

Appendix 5

Drainage and Sewerage Impact Assessment

Prepared for

WORLD FIRM LIMITED

STAR KEY DEVELOPMENT LIMITED

WISE EASE LIMITED

CENTRAL SKY INVESTMENT LIMITED

CENTRAL MIND INVESTMENT LIMITED

Prepared by

Ramboll Hong Kong Limited

**FOR PROPOSED FLAT WITH SHOP AND SERVICES/EATING
PLACE IN "COMMERCIAL" ZONE ON DRAFT WAN CHAI
OUTLINE ZONING PLAN NO. S/H5/32 AT 42-44 YIU WA
STREET AND 28-29 CANAL ROAD EAST, HONG KONG**

DRAINAGE AND SEWERAGE IMPACT ASSESSMENT

Date **April 2026**

Prepared by **Miko Wan**
Environmental Consultant

Signed 

Approved by **Calvin Chiu**
Technical Director

Signed 


Project Reference **TKTYIUWAEI00**

Document No. **R10069_v1.0**

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1. INTRODUCTION

1.1 Project Background

- 1.1.1 The Application Site situated at 42-44 Yiu Wa Street and 28-29 Canal Road East is currently vacant with previous building demolished. It is intended to redevelop the Application Site to include residential flat with shop and services/eating place.
- 1.1.2 It is therefore to seek approval from Town Planning Board ("TPB") under Section 16 of the Town Planning Ordinance for the proposed flat with shop and services/eating place.
- 1.1.3 Ramboll Hong Kong Limited is commissioned by the Applicant to conduct this Drainage and Sewerage Impact Assessment (DSIA) based on the Proposed Development.

1.2 Application Site and its Environs

- 1.2.1 The Application Site is located on east side of Canal Road East and Canal Road Flyover. It is also bounded by Yiu Wa Street on north side and a back alley on south side. The area of the Application Site is approximately 274.2m².
- 1.2.2 The Application Site, together with other adjacent lots on east side of Canal Road East and Canal Road Flyover, falls within area currently zoned as "Commercial" ("C") under Draft Wan Chai Outline Zoning Plan (OZP) No. S/H5/32. Generally, it is surrounded by commercial buildings on north, east and south sides.
- 1.2.3 On the other hand, the areas on opposite side of Canal Road East and Canal Road Flyover are zoned as "Other Specified Uses (MIXED USE)". Both commercial and residential uses can be found.
- 1.2.4 The location of the Application Site and its surrounding environs are shown in **Figure 1.1**.

1.3 Proposed Development

- 1.3.1 The Proposed Development will consist of 1 residential tower, ancillary residential facilities (e.g. clubhouse) and F&B facilities. There is no swimming pool provided.
- 1.3.2 There will be altogether 66 flats, clubhouse of 1,800 m² and F&B commercial area of 3270 m². The tentative occupation year of the development is 2033.
- 1.3.3 The Master Layout Plan (MLP) of the Proposed Development is included in **Appendix 1.1**.

2. DRAINAGE IMPACT ASSESSMENT

2.1 Appraisal of Drainage Impact

- 2.1.1 The Application Site is served by existing drainage systems. According to the drainage plan (**Appendix 2.2**), a Ø300 mm drainage pipe runs along the back alley of the Application Site and connects to the existing Ø300 mm drainage pipe (SWD7015179), which then discharges to the Ø2250 mm drainage pipe along Canal Road East. The Application Site is vacant and 100% paved currently.
- 2.1.2 The estimated surface runoff under the existing and future conditions of the Application Site is shown in **Appendix 2.1**. 20% greenery coverage would be provided for the Proposed Development as a resilient measure. The peak 1 in 50-year runoff from the site is expected to decrease from 0.017m³/s to approximately 0.014m³/s after development. In other words, there will be a reduction of surface runoff when compared with the existing condition due to increased greenery. The surface runoff generated from the Application Site will be collected and connected to the aforementioned drainage pipe (existing private stormwater manhole) and there is no change of flow regime.
- 2.1.3 As the total paved area and in turn the surface runoff is expected to decrease after development, it is anticipated that there is no adverse impact on the existing drainage pipe receiving runoff from the site.
- 2.1.4 The applicant will be responsible to maintain the proposed drainage pipeline connection.
- 2.1.5 It is expected that the Proposed Development (with reduced surface runoff and same flow regime) would not result in worsened drainage impact.

3. SEWERAGE IMPACT ASSESSMENT

3.1 Scope of Work

3.1.1 The aim of this study is to assess whether the existing sewerage facilities serving the Application Site are sufficient to cope with the sewage flow from the Proposed Development.

3.2 Assessment Criteria and Methodology

3.2.1 Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, Version 1 (GESF) has been referred to for the purposes of estimating the quantity of the sewage generated from the Proposed Development and the existing catchment area. Sewage flow parameters and peaking factors in this document have been adopted for this SIA.

3.2.2 Based on the building types in the area, the following unit flow factors are used in the SIA calculation:

- Residents: 0.27 m³/person/day (R2)
- Clubhouse Staff: 0.28 m³/day (J11 - Community, Social & Personal Services)
- F&B employee: 1.58 m³/day (J10 - Restaurants & Hotels)

3.2.3 Catchment Inflow Factor (P_{CIF}) of Wan Chai (1.00) has been applied in the assessment.

3.3 Existing and Future Sewerage System

3.3.1 According to the existing drainage plan (**Appendix 2.2**), there is a Ø150mm sewer along the lane at the back alley of the Application Site (to the south of the Application Site) and then connected to the existing manhole (FMH7061661).

3.3.2 As the existing sewer along Matheson Street is missing invert level, minimum velocity of 1m/s (based on DSD's sewerage manual) is adopted in the hydraulic calculation in this SIA to cater for worse scenario.

3.3.3 The latest drainage plan for the Application Site was approved on 2 February 2023. In accordance with that approved plan, the developer has already installed a new 225mm diameter sewerage pipeline from terminal manhole T1 to existing sewerage manhole F15 in accordance with the approved plan. For the proposed development, the same connection which is already completed will be adopted.

3.3.4 The existing and future sewers in the vicinity of the Application Site are shown in **Figure 3.1**.

3.4 Wastewater Generated by the Proposed Development

3.4.1 Wastewater arising from the Proposed Development will be primarily contributed by residents and staff.

3.4.2 Detailed calculation for the Proposed Development is given in **Table 3.1** below and **Appendix 3.1**.

Table 3.1 Estimated Peak Flow

Development Parameters	Proposed Development		
	Residential Tower	Clubhouse	Commercial Area (F&B)
Total number of units	66	-	-
Assumed Area (m ²)	-	52	162
Number of Population	152 ⁽¹⁾	2	9
Design Flow (m ³ /person/day)	0.27 ⁽²⁾	0.28 ⁽³⁾	1.58 ⁽⁴⁾
Flow Rate (m³/day)	41.0	0.6	14.2
Total Flow Rate with P_{CF} (m³/day)	55.8		
Peak Flow (L/s)	5.2		

(1) 2021 Population Census – Average Household Size of 2.3 in Canal Road

(2) Refer to Table T-1 of GESF – Private R2

(3) Refer to Table T-2 of GESF – J11 Community, Social & Personal Services

(4) Refer to Table T-2 of GESF – J10 Restaurants & Hotels

3.5 Discussion

- 3.5.1 Wastewater from the Proposed Development will be discharged to the existing sewerage manhole S1.
- 3.5.2 The potential sewerage impact due to the Proposed Development has been quantitatively addressed. Sewage generation rate from the Application Site is estimated to be: 55.8m³/day.
- 3.5.3 According to Table 4a of **Appendix 3.1**, regarding the sewage generation rate from the Proposed Development and surrounding areas (**Figure 3.2**), the existing sewerage pipeline would have adequate capacity to receive the flow.
- 3.5.4 The applicant will be responsible to maintain the proposed sewerage pipeline connection which is already implemented. With the proposed connection in place, the sewerage system will have adequate capacity to cater the sewage from the Proposed Development and nearby catchments.

4. OVERALL CONCLUSION

4.1 Conclusion

- 4.1.1 A development including residential flat with shop and services/eating place is proposed at 42-44 Yiu Wa Street. The potential sewerage impact has been quantitatively addressed.
- 4.1.2 The Application Site is currently served by drainage system. The Proposed Development would result in reduced surface runoff and would follow the same flow regime as per existing condition (connected to the same stormwater manhole as it was before development). Resilient measures in terms of 20% greenery is proposed to reduce surface runoff when compared to the existing condition. No worsened drainage impact is therefore anticipated.
- 4.1.3 Sewage generated from the Proposed Development will be discharged and connected to the existing manhole S1 at the back alley of the Application Site. The proposed connection resembles the connection shown in the drainage plan approved on 2 February 2023 and already implemented.
- 4.1.4 Based on the sewerage impact assessment results, it is found that the capacity of the existing sewerage system serving the area would be sufficient to cater for cumulative sewage generated from the Proposed Development and nearby catchment areas. This SIA confirms the feasibility of the Proposed Development in terms of impact on the sewerage system.

Figures

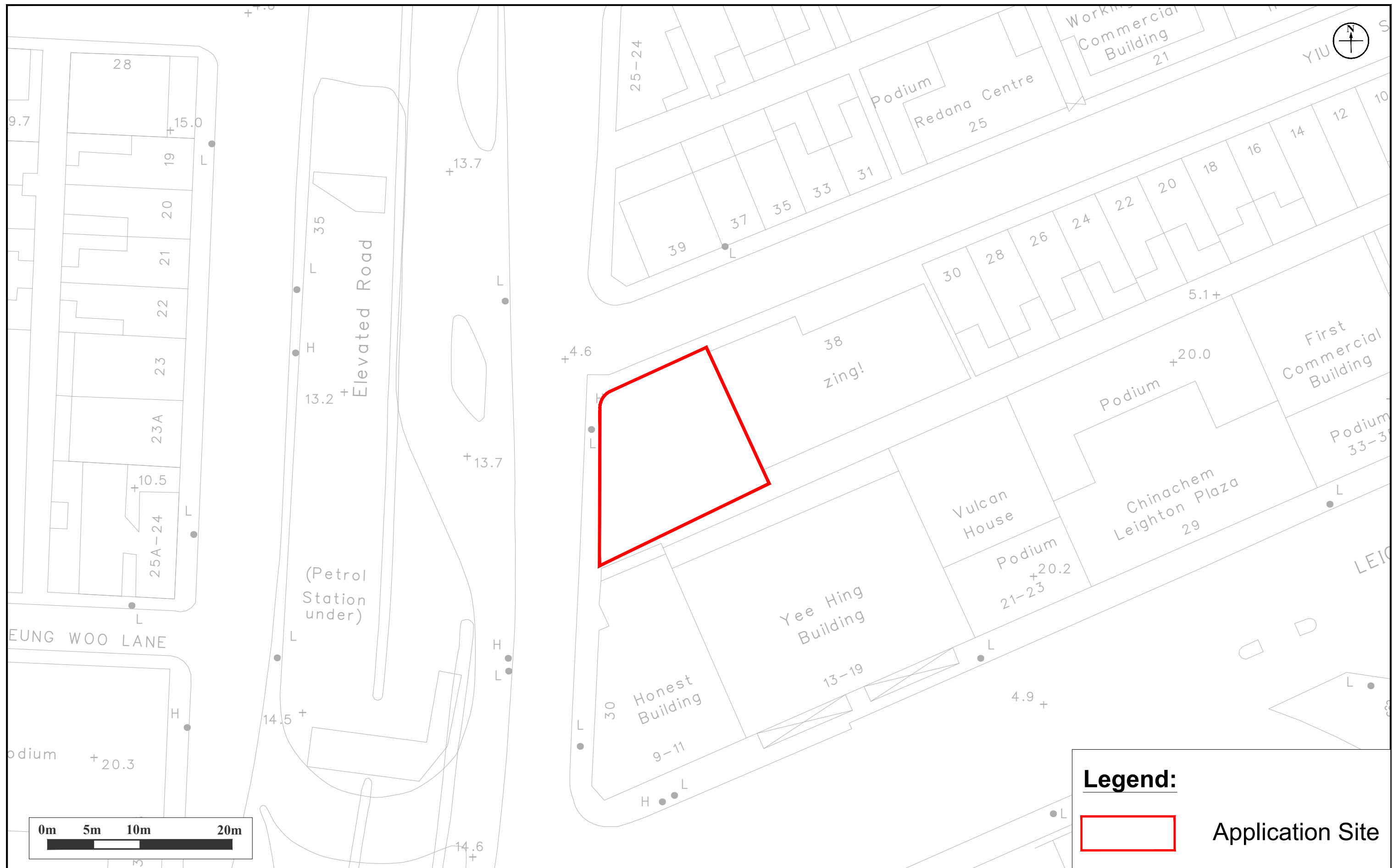


Figure: 1.1
Title: Location of the Application Site and its Environs

Project: For Proposed Flat with Shop and Services/Eating Place in "Commercial" Zone on Draft Wan Chai Outline Zoning Plan No. S/H5/32 at 42-44 Yiu Wa Street and 28-29 Canal Road East, Hong Kong

RAMBOLL	
Drawn by:	GW
Checked by:	CC
Rev.:	1.0
Date:	Apr 2026

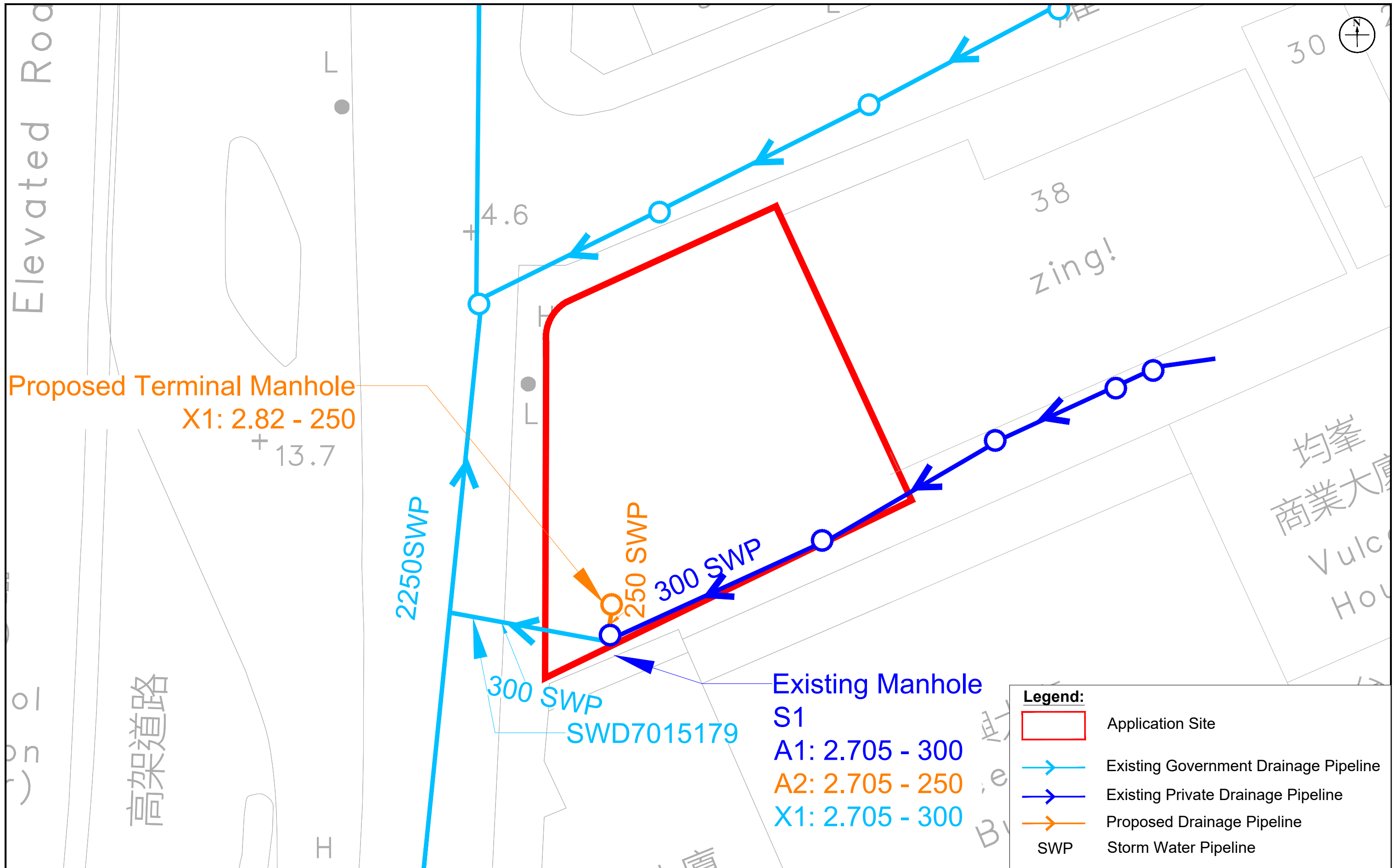


Figure: 2.1

Title: Existing and Proposed Drainage System in the Vicinity of the Application site

Project: For Proposed Flat with Shop and Services/Eating Place in "Commercial" Zone on Draft Wan Chai Outline Zoning Plan No. S/H5/32 at 42-44 Yiu Wa Street and 28-29 Canal Road East, Hong Kong

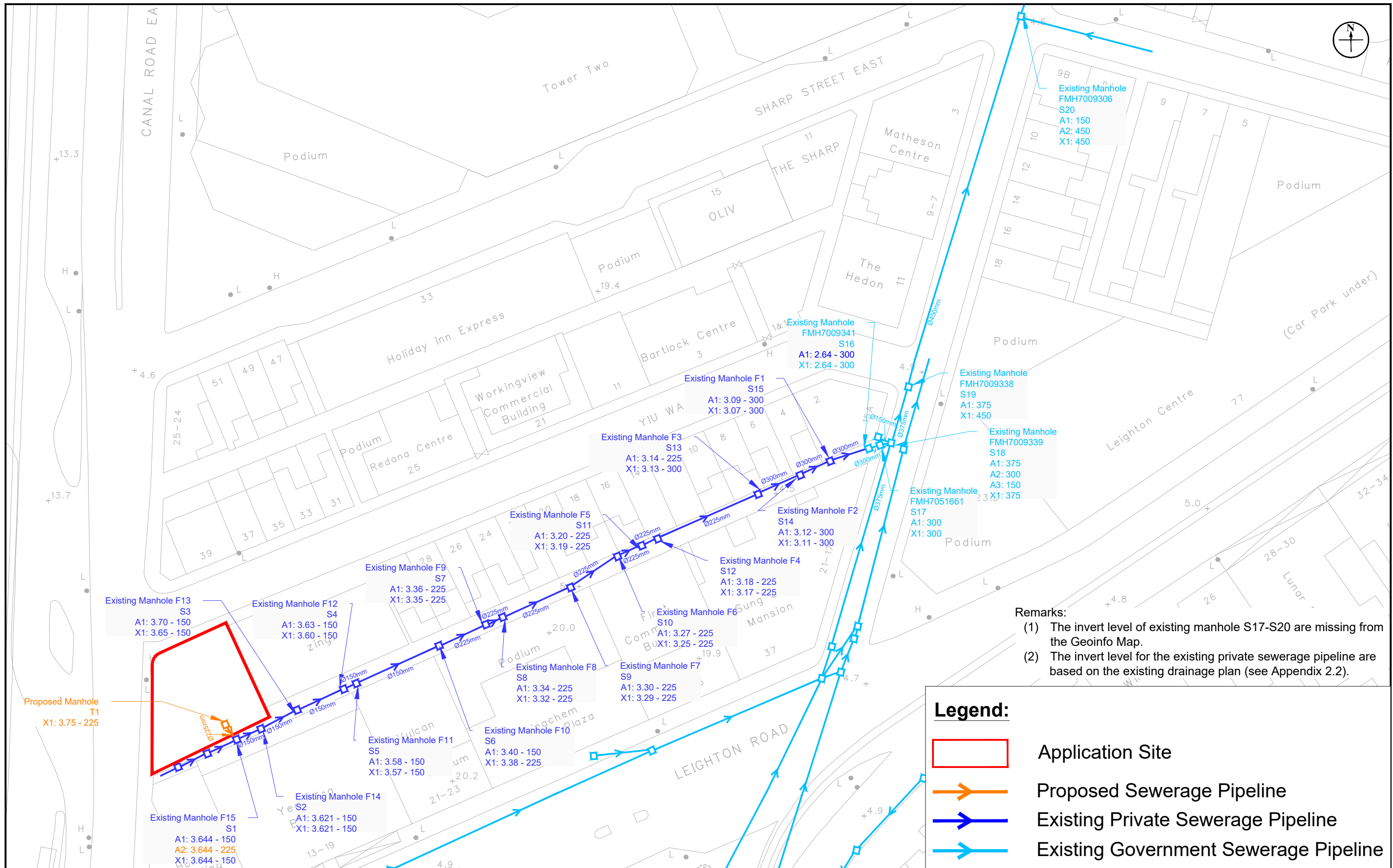
RAMBOLL

Drawn by: GW

Checked by: CC

Rev.: 1.0

Date: Apr 2026



- Remarks:
- (1) The invert level of existing manhole S17-S20 are missing from the Geoinfo Map.
 - (2) The invert level for the existing private sewerage pipeline are based on the existing drainage plan (see Appendix 2.2).

Legend:

- Application Site
- ➔ Proposed Sewerage Pipeline
- ➔ Existing Private Sewerage Pipeline
- ➔ Existing Government Sewerage Pipeline

Figure: 3.1		RAMBOLL
Title: Existing and Proposed Sewerage System in the Vicinity of the Application Site		Drawn by: GW
		Checked by: CC
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		Date: Apr 2026

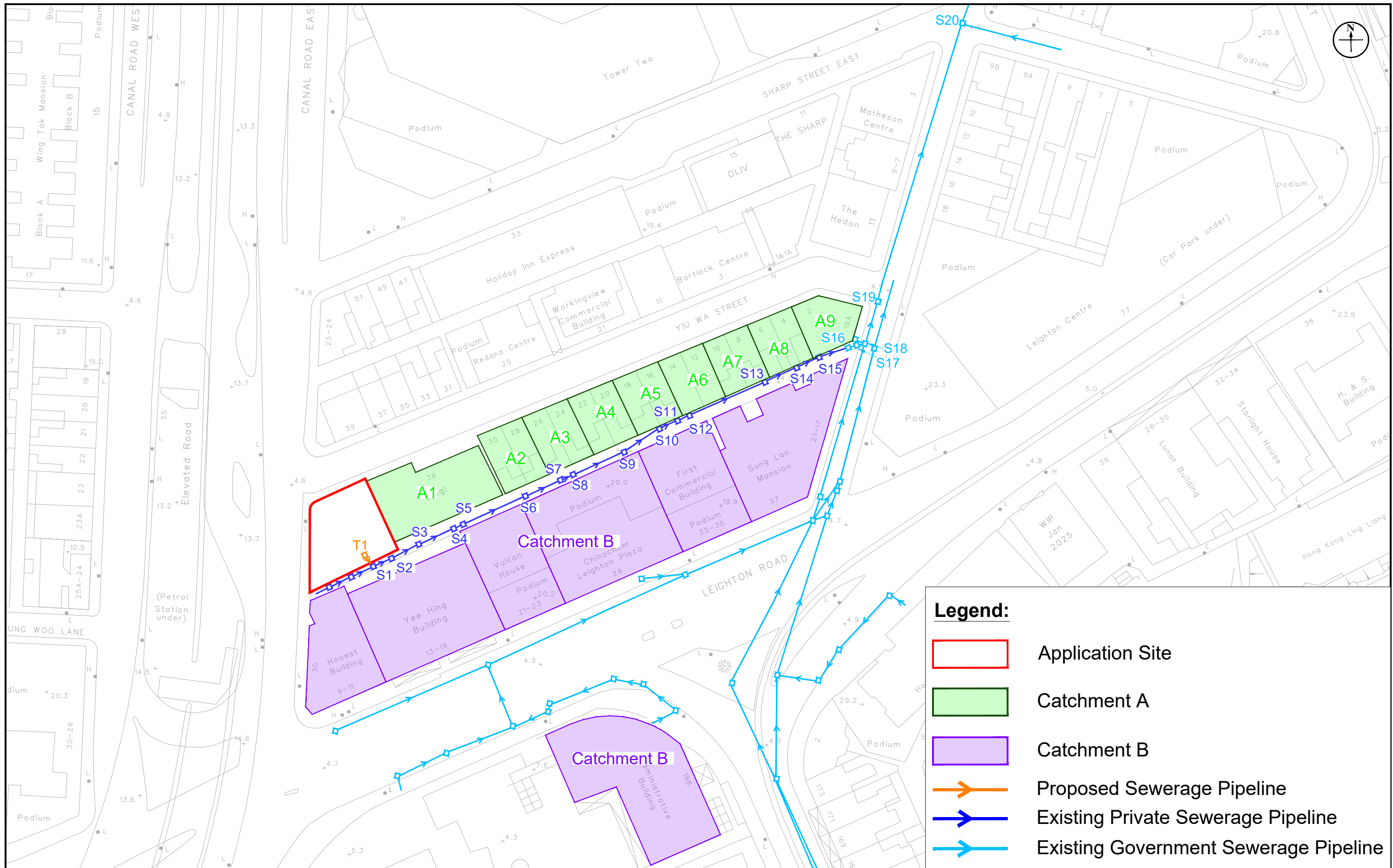


Figure: 3.2

Title: Catchment Areas in the Vicinity of the Application Site

Project: For Proposed Flat with Shop and Services/Eating Place in "Commercial" Zone on Draft Wan Chai Outline Zoning Plan No. S/H5/32 at 42-44 Yiu Wa Street and 28-29 Canal Road East, Hong Kong

RAMBOLL

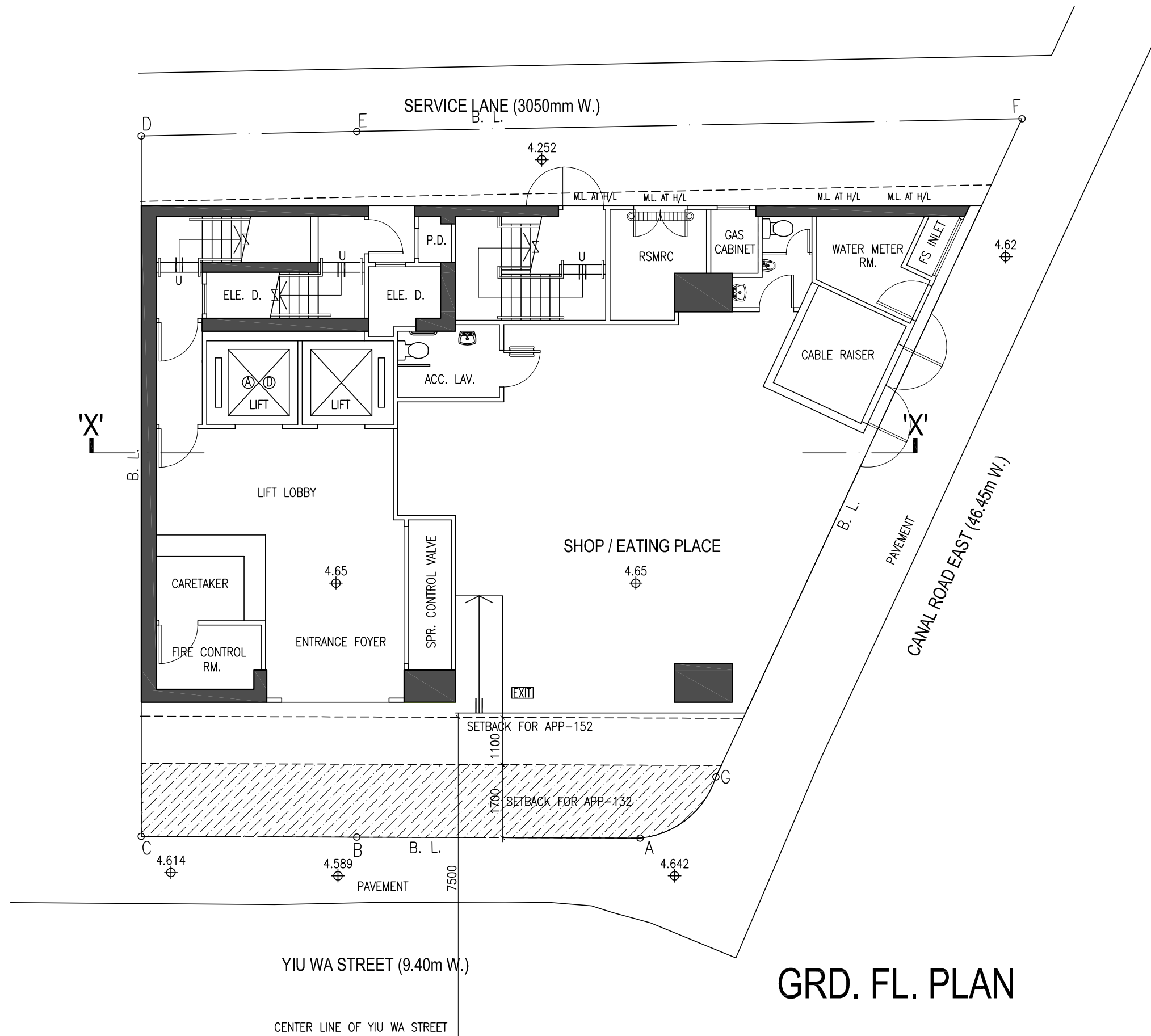
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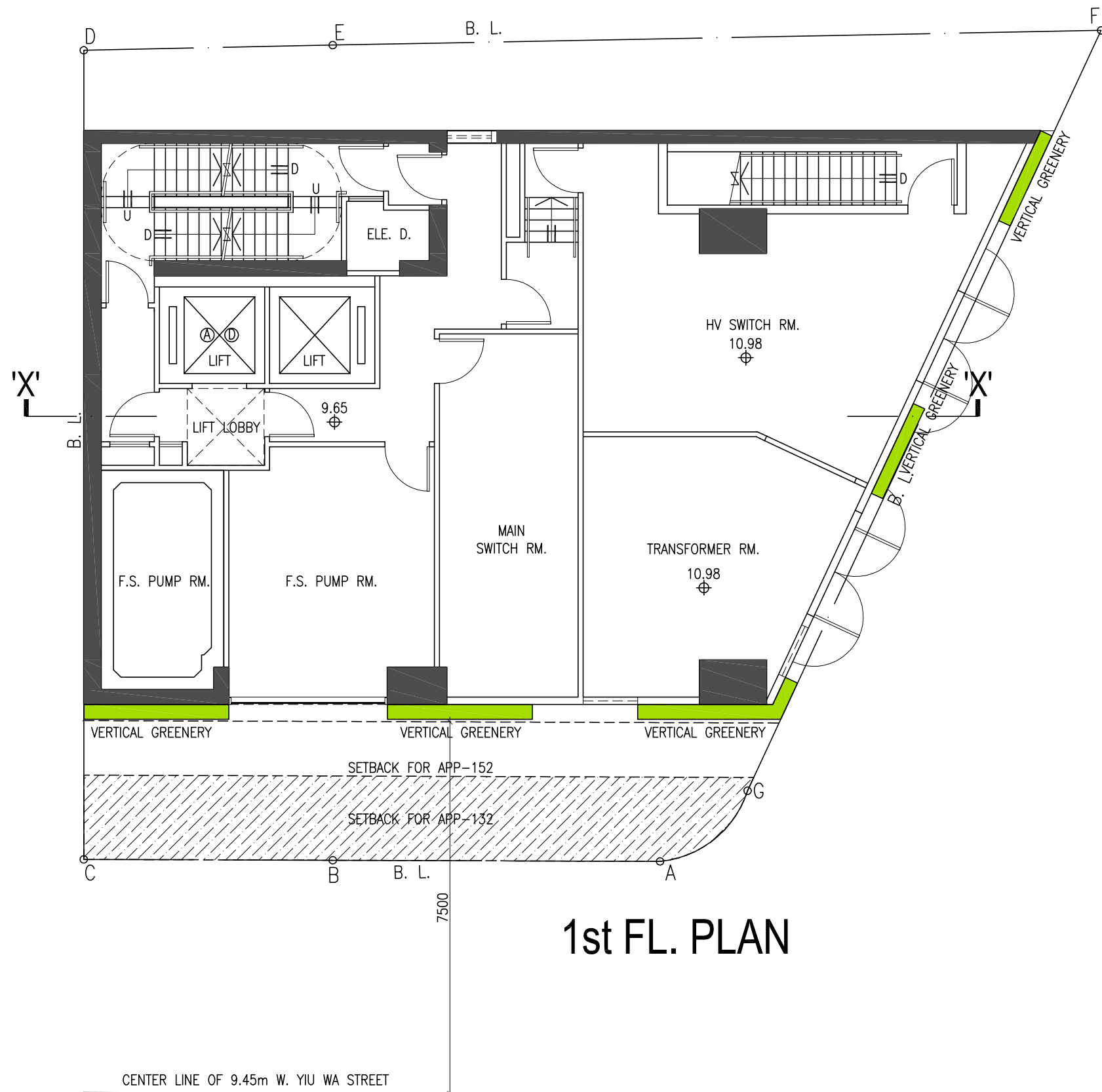
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Appendix 1.1 Master Layout Plan (MLP)



GRD. FL. PLAN

B.L.D. REF. NO.		
F.P.B. NO.		
PROJECT		
PROPOSED COMPOSITE BUILDING AT Nos. 42-44 YIU WAH STREET, CAUSEWAY BAY HONG KONG		
PLAN		
GRD. FL. PLAN		
SCALE		
1 : 100 (A3)		
1 : 200 (A4)		
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FIG-02	A	28/02/2026
	B	05/03/2026
	C	24/03/2026
	D	10/04/2026



1st FL. PLAN

B.L.D. REF. NO.

F.P.B. NO.

PROJECT

PROPOSED COMPOSITE BUILDING
AT Nos. 42-44 YIU WAH STREET,
CAUSEWAY BAY
HONG KONG

PLAN

1st FL. PLAN

SCALE

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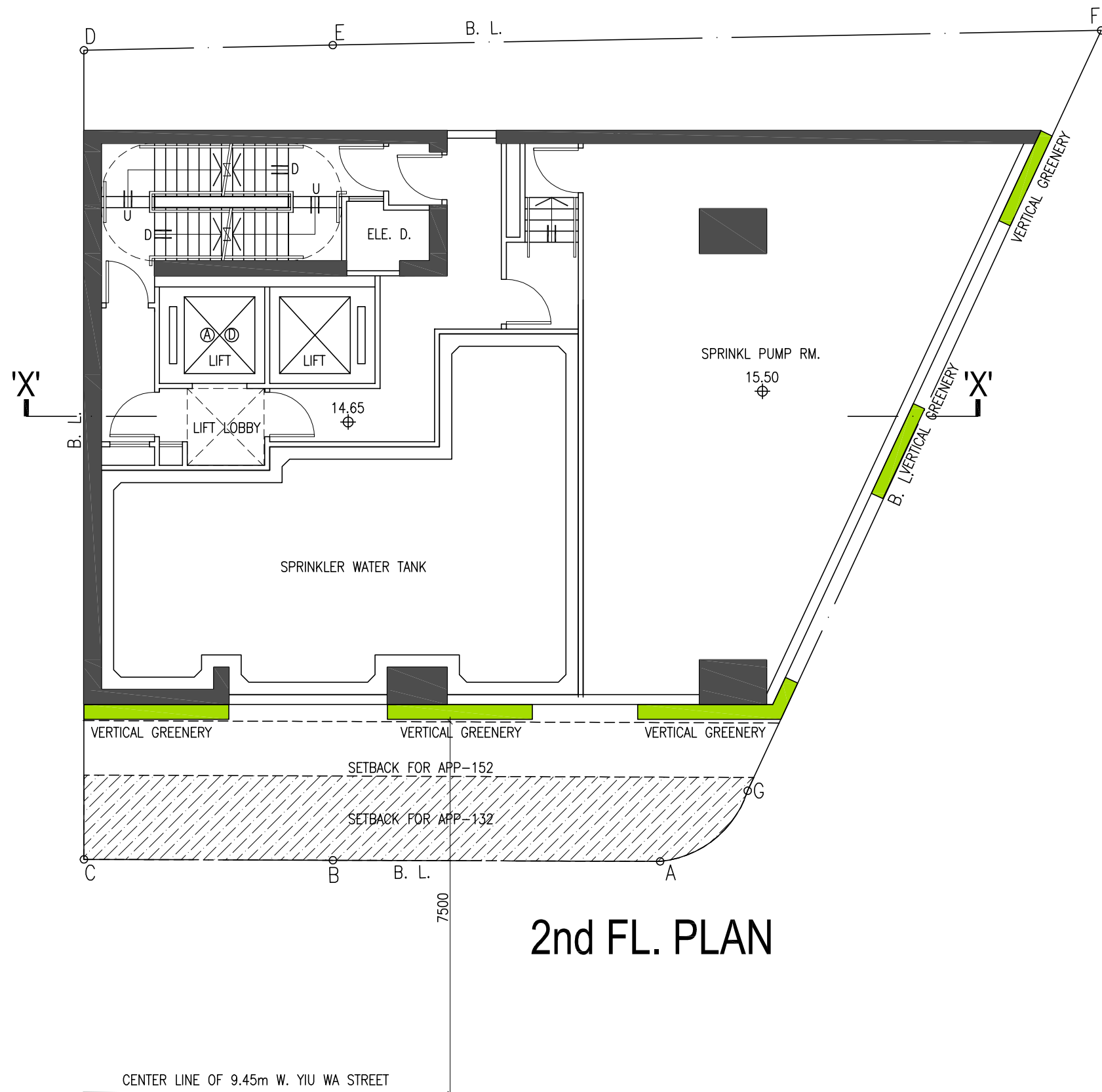
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	C	24/03/2026	
	D	10/04/2026	



2nd FL. PLAN

B.L.D. REF. NO.
F.P.B. NO.

PROJECT
**PROPOSED COMPOSITE BUILDING
AT Nos. 42-44 YIU WAH STREET,
CAUSEWAY BAY
HONG KONG**

PLAN
2nd FL. PLAN

SCALE

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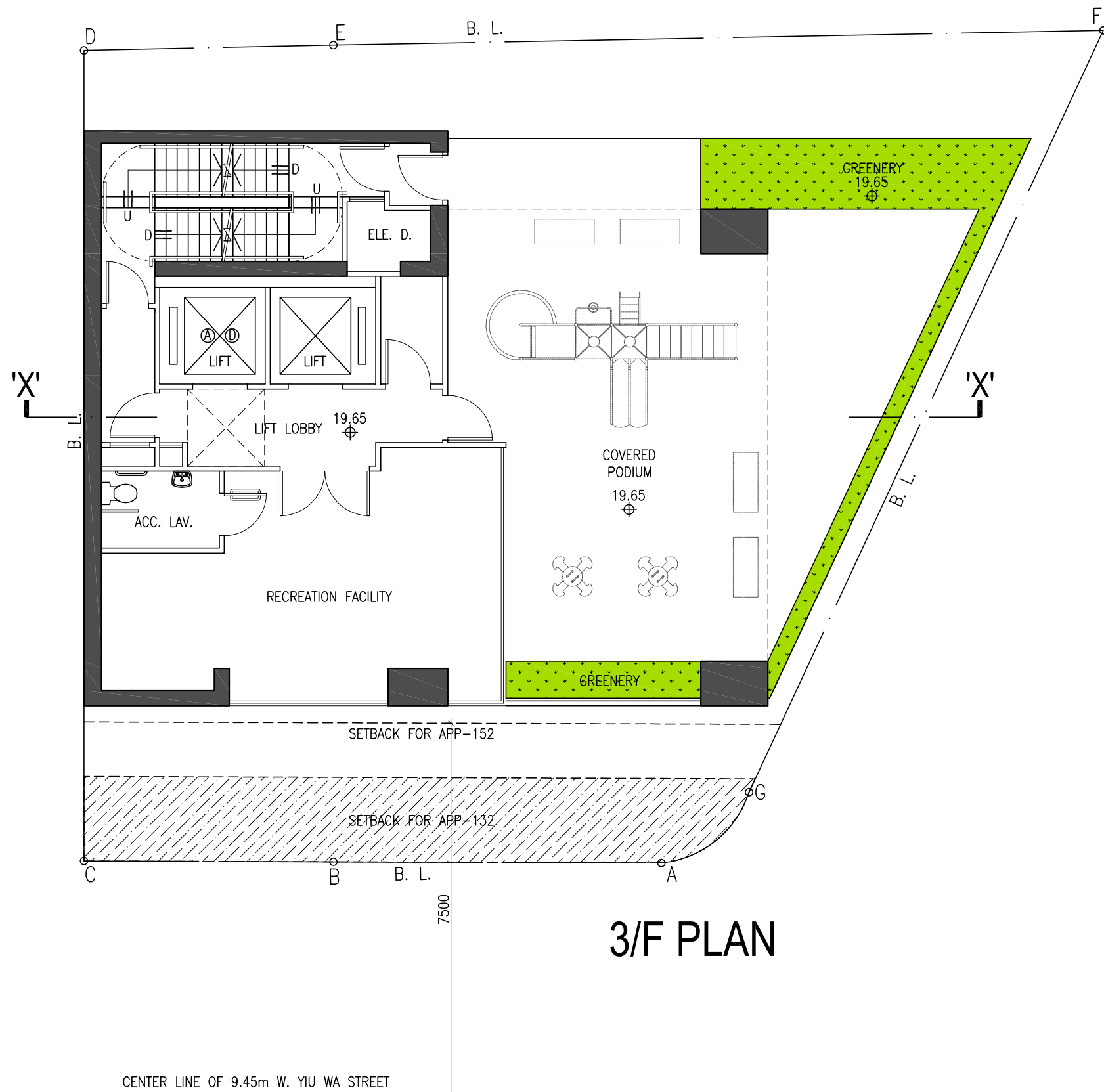
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	D	10/04/2026	



B.L.D. REF. NO.

F.P.B. NO.

PROJECT

PROPOSED COMPOSITE BUILDING
AT Nos. 42-44 YIU WAH STREET,
CAUSEWAY BAY
HONG KONG

PLAN

3rd FL. PLAN

SCALE

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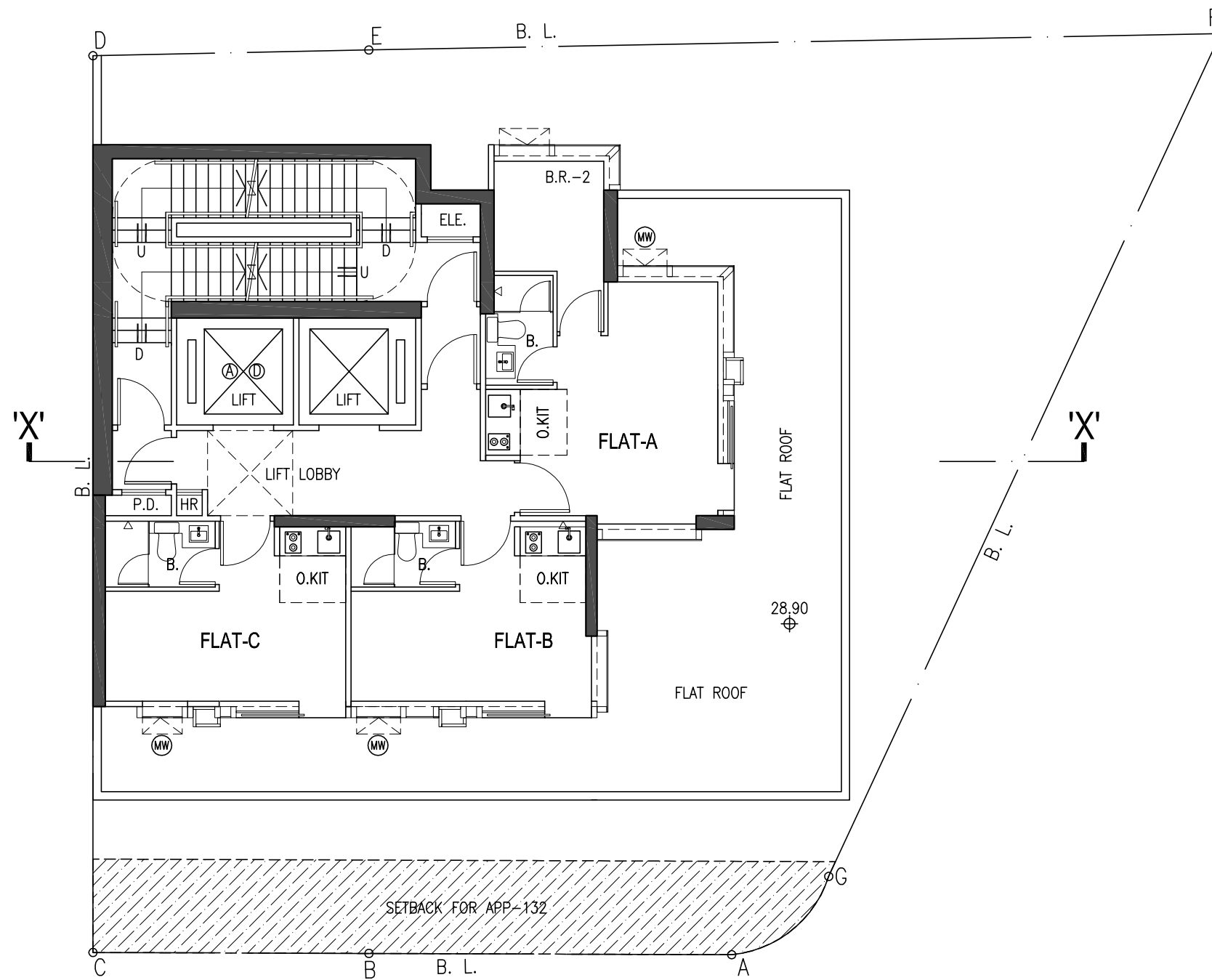
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	C	24/03/2026	
	D	10/04/2026	



5/F PLAN

(NO 4/F)

(MW) MAINTENANCE WINDOW

B.L.D. REF. NO.

F.P.B. NO.

PROJECT

PROPOSED COMPOSITE BUILDING
AT Nos. 42-44 YIU WAH STREET,
CAUSEWAY BAY
HONG KONG

PLAN

5th FL. PLAN

SCALE

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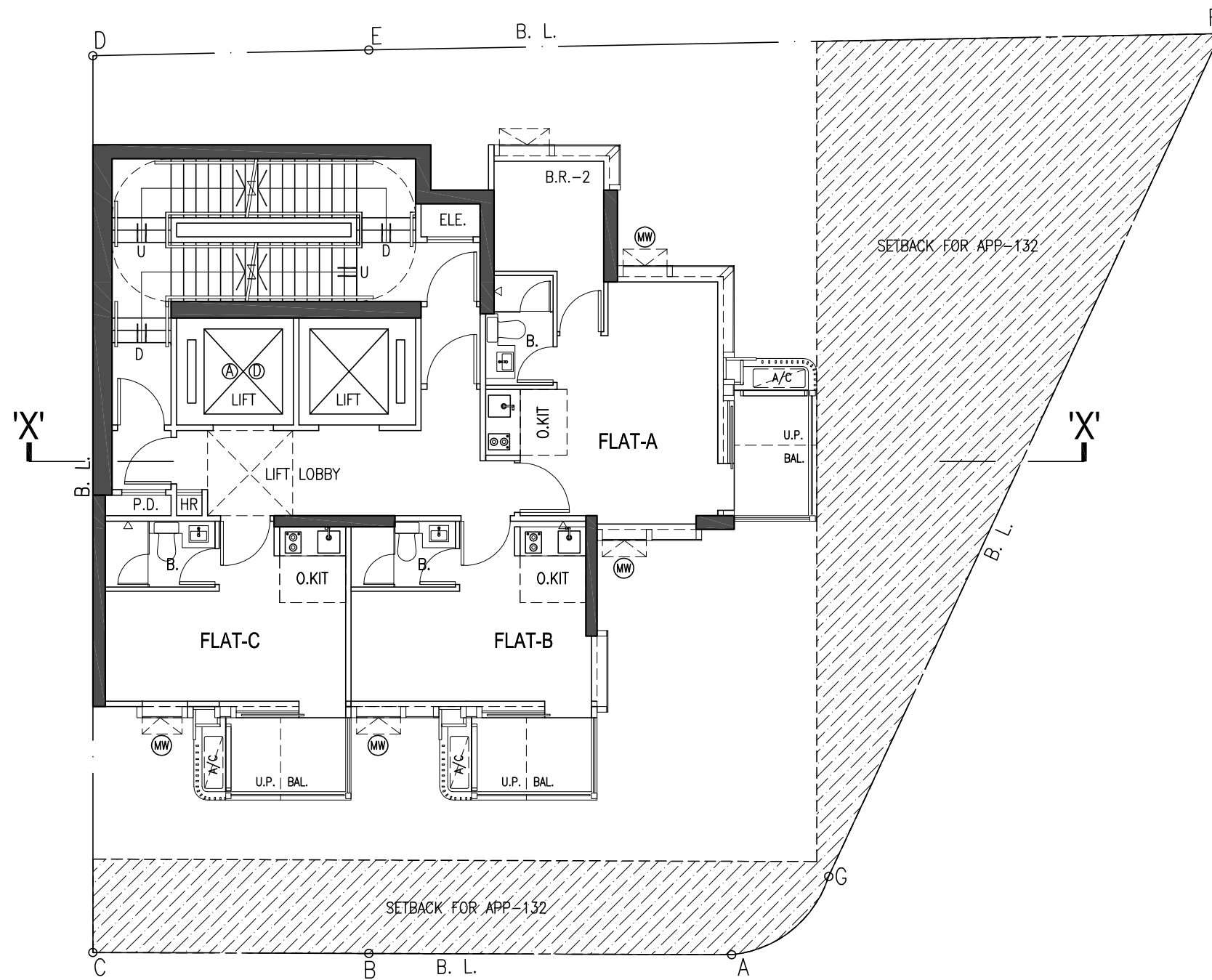
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6-29/F PLAN

(NO 13/F, 14/F & 24/F)

MAINTENANCE WINDOW

B.L.D. REF. NO.

F.P.B. NO.

PROJECT

PROPOSED COMPOSITE BUILDING
AT Nos. 42-44 YIU WAH STREET,
CAUSEWAY BAY
HONG KONG

PLAN

6th-29th FL. PLAN

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Appendix 2.1 Detailed Drainage Impact Assessment Calculation

For Proposed Flat with Shop and Services/Eating Place in " Commercial" Zone on Draft Wan Chai Outline Zoning Plan No. S/H5/32 at 42-44 Yiu Wa Street and 28 - 29 Cnal Road East, Hong Kong

Table 1 - Proposed Catchment Areas and Run-off (1 in 50 year)

$$Q_p = 0.278 C i A$$

Notes:

Site Area 274 m²

where Q_p = peak runoff in m³/s
 C = runoff coefficient (dimensionless)
 i = rainfall intensity in mm/hr
 A = catchment area in km²

Catchments are small, so Rational Method is appropriate

1 in 50-year (according to Table 3 of DSD Manual)

a= 505.5

b= 3.29

c= 0.355

Surface Characteristics	Runoff coefficient, C*
Asphalt	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Grassland (heavy soil**)	
Flat	0.13 - 0.25
Steep	0.25 - 0.35
Grassland (sandy soil)	
Flat	0.05 - 0.15
Steep	0.15 - 0.20

	Catchment	Discharge Manhole	Paved	Unpaved	Area	Total t _c ^[1]	Intensity	Weighted Runoff Coefficient	Run-off	Run-off ^[2]	Run-off ^[3]
					(m ²)	(min)	(mm/h)		(m ³ /s)	(m ³ /s)	(m ³ /s)
Existing	Subject Site										
	S1	T1	100%	0%	274	5.00	239	0.95	0.017	0.019	0.020
Future	Subject Site										
	S1	T1	80%	20%	274	5.00	239	0.79	0.014	0.016	0.017

Remarks:

[1]. Assumed Time of Concentration

[2]. Runoff includes rainfall increase due to Climate Change 11.1% in the mid 21st Century

[3]. Runoff includes rainfall increase due to Climate Change 16% in the end of 21st Century

Appendix 2.2 Existing Drainage Plan

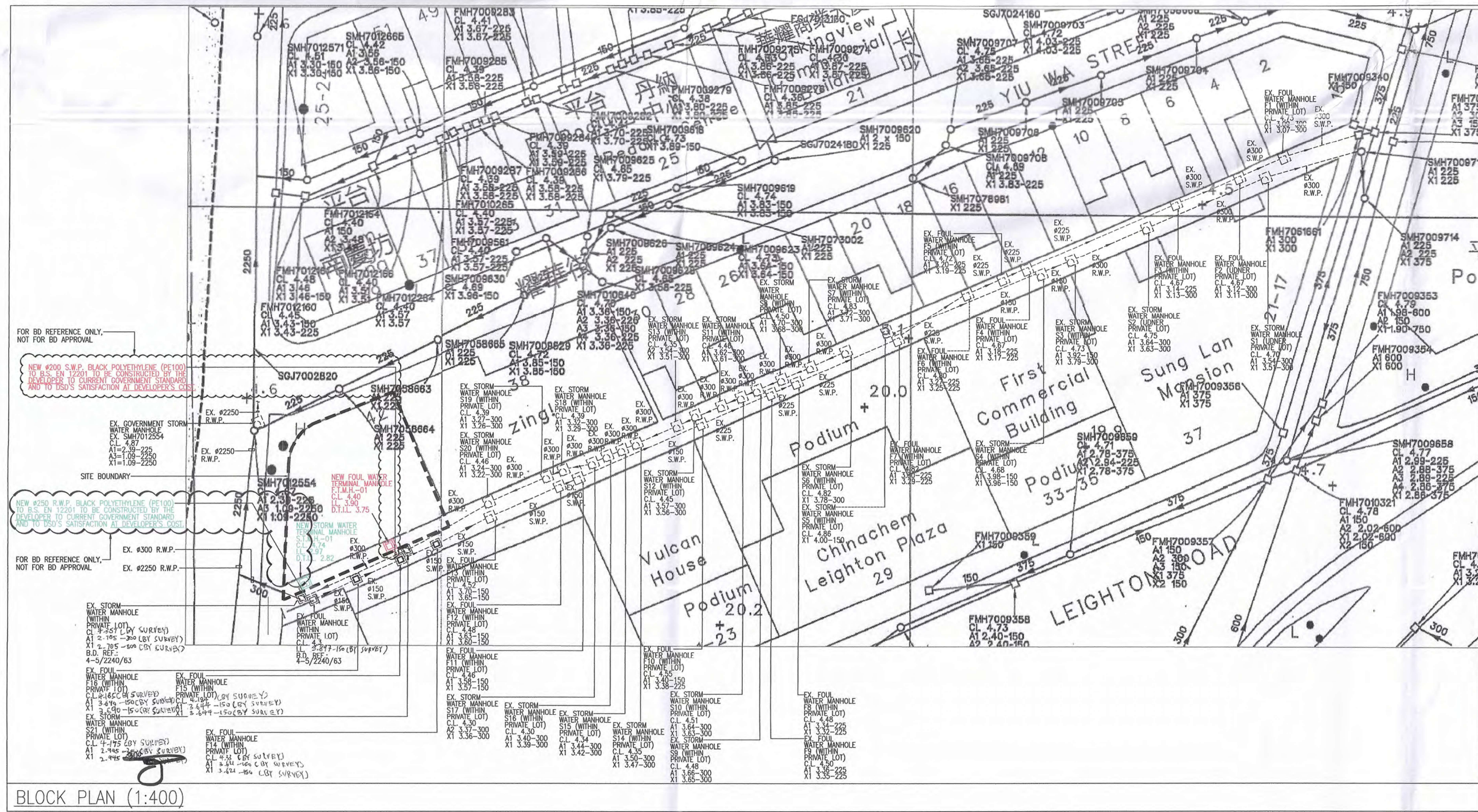
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PRACTICE FOR

1829-BD-3-03
1829-BD-4-01

PROPOSED DRAINAGE LAYOUT PLAN FOR 29/F - TOP FLOOR
INSTALLATION DETAILS

VERNMENT
AL ELEMENTS
05.
PARATELY.

R LEVEL
TRAP
FLOOR LEVEL



Note: This plan has been curtailed check basis under processing system as per ADM-19. The duties of the registered structural engineer, geotechnical engineer concerned under section 4(3)(b) and section 14(2)(c) of the Building Ordinance of particular relevance in this

Plan Approved

 YEUNG Pal
 Senior Building Engineer
 for BUILDING A
 - 2 FEB

BLOCK PLAN (1:400)

Appendix 3.1 Detailed Sewerage Impact Assessment Calculation

Table 1 Calculation for Sewage Generation Rate of the Proposed Development at the Application Site

Proposed Development (Catchment S)

1. Residential

Total number of units	=	66 unit
Total number of residents	=	152 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	41.0 m³/day

2. Clubhouse

Assumed Area	=	52 m ²
Assumed floor area per employee	=	30.30 m ² per worker -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	2 employees
Design flow for commercial activities	=	0.28 m ³ /employee/day -- (refer to Table T-2 of GESF - J11)
Sewage Generation rate	=	0.6 m³/day

3. F&B

Assumed Area	=	162 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	9 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	14.2 m³/day

Total flow from proposed development

Flow Rate (without Catchment Inflow Factor)	=	55.8 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	55.8 m³/day
Contributing Population	=	207 People
Peaking Factor	=	8 Refer to Table T-5 of GESF for population <1,000 incl. stormwater allowance
Peak Flow	=	5.2 litre/sec

Table 2a Hydraulic Capacity of Existing Private Sewers

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k _s	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	m/s ²	m	m ² /s	m/s	m ²	m ³ /s	L/s	
S1 - S2	F15	F14	150	4.2	3.64	3.62	9.81	0.00060	0.005	0.000001	0.74	0.02	0.01	13
S2 - S3	F14	F13	150	6.6	3.62	3.70	9.81	0.00060	-	0.000001	-	0.02	-	-
S3 - S4	F13	F12	150	8.2	3.65	3.63	9.81	0.00060	0.002	0.000001	0.49	0.02	0.01	9
S4 - S5	F12	F11	150	2.3	3.60	3.58	9.81	0.00060	0.009	0.000001	0.94	0.02	0.02	17
S1 - S5 ^[1]	F15	F11	150	20.8	3.64	3.58	9.81	0.00060	0.003	0.000001	0.55	0.02	0.01	10
S5 - S6	F11	F10	150	14.3	3.57	3.40	9.81	0.00060	0.012	0.000001	1.10	0.02	0.02	19
S6 - S7	F10	F9	225	8.2	3.38	3.36	9.81	0.00060	0.002	0.000001	0.64	0.04	0.03	25
S7 - S8	F9	F8	225	3.2	3.35	3.34	9.81	0.00060	0.003	0.000001	0.73	0.04	0.03	29
S8 - S9	F8	F7	225	11.8	3.32	3.30	9.81	0.00060	0.002	0.000001	0.53	0.04	0.02	21
S9 - S10	F7	F6	225	8.9	3.29	3.27	9.81	0.00060	0.002	0.000001	0.61	0.04	0.02	24
S10 - S11	F6	F5	225	4.2	3.25	3.20	9.81	0.00060	0.012	0.000001	1.44	0.04	0.06	57
S11 - S12	F5	F4	225	2.8	3.19	3.18	9.81	0.00060	0.004	0.000001	0.78	0.04	0.03	31
S12 - S13	F4	F3	225	17.4	3.17	3.14	9.81	0.00060	0.002	0.000001	0.54	0.04	0.02	21
S13 - S14	F3	F2	300	7.4	3.13	3.12	9.81	0.00060	0.001	0.000001	0.57	0.07	0.04	40
S14 - S15	F2	F1	300	5.3	3.11	3.09	9.81	0.00060	0.004	0.000001	0.96	0.07	0.07	68

Table 2b Hydraulic Capacity of Existing Government Sewers

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k _s	s	v	V ^[2]	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	m/s ²	m	m ² /s	m/s	m ²	m ³ /s	L/s	
S15 - S16	F1	FMH7009341	300	6.4	3.07	2.64	9.81	0.00060	0.067	0.000001	4.10	0.07	0.29	290
S16 - S17	FMH7009341	FMH7051661	300	1.6	2.64	-	9.81	0.00060	-	0.000001	1.00	0.07	0.07	71
S17 - S18	FMH7051661	FMH7009339	300	0.9	-	-	9.81	0.00060	-	0.000001	1.00	0.07	0.07	71
S18 - S19	FMH7009339	FMH7009338	375	8.5	-	-	9.81	0.00060	-	0.000001	1.00	0.11	0.11	110
S19 - S20	FMH7009338	FMH7009306	450	60.0	-	-	9.81	0.00060	-	0.000001	1.00	0.16	0.16	159

Table 2c Hydraulic Capacity of Proposed Sewers

Segment	Manhole Reference	Manhole Reference	Pipe Dia.	Pipe Length	Invert Level 1	Invert Level 2	g	k _s	s	v	V	Area	Q	Estimated Capacity
			mm	m	mPD	mPD	m/s ²	m	m ² /s	m/s	m ²	m ³ /s	L/s	
T1 - S1	T1	F15	225	3.1	3.75	3.64	9.81	0.00030	0.034	0.000001	2.66	0.04	0.11	106

- Notes:
- [1] Table 2a: According to the drainage plan, the invert level of upstream manhole F14 is lower than the invert level of downstream manhole F15. Therefore, it is assumed that F15 invert level will be connected to F11.
 - [2] Table 2b: According to the Geoinfo Map, the invert level of the existing manhole from FMH7051661 to FMH7009306 are missing. It is assumed that the minimum velocity of 1m/s will be adopted in this calculation.

- Remarks:
- (1) g=gravitational acceleration; k_s=equivalent sand roughness; s=gradient; v=kinematic viscosity of water; V=mean velocity
 - (2) Table 2a-2b: The value of k_s = 0.6mm is used for the calculation of slimed clayware sewer, poor condition (based on Table 5: Recommended roughness values in Sewerage Manual)
 - (3) Table 2c: The value of k_s = 0.3mm is used for the calculation of slimed polyethylene for the proposed sewers, poor condition (based on Table 5: Recommended roughness values in Sewerage Manual)
 - (4) The value of velocity (V) is referred to the Tables for the hydraulic design of pipes, sewers and channels (8th edition)
 - (5) Equation used:
$$V = -\sqrt{(8gDs)} \log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

Catchment A1 (S5)

Zing!

Assumed Area	=	7344.1 m ²
Assumed floor area per employee	=	18.2 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	404 employees
Design flow for commercial activities	=	0.08 m ³ /employee/day -- (refer to Table T-2 of GESF - J6)
Sewage Generation rate	=	32.3 m³/day

F&B

Assumed Area	=	255 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	13 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	20.6 m³/day

Total flow from Catchment A1

Flow Rate (without Catchment Inflow Factor)	=	52.9 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	52.9 m³/day

Catchment A2 (S6)

30, 28 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	106 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.6 m³/day

Total flow from Catchment A2

Flow Rate (without Catchment Inflow Factor)	=	14.8 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.8 m³/day

Catchment A3 (S7)

26, 24 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	106 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.6 m³/day

Total flow from Catchment A3

Flow Rate (without Catchment Inflow Factor)	=	14.8 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.8 m³/day

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

Catchment A4 (S9)

22, 20 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	99 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.0 m³/day

Total flow from Catchment A4

Flow Rate (without Catchment Inflow Factor)	=	14.2 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.2 m³/day

Catchment A5 (S10)

18, 16 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	100 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.1 m³/day

Total flow from Catchment A5

Flow Rate (without Catchment Inflow Factor)	=	14.3 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.3 m³/day

Catchment A6 (S12)

14, 12 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	99 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.0 m³/day

Total flow from Catchment A6

Flow Rate (without Catchment Inflow Factor)	=	14.2 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.2 m³/day

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

Catchment A7 (S13)

10, 8 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	99 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	8.0 m³/day

Total flow from Catchment A7

Flow Rate (without Catchment Inflow Factor)	=	14.2 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	14.2 m³/day

Catchment A8 (S14)

6, 4 Yiu Wa Street

Total number of units	=	10 unit
Total number of residents	=	23 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	6.2 m³/day

F&B

Assumed Area	=	95 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	7.7 m³/day

Total flow from Catchment A8

Flow Rate (without Catchment Inflow Factor)	=	13.9 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	13.9 m³/day

Catchment A9 (S15)

2 Yiu Wa Street

Total number of units	=	5 unit
Total number of residents	=	12 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	3.1 m³/day

F&B

Assumed Area	=	91 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	5 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	7.3 m³/day

Total flow from Catchment A9

Flow Rate (without Catchment Inflow Factor)	=	10.4 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	10.4 m³/day

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

Catchment B

Honest Building

Assumed Area	=	6261.6 m ²
Assumed floor area per employee	=	18.2 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	344 employees
Design flow for commercial activities	=	0.08 m ³ /employee/day -- (refer to Table T-2 of GESF - J6)
Sewage Generation rate	=	27.6 m³/day

F&B

Assumed Area	=	216 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	11 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	17.4 m³/day

Yee Hing Building

Total number of units	=	47 unit
Total number of residents	=	108 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	29.2 m³/day

F&B

Assumed Area	=	465 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	24 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	37.5 m³/day

Vulcan House

Assumed Area	=	4473.7 m ²
Assumed floor area per employee	=	18.2 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	246 employees
Design flow for commercial activities	=	0.08 m ³ /employee/day -- (refer to Table T-2 of GESF - J6)
Sewage Generation rate	=	19.7 m³/day

F&B

Assumed Area	=	263 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	13 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	21.2 m³/day

Chinachem Leighton Plaza

Assumed Area	=	9754.8 m ²
Assumed floor area per employee	=	18.2 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	537 employees
Design flow for commercial activities	=	0.08 m ³ /employee/day -- (refer to Table T-2 of GESF - J6)
Sewage Generation rate	=	42.9 m³/day

F&B

Assumed Area	=	489 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	25 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	39.4 m³/day

Table 3 Calculation for Sewage Generation Rate of the Existing Surrounding Building

First Commercial Building

Assumed Area	=	5045.7 m ²
Assumed floor area per employee	=	18.2 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	278 employees
Design flow for commercial activities	=	0.08 m ³ /employee/day -- (refer to Table T-2 of GESF - J6)
Sewage Generation rate	=	22.2 m³/day

Sung Lan Mansion

Total number of units	=	64 unit
Total number of residents	=	147 people -- (2021 Population Census: Average Household Size of 2.3 in Canal Road)
Design flow	=	0.27 m ³ /person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	39.7 m³/day

F&B

Assumed Area	=	391 m ²
Assumed floor area per employee	=	19.61 m ² per worker -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	20 employees
Design flow for commercial activities	=	1.58 m ³ /employee/day -- (refer to Table T-2 of GESF - J10)
Sewage Generation rate	=	31.5 m³/day

Craigengowar Cricket Club - Administrative Building

Assumed Area	=	1218.9 m ²
Assumed floor area per employee	=	30.3 m ² per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	40 employees
Design flow for commercial activities	=	0.28 m ³ /employee/day -- (refer to Table T-2 of GESF - J11)
Sewage Generation rate	=	11.3 m³/day

Total flow from Catchment B

Flow Rate (without Catchment Inflow Factor)	=	339.5 m ³ /day
Catchment Inflow Factor	=	1.00 Catchment Inflow Factor for Wan Chai in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	339.5 m³/day

Table 4a Comparison of the Hydraulic Capacity of Existing Private Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Catchment Involved	ADWF (m ³ /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
S1 - S2	150	4.2	0.005	13	S	56	207	8	0.0	5.2	39.6%	OK
S2 - S3	150	6.6	-	-	S	56	207	8	0.0	5.2	-	-
S3 - S4	150	8.2	0.002	9	S	56	207	8	0.0	5.2	59.7%	OK
S4 - S5	150	2.3	0.009	17	S	56	207	8	0.0	5.2	31.2%	OK
S1 - S5	150	20.8	0.003	10	S	56	207	8	0.0	5.2	52.9%	OK
S5 - S6	150	14.3	0.012	19	S + A1	109	403	8	0.0	10.1	51.9%	OK
S6 - S7	225	8.2	0.002	25	S + A1 - A2	124	457	8	0.0	11.4	45.0%	OK
S7 - S8	225	3.2	0.003	29	S + A1 - A3	138	512	8	0.0	12.8	44.2%	OK
S8 - S9	225	11.8	0.002	21	S + A1 - A3	138	512	8	0.0	12.8	60.7%	OK
S9 - S10	225	8.9	0.002	24	S + A1 - A4	153	565	8	0.0	14.1	57.8%	OK
S10 - S11	225	4.2	0.012	57	S + A1 - A5	167	618	8	0.0	15.4	27.0%	OK
S11 - S12	225	2.8	0.004	31	S + A1 - A5	167	618	8	0.0	15.4	49.8%	OK
S12 - S13	225	17.4	0.002	21	S + A1 - A6	181	670	8	0.0	16.8	78.6%	OK
S13 - S14	300	7.4	0.001	40	S + A1 - A7	195	723	8	0.0	18.1	45.0%	OK
S14 - S15	300	5.3	0.004	68	S + A1 - A8	209	774	8	0.0	19.4	28.4%	OK

Table 4b Comparison of the Hydraulic Capacity of Existing Government Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Catchment Involved	ADWF (m ³ /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
S15 - S16	300	6.4	0.067	290	S + A1 - A9	220	813	8	0.0	20.3	7.0%	OK
S16 - S17	300	1.6	-	71	S + A1 - A9	220	813	8	0.0	20.3	28.8%	OK
S17 - S18	300	0.9	-	71	S + A1 - A9	220	813	8	0.0	20.3	28.8%	OK
S18 - S19	375	8.5	-	110	S + A1 - A9 + B	559	2070	6	0.0	38.8	35.1%	OK
S19 - S20	450	60.0	-	159	S + A1 - A9 + B	559	2070	6	0.0	38.8	24.4%	OK

Table 4c Comparison of the Hydraulic Capacity of Proposed Sewers from the Terminal Manhole of the Proposed Development for Sewage generated from the Proposed Development

Segment	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Catchment Involved	ADWF (m ³ /day)	Contributing Population	Peaking Factor	Swimming Pool/Public Toilet (L/s)	Peak Flow from the Proposed Development and Catchment Areas (L/s)	Contribution from the Proposed Development and the Surrounding Catchment Areas (%)	Status
T1 - S1	225	3.1	0.034	106	S	56	207	8	0.0	5.2	4.9%	OK

Remarks: (a) The value of peaking factor = 8 is used for population <1,000 incl. stormwater allowance (refers to Table T-5 of GESF)
 (b) The value of peaking factor = 6 is used for population 1,000-5,000 incl. stormwater allowance (refers to Table T-5 of GESF)