Appendix 7

Drainage and Sewerage Impact Assessment

Prepared for

Sime Darby Motor Services Limited

Prepared by

Ramboll Hong Kong Limited

PROPOSED EV MOBILITY CITY WITH ANCILLARY STAFF QUARTERS AND TALENT ACCOMMODATION AT VARIOUS LOTS IN D.D. 51 AND ADJOINING GOVERNMENT LAND, FANLING

DRAINAGE AND SEWERAGE IMPACT ASSESSMENT

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1. INTRODUCTION

1.1 Project Background

1.1.1 The Application Site currently falls within the " Government, Institution or Community" ("G/IC") zone, according to the Approved Fanling / Sheung Shui Outline Zoning Plan ("Approved OZP") No. S/FSS/28. The Applicant proposed to rezone from "G/IC" to "Other Specified Uses (Innovation and Technology)" ("OU(I&T)") zone, given the unique nature of the EV and low-altitude aerial vehicles industries with R&D and business needs.

1.1.2 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 approximately 5,480m^2. The Application Site comprising various lots in D.D.51 is located in the south of Fanling, which is bounded by Tai Wo Service Road West from northeast to northwest of the Application Site. To the immediate east is a Planned Public Housing Development at Fanling Area 48. Wo Hop Shek Village is located from south to southwest of the Application Site.

1.2.2 A feasibility study has been conducted for the above-mentioned Planned Public Housing Development (PHD48) for the OZP amendment (RNTPC Paper No. 1/16). And the Section 16 Planning Application (Application No.: A/FSS/295) for PHD48 has been submitted and approved by Town Planning Broad (TPB) in 2024. The findings from the relevant technical assessments have been referenced to where appropriate.

1.2.3 The location of the Application Site and its surrounding environs are shown in **Figure 1.1**.

1.3 Proposed Development

1.3.1 R&D and I&T facilities on EV, green energy and low-altitude aerial vehicle, related business uses, and ancillary/supporting business and training facilities are proposed at the Application Site.

1.3.2 There is an 7-storey podium building, comprising 6 storeys for R&D and innovations & technology related uses (including research laboratory, pre-delivery inspection, training space/testing centre, battery charging/swapping station, EV showrooms, workbay, main office, storage/warehouse, utility and workshop) and 1 storey of ancillary and supporting business and training facilities (i.e. conference, seminars, training course, and administration & accounting office). There will be one 12 storeys residential institution (talent accommodation) and one 6 storeys staff quarters.

1.3.3 There are altogether 138 units provided. It is estimated that there would be maximum of 414 residents. R&D and innovations & technology related uses are planned.

1.3.4 The tentative completion year is 2031.

1.3.5 The 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 currently is paved with a partially green area and occupied by warehouses and open area. The Application Site is served by existing public drainage system. There is a Ø900mm drainage pipe (SWD1010692) at immediate northwest across Wo Hing Road to receive the runoff discharged from the Application Site and then connected to the existing 3 x 3.8m x 2.55m of box culvert (SBP1001912).

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. It is expected that the peak 1 in 50-year runoff from the Application Site would be decreased from 0.31m^3/s to approximately 0.29m^3/s. 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 discharged to the aforementioned drainage pipe so that there is no change of flow regime.

2.1.3 According to the preliminary drainage impact assessment of the Approved Section 16 Planning Application for PHD48, a slope drains will be proposed to receive the surface runoff from uphill catchment. Therefore, it is anticipated that there is no surface runoff from uphill catchment will be flow into the Application Site.

2.1.4 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.

2.1.5 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 Sewerage Impact Assessment (SIA) is to assess whether the capacity of the existing sewerage network serving the Application Site is sufficient to cope with the sewage flow from the proposed development. Geoinfo Map was obtained for the purposes of this SIA.

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 m^3/person/day (R2)
- Residents: 0.37 m^3/person/day (R4)
- Office employee: 0.08 m^3/day (J12 Public Administration)
- Workshop employee: 0.63 m^3/day (J1 North District)
- EV Showroom employee: 0.28 m^3/day (J4 Wholesale & Retail)
- Warehouse employee: 0.18 m^3/day (J3 Transport, Storage & Communication)

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

3.3 Existing and Future Sewerage System

Existing Sewerage System

3.3.1 According to the Geoinfo Map, there is an existing Ø250mm sewer and then connected to the existing Ø600mm sewer along Wo Hing Road as shown in **Figure 3.1**.

Proposed Sewerage System

3.3.2 Under Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Area, *Contract No. ND/2019/05* and Site Formation and Infrastructure Works for Public Housing Development at Area 48, Fanling, *Contract No. CV/2022/08*, there will be proposed sewerage works in the vicinity of the Application Site.

3.3.3 Based on the information of *Contract No. ND/2019/05*, a new Ø450mm sewer and Ø600mm sewer will be constructed along Tai Wo Service Road West, and the existing Ø600mm sewer will be demolished. Moreover, a new Ø450mm sewer will be constructed running forward northwest under *Contract No. CV/2022/08*. The proposed sewerage layout plans for *Contract No. ND/2019/05* and *Contract No. CV/2022/08* are shown in **Appendix 3.2** and **Appendix 3.3** respectively. The completer year for the proposed sewerage system is 2026.

3.3.4 According to the preliminary sewerage impact assessment of the Approved Section 16 Planning Application for PHD48, the proposed sewerage works for PHD48 will not be connected to the existing Ø600mm sewer along Tai Wo Service Road West and Wo Hing Road. The wastewater generated from PHD48 will be discharged into the new Ø450mm sewer proposed under *Contract No. ND/2019/05*. The proposed sewerage system plan is extracted in **Appendix 3.4**.

3.4 Wastewater Generated by the Proposed Development

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

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	Office	Workshop	EV Showroom	Warehouse/ Storage/Utility
Assumed Area (m^2)	-	3417	7535	4191	277
Number of Population	414	68	371	92	69
Design Flow (m^3/person/day)	0.27(1)	0.08(2)	0.63(3)	0.28(4)	0.18(5)
Flow Rate (m^3/day)	**111.8**	**5.4**	**233.9**	**25.8**	**12.5**
Total Flow Rate with P_{CIF} (m^3/day)	**389.3**				
Peak Flow (L/s)	**27.0**				

(1) Refer to Table T-1 of GESF – R2
(2) Refer to Table T-2 of GESF – J12 Public Administration
(3) Refer to Table T-3 of GESF – J1 Manufacturing + North District
(4) Refer to Table T-2 of GESF – J4 Wholesale & Retail
(5) Refer to Table T-2 of GESF – J3 Transport, Storage & Communication

3.5 Discussion

3.5.1 The potential sewerage impact due to the Proposed Development has been quantitatively addressed. Sewage generation rate from the Proposed Development is estimated to be 389.3 m^3/day (i.e. peak flow 27.0 litre/sec).

3.5.2 The wastewater from Proposed Development will be discharged to the existing manhole S1 (FMH1004311) via a proposed Ø200mm sewer.

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 system has adequate capacity to cater the cumulative flow in future.

3.5.4 However, as the invert levels of the existing sewer S1-S2 (FMH1004311 to FSH1002349) are too high, modification work of the existing sewer S1-S2 would be proposed. The proposed modification work is summarized in **Table 3.2** below.

Table 3.2 Proposed Modification Work

Segment	Length (m)	Original			After Modification Work		
		Size(Ø) (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Size (Ø) (mm)	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)
S1-S2	11.4	250	14.549	13.535	200	13.600	13.375

3.5.5 With the proposed modification work, the sewerage system would have adequate capacity to cater the sewerage generated from the proposed development. Therefore, the sewerage generated from the Proposed Development would not have adverse impact on the existing sewerage system.

4. OVERALL CONCLUSION

4.1.1 The EV Mobility City with Ancillary Staff Quarters and Talent Accommodation is proposed at the Various Lots in D.D. 51, Fanling. The potential drainage and sewerage impact have been qualitatively or quantitatively addressed.

4.1.2 The Application Site is currently served by public drainage system. The Proposed Development would result in reduced surface runoff and follow the same flow regime as per existing condition. It would not result in worsened drainage impact.

4.1.3 Based on the sewerage impact assessment results, it is found that the existing sewerage system has adequate capacity to cater the cumulative flow in future.

4.1.4 However, as the invert levels of the existing sewer S1-S2 (FMH1004311 to FSH1002349) are too high, modification work of the existing sewer S1-S2 would be proposed.

4.1.5 With the proposed modification work in place, it is anticipated that the Proposed Development will not result any adverse impact on the existing sewerage system.

Figures

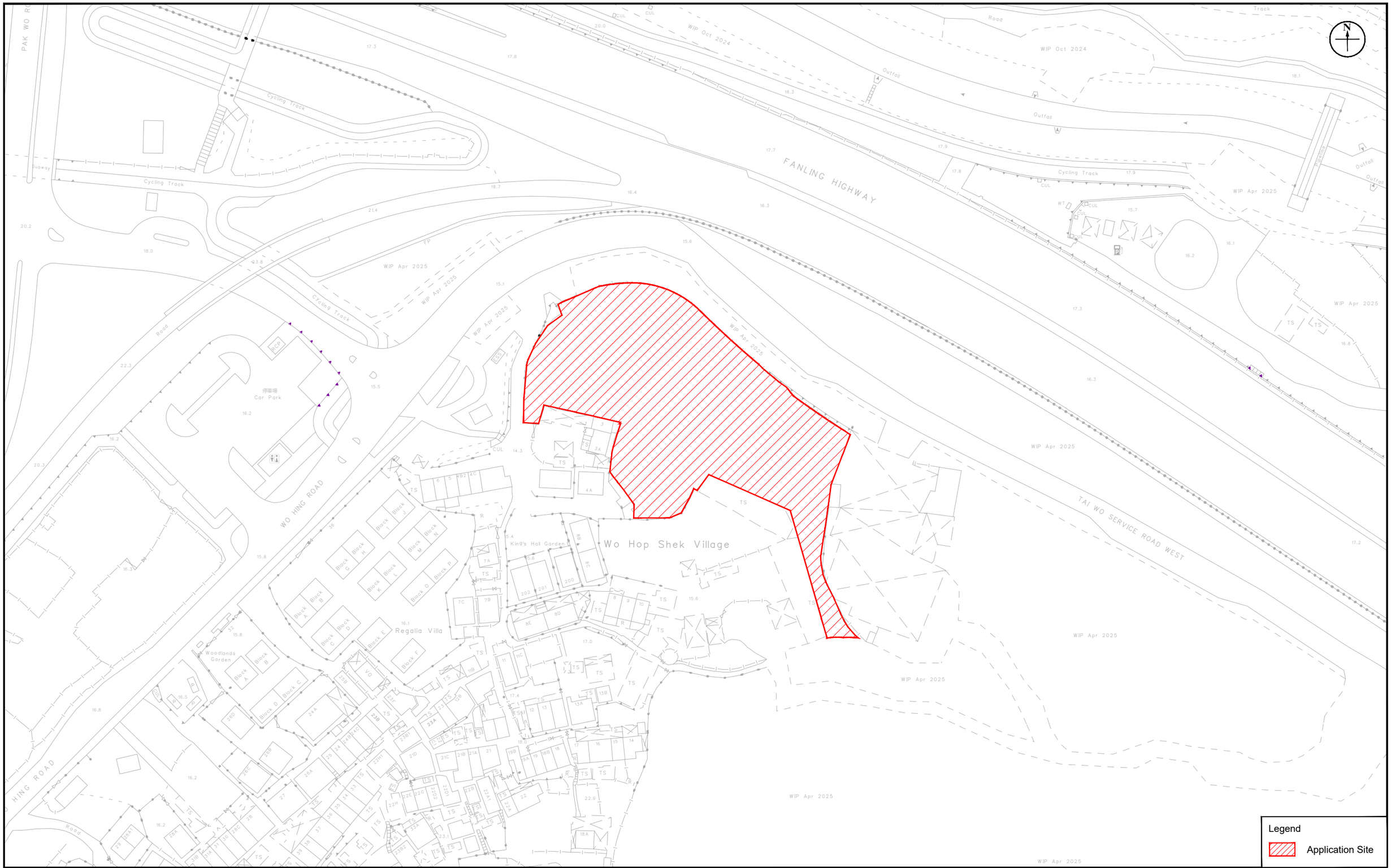

Figure: 1.1	RAMBOLL
Title: Location of the Application Site and its Environs	Drawn by: MW Checked by: BF
Project: Proposed EV Mobility City with Ancillary Staff Quarters and Talent Accommodation at Various Lots in D.D. 51 and Adjoining Government Land, Fanling	Rev.: 1.0 Date: Jul 2025

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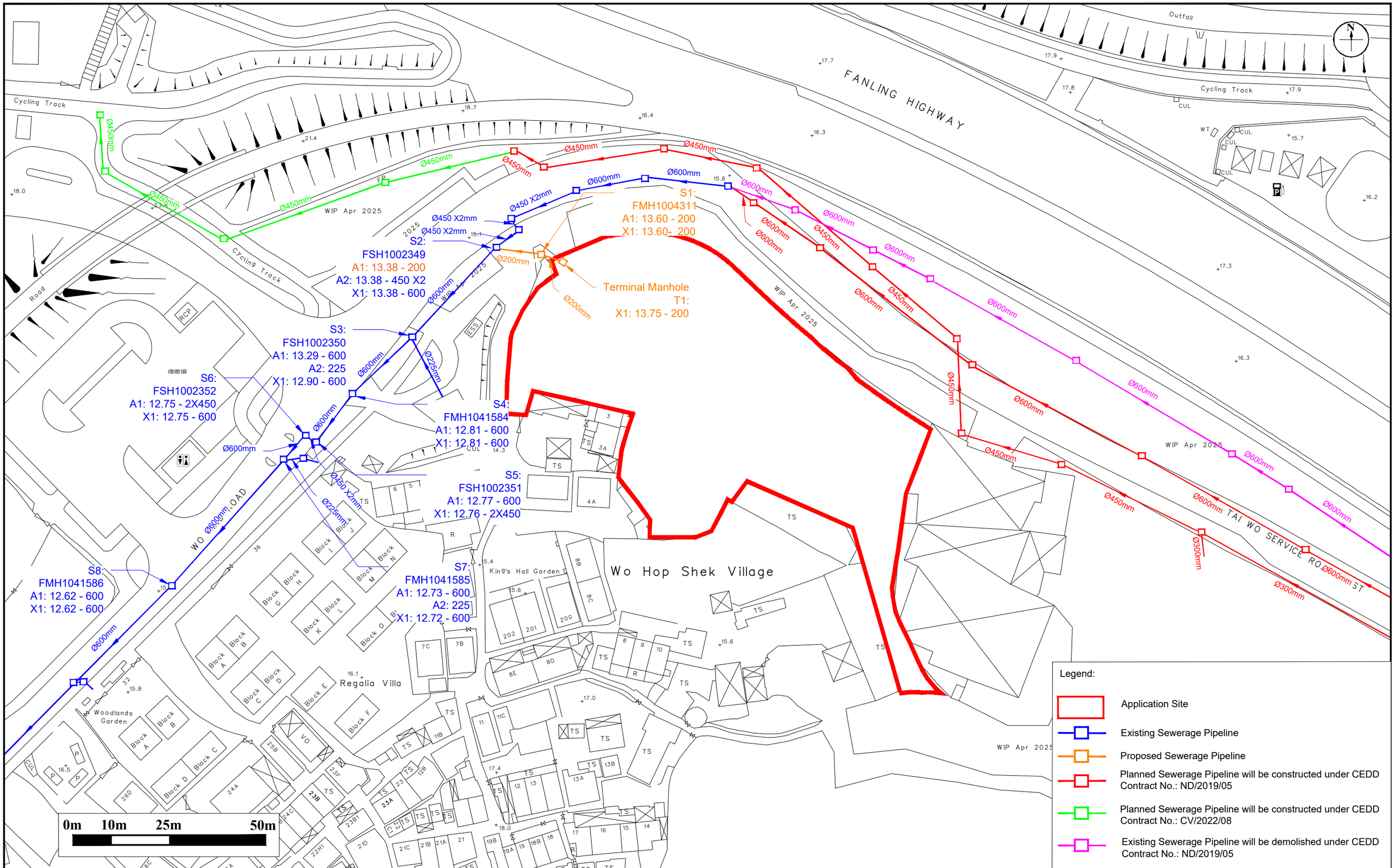

Figure: 3.1

Title: Existing and Proposed Sewerage System in the Vicinity of the Application Site

Project: Proposed EV Mobility City with Ancillary Staff Quarters and Talent Accommodation at Various Lots in D.D. 51 and Adjoining Government Land, Fanling

RAMBOLL

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Checked by:	BF
Rev.:	1.0
Date:	Jul 2025

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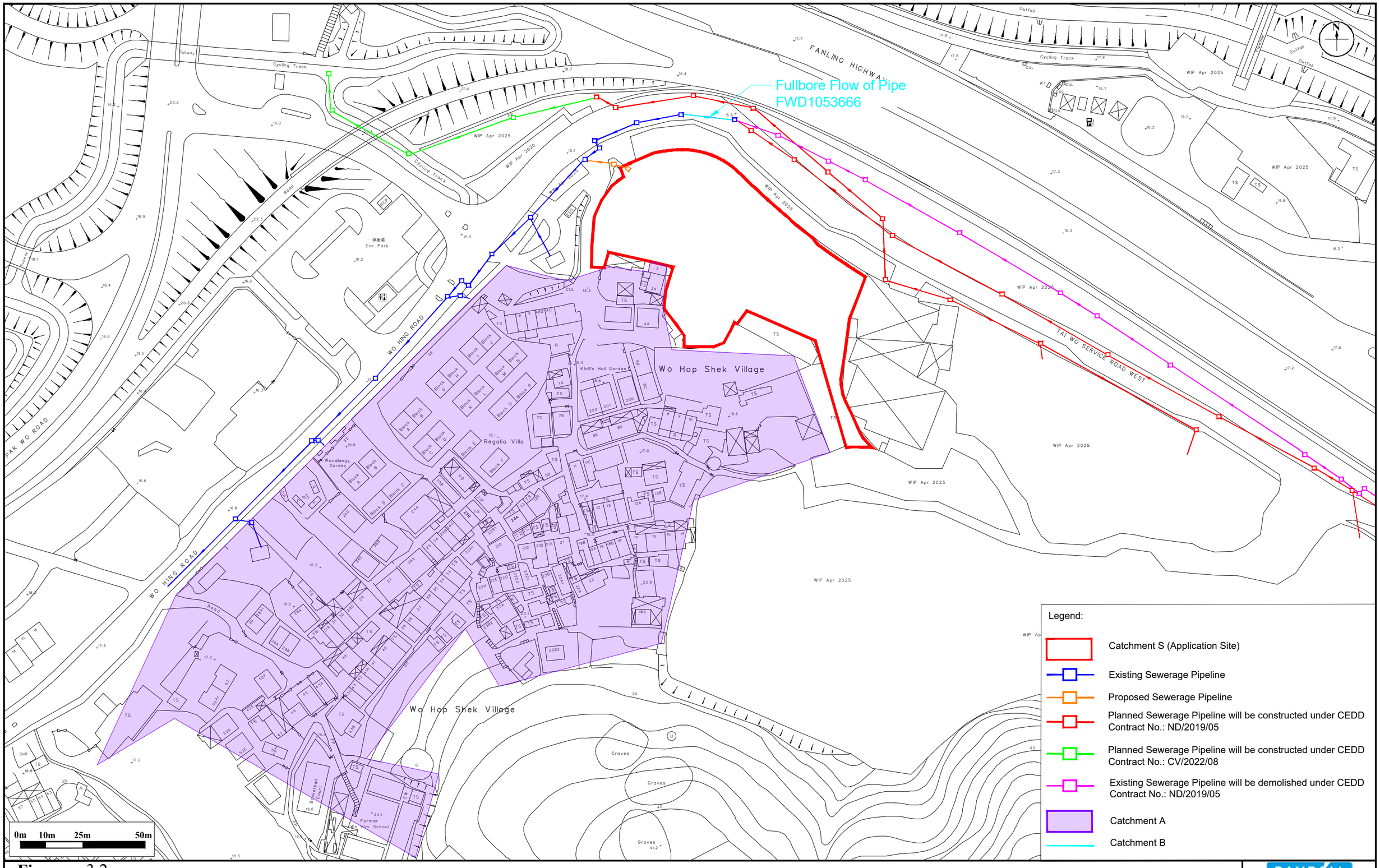

Figure: 3.2

Title: Catchment Areas in the Vicinity of the Application Site

Project: Proposed EV Mobility City with Ancillary Staff Quarters and Talent Accommodation at Various Lots in D.D. 51 and Adjoining Government Land, Fanling

RAMBOLL

Drawn by:	GW
Checked by:	BF
Rev.:	1.0
Date:	Jul 2025

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Appendix 1.1 Master Layout Plan (MLP)

MAIN ENTRANCE

N

A

A'

B

B'

Residential Institution (Talent Accommodation)

Staff Quarters

Innovation & Technology

和合石村

Wo Hop Shek Village

京士豪庭

King's Hall Garden

大嵩西支路

WIP Nov 2024

Residential Institution (Talent Accommodation)

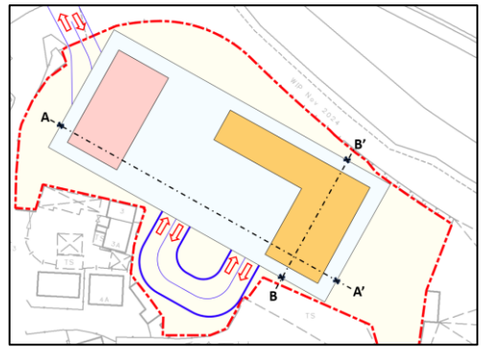
Staff Quarters

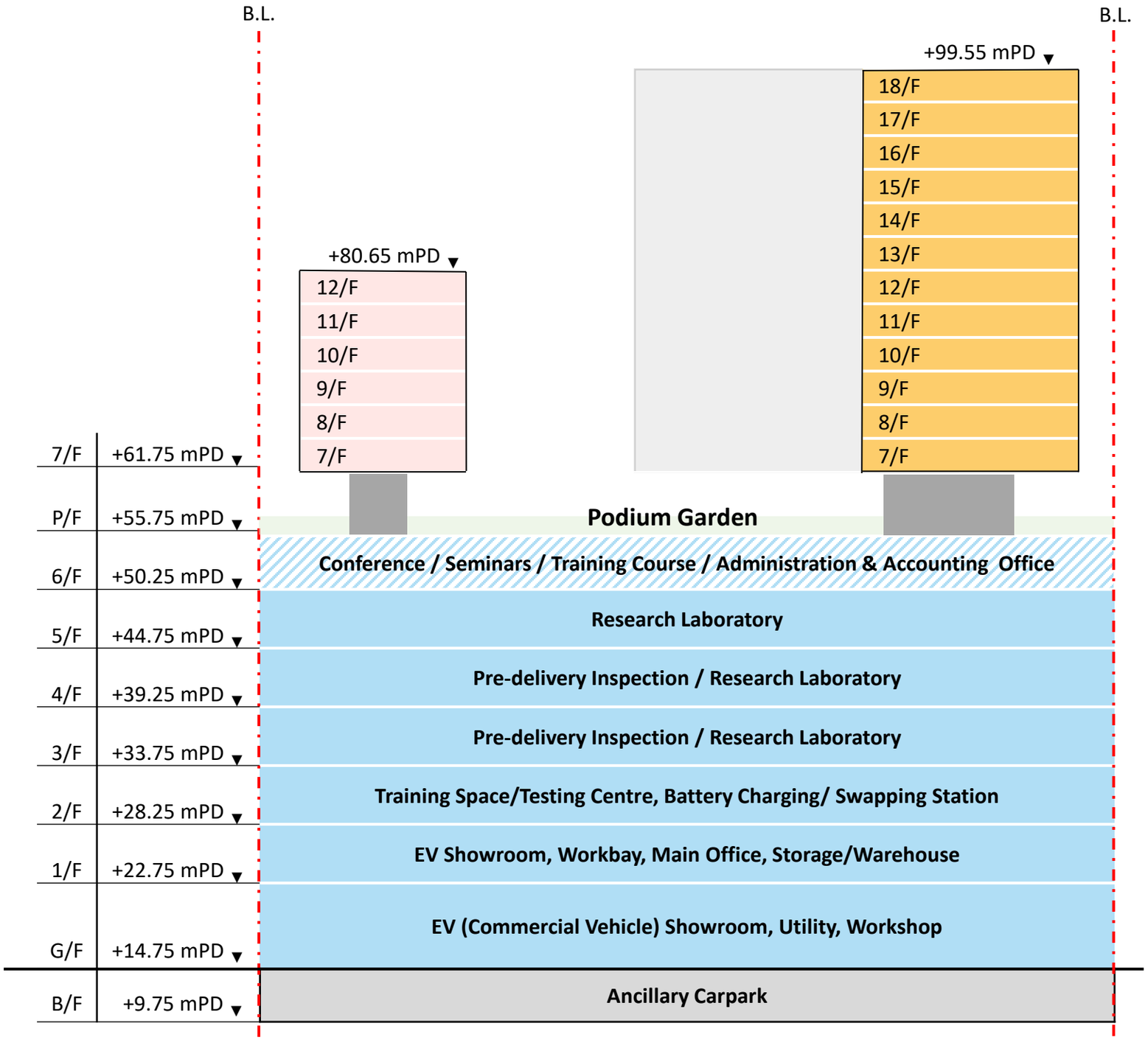
Podium Garden

EV Mobility City (Conference / Seminars / Training Course / Administration & Accounting Office)

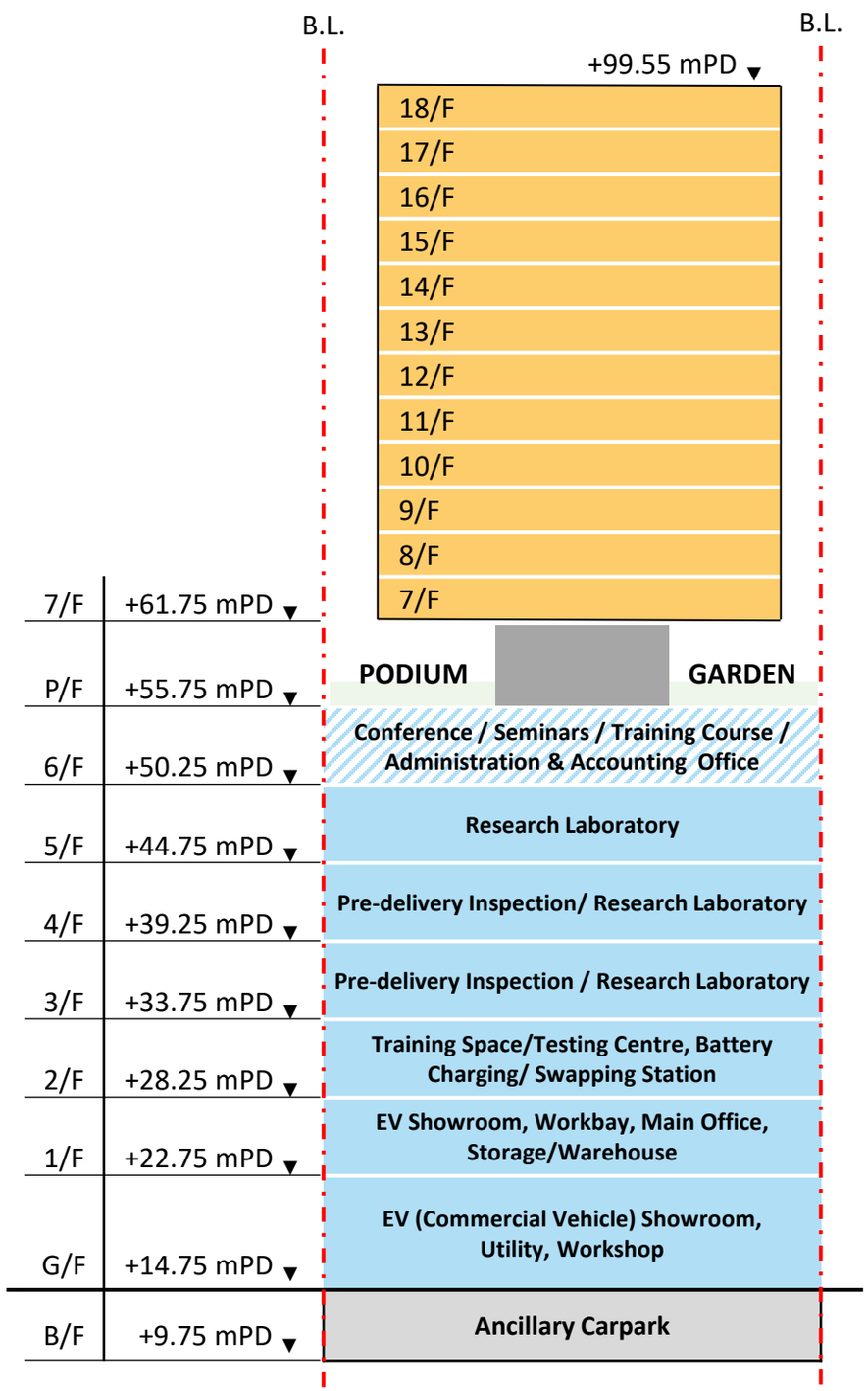
EV Mobility City (Innovation & Technology)

Ancillary Carpark





SECTION A-A'



SECTION B-B'

LIFT LOBBY / LIFT AREA
/ STAIRCASE

ANCILLARY CARPARK

B/F PLAN

N

LIFT LOBBY / LIFT AREA / STAIRCASE

EV (COMMERCIAL VEHICLE) SHOWROOM

WORKSHOP (WITH SUMP PIT)

UTILITY

G/F PLAN

LIFT LOBBY / LIFT AREA / STAIRCASE

STORAGE / WAREHOUSE

WORK BAY

EV SHOWROOM

MAIN OFFICE

1/F PLAN

LIFT LOBBY / LIFT AREA / STAIRCASE

TRAINING SPACE / TESTING CENTRE

BATTERY CHARGING/SWAPPING STATION

2/F PLAN

LIFT LOBBY / LIFT AREA
/ STAIRCASE

PRE-DELIVERY INSPECTION / RESEARCH LABORATORY

3/F & 4/F PLAN

LIFT LOBBY / LIFT AREA
/ STAIRCASE

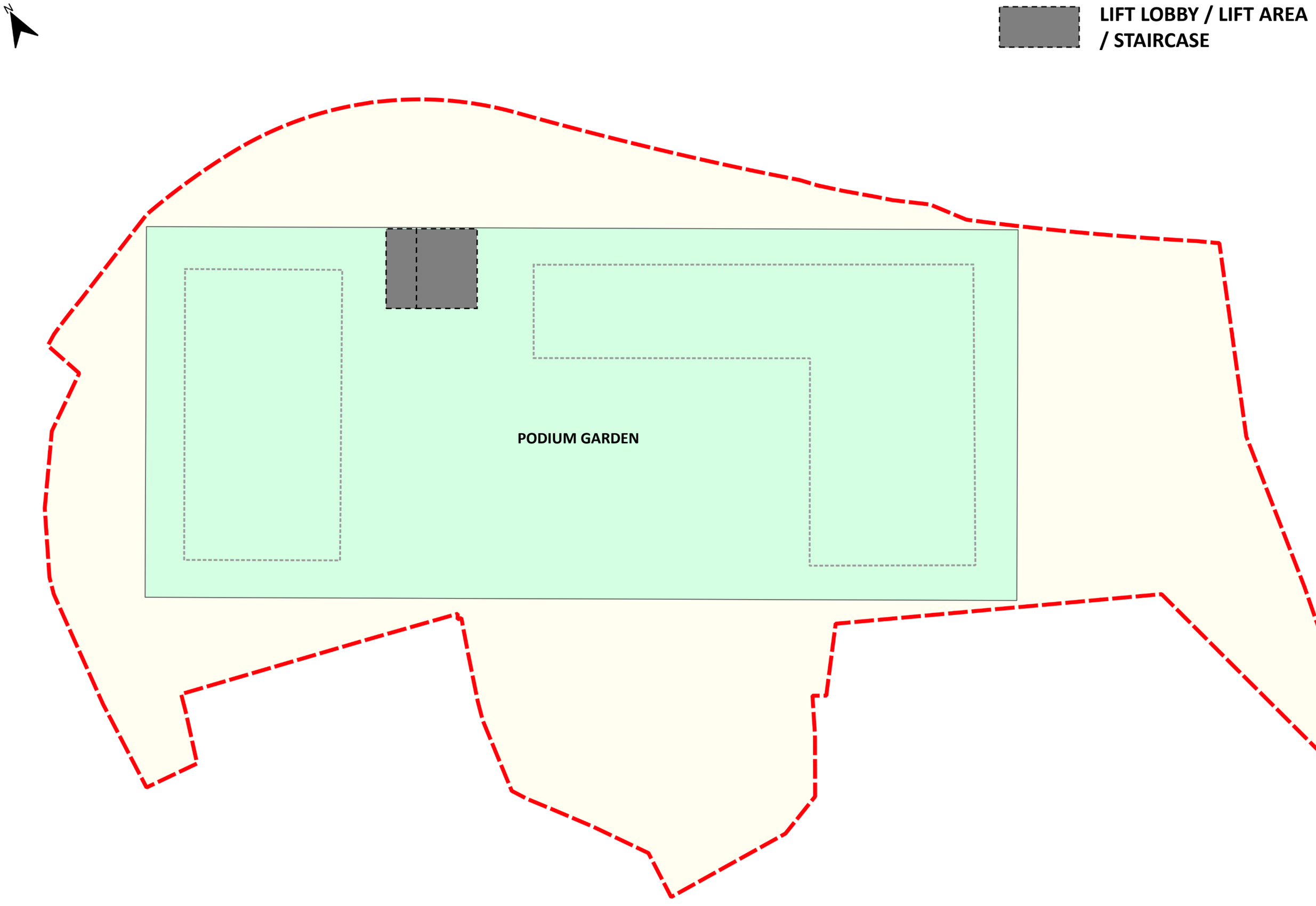
RESEARCH
LABORATORY

5/F PLAN

LIFT LOBBY / LIFT AREA
/ STAIRCASE

CONFERENCE / SEMINARS / TRAINING COURSE /
ADMINISTRATION & ACCOUNTING OFFICE

6/F PLAN



P/F PLAN

LIFT LOBBY / LIFT AREA
/ STAIRCASE

Staff Quarters
(Tower 1)

Residential Institution
(Talent Accommodation)
(Tower 2)

7-18/F PLAN

Appendix 2.1 Detailed Drainage Impact Assessment Calculations

Proposed EV Mobility City with Ancillary Staff Quarters and Talent Accommodation at Various Lots in D.D. 51 and Adjoining Government Land, Fanling
Table 1 - Proposed Catchment Areas and Run-off (1 in 50 year)

$$Q_p = 0.278\ C\ i\ A$$

where Q_p = peak runoff in m^3/s
C = runoff coefficient (dimensionless)
i = rainfall intensity in mm/hr
A = catchment area in km^2

Notes:
Site Area 5,480 m^2

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	Run-off at	Area	Levels (mPD)		Fall	Overland, L	Fall, H	Overland t_c	t_0	Total t_f	Total t_c	Intensity	Weighted Runoff Coefficient[1]	Run-off	Run-off [2]	Run-off [3]
						(m^2)	Upstream	Downstream	(m)	(m)	(m/100m)	(min)	(min)	(min)	(min)	(mm/h)		(m^3/s)	(m^3/s)	(m^3/s)
Existing	**Application Site**																			
	S1	T1	87%	13%	T1	5,480								5.00	5.00	239	0.85	0.31	0.34	0.36
Future	**Application Site**																			
	S1	T1	80%	20%	T1	5,480								5.00	5.00	239	0.80	0.29	0.32	0.34

Remarks:
1. Runoff coefficient of 0.95 for Paved area and 0.20 for Unpaved area
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 3.1 Detailed Sewerage Impact Assessment Calculation

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

Catchment S (Proposed Development)

1. Residential

Total number of residents	=	414	people
Design flow	=	0.27	m^3/person/day -- (refer to Table T-1 of GESF - R2)
Sewage Generation rate	=	**111.8**	m^3/day

2. Office

Assumed Area	=	3417	m^2
Assumed floor area per employee	=	50.5	m^2 per worker -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Bussiness Services)
Total number of employees	=	68	employees
Design flow for commercial activities	=	0.08	m^3/employee/day -- (refer to Table T-2 of GESF - J12)
Sewage Generation rate	=	**5.4**	m^3/day

3. Workshop

Assumed Area	=	7535	m^2
Assumed floor area per employee	=	20.3	m^2 per worker -- (refer to Table 8 of CIFSUS -Manufacturing)
Total number of employees	=	371	employees
Design flow for commercial activities	=	0.63	m^3/employee/day -- (refer to Table T-3 of GESF - J1 + North District)
Sewage Generation rate	=	**233.9**	m^3/day

4. EV Showroom

Assumed Area	=	4191	m²
Assumer flooe area per employee	=	45.45	m² per employee -- (refer to Table 8 of CIFSUS -Wholesale Trade)
Total number of employee	=	92	employees
Design flow for transport employee	=	0.28	m³/employee/day -- (refer to Table T-2 of GESF - J4)
Sewage Generation rate	=	**25.8**	m³/day

5. Warehouses / Storage / Utility	=	277	m²
Assumed Area	=	4.00	m² per employee -- (refer to Table 8 of CIFSUS -Storage)
Assumer flooe area per employee	=	69	employees
Total number of employee	=	0.18	m³/employee/day -- (refer to Table T-2 of GESF - J3)
Design flow for transport employee	=	**12.5**	m³/day
Sewage Generation rate			

Total flow from proposed development

Flow Rate (without Catchment Inflow Factor)	=	389.3	m³/day
Catchment Inflow Factor	=	1.00	Catchment Inflow Factor for North District in Table T-4 of GESF
Flow Rate (with Catchment Inflow Factor)	=	**389.3**	m³/day
Contributing Population	=	1442	People
Peaking Factor	=	6	Refer to Table T-5 of GESF for population 1,000-5,000 incl. stormwater allowance
Peak Flow	=	27.0	litre/sec

Table 2a Hydraulic Capacity of Existing Sewers

Segment	Manhole Reference	Manhole Reference		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	FMH1004311	FSH1002349	250	11.4	14.55	13.54	9.81	0.00060	0.089	0.000001	4.20	0.05	0.21	206
S2-S3	FSH1002349	FSH1002350	600	31.5	13.38	13.29	9.81	0.00300	0.003	0.000001	1.05	0.28	0.30	297
S3-S4	FSH1002350	FMH1041584	600	21.3	12.90	12.81	9.81	0.00300	0.004	0.000001	1.28	0.28	0.36	361
S4-S5	FMH1041584	FSH1002351	600	16.1	12.81	12.77	9.81	0.00300	0.002	0.000001	0.97	0.28	0.27	273
S5-S6	FSH1002351	FSH1002352	450	3.6	12.76	12.75	9.81	0.00060	0.002	0.000001	0.89	0.16	0.14	142
			450	3.6	12.76	12.75	9.81	0.00060	0.002	0.000001	0.89	0.16	0.14	142
S6-S7	FSH1002352	FMH1041585	600	9.2	12.75	12.73	9.81	0.00300	0.002	0.000001	0.89	0.28	0.25	252
S7-S8	FMH1041585	FMH1041586	600	43.2	12.72	12.62	9.81	0.00300	0.002	0.000001	0.95	0.28	0.27	270

Table 2b Hydraulic Capacity of Existing Sewers (After Modification Work of Segment S1-S2)

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	FMH1004311	FSH1002349	200	11.4	13.60	13.38	9.81	0.00030	0.020	0.000001	1.86	0.03	0.06	58
S2-S3	FSH1002349	FSH1002350	600	31.5	13.38	13.29	9.81	0.00300	0.003	0.000001	1.05	0.28	0.30	297
S3-S4	FSH1002350	FMH1041584	600	21.3	12.90	12.81	9.81	0.00300	0.004	0.000001	1.28	0.28	0.36	361
S4-S5	FMH1041584	FSH1002351	600	16.1	12.81	12.77	9.81	0.00300	0.002	0.000001	0.97	0.28	0.27	273
S5-S6	FSH1002351	FSH1002352	450	3.6	12.76	12.75	9.81	0.00060	0.002	0.000001	0.89	0.16	0.14	142
			450	3.6	12.76	12.75	9.81	0.00060	0.002	0.000001	0.89	0.16	0.14	142
S6-S7	FSH1002352	FMH1041585	600	9.2	12.75	12.73	9.81	0.00300	0.002	0.000001	0.89	0.28	0.25	252
S7-S8	FMH1041585	FMH1041586	600	43.2	12.72	12.62	9.81	0.00300	0.002	0.000001	0.95	0.28	0.27	270

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	FMH1004311	200	5.3	13.75	13.60	9.81	0.00030	0.028	0.000001	2.24	0.03	0.07	70

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 2a &2b: The value of k_s = 3mm is used for the calculation of concrete sewer, poor condiction (based on Table 5: Recommended roughness values in Sewerage Manual)

(4) Table 2b & 2c The value of k_s = 0.3mm is used for the calculation of slimed polyethelyene for the proposed sewers, poor condition (based on Table 5: Recommended roughness values in Sewerage Manual)

(5) The value of velocity (V) is referred to the Tables for the hydraulic design of pipes, sewers and channels (8th edition)

(6) Equation used: $$V = -\sqrt{(8gDs)}\log\left(\frac{k_s}{3.7D} + \frac{2.51\nu}{D\sqrt{(2gDs)}}\right)$$

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

Ctachment A
Subunits 628/17-20

Total number of Residents	=	1295	people ((2021 Population Census: Subunit 628/17-20)
Design flow for Residents	=	0.37	m^3/residential/day -- (refer to Table T-1 of GESF - R4)
Sewage Generation rate	=	**479.2**	m^3/day

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

Catchment B (FWD1053666) (upstream)

a. Assumed Pipe Capacity	=	100	%
b. Pipe Diameter	=	600	mm
c. Pipe Length	=	21.43	m
d. Invert Level 1	=	13.595	mPD
e. Invert Level 2	=	13.58	mPD
f. Invert Level Difference	=	0.02	m
g. Gravitational Acceleration	=	9.81	ms^{-2}
h. Equivalent Sand Roughness	=	0.003	m
i. Gradient	=	0.0009	
j. Kinematic Viscosity of Water	=	0.000001	m^2/s
k. Mean Velocity	=	0.58	m/s
l. Cross Sectional Area of the Pipe	=	0.28	m^2
m. Velocity of the Concerned Pipe	=	0.17	m^3/s
n. Estimated Capacity	=	**165.0**	litre/sec

Sub-total

Peak Flow	=	165.0	litre/sec
Peaking factor	=	4.00	Refer to Table T-5 of GESF for population 13,201 incl. stormwater allowa
Contributing Population	=	13201	people
Equivalent Flow Rate	=	**3564.2**	m^3/day

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

Segment	Pipe Dia. (mm)	Pipe Length (m)		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	250	11.4	0.089	206	S	389.3	1442	6	0.0	27.0	13.1%	OK
S2-S3	600	31.5	0.003	297	S + B	3953.5	14643	4	0.0	183.0	61.7%	OK
S3-S4	600	21.3	0.004	361	S + B	3953.5	14643	4	0.0	183.0	50.7%	OK
S4-S5	600	16.1	0.002	273	S + B	3953.5	14643	4	0.0	183.0	66.9%	OK
S5-S6	450	3.6	0.002	142	S + B	3953.5	14643	4	0.0	183.0	64.3%	OK
	450	3.6	0.002	142								
S6-S7	600	9.2	0.002	252	S + B + A	4432.7	16417	4	0.0	205.2	81.3%	OK
S7-S8	600	43.2	0.002	270	S + B + A	4446.2	16468	4	0.0	205.8	76.3%	OK

Table 4b Comparision of the Hydraulic Capacity of Existing Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas (After Modification Work of Segment S1-S2)

Segment	Pipe Dia.	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	200	11.4	0.020	58	S	389.3	1442	6	0.0	27.0	46.2%	OK
S2-S3	600	31.5	0.003	297	S + B	3953.5	14643	4	0.0	183.0	61.7%	OK
S3-S4	600	21.3	0.004	361	S + B	3953.5	14643	4	0.0	183.0	50.7%	OK
S4-S5	600	16.1	0.002	273	S + B	3953.5	14643	4	0.0	183.0	66.9%	OK
S5-S6	450	3.6	0.002	142	S + B	3953.5	14643	4	0.0	183.0	64.3%	OK
	450	3.6	0.002	142								
S6-S7	600	9.2	0.002	252	S + B + A	4432.7	16417	4	0.0	205.2	81.3%	OK
S7-S8	600	43.2	0.002	270	S + B + A	4432.7	16417	4	0.0	205.2	76.1%	OK

Table 4c Comparision 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	200	5.3	0.028	70	S	389.3	1442	6	0.0	27.0	38.4%	OK

Remarks: (a) The value of peaking factor = 4 is used for population 10.000 - 50.000 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)

Appendix 3.2 Proposed Sewerage Layout Plan from Development of Kwu Tung North and Fanling North New Development Areas (KTNFNWDA), Phase 1 under CEDD Contract No. ND/2019/05

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.
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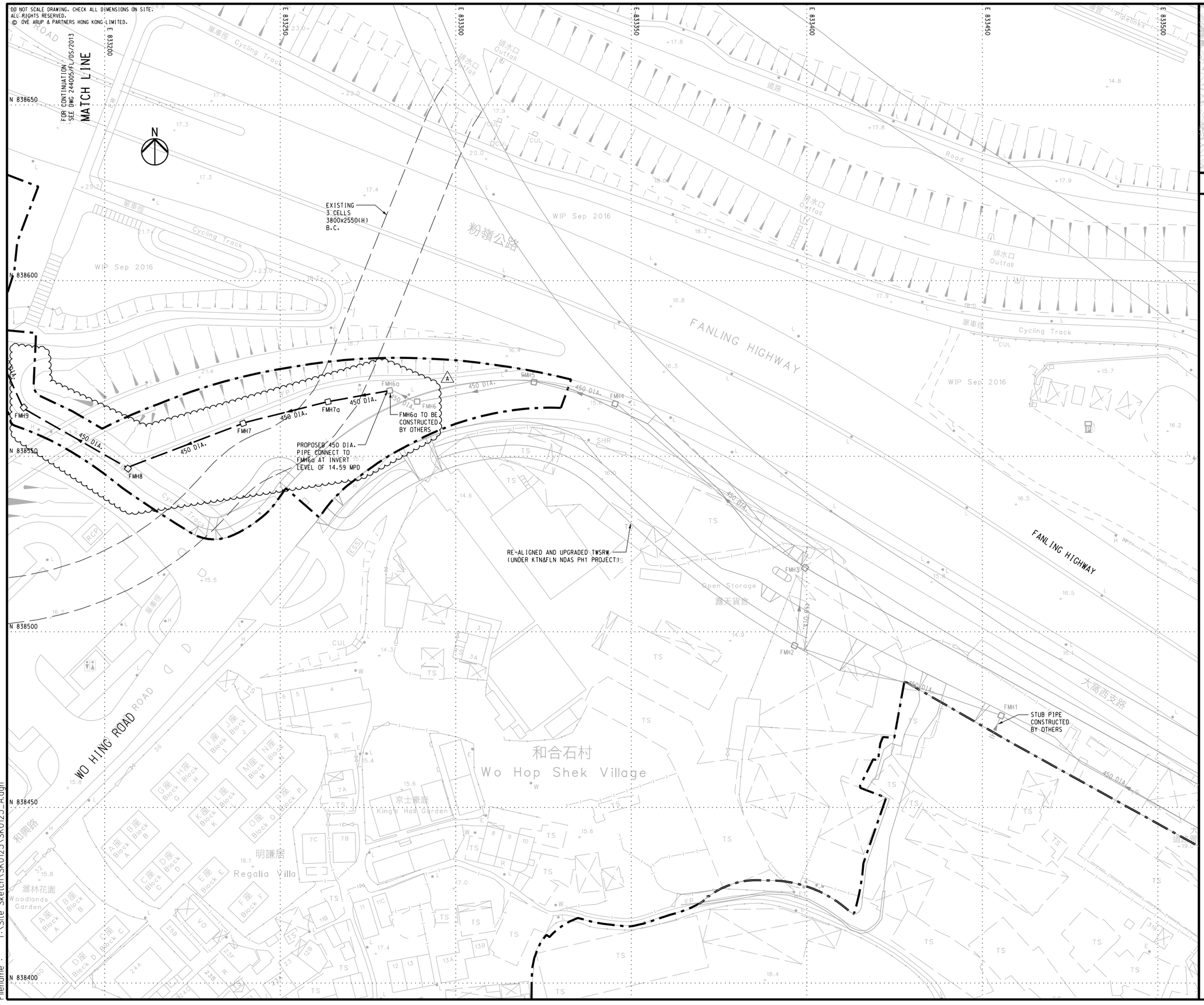

KEY PLAN

NOTES

1. FOR NOTES AND LEGEND, REFER TO DRAWING NOS. 244005/FL/DS/1001 & 1002.
2. FOR MANHOLE AND TAPPING POINT SCHEDULE, REFER TO DRAWING NO. 244005/FL/DS/2021.

Rev	Description	By	Date
A	FOR CONSTRUCTION	WYY	05/25
-	FOR CONSTRUCTION	WYY	08/24

Consultant

ARUP

Contract No. and Title:

Contract No. CV/2022/08

Site Formation and Infrastructure Works at Area 48, Fanling

Drawing title

SEWERAGE LAYOUT PLAN

(SHEET 1 OF 3)

Drawing no.		Rev.
244005/FL/SK0125		A
Drawn: EC	Date: 05/25	Checked: JC	Approved: JY
Scale: 1:500 @A1		EXTRACTED FROM DRG. NO. 244005/FL/DS/2012	

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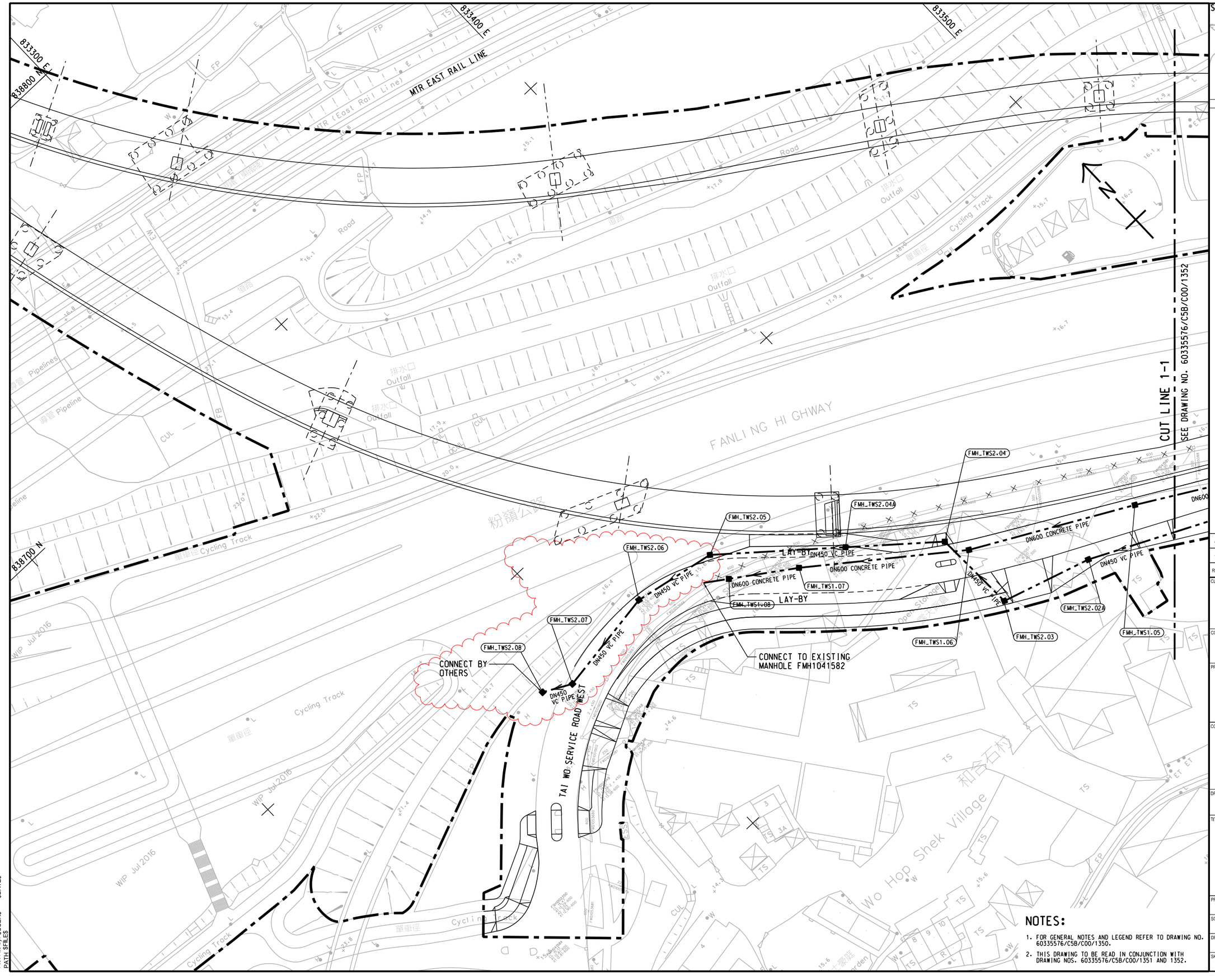
Printed by : 6/5/2025
Filename : T:\Site Sketch\SK0125\SK0125_A.dgn

Appendix 3.3 Proposed Sewerage Layout Plan from Site Formation and Infrastructure Works at Area 48, Fanling under CEDD Contract No. CV/2022/08



NOTES:

1. FOR GENERAL NOTES AND LEGEND REFER TO DRAWING NO. 60335576/C5B/C00/1350.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60335576/C5B/C00/1351 AND 1352.

REV.	DATE	DESCRIPTION	DRAWN	PRE.	APP.
A	24/05/24	SEWERAGE LAYOUT REVISED	HKKL	AC	PP
-	13/12/22	SEWERAGE LAYOUT REVISED	HKKL	JC	AC

CLIENT

土木工程拓展署
Civil Engineering and Development Department

CONSULTANT

AECOM

PROJECT

DEVELOPMENT OF KWU TUNG NORTH AND FANLING NORTH NEW DEVELOPMENT AREAS, PHASE 1

CONTRACT TITLE

FANLING NORTH NEW DEVELOPMENT AREA, PHASE 1: FANLING BYPASS EASTERN SECTION (SHUNG HIM TONG TO KAU LUNG HANG)

DRAWING REFERENCE TO LATEST VERSION

60335576/C5B/C00/1351

TITLE

SEWERAGE LAYOUT PLAN

PROJECT NO.	CONTRACT NO.
60335576	ND/2019/05
SCALE 1:500 (A1) 1:1000 (A3)	DATE 24-JAN-24
DRAWN HKKL	PREPARED AC / APPROVED PP
SKETCH NO. ND/2019/05/R10/130/0558	REV. A

Plot File by: $USER$ $DATE$
PATH $FILE$

Appendix 3.4 Extracted from Engineering Feasibility Study Report for Proposed Public Housing Development at Area 48, Fanling (PHD48)

PART PLAN SEE DRAWING : WSP/CE47/TO4/DR/1213

PART PLAN SEE DRAWING : WSP/CE47/TO4/DR/1212

JOCKEY CLUB ROAD

YAT MING ROAD

PAK WO ROAD

WO HANG ROAD

FANLING HIGHWAY

WAH MING ROAD

KIU TAU ROAD

PROPOSED VEHICULAR ACCESS

838500 N

838000 N

835500 E

835500 E

0 20 40 60 80 100
METRES
1 : 2000

LEGEND :

- PROPOSED WORKS BOUNDARY
- FUTURE PUBLIC HOUSING SITE BOUNDARY
- 800 PIPE SIZE — EXISTING SEWERAGE MANHOLES / EXISTING SEWERAGE PIPE
- 800 PIPE SIZE — PLANNED SEWERAGE MANHOLES (CONSTRUCTED BY OTHERS) / PLANNED SEWERAGE PIPE (CONSTRUCTED BY OTHERS)
- 800 PIPE SIZE — PROPOSED SEWERAGE MANHOLES / PROPOSED SEWERAGE PIPE
- ROAD WORKS (TO BE CONSTRUCTED UNDER KTN&FLN NDAS PH1 PROJECT)

Rev	Description	By	Date
–	FIRST ISSUE	HL	JUL 21

Consultant

wsp

Project title

AGREEMENT NO.CE47/2020 (CE)

TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING DEVELOPMENTS IN ZONE 2 (2021 – 2024) – FEASIBILITY STUDY

Drawing title

TASK ORDER NO. 4
AREA 48, FANLING
PROPOSED SEWERAGE SYSTEM LAYOUT PLAN

Drawing no.	Rev.
CE47/TO4/DR/1211	–

Drawn	Date	Checked	Approved
CAD	JUL 2021	VS	YWY

Scale: 1:2000 (A1)

Status: –

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CIVIL ENGINEERING OFFICE

Date : 28/2/2023
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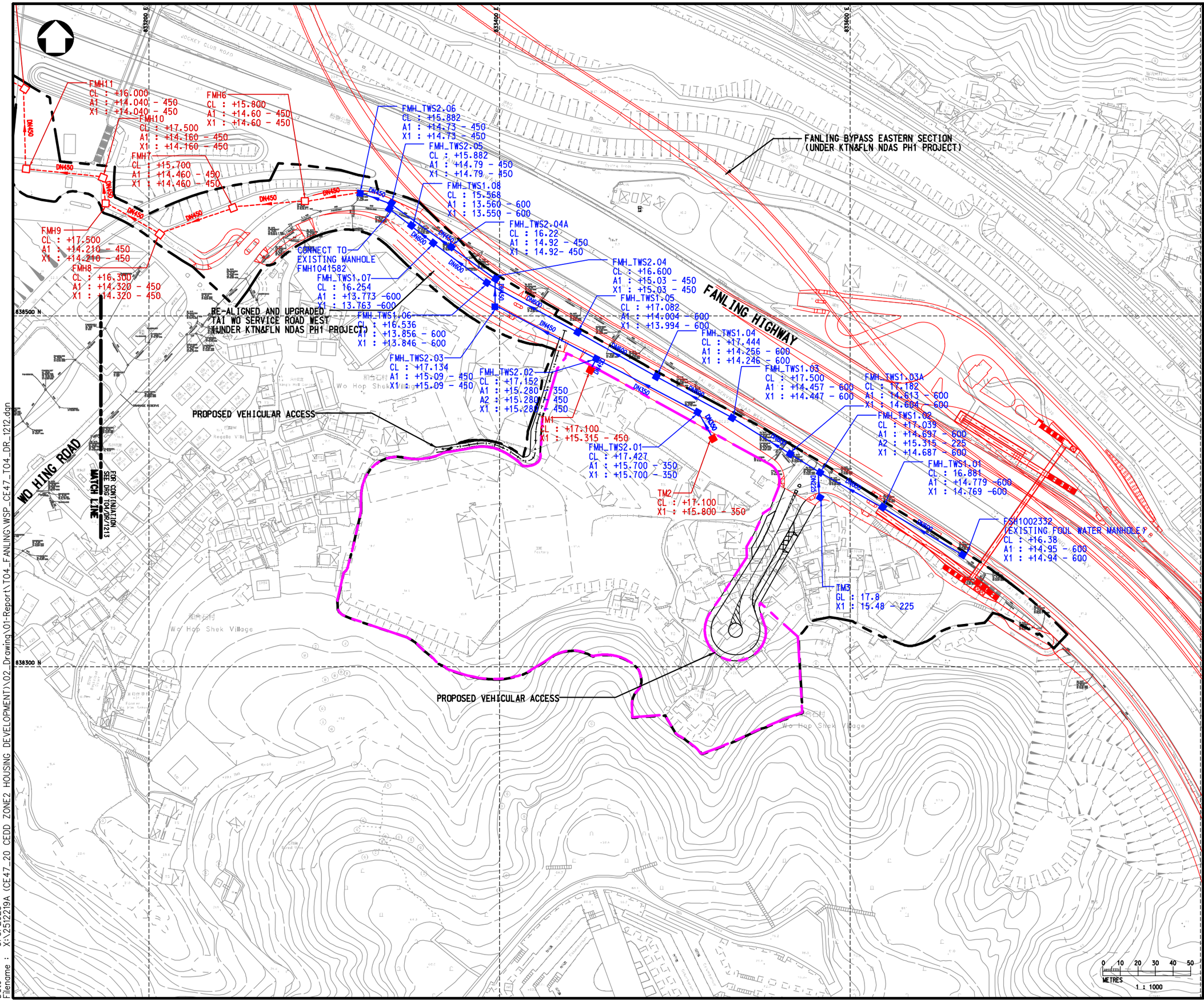

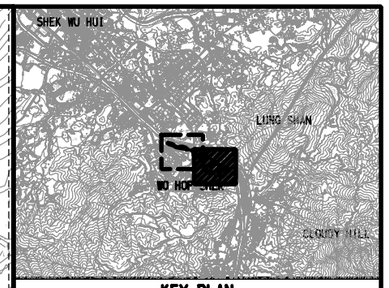

KEY PLAN

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN METRES (M) AND RELATIVE TO HONG KONG PRINCIPAL DATUM (mPD).

LEGEND :

- PROPOSED WORKS BOUNDARY
- FUTURE PUBLIC HOUSING SITE BOUNDARY
- 800 / PIPE SIZE — EXISTING SEWERAGE MANHOLES / EXISTING SEWERAGE PIPE
- 800 / PIPE SIZE — PLANNED SEWERAGE MANHOLES (CONSTRUCTED BY OTHERS) / PLANNED SEWERAGE PIPE (CONSTRUCTED BY OTHERS)
- 800 / PIPE SIZE — PROPOSED SEWERAGE MANHOLES / PROPOSED SEWERAGE PIPE
- ROAD WORKS (TO BE CONSTRUCTED UNDER KTN&FLN NDAS PH1 PROJECT)
- PROPOSED SEWERAGE TERMINAL MANHOLES

Rev	Description	By	Date
-	FIRST ISSUE	HL	NOV 21

Consultant

wsp

Project title

AGREEMENT NO.CE47/2020 (CE)

TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING DEVELOPMENTS IN ZONE 2 (2021 - 2024) - FEASIBILITY STUDY

Drawing title

TASK ORDER NO. 4
AREA 48, FANLING
PROPOSED SEWERAGE SYSTEM LAYOUT PLAN (SHEET 1)

Drawing no.	Rev.
CE47/TO4/DR/1212	-

Drawn	Date	Checked	Approved
CAD	JUL 2021	VS	YWY

Scale: 1:1000 (A1)

Status: -

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土木工程處 CIVIL ENGINEERING OFFICE

Date : 5/5/2023
Filename : X:\2512219A (CE47_20 CEDD ZONE2 HOUSING DEVELOPMENT)\02_Drawing\01-Report\TO4_FANLING WSP_CE47_TO4_DR_1212.dgn