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

23 January 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.

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

Francis Lau

Encl.

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

Comments from Drainage Services Department dated 20.1.2026
Contact person: Mr. TSE Chi Wai ([redacted])

	Comments		Responses
i.	It is noted that the site area is 5285m^2 and the ground to the north of the application site is generally higher. Since the overland flow from the adjacent lands shall be probably intercepted, external catchment shall be considered in the calculation (i.e. Lots 22, 24, 25 and 26, etc. in D.D. 111). Please also make reference to the latest Technical Note No. 1 issued by DSD for more details in preparing the drainage proposal. Please upgrade all drainage facilities size accordingly.		The ground level of the ground to the north is +34.6mPD as shown in Plan 6.1b. The ground level of the western side of the application site is +36.5mPD. Thus, the ground to the north of the application site is lower than the application site. The U-channels within the site are upgraded to 600mm. Please refer to Plan 6.1b.
ii.	Referring to R-to-C, please advise whether any section of the said local ditch is within the application site. If affirmative, please ensure that the existing local ditch and the relevant discharge connection(s) should be maintained due to the proposed development. Please also provide adequate measures and drainage facilities to intercept their flow properly. Please indicate the above on the drainage plan for reference.		No section of the said local ditch is within the application site. Please refer to attached site photographs and Plan 6.1b for the viewpoints of the photographs.
iii.	Catchpit should be provided at the turning point of the proposed u-channel.		Noted. Additional catchpits are provided. Please refer to Plan 6.1b.
iv.	Please advise if any site formation/levelling works to be carried out under this application. Cross sections showing the existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given. Referring to cross sections A-A and B-B, please note that the proposed peripheral surface channels shall be provided along the site boundary at the original/existing ground level (instead of the revised ground level) to collect the surface runoff accrued on the application site and to intercept the overland flow from the adjacent lands.		There are site formation/levelling works to be carried out under this application. Please refer to the cross sections at Plan 6.1b showing the existing and proposed ground levels. The proposed peripheral surface channels are provided along the site boundary at the original/existing ground level. Please refer to the Sections at Plan 6.1b.

	Comments		Responses
v.	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).		Please refer to attached photographs.
vi.	The existing 500 mm u-channel, to which the proposed to discharge the stormwater from the subject site was not maintained by this office. Please resolve any conflict/disagreement arisen for discharging the runoff from the application site(s) to the proposed discharge point(s). Moreover, please ensure that this drainage system and the existing downstream drains/channels/streams have adequate capacity to convey the additional runoff from the application site(s). Regular maintenance should be carried out by the applicant(s) to avoid blockage of the system.		Noted.
vii.	Further to (vi) above, since there is no record of the said discharge path, please provide site photos to demonstrate its presence and existing condition.		The discharge path is updated to discharge to an existing catchpit where there are 2 nos. of 1m underground pipe. Please refer to Plan 6.1b and viewpoint photographs 6 and 7.
viii.	The development should neither obstruct overland flow and nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc.		Noted.
ix.	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.

Application Site

2m underground local ditch

2 nos. of 1m underground pipe

Existing Local catchpit

Proposed 600mm UC 1:100

CP13 G.L. 35.6 I.L. 34.86

CP12 G.L. 35.7 I.L. 34.94

CP11 G.L. 36.7 I.L. 35.36

CP10 G.L. 37.0 I.L. 35.81

CP9 G.L. 38.2 I.L. 36.29

CP8 G.L. 38.6 I.L. 36.81

G.L. 38.7 I.L. 37.3

G.L. 38.7 I.L. 38.1

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. 35.21

CP6 G.L. 35.9 I.L. 35.17

CP7 G.L. 35.8 I.L. 35.11

Proposed 600mm UC 1:50

Proposed 600mm UC 1:80

Proposed 600mm UC 1:150

Proposed 600mm UC 1:200

Proposed 600mm UC 1:30

Fall

Existing Local Ditch

Starting Point of Local Ditch

A

A1

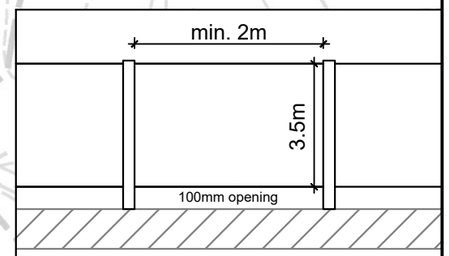
B

B1

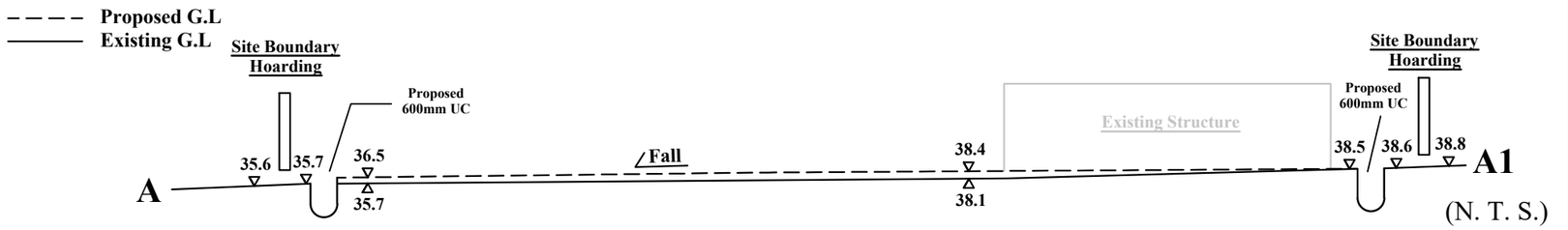
Legend

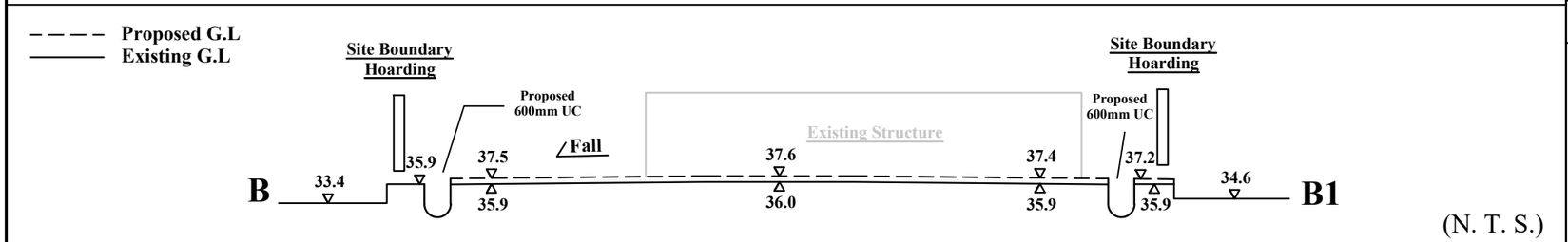
- Catch-pit
- Catch-pit with trap
- U-Channel
- Underground Pipe
- Local Ditch

Site Area (about) : 5,285m²

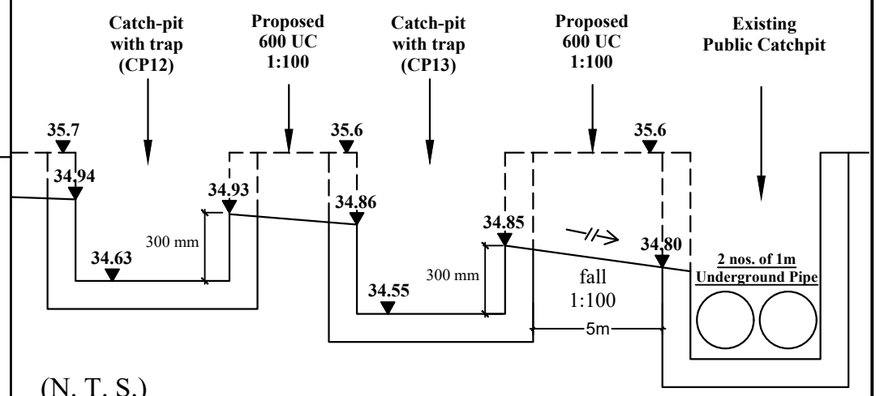


Details of hoarding with 100mm opening

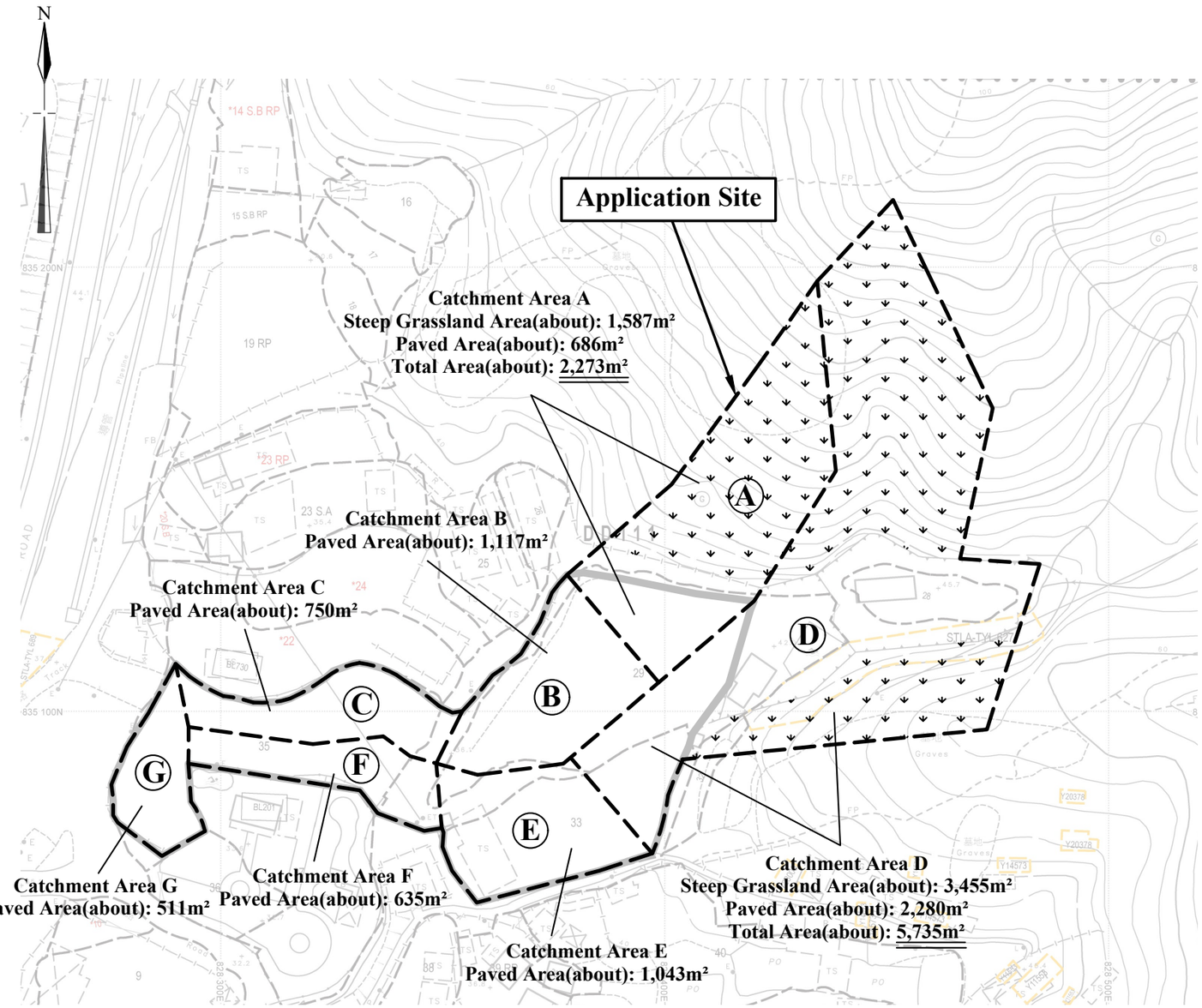




Connection details of proposed outfall between CP12, CP13 and 2 nos. of 1m underground pipe



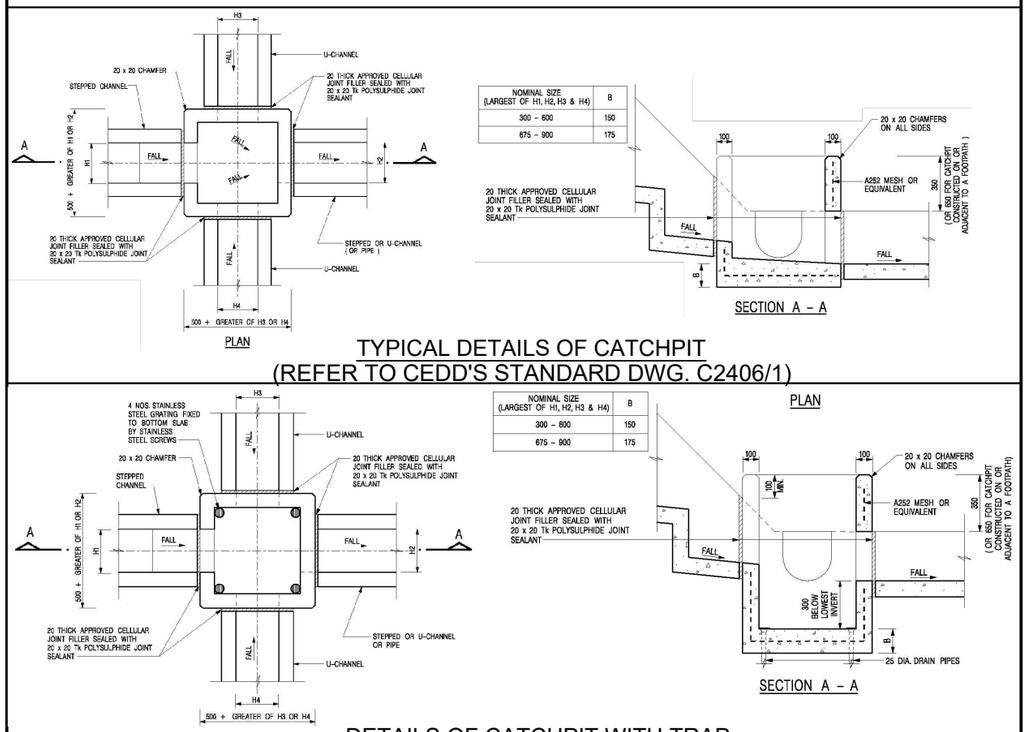
1:500	**Drainage Proposal** **Lot 29(part), 33(part) and 35(part) in DD.111 and adjoining government land Yuen Long, N.T.**	Goldrich Planners & Surveyors Ltd.
January 2026		Plan 6.1b (P 25025)



Application Site Area

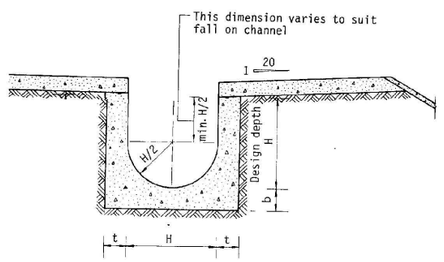
Catchment Area

AREA OF CATCHMENT
(N.T.S)

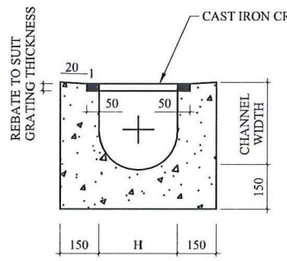


TYPICAL DETAILS OF CATCHPIT
(REFER TO CEDD'S STANDARD DWG. C2406/1)

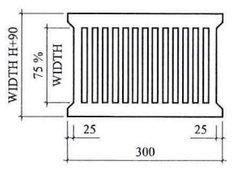
DETAILS OF CATCHPIT WITH TRAP
(REFER TO CEDD'S STANDARD DWG. C2406/1)



TYPICAL DETAILS OF U CHANNEL



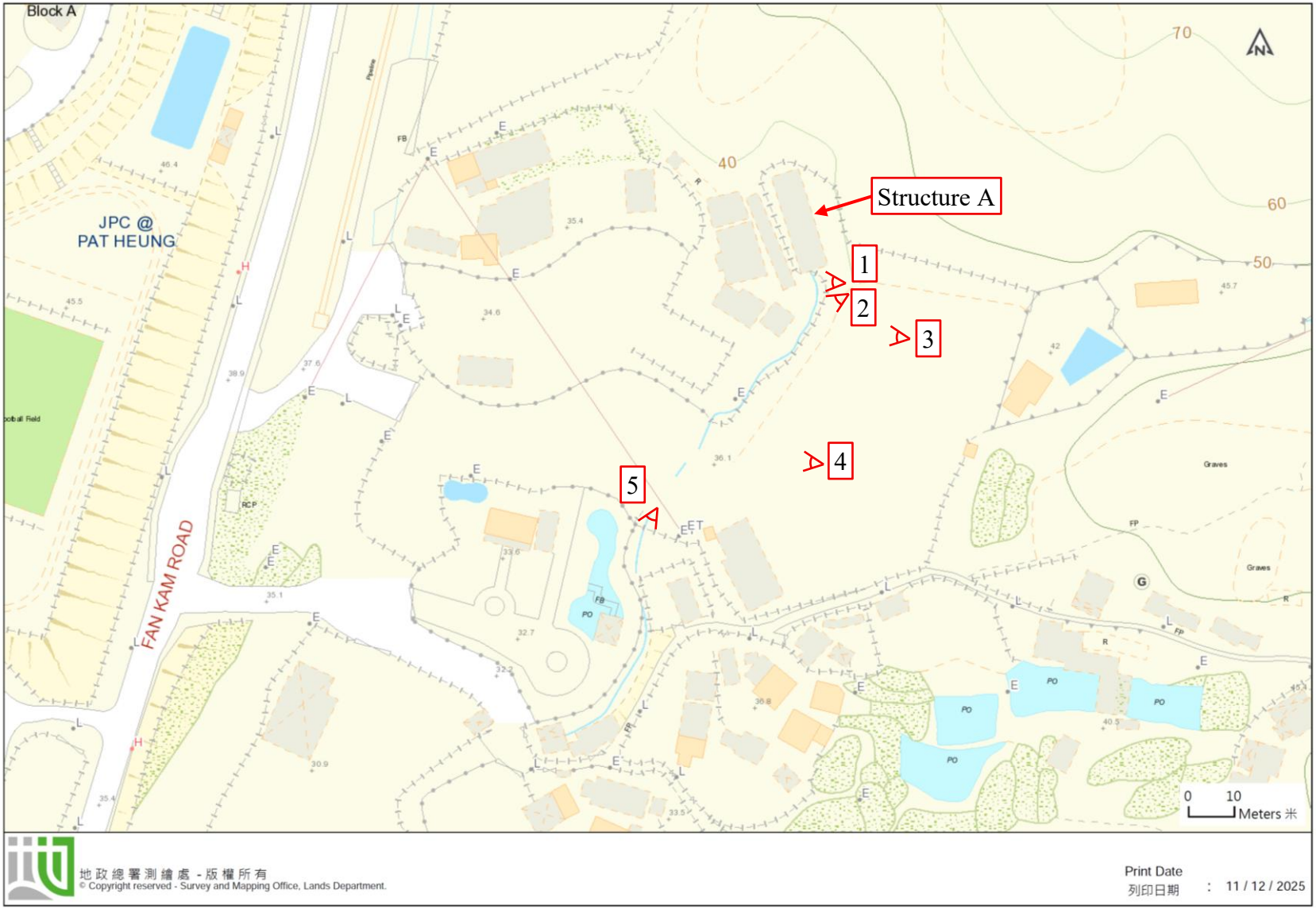
TYPICAL SECTION OF
U-CHANNEL WITH COVER
(N.T.S.)



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)**

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

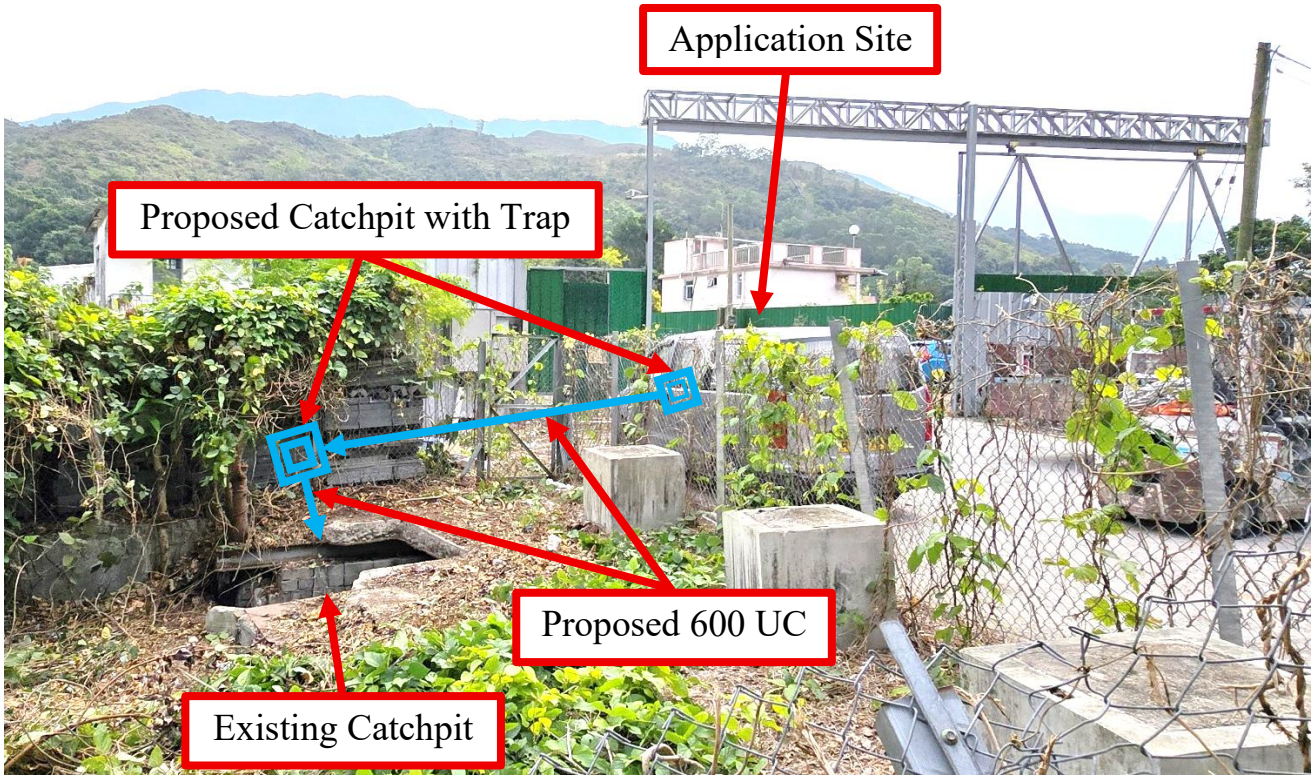
Viewpoint 3

Viewpoint 4

Viewpoint 5


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

Viewpoint 6



Viewpoint 7

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	38.60
Invert level (mPD)	37.30	36.81

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 39.2 m
Depth of vertical part of u-channel, d = 1490 mm
Gradient of u-channel, S_f = (37.3-36.81)/39.2 = 0.0125

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 1490
= 1.035 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 1490
= 3.922 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.264 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.264)^1/6 x (0.264 x 0.012)^1/2 / 0.016 — SDM Table 12
= 2.88 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 / (2.4+0.2+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 269 — 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 = $1.16 \times 0.278i \Sigma C_jA_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 269 x 1207.15 / 1000000 + 0 — Corrigendum 1/2022
= 0.105 m^3/s

Allowable flow, Q_a = a x v
= 1.035 x 2.88
= 2.977 m^3/s

> Q_d (O.K.)

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

Scale: NA	**Hydraulic Calculation**	Goldrich Planners & Surveyors Ltd.
January 2026	Lots 29 (Part), 33 (Part) and 35 (Part) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long	Page 1 (P25025)

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)	38.60	38.20
Invert level (mPD)	36.81	36.29

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 41.5 m
Depth of vertical part of u-channel, d = 1610 mm
Gradient of u-channel, S_f = (36.81-36.29)/41.5 = 0.0125

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 1610
= 1.107 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 1610
= 4.162 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.266 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.266)^1/6 x (0.266 x 0.013)^1/2 / 0.016 — SDM Table 12
= 2.89 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
= 266 — 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 = 0.105 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 266 x 1061.15 / 1000000 + 0.1(— Corrigendum 1/2022
= 0.196 m^3/s

Allowable flow, Q_a = a x v
= 1.107 x 2.89
= 3.205 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 concentration, 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)	38.20	35.70
Invert level (mPD)	36.29	34.94

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 67.5 m
Depth of vertical part of u-channel, d = 460 mm
Gradient of u-channel, S_f = (36.29-34.94)/67.5 = 0.020

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 460
= 0.417 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 460
= 1.862 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.224 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.224)^1/6 x (0.224 x 0.02)^1/2 / 0.016 — SDM Table 12
= 3.26 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 / (1.8+0.3+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 278 — 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	750.0	712.5
		SUM =	712.5

— SDM 7.5.2 (b)

Upstream flow, Q_u = 0.196 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 278 x 712.5 / 1000000 + 0.196 — Corrigendum 1/2022
= 0.260 m^3/s

Allowable flow, Q_a = a x v
= 0.417 x 3.26
= 1.361 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)	38.10	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 = (38.1-37.72)/56.8 = 0.0067

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 0.007)^1/2 / 0.016 — SDM Table 12
= 1.93 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 / (2.8+0.5+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 259 — 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 259 x 3375.25 / 1000000 + 0 — Corrigendum 1/2022
= 0.282 m^3/s

Allowable flow, Q_a = a x v
= 0.489 x 1.93
= 0.947 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 = 0.282 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 + 0.282 — Corrigendum 1/2022
= 0.365 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 = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 310
= 0.327 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 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 = 0.365 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 277 x 603.25 / 1000000 + 0.365 — Corrigendum 1/2022
= 0.419 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	34.94

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 71.4 m
Depth of vertical part of u-channel, d = 460 mm
Gradient of u-channel, S_f = (35.29-34.94)/71.4 = 0.005

Cross-Section Area, a = $0.5 \pi r^2 + w d$ = 0.5 x 3.14 x 300^2 + 600 x 460
= 0.417 m^2
Wetted Perimeter, p = $\pi r + 2 d$ = 3.14 x 300 + 2 x 460
= 1.862 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.224 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.224)^1/6 x (0.224 x 0.005)^1/2 / 0.016 — SDM Table 12
= 1.61 m/s
Time of flow, t_f = 0.7 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+0.7+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 280 — 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 = 0.419 m^3/s

Design flow, Q_d = $1.16 x 0.278i \Sigma C_jA_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 1.16 x 0.278 x 280 x 485.45 / 1000000 + 0.41
= 0.463 m^3/s — Corrigendum 1/2022

Allowable flow, Q_a = a x v
= 0.417 x 1.61
= 0.674 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)	34.94	34.80

Width of u-channel, w = 600 mm
Length of u-channel, L_c = 14.5 m
Depth of vertical part of u-channel, d = 500 mm
Gradient of u-channel, S_f = (34.94-34.8)/14.5 = 0.010

Cross-Section Area, a = $0.5\ \pi r^2 + w\ d$ = 0.5 x 3.14 x 300^2 + 600 x 500
= 0.441 m^2
Wetted Perimeter, p = $\pi\ r + 2\ d$ = 3.14 x 300 + 2 x 500
= 1.942 m
Hydraulic radius, R = a / p — SDM 8.2.1
= 0.227 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.227)^1/6 x (0.227 x 0.01)^1/2 / 0.016 — SDM Table 12
= 2.29 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
= 328 — 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 328 x 0 / 1000000 + 0.723 — Corrigendum 1/2022
= 0.723 m^3/s

Allowable flow, Q_a = a x v
= 0.441 x 2.29
= 1.009 m^3/s

> Q_d (O.K.)

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