

Appendix 6

Sewerage Impact **Assessment**

Prepared by
Ramboll Hong Kong Limited

PROPOSED HOTEL DEVELOPMENT AND SOCIAL WELFARE
FACILITIES AT 107-109 WAI YIP STREET, KWUN TONG,
KOWLOON

SEWERAGE IMPACT ASSESSMENT

Date 12 August 2024

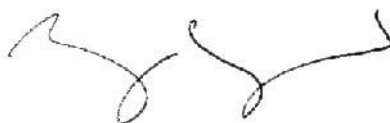
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1. INTRODUCTION

1.1 Background and Objectives

- 1.1.1 According to the Approved Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/26, the Application Site falls within an area zoned "Other Specified Uses (Business)". The purpose of this submission is to seek permission from the Town Planning Board (the Board) in support of the Proposed Development at 107-109 Wai Yip Street (hereafter referred to as the "Application Site").
- 1.1.2 Ramboll Hong Kong Limited has been appointed by the Applicant to conduct this Sewerage Impact Assessment (SIA) in support of the Planning Application under the Town Planning Ordinance.

1.2 Application Site and its Environ

- 1.2.1 The Application Site area is about 1,171 m². It is located at the Kwun Tong Industrial Area bounded by Wai Yip Street to the south and Tai Yip Street to the north. The Application Site is sandwiched between industrial and commercial buildings to the west and east. Figure 1.1 shows the location of the Application Site and its environ.

1.3 Proposed Development

- 1.3.1 The Proposed Development comprises a 33-storey building with 1 level of basement carpark. The building consists of 18 storeys of residential care home for the elderly (RCHE) and 11 storeys of hotel. It contains a GFA of about 16,856 m² for RCHE and hotel use. The development schedule of the proposed development is shown in Table 1.1.

Table 1.1 Development Schedule

Total Site Area	About 1,170.578m ²
Plot Ratio	14.4
Total GFA <ul style="list-style-type: none"> • RCHE • Hotel 	Not more than 16,856.323m ² <ul style="list-style-type: none"> • 12,000m² • 4,856.323m²
No. of Guestroom for Hotel	200 rooms
No. of RCHE Bed Space	Not less than 302 and not more than 557
Site Coverage	Not more than 60%
Class of Site	Class A
No. of Block	1
Maximum Building Height (Main Roof)	About +115mPD
No. of Storeys	33 (including 1 level of basement)

2. SEWERAGE IMPACT ASSESSMENT

2.1 Scope of Work

2.1.1 The aim of this SIA is to assess whether the capacity of the existing sewerage network serving the Application Site is sufficient to cope with the sewage flow from the Proposed Development.

2.2 Assessment Criteria and Methodology

2.2.1 The Commercial and Industrial Floor Space Utilization Survey (CIFSUS) conducted by the Planning Department has been used to determine the worker density for various economic activities and planned usage types.

2.2.2 Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewerage Infrastructure Planning, Version 1 (GESF) has been referred to for the purposes of estimating the quantity of the sewage generated from the Proposed Development and the existing catchment area. Sewage flow parameters and global peaking factors in this document have been adopted for this SIA.

2.2.3 According to the GESF, the overall unit flow is composed of flows due to residents, employees and the associated activities. The following unit flow factors have been adopted in the SIA calculation in accordance with Tables T-1, T-2 and T-3 of the GESF:

- Domestic: 0.19 m³/day (Institutional and Special Class)
- Industrial: 0.53m³/day (Industrial Employee and J1 Manufacturing in East Kowloon)
- Retail Trade: 0.28m³/day (Commercial Employee and J4 Wholesale & Retail)
- Office: 0.08m³/day (Commercial Employee and J6 Finance, Insurance, Real Estate & Business Services)
- Restaurant: 1.58m³/day (Commercial Employee and J10 Restaurants & Hotels)
- Social Facilities: 0.28 m³/day (Commercial Employee and J11 Community, Social & Personal Services)
- Storage: 0.18m³/day (Commercial Employee and J3 Transport, Storage & Communication)

2.2.4 The catchment inflow factor, PCIF of 1.1 (East Kowloon), is adopted in catchment calculations.

2.3 Existing and Future Sewerage System

2.3.1 According to the Drainage Record obtained from DSD, there are Ø225mm sewer pipes running along Tai Yip Street and the back lane of the Proposed Development, and Ø225mm and Ø400mm sewer pipes running along Wai Yip Street. The existing sewers in the vicinity of the Application Site are shown in Figure 2.1.

2.3.2 A new terminal manhole FTMH-01 (P1) will be constructed within the Application Site to collect sewage from the Proposed Development. A new Ø225mm polyethylene sewer pipe is proposed to connect the Proposed Development and the existing government manhole FMH4042668(S1) along Wai Yip Street.

2.3.3 Invert levels and pipe size of the proposed terminal manhole and existing manholes are shown in Appendix 2.1.

2.4 Wastewater Generated by the Proposed Development

2.4.1 Wastewater arising from the Proposed Development will be contributed by residents of the RCHE and the hotel, as well as employees of the RCHE, the hotel, restaurants and RCHE communal facilities. In addition, backwash of the water feature is also considered when assessing the sewage system capacity. Backwash of the water feature will only be conducted in non-peak hours to avoid potential overflow.

2.4.2 Detailed calculation of sewage generation from the Proposed Development is given in Table 2.1 below.

Table 2.1 Estimated Peak Flow

Calculation for Sewage Generation Rate of the Proposed Development			
1. Residential Care Homes for the Elderly (RCHE)			
1a. Total no. of residents	=	570	residents (557 beds + 13 employees ⁽¹⁾)
1b. Design flow	=	190	litre/resident/day – (refer to Table T-1 of GESF – Domestic – Institutional and Special Class)
1c. Sewage generation rate	=	108.3	m ³ /day
2. Hotel			
2a. Assumed area	=	4856	m ²
2b. Assumed floor area per employee	=	31.3	m ² per employee – (refer to Table 8 of CIFSUS – Hotels and Boarding Houses)
2c. Total number of employees	=	155	employees
2d. Design flow	=	1580	litre/employee/day – (refer to Table T-2 of GESF – J10 Restaurants & Hotels)
2e. Sewage generation rate	=	245.5	m ³ /day
3. RCHE F&B/ Restaurant			
3a. Assumed area	=	415	m ²
3b. Assumed floor area per employee	=	19.6	m ² per employee – (refer to Table 8 of CIFSUS – Restaurants)
3c. Total number of employees	=	21	employees
3d. Design flow	=	1580	litre/employee/day – (refer to Table T-2 of GESF – J10 Restaurants & Hotels)
3e. Sewage generation rate	=	33.4	m ³ /day
4. RCHE Communal Facilities			
4a. Assumed area	=	1338	m ²
4b. Assumed floor area per employee	=	30.3	m ² per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
4c. Total number of employees	=	44	employees
4d. Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
4e. Sewage generation rate	=	12.4	m ³ /day
5. Water Feature (Outdoor)			
5a. Volume of Water Feature	=	90.0	m ³
5b. Turnover Rate	=	6	hr
5c. Adopted Surface Loading Rate of Filter	=	50	m ³ /m ² /hr
5d. Adopted Filter Area	=	0.3	m ²
5e. Backwash Duration	=	3	min/d
5f. Backwash flow rate	=	30	m ³ /m ² /hr
5g. Design flow for Water Feature Backwashing	=	0.5	m ³ /day
5h. Design flow for Water Feature Backwashing	=	2.5	litre/sec
Total Flow from the Proposed Development			
Flow Rate	=	399.6	m ³ /day

Calculation for Sewage Generation Rate of the Proposed Development			
Flow Rate with P_{CIF} (East Kowloon – 1.1)	=	439.6	m ³ /day (refer to Table T-4 of GESF – East Kowloon)
Contributing Population	=	1628	people
Peaking factor	=	6	refer to Table T-5 of GESF for a population of less than 5000 incl. stormwater allowance
Peak Flow (excluding backwash of water feature)	=	30.5	litre/sec
Peak Flow (including backwash of water feature)	=	33.0	litre/sec
Remark:			
[1] Maximum no. of employees at one time (including overnight staff) advised by the Applicant to comply with the requirement in the Residential Care Homes (Elderly Persons) Regulation.			

2.5 Assessment of Sewerage Impact

2.5.1 Sewage generated from the Application Site will be discharged from the terminal manhole FTMH-01 (P1) via a polyethylene (PE) pipe, to existing manhole FMH4042668 (S1) of the public sewerage system as shown in Figure 2.1. Catchments in the vicinity of the Application Site are shown in Figure 2.2.

2.5.2 The estimated sewage flow of the Proposed Development and nearby catchments under existing conditions have been compared with the capacity of the existing sewerage system as shown in Appendix 2.1 - Table 3a. For the estimated sewage flow of the Proposed Development and nearby catchments with approved planned developments, the results are shown in Appendix 2.1 – Table 3b.

2.6 Discussion

2.6.1 According to the calculation results presented in Table 4 of Appendix 2.1, the capacity of the existing sewerage network is found to be sufficient to cater for the sewage generated from the Application Site under both existing conditions and with approved planned developments.

2.6.2 As such, no adverse sewerage impact resulting from the Proposed Development is anticipated. No sewerage upgrading work is required.

3. OVERALL CONCLUSION

- 3.1.1 The potential sewerage impact arising from the Application Site has been quantitatively assessed by comparing the estimated sewage flow from the Proposed Development and the capacity of the existing sewerage system in the vicinity.
- 3.1.2 Based on the assessment findings, the capacity of the existing sewerage system would be sufficient to cater for the sewage generation from the Application Site and nearby catchments. No sewerage upgrading work is required.
- 3.1.3 This SIA confirms the feasibility of the Proposed Development in terms of its sewerage impact.

Figures

Figure 1.1

Location of Application Site and its Environ

Figure 2.1

Existing and Proposed Sewerage System in the Vicinity of the
Application Site

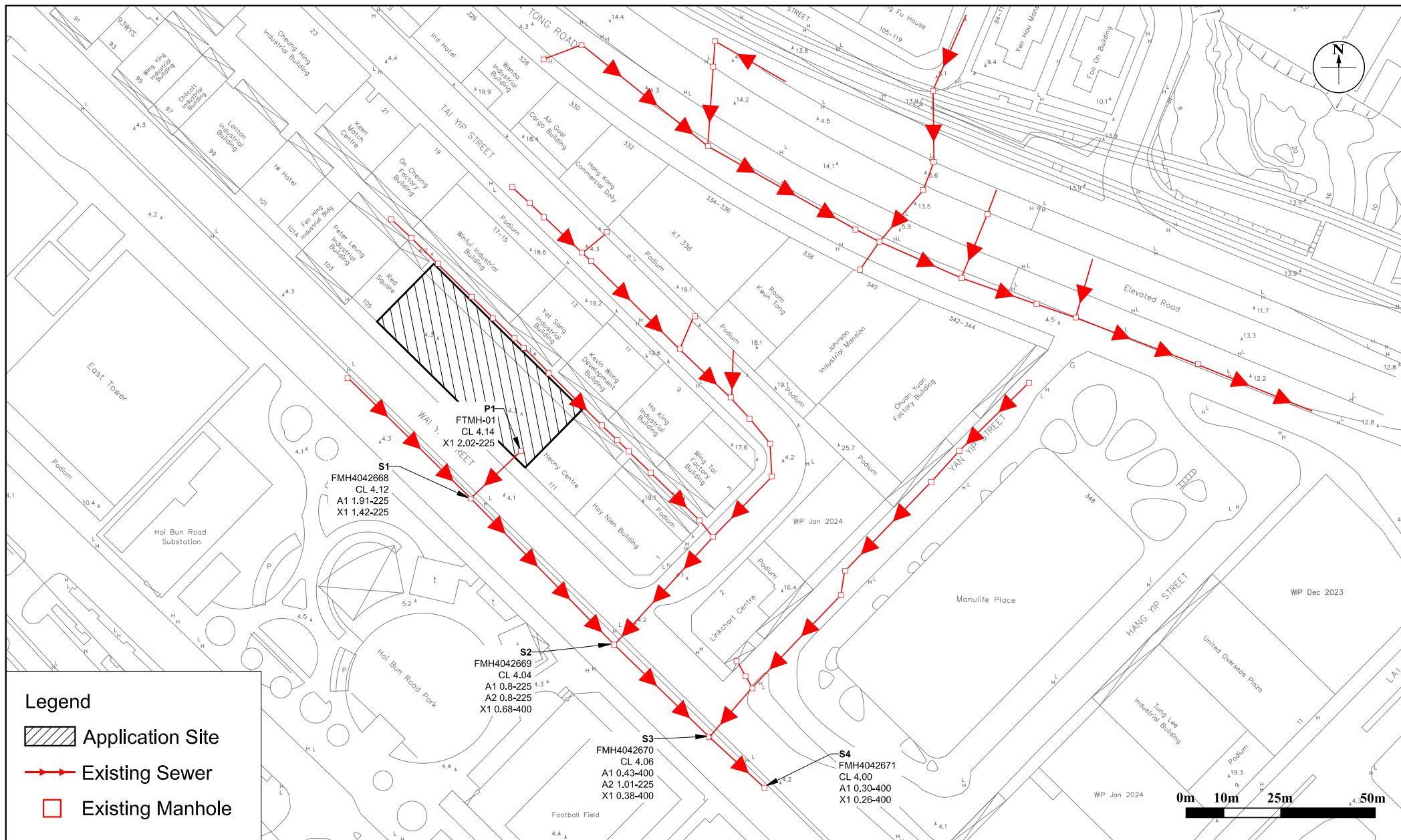


Figure: 2.1

Title: Existing and Proposed Sewerage System in the Vicinity of the Application Site

Project: Proposed Hotel Development and Social Welfare Facilities at 107-109 Wai Yip Street, Kwun Tong, Kowloon

RAMBOLL

Drawn by: JW

Checked by: KY

Rev.: 1.0

Date: Apr 2024

Figure 2.2

Existing and Proposed Sewerage System and Catchment
Area in the Vicinity of the Application Site

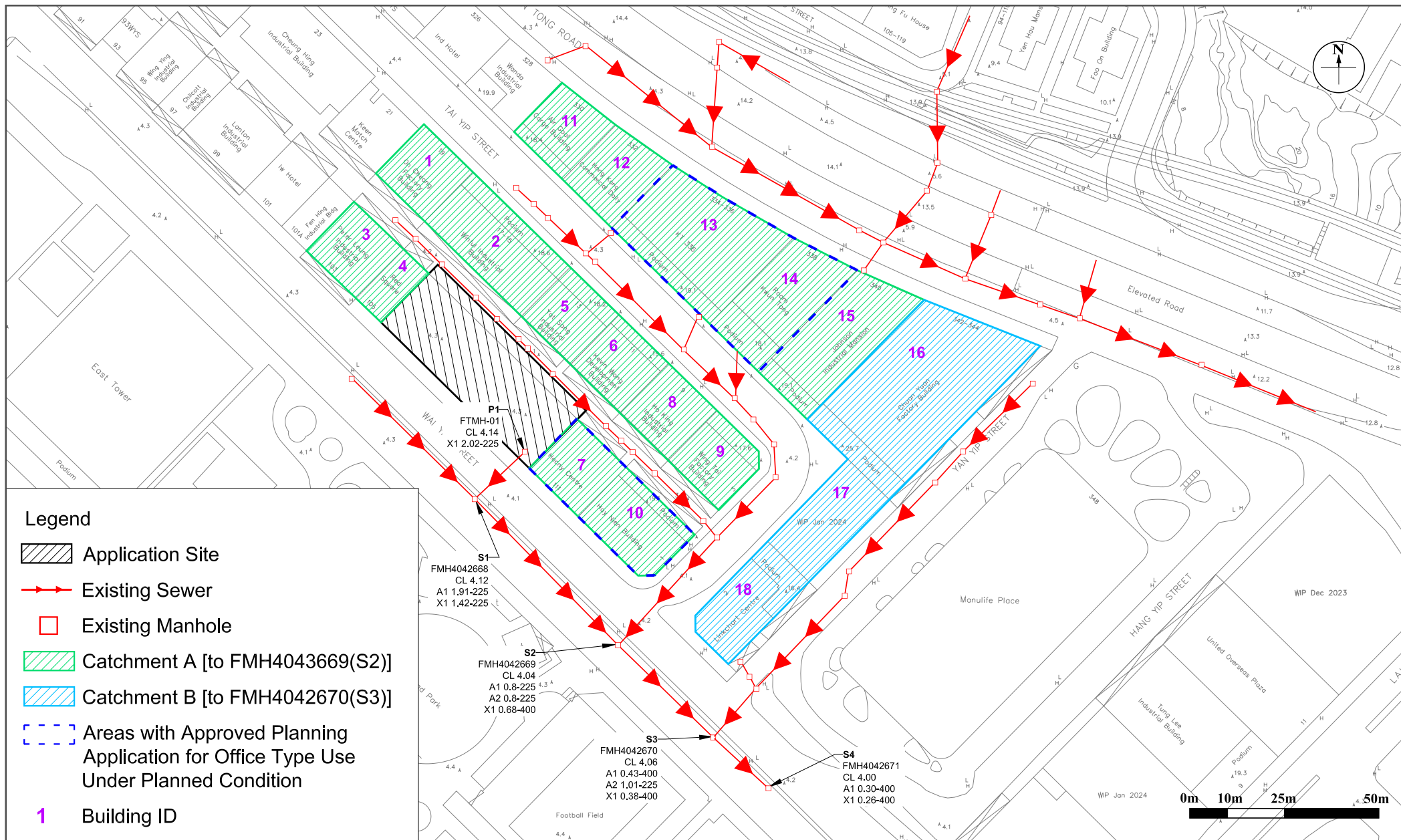


Figure: 2.2

Title: Existing and Proposed Sewerage System and Catchment Area in the Vicinity of the Application Site

Project: Proposed Hotel Development and Social Welfare Facilities at 107-109 Wai Yip Street, Kwun Tong, Kowloon

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Drawn by: JW

Checked by: KY

Rev.: 2.0

Date: Jul 2024

Appendix

Appendix 2.1

Detailed Sewerage Impact Assessment Calculations

Table 1 Calculation for Sewage Generation Rate of the Proposed Development at the Application Site

Residential Care Homes for the Elderly (RCHE)		
Total number of residents ¹	=	570 residents (557 beds + 13 overnight employees ²)
Design flow	=	190 litre/resident/day -- (refer to Table T-1 of GESF - Domestic - Institutional and Special Class)
Sewage generation rate	=	108.3 m ³ /day
Hotel		
Assumed area	=	4856 m ²
Assumed floor area per employee	=	31.3 m ² per employee -- (refer to Table 8 of CIFSUS - Hotels and Boarding Houses)
Total number of employees	=	155 employees
Design flow	=	1580 litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
Sewage generation rate	=	245.5 m ³ /day
F&B / restaurant		
Assumed area	=	415 m ²
Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	21 employees
Design flow	=	1580 litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
Sewage generation rate	=	33.4 m ³ /day
RCHE Communal Facilities		
Assumed area	=	1338 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	44 employees
Design flow	=	280 litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
Sewage generation rate	=	12.4 m ³ /day
Water Feature (outdoor)		
Volume of Water Feature	=	90.0 m ³
Turnover Rate	=	6 hr
Adopted Surface Loading Rate of Filter	=	50 m ³ /m ² /hr
Adopted Filter Area	=	0.3 m ²
Backwash Duration	=	3 min/d
Backwash flow rate	=	30 m ³ /m ² /hr
Design flow for Water Feature Backwashing	=	0.5 m ³ /day
Design flow for Water Feature Backwashing	=	2.5 litre/sec
Total Flow from the Proposed Development		
Flow rate (excluding backwash of water feature)	=	399.6 m ³ /day
Flow rate with P _{CIF} (East Kowloon - 1.1)	=	439.6 m ³ /day (refer to Table T-4 of GESF - East Kowloon - 1.1)
Contributing population	=	1628 people
Peaking factor	=	6 (refer to Table T-5 of GESF for a population of less than 5000 incl. stormwater allowance)
Peak flow (excluding backwash of water feature)	=	<u>30.5</u> litre/sec
Peak flow (including backwash of water feature)	=	<u><u>33.0</u></u> litre/sec

Note:

[1] As a conservative approach, the total number of elderly residents is assumed to be the maximum number of beds provided by the RCHE.

[2] Maximum no. of employees at one time (including overnight staff) advised by the Applicant to comply with the requirement in the Residential Care Homes (Elderly Persons) Regulation.

[3] For job types J10 and J11, the "per-employee" unit flow factor takes into account the flows of customers and/or tenants

Table 2 Hydraulic Capacity of Existing and Proposed Sewers

Segment	Manhole Reference	Manhole Reference	Material	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k _s	s	v	V	Area	Q	Estimated Capacity
				mm	m	mPD	mPD	m/s ²	m	m ² /s	m/s	m ²	m ³ /s	L/s	
P1-S1	FTMH-01	FMH4042668	PE	225	16.37	2.02	1.91	9.81	0.0015	0.007	0.000001	0.94	0.04	0.04	37
S1-S2	FMH4042668	FMH4042669	clayware	225	53.49	1.42	0.80	9.81	0.0006	0.012	0.000001	1.41	0.04	0.06	56
S2-S3	FMH4042669	FMH4042670	clayware	400	34.30	0.68	0.43	9.81	0.0006	0.007	0.000001	1.61	0.13	0.20	202
S3-S4	FMH4042670	FMH4042671	clayware	400	19.14	0.38	0.30	9.81	0.0006	0.004	0.000001	1.22	0.13	0.15	153

Remarks: (1) g=gravitational acceleration; k_s=equivalent sand roughness; s=gradient; v=kinematic viscosity of water; V=mean velocity

(2) The values of k_s = 0.6m is used for the calculation of slimed clayware sewer, poor condition @mean velocity = approximately 1.2m/s (based on Table 5: Recommended Roughness Values in Sewerage Manual)

(3) The values of k_s = 1.5m is used for the calculation of proposed polyethylene sewer, poor condition @mean velocity = approximately 0.75m/s (based on Table 5: Recommended Roughness Values in Sewerage Manual)

(4) The value of velocity (V) is referred to the Tables for the hydraulic design of pipes, sewers and channels (8th edition)

(5) Equation used: $v = \frac{2.51v}{3.7D} \sqrt{\frac{k_s}{2gDs}}$

Table 3a Calculation for Sewage generation rate of the Surrounding Building (Existing Condition)
Catchment A, discharges to FMH4042669 (S2)

1. On Cheong Factory Building (19 Tai Yip Street)	
Industrial - Manufacturing	
Assumed area	= 2510 m ²
Assumed floor area per employee	= 43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	= 58 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 30.6 m ³ /day
2. Winful Industrial Building (15-17 Tai Yip Street)	
Industrial - Manufacturing	
Assumed area	= 6378 m ²
Assumed floor area per employee	= 30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	= 210 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 111.5 m ³ /day
3. Peter Leung Industrial Building (103 Wai Yip Street)	
a) Industrial - Manufacturing	
Assumed area	= 2827 m ²
Assumed floor area per employee	= 30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	= 93 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 49.4 m ³ /day
b) Express delivery	
Assumed area	= 201 m ²
Assumed floor area per employee	= m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services - I/O Buildings)
Total number of employees	= 22.7 Buildings)
Design flow	= 9 employees
Sewage generation rate	= 80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
	= 0.7 m ³ /day
4. Red Square (105 Wai Yip Street)	
Office	
Assumed area	= 1739 m ²
Assumed floor area per employee	= 18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	= 96 employees
Design flow	= 80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	= 7.7 m ³ /day
F&B	
Assumed area	= 191 m ²
Assumed floor area per employee	= 19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	= 10 employees
Design flow	= 1580 litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurants and Hotels)
Sewage generation rate	= 15.4 m ³ /day
5. Yat Sang Industrial Building	
Industrial - Manufacturing	
Assumed area	= 2928 m ²
Assumed floor area per employee	= 43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	= 67 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 35.7 m ³ /day
6. Kevin Wong Development Building (11 Tai Yip Street)	
Industrial - Manufacturing	
Assumed area	= 3809 m ²
Assumed floor area per employee	= 30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	= 126 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 66.6 m ³ /day

Table 3a Calculation for Sewage generation rate of the Surrounding Building (Existing Condition)

7. Hecny Centre (111 Wai Yip Street)

a) Office

Assumed area	=	1772 m ²
Assumed floor area per employee	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	97 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	7.8 m ³ /day

b) Retail

Assumed area	=	253 m ²
Assumed floor area per employee	=	28.6 m ² per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
Total number of employees	=	9 employees
Design flow	=	280 litre/employee/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
Sewage generation rate	=	2.5 m ³ /day

c) F&B

Assumed area	=	406 m ²
Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	21 employees
Design flow	=	1580 litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurants and Hotels)
Sewage generation rate	=	32.7 m ³ /day

8. Ho King Industrial Building (9 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	2044 m ²
Assumed floor area per employee	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	=	47 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	24.9 m ³ /day

9. Wing Tai Factory Building (3 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	3144 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	=	104 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	55.0 m ³ /day

Storage

Assumed area	=	147 m ²
Assumed floor area per employee	=	250.0 m ² per employee -- (refer to Table 8 of CIFSUS - Storage)
Total number of employees	=	1 employees
Design flow	=	180 litre/employee/day -- (refer to Table T-2 of GESF - J3 Transport, Storage & Communication)
Sewage generation rate	=	0.1 m ³ /day

10. Hay Nien Building (1 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	5842 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	=	193 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	102.2 m ³ /day

11. Air Goal Cargo Building (330 Kwun Tong Road)

Industrial - Manufacturing

Assumed area	=	2309 m ²
Assumed floor area per employee	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	=	53 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	28.2 m ³ /day

12. Hong Kong Commercial Daily (332 Kwun Tong Road)

Office

Assumed area	=	2304 m ²
Assumed floor area per employee	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	127 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	10.1 m ³ /day

Table 3a Calculation for Sewage generation rate of the Surrounding Building (Existing Condition)**13. Far East Factory Building (334-336 Kwun Tong Road)**

Office	
Assumed area	= 7833 m ²
Assumed floor area per employee	= 30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	= 258 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 137.0 m ³ /day

14. Room Kwun Tong (338 Kwun Tong Road)

Storage	
Assumed area	= 6570 m ²
Assumed floor area per employee	= 250.0 m ² per employee -- (refer to Table 8 of CIFSUS - Storage)
Total number of employees	= 26 employees
Design flow	= 180 litre/employee/day -- (refer to Table T-2 of GESF - J3 Transport, Storage & Communication)
Sewage generation rate	= 4.7 m ³ /day

15. Johnson Industrial Mansion (340 Kwun Tong Road)

Industrial - Manufacturing	
Assumed area	= 5772 m ²
Assumed floor area per employee	= 30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	= 190 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 101.0 m ³ /day

Total Flow of Catchment A, discharges to FMH4042669 (S2) = 823.8 m³/day

Catchment B, discharges to FMH4042670 (S3)**16. Chuan Yuan Factory Building (342-344 Kwun Tong Road)**

Industrial - Manufacturing	
Assumed area	= 13344 m ²
Assumed floor area per employee	= 43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	= 307 employees
Design flow	= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	= 162.7 m ³ /day

17. Hong Kong Baptist Hospital (4 Tai Yip Street)

Sewage generation rate Reference: SIA report under Planning Application A/K14/782

= 181.6 m³/day

18. Linkchart Centre (2 Tai Yip Street)

Reference: Online building profile (<https://www.interasia.com.hk/en/Kowloon-Building/Kwun-Tong/1563/Linkchart-Centre>)

Office	
Assumed area	= 9109 m ²
Assumed floor area per employee	= 18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	= 501 employees
Design flow	= 80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	= 40.1 m ³ /day

Total Flow of Catchment B, discharges to FMH4042670 (S3) = 384.3 m³/day

Sub-total

Total Flow at P1 (including Proposed Development)	= 399.6 m ³ /day
Total Flow at S1 (including Proposed Development)	= 399.6 m ³ /day
Total Flow at S2 (including Proposed Development + Catchment A)	= 1,223.4 m ³ /day
Total Flow at S4 (including Proposed Development + Catchment A & B)	= 1,607.8 m ³ /day

Sub-total with Catchment Inflow Factor - East Kowloon = 1.1

Total Flow at P1 (including Proposed Development)	= 439.6 m ³ /day
Total Flow at S1 (including Proposed Development)	= 439.6 m ³ /day
Total Flow at S2 (including Proposed Development + Catchment A)	= 1,345.8 m ³ /day
Total Flow at S4 (including Proposed Development + Catchment A & B)	= 1,768.6 m ³ /day

Table 3b Calculation for Sewage generation rate of the Existing Surrounding Building (Planned Condition)

Catchment A discharges to FMH4042669 (S2)

1. On Cheong Factory Building (19 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	2510 m ²
Assumed floor area per employee	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	=	58 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	30.6 m ³ /day

2. Winful Industrial Building (15-17 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	6378 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	=	210 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	111.5 m ³ /day

3. Peter Leung Industrial Building (103 Wai Yip Street)

a) Industrial - Manufacturing

Assumed area	=	2827 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	=	93 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	49.4 m ³ /day

b) Express delivery

Assumed area	=	201 m ²
Assumed floor area per employee	=	22.7 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services - I/O Buildings)
Total number of employees	=	9 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	0.7 m ³ /day

4. Red Square (105 Wai Yip Street)

Office	=	
Assumed area	=	1739 m ²
Assumed floor area per employee	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	96 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	7.7 m ³ /day

F&B

Assumed area	=	191 m ²
Assumed floor area per employee	=	19.6 m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	=	10 employees
Design flow	=	1580 litre/employee/day -- (refer to Table T-2 of GESF - J10 restaurant and hotel)
Sewage generation rate	=	15.4 m ³ /day

5. Yat Sang Industrial Building

Industrial - Manufacturing

Assumed area	=	2928 m ²
Assumed floor area per employee	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Total number of employees	=	67 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	35.7 m ³ /day

6. Kevin Wong Development Building (11 Tai Yip Street)

Industrial - Manufacturing

Assumed area	=	3809 m ²
Assumed floor area per employee	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Total number of employees	=	126 employees
Design flow	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Sewage generation rate	=	66.6 m ³ /day

7. Proposed Office (111 Wai Yip Street, 1 Tai Yip Street)

Office	=	Reference: Application No. - A/K14/809 (https://www.ozp.tpb.gov.hk/api/Perm/Gist?caseNo=A%2fK14%2f809&lang=EN&ext=pdf&dType=in)
Assumed area	=	13349 m ²
Assumed floor area per employee	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	734 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	58.7 m ³ /day

8. Ho King Industrial Building (9 Tai Yip Street)

Table 3b Calculation for Sewage generation rate of the Existing Surrounding Building (Planned Condition)

Industrial - Manufacturing	=	2044 m ²
Assumed area	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Assumed floor area per employee	=	47 employees
Total number of employees	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Design flow	=	24.9 m ³ /day
Sewage generation rate	=	
9. Wing Tai Factory Building (3 Tai Yip Street)		
Industrial - Manufacturing	=	3144 m ²
Assumed area	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Assumed floor area per employee	=	104 employees
Total number of employees	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Design flow	=	55.0 m ³ /day
Sewage generation rate	=	
Storage		
Assumed area	=	147 m ²
Assumed floor area per employee	=	250.0 m ² per employee -- (refer to Table 8 of CIFSUS - Storage)
Total number of employees	=	1 employees
Design flow	=	180 litre/employee/day -- (refer to Table T-2 of GESF - Transport, Storage & Communication)
Sewage generation rate	=	0.1 m ³ /day
10. Hay Nien Building (1 Tai Yip Street)		
Industrial - Manufacturing	=	5842 m ²
Assumed area	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Assumed floor area per employee	=	193 employees
Total number of employees	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Design flow	=	102.2 m ³ /day
Sewage generation rate	=	
11. Air Goal Cargo Building (330 Kwun Tong Road)		
Industrial - Manufacturing	=	2309 m ²
Assumed area	=	43.5 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)
Assumed floor area per employee	=	53 employees
Total number of employees	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Design flow	=	28.2 m ³ /day
Sewage generation rate	=	
12. Hong Kong Commercial Daily (332 Kwun Tong Road)		
Office	=	2304 m ²
Assumed area	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Assumed floor area per employee	=	127 employees
Total number of employees	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Design flow	=	10.1 m ³ /day
Sewage generation rate	=	
13. Planned Development (334-336 & 338 Kwun Tong Road)		
Office	=	Reference: Application no. - A/K14/804 (https://www.ozp.tpb.gov.hk/api/Perm/Gist?caseNo=A%2FK14%2F804&lang=EN&ext=pdf&dType=in)
Assumed area	=	23211 m ²
Assumed floor area per employee	=	18.2 m ² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	1277 employees
Design flow	=	80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	102.1 m ³ /day
14. Johnson Industrial Mansion (340 Kwun Tong Road)		
Industrial - Manufacturing	=	5772 m ²
Assumed area	=	30.3 m ² per employee -- (refer to Table 8 of CIFSUS - Manufacturing - I/O Buildings)
Assumed floor area per employee	=	190 employees
Total number of employees	=	530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)
Design flow	=	101.0 m ³ /day
Sewage generation rate	=	
Total Flow of Catchment A, discharges to FMH4042669 (S2)	=	799.9 m³/day

Table 3b Calculation for Sewage generation rate of the Existing Surrounding Building (Planned Condition)

Catchment B, discharges to FMH4042670 (S3)

16. Chuan Yuan Factory Building (342-344 Kwun Tong Road)

Industrial - Manufacturing

Assumed area

= 13344 m²

Assumed floor area per employee

= 43.5 m² per employee -- (refer to Table 8 of CIFSUS - Manufacturing)

Total number of employees

= 307 employees

Design flow

= 530 litre/employee/day -- (refer to Table T-3 of GESF - J1 Manufacturing in East Kowloon)

Sewage generation rate

= 162.7 m³/day

17. Hong Kong Baptist Hospital (4 Tai Yip Street)

Sewage generation rate

Reference: SIA report under Planning Application A/K14/782

= 181.6 m³/day

18. Linkchart Centre (2 Tai Yip Street)

Office

Reference: Online building profile (<https://www.interasia.com.hk/en/Kowloon-Building/Kwun-Tong/1563/Linkchart-Centre>)

Assumed area

= 9109 m²

Assumed floor area per employee

= 18.2 m² per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)

Total number of employees

= 501 employees

Design flow

= 80 litre/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)

Sewage generation rate

= 40.1 m³/day

Total Flow of Catchment B, discharges to FMH4042670 (S3)

= 384.3 m³/day

Sub-total

Total Flow at S0 (including Proposed Development)

= 399.6 m³/day

Total Flow at S1 (including Proposed Development)

= 399.6 m³/day

Total Flow at S2 (including Proposed and Planned Development + Catchment A)

= 1,199.6 m³/day

Total Flow at S4 (including Proposed and Planned Development + Catchment A & B)

= 1,583.9 m³/daySub-total with Catchment Inflow Factor - East Kowloon = 1.1

Total Flow at S0 (including Proposed Development)

= 439.6 m³/day

Total Flow at S1 (including Proposed Development)

= 439.6 m³/day

Total Flow at S2 (including Proposed and Planned Development + Catchment A)

= 1,319.5 m³/day

Total Flow at S4 (including Proposed and Planned Development + Catchment A & B)

= 1,742.3 m³/day

Table 4a Comparison of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas (Existing Condition)

Hydraulic Capacity of Existing Sewers

Segment	Manhole Reference	Manhole Reference	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Peak Flow from the Proposed Development only (L/s)	Contribution from the Proposed Development only (%)	Status	Included Catchment	Daily Flow (m ³ /day)	Contributing Population	Peaking Factor	Peak Flow from the Proposed Development and Catchment Areas (Without Water Feature Backwash) (L/s)	Water Feature Backwash (L/s)	Peak Flow from the Proposed Development and Catchment Areas (With Water Feature Backwash) (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
P1-S1	FTMH-01	FMH4042668	225	16.4	0.007	37	30.5	81.7%	OK	-	439.6	1,628	6	30.5	2.5	33.0	88.4%	OK
S1-S2	FMH4042668	FMH4042669	225	53.5	0.012	56	30.5	54.5%	OK	-	439.6	1,628	6	30.5	2.5	33.0	59.0%	OK
S2-S3	FMH4042669	FMH4042670	400	34.3	0.007	202	30.5	15.1%	OK	A	1345.8	4,984	6	93.5	2.5	96.0	47.4%	OK
S3-S4	FMH4042670	FMH4042671	400	19.1	0.004	153	30.5	20.0%	OK	A + B	1768.6	6,550	5	102.3	2.5	104.8	68.6%	OK

Table 4b Comparison of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas (Planned Condition)

Hydraulic Capacity of Existing Sewers

Segment	Manhole Reference	Manhole Reference	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Peak Flow from the Proposed Development only (L/s)	Contribution from the Proposed Development only (%)	Status	Included Catchment	Daily Flow (m ³ /day)	Contributing Population	Peaking Factor	Peak Flow from the Proposed Development and Catchment Areas (Without Water Feature Backwash) (L/s)	Water Feature Backwash (L/s)	Peak Flow from the Proposed Development and Catchment Areas (With Water Feature Backwash) (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
P1-S1	FTMH-01	FMH4042668	225	16.4	0.007	37	30.5	81.7%	OK	-	439.6	1,628	6	30.5	2.5	33.0	88.4%	OK
S1-S2	FMH4042668	FMH4042669	225	53.5	0.012	56	30.5	54.5%	OK	-	439.6	1,628	6	30.5	2.5	33.0	59.0%	OK
S2-S3	FMH4042669	FMH4042670	400	34.3	0.007	202	30.5	15.1%	OK	A	1319.5	4,887	6	91.6	2.5	94.1	46.5%	OK
S2-S3	FMH4042670	FMH4042671	400	19.1	0.004	153	30.5	20.0%	OK	A + B	1742.3	6,453	5	100.8	2.5	103.3	67.6%	OK