Annex E

Updated Report of the Drainage Impact Assessment

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

Drainage Impact Assessment

May 2026

Date	Revision	Prepared by	Checked by	Approved by
July 2025	0	Robben Cheung	Casey Man	T.C Lam
Dec 2025	1	Robben Cheung	Casey Man	T.C Lam
Mar 2026	2	Alex Lau	Casey Man	T.C Lam
May 2026	3	Alex Lau	Casey Man	T.C Lam

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邁進基建環保工程顧問有限公司

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1. INTRODUCTION

1.1 Meinhardt Infrastructure & Environmental Ltd (MIEL) has been commissioned to conduct this Drainage Impact Assessment ("DIA") to demonstrate the proposed medium-rise residential development on the Application Site is technically feasible in the drainage aspect.

1.2 The Application Site (hereinafter referred to as "the Site") is located east of Kam Pok Road near Fairview Park in Yuen Long. The Site location is shown in Figure 1 in **Appendix A**.

1.3 The objectives of this DIA are:

- Review the existing drainage conditions of the Application Site based on available information;
- Outline the methodology adopted in this assessment;
- Outline changes to the drainage characteristics and potential drainage impacts which may arise due to the Proposed Development, especially in the respect of the following:
  - Effect on the existing drainage conditions;
  - Susceptibility to flooding of neighboring areas upstream or downstream of the Proposed Development; and
  - Assessing the drainage impact upon completion of the Proposed Development.
- Propose drainage mitigation measures where appropriate to mitigate the potential drainage impact arise from the Proposed Development.

2. GENERAL SITE DESCRIPTION

2.1 The Site is bounded by Fung Chuk Road, Ha Chuk Yuen Road, Kam Pok Road and Ha San Wai Road with an area of about 37,870m^2. It locates in the vicinity of Fairview Park, Villa Camellia, Helene Terrace, 3-storey village dwellings in Ha San Wai and Light Public Housing at Yau Pok Road.

2.2 The existing topography of the Site is sloping gently from the north towards the south with ground level varies from +7.0mPD to +4.3mPD approximately.

3. DEVELOPMENT PROPOSAL

3.1 The Proposed Development comprises five medium-rise residential buildings with a domestic plot ratio of 1.5, and one 2-storey facility compound containing one club house, one 6-classroom kindergarten and an elderly activity centre. The building heights of these 5 residential towers are 16 residential storeys high. The total domestic GFA is about 56,805m^2. Upon completion in 2031, the Proposed Development will provide a total of 1,303 private high-quality flats.

3.2 The Proposed Development also includes a two-storey facility compound comprising a clubhouse (about 2,272m^2 exempted non-domestic GFA), which includes a restaurant, an indoor swimming pool and an outdoor swimming pool; one clubhouse, the 6-classroom kindergarten of about 380 m^2 GFA and one elderly activity centre of about 303m^2 in NOFA.

3.3 The proposed master layout plan is shown in Figure 1 in **Appendix A**.

4. EXISTING STORMWATER DRAINAGE SYSTEM OF THE AREA

4.1 The Site is surrounded by existing open channels. A main drainage channel, Ngau Tam Mei Channel (NTMC), is running alongside Kam Pok Road to the west of the Site. Two rectangular channels of 6.0m and 7.2m wide are located to the east and south of the Site along Ha Chuk Yuen Road and Ha San Wai Road respectively. The 6m rectangular channel along Ha Chuk Yuen Road connects to the flood relief pond located at the north of Fung Chuk Road. The stormwater storage in the flood relief pond is then pumped to NTMC by Chuk Yuen Stormwater Pumping Station (CYSPS).

4.2 There are stormwater drains of diameter ranging from 225mm to 750mm along carriageways of Fung Chuk Road, Ha Chuk Yuen Road and Ha San Wai Road to collect surface runoff from road gullies and surface channels for subsequent discharge to the abovementioned open channels.

4.3 There are surface channels with size ranging from 300mm to 600mm at north and north-east of the Site that connect to the stormwater drains along carriageways of Fung Chuk Road and Ha Chuk Yuen Road.

4.4 In addition, there are surface channels with size ranging from 225mm to 375mm at west of the Site for discharging surface runoff to NTMC via 3 nos. of existing 450mm dia. pipe (Outlet 1, 3 & 4) and a 2.5m (H) x 2.1m (W) box culvert (Outlet 2). Flap valves are found installed at all outlets to prevent back flows from NTMC.

4.5 The existing drainage layout plan and catchment plan are shown in Figure 2 and Figure 3 respectively in **Appendix B**.

4.6 Based on the existing topography, the flow from the catchment area at southern side of site has been collected via 450mm and 850mm u-channel along the site boundary and conveyed to the existing box culvert. The hydraulic calculation is enclosed in **Appendix F**.

5. PROPOSED STORMWATER DRAINAGE SYSTEM OF THE AREA

5.1 The existing connecting drains that connect between the Site and the public drainage system and Outlets 1, 2, 3 and 4 will be retained to convey the surface runoff from the proposed residential development. However, the existing surface channels are proposed to be demolished to suit the proposed residential development.

5.2 It is proposed that the surface runoff from the proposed residential development will be conveyed by the proposed internal drains within the site boundary and be discharged to the abovementioned connecting drains and Outlets. The delineation of catchments for the proposed residential development is presented in Figure 4 in **Appendix C**.

5.3 In order to match the formation level of the subject development, the existing uncovered wing wall structure at upstream of the existing box culvert within the site will be demolished and decked over. The proposed decking over the existing box culvert wing wall structure will be designed to allow future maintenance access via removable/inspectable panels. Detailed design stage will provide specifications for maintenance access points and methodology.

5.4 The internal drains will be designed and assessed in the detailed design stage while the capacities of the connecting drains and Outlets have been assessed and discussed in section 7.

6. DESIGN CRITERIA, ASSUMPTIONS AND METHODOLOGY OF DRAINAGE IMPACT ASSESSMENT

Design Standards

6.1 The following design manual(s) have been used in this drainage impact assessment:

- Stormwater Drainage Manual (SDM) 5th Edition published by Drainage Services Department (DSD)
- Stormwater Drainage Manual Corrigendum No. 1/2022 published by Drainage Services Department (DSD)
- Stormwater Drainage Manual Corrigendum No. 1/2024 published by Drainage Services Department (DSD)
- Advice Note No.1 – Application of the Drainage Impact Assessment Process to Private Sector Projects published by Drainage Services Department (DSD)

Flood Protection Level

6.2 The Proposed Development is located at a suburb area currently. It is noted that there are various developments in the vicinity of the Site. As such, it is anticipated that the area surrounded the Site will change to an urban area. Therefore, the flood protection levels adopted in this assessment are as follows:

- 1 in 50-year return period flood protection level for branch drainage system
- 1 in 200-year return period flood protection level for trunk drainage system

Rainfall Intensity

6.3 The rainfall profile adopted in this assessment are formulated by the following equations as stipulated in section 4.3.3 of SDM.

$$i = \frac{a}{(t_d + b)^c}$$

where i = extreme mean intensity in mm/hr
t_d = rainstorm duration (in minutes)
a, b, c = storm constants

6.4 The storm constants are referenced to **Table 6.1** which is duplicated from Table 3a in SDM Corrigendum No.1/2024.

Table 6.1 Storm Constants of HKO Headquarters

Return Period	a	b	c
50	505.5	3.29	0.355
200	508.8	3.46	0.322

6.5 The rainfall intensity should be multiplied by a factor of 1.16 for the climate change effect up to end-21st century and a factor of 1.121 for design allowance.

Runoff Coefficient

6.6 Rational Method is adopted for estimation of surface runoff for the Site. The runoff coefficients used are shown in below **Table 6.2**.

Table 6.2 Storm Constants of HKO Headquarters

Surface Characteristics	Runoff Coefficient, C
Paved Area	0.95
Unpaved Area	0.30

Sediment Depth

6.7 5% sediment depth is applied for the pipe gradient greater than 1 in 25 and 10% sediment depth is applied for the pipe gradient equal and less than 1 in 25.

Hydraulic Analysis

6.8 Colebrook-White Equation is adopted for the hydraulic analyses.

Roughness Coefficient

6.9 A roughness coefficient k_s = 0.6mm is adopted for the Colebrook-White Equation, which is consistent with the value for "Precast concrete pipes with 'O' ring joints" as specified in Table 14 of the Stormwater Drainage Manual (SDM).

Gradient

6.10 The gradient of drains is calculated based on the available information. For those drains without sufficient information to determine the gradient, 1 in 150 is assumed in this assessment.

7. DRAINAGE IMPACT ASSESSMENT

Change in Catchment Characteristics

7.1 The proposed residential development will change the catchment characteristics within the site boundary. The summary of changes is presented in below **Table 7.1**.

Table 7.1 Change in Catchment Characteristics

	Paved Area (m^2)	Unpaved Area (m^2)	Total Area within the Site Boundary (m^2)
Before Development	23,944	10,484	37,645
After Development	22,085	15,560	37,645

Change in Surface Runoff

7.2 The impact on surface runoff is assessed by comparing the equivalent runoff coefficient (*C*) between the pre-development and post-development conditions. Due to the change in catchment characteristics, the equivalent (*C*) value for the application site are presented in below **Table 7.2**. Detailed calculations are shown in **Appendix D**.

Table 7.2 Change in Surface Runoff

Site Condition	Calculation / Breakdown	Equivalent C Value
Before Development	(23944x0.95+10484x0.3+3217x1)/37645	0.773
After Development	(22085x0.95+15560x0.3+)/37645	0.681

As shown in **Table 7.2**, the equivalent (*C*) value decreases from 0.773 to 0.681 after development. This indicates that the post-development surface runoff will not exceed the pre-development runoff. Detailed catchment breakdowns and calculations are provided in **Appendix D**.

Drainage Impact Assessment

7.3 The hydraulic impact from the southern external catchment has been evaluated under existing conditions. Calculations in **Appendix F** demonstrate that the existing drainage characteristics effectively mitigate potential flooding from external sources, ensuring the proposed development remains free from adverse drainage impact.

7.4 It is noted that the total amount of surface runoff in post-development condition is less than that in pre-development due to the increase in unpaved area. As such, there will be no adverse drainage impacts to the existing drainage system including NTMC.

7.5 The capacities of the connecting drains and Outlets have been assessed. The results show that all of them have sufficient capacities to convey the surface runoff from the proposed residential development. The summaries of the results are presented in **Tables 7.3** and **7.4** and detail calculations are shown in **Appendix D**

7.6 To assess the hydraulic impact to Chuk Yuen Stormwater Pumping Station, the total runoff discharged via existing manholes SMH1038220 and SMH1038240 has been assessed. The results indicate that the total discharge to the pumping station decreases from 0.27 m^3/s (Pre-development) to 0.26 m^3/s (Post-development). Therefore, the proposed development will not impose any adverse impact on the operation of Chuk Yuen Stormwater Pumping Station. Detailed calculations are provided in **Appendix D**.

Table 7.3 Summary of Surface Runoff to Existing Drainage System for Pre-Development Condition

Discharge Point	Drain Size (mm)	Gradient	Return Period (1 in X yr)	Peak Surface Runoff (m^3/s)	Capacity (m^3/s)	Spare Capacity (m^3/s)	Full Bore Velocity (m/s)
Outlet 1	450	1 in 150	50	0.182	0.265	0.084	1.579
Outlet 2	2.1(W) x 2.5(H)	1 in 500	200	2.380	9.849	7.469	2.085
Outlet 3	450	1 in 150	50	0.025	0.226	0.201	1.581
Outlet 4	450	1 in 150	50	0.041	0.226	0.185	1.580
SMH1038285	600	1 in 50	50	0.032	0.826	0.795	3.246
SMH1038283	600	1 in 13	50	0.051	1.769	1.718	6.585
SMH1038240	600	1 in 55	50	0.034	0.790	0.756	3.105
SMH1038220	450	1 in 10	50	0.011	0.949	0.938	6.280

Table 7.4 Summary of Surface Runoff to Existing Drainage System for Post-Development Condition

Discharge Point	Drain Size (mm)	Gradient	Return Period (1 in X yr)	Peak Surface Runoff (m^3/s)	Capacity (m^3/s)	Spare Capacity (m^3/s)	Full Bore Velocity (m/s)
Outlet 1	450	1 in 150	50	0.224	0.265	0.041	1.579
Outlet 2	2.1(W) x 2.5(H)	1 in 500	200	2.118	9.849	7.732	2.085
Outlet 3	450	1 in 150	50	0.032	0.226	0.194	1.581
Outlet 4	450	1 in 150	50	0.016	0.226	0.210	1.580
SMH1038285	600	1 in 50	50	0.037	0.826	0.789	3.246
SMH1038283	600	1 in 13	50	0.068	1.769	1.701	6.585
SMH1038240	600	1 in 55	50	0.023	0.790	0.767	3.105
SMH1038220	450	1 in 10	50	0.003	0.949	0.946	6.280

8. MAINTENANCE RESPONSIBILITY

8.1 During the construction phase, the Applicant will be responsible for the maintenance of all existing surface channels, internal drainage system within the boundary of the Site, while the existing outlet pipes outside the Site boundary/ box culvert shall be maintained by Drainage Services Department (DSD).

8.2 Upon the completion of construction, no additional drainage outlet will be resulted and the Applicant will be responsible for the maintenance of proposed surface channels and internal drainage system, including the proposed sand trap within the Site boundary.

8.3 The maintenance responsibility of all drainage facilities outside the Site will remain unchanged.

9. CONCLUSION

9.1 This report has assessed the drainage impact due to the proposed development of Lot 4822 in D.D. 104 and adjoining government land, Kam Pok Road, Mai Po, Yuen Long.

9.2 The surface runoff to be collected from the proposed development will be conveyed by the proposed internal drainage system, which will be designed in detailed design stage, and then be discharged to the connecting drains between the Site and public drainage system.

9.3 Based on the assessment results, the surface runoff in post-development status is less than that of the pre-development status. As such, it is anticipated that there is no adverse drainage impact to the existing drainage system due to the proposed residential development.

9.4 The connecting drains are also assessed and the results show that all connecting drains have sufficient capacities to cater the surface runoff from the Site.

APPENDIX A –

SITE LOCATION AND MASTER LAYOUT PLAN

PLOTTED BY : $USER$

823200 E
823400 E
823600 E
823800 E
837500 N
837300 N
837100 N

FAIRVIEW PARK
YAU POK ROAD LIGHT PUBLIC HOUSING
CHUK YUEN TSUEN
HA SAN WAI
KAM POK ROAD
FUNG CHUK ROAD
HA CHUK YUEN ROAD
SAN TIN HIGHWAY
YAU POK ROAD
NGAU TAM MEI CHANNEL
HA SAN WAI ROAD
HELENE TERRACE
VILLA CAMELLIA

T6
T5
T3
T2
T1
TX ROOM & MAIN SWITCH ROOM
SEWAGE PUMPING STATION
KINDERGARTEN & ELDERLY ACTIVITY CENTRE
OUTDOOR SWIMMING POOL
CLUBHOUSE

LEGENDS:

APPLICATION SITE

PLOT DRV : $PLTDRVL$

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LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI PO, YUEN LONG

LOCATION PLAN AND PROPOSED MASTER LAYOUT PLAN

FIGURE 1

Scale 1 : 1250(A1)

CAD FILE : $FILE$

PLOT DATE & TIME : $DATE$ $TIME$

APPENDIX B –

EXISTING DRAINAGE LAYOUT PLAN

PLOTTED BY : wytang

LEGEND:
- APPLICATION SITE
- EXISTING U-CHANNEL
- EXISTING STEP CHANNEL
- EXISTING STORMWATER DRAIN
- EXISTING STORMWATER DRAIN BY DSD
- EXISTING OUTLET
- EXISTING CATCHPIT
- EXISTING FLOW PATH

837100 N
837200 N
837300 N
823400 E
823500 E

KAM POK ROAD
HA SAN WAI ROAD
FUNG CHUK ROAD
HA CHUK YUEN ROAD

OUTLET 1
OUTLET 2
OUTLET 3
OUTLET 4
TWIN-CELL BOX CULVERT 2.5m(H)x2.1m(W)
EXISTING WING WALL
ABANDONED POND (EXTENT APPROXIMATE ONLY)
OPEN STORAGE AND GARAGE
SMH1038220
SCH1019340
TO STORM DRAIN ALONG HA CHUK YUEN ROAD
TO STORM DRAIN ALONG FUNG CHUK ROAD

450ø
225 U
300 U
375 U
450 U
600 U

PLOT DRV : K:\91321 Liantang Contact 3 Construction Stage\CAD_ADMIN\PLOT_DRV\BW.plt

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LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI PO, YUEN LONG

EXISTING DRAINAGE FACILITIES

FIGURE 2

Scale 1 : 1000 (A3)

CAD FILE : L:\CIVIL\ACTIVE JOBS\91469 Kam Pok Road Proposed Low Rise and Low Density Residential Development (DIA, SIA)\Drawing\91469_DIA_Figure_2.dgn

PLOT DATE & TIME : 2016-11-08 11:04:27 AM

PLOTTED BY : wytang

N

837100 N

837500 N

832400 E

NGAU TAM MEI CHANNEL

KAM POK ROAD

OUTLET 1

OUTLET 2

OUTLET 3

OUTLET 4

TWIN-CELL
BOX CULVERT
2.5m(H)x2.1m(W)

AREA A1: 518m2

AREA A2: 835m2

AREA A3: 744m2

AREA A4: 1034m2

AREA A5: 1749m2

AREA A6: 1243m2

AREA A7: 1031m2

AREA A10: 26314m2

POND AREA C1: 3217m2

AREA A9: 374m2

AREA B2:
775m2

AREA B1:
935m2

7200mm(W) RECTANGULAR
CHANNEL

EXISTING CHUK YUEN FLOOD
WATER PUMPING STATION

SURFACE RUNOFF WILL
BE COLLECTED BY
THE INTERNAL DRAINS
OF THE DEVELOPMENT

6000mm(W) RECTANGULAR
CHANNEL

LEGEND:

- APPLICATION SITE
- EXISTING FLOW PATH
- EXISTING STORMWATER DRAIN
- EXISTING OUTLET
- 6.70 EXISTING TOPO SURVEY LEVEL

PLOT DRV : K:\91321 Liantang Contact 3 Construction Stage\CAD_ADMIN\PLOT_DRV\BW.plt

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LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI PO, YUEN LONG

FLOW PATTERN OF THE SURROUNDING AREA

FIGURE 3

Scale 1 : 1500 (A3)

CAD FILE : L:\CIVIL\ACTIVE JOBS\91469 Kam Pok Road Proposed Low Rise and Low Density Residential Development (DIA, SIA)\Drawing\91469_DIA_Figure_3.dgn

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APPENDIX C –

PROPOSED DRAINAGE LAYOUT PLAN

PLOTTED BY : caseymon

837100 N
837200 N
837300 N
823400 E
823500 E

KAM POK ROAD
KAM POK ROAD
Nullah
單車徑 Cycling Track
攸學路
錦學路
下荔圍路
FUNG CHUK ROAD
HA CHUK YUEN ROAD
Open Storage & Garage 露天貨倉及車房
泥路
Ramp
Track
WIP Feb 2024

OUTLET 1
450ø
BOX CULVERT
2.5m(H)x2.1m(W)
NGAU TAM MEI CHANNEL
排水口 Outfall
OUTLET 2
OUTLET 3
OUTLET 4
450ø
450ø
450ø

AREA A1= 3110m²
AREA A2= 1365m²
AREA A3= 630m²
AREA A4
= 740m²
AREA A5
= 875m²
AREA A6
=115m²
AREA A7
= 100m²
AREA A8= 30710m²
AREA B1
= 935m²
AREA B2
= 775m²

T1
T2
T3
T5
T6
OUTDOOR
SWIMMIMNG POOL
CLUBHOUSE
KINDERGARTEN &
ELDERLY
ACTIVTIY CENTRE

SMH1038285
SMH1038283
SCH1019340
SMH1038220
SMH1038240

600U
300U
300U
600U
450U

LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI

LEGENDS:

- APPLICATION SITE
- EXISTING U-CHANNEL
- EXISTING STORM DRAIN
- EXISTING CATCHPIT
- EXISTING OUTLET
- EXISTING MANHOLE
- PAVED AREA (22085m²)
- UNPAVED AREA (15560m²)
- CATCHMENT

PLOT DRV : K:_STANDARD\MICROSTATION\Plot\MIEL_A1_COL.PLT

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LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI PO, YUEN LONG

PROPOSED DRAINAGE LAYOUT PLAN

FIGURE 4

Scale 1 : 500 (A1)

CAD FILE : A:\Projects Current\CIVIL\91469 Kam Pok Road Proposed Low Rise and Low Density Residential Development (DIA, SIA)\S12A Application\DIA\Rev C\20251208\Drawings\91469_DIA_Figure_4.dgn

PLOT DATE & TIME : 8/12/2025 4:25:15 pm

N

837200 N

837400 N

823400 E

823600 E

KAM POK ROAD

OUTLET 4

OUTLET 1

EXSTING B.C.

OUTLET 3

OUTLET 2

CP6

APPLICANT SITE

D2=2393m²

D1=16136m²

SMH1038285

SCH1019401

SMH1038283

SCH1019400

FUNG CHUK ROAD

SCH1019340

SMH1038220

HA CHUK YUEN ROAD

SMH1038240

SCH1019341

CHUK YUEN TSUEN

NOTES :

1. INTERNAL DRAINAGE WITHIN THE SITE WILL BE SUBMITTED UNDER SEPARATE SUBMISSION.
2. CATCHMENTS A5, A6, A7 & A8 DISCHARGE TO EXISTING DRAINAGE SYSTEM ALONG FUNG CHUK ROAD AND HA CHUK YUEN ROAD.

LEGEND:

- CATCHMENT AREA
- UNPAVED AREA
- PAVED AREA
- EXISTING OUTLET
- EXISTING STORMWATER DRAIN
- EXISTING STORMWATER MANHOLE
- EXISTING CATCHPIT

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PROPOSED HOUSE DEVELOPMENT WITH MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FROM 6M TO 6.6M, AND FILLING OF POND/LAND AND EXCAVATION OF LAND AT LOT NO. 4822 IN D.D.104, MAI PO, YUEN LONG, NEW TERRITORIES

CATCHMENT AREA OUTSIDE APPLICANT SITE

FIGURE 4A

Scale 1 : 2000 (A3)

APPENDIX D –

DETAILED CALCULATIONS FOR DRAINGE IMPACT ASSESSMENT

Catchment Breakdown before Development

Catchment	Total Area (m²)	Paved Area (m²)	C-Value for Paved Area	Unpaved Area (m²)	C-Value for Unpaved Area	Pond (m²)	C-Value for Unpaved Area
Area within Applicant Site	37,645	23,944	0.95	10,484	0.3	3,217	1
Area outside Applicant Site	20,419	18,709	0.95	1,710	0.2	-	-

Catchment Breakdown after Development

Catchment	Total Area (m²)	Paved Area (m²)	C-Value for Paved Area	Unpaved Area (m²)	C-Value for Unpaved Area	Discharge to	
A1	3,110	0	0.95	3,110	0.3	Outlet 1	
A2	1,365	0	0.95	1,365	0.3	Outlet 4	
A3	630	0	0.95	630	0.3	Outlet 3	
A4	740	306	0.95	434	0.3	SMH1038285	
A5	875	375	0.95	500	0.3	SMH1038283	
A6	115	0	0.95	115	0.3	SMH1038240	
A7	100	0	0.95	100	0.3	SMH1038220	
A8	30,710	21,404	0.95	9,306	0.3	SMH1038220	
B1	935	0	0.95	935	0.3	SMH1038283	(Outside Applicant Site)
B2	775	0	0.95	775	0.3	SMH1038240	(Outside Applicant Site)
D1	16,316	16,316	0.95	0	0.3	Outlet 2	(Outside Applicant Site)
D2	2,393	2,393	0.95	0	0.3	Outlet 1	(Outside Applicant Site)

Equivalent C Value Calculation for the Site

Description	Formula / Calculation	Result
C Value for the Site before Development	(23944x0.95+10484x0.3+3217x1)/37645	**0.773**
C Value for the Site after Development	(22085x0.95+15560x0.3+)/37645	**0.681**
Decrease in Equivalent C Value	0.773-0.681	**0.092**

91469 - Lot 4822 in D.D. 104, Kam Pok Road and Adjoining Government Land, Mai Po, Yuen Long - Drainage Impact Assessment (Discharge Points Assessment) (1 in 50-year return period)(Pre-Development)

US	DS	Catchment Area						Channel character								Hydraulic parameter		Time of Concentration	i	Peak	Full bore	Full bore	Q_{check}	Percentage Used
		Paved Area		Unpaved Area		Total		channel shape	No. of pipes	pipe size			invert level		channel slope	ks (mm) 0.6000		t_c	**50**	Runoff	Capacity	Velocity	(capacity - peak runoff)	(min. 10% allowance for blockage should be provided in the design)
		Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)			width (mm)	height (mm)	length (m)	US (mPD)	DS (mPD)		cross area (m^2)	Wetted Perimeter (m)	(min)	yr (mm/h)	(m^3/s)	(m^3/s)	(m/s)	(m^3/s)	
Catchment A1+D2	Outlet 1	2,393	2,393	518	518	2,911	2,911	CC	1	450	450	13.9	2.620	2.493	0.009	0.143	1.375	9.11	268.92	0.182	0.265	1.853	0.084	68%
Catchment A4	Outlet 3	0	0	1,034	1,034	1,034	1,034	CC	1	450	450	25.7	2.150	1.978	0.007	0.143	1.375	6.33	294.33	0.025	0.226	1.581	0.201	11%
Catchment A5	Outlet 4	0	0	1,749	1,749	1,749	1,749	CC	1	450	450	36.4	1.350	1.107	0.007	0.143	1.375	7.81	279.73	0.041	0.226	1.580	0.185	18%
Catchment A6	SMH1038285	0	0	1,243	1,243	1,243	1,243	CC	1	600	600	10.3	1.250	1.050	0.020	0.254	1.833	5.50	303.91	0.032	0.826	3.246	0.795	4%
Catchment A7 + Catchment B1	SMH1038283	0	0	1,966	1,966	1,966	1,966	CC	1	600	600	3.9	1.400	1.100	0.076	0.269	1.860	5.03	309.86	0.051	1.769	6.585	1.718	3%
Catchment A8 + Catchment B2	SMH1038240	0	0	1,361	1,361	1,361	1,361	CC	1	600	600	5.6	1.780	1.680	0.018	0.254	1.833	5.80	300.25	0.034	0.790	3.105	0.756	4%
Catchment A9	SMH1038220	0	0	374	374	374	374	CC	1	450	450	3.7	2.520	2.150	0.099	0.151	1.395	2.46	353.36	0.011	0.949	6.280	0.938	1%

Notes: Rational Method is adopted for the peak runoff estimate i.e. Qp = 0.278 C i A
The runoff coefficient of 0.95 for the paved area and 0.3 for the unpaved area have been adopted.

91469 - Lot 4822 in D.D. 104, Kam Pok Road and Adjoining Government Land, Mai Po, Yuen Long - Drainage Impact Assessment (Discharge Points Assessment) (1 in 200-year return period)(Pre-Development)

US	DS	Catchment Area								Channel character								Hydraulic parameter		Time of Concentration	i	Peak	Full bore	Full bore	Q_{check}	Percentage Used
		Pond Area		Paved Area		Unpaved Area		Total		channel shape	No. of pipes	pipe size			invert level		channel slope	ks (mm) 0.6000		t_c	**200** yr	Runoff	Capacity	Velocity	(capacity - peak runoff)	(min. 10% allowance for blockage should be provided in the design)
		Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)			width (mm)	height (mm)	length (m)	US (mPD)	DS (mPD)		cross area (m^2)	Wetted Perimeter (m)	(min)	(mm/h)	(m^3/s)	(m^3/s)	(m/s)	(m^3/s)	
Catchment A2 + A3 + A10 + C1+D1	Outlet 2	19,533	19,533	23,944	23,944	3,949	3,949	47,426	47,426	BC	1	2100	2500	33.0	2.000	1.950	0.002	4.725	8.700	39.59	197.01	2.380	9.849	2.085	7.469	24%

Notes: Rational Method is adopted for the peak runoff estimate i.e. Qp = 0.278 C i A
The runoff coefficient of 1.0 for pond area, 0.95 for the paved area and 0.3 for the unpaved area have been adopted.

91469 - Lot 4822 in D.D. 104, Kam Pok Road and Adjoining Government Land, Mai Po, Yuen Long - Drainage Impact Assessment (Discharge Points Assessment) (1 in 50-year return period) (Post-Development)

US	DS	Catchment Area						Channel character								Hydraulic parameter		Time of Concentration	i	Peak	Full bore	Full bore	Q_{check}	Percentage Used
		Paved Area		Unpaved Area		Total		channel shape	No. of pipes	pipe size			invert level		channel slope	ks (mm)	0.6000	t_c	**50**	Runoff	Capacity	Velocity	(capacity - peak runoff)	(min. 10% allowance for blockage should be provided in the design)
		Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)			width (mm)	height (mm)	length (m)	US (mPD)	DS (mPD)		cross area (m^2)	Wetted Perimeter (m)	(min)	yr (mm/h)	(m^3/s)	(m^3/s)	(m/s)	(m^3/s)	
Catchment A1+D2	Outlet 1	2,393	2,393	3,110	3,110	5,503	5,503	CC	1	450	450	13.9	2.620	2.493	0.009	0.143	1.375	11.72	251.31	0.224	0.265	1.853	0.041	84%
Catchment A2	Outlet 3	0	0	1,365	1,365	1,365	1,365	CC	1	450	450	25.7	2.150	1.978	0.007	0.143	1.375	7.34	284.04	0.032	0.226	1.581	0.194	14%
Catchment A3	Outlet 4	0	0	630	630	630	630	CC	1	450	450	36.4	1.350	1.107	0.007	0.143	1.375	5.57	302.97	0.016	0.226	1.580	0.210	7%
Catchment A4	SMH1038285	306	306	434	434	740	740	CC	1	600	600	10.3	1.250	1.050	0.020	0.254	1.833	4.52	316.89	0.037	0.826	3.246	0.789	4%
Catchment A5 + Catchment B1	SMH1038283	375	375	1,435	1,435	1,810	1,810	CC	1	600	600	3.9	1.400	1.100	0.076	0.269	1.860	4.87	311.92	0.068	1.769	6.585	1.701	4%
Catchment A6 + Catchment B2	SMH1038240	0	0	890	890	890	890	CC	1	600	600	5.6	1.780	1.680	0.018	0.254	1.833	4.92	311.25	0.023	0.790	3.105	0.767	3%
Catchment A7	SMH1038220	0	0	100	100	100	100	CC	1	450	450	3.7	2.520	2.150	0.099	0.151	1.395	1.46	378.09	0.003	0.949	6.280	0.946	0.3%

Notes: Rational Method is adopted for the peak runoff estimate i.e. Qp = 0.278 C i A
The runoff coefficient of 0.95 for the paved area and 0.3 for the unpaved area have been adopted.

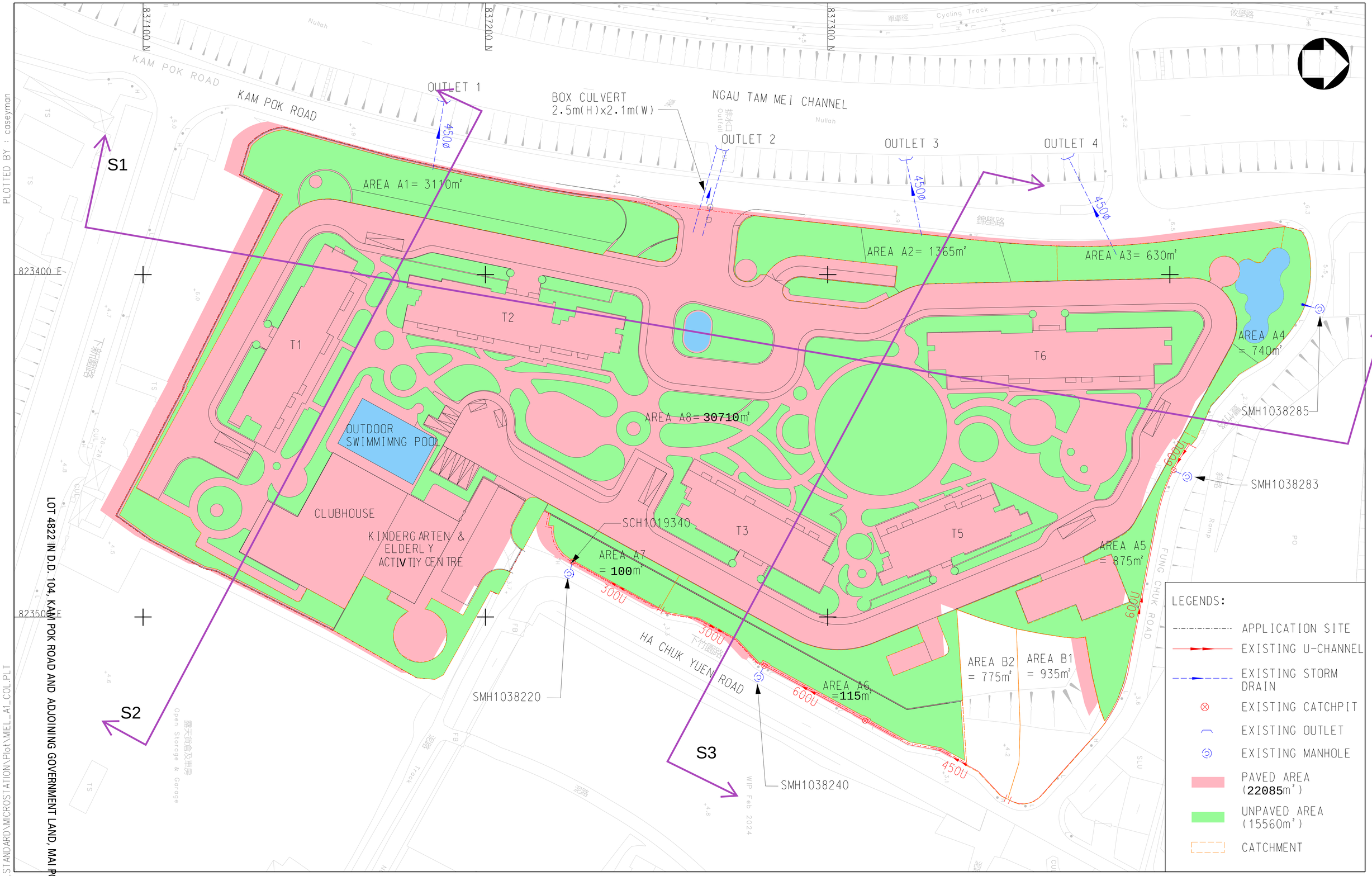
91469 - Lot 4822 in D.D. 104, Kam Pok Road and Adjoining Government Land, Mai Po, Yuen Long - Drainage Impact Assessment (Discharge Points Assessment) (1 in 200-year return period) (Post-Developoment)

US	DS	Catchment Area						Channel character								Hydraulic parameter		Time of Concentration	i	Peak	Full bore	Full bore	Q_{check}	Percentage Used
		Paved Area		Unpaved Area		Total		channel shape	No. of pipes	pipe size			invert level		channel slope	ks (mm)	0.6000	t_c	**200**	Runoff	Capacity	Velocity	(capacity - peak runoff)	(min. 10% allowance for blockage should be provided in the design)
		Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)	Sub-catchment (m^2)	Accumulative Area (m^2)			width (mm)	height (mm)	length (m)	US (mPD)	DS (mPD)		cross area (m^2)	Wetted Perimeter (m)	(min)	yr (mm/h)	(m^3/s)	(m^3/s)	(m/s)	(m^3/s)	
Catchment A8+D1	Outlet 2	37,720	37,720	9,306	9,306	47,026	47,026	BC	1	2100	2500	33.0	2.000	1.950	0.002	4.725	8.700	39.45	197.21	2.118	9.849	2.085	7.732	21%

Notes: Rational Method is adopted for the peak runoff estimate i.e. Qp = 0.278 C i A
The runoff coefficient of 0.95 for the paved area and 0.3 for the unpaved area have been adopted.

APPENDIX E –

SECTIONS SHOWING EXISTING GROUND LEVEL AND PROPOSED GROUND LEVEL



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LOT 4822 IN D.D. 104, KAM POK ROAD AND ADJOINING GOVERNMENT LAND, MAI PO, YUEN LONG

PROPOSED DRAINAGE LAYOUT PLAN

FIGURE 5

Scale 1 : 500 (A1)

CAD FILE : A:\Projects Current\CIVIL\91469 Kam Pok Road Proposed Low Rise and Low Density Residential Development (DIA, SIA)\S12A Application\DIA\Rev C\20251208\Drawings\91469_DIA_Figure_4.dgn

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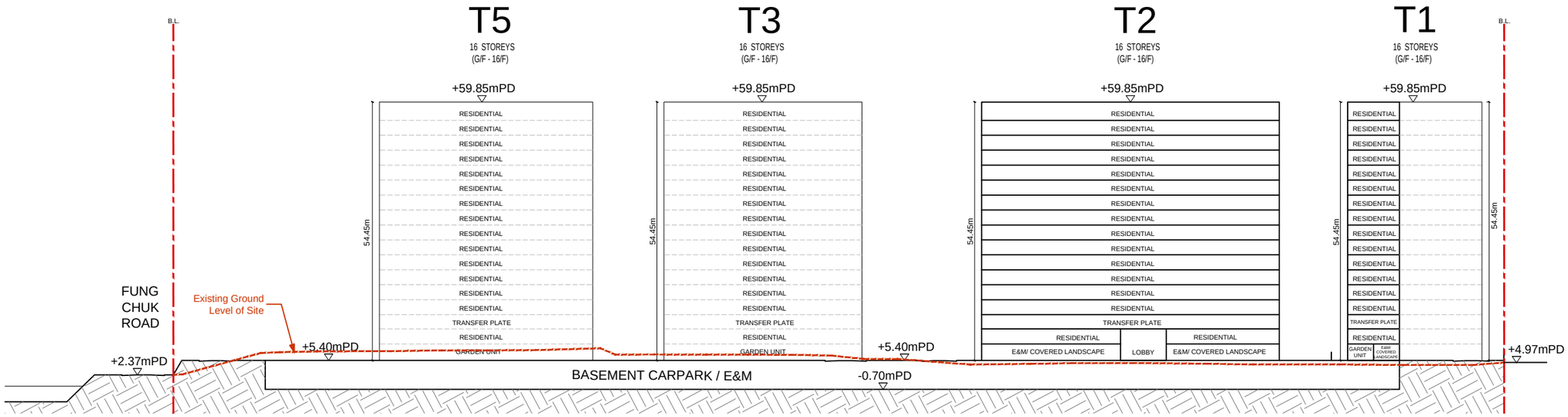
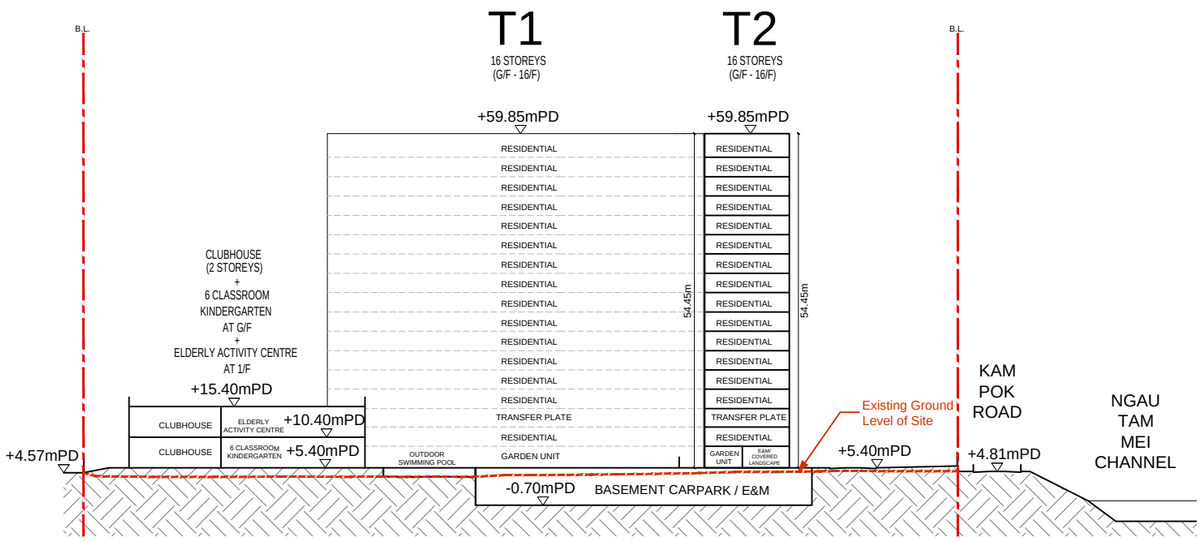


SECTION S1-S1



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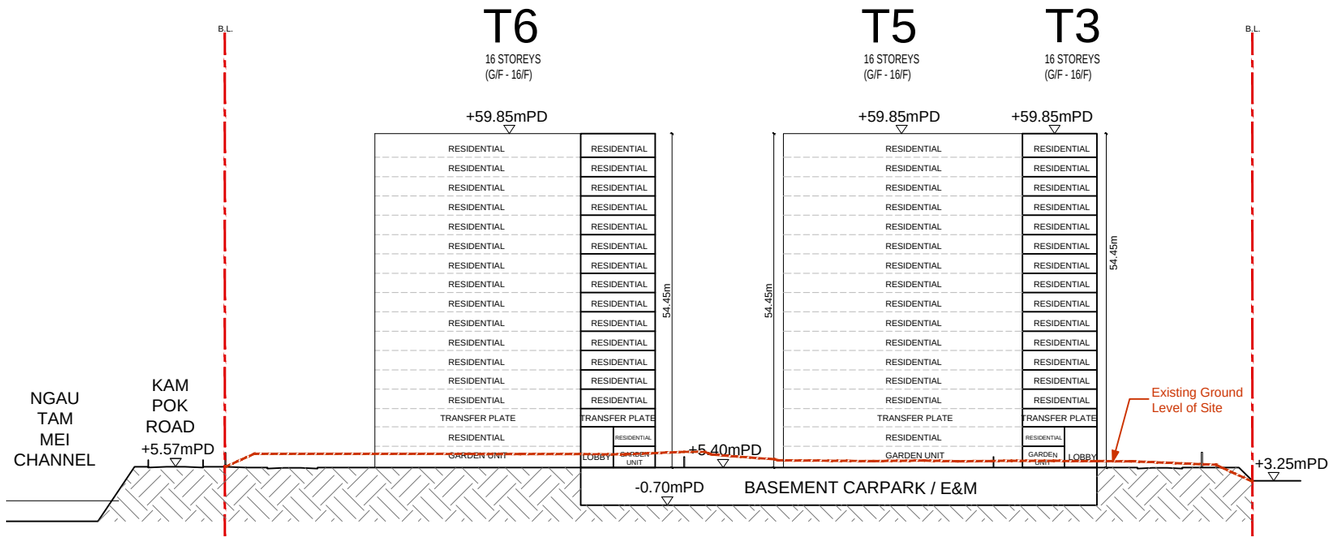

SECTION S3-S3

Lot 4822 IN D.D.104, Kam Pok Road, Mai Po, Yuen Long

INDICATIVE SECTIONS

0 10 20 30m

DATE : 26/01/2026

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APPENDIX F –

FLOOD MITIGATION MEASURE INCORPORATED WITH CATCHMENT AREA AND CALCULATION

NOTES :

1. INTERNAL DRAINAGE WITHIN THE SITE WILL BE SUBMITTED UNDER SEPARATE SUBMISSION.
2. CATCHMENTS A5, A6, A7 & A8 DISCHARGE TO EXISTING DRAINAGE SYSTEM ALONG FUNG CHUK ROAD AND HA CHUK YUEN ROAD.

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PROPOSED HOUSE DEVELOPMENT WITH MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FROM 6M TO 6.6M, AND FILLING OF POND/LAND AND EXCAVATION OF LAND AT LOT NO. 4822 IN D.D.104, MAI PO, YUEN LONG, NEW TERRITORIES

FLOOD MITIGATION MEASURE INCORPORATED WITH CATCHMENT AREA

FIGURE 6

Scale 1 : 2000 (A3)

Hydraulic Calculation of U-Channel along site boundary for Flood Mitigation

Locations		Sub-Catchment	Catchment Area						Channel character									Manning Coefficient n= 0.016		Peak	Hydraulic	Mean	Capacity of Channel Used	Water	Free
			Impermeable Areas (C = 0.95)		Permeable Areas (C = 0.3)		Total		channel		channel size			ground level		invert level		channel							
US	DS	Reference	Sub-catchment	Accumulative Area	Sub-catchment	Accumulative Area	Sub-catchment	Accumulative Area	shape		width	height	length	USG	DSG	US	DS	slope	Cross Area	Wetted Piermeter	Runoff	Capacity	Velocity	(min. 10% allowance for blockage should be provided in the design)	Level	Board
			(m^2)	(m^2)	(m^2)	(m^2)	(m^2)	(m^2)			(mm)	(mm)	(m)	(mPD)	(mPD)	(mPD)	(mPD)		(m^2)	(m)	(m^3/s)	(m^3/s)	(m/s)	%	(mPD)	(m)
	CPa	B1, A1	16,136	16,136	662	662	16,798	16,798	UC	Single	850	850	99.2	4.380	4.380	3.450	3.000	0.0045	0.645	2.185	0.827	1.444	2.2	57.24%	3.77	0.609
CPa	CPb	B1, A1, A10	0	16,136	160	822	160	16,958	UC	Single	850	850	31.8	4.380	4.130	3.000	2.866	0.0042	0.645	2.185	0.762	1.392	2.2	54.71%	3.28	1.103
CPb	CPc	B1, A1, A10	0	16,136	0	822	0	16,958	UC	Single	850	850	2.9	4.130	4.200	2.866	2.855	0.0038	0.645	2.185	0.758	1.321	2.0	57.42%	3.19	0.940
CPc	MH1	B1, A1, A10	55	16,191	150	972	205	17,163	UC	Single	850	850	26.9	4.200	4.300	2.855	2.630	0.0084	0.645	2.185	1.238	1.961	3.0	63.13%	3.28	0.922
	CPd1	B2, A2	922	922	336	336	1,258	1,258	UC	Single	450	450	34.3	5.300	5.300	4.850	4.650	0.0058	0.181	1.157	0.067	0.300	1.7	22.38%	4.70	0.599
CPd1	CPd2	B2, A2	904	1,826	0	336	904	2,162	UC	Single	450	450	33.6	5.300	4.500	4.350	3.760	0.0176	0.181	1.157	0.136	0.521	2.9	26.16%	4.24	1.064
CPd2	CPd	B2, A2	941	2,767	0	336	941	3,103	UC	Single	450	450	35.0	4.260	4.360	3.460	3.350	0.0031	0.181	1.157	0.184	0.220	1.2	83.62%	3.87	0.389
CPd	CPe	B2, A2 A3	0	2,767	0	336	0	3,103	UC	Single	450	450	11.0	4.360	4.430	3.350	3.295	0.0050	0.181	1.157	0.174	0.278	1.5	62.68%	3.57	0.790
CPe	CPf	B2, A2 A3	0	2,767	371	707	371	3,474	UC	Single	450	450	27.3	4.430	4.440	3.295	3.151	0.0053	0.181	1.157	0.211	0.286	1.6	73.80%	3.62	0.814
CPf	CPg	B2, A2 A3	0	2,767	140	847	140	3,614	UC	Single	450	450	20.9	4.430	4.440	3.151	3.050	0.0048	0.181	1.157	0.226	0.273	1.5	82.72%	3.55	0.876
CPg	TMH1	B2, A2 A3	0	2,767	48	895	48	3,662	UC	Single	450	450	11.7	4.430	4.440	2.900	2.680	0.0188	0.181	1.157	0.262	0.539	3.0	48.59%	2.99	1.439

Abbreviations: UC - U-Channel
i - Rainfall Intensity (based on Intensity-Duration-Frequency Relationship)

Notes: Rational Method is adopted for the peak runoff estimate i.e. Qp = 0.278 C i A
The rainstorm event of 1 in 50 years return period has been adopted in the design of the proposed drainage system.
The rainfall intensity has been calculated based on the Intensity-Duration-Frequency (IDF) Relationship.
The runoff coefficients of 0.3 and 0.95 for permeable and impermeable areas have been adopted in the assessment respectively.
The Manning's equation was used for hydraulic analysis of the drainage system.
The Manning coefficient of 0.016 for stormwater pipe/culvert was assumed in the assessment.