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From: Rich Gold [redacted]
Sent: 2026-02-04 星期三 10:21:05
To: tpbpd/PLAND <tpbpd@pland.gov.hk>
Cc: [redacted]
Subject: Planning Application No. A/YL-PH/1077 - Submission of Further Information
Attachment: A_YL-PH_1077_Lr to TPB_FI_DSD_3.2.2026.pdf

Dear Sir/Madam,

We would like to submit further information to supersede the submissions on 2.2.2026 11:07a.m. and 2.2.2026 3:14p.m.

It is noted that there are some overgrown vegetation and silting in the downstream channel outside the site (see Plan 6.3 and viewpoints 10-12). The applicant undertakes to clear these overgrown vegetation and silting.

Regards,
Alan Poon

--
Goldrich Planners and Surveyors Ltd.
[redacted]

GoldRich PLANNERS & SURVEYORS LTD.
金 潤 規 劃 測 量 師 行 有 限 公 司
[redacted]

Your Ref.: A/YL-PH/1077 Our Ref.: P25025/TL26046 3 February 2026

The Secretary
Town Planning Board
15/F., North Point Government Offices
333 Java Road, North Point, Hong Kong

By Post and E-mail
tpbpd@pland.gov.hk

Dear Sir,

Submission of Further Information

Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Office and associated Filling of Land for a Period of 3 Years
Lots 29 (Part), 33 (Part) and 35 (Part) in D.D. 111
and Adjoining Government Land, Pat Heung, Yuen Long
(Application No.: A/YL-PH/1077)

We would like to submit further information to respond to the comments from Drainage Services Department.

It is noted that there are some overgrown vegetations and silting in the downstream channel outside the site (see Plan 6.3 and viewpoints 10-12). The applicant undertakes to clear these overgrown vegetation and silting.

Yours faithfully,
For and on behalf of
Goldrich Planners & Surveyors Ltd.

Alan Poon p.p.
Francis Lau

Encl.

c.c.
DPO/FS&YLE, PlanD [redacted] *by email only*

Comments from Drainage Services Department dated 30.1.2026
Contact person: [redacted]

<table>
<tr><th></th><th>Comments</th><th></th><th>Responses</th></tr>
<tr><td>i.</td><td>The hydraulic capacity of the proposed downstream facility (from CP12 to the existing underground pipe - 600mm u-channel at 1:100) should be larger than the upstream ones. (from CP11 to CP12 - 600mm u-channel at 1:50). A similar case is also happened for the proposed drainage facility from CP3 to CP4 - 600mm u-channel at 1:30. Please review the size and gradient of the proposed drainage facility at downstream.</td><td></td><td>The u-channels after CP4 are upgraded to 650mm u-channels. The hydraulic capacity of the proposed downstream facility is larger than the upstream. The hydraulic capacity is as follows:
<table>
<tr><th>Section of U-channel</th><th>Specification of U-channel</th><th>Capacity</th><th>Capacity larger than Upstream?</th></tr>
<tr><td>Before CP1</td><td>600mm UC
1:200
min. depth: 690mm</td><td>0.820 m^3/s</td><td>Yes</td></tr>
<tr><td>CP1-CP3</td><td>600mm UC
1:150
min. depth: 830mm</td><td>0.907 m^3/s</td><td>Yes</td></tr>
<tr><td>CP3-CP4</td><td>600mm UC
1:30
min. depth: 610mm</td><td>1.318 m^3/s</td><td>Yes</td></tr>
<tr><td>CP4-CP12</td><td>650mm UC
1:100
min. depth: 610mm</td><td>1.740 m^3/s</td><td>Yes</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Before CP8</td><td>600mm UC
1:100
min. depth: 600mm</td><td>0.704 m^3/s</td><td>Yes</td></tr>
<tr><td>CP8-CP9</td><td>600mm UC
1:30
min. depth: 600mm</td><td>1.529 m^3/s</td><td>Yes</td></tr>
<tr><td>CP9-CP12</td><td>600mm UC
1:65
min. depth: 650mm</td><td>1.925 m^3/s</td><td>Yes</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>After CP12</td><td>650mm UC
1:50
min. depth: 1120mm</td><td>2.973 m^3/s</td><td>Yes</td></tr>
</table>
</td></tr>
</table>

	Comments		Responses
			Please refer to Hydraulic Calculation Page 1 to Page 8 for reference. The hydraulic capacity of the drainage facilities is underlined.
ii.	Please indicate clearly the full alignment of the discharge path from the application site all the way down to the ultimate discharge point (e.g. a well-established stream course/public drainage system) for the existing underground pipe and provide site photos to demonstrate its presence and existing condition at downstream.		Please refer to Plan 6.3 showing the viewpoints of photographs and attached drainage photographs. It is observed that there are some weeds in the channel downstream (Viewpoints 11 and 12). The applicant undertakes to clear the weeds.
iii.	The development should neither obstruct overland flow and nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc.		Noted.
iv.	Please resolve any conflict/disagreement with relevant lot owner(s) and seek permission from DLO/YL for laying new drains/channels and/or modifying/upgrading existing ones in other private lots or on Government Land, where required, outside the application site(s)		Noted.

N

Application Site

2m underground local channel

2 nos. of 1m underground pipe

Existing 2m covered channel

Existing minimum 2m local channel

Existing Local catchpit

Proposed 650mm UC 1: 50 Min. depth: 1120mm

Proposed 650mm UC 1:100 Min. depth: 610mm

Proposed 650mm UC 1:100 Min. depth: 610mm

Proposed 600mm UC 1:65 Min. depth: 650mm

Proposed 600mm UC 1:65 Min. depth: 650mm

Proposed 600mm UC 1:65 Min. depth: 650mm

Proposed 600mm UC 1:30 Min. depth: 600mm

Proposed 600mm UC 1:100 Min. depth: 600mm

Proposed 600mm UC 1:200 Min. depth: 690mm

Proposed 600mm UC 1:30 Min. depth: 610mm

Proposed 600mm UC 1:50 Min. depth: 830mm

Proposed 600mm UC 1:150 Min. depth: 830mm

Fall

Existing Local Channel

Starting Point of Local Channel

CP1 G.L. 38.6 I.L. 37.72

CP2 G.L. 38.3 I.L. 37.47

CP3 G.L. 38.2 I.L. 37.35

CP4 G.L. 35.9 I.L. 35.29

CP5 G.L. 35.9 I.L. 35.14

CP6 G.L. 35.9 I.L. 35.05

CP7 G.L. 35.8 I.L. 34.93

CP8 G.L. 37.6 I.L. 37.0

CP9 G.L. 36.3 I.L. 35.62

CP10 G.L. 35.9 I.L. 35.25

CP11 G.L. 35.8 I.L. 34.9

CP12 G.L. 35.7 I.L. 34.58

CP13 G.L. 35.6 I.L. 34.39

G.L. 38.7 I.L. 37.39

G.L. 38.7 I.L. 38.01

A

A1

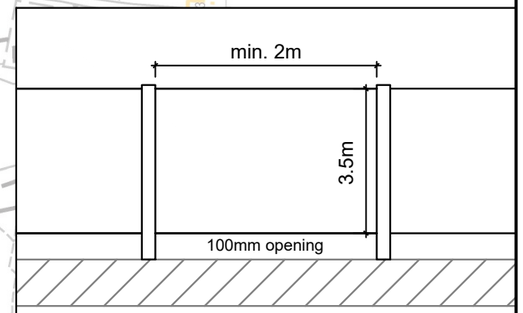
B

B1

Legend

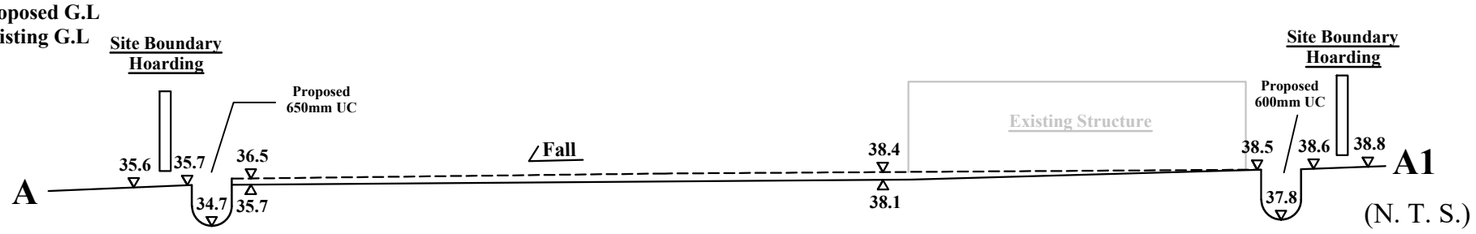
- Catch-pit
- Catch-pit with trap
- U-Channel
- Underground Pipe
- Local Channel
- Viewpoint of Drainage Photo

Site Area (about) : 5,285m²



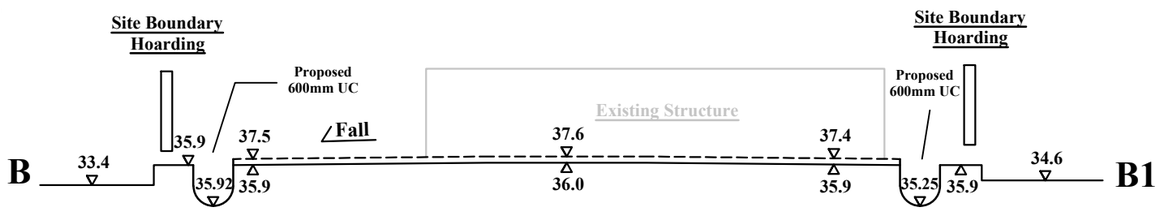
Details of hoarding with 100mm opening

Proposed G.L
Existing G.L



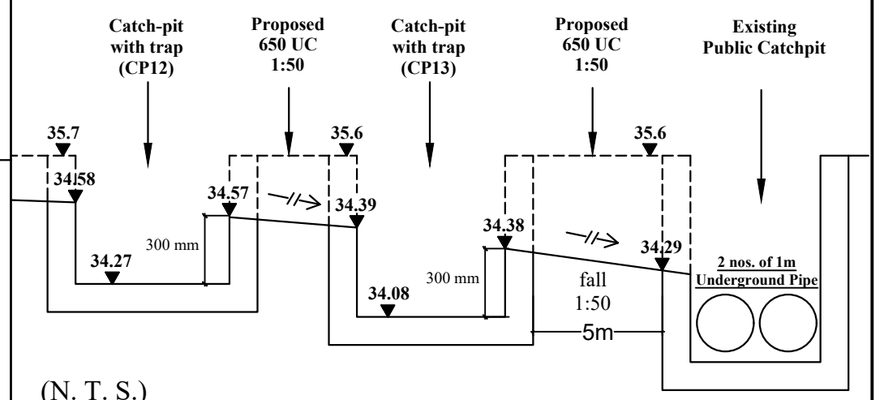
(N. T. S.)

Proposed G.L
Existing G.L



(N. T. S.)

Connection details of proposed outfall between CP12, CP13 and 2 nos. of 1m underground pipe



(N. T. S.)

1:750

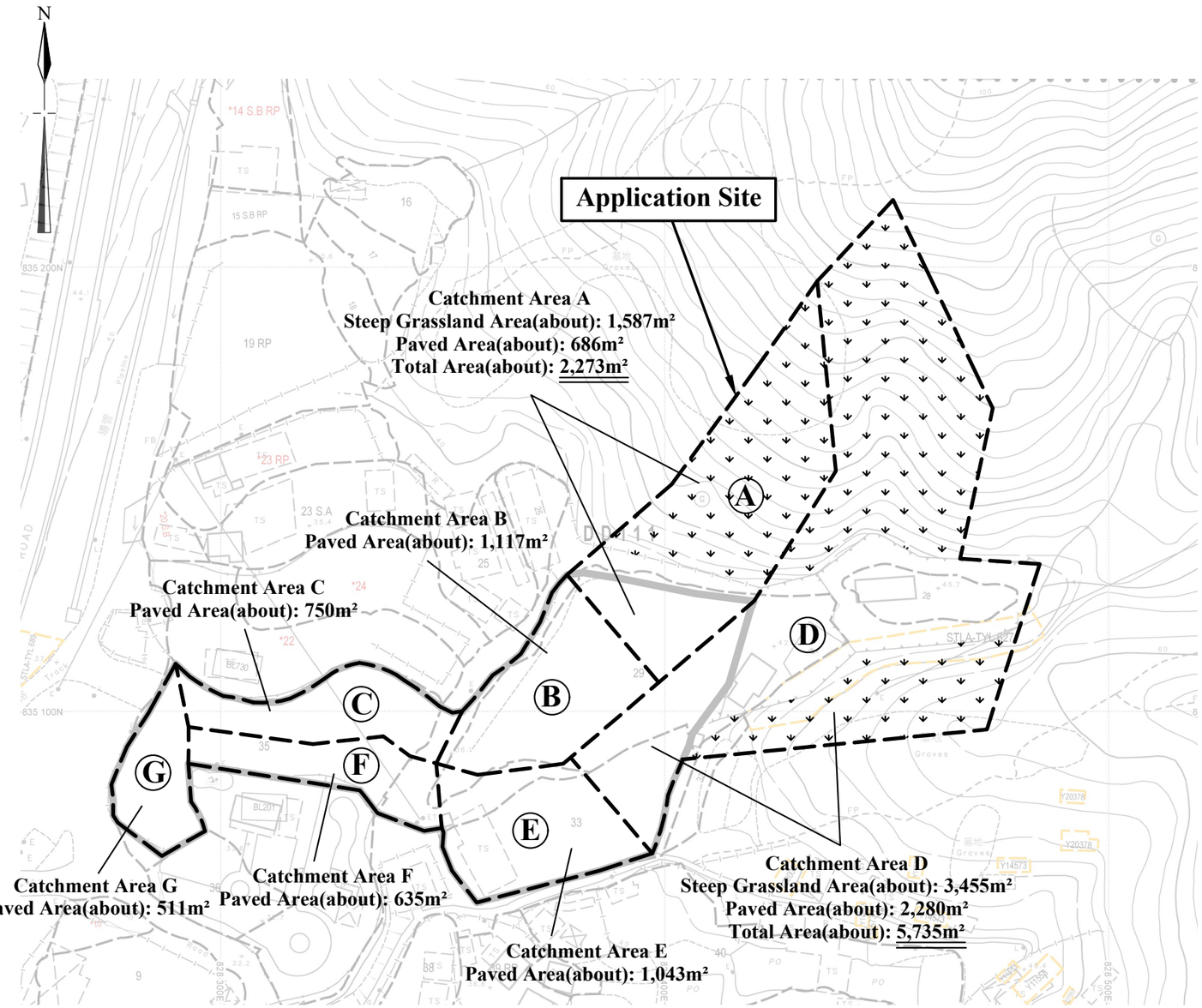
January 2026

Drainage Proposal

Lot 29(part), 33(part) and 35(part) in DD.111 and adjoining government land Yuen Long, N.T.

Goldrich Planners & Surveyors Ltd.

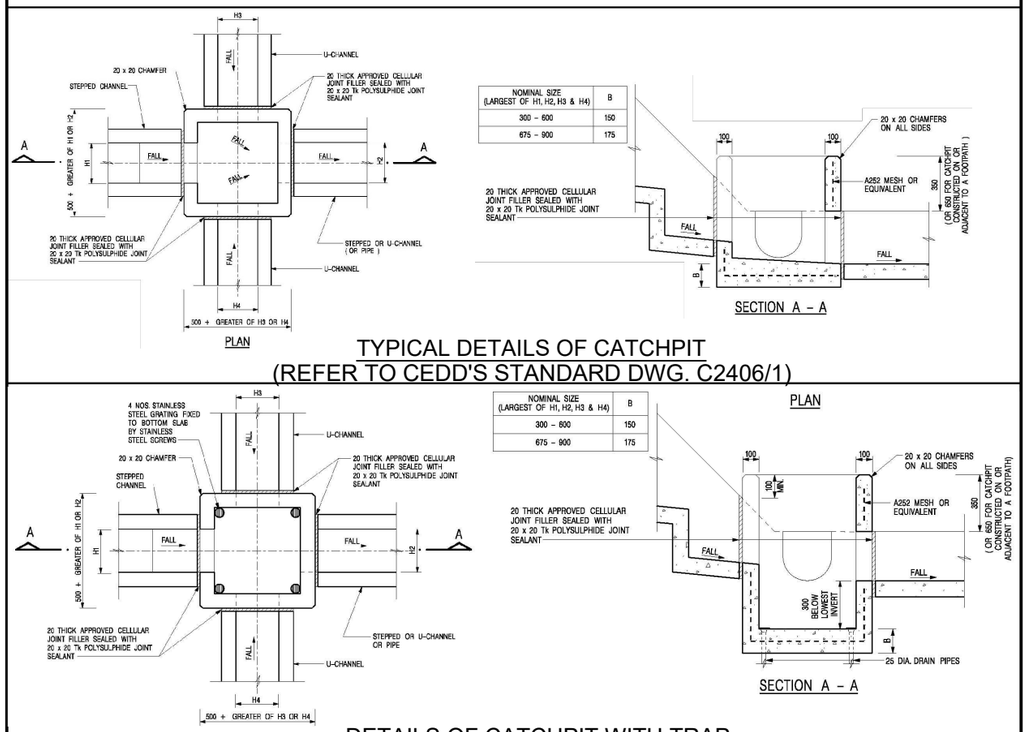
Plan 6.1b (P 25025)



Application Site Area

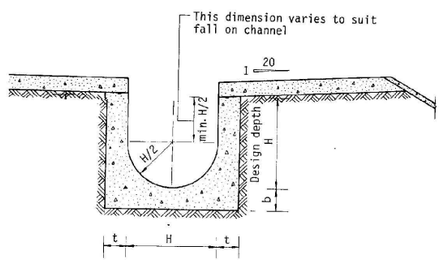
Catchment Area

AREA OF CATCHMENT
(N.T.S)

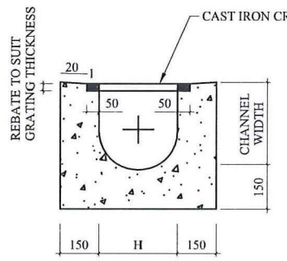


TYPICAL DETAILS OF CATCHPIT
(REFER TO CEDD'S STANDARD DWG. C2406/1)

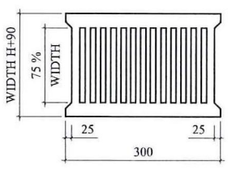
DETAILS OF CATCHPIT WITH TRAP
(REFER TO CEDD'S STANDARD DWG. C2406/1)



TYPICAL DETAILS OF U CHANNEL



TYPICAL SECTION OF
U-CHANNEL WITH COVER
(N.T.S.)



CAST IRON CRATING
(HEAVY DUTY)

N.T.S	**Drainage Proposal** **Lot 29(part), 33(part) and 35(part) in DD.111 and adjoining government land Yuen Long, N.T.**	**Goldrich Planners & Surveyors Ltd.**
January 2026		**Plan 6.2b (P 25025)**

Application Site

2m underground local channel

2 nos. of 1m underground pipe

Existing 2m covered channel

Existing minimum 2m local channel

Existing minimum 2m local channel

It is observed that there are some weeds in the channel. The applicant undertakes to clear the weeds.

It is observed that there are some weeds in the channel. The applicant undertakes to clear the weeds.

Existing Local Channel

Starting Point of Local Channel

Fall

CP1 G.L. 38.6 I.L. 37.72
CP2 G.L. 38.3 I.L. 37.47
CP3 G.L. 38.2 I.L. 37.35
CP4 G.L. 35.9 I.L. 35.29
CP5 G.L. 35.9 I.L. 35.14
CP6 G.L. 35.9 I.L. 35.05
CP7 G.L. 35.8 I.L. 34.93
CP8 G.L. 37.6 I.L. 37.0
CP9 G.L. 36.3 I.L. 35.62
CP10 G.L. 35.9 I.L. 35.25
CP11 G.L. 35.8 I.L. 34.9
CP12 G.L. 35.7 I.L. 34.58
CP13 G.L. 35.6 I.L. 34.39

G.L. 38.7 I.L. 37.39
G.L. 38.7 I.L. 38.01

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Existing Local catchpit

Proposed 650mm UC 1: 50 Min. depth: 1120mm

Proposed 600mm UC 1:100 Min. depth: 600mm

Proposed 600mm UC 1:30 Min. depth: 600mm

Proposed 600mm UC 1:200 Min. depth: 690mm

Proposed 600mm UC 1:150 Min. depth: 830mm

Proposed 600mm UC 1:65 Min. depth: 650mm

Proposed 650mm UC 1:100 Min. depth: 610mm

Proposed 600mm UC 1:30 Min. depth: 610mm

Proposed 650mm UC 1:100 Min. depth: 610mm

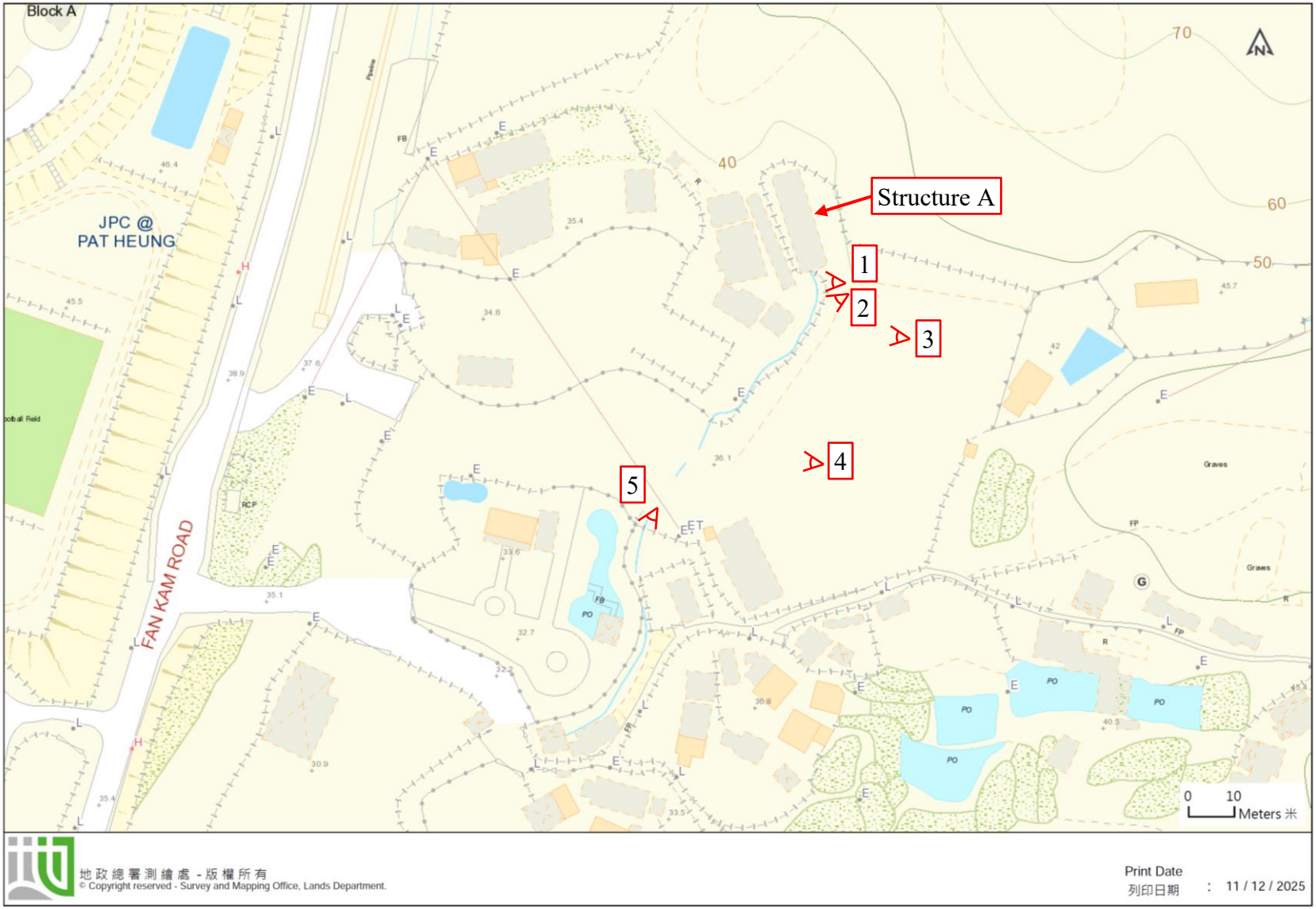
Legend

- Catch-pit
- Catch-pit with trap
- U-Channel
- Underground Pipe
- Local channel
- Viewpoint of Drainage Photo

Site Area (about) : 5,285m²

1:750(A3)	**Drainage Proposal** Lot 29(part), 33(part) and 35(part) in DD.111 and adjoining government land Yuen Long, N.T.	Goldrich Planners & Surveyors Ltd.
February 2026		Plan 6.3 (P 25025)

Map A


Block A
JPC @
PAT HEUNG
FAN KAM ROAD
Structure A
1
2
3
4
5
70
60
50
40
0 10
Meters 米
地政總署測繪處 - 版權所有
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Print Date
列印日期 : 11 / 12 / 2025

Viewpoint 1

Viewpoint 2

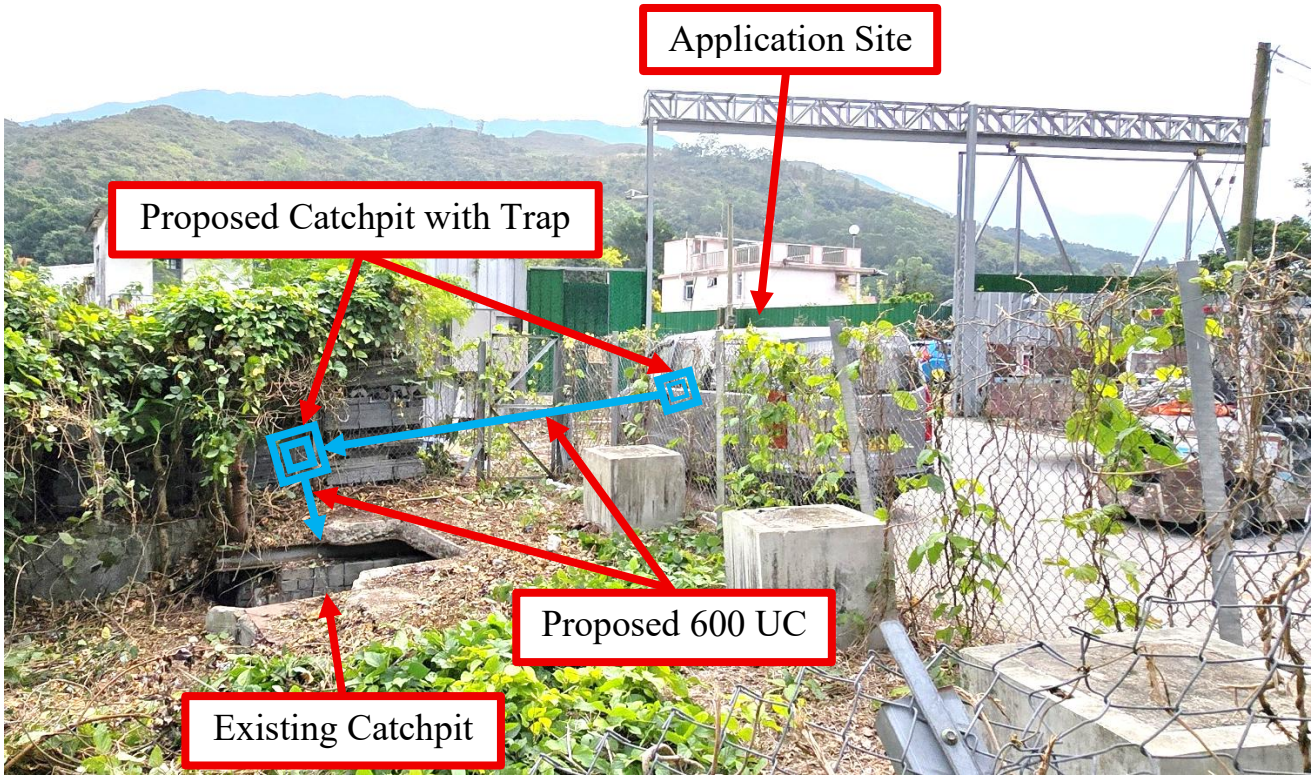
Viewpoint 3

Viewpoint 4

Viewpoint 5


Starting point of local channel
Existing local channel outside the site at the south

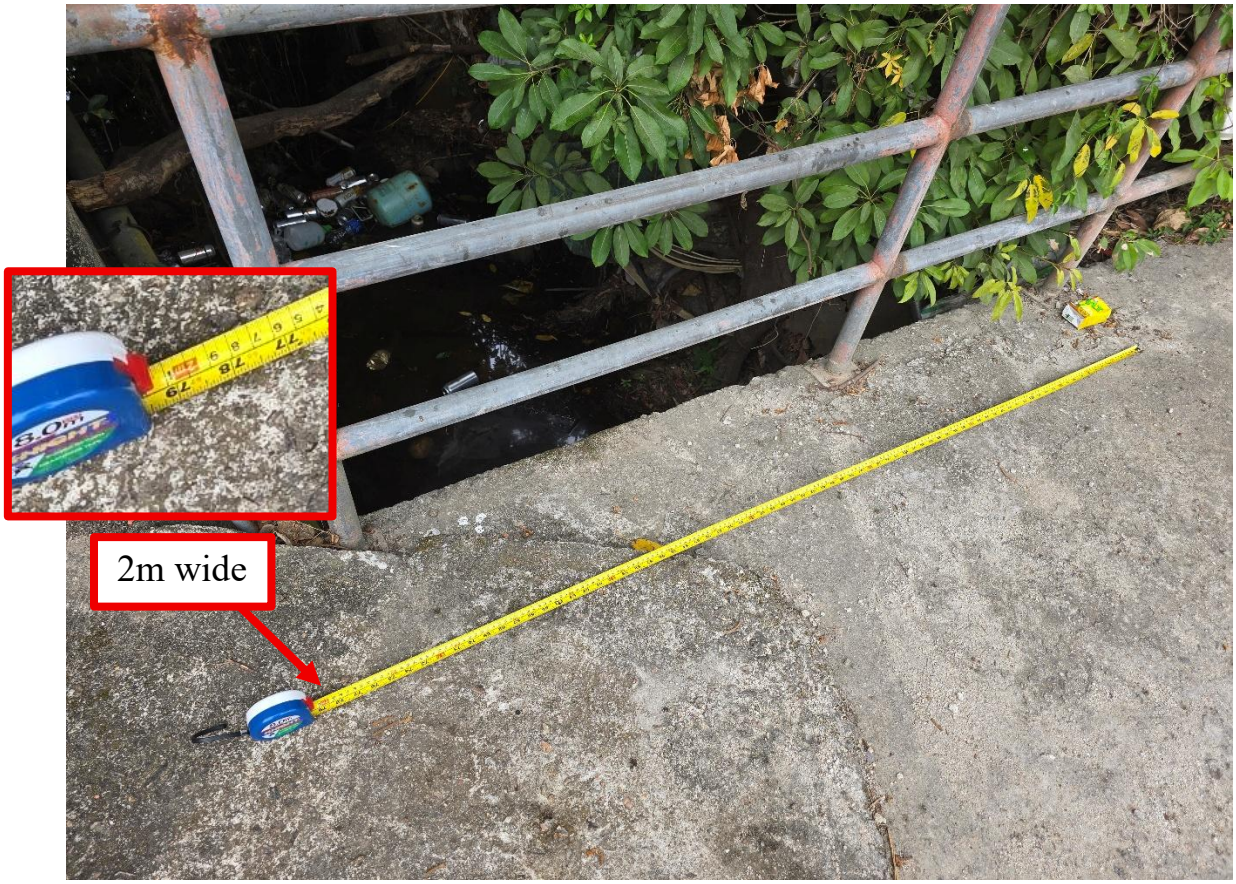
Viewpoint 6



Viewpoint 7

Viewpoint 8

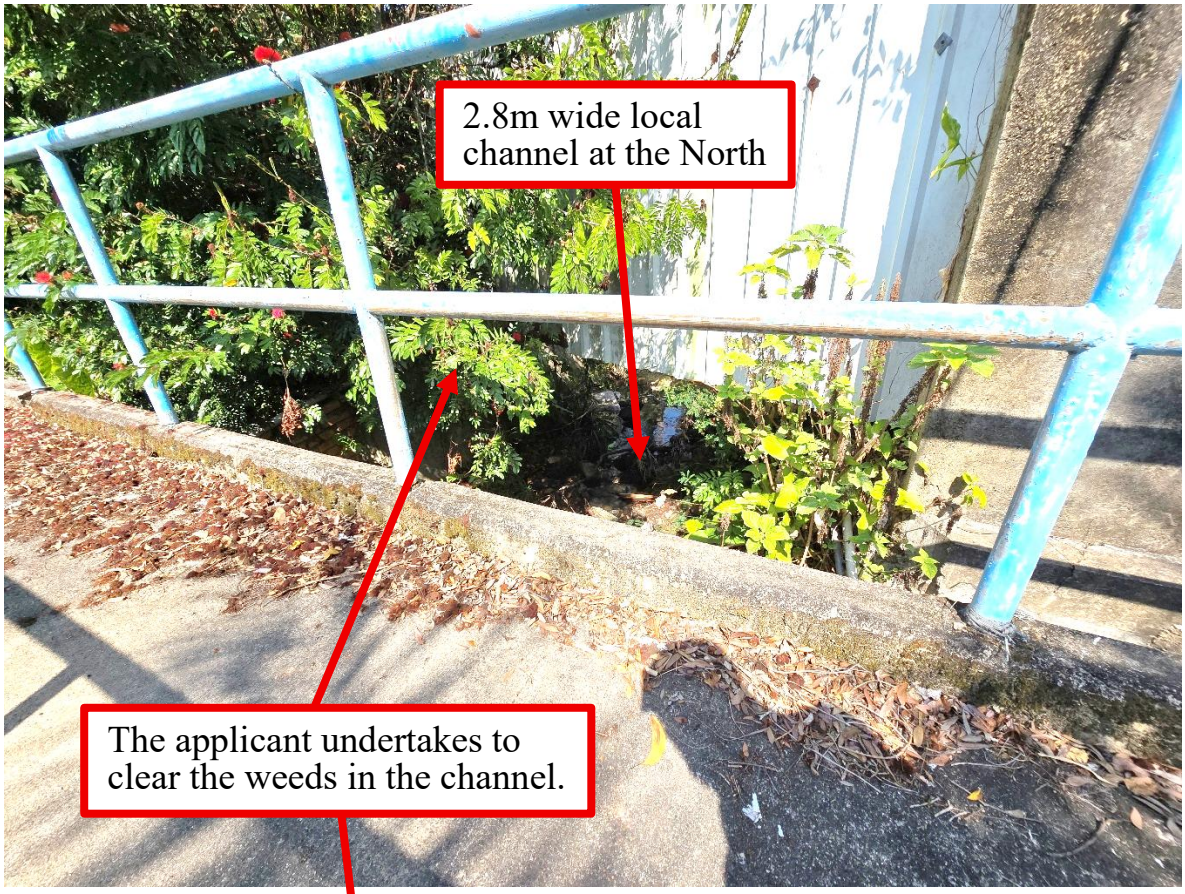

Existing Local Channel
2m wide underground channel


2m wide

Viewpoint 9

Viewpoint 10

Viewpoint 11



Viewpoint 12

1 For Catchment Area A

Ref.

Area, A = 2273 m^2
Average slope, H = 47.5 m per 100m
Distance on the line of natural flow, L = 77 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (77) / (47.5^0.2*2273^0.1) — SDM 7.5.2 (d)
= 2.4 min

2 For Proposed UC in Catchment Area A

	From	To
Ground level (mPD)	38.70	37.60
Invert level (mPD)	37.39	37.00

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 39.2 m
Depth of vertical part of u-channel, d = 300 mm
Gradient of u-channel, S_f = (37.39-37)/39.2 = 0.010

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 300
= 0.321 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 300
= 1.542 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.208 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.208)^1/6 x (0.208 x 0.01)^1/2 / 0.016 — SDM Table 12
= 2.19 m/s
Time of flow, t_f = 0.3 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (2.4+0.3+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 268 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Steep Glassland(heavy soil)	0.35	1587.0	555.5
Concrete Paving	0.95	686.0	651.7
		SUM =	1207.2

— SDM 7.5.2 (b)

Upstream flow, Q_u = 0 m^3/s

Design flow, Q_d = $1.16 \times 0.278 i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 268 x 1207.15 / 1000000 + 0 — Corrigendum 1/2022
= 0.104 m^3/s

Allowable flow, Q_a = a x v
= 0.321 x 2.19
= 0.704 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area B

Ref.

Area, A = 1117 m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = 22.5 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (22.5) / (0.1^0.2*1117^0.1) — SDM 7.5.2 (d)
= 2.6 min

2 For Proposed UC in Catchment Area B

	From	To
Ground level (mPD)	37.60	36.30
Invert level (mPD)	37.00	35.62

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 41 m
Depth of vertical part of u-channel, d = 380 mm
Gradient of u-channel, S_f = (37-35.62)/41 = 0.0337

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 380
= 0.369 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 380
= 1.702 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.217 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.217)^1/6 x (0.217 x 0.034)^1/2 / 0.016 — SDM Table 12
= 4.14 m/s
Time of flow, t_f = 0.2 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (2.6+0.2+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 267 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Flat Glassland(heavy soil)	0.25	0.0	0.0
Concrete Paving	0.95	1117.0	1061.2
		SUM =	1061.2

SDM 7.5.2 (b)

Upstream flow, Q_u = 0.104 m^3/s

Design flow, Q_d = $1.16 \times 0.278 i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 267 x 1061.15 / 1000000 + 0.1(— Corrigendum 1/2022
= 0.196 m^3/s

Allowable flow, Q_a = a x v
= 0.369 x 4.14
= 1.529 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area C

				Ref.
Area, A	=	750	m^2	
Average slope, H	=	0.1	m per 100m	
Distance on the line of natural flow, L	=	15	m	
Time of concentraction, t_o	=	0.14465L / ($H^{0.2}A^{0.1}$) = 0.14465 (15) / (0.1^0.2*750^0.1)		SDM 7.5.2 (d)
	=	1.8	min	

2 For Proposed UC in Catchment Area C

	From	To
Ground level (mPD)	36.30	35.70
Invert level (mPD)	35.62	34.58

Width of u-channel, w	=	600	mm	
Length of u-channel, L_c	=	67.5	m	
Depth of vertical part of u-channel, d	=	820	mm	
Gradient of u-channel, S_f	=	(35.62-34.58)/67.5 = 0.0154		
Cross-Section Area, a	=	0.5 πr^2 + w d = 0.5 x 3.14 x 300^2 + 600 x 820		
	=	0.633	m^2	
Wetted Perimeter, p	=	π r + 2 d = 3.14 x 300 + 2 x 820		
	=	2.582	m	
Hydralic radius, R	=	a / p		SDM 8.2.1
	=	0.245	m	

3 Use Manning Equation for estimating velocity of stormwater

Take n	=	0.016	for concrete lined channels:-	SDM Table 13
Allowable velocity, v	=	$R^{1/6}$x $(RS_f)^{1/2}$/n = (0.245)^1/6 x (0.245 x 0.015)^1/2 / 0.016		SDM Table 12
	=	3.04	m/s	
Time of flow, t_f	=	0.4	min	

4 Use "Rational Method" for calculation of design flow

Design intensity, i	=	a / (t_o + t_f +b)^c		SDM 4.3.2
	=	505.5 / (1.8+0.4+3.29)^0.355 for return period T = 50 years		Corrigendum 1/2024
	=	277		SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A	SDM 7.5.2 (b)
Flat Glassland(heavy soil)	0.25	0.0	0.0	
Concrete Paving	0.95	750.0	712.5	
		SUM =	712.5	

Upstream flow, Q_u	=	0.196	m^3/s	
Design flow, Q_d	=	1.16 x 0.278i Σ C_jA_j + Q_u where A_j is in km^2		SDM 7.5.2 (a)
	=	1.16 x 0.278 x 277 x 712.5 / 1000000 + 0.196		Corrigendum 1/2022
	=	0.260	m^3/s	
Allowable flow, Q_a	=	a x v		
	=	0.633 x 3.04		
	=	1.925	m^3/s	

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area D

Ref.

Area, A = 5735 m^2
Average slope, H = 48.1 m per 100m
Distance on the line of natural flow, L = 100 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (100) / (48.1^0.2*5735^0.1) — SDM 7.5.2 (d)
= 2.8 min

2 For Proposed UC in Catchment Area D

	From	To
Ground level (mPD)	38.70	38.60
Invert level (mPD)	38.01	37.72

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 56.8 m
Depth of vertical part of u-channel, d = 580 mm
Gradient of u-channel, S_f = (38.01-37.72)/56.8 = 0.0050

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 580
= 0.489 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 580
= 2.102 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.233 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.233)^1/6 x (0.233 x 0.005)^1/2 / 0.016 — SDM Table 12
= 1.68 m/s
Time of flow, t_f = 0.6 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (2.8+0.6+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 258 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Steep Glassland(heavy soil)	0.35	3455.0	1209.3
Concrete Paving	0.95	2280.0	2166.0
		SUM =	3375.3

SDM 7.5.2 (b)

Upstream flow, Q_u = 0 m^3/s

Design flow, Q_d = $1.16 \times 0.278i \Sigma C_jA_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 258 x 3375.25 / 1000000 + 0 — Corrigendum 1/2022
= 0.281 m^3/s

Allowable flow, Q_a = a x v
= 0.489 x 1.68
= 0.820 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area E

Ref.

Area, A = 1043 m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = 25 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (25) / (0.1^0.2*1043^0.1) — SDM 7.5.2 (d)
= 2.9 min

2 For Proposed UC in Catchment Area E

	From	To
Ground level (mPD)	38.60	38.20
Invert level (mPD)	37.72	37.35

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 55.3 m
Depth of vertical part of u-channel, d = 550 mm
Gradient of u-channel, S_f = (37.72-37.35)/55.3 = 0.0067

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 550
= 0.471 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 550
= 2.042 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.231 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.231)^1/6 x (0.231 x 0.007)^1/2 / 0.016 — SDM Table 12
= 1.92 m/s
Time of flow, t_f = 0.5 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (2.9+0.5+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 258 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Flat Glassland(heavy soil)	0.25	0.0	0.0
Concrete Paving	0.95	1043.0	990.9
		SUM =	990.9

— SDM 7.5.2 (b)

Upstream flow, Q_u = 0.281 m^3/s

Design flow, Q_d = $1.16 \times 0.278 i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 258 x 990.85 / 1000000 + 0.281 — Corrigendum 1/2022
= 0.364 m^3/s

Allowable flow, Q_a = a x v
= 0.471 x 1.92
= 0.907 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area F

Ref.

Area, A = 635 m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = 16 m

Time of concentration, t_o = 0.14465L / ($H^{0.2}A^{0.1}$) = 0.14465 (16) / (0.1^0.2*635^0.1) — SDM 7.5.2 (d)
= 1.9 min

2 For Proposed UC in Catchment Area F

	From	To
Ground level (mPD)	38.20	35.90
Invert level (mPD)	37.35	35.29

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 61.8 m
Depth of vertical part of u-channel, d = 310 mm
Gradient of u-channel, S_f = (37.35-35.29)/61.8 = 0.0333

Cross-Section Area, a = 0.5 πr^2 + w d = 0.5 x 3.14 x 300^2 + 600 x 310
= 0.327 m^2
Wetted Perimeter, p = π r + 2 d = 3.14 x 300 + 2 x 310
= 1.562 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.210 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6}$x $(RS_f)^{1/2}$/n = (0.21)^1/6 x (0.21 x 0.033)^1/2 / 0.016 — SDM Table 12
= 4.03 m/s
Time of flow, t_f = 0.3 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = a / (t_o + t_f +b)^c — SDM 4.3.2
= 505.5 / (1.9+0.3+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 277 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Flat Glassland(heavy soil)	0.25	0.0	0.0
Concrete Paving	0.95	635.0	603.3
		SUM =	603.3

— SDM 7.5.2 (b)

Upstream flow, Q_u = 0.364 m^3/s

Design flow, Q_d = 1.16 x 0.278i Σ C_jA_j + Q_u where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 277 x 603.25 / 1000000 + 0.364 — Corrigendum 1/2022
= 0.418 m^3/s

Allowable flow, Q_a = a x v
= 0.327 x 4.03
= 1.318 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For Catchment Area G

Ref.

Area, A = 511 m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = 10 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (10) / (0.1^0.2*511^0.1) — SDM 7.5.2 (d)
= 1.2 min

2 For Proposed UC in Catchment Area G

	From	To
Ground level (mPD)	35.90	35.70
Invert level (mPD)	35.29	34.58

Width of u-channel, w = 650 mm
Length of u-channel, L_c = 71.4 m
Depth of vertical part of u-channel, d = 795 mm
Gradient of u-channel, S_f = (35.29-34.58)/71.4 = 0.010

Cross-Section Area, a = $0.5 \pi r^2 + w d$ = 0.5 x 3.14 x 325^2 + 650 x 795
= 0.683 m^2
Wetted Perimeter, p = $\pi r + 2 d$ = 3.14 x 325 + 2 x 795
= 2.611 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.261 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.261)^1/6 x (0.261 x 0.01)^1/2 / 0.016 — SDM Table 12
= 2.55 m/s
Time of flow, t_f = 0.5 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (1.2+0.5+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 286 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Flat Glassland(heavy soil)	0.25	0.0	0.0
Concrete Paving	0.95	511.0	485.5
		SUM =	485.5

SDM 7.5.2 (b)

Upstream flow, Q_u = 0.418 m^3/s

Design flow, Q_d = $1.16 \times 0.278 i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 286 x 485.45 / 1000000 + 0.418 — Corrigendum 1/2022
= 0.463 m^3/s

Allowable flow, Q_a = a x v
= 0.683 x 2.55
= 1.740 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD

1 For connection between CP12, CP13 and 2 nos. of 1 m underground pipe

Ref.

Area, A = 0 m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = 0 m

Time of concentration, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (0) / (0.1^0.2*0^0.1) — SDM 7.5.2 (d)
= 0.0 min

2 For Proposed UC in between CP12, CP13 and 2 nos. of 1 m underground pipe

	From	To
Ground level (mPD)	35.70	35.60
Invert level (mPD)	34.58	34.29

Width of u-channel, w = 650 mm
Length of u-channel, L_c = 14.5 m
Depth of vertical part of u-channel, d = 985 mm
Gradient of u-channel, S_f = (34.58-34.29)/14.5 = 0.020

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 325^2 + 650 x 985
= 0.806 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 325 + 2 x 985
= 2.991 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.270 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.27)^1/6 x (0.27 x 0.02)^1/2 / 0.016 — SDM Table 12
= 3.69 m/s
Time of flow, t_f = 0.1 min

4 Use "Rational Method" for calculation of design flow

Design intensity, i = $a / (t_o + t_f + b)^c$ — SDM 4.3.2
= 505.5 / (0+0.1+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 329 — SDM Table 3a

Type of surface	Runoff Coefficient C	Catchment Area A (m^2)	C x A
Flat Glassland(heavy soil)	0.25	0.0	0.0
Concrete Paving	0.95	0.0	0.0
		SUM =	0.0

SDM 7.5.2 (b)

Upstream flow, Q_u = 0.723 m^3/s

Design flow, Q_d = $1.16 \times 0.278 i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 329 x 0 / 1000000 + 0.723 — Corrigendum 1/2022
= 0.723 m^3/s

Allowable flow, Q_a = a x v
= 0.806 x 3.69
= 2.973 m^3/s

> Q_d (O.K.)

Reference was made to Stormwater Drainage Manual (SDM) by DSD