Appendix I

寄件者: Isa Yuen [redacted]
寄件日期: 2026年06月26日星期五 17:30
收件者: tpbpd/PLAND
副本: Jason Sek Hei WONG/PLAND; Thomas Luk; YC Lit
主旨: [PLG10340] Planning Application No. A/YL-SK/456 - Further Information
附件: ADCL_PLG_10340_L003.pdf

郵件標幟: 待處理
標幟狀態: 已標幟

類別: Internet Email

Dear Sir/Madam,

We refer to our submission and would like to provide further information to facilitate considerations by the relevant departments and the Town Planning Board. Enclosed self-explanatory letter for your processing please.

Thank you for your attention.

Best regards,
Isa Yuen
Man Chi Consultants and Construction Limited
Tel: [redacted]

Man Chi Consultants and Construction Limited
敏志顧問及建築工程有限公司

Tel 電話：[redacted]
Fax 傳真：

Date : 26th June, 2026
Our Ref. : [redacted]

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

By Email

Dear Sir/Madam,

Re: Section 16 Planning Application for Proposed Temporary Shop and Services (Motor-vehicle Showroom) with Ancillary Office and Facilities and Associated Filling of Land for a Period of 3 Years at Lot Nos. 786 RP (Part) in D.D. 114, Shek Kong, Yuen Long
(Planning Application No. A/YL-SK/456)

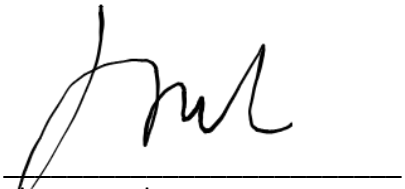
We refer to our submission and the comments received from the Drainage Services Department regarding the subject application. To facilitate the consideration of the Town Planning Board and relevant departments, we hereby submit the following information:

i. Drainage Proposal; and
ii. Replacement page of the Planning Statement.

Additionally, we would like to clarify that the proposed building height of not more than 10m is functionally necessary to accommodate new/second-hand lorries, the majority of which are fitted with mounted cranes. These vehicles require significant vertical clearance for safe operational maneuvers and boom extensions to serve display purposes (please refer to the attached images). The proposed building height ensures that dynamic crane movements and high-reaching boom arcs do not interfere with or damage essential overhead infrastructure. Furthermore, this overhead clearance is critical for the integration and maintenance of essential facility infrastructure including high-intensity display lighting, elevated platforms and fire services installations systems, ensuring compliance with both operational utility and safety standards.

Thank you for your kind attention and should you have any queries, please do not hesitate to contact the undersigned at [redacted]

Yours faithfully,
For and on behalf of
Man Chi Consultants And Construction Limited



Thomas Luk
Planning Consultant

Encl.

Address 地址：
[redacted]

Appendix 1

Drainage Proposal

Drainage Design Report

Proposed Drainage Facilities in Lot 786 RP in D.D. 114, Kam Sheung Road, Yuen Long, New Territories

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A Proposed Drainage Details for the Application Site

B Design Calculation

1. INTRODUCTION

This application is for the Proposed Drainage Facilities in Lot 786 RP in D.D. 114, Kam Sheung Road, Yuen Long, New Territories.

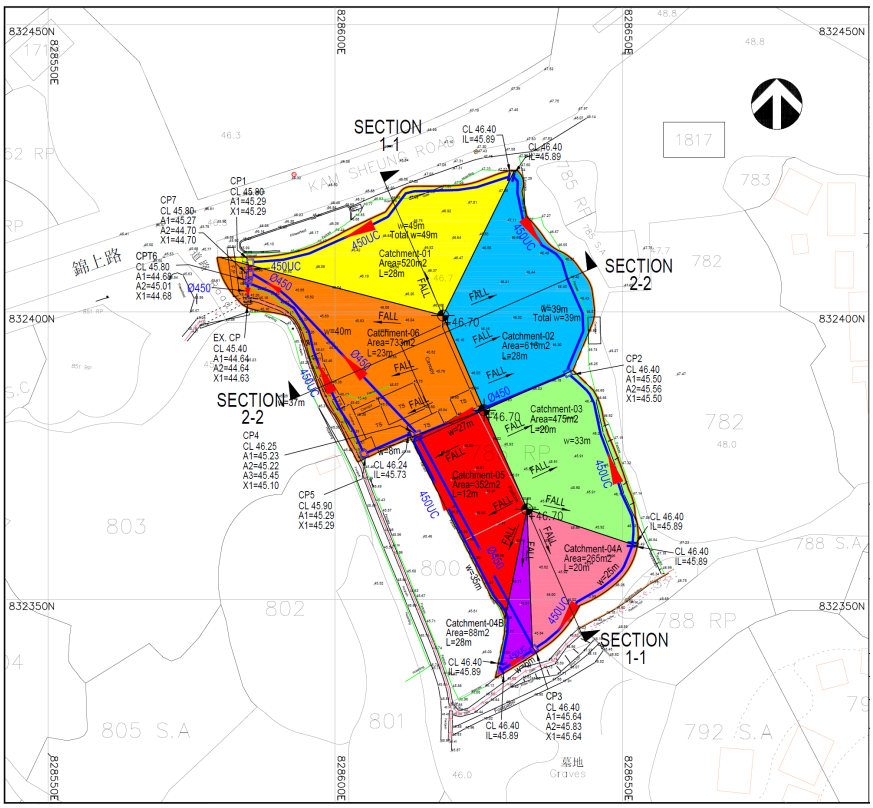
This report has been prepared to support the drainage proposal by:

(a) Identifying the catchments;

(b) Demonstrating through hydraulic calculations that the proposed drainage facilities, along with existing downstream facilities, are adequate to collect, convey, and discharge surface runoff, as shown in Appendix B.

2. IDENTIFY CATMENT AREA AND RUNOFF

In the hydraulic calculations, the catchments are located within the application site for the design of the facilities. Below are the key plans for the proposed catchments, as shown in Figure 1.



i) Figure 1

i) The area within the application site, Lot No. 786 RP in D.D. 114, is situated on flat terrain. The northern boundary is adjacent to the existing Kam Sheung Road with its own drainage system. The eastern, southern and western boundaries is enclosed by a existing fence/hoarding and are at a higher level to the surroundings; Therefore, the application site is unlikely to collect surface runoff from outside its boundaries.

a. In Catchment 1, denoted by the Yellow area, the surface runoff flows in north directions and will be directed to a U-Channel.

b. In Catchment 2, denoted by the Blue area, the surface runoff flows in northeast directions and will be directed to a U-Channel.

c. In Catchment 3, denoted by the Green area, the surface runoff flows in east directions and will be directed to a U-Channel.

d. In Catchment 4A & 4B, denoted by the Pink & Purple area, the surface runoff flows in southeast and southwest directions and will be directed to a U-Channel.

e. In Catchment 5, denoted by the Red area, the surface runoff flows in west directions and will be directed to a U-Channel.

f. In Catchment 6, denoted by the Orange area, the surface runoff flows in northwest directions and will be directed to a U-Channel.

Detailed hydraulic calculations are provided in Appendix B.

3. DESIGN OF DRAINAGE FACILITIES

The proposed facilities are designed according to the following codes and guidelines:

1. Geotechnical Manual for Slopes (GCO, 1984);
2. Stormwater Drainage Manual 2018 (SDM 2018);
3. GEO Technical Guidance Note No. 30 (TGN 30);
4. GEO Technical Guidance Note No. 39 (TGN 39);
5. GEO Technical Guidance Note No. 43 (TGN 43);

The surface runoff for a 1 in 50-year return period rainstorm is calculated using the rational method in accordance with SDM 2018 and SDM Corrigendum No. 1/2024; the calculations are attached in Appendix B.

The increment for climate change is included in the calculations in accordance with SDM Corrigendum No. 1/2022, +16.0%.

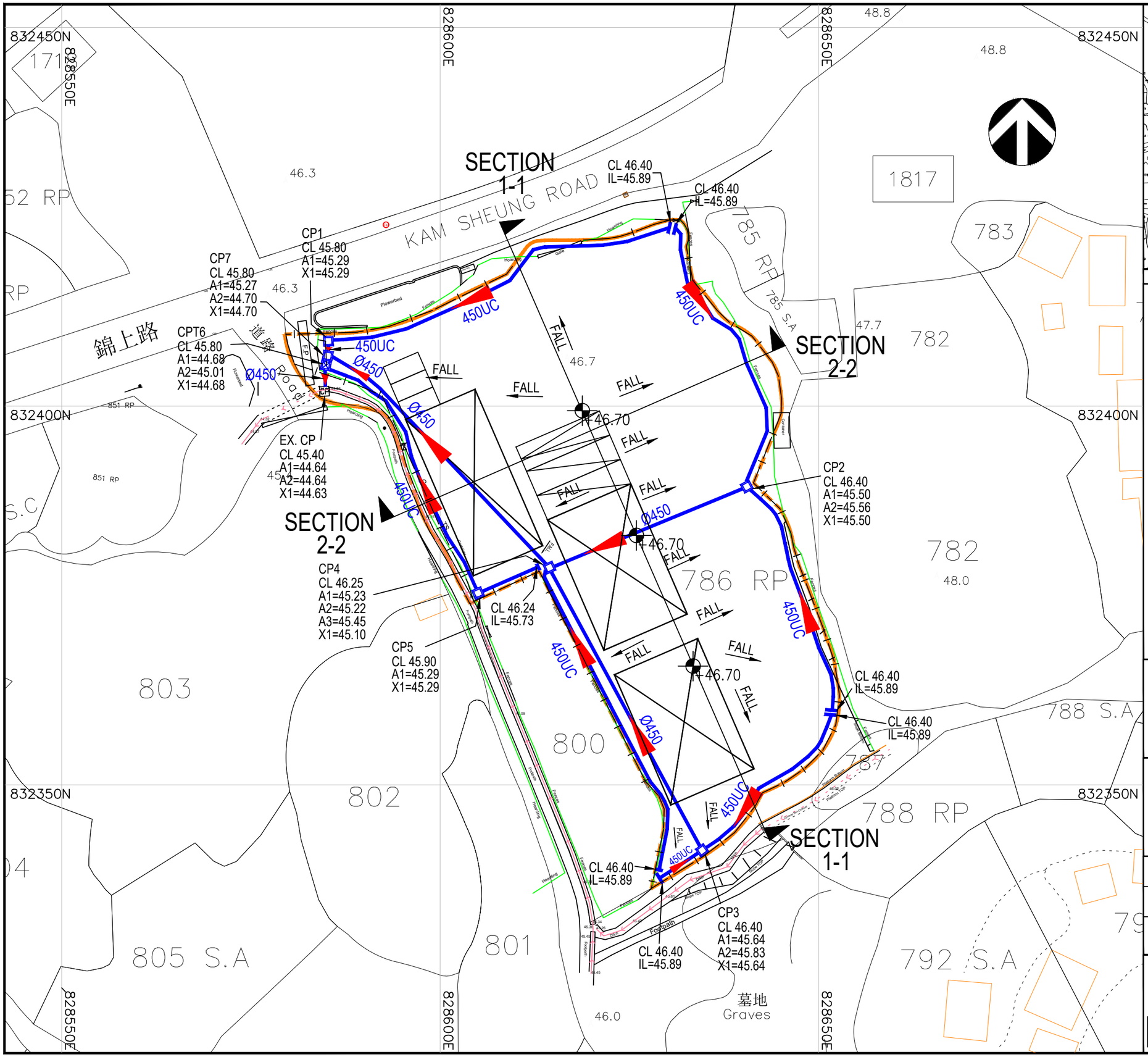
It is concluded that 450mm U-Channels (minimum 1 in 100 fall) will be provided to surround all boundaries of the subjected site, as detailed in Appendix A. All U-channels from the catchments will be connected to a proposed Catchpit with Trap (CPT6) located within the subject site boundary. The runoff from CPT6 will then drain into a 450mm underground pipe leading to an existing catchpit, that discharges into an existing 1.2m wide channel.

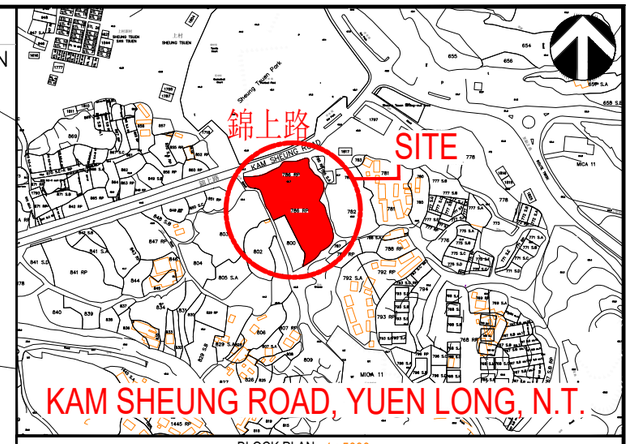
The hydraulic calculations demonstrate that the facilities are sufficient to collect surface runoff from the application site.

The design is considered adequate.

APPENDIX A

Proposed Drainage Details for the Application Site





BLOCK PLAN 1 : 5000

LEGENDS:

- APPLICATION SITE BOUNDARY LINE
- Fences — EXISTING FENCES
- INGRESS/EGRESS
- +46.00 — EX. SPOT LEVEL (mPD)
- +46.70 — PROPOSED SITE FORMATION LEVEL (mPD)
- CP — EXISTING STORMWATER CATCHPIT (EX. CP)
- EX. (SIZE)UC — EXISTING U-CHANNEL (SIZE DENOTED)
- EX. ø(DIA) — EXISTING STORM WATER PIPE (UNDERGROUND) (NOMINAL DIAMETER DENOTED)
- PROPOSED CATCHPIT WITH TRAP
- PROPOSED CATCHPIT WITHOUT TRAP
- (SIZE)UC — PROPOSED U-CHANNEL (SIZE DENOTED, MIN. FALL 1:100)
- ø(DIA) — PROPOSED STORM WATER PIPE (UNDERGROUND) (NOMINAL DIAMETER DENOTED, MIN. FALL 1:100)

PROJECT :

PROPOSED DRAINAGE FACILITIES AT LOT 786RP IN D.D. 114, KAM SHEUNG ROAD, YUEN LONG, N.T.

DRAWING TITLE :

DRAINAGE DESIGN LAYOUT PLAN

SCALE :	1:500	DRAWN BY :	C.W.
DATE :	JUN 2026	CHECKED BY :	R.W.
DRAWING NO.	DD114-786RP/D-01	REV.	B

GEOTECHNICAL CONSULTANT :

PHILIP SO & ASSOCIATES
CONSULTING CIVIL AND GEOTECHNICAL ENGINEERS LTD.
[redacted]
TEL. [redacted]
FAX.

2026-24-06 19:52 Calvin

NOTES FOR CATCHPIT

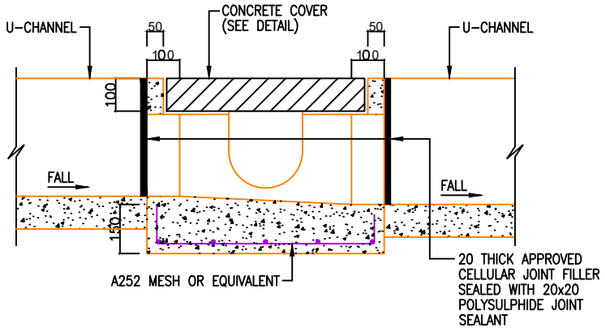
1. ALL CONCRETE SHALL BE GRADE C30 AND COMPLY WITH CS1:2010.
2. MINIMUM CONCRETE COVER SHALL BE 40mm.
3. ALL REINFORCEMENT (GRADE 500B) TO BE HIGH TENSILE DEFORMED BAR.
   ALL REINFORCEMENT SHALL COMPLY WITH CS2:2012.
   ALL WIRE MESH SHALL BE GRADE 500B STEEL COMPLY WITH CS2:2012.
4. RUN OFF FROM THIS SITE SHALL BE PROPERLY TREATED AND CONVEYED TO THE PUBLIC DRAIN VIA SANDTRAP/CATCHPIT DURING THE SITE FORMATION WORKS.

NOTES FOR U-CHANNEL

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. H = NOMINAL CHANNEL SIZE
3. FOR DIMENSIONS OF CHANNEL SEE TABLE.

NOMINAL SIZE H	T	B	REINFORCEMENT
200-300	100	100	A252 MESH PLACED CENTRALLY
375-675	100	150	

4. CONCRETE SURFACE FINISH SHALL BE CLASS U2 OR F2 AS APPROPRIATE.
5. EXPANSION JOINTS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 10 METRES.
6. ALL CONCRETE SHALL BE GRADE C30.
7. ALL CAST IRON FOR GRATINGS SHALL BE GRADE EN-GJL-150 COMPLYING WITH BS EN 1561.



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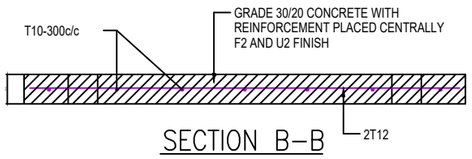
(SCALE N.T.S.)



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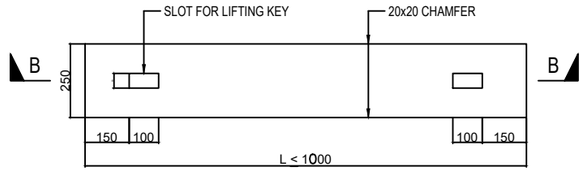
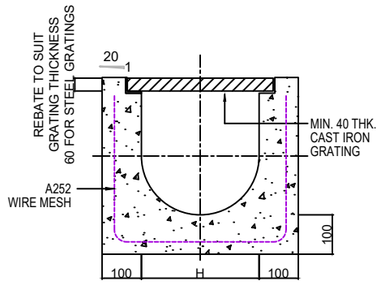
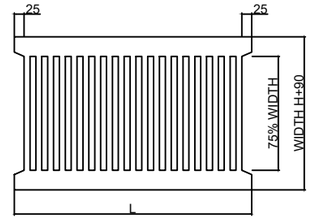


PLAN OF PRECAST CONCRETE COVER FOR CATCHPIT
TYPE 1 - FOR SPAN UP TO 1.0m N.T.S.

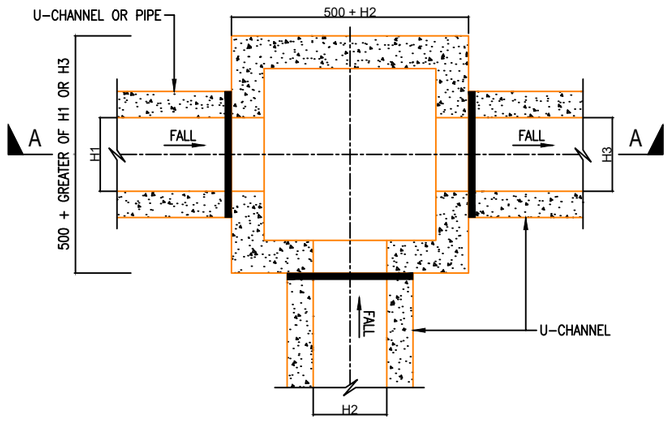


TYPICAL SECTION

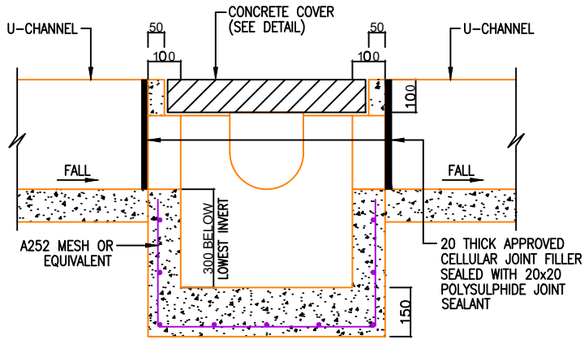


CAST IRON GRATING

U-CHANNEL WITH CAST IRON GRATING N.T.S.
(UP TO H OF 525)
(DIMENSIONS ARE FOR GUIDANCE ONLY, CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)



PLAN
TYPICAL DETAIL OF CATCHPIT N.T.S.



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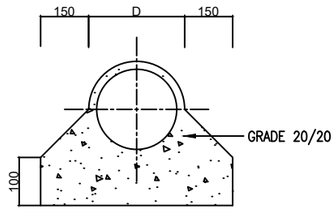
(SCALE N.T.S.)



PIPE BEDDING DETAIL
(SCALE N.T.S.)

GEOTECHNICAL CONSULTANT :
PHILIP SO & ASSOCIATES
CONSULTING CIVIL AND GEOTECHNICAL ENGINEERS LTD.
[redacted]
TEL.
FAX.

PROJECT :
PROPOSED DRAINAGE FACILITIES AT LOT 786RP IN D.D. 114, KAM SHEUNG ROAD, YUEN LONG, N.T.

DRAWING TITLE :
STORMWATER DRAINAGE WORKS - NOTES AND DETAILS - 1

SCALE :	AS SHOWN	DRAWN BY :	C.W.
DATE :	JAN 2026	CHECKED BY :	R.W.
DRAWING NO.	DD114-786RP/D-02	REV.	A

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NOTES FOR CATCHPIT

1. ALL CONCRETE SHALL BE GRADE C30 AND COMPLY WITH CS1:2010.

2. MINIMUM CONCRETE COVER SHALL BE 40mm.

3. ALL REINFORCEMENT (GRADE 500B) TO BE HIGH TENSILE DEFORMED BAR.
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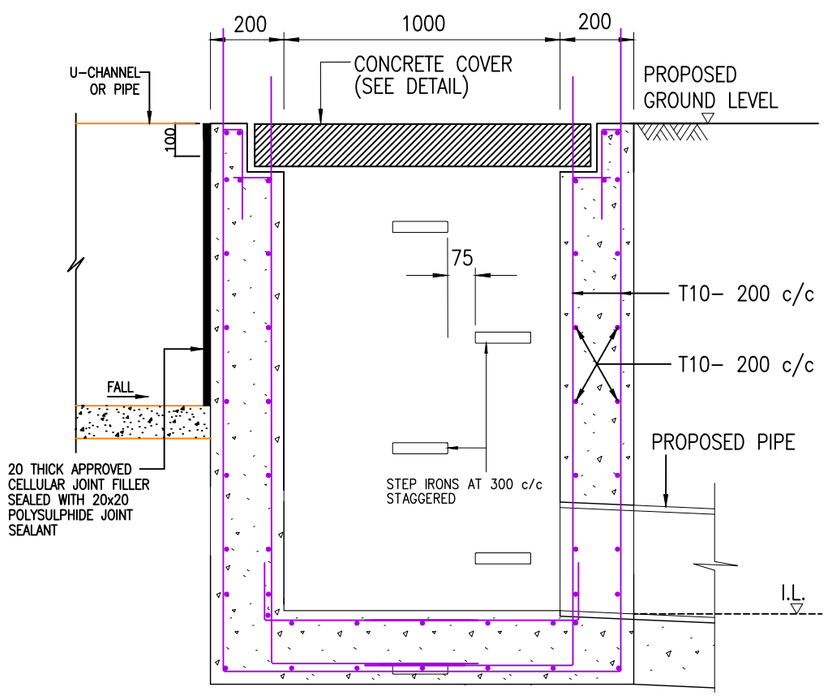

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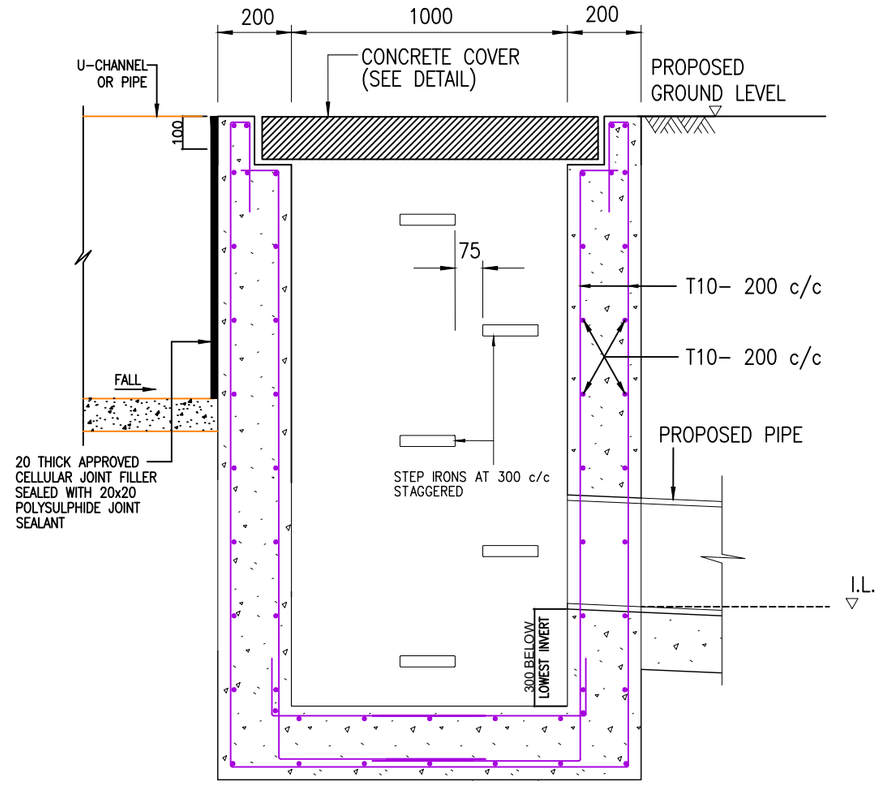

SECTION A–A (WITH TRAP)
(FOR GROUND LEVEL TO I.L.>1.0M, MAX. 2.50M)
(SCALE N.T.S.)

GEOTECHNICAL CONSULTANT :
PSA PHILIP SO & ASSOCIATES
CONSULTING CIVIL AND GEOTECHNICAL ENGINEERS LTD.
[redacted]
TEL. [redacted]
FAX.

PROJECT :
PROPOSED DRAINAGE FACILITIES AT LOT 786RP IN D.D. 114, KAM SHEUNG ROAD, YUEN LONG, N.T.

DRAWING TITLE :
STORMWATER DRAINAGE WORKS – NOTES AND DETAILS – 2

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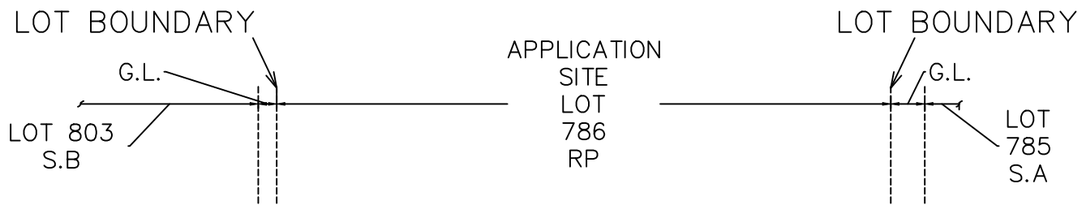

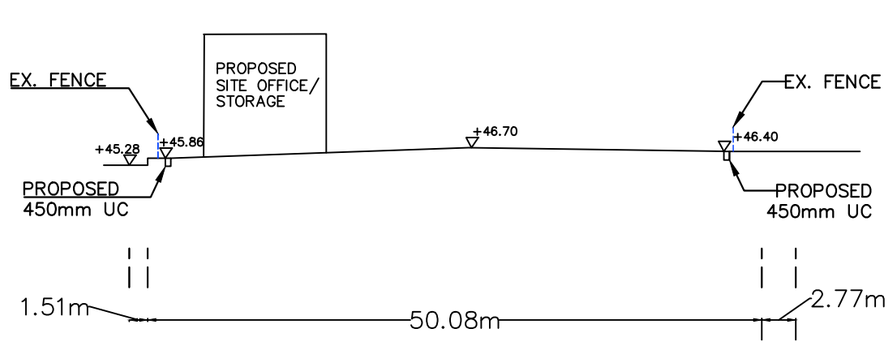

SECTION 1-1 1 : 500

GEOTECHNICAL CONSULTANT :

PSA PHILIP SO & ASSOCIATES
CONSULTING CIVIL AND GEOTECHNICAL ENGINEERS LTD.

[redacted]
TEL.
FAX. [redacted]

PROJECT :

PROPOSED DRAINAGE FACILITIES AT
LOT 786RP IN D.D. 114,
KAM SHEUNG ROAD, YUEN LONG, N.T.

DRAWING TITLE :

SECTION 1-1

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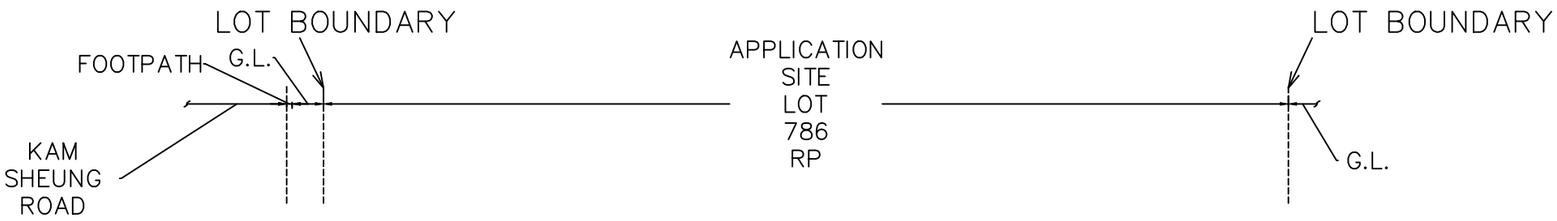

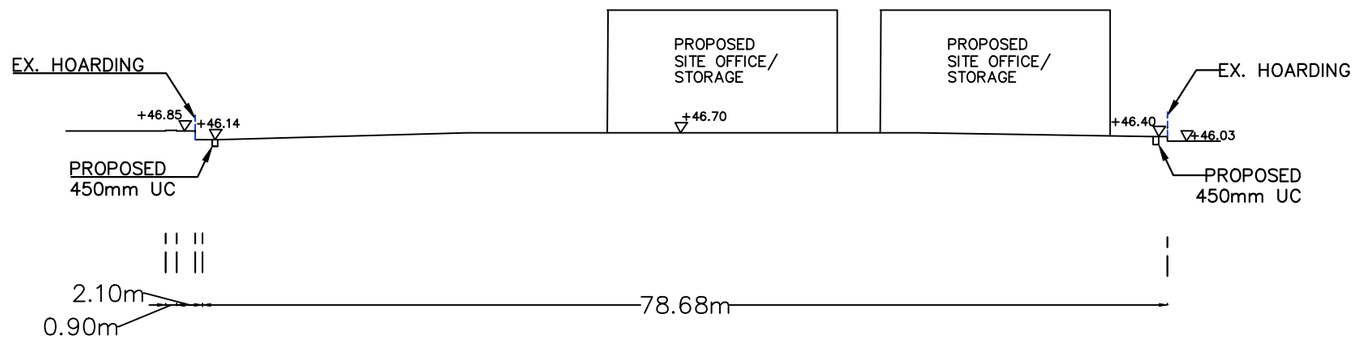

SECTION 2-2 1 : 500

GEOTECHNICAL CONSULTANT :

PSA PHILIP SO & ASSOCIATES
CONSULTING CIVIL AND GEOTECHNICAL ENGINEERS LTD.

[redacted]

TEL. [redacted]
FAX.

PROJECT :

PROPOSED DRAINAGE FACILITIES AT
LOT 786RP IN D.D. 114,
KAM SHEUNG ROAD, YUEN LONG, N.T.

DRAWING TITLE :

SECTION 2-2

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APPENDIX B

Design Calculation

		PROJECT No. **DD114-786RP**
OFFICE **PSA**	PROJECT TITLE **DRAINAGE DESIGN REPORT for Lots 786 RP in D.D. 114, Kam Sheung Road, Yuen Long**	CATCHMENT No.

NOTES

1. Refer: Geotechnical Manual for Slopes (GCO, 1984)".
2. Refer: Stormwater Drainage Manual 2018 (SDM 2018)
3. Refer: SDM Corrigendum No. 1/2024
4. Refer: SDM Corrigendum No. 1/2022
5. Refer: GEO Technical Guidance Note No. 43 (TGN 44)

Design Parameters and Assumption

1 The design of surface drainage system is based on the guidelines given in the "Geotechnical Manual for Slopes (GCO, 1984)".

2 The design is in accordance with Stormwater Drainage Manual 2018 (SDM 2018)

3 Rainfall intensity is taken from "Table 3b – Storm Constants for Different Return Periods of Tai Mo Shan Area, SDM 2018"

4 Rainfall Increase due to Climate Change is taken from "Section 6.8 & Table 28 – Rainfall Increase due to Climate Change, SDM, Corrigendum No. 1/2022"

5 All designed drainages are using Concrete U-Channel, in accordance to "Guidelines on Hydraulic Design of U-shaped and Half-round Channels on Slopes, GEO Technical Guidance Note No. 43 (TGN 43)"

6 The required design intensity is based on a 50-years return period storm according to the SDM 2018. (Section 4.3.2-4.3.4, 6.6.1 SDM 2018)

7 The flow in the catchment area is calculated using the "Rational Method",

The formula is $Q = k \times I \times A/3600$ (Ref. Eq. 8.1, Ch. 8.2.1, GCO, 1984)

where
Q = Maximum Runoff (litres/sec)
I = Design mean intensity of rainfall (mm/hr)
A= Area if catchment (m^2)
k = Runoff coefficient (Ref. Section 7.5.2 (b), to P37, SDM 2018)

8 The Time of Concentration is calculated using the modified form of original Bransby--Williams equation,

$t = 0.14465 \times L/ (H^{0.2} \times A^{0.1})$ (Ref. Eq. 8.2, Ch. 8.2.3, GCO 1984)

where

t = Time of Concentration (min)
H = Average fall (m/100m) from the summit of catchment to the pt. of design.
A= Area of catchment (m^2)
L = Distance in (m) measured on the line of natural flow between the design section and that pt, of the catchment from which water would take the longest time to reach the design section.

9 All design pipe are using concrete pipe/DI pipe.

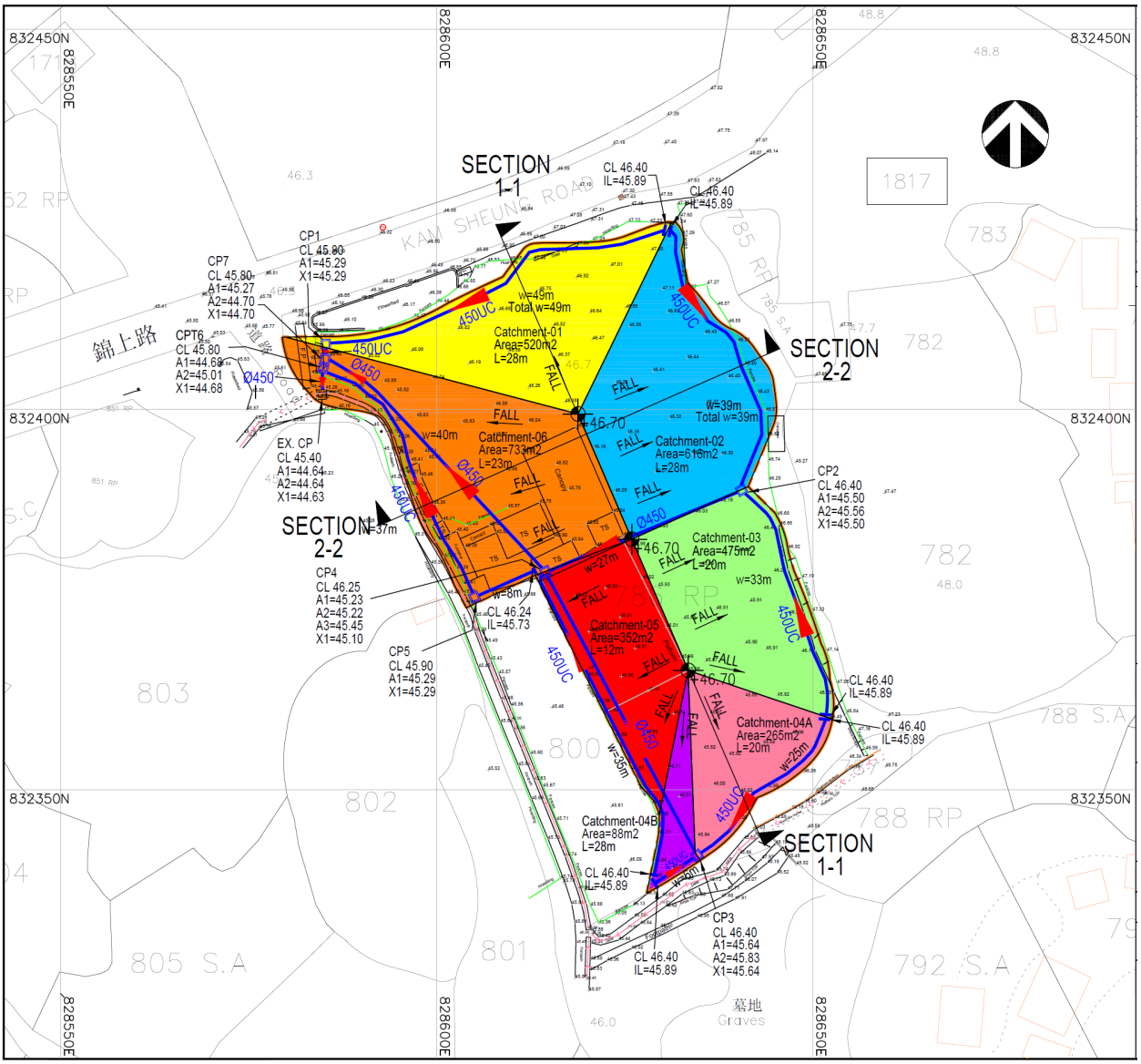
10 Maximum velocity of flow is 4.0 m/s.

11 Area is divided into sub-catchment areas for the calculation of surface runoff if necessary. Runoff is collected by U-channels,

12 The stormwater collected by the surface drainage system is connected to the existing stream.

Drainage Facilities Arrangement within Application Site

	Ref.		Direction (Clockwise?)	Beginning	L-increment (Chainage)	CL	IL	Depth of Catchpit	DS Channel Length	DWG. Chainage	END	C.L	I.L	Depth of Catchpit	Delta IL (Height Diff)	Gradient X in 100	Required Pipe/Channel	Channel Capacity (litre/min)	Velocity at Capacity (m/s)	
U-Channel	IL	CP1	ACW	IL	0.00	46.400	45.890	**0.510**	49	49.00	CP1	45.800	45.290	**0.510**	0.600	81.7	450UC 1 in 82	26565	2.45	ok
	IL	CP2	CW	IL	0.00	46.400	45.890	**0.510**	39	39.00	CP2	46.400	45.500	**0.900**	0.390	100.0	450UC 1 in 100	24056	2.22	ok
	IL	CP2	ACW	IL	0.00	46.400	45.890	**0.510**	33	33.00	CP2	46.400	45.560	**0.840**	0.330	100.0	450UC 1 in 100	24056	2.22	ok
	IL	CP3	CW	IL	0.00	46.400	45.890	**0.510**	25	25.00	CP3	46.400	45.640	**0.760**	0.250	100.0	450UC 1 in 100	24056	2.22	ok
	IL	CP3	CW	IL	0.00	46.400	45.890	**0.510**	6	6.00	CP3	46.400	45.830	**0.570**	0.060	100.0	450UC 1 in 100	24056	2.22	ok
	IL	CP4	CW	IL	0.00	46.400	45.890	**0.510**	44	44.00	CP4	46.250	45.450	**0.800**	0.440	100.0	450UC 1 in 100	24056	2.22	ok
	IL	CPT5	CW	IL	0.00	46.240	45.730	**0.510**	8	8.00	CPT5	45.900	45.452	**0.448**	0.278	28.7	450UC 1 in 100	24056	2.22	ok
	CP1	CP7	ACW	CP1	0.00	45.800	45.290	**0.510**	2	2.00	CP7	45.800	45.270	**0.530**	0.020	100.0	450UC 1 in 100	24056	2.22	ok
Pipe	CP2	CP4		CP2	0.00	46.400	45.500	**0.900**	27	27.00	CP4	46.250	45.230	**1.020**	0.270	100.0	450P 1 in 100	24185	2.53	ok
	CP3	CP4		CP3	0.00	46.400	45.640	**0.760**	42	42.00	CP4	46.250	45.220	**1.030**	0.420	100.0	450P 1 in 100	24185	2.53	ok
	CP4	CPT7		CP4	0.00	46.250	45.100	**1.150**	40	40.00	CPT7	45.800	44.700	**1.100**	0.400	100.0	450P 1 in 100	24185	2.53	ok
	CPT6	EX.CP		CPT6	0.00	45.800	44.680	**1.120**	3	3.00	EX.CP	45.400	44.640	**0.760**	0.040	75.0	450P 1 in 75	28058	2.94	ok



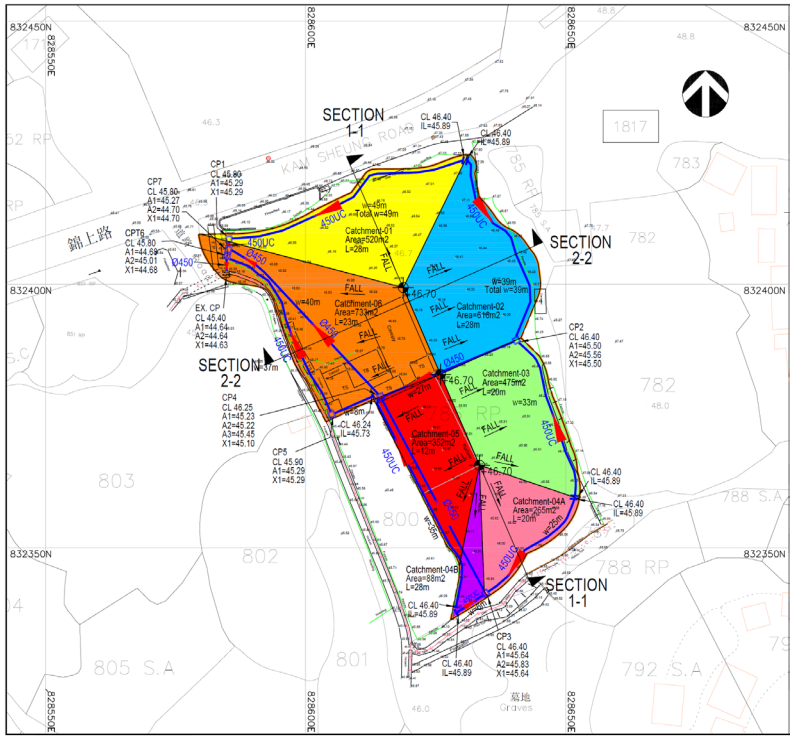
Capacity Calculation for drainage facilities within Application Site

Rainfall intensity is taken from "Table 3b – Storm Constants for Different Return Periods of Tai Mo Shan Area, SDM 2018"
for Return Period 50 years

a	b	c
1740.1	19.78	0.57

Catchment ID	Area (m^2)	Run-off Co-efficient	Flow Path L (m)	Highest Catchment Level (mPD)	Collection Pt. Level (mPD) (m)	Delta-h (m)	H - Drop in 100m (m per 100m)	Time of Entry t_o (min)	U-Channel Length w (m)	Assumed Velocity v (m/s)	Time of Flow t_f (min)	Time of Concentration T_c (min)	Rainfall Intensity - a	Rainfall Intensity - b	Rainfall Intensity - c	Rainfall Intensity (mm/hr)	Increment for Climate Change (%)	Peak Runoff Q (litre/min)	Required Pipe/Channel	Channel Capacity (litre/min)	Velocity at Capacity (m/s) (<=4.0m/s)	Status
Catchment 1	520	1.00	28.0	46.70	46.40	0.30	1.1	2.14	49.0	2.45	0.33	2.47	1740.1	19.78	0.57	296.9	16.0%	2,985	450UC 1 in 82	26,565	2.45	ok
Catchment 2	616	1.00	28.0	46.70	46.40	0.30	1.1	2.10	39.0	2.22	0.29	2.39	1740.1	19.78	0.57	297.5	16.0%	3,543	450UC 1 in 100	24,056	2.22	ok
Catchment 3	475	1.00	20.0	46.70	46.40	0.30	1.5	1.44	33.0	2.22	0.25	1.69	1740.1	19.78	0.57	303.0	16.0%	2,783	450UC 1 in 100	24,056	2.22	ok
Catchment 4A	265	1.00	20.0	46.70	46.40	0.30	1.5	1.53	25.0	2.22	0.19	1.71	1740.1	19.78	0.57	302.8	16.0%	1,551	450UC 1 in 100	24,056	2.22	ok
Catchment 4B	88	1.00	28.0	46.70	46.40	0.30	1.1	2.55	6.0	2.22	0.05	2.60	1740.1	19.78	0.57	295.9	16.0%	503	450UC 1 in 100	24,056	2.22	ok
Catchment 5	352	1.00	12.0	46.70	46.05	0.65	5.4	0.69	35.0	2.22	0.26	0.95	1740.1	19.78	0.57	309.1	16.0%	2,104	450UC 1 in 100	24,056	2.22	ok
Catchment 6	733	1.00	23.0	46.70	45.90	0.80	3.5	1.34	37.0	2.22	0.28	1.62	1740.1	19.78	0.57	303.6	16.0%	4,302	450UC 1 in 100	24,056	2.22	ok
Sum	1,913																Sum	17,770				

Collect Area	Total Peak Run-off (litre/min)	Required Pipe/Channel	Channel Capacity (litre/min)	Velocity at Capacity (m/s)	Status	(Notes)	Direction (Clockwise?)
Catchment 1	2,985	450UC 1 in 82	26,565	2.45	ok	IL-CP1	ACW
	2,985	450UC 1 in 100	24,056	2.22	ok	CP1-CP7	ACW
Catchment 2	3,543	450UC 1 in 100	24,056	2.22	ok	IL-CP2	CW
Catchment 3	2,783	450UC 1 in 100	24,056	2.22	ok	IL-CP2	ACW
Sub-Total	**6,325**	**450P 1 in 100**	**24,185**	**2.53**	**ok**	CP2-CP4	
Catchment 4A	1,551	450UC 1 in 100	24,056	2.22	ok	IL-CP3	CW
Catchment 4B	503	450UC 1 in 100	24,056	2.22	ok	IL-CP3	ACW
Sub-Total	2,055	450P 1 in 100	24,185	2.53	ok	CP3-CP4	
Catchment 5	2,104	450UC 1 in 100	24,056	2.22	ok	IL-CP4	CW
Catchment 2+3+4A+4B+5	**10,484**	**450P 1 in 100**	**24,185**	**2.53**	**ok**	CP4-CP7	
Catchment 6	4,302	450UC 1 in 100	24,056	2.22	ok	IL-CPT6	CW
Total							
Catchment 1+2+3+4+5+6	**17,770**	**450P 1 in 75**	**28,058**	**2.94**	**OK**	CPT5-EX.CP	



Calculation of 450mm U-Channal Capacity by using Manning's Formula

Refer to Section 8.3.4 of Geotechnical Manual for Slopes (GCO, 1984) &
5.1 of GEO Technical Guidance Note No. 43 (TGN 44)

For U-Channel

R=Dh=A/P

b= 0.450 m
h= 0.450 m
r=b/2= 0.225 m half full A= 0.079522

For h <=r, Half-Circle:

$\theta=2*Cos^{-1}((r-h)/r)=$ 3.141593

P=rθ= 0.706858 m

$A=r^2(\theta-\sin\theta)/2=$ 0.079522 m2, (limit at half circle) Hydraculic Radius, R=A/P= 0.1125

For h>r, Upper Rectangle:

h'=h-r= 0.225 m

Additional P'=2h= 0.45 m

Additional, A'=bh'= 0.10125 m2 Hydraculic Radius, R=A/P= 0.225

Combined:

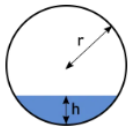
P= 1.156858 m

A= 0.180772 m2 Hydraculic Radius, R=A/P= 0.156261 m

Manning's formula,

$V=R^{0.67}*S^{0.5}/n$ 8.3.4 of GCO 1984 & 5.1 of TGN43

2. Pipe (less than full)



The problem gets a bit more complicated when the pipe is only partially filled. We already calculated this wetted perimeter in the wetted perimeter of a pipe section:

`P = r × θ`, where the central angle `θ = 2 × arccos [(r − h) / r]`

What about the area, then? You can use the segment area calculator or directly the formula for the circle segment area:

`A = r² × (θ − sin(θ)) / 2`

Combining the two, we find the hydraulic radius equation:

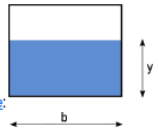
`R = A / P = [r² × (θ − sin(θ)) / 2] / (r × θ)`

This is quite a formula! Luckily, you can use this handy hydraulic radius calculator instead of meticulously performing all the calculations by hand ;)

Hydraulic radius equation for rectangular, trapezoidal, and triangular channel

This hydraulic radius calculator can be used for channels of various shapes, including rectangles, trapezoids, and triangles. Let's analyze them in more detail to find out which hydraulic radius equations can be used in each case.

1. Rectangular channel



In the case of a rectangular channel, the formulas are very straightforward. The hydraulic radius is simply equal to the rectangle's area divided by the wetted perimeter, as explained in the first example:

`R = A / P = (b × y) / (b + y + y) = (b × y) / (b + 2y)`

That's it — you can use this formula to find the hydraulic radius of a rectangular open channel.

								Lower half-Circle		Upper Rectangle							
	b	h	r=b/2	θ	1 in	S=	n=	A	P	A'	P'	A+A'	P+P'	R=Dh=A/P	V m/s		Q, m3/s	Q, L/min
Cap/Chart	0.45	0.4500	0.225	3.141593	40.00	0.025	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	3.51		0.633923	38,035
Cap/Chart	0.45	0.4500	0.225	3.141593	50.00	0.020	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	3.14		0.566998	34,020
Cap/Chart	0.45	0.4500	0.225	3.141593	60.00	0.017	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	2.86		0.517596	31,056
Cap/Chart	0.45	0.4500	0.225	3.141593	70.00	0.014	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	2.65		0.4792	28,752
Cap/Chart	0.45	**0.4500**	0.225	3.141593	80.00	0.013	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	**2.48**		0.448251	26,895
Cap/Chart	0.45	**0.4500**	0.225	3.141593	82.00	0.012	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	**2.45**		0.442751	26,565
Cap/Chart	0.45	**0.4500**	0.225	3.141593	95.00	0.011	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	**2.28**		0.411343	24,681
Cap/Chart	0.45	**0.4500**	0.225	3.141593	100.00	0.010	0.013	0.079522	0.706858	0.10125	0.45	0.180772	1.156858	0.156261	**2.22**		0.400928	24,056

Calculation of Proposed 450mm Pipe (at 1:100) Capacity by using Colebrook-White's Formula

Refer to Section 8.3.1, Table 12 & Table 14 SDM 2018

Refer to Section 3.12.2 of Guidance Notes On Road Pavement Drainage Design
RD/GN/035A, February 2020

For Pipe

Pipe Diameter=	0.45	m					
A_p=	0.1590	m2					
R =Hydraulic Radius=	0.1125	m					
g=	9.81	m/s2					
S_f	0.01	m/m		eqv. (1 in X) =	100.0		
k_s =	0.00006	m	takes k_s=0.06mm for PE Pipe, Table 14, SDM 2018				
v =	0.000001	m2/s					
V= Cross-Sectional Mean Velocity =	-	0.5943	* log (	3.604E-05	+	1.832E-05	)
=	**2.53**	m/s					
Q_p =	A_p	*	V				
=	0.1590	*	2.534				
=	0.403	m^3/s					
=	**24,185**	**L/min**					

Table 12, SDM 2018

Colebrook-White	$\overline{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$	transition between rough and smooth turbulent flow

RD/GN/035A

3.12.2 The capacity of an outlet pipe can be computed by using the Colebrook-White equation as shown in Equation (6):

$$Q_P = -A_P\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right] \qquad (6)$$

where
- Q_P = pipe capacity (m^3/s)
- A_P = cross-sectional area of the pipe (m^2)
- g = gravitational acceleration (m/s^2) (the typical value is of 9.81 m/s^2)
- R = hydraulic radius (m) (= pipe diameter/4)
- S_f = slope of the pipe
- k_s = roughness value of the pipe (m) (the typical values for concrete pipe and PVC pipe are 0.0006 m (i.e. 0.6 mm) and 0.00006 m (i.e. 0.06 mm) respectively)
- ν = viscosity of stormwater (m^2/s) (the typical value is of 1 x 10^{-6} m^2/s)

Calculation of Proposed 450mm Pipe (at 1:75) Capacity by using Colebrook-White's Formula

Refer to Section 8.3.1, Table 12 & Table 14 SDM 2018

Refer to Section 3.12.2 of Guidance Notes On Road Pavement Drainage Design
RD/GN/035A, February 2020

For Pipe

Pipe Diameter=	0.45	m					
A_p=	0.1590	m2					
R =Hydraulic Radius=	0.1125	m					
g=	9.81	m/s2					
S_f	0.01333333	m/m		eqv. (1 in X) =	75.0		
k_s =	0.00006	m	takes k_s=0.06mm for PE Pipe, Table 14, SDM 2018				
v =	0.000001	m2/s					
V= Cross-Sectional Mean Velocity =	-	0.6862	* log (	3.604E-05	+	1.587E-05	)
=	**2.94**	m/s					
Q_p =	A_p	*	V				
=	0.1590	*	2.940				
=	0.468	m^3/s					
=	**28,058**	**L/min**					

Table 12, SDM 2018

Colebrook-White	$\overline{V} = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$	transition between rough and smooth turbulent flow

RD/GN/035A

3.12.2 The capacity of an outlet pipe can be computed by using the Colebrook-White equation as shown in Equation (6):

$$Q_P = -A_P\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right] \qquad (6)$$

where
- Q_P = pipe capacity (m^3/s)
- A_P = cross-sectional area of the pipe (m^2)
- g = gravitational acceleration (m/s^2) (the typical value is of 9.81 m/s^2)
- R = hydraulic radius (m) (= pipe diameter/4)
- S_f = slope of the pipe
- k_s = roughness value of the pipe (m) (the typical values for concrete pipe and PVC pipe are 0.0006 m (i.e. 0.6 mm) and 0.00006 m (i.e. 0.06 mm) respectively)
- ν = viscosity of stormwater (m^2/s) (the typical value is of 1 x 10^{-6} m^2/s)

END

of

Drainage Design Report

Appendix 2

Replacement Page of the Planning Statement

EXECUTIVE SUMMARY

(In case of discrepancy between English and Chinese versions, English shall prevail)

This Planning Statement is submitted to the Town Planning Board (hereinafter referred to as "the Board") in support of a planning application (hereinafter referred to as "the Current Application") for **Temporary Shop and Services (Motor-vehicle Showroom) with Ancillary Office and Facilities and Associated Filling of Land for a Period of 3 Years** (hereinafter referred to as "the applied use") at Lot Nos. 786 RP (Part) in D.D. 114, Shek Kong, Yuen Long (hereinafter referred to "the Application Site"). The Application Site has a total area of approximately 2,980m^2. This Planning Statement serves to provide background information and planning justifications in support of the applied use in order to facilitate the consideration by the Board.

The Application Site currently falls completely within an area zoned "Village Type Development" ("V") on the draft Shek Kong Outline Zoning Plan No. S/YL-SK/10. As detailed throughout the Planning Statement, the applied use is well justified on the grounds that:-

(a) The applied use serves to provide a motor vehicle showroom for displaying new and/or second-hand lorries for sale which is compatible with surrounding land uses mainly comprising vehicle repair workshop, warehouses and temporary structures;
(b) Temporary nature of the applied use for shop and services will not jeopardize nor pre-empt the long-term planning intention of "V" zone;
(c) As the applied use is showroom in nature, the operation of the business will not involve frequent loading and unloading activities. No adverse traffic impact is anticipated, and the daily generation of vehicle trips to/from the Application Site for the applied use is expected to be minimal;
(d) No significant environmental impact shall be envisaged as the applied use is for displaying vehicles at restricted hours only, and no fire risks shall be envisaged; and
(e) No undesirable precedent will be set given there are similar approved applications on the same OZP.

In view of the above and the list of detailed planning justifications in the Planning Statement, it is sincerely hoped that members of the Board will give favorable consideration to approve the Current Application for the applied use for a temporary period of 3 years.

Appendix 3

Reference Images

Operations Managed by the Applicant Showing the Type of Vehicles for Display Purposes