Lee Chung Street and Kut Shing Street, assume full capacity (Catchment F) - diverted to FMH7035003

3. Evaluation and Assessment of Impact

Toilet flushing, showering, housekeeping, kitchen and laundry wastewater are the major sewage sources arising from the proposed development. All sewage will be collected by the nearest sewers and the sewers will be connected to the new terminal manhole and eventually directed to Government sewerage networks and treatment facilities.

Base on the design assumptions and criteria as detailed in Section 2 above, the calculation of peak sewage flow from each of the catchment has been tabulated below. Detailed calculation has been presented in **Appendix A**.

Manhole	Catchment Served	Estimated Cumulative Peak Discharge (m^3/s)
Terminal Manhole	Site	0.0412 m^3/s
FMH7035727	Site & A	0.0463 m^3/s
FMH7035726	Site & A & B	0.0705 m^3/s
FMH7034985	Site & A & B & C1 & C2	0.0787 m^3/s
FMH7034984	Site & A & B & C1 & C2 & D	0.5182 m^3/s
FMH7034991	Site & A & B & C1 & C2 & D & E	0.5526 m^3/s
FMH7035003	Site & A & B & C1 & C2 & D & E & F	1.3237 m^3/s

Table 4 Summary of Peak Sewage Flow

The capacities of respective sewers have been calculated in accordance with the *SM* and *GESF*, and the SIA associated with the proposed development have been detailed below and in **Appendix B**.

Sewer Manhole No. (From)	Sewer Manhole No. (To)	Pipe Diameter, D (m)	Pipe Capacity, Q (m^3/s)	Estimated Cumulative Peak Discharge (m^3/s)	Percentage of sewer capacity	Sufficient Capacity?
Terminal Manhole	FMH7035727	0.300	0.1302	0.0412	31.6%	Yes
FMH7035727	FMH7035726	0.300	0.1135	0.0463	40.9%	Yes
FMH7035726	FMH7035052	0.300	0.1212	0.0705	58.1%	Yes
FMH7035052	FMH7035049	0.300	0.1223	0.0705	57.6%	Yes

Sewer Manhole No. (From)	Sewer Manhole No. (To)	Pipe Diameter, D (m)	Pipe Capacity, Q (m^3/s)	Estimated Cumulative Peak Discharge (m^3/s)	Percentage of sewer capacity	Sufficient Capacity?
FMH7035049	FMH7034985	0.300	0.0857	0.0705	82.2%	Yes
FMH7034985	FMH7034984	0.400	0.3220	0.0787	24.4%	Yes
FMH7034984	FMH7034991	0.600	0.9502	0.5182	54.5%	Yes
FMH7034991	FMH7035005	0.600	1.0026	0.5526	55.1%	Yes
FMH7035005	FMH7035003	0.600	0.8257	0.5526	66.9%	Yes
FMH7035003	FMH7035002	1.200	1.8530	1.3237	71.4%	Yes

Table 5 Summary of Estimated Sewage Flow Capacities

To summarize, the sewage from the proposed development will be collected and diverted to manhole no. FMH7035727 through a proposed 300mm connection sewer diameter underneath Lee Chung Street. It is expected from the hydraulic calculation that the proposed 300mm dia. sewer, as well as the existing 300mm dia., 400mm dia., and 600mm dia. sewers, can cater to the cumulative peak discharge of the Site and Catchment A to D, and no exceedance of hydraulic capacity is anticipated.

The cumulative flow will continue along the existing 600mm dia. and 1200mm dia. sewers further downstream along Lee Chung Street and Ning Foo Street along with the sewerage flow from Catchment E and Catchment F.

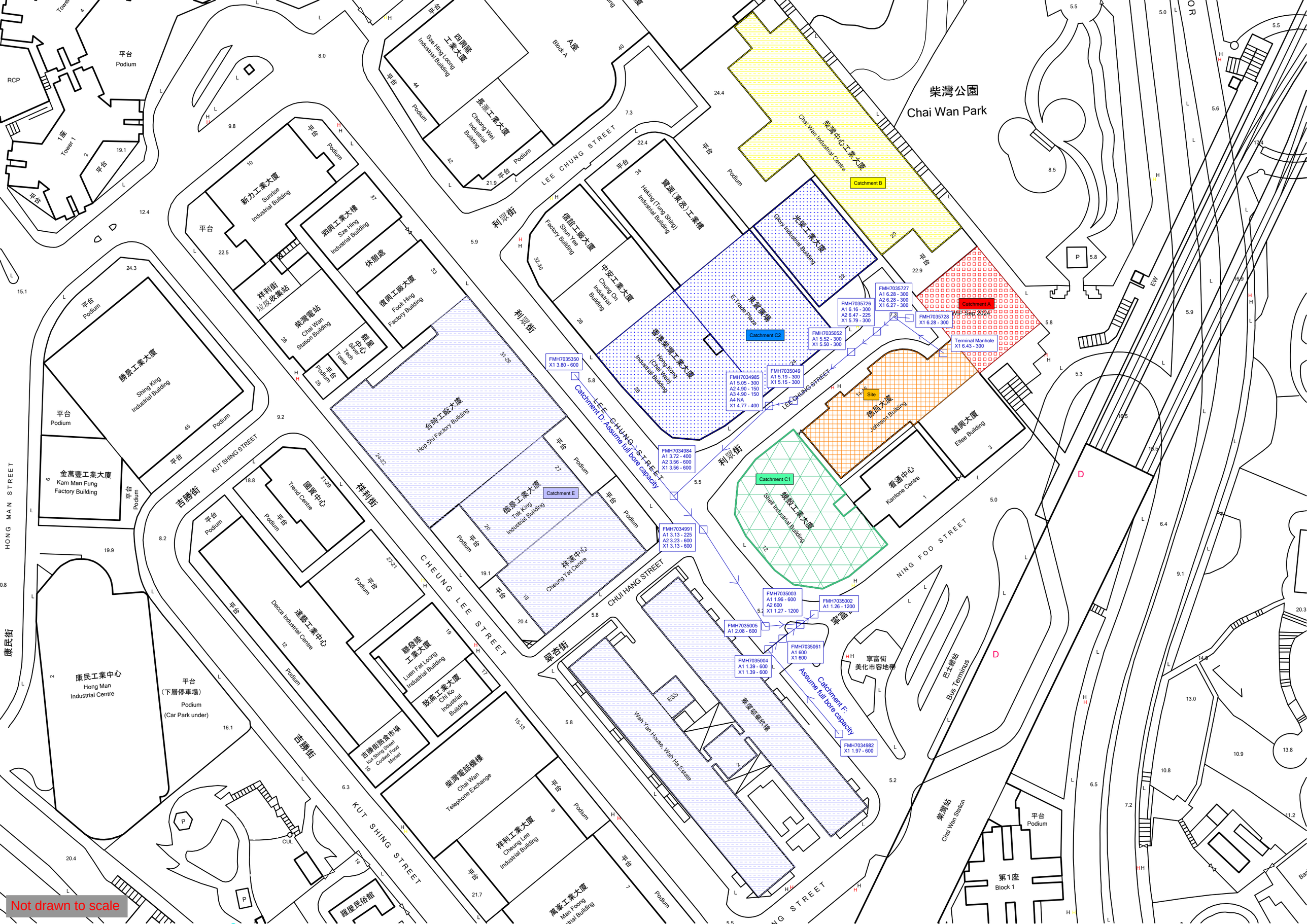
It is expected that the existing sewers are sufficient to cater the cumulative peak flow of the proposed development, and no exceedance of hydraulic capacity is anticipated. The sewage impact associated with the proposed conversion is considered insignificant.

4. Conclusions

A SIA has been conducted to evaluate the potential sewerage impacts on the local sewerage network as a result of the Proposed Hotel Development at 14-16 Lee Chung Street, Chai Wan, Hong Kong.

In conclusion, the results of the sewerage impact reveal that the existing sewage capacity is sufficient to cater to the cumulative peak discharge arising from the proposed development and development in the vicinity along 12-18 Lee Chung Street. Hence, the sewage impact associated with the proposed conversion is considered insignificant.

Figure 1 Drainage Plan


Not drawn to scale
Catchment A
WIP Sep 2024
Catchment B
Catchment C1
Catchment C2
Catchment D: Assume full bore capacity
Catchment E
Catchment F: Assume full bore capacity
Site
FMH7035727
A1 6.28 - 300
A2 6.28 - 300
X1 6.27 - 300
FMH7035728
X1 6.28 - 300
Terminal Manhole
X1 6.43 - 300
FMH7035726
A1 6.16 - 300
A2 6.47 - 225
X1 5.79 - 300
FMH7035052
A1 5.52 - 300
X1 5.50 - 300
FMH7035049
A1 5.19 - 300
X1 5.15 - 300
FMH7034985
A1 5.05 - 300
A2 4.90 - 150
A3 4.90 - 150
A4 NA
X1 4.77 - 400
FMH7035350
X1 3.80 - 600
FMH7034984
A1 3.72 - 400
A2 3.56 - 600
X1 3.56 - 600
FMH7034991
A1 3.13 - 225
A2 3.23 - 600
X1 3.13 - 600
FMH7035003
A1 1.96 - 600
A2 600
X1 1.27 - 1200
FMH7035002
A1 1.26 - 1200
FMH7035005
A1 2.08 - 600
FMH7035061
A1 600
X1 600
FMH7035004
A1 1.39 - 600
X1 1.39 - 600
FMH7034982
X1 1.97 - 600
LEE CHUNG STREET
CHEUNG LEE STREET
CHUI HANG STREET
KUT SHING STREET
NING FOO STREET
HONG MAN STREET
利眾街
翠杏街
吉勝街
祥利街
康民街
寧富街
柴灣公園
Chai Wan Park
四興隆工業大廈
Sze Hing Loong Industrial Building
A座
Block A
長滙工業大廈
Cheong Wai Industrial Building
柴灣中心工業大廈
Chai Wan Industrial Centre
新力工業大廈
Sunrise Industrial Building
四興工業大樓
Sze Hing Industrial Building
休憩處
復興工業大廈
Fook Hing Factory Building
祥利街垃圾收集站
柴灣電站
Chai Wan Station Building
Silver Tech Tower
信誠工業大廈
Shun Yee Factory Building
興順(東丞)工業大樓
Heking (Tung Shing) Industrial Building
中安工業大廈
Chung On Industrial Building
光榮工業大廈
Glory Industrial Building
香港柴灣工業大廈
Hong Kong Chai Wan Industrial Building
貿發展場
E-Trade Plaza
勝景工業大廈
Shing King Industrial Building
金萬豐工業大廈
Kam Man Fung Factory Building
合時工業大廈
Hop Shi Factory Building
德泰工業大廈
Tak King Industrial Building
祥達中心
Cheung Tat Centre
祥利工業大廈
Cheung Lee Industrial Building
柴灣電話機樓
Chai Wan Telephone Exchange
華厦邨華欣樓
Wah Yan House, Wah Ha Estate
ESS
聯發隆工業大廈
Luen Fat Loong Industrial Building
致高工業大廈
Chi Ko Industrial Building
吉勝街熟食市場
Kut Shing Street Cooked Food Market
遠毅工業中心
Decca Industrial Centre
圓翼中心
Trend Centre
康民工業中心
Hong Man Industrial Centre
平台（下層停車場）
Podium (Car Park under)
羅屋民俗館
穀殼工業大廈
Shell Industrial Building
德福工業大廈
Johnson Building
看通中心
Kantone Centre
寧富街美化市容地帶
巴士總站
Bus Terminus
柴灣站
Chai Wan Station
第1座
Block 1
譽興大廈
Eltee Building
萬華工業大廈
Man Foong Industrial Building
平台
Podium
RCP
1座
Tower 1
2座
Tower 2
3座
Tower 3
4座
Tower 4
P
CUL
D
EW

Appendix A Calculation of Flow Estimation

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JOB NUMBER / FILE: 1044815

CALCULATION NUMBER: 01

DRAWING REFERENCE:

JOB TITLE:

Sewerage Impact Assessment for Proposed Hotel Development at 14-16 Lee Chung St, Chai Wan, Hong Kong

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
A	R.L	22 Aug 2025	I.H	H.W

CALCULATION:

01 Calculation of Sewage Loading

Catchment	Sewer Manhole No.	Buildings in Zone	Type of Use	GFA (m^2)	No. of Flat	Type of Population	Occupancy Density (person/100m^2 GFA) or person/room*	Estimated Population	Unit Flow Factor (m^3/day/ person)	Estimated Average Dry Weather Flow (m^3/day)	Remarks
A (Upstream)	FMH7035728	Minico Building	Industrial	8,943	-	Industrial Employee	2.3	206	0.33	67.98	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing. This calculation is made with reference to the Minico Building SIA report, as enclosed in Appendix D of the SIA report.
-	FMH7035727	Site (Johnson Building)	Hotel	9,087	-	Hotel Employee	3.2	291	1.58	459.78	Unit Flow Factor: GESF - Combined UFF of commercial employees and commercial activities in J10 Restaurant & Hotels is 1.580 m3/person/day. For job types J10 and J11, the "per-employee" unit flow factor takes into account the flows of customers and/or tenants. Worker density: assumed to be 3.2 person per 100 m2 of utilized GFA (Saleable Floor Area (SFA) which is greater than the GFA is adopted hereby) in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for hotels and boarding houses. Please refer to the tab "Area Schedule" or Appendix C of the SIA report for the area schedule of the proposed development.
			Office	703	-	Office Employee	5.5	39	0.08	3.12	Unit Flow Factor: GESF - Combined UFF of commercial employees and commercial activities in J6 Finance, Insurance, Real Estates and Business Services is 0.08 m3/person/day. Worker density: assumed to be 5.5 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for Finance, Insurance, Real Estates and Business Services Please refer to the tab "Area Schedule" or Appendix C of the SIA report for the area schedule of the proposed development.
			F&B	943	-	F&B Employee	5.1	48	1.58	75.84	Unit Flow Factor: GESF - Combined UFF of commercial employees and commercial activities in J10 Restaurant & Hotels is 1.580 m3/person/day. For job types J10 and J11, the "per-employee" unit flow factor takes into account the flows of customers and/or tenants. Worker density: assumed to be 5.1 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for restaurants. Please refer to the tab "Area Schedule" or Appendix C of the SIA report for the area schedule of the proposed development.
B	FMH7035726	Chai Wan Industrial Centre (柴灣中心工業大廈)	Industrial	41,592	-	Industrial Employee	2.3	957	0.33	315.81	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
C1	FMH7034985	Shell Industrial Building (蜆殼工業大廈)	Industrial	13,403	-	Industrial Employee	2.3	308	0.33	101.64	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
	FMH7034985	Glory Industrial Building (光榮工業大廈)	Industrial	7,536	-	Industrial Employee	2.3	173	0.33	57.09	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.

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JOB TITLE:

Sewerage Impact Assessment for Proposed Hotel Development at 14-16 Lee Chung St, Chai Wan, Hong Kong

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
A	R.L	22 Aug 2025	I.H	H.W

CALCULATION:

01 Calculation of Sewage Loading

Catchment	Sewer Manhole No.	Buildings in Zone	Type of Use	GFA (m^2)	No. of Flat	Type of Population	Occupancy Density (person/100m^2 GFA) or person/room*	Estimated Population	Unit Flow Factor (m^3/day/ person)	Estimated Average Dry Weather Flow (m^3/day)	Remarks
C2	FMH7034985	E-Trade Plaza (東貿廣場)	Office	18,568		Office Employee	5.5	1021	0.08	81.68	Unit Flow Factor: GESF - Combined UFF of commercial employees and commercial activities in J6 Finance, Insurance, Real Estates and Business Services is 0.08 m3/person/day. Worker density: assumed to be 5.5 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for Finance, Insurance, Real Estates and Business Services
	FMH7034985	Hong Kong (Chai Wan) Industrial Building (香港柴灣工業大廈)	Industrial	9,601	-	Industrial Employee	2.3	221	0.33	72.93	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
E	FMH7034991	Hop Shi Factory Building (合時工廠大廈)	Industrial	21,607	-	Industrial Employee	2.3	497	0.33	164.01	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
	FMH7034991	Tak King Industrial Building (德景工業大廈)	Industrial	16,059	-	Industrial Employee	2.3	369	0.33	121.77	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
	FMH7034991	Cheung Tat Centre (祥達中心)	Industrial	19,664	-	Industrial Employee	2.3	452	0.33	149.16	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.
	FMH7034991	Wah Ha Estate (華廈邨)	Residential (PR/R1)	-	200	Residents	2.8	560	0.19	106.4	Unit Flow Factor: GESF - UFF of Public Rental/ R1 Private Development is 0.190m3/person/day. Household Density: Average Domestic Household Size is 2.8 persons/ household as per 2021 population census for eastern district.

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JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
1044815	01	

JOB TITLE:
Sewerage Impact Assessment for Proposed Hotel Development at 14-16 Lee Chung St, Chai Wan, Hong Kong

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
-	R.L	01 Aug2025	I.H	H.W

CALCULATION:

01 Calculation of Sewage Loading (Cont')

Site			
Estimated Average Daily Flow	=	538.74	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	592.61	m^3/day
Contributing Population	=	2195	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0412	m^3/s

Catchment A			
Estimated Average Daily Flow	=	67.98	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	74.78	m^3/day
Contribution Population	=	277	
Peaking Factor	=	8	
Estimated Peak Flow	=	0.0069	m^3/s

Catchment B			
Estimated Average Daily Flow	=	315.81	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	347.39	m^3/day
Contribution Population	=	1287	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0241	m^3/s

Catchment C1			
Estimated Average Daily Flow	=	101.64	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	111.80	m^3/day
Contribution Population	=	414	
Peaking Factor	=	8	
Estimated Peak Flow	=	0.0104	m^3/s

Catchment C2			
Estimated Average Daily Flow	=	211.70	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	232.87	m^3/day
Contribution Population	=	862	
Peaking Factor	=	8	
Estimated Peak Flow	=	0.0216	m^3/s

Catchment E			
Estimated Average Daily Flow	=	541.34	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	595.47	m^3/day
Contribution Population	=	2205	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0414	m^3/s

Catchment A + Site			
Estimated Average Daily Flow	=	606.72	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	667.39	m^3/day
Contribution Population	=	2472	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0463	m^3/s

CUNDALL

JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
1044815	01	

JOB TITLE:
Sewerage Impact Assessment for Proposed Hotel Development at 14-16 Lee Chung St, Chai Wan, Hong Kong

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
-	R.L	01 Aug2025	I.H	H.W

CALCULATION:

01 Calculation of Sewage Loading (Cont')

Catchment A & B + Site			
Estimated Average Daily Flow	=	922.53	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	1014.78	m^3/day
Contribution Population	=	3758	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0705	m^3/s

Catchment A & B & C1 + Site			
Estimated Average Daily Flow	=	1024.17	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	1126.59	m^3/day
Contribution Population	=	4173	
Peaking Factor	=	6	
Estimated Peak Flow	=	0.0782	m^3/s

Catchment A & B & C1 & C2+ Site			
Estimated Average Daily Flow	=	1235.87	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	1359.46	m^3/day
Contribution Population	=	5035	
Peaking Factor	=	5	
Estimated Peak Flow	=	0.0787	m^3/s

Catchment A & B & C1 & C2 & E+ Site			
Estimated Average Daily Flow	=	1777.21	m^3/day
Catchment Inflow Factor	=	1.1	
Corrected Average Daily Flow	=	1954.93	m^3/day
Contribution Population	=	7240	
Peaking Factor	=	5	
Estimated Peak Flow	=	0.1131	m^3/s

Appendix B Detailed Calculation of Hydraulic Capacity

CUNDALL

JOB NUMBER / FILE: 1044815

CALCULATION NUMBER: 02

DRAWING REFERENCE:

JOB TITLE:

Sewerage Impact Assessment for Proposed Hotel Development at 14-16 Lee Chung St, Chai Wan, Hong Kong

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
A	R.L	22 Aug 2025	I.H	H.W

CALCULATION:

02 Detailed Calculation of Hydraulic Capacity

Sewer Manhole No. (From)	Sewer Manhole No. (To)	Pipe Diameter, D (m)	Cross-section Area, A (m^2)	Wetted Perimeter, P (m)	Length, L (m)	Inlet Invert Level (mPD)	Outlet Invert Level (mPD)	Colebrook-White Roughness Coefficient, Ks (mm)	Hydraulic Radius, R (m)	Slope, s	Velocity, V (m/s)	Pipe Capacity, Q (m^3/s)	Estimated Cumulative Peak Discharge (m^3/s)	Percentage of Pipe capacity	Sufficient Capacity?	Remarks
Terminal Manhole	FMH7035727	0.300	0.0707	0.9425	12.8	6.43	6.28	0.3	0.0750	0.01172	1.8413	0.1302	0.0412	31.6%	Yes	Site - Assumed the uPVC sewer or equivalen to be adopted
FMH7035727	FMH7035726	0.300	0.0707	0.9425	6.6	6.27	6.16	3.0	0.0750	0.01667	1.6050	0.1135	0.0463	40.9%	Yes	Site + Catchment A
FMH7035726	FMH7035052	0.300	0.0707	0.9425	14.2	5.79	5.52	3.0	0.0750	0.01901	1.7146	0.1212	0.0705	58.1%	Yes	Site + Catchment A + Catchment B
FMH7035052	FMH7035049	0.300	0.0707	0.9425	16.0	5.50	5.19	3.0	0.0750	0.01938	1.7308	0.1223	0.0705	57.6%	Yes	
FMH7035049	FMH7034985	0.300	0.0707	0.9425	10.5	5.15	5.05	3.0	0.0750	0.00952	1.2124	0.0857	0.0705	82.2%	Yes	
FMH7034985	FMH7034984	0.400	0.1257	1.2566	36.3	4.77	3.72	3.0	0.1000	0.02893	2.5624	0.3220	0.0787	24.4%	Yes	Site + Catchment A + Catchment B + Catchment C1 & C2
FMH7034984	FMH7034991	0.600	0.2827	1.8850	11.3	3.56	3.23	3.0	0.1500	0.02920	3.3606	0.9502	0.5182	54.5%	Yes	Site + Catchment A + Catchment B + Catchment C1 & C2 + Catchment D (Assumed to be full bore capacity)
FMH7034991	FMH7035005	0.600	0.2827	1.8850	32.3	3.13	2.08	3.0	0.1500	0.03251	3.5458	1.0026	0.5526	55.1%	Yes	Site + Catchment A + Catchment B + Catchment C1 & C2 + Catchment D (Assumed to be full bore capacity) + Catchment E
FMH7035005	FMH7035003	0.600	0.2827	1.8850	5.4	2.08	1.96	3.0	0.1500	0.02206	2.9203	0.8257	0.5526	66.9%	Yes	
FMH7035003	FMH7035002	1.200	1.1310	3.7699	3.5	1.27	1.26	3.0	0.3000	0.00285	1.6384	1.8530	1.3237	71.4%	Yes	- Site + Catchment A + Catchment B + Catchment C1 & C2 + Catchment D (Assumed to be full bore capacity) + Catchment E + Catchment F (Assumed to be full bore capacity) - Assumed the worst Inlet Invert Level:1.27 mPD
FMH7035350	FMH7034984	0.600	0.2827	1.8850	38.3	3.80	3.56	3.0	0.1500	0.00626	1.5544	0.4395	0.4395	100.0%	Yes	Catchment D: Assumed to be full bore capacity
FMH7034982	FMH7035004	0.600	0.2827	1.8850	30.2	1.97	1.39	3.0	0.1500	0.01924	2.7269	0.7710	0.7710	100.0%	Yes	Catchment F: Assumed to be full bore capacity

Remarks:

1 Information from Drainage Services Department (DSD)'s drainage record plans or proposed sewer design

2 Wetted perimeter, P, is calculated from:
$P = \pi D$

3 The mean velocity is calculated using the Colebrook-White Equation for circular pipes flowing full:

$$V = -2(2gDS)^{0.5}\log\left(\frac{k}{3.7D} + \frac{2.51\nu}{D(2gDS)^{0.5}}\right)$$

where

K = Colebrook-White roughness coefficient (m)
V = mean velocity (m/s)
D = circular cross-section pipe, inside diameter (m)
S = slope, in meters per meter
v = kinematic viscosity of water, in meters per second (0.000001306 m/s)
g = gravitational acceleration (m/s^2) (9.807m/s^2)

4 The Colebrook-White Roughness Coefficient, Ks, is assumed to be 6.0 mm, 3.0mm or interpolated values from slimed sewers of concrete (Table 5 in DSD's "Sewerage Manual Part 1") for existing pipes, and 0.3 mm from the slimed sewer of uPVC for new sewer pipes

5 Hydraulic radius, R, is calculated from:
$R = A/P$

6 Peak flow, Q, is calculated from:
$Q = V \times A$

7 With reference Table T-4 in "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning" issued by EPD, an inflow catchment factor of 1.1 was adopted for the Subject Site.

Appendix C Area Schedule of the Proposed Development

Area Schedule [Saleable Floor Area (SFA)]

Floors	Hotel Rooms (sq m)	Hotel's ancillary uses (including the hotel's F&B, Shops, Services, etc.) (sq m)	Hotel BoH (sq m)	GFA - Other E&M (sq m)
G/F	-	87	-	617
1/F	-	384	-	352
2/F	-	249	165	352
3/F	-	223	160	8
4-27/F	8,184	-	336	288
28-30/F	903	-	42	27
Total	**9,087**	**943**	**703**	**1,644**

Area Schedule [Gross Floor Area (GFA)]

Floors	Hotel Rooms (sq m)	Hotel's ancillary uses (including the hotel's F&B, Shops, Services, etc.) (sq m)	Hotel BoH (sq m)	GFA - Other E&M (sq m)
G/F	-	87	-	617
1/F	-	384	-	352
2/F	-	249	165	352
3/F	-	223	160	8
4-27/F	7,896	-	336	288
28-30/F	870	-	42	27
Total	**8,766**	**943**	**703**	**1,644**

	Area (sq m)	Remarks
Hotel	9,087	SFA which is greater than the GFA is adopted as the worst-case scenario
Office	703	GFA is adopted
F&B	943	GFA is adopted; Assuming all Hotel's ancillary use area as "F&B" as the worst-case scenario

Appendix D Extracts of Minico Building (Catchment A) SIA

CUNDALL

JOB TITLE:

Proposed Redevelopment Works of Minico Building, 18 Lee Chung Street, Chai Wan, Hong Kong

CALCULATION:

01 Calculation of Sewage Loading

JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
1024307	01	

REV:	CALCULATION BY:	DATE:	CHECKED BY:	VERIFIED BY:
D	C. Chan	30 Sep 2022	J.Yau	

The yellow-highlighted figures and information are adopted in this SIA report.

Catchment	Sewer Manhole No.	Buildings in Zone	Type of Use	GFA	Type of Population	Occupancy Density (person/100m^2 GFA) or person/room*	Estimated Population	Unit Flow Factor (m^3/day/ person)	Estimated Average Dry Weather Flow (m^3/day)	Estimated Average Dry Weather Flow (m^3/day)	Catchment Inflow Factor	Corrected Average Dry Weather Flow (m^3/day)	Contributing Population	Peaking Factor	Estimated Peak Flow (m^3/s)		Remarks
-	FMH7035728	Site	Industrial	8,943	Industrial Employee	2.3	206	0.33	67.98	67.98	1.1	74.78	277	8	0.0069	0.0069	Unit Flow Factor: GESF - Combined UFF of industrial employees and industrial activities in J1 Manufacturing in Hong Kong Island (except Aderdeen & Ap Lei Chau), San Po Kong is 0.33 m3/person/day. Worker density: assumed to be 2.3 person per 100 m2 of utilized GFA in accordance with Planning Department's "Commercial and Industrial Floor Space Utilization Survey", worker density by Industry Group (Figure 9) for manufacturing.