

**Rezoning from “Residential (Group D)” to “Residential (Group C) 1” Zone
For a Proposed Residential Development
at Various Lots in D.D. 104 and the Adjoining Government Land
in Yuen Long, N.T.
- S12A Amendment of Plan Application -
(Planning Application No: Y/YL-MP/10)**

Further Information No. 4

Appendix II
Revised Sewerage Impact Assessment

S.12A Planning Application
on the Draft Mai Po & Fairview Park OZP No. S/YL-MP/7
Rezoning from “Residential (Group D)” to “Residential (Group C) 1” Zone
for a Proposed Residential Development
at Various Lots in D.D. 104 and the Adjoining Government Land
in Yuen Long, N.T.

Sewerage Impact Assessment Report

February 2025

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1. Introduction

1.1. Background

- 1.1.1. AECOM Asia Company Limited (AECOM) has been commissioned by the Applicant to conduct a Sewerage Impact Assessment (SIA) in support of the S12A planning application to enable a medium-rise residential development on the Application Site.
- 1.1.2. The Application Site is bounded by Kam Pok Road to its immediate north and west, a village area and Ha Chuk Yuen Tsuen Road to its immediate east, and the existing Drainage Services Department (DSD) Chuk Yuen Floodwater Pumping Station (CYFPS) with its water retention pond to its immediate south. **Figure 1** presents the location of the Project.
- 1.1.3. The Application Site has been previously approved for a 2-storey house development (TPB Ref.: A/YL-MP/205 & 205-1). The current application aims to better utilize the land resource/development potential of the Site to increase flat supply without generating any insurmountable adverse impacts.

1.2. Objective of this Submission

- 1.2.1. The current report outlines the assessment results of the potential sewerage impacts (if any) of a revised residential scheme at the same site. The main objectives of this assessment include the followings:
- (i) Indicate any increase in sewage flow due to the Proposed Development.
 - (ii) Review the existing sewerage condition of the Application Site based on available information.
 - (iii) Outline the methodology adopted in this assessment.
 - (iv) Assess any potential impact on the existing or planned sewerage facilities nearby due to the Proposed Development.
 - (v) Propose mitigation measures and/or improvement works to minimize any potential sewerage impact from the Proposed Development.

2. Development Proposal

2.1.1. The current scheme comprises mainly medium-rise residential development with a domestic plot ratio of 1.5 and non-domestic plot ratio of about 0.09. The site will accommodate 10 residential blocks with a height of 14 to 16 storeys, providing about 2,322 flats. Total domestic GFA is about 98,535m² and total commercial GFA of about 3,292m² planned for retail (about 2,363m²) and kindergarten (about 929m²). In addition, there will be a transport layby (not more than 2,400m²) and social welfare facilities including a neighbourhood elderly center (NEC) (about 328m² NOFA), as well as other residential ancillary facilities(e.g. a basement carpark, residents' clubhouse, swimming pool and landscape area) within the site. The general layout of the Proposed Development is shown in **Figure 2**.

3. Methodology of Sewerage Impact Assessment

3.1. Methodology

3.1.1. Capacity checking of the sewerage pipe, pumping station and effluent polishing plant is carried out to assess the adequacy of the proposed sewerage system. The design assumption and basis are shown in **Table 3-1**.

Table 3-1: Design Assumption and Basis

Design Standard	DSD Sewerage Design Manual, Part 1 & 2
Flow Formula	Colebrook White Formula
Pipe Roughness (K_s)	1.5mm (Concrete, velocity approx. 1.2m/s, normal condition)
Unit Flow Factor	EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF): Table T-1 and Table T-2 <u>Proposed Development:</u> 0.19 m³/day/head (Domestic, housing type specific for Private (R1)), 0.27 m³/day/head (Domestic, housing type specific for Private (R2)), 0.37 m³/day/head (Domestic, housing type specific for Private (R3)), 0.28 m³/day/head ("Commercial Employee" plus "Community, Social & Personal Services" (J11)) 1.58 m³/day/head ("Commercial Employee" plus "Restaurants & Hotels" (J10)) 0.04 m³/day/head ("School Students")

Contributing Population	EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning (Section 12.1): <u>Contributing Population =</u> Calculated total average flow/ 0.27
Peaking Factors	EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning: Table T-5
Catchment Inflow Factor	EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning: Table T-4 Catchment Inflow Factors (PCIF): Yuen Long = 1.00
Intake Year	2031 (Tentatively)
Projected Sewage flow Based on EPD Initial Estimation	The size of the proposed gravity sewer should be large enough to serve other developments in the same area. Based on EPD initial estimation, such sewer needs to cater for a sewage flow of at least 15,500 m³/d.

3.2. Estimation of Sewage Flow for Proposed Development

- 3.2.1. The estimation of sewage flow for the Proposed Development is in accordance with the EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning. The detailed calculation can be found in **Appendix 1**. The findings are summarized in **Table 3-2**.

Table 3-2: Estimated Sewage Flow from Proposed Development

Application Site			
Population Type	No. of Person	Unit Flow Factor (m ³ /h/d)	Average Dry Weather Flow (m ³ /d)
Residential ¹	6,502	0.27	1755.6
Employee for Clubhouse (F&B)	53	1.58	83.8
Employee for Clubhouse (non F&B)	51	0.28	14.3
Employee for Retail (F&B)	36	1.58	56.9
Employee for Retail (non F&B)	35	0.28	9.8
Kindergarten (Student) ²	180	0.04	7.2
Kindergarten (Teacher) ²	22	0.28	6.2
NEC (Elderly)	8	0.28	2.3
NEC (Staff) ³	11	0.28	3.1
Swimming Pool	-	-	33.8
Sub-Total	6,898	-	1,973

Notes:

- 1) A PPoF of 2.8 with reference to the average household size in Yuen Long District according to Statistics on Domestic Household Characteristics by District Council District in 2023.
- 2) According to Education Bureau Key Statistics on Kindergarten Pupil-Teacher Ratio of 8:1. The proposed kindergarten has 6 classrooms with an average class size of 30.
- 3) According to Social Welfare Department Notional Staffing Establishments Neighbourhood Elderly Centre (NEC), a NEC required 11 staff.

3.2.2. The estimated Average Dry Weather Flow (ADWF) from the Proposed Development is approximately 1,973m³/day.

4. Review of Existing and Planned Sewerage System

4.1. Existing & Planned Sewerage System

- 4.1.1. There is currently limited existing public sewerage system in vicinity of the Proposed Development as shown in **Figure 3**.
- 4.1.2. Nam Sang Wai Sewerage Pumping Station (NSWSPS) and the associated connection to Yuen Long Sewage Treatment Works (YLSTW) have already been completed in 2010 by DSD under PWP No. 4215DS, "Yuen Long and Kam Tin Sewerage and Sewage Disposal – Kam Tin Trunk Sewerage Stage 1 and Au Tau Trunk Sewers".
- 4.1.3. According to the approved EIA report for "Yuen Long Effluent Polishing Plant – Investigation, Design and Construction" (EIA-259/2018), DSD proposed to upgrade existing YLSTW to Yuen Long Effluent Polishing Plant (YLEPP) to enhance its capacity and treatment level. The upgrade works would be carried out in 2 stages. Under Stage 1, YLSTW will be upgraded to YLEPP with treatment capacity of 100,000 m³/day. The project completion date of YLEPP - Stage 1 is mid 2027, which will be completed before the project completion of the Proposed Development in 2031. The following Stage 2 work planned to increase YLEPP treatment capacity to 180,000 m³/day by 2030 tentatively.
- 4.1.4. The designed capacity and the current average daily flow of Nam Sang Wai Sewerage Pumping Station is presented on **Table 4-1**.

Table 4-1: Design Capacity and Current Average Daily Flow of Nam Sang Wai Sewerage Pumping Station

Sewerage Facilities	Design Capacity (m ³ /day) ⁽¹⁾	Current Average Daily Flow (m ³ /day)	Spare Capacity (m ³ /day)
NSWSPS	42,921	3,900	39,021

Notes:

- 1) For NSWSPS the design capacity and current average daily flow comparison refer to ADWF.

4.2. Sewerage Impact to Existing and Planned Sewage System

- 4.2.1. Designed capacity, current average daily flow and estimated future flow of Nam Sang Wai Sewerage Pumping Station is presented in **Table 4-2** below.

Table 4-2: Comparison of Additional Sewage Flow with Capacity of Public Sewerage

Sewerage Facilities	Design Capacity (m ³ /day) ⁽¹⁾	Current Average Daily Flow (m ³ /day)	Estimated Future Flow ⁽²⁾ (m ³ /day)	Total Future Flow (m ³ /day)	Spare Capacity (m ³ /day)
NSWSPS	42,921	3,900	16,561	20,461	22,460

Notes:

- 1) For NSWSPS and YLEPP, the design capacity and current average daily flow comparison refer to ADWF.
- 2) The estimated future flow includes the EPD initial estimation for the communal gravity sewers (i.e., 15,500 m³/d) and the estimated sewage flow from light public housing (i.e., 1,061 m³/d). The estimated sewage flow from light public housing is based on the technical schedule of "Light Public Housing at Yau Pok Road, Yuen Long - Project Profile". **Appendix 3 and 4** refers.

4.2.2. The sewage from the Development (i.e. 1,973m³/day) merely occupies 5% of the design capacity of existing NSWSPS, 2% of the design capacity of existing YLEPP (phase I) and 1% of the design capacity of planned YLEPP (Phase II). Hence no adverse impact on the existing NSWSPS, existing YLEPP (Phase I) and planned YLEPP (Phase II) is envisaged. The assessment also shows that the existing and planned sewerage system would be sufficient to cater for the Proposed Development.

4.2.3. It is noted a light public housing site is located within the vicinity. The location of the light public housing site is as shown in **Figure 3**. The sewage (i.e. ADWF=1,061m³/day) generated will be conveyed to NSWSPS via exclusive sewage rising mains serving the public housing site only.

4.3. Proposed Sewerage System

4.3.1. The sewage generated from the Proposed Development will be conveyed to a private underground sewage pumping station (SPS) located at the western boundary of the site. It is proposed that twin 200mm dia. rising mains will lay along Kam Pok Road to convey the sewage to a proposed common conversion chamber at Pok Wai South Road. The conversion chamber connected to proposed communal gravity sewers downstream is designed to cater for other existing and planned developments within the area. The proposed communal gravity sewers and manholes also facilitate future discharge of sewage from other development in the vicinity. The proposed downstream communal gravity sewers and manholes are proposed public sewerage system serving multiple users. The sewer will be constructed to discharge the sewage from the Proposed Development to the existing NSWSPS and ultimately discharge to YLEPP. The proposed alignment of the rising mains and the gravity sewers is shown in **Figure 3**. The tentative location of the proposed private SPS is shown in **Figure 4**.

4.3.2. Hydraulic checking of the proposed rising mains has been conducted. It is found to be adequate to serve the Proposed Development, **Appendix 2** refers.

- 4.3.3. The longitudinal profile of the proposed rising mains is shown in **Appendix 2** to demonstrate feasibility. The design shall undergo further analysis and be submitted to the relevant departments for approval during the detailed design stage.
- 4.3.4. The Proposed Development would not have population intake before the sewerage infrastructure of the project is functionally connected to the existing public sewerage system.
- 4.3.5. In addition, discharge license under the Water Pollution Control Ordinance from EPD for the Food and Beverages facilities within the development would be obtained prior to its discharge into the SPS.

4.4. Proposed Communal Gravity Sewer

- 4.4.1. The size of the proposed communal gravity sewer should be large enough to serve other developments in the same area. Based on EPD initial estimation, such sewer needs to cater for a sewage flow of at least 15,500 m³/d. Relevant information is shown in **Appendix 4**.
- 4.4.2. Hence, at the downstream of the conversion chamber, twin 675mm diameter gravity sewers are proposed to serve other developments in the same area. The gravity sewers convey the sewage by gravity to an existing sewage manhole FSH1001886 at the entrance of Nam Sang Wai Sewage Pumping Station. The hydraulic assessment of proposed communal sewer is conducted in **Appendix 5** to demonstrate the feasibility in terms of proposed pipe size and gradient. The proposed alignment of the rising mains and the gravity sewers is shown in **Figure 3**.
- 4.4.3. It is noted that downstream sections of the communal gravity sewer, from manhole WKT009 to existing manhole FSH1001886, which connect along Pok Wai South Road from the junction with Pok Wai West Road to the existing sewage manhole connecting to Nam Sang Wai Sewage Pumping Station (NSWSPS), have been proposed by Approved Planning Application No. Y/YL-NSW/7. The proposed alignment of this downstream section of the communal gravity sewer are shown in **Appendix 6** and is illustrated in **Figure 6**.

5. Maintenance Responsibility

Private Sewerage Facilities

- 5.1.1. All sewers and sewerage facilities within the Proposed Development will be constructed, operated, and maintained by the Proposed Development.
- 5.1.2. The proposed external twin rising mains and conversion chamber will also be constructed and maintained by the Proposed Development.

Communal Gravity Sewer

- 5.1.3. As mentioned in **Section 4.4.3**, downstream sections of the communal gravity sewer are also proposed under Approved Planning Application No. Y/YL-NSW/7. Therefore, there may be two scenarios:-

Case 1 – The Proposed Development Proceeds to Construct the Proposed Communal Gravity Sewer First

- 5.1.4. If the Proposed Development is to proceed before the Approved Planning Application No. Y/YL-NSW/7, the proposed gravity sewer (see **Figure 5**) will be constructed by the Proposed Development.
- 5.1.5. For maintenance responsibility, the downstream communal gravity sewers are proposed to become a public sewage system serving multiple users and will be handed over to government for future maintenance.
- 5.1.6. The proposed construction and maintenance responsibilities are illustrated in **Figure 5**.

Case 2 - Y/YL-NSW/7 Proceeds to Construct the Proposed Communal Gravity Sewer First

- 5.1.7. The downstream sections of the communal gravity sewer, from manhole WKT009 to existing manhole FSH1001886, which connect along Pok Wai South Road from the junction with Pok Wai West Road to the existing sewage manhole connecting to Nam Sang Wai Sewage Pumping Station (NSWSPS), have been proposed by the Approved Planning Application No. Y/YL-NSW/7. The proposed alignment of this downstream section of the communal gravity sewer are shown in **Appendix 6** and is illustrated in **Figure 6**.
- 5.1.8. If the Approved Planning Application No. Y/YL-NSW/7 is to proceed before this application, the applicant of Planning Application No. Y/YL-NSW/7 will construct the section of the proposed communal gravity sewer between manhole no. WKT009 and WKT015. The Proposed Development of Y/YL-MP/10 will be responsible for the section of the proposed communal gravity sewer between the conversion chamber and manhole number no. WKT009. The proposed sewer alignment, manhole location and hydraulic assessment are presented in **Appendix 5**.

- 5.1.9. For maintenance responsibility, the applicant under Y/YL-NSW/7 proposes to hand over the downstream section of the communal gravity sewer to the DSD for future maintenance. For the section of the proposed communal gravity sewer between the conversion chamber and manhole no. WKT009, since it is also intended to become a public sewage system serving multiple users, it is proposed to be handed over to the government for future maintenance.

6. Conclusion

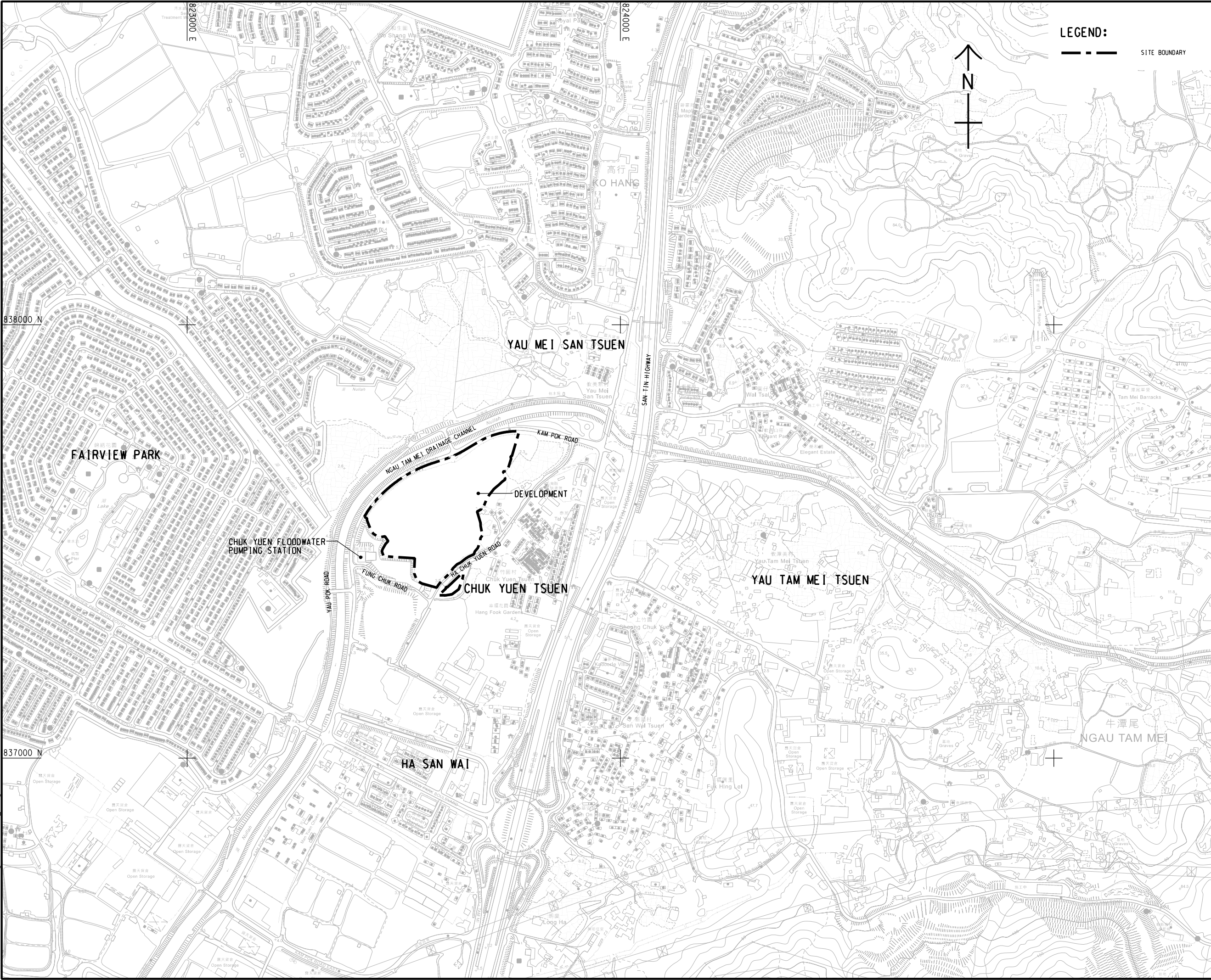
- 6.1.1. This report aims to assess the sewerage impact arising from the proposed residential development to the existing and planned public sewerage network under PWP Nos. 4215DS respectively. The Application Site is designated for residential use by the government under the current Mai Po and Fairview Park OZP and has been previously approved for housing development (A/YL-MP/193, 205 & 205-1). The Applicant currently proposes to increase the domestic plot ratio of the site in line with the prevailed government's housing policy, which calls for utilizing the development potential of undeveloped housing sites to increase the flat supply for the Territory.
- 6.1.2. The sewage generated from the proposed residential development will be conveyed to a private sewage pumping station (SPS) located at the western edge of the site near Kam Pok Road. It is proposed that twin 200mm dia. rising mains will lay along Kam Pok Road to convey the sewage to a proposed common conversion chamber at Pok Wai South Road. The conversion chamber connected to proposed twin 675mm gravity sewers downstream is designed to cater for other existing and planned developments within the area. The proposed twin 675mm diameter gravity sewers and manholes are proposed public sewerage system serving multiple users. The sewer will be constructed to discharge the sewage from the Proposed Development to the existing NSWSPS and ultimately discharge to YLEPP.
- 6.1.3. The Proposed Development will not have population intake before the sewage infrastructure of the project is functionally connected to the government sewerage network.
- 6.1.4. Hydraulic analysis shows that the public sewerage collection system in the area has adequate spare capacity to convey the additional sewage from the Proposed Development. The capacity of the YLEPP is also capable to cater for the additional flow generated from the Proposed Development and neighbouring sites.

End of Report

Figures

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LEGEND:
--- SITE BOUNDARY

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KEY PLAN
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PROJECT NO.
項目編號
60098971

AGREEMENT NO.
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SHEET TITLE
圖紙名稱
LOCATION PLAN

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60098971/SIA/FIGURE 1

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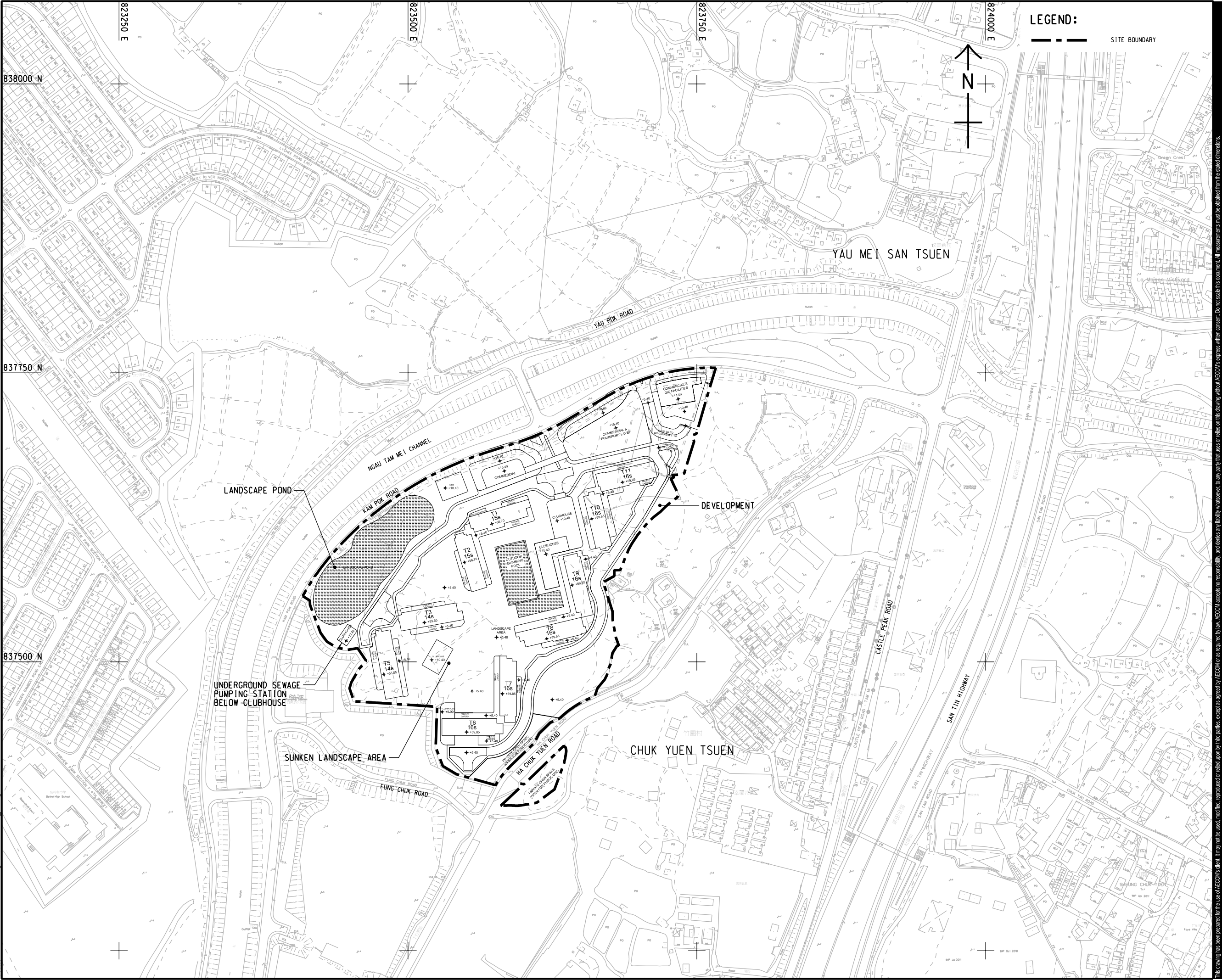
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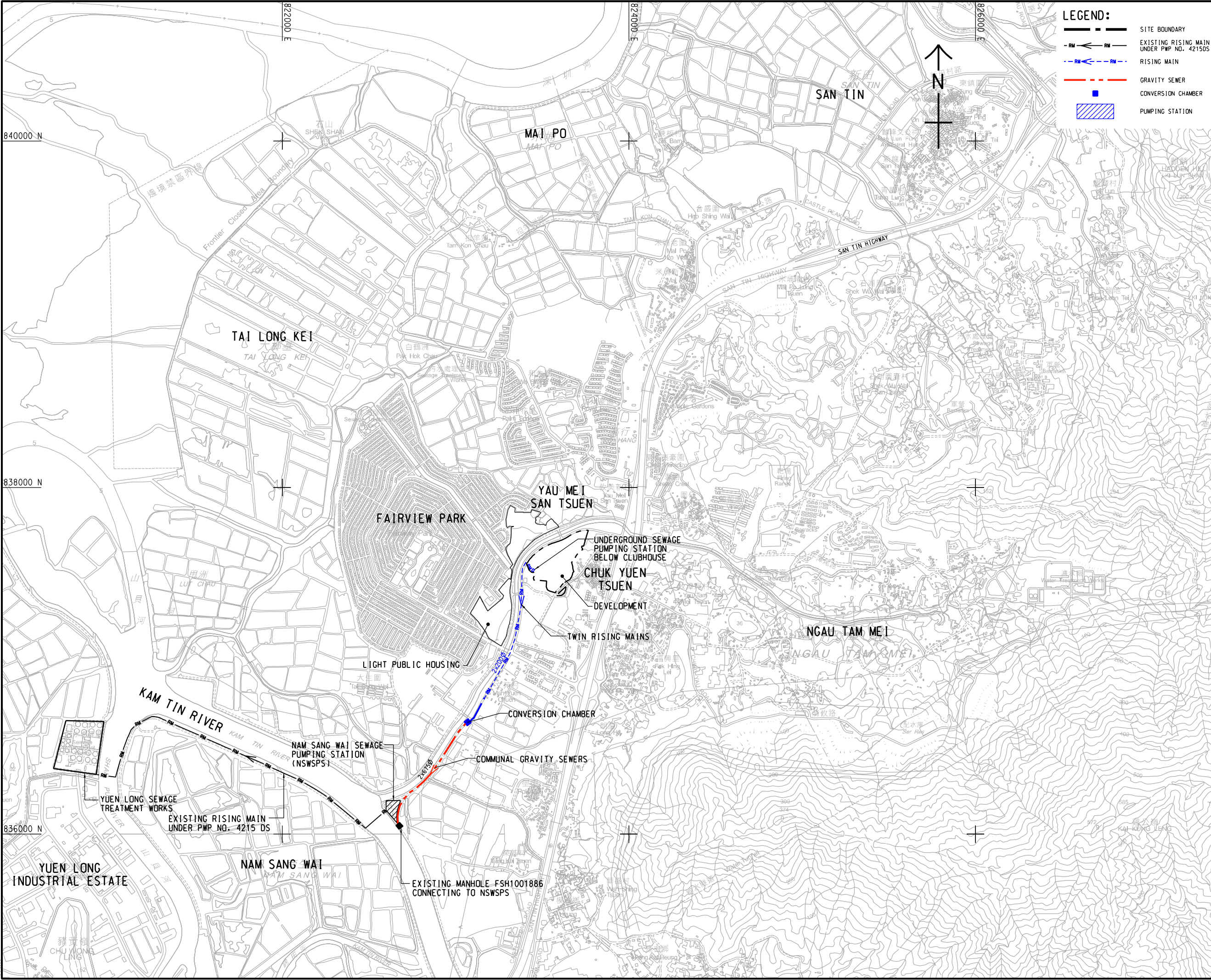
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MASTER LAYOUT PLAN

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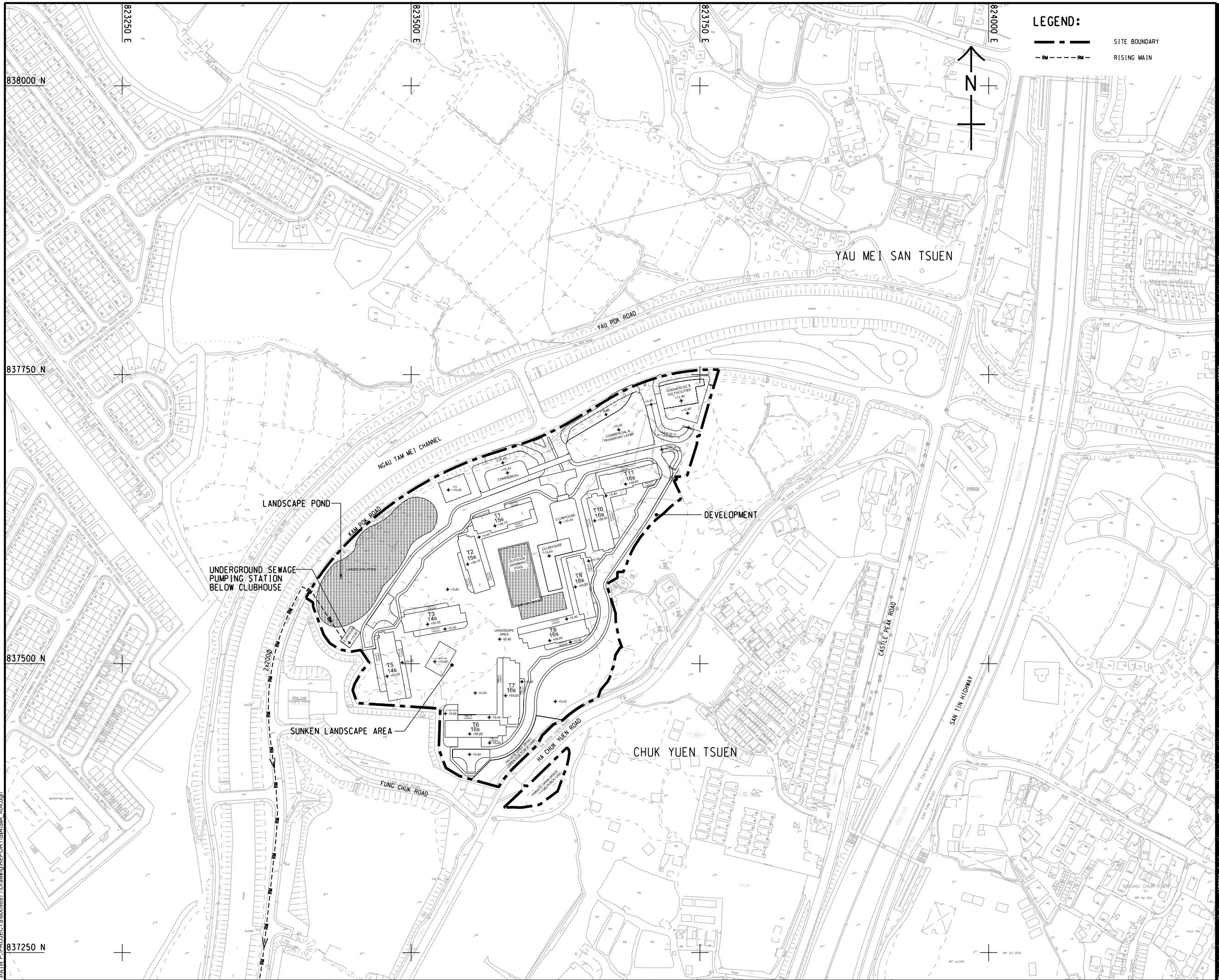
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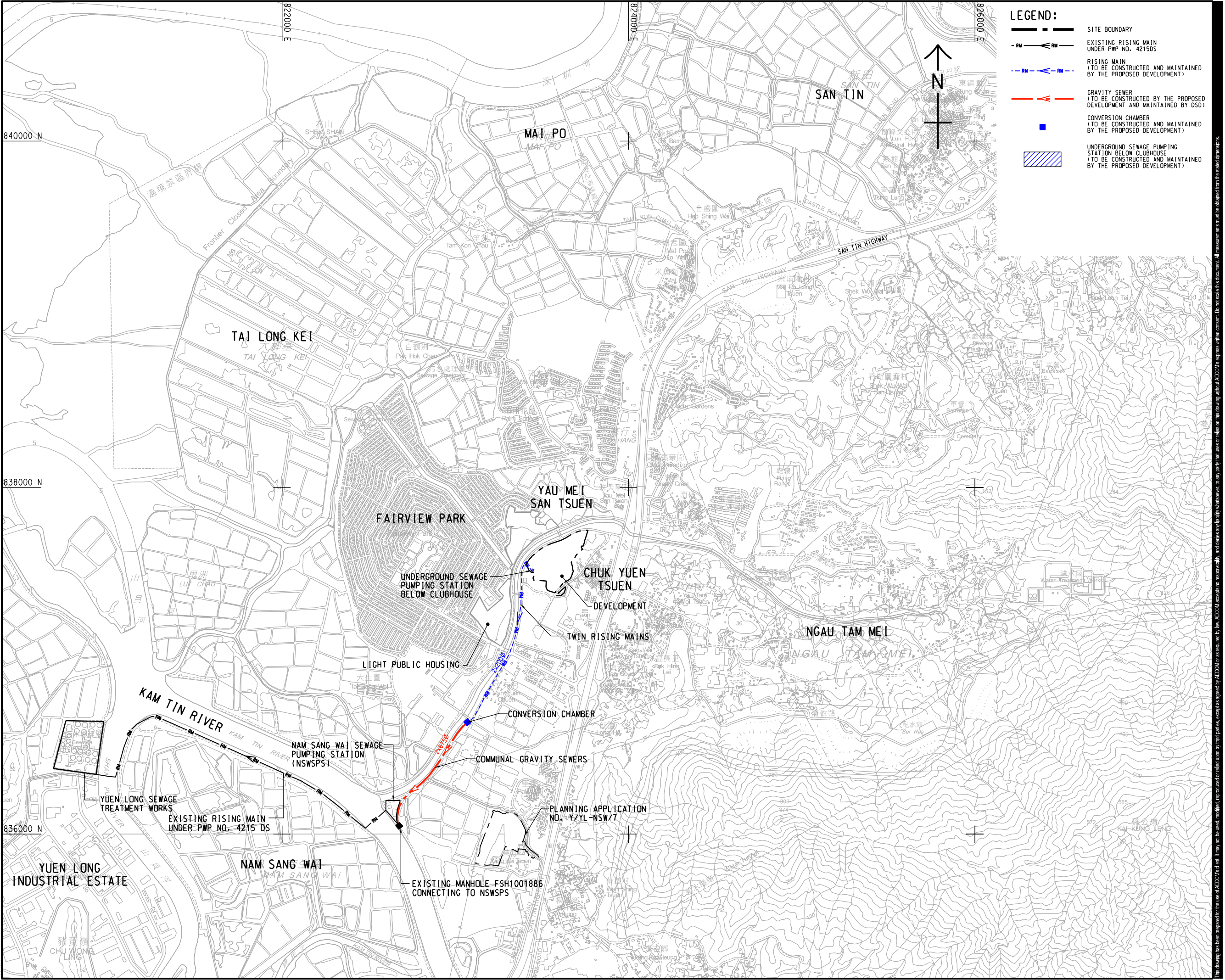
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60098971/SIA/FIGURE 4

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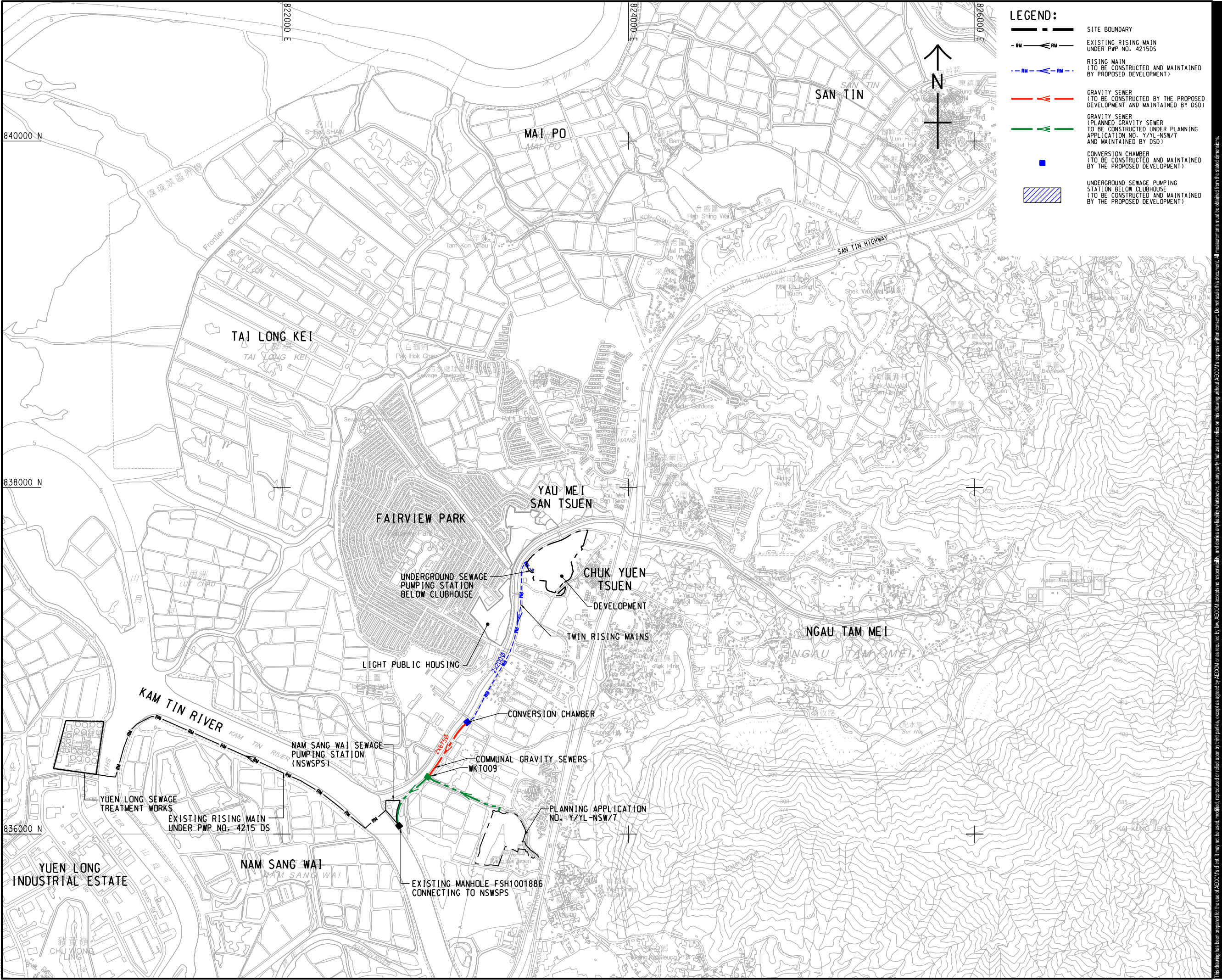
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MAINTENANCE RESPONSIBILITY PLAN CASE 1	
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60098971/SIA/FIGURE 5	

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LEGEND:

- SITE BOUNDARY
- EXISTING RISING MAIN UNDER PWP NO. 4215DS
- RISING MAIN (TO BE CONSTRUCTED AND MAINTAINED BY PROPOSED DEVELOPMENT)
- GRAVITY SEWER (TO BE CONSTRUCTED BY THE PROPOSED DEVELOPMENT AND MAINTAINED BY DSD)
- GRAVITY SEWER (PLANNED GRAVITY SEWER TO BE CONSTRUCTED UNDER PLANNING APPLICATION NO. Y/YL-NSW/7 AND MAINTAINED BY DSD)
- CONVERSION CHAMBER (TO BE CONSTRUCTED AND MAINTAINED BY THE PROPOSED DEVELOPMENT)
- UNDERGROUND SEWAGE PUMPING STATION BELOW CLUBHOUSE (TO BE CONSTRUCTED AND MAINTAINED BY THE PROPOSED DEVELOPMENT)

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PROJECT NO.

60098971

AGREEMENT NO.

60098971

SHEET TITLE

MAINTENANCE RESPONSIBILITY PLAN CASE 2

SHEET NUMBER

60098971/SIA/FIGURE 6

Appendix 1

Estimation of Sewage Generation from Proposed Development

Estimation of Sewage Generation from Proposed Development

Estimated Sewage Flow from the Development		
Residential Unit (no.)	=	2,322
Person per Unit ⁽¹⁾	=	2.8
Residential Population (person)	=	6,502
Unit Flow Factor (m ³ /d/head)	=	0.27
DWF (m ³ /day)	=	1,755.54
DWF (l/s)	=	20.319
Clubhouse GFA (m ²)	=	3,448.71
Clubhouse F&B GFA (m ²)	=	1,034.61
Assumed Worker Density (workers per GFA (in 100 m ²))	=	5.10
Restaurant staff (no.)	=	53
Unit Flow Factor (m ³ /d/head)	=	1.58
DWF (m ³ /day)	=	83.74
DWF (l/s)	=	0.969
Clubhouse non-F&B GFA (m ²)	=	2,414.10
Assumed Worker Density (workers per GFA (in 100 m ²))	=	2.10
Non-restaurant staff (no.)	=	51
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	14.28
DWF (l/s)	=	0.165
Retail GFA (m ²)	=	2,363.00
Retail F&B GFA (m ²)	=	708.90
Assumed Worker Density (workers per GFA (in 100 m ²))	=	5.10
Restaurant staff (no.)	=	36
Unit Flow Factor (m ³ /d/head)	=	1.58
DWF (m ³ /day)	=	56.88
DWF (l/s)	=	0.658
Retail non-F&B GFA (m ²)	=	1,654.10
Assumed Worker Density (workers per GFA (in 100 m ²))	=	2.10
Non-restaurant staff (no.)	=	35
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	9.80
DWF (l/s)	=	0.113
Kindergarten GFA (m ²)	=	929.00
Student (no.)	=	180
Teacher (no.)	=	22
Unit Flow Factor (Student) (m ³ /d/head)	=	0.04
Unit Flow Factor (Staff) (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	13.36
DWF (l/s)	=	0.155
NEC NOFA (m ²)	=	328.00
Elderly(no.)	=	8
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	2
DWF (l/s)	=	0.03
Staff (no.)	=	11
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	3.080
DWF (l/s)	=	0.036

(1)

(2)

(Refer to Table 8 of CIFSUS - Restaurants)

(2)

(Refer to Table 8 of CIFSUS - Retail Trade)

(2)

(Refer to Table 8 of CIFSUS - Restaurants)

(2)

(Refer to Table 8 of CIFSUS - Retail Trade)

(3)

(3)

(4)

Swimming Pool Volume (m ³)	=	2,707.50	* Outdoor Swimming Pool
Turnover rate (hours)	=	6	
Assumed Surface Loading Rate of Filter (m ³ /m ² /hr)	=	20	
Filter Area Required (m ²)	=	22.6	
Duration of Backwash (min/day)	=	3	
Assumed Backwash Flowrate (m ³ /m ² /hr)	=	30	
Volume of Backwash (m ³)	=	33.84	
Assumed Discharge Duration (min)	=	3	
Discharge Flow Rate (m ³ /min)	=	11.28	
Discharge Flow Rate (m ³ /s)	=	0.19	
Total DWF (m ³ /day)	=	1,972.76	
Total DWF (l/s)	=	22.83	

* Pool depth is assumed to be 1.5m and the size of the pool is around 1,805m²

Notes:

- 1 A PPoF of 2.8 with reference to the average household size in Yuen Long District according to Statistics on Domestic Household Characteristics by District Council District in 2023.
- 2 The clubhouse GFA and retail GFA is assumed 30% F&B and 70% non F&B.
- 3 According to Education Bureau Key Statistics on Kindergarten Pupil-Teacher Ratio of 8:1. The proposed kindergarten has 6 classrooms with an average class size of 30.
- 4 According to Social Welfare Department Notional Staffing Establishments Neighbourhood Elderly Centre (NEC), a NEC required 11 staff.

Appendix 2

Hydraulic Checking of Proposed Twin Rising Mains

Hydraulic Assessment of Proposed Twin Rising Mains

Total DWF (m ³ /day)	=	1,971.12	
Total DWF (l/s)	=	22.81	
Contributing population	=	7,300	(1)
Peaking Factor	=	3	(2)
Catchment Inflow Factor	=	1.00	(3)
Peak Flow (m ³ /day)	=	5,913.37	
Peak Flow (l/s)	=	68.44	

Calculation of Twin Rising Mains

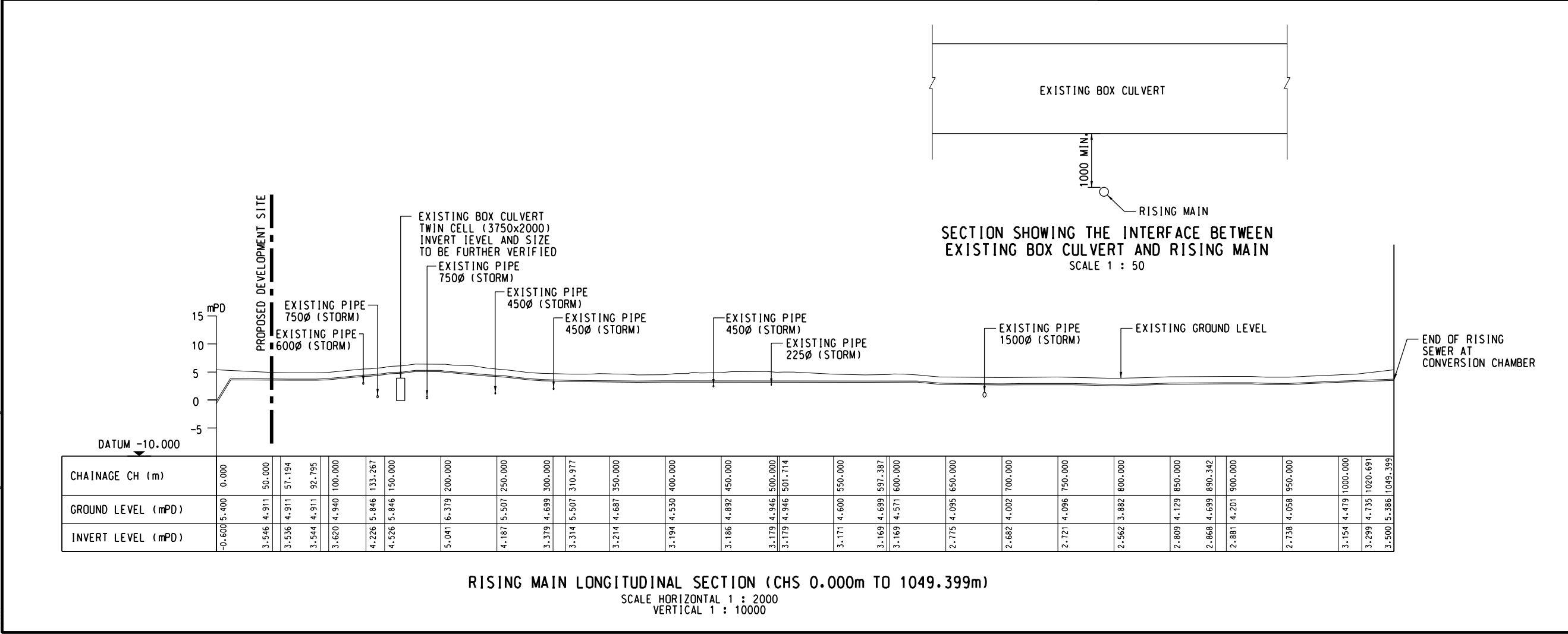
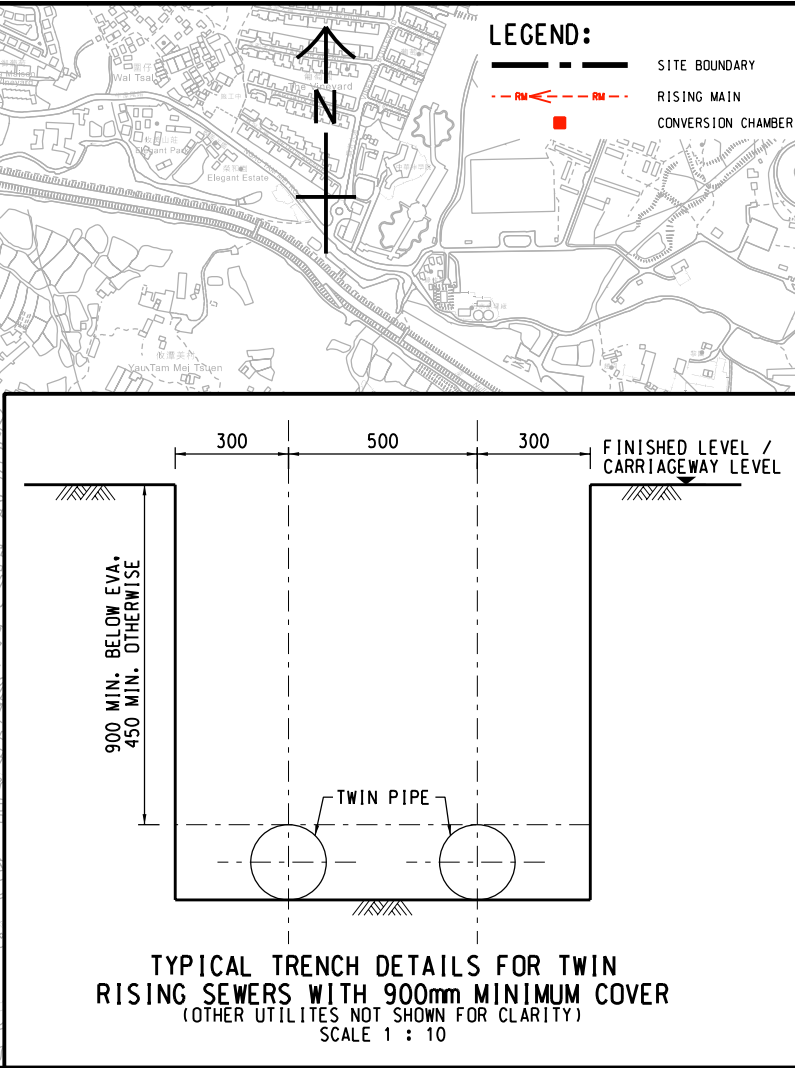
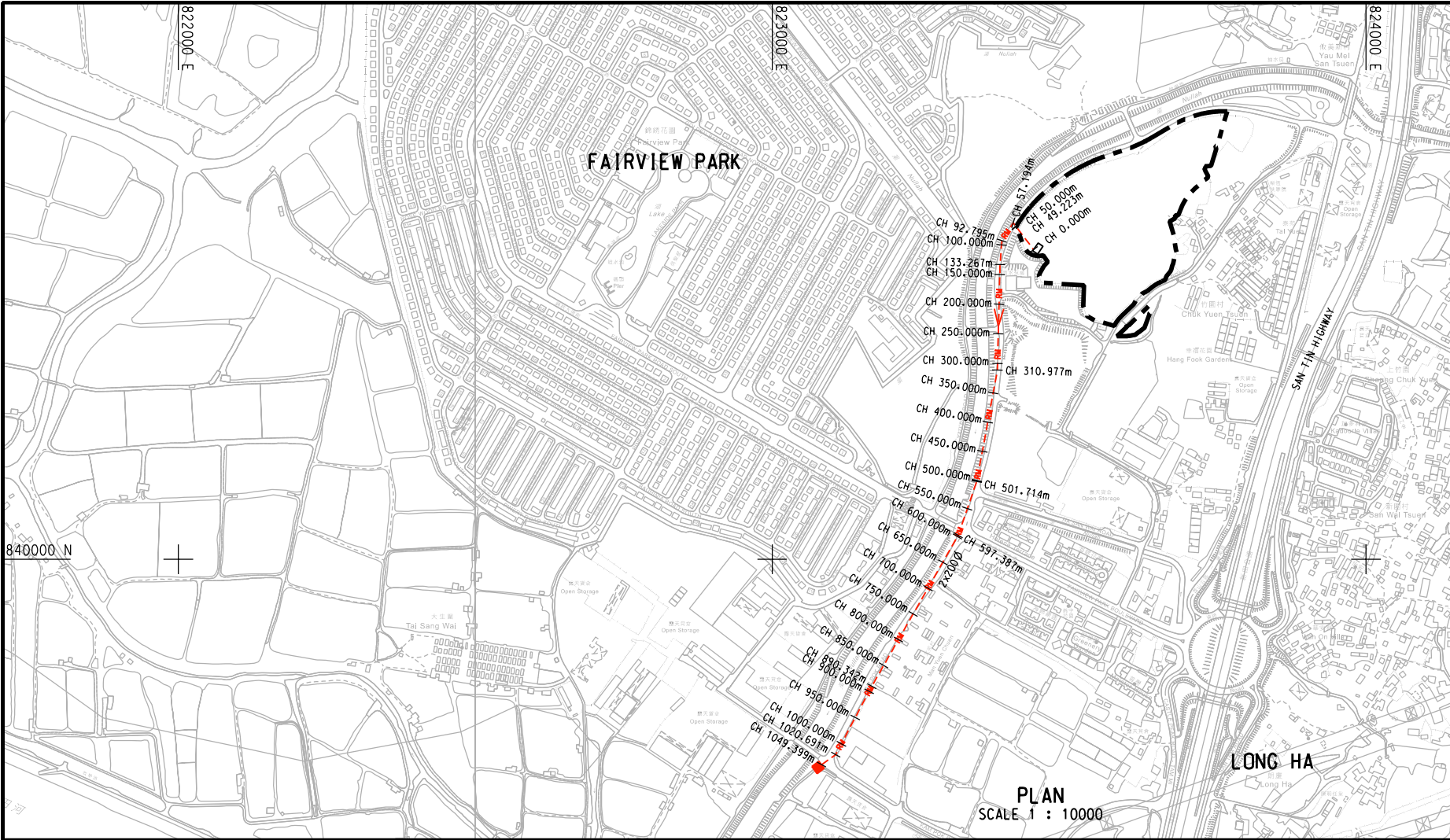
Diameter (mm)	Area (m ²)	Max. Discharge (m ³ /s)	Maximum Velocity (m/s)	
200	0.031	0.034	1.09	< 3 m/s (4)

Notes:

- Contributing population = Projected Flow (ADWF in m³/day) / 0.27 (m³/person/day)
- According to Table T-5(b) of GESF, the new pumping station and new rising main with new upstream sewerage, peaking factor 3 has been adopted
- Catchment Inflow Factor for Yuen Long, 1.00 is adopted
- According to Sewerage Manual (Part 2), the maximum velocity of rising mains should not exceed 3 m/s. The desirable range of velocity should be 1 m/s to 2 m/s, therefore the diameter of the proposed rising main for the development is found to be acceptable.

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:

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Plot File by: haiquan.zhao 4/23/2025
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AECOM

PROJECT
S.12A PLANNING APPLICATION ON THE APPROVED MAI PO & FAIRVIEW PARK OZP NO. S/YL-MP/6 REZONING FROM "RESIDENTIAL (GROUP D)" TO "RESIDENTIAL (GROUP C) 1" ZONE FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT VARIOUS LOTS IN D.D. 104 AND THE ADJOINING GOVERNMENT LAND IN YUEN LONG, N.T.

CLIENT
英千

CONSULTANT
1. 軒翰有限公司
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分列工程顧問公司

ISSUE/REVISION
設計

I/R	DATE	DESCRIPTION	CHK.

STATUS
待批

SCALE
比例

DIMENSION UNIT
尺寸單位

AS SHOWN
小尺碼

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60098971

AGREEMENT NO.
協議編號

SHEET TITLE
圖紙名稱

60098971/SK4001

RISING MAIN LONGITUDINAL PROFILE

SHEET NUMBER
圖紙編號

60098971/SK4001

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Appendix 3

Sewage Flow Estimation of Light Public Housing

Sewage Flow Estimation of Light Public Housing

Estimated Sewage Flow from Light Public Housing		
Residential Population (person)	=	5,500 ^{(1), (2)}
Unit Flow Factor (m ³ /d/head)	=	0.19
DWF (m ³ /day)	=	1,045.00
DWF (l/s)	=	12.095
Non-domestic GFA (m ²)	=	1,075.00 ⁽¹⁾
Community Facilities GFA (m ²)	=	537.50 ⁽³⁾
Retail GFA (m ²)	=	537.50 ⁽³⁾
Community Facilities GFA (m ²)	=	537.50
Assumed Worker Density (workers per GFA (in 100 m ²))	=	3.30 ⁽⁵⁾
Staff (no.)	=	18
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	5.04
DWF (l/s)	=	0.058
Retail F&B GFA (m ²)	=	161.25 ⁽⁴⁾
Assumed Worker Density (workers per GFA (in 100 m ²))	=	5.10 ⁽⁶⁾
Restaurant staff (no.)	=	8
Unit Flow Factor (m ³ /d/head)	=	1.58
DWF (m ³ /day)	=	12.64
DWF (l/s)	=	0.146
Retail non-F&B GFA (m ²)	=	376.25 ⁽⁴⁾
Assumed Worker Density (workers per GFA (in 100 m ²))	=	3.50 ⁽⁷⁾
Non-restaurant staff (no.)	=	13
Unit Flow Factor (m ³ /d/head)	=	0.28
DWF (m ³ /day)	=	3.64
DWF (l/s)	=	0.042
Total DWF (m ³ /day)	=	1,061.28
Total DWF (l/s)	=	12.28

1. Information extracted from "Light Public Housing at Yau Pok Road, Yuen Long - Project Profile".
2. For conservative approach, 5,500 of maximum design population was is adopted.
3. The non-domestic GFA is assumed 50% Retail and 50% Community Facilities.
4. The retail GFA is assumed 30% F&B and 70% non-F&B.
5. Refer to Table 8 of CIFSUS - Community, Social & Personal Services.
6. Refer to Table 8 of CIFSUS - Restaurants.
7. Refer to Table 8 of CIFSUS - Retail Trade.

Appendix 4

EPD Estimation on Sewage Flow of the Proposed Gravity Sewer

Wan, Willie

From: sftsang@epd.gov.hk
Sent: Monday, December 5, 2022 3:50 PM
To: Dai, Yuki
Cc: sftsang@epd.gov.hk; jackson@epd.gov.hk; kmtang@dsd.gov.hk; khcheng@dsd.gov.hk; Wan, Willie
Subject: Fw: Planning Application Y/YL-MP/6

This Message Is From an External Sender

This message came from outside your organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Report Suspicious

Dear Yuki

Referring to the discussion between AECOM, DSD and EPD on 18.11.2022, we have no objection to the your proposal from sewerage planning perspective subject to the following conditions:

1. The size of the proposed gravity sewer should be large enough to serve other developments in the same area. Based on our initial estimation, such sewer needs to cater for a sewage flow of at least 15,500 m³/d.
2. There remains sufficient unoccupied space under Kam Pok Road to accommodate two additional rising mains (say, 900mm in diameter) which will be constructed together with the proposed new Ngau Tam Mei SPS.

Regards

Matthew TSANG
E(SI)72
SIG/EPD
3107 8417

----- Forwarded by SF TSANG/EPD/HKSARG on 15/11/2022 10:06 -----

From: "Dai, Yuki" [REDACTED]
To: "sftsang@epd.gov.hk" <sftsang@epd.gov.hk>, "jackson@epd.gov.hk" <jackson@epd.gov.hk>, "kmtang@dsd.gov.hk" <kmtang@dsd.gov.hk>, "khchen @dsd .ov.hk" <khcheng@dsd.gov.hk>
Cc: "Wan, Willie" <[REDACTED]>
Date: 09/11/2022 12:27
Subject: RE: Planning Application Y/YL-MP/6

Dear all,

Further to the email below, a meeting regarding the captioned subject has been arranged with details as follows:-

Date : 11 November 2022 (Friday)

Time : 3 pm

Please find the link below for the meeting:-

Microsoft Teams meeting

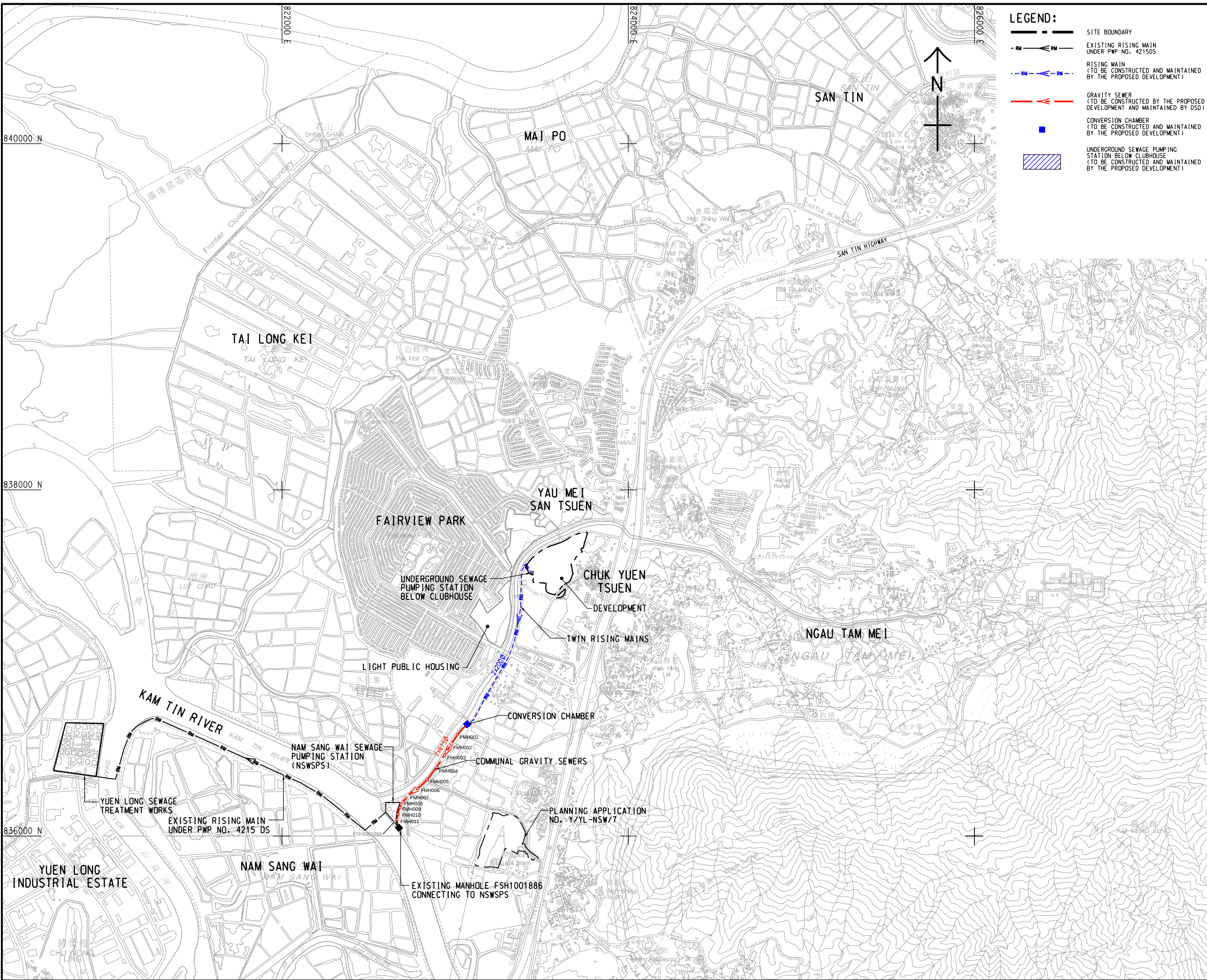
Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Wan, Willie

Appendix 5

Hydraulic Assessment of Proposed Communal Sewer



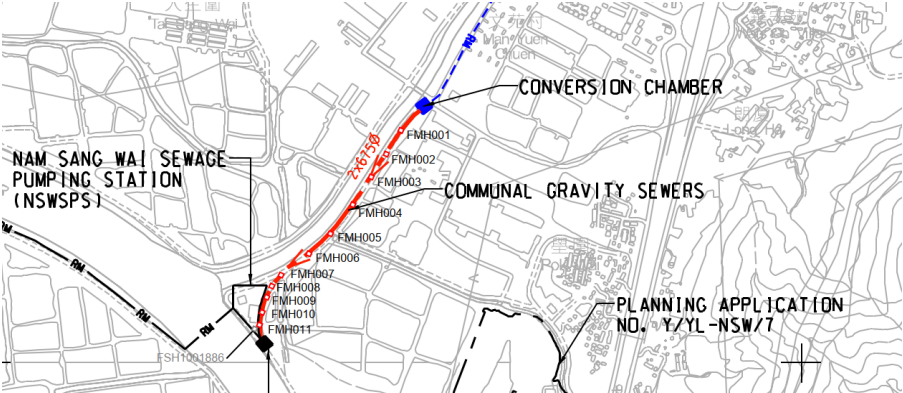
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Hydraulic Assessment of Communal Sewers

Case 1: The Proposed Development Proceeds to Construct the Proposed Communal Gravity Sewer First

Site	Application No.	ADWF (m³/day)	Remarks	Proposed Discharge
1	Y/YL-MP/10	1,973.0	Application Site	To the communal gravity sewer.
2	Y/YL-MP/8	1,020.2	REC Northern Site	
3	Y/YL-MP/7	1,038.5	REC Southern Site	
4	Y/YL-ST/1	3,229.0	referenced to Y/YL-NSW/7 SIA	
5	Y/YL-NSW/7	1,565.0	referenced to Y/YL-NSW/7 SIA	To FMH005.
Total		8,825.7		

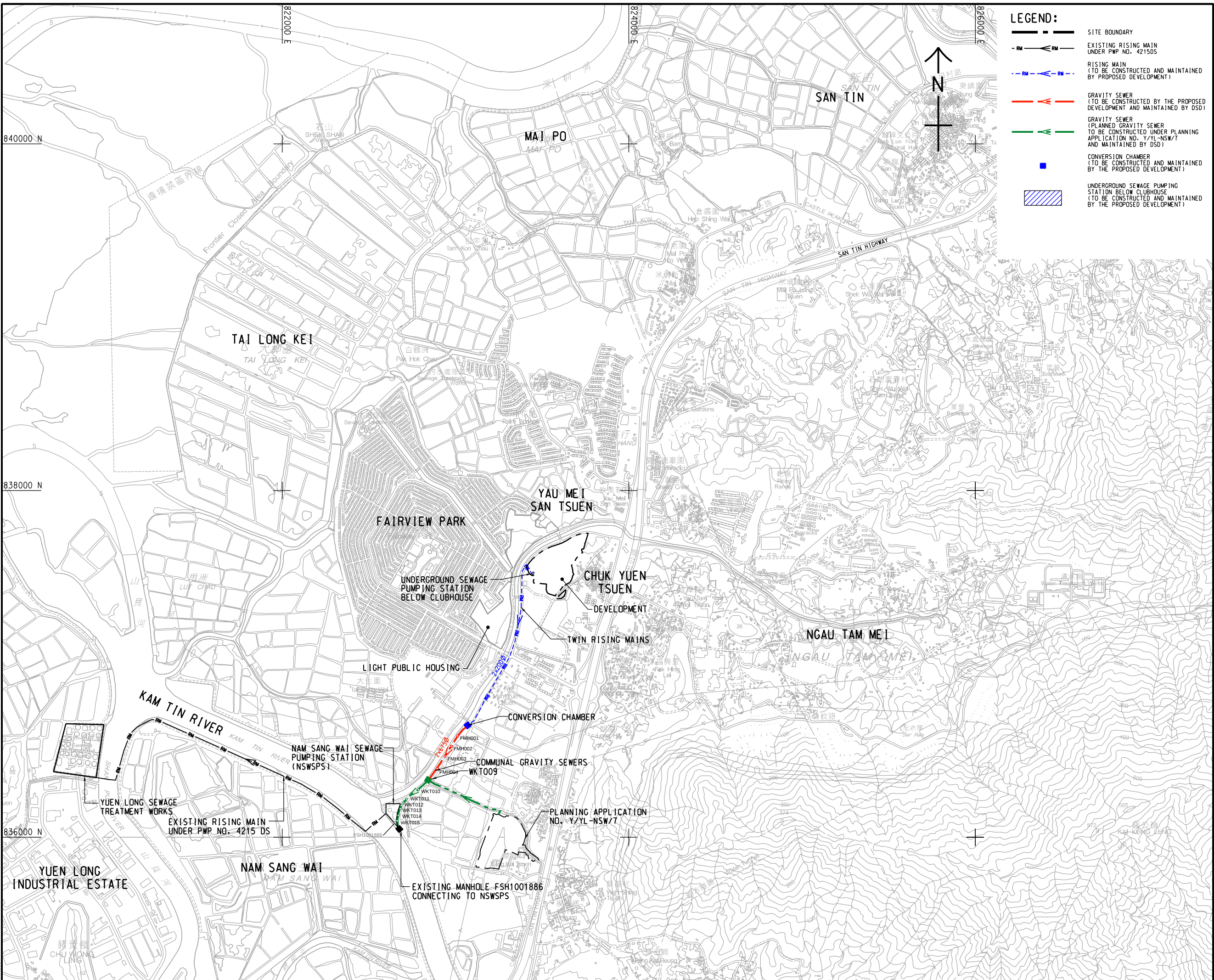
V of water = 0.000001 m²/s 20°C



Manhle No.		Pipe																		
		Cover Level		Invert Level		Nominal Outside Diameter (OD)	Nominal Diameter (DN)	Length	Hydraulic Radius	Flow Area	Pipe Gradient	Pipe Velocity	Capacity	Roughness ⁽⁴⁾	Accumulated ADWF	Contributing Population	Peaking Factor	Estimated Peak Discharge	Capacity Check	Remark
U/S	D/S	U/S	D/S	U/S	D/S															
Conversion Chamber	FMH001	4.50	4.50	-2.68	-2.87	800	675	75.0	0.152	0.36	400	1.40	1.00	0.150	7,261	26,892	4	0.336	34	ADWF from Site 1 - 4.
FMH001	FMH002	4.50	4.55	-2.87	-3.04	800	675	70.0	0.152	0.36	400	1.40	1.00	0.150	7,261	26,892	4	0.336	34	ADWF from Site 1 - 4.
FMH002	FMH003	4.55	4.60	-3.04	-3.22	800	675	70.0	0.152	0.36	400	1.40	1.00	0.150	7,261	26,892	4	0.336	34	ADWF from Site 1 - 4.
FMH003	FMH004	4.60	4.65	-3.22	-3.41	800	675	75.0	0.152	0.36	400	1.40	1.00	0.150	7,261	26,892	4	0.336	34	ADWF from Site 1 - 4.
FMH004	FMH005	4.65	4.20	-3.41	-3.61	800	675	80.0	0.152	0.36	400	1.40	1.00	0.150	7,261	26,892	4	0.336	34	ADWF from Site 1 - 4.
FMH005	FMH006	4.20	4.00	-3.61	-3.81	800	675	80.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH006	FMH007	4.00	4.15	-3.81	-4.01	800	675	80.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH007	FMH008	4.15	4.20	-4.01	-4.12	800	675	45.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH008	FMH009	4.20	4.15	-4.12	-4.21	800	675	35.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH009	FMH010	4.15	4.10	-4.21	-4.28	800	675	30.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH010	FMH011	4.10	4.05	-4.28	-4.34	800	675	25.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.
FMH011	FSH1001886	4.05	5.35	-4.34	-4.38	800	675	15.0	0.152	0.36	400	1.40	1.00	0.150	8,826	32,688	4	0.409	41	ADWF from Site 1 - 5.

Note:

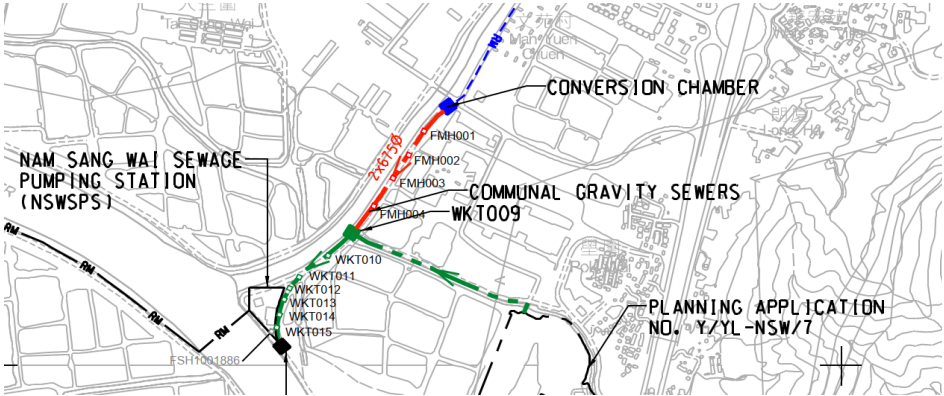
- Contributing population = Projected Flow + Flow from Development (ADWF in m³/day) / 0.27 (m³/person/day).
- Peaking factor with stormwater allowance is adopted.
- The proposed gravity sewer shall be constructed to discharge the sewage to from the both R(D) and REC Development and other residential development which has similar sewerage arrangement in the vicinity to the existing NSWSPS and ultimately to YLEPP.
- According to SIA under Planning Application No.: Y/YL-NSW/7, the proposed sewerage pipes to be HDPE pipe under normal condition, and pursuant to the Sewerage Manual, assume the roughness value of HDPE sewer type with slimed sewer ks=0.15.
- The infomration of WKT009 to FSH1001886 is extracted from the SIA submitted under Y/YL-NSW/7. According to this SIA, proposed sewage from sites 4 and 5 will be discharged into WKT009 via the sewer sections WKT001 to WKT009..



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Hydraulic Assessment of Communal Sewers
Case 2: Y/YL-NSW/7 Proceeds to Construct the Proposed Communal Gravity Sewer First

Site	Application No.	ADWF (m³/day)	Remarks	Proposed Discharge
1	Y/YL-MP/10	1,973.0	Application Site	To the communal gravity sewer.
2	Y/YL-MP/8	1,020.2	REC Northern Site	
3	Y/YL-MP/7	1,038.5	REC Southern Site	
4	Y/YL-ST/1	3,229.0	referenced to Y/YL-NSW/7 SIA	To WKT009.
5	Y/YL-NSW/7	1,565.0	referenced to Y/YL-NSW/7 SIA	
Total		8,825.7		



Manhle No.		Pipe																		
		Cover Level		Invert Level		Nominal Outside Diameter (OD)	Nominal Diameter (DN)	Length	Hydraulic Radius	Flow Area	Pipe Gradient	Pipe Velocity	Capacity	Roughness ⁽⁴⁾	Accumulated ADWF	Contributing Population	Peaking Factor	Estimated Peak Discharge	Capacity Check	Remark
U/S	D/S	U/S	D/S	U/S	D/S															
Conversion Chamber	FMH001	4.50	4.50	-0.93	-1.11	800	675	75.0	0.152	0.36	400	1.40	1.00	0.150	4,032	14,933	4	0.187	19	ADWF from Site 1 - 3.
FMH001	FMH002	4.50	4.55	-1.11	-1.29	800	675	70.0	0.152	0.36	400	1.40	1.00	0.150	4,032	14,933	4	0.187	19	ADWF from Site 1 - 3.
FMH002	FMH003	4.55	4.60	-1.29	-1.46	800	675	70.0	0.152	0.36	400	1.40	1.00	0.150	4,032	14,933	4	0.187	19	ADWF from Site 1 - 3.
FMH003	FMH004	4.60	4.65	-1.46	-1.65	800	675	75.0	0.152	0.36	400	1.40	1.00	0.150	4,032	14,933	4	0.187	19	ADWF from Site 1 - 3.
FMH004	WKT009	4.65	4.20	-1.65	-1.85	800	675	80.0	0.152	0.36	400	1.40	1.00	0.150	4,032	14,933	4	0.187	19	ADWF from Site 1 - 3.
WKT009	WKT010	4.20	4.00	-1.85	-2.11	710	623.6	80.0	0.140	0.31	308	1.52	0.46	0.150	8,826	32,688	4	0.409	88	ADWF from Site 1 - 5.
WKT010	WKT011	4.00	4.15	-2.11	-2.38	710	623.6	80.0	0.140	0.31	296	1.55	0.47	0.150	8,826	32,688	4	0.409	86	ADWF from Site 1 - 5.
WKT011	WKT012	4.15	4.20	-2.38	-2.53	710	623.6	45.0	0.140	0.31	300	1.54	0.47	0.150	8,826	32,688	4	0.409	87	ADWF from Site 1 - 5.
WKT012	WKT013	4.20	4.15	-2.53	-2.65	710	623.6	35.0	0.140	0.31	292	1.56	0.48	0.150	8,826	32,688	4	0.409	86	ADWF from Site 1 - 5.
WKT013	WKT014	4.15	4.10	-2.65	-2.75	710	623.6	30.0	0.140	0.31	300	1.54	0.47	0.150	8,826	32,688	4	0.409	87	ADWF from Site 1 - 5.
WKT014	WKT015	4.10	4.05	-2.75	-2.83	710	623.6	25.0	0.140	0.31	313	1.51	0.46	0.150	8,826	32,688	4	0.409	89	ADWF from Site 1 - 5.
WKT015	FSH1001886	4.05	5.35	-2.83	-2.88	710	623.6	15.0	0.140	0.31	300	1.54	0.47	0.150	8,826	32,688	4	0.409	87	ADWF from Site 1 - 5.

Note:

- Contributing population = Projected Flow + Flow from Development (ADWF in m³/day) / 0.27 (m³/person/day).
- Peaking factor with stormwater allowance is adopted.
- The proposed gravity sewer shall be constructed to discharge the sewage to from the both R(D) and REC Development and other residential development which has similar sewerage arrangement in the vicinity to the existing NSWSPS and ultimately to YLEPP.
- According to SIA under Planning Application No.: Y/YL-NSW/7, the proposed sewerage pipes to be HDPE pipe under normal condition, and pursuant to the Sewerage Manual, assume the roughness value of HDPE sewer type with slimed sewer ks=0.15.
- The infomration of WKT009 to FSH1001886 is extracted from the SIA submitted under Y/YL-NSW/7. According to this SIA, proposed sewage from sites 4 and 5 will be discharged into WKT009 via the sewer sections WKT001 to WKT009..

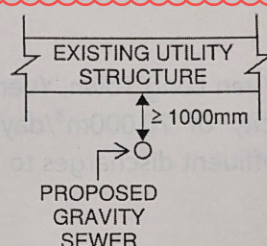
Appendix 6

Planned Communal Gravity Sewers under Approved Application No. Y/YL-NSW/7

with necessary manholes will be constructed from the Proposed Development and connect to the existing NSWSPS. No private land will be affected for making such connection.

- 4.1.3 As per EPD request, the proposed gravity sewers have taken account the sewage flow from other sites in the vicinity leading to NSWSPS via Pok Wai South Road. The proposed sewage disposal scheme, proposed sewer longitudinal profile and calculations of design flow and manhole schedule are shown in **Figure 2**, **Figure 3** and **Annex 4** respectively. Clearance of not less than 1000mm will be maintained between the proposed sewers and existing utility structures (i.e. 2 cells 4000x2950 Box Culvert at J/O Kam Pok Road and Pok Wai West Road and 4 cells 2500x2000 trunk box culvert at Pok Wai South Road near Pok Wai West Road).

planned communal gravity sewers under Approved Planning Application No. Y/YL-NSW/7



Section showing the interface between existing utility structure and proposed gravity sewer

- 4.1.4 The design capacity of NSWSPS is 42,921m³/day in ADWF and the average daily flow recorded in December 2021 is around 3,600m³/day (see **Annex 3**). Based on the calculations shown in **Table 2**, the estimated sewage to be generated from the Proposed Development is 1,565m³/day, which is only equivalent to 3.6% of existing NSWSPS design capacity and 2.2% of existing YLSTW design capacity. Therefore, it is considered that sewage generated by the Proposed Development would not overload NSWSPS and YLSTW.

- 4.1.5 A matrix for different type of proposed sewerage system is provided in **Table 3** to summarize the construction and maintenance responsibilities.

Table 3 – Matrix of construction and maintenance responsibilities

Element	Location	Construction Responsibility	Maintenance Responsibility
Proposed Sewage Pumping Station	Within Development Boundary	The Developer	The Developer
Proposed Rising Mains	Within Development Boundary	The Developer	The Developer
Proposed Terminal Manhole	Within Development Boundary	The Developer	The Developer
Proposed Sewers and Manholes	Outside Development Boundary	The Developer	DSD

5. EVALUATION OF THE STRATEGY AND RECOMMENDATIONS

5.1 Regional sewerage strategy

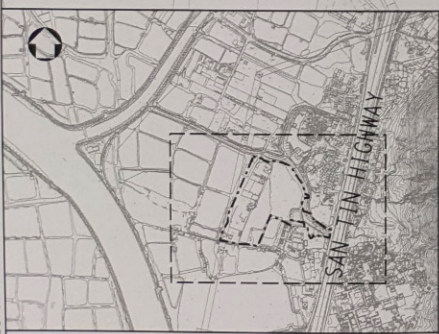
Matrix of construction and maintenance responsibilities under the Approved Application Y/YL-NSW/7

Planing communal gravity
sewers under the
Approved Application
Y/YL-NSW/7

NAM SANG WAI
SEWAGE PUMPING
STATION (NSWSPS)

FWD1050573
DIAMETER 1200(mm)
UPSTREAM INVERT LEVEL -4.4(mPD)

FSH1001886
CL 5.35
A1-3.70-1200
A2-4.38-700
X1-4.40-1200
SP M/H



KEY PLAN
1 : 30000

- LEGEND:
- REZONING SITE
 - DEVELOPMENT BOUNDARY
 - PROPOSED ALIGNMENT OF GRAVITY SEWERS AND MANHOLE
 - PROPOSED ALIGNMENT OF TWIN RISING MAIN
 - PROPOSED LAST MANHOLE

Title PROPOSED SEWAGE DISPOSAL SCHEME	Figure no. FIGURE 2	
	Prepared SYW	Checked CYW
	Date 04/22	Scale A3 1:3000

PROPOSED REZONING FROM "QUICDWRA1" TO "QUICDWRA11" FOR COMPREHENSIVE RESIDENTIAL DEVELOPMENT WITH WETLAND RESTORATION AREA AT VARIOUS LOTS IN DD104 AND ADJOINING GOVERNMENT LAND, WING KEI TSUEN, NAM SANG WAI, YUEN LONG - S12A AMENDMENT OF PLAN APPLICATION



Plot date : 8/3/2022

Annex 4

Calculations of Design Flow and Manhole Schedule

PROPOSED MANHOLE SCHEDULE FOR WING KEI TSUEN

MANHOLE NO.	MANHOLE TYPE	COVER LEVEL (mPD)	INLET		OUTLET			Pipe material	Type of Bedding	Remarks
			INVERT LEVEL (mPD)	PIPE SIZE (mm) OD	INVERT LEVEL (mPD)	PIPE SIZE (mm) OD	TO MANHOLE			
WKT000	L	4.70	-0.27	400	-0.36	400	WKT001	HDPE	TYPE B BEDDING	-
WKT001	L	4.60	-0.36	560	-0.50	560	WKT002	HDPE	TYPE B BEDDING	-
WKT002	L	4.90	-0.50	560	-0.56	560	WKT003	HDPE	TYPE B BEDDING	-
WKT003	L	4.85	-0.56	560	-0.63	560	WKT004	HDPE	TYPE B BEDDING	-
WKT004	L	4.80	-0.63	560	-0.90	560	WKT005	HDPE	TYPE B BEDDING	-
WKT005	L	4.75	-0.90	560	-1.16	560	WKT006	HDPE	TYPE B BEDDING	-
WKT006	L	4.70	-1.16	560	-1.43	560	WKT007	HDPE	TYPE B BEDDING	-
WKT007	L	4.50	-1.43	560	-1.70	560	WKT008	HDPE	TYPE B BEDDING	-
WKT008	Special Type 1	4.70	-1.70	560	-1.85	560	WKT009	HDPE	TYPE B BEDDING	-
WKT009	L	4.20	-1.85	710	-2.11	710	WKT010	HDPE	TYPE B BEDDING	-
WKT010	L	4.00	-2.11	710	-2.38	710	WKT011	HDPE	TYPE B BEDDING	-
WKT011	Special Type 1	4.15	-2.38	710	-2.53	710	WKT012	HDPE	TYPE B BEDDING	-
WKT012	Special Type 1	4.20	-2.53	710	-2.65	710	WKT013	HDPE	TYPE B BEDDING	-
WKT013	Special Type 1	4.15	-2.65	710	-2.75	710	WKT014	HDPE	TYPE B BEDDING	-
WKT014	Special Type 1	4.10	-2.75	710	-2.83	710	WKT015	HDPE	TYPE B BEDDING	-
WKT015	Special Type 1	4.05	-2.83	710	-2.88	710	Existing	HDPE	TYPE B BEDDING	-

*Remarks: Special Type Manhole details will be provided in detailed design stage.

Design Flow Calculation

Nearby Potential Development	ADWF (m3/day)	Contributing Population
Planning Application No. Y/YL-MP/6	2472.65	9158
Planning Application No. Y/YL-MP/7	986.84	3655
Planning Application No. Y/YL-MP/8	975.26	3613
Planning Application No. Y/YL-ST/1	3229	11960
Planning Application No. Y/YL-NSW/7	1565	5797

Potential flow from the Approved Application No. Y/YL-MP/6 with ADWF of **2472.65 m³/day** has been taken into account, which is larger than current ADWF of **1973 m³/day**.

Section	Contributing Development	Total ADWF (m3/day)	Total Contributing Population	Peaking Factor	Design Peak Flow (m3/day)	Design Peak Flow (m3/s)
WKT000 - WKT001	Planning Application No. Y/YL-NSW/7	1565	5797	4	6260	0.072
WKT001 - WKT009	Planning Application No. Y/YL-ST/1	4794	17757	3	14382	0.166
WKT009 - WKT015	Planning Application No. Y/YL-NSW/7 Planning Application No. Y/YL-MP/6 Planning Application No. Y/YL-MP/7 Planning Application No. Y/YL-MP/8 Planning Application No. Y/YL-ST/1 Planning Application No. Y/YL-NSW/7	9228.75	34183	3	27686.25	0.320

PROPOSED REZONING FROM "OU(CDWRA)" TO "OU(CDWRA)1"
FOR COMPREHENSIVE RESIDENTIAL DEVELOPMENT WITH WETLAND RESTORATION AREA
AT VARIOUS LOTS IN DD104 AND ADJOINING GOVERNMENT LAND,
WING KEI TSUEN, NAM SANG WAI, YUEN LONG – S12A AMENDMENT OF PLAN APPLICATION

Manhole Schedule - Wing Kei Tsuen

Manhole No.	Manhole type	Backdrop manhole required	Manhole type (Combine)	To Manhole	From Manhole	Ground Level (mPD)	PIPE IN			PIPE OUT			
							Invert Level (mPD)	Pipe Size (mm) DN	Pipe Size (mm) OD	Invert Level (mPD)	IL Check	Pipe Size (mm) DN	Pipe Size (mm) OD
WKT000	L	-	L	WKT001	WKT000	4.70	-0.27	351.35	400.00	-0.36	OK	351.35	400.00
WKT001	L	No	L	WKT002	WKT001	4.60	-0.36	491.85	560.00	-0.50	OK	491.85	560.00
WKT002	L	No	L	WKT003	WKT002	4.90	-0.50	491.85	560.00	-0.56	OK	491.85	560.00
WKT003	L	No	L	WKT004	WKT003	4.85	-0.56	491.85	560.00	-0.63	OK	491.85	560.00
WKT004	L	No	L	WKT005	WKT004	4.80	-0.63	491.85	560.00	-0.90	OK	491.85	560.00
WKT005	L	No	L	WKT006	WKT005	4.75	-0.90	491.85	560.00	-1.16	OK	491.85	560.00
WKT006	L	No	L	WKT007	WKT006	4.70	-1.16	491.85	560.00	-1.43	OK	491.85	560.00
WKT007	L	No	L	WKT008	WKT007	4.50	-1.43	491.85	560.00	-1.70	OK	491.85	560.00
WKT008	Special Type 1	No	Special Type 1	WKT009	WKT008	4.70	-1.70	491.85	560.00	-1.85	OK	491.85	560.00
WKT009	L	No	L	WKT010	WKT009	4.20	-1.85	623.60	710.00	-2.11	OK	623.60	710.00
WKT010	L	No	L	WKT011	WKT010	4.00	-2.11	623.60	710.00	-2.38	OK	623.60	710.00
WKT011	Special Type 1	No	Special Type 1	WKT012	WKT011	4.15	-2.38	623.60	710.00	-2.53	OK	623.60	710.00
WKT012	Special Type 1	No	Special Type 1	WKT013	WKT012	4.20	-2.53	623.60	710.00	-2.65	OK	623.60	710.00
WKT013	Special Type 1	No	Special Type 1	WKT014	WKT013	4.15	-2.65	623.60	710.00	-2.75	OK	623.60	710.00
WKT014	Special Type 1	No	Special Type 1	WKT015	WKT014	4.10	-2.75	623.60	710.00	-2.83	OK	623.60	710.00
WKT015	Special Type 1	No	Special Type 1	Existing	WKT015	4.05	-2.83	623.60	710.00	-2.88	OK	623.60	710.00

Manhole No.	Material of pipe	Velocity (m/s)	Velocity check	Cumulative Design Flow (m3/s)	Full Bore Capacity (m3/s)	Full Bore Capacity with 10% reduction (m3/s)	Usage percentage (%)	Capacity check	TYPE OF BEDDING
WKT000	HDPE	1.22	OK	0.072	0.118	0.107	67.98	OK	TYPE B BEDDING
WKT001	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT002	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT003	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT004	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT005	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT006	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT007	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT008	HDPE	1.51	OK	0.166	0.287	0.258	64.46	OK	TYPE B BEDDING
WKT009	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT010	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT011	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT012	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT013	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT014	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING
WKT015	HDPE	1.75	OK	0.320	0.535	0.481	66.56	OK	TYPE B BEDDING

Details of the planned communal gravity sewers under the Approved Application No. Y/YL-NSW/7

20.00	300
80.00	300
80.00	300
80.00	300
80.00	300
80.00	300
45.00	300
80.00	300
45.00	300
35.00	300
30.00	300
25.00	300
15.00	300