寄件者: [redacted]
寄件日期: 2025年10月15日星期三 11:16
收件者: tpbpd/PLAND
副本: [redacted]
主旨: Fw: S. 16 Planning Application No. A/YL-KTN/1165 - Departmental Comments
附件: AYL-KTN 1165 DS 20251014.pdf

[redacted]

Thank you for the email. Please see the attachment for the further information on the comment from DSD. Please contact Mr. Tang via email [redacted] if you have any question regarding to the captioned application.

Yours sincerely,
Mr. Tang

渠務署及城市規劃委員會:

A/YL-KTN/1165 的擬議渠務建議詳細

申請地點範圍有約 816.9 平方米，位於錦田北的鄉郊範圍。目前為空置。

申請地點附近有大量的草地及屋群。水平為約+17.1 mPD (此水平已完成填土及平整)。

有一條河流道位於申請地點的東面，並計劃將場內水流引導到該河道。

申請地點的擬議佈局平面圖請參考 Appendix 2。

擬議發展	
申請地點範圍 (約 m^2)，以混凝土地面材質	816.9
申請地點外範圍 (約 m^2)，以混凝土作地面材質	224.8

根據 STORMWATER DRAINAGE MANUAL (SDM) - Table 10 – Recommended Design Return Periods based on Flood Levels

Intensively Used Agricultural Land	2-5 years
Village Drainage including Internal Drainage System under a Polder Scheme	10 years
Main Rural Catchment Drainage Channels	50 years
Urban Drainage Trunk Systems	200 years
Urban Drainage Branch Systems	50 years

本報告將使用 Main Rural Catchment Drainage Channels, 1 in 50 years return period 作評估。

本渠道設計將參考由　貴署所編寫的 SDM 作基礎，以下為所採用的數據及計算方法。

1. Intensity-Duration-Frequency Relationship - The Recommended Intensity-Duration-Frequency relationship is used to estimate the intensity of rainfall. It can be expressed by the following algebraic equation. In order to accommodate more rainfall in the event of extreme weather, 16% increases has been added due to climate change.

$$i = 1.16\,\frac{a}{(t_d + b)^c}$$

The site is located within the HKO Headquarters Rainfall Zone. Therefore, for 50 years return period, the following values are adopted. (The latest figures are provided in Corrigendum No.1 2024 Stormwater Drainage Manual)

a = 505.5

b = 3.29

c = 0.355

2. The peak runoff is calculated by the Rational Method.

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

where V = peak runoff in m^3/s

C = runoff coefficient (dimensionless)

i = rainfall intensity in mm/hr

A = catchment area in km^2

3. According to Section 7.5.2(b) of the Stormwater Drainage Manual (SDM), Fifth Edition January 2018

Surface Characteristics	Runoff coefficient, C
Asphalt	0.70-0.95
Concrete	0.80-0.95
Brick	0.70-0.85
Grassland (heavy soil)	
Flat	0.13-0.25
Steep	0.25-0.35
Grassland (sandy soil)	
Flat	0.05-0.15
Steep	0.15-0.20

The run-off coefficient (C) of surface runoff area taken as follows:

- Concrete Area C = 0.95
- Grassland (heavy soil) with flat surface C = 0.25

4. Manning's Equation is used for calculation of velocity of flow inside the channels. It can be expressed by the following algebraic equation.

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

where	V	=	Velocity of the pipe flow (m/s)
	S_f	=	Hydraulic gradient
	n	=	manning's coefficient
	R	=	Hydraulic radius (m)

5. Colebrook-White Equation is used for calculation of velocity of flow inside the pipes. It can be expressed by the following algebraic equation.

$$\bar{V} = -\sqrt{8gDS} \quad \log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{2gDS}}\right)$$

where	V	=	Velocity of the pipe flow (m/s)
	g	=	gravitational acceleration (m/s^2)
	k_s	=	hydraulic pipeline roughness (m)
	v	=	kinematics viscosity of fluid (m^2/s)
	D	=	internal pipe diameter (m)
	s	=	hydraulic gradient (energy loss per unit length due to friction)

申請範圍主要平坦，並緩緩斜向東北面，渠道設計請參考 Appendix 7。

渠道容量計算請參考 Appendix – Calculation。

根據本報告，本臨時發展不會對附近的渠道有重大影響。

<u>Check The Capacity of Existing natural stream</u>

Manning Equation is used in hydraulic design and analysis. The cross-sectional mean velocity is given in the following expression:

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

Where R = hydraulic radius (m)
N = Manning coefficient (s/m1/3), refer Table 13 of SDM
Sf = friction gradient (dimensionless)

Using Manning's Equation
$V = R^{2/3} * S_f^{0.5}/n$

Where R	= A/P = 2.33 m	A = 49 m^2
		P = 21 m
n	= 0.05 $s/m^{1/3}$	(Table 13 of Stormwater Drainage Manual)
S_f	= 0.32	

Therefor V $= 2.33^{2/3} * 0.32^{0.5}/0.05$
= 19.88 m/sec

Maximum Capacity (Qmax)
= 0.8V*A
= 779 m^3/sec
> Q_{total}

The Existing natural stream has enough capacity.

Appendix – Calculation

Capacity Flows Estimation for Propose Catchments and Drainage System with 50 Year Return Period

Note:

Runoff is calculated in accordance with DSD's "Stormwater Drainage Manual – Planning, Design and Management" (SDM), fifth edition, January 2018.

Equation used: $t_0 = \frac{0.14465L}{H^{0.2}A^{0.1}}$ $t_c = t_0 + t_f$ $i = 1.16 * \frac{a}{(t_d+b)^c}$ $Q_p = 0.278\ C\ i\ A$ $V = \frac{R^{1/6}}{n}\sqrt{RS_f}$

Calculation of the runoff of Existing Drainage System

Surface Type	Catchment Area (A), m^2	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Time of Concentration (t_c), min	a (50 year return period)	b (50 year return period)	c (50 year return period)	Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
Grassland (Heavy soil) with flat surface	274,239	0.274	31.86	909	18.8	505.5	3.29	0.355	195	0.25	0.0685	3.71
									(16% increase due to climate change)		Total	3.71

Adequacy Check for Existing Drainage System

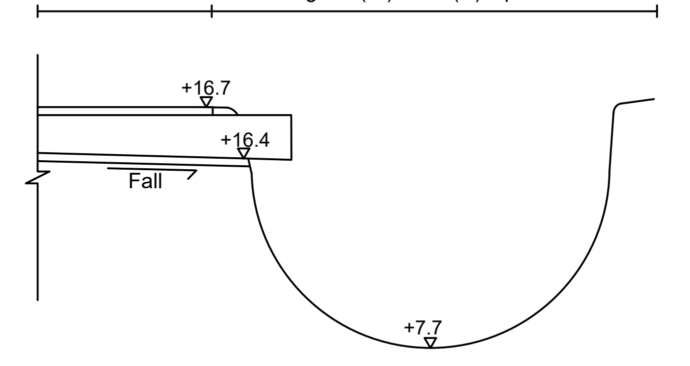
Channel Type	Width, m	Depth, m	Slope	Length, m	Manning's Roughness Coefficient	Cross Section Area, m2	Wetted Perimeter, m	Hydraulic radius, m	Mean Velocity, m/s	Capacity flow, m3/s	Catchment Served, km^2	Runoff, m3/s	% of capacity flow	Sufficient Capacity (Y/N)
Natural-Stream (7)	7	7	0.32	909	0.05	49	21	0.67	8.66	779	0.274	3.71	1%	Y

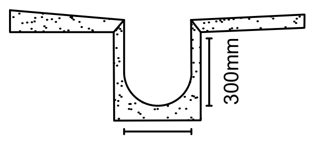
*Allowed 20% for sedimentation. For assessment purpose, the adequacy checking will be using 7m x 7m as calculation perimeter.


LASER DISTANCE METER

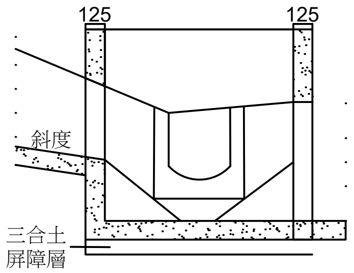

LASER DISTANCE METER

Connection Detail

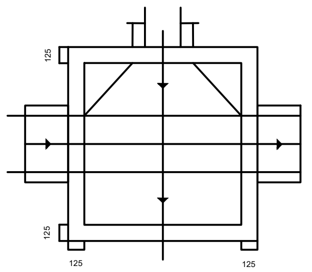




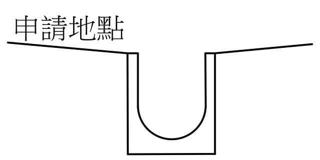
U型明渠切面圖



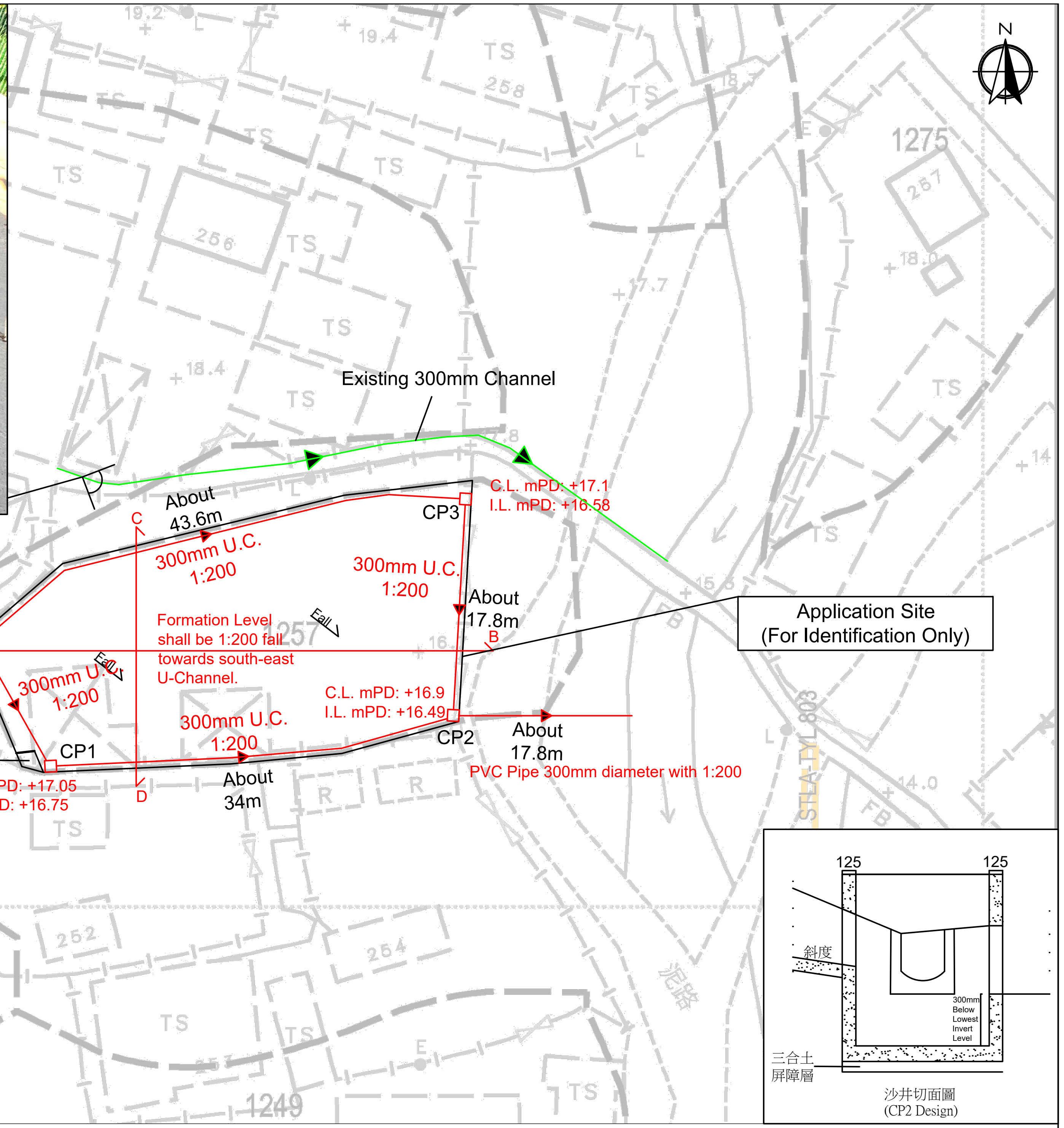
沙井切面圖

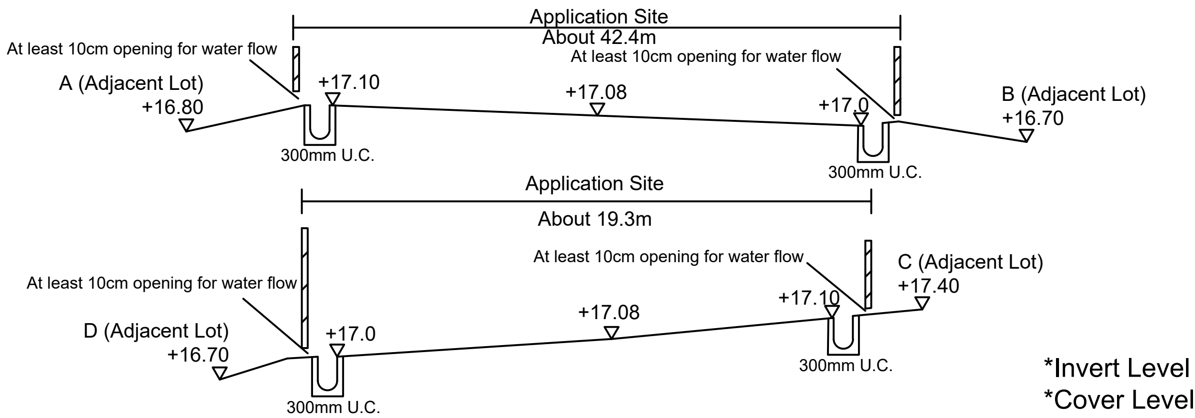


沙井俯視圖



U型明渠切面略圖



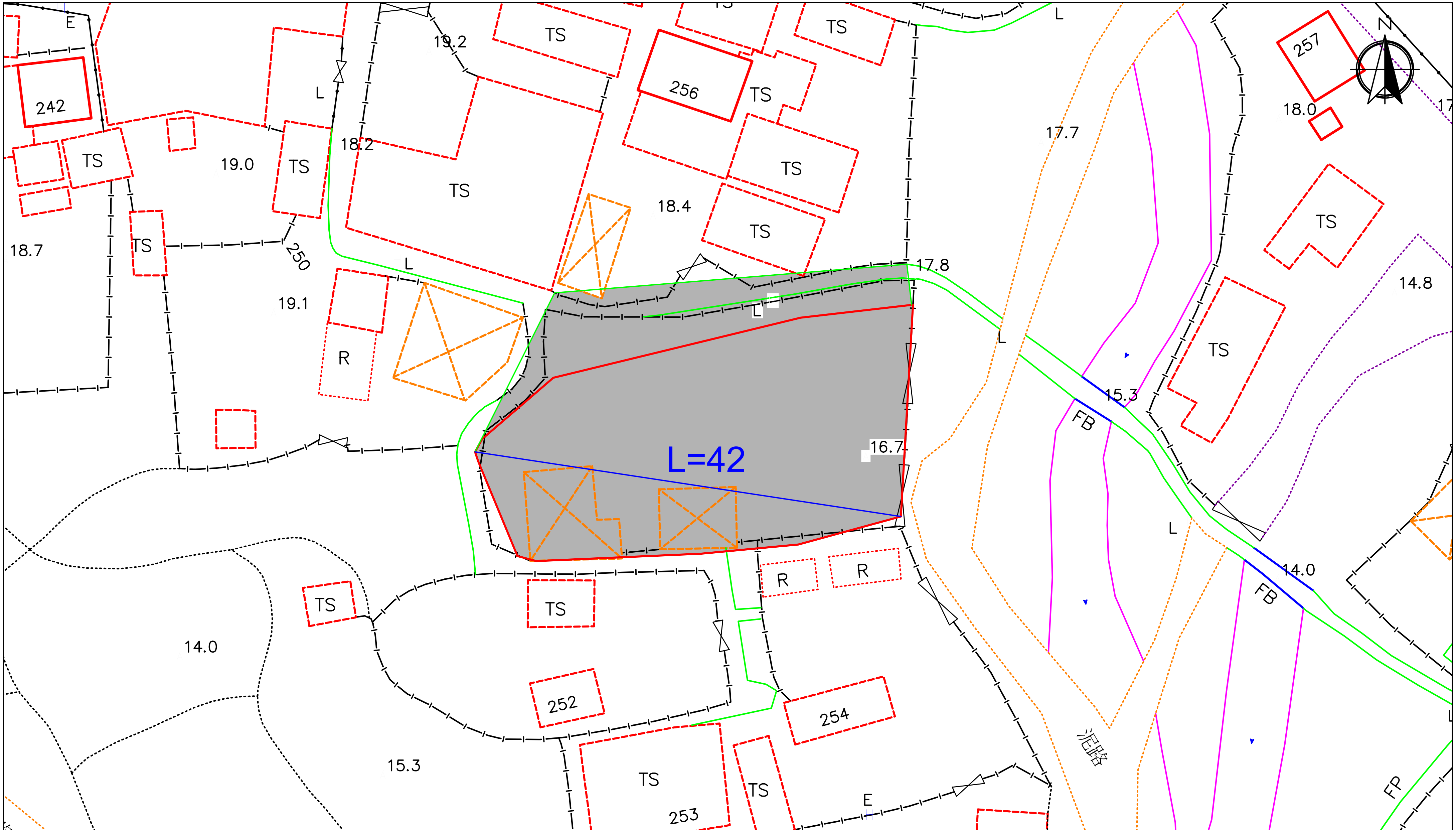


Note:
1. Adequate opening will be provided around the application site.
2. Catchpit design shall follow CEDD standard drawing No. C2406I.
3. All proposed U-channel and Catchpit must maintain in good shape (i.e. Inspection and maintenance regularly).
4. Grating Cover is provided to reduce the irregular road surface from entering the site.

Legend:
- Proposed Catchpit
- Proposed U-Channel
- Water Flow
- Viewing Point

*Invert Level of Connection Point Should Be Verified On Site Before Construction.
*Cover Level Are Indicative Only Which Should Be Verified On Site.

Appendix 7	Location: DD 107 Lot 1257 (Part) App. No.: A/YL-KTN/1165 OZP: S/YL-KTN/11 District: Kam Tin North Zoning: Agriculture	Project: Proposed Temporary Open Storage with Ancillary Facilities for a Period of 3 Years and Filling of Land	Proposed Drainage Plan and Cross Section	Scale: 1:500 @A3	Drawing No. 7.1-1 For Identification Only Date: 14 October 2025



Appendix 7.2

Catchment Area

Location:
D.D. 107 Lot 1257 (Part)
OZP: S/YL-KTN/11
District: Kam Tin North
Zoning: Agriculture

Project:
Proposed Temporary Open Storage with Ancillary Facilities and Associated Filling of Land For a Period of 3 Years

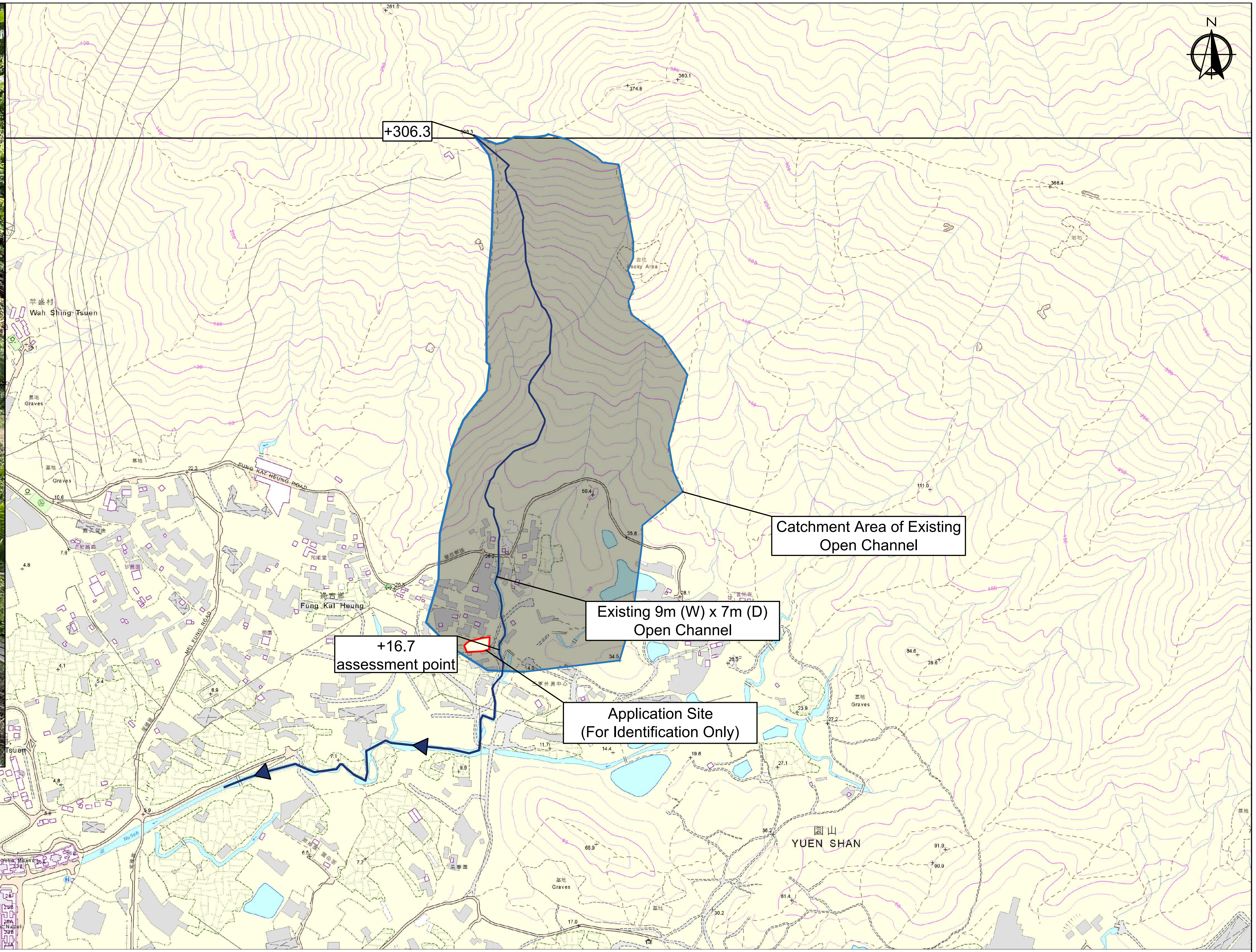
Around 1,041.7 m^2

Scale: 1:500 @A4

Drawing No.:
7.2-1

For Identification Only

Date: 13/10/2025



Legend:

Existing Channel

Application Site

Captured from hkmapservices iB5000 2-SE-C and iB5000 6-NE-A on 12th October 2025

Appendix 7.3	Location: DD 107 Lot 1257 (Part) App. No.: A/YL-KTN/1165 OZP: S/YL-KTN/11 District: Kam Tin North Zoning: Agriculture	Project: Proposed Temporary Open Storage with Ancillary Facilities for a Period of 3 Years and Filling of Land	Existing Drainage Channel Plan and Ultimate Discharge Point	Scale: Undefined @A3	Drawing No. 7.3-1 For Identification Only Date: 14 October 2025

The Application Site	=	816.9 m^2	(About)	C:	0.95 (Covered with Concrete)
Outside of application site	=	224.8 m^2	(About)	C:	0.95 (Covered with Concrete)

Calculation of Desgin Runoff of the Proposed Development,

For the design of drains inside the site, For Concrete

Q_p = 0.278C I A

A = 1,041.7 m^2

= 1,041.7 m^2

= 0.0010417 km^2

t = $0.14465L/H^{0.2}A^{0.1}$

= $0.14465*42/0.5^{0.2}*1041.7^{0.1}$

= 3.483 min

i = $1.16*a/(t+b)^c$

= $1.16*505.5/(3.483+3.29)^{0.355}$

= 297.33325

(50 years return period, Table 3a, Corrigendum 2024, SDM) and (16% increase due to climate change)

Q = 0.278*0.95*397*1041.7/1000000

= 0.0818002 m^3/sec

= 4908 lit/min

Check 300mm dia. Pipes by Colebrook-White Equation

By Colebrook White Equation

$$V = -\sqrt{(8gDs)}\log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

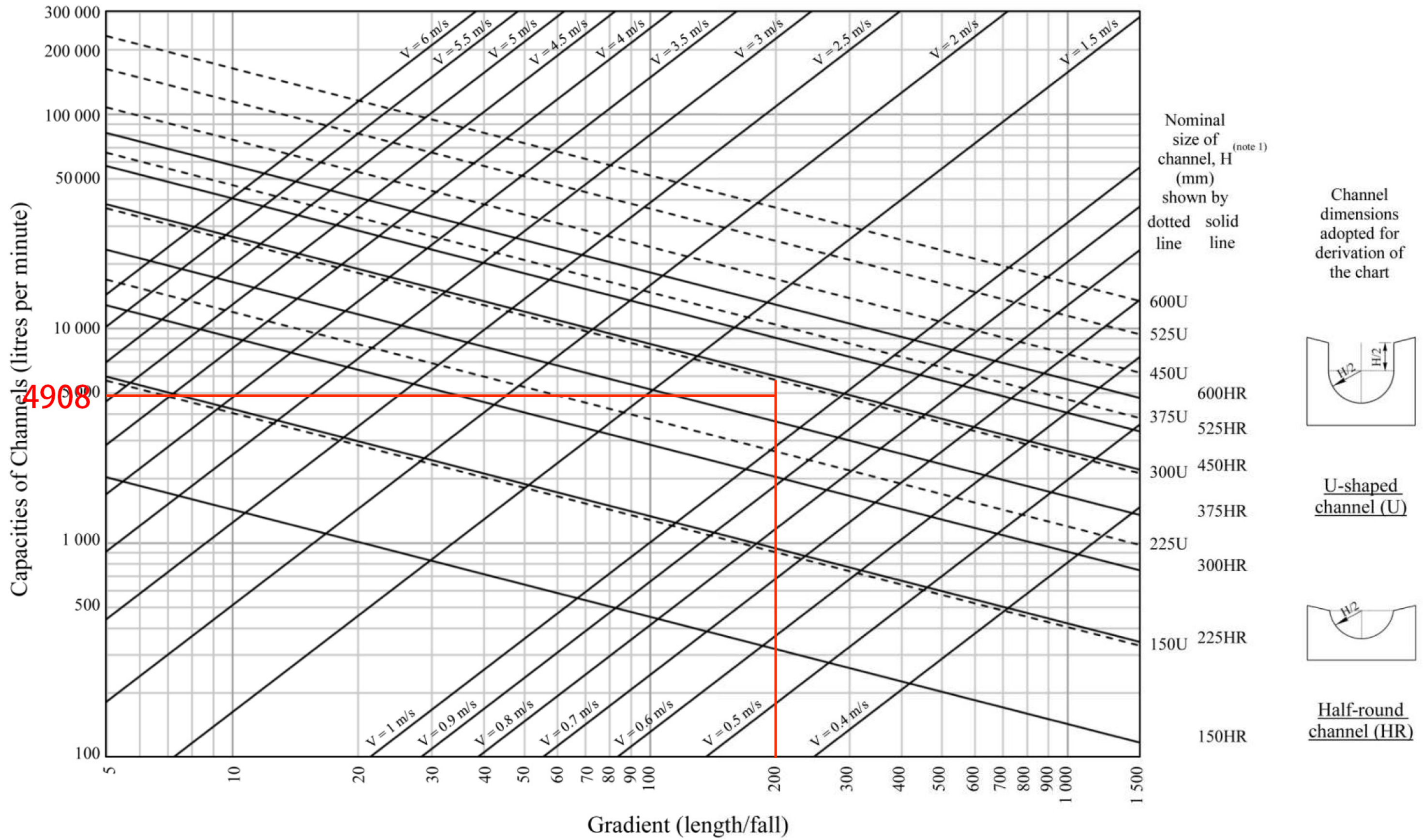
where:	V	=	mean velocity (m/s)	
	g	=	gravitational acceleration (m/s^2)	
	D	=	internal pipe diameter (m)	
	k_s	=	hydraulic pipeline roughness (m)	(Table 14, from DSD SDM 2018, concrete pipe)
	v	=	kinematic viscosity of fluid (m^2/s)	(Transitional flow and water at 15 degree celcius)
	s	=	hydraulic gradient (energy loss per unit length due to friction)	

g	=	9.81	m/s^2
D	=	0.3	m
k_s	=	0.00015	m
v	=	1.14E-06	m/s^2
s	=	0.01	

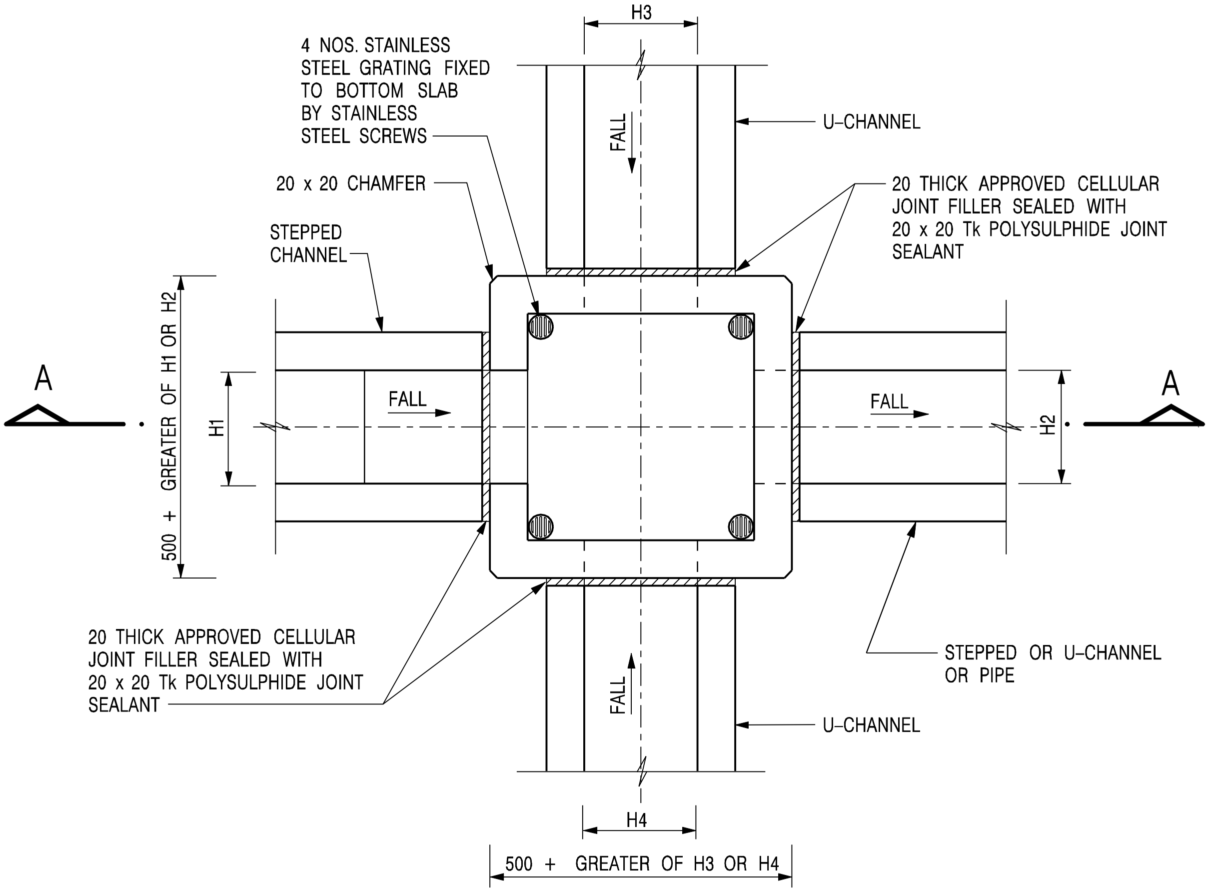
Therefore, design V of pipe capacit	=	1.823623	m/s	
Q	=	0.8VA		(0.8 factor for sedimentation)
	=	0.117212	m^3/s	
	=	7032.731	lit/min	
	>	4908	lit/min	

Provide 300mm dia. pipe has enough capacity to accomend the runoff of the proposed development

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

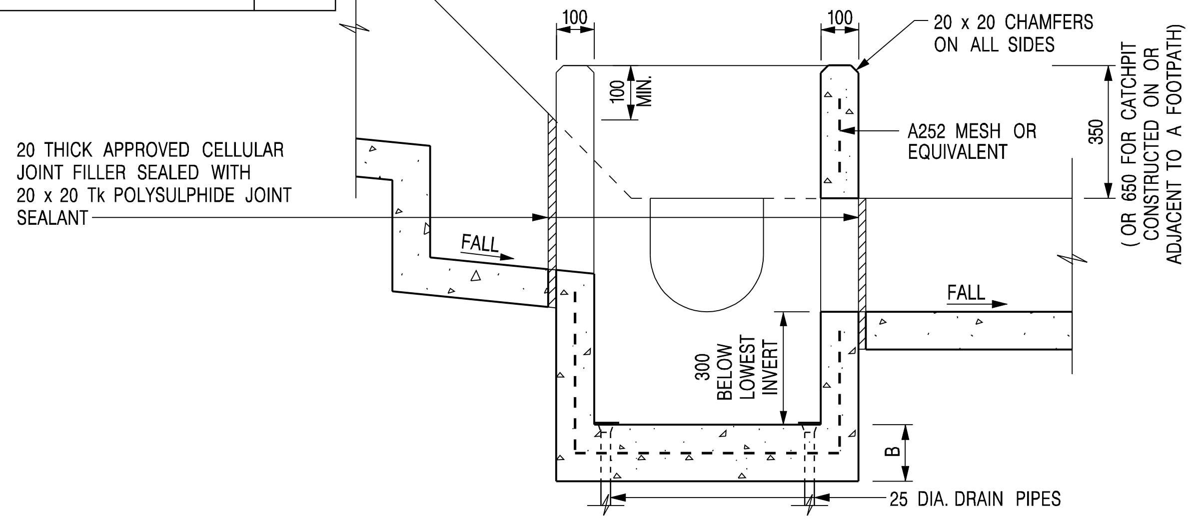


Note: (1) Refer to the latest CEDD Standard Drawings for the details of U-shaped (U) and half-round (HR) channels.



PLAN

NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4)	B
300 – 600	150
675 – 900	175



SECTION A – A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 2 FOR OTHER NOTES.

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

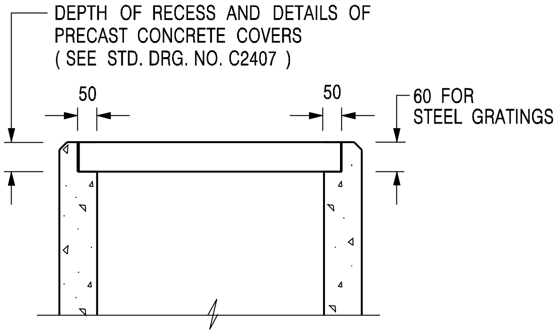
CATCHPIT WITH TRAP

(SHEET 1 OF 2)

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20
DATE JAN 1991
DRAWING NO. C2406 /1

卓越工程 建設香港
We Engineer Hong Kong's Development



ALTERNATIVE TOP SECTION
FOR PRECAST CONCRETE COVERS / GRATINGS

NOTES:

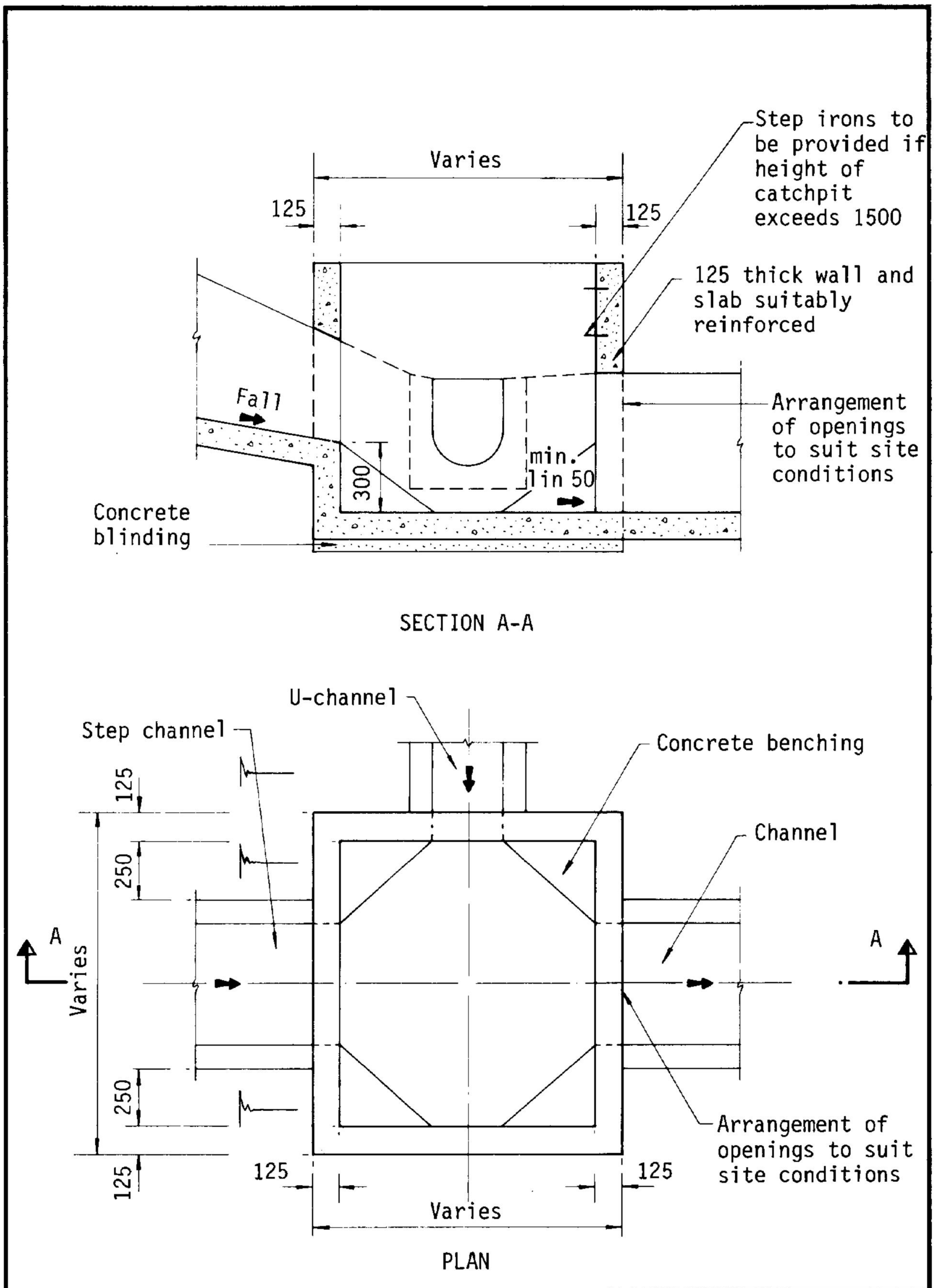
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE SHALL BE GRADE 20 /20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2 OR F2 AS APPROPRIATE.
4. FOR DETAILS OF JOINT, REFER TO STD. DRG. NO. C2413.
5. CONCRETE TO BE COLOURED AS SPECIFIED.
6. UNLESS REQUESTED BY THE MAINTENANCE PARTY AND AS DIRECTED BY THE ENGINEER, CATCHPIT WITH TRAP IS NORMALLY NOT PREFERRED DUE TO PONDING PROBLEM.
7. UPON THE REQUEST FROM MAINTENANCE PARTY, DRAIN PIPES AT CATCHPIT BASE CAN BE USED BUT THIS IS FOR CATCHPITS LOCATED AT SLOPE TOE ONLY AND AS DIRECTED BY THE ENGINEER.
8. FOR CATCHPITS CONSTRUCTED ON OR ADJACENT TO A FOOTPATH, STEEL GRATINGS (SEE DETAIL 'A' ON STD. DRG. NO. C2405) OR CONCRETE COVERS (SEE STD. DRG. NO. C2407) SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER.
9. IF INSTRUCTED BY THE ENGINEER, HANDRAILING (SEE DETAIL 'G' ON STD. DRG. NO. C2405; EXCEPT ON THE UPSLOPE SIDE) IN LIEU OF STEEL GRATINGS OR CONCRETE COVERS CAN BE ACCEPTED AS AN ALTERNATIVE SAFETY MEASURE FOR CATCHPITS NOT ON A FOOTPATH NOR ADJACENT TO IT. TOP OF THE HANDRAILING SHALL BE 1 000 mm MIN. MEASURED FROM THE ADJACENT GROUND LEVEL.
10. MINIMUM INTERNAL CATCHPIT WIDTH SHALL BE 1 000 mm FOR CATCHPITS WITH A HEIGHT EXCEEDING 1 000 mm MEASURED FROM THE INVERT LEVEL TO THE ADJACENT GROUND LEVEL. AND, STEP IRONS (SEE DSD STD. DRG. NO. DS1043) AT 300 c/c STAGGERED SHALL BE PROVIDED. THICKNESS OF CATCHPIT WALL FOR INSTALLATION OF STEP IRONS SHALL BE INCREASED TO 150 mm.
11. FOR RETROFITTING AN EXISTING CATCHPIT WITH STEEL GRATING, SEE DETAIL 'F' ON STD. DRG. NO. C2405.
12. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP
(SHEET 2 OF 2)

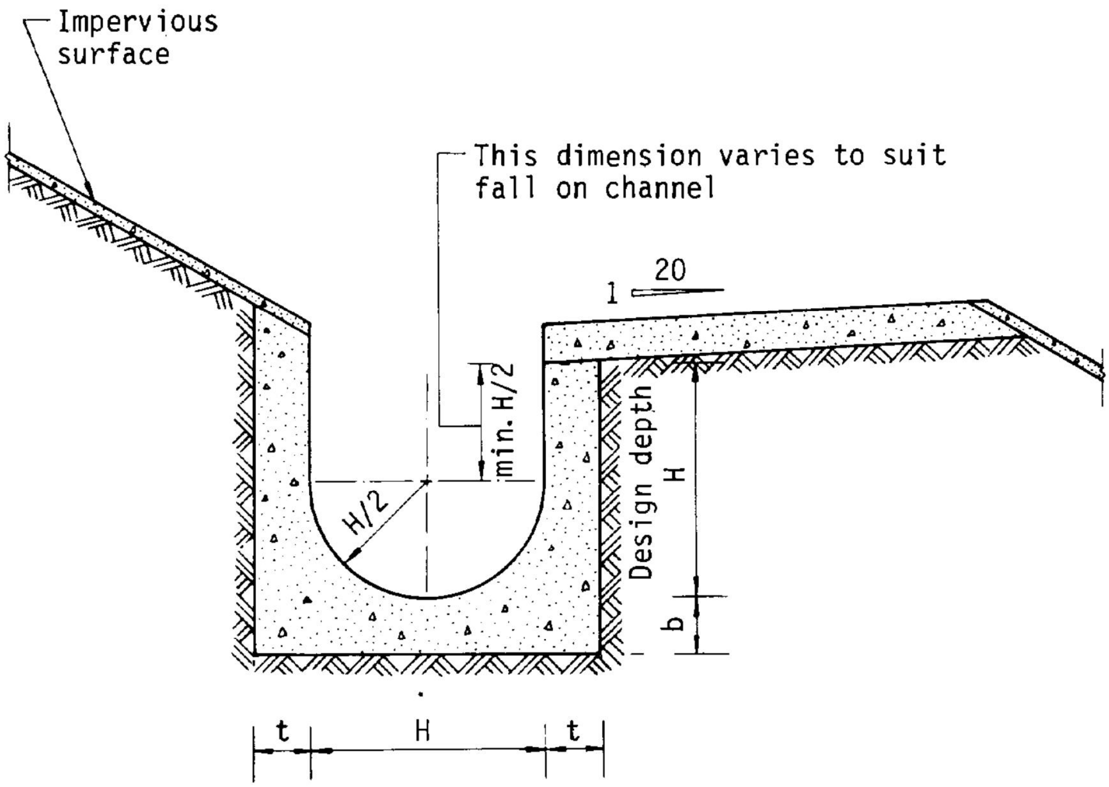
CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20
DATE JAN 1991
DRAWING NO. C2406 /2



Note : All dimensions in millimetres

Figure 8.10 - Typical Details of Catchpits



Dimensions of U - channel		
Nominal size of channel H (mm)	Thickness t (mm)	Thickness b (mm)
225 to 600	150	150
675 to 1200	175	225

Figure 8.11 - Typical U-channel Details

Table 3a – Storm Constants for Different Return Periods of HKO Headquarters

Return Period T (years)	2	5	10	20	50	100	200	500	1000
a	446.1	470.5	485.0	496.0	505.5	508.6	508.8	504.6	498.7
b	3.38	3.11	3.11	3.17	3.29	3.38	3.46	3.53	3.55
c	0.463	0.419	0.397	0.377	0.355	0.338	0.322	0.302	0.286

Table 3d – Storm Constants for Different Return Periods of North District Area

Return Period T (years)	2	5	10	20	50	100	200
a	439.1	448.1	454.9	462.3	474.6	486.6	501.4
b	4.10	3.67	3.44	3.21	2.90	2.67	2.45
c	0.484	0.437	0.412	0.392	0.371	0.358	0.348

Table 13 - Values of n to be used with the Manning equation

Source: Brater, E.F. & King, H.W. (1976)

Surface	**Best**	**Good**	**Fair**	**Bad**
Uncoated cast-iron pipe	0.012	0.013	0.014	0.015
Coated cast-iron pipe	0.011	0.012*	0.013*	
Commercial wrought-iron pipe, black	0.012	0.013	0.014	0.015
Commercial wrought-iron pipe, galvanized	0.013	0.014	0.015	0.017
Smooth brass and glass pipe	0.009	0.010	0.011	0.013
Smooth lockbar and welded "OD" pipe	0.010	0.011*	0.013*	
Riveted and spiral steel pipe	0.013	0.015*	0.017*	
Vitrified sewer pipe	0.010	0.013*	0.015	0.017
Common clay drainage tile	0.011	0.012*	0.014*	0.017
Glazed brickwork	0.011	0.012	0.013*	0.015
Brick in cement mortar; brick sewers	0.012	0.013	0.015*	0.017
Neat cement surfaces	0.010	0.011	0.012	0.013
Cement mortar surfaces	0.011	0.012	0.013*	0.015
Concrete pipe	0.012	0.013	0.015*	0.016
Wood stave pipe	0.010	0.011	0.012	0.013
Plank flumes - Planed	0.010	0.012*	0.013	0.014
- Unplaned	0.011	0.013*	0.014	0.015
- With battens	0.012	0.015*	0.016	
Concrete-lined channels	0.012	0.014*	0.016*	0.018
Cement-rubble surface	0.017	0.020	0.025	0.030
Dry-rubble surface	0.025	0.030	0.033	0.035
Dressed-ashlar surface	0.013	0.014	0.015	0.017
Semicircular metal flumes, smooth	0.011	0.012	0.013	0.015
Semicircular metal flumes, corrugated	0.0225	0.025	0.0275	0.030
Canals and ditches				
1. Earth, straight and uniform	0.017	0.020	0.0225*	0.025
2. Rock cuts, smooth and uniform	0.025	0.030	0.033*	0.035
3. Rock cuts, jagged and irregular	0.035	0.040	0.045	
4. Winding sluggish canals	0.0225	0.025*	0.0275	0.030
5. Dredged-earth channels	0.025	0.0275*	0.030	0.033
6. Canals with rough stony beds, weeds on earth banks	0.025	0.030	0.035*	0.040
7. Earth bottom, rubble sides	0.028	0.030*	0.033*	0.035
Natural-stream channels				
1. Clean, straight bank, full stage, no rifts or deep pools	0.025	0.0275	0.030	0.033
2. Same as (1) but some weeds and stones	0.030	0.033	0.035	0.040
3. Winding some pools and shoals, clean	0.033	0.035	0.040	0.045
4. Same as (3), lower stages, more ineffective slope and sections	0.040	0.045	0.050	0.055

Table 13 (Cont'd)

Surface	Best	Good	Fair	Bad
5. Same as (3) some weeds and stones	0.035	0.040	0.045	0.050
6. Same as (4) stony sections	0.045	0.050	0.055	0.060
7. Sluggish river reach, rather weedy or with very deep pools	0.050	0.060	0.070	0.080
8. Very weedy reaches	0.075	0.100	0.125	0.150

Notes: *Values commonly used for design.