By Post and Fax [redacted]

規劃署

粉嶺、上水及元朗東規劃處
新界荃灣青山公路 388 號
中染大廈 22 樓 2202 室

Planning Department

Fanling, Sheung Shui & Yuen Long East
District Planning Office
Unit 2202, 22/F, CDW Building,
388 Castle Peak Road, Tsuen Wan, N.T.

來函檔號	Your Reference :	S3114/YPR_LPH/23/006Lg
本署檔號	Our Reference :	( ) in TPB/A/YL-MP/341
電話號碼	Tel. No. :	3168 4072
傳真機號碼	Fax No. :	3168 4074 / 3168 4045

INWARD
Rec'd 10 SEP 202
KT
PL
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G
Ci

3 September 2024

[redacted]

Dear Madam,

Compliance with Approval Condition (c)
Submission of a Revised Drainage Impact Assessment

Proposed Temporary Light Public Housing Development for a Period of 3 Years and Associated Filling and Excavation of Land in "Recreation" and "Residential (Group C)" Zones, Various Lots in D.D. 104 and Adjoining Government Land, Yau Pok Road, Mai Po, Yuen Long
(Section 16A Application No. A/YL-MP/341)

I refer to your submission dated 5.8.2024 regarding the submission of a revised drainage impact assessment for compliance with approval condition (c). Your submission is considered:

☑ Acceptable. The captioned condition has been complied with. Please find detailed departmental comments in ***Appendix***.

☐ Acceptable. Since the captioned condition requires both the submission and implementation of the proposal, it has not been fully complied with. Please proceed to implement the accepted proposal for full compliance with the approval condition.

☐ Not acceptable. The captioned condition has not been complied with.

Should you have any queries, please contact Mr. Terence TANG (Tel: 2300 1257) of the Drainage Services Department directly.

Yours sincerely,

(Josephine LO)
District Planning Officer/
Fanling, Sheung Shui and Yuen Long East
Planning Department

c.c.
CE/MN, DSD (Attn: Mr. Terence TANG)
CTP/TPB(3)

JL/ckl

Appendix

Detailed comments of the CE/MN, DSD:

(i) Should there be any changes of design parameters in the course of the development which would materially affect the validity of the drainage impact assessment (DIA) report, the applicant should review/revise the DIA report and submit it to the Planning Department and Drainage Services Department for comment.

(ii) The applicant should implement the drainage provisions on site in accordance with the agreed DIA.

(iii) The applicant is required to rectify the drainage system if they are found to be inadequate or ineffective during operation. The applicant shall also be liable for and shall indemnify claims and demands arising out of damage or nuisance caused by a failure of the drainage system.

(iv) The proposed development would neither obstruct overland flow nor adversely affected any existing natural streams, village drains, ditches and the adjacent areas.

(v) The applicant should consult District Lands Office, Yuen Long and seek consent from relevant lot owners for any works to be carried out outside his lot boundary before commencement of the drainage works.

PLANNING LIMITED
規劃顧問有限公司

[redacted]

By Email

Our Ref: S3114/YPR_LPH/23/006Lg

5 August 2024

Fanling, Sheung Shui &
Yuen Long East District Planning Office
Planning Department
Unit 2202
22/F CDW Building
388 Castle Peak Road
Tsuen Wan, N.T..

Attn: Ms Jane Lau

Dear Jane,

S16A(2) Application for Amendment to Permission
Approved Temporary Light Public Housing Development For a Period of 3 Years
at Various Lots in DD 104 and the Adjoining Government Land,
Yau Pok Road, Yuen Long
TPB Ref.: A/YL-MP/341
- Discharge of Approval Condition (c) -

Reference is made to the S16 Planning Application approved by the Town Planning Board on 9 June 2023. We hereby submit information to facilitate compliance with the following Planning Approval Condition:

(c) – "*the submission of a revised drainage impact assessment to the satisfaction of the Director of Drainage Services or of the TPB by 9.9.2024 as required under approval condition (c)*"

Meanwhile, should you have any queries in relation to the attached, please do not hesitate to contact Mr Kenneth To or the undersigned at [redacted].

Thank you for your kind attention.

Yours faithfully
For and on behalf of
KTA PLANNING LIMITED

Gladys Ng

Encl.

cc. the Applicant & Team

KT/GN/vy

Prepared for

Andrew Lee King Fun & Associates Architects Limited

Prepared by

Ramboll Hong Kong Limited

DESIGN AND CONSTRUCTION OF LIGHT PUBLIC HOUSING AT YAU POK ROAD, YUEN LONG

DRAINAGE IMPACT ASSESSMENT

Date	9 July 2024
Prepared by	Gary Yuen Environmental Consultant
Signed	
Approved by	Steve Lo Principal Consultant
Signed	
Project Reference	CHEM518-ED00
Document No.	R9293_v1.0e.docx

Q:\Projects\CHEM518-ED00\04 Deliverables\Contract Stage\02 DIA\03 Yuen Long\R9293_v1.0d.docx

CHAPTERS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

1.1 Background

1.1.1 The Applicant is responsible for the design and construction of the Light Public Housing (hereafter as "LPH") Development on a 3-year temporary basis (hereafter as "Proposed Development"), located at Yau Pok Road, Yuen Long (hereafter as "the Application Site").

1.1.2 Ramboll Hong Kong Limited is commissioned to prepare this Drainage Impact Assessment (DIA) for the Indicative Scheme at the Application Site. This DIA report has been prepared with respect to the Indicative Scheme to review the proposed drainage facilities in the vicinity of the Proposed Development at the Application Site, evaluate potential impacts based on catchments and recommend appropriate options for stormwater discharge, if necessary.

1.2 Subject Site and Its Environs

1.2.1 The Application Site is located at East of Fairview Park in Yuen Long, abutting Yau Pok Road. The location of the Site and its environ are shown in Figure 1.

1.2.2 The area of the Subject Site is about 86619 m^2.

1.2.3 Figure 1 shows the location of the Subject Site, Proposed Development and its environs.

1.3 Proposed Development

1.3.1 The Proposed Development is divided into two zones and comprises 10 three-storey LPH blocks to offer a total of 2,161 residential units for home of about 5,100 population. The Proposed Development also offer ancillary facilities including management office and retail shops.

1.3.2 The Proposed Development has adopted a Building Height of not more than 3 storeys for 17 Residential Blocks, 2 one-storey Amenity Blocks will be provided to accommodate ancillary facilities (including restaurants, retails, etc.) for residents and 11 one-storey Building Services Blocks (including E&M and 2 Refuse Collection Points), 2 guardhouses, and 1 Sewage Pumping Station will be provided to house necessary facilities in support of the development and its operation.

1.3.3 The construction works has been tentatively commenced in late 2023.

1.3.4 Development is anticipated to begin operation in Year 2025. The LPH is planned to operate for five years.

1.3.5 The latest proposed greenery areas drawings extracted from latest GBP is presented as Appendix A.

1.3.6 In accordance with the information promulgated by Land Drainage Division of Drainage Service Department (DSD), the Proposed Housing Development Site is not classified as a flooding blackspot.

2. DRAINAGE IMPACT ASSESSMENT

2.1 Introduction

2.1.1 Surface runoff is mainly from rainfall in the Application Site. According to the site nature, in pre-development stage, the Application Site is divided into 5 catchment areas, namely Catchment A to Catchment E. Figure 2a shows the pre-development drainage catchment plan.

2.1.2 Pavement and landscape for the areas outside the development sites are assumed to be the same as the existing condition.

2.1.3 After development, there will be about 66% paved area in northern part of the Application Site (Catchment A, A', B and B'), and about 70% paved area in southern part of the Application Site (Catchment C, C', D and D').

2.1.4 Paved and unpaved area of proposed conditions are summarized in Table 2.1.

Table 2.1 Proposed Catchment Areas and Paving Conditions in Post-Development Scenario

Catchment	Description	Total Area (m2)	Paved Area (m2)	% of Total Catchment Area	Unpaved Area (m2)	% of Total Catchment Area
A+B	North side of Application Site	40674	25590	66.1%	15085	33.9%
A'	Slope Area alongside of Catchment Area A	2261	2261	100%	0	0%
B'	Slope Area alongside of Catchment Area B	1501	1501	100%	0	0%
C+D	South side of Application Site	38107	25279	69.6%	12828	30.4%
C'	Slope Area alongside of Catchment Area C	766	766	100%	0	0%
D'	Slope Area alongside of Catchment Area D	3310	3310	100%	0	0%
E	Cycling Track near Catchment A	1287	1287	100%	0	0%
F	North Cycling Track near Catchment B	801	801	100%	0	0%
G	South Cycling Track near Catchment B	737	737	100%	0	0%
H	Cycling Track near Catchment D	1921	1921	100%	0	0%
I	North Cycling Track near Catchment C	709	709	100%	0	0%
J	South Cycling Track near Catchment C	1036	1036	100%	0	0%

2.1.5 Ngau Tam Mei Drainage Channel (NTMDC) is available at the southeast of the Application Site between Yau Pok Road and Kam Pok Road.

2.2 Existing Drainage System

2.2.1 According to the existing drainage record plan, stormwater runoff is collected by the existing public stormwater network along the west side of Application Site and flow into the Shan Pui River as shown in Figure 2a.

2.2.2 In addition, Ngau Tam Mei Drainage Channel (NTMDC) is available at the southeast of Application Site between Yau Pok Road and Kam Pok Road. All the existing stormwater network along the Application Site is available for the collection of surface runoff generated from the Application Site as shown in Figure 2b.

2.3 Drainage Arrangement in Post-Development

2.3.1 The LPH development lies on Catchments A, B, C and D.

2.3.2 In Post-development scenario, 100% of all stormwater collected from the LPH development will ultimately be diverted into NTMDC through the existing drainage pipes along Yau Pok Road.

2.3.3 As shown in Figure 2a and Figure 2b, Pre-development and Post-development have different catchment areas and they will be using different drainages. The rationale behind is the excavation and filling which will be carried out during the construction phase of the Proposed Development, causing the changes in the topography of the Application Site. Drainage along Yau Pok Road and Fairview Park nullah will be used in Post Development scenario.

2.4 Assessment Criteria and Methodology

2.4.1 The assessment standard complies with Drainage Services Department (DSD) Stormwater Drainage Manual (SDM) (2018 Edition) and Stormwater Drainage Manual Corrigendum No. 1/2022 and No.1/2024. A 1-in-50-year return storm has therefore been adopted for the DIA.

2.4.2 The catchment runoff has been calculated using the “Rational Method”, as outlined in the DSD SDM:

$$Q = 0.278\, C\, i\, A$$

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

2.4.3 Most of the upstream catchment comprises steep natural vegetated hillsides.

2.4.4 The proposed development will comprise 17 Residential Blocks, 2 Ancillary Blocks, 11 Building Services Blocks, paved roads. An overall runoff coefficient of 0.95 has been adopted for aforementioned area. Other greenery landscape areas will be kept as steep grassland (runoff coefficient of 0.35).

2.4.5 The rainfall intensity parameter “i” is dependent on the return period, rainfall duration and the time of concentration of the catchment under consideration. Runoff calculations are included in Appendix B.

2.5 Assessment Result

2.5.1 The assessment results of estimated peak flow in both pre-development and post-development can be found in Appendix B.

2.5.2 For pre-development, by assuming a 200-year of return periods for an Urban Drainage Trunk System, the total peak flow from the Application Site under 1-in-200-year storm event is found to be 1.971 m/s.

2.5.3 According to the results of calculations, based on the assumption of a return periods for an Urban Drainage Branch System as stated in the Stormwater Drainage Manual, the total peak runoff from the catchment Areas under a 1-in-50-year storm event is 4.029 m/s. Detailed calculation are shown in Appendix B.

2.5.4 Considering the effect of climate change (Section 6.8 and Table 28 of DSD's Stormwater Drainage Manual refer), the projection of potential future rainfall increases of 11.1% for Mid-21st century is considered.

2.5.5 Adverse stormwater drainage impact due to the Proposed Development would be imposed to the existing drainage system if no mitigation measures to be carried out on the existing drainage. The occupancies of most of the pipes are predicted to be above 80% of the full capacity over 50 years return period, when the Proposed Development will be undertaken.

2.5.6 To mitigate the drainage impact, surface runoff within the Application Site will be collected by the existing drainage system with two additional stormwater pipes with diameter of 750mm and discharged to the existing 38000mm Ngau Tam Mei Drainage Channel. The location of the two new connection pipes, serving the northern and southern part of the Application Site respectively, are illustrated in Figure 3. Details of the connection pipes can be found in Appendix B.

2.5.7 After the proposed installation works, it is anticipated that there is adequate capacity in the stormwater pipes to cater for the proposed development. No adverse stormwater drainage impact due to the Proposed Development would be imposed to the drainage system. In addition, the occupancies of pipes are predicted to be below 80% of the full capacity over 50-year return period, when the Proposed Development will be undertaken.

2.6 Discussion

2.6.1 The drainage impact of the proposed development has been quantitatively addressed.

2.6.2 The expected surface runoff of Proposed Development will be of 4.029 m^3/s for the 1-in-50-year scenario.

2.6.3 Even with future increases in rainfall, as set out in Table 28 of DSD's SDM, the ultimate peak discharges of all catchment areas will represent no more than 78% of the proposed drainage capacity.

2.6.4 In Post-development scenario, 100% of all stormwater collected from the LPH development will ultimately be diverted into NTMDC through the existing drainage pipes along Yau Pok Road.

2.6.5 Within the Application Site, it is noted that the LPH development only lies on the Catchment A, B, C and D, such that there is no change in the terrain and land characteristics in Catchment A', B', C' and D'. With regards to this setting, most drainage discharge of the Application Site would be handled by the proposed drainage system when compared to that in pre-development stage. This implies that drainage discharge to the Fairview Park nullah by surface runoff and other means would also be decreased when compared to that in pre-development stage.

2.6.6 Therefore, it is concluded that the proposed development will not cause any unacceptable increase in the risk of flooding in areas upstream of, adjacent to and downstream of the development.

3. CONCLUSION

3.1.1 A light public housing development is proposed at Yau Pok Road, Yuen Long. The potential drainage impact for the proposed development has been quantitatively addressed.

3.1.2 Based on the hydraulic calculations, it is found that the capacity of the proposed drainage system serving the area would be sufficient to cater for the stormwater runoff from the proposed development, even under extreme tide and rainfall events. Surface runoff from the Application Site will be discharged to Ngau Tam Mei Drainage Channel via existing drainage system and two additional connection pipes, serving the northern and southern part of the Application Site respectively.

3.1.3 This Drainage Impact Assessment confirms the feasibility of the proposed development.

Figure

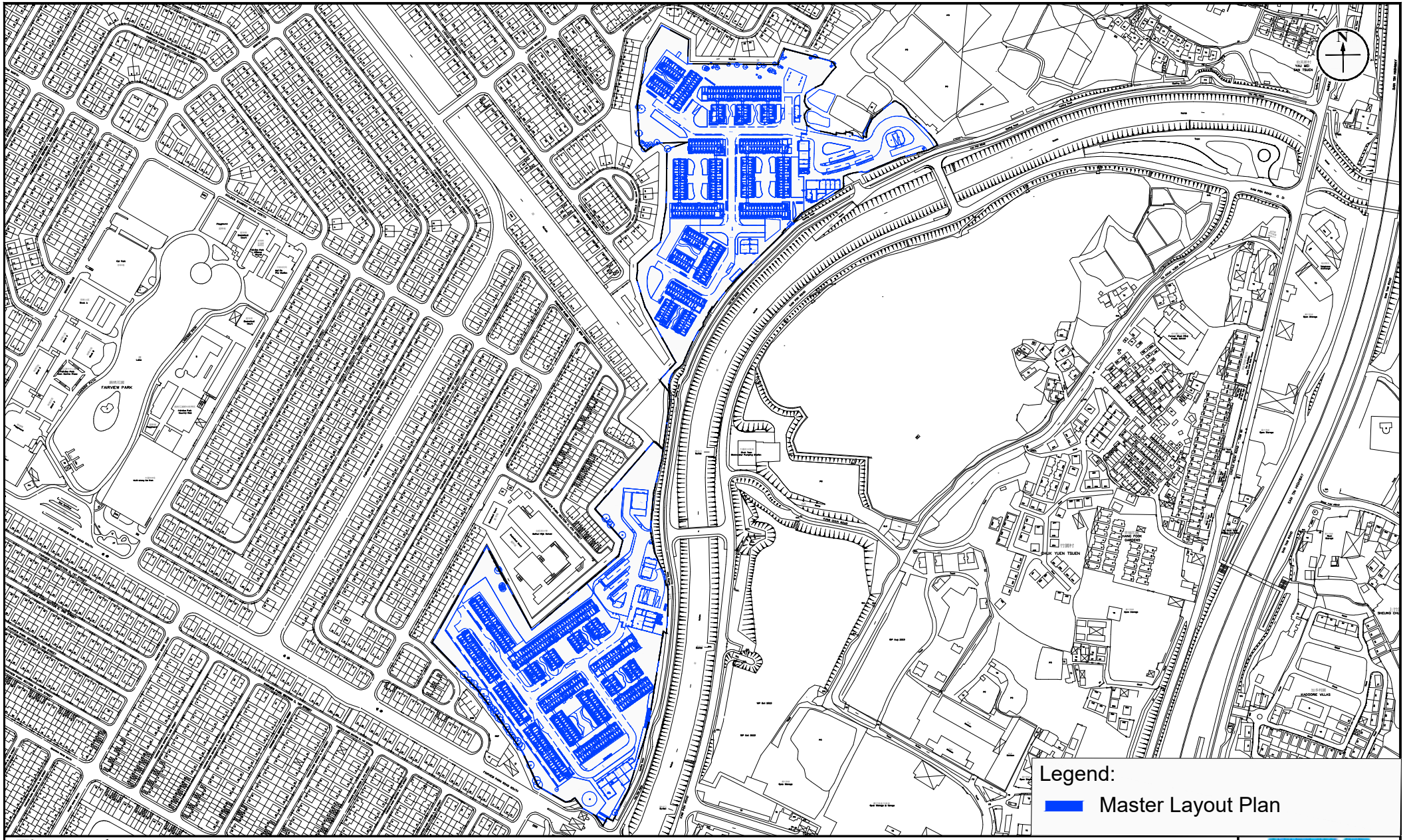

Figure: 1

Title: Location of the Application Site and its Environs

Project: Design and Construction of Light Public Housing at Yau Pok Road, Yuen Long

RAMBOLL

Drawn by:	GY
Checked by:	TC
Rev.:	1.0
Date:	Jan 2024

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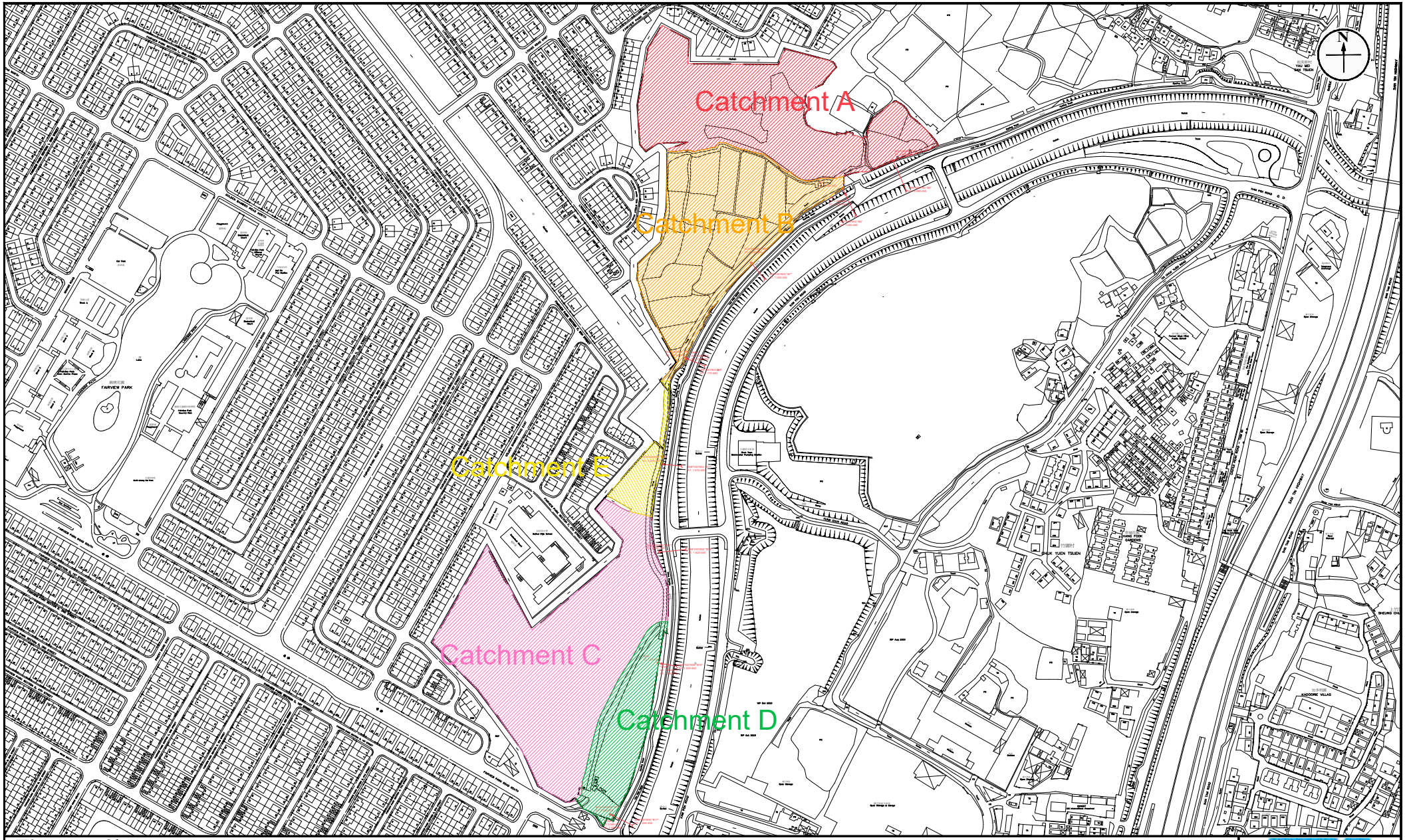

Figure: 2b	RAMBOLL
Title: Drainage Catchment Plan for Post-Development Scenario	Drawn by: GY Checked by: TC
Project: Design and Construction of Light Public Housing at Yau Pok Road, Yuen Long	Rev.: 1.0 Date: Jan 2024

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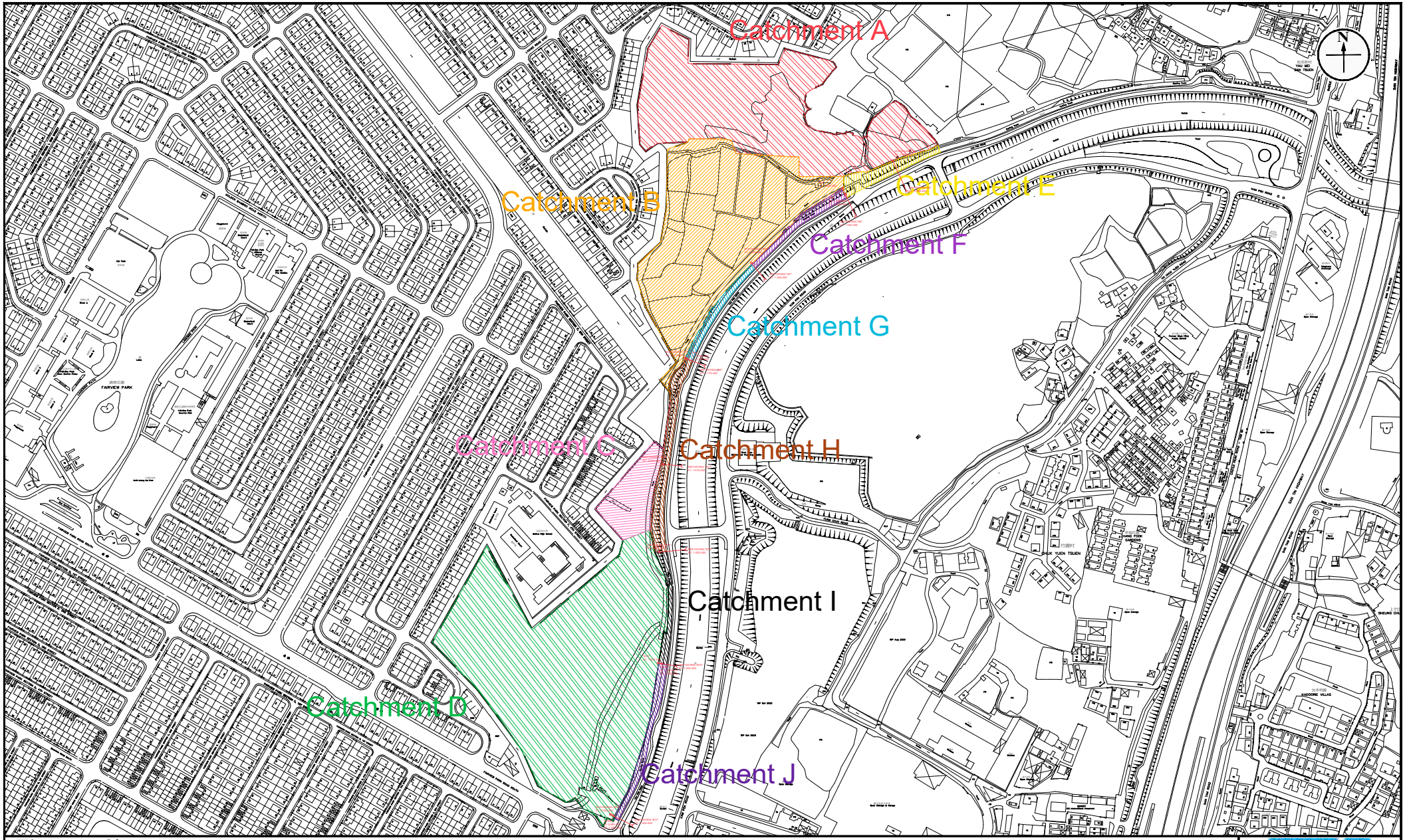

Figure: 2b	RAMBOLL
Title: Drainage Catchment Plan for Post-Development Scenario	Drawn by: GY Checked by: TC
Project: Design and Construction of Light Public Housing at Yau Pok Road, Yuen Long	Rev.: 1.0 Date: Jan 2024

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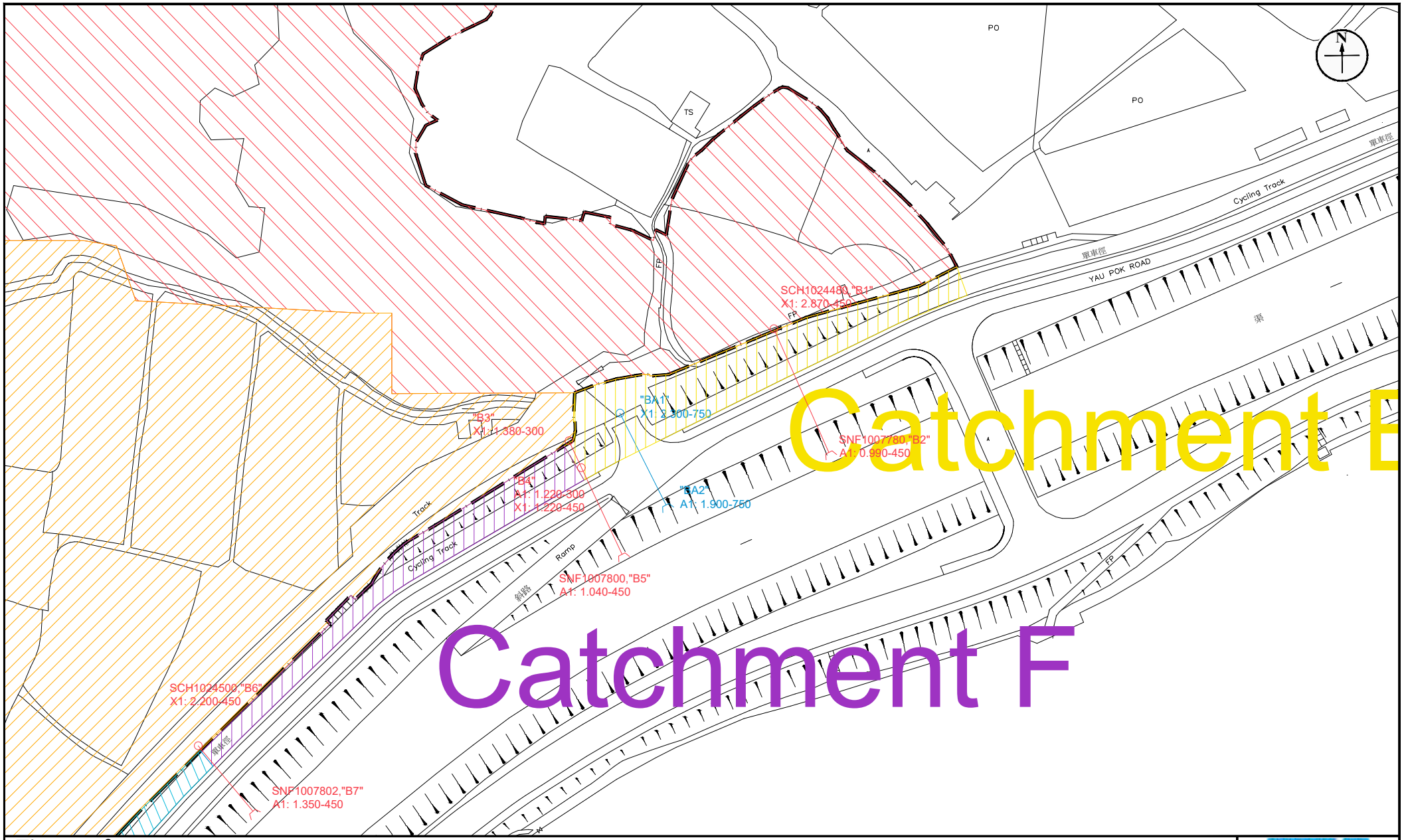

Figure: 3a	RAMBOLL
Title: New Drainage Connection Pipe "BA1-BA2"	Drawn by: GY Checked by: TC
Project: Design and Construction of Light Public Housing at Yau Pok Road, Yuen Long	Rev.: 1.0 Date: Jan 2024

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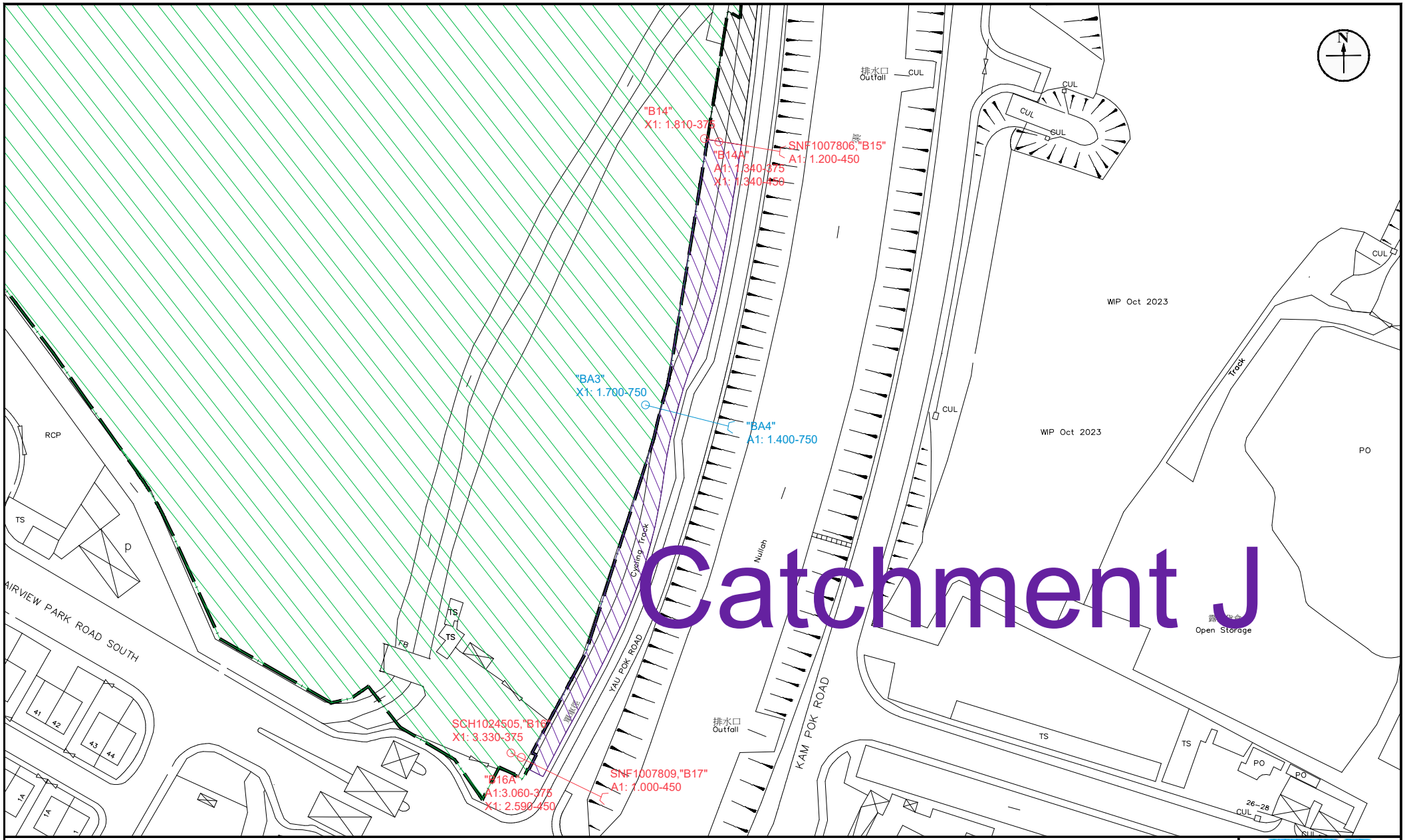

Figure: 3b	RAMBOLL
Title: New Drainage Connection Pipe "BA3-BA4"	Drawn by: GY Checked by: TC
Project: Design and Construction of Light Public Housing at Yau Pok Road, Yuen Long	Rev.: 1.0 Date: Jan 2024

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Appendix A

Latest Drawing of Proposed Greenery Area

GREENERY AREA DIAGRAM (ZONE 1)

GREENERY AREA CALCULATION (ZONE 1)

1	PLANTER	= 6167.217 S.M.	51	PLANTER	= 29.606 S.M.	101	PLANTER	= 20.514 S.M.
2	PLANTER	= 2400.017 S.M.	52	PLANTER	= 29.606 S.M.	102	PLANTER	= 18.495 S.M.
3	PLANTER	= 382.245 S.M.	53	PLANTER	= 34.031 S.M.	103	PLANTER	= 73.443 S.M.
4	PLANTER	= 627.625 S.M.	54	PLANTER	= 17.637 S.M.	104	PLANTER	= 25.603 S.M.
5	PLANTER	= 219.460 S.M.	55	PLANTER	= 17.637 S.M.	105	PLANTER	= 65.617 S.M.
6	PLANTER	= 43.578 S.M.	56	PLANTER	= 29.346 S.M.	106	PLANTER	= 13.449 S.M.
7	LAWN	= 428.780 S.M.	57	PLANTER	= 19.779 S.M.	107	PLANTER	= 20.646 S.M.
8	PLANTER	= 56.382 S.M.	58	PLANTER	= 4.521 S.M.	108	PLANTER	= 311.887 S.M.
9	PLANTER	= 15.108 S.M.	59	PLANTER	= 29.997 S.M.			
10	PLANTER	= 17.127 S.M.	60	PLANTER	= 123.039 S.M.			
11	LAWN	= 125.731 S.M.	61	LAWN	= 239.539 S.M.			
12	LAWN	= 95.908 S.M.	62	PLANTER	= 145.615 S.M.			
13	PLANTER	= 13.314 S.M.	63	PLANTER	0.960 x 20 = 19.200 S.M.			
14	PLANTER	= 9.600 S.M.	64	PLANTER	0.960 x 20 = 19.200 S.M.			
15	PLANTER	= 54.141 S.M.	65	PLANTER	= 29.658 S.M.			
16	PLANTER	= 66.938 S.M.	66	PLANTER	= 16.241 S.M.			
17	PLANTER	= 10.065 S.M.	67	PLANTER	= 29.346 S.M.			
18	PLANTER	= 6.219 S.M.	68	PLANTER	= 17.637 S.M.			
19	PLANTER	= 212.408 S.M.	69	PLANTER	= 17.637 S.M.			
20	PLANTER	= 82.530 S.M.	70	PLANTER	= 41.924 S.M.			
21	PLANTER	= 8.748 S.M.	71	PLANTER	= 33.063 S.M.			
22	PLANTER	= 8.748 S.M.	72	PLANTER	= 33.064 S.M.			
23	PLANTER	= 8.748 S.M.	73	PLANTER	= 41.924 S.M.			
24	PLANTER	= 8.748 S.M.	74	PLANTER	= 17.637 S.M.			
25	PLANTER	= 36.503 S.M.	75	PLANTER	= 17.649 S.M.			
26	PLANTER	0.960 x 7 = 6.720 S.M.	76	PLANTER	= 29.346 S.M.			
27	PLANTER	0.960 x 6 = 5.760 S.M.	77	PLANTER	= 6.144 S.M.			
28	PLANTER	= 17.646 S.M.	78	PLANTER	= 12.123 S.M.			
29	PLANTER	= 17.646 S.M.	79	PLANTER	= 12.123 S.M.			
30	PLANTER	= 7.836 S.M.	80	PLANTER	= 6.279 S.M.			
31	PLANTER	= 10.782 S.M.	81	PLANTER	= 36.903 S.M.			
32	PLANTER	= 6.144 S.M.	82	PLANTER	= 111.000 S.M.			
33	PLANTER	= 20.514 S.M.	83	LAWN	= 574.101 S.M.			
34	PLANTER	= 18.495 S.M.	84	PLANTER	= 132.506 S.M.			
35	LAWN	= 68.238 S.M.	85	PLANTER	= 21.909 S.M.			
36	LAWN	= 45.026 S.M.	86	PLANTER	= 6.144 S.M.			
37	PLANTER	= 13.449 S.M.	87	PLANTER	= 8.748 S.M.			
38	PLANTER	= 20.646 S.M.	88	PLANTER	= 8.748 S.M.			
39	LAWN	= 402.607 S.M.	89	PLANTER	= 4.851 S.M.			
40	PLANTER	= 319.741 S.M.	90	PLANTER	= 18.495 S.M.			
41	PLANTER	0.960 x 5 = 4.800 S.M.	91	PLANTER	= 20.514 S.M.			
42	PLANTER	= 204.727 S.M.	92	PLANTER	= 89.380 S.M.			
43	PLANTER	= 17.729 S.M.	93	PLANTER	= 145.455 S.M.			
44	PLANTER	= 37.038 S.M.	94	PLANTER	= 20.514 S.M.			
45	PLANTER	= 12.132 S.M.	95	PLANTER	= 18.495 S.M.			
46	PLANTER	= 12.132 S.M.	96	PLANTER	= 17.646 S.M.			
47	PLANTER	= 29.346 S.M.	97	PLANTER	= 17.646 S.M.			
48	PLANTER	= 17.637 S.M.	98	PLANTER	= 6.144 S.M.			
49	PLANTER	= 17.637 S.M.	99	PLANTER	= 10.782 S.M.			
50	PLANTER	= 34.031 S.M.	100	PLANTER	= 7.836 S.M.			

TOTAL = 15422.366 S.M.

Notes :

No.	Date	Description	Initial

Revision

DESIGN AND BUILD CONTRACTOR : CHEVALIER / 中国铁建

ARCHITECT : ALKF+ ANDREW LEE KING FUN & ASSOCIATES ARCHITECTS LTD

CIVIL & STRUCTURAL ENGINEER : Wilson & Associates Ltd Consulting Engineers Planners Managers — WILSON & ASSOC. LTD.

GEOTECHNICAL ENGINEER : asia infrastructure solutions — ASIA INFRASTRUCTURE SOLUTION LTD.

MiC CONSULTANT : Wilson & Associates Ltd Consulting Engineers Planners Managers — WILSON & ASSOC. LTD.

BUILDING SERVICES ENGINEER : JRP 潔信 — J. ROGER PRESTON LTD.

LANDSCAPE CONSULTANT : EARTHASIA LTD.

INTERIOR & BRANDING DESIGNER : BREAD — BREAD STUDIO

ENVIRONMENTAL, BEAM CERTIFICATION, SUSTAINABILITY & ACOUSTIC CONSULTANT : RAMBOLL — RAMBOLL H.K. LTD.

PLANNING CONSULTANT : KTA PLANNING LTD.

TRAFFIC CONSULTANT : CKM ASIA LIMITED — CKM ASIA LTD.

	Name	Signed	Date
Designed	LARRY CHAN		05/09/2023
Drawn	W. MAN		05/09/2023
Checked	LARRY CHAN		05/09/2023
Approved	PM TANG		05/09/2023

Contract No. SS M518

Project Title

DESIGN AND CONSTRUCTION OF LIGHT PUBLIC HOUSING AT YAU POK ROAD, YUEN LONG, AT TUEN MUN AREA 3A AND AT CHOI HING ROAD, NGAU TAU KOK

AIP/DDA SUBMISSION

( )CONSENT IS GIVEN WITHOUT CONDITIONS
( )CONSENT IS GIVEN WITH CONDITIONS
( )CONSENT NOT GRANTED

FOR AND ON BEHALF OF
ARCHITECTURAL SERVICES DEPARTMENT

DATE:

ARCHITECTURAL DESIGNER'S SIGNATURE FOR SUBMISSION

ZHOU RAYMOND CHUN SUM
FOR AND ON BEHALF OF
ANDREW LEE KING FUN
& ASSOCIATES ARCHITECTS LTD. Date:

ARCHITECTURAL DESIGN CHECKER'S SIGNATURE FOR SUBMISSION

YU KWUN HO, KENNETH
FOR AND ON BEHALF OF
K&W ARCHITECTS LTD.
Date:

Drawing Title

S.B.D. CALCULATION '2'
(AT YAU POK ROAD, YUEN LONG)

Drawing No.	Scale	Rev.
AB/8800/SC53	1:400@A0	-

Date: 05/09/2023

建築署 Architectural Services Department

N

GREENERY AREA DIAGRAM (ZONE 2)

GREENERY AREA CALCULATION (ZONE 2)

(1)	PLANTER	=	2915.084 S.M.	(51)	PLANTER	=	23.640 S.M.
(2)	PLANTER	=	69.502 S.M.	(52)	PLANTER	=	12.132 S.M.
(3)	PLANTER	=	5738.417 S.M.	(53)	PLANTER	=	12.132 S.M.
(4)	PLANTER	=	8.253 S.M.	(54)	PLANTER	=	53.766 S.M.
(5)	PLANTER	=	15.111 S.M.	(55)	PLANTER	=	593.784 S.M.
(6)	PLANTER	=	82.670 S.M.	(56)	PLANTER	=	204.483 S.M.
(7)	PLANTER	=	74.086 S.M.	(57)	PLANTER	=	328.312 S.M.
(8)	PLANTER	=	20.750 S.M.	(58)	PLANTER	=	31.983 S.M.
(9)	PLANTER	=	15.111 S.M.	(59)	PLANTER	=	8.748 S.M.
(10)	PLANTER	=	15.111 S.M.	(60)	PLANTER	=	17.745 S.M.
(11)	PLANTER	=	17.130 S.M.	(61)	PLANTER	=	11.491 S.M.
(12)	PLANTER	=	95.656 S.M.	(62)	PLANTER	=	17.130 S.M.
(13)	PLANTER	=	74.086 S.M.	(63)	PLANTER	=	101.497 S.M.
(14)	PLANTER	=	15.111 S.M.	(64)	PLANTER	=	73.873 S.M.
(15)	PLANTER	=	18.054 S.M.	(65)	PLANTER	=	13.510 S.M.
(16)	PLANTER	=	133.049 S.M.	(66)	PLANTER	=	18.731 S.M.
(17)	PLANTER	=	7.905 S.M.	(67)	PLANTER	=	8.436 S.M.
(18)	PLANTER	=	10.782 S.M.	(68)	PLANTER	=	9.156 S.M.
(19)	PLANTER	=	6.153 S.M.	(69)	PLANTER	=	46.994 S.M.
(20)	PLANTER	=	6.153 S.M.	(70)	PLANTER	=	55.294 S.M.
(21)	PLANTER	=	10.782 S.M.				
(22)	PLANTER	=	7.905 S.M.				
(23)	PLANTER	=	7.456 S.M.				
(24)	PLANTER	=	59.916 S.M.				
(25)	PLANTER	=	22.722 S.M.				
(26)	PLANTER	=	24.483 S.M.				
(27)	PLANTER	=	44.202 S.M.				
(28)	PLANTER	=	875.424 S.M.				
(29)	PLANTER	0.960 x 7	= 6.720 S.M.				
(30)	PLANTER	0.960 x 18	= 17.280 S.M.				
(31)	PLANTER	0.960 x 12	= 11.520 S.M.				
(32)	PLANTER	0.960 x 11	= 10.560 S.M.				
(33)	PLANTER	=	19.437 S.M.				
(34)	PLANTER	=	21.099 S.M.				
(35)	PLANTER	=	30.408 S.M.				
(36)	PLANTER	=	21.109 S.M.				
(37)	PLANTER	=	21.099 S.M.				
(38)	PLANTER	=	42.138 S.M.				
(39)	PLANTER	=	35.370 S.M.				
(40)	PLANTER	=	45.654 S.M.				
(41)	PLANTER	0.960 x 65	= 62.400 S.M.				
(42)	PLANTER	=	116.143 S.M.				
(43)	PLANTER	=	45.798 S.M.				
(44)	PLANTER	=	12.132 S.M.				
(45)	PLANTER	=	19.407 S.M.				
(46)	PLANTER	=	23.640 S.M.				
(47)	PLANTER	=	29.526 S.M.				
(48)	PLANTER	=	75.139 S.M.				
(49)	PLANTER	=	107.624 S.M.				
(50)	PLANTER	=	19.841 S.M.				

TOTAL = 12827.945 S.M.

SITE COVERAGE OF GREENERY AT PRIMARY ZONE

SITE COVERAGE OF GREENERY

$= \frac{\text{GREENERY AREA AT PRIMARY ZONE}}{\text{SITE AREA}} \times 100\%$

$= \frac{15422.366\ (\text{ZONE 1}) + 12827.945\ (\text{ZONE 2})}{86619.000} \times 100\%$

= 32.614 % > 15% (REQUIRED)

TOTAL SITE COVERAGE OF GREENERY

SITE COVERAGE OF GREENERY

$= \frac{\text{TOTAL GREENERY AREA}}{\text{SITE AREA}} \times 100\%$

$= \frac{15422.366\ (\text{ZONE 1}) + 12827.945\ (\text{ZONE 2})}{86619.000} \times 100\%$

= 32.614 % > 30% (REQUIRED)

Notes :

No.	Date	Description	Initial

Revision

DESIGN AND BUILD CONTRACTOR : CHEVALIER / 中国铁建

ARCHITECT : ALKF+ ANDREW LEE KING FUN & ASSOCIATES ARCHITECTS LTD

CIVIL & STRUCTURAL ENGINEER : Wilson & Associates Ltd Consulting Engineers Planners Managers — WILSON & ASSOC. LTD.

GEOTECHNICAL ENGINEER : asia infrastructure solutions — ASIA INFRASTRUCTURE SOLUTION LTD.

MiC CONSULTANT : Wilson & Associates Ltd Consulting Engineers Planners Managers — WILSON & ASSOC. LTD.

BUILDING SERVICES ENGINEER : JRP 潔佰 — J. ROGER PRESTON LTD.

LANDSCAPE CONSULTANT : — EARTHASIA LTD.

INTERIOR & BRANDING DESIGNER : BREAD — BREAD STUDIO

ENVIRONMENTAL, BEAM CERTIFICATION, SUSTAINABILITY & ACOUSTIC CONSULTANT : RAMBOLL — RAMBOLL H.K. LTD.

PLANNING CONSULTANT : KTA — KTA PLANNING LTD.

TRAFFIC CONSULTANT : CKM ASIA LIMITED — CKM ASIA LTD.

	Name	Signed	Date
Designed	LARRY CHAN		05/09/2023
Drawn	W. MAN		05/09/2023
Checked	LARRY CHAN		05/09/2023
Approved	PM TANG		05/09/2023

Contract No. SS M518

Project Title

DESIGN AND CONSTRUCTION OF LIGHT PUBLIC HOUSING AT YAU POK ROAD, YUEN LONG, AT TUEN MUN AREA 3A AND AT CHOI HING ROAD, NGAU TAU KOK

AIP/DDA SUBMISSION

( )CONSENT IS GIVEN WITHOUT CONDITIONS
( )CONSENT IS GIVEN WITH CONDITIONS
( )CONSENT NOT GRANTED

FOR AND ON BEHALF OF
ARCHITECTURAL SERVICES DEPARTMENT

DATE:

ARCHITECTURAL DESIGNER'S SIGNATURE FOR SUBMISSION

ZHOU RAYMOND CHUN SUM
FOR AND ON BEHALF OF
ANDREW LEE KING FUN
& ASSOCIATES ARCHITECTS LTD. Date:

ARCHITECTURAL DESIGN CHECKER'S SIGNATURE FOR SUBMISSION

YU KWUN HO, KENNETH
FOR AND ON BEHALF OF
K&W ARCHITECTS LTD.
Date:

Drawing Title

S.B.D. CALCULATION '3'
(AT YAU POK ROAD, YUEN LONG)

Drawing No.	Scale	Rev.
AB/8800/SC54	1:400@A0	-

Date: 05/09/2023

建築署 Architectural Services Department

Appendix B

Detailed Drainage Impact Assessment Calculations

Peak Runoff Estimation of Subcatchments Pre-development

Catchment	Average Slope, H (m per 100m)	Catchment Area, A (m2)	Flow Distance, L (m)	Inlet Time, t0 (min) [1]	Flow Time, tf (min) [2]	Duration, tc (min) [3]	200-year return period				Runoff Coefficient, C [6]	Rainfall Increase due to Climate Change, % [7]	200-year Return Period Peak Runoff, Qp (m3/s) [8]
							Storm Constant, a [4]	Storm Constant, b [4]	Storm Constant, c [4]	Extreme Mean Intensity, I (mm/hr) [5]			
A	0.39	23843	233	14.85	0	14.85	429.5	2.05	0.295	186.52	0.35	16	0.502
B	0.26	21822	232	16.18	0	16.18	429.5	2.05	0.295	182.41	0.35	16	0.449
C	0.82	32947	304	16.17	0	16.17	429.5	2.05	0.295	182.44	0.35	16	0.678
D	0.09	7468	215	20.63	0	20.63	429.5	2.05	0.295	171.01	0.35	16	0.144
E	0.66	2969	136	9.61	0	9.61	429.5	2.05	0.295	208.11	0.35	16	0.070

Peak Runoff Estimation of Subcatchments Post-development

Catchment	Average Slope, H (m per 100mm)	Total Catchment Area, A (m2)	Land Use Surface Characteristics	Catchment Area, A (m2)	Flow Distance, L (m)	Inlet Time, t0 (min) [1]	Flow Time, tf (min) [2]	Duration, tc (min) [3]	50-year return period				Runoff Coefficient, C [6]	Rainfall Increase due to Climate Change, % [7]	50-year Return Period Peak Runoff, Qp (m3/s) [8]	Total Peak Runoff, Qp (m3/s) [8]
									Storm Constant, a [4]	Storm Constant, b [4]	Storm Constant, c [4]	Extreme Mean Intensity, I (mm/hr) [5]				
A+B	0.05	44436.9	Concrete	29352.1	297.8	26.90	0	26.90	451.3	2.46	0.337	144.50	0.95	11.1	1.244	1.480
			Greenery	15084.8									0.35	11.1	0.236	
C+D	0.62	42182.8	Concrete	29354.8	290	15.91	0	15.91	451.3	2.46	0.337	169.22	0.95	11.1	1.457	1.692
			Greenery	12827.9									0.35	11.1	0.235	
E	0.63	1287.2	Concrete	1287.2	105	8.14	0	8.14	451.3	2.46	0.337	203.67	0.95	11.1	0.077	0.077
			Greenery	0									0.35	11.1	0.000	
F	0.23	801.2	Concrete	801.2	146	14.52	0	14.52	451.3	2.46	0.337	173.77	0.95	11.1	0.041	0.041
			Greenery	0									0.35	11.1	0.000	
G	0.11	736.8	Concrete	736.8	88	10.23	0	10.23	451.3	2.46	0.337	191.70	0.95	11.1	0.041	0.041
			Greenery	0									0.35	11.1	0.000	
H	0.36	1921.2	Concrete	1921.2	167	13.91	0	13.91	451.3	2.46	0.337	175.92	0.95	11.1	0.099	0.099
			Greenery	0									0.35	11.1	0.000	
I	1.07	708.8	Concrete	708.8	144	10.66	0	10.66	451.3	2.46	0.337	189.55	0.95	11.1	0.039	0.039
			Greenery	0									0.35	11.1	0.000	
J	0.01	1035.6	Concrete	1035.6	164	29.76	0	29.76	451.3	2.46	0.337	140.03	0.95	11.1	0.043	0.043
			Greenery	0									0.35	11.1	0.000	

Emergency Overflow from Sewage Pumping Station	37	L/s
	0.037	m3/s

Note:

[1] Brandsby William's equation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition).

$$t_o = \frac{0.14465L}{H^{0.2} A^{0.1}}$$

where t_o = time of concentration of a natural catchment (min.)

A = catchment area (m^2)

H = average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration

L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

[2] tf is assumed to be 0 for conservative estimation.

[3] $t_c = t_o + t_f$

[4] Storm constants are referenced to Table 3a in DSD Stormwater Drainage Manual (Fifth Edition) based on corresponding return periods.

[5] Intensity-Duration-Frequency calculation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition).

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

where i = extreme mean intensity in mm/hr,

t_d = duration in minutes ($t_d \leq 240$), and

a, b, c = storm constants given in Tables 3a, 3b, 3c and 3d.

[6] Runoff coefficient is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition). The value of 0.35 is proposed for unpaved area whereas 0.95 for paved area. For consevative estimation, coefficient of 0.35 is assumed for unpaved area while that of 0.95 for paved area.

[7] Rainfall increase percentage due to climate change is referenced from Table 28 in Stormwater Drainage Manual Corrigendum No. 1/2022. 11.1% for Mid of 21st century is adopted.

[8] Rational method for peak runoff estimation is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

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

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

Hydraulic Testing for Pre-development

ID	From	ID	To	Diameter, D (m) OR Width, W (m) & Height, H (m) [1]		Cross-section Area, A (m2) [2]	Wetted Perimeter, P (m) [2]	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Flow Type	Equation [5]	Velocity, V (m/s) [6]	Full Capacity, Q (m3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m3/s)	Total Flow from All Catchment Area, Q (m3/s)	Occupancy (%)
1	A1	2	A2	2.000	0.500	0.9	2.900	0.3103	181	3.5	2.6	0.005	Open Channel	Manning	2.2	1.939	A	200	0.155	0.155	8%
2	A2	3	A3	2.000	1.000	1.8	6.283	0.2865	256	2.6	2.5	0.000	Open Channel	Manning	0.6	1.031	A	200	0.155	0.155	15%
2	A3	3	A4	8.000	2.000	14.4	25.133	0.5730	256	2.5	2.4	0.000	Open Channel	Manning	0.9	13.089	A+B	200	0.570	0.570	4%
3	A5	4	A6	5.000	2.000	9	15.708	0.5730	201	4.9	4.8	0.000	Open Channel	Manning	1.0	9.232	D	200	0.209	0.779	8%
4	A6	5	A7	7.000	2.000	12.6	10.600	1.1887	628	4.8	4.4	0.001	Open Channel	Manning	1.9	23.789	C+D	200	0.209	0.988	4%
5	A7	6	A4	8.000	2.000	14.4	11.600	1.2414	184	4.4	2.4	0.011	Open Channel	Manning	8.0	115.606	C+D+E	200	0.406	1.549	1%

Hydraulic Testing for Post-development Under Unmitigated Scenario (Existing drainages)

ID	From	ID	To	Diameter, D (m) OR Width, W (m) & Height, H (m) [1]	Cross-section Area, A (m2) [2]	Wetted Perimeter, P (m)	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Roughness [6]	Flow Type	Equation [5]	Velocity, V (m/s) [6]	Full Capacity, Q (m3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m3/s)	Total Flow from All Catchment Area (m3/s)	Occupancy (%)
1	B1	2	B2	0.450	0.151	1.414	0.1069	33.7	2.87	0.99	0.056	0.003	Pipe	Colebrook-White	3.7	0.562	A+B	50	0.389	0.389	69%
3	B3	4	B4	0.300	0.064	0.942	0.0675	5.6	1.38	1.22	0.029	0.003	Pipe	Colebrook-White	2.0	0.125	A+B	50	0.071	0.071	57%
5	B4	6	B5	0.450	0.143	1.414	0.1013	21	1.22	1.04	0.009	0.003	Pipe	Colebrook-White	1.4	0.201	A+B+E+F	50	0.13	0.13	65%
6	B6	7	B7	0.450	0.143	1.414	0.1013	21.4	2.20	1.35	0.040	0.003	Pipe	Colebrook-White	3.0	0.433	A+B	50	0.354	0.354	82%
8	B8	9	B8a	0.375	0.105	1.178	0.0891	5.5	2.41	1.25	0.211	0.003	Pipe	Colebrook-White	6.4	0.673	A+B	50	0.955	0.955	142%
10	B8a	11	B9	0.450	0.143	1.414	0.1013	14.2	1.25	1.17	0.006	0.003	Pipe	Colebrook-White	1.1	0.163	A+B+G+H	50	1.011	1.011	621%
12	B10	13	B11	0.450	0.151	1.414	0.1069	22.8	2.27	1.01	0.055	0.003	Pipe	Colebrook-White	3.7	0.559	C+D+ Emergency Overflow	50	0.521	0.521	93%
14	B12	15	B13	0.450	0.143	1.414	0.1013	26.4	2.43	1.62	0.031	0.003	Pipe	Colebrook-White	2.7	0.381	C+D	50	0.323	0.323	85%
16	B14	17	B14A	0.375	0.105	1.178	0.0891	6	1.81	1.34	0.078	0.003	Pipe	Colebrook-White	3.9	0.410	C+D	50	0.363	0.363	89%
18	B14A	19	B15	0.450	0.143	1.414	0.1013	14.5	1.34	1.20	0.010	0.003	Pipe	Colebrook-White	1.5	0.213	C+D+I+J	50	0.363	0.363	170%
18	B16	19	B16A	0.375	0.105	1.178	0.0891	2.3	3.33	3.06	0.117	0.003	Pipe	Colebrook-White	4.8	0.502	C+D	50	0.424	0.424	85%
20	B16A	21	B17	0.450	0.151	1.414	0.1069	19.7	2.59	1.00	0.081	0.003	Pipe	Colebrook-White	4.5	0.676	C+D	50	0.847	0.847	125%

Hydraulic Testing for Post-development Under Mitigated Scenrio

ID	From	ID	To	Diameter, D (m) OR Width, W (m) & Height, H (m) [1]	Cross-section Area, A (m2) [2]	Wetted Perimeter, P (m)	Hydraulic Radius, R (m) [3]	Length of Pipe, L (m) [1]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, s [4]	Roughness [6]	Flow Type	Equation [5]	Velocity, V (m/s) [6]	90% of Full Capacity, Q (m3/s)	95% of Full Capacity, Q (m3/s)	Full Capacity, Q (m3/s) [7]	Contributing Catchment Area [8]	Return Periods (Year) [9]	Additional Peak Flow, Q (m3/s)	Total Flow from All Catchment Area (m3/s)	Occupancy (%)
1	B1	2	B2	0.450	0.151	1.414	0.1069	33.7	2.87	0.99	0.056	0.003	Pipe	Colebrook-White	3.7	--	0.562	0.591	A+B	50	0.44	0.44	78%
3	BA1	4	BA2	0.750	0.398	2.356	0.1688	43.5	2.30	1.90	0.009	0.003	Pipe	Colebrook-White	2.0	0.809	--	0.898	A+B	50	0.587	0.587	73%
5	B3	6	B4	0.300	0.064	0.942	0.0675	5.6	1.38	1.22	0.029	0.003	Pipe	Colebrook-White	2.0	0.125	--	0.138	A+B	50	0.092	0.092	74%
7	B4	8	B5	0.450	0.143	1.414	0.1013	21	1.22	1.04	0.009	0.003	Pipe	Colebrook-White	1.4	0.201	--	0.223	A+B+E+F	50	0.149	0.149	74%
9	B6	10	B7	0.450	0.143	1.414	0.1013	21.4	2.20	1.35	0.040	0.003	Pipe	Colebrook-White	3.0	0.433	--	0.481	A+B	50	0.294	0.294	68%
11	B8	12	B8A	0.375	0.105	1.178	0.0891	5.5	2.41	1.25	0.211	0.003	Pipe	Colebrook-White	6.4	--	0.673	0.708	A+B	50	0.311	0.311	46%
13	B8A	14	B9	0.450	0.143	1.414	0.1013	14.2	1.25	1.17	0.006	0.003	Pipe	Colebrook-White	1.1	0.163	--	0.181	A+B+G+H	50	0.118	0.118	72%
15	B10	16	B11	0.450	0.151	1.414	0.1069	22.8	2.27	1.01	0.055	0.003	Pipe	Colebrook-White	3.7	--	0.559	0.589	C+D+Emergency Overflow	50	0.425	0.425	76%
17	B12	18	B13	0.450	0.143	1.414	0.1013	26.4	2.43	1.62	0.031	0.003	Pipe	Colebrook-White	2.7	0.381	--	0.423	C+D	50	0.288	0.288	76%
19	B14	20	B14A	0.375	0.105	1.178	0.0891	6	1.81	1.34	0.078	0.003	Pipe	Colebrook-White	3.9	--	0.410	0.431	C+D	50	0.228	0.228	56%
21	B14A	22	B15	0.450	0.143	1.414	0.1013	14.5	1.34	1.20	0.010	0.003	Pipe	Colebrook-White	1.5	0.213	--	0.237	C+D+I+J	50	0.158	0.158	74%
23	BA3	24	BA4	0.750	0.398	2.356	0.1688	24.5	1.70	1.40	0.012	0.003	Pipe	Colebrook-White	2.3	0.933	--	1.037	C+D	50	0.598	0.598	64%
25	B16	26	B16A	0.375	0.105	1.178	0.0891	2.3	3.33	3.06	0.117	0.003	Pipe	Colebrook-White	4.8	--	0.502	0.528	C+D	50	0.372	0.372	74%
27	B16A	28	B17	0.450	0.151	1.414	0.1069	19.7	2.59	1.00	0.081	0.003	Pipe	Colebrook-White	4.5	--	0.676	0.711	C+D	50	0.516	0.516	76%

Note:

[1] Information of stormwater pipe and open channel is obtained from the latest drainage record plan purchased in December 2022.

[2] According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.

[3] Hydraulic Radius = Cross-section Area / Wetted Perimeter

[4] Slope = (Inlet Invert Level - Outlet Invert Level) / Length of Pipe

[5] Colebrook-White Equation is adopted for calculation of pipe capacity, while Manning's Equation for calculation of channel capacity.

[6] Velocity is calculated based on different equations.

By Manning Equation,

$$\overline{V} = \frac{R^{1/6}}{n}\sqrt{RS_f}$$

By Colebrook-White Equation,

$$\overline{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$

Where

$\overline{V}$ = cross-sectional mean velocity (m/s)
R = hydraulic radius (m)
S_f = friction gradient (dimensionless)
n = Manning coefficient ($s/m^{1/3}$)
k_s = surface roughness (m)
ν = kinematic viscosity (m^2/s)
g = acceleration due to gravity (m/s^2)

Surface roughness is assumed to be 0.003mm with referenced to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Kinematic viscosity is 0.000001306 m/s.
Gravitational acceleration is 9.8 m/s2.

[7] Capacity = Cross-section Area x Velocity

[8] Bold and underlined subcatchment ID stands for stormwater in those subcatchments flowing into the corresponding pipe.

[9] With reference to Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), pipes with size or box culvert with an equivalent diameter smaller than 1.8m are considered under "Urban Drainage Branch System". According to Table 10, the recommended design return periods for Urban Drainage Branch System is 50 years.

[10] With reference to Note 2, sedimentation effect has been taken accounted.

[11] According to Section 6.5 in DSD Stormwater Drainage Manual (Ffith Edition), at least 500mm allowance of freeboard for open channel is taken into account due to margin of safety (300mm) and the effect of super-elevations at bends, if any (200mm).