N

This portion of the u-channel is outside the application boundary but within the lot boundary which is on the same lot of the application. The applicant undertakes the management of this portion of u-channel.

Ex. CP2
G.L 14.5
I.L 13.62

Existing 300UC 1:100

Existing 500UC 1:200

Existing 300pipe 1:3

Existing 300UC 1:100

B1

Existing 550mm Public drain

G.L 11.3
I.L 10.6

①

②

CUL

G.L 11.3
I.L 10.36

Existing Local Ditch

New CP4
G.L 14.5
I.L 13.63

Application Site

Ex. CP5
G.L 14.5
I.L 13.35

Fall

A

Existing 300UC 1:100

Fall

Fall

Existing Structure

Existing 300UC 1:100

Fall

Fall

Ex. CP1
G.L 14.6
I.L 14.06

Existing 300UC 1:100

Fall

A1

Existing 300UC 1:100

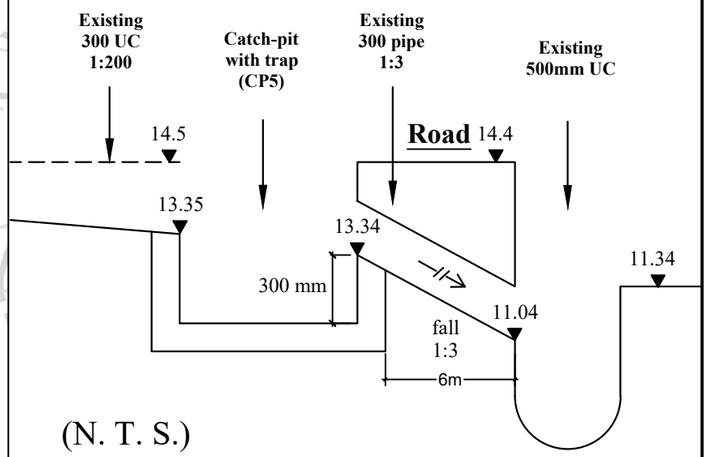
G.L 14.7
I.L 14.4

G.L 14.7
I.L 14.23

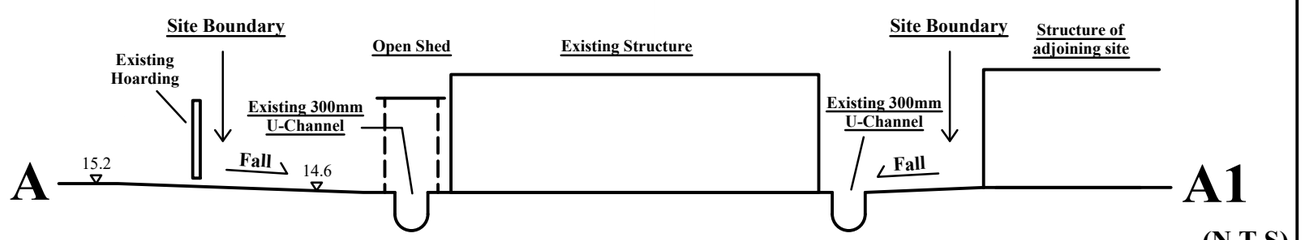
B

New CP3
G.L 14.6
I.L 14.04

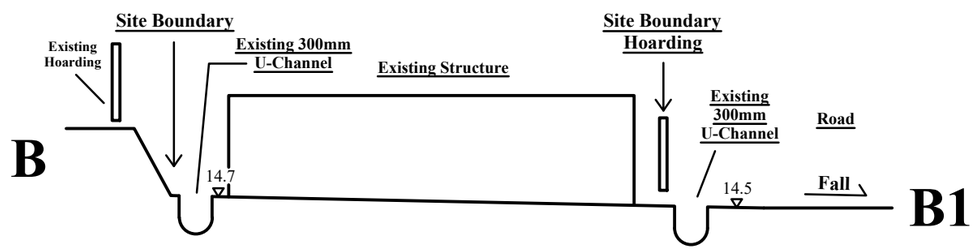
Connection details of proposed outfall between CP5 and existing 500 UC



(N. T. S.)



(N.T.S)

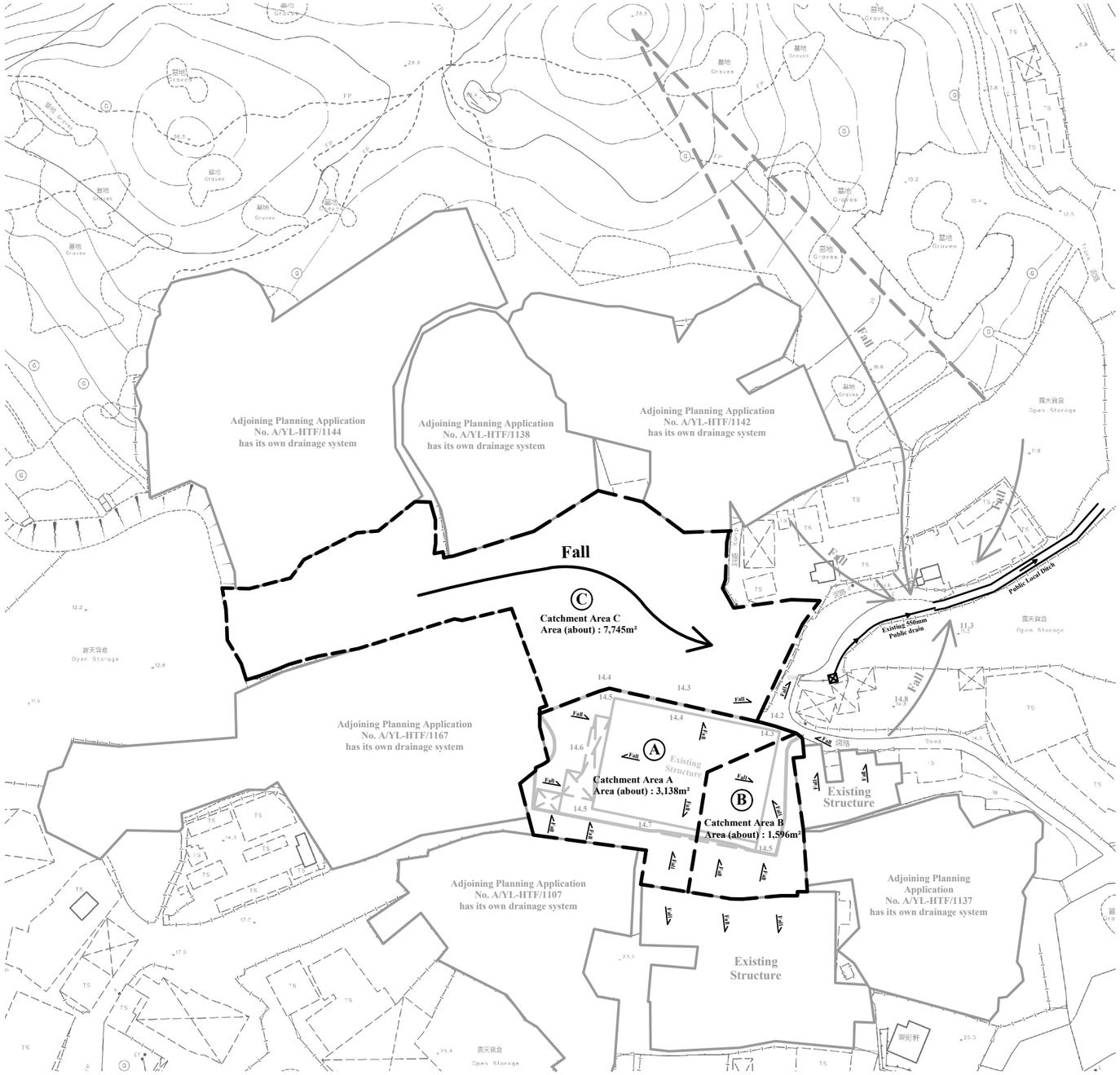


(N.T.S)

Legend

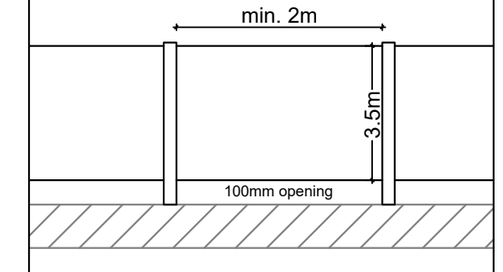
- Catch-pit
- Catch-pit with trap
- Existing U-Channel
- Covered U-Channel
- Existing Pipe
- Viewpoint of drainage photo

1:500(A3)	**Drainage Proposal** **Lots 154 (Part), 159 S.A (Part) in D.D. 128 and Adjoining Government Land, Yuen Long, New Territories**	Goldrich Planners & Surveyors Ltd.
February 2025		Plan 1.1 (P 24034)



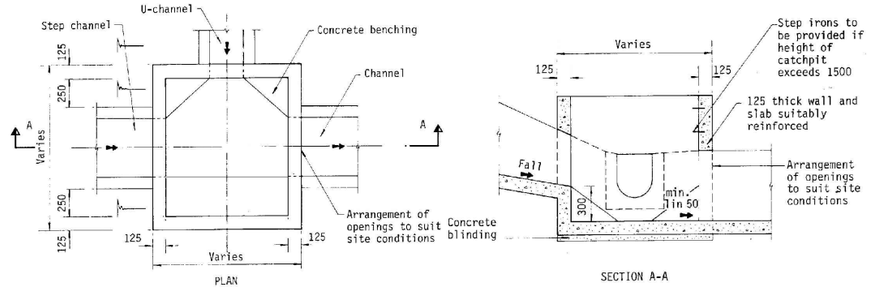
AREA OF CATCHMENT

(N.T.S)

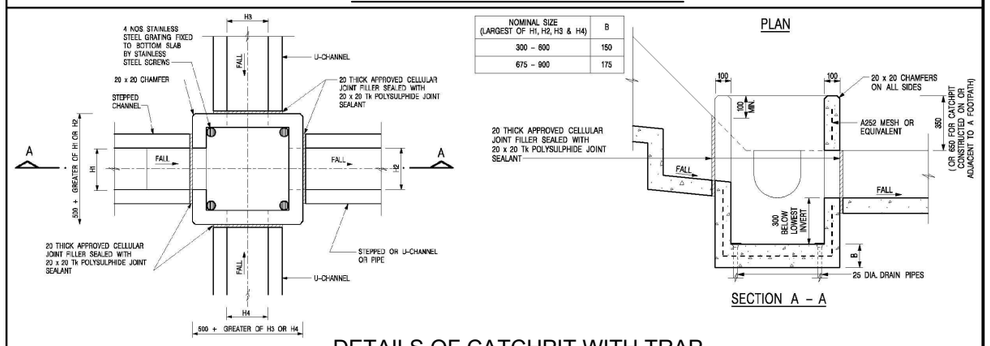


Details of hoarding with 100mm opening

(N. T. S.)

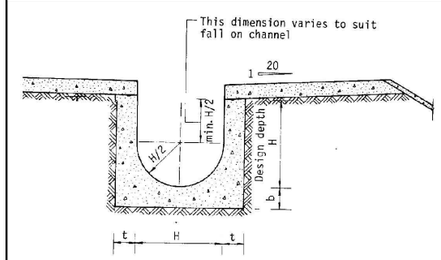


TYPICAL DETAILS OF CATCHPIT

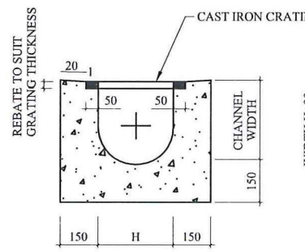


DETAILS OF CATCHPIT WITH TRAP

(REFER TO CEDD'S STANDARD DWG. C2406/1)

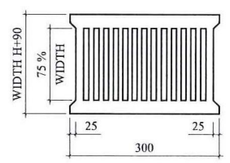


TYPICAL DETAILS OF U CHANNEL



TYPICAL SECTION OF
U-CHANNEL WITH COVER

(N.T.S.)



CAST IRON CRATING
(HEAVY DUTY)

N.T.S	**Drainage Proposal** **Lots 154 (Part), 159 S.A (Part) in D.D. 128 and Adjoining Government Land, Yuen Long, New Territories**	**Goldrich Planners & Surveyors Ltd.**
February 2025		**Plan 1.2** **(P 24034)**

1 For Catchment Area A

Ref.

Area, A = **3138** m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = **22.5** m

Time of concentraction, t_o = 0.14465L / ($H^{0.2}A^{0.1}$) = 0.14465 (22.5) / (0.1^0.2*3138^0.1) — SDM 7.5.2 (d)
= 2.3 min

2 For U-Channel of Catchment Area A

	From	To
Ground level (mPD)	**14.70**	**14.40**
Invert level (mPD)	**14.40**	**13.35**

Width of u-channel, w = **300** mm
Length of u-channel, L_c = **105.2** m
Depth of vertical part of u-channel, d = 900 mm
Gradient of u-channel, S_f = (14.4-13.35)/105.2 = 0.0100

Cross-Section Area, a = 0.5 πr^2 + w d = 0.5 x 3.14 x 150^2 + 300 x 900
= 0.305 m^2
Wetted Perimeter, p = π r + 2 d = 3.14 x 150 + 2 x 900
= 2.271 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.134 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 = (0.134)^1/6 x (0.134 x 0.01)^1/2 / 0.016 — SDM Table 12
= 1.64 m/s
Time of flow, t_f = 1.1 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 / (2.3+1.1+3.29)^0.35 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	**3145.0**	2987.8
		SUM =	2987.8

SDM 7.5.2 (b)

Upstream flow, Q_u = **0** m^3/s

Design flow, Q_d = 0.278i Σ C_jA_j x 1.16 + Q_u where A_j is in km^2 — SDM 7.5.2 (a)
= 0.278 x 258 x 2987.75 / 1000000 + 0
= 0.214 m^3/s

Allowable flow, Q_a = a x v
= 0.305 x 1.64
= 0.500 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 = **1589** m^2
Average slope, H = 0.1 m per 100m
Distance on the line of natural flow, L = **20.5** m

Time of concentraction, t_o = $0.14465L / (H^{0.2}A^{0.1})$ = 0.14465 (20.5) / (0.1^0.2*1589^0.1) — SDM 7.5.2 (d)
= 2.2 min

2 For U-Channel of Catchment Area B

	From	To
Ground level (mPD)	**14.60**	**14.40**
Invert level (mPD)	**14.23**	**13.35**

Width of u-channel, w = **300** mm
Length of u-channel, L_c = **88.2** m
Depth of vertical part of u-channel, d = 900 mm
Gradient of u-channel, S_f = (14.23-13.35)/88.2 = 0.0100

Cross-Section Area, a = $0.5 \pi r^2 + w d$ = 0.5 x 3.14 x 150^2 + 300 x 900
= 0.305 m^2
Wetted Perimeter, p = $\pi r + 2 d$ = 3.14 x 150 + 2 x 900
= 2.271 m
Hydralic radius, R = a / p — SDM 8.2.1
= 0.134 m

3 Use Manning Equation for estimating velocity of stormwater

Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (0.134)^1/6 x (0.134 x 0.01)^1/2 / 0.016 — SDM Table 12
= 1.64 m/s
Time of flow, t_f = 0.9 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 / (2.2+0.9+3.29)^0.35 for return period T = 50 years — Corrigendum 1/2024
= 261 — 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	**1589.0**	1509.6
		SUM =	1509.6

— SDM 7.5.2 (b)

Upstream flow, Q_u = **0** m^3/s

Design flow, Q_d = $0.278i \Sigma C_jA_j$ x 1.16 + Q_u where A_j is in km^2 — SDM 7.5.2 (a)
= 0.278 x 261 x 1509.55 / 1000000 + 0
= 0.110 m^3/s

Allowable flow, Q_a = a x v
= 0.305 x 1.64
= 0.500 m^3/s

> Q_d (O.K.)

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

1 For Catchment Area of 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 concentraction, 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 Underground Pipe after Existing CP5

Size(Diameter) w = **300** mm
Length of Pipe = **6** m
Design the pipe to 9/10 full bore capactity, then
Area of ventilated portion = 0.1 of pipe area
$½ r^2 \theta - ½ r^2 \sin(\theta)$ = $0.1 \pi r^2$
$\theta - \sin(\theta)$ = 0.2 π
θ = 1.63 rad = 93.4^O (By trial and error)

Area A = $0.9 \pi r^2$
= 0.9 x 3.14 x 300^2 — SDM 8.2.1
= 0.254 m^2

Wetted Perimeter P = $2 \pi r - r \theta$ = 1396 mm
Hydralic radius R = A/P
182.2 mm

3 Use Manning Equation for estimating velocity of stormwater

Fall S = 1: **3**
Take n = 0.016 for concrete lined channels:- — SDM Table 13
Allowable velocity, v = $R^{1/6} x (RS_f)^{1/2}/n$ = (182.2)^1/6 * (182.2/3)^1/2 / 0.016 — SDM Table 12
= 13.47 m/s
Time of flow, t_f = 0.01 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+0.01+3.29)^0.355 for return period T = 50 years — Corrigendum 1/2024
= 331 — 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
Macadam Roadways	0.425	**0.0**	0.0
Wooded Areas	0.105	**0.0**	0.0
		SUM =	0.0

— SDM 7.5.2 (b)

Upstream flow, Q_u = **0.324** m^3/s

Design flow, Q_d = $0.278i \Sigma C_j A_j + Q_u$ where A_j is in km^2 — SDM 7.5.2 (a)
= 0.278 x 331 x 0 / 1000000 + 0.324
= 0.324 m^3/s

Allowable flow, Q_a = a x v
= 0.3974 x 1.35
= 3.425 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	=	**7745** m^2	
Average slope, H	=	0.1 m per 100m	
Distance on the line of natural flow, L	=	**190.5** m	
Time of concentraction, t_o	=	0.14465L / ($H^{0.2}A^{0.1}$) = 0.14465 (190.5) / (0.1^0.2*7745^0.1)	SDM 7.5.2 (d)
	=	17.8 min	

2 For Existing 550mm Public Drain

	From	To
Ground level (mPD)	**11.30**	**11.30**
Invert level (mPD)	**10.60**	**10.36**

Width of u-channel, w	=	**550** mm	
Length of u-channel, L_c	=	**46.8** m	
Depth of vertical part of u-channel, d	=	665 mm	
Gradient of u-channel, S_f	=	(10.6-10.36)/46.8 = 0.0051	
Cross-Section Area, a	=	0.5 πr^2 + w d = 0.5 x 3.14 x 275^2 + 550 x 665	
	=	0.485 m^2	
Wetted Perimeter, p	=	π r + 2 d = 3.14 x 275 + 2 x 665	
	=	2.194 m	
Hydralic radius, R	=	a / p	SDM 8.2.1
	=	0.221 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 = (0.221)^1/6 x (0.221 x 0.005)^1/2 / 0.016	SDM Table 12
	=	1.64 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 / (17.8+0.5+3.29)^0.3 for return period T = 50 years	Corrigendum 1/2024
	=	170	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	**7745.0**	7357.8	
		SUM =	7357.8	

Upstream flow, Q_u	=	**0.324** m^3/s	
Design flow, Q_d	=	0.278i Σ C_jA_j x 1.16 + Q_u where A_j is in km^2	SDM 7.5.2 (a)
	=	0.278 x 170 x 7357.75 / 1000000 + 0.324	
	=	0.671 m^3/s	
Allowable flow, Q_a	=	a x v	
	=	0.485 x 1.64	
	=	0.713 m^3/s	
	>	Q_d (O.K.)	

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

Viewpoint 1

Viewpoint 2