APPENDIX 6

SEWERAGE IMPACT ASSESSMENT

Section 16 Application for Proposed Minor Relaxation of Building Height Restriction for Proposed Hotel Development with Shop and Services at "Residential(A)" Zone and Area Shown as 'Road' at Nos. 9-19 (odds) Kam Wa Street, Shau Kei Wan

Sewerage Impact Assessment

(V3.0)

May 2026

Approved By 

(Project Manager: K.S. Lee)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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1 INTRODUCTION

1.1 Background

1.1.1 Land Glory Holdings Ltd. ("the Project Proponent") has proposed the development of a hotel located at Nos. 9-19 Kam Wa Street, Shau Kei Wan.

1.1.2 Cinotech Consultants Limited has been commissioned by Paliburg Development Consultants Ltd. (PDCL) to conduct a Sewerage Impact Assessment (SIA) to evaluate the sewerage impacts related to the implementation of the Project and to recommend any necessary upgrades.

1.1.3 This SIA is prepared to support a planning permission application to the Town Planning Board (TPB) under Section 16 of the Town Planning Ordinance (CAP. 131) for the hotel development with shop and services, which includes a request for relaxation of height restrictions.

1.2 DESCRIPTION OF THE ENVIRONMENT

1.2.1 The Application Site (the "Site") is situated in a residential and commercial area in Shau Kei Wan, along Kam Wa Street near its intersection with Mong Lung Street (see **Figure 1-1**).

1.2.2 The Site covers approximately 518 m² and is currently vacant. The tentative layout of the proposed development is presented in **Appendix 1-1**. The tentative population intake year is 2031.

2 SEWERAGE IMPACT ASSESSMENT

2.1 Methodology

2.1.1 "Guidelines for Estimating Sewage Flows for Infrastructure Planning" (GESF), version 1.0, March 2005, prepared by Environmental Protection Department (EPD) provides guidelines for the unit flow factor, catchment inflow factor and peaking factor. The daily sewage discharge and the peak sewage flow are estimated by population, unit flow factors and peaking factors.

2.1.2 "Sewerage Manual – Key Planning Issues and Gravity Collection System", third edition, May 2013, (hereafter called "the DSD Manual") prepared by Drainage Services Department (DSD) provides guidelines for the design of the drainage system. The capacities of the public sewers are calculated by Colebrook-White Equation.

2.2 Sewage Discharge from the Site

2.2.1 The population of non-residential area for hotel and retail are estimated according to the Gross Site Area (GFA) and the worker density from Figure 9 of Commercial and Industrial Floor Space Utilization, published by Planning Department. **Table 2-1** indicates the population calculation of the Site.

Table 2-1 Estimation of Population

Section	Non-residential GFA (m^2)	Non-residential Portion	
		Worker Density (worker/100 m^2)	No. of Employee
Retail	49	3.5	2
Hotel	7,309	3.2	234
Total			**236**

Note:
[1] According to figure 9 of Commercial and Industrial Floor Space Utilization Survey by Planning Department, the staff densities are: -
-- 3.2 staff per 100m^2 GFA for Hotels and Boarding Houses
-- 3.5 staff per 100m^2 GFA for Retails and Shops
[2] Swimming pool will not be provided in the Project.

2.2.2 The Site is located in Shau Kei Wan and therefore Catchment Inflow Factor, P_{cif}, of 1.25, has been adopted in the catchment calculation. The estimated sewage flow rates from the Site are summarised in **Table 2-2**. With the P_{cif} taken into account, the total Average Dry Weather Flow (ADWF) is 462.9 m^3/day.

Table 2-2 Calculation of Sewage Discharge

Occupant Type	Unit Flow Factors (m^3/day/person) [1]	No. of Employee	ADWF (m^3/day)
Retail	0.28	2	0.6
Hotel	1.58	234	369.7
Total ADWF (m^3/day) with P_{cif}			**462.9**

Notes:
[1] According to EPD's Guidelines for Estimating Sewage Flows for Infrastructure Planning, the Unit Flow Factor are: -
-- 0.28 m^3/day/person for Retail;
-- 1.58 m^3/day/person for Hotel.

2.3 Sewage Discharge from the Vicinity

2.3.1 The surrounding developments near the Site are sectioned into different catchments based on the existing sewerage system. The sewage catchment areas in the vicinity are shown in **Figures 2-1a & 2-1b**, and the estimated sewage discharges from each catchment, taking into account P_{cif}, are summarized in **Table 2-3**. These surrounding catchments are located in the Shaukeiwan District Council Constituency Area as per the 2021 Population Census, which has a household size of 2.5, adopted in the current assessment. Detailed calculations of the flow rate and population are presented in **Appendix 2-1**.

Table 2-3 Sewage Discharge from Surrounding Catchments

Catchment ID	Total ADWF for each Catchment with P_{cif} (m^3/day)
A	145.4
B	34.2
C	9.8
D	876.5
E	492.0
F	405.5
G	3035.0
H	682.7
I	36.3

[1] The calculation is detailed in **Appendix 2-1**.

2.4 Assessment of Existing Sewerage System and Proposed New Sewer

Approved Drainage Installation Plan & Discharge Route

2.4.1 The Project Proponent submitted a Drainage Installation Plan in association with the General Building Plan for a proposed residential development on the Site. The Drainage Installation Plan was approved by the Building Department on 19th May 2025 (BD reference: BD 4/3009/19), as presented in **Appendix 2-2**.

2.4.2 According to the approved Drainage Installation Plan, a new public manhole (FMH-01) is planned to be constructed between manholes FMH7039281 and FMH7039323. Sewage

generated from the Site is to be collected by terminal manhole FTMH-01 and further discharged to FMH-01, as shown in **Figure 2-2**.

2.4.3 The configuration of the previously approved Drainage Installation Plan, including the discharge route and invert levels, has been adopted in the current assessment.

2.4.4 Since the sewage discharge from the Site is expected to increase in compared to the previously proposed residential development, the downstream sewers shall be checked for sufficient capacities to cater for the sewage discharge.

Capacity of Downstream Sewers

2.4.5 The capacities of the existing downstream sewer pipe sections (PS01 - PS05, **Figure 2-2**), have been calculated by Colebrook-White Equation. The calculated capacities are summarised in **Table 2-4** and the detailed calculation can be found in **Table A of Appendix 2-3**.

Table 2-4 Capacity of Existing Foul Sewers

Pipe Section	Upstream Manhole	Downstream Manhole	Full Capacity (L/s)
Existing Downstream Sewer			
PS01	FMH-01	FMH7039281	51.9
PS02	FMH7039281	FMH7039241	193.9
PS03	FMH7039241	FMH7039242	282.5
PS04	FMH7039242	FMH7039243	746.2
PS05	FMH7039243	FMH7039244	729.6

Note:
[1] The calculation is detailed in Table A of **Appendix 2-3**.

2.4.6 A summary of the utilization of the sewers is shown in **Table 2-5**. Detailed calculation is shown in Tables B of **Appendix 2-3**. The results indicate that existing downstream 675mm sewer (PS03) have insufficient capacity to cater for the expected sewage flow. Upgrading works for the existing sewer is considered necessary.

Table 2-5 Proportion of Peak Flow to Full Capacity (Existing Pipes and New Proposed Manhole)

Pipe Section	Full Capacity (L/s)	Peak Flow (L/s)	Utilization
Existing Downstream Sewer			
PS01	51.9	42.2	81%
PS02	193.9	44.6	23%
PS03	**282.5**	**286.1**	**101%**
PS04	746.2	286.1	38%
PS05	729.6	286.1	39%

Note:
[1] The calculation is detailed in **Table B of Appendix 2-3**.
[2] Bolded and underlined indicate the surcharged sewer.

Discharge Sewer of the Site

2.4.7 In line with the previously approved Drainage Installation Plan, the sewage discharged from the Site is proposed to be collected by terminal manhole FTMH-01 and discharged to the new public manhole FMH-01 via a 225 mm PE sewer (PP01) (see **Figure 2-2**).

Table 2-6 Proportion of Peak Flow to Full Capacity (Proposed New Sewers)

Pipe Section	Upstream Manhole	Downstream Manhole	Diameter (mm)	Full Capacity (L/s)	Peak Flow (L/s)	Utilization
PP01	FTMH-01	FMH-01	225	135.8	32.1	24%

Proposed Upgrade in the Surrounding

2.4.8 The 675 mm concrete sewer, PS03, is proposed to be improved by providing a Polyvinyl Chloride (PVC) lining. The proposed upgrade involves the insertion of a close-fit pipe liner into the sewer. The utilization of the upgraded sewer is summarized in **Table 2-7** and detailed in **Appendix 2-4**.

Table 2-7 Proportion of Peak Flow to Full Capacity (Proposed Upgraded Sewer)

Pipe Section	Material	Diameter (mm)	Full Capacity (L/s)	Peak Flow (L/s)	Utilization
PS03	Concrete Sewer with PVC Lining	675	345.9	286.1	83%

2.4.9 With the new public manhole and sewer connection as approved by the Building Department under the Drainage Installation Plan and the upgraded sewer by PVC lining, the downstream sewer will be able to cater for the expected peak sewage flow no sewerage impact arising from the Site is anticipated.

3 CONCLUSION

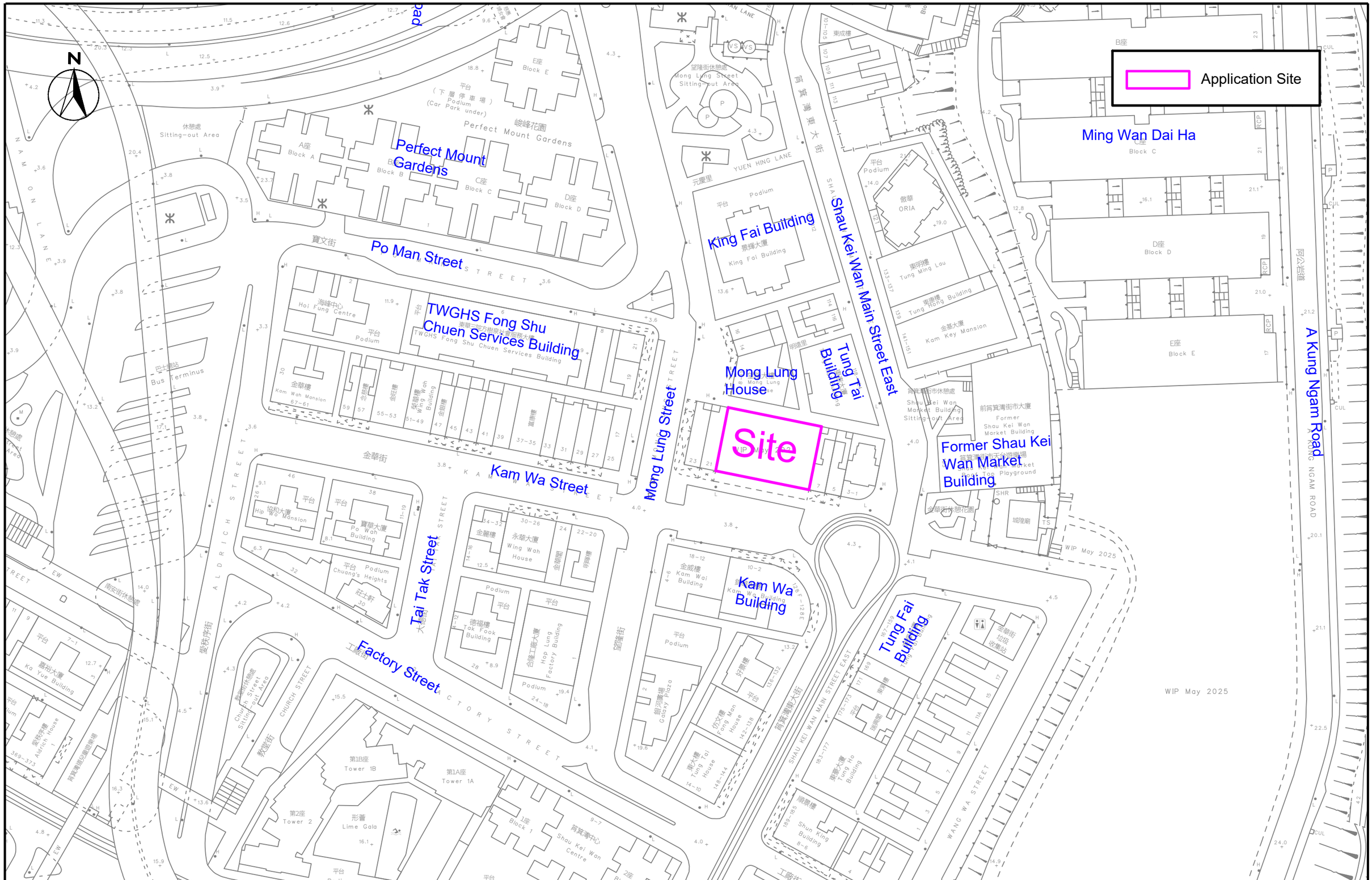
3.1.1 This Sewerage Impact Assessment has been undertaken to assess the potential sewerage impact of the Proposed Development and to serves as a supporting document for the planning permission from TPB under Section 16.

3.1.2 The sewage discharged from the Site is proposed to be collected by terminal manhole FTMH-01 and discharged to the new public manhole FMH-01 via a 225 mm PE sewer (PP01).

3.1.3 The 675 mm concrete sewer, PS03, is proposed to be improved by providing a Polyvinyl Chloride (PVC) lining.

3.1.4 With the proposed new public manhole, sewer connection and upgraded sewers, the downstream sewers will be able to cater for the expected peak sewage flow arising from the Site. No adverse sewerage impact is anticipated.

FIGURES



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Section 16 Application for Proposed Minor Relaxation of Building Height Restriction for Proposed Hotel Development with Shop and Services at "Residential(A)" Zone and Area Shown as 'Road' at Nos. 9-19 (odds) Kam Wa Street, Shau Kei Wan

Site Location Plan

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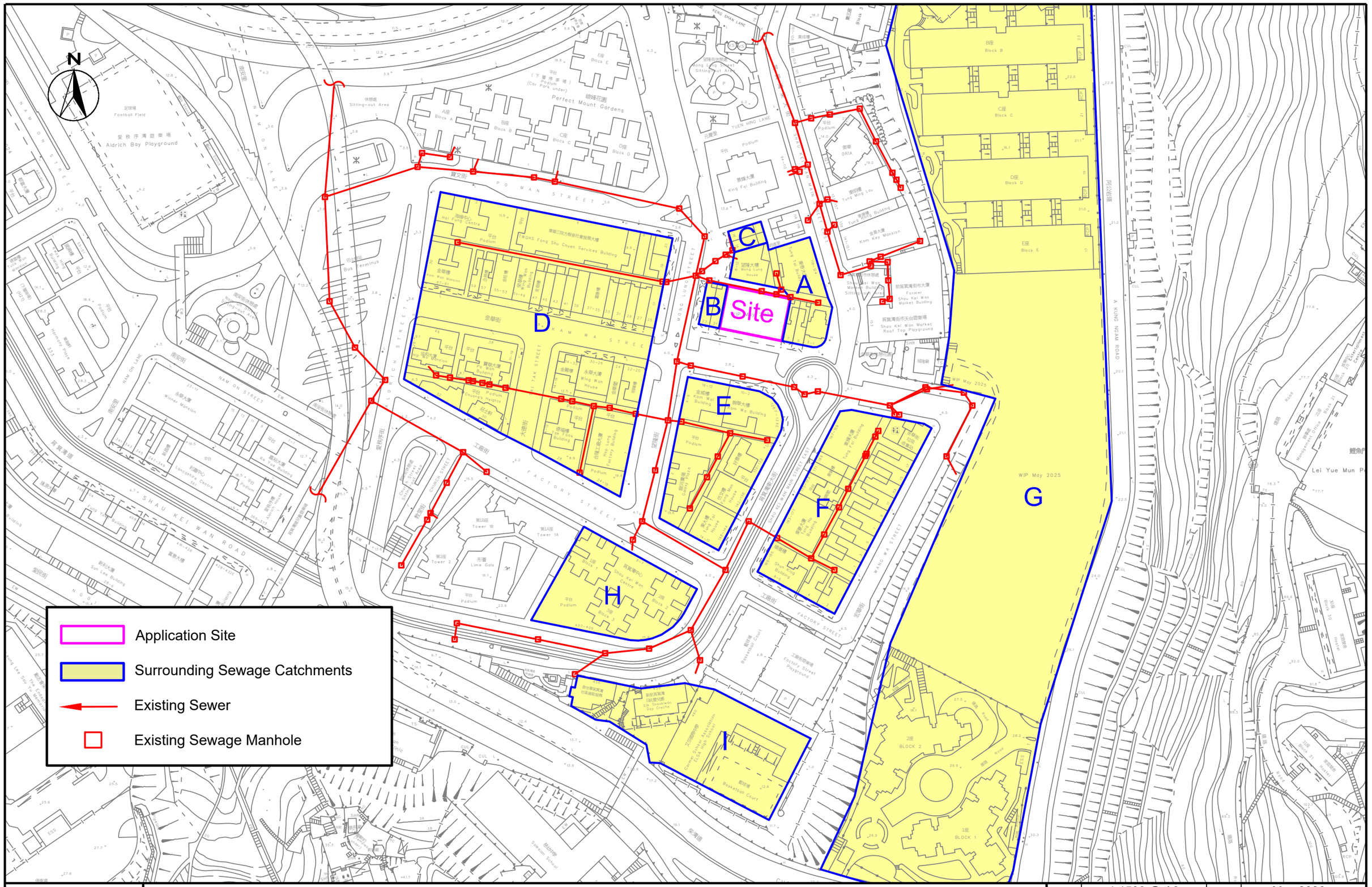
		REV	-



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Existing Sewerage System (Overview)

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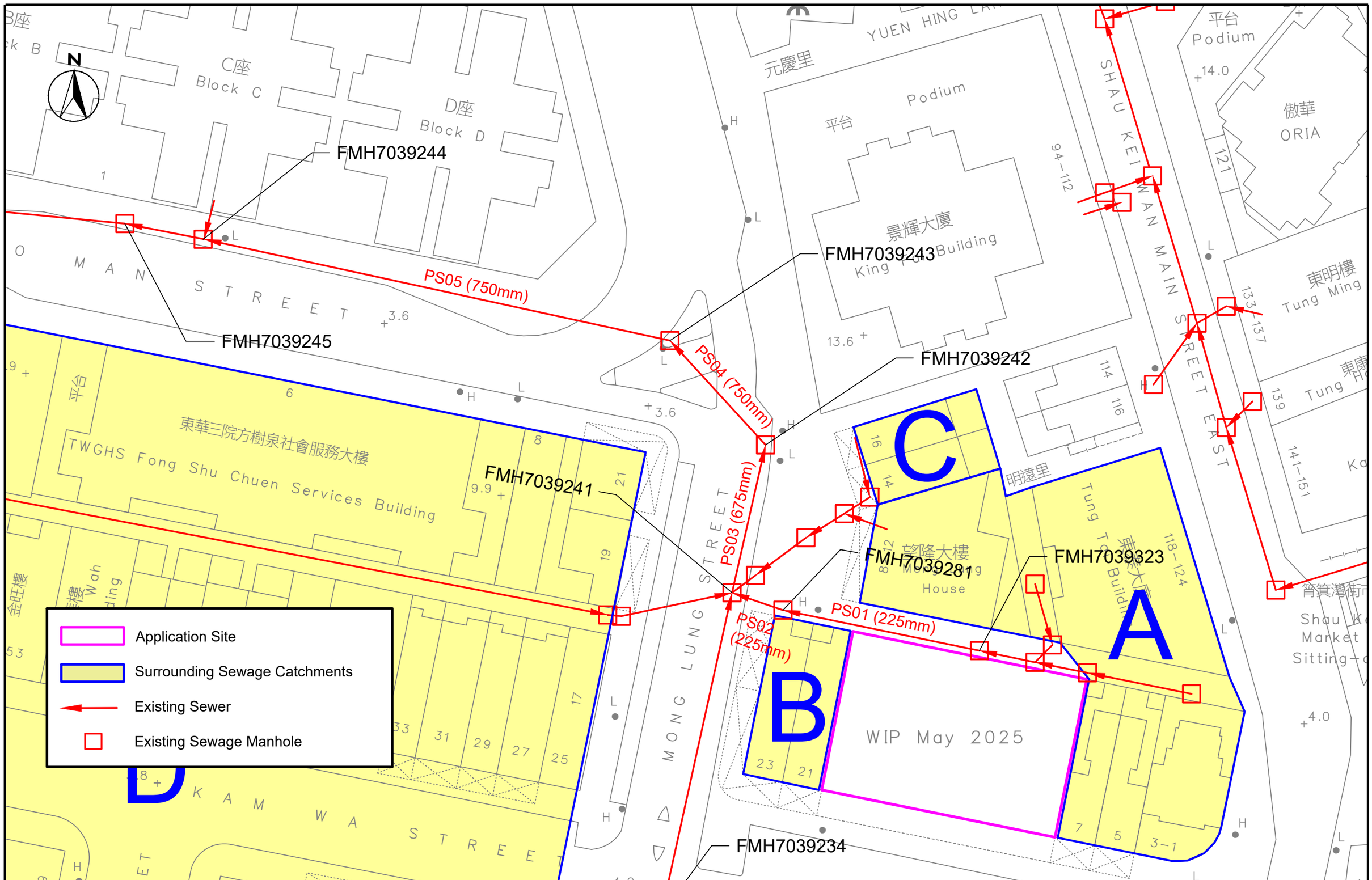

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Existing Sewerage System (Zoom-in View)

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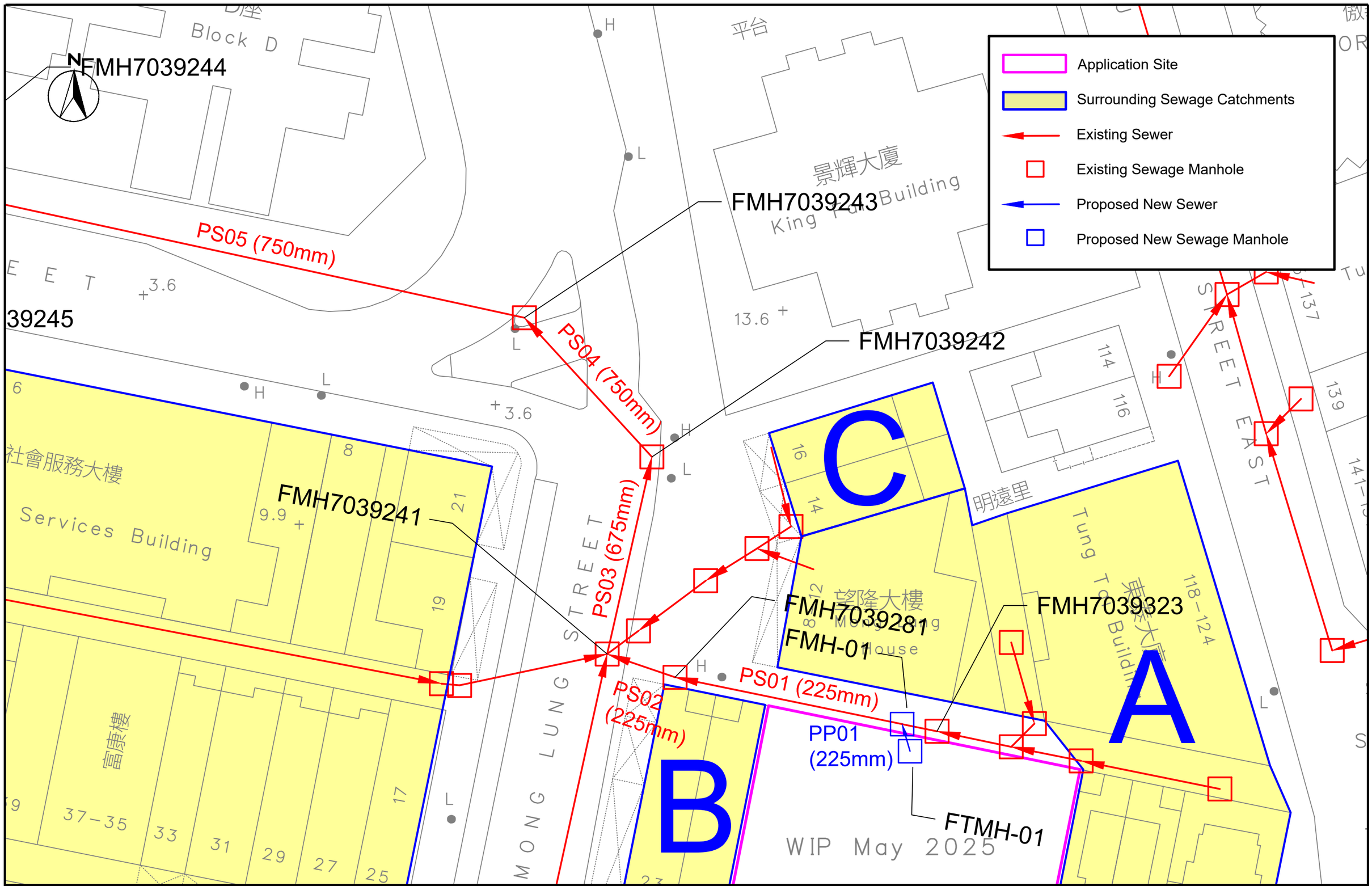

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Section 16 Application for Proposed Minor Relaxation of Building Height Restriction for Proposed Hotel Development with Shop and Services at "Residential(A)" Zone and Area Shown as 'Road' at Nos. 9-19 (odds) Kam Wa Street, Shau Kei Wan

Proposed New Sewer & Manhole

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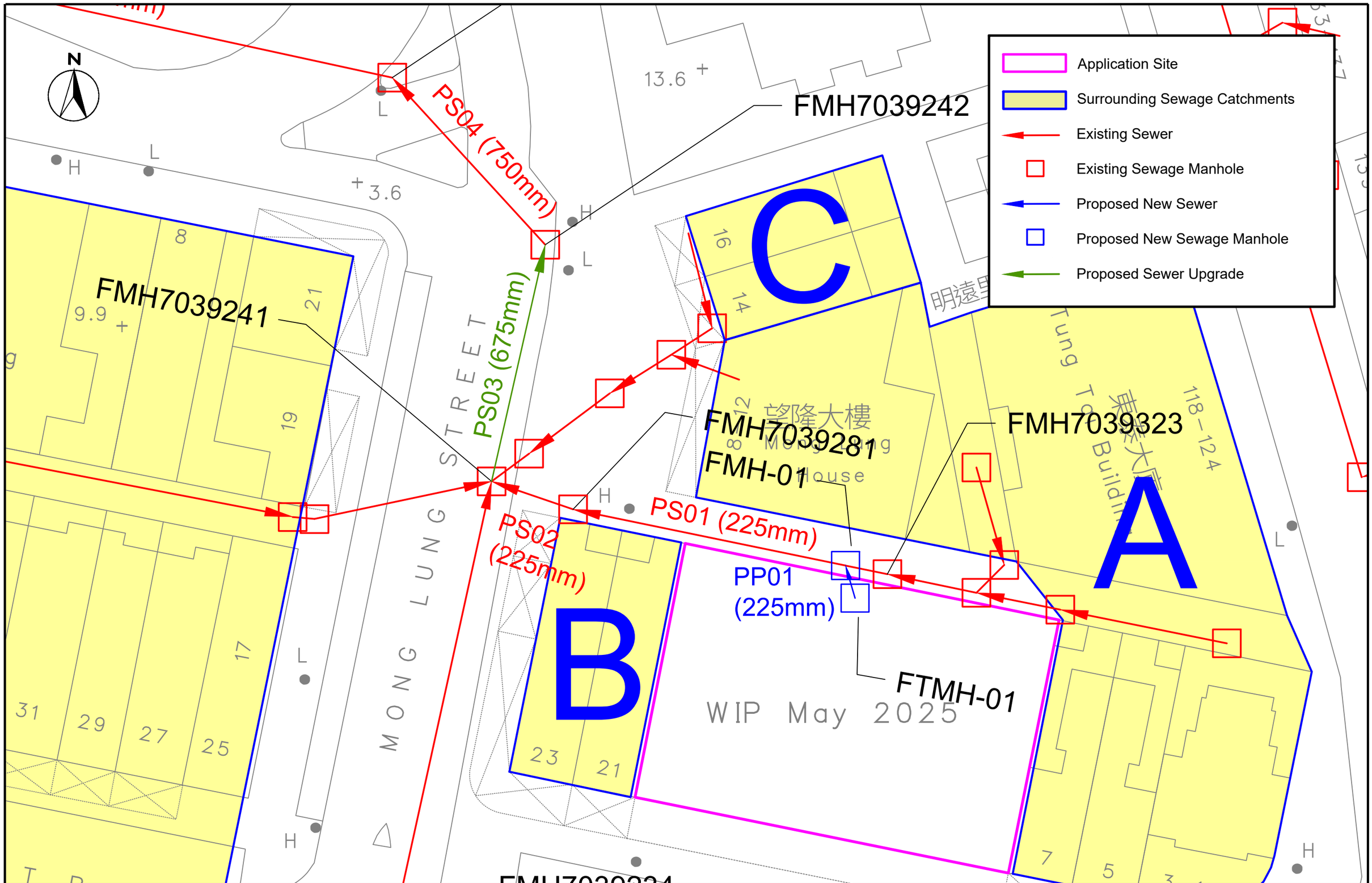

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Proposed Upgraded Sewer

SCALE	1:250 @ A3	DATE	May 2026
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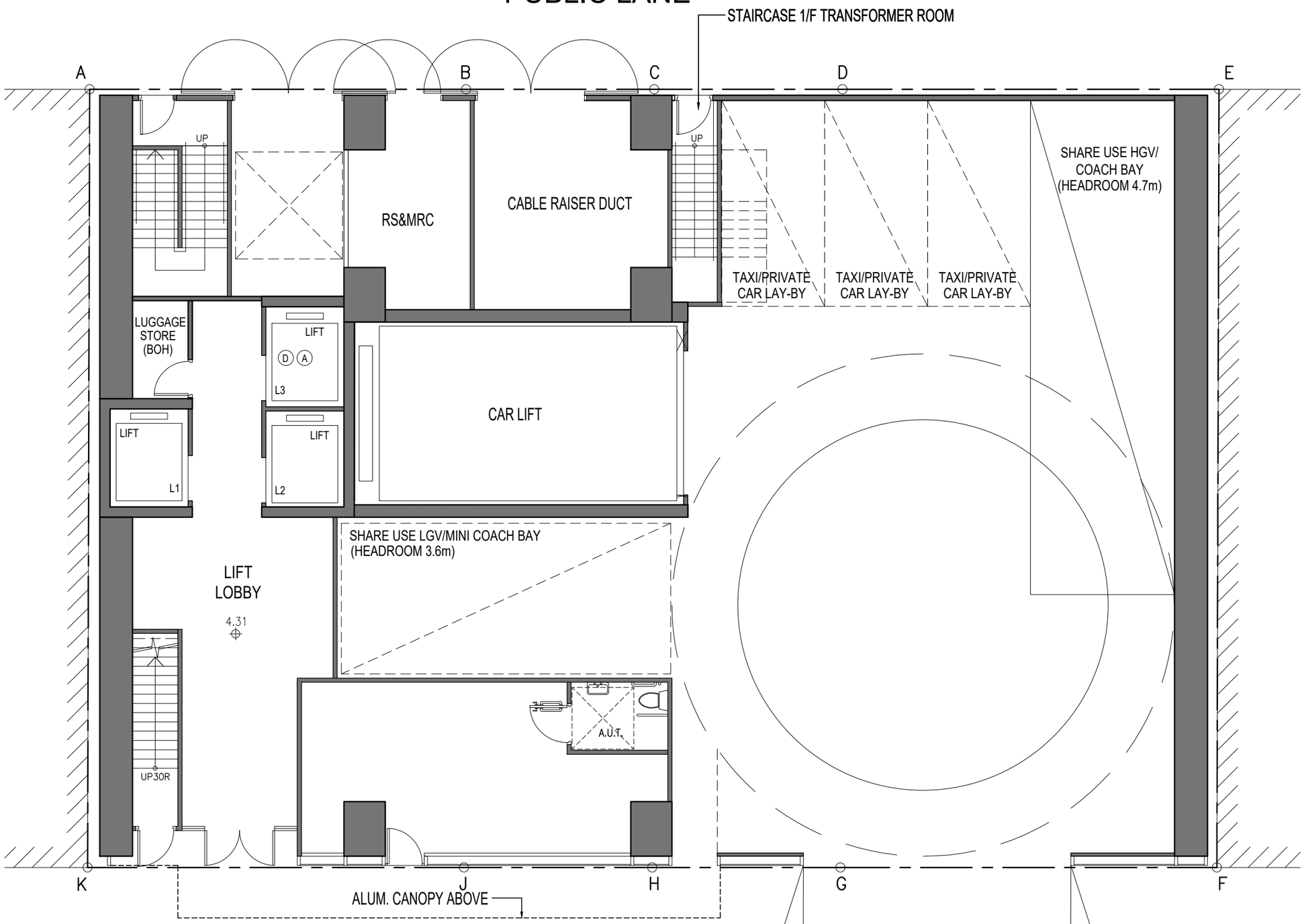
		REV	-

APPENDIX 1-1
TENTATIVE LAYOUT OF THE PROPOSED DEVELOPMENT

PUBLIC LANE



GROUND FLOOR PLAN

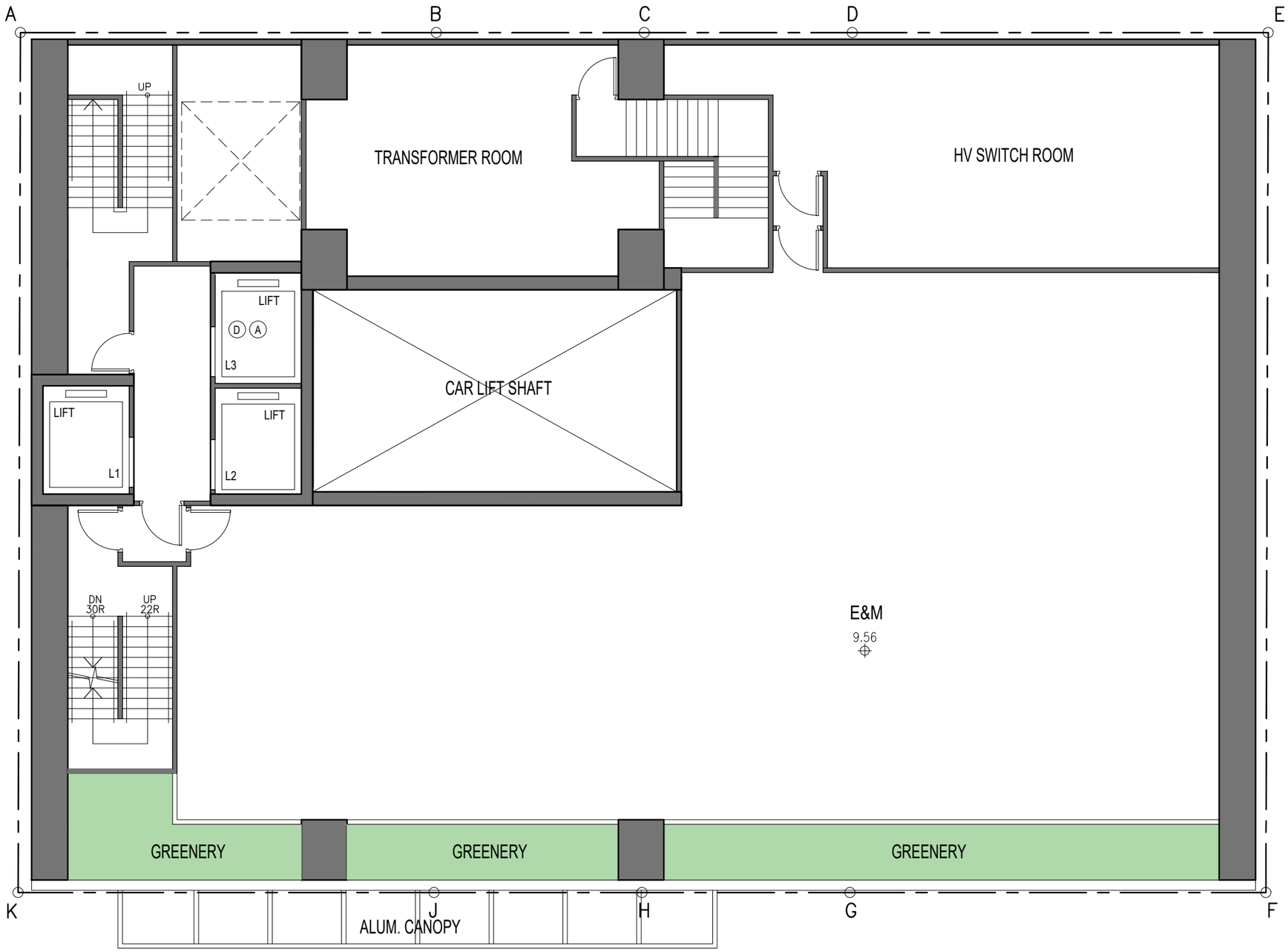
1:100

TS TS TS TS TS

(9-19) KAM WA STREET - SHAU KEI WAN

KAM WA STREET

07/05/2026

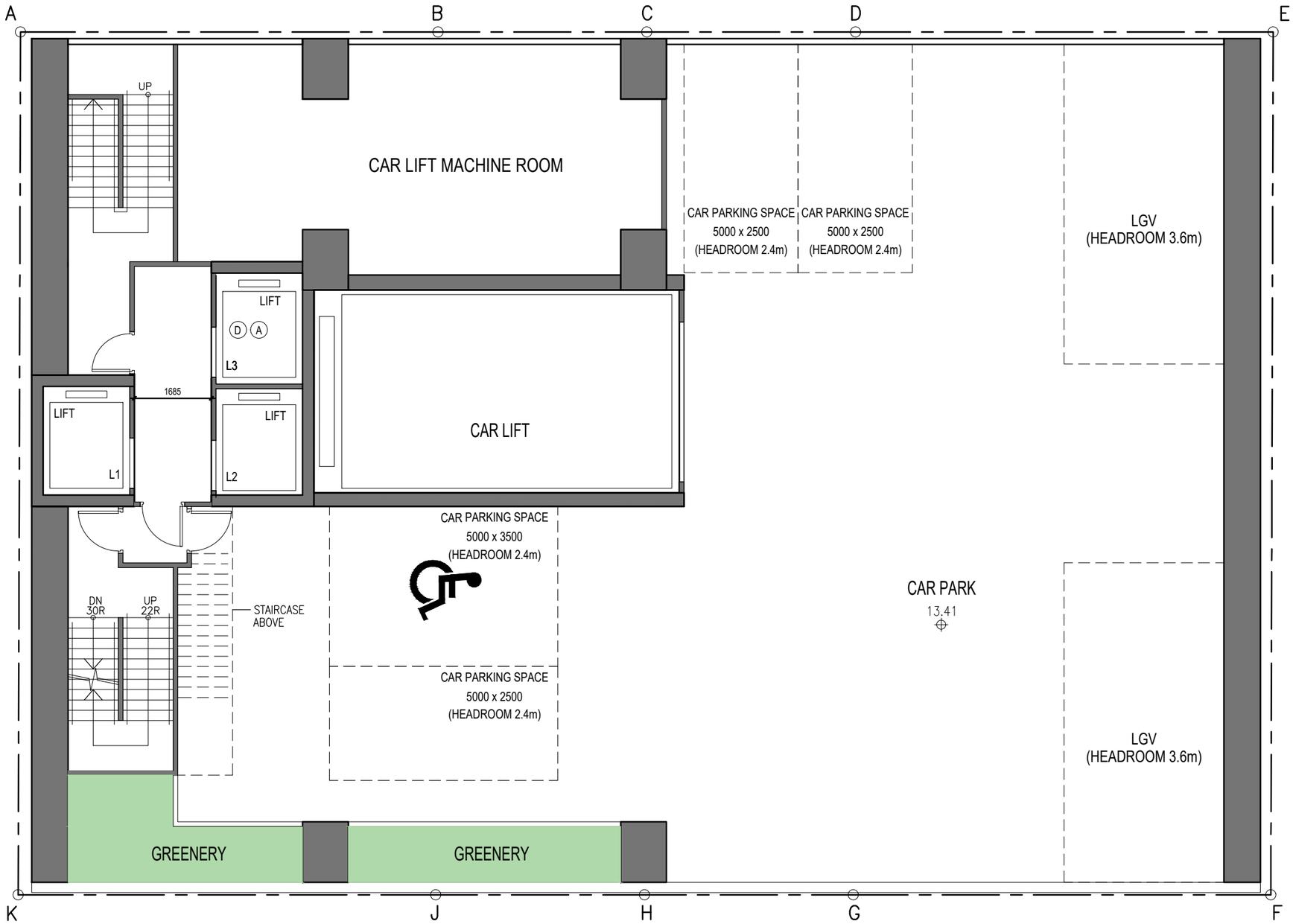


1ST FLOOR PLAN (E&M)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

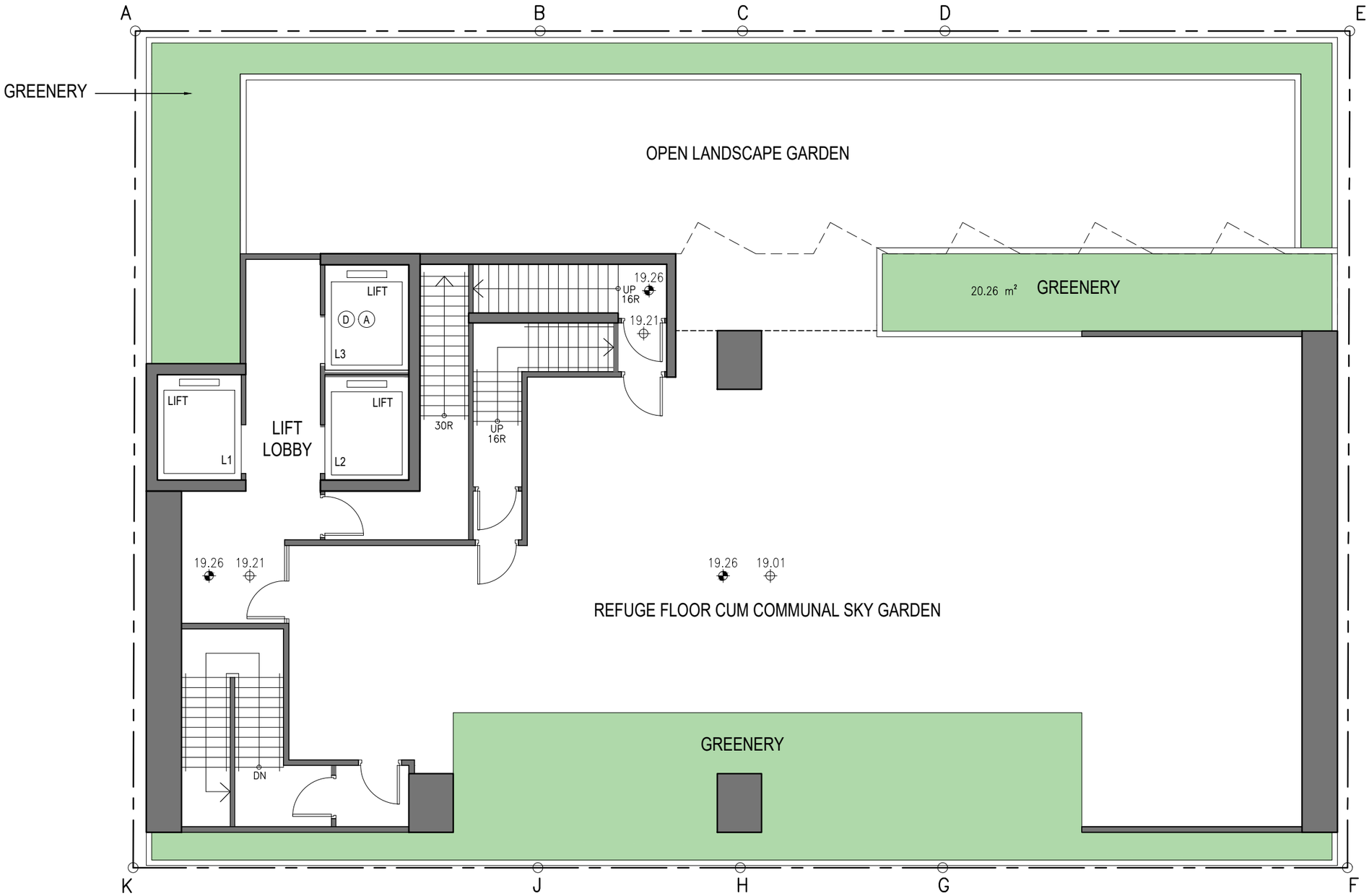


2ND FLOOR PLAN (CAR PARK)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

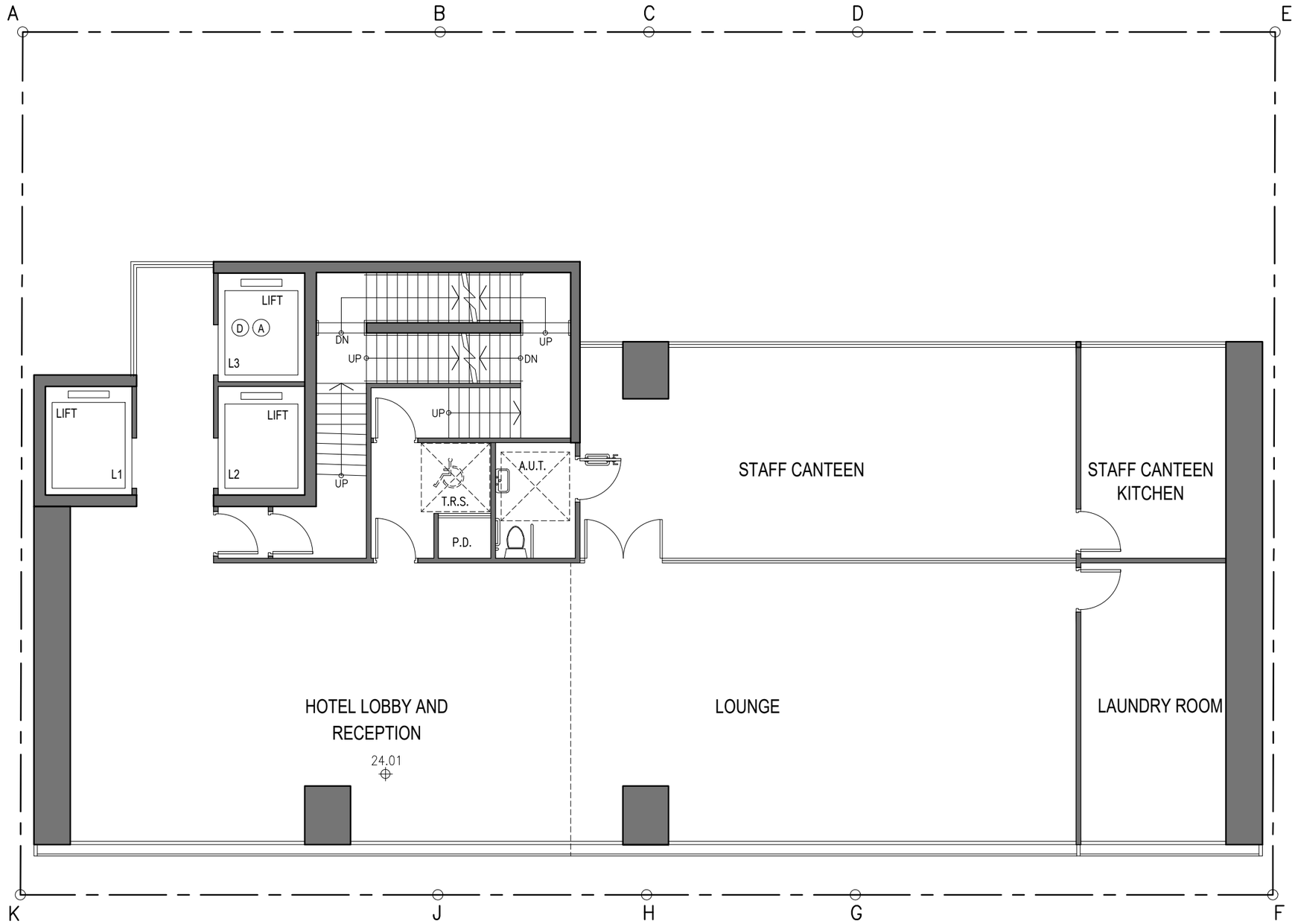


3RD FLOOR PLAN (REFUGE FLOOR)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

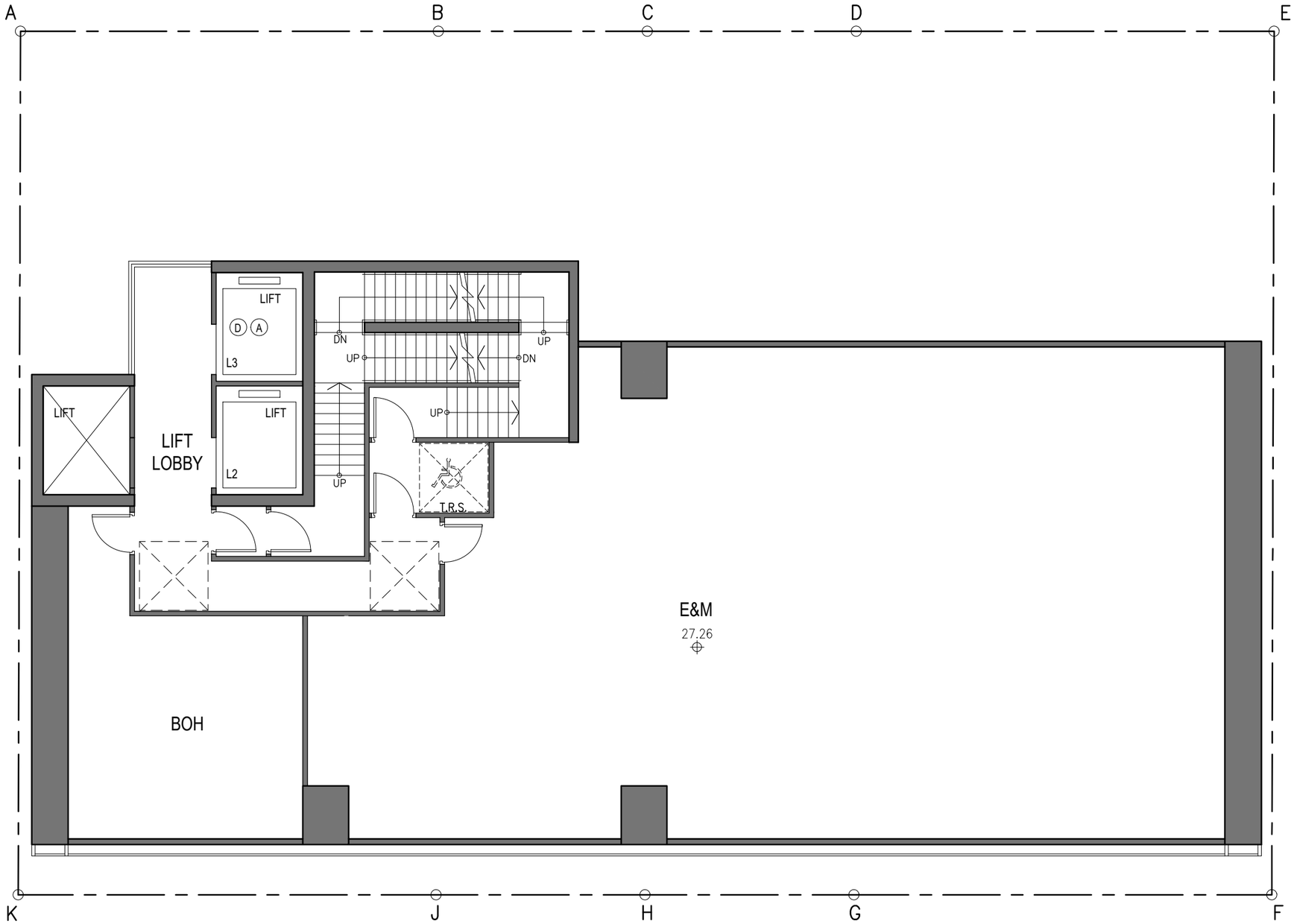


4TH FLOOR PLAN (LOBBY/BOH)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

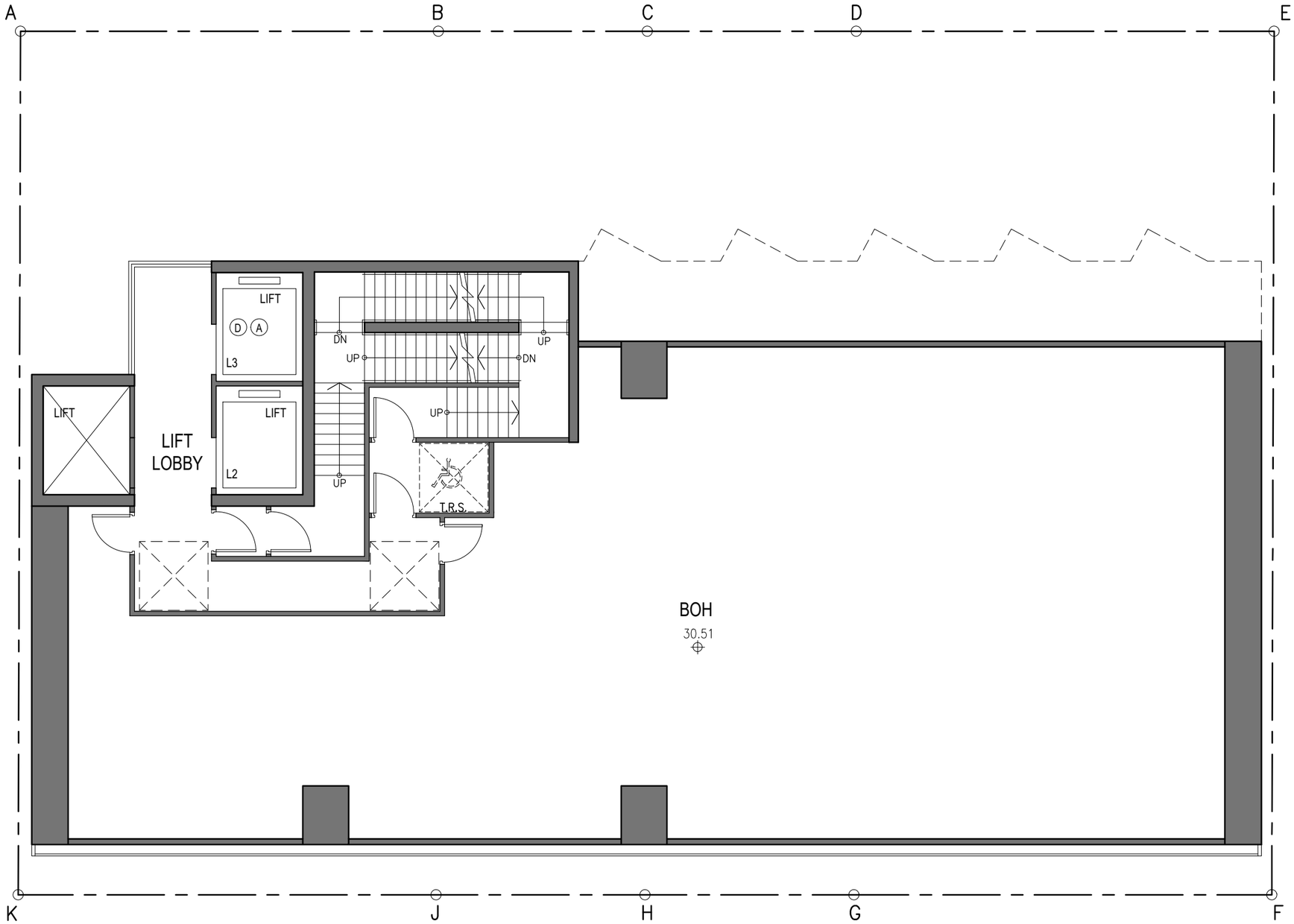


5TH FLOOR PLAN (E&M / BOH)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

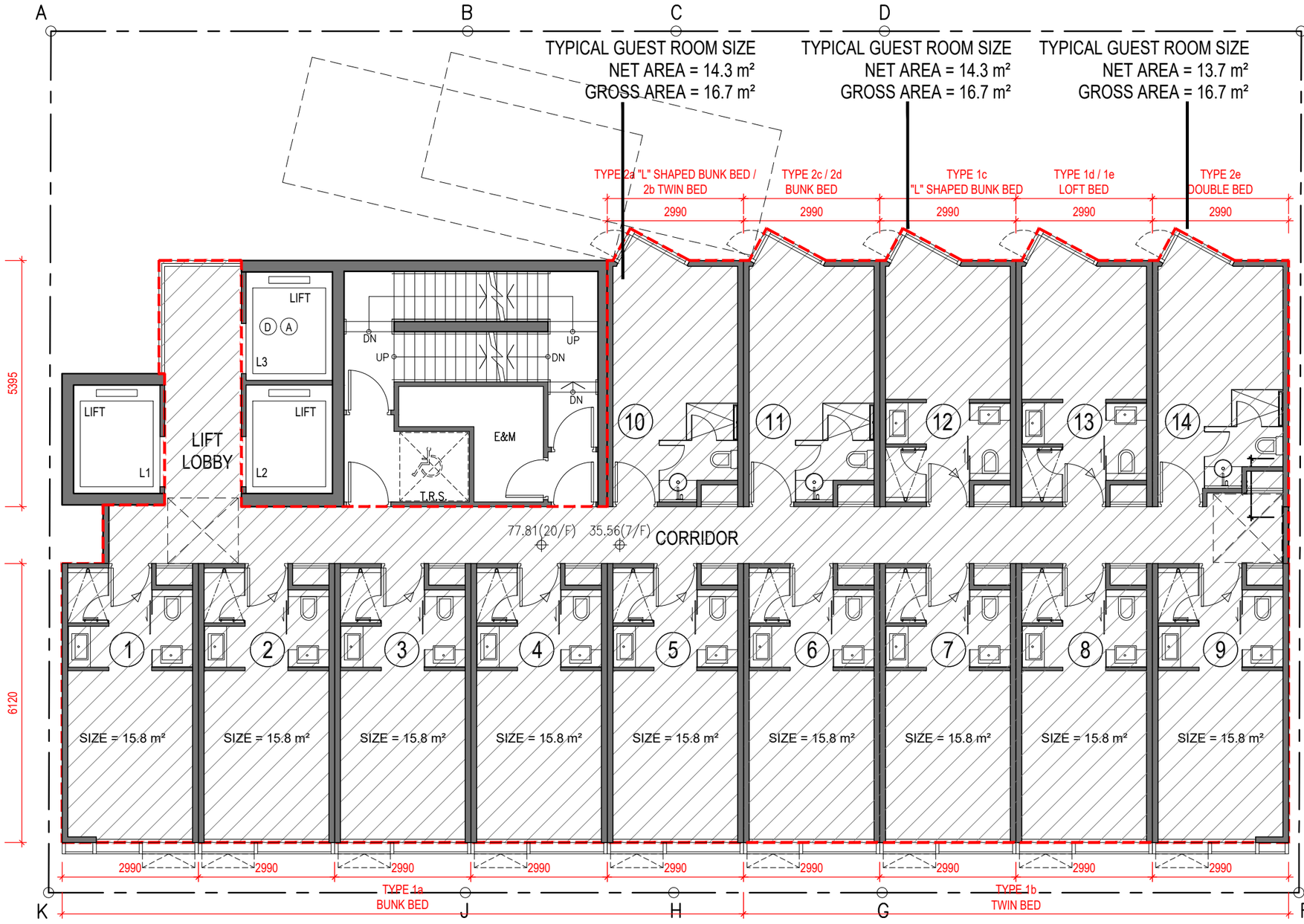


6TH FLOOR PLAN (BOH)

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026



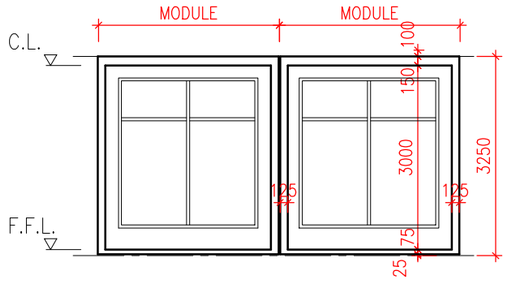
SITE PARTICULAR

AREA OF SITE = 518.408 m²
CLASS OF SITE = 'A'
PERMISSIBLE SITE COVERAGE FOR NON-DOMESTIC (OVER 61m)
= 60%
ACTUAL MIC AREA = 290.231 m² (PER FLOOR)
EXEMPTED 10% MIC AREA
= 290.231 m² x 10%
= 29.023 m² (PER FLOOR)
ACTUAL SITE COVERAGE FOR NON-DOMESTIC
= (340.006 m² - 29.023 m²) / 518.408 m² x 100%
= 59.988 % < 60%

ACTUAL GFA = 305.657 m² (PER FLOOR)
CORE AREA = 44.449 m² (PER FLOOR)

MIC TYPICAL ROOM SECTION

FLOOR TO FLOOR HEIGHT = 3.250 m



7TH ~ 20TH FLOOR PLAN (14 STOREYS)

1:100

TOTAL GUEST ROOM NOS. = 14 NOS. x 14 STOREYS = 196 NOS.

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

ACTUAL MIC AREA = 287.262 m² (PER FLOOR)

EXEMPTED 10% MIC AREA

= 287.262 m² x 10%

= 28.726 m² (PER FLOOR)

ACTUAL GFA = 302.985 m² (PER FLOOR)

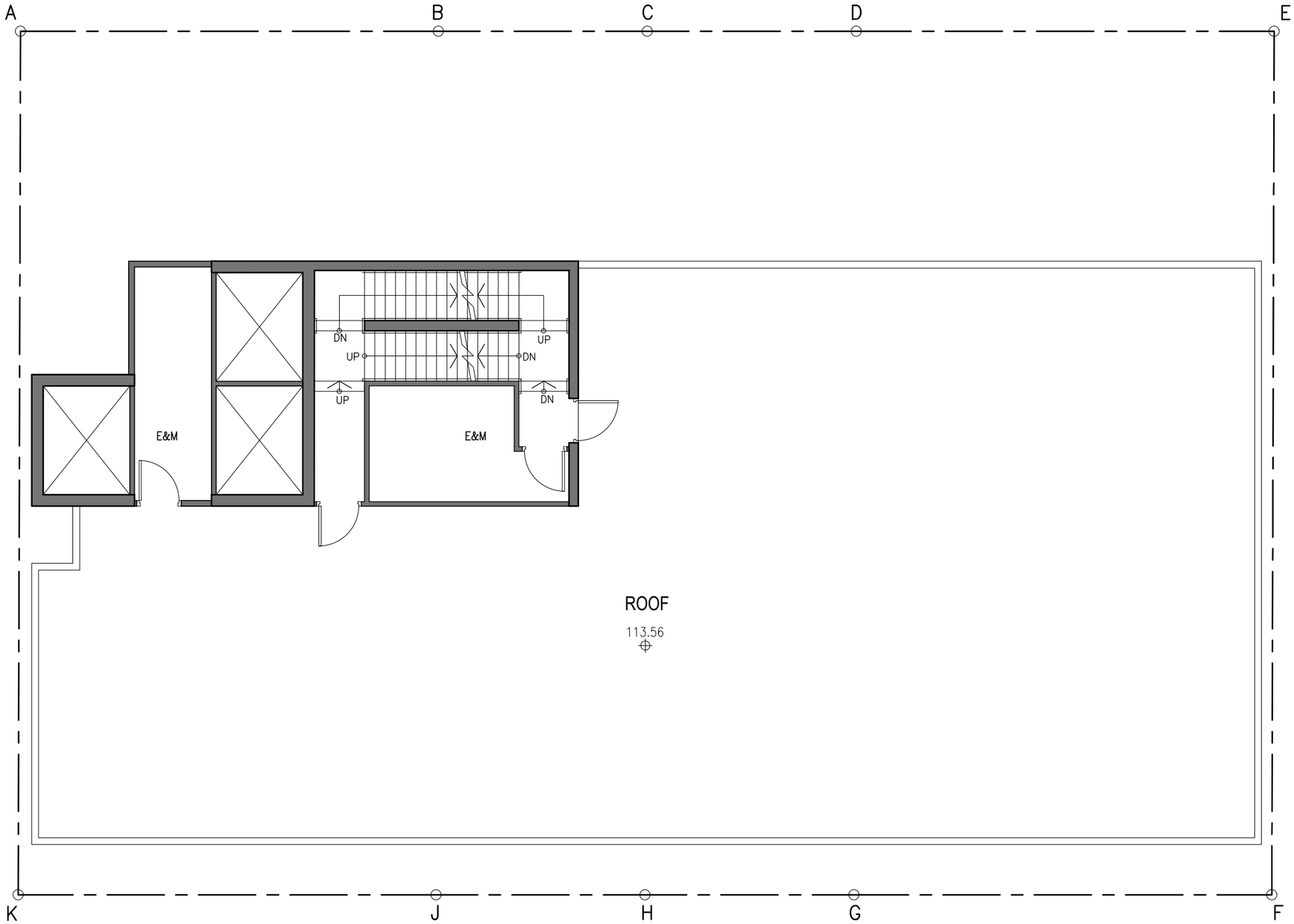
21TH ~ 30TH FLOOR PLAN (10 STOREYS)

1:100

TOTAL GUEST ROOM NOS. = 14 NOS. x 10 STOREYS = 140 NOS.

(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026



ROOF PLAN

1:100

(9-19) KAM WA STREET - SHAU KEI WAN

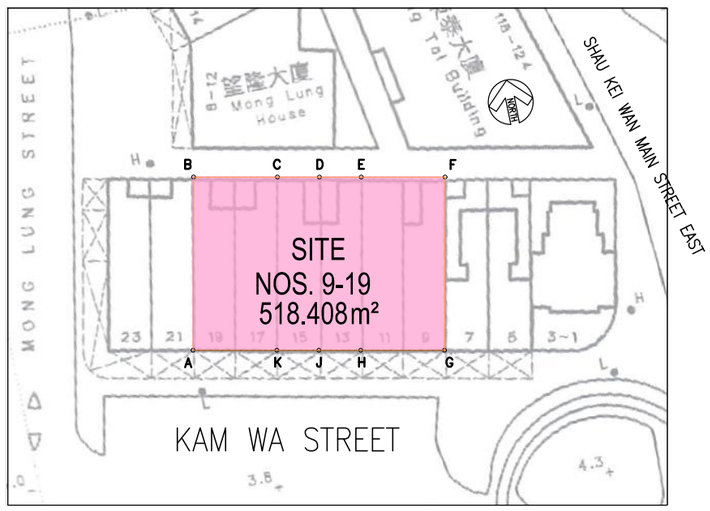
07/05/2026

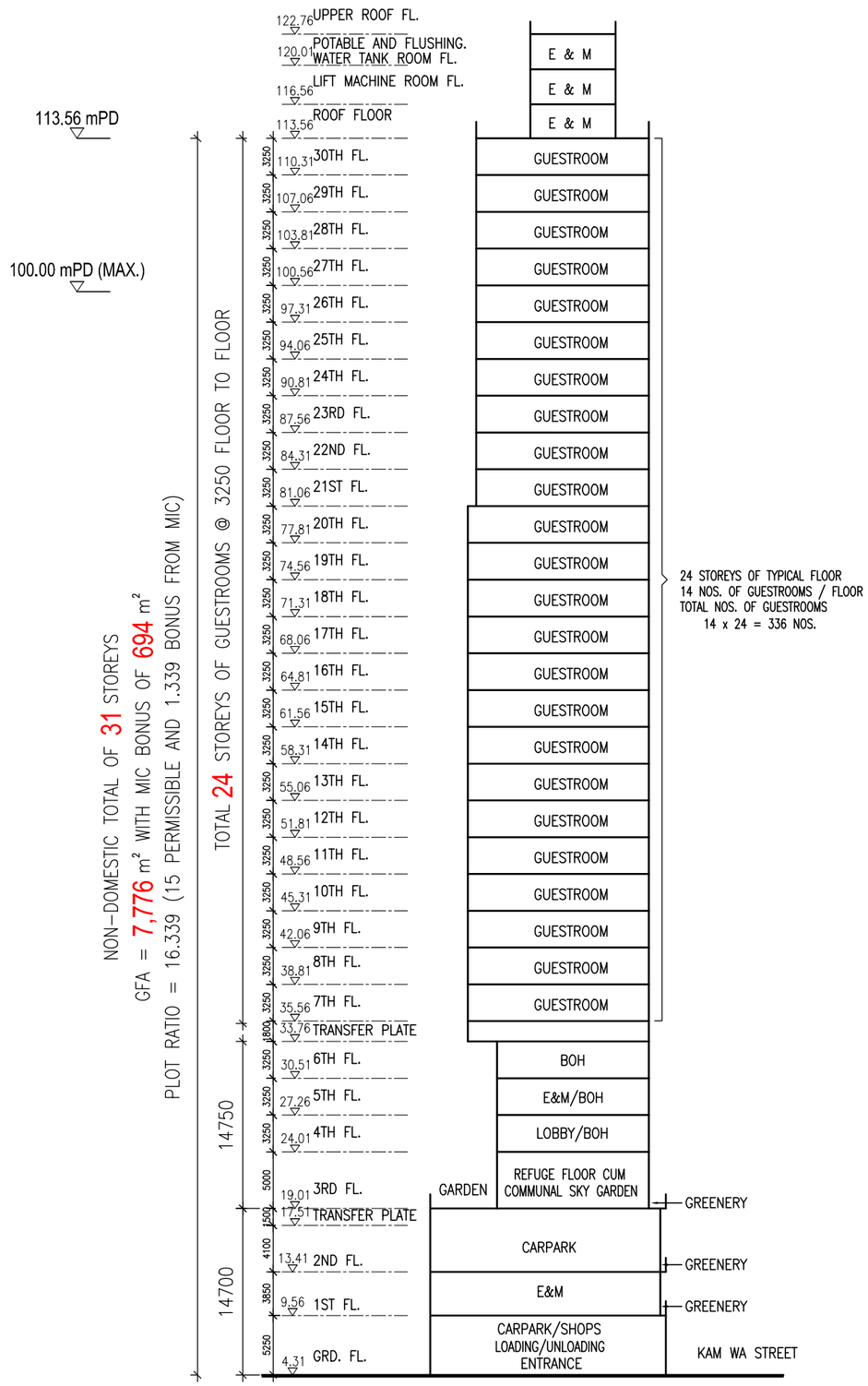
SITE PARTICULARS

ADDRESS	= NOS. 9-19 KAM WA STREET, SHAU KEI WAN, HONG KONG
LOT NO.	= SIL 433 S.F, SIL 433 S.G, SIL 433 RP, SIL 433 S.D
AREA OF SITE	= 518.408 m²
CLASS OF SITE	= 'A'
OZP UNDER TOWN PLANNING	= R(A) and area shown as "Road", S16 CHANGE TO HOTEL
PERMITTED BUILDING HEIGHT	= 100 mPD
PERMITTED SITE COVERAGE	= 60%

PROPOSED NON-DOMESTIC

MIC BONUS HEIGHT	= 24x 3.25m x4% = 3.12m
PLOT RATIO	= 15
MIC BONUS PLOT RATIO	= 1.339
GROSS FLOOR AREA	= 7,776 m²
MIC BONUS GFA	= 694 m²
SITE COVERAGE	= 60 % + 5.598 % (MIC BONUS) = 65.598%
NOS. OF GUEST ROOM	= 336
TYPICAL GUEST ROOM SIZE	= 15.8 m²





(9-19) KAM WA STREET - SHAU KEI WAN

07/05/2026

APPENDIX 2-1
SEWAGE DISCHARGE FROM SURROUNDING CATCHMENTS

Appendix 2-1: Sewage Discharge from Surrounding Catchments

Catchment ID	Building	No. of Flats	Total Area (m^2) [2]			Population [1]					ADWF (m^3/day)					Total ADWF (m^3/day)	Total ADWF for each catchment with P_{CIF} (m^3/day)[4]	Reference
			Community, Social & Personal Services	Retails	Restaurant	Staff (by worker density - Community, Social & Personal Services)	Staff (by worker density - Retails)	Staff (by worker density - Restaurants)	Student	Residential	Residential UFF = 0.27	Community, Social & Personal Services UFF = 0.28	Wholesale & Retail UFF = 0.28	Restaurants UFF = 1.58	Students UFF = 0.04			
A	Tung Tai Building	53	--	316	--	--	12	--	--	133	35.9	--	3.4	--	--	116.3	145.4	No. of Flats - Centaline Property
	1 -3, 5 - 7 Kam Wa Street	30	331	--	172	11	--	9	--	75	20.3	3.1	--	14.2	--			
	Mong Lung House	55	--	210	--	--	8	--	--	138	37.3	--	2.2	--	--			
B	21, 23 Kam Wa Street	27	--	86	85	--	4	5	--	68	18.4	--	1.1	7.9	--	27.4	34.2	
C	14, 16 Mong Lung Street	10	--	104	--	--	4	--	--	25	6.8	--	1.1	--	--	7.9	9.8	
D	TWGHS Fong Shu Chuen Services Building	ADWF of the development is extracted from Planning Application No: A/H9/78.														98.0	876.5	A/H9/78 - Sewerage Cachement U
	Hoi Fung Centre	--	640	546	94	22	20	5	--	1873	505.7	6.2	5.6	7.9	--	603.2		Residential Population - Population Census 2021 - Subunits 161/14-16 and 161/90
	8 Po Man Street	--	--	--	88	--	--	5	--			--	--	7.9	--			
	19 - 21 Mong Lung Street	--	--	--	--	--	--	--	--			--	--	--	--			
	Kam Wah Mansion	--	--	336	40	--	12	3	--			--	3.4	4.7	--			
	Nim Chi Lau	--	--	189	--	--	7	--	--			--	2.0	--	--			
	Kam Wong House	--	--	202	--	--	8	--	--			--	2.2	--	--			
	Wing Wah Building	--	--	165	--	--	6	--	--			--	1.7	--	--			
	45 - 47 Kam Wa Street	--	--	179	--	--	7	--	--			--	2.0	--	--			
	41 - 43 Kam Wa Street	--	--	200	--	--	7	--	--			--	2.0	--	--			
	39 Kam Wa Street	--	--	104	--	--	4	--	--			--	1.1	--	--			
	Fu Hong Lau	--	--	187	--	--	7	--	--			--	2.0	--	--			
	31 - 33 Kam Wa Street	--	--	192	--	--	7	--	--			--	2.0	--	--			
	29 Kam Wa Street	--	--	89	--	--	4	--	--			--	1.1	--	--			
	27 Kam Wa Street	--	--	104	--	--	4	--	--			--	1.1	--	--			
	25 Kam Wa Street	--	--	88	--	--	4	--	--			--	1.1	--	--			
	Hip Wo Mansion	--	--	322	39	--	12	2	--			--	3.4	3.2	--			
	Po Wah Building	--	--	443	--	--	16	--	--			--	4.5	--	--			
	32 Factory Street	--	--	193	--	--	7	--	--			--	2.0	--	--			
	Chuang's Heights	--	--	286	--	--	11	--	--			--	3.1	--	--			
	32 - 34 Kam Wa Street	--	--	174	--	--	7	--	--			--	2.0	--	--			
	Wing Wah House	--	--	252	--	--	9	--	--			--	2.5	--	--			
	Kam Wah Court	--	--	83	--	--	3	--	--			--	0.8	--	--			
	20 - 22 Kam Wa Street	--	--	172	--	--	7	--	--			--	2.0	--	--			
	Tak Fook Building	--	--	473	--	--	17	--	--			--	4.8	--	--			
	Hop Lung Factory Building	--	--	455	124	--	16	7	--			--	4.5	11.1	--			

Appendix 2-1: Sewage Discharge from Surrounding Catchments

Catchment ID	Building	No. of Flats	Total Area (m^2) [2]			Population [1]					ADWF (m^3/day)					Total ADWF (m^3/day)	Total ADWF for each catchment with P_{CIF} (m^3/day)[4]	Reference
			Community, Social & Personal Services	Retails	Restaurant	Staff (by worker density - Community, Social & Personal Services)	Staff (by worker density - Retails)	Staff (by worker density - Restaurants)	Student	Residential	Residential UFF = 0.27	Community, Social & Personal Services UFF = 0.28	Wholesale & Retail UFF = 0.28	Restaurants UFF = 1.58	Students UFF = 0.04			
E	Kam Wai Building	--	--	127	208	--	5	11	--	1166	314.8	--	1.4	17.4	--	393.6	492.0	Residential Population - Population Census 2021 - Subunit 161/17 in 2021
	Kam Wa Building	--	--	311	120	--	11	7	--			--	3.1	11.1	--			
	Galaxy Plaza	--	--	2595	37	--	91	2	--			--	25.5	3.2	--			
	132 - 136 Shau Kei Wan Main Street East	--	327	254	73	11	9	4	--			3.1	2.5	6.3	--			
	Fong Man House	--	--	219	--	--	8	--	--			--	2.2	--	--			
	Tung Tai House	--	--	301	--	--	11	--	--			--	3.1	--	--			
F	Shun King Building	30	--	159	114	--	6	6	--	75	20.3	--	1.7	9.5	--	273.4	405.5	No. of Flats - Centaline Property
	Tung Ho building	92	--	292	--	--	11	--	--	230	62.1	--	3.1	--	--			
	Shui Hing Court	42	144	--	--	5	--	--	--	105	28.4	1.4	--	--	--			
	169 - 171 Shau Kei Wan Main Street East	6	--	90	90	--	4	5	--	15	4.1	--	1.1	7.9	--			
	Tung Fai Building	72	800	333	400	27	12	21	--	180	48.6	7.6	3.4	33.2	--			
	2 - 4 Factory Street	12	--	--	--	--	--	--	--	30	8.1	--	--	--	--			
	1 - 3 Wang Wa Street	12	--	--	--	--	--	--	--	30	8.1	--	--	--	--			
	5 - 9 Wang Wa Street	15	--	--	--	--	--	--	--	38	10.3	--	--	--	--			
	11 - 11A Wang Wa Street	10	--	--	--	--	--	--	--	25	6.8	--	--	--	--			
	15 - 17 Wang Wa Street	12	--	--	--	--	--	--	--	30	8.1	--	--	--	--			
	Kam Wa Steet RCP	ADWF of the development is extracted from Planning Application No: A/H9/78.														51.0		A/H9/78 - Sewerage Cachements A & B
	Public Toilet	ADWF of the development is extracted from Planning Application No: A/H9/78.																
G	Ming Wah Da Ha Redevelopment	ADWF of the development is extracted from Planning Application No: A/H9/78.														2428.0	3035.0	A/H9/78 - Sewerage Cachements Proposed Development Phase 1 - 3
H	Shau Kei Wan Centre (Block 1 - Block 3)	528	--	2089	2089	--	74	107	--	1320	356.4	--	20.7	169.1	--	546.2	682.7	No. of Flats - Centaline Property
I	Carmel School Association ELSA High School	--	--	--	--	--	--	--	460	--	--	--	--	--	18.4	29.0	36.3	Carmel School Annual Report 2024-25 Teachers also included.
	SIA Shaukiwan Day Creche	--	494	--	--	17	--	--	--	--	--	4.8	--	--	--			
	The Salvation Army Shau Kei Wan Community Day Rehabilitation Service	--	618	--	--	21	--	--	--	--	--	5.9	--	--	--			

Notes:

[1] The surrounding residential development are located at the Shaukeiwan District Council Constituency Area. According to the Population Census 2021, the average domestic household size for Shaukeiwan District Council Constituency Area is 2.5, which has been adopted in the current assessment.

According to figure of Commercial and Industrial Floor Space Utilization Survey by Planning Department, the staff density is: -

- 3.3 staff per $100m^2$ GFA for Community, Social & Personal Services
- 3.5 staff per $100m^2$ GFA for Retails and Shops
- 5.1 staff per $100m^2$ GFA for Restaurants

[2] Estimated according to available informtion.

[3] According to EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (Version 1.0), the Unit Flow Factors are: -

- 0.27 m^3/person/day for Residential flat (R2)
- 0.28 m^3/staff/day (0.08 + 0.20) for Community, Social & Personal Services and Wholesale & Retail
- 1.58 m^3/staff/day (0.08 + 1.50) for Restaurants
- 0.04 m^3/person/day for School Student

[4] Catchment Inflow Factors (P_{CIF}) of Shau Kei Wan (1.25) has been adopted.

APPENDIX 2-2
APPROVED DRAINAGE INSTALLATION PLAN

GENERAL NOTES

1. IN ABOVE GROUND DRAINAGE SYSTEMS, CLEANING EYE MUST BE PROVIDED AT EVERY CHANGE IN DIRECTION OF FLOW AND AT SUITABLE LOCATION AS NECESSARY FOR PIPEWORK TO BE CLEARED OF ANY OBSTRUCTION.
2. TRAPS FOR SOIL AND WASTE FITMENTS SHALL HAVE A WATER SEAL OF NOT LESS THAN 80mm DEEP.
3. EVERY DRAIN OR SEWER SHALL BE LAID WITH A MINIMUM FALL FROM ITS HIGHEST INLET TO THE FINAL DISCHARGE IN ACCORDANCE WITH THE FOLLOWING :–

DIAMETER OF PIPE (mm)	FALL
100 & BELOW	1 : 40
150	1 : 70
225	1 : 100
300 OR ABOVE	1 : 150

4. TRAPS FOR WASH BASINS AND SINKS SHALL BE WHITE UPVC PLASTIC BOTTLE, ANTI–VACUUM TYPE WITH A WATER SEAL OF MINIMUM OF 80mm DEEP.
5. APPROVED TYPE PLASTIC WATER–CLOSET PAN CONNECTOR OF BELOW OR STRAIGHT TYPE SHALL BE PROVIDED FOR EVERY WATER–CLOSET.
6. LONG RADIUS BENDS SHALL BE PROVIDED AT BOTTOM OF ALL SOIL, WASTE & RAIN WATER STACKS.
7. THE CONTRACTOR SHALL PROVIDED MIN FALL 1:100 TO ALL CHANNEL AND FLOOR SCREEDING INSIDE BUILDING, UNLESS OTHERWISE SPECIFIED. EXTERNAL GROUND SHALL BE LAID TO FALL AT GRADIENT NOT LESS THAN 1 : 80.
8. ALL UNITS TO BE IN MILLIMETER UNLESS OTHERWISE SPECIFIED.
9. ALL U/G PIPE SHALL BE PROVIDED WITH CONCRETE SURROUND.
10. PIPE WORK PASSING BUILDING JOINT SHALL BE PROVIDED WITH FLEXIBLE JOINT.
11. CROSS VENTILATION AT EVERY THREE FLOORS (AT 3/F, 7/F, 10/F, 15/F, 18/F, 21/F, 25/F, 28/F & 31/F) SHALL BE PROVIDED FOR DOWNSTACK OF SOIL & WASTE PIPE.
12. ALL PIPES PASSING THROUGH FIRE COMPARTMENT SHOULD BE COMPLIED WITH FIRE RESISTING CONSTRUCTION REQUIREMENT IN PART C AND PART E OF COP FOR FIRE SAFETY IN BUILDING 2011 (OCTOBER 2015 VERSION).
13. NO DRAINAGE PIPING SHALL BE EMBEDDED IN STRUCTURAL ELEMENT AS STATED ON PNAP APP–105.
14. ALL C.I. PIPES SHOULD BE COMPLIED WITH PNAP APP–133.
15. MAINTENANCE ACCESS TO COMMON DRAINAGE PIPES LOCATED WITHIN THE LIGHT WELL, PIPE WELL AND/OR RE–ENTRANT WILL BE PROVIDED AND ACCESS WILL BE PROVIDED VIA AREAS TO BE DESIGNATED AS COMMON PARTS.
16. UNLESS OTHERWISE STATED, SIZE OF BRANCH PIPES FOR SANITARY FITTINGS SHALL BE AS BELOW:
    BASIN – ø32mm BATH – ø50mm FLOOR DRAIN – ø50mm URINAL – ø40mm
    SHOWER – ø50mm SINK – ø40mm WATER CLOSET – ø100mm WM – ø40mm
17. THE SOIL & WASTE DOWNSTACKS ARE PROVIDED IN SEPARATE ZONES AND THE ZONE DIVISIONS ARE LISTED AS BELOW:
    HIGH ZONE : 5/F–30/F
    LOW ZONE : 3/F
18. THE FALL RATIO TO ALL BALCONY, UTILITY PLATFORM & COVERS OF BALCONY AND UTILITY PLATFORM SHALL BE 1:75.
19. DRAINAGE PIPE SHALL NOT PASS THROUGH STRUCTURAL ELEMENT.
20. MANHOLES COVER SHALL BE DOUBLE SEAL AND AIRTIGHT.
    HEAVY DUTY – SUBJECT TO VEHICULAR TRAFFIC
    MEDIUM DUTY – SUBJECT TO PEDESTRIAN TRAFFIC
21. ARRANGEMENT FOR INSPECTION OF EXTERNAL DRAINAGE PIPES ENCLOSED BY ARCHITECTURAL FEATURES SHOULD BE PROVIDED.
22. FLOOR DRAIN / SHOWER DRAIN RUN INSIDE SUNKEN SLAB SHOULD BE TOP ACCESS.
23. ALL CLADDINGS FOR RAINWATER STACK SHALL BE DEMOUNTABLE PANEL WITH SAFETY CHAIN (FOR MAINTENANCE),UNOBSTRUCTED VERTICAL SPACE FOR INSPECTION BY CAMERA (MIN. 120mm. DIA.) PROVIDING CLEAR VIEW OF ALL PIPES.
24. ALL CHANNEL SHALL BE CONSTRUCTED WITH A MINIMUM FALL OF 1:100.
25. ALL VENT AND ANTI–SYPHONAGE PIPES WILL BE INSTALLED WITH GRADIENTS TOWARDS STACK.
26. FRESH AIR INLETS FOR SEWAGE TERMINAL SHALL BE TERMINATED NOT LESS THAN 2500mm ABOVE FINISHED FLOOR LEVEL.
27. ALL WASTE AND VENT STACKS, SOIL PIPE AND VENT STACKS, SOIL & WASTE PIPE AND VENT STACKS, RAIN WATER PIPE AND VENT STACKS, SHALL BE CARRIED UP TO THE ROOF AND TERMINATED AT 3000mm ABOVE THE ROOF OR AS SHOWN.
28. NO UPVC PIPES SHOULD PASS THROUGH COMPARTMENT WALLS & FLOORS.
29. IF THE BALCONY / UTILITY PLATFORM IS CONSTRUCTED WITH CANTILEVERED STRUCTURE, IT SHALL BE PROVIDED WITH FALL OF NOT LESS THAN 1:75 .
30. ALL THE PIPES TO BE RUN INSIDE FIRE PROTECTED AREA SHALL BE PROVIDED WITH FRR ENCLOSURE BY BUILDERS. FIRE RESISTING PERIOD OF THE FIRE RATED ENCLOSURE MUST NOT LESS THAN THE FIRE RESISTING PERIOD OF THE BOUNDARY BUILDING ELEMENTS OF THE PROTECTIVE AREA.
31. EXPANSION JOINT / FLEXIBLE JOINT SHALL BE PROVIDED FOR ALL PIPEWORKS PASSING THROUGH THE BUILDING EXPANSION JOINT.
32. ALL CONCEAL PIPEWORKS SHALL BE CONCEALED IN NON–BEARING STRUCTURE MEMBER.
33. CHANNEL GRATING DUTIES ARE CLASSIFIED AS FOLLOWS :–
    MEDIUM DUTY – BEAR WHEEL LOADS UP TO 5.00 TONNES, FOR USE IN CARRIAGEWAYS.
    HEAVY DUTY – BEAR WHEEL LOADS UP TO 11.50 TONNES, FOR USE IN CARRIAGEWAYS.
34. MAINTENANCE ACCESS TO COMMON DRAINAGE PIPES LOCATED WITHIN LIGHT WELL, PIPE WELL AND/OR RE ENTRANT WILL BE PROVIDED AND SUCH ACCESS WILL PROVIDE VIA AREA TO BE DESIGNATED AS COMMON PIPES.
35. THE DRAINAGE PLUS CORRESPOND TO THE LATEST GBP / SITE FORMATION PLANS.
36. OPENINGS FOR DRAINAGE PIPES THROUGH FIRE BARRIERS OR ENCLOSURE AROUND SERVICES IN REQUIRED STAIRCASES / PROTECTED LOBBY COMPLY WITH THE FIRE RESISTING CONSTRUCTION REQUIREMENTS IN PART C AND E OF CODE OF PRACTICE FOR FIRE SAFETY IN BUILDINGS 2011 (OCTOBER 2015 VERSION).
37. DIRECTION OF FLOW FOR UNDERGROUND DRAIN COMPLIED WITH B (SSFPD&L) REGS. 48 & 49.
38. NO SURFACE WATER DISCHARGE INTO FOUL WATER DRAINS AND FOUL WATER DISCHARGE INTO SURFACE DRAINS.
39. COMMON UNDERGROUND DRAIN IS LOCATED IN COMMON PARTS OF THE BUILDING, WHICH ARE SO DESIGNATED IN BUILDING PLANS IN ACCORDANCE WITH PNAP APP–93.
40. COMMON ABOVE–GROUND SOIL / WASTE / RAINWATER STACKS LOCATED IN COMMON PARTS OF THE BUILDING.
41. SUNKEN SLABS IS DESIGNED IN ACCORDANCE WITH PNAP APP–93.
42. ALL WORKS OUTSIDE LOT BOUNDARY ARE FOR REFERENCE ONLY AND NOT FOR BD APPROVAL.
43. STRUCTURAL DETAIL WILL BE SUBMITTED UNDER SEPARATE SUBMISSION
44. REINFORCEMENTS LAYOUT IN THIS SUBMISSION ARE FOR REFERENCE ONLY.
45. THE ACCESS POINTS TO THE DUCTS BEING PROVIDED AS PER INDICATED ON DRAWING.
46. CARBON STEEL GRIP COLLAR SHALL PROVIDED AS PER INDICATED ON DRAWING.
47. THE DESIGN & CONSTRUCTION OF THE DRAINAGE WORKS SHOULD COMPLIED W/ BUILDING (SSFPDW&L) REGULATIONS & PNAPS AND BUILDING ORDINANCE.
48. CROSS VENTILATION CONNECTING PIPES TO BE PROVIDED AND SLOPING UPWARDS AT AN ANGLE NOT GREATER THAN 67.5 DEGREE FROM THE DRAINAGE STACK WITH INTERNAL DIAMETER NOT LESS THAN THE MAIN ANTI–SYPHONAGE PIPE.
49. THE WHOLE OF DRAINAGE INSTALLATION SHOULD BE COMPLIED WITH BUILDING REGULATION, BUILDING ORDINANCE, PNAPs.

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LEGENDS

—S—S—S—	SOIL & WASTE PIPE
—S(PP)—S(PP)—S(PP)—	SOIL & WASTE PIPE (PUMPED PIPE)
—W—W—W—	WASTE PIPE
—W(PP)—W(PP)—W(PP)—	WASTE PIPE (PUMPED PIPE)
—V—V—V—	VENT PIPE
—ASP—ASP—ASP—	ANTI–SYPHONAGE PIPE
—R—R—R—	RAIN WATER PIPE
—C—C—C—	CONDENSATE DRAIN PIPE
—SSP—SSP—SSP—	SUB–SOIL PIPE
	WATER CLOSET (LAYOUT / SCHEMATIC)
	WASH BASIN (LAYOUT / SCHEMATIC)
	URINAL (LAYOUT / SCHEMATIC)
FD SD	FLOOR DRAIN / SHOWER DRAIN / RAIN WATER OUTLET (LAYOUT / SCHEMATIC)
FD(T) SD(T)	FLOOR DRAIN(T) / SHOWER DRAIN(T) (LAYOUT / SCHEMATIC)
FD W/ TG	FD W/ TG FLOOR DRAIN W/ TRAPPED GULLY / RAIN WATER OUTLET W/ TRAPPED GULLY (LAYOUT / SCHEMATIC)
	OPEN TRAPPED GULLY (LAYOUT / SCHEMATIC)
	BACK INLET TRAPPED GULLY (LAYOUT / SCHEMATIC)
W.M. VG VRWO	FOR WASHING MACHINE WITH TRAP (LAYOUT / SCHEMATIC)
W.M. VG VRWO	VERTICAL GRATING OF FLOOR DRAIN / VERTICAL RAINWATER OUTLET (LAYOUT / SCHEMATIC)
	ENLARGER / REDUCER
	PLUG OFF POINT
	WIRE BALLOON / VENT COWL
	FRESH AIR INLET
	RAIN WATER MANHOLE (LAYOUT / SCHEMATIC)
	FOUL WATER MANHOLE (LAYOUT / SCHEMATIC)
	SURFACE CHANNEL W/ COVER (LAYOUT / SCHEMATIC)
	FLAT CHANNEL
	SUNKEN AREA W/ BACKFILLED BY LIGHT WEIGHT CONCRETE (350MM DEPTH)
	FRR ENCLOSURE (–/120/120)
	NON–RETURN VALVE
CE CE	CLEANING EYE (LAYOUT / SCHEMATIC)

ABBREVIATIONS

S.W.P.	SOIL & WASTE PIPE	W/	WITH
W.P.	WASTE PIPE	F/A	FROM ABOVE
V.P.	VENT PIPE	F/B	FROM BELOW
R.W.P.	RAIN WATER PIPE	T/A	TO ABOVE
FMH	FOUL WATER MANHOLE	T/B	TO BELOW
SMH	STORM WATER MANHOLE	H/L	HIGH LEVEL
B.I.T.G.	BACK INLET TRAPPED GULLY	L/L	LOW LEVEL
O.T.G.	OPEN TRAP GULLY	U/G	UNDERGROUND
F.D.	FLOOR DRAIN	C.L.	COVER LEVEL
V.G.	VERTICAL GRATING OF FLOOR DRAIN	I.L.	INVERT LEVEL
S.D.	SHOWER DRAIN	D.T.I.L.	DISCONNECTING TRAP INVERTED LEVEL
T.G.	TRAP GULLY	A.F.F.L.	ABOVE FINISHED FLOOR LEVEL
A.P.	ACCESS PANEL	C.I.	CAST IRON
R.W.O.	RAIN WATER OUTLET	N.T.S.	NOT TO SCALE
V.R.W.O.	VERTICAL RAIN WATER OUTLET	EX.	EXISTING
F.A.I.	FRESH AIR INLET	L–R	LEFT TO RIGHT
F.D. (T)	TOP ACCESS RESEALING FLOOR DRAIN	T–B	TOP TO BOTTOM
S.D. (T)	TOP ACCESS RESEALING SHOWER DRAIN	C.E.	CLEANING EYE
C/W	COMPLETED WITH	A.S.P.	ANTI–SYPHONAGE PIPE
STMH	STORM WATER TERMINAL MANHOLE	P.P.	PUMPED PIPE
FTMH	FOUL WATER TERMINAL MANHOLE		

DRAWING LIST

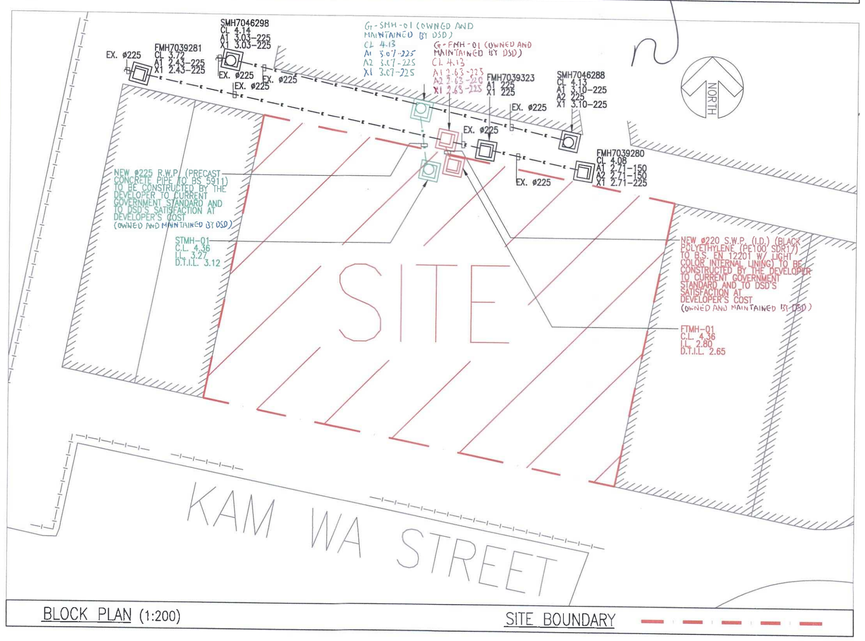
DRAWING NO.	DRAWING TITLE
1938–BD–1–01	GENERAL NOTES, BLOCK PLAN AND DRAWING LIST
1938–BD–2–01	SCHEMATIC LINE DIAGRAM FOR DRAINAGE SYSTEM
1938–BD–3–01	PROPOSED DRAINAGE LAYOUT PLAN FOR G/F – 2/F
1938–BD–3–02	PROPOSED DRAINAGE LAYOUT PLAN FOR 3/F – 28/F
1938–BD–3–03	PROPOSED DRAINAGE LAYOUT PLAN FOR 29/F – UR/F
1938–BD–4–01	INSTALLATION DETAILS

FOR BUILDINGS DEPARTMENT
21 MAR 2025

PIPEWORK MATERIAL SCHEDULE :

	DESCRIPTION	SPECIFIED
A)	ABOVE GROUND CONDENSATION, RAIN, SOIL & WASTE AND VENT DRAINAGE SYSTEM FOR THE FOLLOWINGS:–	
	I) DRAINAGE PIPES RUN INSIDE INTERNAL AREA OR SUNKEN SLAB (EXCLUDE THE PIPE WHEN / AFTER PASSING THROUGH DIFFERENT FIRE COMPARTMENTS)	32MM – 50MM DIA.: UPVC PIPE AND FITTINGS TO BS EN 1329. 80MM – 100MM DIA.: UPVC PIPE AND FITTINGS TO BS 4514.
	II) DRAINAGE PIPES WHEN / AFTER PASSING THROUGH DIFFERENT FIRE COMPARTMENTS	50MM – 200MM DIA.: SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN 877 WITH INTERNAL AND EXTERNAL AVERAGE 120–150 MIN. MICRONS EPOXY COATING TO BS EN 877. COUPLING SHALL BE 316 STAINLESS STEEL SHELL AND BOLTING, INCLUDING EPDM ELASTOMER SLEEVE, COMPLETED WITH ELECTRICAL CONTINUITY CHIPS, AND A STAINLESS STEEL COLLAR WITH TWO PIECES OF STAINLESS STEEL SCREWS AND NUTS.
	III) DRAINAGE PIPES RUN AT EXTERNAL AREA	32MM – 50MM DIA.: UPVC PIPE AND FITTINGS TO BS EN 1329. 80MM – 150MM DIA.: UPVC PIPE AND FITTINGS TO BS 4514. 200MM DIA.: SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN 877 WITH INTERNAL AND EXTERNAL AVERAGE 120–150 MIN. MICRONS EPOXY COATING TO BS EN 877. COUPLING SHALL BE 316 STAINLESS STEEL SHELL AND BOLTING, INCLUDING EPDM ELASTOMER SLEEVE, COMPLETED WITH ELECTRICAL CONTINUITY CHIPS, AND A STAINLESS STEEL COLLAR WITH TWO PIECES OF STAINLESS STEEL SCREWS AND NUTS.
	IV) DRAINAGE PIPES (PASSING THROUGH TRANSFER PLATE)	50MM DIA.: SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN 877 WITH INTERNAL AND EXTERNAL AVERAGE 120–150 MIN. MICRONS EPOXY COATING TO BS EN 877. COUPLING SHALL BE 316 STAINLESS STEEL SHELL AND BOLTING, INCLUDING EPDM ELASTOMER SLEEVE, COMPLETED WITH ELECTRICAL CONTINUITY CHIPS, AND A STAINLESS STEEL COLLAR WITH TWO PIECES OF STAINLESS STEEL SCREWS AND NUTS. 80MM – 150MM DIA.: DUCTILE IRON PIPES AND FITTINGS TO BS EN 598, WITH INTERNAL CEMENT LINING AND FITTING OF PUSH – ON TYPE FLEXIBLE JOINT WITH RUBBER SEALING GASKET. (REFER NOTES 1 AND 2)
B)	UNDERGROUND SOIL & WASTE, RAINWATER AND VENT DRAINAGE SYSTEM	100MM – 225MM DIA.: CAST IRON PIPES AND FITTINGS TO BS437. (REFER NOTE 3)
C)	UNDERGROUND SOIL & WASTE DRAINAGE SYSTEM OUTSIDE SITE BOUNDARY (FOR BD INFORMATION ONLY)	BLACK POLYETHYLENE (PE100) TO B.S. EN 12201 (FOR BD INFORMATION ONLY)
D)	UNDERGROUND STORM DRAINAGE SYSTEM OUTSIDE SITE BOUNDARY (FOR BD INFORMATION ONLY)	PRECAST CONCRETE PIPES AND FITTINGS TO BE BS 5911: PT 100 WITH FLEXIBLE JOINTS OF SPIGOT AND SOCKET. (FOR BD INFORMATION ONLY)
E)	SUB–SOIL DRAINAGE SYSTEM	PERFORATED SUB–SOIL PIPES AND FITTINGS TO BS 4962. OF SPIGOT AND SOCKET.
F)	A/C CONDENSATE DRAIN PIPE	32MM – 50MM DIA.: UPVC PIPE AND FITTINGS TO BS 5255 OR BS EN 1329 WITH MATCHING COLOUR. 80MM – 100MM DIA.: UPVC PIPE AND FITTINGS TO BS 4514. FOR INTERNAL AREA (50MM – 100MM DIA.) SOCKETLESS EPOXY COATED CAST IRON PIPE TO B.S. EN 877 WITH INTERNAL AND EXTERNAL AVERAGE 120–150 MICRONS EPOXY COATING TO B.S. EN 877. CAST IRON PIPE FITTING TO B.S. EN 877 WITH AVERAGE 120–150 MICRON EPOXY COATING APPLIED INTERNALLY AND EXTERNALLY. COUPLING SHALL BE 316 STAINLESS STEEL SHELL AND BOLTING, INCLUDING EPDM ELASTOMER SLEEVE, COMPLETED WITH ELECTRICAL CONTINUITY CHIPS, AND A STAINLESS STEEL COLLAR WITH TWO PIECES OF STAINLESS STEEL SCREWS AND NUTS.
G)	SUMP AND PUMP DRAINAGE SYSTEM	DUCTILE IRON PIPES AND FITTINGS TO BS EN 598 WITH INTERNAL CEMENT LINING AND INTEGRALLY CAST OR SCREWED FLANGES TO BS EN 1092. (REFER NOTES 1 AND 2)

NOTE:
1) INTEGRALLY CAST OR SCREWED FLANGES TO BS EN 1092–1 (STEEL), BS EN 1092–2 (CAST IRON / DUCTILE IRON) AND BS EN 1092–3 (COPPER ALLOY) AS APPROPRIATE. SUITABLE JOINTING RINGS OR FIBRE GASKETS TO BS EN 1514–1 SHALL BE USED AND MUST BE COATED WITH JOINTING COMPOUND. FLANGE BOLTS SHALL BE HEXAGONAL HEADED BRIGHT STEEL COATED WITH RUSTOLEUM PAINT BEFORE INSTALLATION. BOLT THREADS SHALL PROTRUDE THROUGH NUT.
2) DUCTILE IRON TO BS EN 545 / BS EN 598, INTERNALLY AND EXTERNALLY COATED WITH BITUMEN TO BS 4164. THE COAT TAR LINING SHALL NOT BE SOLUBLE IN POTABLE WATER NOR SHALL IT IMPART ANY TASTE OR SMELL TO THE WATER.
3) THE CAST IRON PIPE SHALL BE INTERNALLY COATED WITH COLD APPLIED BITUMEN–BASED COATING TO BS 3416 OR OTHER EQUIVALENT INTERNATIONAL STANDARDS. EXTERNAL COATING SHALL CONTAIN ANTI–CORROSION INHIBITORS USED ON METALLIC STRUCTURES.



BLOCK PLAN (1:200) SITE BOUNDARY

B.D. REF. NO.: BD 4/3009/19

NO	REVISIONS	DESIGNED	APPROVED	DATE ISSUED
A	ISSUE FOR BD SUBMISSION	MC	MC	20/03/25

THIS DRAWING IS FOR TENDER AND CONTRACT PURPOSES ONLY WORKING DRAWINGS SHOULD BE SUBMITTED FOR CHECKING BEFORE INSTALLATION THE OWNERSHIP AND COPYRIGHT OF THIS DRAWING IS RETAINED BY FAR EAST CONSULTING ENGINEERS WHOSE CONSENT MUST BE OBTAINED BEFORE ANY USE OR REPRODUCTION OF THE DRAWING OR ANY PART THEREOF CAN BE MADE

PROJECT:
PROPOSED COMMERCIAL/RESIDENTIAL ON SIL 433 S.F, SIL 433 S.G, SIL 433 RP, SIL 433 S.D AT NOS. 9–19 KAM WA STREET, SHAU KEI WAN, HONG KONG

TITLE: (DRAINAGE INSTALLATION)
GENERAL NOTES, BLOCK PLAN AND DRAWING LIST

DESIGNED: MC CHAN	DATE: 20/03/2025
DRAWN: MC CHAN	DRAWING NO: 1938–BD–1–01
CHECKED: MC CHAN	
APPROVED: M. LEE	SCALE: N.T.S. (A1)

CLIENT:
LAND GLORY HOLDINGS LIMITED

ARCHITECT:
百利保發展顧問有限公司
Paliburg Development Consultants Limited

E & M CONSULTING ENGINEER:
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AP SIGNATURE / STAMP CHOP
NG KIT WAH BENNY
AUTHORIZED PERSON - ARCHITECT

BD's OFFICIAL USE
Plan Approved
YEUNG Pak–shing
Senior Building Surveyor
for BUILDING AUTHORITY
19 MAY 2025

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM–19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

APPENDIX 2-3
DETAILED CALCULATION OF EXISTING SEWERS

Appendix 2-3: Detailed Calculation of Existing Sewers (Under Configuration of the Approved Drainage Installation Plan)

Table A: Calculation of Existing Sewers Capacity

Sewer	Upstream Manhole	Downstream Manhole	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Length (m)	Diameter (mm)	Diameter (m)	Area (m^2)	Hydraulic Radius (m)	Slope	Kinematic Viscosity (m^2/s)	Pipe material	Hydraulic Pipeline Roughness (m) [1]	Velocity (m/s)	Full Capacity (l/s)
Existing Downstream Sewer															
PS01	FMH-01	FMH7039281	2.63	2.43	20.0	225	0.225	0.040	0.05625	0.0100	0.00000114	Vitrified Clay	0.001	1.31	51.9
PS02	FMH7039281	FMH7039241	2.43	1.58	6.2	225	0.225	0.040	0.05625	0.1373	0.00000114	Vitrified Clay	0.001	4.88	193.9
PS03	FMH7039241	FMH7039242	1.58	1.55	17.4	675	0.675	0.358	0.16875	0.0017	0.00000114	Concrete	0.006	0.79	282.5
PS04	FMH7039242	FMH7039243	1.55	1.46	16.3	750	0.75	0.442	0.1875	0.0055	0.00000114	Concrete	0.003	1.69	746.2
PS05	FMH7039243	FMH7039244	1.46	1.17	54.9	750	0.75	0.442	0.1875	0.0053	0.00000114	Concrete	0.003	1.65	729.6

Note:
[1] The roughness coefficient for slimed concrete sewer under poor condition has been adopted; the ks values are 3mm for velocities greater than 1.2m/s, otherwise 6mm.
[2] The location and invert level of FMH-01 are based on the Drainage Plan (approved by Building Department) for the previous design of commercial and residential uses.

Appendix 2-3: Detailed Calculation of Existing Sewers (Under Configuration of the Approved Drainage Installation Plan)

Table B: Calculation of Existing Sewers Utilization

Sewer	Upstream Manhole	Downstream Manhole	Full Capacity (L/s)	Catchment	Total ADWF with P_{cif} (Exclude Upstream Sewers) (m^3/day)	Contributing Population[1]	Peaking Factor[2]	Total Peak Flow [4] (L/s)	% of full capacity
Existing Downstream Sewer									
PS01	FMH-01	FMH7039281	51.9	Project + Catchment A	608.3	2253	6	42.2	81%
PS02	FMH7039281	FMH7039241	193.9	Project + Catchment A + B	642.5	2380	6	44.6	23%
PS03	FMH7039241	FMH7039242	282.5	Project + Catchment A + B + C + D + E + F + G + H + I	6180.4	22890	4	286.1	101%
PS04	FMH7039242	FMH7039243	746.2	Project + Catchment A + B + C + D + E + F + G + H + I	6180.4	22890	4	286.1	38%
PS05	FMH7039243	FMH7039244	729.6	Project + Catchment A + B + C + D + E + F + G + H + I	6180.4	22890	4	286.1	39%

Note:

[1] The contributing population = total catchment discharge (m^3/day) / 0.27(m^3/day/person)

[2] Peaking Factor of 8 for contribution population <1,000, 6 for contribution population of 1000 - 5000, 5 for contribution population of 5000 - 10000, 4 for contribution population of 10000 - 50000.

[3] Peak Flow = Daily average dry weather flow × Peaking Factor (including stormwater allowance) × Catchment Inflow Factor / 24 / 3600, the operation hour is assumed to be 24 hours.

[4] Total Peak Flow = Peak Flow (Exclude Upstream Sewers) + Discharge of Upstream Sewers + Discharge from Swimming Pool.

APPENDIX 2-4
DETAILED CALCULATION OF PROPOSED SEWERS

Appendix 2-4: Detailed Calculation of Proposed Sewers

Table A: Calculation of Proposed Sewer Capacity

Sewer	Upstream Manhole	Downstream Manhole	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Length (m)	Diameter (mm)	Diameter (m)	Area (m^2)	Hydraulic Radius (m)	Slope	Kinematic Viscosity (m^2/s)	Pipe material	Hydraulic Pipeline Roughness (m) [1]	Velocity (m/s)	Full Capacity (l/s)
Proposed New Sewer															
PP01	FTMH-01	FMH-01	2.80	2.63	3.0	225	0.225	0.040	0.05625	0.0567	0.00000114	PE	0.0003	3.41	135.8
Proposed Upgraded Sewer															
PS03	FMH7039241	FMH7039242	1.58	1.55	17.4	675	0.675	0.358	0.16875	0.0017	0.00000114	**PE**	0.0015	0.97	345.9

Note:
[1] The roughness coefficient for Slimed uPVC sewer under poor condition has been adopted for PE sewer; the ks values are 0.3mm for velocities greater than 1.2m/s, otherwise 1.5mm.
[2] The proposed modifications to existing sewers are **bolded and underlined** .
[3] All proposed new sewer manhole and pipes are subject to change during detail design stage.

Appendix 2-4: Detailed Calculation of Proposed Sewers

Table B: Calculation of Propsoed Sewer Utilization

Sewer	Upstream Manhole	Downstream Manhole	Full Capacity (L/s)	Catchment	Total ADWF with P_{cif} (Exclude Upstream Sewers) (m^3/day)	Contributing Population[1]	Peaking Factor[2]	Total Peak Flow [4] (L/s)	% of full capacity
Proposed New Sewer									
PP01	FTMH-01	FMH-01	135.8	Project	462.9	1714	6	32.1	24%
Proposed Upgraded Sewer									
PS03	FMH7039241	FMH7039242	345.9	Project + Catchment A + B + C + D + E + F + G + H + I	6180.4	22890	4	286.1	83%

Note:

[1] The contributing population = total catchment discharge (m^3/day) / 0.27(m^3/day/person)

[2] Peaking Factor of 8 for contribution population <1,000, 6 for contribution population of 1000 - 5000, 5 for contribution population of 5000 - 10000, 4 for contribution population of 10000 - 50000.

[3] Peak Flow = Daily average dry weather flow × Peaking Factor (including stormwater allowance) × Catchment Inflow Factor / 24 / 3600, the operation hour is assumed to be 24 hours.