

Appendix 3

Revised Sewerage Impact
Assessment (SIA)

PROPOSED SOCIAL WELFARE FACILITIES (RESIDENTIAL CARE HOME FOR THE DISABILITIES (RCHD)) IN “VILLAGE TYPE DEVELOPMENT” ZONE, VARIOUS LOTS IN D.D. 104 AND ADJOINING GOVERNMENT LAND, NAM SANG WAI, YUEN LONG

SEWERAGE IMPACT ASSESSMENT

14 Oct 2025

Report No: RT25285-SIA-02B

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Project:	PROPOSED SOCIAL WELFARE FACILITIES (RESIDENTIAL CARE HOME FOR THE DISABILITIES (RCHD)) IN "VILLAGE TYPE DEVELOPMENT" ZONE, VARIOUS LOTS IN D.D. 104 AND ADJOINING GOVERNMENT LAND, NAM SANG WAI, YUEN LONG SEWERAGE IMPACT ASSESSMENT				
Report No.:	Ref: RT25285-SIA-02A				
Revision	Issue Date	Description	Author	Checker	Approver
0	20/05/2025	Issued for Comment	LY	YS	HM
A	08/07/2025	Issued for Comment	LY	YS	HM
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Prepared By:

Checked by

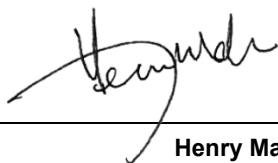


Various

Leo Yu

Consultant

Approved by:



Henry Mak

Director

Disclaimer:

- This report is prepared and submitted by Beexergy Consulting Limited with all reasonable skill to the best of our knowledge, incorporating our Terms and Conditions and taking account of the resources devoted to it by agreement with the client.
- We disclaim any responsibility to the client and others in respect of any matters outside the project scope.
- This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. The Project Proponent proposes to develop a 3-storey Residential Care Home for the Disabilities (RCHD) in various lots in D.D. 104, Nam Sang Wai (hereafter called “the Proposed Development”).
- 1.1.1. BeeXergy Consulting Limited was appointed by DeSPACE (International) Limited (the Town Planner) to conduct a Sewerage Impact Assessment (SIA) for the Proposed Development to support the application under Section 16 of the Town Planning Ordinance. The latest architectural drawings and technical information on the Project Site were largely provided by the Project Architect.

1.2 PROJECT LOCATION

- 1.2.1. The Project Site is approximately 1603m², currently bounded by abandoned fishponds to the north and west, Kam Pok Road East to the south. **Figure 1** shows the location of the Project Site and its surrounding area.

1.3 DESCRIPTION OF THE SUBJECT SITE AND PROPOSED DEVELOPMENT

- 1.3.1. The Project Site area is approximately 1,603m². The Proposed Development is an 3-storey building consisting of RCHD dormitory and communal area. The master layout plan provided by the Project Architect is enclosed in **Appendix A**. The tentative population intake year is 2030.

2 SEWERAGE IMPACT ASSESSMENT

2.1 SCOPE OF WORKS

- 2.1.1. The objective of this SIA is to assess whether the capacity of the sewerage networking is sufficient to cope with the peak sewage flow arising from the Proposed Development during its operation stage or not and to recommend appropriate mitigation measures to alleviate unacceptable sewerage impact, if any.

2.2 EXISTING SEWERAGE FACILITIES

- 2.2.1. The existing sewerage record from the Lands Department (LandsD) and Drainage Service Department (DSD) are obtained for this SIA and attached in **Figure 2**. There are no existing manholes identified in the sewerage plan. The public sewerage facility located closest to the Project Site is Nam Sang Wai Sewage Pumping Station which is located approximately 800m away from the boundary of the Project Site. Reference

was made to the approved planning application (A/YL-NSW/314), a set of existing 225mm public sewerage system (from feature no. MH540 to MH235) is identified along Kam Pok Road East, which is currently not in use, the relevant information is extracted in **Appendix C**.

2.3 OTHER PLANNED SEWERAGE FACILITIES

- 2.3.1. Reference was made to the approved planning application (A/YL-NSW/314), newly proposed sewers (P1 to P15) and upgrading works of the existing sewers identified along Kam Pok Road East (MH540 to MH235) were proposed to serve its own development and planned development sites in vicinity. The proposed sewers of another planning application (A/YL-NSW/349) along Kam Pok Road East (MH660 to MH580) can also serve the Proposed Development. The proposed communal sewers will also become public sewers and maintained by relevant government department such as DSD. The location of the proposed connection are shown in **Figure 3**.
- 2.3.2. It is noted that downstream sections of the communal gravity sewer, from manhole at the junction with Kam Pok Road connecting proposed manhole P3 to existing manhole FSH1001886, which connect along Pok Wai South Road to Nam Sang Wai Sewage Pumping Station (NSWSPS), have been proposed by several approved planning applications (No.: A/YL-NSW/314, Y/YL-NSW/7 and Y/YL-MP/10). The proposed alignment of this downstream section of the communal gravity sewer of different planning applications are shown in **Appendix D**. The proposed communal sewers ranged from twin 675 mm to twin 750 mm for sewer P3 to FSH1001886 along the Pok Wai South Road which will be sufficient to cater the additional sewage due to other nearby developments.

2.4 PROPOSED SEWERAGE FACILITIES

- 2.4.1. New terminal manhole (namely S1, MH700 and MH740) will be built to collect the sewage generated from the Proposed Development and connect to the communal sewer via a new 225mm diameter sewer pipe. The location of the proposed connection are shown in **Figure 3**. The cover level of proposed terminal manhole should be higher than that of the downstream public manhole(s). The proposed new terminal manhole and 225mm sewer pipe within site boundary will be implemented and maintained by the Project Proponent, other proposed manhole and sewer outside site boundary will become a public sewage system serving multiple users and will be handed over to government for future maintenance. The capacity check of the sewer will start from the proposed terminal manhole S1. The proposed development would not have population

intake before the sewerage infrastructure of the project is functionally connected to the public sewerage system by other development mentioned in Section 2.3.

- 2.4.2. For other proposed sewers and upgrading works from MH660 to FSH100188, the Project Proponent will be responsible for the liaison and coordination with the other interfacing projects for the implementation of the required sewerage works in later stage. In case these planned sewers are not available at the time of completion of the Proposed Development, there will be no population intake until proposed sewerage system becomes available, or otherwise the Project Proponent will, after liaison with DSD and the other future developments near the Proposed Site, construct the sewers in order to secure discharge during operation of Proposed Development should a population intake be required.

2.5 MAINTENANCE RESPONSIBILITY

- 2.5.1. All sewers and sewerage facilities within the proposed development will be constructed, operated, and maintained by the Proposed Development.
- 2.5.2. For downstream sections of the communal gravity sewer that are proposed along Kam Pok East and Pok Wai South Rod to NSWSPS will become public sewers and handed over to the DSD for future maintenance.

2.6 ASSESSMENT CRITERIA, METHODOLOGY, AND ASSUMPTIONS

- 2.6.1. The Unit Flow Factors and Global Peaking Factor are adopted from the figures in the Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (Version 1.0)¹ (GESF) issued by the Environmental Protection Department (EPD) in March 2005 to estimate the sewage flows generated from the Project Site.
- 2.6.2. The Unit Flow Factors and Catchment Inflow Factors as shown in **Table 2.1** below are adopted in the assessment and the surrounding catchments are shown in **Figure 3**.

Table 2.1 Unit Flow Factors and Catchment Inflow Factors Extracted from GESF

Parameter	Value	Justification
<i>Population</i>		
Residents in Proposed Development	178 people	178 beds
Employees in Proposed Development	90 people	Advised by Project Proponent

¹ http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/water/guide_ref/files/gesf.pdf

<i>Unit Flow Factors</i>		
Residents and Visitors in Proposed Development	0.19m ³ /day	“Institutional and special class” based on EPD’s GESF Table T-1.
Employees in Proposed Development	0.28m ³ /day	J11 “Community, Social & Personal Services” based on EPD’s GESF Table T-2.
<i>Catchment Inflow Factor (P_{CIF})</i>		
Discharge from the Project Site and all Catchments	1.0	Yuen Long Catchment based on EPD’s GESF Table T-4.

- 2.6.3. With reference to Table T-5 of GESF, a global peaking factor of 8 and 6 (including stormwater allowance) are adopted according to the contributing population.
- 2.6.4. With reference to Table 5 in the Sewerage Manual (Part 1)² issued by the DSD in May 2013, slimed sewer of k_s of 0.6mm under “Poor” condition is assumed for both the sewers from the Subject Site and existing sewerage system in the worst-case scenario. The Colebrook-White Equation will be used to analyse the flow conditions. Equation (ii) for circular pipes flowing partially full is adopted to estimate the sewage flow for the Subject Site and following sewers.

2.7 RESULTS AND DISCUSSION

- 2.7.1. The estimated average flow rate and total peak flow of the Proposed Development are approximately 59.0m³/day and 5.46L/s.
- 2.7.2. Sewage generated from the Proposed Development and surrounding catchment areas will be connected at the downstream of sewage network. The cumulative flow is generally no more than 30% of sewer capacity and no adverse sewerage impacts to the existing sewerage system are identified. Therefore, no upgrading or improvement works of the sewerage system are required. Details of the sewage calculation are included in **Appendix B**.

² http://www.dsd.gov.hk/EN/Files/Technical_Manual/technical_manuals/Sewerage_Manual_1_Eurocodes.pdf

3 CONCLUSION

- 3.1.1. A Social Welfare Facility (Residential Care Home for the Disabilities) is proposed to develop at various lots in D.D. 104, Nam Sang Wai. This is the SIA to support the application under Section 16 of the Town Planning Ordinance.
- 3.1.2. Based on the SIA results, it is found that the existing sewerage system serving the area has sufficient capacity to cater for the sewage generation from the proposed development and the surrounding catchment areas. Adverse sewerage impacts are not anticipated, and thus no upgrading or improvement works are required.

FIGURE 1

**LOCATION OF THE PROJECT SITE AND ITS
SURROUNDING AREA**



LEGEND:

Site Boundary

	Prepared	Checked	Approved
Initial	LY	YS	HM
Date	20250530	20250530	20250530

Project Title

Proposed Social Welfare Facilities (Residential Care Home for the Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DrawingTitle

PROPOSED DEVELOPMENT LOCATION

Drawing No.	Rev.
FIGURE 1	0

Scale:

A4 - 1:5500

FIGURE 2

EXISTING SEWERAGE SYSTEM

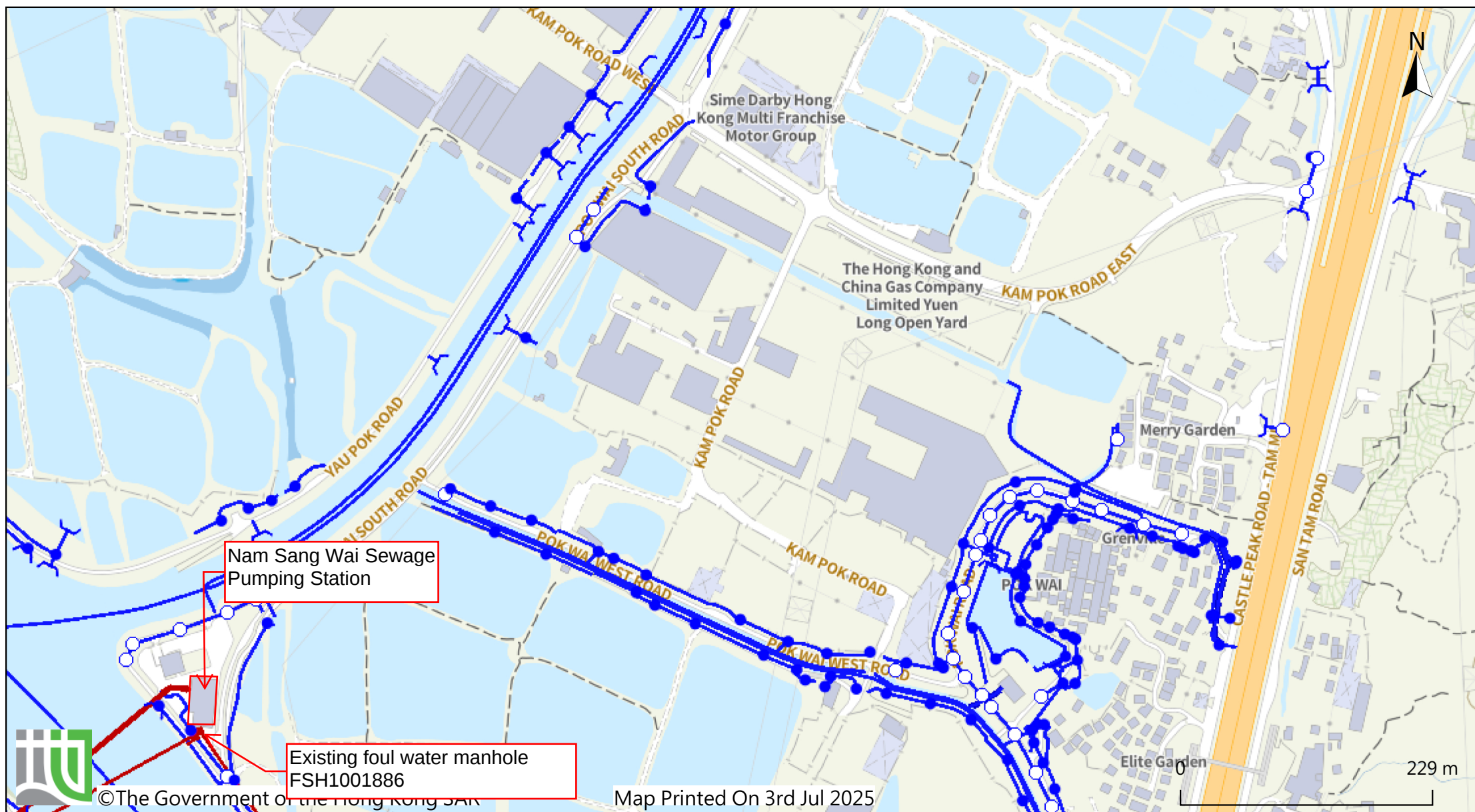


FIGURE 3

**PROPOSED TERMINAL MANHOLE AND
CONNECTION**

APPENDIX A

MASTER LAYOUT PLAN



MASTER LAYOUT PLAN
KAM POK ROAD E RCHD 1:400 @ A3

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NOTES:

LEGEND:

THE SITE

GOVERNMENT LAND

OVERHEAD LINES

EXISTING NOISE BARRIER

SHARED EVA

REV	DATE	DESCRIPTION	BY	CHKD
A	22.9.2025	CONCEPT DESIGN	KC	PC
-	5.5.2025	CONCEPT DESIGN	KC	PC

Do not scale from drawings. All dimensions must be checked and verified on site before any works are undertaken. Any discrepancies must be reported in writing to Architect.

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TOWN PLANNER

DeSPACE (International) Limited

ARCHITECT

Vessel International Limited
Syn Plus Design Limited

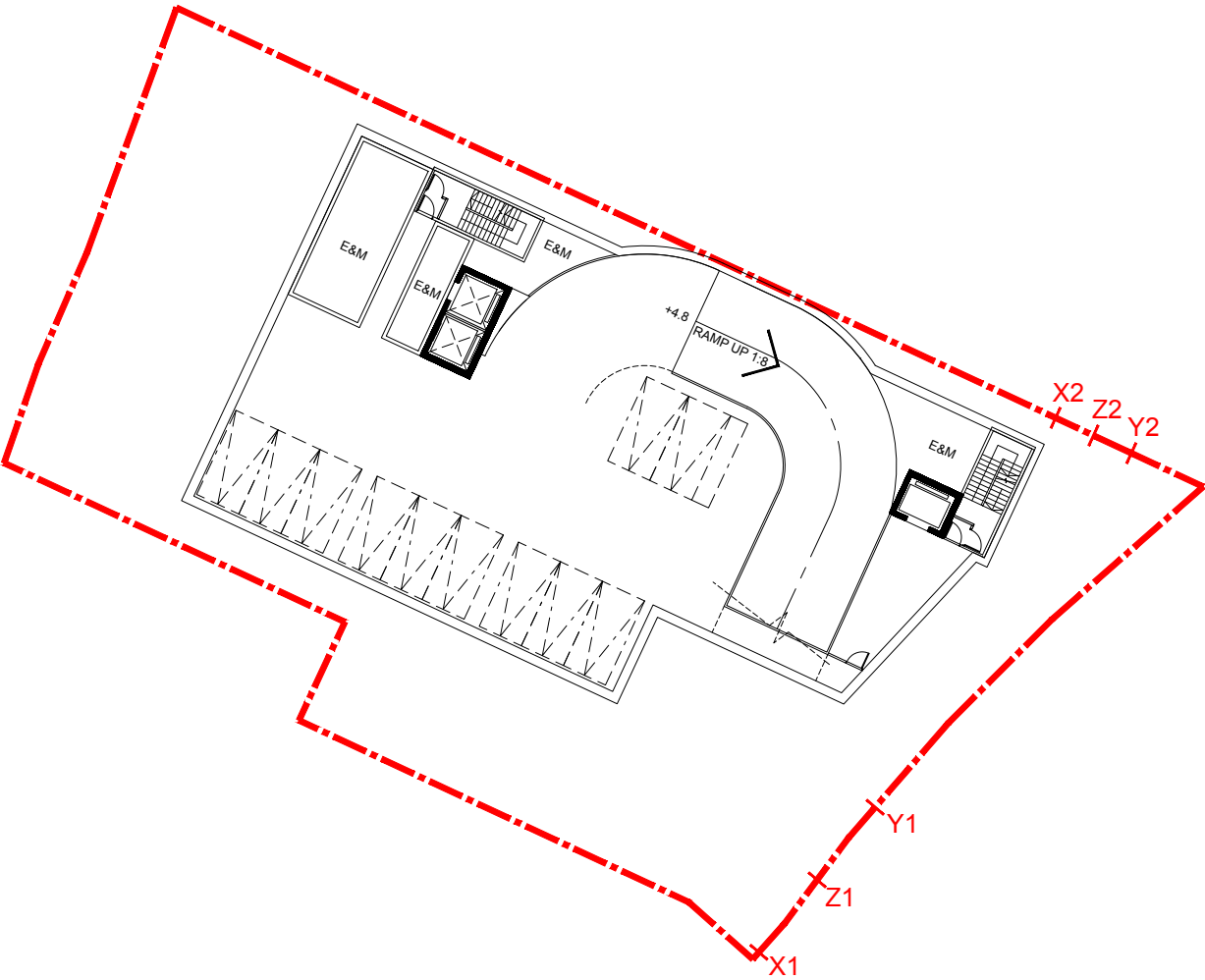
Syn Plus

PROJECT : Proposed Social Welfare Facilities (Residential Care Home for Persons with Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DRAWING : MASTER LAYOUT PLAN

SCALE : 1: 400 @A3
PROJECT NO: 25001_KPR

Rev: A
Date: MAY 2025



BASEMENT FLOOR PLAN
KAM POK ROAD E RCHD 1:400 @ A3

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NOTES:

REV	DATE	DESCRIPTION	BY	CHKD
B	22.9.2025	CONCEPT DESIGN	KC	PC
A	9.7.2025	CONCEPT DESIGN	KC	PC
-	5.5.2025	CONCEPT DESIGN	KC	PC

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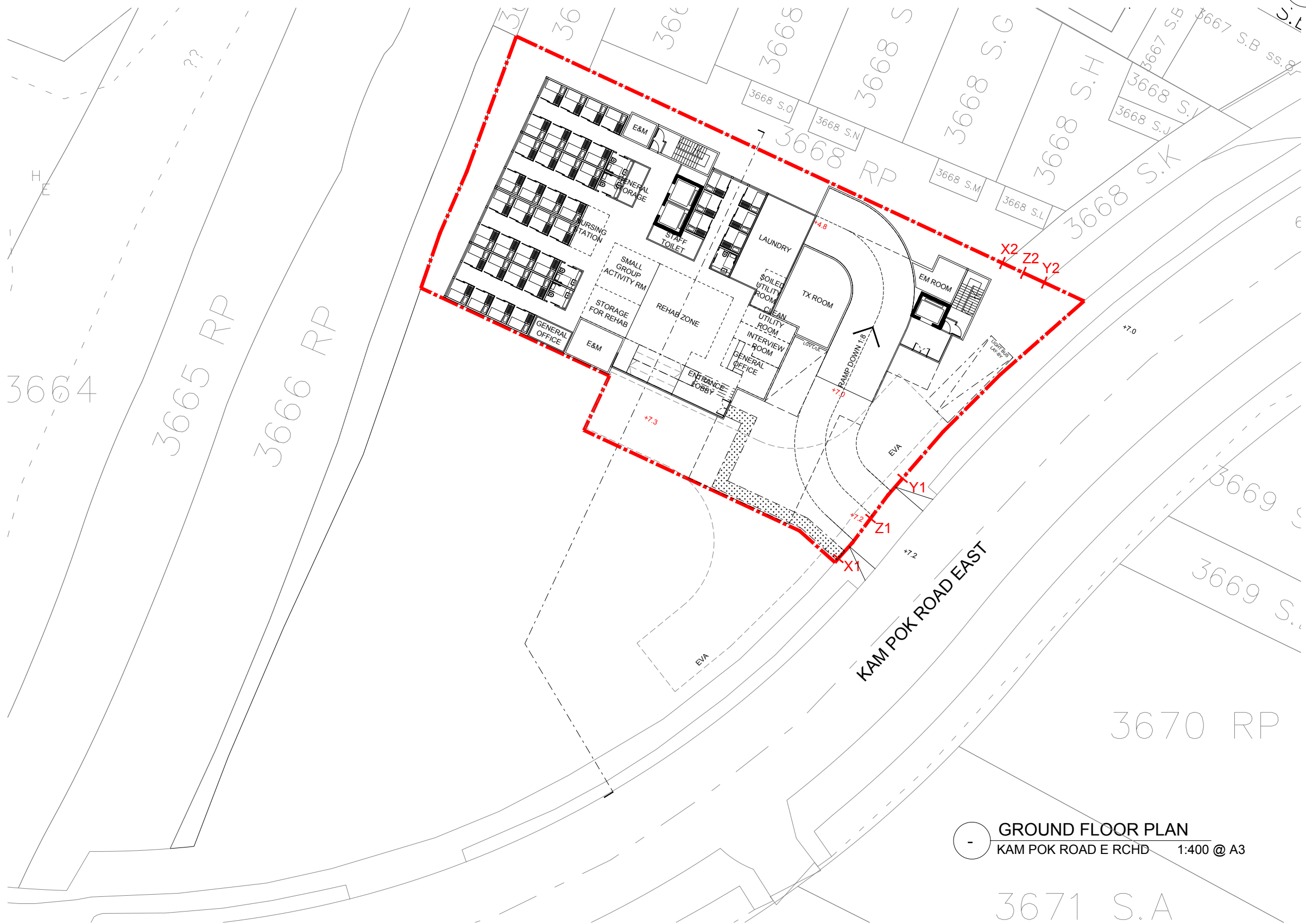

PROJECT : Proposed Social Welfare Facilities (Residential Care Home for Persons with Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DRAWING : BASEMENT FLOOR PLAN

SCALE : 1: 400 @A3
PROJECT NO: 25001_KPR

Drawing No. :
CP-A102

Rev: B
Date: MAY 2025



GROUND FLOOR PLAN
KAM POK ROAD E RCHD 1:400 @ A3

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NOTES:

LEGEND:

PROPOSED PEDESTRIAN ACCESS

B	22.9.2025	CONCEPT DESIGN	KC	PC
A	9.7.2025	CONCEPT DESIGN	KC	PC
-	5.5.2025	CONCEPT DESIGN	KC	PC
REV	DATE	DESCRIPTION	BY	CHKD

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DRAWING : GROUND FLOOR PLAN

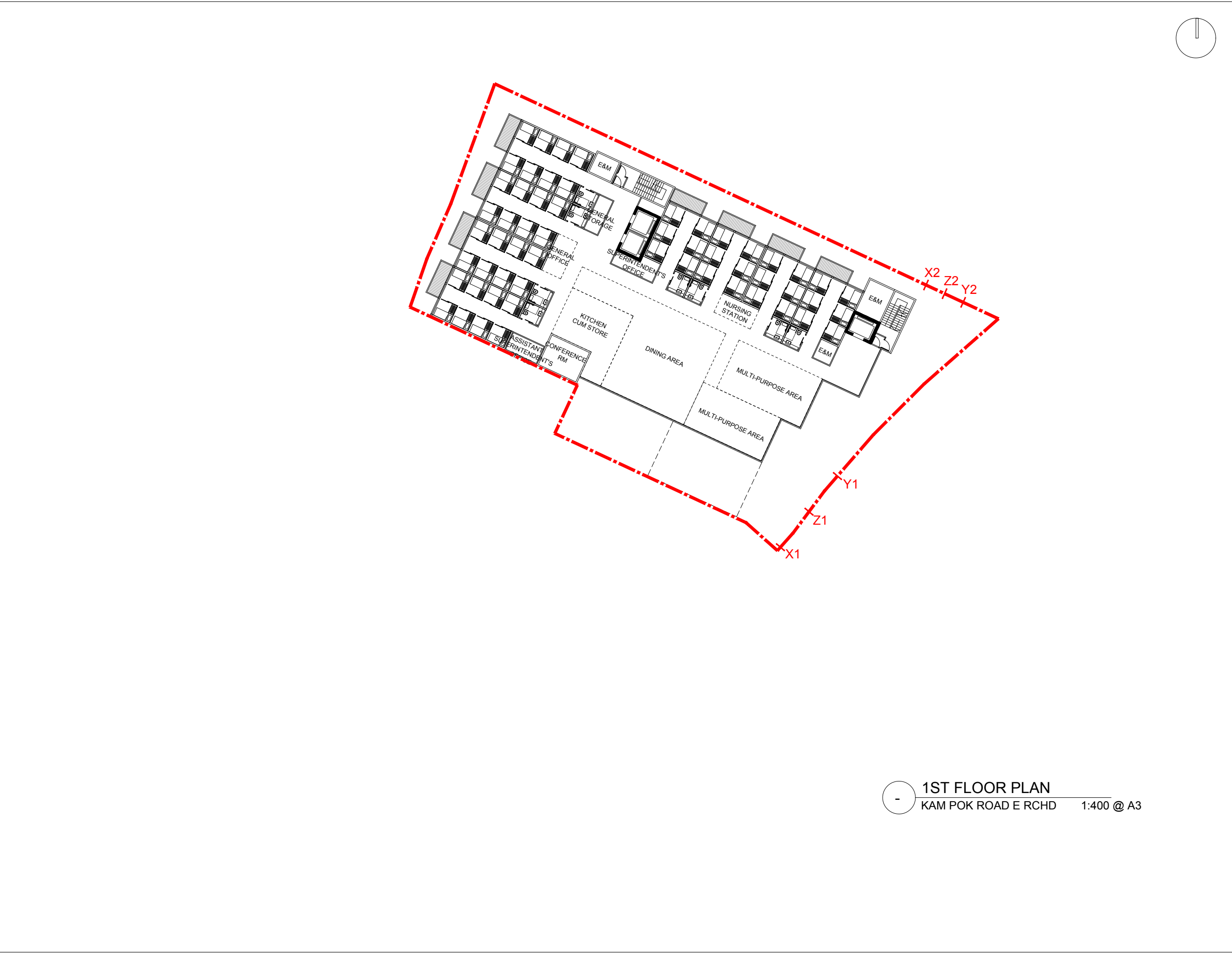
SCALE : 1: 400 @A3

PROJECT NO: 25001_KPR

Drawing No. : CP-A103

Rev: B

Date: MAY 2025



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NOTES:

A	9.7.2025	CONCEPT DESIGN	KC	PC
-	5.5.2025	CONCEPT DESIGN	KC	PC
REV	DATE	DESCRIPTION	BY	CHKD

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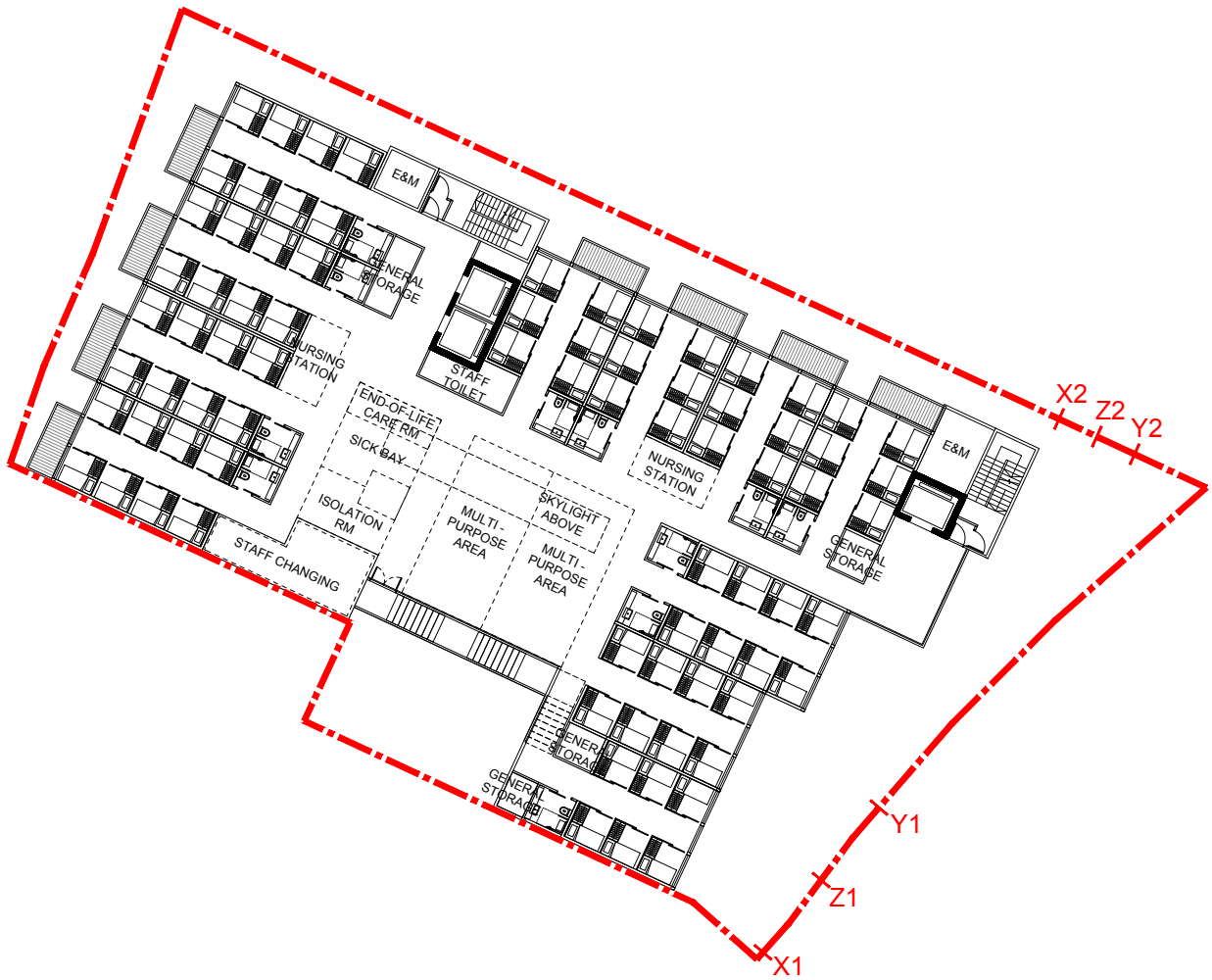
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PROJECT : Proposed Social Welfare Facilities (Residential Care Home for Persons with Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DRAWING : FIRST FLOOR PLAN

SCALE : 1: 400 @A3
PROJECT NO: 25001_KPR

Drawing No. : CP-A104
Date: MAY 2025



2ND FLOOR PLAN
KAM POK ROAD E RCHD 1:400 @ A3

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NOTES:

REV	DATE	DESCRIPTION	BY	CHKD
A	9.7.2025	CONCEPT DESIGN	KC	PC
-	5.5.2025	CONCEPT DESIGN	KC	PC

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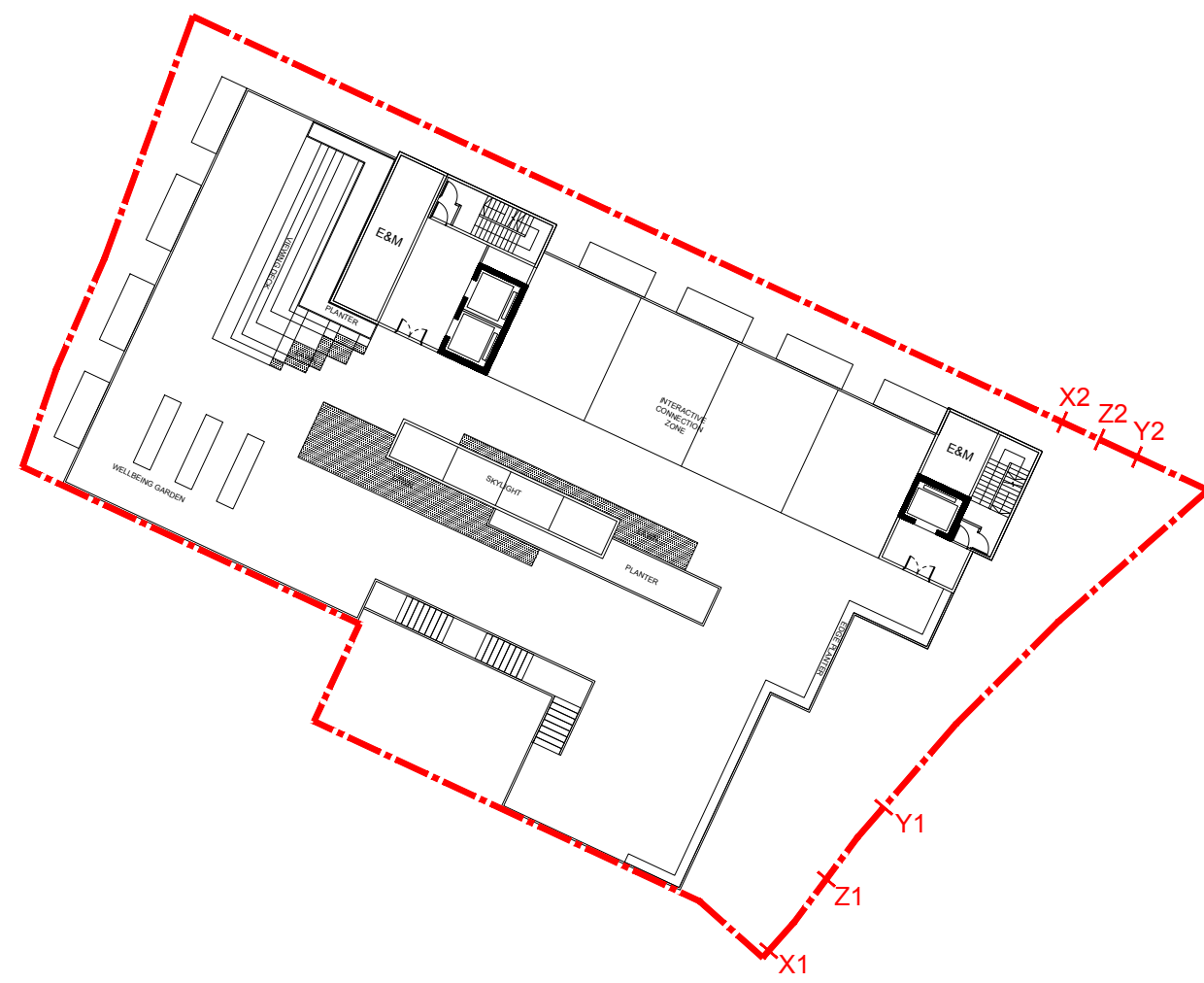


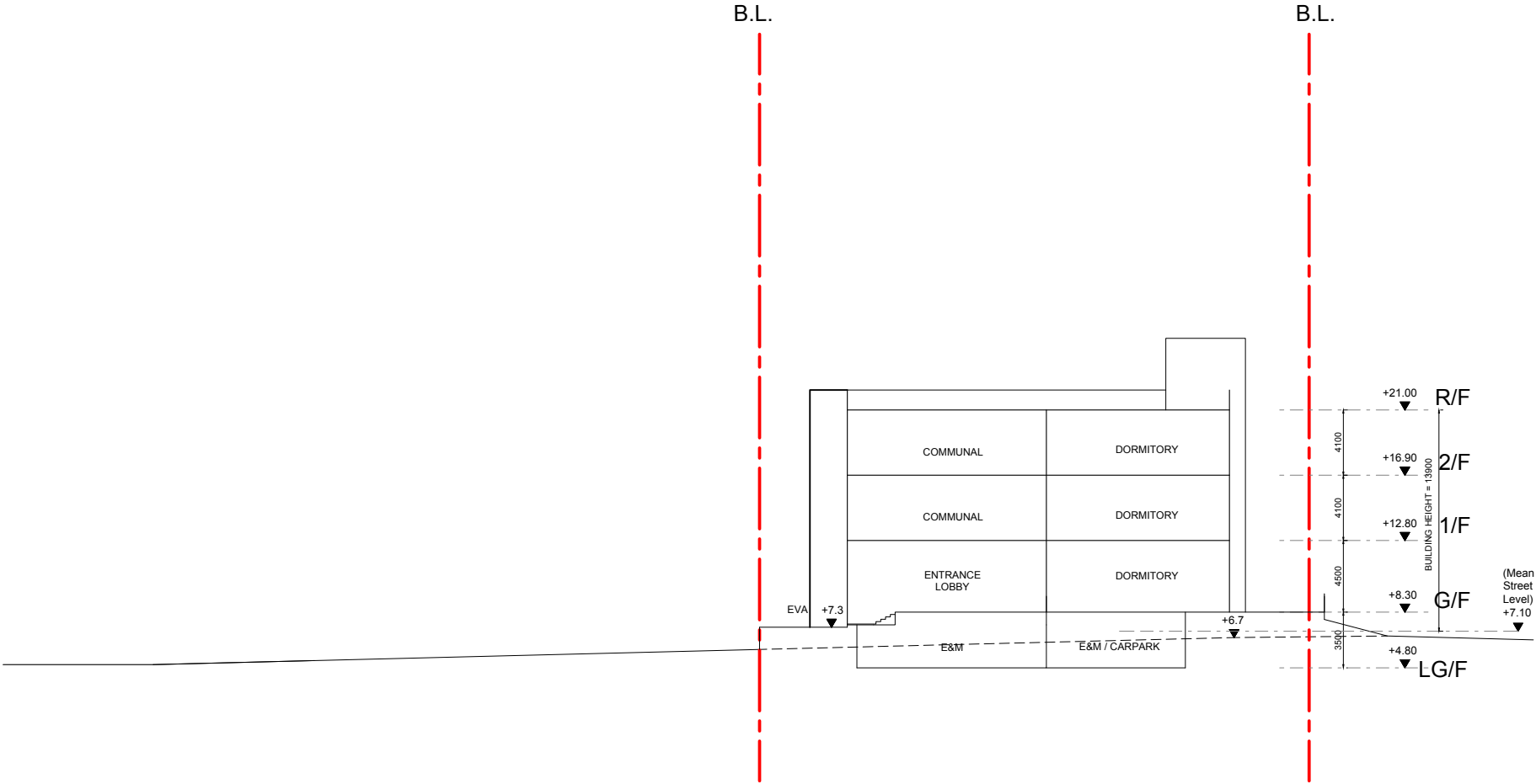
PROJECT : Proposed Social Welfare Facilities (Residential Care Home for Persons with Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DRAWING : SECOND FLOOR PLAN

SCALE : 1:400 @A3
PROJECT NO: 25001_KPR

Drawing No. : CP-A105
Date: MAY 2025





SCHEMATIC SECTION
KAM POK ROAD E RCHD 1:400 @ A3

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NOTES:

REV	DATE	DESCRIPTION	BY	CHKD
-	5.5.2025	CONCEPT DESIGN	KC	PC

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PROJECT : Proposed Social Welfare Facilities (Residential Care Home for Persons with Disabilities (RCHD)) in "Village Type Development" Zone, Various Lots in D.D. 104 and Adjoining Government Land, Nam Sang Wai, Yuen Long

DRAWING : SCHEMATIC SECTION

SCALE : 1: 400 @A3 Rev: —

PROJECT NO: 25001_KPR

Drawing No. : Date:

CP—A201 MAY 2025

APPENDIX B

SEWAGE CALCULATION AND HYDRAULIC CAPACITY CHECK

APPENDIX B - CALCULATION OF SEWAGE FLOW

Development	GFA (m ²)	No. of Flat	Occupancy Density ^{(a), (b)} (Number of Persons) (Workers per GFA in 100m ²)	Estimated Population	Unit Flow Factor (m ³ /day)	Estimated Average Dry Weather Flow (m ³ /day)	Catchment Inflow Factor	Estimated Average Dry Weather Flow X Catchment Inflow Factor (m ³ /day)	Remarks	
1) Proposed Development										
Residents in Proposed Development	3286	-	-	178	0.19	33.820	1.0	33.820	Estimated Population: The proposed development scheme will provide 178 bed spaces. Unit Flow Factor: 0.190m ³ /day for 'Institutional and special class' based on EPD's GESF Table T-1	
Employees in Proposed Development		-	-	90	0.28	25.200		25.200	Estimated Population: Number of staff advised by Project Proponent . Unit Flow Factor: 0.280m ³ /day for 'Institutional and special class' based on EPD's GESF Table T-1	
Total Aaverage Daily Dry Weather Flow of Proposed Development (m ³ /day)									59.020	

Sewage Flow of Planned Development

Planning Application No.	ADWF (m3/day)	Contributing Populatoin
A/YL-NSW/349	64.72	298
A/YL-NSW/314	125.3	464
Y/YL-MP/10	1972.76	6878
Y/YL-NSW/7	1565	5742

Section	Contributing Development	Total ADWF (m3/day)	Total Contributing Population	Peaking Factor	Peak Flow (L/s)
MH660 to MH540	Proposed Development	59.020	268	8	5.46
MH660 to MH540	Proposed Development A/YL-NSW/349	123.740	566	8	11.46
MH540 to P3	Proposed Development A/YL-NSW/348 A/YL-NSW/314	249.040	1030	6	17.29
P3 to P8	Proposed Development A/YL-NSW/348 A/YL-NSW/314 Y/YL-MP/10	2221.800	7908	5	128.58
P8 to FSH1001886	Proposed Development A/YL-NSW/348 A/YL-NSW/314 Y/YL-MP/10 Y/YL-NSW/7	3786.800	13650	4	175.31

Appendix B - Hydraulic Capacity of the Proposed and Downstream Sewers

Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Upstream Invert Level	Downstream Invert Level	$g^{(1)}$	$k_s^{(1),(2)}$	$s^{(1)}$	$v^{(1)}$	$v^{(1),(2)}$	A	$Q^{(4)}$	Estimated Capacity	ADWF	Contributing Population	Peaking Factor	Peak Flow	Capacity	Compliance	Remarks
		mm	m	mPD	mPD	m/s ²	m		m/s	m/s	m ²	m ³ /s	L/s	m ³ /day			L/s	%		
S1	MH740	225	17.0	5.200	5.000	9.81	0.0006	0.0118	1.306E-06	1.1451	0.0398	0.0563	56.27	59.02	268	8	5.46	9.7%	Yes	
MH740	MH700	225	12.0	5.000	4.700	9.81	0.0006	0.0250	1.306E-06	2.0704	0.0398	0.0823	82.32	59.02	268	8	5.46	6.6%	Yes	
MH700	MH660	225	27.0	4.700	4.500	9.81	0.0006	0.0074	1.306E-06	1.1196	0.0398	0.0445	44.52	59.02	268	8	5.46	12.3%	Yes	
MH660	MH620	225	42.0	4.500	3.650	9.81	0.0006	0.0202	1.306E-06	1.8611	0.0398	0.0740	74.00	123.74	566	8	11.46	15.5%	Yes	
MH620	MH580	225	31.0	3.650	3.150	9.81	0.0006	0.0161	1.306E-06	1.6597	0.0398	0.0660	65.99	123.74	566	8	11.46	17.4%	Yes	
MH580	MH540	225	38.0	3.150	2.500	9.81	0.0006	0.0171	1.306E-06	1.7097	0.0398	0.0680	67.98	123.74	566	8	11.46	16.9%	Yes	
MH540	MH500	300	46.0	2.500	2.300	9.81	0.0006	0.0043	1.306E-06	1.0286	0.0707	0.0727	72.71	249.04	1030	6	17.29	23.8%	Yes	
MH500	MH460	300	40.0	2.300	2.100	9.81	0.0006	0.0050	1.306E-06	1.1042	0.0707	0.0781	78.05	249.04	1030	6	17.29	22.2%	Yes	
MH460	MH420	300	27.0	2.100	2.000	9.81	0.0006	0.0037	1.306E-06	0.9482	0.0707	0.0670	67.02	249.04	1030	6	17.29	25.8%	Yes	
MH420	MH380	300	24.0	2.000	1.900	9.81	0.0006	0.0042	1.306E-06	1.0066	0.0707	0.0712	71.16	249.04	1030	6	17.29	24.3%	Yes	
MH380	MH380(1)	300	23.0	1.900	1.800	9.81	0.0006	0.0043	1.306E-06	1.0286	0.0707	0.0727	72.71	249.04	1030	6	17.29	23.8%	Yes	
MH380(1)	MH340	300	29.0	1.800	1.700	9.81	0.0006	0.0034	1.306E-06	0.9144	0.0707	0.0646	64.63	249.04	1030	6	17.29	26.8%	Yes	
MH340	MH300	300	38.0	1.700	1.570	9.81	0.0006	0.0034	1.306E-06	0.9107	0.0707	0.0644	64.37	249.04	1030	6	17.29	26.9%	Yes	
MH300	MH260	300	35.0	1.570	1.450	9.81	0.0006	0.0034	1.306E-06	0.9117	0.0707	0.0644	64.44	249.04	1030	6	17.29	26.8%	Yes	
MH260	MH235	300	39.0	1.450	1.320	9.81	0.0006	0.0033	1.306E-06	0.8987	0.0707	0.0635	63.53	249.04	1030	6	17.29	27.2%	Yes	
MH235	P1	675	13.0	1.320	1.270	9.81	0.0006	0.0038	1.306E-06	1.6166	0.3578	0.5785	1157.03	249.04	1030	6	17.29	1.5%	Yes	Twin pipe
P1	P2	675	66.0	0.170	-0.300	9.81	0.0006	0.0071	1.306E-06	2.2057	0.3578	0.7893	1578.57	249.04	1030	6	17.29	1.1%	Yes	Twin pipe
P2	P3	675	16.0	-1.400	-1.510	9.81	0.0006	0.0069	1.306E-06	2.1669	0.3578	0.7754	1550.84	249.04	1030	6	17.29	1.1%	Yes	Twin pipe
P3	P4	675	43.0	-2.610	-2.920	9.81	0.0006	0.0072	1.306E-06	2.2194	0.3578	0.7942	1588.38	2221.80	7908	5	128.58	8.1%	Yes	Twin pipe
P4	P5	675	52.0	-2.920	-3.200	9.81	0.0006	0.0054	1.306E-06	1.9158	0.3578	0.6856	1371.14	2221.80	7908	5	128.58	9.4%	Yes	Twin pipe
P5	P6	750	60.0	-3.200	-3.330	9.81	0.0006	0.0022	1.306E-06	1.2920	0.4418	0.5708	1141.60	2221.80	7908	5	128.58	11.3%	Yes	Twin pipe
P6	P7	750	88.0	-3.330	-3.520	9.81	0.0006	0.0022	1.306E-06	1.2897	0.4418	0.5698	1139.58	2221.80	7908	5	128.58	11.3%	Yes	Twin pipe
P7	P8	750	50.0	-3.520	-3.630	9.81	0.0006	0.0022	1.306E-06	1.3020	0.4418	0.5752	1150.45	2221.80	7908	5	128.58	11.2%	Yes	Twin pipe
P8	P9	750	61.0	-3.630	-3.760	9.81	0.0006	0.0021	1.306E-06	1.2813	0.4418	0.5660	1132.09	2221.80	7908	5	128.58	11.4%	Yes	Twin pipe
P9	P10	750	59.0	-3.760	-3.890	9.81	0.0006	0.0022	1.306E-06	1.3031	0.4418	0.5757	1151.35	3786.80	13650	4	175.31	15.2%	Yes	Twin pipe
P10	P11	750	67.0	-3.890	-4.030	9.81	0.0006	0.0021	1.306E-06	1.2685	0.4418	0.5604	1120.85	3786.80	13650	4	175.31	15.6%	Yes	Twin pipe
P11	P12	750	34.0	-4.030	-4.100	9.81	0.0006	0.0021	1.306E-06	1.2591	0.4418	0.5562	1112.48	3786.80	13650	4	175.31	15.8%	Yes	Twin pipe
P12	P13	750	40.0	-4.100	-4.180	9.81	0.0006	0.0020	1.306E-06	1.2407	0.4418	0.5481	1096.27	3786.80	13650	4	175.31	16.0%	Yes	Twin pipe
P13	P14	750	34.0	-4.180	-4.250	9.81	0.0006	0.0021	1.306E-06	1.2591	0.4418	0.5562	1112.48	3786.80	13650	4	175.31	15.8%	Yes	Twin pipe
P14	P15	750	39.0	-4.250	-4.330	9.81	0.0006	0.0021	1.306E-06	1.2567	0.4418	0.5552	1110.41	3786.80	13650	4	175.31	15.8%	Yes	Twin pipe
P15	FSH1001886	750	24.0	-4.330	-4.380	9.81	0.0006	0.0021	1.306E-06	1.2666	0.4418	0.5596	1119.16	3786.80	13650	4	175.31	15.7%	Yes	Twin pipe

Note:

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

(2) The mean velocity (V) is calculated by the Colebrook-White Equation for circular pipes:

$$V = -\sqrt{(8gDs)} \log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where V = mean velocity (m/s)

g = gravitational acceleration (m/s²)

D = internal pipe diameter (m)

s = slope

k_s = roughness coefficient(m)

v = kinematic viscosity of fluid (m²/s)

(3) The value of k_s = 0.6mm is used for the calculation of existing pipe for conservative approach and 0.6mm for proposed new clayware pipe in poor condition based on DSD's "Sewerage Manual" Table 5: Recommended roughness values

(4) Peak flow (Q) is calculated by $Q = V \times A$

APPENDIX C

**EXISTING SEWERS IDENTIFIED UNDER
APPROVED APPLICATION NO. A/YL-NSW/314**

2. SEWERAGE IMPACT ASSESSMENT ("SIA")

2.1 Introduction

- 2.1.1 The Proposed Development is a comprehensive development scheme to include wetland restoration proposal. This section gives a brief discussion on the current environmental legislation and standards and assess the impacts arising from the proposed development. Recommendations of mitigation measures have been made if there is any adverse effect induced by the proposed development.

2.2 Existing and Planned Sewerage Infrastructure

- 2.2.1 The site currently falls within the Yuen Long / Kam Tin sewerage catchment and is classified as an ~~unsewered area under the Yuen Long / Kam Tin Sewerage Master Plan (YLKT SMP)~~. A set of existing 225mm public sewerage system (from feature no. MH540 to MH235) is identified along Kam Pok Road East, which is currently not in use and could serve the Project Site.
- 2.2.2 The existing Yuen Long Sewage Treatment Works (YLSTW) serves Yuen Long Town, Yuen Long Industrial Estate and Kam Tin areas with a design capacity of 70,000m³/day (ADWF). It provides primary and secondary treatment to the effluent, which is then discharged to the Shan Pui River and then to Deep Bay.
- 2.2.3 The public sewerage facility located at the Yuen Long Sewage Treatment Works Pumping Station (SPS), as shown in **Figure 2-1**.

Existing public sewers under
Approved Planning Application No.
A/YL-NSW/314

2.3 Assessment Methodology and Assumptions

- 2.3.1 An analysis of the capacity of the sewage pipes and the SPS has been carried out to evaluate the adequacy of the proposed sewerage system. The design assumptions and basis are shown in **Table 2-1**.

Table 2-1 Design Assumption and Basis

Items	Values
Design Standard	DSD Sewerage Design Manual, Part 1 & 2
Flow Formula Used	Colebrook White Formula
Unit Flow Factor	EPD Guideline for Estimating Sewerage Flows for Sewerage Infrastructure Planning (GESF) 0.37 m ³ /d/head (Domestic, Private R3) for residents 0.28 m ³ /d/head (Commercial, J11) for clubhouse staff 1.58 m ³ /d/head (Restaurant, J10) for restaurant

2.4 Estimate of Sewage Flow

- 2.4.1 The sewage flow to be generated from the projected residential population, as well as activities at the clubhouse and the associated facilities has been estimated following "EPD Guideline for Estimating Sewage Flows for Sewage Infrastructure Planning". Major contributions of sewage flow from the Proposed Development include projected 270 residents. The estimated sewage flow is shown in **Table 2-2**.

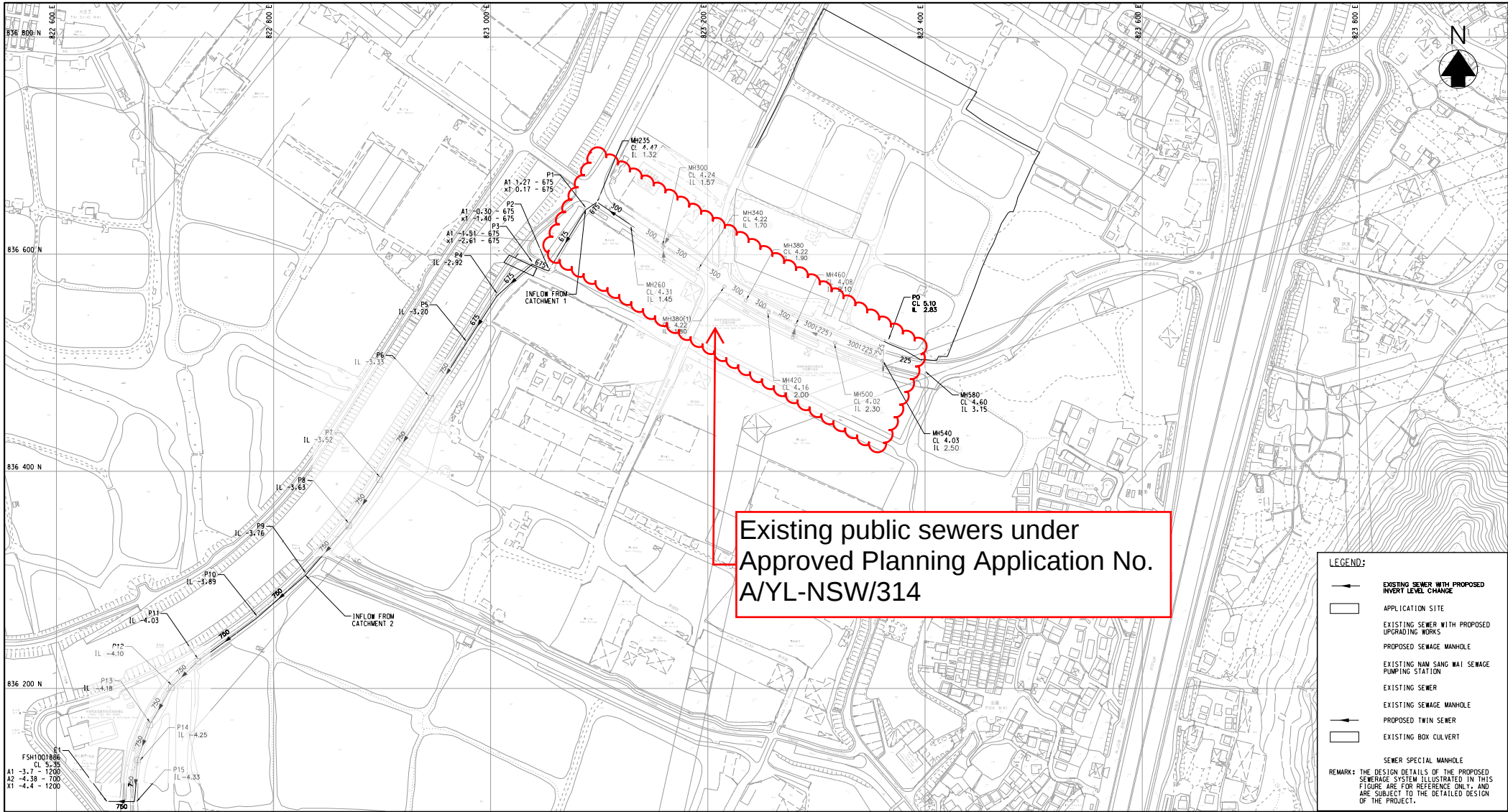


Figure: 2.1

Title: PROPOSED SEWERAGE SYSTEM FOR THE APPLICATION SITE

Project: PLANNING APPLICATION FOR PROPOSED COMPREHENSIVE DEVELOPMENT SCHEME TO INCLUDE WETLAND RESTORATION PROPOSAL AND PROPOSED FILLING OF PONDS/LAND AND EXCAVATION OF LAND IN "OU(CDWRA)" ZONE AT VARIOUS LOTS IN D.D. 104, NORTH OF KAM POK ROAD EAST, POK WAI, YUEN LONG, NEW TERRITORIES



Drawn by: CL

Checked by: NH

Rev: 6.1

Date: Aug 2023

APPENDIX D

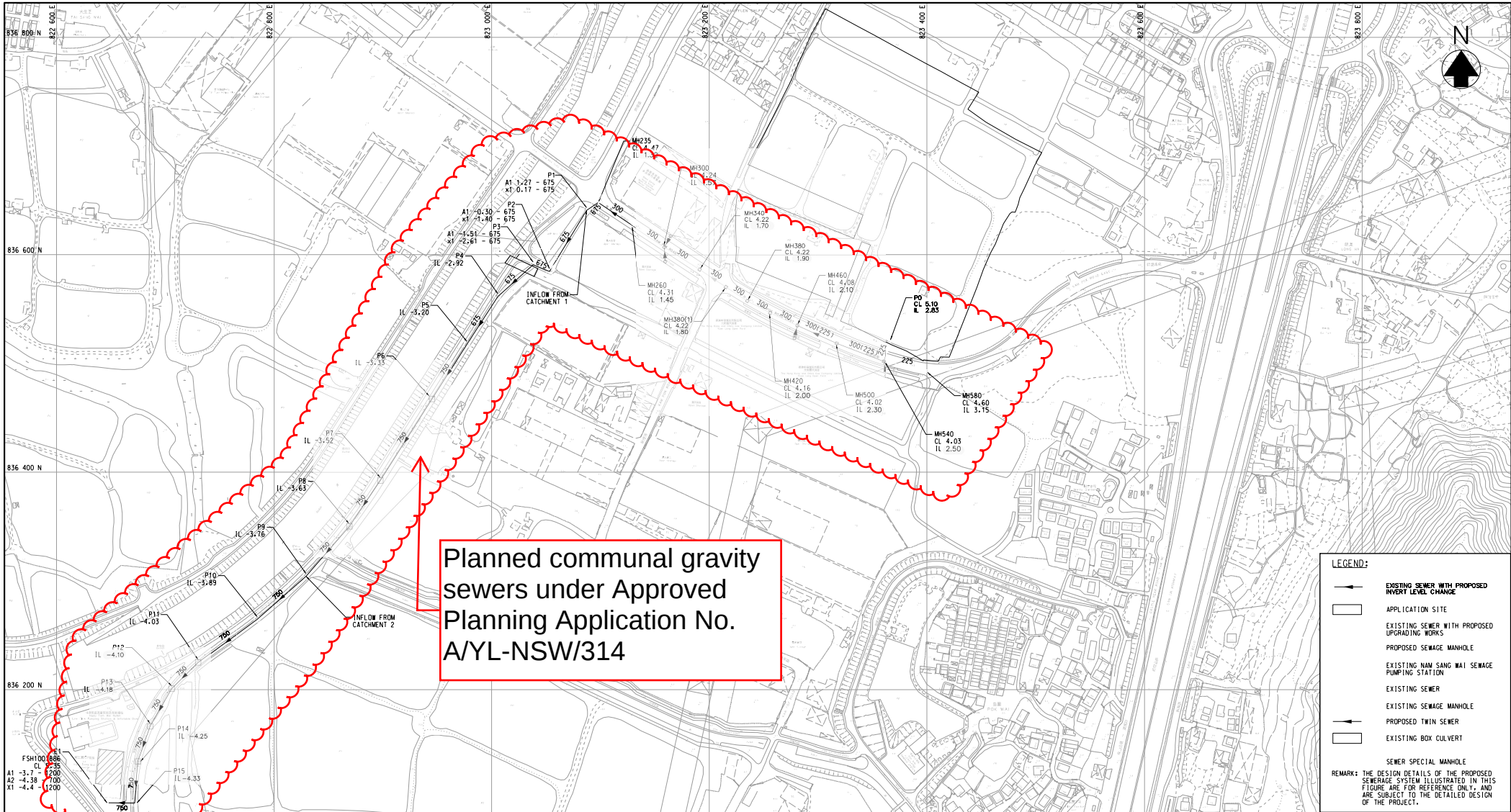
PLANNED COMMUNAL GRAVITY SEWERS UNDER OTHER APPROVED APPLICATION

Total Flow from Proposed Development			
Flow rate	=	125.3	m ³ /day
Contributing population *	=	464	People
Peaking factor	=	8	– (Table T-5 of GESF for population <1,000 incl. stormwater allowance)
Peak flow	=	11.60	litre/sec
Note: 1. According to the submitted planning statement for current proposed development, the concerned dwellings will comprise 2-storeys to 4-storeys housing units with an average household size is assumed to be 3 people. 2. * according to the calculation method in GESF for the so-called "Contributing Population" for peaking factor selection.			

- 2.4.2 The average flow and the peak flow from the Application Site will be approximately 125.3 m³/day and 11.60 L/s, respectively.

2.5 Sewerage Impact Assessment

- 2.5.1 It is proposed that the sewage generated from the Proposed Development will be discharged into the existing 225mm diameter communal sewer at the south of the Application Site for disposal at YLSTW via Nam Sang Wai SPS (**Figure 2.1** refers). Relevant proposed upgrading works and proposed change in invert levels at some of the existing sewers, are also illustrated in **Figure 2.1** such as those between sewer MH540 to MH460, and between MH460 and MH235. The hydraulic checking of existing and proposed sewers starting from the discharge point to Nam Sang Wai SPS is provided in **Appendix 2.1** and it is found to be adequate to serve the Proposed Development with upgrading and modification works on several sewer segments.
- 2.5.2 There are existing stormwater pipe and box culvert along Pok Wai South Road, which are in vicinity of the proposed sewage system. **Planned communal gravity sewers under Approved Planning Application No. A/YL-NSW/314** drawings **3.**
- 2.5.3 It is understood there are other planned public sewers. Manhole P1, P2 and P3 are designed as backdrop manhole to cater for the high velocity flow and to avoid the box culvert located at the outfall at Pok Wai South Road at the same time. In order to ensure there is sufficient capacity reserved, a sensitivity test has also been undertaken and provided in **Appendix 2.2**. It is understood that the gravity sewer P1 to E1 should have sufficient capacity to cater the additional sewage of around 15,000 m³/d due to other nearby developments (**Appendix 4.1** refers). This is considered to be a very conservative approach. It is therefore suggested to provide twin 675 mm to 750 mm gravity sewers for sewer P1 to E1 along the Pok Wai South Road. The design checking of proposed sewage system, considering a capacity of 15,000 m³/d from nearby developments, is provided in



Planned communal gravity
sewers under Approved
Planning Application No.
A/YL-NSW/314

LEGEND:

- EXISTING SEWER WITH PROPOSED INVERT LEVEL CHANGE
- APPLICATION SITE
- EXISTING SEWER WITH PROPOSED UPGRADING WORKS
- PROPOSED SEWAGE MANHOLE
- EXISTING NAM SANG WAI SEWAGE PUMPING STATION
- EXISTING SEWER
- EXISTING SEWAGE MANHOLE
- PROPOSED TWIN SEWER
- EXISTING BOX CULVERT
- SEWER SPECIAL MANHOLE

REMARK: THE DESIGN DETAILS OF THE PROPOSED SEWERAGE SYSTEM ILLUSTRATED IN THIS FIGURE ARE FOR REFERENCE ONLY, AND ARE SUBJECT TO THE DETAILED DESIGN OF THE PROJECT.

Figure: 2.1		
Title: PROPOSED SEWERAGE SYSTEM FOR THE APPLICATION SITE		
Project: PLANNING APPLICATION FOR PROPOSED COMPREHENSIVE DEVELOPMENT SCHEME TO INCLUDE WETLAND RESTORATION PROPOSAL AND PROPOSED FILLING OF PONDS/LAND AND EXCAVATION OF LAND IN "OU(CDWRA)" ZONE AT VARIOUS LOTS IN D.D. 104, NORTH OF KAM POK ROAD EAST, POK WAI, YUEN LONG, NEW TERRITORIES	Drawn by:	CL
	Checked by:	NH
	Rev:	6.1
	Date:	Aug 2023



Appendix 2.2 Hydraulic Calculation of the Proposed Sewers for the Application Site (Sensitivity Analysis)

Note:

- 1) Colebrook-White's equation is adopted for full-bore pipe velocity calculation.
- 2) Backwash Flowrate generated by swimming pool from developments, if any, has been included in the Design Peak Flowrate.
- 3) Catchment 1 is the planned development in the upstream
- 4) Catchment 2 is the application Y/YL-NSW/7, the ADWF is obtained from the approved SIA Report at October 2023

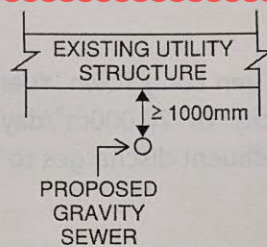
Catchment 1, ADWF				=	13435	m3/day	Proposed Deve, ADWF				=	125.3	m3/day	Catchment 2, ADWF				=	1565	m3/day
				=	13435/3600/24						=	125.3/3600/24						=	1565/3600/24	
				=	0.1555	m3/s					=	0.0015	m3/s					=	0.0181	m3/s
Pipe	Diameter (mm)	Diameter for calculation	Original Diameter	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Pipe Length (m)	Gradient (1 in)	Roughness (mm)	No. of Pipes	Inflow	ADWF (m ³ /s)	Contributing Population	Peak Factor	Design Peak Flowrate (m ³ /s)	Full Bore Velocity (m/s)	Full Bore Capacity (m ³ /s)	Utilization (%)			
P0 to MH540	225	225	225	2.83	2.50	18,910	57	3,000	1	Proposed Deve.	0.0015	464	8	0.012	1.354	0.054	21.6%			
MH540 to MH500	300	300	300	2.50	2.30	46,020	230	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.819	0.058	20.0%			
MH500 to MH460	300	300	300	2.30	2.10	39,640	198	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.882	0.062	18.6%			
MH460 to MH420	300	300	300	2.10	2.00	27,370	274	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.751	0.053	21.9%			
MH420 to MH380	300	300	300	2.00	1.90	23,630	236	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.808	0.057	20.3%			
MH380 to MH380(1)	300	300	300	1.90	1.80	23,230	232	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.815	0.058	20.1%			
MH380(1) to MH340	300	300	300	1.80	1.70	28,910	289	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.730	0.052	22.5%			
MH340 to MH300	300	300	300	1.70	1.57	38,240	294	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.724	0.051	22.7%			
MH300 to MH260	300	300	300	1.57	1.45	34,900	291	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.728	0.051	22.5%			
MH260 to MH235	300	300	300	1.45	1.32	38,840	299	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.718	0.051	22.9%			
MH235 to P1	300	300	300	1.32	1.27	12,590	252	3,000	1	Proposed Deve.	0.0015	464	8	0.012	0.783	0.055	21.0%			
P1 to P2	675	675	675	0.17	-0.30	65,790	140	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.794	1.284	49.6%			
P2 to P3	675	675	675	-1.40	-1.51	16,250	148	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.746	1.250	50.9%			
P3 to P4	675	675	675	-2.61	-2.92	43,380	140	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.794	1.284	49.6%			
P4 to P5	675	675	675	-2.92	-3.20	52,150	186	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.555	1.113	57.2%			
P5 to P6	750	750	750	-3.20	-3.33	59,790	460	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.058	0.935	68.1%			
P6 to P7	750	750	750	-3.33	-3.52	88,210	464	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.053	0.931	68.4%			
P7 to P8	750	750	750	-3.52	-3.63	50,460	459	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.060	0.936	68.0%			
P8 to P9	750	750	750	-3.63	-3.76	61,240	471	3,000	2	Catchment 1, Proposed Deve.	0.1569	50,223	4.05684	0.637	1.046	0.924	68.9%			
P9 to P10	750	750	750	-3.76	-3.89	59,460	457	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.061	0.938	74.5%			
P10 to P11	750	750	750	-3.89	-4.03	67,200	480	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.036	0.915	76.3%			
P11 to P12	750	750	750	-4.03	-4.10	34,060	487	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.029	0.909	76.8%			
P12 to P13	750	750	750	-4.10	-4.18	39,540	494	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.021	0.902	77.5%			
P13 to P14	750	750	750	-4.18	-4.25	33,830	483	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.032	0.912	76.6%			
P14 to P15	750	750	750	-4.25	-4.33	38,830	485	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.030	0.910	76.7%			
P15 to E1	750	750	750	-4.33	-4.38	23,630	473	3,000	2	Catchment 1, Catchment 2, Proposed Deve.	0.1751	56,020	3.991	0.699	1.044	0.923	75.7%			

Details of the planned communal gravity sewers under the Approved Application No. A/YL-NSW/314

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

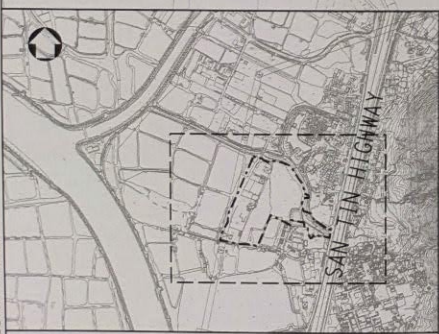
Matrix of construction and maintenance responsibilities under the Approved Application Y/YL-NSW/7

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	
PROPOSED REZONING FROM "OUICDWR1" TO "OUICDWR11" 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	Prepared SYW	Checked CYW	Date 04/22
binnies BINNIES HONG KONG LIMITED 寶尼新工程顧問有限公司	Date 04/22	Scale A3 1:3000	

Plot date : 8/3/2022

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

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.

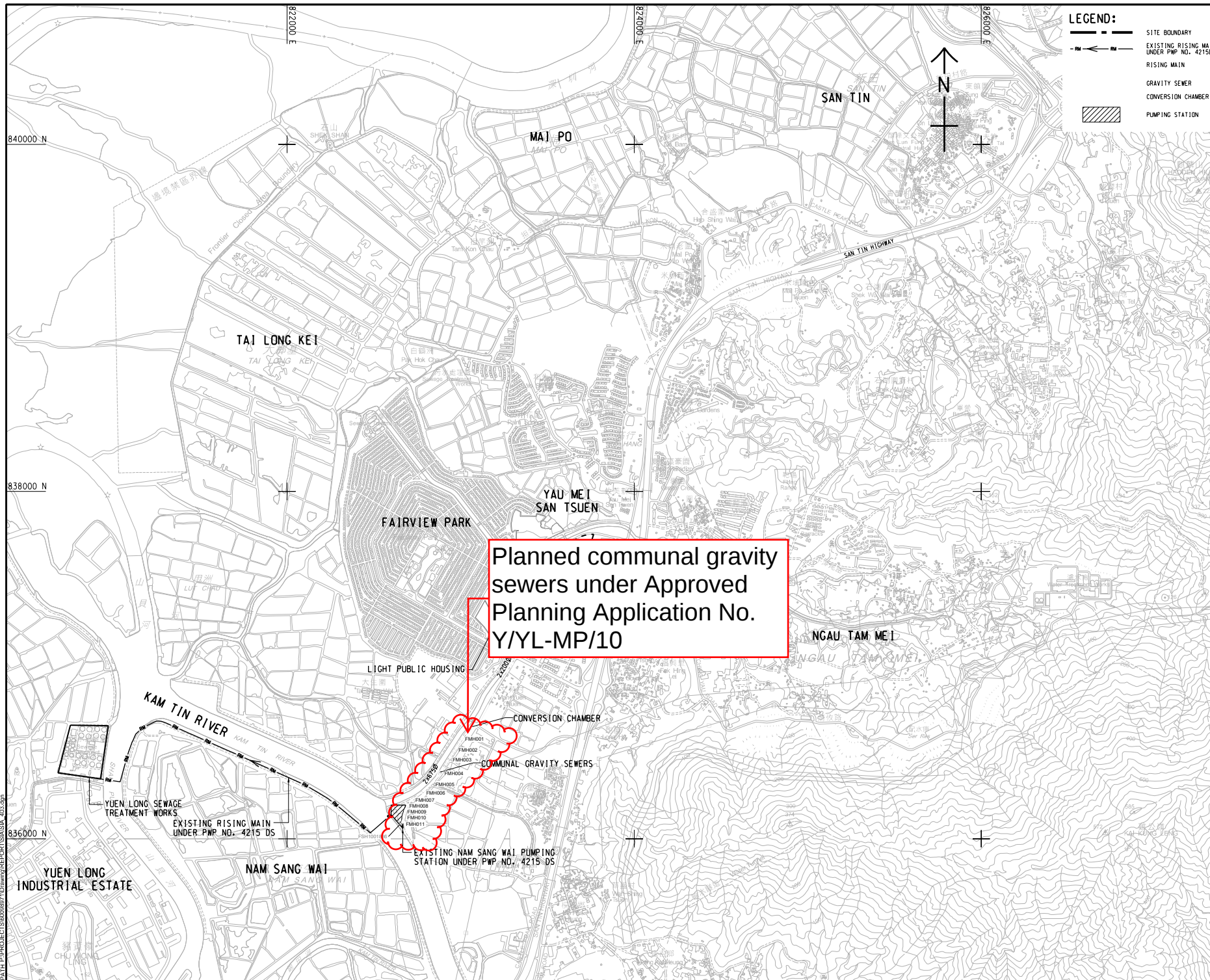
4.2.3. It is noted a light public housing site is located within the vicinity. The location of the light public housing site is as shown in **Figure 3**. The sewage (i.e. ADWF=1,061m³/day) generated will be conveyed to NSWSPS via exclusive sewage rising main from the site only.

4.3. Proposed communal gravity sewers under Approved Planning Application No.

4.3.1. The Y/YL-MP/10

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.



V of water = 0.000001 m³/s 20 °C

Manhole No.		Pipe																		Remark
		Cover Level		Invert Level		Nominal Outside Diameter (OD)	Nominal Diameter (DN)	Length	Flow Area	Pipe Gradient	Pipe Velocity	Capacity (Twin Pipe)	Roughness ⁽⁴⁾	Accumulated ADWF ⁽⁵⁾	Contributing Population	Peaking Factor ⁽⁶⁾	Estimated Peak Discharge	Capacity Check		
U/S	D/S	U/S	D/S	U/S	D/S														mm	mm
Conversion Chamber	FMH001	4.50	4.50	-2.68	-2.87	800	675	75.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH001	FMH002	4.50	4.55	-2.87	-3.04	800	675	70.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH002	FMH003	4.55	4.60	-3.04	-3.22	800	675	70.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH003	FMH004	4.60	4.65	-3.22	-3.41	800	675	75.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH004	FMH005	4.65	4.20	-3.41	-3.61	800	675	80.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH005	FMH006	4.20	4.00	-3.61	-3.81	800	675	80.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH006	FMH007	4.00	4.15	-3.81	-4.01	800	675	80.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH007	FMH008	4.15	4.20	-4.01	-4.12	800	675	45.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH008	FMH009	4.20	4.15	-4.12	-4.21	800	675	35.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH009	FMH010	4.15	4.10	-4.21	-4.28	800	675	30.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH010	FMH011	4.10	4.05	-4.28	-4.34	800	675	25.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		
FMH011	FSH1001886	4.05	5.35	-4.34	-4.38	800	675	15.0	0.36	400	1.09	0.78	1.5	15,500	57,408	3.98	0.713	91		

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.
- Concrete sewers slimed to about half depth; velocity, when flowing half full, approximately 1.2 m/s, normal condition is as
- Base on EPD initial estimation, the communal gravity sewer need to cater for design sewage flow of at least 15,500 m³/d.
- The communal gravity sewer is subject to detailed design, the hydraulic calculation demonstrate the feasibility in terms of

Details of the planned communal gravity sewers under the Approved Application No. Y/YL-MP/10