

Your Ref.: TPB/A/NE-TK/800

7 February, 2025

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

Dear Sir/Madam,

**Temporary Private Vehicle Park (Private Cars and Light Goods Vehicles Only)
for a Period of 3 Years and Associated Filling of Land in “Green Belt”, “Village
Type Development” and area shown as “Road”
Various Lots in D.D. 26, Shuen Wan Chim Uk, Ting Kok, Tai Po, New Territories
(Application No. A/NE-TK/800)
Submission of Revised Stormwater Drainage Proposal**

Further to your email with comments from Drainage Services Department (DSD), we are pleased to tabulate the following responses to your comments for your easy reference:

Item	DSD comments	Our Responses
(a)	R to C Item H refers. Please indicate on the drainage proposal that catchpit with trap (CP19) will be provided. Details of the catchpit with trap should also be provided.	The "existing catchpit CP19 to be modified to desilted catchpit" is already marked on drainage plan and the details of desilted catchpit is provided in this resubmission.
(b)	It is noted that the existing 375 U-channels between catchpits CP15 and CP20 will be upgraded to 450 U-channels. Please advise if the invert levels of the proposed 450 U-channels will be same as the invert levels of the existing 375 U-channels. Details of the proposed u-channel and its grating cover should also be provided.	The invert level of the catchpit CP15 to CP20 and proposed 450UC is already revised in this resubmission. Besides, the details of u-channel and its grating cover are provided in this resubmission.
(c)	Sections A-A, B-B and C-C do not match with the existing site condition. Please review.	The section A-A, B-B and C-C is revised to match with the existing condition in this resubmission.

添比建設有限公司

Ratio Architecture & Construction Limited



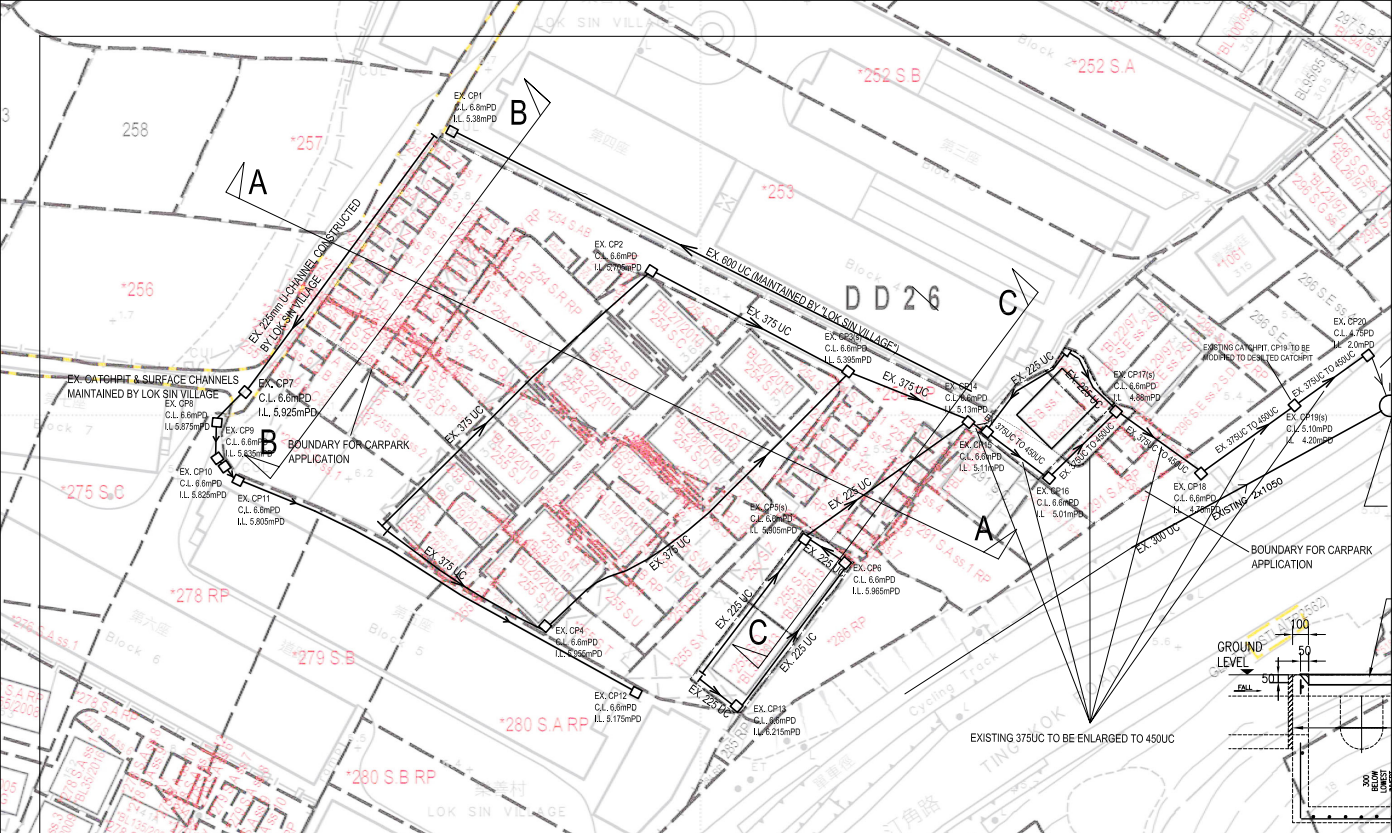
We are pleased to submit herewith revised stormwater drainage plan and revised catchment area plan of the captioned development for DSD's approval.

Yours faithfully,
On behalf of



Ratio Architecture & Construction Limited
Mr. Dennis TSE
Director

Encl. As stated



- LEGEND:**
- EX. 225UC → EXISTING 225mm U-CHANNEL
 - EX. 375UC → EXISTING 375mm U-CHANNEL
 - EX. CP □ EXISTING CATCHPIT
 - EX. CP3(s) □ EXISTING DESILTED CATCHPIT

GENERAL NOTE

1. THE PROPOSED DRAINAGE WORK, WHETHER WITHIN OR OUTSIDE THE LOT BOUNDARY, SHOULD BE CONSTRUCTED AND MAINTAINED BY THE LOT OWNER AT HIS OWN EXPENSE. FOR WORKS TO BE UNDERTAKEN OUTSIDE THE LOT BOUNDARY, PRIOR CONSENT AND AGREEMENT FROM DLO AND/OR RELEVANT PRIVATE LOT OWNER SHOULD BE SOUGHT.
2. THE 100mm OPENING AT 1m C/C SHALL BE PROVIDED AT THE BOTTOM OF HOARDING OR WALLS IF ANY.

CONCRETE STRENGTH AND STEEL REINFORCEMENT SPECIFICATION FOR DRAINAGE DETAILS

1. CONCRETE GRADE FOR CATCHPITS AND U-CHANNEL SHALL BE 30D DESIGN IN COMPLIANCE WITH CS1 : 2010 FOR BLINDING LAYER SHALL BE 15D, DESIGN COMPLY WITH CS1-2010.
2. ALL MAIN BARS TO BE HOT ROLLED HIGH YIELD STEEL DEFORMED BAR COMPLY WITH CS2 : 2012
Y – HIGH YIELD BAR 500 MPa
M – MILD STEEL BAR 250 MPa
3. CONCRETE COVER TO MAIN REINFORCEMENT TO BE 50mm.
4. LAP LENGTH FOR ALL BARS TO BE 46x DIAMETER OF LARGER BAR TO BE LAPPED.
5. REACTIVE ALKALI CONTENT EXPRESSED IN SODIUM OXIDE PER CUBIC METER OF CONCRETE SHOULD NOT EXCEED 3KG AS PER PNAP APP-74.

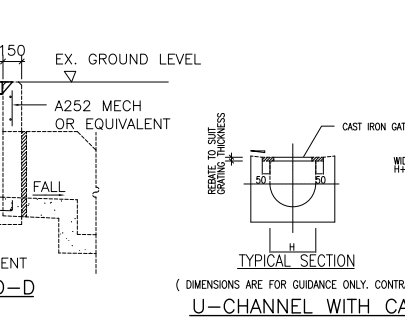
HALF ROUND, U, AND STEPPED – CHANNELS

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. CONCRETE SURFACE FINISHING SHALL BE CLASS U2 OR F2 AS APPROPRIATE
3. FOR HALF ROUND AND U – CHANNEL, SPACING OF EXPANSION JOINT IN CHANNELS, BERMS AND APRON TO BE 10m MAXIMUM. FOR STEPPED CHANNELS, EXPANSION JOINTS TO BE PROVIDED AT A MAXIMUM SPACING OF 10m.
4. DIMENSIONS FOR HALF ROUND AND U-CHANNELS SEE TABLE 1.
5. THE COVER FOR U-CHANNELS AND CATCHPIT SHALL COMPLY WITH CEDD'S STANDARD DRAWINGS NO. C2405 TO C2407 AND C2412.
6. ALL PROPOSED U-CHANNELS SHALL BE COVERED WITH GRATING

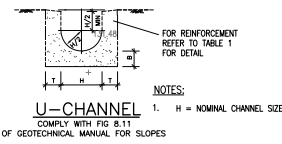
TABLE 1 : DIMENSION OF U-CHANNEL AND HALF-ROUND CHANNEL

NORMAL SIZE H	T	B	REINFORCING
<300	100	100	NIL
375 – 675	150	150	NIL
750 – 900	175	175	A252 MESH PLACED CENTRALLY

SECTION D – D WITH DESILTED TRAP
COMPLY WITH CEDD'S DRAWING NO. DS C2405 AND C2406I



TYPICAL SECTION CAST IRON GRATING
(DIMENSIONS ARE FOR GUIDANCE ONLY. CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)
U-CHANNEL WITH CAST IRON GRATING



U-CHANNEL
COMPLY WITH FIG 8.11 OF GEOTECHNICAL MANUAL FOR SLOPES

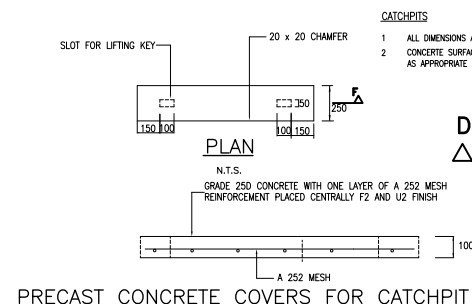
REV	DESCRIPTION	CHECKED	APPROVED	DATE
B	DSO'S COMMENT	RC	AY	RY FEB 25
A	DSO'S COMMENT	RC	AY	RY DEC 24
	DLO SUBMIT	RC	AY	RY NOV 24

ENGINEERING CONSULTANT
RATIO ARCHITECTURE & CONSTRUCTION COMPANY
2/F, NO.73 KWONG FUK ROAD, TAI PO, N.T.

PROJECT TITLE:
STORMWATER DRAINAGE PROPOSAL FOR TEMPORARY PRIVATE VEHICLE PARK (PRIVATE CARS AND LIGHT GOODS VEHICLES ONLY) FOR A PERIOD OF 3 YEARS AT VARIOUS LOT IN D.D. 26 AT SHUEN WAN CHIM UK, TAI PO

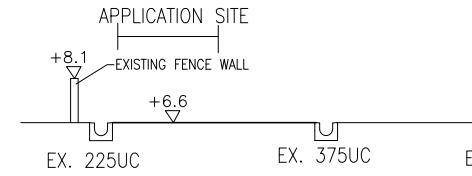
DRAWING TITLE:
DRAINAGE PROPOSAL PLAN AND TYPICAL DETAILS

SCALE :	N.T.S.	CAD FILE:	CAD_REF
DRAWN	RY	DRAWING NO.	
S.D	RY	SDP001B	
DESIGNED	RC		
CHECKED	AY	B.D. REF. NO.:	

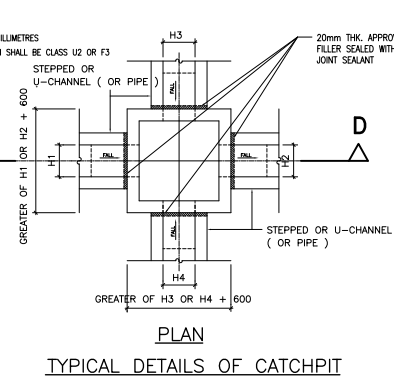


PRECAST CONCRETE COVERS FOR CATCHPIT

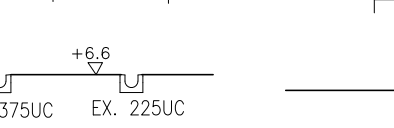
N.T.S.



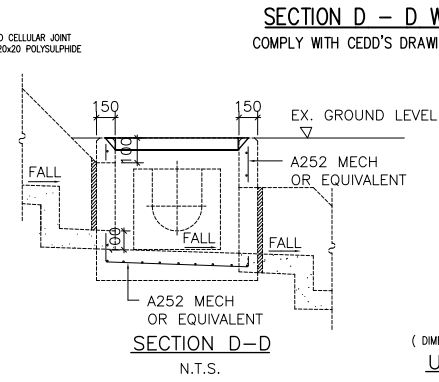
SECTION A-A
(NO FILLING AND EXCAVATION WORKS IS PROPOSED)



TYPICAL DETAILS OF CATCHPIT



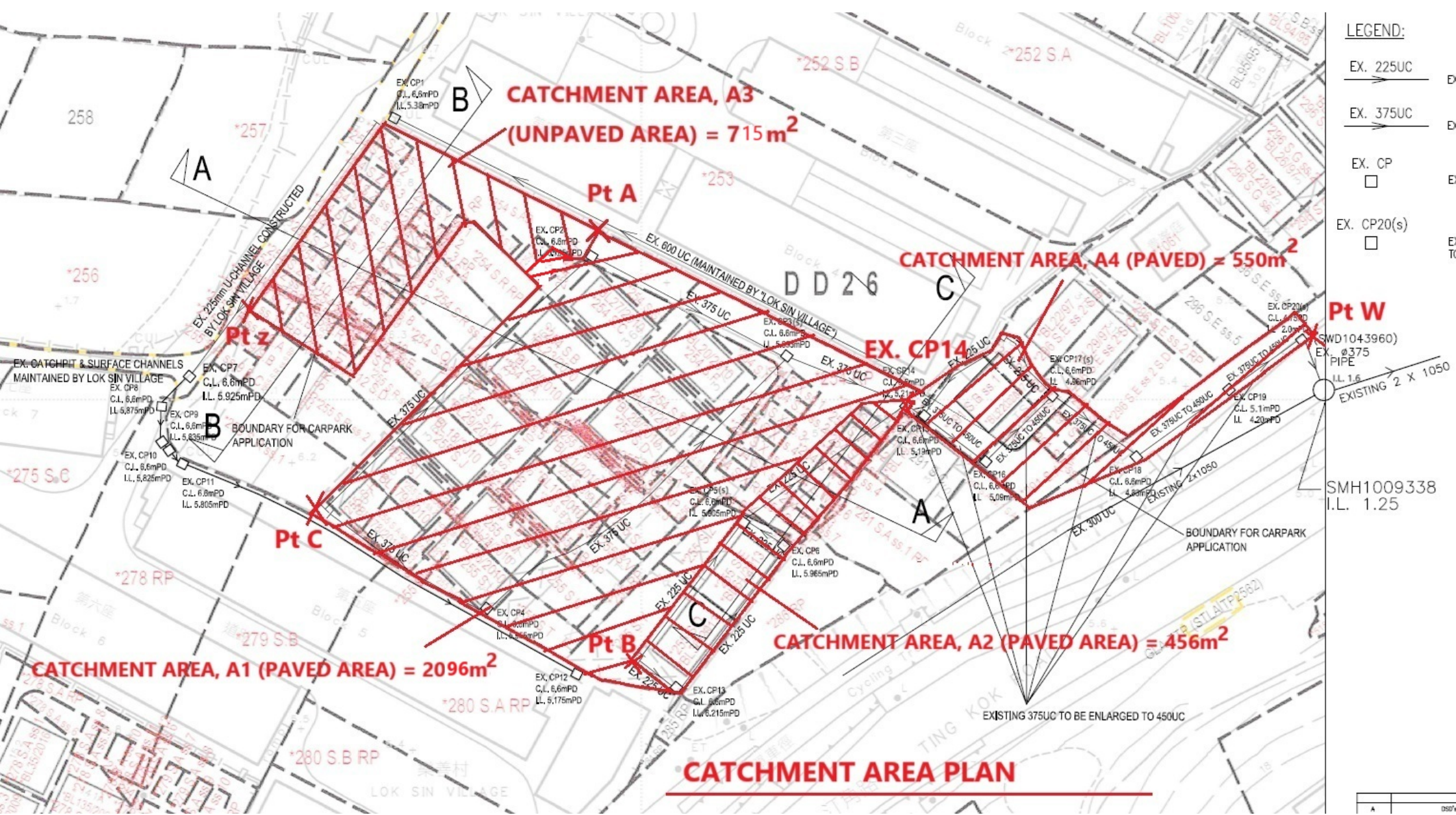
SECTION B-B
(NO FILLING AND EXCAVATION WORKS IS PROPOSED)



SECTION C-C
(NO FILLING AND EXCAVATION WORKS IS PROPOSED)



SECTION D-D
(NO FILLING AND EXCAVATION WORKS IS PROPOSED)



- LEGEND:**
- EX. 225UC
 - EX. 375UC
 - EX. CP
 - EX. CP20(s)

CATCHMENT AREA PLAN

A	050
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Project No.: Drainage Design at Chim Uk,Tai Po Date: 7-Feb-25
 Prepared by: Ray Cheng

Check for the drainage capacity of existing 375UC

Catchment area, A1 = 2096 m² Assume k = 0.95 for paved surface

Total Catchment Area, A = A1 x 0.95 = 1991.2 m²

Use Rational Method from Geo-Manual

$$Q = kiA/3600$$

where,

Q = Maximum runoff (lit/sec)

k = Runoff coefficient

i = Design mean intensity of rainfall (mm/hr)

A = Total catchment area (m²)

Longest distance from summit point to outlet, Ex. CP14

(Ld) = 102.00 m

Shortest distance from summit point to outlet, Ex. CP14

(Ls) = 84.00 m

Elevation of remote point (Pt C) = 6.60 mPD

Elevation of outlet point, Ex. CP14 = 4.80 mPD

Average fall, H = (z₁-z₂)/L_s x 100
 = 2.14 m per 100m

From TGN30

$$T_c = 0.14465 \times L_d / (H^{0.2} \times A^{0.1})$$

$$= 5.93 \text{ min}$$

Assume a 1 in 50 year design rainfall return period for rural area
 From Geo-Manual (Fig 8.2)

$$i = 310 \text{ mm/hr}$$

$$Q = \frac{kiA}{60} \times 1.16 = 11934 \text{ lit/min}$$

From TGN 43A1

For existing 375 UC with 1 in 100 gradient

Maximum capacity = 13500 lit/min > 11934 o.k.

The corresponding velocity = 2.00 m/s < 4 o.k.

Project No.: Drainage Design at Chim Uk, Tai Po Date: 14-Dec-24
 Prepared by: Ray Cheng

Check for the drainage capacity of existing 225UC

Catchment area, A2 = 456 m² Assume k = 0.95 for paved surface
 Total Catchment, A= A2 x 0.95 = 433.2 m³

Use Rational Method from Geo-Manual

$$Q = kiA/3600$$

where,

Q = Maximum runoff (lit/sec)
 k = Runoff coefficient
 i = Design mean intensity of rainfall (mm/hr)
 A = Total catchment area (m²)

Longest distance from summit point to outlet, Pt Y (Ld) = 70.00 m
 Shortest distance from summit point to outlet, Pt Y (Ls) = 53.00 m

Elevation of remote point (Pt B) = 6.60 mPD
 Elevation of outlet point, Pt Y = 4.35 mPD

Average fall, H = (z₁-z₂)/L_s x 100
 = 4.25 m per 100m

From TGN30

$$T_c = 0.14465 \times L_d / (H^{0.2} \times A^{0.1})$$

$$= 4.13 \text{ min}$$

Assume a 1 in 50 year design rainfall return period for rural area
 From Geo-Manual (Fig 8.2)

i = 340 mm/hr
 Q = kiA/60 x 1.16
 = 2848 lit/min

From TGN 43A1

For existing 225 UC with 1 in 100 gradient

Maximum capacity = 3510 lit/min > 2848 o.k.
 The corresponding velocity = 1.40 m/s < 4 o.k.

Project No.: Drainage Design at Chim Uk, Tai Po Date: 7-Feb-25
 Prepared by: Ray Cheng

Check for the drainage capacity of existing 225UC

Catchment area, A3 = 715 m² Assume k = 0.3 for unpaved surface
 = 715 x 0.3 m²
 = 214.5 m²

Use Rational Method from Geo-Manual

$Q = kiA/3600$

where,

Q = Maximum runoff (lit/sec)
 k = Runoff coefficient
 i = Design mean intensity of rainfall (mm/hr)
 A = Total catchment area (m²)

Longest distance from summit point to outlet, Pt Z (Ld) = 69.00 m
 Shortest distance from summit point to outlet, Pt Z (Ls) = 55.00 m

Elevation of remote point (Pt A) = 6.60 mPD
 Elevation of outlet point, Pt Z = 5.92 mPD

Average fall, H = $(z_1 - z_2) / L_s \times 100$
 = 1.24 m per 100m

From TGN30

$T_c = 0.14465 \times L_d / (H^{0.2} \times A^{0.1})$
 = 5.59 min

Assume a 1 in 50 year design rainfall return period for rural area
 From Geo-Manual (Fig 8.2)

i = 315 mm/hr
 Q = $kiA/60 \times 1.16$
 = 1306 lit/min

From TGN 43A1

For existing 225 UC with 1 in 100 gradient

Maximum capacity = 3510 lit/min > 1306 o.k.
 The corresponding velocity = 1.40 m/s < 4 o.k.

Project No.: Drainage Design at Chim Uk,Tai Po Date: 16-Dec-24
 Prepared by: Ray Cheng

Check for the drainage capacity of proposed 450UC

Catchment area,	A1	=	2085	m ²	Assume k = 0.95 for paved surface
	A2	=	456	m ²	
	A4	=	550	m ²	
Total Catchment Area, A = (A1+A2+A4) x 0.95 =			2936.45	m ²	

Use Rational Method from Geo-Manual

$Q = kiA/3600$ where, $Q = \text{Maximum runoff (lit/sec)}$
 $k = \text{Runoff coefficient}$
 $i = \text{Design mean intensity of rainfall (mm/hr)}$
 $A = \text{Total catchment area (m}^2\text{)}$

Longest distance from summit point to outlet, Pt W (Ld) = 161.00 m
 Shortest distance from summit point to outlet, Pt W (Ls) = 140.00 m

Elevation of remote point (Pt C) = 6.60 mPD
 Elevation of outlet point, Pt W = 4.20 mPD

Average fall, H = $(z_1 - z_2) / L_s \times 100$
 = 1.71 m per 100m

From TGN30

$T_c = 0.14465 \times L_d / (H^{0.2} \times A^{0.1})$
 = 9.41 min

Assume a 1 in 50 year design rainfall return period for rural area
 From Geo-Manual (Fig 8.2)

$i = 270 \text{ mm/hr}$
 $Q = kiA/60 \times 1.16$
 = 15038 lit/min

From TGN 43A1

For proposed 450 UC with 1 in 100 gradient

Maximum capacity = 22500 lit/min > 15038 o.k.
 The corresponding velocity = 2.00 m/s < 4 o.k.

The capacity of the existing 375mm dia. Underground pipe = 28,728 lit/min > 15038lit/min O.K.

GEO Technical Guidance Note No. 30 (TGN 30)
Updated Intensity-Duration-Frequency Curves with Provision for
Climate Change for Slope Drainage Design

Issue No.: 2	Revision: -	Date: 23.10.2018	Page: 3 of 4
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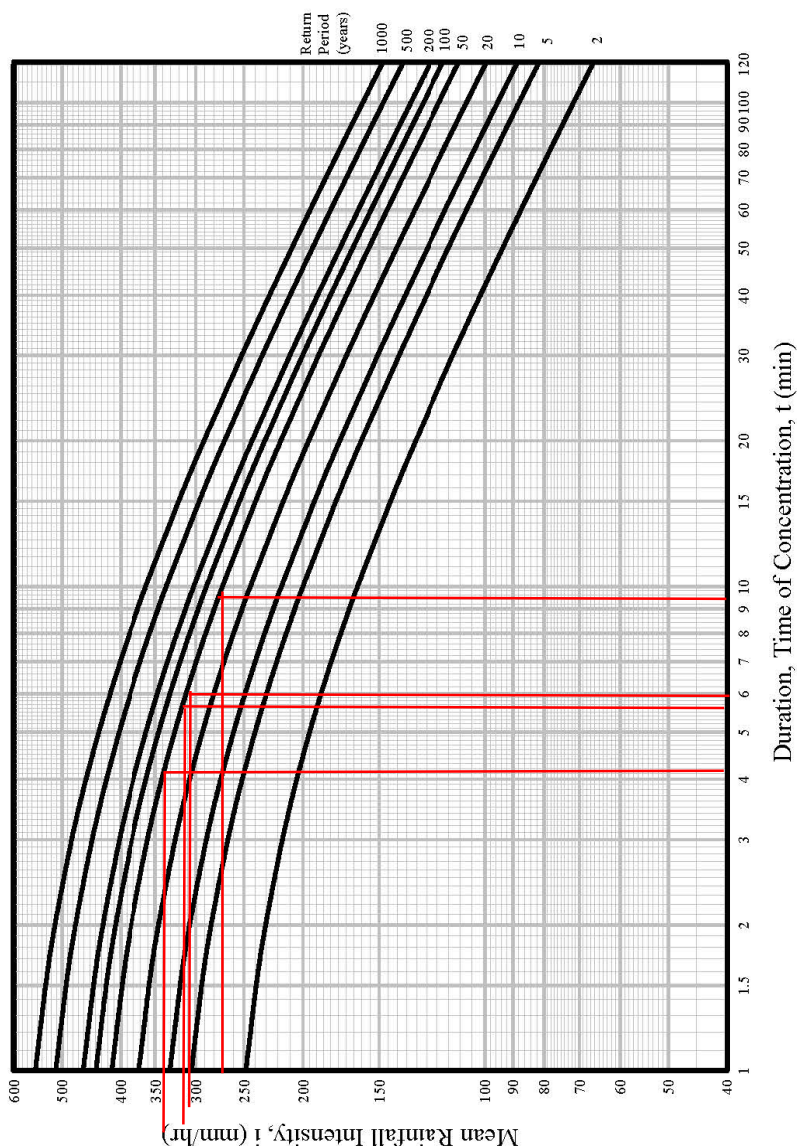
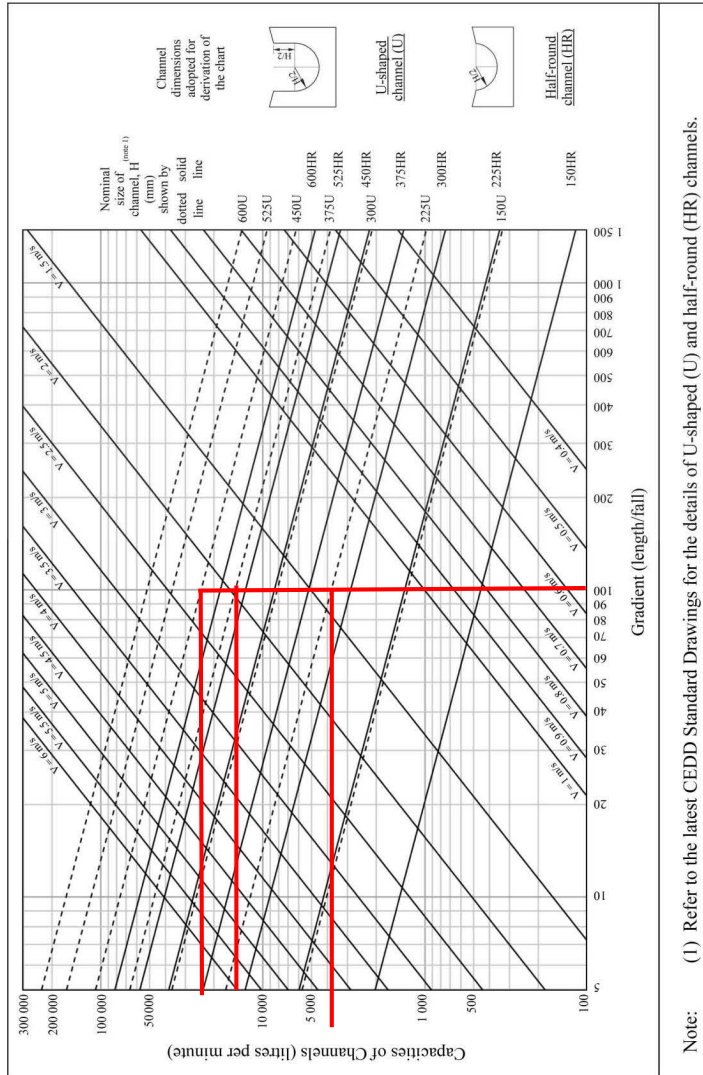


Figure 1 – Updated Intensity-Duration-Frequency Curves

- Notes:
1. These IDF curves are to supersede those given in Figure 8.2 of the Geotechnical Manual for Slopes (GCO, 1984).
 2. These IDF curves have not incorporated any projected climate change effects. Except for temporary slope drainage design, the mean rainfall intensity given by these IDF curves shall be increased by 13.8% for incorporating climate change effects.
 3. The mathematical formulae of these IDF curves are shown in Table 1 of Annex TGN 30 A1.

GEO Technical Guidance Note No. 43 (TGN 43)
Guidelines on Hydraulic Design of U-shaped and Half-round Channels on Slopes

Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600 mm



Since 10% reduction would be considered for deposition of sediment, the capacity of the proposed
 225UC should be $3,900 \times 0.9 = 3,510$ lit/min,
 375UC should be $15,000 \times 0.9 = 13,500$ lit/min,
 450UC should be $25,000 \times 0.9 = 22,500$ lit/min

Upstream level of SWD1043960 is +2.0mPD
 Downstream level of SWD1043960 is +1.6mPD
 Length of SWD1043960 is 5.4m
 Gradient of SWD1043960 = $5.4 / (2 - 1.6) = 1:13.5$

$k_s = 0.600 \text{ mm}$
 $i = 0.004 \text{ to } 0.1$
 ie hydraulic gradient =
 1 in 250 to 1 in 10

Water (or sewage) at 15°C
 full bore conditions.
 velocities in m/s
 discharges in m^3/s

The Capacity of SWD1043960 = $0.532 \times 1000 \times 60 \times 0.9 = 28,728 \text{ l/min} > 15,038 \text{ l/min}$

Gradient	Pipe diameters in mm :											
	350	375	400	450	500	525	600	675	700	750	800	825
0.02000 1/ 50	2.456	2.566	2.673	2.879	3.076	3.171	3.444	3.710	3.795	3.962	4.123	4.203
	0.236	0.283	0.336	0.458	0.604	0.687	0.975	1.328	1.461	1.750	2.073	2.247
0.02200 1/ 45	2.577	2.692	2.804	3.020	3.227	3.327	3.617	3.892	3.981	4.156	4.325	4.409
	0.248	0.297	0.352	0.480	0.634	0.720	1.023	1.393	1.532	1.836	2.174	2.357
0.02400 1/ 42	2.692	2.812	2.929	3.155	3.371	3.476	3.778	4.066	4.159	4.341	4.518	4.605
	0.259	0.311	0.368	0.502	0.662	0.752	1.068	1.455	1.601	1.918	2.271	2.462
0.02600 1/ 38	2.803	2.928	3.050	3.284	3.509	3.618	3.933	4.233	4.329	4.519	4.703	4.794
	0.270	0.323	0.383	0.522	0.689	0.783	1.112	1.515	1.666	1.996	2.364	2.563
0.02800 1/ 36	2.909	3.039	3.165	3.409	3.642	3.755	4.082	4.393	4.493	4.690	4.882	4.975
	0.280	0.336	0.398	0.542	0.715	0.813	1.154	1.572	1.729	2.072	2.454	2.660
0.03000 1/ 33	3.012	3.146	3.277	3.529	3.770	3.888	4.226	4.548	4.652	4.855	5.053	5.151
	0.290	0.347	0.412	0.561	0.740	0.842	1.195	1.627	1.790	2.145	2.540	2.753
0.03200 1/ 31	3.111	3.250	3.385	3.645	3.895	4.015	4.365	4.697	4.805	5.015	5.220	5.320
	0.299	0.359	0.425	0.580	0.765	0.869	1.234	1.681	1.849	2.216	2.624	2.844
0.03400 1/ 29	3.207	3.350	3.489	3.758	4.015	4.140	4.500	4.842	4.953	5.170	5.381	5.484
	0.309	0.370	0.438	0.598	0.788	0.896	1.272	1.733	1.906	2.284	2.705	2.932
0.03600 1/ 28	3.300	3.448	3.591	3.867	4.132	4.260	4.631	4.983	5.097	5.320	5.537	5.644
	0.318	0.381	0.451	0.615	0.811	0.922	1.309	1.783	1.962	2.350	2.783	3.017
0.03800 1/ 26	3.391	3.542	3.690	3.974	4.245	4.377	4.758	5.120	5.237	5.466	5.689	5.799
	0.326	0.391	0.464	0.632	0.834	0.948	1.345	1.832	2.015	2.415	2.860	3.100
0.04000 1/ 25	3.480	3.635	3.786	4.077	4.356	4.491	4.882	5.253	5.374	5.609	5.837	5.950
	0.335	0.401	0.476	0.648	0.855	0.972	1.380	1.880	2.068	2.478	2.934	3.180
0.04200 1/ 24	3.566	3.725	3.880	4.178	4.464	4.602	5.003	5.384	5.507	5.747	5.982	6.097
	0.343	0.411	0.488	0.665	0.877	0.996	1.415	1.926	2.119	2.539	3.007	3.259
0.04400 1/ 23	3.650	3.813	3.972	4.277	4.569	4.711	5.121	5.511	5.637	5.883	6.123	6.241
	0.351	0.421	0.499	0.680	0.897	1.020	1.448	1.972	2.169	2.599	3.078	3.336
0.04600 1/ 22	3.733	3.899	4.061	4.374	4.672	4.817	5.236	5.635	5.764	6.016	6.261	6.381
	0.359	0.431	0.510	0.696	0.917	1.043	1.481	2.016	2.218	2.658	3.147	3.411
0.04800 1/ 21	3.813	3.983	4.149	4.468	4.773	4.921	5.349	5.756	5.888	6.145	6.396	6.519
	0.367	0.440	0.521	0.711	0.937	1.065	1.512	2.060	2.266	2.715	3.215	3.485
0.05000 1/ 20	3.892	4.066	4.235	4.560	4.872	5.023	5.460	5.875	6.010	6.272	6.528	6.654
	0.374	0.449	0.532	0.725	0.957	1.087	1.544	2.102	2.313	2.771	3.281	3.557
0.05500 1/ 18	4.083	4.265	4.442	4.784	5.111	5.269	5.727	6.163	6.304	6.579	6.848	6.979
	0.393	0.471	0.558	0.761	1.003	1.141	1.619	2.205	2.426	2.907	3.442	3.731
0.06000 1/ 17	4.265	4.455	4.640	4.997	5.338	5.504	5.982	6.437	6.585	6.872	7.153	7.290
	0.410	0.492	0.583	0.795	1.048	1.191	1.692	2.304	2.534	3.036	3.595	3.897
0.06500 1/ 15	4.440	4.638	4.830	5.202	5.557	5.729	6.227	6.701	6.854	7.154	7.445	7.589
	0.427	0.512	0.607	0.827	1.091	1.240	1.761	2.398	2.638	3.160	3.742	4.057
0.07000 1/ 14	4.608	4.813	5.013	5.399	5.767	5.946	6.463	6.954	7.113	7.424	7.727	7.876
	0.443	0.532	0.630	0.859	1.132	1.287	1.827	2.489	2.738	3.280	3.884	4.210
0.07500 1/ 13	4.770	4.983	5.190	5.589	5.970	6.155	6.690	7.199	7.364	7.685	7.999	8.153
	0.459	0.550	0.652	0.889	1.172	1.332	1.892	2.576	2.834	3.395	4.021	4.358
0.08000 1/ 13	4.927	5.147	5.360	5.772	6.167	6.358	6.910	7.436	7.606	7.938	8.262	8.420
	0.474	0.568	0.674	0.918	1.211	1.376	1.954	2.661	2.927	3.507	4.153	4.501
0.08500 1/ 12	5.079	5.306	5.526	5.951	6.357	6.554	7.123	7.665	7.840	8.183	8.516	8.680
	0.489	0.586	0.694	0.946	1.248	1.419	2.014	2.743	3.017	3.615	4.281	4.640