

Drainage Assessment Report

Project:

Proposed Village Housing

Location:

D.D. 293 Lot Nos. 662 S.A, 664 S.B, 668 S.B, 669 RP & 664 S.A, 667 S.C, 668 S.A, 669 S.B, 671 S.B & 654 S.A RP, 658 RP, 659, 660 RP, 661 RP & 658 S.B, 658 S.C, 660 S.B, 660 S.C, 661 S.B, 662 S.B, 662 S.C, To Kwa Peng, Sai Kung North, New Territories.

Proposed by

M&D Planning and Construction Consultant Ltd.

Date: 17 August 2026

1. Introduction

This report assesses the drainage design for the proposed village housing development, with particular focus on the use of a **surface channels, underground sewer and 1200mm open channel** for stormwater management.

2. Design Criteria

2.1. Gravity Pipe

In General, drainage design will be carried out in accordance with the criteria set out in the Stormwater Drainage Manual (Drainage Services Department, 2018) and Corrigendum No. 1/2022 and Corrigendum No. 1/2024. The proposed design criteria to be adopted for design of this stormwater drainage and factors which have been considered are discussed below.

1. All hydraulic design is based on Stormwater Drainage Manual and Sewerage Manual published by Drainage Services Department and the relevant Building Regulations.
2. Return periods – The following Return Period has been adopted.

Stormwater drainage 1 in 200 years

3. Run-off estimated for internal storm drainage has been based on the Rational Method as recommended in the Stormwater Drainage Manual with a run-off coefficient of $C=0.95$ for paved area and $C=0.35$ for grassland. However, a standard time of entry five minutes under urban conditions has been adopted instead of using Brands by Williams formula to estimate the time of concentration as this was derived originally from data for moderately sized rural catchment and include flow time natural water courses.
4. Stormwater drains should be of concrete pipes with flexible joints.
5. Colebrook-White Equation and Manning's Equation are given below for calculation of flow velocity of pipes and u-channels respectively.

Colebrook-White Equation:
$$\frac{1}{\bar{v}} = -\sqrt{32gRS} \log\left(\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right)$$

Manning's Equation:
$$\bar{v} = \frac{R^{1/6}}{n} \sqrt{RS_f}$$

6. The roughness value used for

Precast Concrete Pipes in Colebrook White Equation $k_s = 0.6\text{mm}$

Manning's Equation $N = 0.018\text{mm}$

7. Wherever possible, the following limiting design velocities in pipelines will be used:-

Minimum Design Full-bore Velocity = 0.75 m/s

Maximum Design Full-bore Velocity = 3.00 m/s

2.2. U-Channel

The u-channels are designed adopting the same methodology as that for gravity pipes as detailed in Section 2.1. Manning's Equation will be adopted to evaluate the hydraulic capacities of the drainage channels.

3. Drainage Design

3.1. Drainage Catchment

The drainage catchment plan is included in **Appendix A**.

3.2. U-Channel Design

The hydraulic calculation of u-channels design is included in **Appendix B**.

3.3. Storm Drain Design

The hydraulic calculation of storm drain design is included in **Appendix C**.

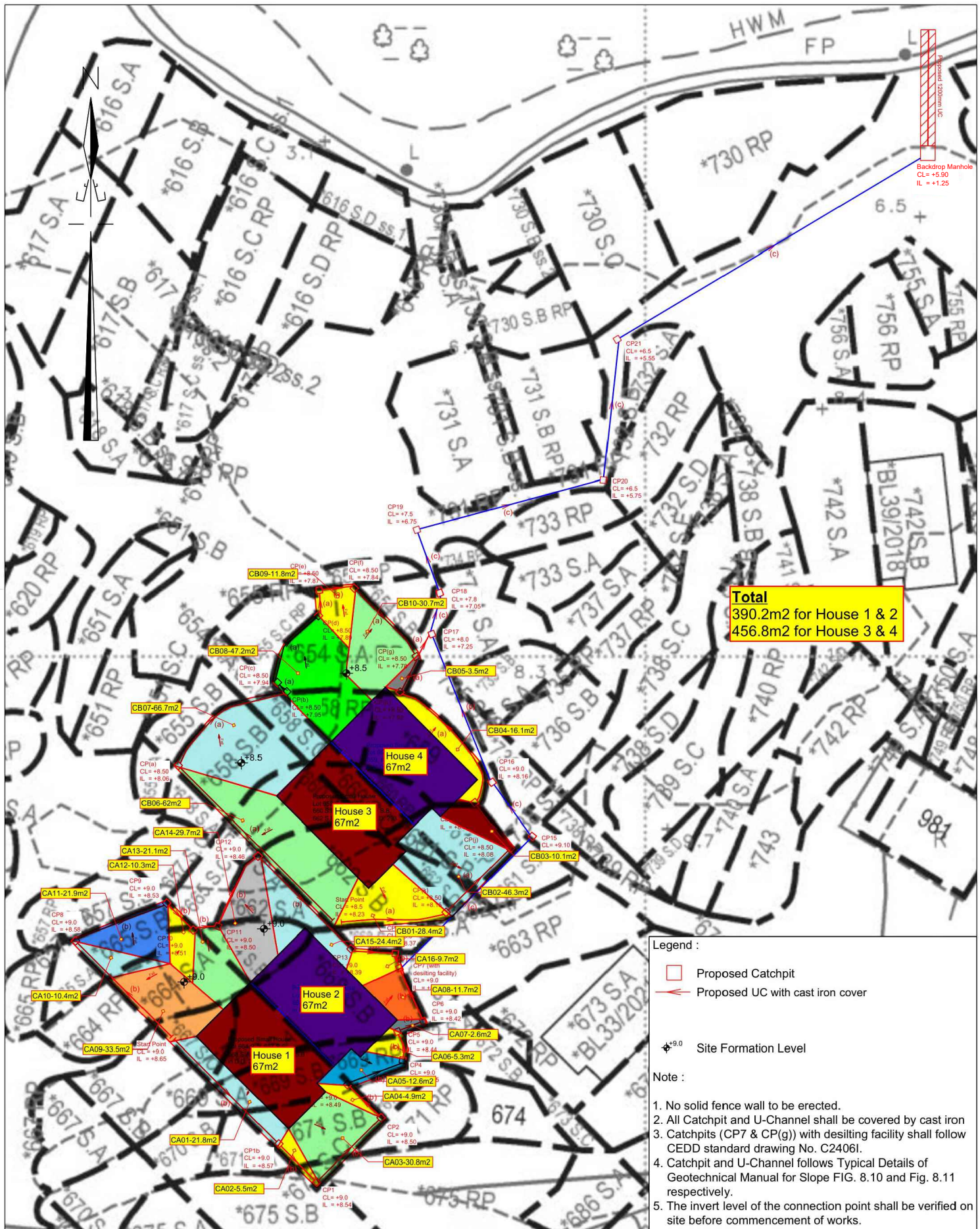
Appendix A
Catchment Plan

Appendix B

U-channel Hydraulic Calculations

Appendix C

Drainage Design



Project Title :

D.D. 293 Lot Nos. 662 S.A, 664 S.B, 668 S.B, 669 RP & 664 S.A, 667 S.C, 668 S.A, 669 S.B, 671 S.B & 654 S.A RP, 658 RP, 659, 660 RP, 661 RP & 658 S.B, 658 S.C, 660 S.B, 660 S.C, 661 S.B, 662 S.B, 662 S.C, To Kwa Peng, Sai Kung North, New Territories.

Drawing Title :

Proposed Stormwater Drainage Plan

Scale :

Not to scale

Plan No. :

CW/TKP/DP/04

Date :

25-04-2026

Survey Sheet No. :

8-NE-16A

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No. 2-24, Wo Tai Street,
Luen Wo Hui, Fanling, N.T.
Telephone : 26831600 Mobile : 66862836 Fax : 26831380
E-mail : chuowang.ssc@gmail.com / h.y.pang@hotmail.com

Legend :

- Proposed Catchpit
- Proposed UC with cast iron cover
- + Site Formation Level

Note :

1. No solid fence wall to be erected.
2. All Catchpit and U-Channel shall be covered by cast iron
3. Catchpits (CP8, CP16 & CP19) with desilting facility shall follow CEDD standard drawing No. C2406I.
4. Catchpit and U-Channel follows Typical Details of Geotechnical Manual for Slope FIG. 8.10 and Fig. 8.11 respectively.
5. The invert level of the connection point shall be verified on site before commencement of works.



Project Title :

D.D. 293 Lot Nos. 741 S.A, 742 S.A & 742 S.B & 742 S.C, 752 S.A, 753 S.A,
To Kwa Peng, Sai Kung North, New Territories.

Scale :

Not to scale

Plan No. :

CW/TKP/DP/01

Date :

25-04-2026

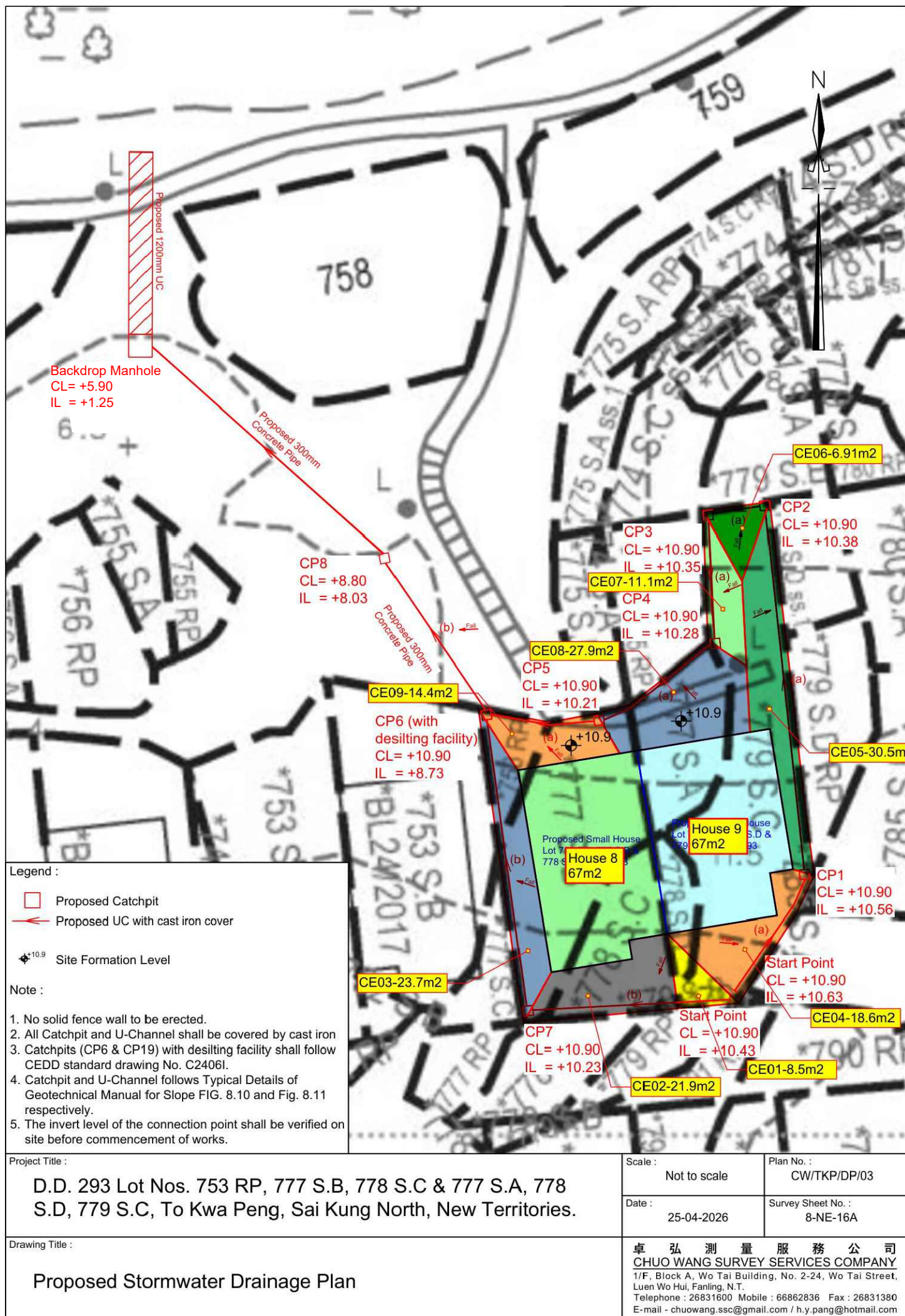
Survey Sheet No. :

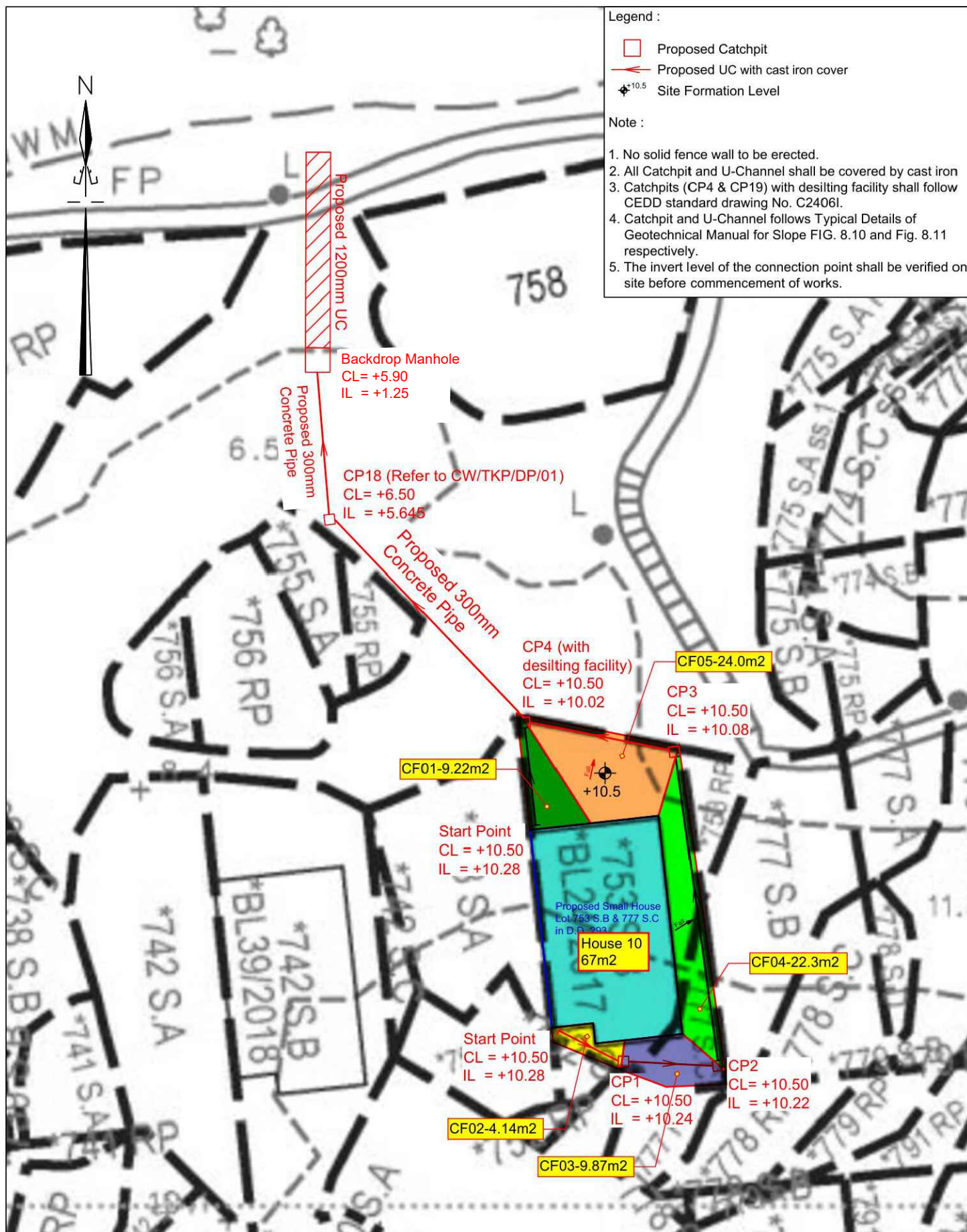
8-NE-16A

Drawing Title :

Proposed Stormwater Drainage Plan

卓弘測量服務公司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No. 2-24, Wo Tai Street,
Luen Wo Hui, Fanling, N.T.
Telephone : 26831600 Mobile : 66862836 Fax : 26831380
E-mail - chuowang.ssc@gmail.com / h.y.pang@hotmail.com





Project Title :

D.D. 293 Lot No. 753 S.B & 777 S.C
To Kwa Peng, Sai Kung North, New Territories.

Scale :

Not to scale

Plan No. :

CW/TKP/DP/02

Date :

25-04-2026

Survey Sheet No. :

8-NE-16A

Drawing Title :

Proposed Stormwater Drainage Plan

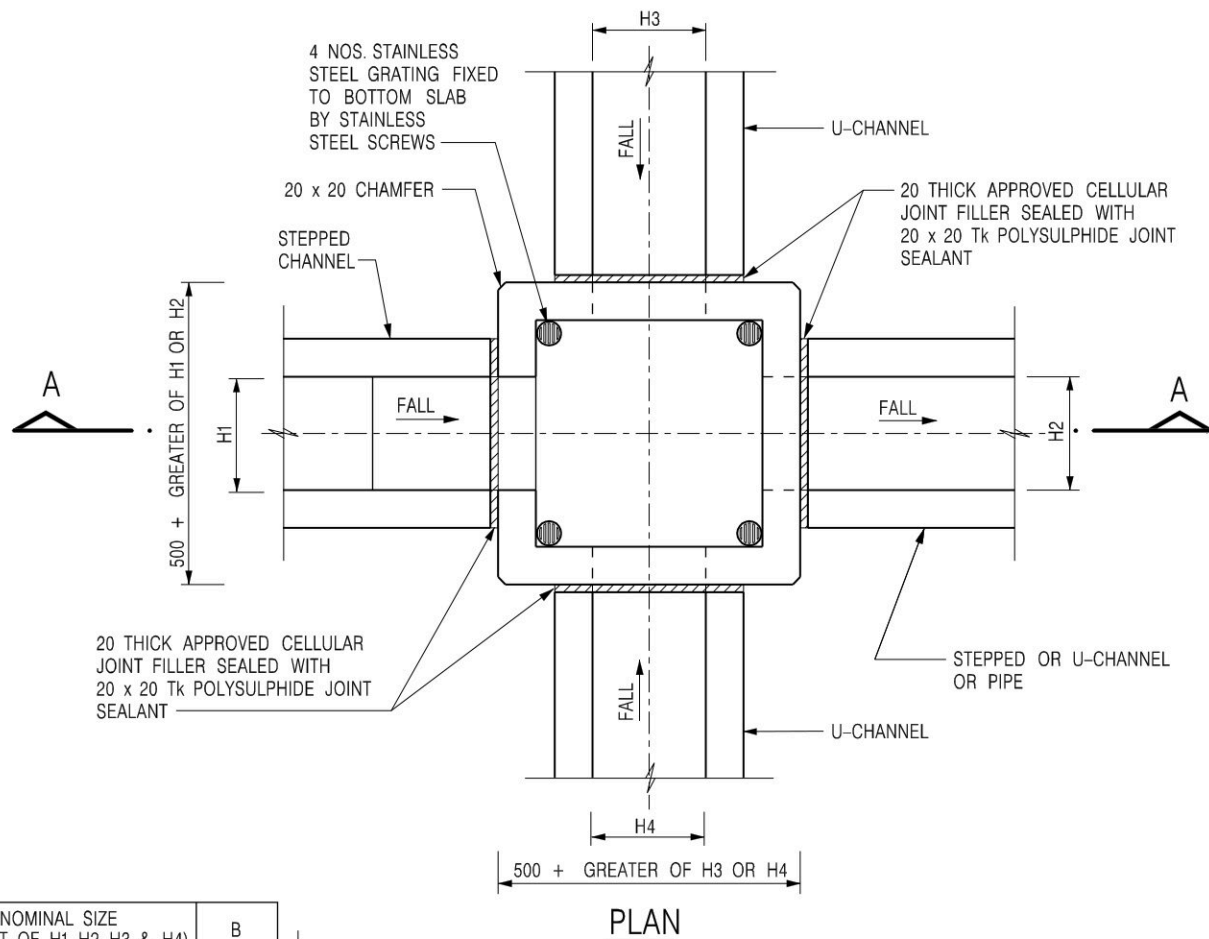
卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No. 2-24, Wo Tai Street,
Luen Wo Hui, Fanling, N.T.
Telephone : 26831600 Mobile : 66862836 Fax : 26831380
E-mail - chuowang.ssc@gmail.com / h.y.pang@hotmail.com

MANHOLE		PIPE			INVERT LEVEL		FINISHED ROAD LEVEL	PIPE BEDDING	PIPE																				
MANHOLE NO.	MANHOLE TYPE	LENGTH	DIAMETER	GRADIENT	INLET	OUTLET			ROUGHNESS Ks (mm)	PERCENTAGE AREA ALLOWANCE FOR SEDIMENT	FLOW AREA, A (m²)	WETTED PERIMETER, P(m)	HYDRAULIC RADIUS, R(m)	FULL FLOW VELOCITY, V (m/s)	0.75<V<3?	CAPACITY WITH SEDIMENT, Qc (m³/s)	PIPE MATERIAL	PAVED CATCHMENT AREA (m²)		UNPAVED CATCHMENT AREA (m²)		DISCHARGE FROM OTHERS		TIME OF FLOW, tf (MIN)	TIME OF CONC., tc (MIN)	INTENSITY (mm/HOUR)	DISCHARGE WITH CLIMATE CHANGE 11.1%, Q (m³/s)	% OF CAPACITY	Qc>Q?
		m	mm	1 IN	mPD	mPD												mPD	INCREMENTAL	CUMULATIVE	INCREMENTAL	CUMULATIVE	INCREMENTAL						
CP7	Trapped	15.05	300	100		8.360	9.000	S I	0.60	0.10	0.07	0.94	0.08	1.57	OK	0.10	CONCRETE	390.2000	390.2000		0.0000		0.0000	0.160	5.000	255.820	0.029	29.3%	OK
CP15	Catchpit	5.10	300	102	8.210	8.210	9.100	S I	0.60	0.10	0.06	0.94	0.07	1.45	OK	0.08	CONCRETE		390.2000		0.0000		0.0000	0.058	5.058	255.253	0.029	35.1%	OK
CP16	Catchpit	12.78	300	25	8.160	7.760	9.000	S I	0.60	0.10	0.06	0.94	0.07	2.95	OK	0.17	CONCRETE		390.2000		0.0000		0.0000	0.072	5.131	254.559	0.029	17.2%	OK
CP17	Catchpit	3.06	300	26	7.250	7.170	8.000	S I	0.60	0.10	0.06	0.94	0.07	2.92	OK	0.17	CONCRETE	456.8000	847.0000		0.0000		0.0000	0.017	5.148	254.393	0.063	37.7%	OK
CP18	Catchpit	5.07	300	25	7.050	6.950	7.800	S I	0.60	0.10	0.06	0.94	0.07	2.93	OK	0.17	CONCRETE		847.0000		0.0000		0.0000	0.029	5.177	254.119	0.063	37.6%	OK
CP19	Catchpit	15.55	300	26	6.750	6.350	7.500	S I	0.60	0.10	0.06	0.94	0.07	2.90	OK	0.17	CONCRETE		847.0000		0.0000		0.0000	0.089	5.266	253.278	0.063	37.9%	OK
CP20	Catchpit	11.28	300	56	5.750	5.750	6.500	S I	0.60	0.10	0.06	0.94	0.07	1.96	OK	0.11	CONCRETE		847.0000		0.0000		0.0000	0.096	5.362	252.388	0.063	55.8%	OK
CP21	Catchpit	29.13	300	25	5.550	5.050	6.500	B	0.60	0.10	0.06	0.94	0.07	2.93	OK	0.17	CONCRETE		847.0000		0.0000		0.0000	0.166	5.528	250.881	0.062	37.1%	OK
CP22	Trapped Catchpit				3.900		5.900												847.0000		0.0000		0.0000						

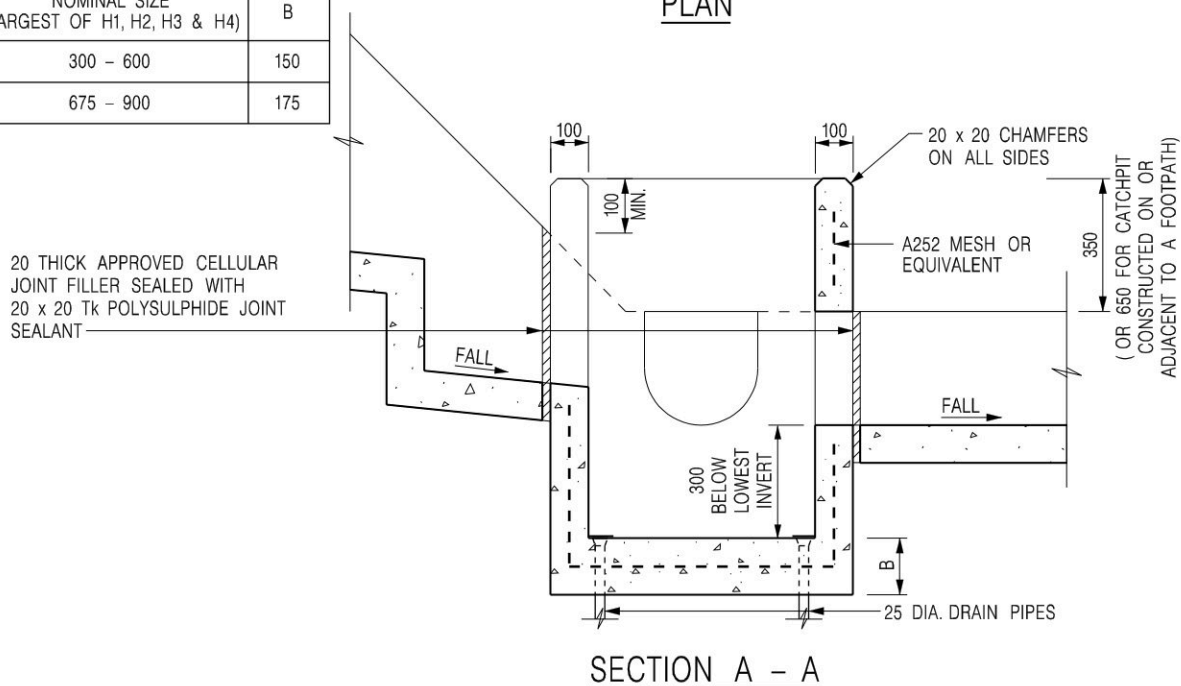
MANHOLE		PIPE			INVERT LEVEL		FINISHED ROAD LEVEL	PIPE BEDDING	PIPE								PAVED CATCHMENT AREA (m ²)		UNPAVED CATCHMENT AREA (m ²)		DISCHARGE FROM OTHERS		TIME OF FLOW, tf (MIN)	TIME OF CONC., tc (MIN)	INTENSITY (mm/HOUR)	DISCHARGE WITH CLIMATE CHANGE 11.1%, Q (m ³ /s)	% OF CAPACITY	Qc>Q?	
MANHOLE NO.	MANHOLE TYPE	LENGTH	DIAMETER	GRADIENT	INLET	OUTLET			ROUGHNESS Ks (mm)	PERCENTAGE AREA ALLOWANCE FOR SEDIMENT	FLOW AREA, A (m ²)	WETTED PERIMETER, P(m)	HYDRAULIC RADIUS, R(m)	FULL FLOW VELOCITY, V (m/s)	0.75<V<3?	CAPACITY WITH SEDIMENT, Qc (m ³ /s)	PIPE MATERIAL	INCREMENTAL	CUMULATIVE	INCREMENTAL	CUMULATIVE	INCREMENTAL							CUMULATIVE
		m	mm	1 IN	mPD	mPD												mPD											
CP8	Trapped Catchpit	14.04	300	100	8.240	6.240	9.000	S I	0.60	0.10	0.07	0.94	0.08	1.57	OK	0.10	CONCRETE	433.9000	433.9000		0.0000		0.0000	0.149	5.000	255.820	0.033	32.5%	OK
CP18	Catchpit	7.02	300	100	8.100	5.650	6.500	S I	0.60	0.10	0.06	0.94	0.07	1.47	OK	0.08	CONCRETE	136.5300	570.4300		0.0000		0.0000	0.080	5.080	255.048	0.043	50.7%	OK
CP22	Trapped Catchpit				5.580	3.900	5.900												570.4300		0.0000		0.0000						

MANHOLE		PIPE			INVERT LEVEL		FINISHED ROAD LEVEL	PIPE BEDDING	PIPE								PAVED CATCHMENT AREA (m²)		UNPAVED CATCHMENT AREA (m²)		DISCHARGE FROM OTHERS		TIME OF FLOW, tf (MIN)	TIME OF CONC., tc (MIN)	INTENSITY (mm/HOUR)	DISCHARGE WITH CLIMATE CHANGE 11.1%, Q (m³/s)	% OF CAPACITY	Qc>Q?	
MANHOLE NO.	MANHOLE TYPE	LENGTH	DIAMETER	GRADIENT	INLET	OUTLET			ROUGHNESS Ks (mm)	PERCENTAGE AREA ALLOWANCE FOR SEDIMENT	FLOW AREA, A (m²)	WETTED PERIMETER, P(m)	HYDRAULIC RADIUS, R(m)	FULL FLOW VELOCITY, V (m/s)	0.75<V<3?	CAPACITY WITH SEDIMENT, Qc (m³/s)	PIPE MATERIAL	INCREMENTAL	CUMULATIVE	INCREMENTAL	CUMULATIVE	INCREMENTAL							CUMULATIVE
		m	mm	1 IN	mPD	mPD	mPD										297.5100	297.5100		0.0000		0.0000		0.100	5.000	255.820	0.022	22.3%	OK
CP6	Trapped Catchpit	9.42	300	100		8.730	10.900			SI	0.60	0.10	0.07	0.94	0.08	1.57	OK	0.10	CONCRETE										
CP8	Catchpit	16.42	300	100		8.636	8.030			SI	0.60	0.10	0.06	0.94	0.07	1.47	OK	0.08	CONCRETE					0.186	5.186	254.031	0.022	26.3%	OK
CP22	Trapped Catchpit				7.866	3.900	5.900											297.5100		0.0000		0.0000							

MANHOLE		PIPE			INVERT LEVEL		FINISHED ROAD LEVEL	PIPE BEDDING	PIPE																				
MANHOLE NO.	MANHOLE TYPE	LENGTH	DIAMETER	GRADIENT	INLET	OUTLET			ROUGHNESS Ks (mm)	PERCENTAGE AREA ALLOWANCE FOR SEDIMENT	FLOW AREA, A (m²)	WETTED PERIMETER, P(m)	HYDRAULIC RADIUS, R(m)	FULL FLOW VELOCITY, V (m/s)	0.75<V<3?	CAPACITY WITH SEDIMENT, Qc (m³/s)	PIPE MATERIAL	PAVED CATCHMENT AREA (m²)		UNPAVED CATCHMENT AREA (m²)		DISCHARGE FROM OTHERS		TIME OF FLOW, tf (MIN)	TIME OF CONC., tc (MIN)	INTENSITY (mm/HOUR)	DISCHARGE WITH CLIMATE CHANGE 11.1%, Q (m³/s)	% OF CAPACITY	Qc>Q?
		m	mm	1 IN	mPD	mPD												INCREMENTAL	CUMULATIVE	INCREMENTAL	CUMULATIVE	INCREMENTAL	CUMULATIVE						
CP4	Trapped Catchpit																136.5300	136.5300		0.0000		0.0000							
		13.50	300	100		10.020	10.500		0.60	0.10	0.07	0.94	0.08	1.57	OK	0.10	CONCRETE		136.5300		0.0000		0.0000	0.143	5.000	255.820	0.010	10.2%	OK
CP18	Catchpit				9.885	5.645	6.500																						



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

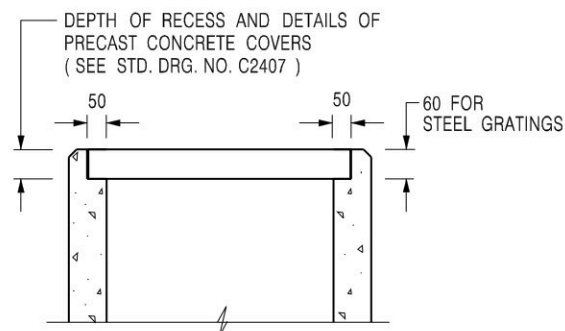


NOTES:

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

CATCHPIT WITH TRAP
(SHEET 1 OF 2)

-	FORMER DRG. NO. C2406J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE
 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT			
SCALE 1 : 20		DRAWING NO. C2406 /1	
DATE JAN 1991			



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.

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

CATCHPIT WITH TRAP
(SHEET 2 OF 2)



**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2406 /2

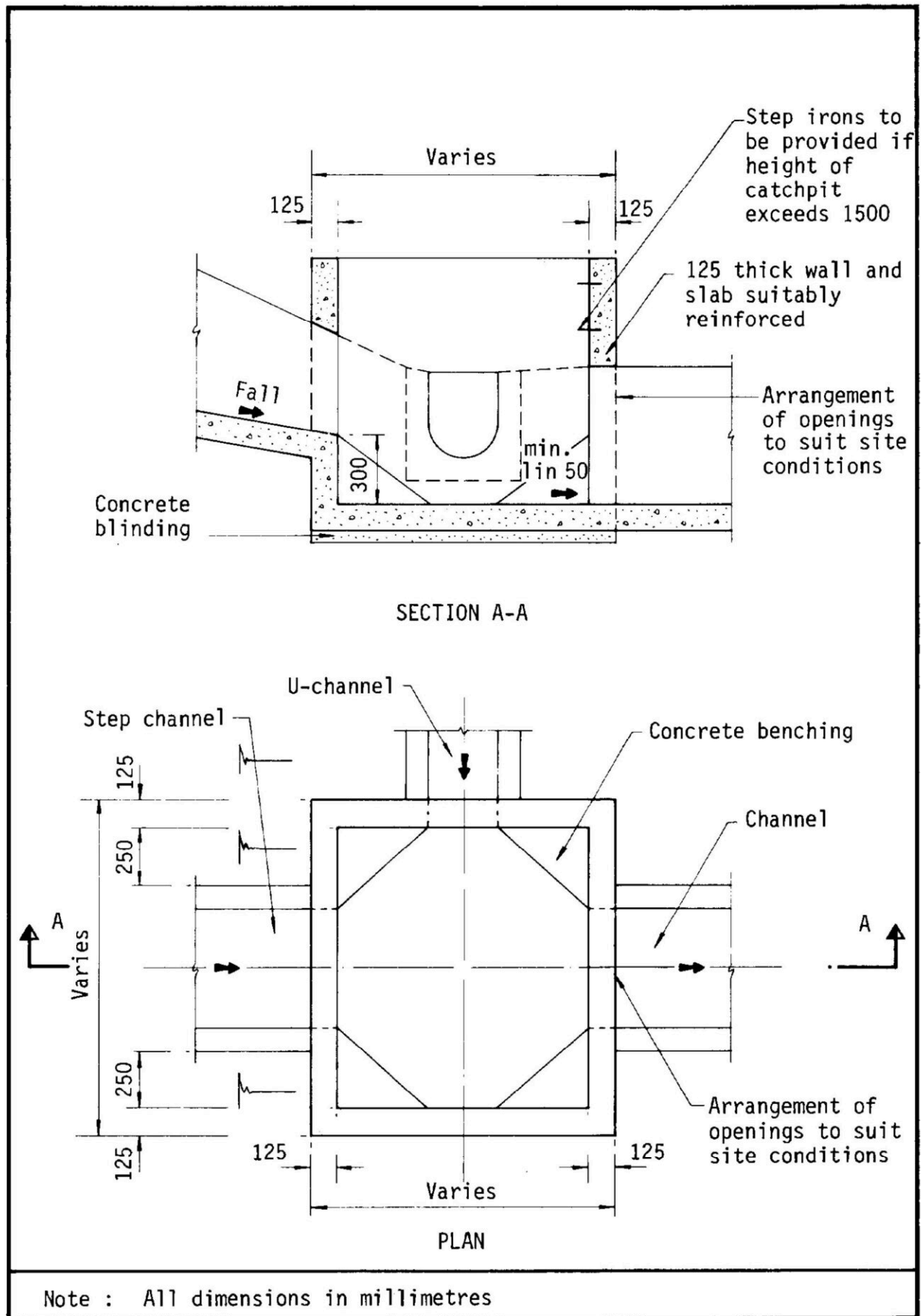
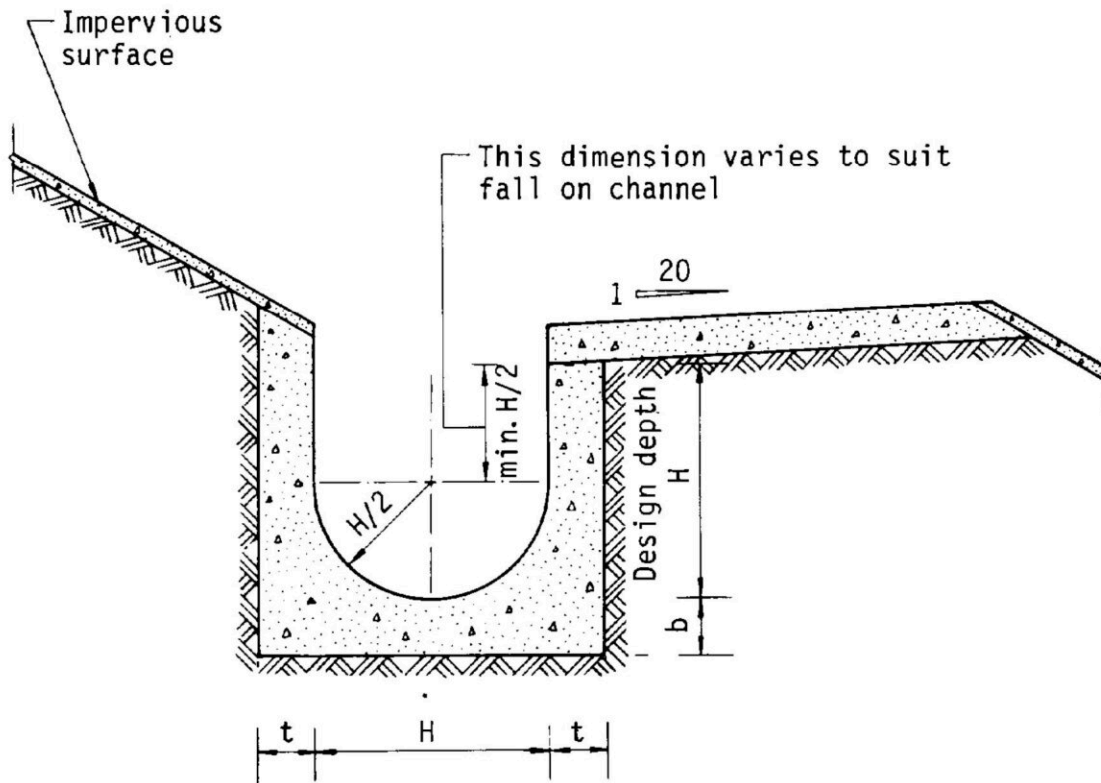


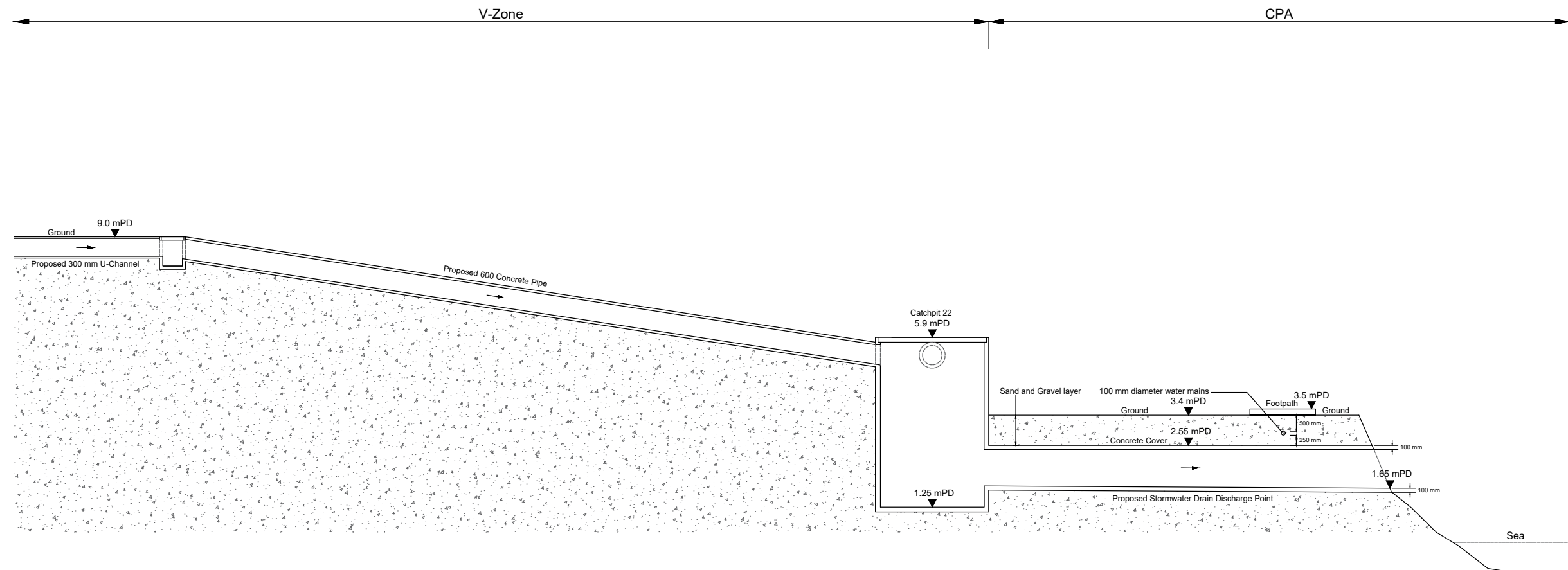
Figure 8.10 - Typical Details of Catchpits



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



Project Title :

Proposed Stormwater Drain Discharge Point

Scale :

1 : 150

Plan No. :

CW/TKP/LOP

Date :

29-08-2026

Survey Sheet No. :

8-NE-16A

Drawing Title :

Construction Proposal

CHUO WANG SURVEY SERVICES COMPANY
 1/F, Block A, Wo Tai Building, No. 2-24, Wo Tai Street,
 Luen Wo Hui, Fanling, N.T.
 Telephone : 26831600 Mobile : 66862836 Fax : 26831380
 E-mail - chuowang.ssc@gmail.com / h.y.pang@hotmail.com

