Appendix 5

Environmental **Assessment**

Prepared for

Diamond Ocean Investments Limited

Prepared by

Ramboll Hong Kong Limited

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

ENVIRONMENTAL ASSESSMENT (AIR QUALITY & NOISE)

Date	**03 July 2024**
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Project Reference	**KTAWY107EI00**
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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Project Background

1.1.1 The Application Site at 107-109 Wai Yip Street, Kwun Tong, is zoned as "Other Specified Uses (Business)" (OU(B)) under the Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/26, with site area of about 1,171 m^2. This planning application is to seek permission from the Town Planning Ordinance (the Board) in support of the proposed development, which will be developed into a residential care home for the elderly (RCHE) and hotel (hereafter referred to as the "Proposed Development").

1.1.2 Ramboll Hong Kong Limited has been commissioned by the Applicant to conduct this Environmental Assessment (EA) for the subject planning application.

1.1.3 The EA will assess the air quality and noise impacts associated with the Proposed Development.

1.1.4 As the scale of the Proposed Development is small, construction phase environmental impact is expected to be readily controlled by implementing the good practices stipulated in the "Recommended Pollution Control Clauses for Construction Contracts" issued by the EPD. Hence, construction phase impact will not be assessed in this EA.

1.2 Application Site and its Environs

1.2.1 The Application Site is bounded by Tai Yip Street to the north and Wai Yip Street to the south. It is surrounded by industrial buildings to the north, west and east.

1.2.2 **Figure 1.1** shows the location of the Application Site and its environs. The Application Site is currently vacant and was occupied by an office building, Hsin Chong Centre, previously.

1.3 Proposed Development

1.3.1 The Proposed Development comprises a 33-storey (including one basement level) RCHE and hotel with a total GFA of about 16,856 m^2. The maximum building height is at 115 mPD. The indicative layout plan of the Proposed Development is shown in **Appendix 1.1**.

2. AIR QUALITY

2.1 Introduction

2.1.1 The aim of this study is to assess the potential air quality impact arising from traffic emissions along the road carriageways surrounding the Application Site and the chimney emission from industrial stack in the vicinity of the Application Site, if identified, during the operation of the Proposed Development.

2.2 Assessment Criteria

2.2.1 Table 3.1 of the Chapter 9 (Environment) of the Hong Kong Planning Standards and Guidelines (HKPSG) shows the minimum horizontal buffer distance between kerb side of roads and sensitive uses for various types of roads, and also shows the recommended buffer distance between industrial sites with chimneys and sensitive uses. The mentioned recommendations are extracted and shown in **Table 2.1** below.

Table 2.1 Guidelines on Usage of Open Space Site

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	*Type of Road*		
	Trunk Road and Primary Distributor	>20m	Active and passive recreational uses
		3 – 20m	Passive recreational uses
		<3m	Amenity areas
	District Distributor	>10m	Active and passive recreational uses
		<10m	Passive recreational uses
	Local Distributor	>5m	Active and passive recreational uses
		<5m	Passive recreational uses
	Under Flyovers		Passive recreational uses
Industrial Areas	*Difference in Height between Industrial Chimney Exit and the Site*		
	<20m	>200m	Active and passive recreational uses
		5 – 200m	Passive recreational uses
	20 – 30m (*)	>100m	Active and passive recreational uses
		5 – 100m	Passive recreational uses
	30 – 40m	>50m	Active and passive recreational uses
		5 – 50m	Passive recreational uses
	>40m	>10m	Active and passive recreational uses
Construction and earth moving Activities	-	<50m	Passive recreational uses
		>50m	Active and passive recreational uses

Remarks:

(a) In situations where the height of chimneys is not known, use the set of guidelines marked with an asterisk for preliminary purpose and refine as and when more information is available.

(b) The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites.

(c) The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishments which are likely to be significant air pollution sources. Consult EPD when planning open space sites close to such establishments.

(d) Amenity areas are permitted in any situation.

2.3 Vehicular Emission Impact

2.3.1 With reference to Annual Traffic Census 2022 published by Transport Department, Wai Yip Street, located to the south of the Application Site, is classified as a Primary Distributor. According to **Table 2.1**, a buffer separation of at least 20m is recommended between the kerb side of a Primary Distributor and the air sensitive uses.

2.3.2 **Figure 2.1** shows the buffer distance from Wai Yip Street to the Application Site. Most part of the building will be located within the 20m buffer zone, except the façade facing the back lane. The Proposed Development will adopt centralised air-conditioning system with fresh air supply, which can ensure adequate ventilation in the building without relying on openable windows. It has been confirmed that there will be no air sensitive use/ fresh air intake/ openable window[1] within the buffer zone. The fresh air intake point will be positioned outside the buffer zone, at about 24m from the kerb side of Wai Yip Street. As such, the fresh air intake point location complies with the HKPSG requirement and no adverse vehicular emission impact is anticipated.

2.4 Industrial Emission Impact

2.4.1 A site visit was carried out in March 2024 and two chimneys have been identified within 200m of the Application Site, which are located at Wing Tai Factory Building and United Overseas Plaza, respectively. The chimney at Wing Tai Factory Building belongs to a laundry shop. As advised by the owner of the laundry shop, the chimney at Wing Tai Factory Building is abandoned and no longer in use.

2.4.2 The chimney at United Overseas Plaza is reported to be still active according to the management office of United Overseas Plaza. As shown in **Figure 2.1**, the location of the fresh air intake point is located beyond 200m from the chimney, satisfying HKPSG's recommended buffer distance for industrial uses of 200m as presented in **Table 2.1**. With the provision of adequate buffer distance for chimneys, adverse air quality impacts from chimney emissions are not anticipated at the Proposed Development.

[1] Windows are not opened under normal circumstances, except for maintenance purpose.

3. NOISE

3.1 Potential Noise Source

3.1.1 The Proposed Development is surrounded by clusters of industrial and commercial buildings. The traffic road network in the vicinity of the Proposed Development and the ventilation equipment at the nearby industrial and commercial buildings have been identified as the major noise source. However, as the Proposed Development will have a centralised air-conditioning system and do not rely on openable windows for ventilation, adverse traffic noise and fixed noise impact on the Proposed Development are not anticipated.

3.1.2 On the other hand, as the Proposed Development will have a centralised air-conditioning system, potential fixed plant noise source i.e. cooling towers/ chillers, will be installed at the Proposed Development. The location of the cooling towers/chillers is not confirmed yet, which can be located at the podium, inside the plant room or at the rooftop. As the Proposed Development is surrounded by industrial and commercial buildings, locating the cooling towers/ chillers at the rooftop with sightline to noise sensitive receivers is assumed for conservative assessment.

3.2 Nearby Noise Sensitive Receivers

3.2.1 There are mainly industrial and commercial development in the vicinity of the Application Site. The nearest noise sensitive receiver (NSR) which will have a line of sight to the cooling towers/ chillers of the Proposed Development is the Foo Yue Building at Ting Fu Street, which is located about 140m to the north of the Proposed Development as shown in **Figure 3.1**. This NSR is chosen for fixed noise impact assessment.

3.3 Fixed Noise Impact Assessment

3.3.1 The IND-TM sets out the appropriate Acceptable Noise Level (ANL) for fixed noise source which are dependent on the Area Sensitivity Ratings (ASRs) of the NSRs. According to Table 4.1 of HKPSG Chapter 9, the planned fixed noise source shall comply with 5dB(A) below the ANL shown in **Table 3.1** or the prevailing background noise level, whichever lower.

3.3.2 Considering that the nearest NSR is close to Kwun Tong Road and Kai Fuk Road with busy traffics as well as MTR Kwun Tong Line, the prevailing background noise levels is very likely to be higher than ANL-5. Therefore, ANL-5 is adopted as the noise criteria for the assessment.

Table 3.1 Acceptable Noise Levels (ANLs)

Time Period	ANL on Different Area Sensitivity Rating (Leq, 30min, dB(A))		
	ASR A	ASR B	ASR C
Day (0700 to 1900 hours)	**60**	**65**	**70**
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	**50**	**55**	**60**

3.3.3 According to the Annual Traffic Census 2022, Kwun Tong Road and Kai Fuk Road with annual average daily traffic flow (AADT) lower than 30,000 are not considered as an influencing factor. Foo Yue Building is located in urban area and is not affected by the influencing factor, an ASR of "B" has been assumed and adopted for this NSR in the assessment.

3.3.4 Based on standard acoustic principle for attenuation ($20 \times \log(distance) + 8$) and façade correction (+3 dB(A)), the maximum allowable sound power levels of the ventilation equipment of the Proposed Development are back calculated as 102 dB(A) for daytime and evening time (0700 – 2300 hours) and 92 dB(A) for night time (2300 – 0700 hours), assuming no screening correction applied. Calculations of maximum allowable sound power levels is provided in **Appendix 3.1**. Depending on the detailed design of the Proposed Development, should screening structure be incorporated into the design, the maximum allowable sound power levels could be adjusted. Provided that the future design on ventilation equipment of the centralised air-conditioning system is designed in compliance with the requirement of the IND-TM and the HKPSG, no adverse fixed noise impact is anticipated at Foo Yue Building.

3.4 Discussion

3.4.1 The Proposed Development will be equipped with central air-conditioning system and will not rely on openable windows for ventilation under normal circumstances. Therefore, traffic noise and industrial noise from the surroundings would not cause adverse noise impact on the Proposed Development.

3.4.2 The cooling towers/ chillers of the Proposed Development may cause potential fixed noise impact to the surrounding NSRs. The equipment will be designed to meet the relevant noise criteria stipulated in the HKPSG and the IND-TM and incorporate at-source noise mitigation measures as necessary. As such, potential fixed noise impact due to the proposed development is not anticipated.

4. OVERALL CONCLUSION

4.1.1 The Application Site is bounded by Wai Yip Street and an active chimney is identified within 200m of the Site. The fresh air intake point for the central air-conditioning system is carefully positioned beyond 200m from the chimney and beyond 20m from Wai Yip Street. Adequate buffer distance from both the road and the chimney is provided in accordance with the requirements outlined in the HKPSG. Therefore, no adverse vehicular and chimney emission impacts are anticipated.

4.1.2 The Proposed Development will be equipped with central air-conditioning system and will not rely on openable windows for ventilation under normal circumstances. Therefore, traffic noise and industrial noise from the surroundings would not cause adverse noise impact on the Proposed Development. The cooling towers/ chillers on the rooftop of the Proposed Development will be appropriately designed to meet the relevant noise criteria stipulated in the HKPSG and the Noise Control Ordinance.

4.1.3 In conclusion, this EA confirms the overall acceptability from the air quality and noise perspectives.

Figures

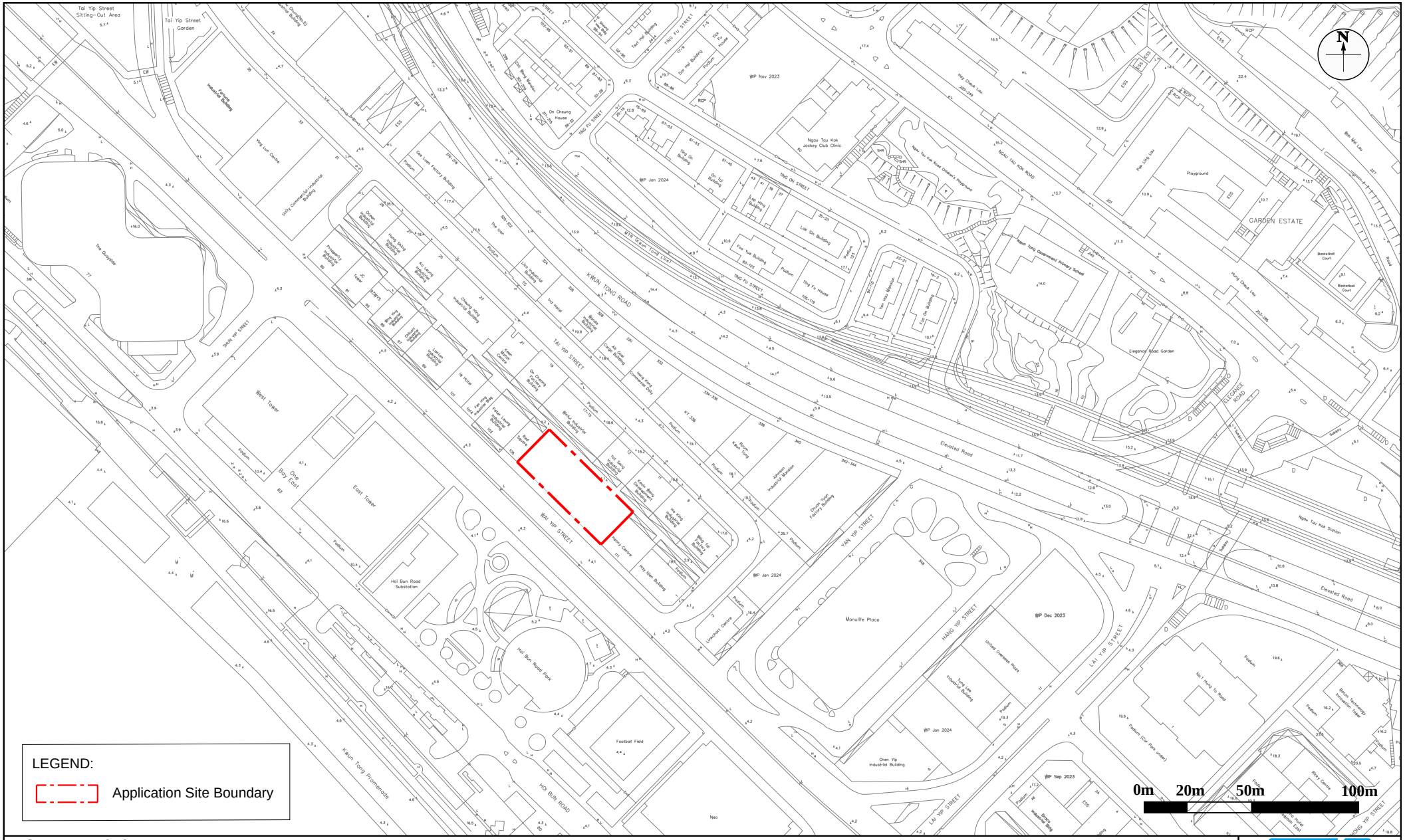

Figure: 1.1	RAMBOLL
Title: Location of Application Site and Its Environs	Drawn by: NT
	Checked by: KY
Project: Proposed Hotel Development and Social Welfare Facilities at 107 - 109 Wai Yip Street, Kwun Tong, Kowloon	Rev.: 1.0
	Date: Mar 2024

Q:\Projects\KTAWY107EI00\04 Deliverables\01 EA Report\01 Figures\v1.0\Source\Figure 1.1 Loation of Application Site.dwg

Wing Tai Factory Building

United Overseas Plaza

LEGEND:

- Application Site Boundary
- 20m Buffer Zone for Primary Distributor
- Identified Abandoned Chimney
- Identified Active Chimney
- 200m from Active Chimney
- Indicative Fresh Air Intake Location

0m 20m 50m 100m

Figure: 2.1

Title: HKPSG's Recommended Buffer Distance for Road and Chimney

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

RAMBOLL

Drawn by: NT

Checked by: KY

Rev.: 1.0

Date: Mar 2024

Q:\Projects\KTAWY107EI00\04 Deliverables\01 EA Report\01 Figures\v1.0\Source\Figure 2.1 HKPSG's Buffer Distance Requirement.dwg

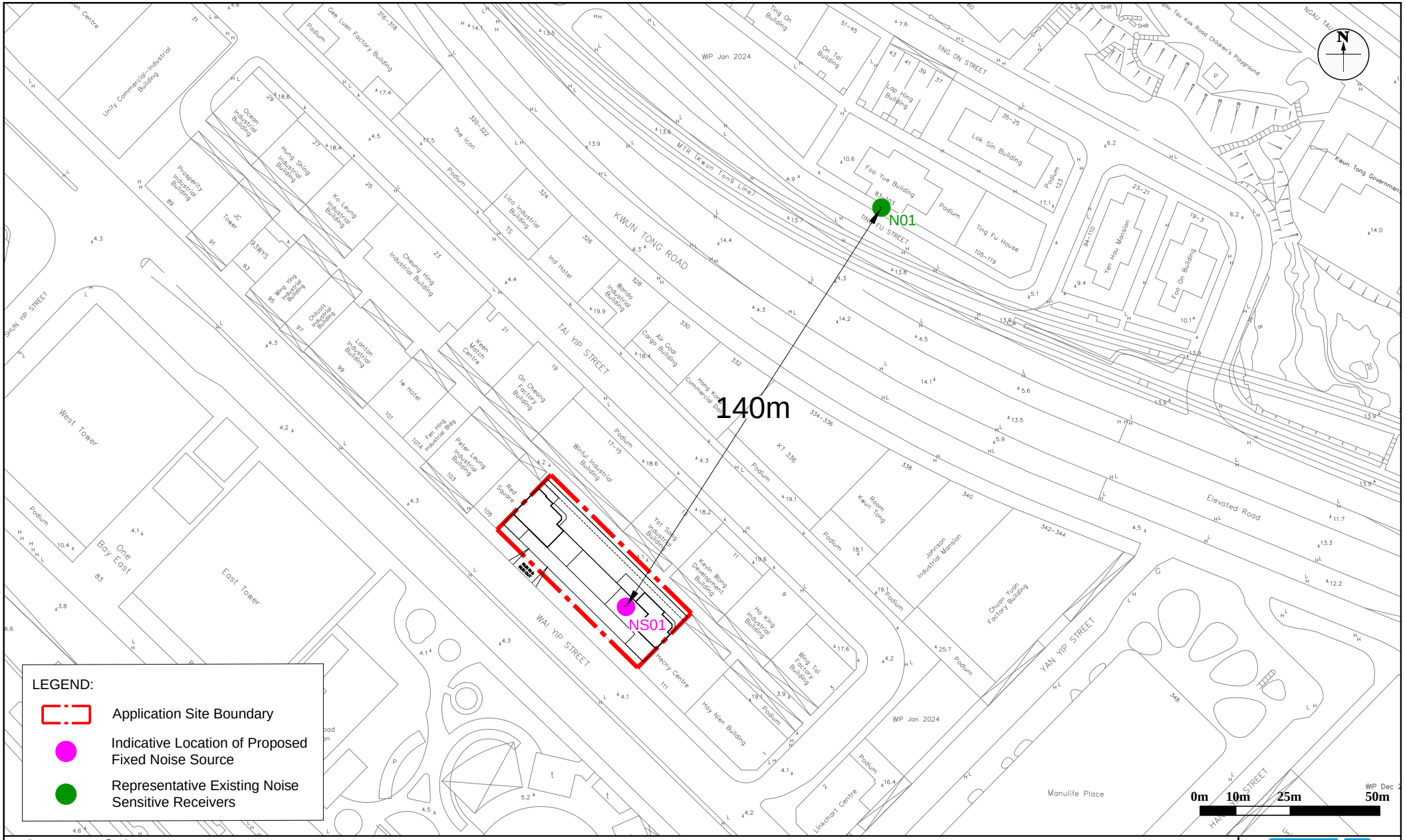

Figure: 3.1

Title: Location of Representative Noise Sensitive Receiver

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

RAMBOLL

Drawn by: NT

Checked by: KY

Rev.: 2.0

Date: Jul 2024

Q:\Projects\KTAWY107EI00\04 Deliverables\01 EA Report\01 Figures\v2.0\Source\Figure 3.1 Location of NSR.dwg

Appendix

Appendix 1.1 Indicative Layout Plan of the Proposed Development (Please refer to the Planning Statement)

Appendix 3.1 Calculations of Maximum Allowable Sound Power Levels

Calculation of Maximum Allowable SWLs for Planned Fixed Noise Sources (Day & Evening Time Period)

NSR					Fixed Plant Noise Source								Correction, dB(A)				SPL at NSR, dB(A)	Day and Evening Time Noise Criterion, dB(A). ANL - 5 db(A)
ID	Description	Location			ID	Description	Location			Max. allowable SWL LAeq, dB(A)	No. of Plants	Distance to NSR, m	Distance	Screening	Tonality	Facade		
		X	Y	Elevation (mPD)			X	Y	Elevation (mPD)									
N01	Foo Yue Building	840357	819722	70	NS01	Chillers/ Cooling Towers	840293	819605	116	102	1	140	-51	0	6	3	60	60

Notes
[1] Day and evening time is defined as 0700 to 2300 hours.
[2] Assume no screening correction
[3] Noise levels are rounded to the nearest dB(A).

Calculation of Maximum Allowable SWLs for Planned Fixed Noise Sources (Night Time Period)

NSR					Fixed Plant Noise Source								Correction, dB(A)				SPL at NSR, dB(A)	Night Time Noise Criterion, dB(A). ANL - 5 dB(A)
ID	Description	Location			ID	Description	Location			Max. allowable SWL LAeq, dB(A)	No. of Plants	Distance to NSR, m	Distance	Screening	Tonality	Facade		
		X	Y	Elevation (mPD) [5]			X	Y	Elevation (mPD)									
N01	Foo Yue Building	840357	819722	70	NS01	Chillers/ Cooling Towers	840293	819605	116	92	1	140	-51	0	6	3	50	50

Notes
[1] Night time is defined as 2300 to 0700 hours.
[2] Assume no screening correction
[3] Noise levels are rounded to the nearest dB(A).

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	**14 November 2024**
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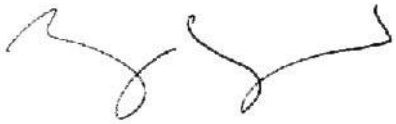
Signed	
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CHAPTERS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Background and Objectives

1.1.1 According to the Approved Kwun Tong (South) Outline Zoning Plan (OZP) No. S/K14S/25, 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 m^2. 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 m^2 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 • **RCHE** • **Hotel**	Not more than 16,856.323m^2 • 12,000m^2 • 4,856.323m^2
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)

1.3.2 Although the proposed maximum number of beds is 557, the RCHE GFA can accommodate up to 644 beds if adopting the minimum space per bed requirement for nursing home or care and attention home under Section 22(1) of the Residential Care Homes (Elderly Persons) Regulation. Therefore, the assessment assumption adopting 644 beds has been assumed as a worst case scenario in this SIA.

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 Sewage 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 m^3/day (Institutional and Special Class)
- Industrial: 0.53m^3/day (Industrial Employee and J1 Manufacturing in East Kowloon)
- Retail Trade: 0.28m^3/day (Commercial Employee and J4 Wholesale & Retail)
- Office: 0.08m^3/day (Commercial Employee and J6 Finance, Insurance, Real Estate & Business Services)
- Restaurant: 1.58m^3/day (Commercial Employee and J10 Restaurants & Hotels)
- Social Facilities: 0.28 m^3/day (Commercial Employee and J11 Community, Social & Personal Services)
- Storage: 0.18m^3/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	=	644	residents (644 beds)
1b. Design flow of residents	=	190	litre/resident/day – (refer to Table T-1 of GESF – Domestic – Institutional and Special Class)
1c. Sewage generation rate from residents	=	**122.4**	m^3/day
1d. Total no. of employees [1]	=	**148**	Employees
1e. Design flow of employees	=	**280**	Litre/employee/day – (refer to Table T-2 of GESF – J11 Community, Social & Personal Services)
1f. Sewage generation rate from employees	=	**41.4**	m^3/day
2. Hotel			
2a. Assumed area	=	4856	m^2
2b. Assumed floor area per employee	=	71.4	m^2 per employee – (refer to Table 8 of CIFSUS – Hotels and Boarding Houses, Private Commercials)
2c. Total number of employees	=	68	employees
2d. Design flow	=	1580	litre/employee/day – (refer to Table T-2 of GESF – J10 Restaurants & Hotels)
2e. Sewage generation rate	=	**107.4**	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

Calculation for Sewage Generation Rate of the Proposed Development

5h. Design flow for Water Feature Backwashing	=	**2.5**	litre/sec

Total Flow from the Proposed Development

Flow Rate	=	317.0	m^3/day
Flow Rate with P_{CIF} (East Kowloon – 1.1)	=	348.7	m^3/day (refer to Table T-4 of GESF – East Kowloon)
Contributing Population	=	1292	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)	=	**24.2**	litre/sec
Peak Flow (including backwash of water feature)	=	**26.7**	litre/sec

Remark:
[1] Build-up of staff under Code of Practice for RCHE Section 9.1.1 for Care and Attention Home:
1) 1 health worker / nurse for every 30 residents, i.e. 644/30 = 23 nos.
2) 1 care worker for every 20 residents, i.e. 644/20 = 34 nos.
3) 1 ancillary worker for every 40 residents, i.e. 644/40 = 17 nos.
4) General staff = 2 nos.
Total staff = 74 nos.
Assuming there are two shifts of staff, i.e. daytime and night-time, the total daily number of employees at the RCHE is 148. It should be noted that night-time requires less staff than daytime. Therefore, the current assumption serves as a conservative scenario.

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

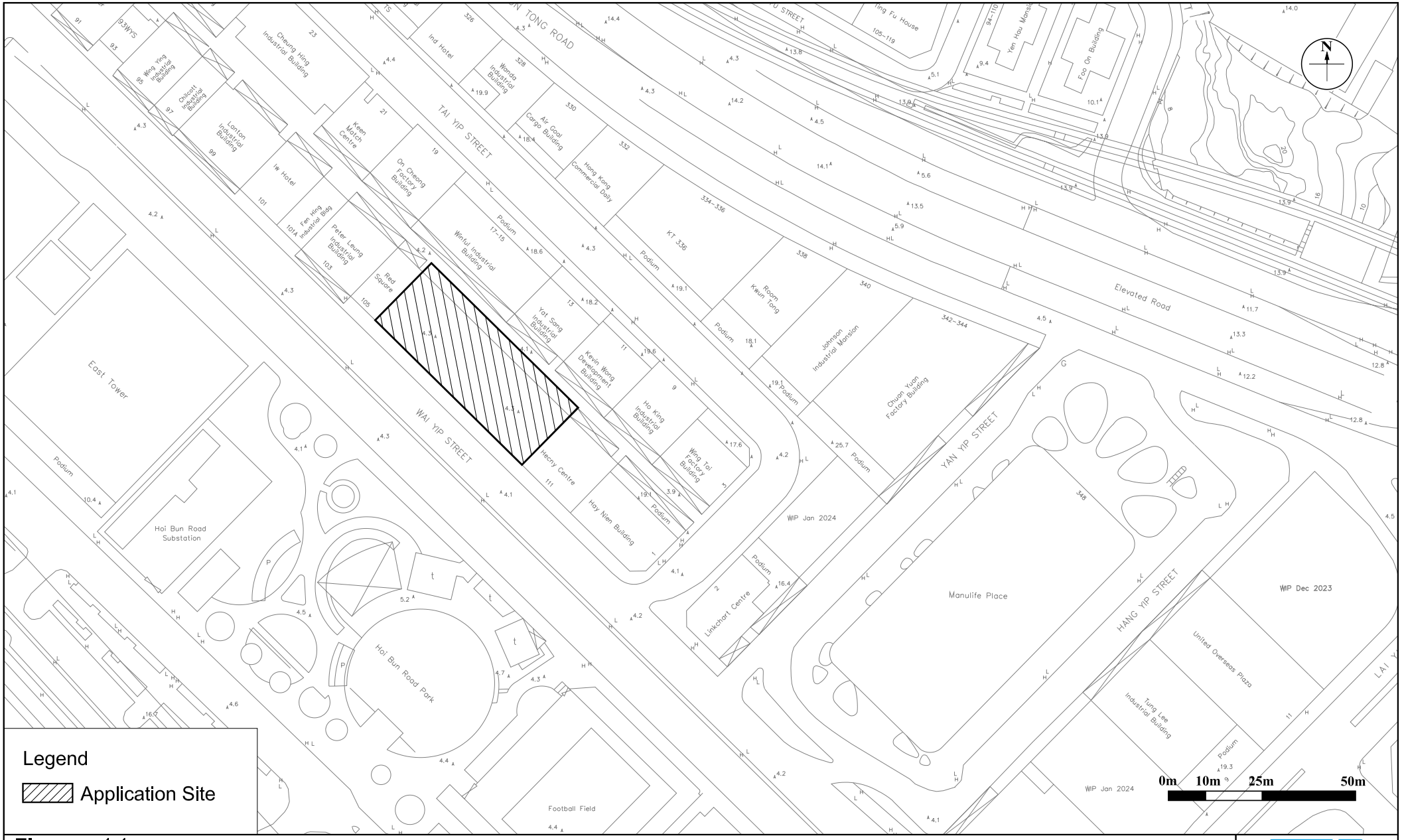

Figure: 1.1

Title: Location of the Application Site and its Environ

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

RAMBOLL

Drawn by: CL

Checked by: KY

Rev.: 1.0

Date: Apr 2024

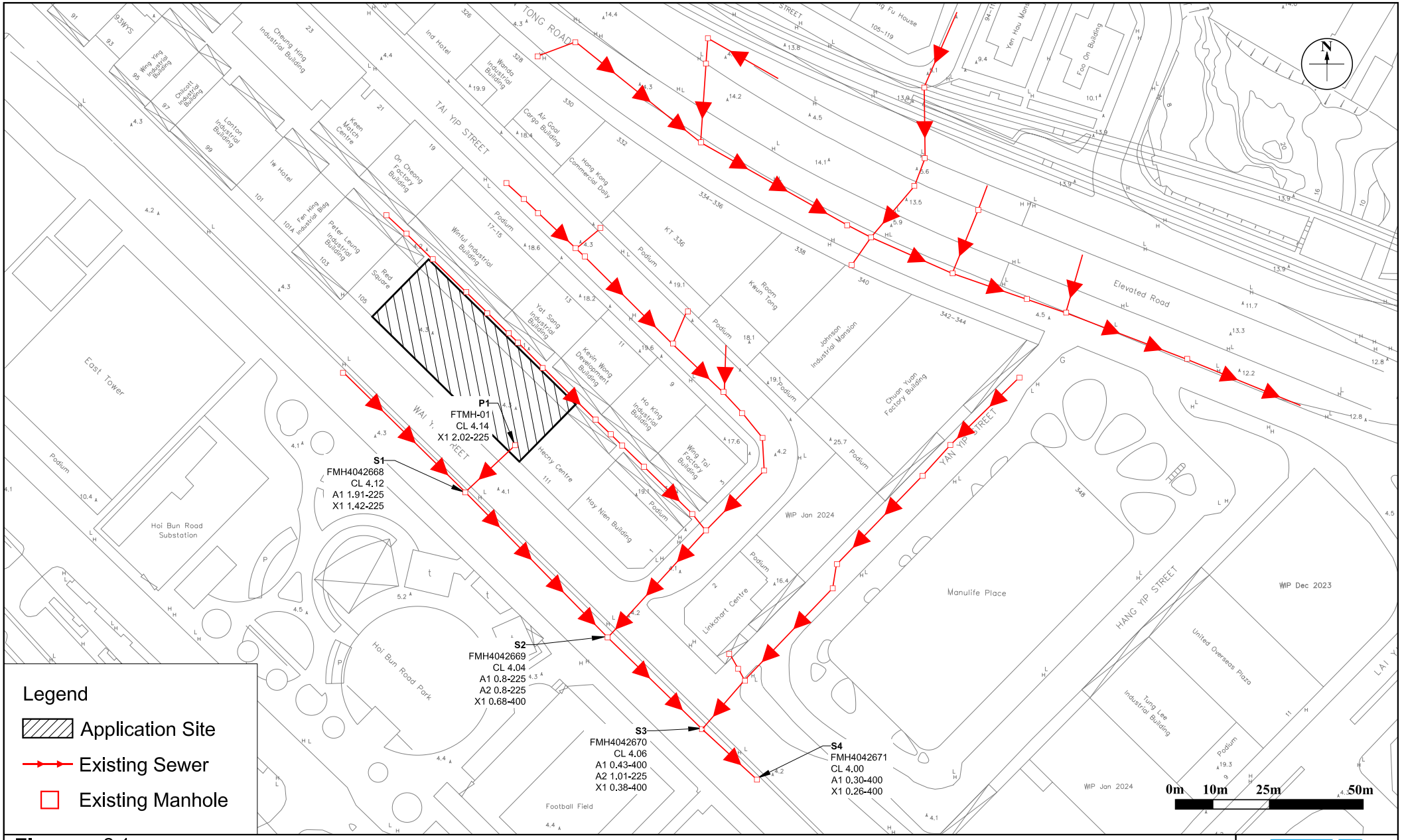

Figure: 2.1

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

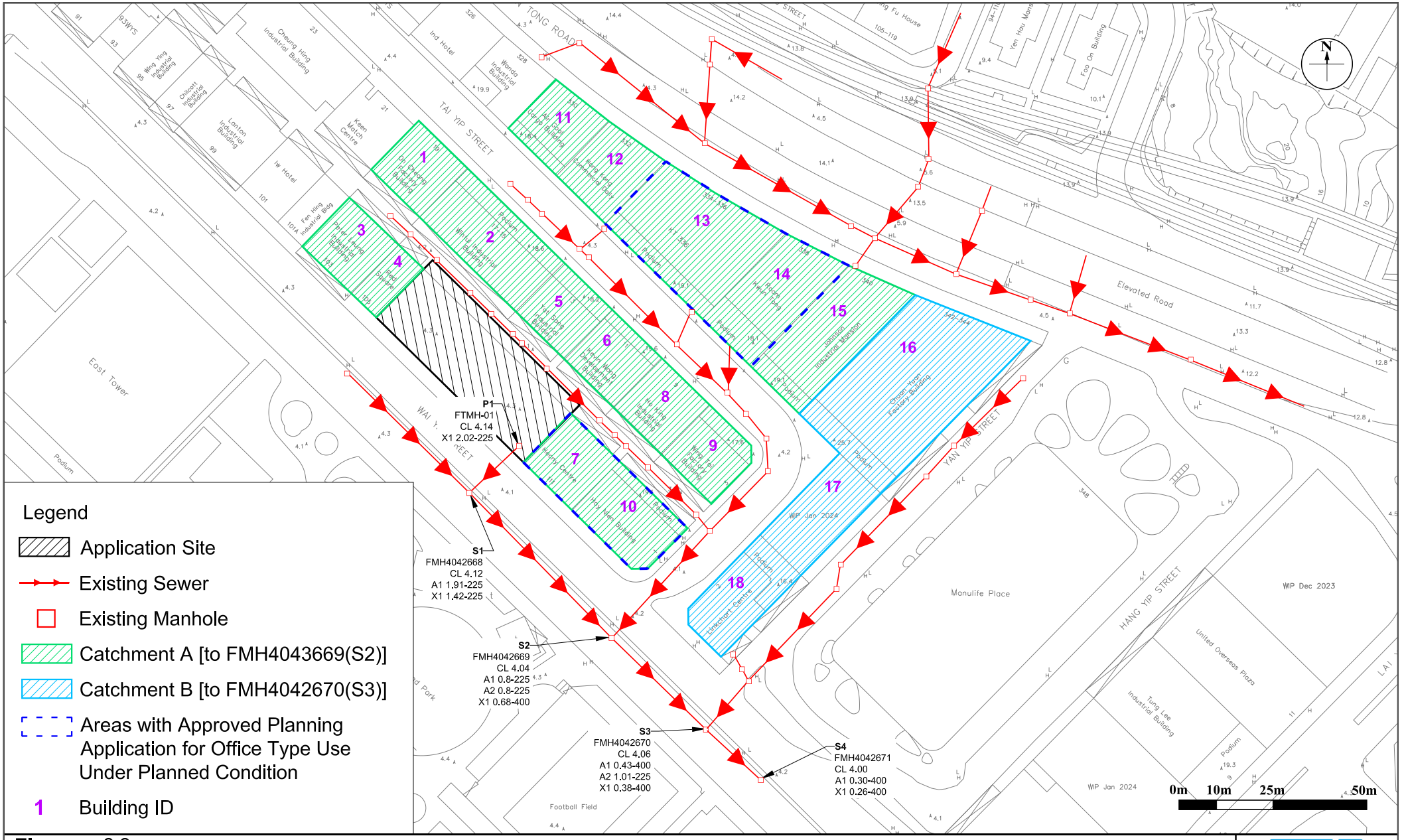

Figure: 2.2

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

RAMBOLL

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]	=	644	residents (644 beds)
Design flow of residents	=	190	litre/resident/day -- (refer to Table T-1 of GESF - Domestic - Institutional and Special Class)
Sewage generation rate	=	**122.4**	m^3/day
Total number of employees[2]	=	148	employees
Design flow of employees	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social & Personal Services)
Sewage generation rate	=	**41.4**	m^3/day
Hotel			
Assumed area	=	4856	m^2
Assumed floor area per employee	=	71.4	m^2 per employee -- (refer to Table 8 of CIFSUS - Hotels and Boarding Houses, Private Commercials)
Total number of employees	=	68	employees
Design flow	=	1580	litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurants & Hotels)
Sewage generation rate	=	**107.4**	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)	=	317.0	m^3/day
Flow rate with P_{CIF} (East Kowloon - 1.1)	=	348.7	m^3/day (refer to Table T-4 of GESF - East Kowloon - 1.1)
Contributing population	=	1292	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)	=	**24.2**	litre/sec
Peak flow (including backwash of water feature)	=	**26.7**	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] Build-up of staff under Code of Practice for RCHE Section 9.1.1 for Care and Attention Home:
1) 1 health worker / nurse for every 30 residents, i.e. 644/30 = 23 nos.
2) 1 care worker for every 20 residents, i.e. 644/20 = 34 nos.
3) 1 ancillary worker for every 40 residents, i.e. 644/40 = 17 nos.
4) General staff = 2 nos.
Total staff = 74 nos.
Assuming there are two shifts of staff, i.e. daytime and night-time, the total daily number of employee at the RCHE is 148. It should be noted that night-time requires less staff than daytime. Therefore, the current assumption serves as a conservative scenario.
[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 ks = 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 ks = 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: $V=-\sqrt{(8gDs)}\log\left(\frac{k_s}{3.7D}+\frac{2.51v}{D\sqrt{(2gDs)}}\right)$

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	=	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 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)

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

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**	**m^3/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) Reference: SIA report under Planning Application A/K14/782

Sewage generation rate	=	**181.6**	m^3/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**	**m^3/day**

Sub-total

Total Flow at P1 (including Proposed Development)	=	**317.0**	m^3/day
Total Flow at S1 (including Proposed Development)	=	**317.0**	m^3/day
Total Flow at S2 (including Proposed Development + Catchment A)	=	**1,140.8**	m^3/day
Total Flow at S4 (including Proposed Development + Catchment A & B)	=	**1,525.2**	m^3/day

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

Total Flow at P1 (including Proposed Development)	=	**348.7**	m^3/day
Total Flow at S1 (including Proposed Development)	=	**348.7**	m^3/day
Total Flow at S2 (including Proposed Development + Catchment A)	=	**1,254.9**	m^3/day
Total Flow at S4 (including Proposed Development + Catchment A & B)	=	**1,677.7**	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)
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)
Office

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

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

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)
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 - 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

13. Planned Development (334-336 & 338 Kwun Tong Road) 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)
Office

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

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)	**=**	**799.9**	**m^3/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	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) Reference: SIA report under Planning Application A/K14/782

Sewage generation rate = **181.6** m^3/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**	**m^3/day**

Sub-total

Total Flow at S0 (including Proposed Development)	=	**317.0**	m^3/day
Total Flow at S1 (including Proposed Development)	=	**317.0**	m^3/day
Total Flow at S2 (including Proposed and Planned Development + Catchment A)	=	**1,117.0**	m^3/day
Total Flow at S4 (including Proposed and Planned Development + Catchment A & B)	=	**1,501.3**	m^3/day

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

Total Flow at S0 (including Proposed Development)	=	**348.7**	m^3/day
Total Flow at S1 (including Proposed Development)	=	**348.7**	m^3/day
Total Flow at S2 (including Proposed and Planned Development + Catchment A)	=	**1,228.7**	m^3/day
Total Flow at S4 (including Proposed and Planned Development + Catchment A & B)	=	**1,651.4**	m^3/day

Table 4a Comparision 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	24.2	64.8%	OK	-	348.7	1,292	6	24.2	2.5	26.7	71.5%	OK
S1-S2	FMH4042668	FMH4042669	225	53.5	0.012	56	24.2	43.2%	OK	-	348.7	1,292	6	24.2	2.5	26.7	47.7%	OK
S2-S3	FMH4042669	FMH4042670	400	34.3	0.007	202	24.2	12.0%	OK	A	1254.9	4,648	6	87.1	2.5	89.6	44.3%	OK
S3-S4	FMH4042670	FMH4042671	400	19.1	0.004	153	24.2	15.9%	OK	A + B	1677.7	6,214	5	97.1	2.5	99.6	65.2%	OK

Table 4b Comparision 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	24.2	64.8%	OK	-	348.7	1,292	6	24.2	2.5	26.7	71.5%	OK
S1-S2	FMH4042668	FMH4042669	225	53.5	0.012	56	24.2	43.2%	OK	-	348.7	1,292	6	24.2	2.5	26.7	47.7%	OK
S2-S3	FMH4042669	FMH4042670	400	34.3	0.007	202	24.2	12.0%	OK	A	1228.7	4,551	6	85.3	2.5	87.8	43.4%	OK
S2-S3	FMH4042670	FMH4042671	400	19.1	0.004	153	24.2	15.9%	OK	A + B	1651.4	6,116	5	95.6	2.5	98.1	64.2%	OK