

Appendix 10

Sewerage Impact Assessment

Lot 4822 in D.D. 104, Kam Pok Road and the Adjacent Government Land, Mai Po, Yuen Long

Sewerage Impact Assessment

July 2025

Date	Revision	Prepared by	Checked by	Approved by
July 2025	0	Robben Cheung	Casey Man	T.C Lam



**Meinhardt Infrastructure and
Environment Ltd**

邁進基建環保工程顧問有限公司

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1. INTRODUCTION

- 1.1. Meinhardt Infrastructure & Environment Limited (MIEL) has been commissioned to conduct a Sewerage Impact Assessment (“SIA”) to demonstrate the proposed medium-rise residential development on the Application Site is technically feasible in the sewage disposal aspect.
- 1.2. The Application Site (hereinafter referred to as “the Site”) is located east of Kam Pok Road near Fairview Park in Yuen Long. The Site location is shown in **Appendix A**.
- 1.3. The objectives of this SIA are as follows:
 - Identification of existing sewerage facilities serving the concerned area;
 - Description of methodology adopted in this assessment;
 - Estimation of sewage flow from the subject development;
 - Assessment of sewerage impact on the existing or/and planned sewerage facilities due to the increased sewage flow from the subject development; and
 - Recommendation of on-site sewerage facilities to cater for the development if found necessary.

2. GENERAL SITE DESCRIPTION

- 2.1. The Site is bounded by Fung Chuk Road, Ha Chuk Yuen Road, Kam Pok Road and Ha San Wai Road covering a total land area of about 37,870m². It is located in the vicinity of Fairview Park, Villa Camellia, Helene Terrace, 3-storey village dwellings in Ha San Wai and Yau Pok Road Light Public Housing.
- 2.2. The existing topography of the Site is sloping gently from the north towards the south with ground level varies from +7.0mPD to +4.3mPD approximately.

3. DEVELOPMENT PROPOSAL

- 3.1. The proposed development comprises five medium-rise residential buildings with a domestic plot ratio of 1.5, a club house, one 6-classroom kindergarten and a neighbourhood elderly centre. The building heights of these 5 residential towers are 16 residential storeys high. The total domestic GFA is about 56,805m². Upon completion in 2031, the proposed development will provide a total of 1,303 private high-quality flats.
- 3.2. The proposed development also includes a two-storey clubhouse, which includes a restaurant, an indoor swimming pool and an outdoor swimming pool. GFA of the clubhouse and the 6-classroom kindergarten are about 2,272m² and 380m² respectively. The neighbourhood elderly centre with NOFA is 303m².
- 3.3. The proposed master layout plan is shown in **Appendix A**.

4. EXISTING AND PLANNED SEWERAGE SYSTEM

Existing Sewerage System

- 4.1. Based on the sewerage records, there are no existing public sewers in the vicinity of the Site. The closest existing public sewerage facility is Nam Sang Wai Sewage Pumping Station (NSWSPS),

which is located west of Pok Wai South Road. The collected sewage in NSWSPS is eventually conveyed to existing Yuen Long Sewage Treatment Works (YLSTW).

- 4.2. The designed capacity and the current average daily flow in terms of ADWF (m³/day) of NSWSPS are shown in **Table 1**.

Table 1 – Capacity of NSWSPS

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

Planned Sewerage System

- 4.3. 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 100,000m³/day. The project completion date of YLEPP – Stage 1 is mid-2027, which will be completed before the completion of the proposed development at the Site in 2031. The following Stage 2 works being planned to increase YLEPP treatment capacity to 180,000m³/day by 2030 tentatively.
- 4.4. According to the approved Planning Application No. Y/YL-NSW/7, there will be communal gravity sewers ranging from 375mm to 600mm diameter located along Pok Wai West Road and Pok Wai South Road connecting to NSWSPS. These sewers from manhole WKT009 to manhole WKT015 are planned to serve the potential development in the surrounded area with a minimum capacity of 15,500m³/d, which is an initial estimation by EPD, and Yau Pok Road Light Public Housing and proposed development at Yau Mei San Tsuen with an estimated sewage flow of 1,066.65m³/d and 962.28 m³/d respectively. The estimated sewage flow from Yau Pok Road Light Public Housing and Yau Mei San Tsuen is shown in **Appendix B**. The proposed completion year of this rezoning development is 2028.

5. ASSESSMENT METHODOLOGY AND PARAMETERS

- 5.1. Capacity assessment of the public sewers, pumping station and sewage treatment plant is being carried out to assess the adequacy of the capacity in the existing or/and planning sewerage system. The design parameters and standards are shown in **Table 2** below.

Table 2 - Design Parameters and Standards

Design Standards/ Guidelines	<ul style="list-style-type: none"> • DSD Sewerage Design Manual, Part 1 & 2 (SDM) • EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) • Data published by Census and Statistics Department (C&SD) • Commercial and Industrial Floor Space Utilization Survey (CIFSUS) by Planning Department
Flow Formula	Colebrook White Formula

Sewer Roughness Coefficient, Ks	1.5 mm
Unit Flow Factor	<ul style="list-style-type: none"> • 0.27m³/d/head (Domestic, Private R2) • 0.28m³/d/head (Commercial Employee plus “Community, Social & Personal Services”, J11) • 1.58m³/d/head (Commercial Employee plus “Restaurants & Hotels”, J10) • 0.04m³/d/head (School Student)
Contributing Population	Contributing Population = Calculated ADWF/0.27
Peaking Factors	Table T-5 of GESF
Catchment Inflow Factor	Table T-4 of GESF Catchment Inflow Factors (PCIF): Yuen Long =1.00
Average Household Size	2.7
Staff Density of Club House	Table 8 of CIFSUS Community, Social & Personal Services: 2.3 workers per 100m ² GFA
No. of Staff in Restaurant	15
No. of Student in Kindergarten	180 (6 classes of 30 students)
No. of Teacher in Kindergarten	23 (Pupil-Teacher Ratio is 8:1 under Key Statistics on Kindergarten Education)
Neighbourhood Elderly Centre Population	76 (4m ² /person)

6. ESTIMATION OF SEWAGE FLOW

6.1. The estimation of sewage flow of the proposed development is shown in **Appendix C** and summarized in **Table 3** below.

Table 3 - Total Estimated Sewage Flow from the Proposed Development

Population Type	No. of Population	Unit Flow Factor (m ³ /d/person)	Average Dry Weather Flow (m ³ /d)
Residential Population	3,519	0.27	950.13
Staff of Clubhouse	53	0.28	14.84
Staff of Restaurant	15	1.58	23.70
Students in Kindergarten	180	0.04	7.20
Teachers in Kindergarten	23	0.28	6.44
Neighbourhood Elderly Centre Population	76	0.28	21.28
Outdoor Swimming Pool	-	-	7.03
Indoor Swimming Pool	-	-	8.44
Total	3,866	-	1039.06

6.2. The estimated Average Dry Weather Flow (ADWF) from the proposed development is approximately 1039.06m³/day.

7. PROPOSED SEWERAGE SYSTEM

- 7.1. The sewage from the proposed development will be collected by the proposed gravity sewers within the Site and then conveyed to the proposed on-site sewage pumping station. The sewage will then be pumped by a twin DN150 rising mains to the communal gravity sewer and eventually be conveyed to NSWSPS.
- 7.2. Under normal circumstances, the sewage from the proposed rezoning development will be directed into NSWSPS via a proposed sewer line (PSL), which runs along the east of Kam Pok Road and Pok Wai Road South, ending at the existing manhole FSH1001886 that connects to NSWSPS, as depicted in Figure 2 in **Appendix D**.
- 7.3. There are five nearby up-zoning application nos. (Y/YL-NSW/7, Y/YL-MP/7, Y/YL-MP/8, Y/YL-MP/9 and Y/YL-MP/10) and a potential site development at Yau Mei San Tsuen. All six proposed developments are expected to have populations by 2031, coinciding with the timeline of this rezoning application.
- 7.4. To manage the cumulative impacts, there are two scenarios:

Scenario 1 (the six proposed developments under application nos. (Y/YL-NSW/7, Y/YL-MP/7, Y/YL-MP/8, Y/YL-MP/9 and Y/YL-MP/10) and the potential site development at Yau Mei San Tsuen (not yet implemented) – The Applicant will be responsible for the entire section of the PSL, accounting for these six potential developments, subject to agreement with the approval authority. Figure 3 in **Appendix D** illustrates the schematic alignment and preliminary technical details of the PSL.

Scenario 2 - If application nos. Y/YL-NSW/7 and Y/YL-MP/10 are completed as planned by 2028 or before the commencement of the current subject rezoning application, the Applicant will liaise directly with the developer involved to arrange the sharing of PSL works. This applies to the other two rezoning applications and one potential development mentioned above. The timing for the full implementation of the PSL will be determined, subject to agreement from the approval authority. Each developer will be responsible for completing any remaining sections of the PSL, as shown in Figure 4 including application nos. Y/YL-NSW/7 and Y/YL-MP/10 in **Appendix D**. The sewage will be pumped from NSWSPS to YLEPP eventually.

- 7.5. The hydraulic checking of the proposed rising mains is shown in **Appendix E**.

8. SEWERAGE IMPACT ASSESSMENT

- 8.1. The sewerage impact on NSWSPS and the communal gravity sewers due to the sewage flow generated by the proposed development within the Site has been assessed.
- 8.2. The results of the sewerage assessment on NSWSPS are summarized in **Table 4**. **Table 5-6** summarizes the implications of the communal gravity sewers in the two scenarios. The hydraulic calculations for the planned communal gravity sewers are shown in **Appendix F**.

Table 4 – Assessment Results of NSWSPS

Sewerage Facility	Design Capacity (m ³ /day)	Current Average Daily Flow (m ³ /day)	Estimated Future Average Daily Flow (m ³ /day) ₍₁₎	Total Future Average Daily Flow (m ³ /day)	Spare Capacity (m ³ /day)
NSWSPS	42,921	3,900	18,567.99	22467.99	20,453.01

(1) The estimated future flow includes the EPD initial estimation for the communal gravity sewers (i.e. 15,500m³/d), the estimated sewage flow from light public housing based on the Project Profile of Yau Pok Road Light Public Housing, Yuen Long (i.e. 1,066.65m³/d) and the potential development at Yau Mei San Tsuen (i.e. 962.28m³/d) (Appendix C refers) and the sewage flow generated from this proposed development.

Table 5 – Assessment Results of the Communal Gravity Sewers (Scenario 1)

Nominal Diameter (mm)	Average Daily Flow (m ³ /day)	Average Daily Flow (m ³ /s)	Peaking Factor	Peak Daily Flow (m ³ /s)	Gradient (1in X)	Flow Velocity (m/s)	Flow Capacity (m ³ /s)
Communal Gravity Sewers under this planning application							
1000	18,567.99	0.215	3.87	0.832	400	1.550	1.361

Table 6 – Assessment Results of the Communal Gravity Sewers (Scenario 2)

	Nominal Diameter (mm)	Average Daily Flow (m ³ /day)	Average Daily Flow (m ³ /s)	Peaking Factor	Peak Daily Flow (m ³ /s)	Gradient (1in X)	Flow Velocity (m/s)	Flow Capacity (m ³ /s)
Communal Gravity Sewers under Y/YL-MP/10								
Existing Design	2 x 675	18,567.99	0.215	3.87	0.832	400	1.167	0.835
Proposed Upgrade	2 x 800	18,567.99	0.215	3.87	0.832	400	1.199	0.933
Communal Gravity Sewers under Y/YL-NSW/7								
Existing Design	600	15,500	0.179	3.98	0.713	300	1.283	0.393
Proposed Upgrade	900	18,567.99	0.215	3.87	0.832	300	1.595	0.970

8.3. For scenario 1, the proposed DN1000 sewer has sufficient capacity to cater the sewage flow generated from the proposed development within the Site and the potential new developments.

8.4. For scenario 2, the results of the assessment have demonstrated that NSWSPS and the proposed communal gravity sewers (2 x DN675) under application no. Y/YL-MP/10 almost use up the capacity to cater the sewage flow generated from the proposed development within the Site. It is suggested to upgrade the sewer to 2 x DN800. Besides, it is found that the existing design of the planned communal gravity sewers under application no. Y/YL-NSW/7 in scenario 1, i.e. DN600, has insufficient capacity to cater its planned ADWF of 18,567.99 m³/day. It is suggested to upgrade the sewer size to DN900. The abovementioned upgrade will allow sufficient capacity to

cater the planned sewage flow and the sewage flow generated by the proposed development within the Site.

- 8.5. After upgrade the planned communal gravity sewers, there will be no adverse sewerage impact on the planned communal gravity sewers, NSWWS and YLEPP due to this proposed development is anticipated.

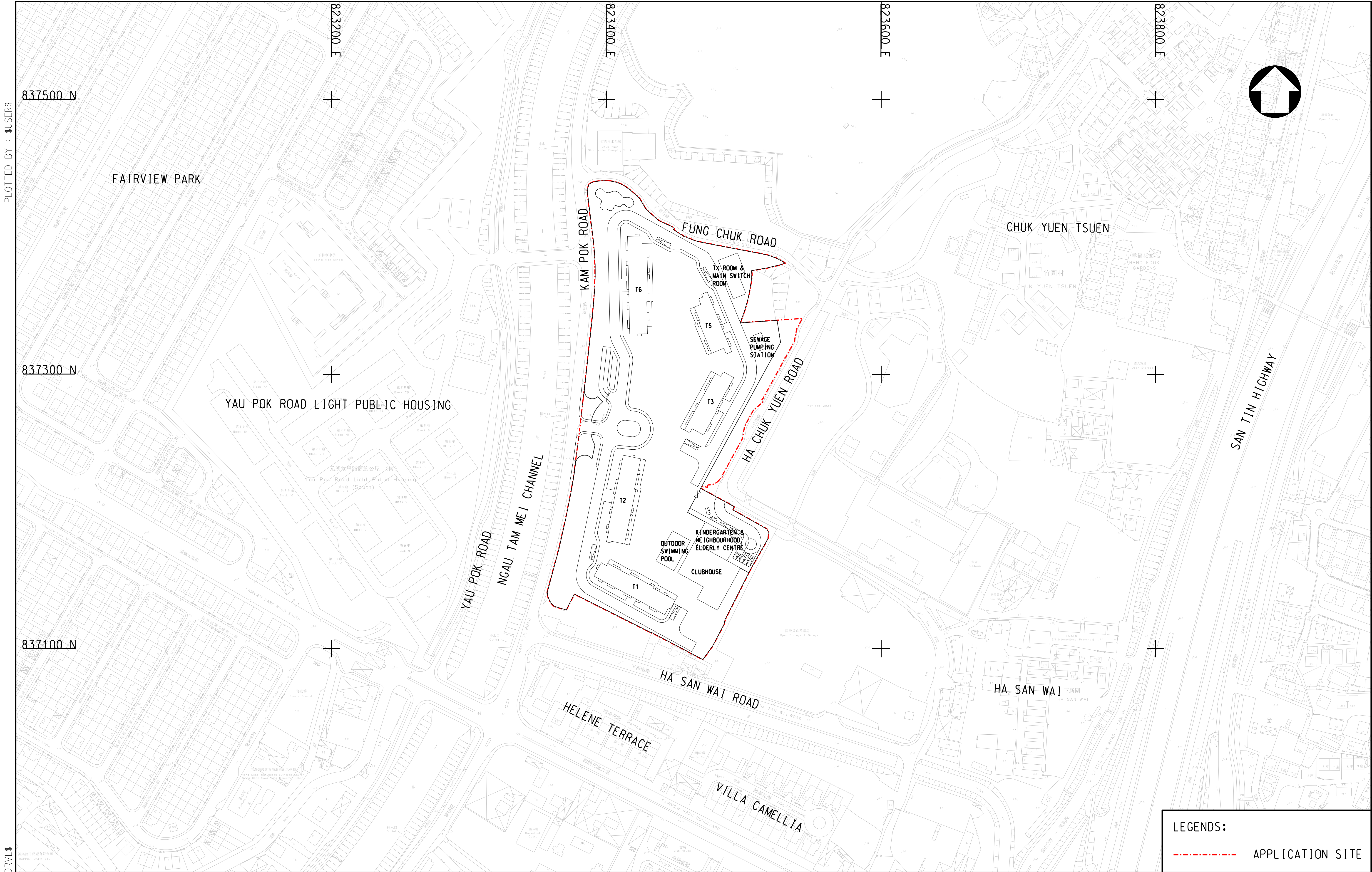
9. MAINTENANCE RESPONSIBILITY

- 9.1. All proposed sewers and sewerage facilities within the proposed development will be constructed, operated and maintained by the Applicant.
- 9.2. The proposed external twin DN150 rising mains will be constructed and maintained by the Applicant.
- 9.3. For the communal gravity sewers, both scenario 1 and scenario 2 are technically feasible. The long-term maintenance of either option will be handed back to relevant government department.

10. CONCLUSION

- 10.1. This report has assessed the sewerage impact due to the proposed development of Lot No. 4822 in D.D. 104 and the adjacent Government Land, Kam Pok Road, Mai Po, Yuen Long.
- 10.2. The sewage flow generated from the proposed development will be collected by proposed gravity sewers within the Site and then conveyed into the proposed sewer line via an on-site underground sewage pumping station. The sewage flow will continue to be conveyed by communal gravity sewers in one of the two scenarios: scenario 1: DN1000 sewer and scenario 2: 2 x DN800 sewer and DN600 sewer (recommended to be upgraded to sewer DN900).
- 10.3. The results of the assessment have demonstrated that both proposed scenario options are technically feasible from the sewerage engineering standpoint.

APPENDIX A – SITE LOCATION AND PROPOSED MASTER LAYOUT PLAN



LEGENDS:

APPLICATION SITE

APPENDIX B – ESTIMATION OF SEWERAGE FLOW FOR YAU POK ROAD LIGHT PUBLIC HOUSING

Project : Lot 4822 in D.D. 104 and the adjacent Government
 Project No. : Land, Kam Pok Road, Mai Po, Yuen Long
 Project No. : 91469
 Prepared by : HSC
 Date : 29/07/2025



Checked by : CYM
 Sheet No. : 1

Estimation of Sewage Flow from the Light Public Housing

Residential Population

Residential Population (person)	=	5500
Unit Flow Factor (m ³ /d/head)	=	0.19
ADWF (m ³ /day)	=	1045.00
ADWF (l/s)	=	12.09

Domestic - Public rental

Community Facilities

Total Gross Floor Area (GFA) (m ²)	=	537.5
Assumed Worker Density (workers per 100m ² GFA)	=	3.3
No. of Staff	=	17.74
Unit Flow Factor (m ³ /d/head)	=	0.28
ADWF (m ³ /day)	=	4.97
ADWF (l/s)	=	0.06

Assumed 50% of Non-Domestic GFA

Table 8 of CIFSUS - All Types - Community, Social & Personal Services

Commercial - J11

Retail

Total Gross Floor Area (GFA) (m ²)	=	376.25
Assumed Worker Density (workers per 100m ² GFA)	=	3.5
No. of Staff	=	13.17
Unit Flow Factor (m ³ /d/head)	=	0.28
ADWF (m ³ /day)	=	3.69
ADWF (l/s)	=	0.04

Assumed 35% of Non-Domestic GFA

Table 8 of CIFSUS - All Types - Retail Trade

Commercial - J4

Resturant

Total Gross Floor Area (GFA) (m ²)	=	161.25
Assumed Worker Density (workers per 100m ² GFA)	=	5.1
No. of Staff	=	8.22
Unit Flow Factor (m ³ /d/head)	=	1.58
ADWF (m ³ /day)	=	12.99
ADWF (l/s)	=	0.15

Assumed 15% of Non-Domestic GFA

Table 8 of CIFSUS - All Types - Restaurants

Resturants & Hotels - J10

Total ADWF (m³/day)	=	1066.65
ADWF (l/s)	=	12.35

Project : Lot 4822 in D.D. 104 and the adjacent Government
 Project No. : Land, Kam Pok Road, Mai Po, Yuen Long
 Project No. : 91469
 Prepared by : HSC
 Date : 29/07/2025



Checked by : CYM
 Sheet No. : 2

Estimation of Sewage Flow from the Proposed Development at Yau Mei San Tsuen

Residential Population

Residential Population (person)	=	3564
Unit Flow Factor (m ³ /d/head)	=	0.27
ADWF (m ³ /day)	=	962.28
ADWF (l/s)	=	11.14

Domestic - Private R2

Total ADWF (m³/day)	=	962.28
ADWF (l/s)	=	11.14

APPENDIX C – ESTIMATION OF SEWERAGE FLOW FOR THE PROPOSED DEVELOPMENT

Project : Lot 4822 in D.D. 104 and the Adjacent Government
 Project No. : Land, Kam Pok Road, Mai Po, Yuen Long
 Project No. : 91469
 Prepared by : HSC
 Date : 29/07/2025



Checked by : CYM
 Sheet No. : 1

Estimation of Sewage Flow from the Proposed Development

Residential

No. of Units	=	1303
Average Household size per unit	=	2.7
Residential Population (person)	=	3519
Unit Flow Factor (m ³ /d/head)	=	0.27
ADWF (m ³ /day)	=	950.13
ADWF (l/s)	=	11.00

Domestic - Private R2

Club House

No. of Storeys	=	2
Gross Floor Area per storey	=	1136
Total Gross Floor Area (GFA) (m ²)	=	2272
Assumed Worker Density (workers per 100m ² GFA)	=	2.3
No. of Staff	=	53
Unit Flow Factor (m ³ /d/head)	=	0.28
ADWF (m ³ /day)	=	14.84
ADWF (l/s)	=	0.17

Table 8 of CIFSUS - Private Commercials -
Community, Social & Personal Services

Commercial - J11

Restaurant

No. of Staff	=	15
Unit Flow Factor (m ³ /d/head)	=	1.58
ADWF (m ³ /day)	=	23.70
ADWF (l/s)	=	0.27

Commercial - J10

Kindergarten

Nos. of Students	=	180
Nos. of Teacher	=	23
Unit Flow Factor - Student (m ³ /d/head)	=	0.04
Unit Flow Factor - Teacher (m ³ /d/head)	=	0.28
ADWF (m ³ /day)	=	13.64
ADWF (l/s)	=	0.16

Assume 6 classes and 30 students in a class
Pupil-Teacher Ratio is around 8:1 under Key
Statistics on Kindergarten Education

Commercial - J11

Neighbourhood Elderly Centre

Population	=	76
Unit Flow Factor - Student (m ³ /d/head)	=	0.28
ADWF (m ³ /day)	=	21.28
ADWF (l/s)	=	0.25

Commercial - J11

Project : Lot 4822 in D.D. 104 and the Adjacent Government
 Project No. : 91469
 Prepared by : HSC
 Date : 29/07/2025



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Outdoor Swinning Pool

Swimming Pool Volume (m ³) (25m x 15m x 1.5m)	=	562.5
Turnover rate (hours)	=	6
Assumed Surface Loading Rate of Filter (m ³ /m ² /hr)	=	20
Filter Area Required (m ²)	=	4.69
Duration of Backwash (min/day)	=	3.00
Assumed Backwash Flowrate (m ³ /m ² /hr)	=	30.00
Volume of Backwash (m ³ /day)	=	7.03
Assumed Discharge Duration (min)	=	3
Discharge Flow Rate (m ³ /min)	=	2.34
Discharge Flow Rate (m ³ /s)	=	0.04

B1.1.2 Outdoor Swimming Pool Turnver Rate -
General Specification for Swimming Pool Water
Treatment Installation

Indoor Swinning Pool

Swimming Pool Volume (m ³) (20m x 15m x 1.5m)	=	450
Turnover rate (hours)	=	4
Assumed Surface Loading Rate of Filter (m ³ /m ² /hr)	=	20
Filter Area Required (m ²)	=	5.63
Duration of Backwash (min/day)	=	3.00
Assumed Backwash Flowrate (m ³ /m ² /hr)	=	30.00
Volume of Backwash (m ³ /day)	=	8.44
Assumed Discharge Duration (min)	=	3
Discharge Flow Rate (m ³ /min)	=	2.81
Discharge Flow Rate (m ³ /s)	=	0.05

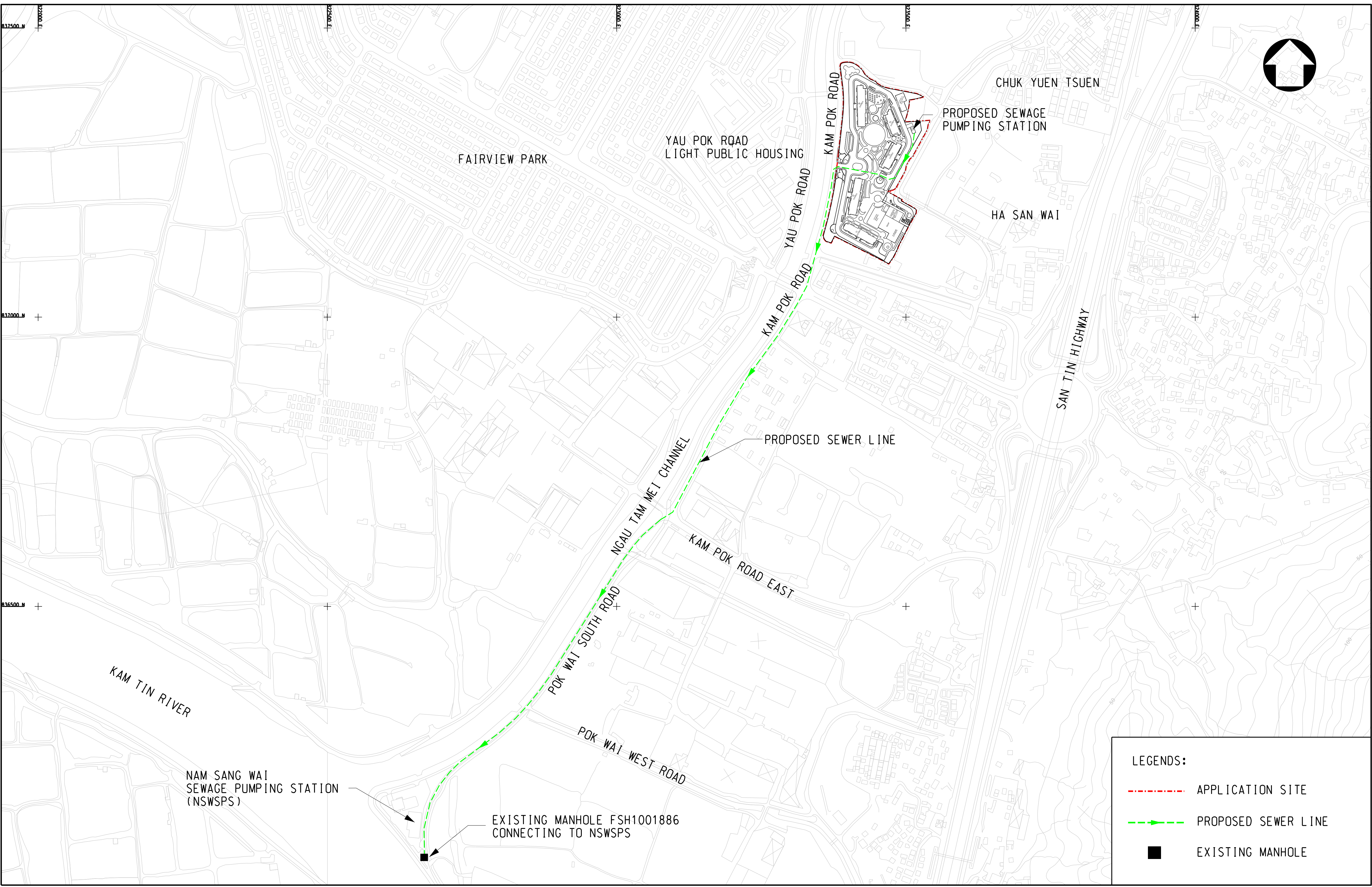
B1.1.2 Indoor Swimming Pool Turnver Rate -
General Specification for Swimming Pool Water
Treatment Installation

Total ADWF (m³/day)	=	1039.06
ADWF (l/s)	=	12.03

APPENDIX D – LAYOUT PLAN FOR PROPOSED PRIVATE SEWAGE PUMPING STATION AND RISING MAINS

PLOTTED BY : \$USER\$

PLOT DRV : \$PLTORVLS\$



LEGENDS:

APPLICATION SITE

PROPOSED SEWER LINE

EXISTING MANHOLE

Meinhardt Infrastructure and Environment Limited
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LOT 4822 IN D.D. 104, KAM POK ROAD AND THE ADJACENT GOVERNMENT LAND, MAI PO, YUEN LONG

PROPOSED SEWERAGE ALIGNMENT

FIGURE 2

Scale 1 : 3000(A1)

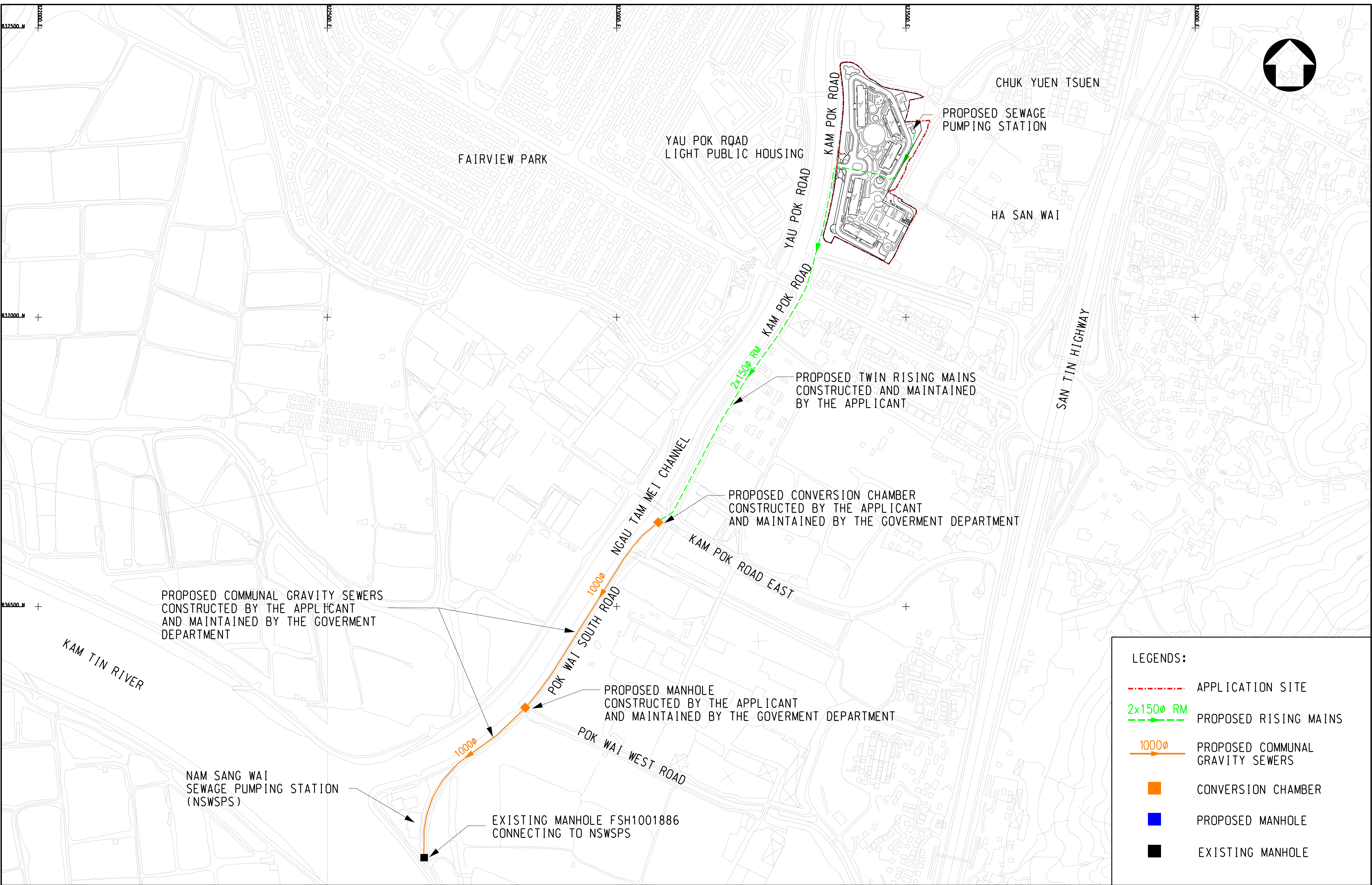
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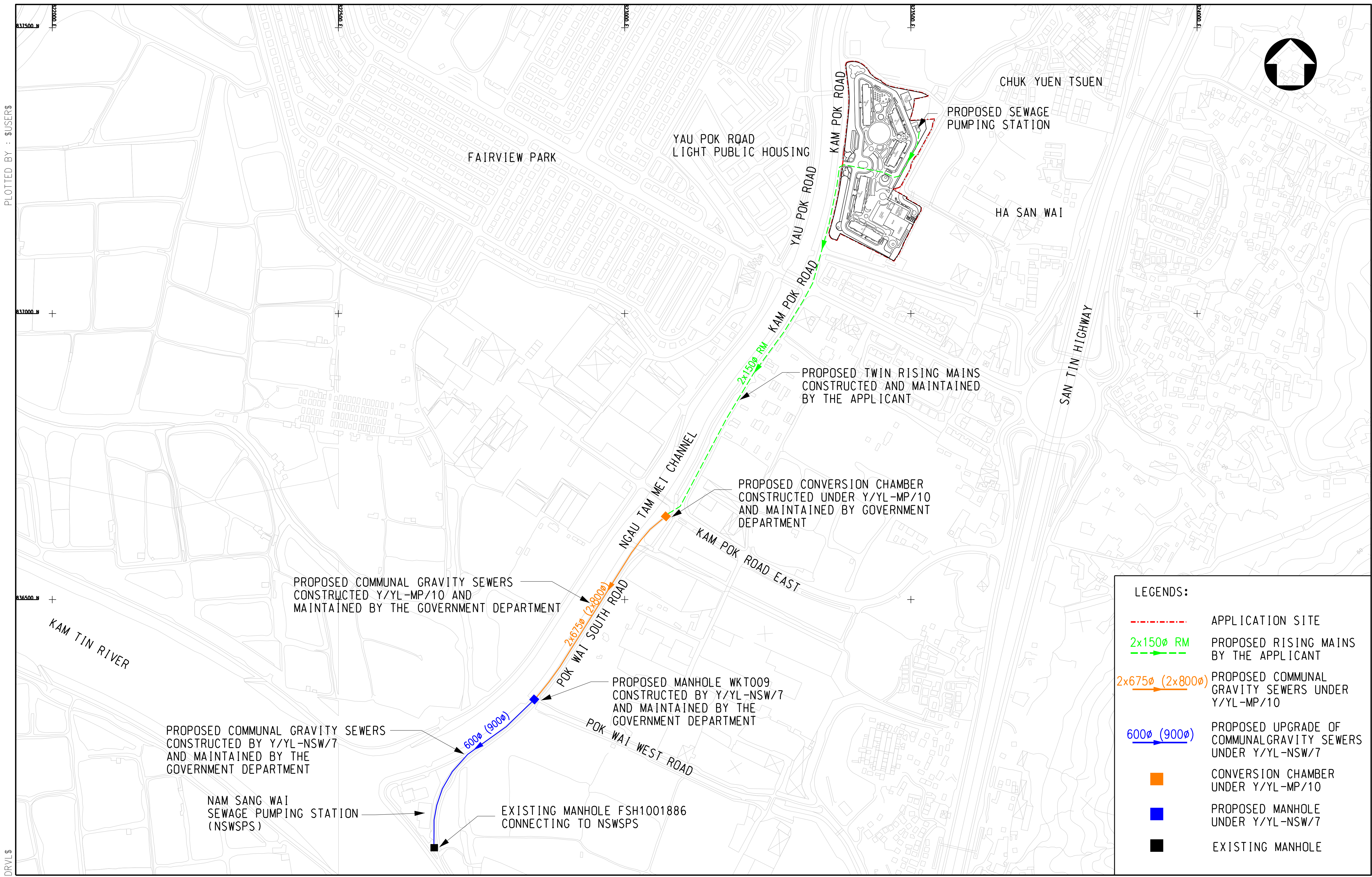
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PLOT DRV : \$PLTDORVL\$

CAD FILE : \$FILE\$



APPENDIX E – HYDRAULIC ASSESSMENT FOR RISING MAINS

Project : Lot 4822 in D.D. 104 and the Adjacent Government
 Project No. : Land, Kam Pok Road, Mai Po, Yuen Long
 Prepared by : 91469
 Date : HSC
 : 29/07/2025



Checked by : CYM
 Sheet No. : 1

Hydraulic Assessment of Proposed Pump Rate

Total ADWF (m ³ /d)	=	1039.06
Contributing Population	=	3848.37
Peaking Factor	=	4
Total PDWF (m ³ /d)	=	4156.24
Total PDWF (l/s)	=	48.10
Design Pump Capacity (l/s)	=	50.00

Design of Proposed Twin Rising Mains

Diameter (mm)	=	140.4
Flow Area of one Rising Main (m ²)	=	0.0155
Flow in one Rising Main (m ³ /s)	=	0.0250
Flow Velocity in one Rising Main (m/s)	=	1.61

APPENDIX F – HYDRAULIC ASSESSMENT FOR COMMUNAL SEWERS

Hydraulic Checking for Communal Gravity Sewers (Scenario 1)																INITIAL	DATE	REV.
																HSC	7/29/2025	-
PROJECT :	Lot 4822 in D.D. 104 and the adjacent Government Land, Kam Pok Road, Yuen Long															Roughness Coefficient ks (mm)	1.5	
Manholes		Pipes Details							Pipe Capacity		Check for Capacity						Check for Self-cleansing Velocity	
From	To	Internal Pipe Diameter (mm)	Upper Ground Level (mPD)	Lower Ground Level (mPD)	Upper Invert Level (mPD)	Lower Invert Level (mPD)	Existing Pipe (Y / N)	Minimum Hydraulic Gradient (1 in _)	Velocity (m/s)	Capacity (m3/s)	ADWF(m³/s)	Contribution Population	Peaking Factor*	Peak Flow (m³/s)	Ratio of the Peak flow to the Full Bore Capacity (%)	Pipe Capacity > Peak Flow?	Velocity in Full Pipe Condition (m/s)	Velocity >1 m/s?
Conversion Chamber	NSWSPS	1057.1	4.50	4.20	NA	NA	N	400	1.550	1.361	0.214907	68770.33	3.87	0.831695	61.12%	YES	1.550	OK

Notes

* Peaking factors taken including stormwater allowance
The contribution population, peaking factors are determined according to GESF published by EPD
Roughness Coefficient ks of 1.5mm is adopted in the assessment.
All proposed sewers will be HDPE pipe

Remarks

Hydraulic Checking for Communal Gravity Sewers (Scenario 2)																INITIAL	DATE	REV.
																HSC	7/29/2025	-
PROJECT :	Lot 4822 in D.D. 104 and the adjacent Government Land, Kam Pok Road, Yuen Long															Roughness Coefficient ks (mm)	1.5	
Manholes		Pipes Details							Pipe Capacity		Check for Capacity						Check for Self-cleansing Velocity	
From	To	Internal Pipe Diameter (mm)	Upper Ground Level (mPD)	Lower Ground Level (mPD)	Upper Invert Level (mPD)	Lower Invert Level (mPD)	Existing Pipe (Y / N)	Minimum Hydraulic Gradient (1 in _)	Velocity (m/s)	Capacity (m3/s)	ADWF(m³/s)	Contribution Population	Peaking Factor*	Peak Flow (m³/s)	Ratio of the Peak flow to the Full Bore Capacity (%)	Pipe Capacity > Peak Flow?	Velocity in Full Pipe Condition (m/s)	Velocity >1 m/s?
WKT009	WKT010	624.6	4.20	4.00	-1.85	-2.11	N	300	1.283	0.393	0.179398	57407.41	3.98	0.713338	181.42%	NO	1.283	OK
WKT009	WKT010	879.8	4.20	4.00	-1.85	-2.11	N	300	1.595	0.970	0.179398	57407.41	3.98	0.713338	73.55%	YES	1.595	OK
Conversion Chamber	WKT009	675	4.50	4.20	NA	NA	N	400	1.167	0.835	0.214907	68770.33	3.87	0.831695	99.58%	YES	1.167	OK
	WKT009	703.9	4.50	4.20	NA	NA	N	400	1.199	0.933	0.214907	68770.33	3.87	0.831695	89.15%	YES	1.199	OK
WKT009	WKT010	879.8	4.20	4.00	-1.85	-2.11	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT010	WKT011	879.8	4.00	4.15	-2.11	-2.38	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT011	WKT012	879.8	4.15	4.20	-2.38	-2.53	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT012	WKT013	879.8	4.20	4.15	-2.53	-2.65	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT013	WKT014	879.8	4.15	4.10	-2.65	-2.75	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT014	WKT015	879.8	4.10	4.05	-2.75	-2.83	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK
WKT015	FSH1001886	879.8	4.05	5.35	-2.83	-2.88	N	300	1.595	0.970	0.214907	68770.33	3.87	0.831695	85.75%	YES	1.595	OK

Notes

* Peaking factors taken including stormwater allowance

The contribution population, peaking factors are determined according to GESF published by EPD

Roughness Coefficient ks of 1.5mm is adopted in the assessment.

All proposed sewers will be HDPE pipe

Remarks

Existing Design

Proposed Upgrade

(2xDN675)

(2xDN700)