

Our Ref.: DD107 Lot 490 & VL
Your Ref.: TPB/A/YL-KTN/1032

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

By Email

7 October 2024

Dear Sir,

2nd Further Information

**Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities
for a Period of 3 Years and Associated Filling of Land in "Agriculture" Zone, Various Lots in
D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New Territories**

(S.16 Planning Application No. A/YL-KTN/1032)

We write to submit a drainage impact assessment, which is identical to our previous submission dated 13.09.2024, signed and certified by a qualified engineer for the subject application to address departmental comments from the Drainage Services Department (**Appendix I**).

Should you require more information regarding the subject application, please contact our Mr. Danny NG at or the undersigned at your convenience.
Thank you for your kind attention.

Yours faithfully,

For and on behalf of
R-riches Property Consultants Limited



Christian CHIM
Town Planner

cc DPO/FSYLE, Pland

(Attn.: Ms. Andrea YAN
(Attn.: Mr. David CHENG
(Attn.: Ms. Olivia NG

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Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land in "Agriculture" Zone in Various Lots in D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New Territories

Drainage Impact Assessment

September 24



Prepared by: Yeung Toi Tung RP0666920
Marvellous Construction & Design Company Limited
For Harvest Hill (Hong Kong) Limited



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1 Introduction

1.1 Background

- 1.1.1 The applicant seeks planning permission from the Town Planning Board (the Board) to use Various Lots in D.D. 107 and Adjoining Government Land (GL), Fung Kat Heung, Kam Tin, Yuen Long, New Territories (the Site) for 'Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land'.
- 1.1.2 This report aims to support the development in drainage aspect.

1.2 Application Site

- 1.2.1 The application site is situated near Fung Kat Heung. It has an area of approx. 14,061 m². The site location is shown in **Figure 1**.
- 1.2.2 A large portion of the site was the approved site under A/YL-KTN/939 by the same applicant, in which the site area is currently hard paved (in north of east of the site). The other area is mainly covered by vegetation.
- 1.2.3 The existing site levels are proposed to be raised to +5.6 mPD from +3.1~3.7 mPD in order to match with existing road level adjacent to the site.
- 1.2.4 There are an existing 1500mm pipes constructed under A/YL-KTN/939. One end of the pipes is in close proximity to the application site, the other end was connected to a branch channel to Kam Tin River. **Figure 2** indicate the existing drainage system of the area.

2 Development Proposal

2.1 The Proposed Development

- 2.1.1 The total site area is approximately 14,061 m². A large portion of the site was the approved site under A/YL-KTN/939 by the same applicant, in which the site area is currently hard paved (in north of east of the site). The other area is mainly covered by vegetation.
- 2.1.2 After the development the site would be fully paved. The catchment plan is shown in **Figure 4**.

Proposed Development	
Total Site Area (m ²)	14,061
Paved Area after Development (m ²)	14,061

Table 1 – Site Development Area

3 Assessment Criteria

- 3.1.1 The Recommended Design Return Period based on Flood Level from SDM (Table 10) is adopted for this report. The recommendation is summarized in **Table 2** below.

Description	Design Return Periods
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 System	200 Years
Urban Drainage Branch System	50 Years

Table 2– Design Return Periods under SDM

- 3.1.2 The proposed drainage system intended to collect runoff from internal site and external catchment. 1 in 10 years return period is adopted for the drainage design.

3.1.3 Stormwater drainage design will be carried out in accordance with the criteria set out in the Stormwater Drainage Manual published by DSD. The proposed design criteria to be adopted for design of this stormwater drainage system and factors which have been considered are summarised below.

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.

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

The site is located within the HKO Zone. Therefore, for 10 years return period, the following values are adopted.

a	=	485
b	=	3.11
c	=	0.397

2. The peak runoff is calculated by the Rational Method
i.e. $Q_p = 0.278CiA$

where	Q_p	=	peak runoff in m^3/s
	C	=	runoff coefficient (dimensionless)
	i	=	rainfall intensity in mm/hr
	A	=	catchment area in km^2

3. The run-off coefficient (C) of surface runoff are taken as follows:

1. Paved Area: $C = 0.95$
2. Unpaved Area: $C = 0.35$

4. Manning's Equation is used for calculation of velocity of flow inside the channels:

$$\text{Manning's Equation: } v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$$

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:

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

where,

V	=	velocity of the pipe flow (m/s)
S _f	=	hydraulic gradient
k _f	=	roughness value (m)
v	=	kinematics viscosity of fluid
D	=	pipe diameter (m)
R	=	hydraulic radius (m)

4 Proposed Drainage System

4.1. Proposed Channels

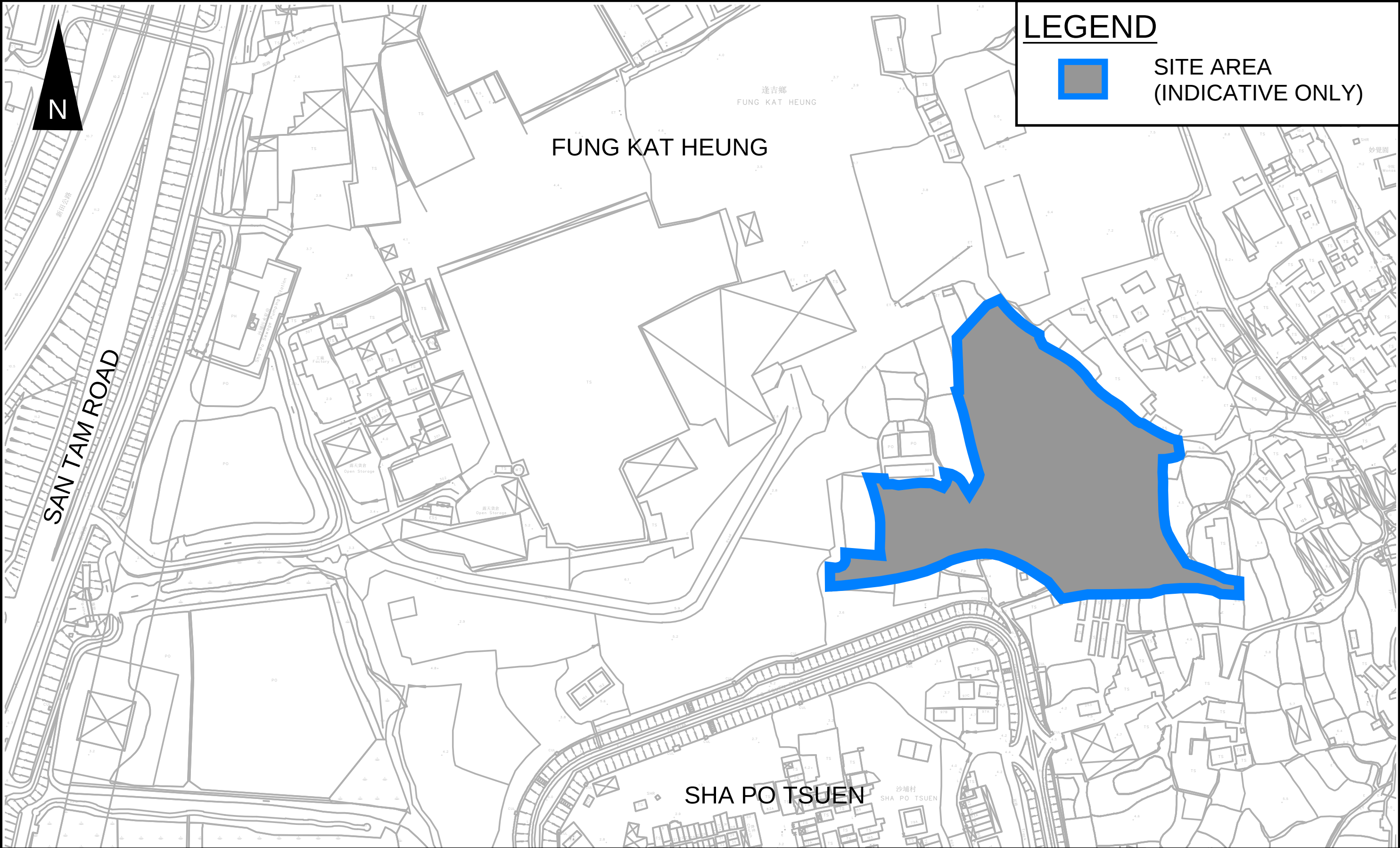
- 4.1.1 Proposed Channels are designed for collection of runoff for internal and external catchment. They are proposed to connect to existing 1500mm drains which eventually discharge to Kam Tin River. The utilization of the existing 1500mm drains is not more than 40% according to **Appendix A**.
- 4.1.2 In addition, a channel starting from SP7 (UC10) collecting runoff from existing catchment is proposed to connect to existing drains at the east of the site. As the equivalent area to the drain is reduced after the development, there is no additional flow to the existing drain due to the development (please refer to **Appendix A** and **Figure 3-3**).
- 4.1.3 The design calculations of proposed UChannel are shown in **Appendix A**.
- 4.1.4 The alignment, size, gradient and details of the proposed drains are shown in **Figure 3-1 to Figure 3-3**. The catchment plan is shown in **Figure 4**.
- 4.1.5 Reference Drawings are shown in **Appendix C** for reference.

5 Conclusion

- 5.1.1 Drainage review has been conducted for the Proposed Development. The surface runoff will be collected by the proposed drains and discharged to existing drainage system. With implementation of the above drainage system, the no unacceptable drainage impact is anticipated.

- End of Text -

FIGURES



PROJECT:
Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities
for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

TITLE
SITE LOCATION PLAN

FIGURE NUMBER
FIGURE 1

LOCATION:
Various Lots in D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New
Territories



VER	DESCRIPTION	DATE
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LEGEND

SITE AREA
(INDICATIVE ONLY)

EXISTING DRAIN
(DIVERTED UNDERGROUND UNDER
A/YL-KTN/939, NO ADDITIONAL
DIVERSION REQUIRED)

EXISTING 1500mm CONCRETE PIPE
(CONSTRUCTED UNDER PLANNING
APPROVAL OF A/YL-KTN/939)

The main map displays a large site area outlined in blue. A green line indicates an existing drain that has been diverted underground. A dashed line with square markers shows the path of an existing 1500mm concrete pipe. The map includes various geographical features like roads, water bodies, and buildings. A 'PHOTO DIRECTION' arrow points towards a specific location on the map.

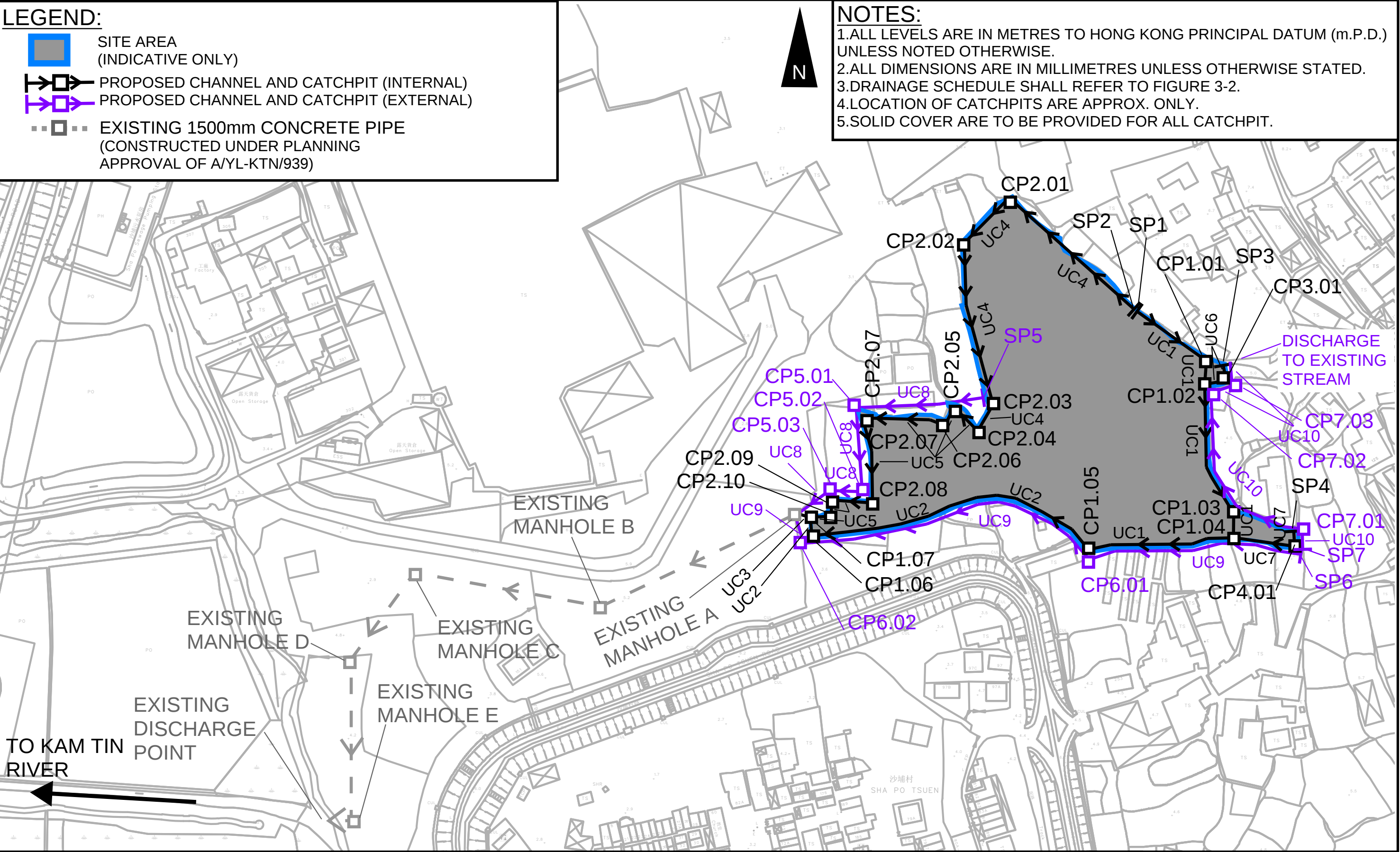
A photograph showing the discharge point of an existing 1500mm concrete pipe. The pipe is surrounded by vegetation and a concrete structure. A blue dashed circle highlights the area of interest.

PHOTO: DISCHARGE POINT OF EXISTING 1500mm CONCRETE PIPE

LEGEND:

	Combined Manhole		Tapping Point (Sewer)		Tapping Point (Storm)
	Overflow (Combined)		Sewer Terminal Manhole		Storm Water Terminal Manhole
	Pipe (Combined)		Catchpit		Tunnel Protection Zone (100m / 200m)
	Interface Valve Chamber		Inlet		Tunnel Protection Zone (General Range)
	Sewer Manhole		Storm Water Manhole		Tunnel / Box Culvert (Sewer)
	Oil / Petrol Interceptor		Outlet		Tunnel / Box Culvert (Storm)
	Overflow (Sewer)		Pipe (Storm)		
	Pipe (Sewer)		Sand Trap		

PROJECT: Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone	TITLE EXISTING DRAINAGE PLAN	FIGURE NUMBER FIGURE 2		
LOCATION: Various Lots in D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New Territories				
		VER	DESCRIPTION	DATE



PIT SCHEDULE

PIT #	GROUND LEVEL	INVERT LEVEL
Internal Catchment		
SP1	5.60	5.00
CP1.01	5.60	4.82
CP1.02	5.60	4.77
CP1.03	5.60	4.48
CP1.04	5.60	4.42
CP1.05	5.60	4.11
CP1.06	5.60	3.47
CP1.07	5.60	3.44
SP2	5.60	5.00
CP2.01	5.60	4.64
CP2.02	5.60	4.51
CP2.03	5.60	4.16
CP2.04	5.60	4.09
CP2.05	5.60	4.02
CP2.06	5.60	3.97
CP2.07	5.60	3.80
CP2.08	5.60	3.61
CP2.09	5.60	3.52
CP2.10	5.60	3.49
SP3	5.60	5.08
CP3.01	5.60	5.03
SP4	5.60	5.08
CP4.01	5.60	5.04
External Catchment		
SP5	3.50	3.13
CP5.01	3.50	2.96
CP5.02	3.10	2.73
CP5.03	3.10	2.68
SP6	5.00	4.63
CP6.01	5.00	4.21
CP6.02	3.60	3.23
SP7	5.00	4.55
CP7.01	5.00	4.49
CP7.02	5.00	3.95
CP7.03	5.00	3.89

PROPOSED CHANNEL

Uchannel (Internal)
Proposed Channel UC1, 600 mm, 1 in 200
Proposed Channel UC2, 600 mm, 1 in 200
Proposed Channel UC3, 750 mm, 1 in 200
Proposed Channel UC4, 600 mm, 1 in 200
Proposed Channel UC5, 600 mm, 1 in 200
Proposed Channel UC6, 525 mm, 1 in 150
Proposed Channel UC7, 525 mm, 1 in 200
Uchannel (External)
Proposed Channel UC8, 375 mm, 1 in 330
Proposed Channel UC9, 375 mm, 1 in 200
Proposed Channel UC10, 450 mm, 1 in 150

Channel Alignment refer to Figure 3-1

NOTES:

- 1.ALL LEVELS ARE IN METRES TO HONG KONG PRINCIPAL DATUM (m.P.D.) UNLESS NOTED OTHERWISE.
- 2.ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- 3.THIS DRAWING SHALL BE READ IN CONJUNCTION WITH FIGURE 3-1.
- 4.COVER LEVELS ARE APPROX. ONLY.

PROJECT:

Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

TITLE
DRAINAGE SCHEDULE

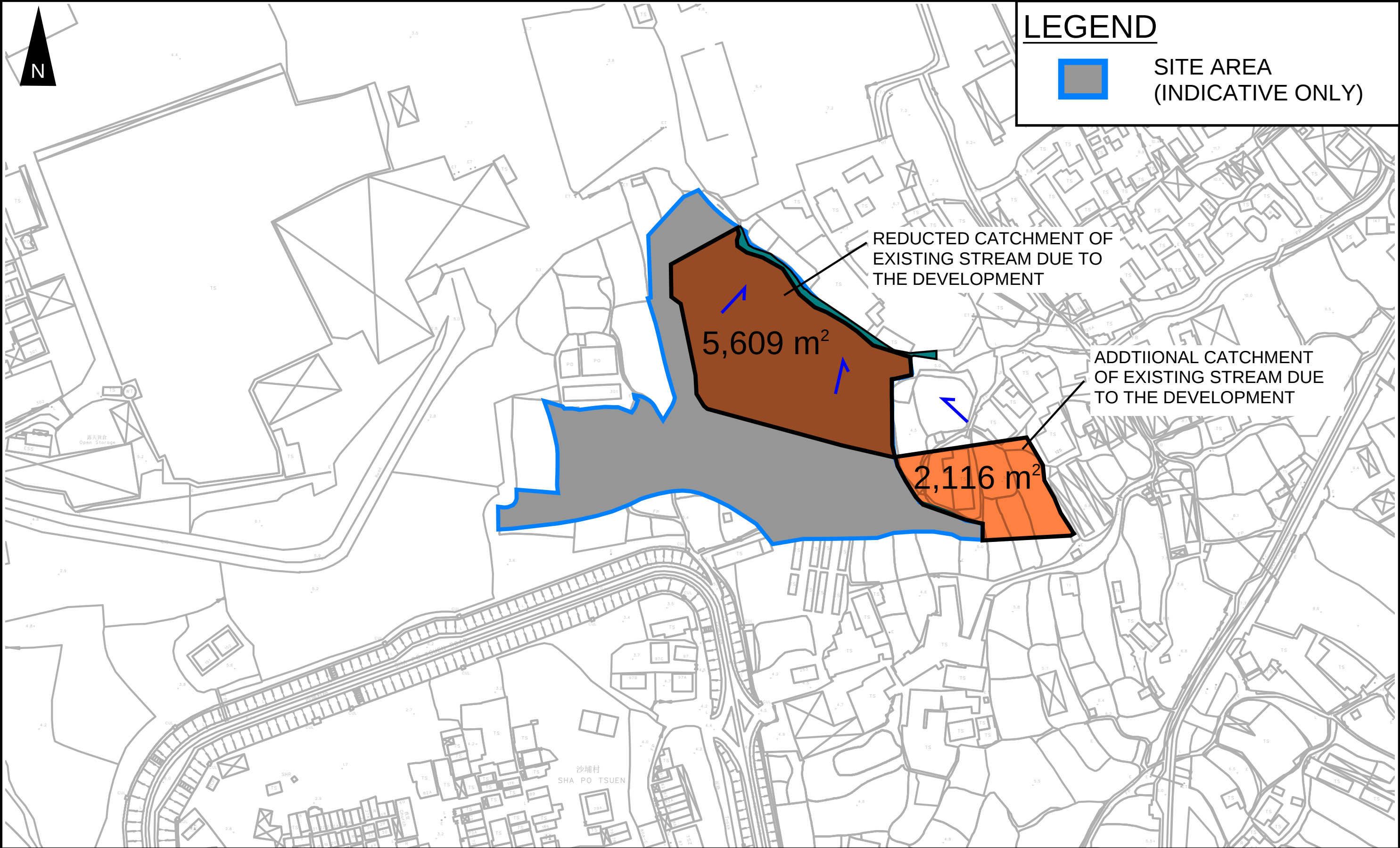
FIGURE NUMBER
FIGURE 3-2

LOCATION:

Various Lots in D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New Territories



VER	DESCRIPTION	DATE
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PROJECT:

Proposed Temporary Warehouse (excluding Dangerous Goods Godown) with Ancillary Facilities
for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

LOCATION:

Various Lots in D.D. 107 and Adjoining Government Land, Fung Kat Heung, Kam Tin, Yuen Long, New
Territories

TITLE
EXISTING STREAM -
CHANGE OF CATCHMENT

FIGURE NUMBER
FIGURE 3-3



VER	DESCRIPTION	DATE
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LEGEND:

	FALL
+5.7	EXISTING LEVEL
+5.6	PROPOSED LEVEL

EXISTING DEVELOPMENT WITH OWN DRAINS

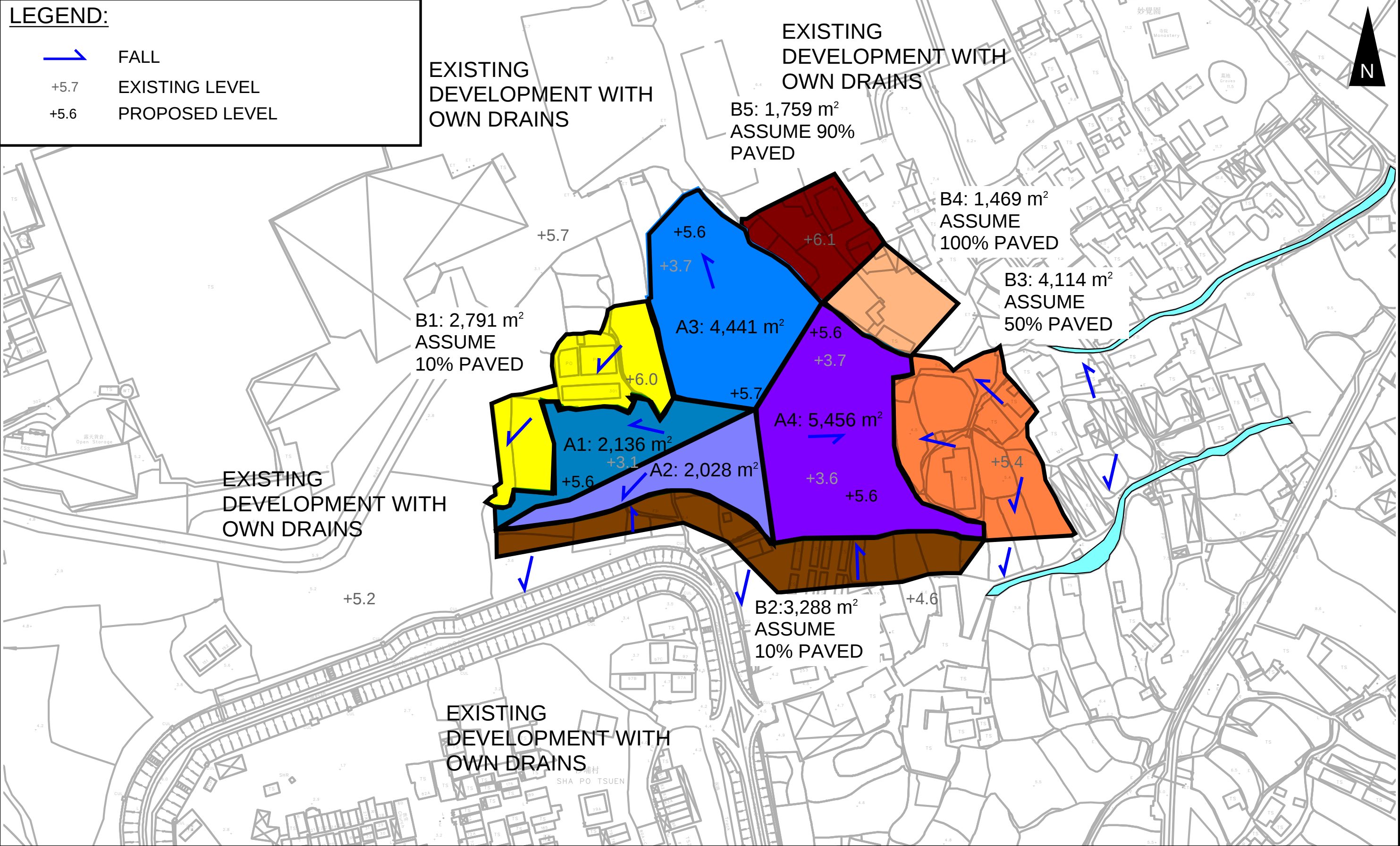
EXISTING DEVELOPMENT WITH OWN DRAINS

EXISTING DEVELOPMENT WITH OWN DRAINS

B5: 1,759 m²
ASSUME 90°

[illegible]

VER	DESCRIPTION	DATE
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APPENDIX

Appendix A: Design Calculation

Zone	HKO	Return Period	1 in	10	years	n	0.014	Storm Constant	HKO a	485
						Ks	0.15		HKO b	3.11
						Viscosity	0.000001		HKO c	0.397

Catchment Area Table (Area in m²)

Catchment	A1	A2	A3	A4	B1	B2	B3	B4	B5	Total Site Area		REDUCED CATCHMENT OF EXISTING STREAM DUE TO THE DEVELOPMENT *	ADDITIONAL CATCHMENT OF EXISTING STREAM DUE TO THE DEVELOPMENT (from SP7) *	
Total Area	2136	2028	4441	5456	2791	3288	4114	1469	1759	14061		5609	2116	
Hard Paved Area	2136	2028	4441	5456	837.3	328.8	2057	1469	1583.1	14061.00		560.90	1058.00	
Unpaved Area	0	0	0	0	1953.7	2959.2	2057	0	175.9	0.00		5048.10	1058.00	
Equival. Area	2029.2	1926.6	4218.95	5183.2	1479.23	1348.08	2674.1	1395.55	1565.51	13357.95		2299.69	1375.40	

Pavement Type	Hard Paved	Green
Runoff Coefficient	0.95	0.35

For channel from SP7 (UC10) to existing stream
*As Equival. Area is reduced (2299.69 > 1375.4), the total flow to existing stream is reduced.

Area refer to Figure 3-3

DRAINAGE DESIGN

Item	Total Equivalent Area m2 (1)	ToC min (2)	Intensuty mm/hr (2)	Total Discharge m3/s (3)	Size mm	Gradient 1 in	V m/s (4)	Capacity m3/s (5)	Utilitization (6)	Remark
Design of Channel UC1 for Catchment, A4,B4	6579	5.00	211.28	0.39	600	200	1.78	0.57	68%	From CP1.07 to Existing Manhole A
Design of Channel UC2 for Catchment, A2,A4,B4	8505	6.67	196.17	0.46	600	200	1.78	0.57	81%	
Design of Channel UC3 for Catchment, Total Site Area,B4,B5	16319	7.94	186.89	0.85	750	200	2.06	1.03	82%	
Design of Channel UC4 for Catchment, A3,B5	5784	5.00	211.28	0.34	600	200	1.78	0.57	60%	
Design of Channel UC5 for Catchment, A1,A3,B5	7814	6.71	195.83	0.43	600	200	1.78	0.57	75%	
Design of Channel UC6 for Catchment, A4,B4	6579	5.00	211.28	0.39	525	150	1.88	0.46	84%	
Design of Channel UC7 for Catchment, A4	5183	5.00	211.28	0.30	525	200	1.62	0.40	76%	Existing 1500mm Drains
Review of Existing MH A to B, Catchment: Total Site Area,B1,B2,B4,B5	19146	7.94	186.89	0.99	1500	1142	1.42	2.51	40%	
Review of Existing MH B to C, Catchment: Total Site Area,B1,B2,B4,B5	19146	9.01	180.15	0.96	1500	1087	1.46	2.58	37%	
Review of Existing MH C to D, Catchment: Total Site Area,B1,B2,B4,B5	19146	9.88	175.26	0.93	1500	772	1.74	3.07	30%	
Review of Existing MH D to E, Catchment: Total Site Area,B1,B2,B4,B5	19146	10.40	172.55	0.92	1500	1300	1.33	2.35	39%	
Review of Existing MH E to Outlet, Catchment: Total Site Area,B1,B2,B4,B5	19146	11.21	168.59	0.90	1500	267	2.99	5.28	17%	
Design of Channel UC8 for Catchment, B1	1479	5.00	211.28	0.09	375	330	1.01	0.13	69%	
Design of Channel UC9 for Catchment, B2	1348	5.00	211.28	0.08	375	200	1.30	0.16	49%	
Design of Channel UC10 for Catchment, B3	2674	5.00	211.28	0.16	450	150	1.69	0.31	51%	

1) Sum of Area in Catchment Table

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

3) 0.278 x Intensity x Equivalent Area

4) Channel: Manning Equation, Pipe Colebrook-White Equation

5) Q = A x V

6) Less than 90%, for 10% allowance for siltation

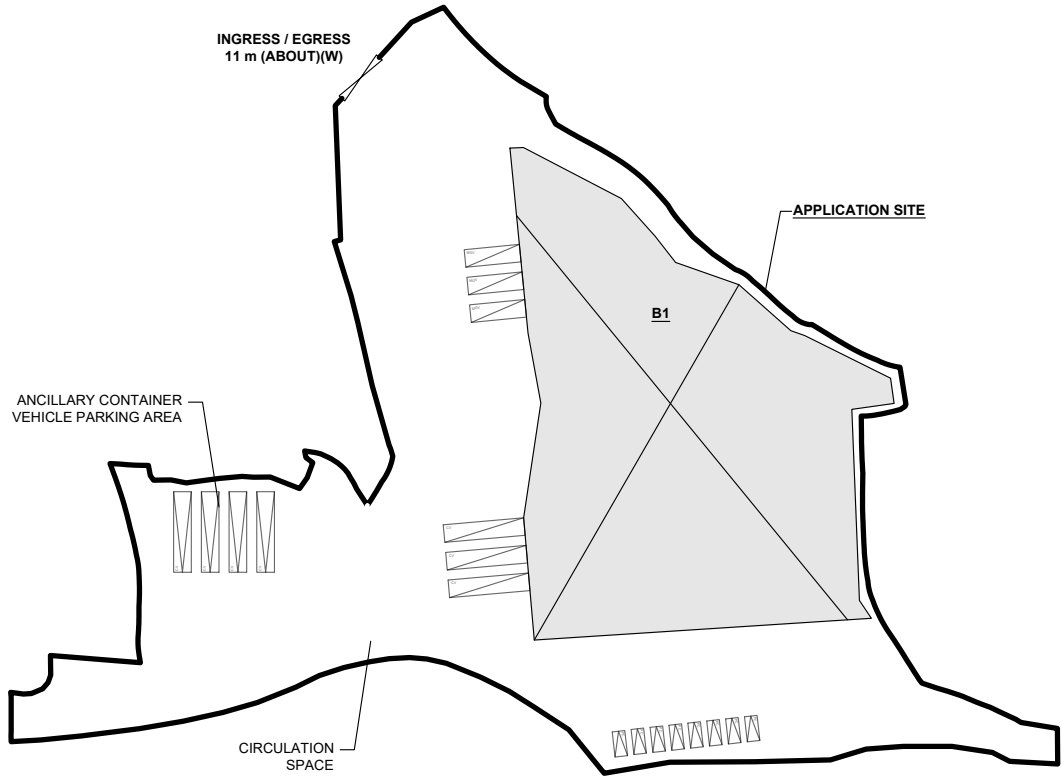
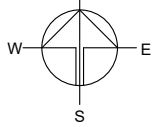
Manning Equation $v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$ Colebrook-White Equation $\underline{v} = -\sqrt{32gRS} \log \log (\frac{k_s}{14.8R} + \frac{1.255v}{R\sqrt{32gRS_f}})$

APPENDIX B - PROPOSED SITE LAYOUT PLAN

DEVELOPMENT PARAMETERS

APPLICATION SITE AREA	: 14,061 m ²	(ABOUT)
COVERED AREA	: 4,912 m ²	(ABOUT)
UNCOVERED AREA	: 9,149 m ²	(ABOUT)
PLOT RATIO	: 0.70	(ABOUT)
SITE COVERAGE	: 35 %	(ABOUT)
NO. OF STRUCTURE	: 1	
DOMESTIC GFA	: NOT APPLICABLE	
NON-DOMESTIC GFA	: 9,824 m ²	(ABOUT)
TOTAL GFA	: 9,824 m ²	(ABOUT)
BUILDING HEIGHT	: 16.5 m	(ABOUT)
NO. OF STOREY	: 2	

		AREA	HEIGHT
B1	WAREHOUSE (EXCLUDING D.G.G.), SITE OFFICE, WASHROOM	4,912 m ² (ABOUT)	9,824 m ² (ABOUT)
TOTAL		4,912 m ² (ABOUT)	9,824 m ² (ABOUT)
*D.G.G. - DANGEROUS GOODS GODOWN			



PARKING AND LOADING / UNLOADING PROVISIONS

NO. OF PRIVATE CAR PARKING SPACE	: 8
DIMENSION OF PARKING SPACE	: 5 m (L) x 2.5 m (W)
NO. OF CONTAINER VEHICLE PARKING SPACE	: 4
DIMENSION OF PARKING SPACE	: 16 m (L) x 3.5 m (W)
NO. OF L/UL SPACE FOR MEDIUM GOODS VEHICLE	: 3
DIMENSION OF L/UL SPACE	: 11 m (L) x 3.5 m (W)
NO. OF L/UL SPACE FOR CONTAINER VEHICLE	: 3
DIMENSION OF L/UL SPACE	: 16 m (L) x 3.5 m (W)

LEGEND

	APPLICATION SITE
	STRUCTURE
	PARKING SPACE (PC)
	LOADING / UNLOADING SPACE (MGV)
	LOADING / UNLOADING SPACE (CV)
	INGRESS / EGRESS

PLANNING CONSULTANT



PROJECT

PROPOSED WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND

SITE LOCATION

VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

SCALE

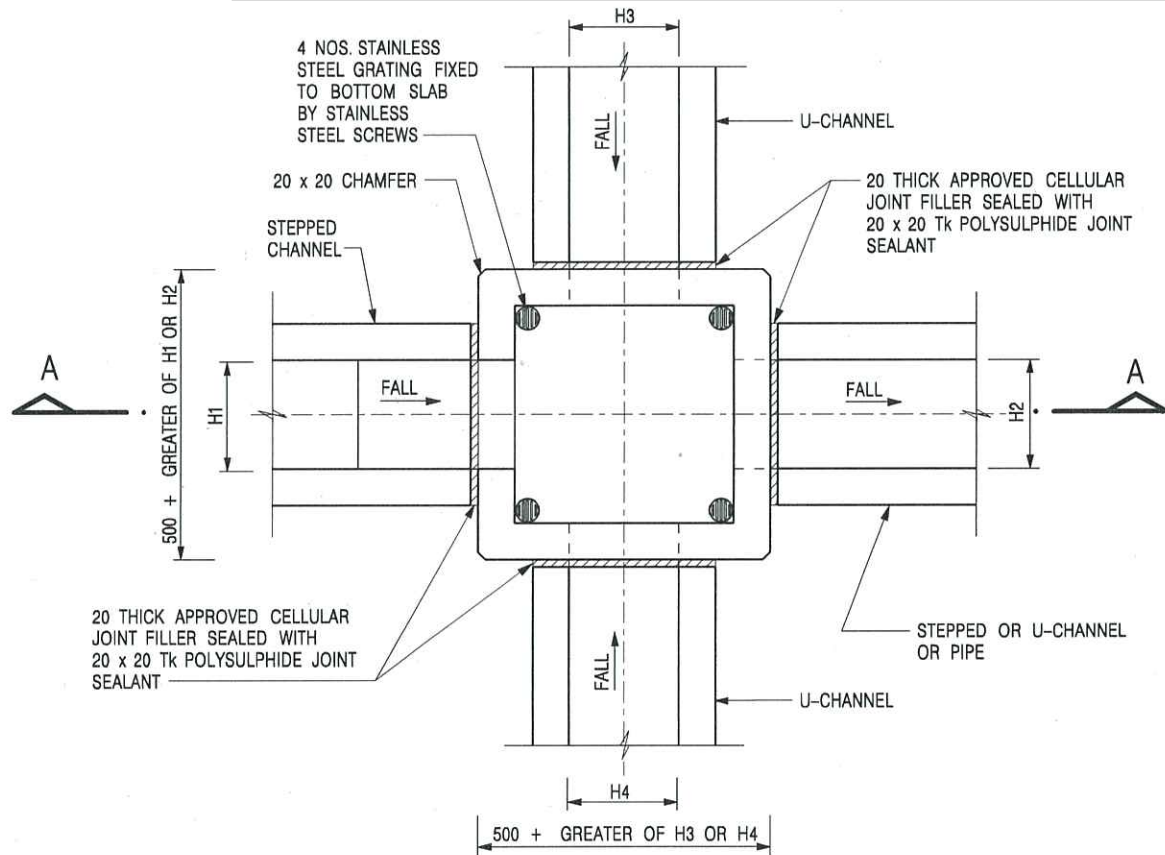
1 : 1500 @ A4

DRAWN BY MN	DATE 6.6.2024
REVISED BY	DATE
APPROVED BY	DATE

DWG. TITLE
LAYOUT PLAN

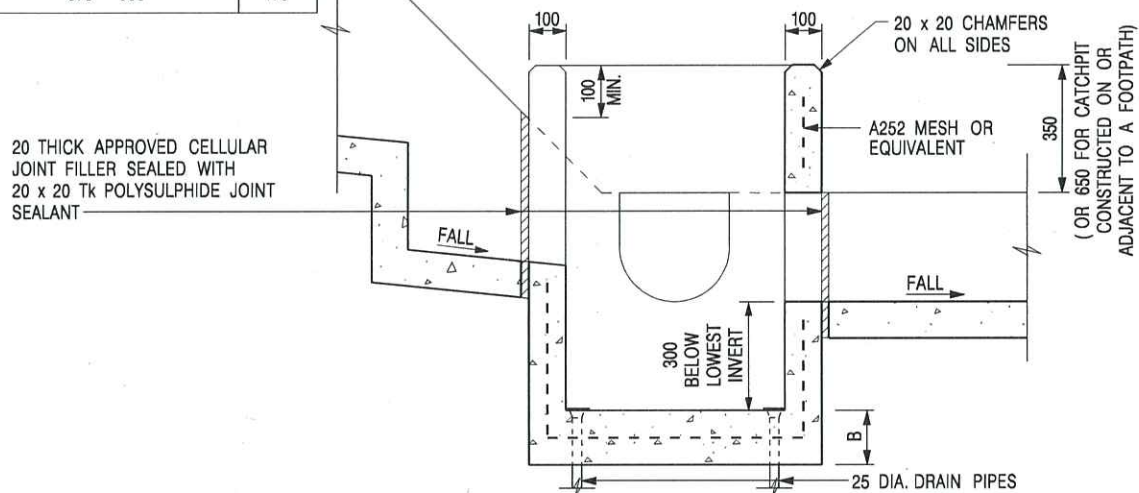
DWG NO. PLAN 4	VER. 001
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Appendix C - Reference Drawings



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.

CATCHPIT WITH TRAP
(SHEET 1 OF 2)

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



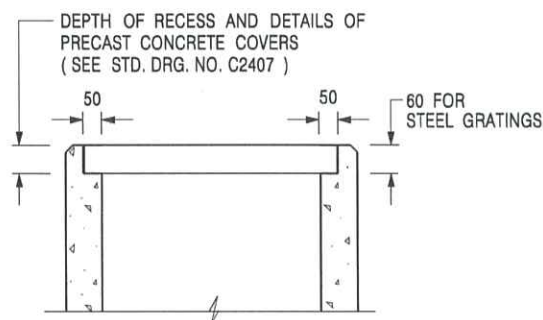
CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2406 /1



**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 /2) 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 'J' ON STD. DRG. NO. C2405 /5; 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 'G' ON STD. DRG. NO. C2405 /4.
12. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.

A	MINOR AMENDMENT.	Original Signed	04.2016
-	FORMER DRG. NO. C2406J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE

**CATCHPIT WITH TRAP
(SHEET 2 OF 2)**



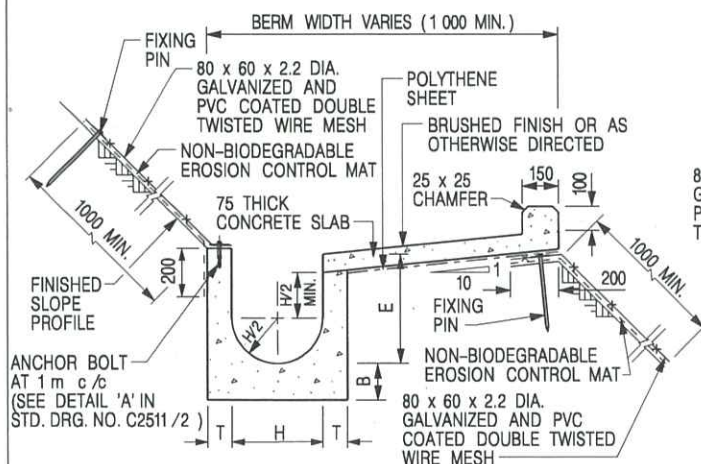
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

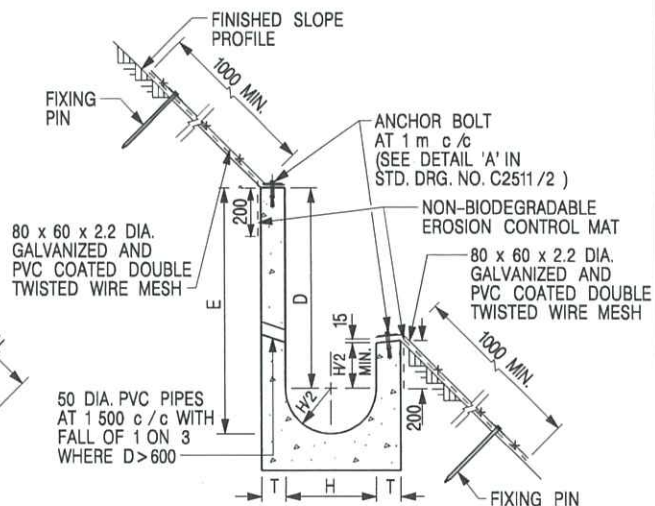
DRAWING NO.

DATE JAN 1991

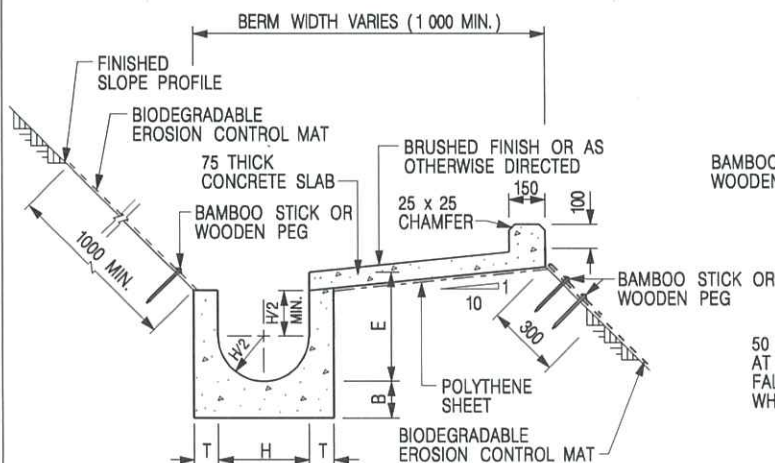
C2406 /2A



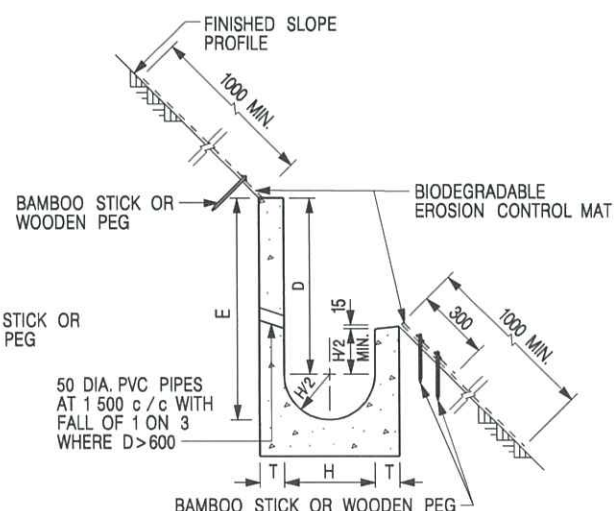
**U-CHANNELS CONSTRUCTED ON BERM
WITH NON-BIODEGRADABLE
EROSION CONTROL MAT**



**U-CHANNELS NOT CONSTRUCTED ON BERM
WITH NON-BIODEGRADABLE
EROSION CONTROL MAT**



**U-CHANNELS CONSTRUCTED ON BERM
WITH BIODEGRADABLE
EROSION CONTROL MAT**



**U-CHANNELS NOT CONSTRUCTED ON BERM
WITH BIODEGRADABLE
EROSION CONTROL MAT**

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES.
- ALL CONCRETE TO BE GRADE 20 /20.
- CONCRETE SURFACE FINISH SHALL BE CLASS U2, F2 OR BRUSHED FINISH AS DIRECTED.
- SPACING OF EXPANSION JOINT IN CHANNELS, BERM SLABS AND APRONS TO BE 10 METRES MAXIMUM, SEE STD. DRG. NO. C2413 FOR DETAILS.
- JOINTS FOR CHANNELS, BERM SLABS, APRONS AND WALLS, ETC. TO BE ON THE SAME ALIGNMENT.
- FOR DIMENSIONS T, H, & B, SEE TABLE BELOW.
- FOR TYPICAL FIXING PIN DETAILS, SEE STD. DRG. NO. C2511/2.
- MINIMUM SIZE OF 25 x 50 x 300mm SHALL BE PROVIDED FOR WOODEN PEG.
- MINIMUM SIZE OF 10mm DIAMETER WITH 200mm LONG SHALL BE PROVIDED FOR BAMBOO STICK.
- THE FIXING DETAILS OF NON-BIODEGRADABLE AND BIODEGRADABLE EROSION CONTROL MATS ON EXISTING BERM SHALL REFER TO STD. DRG. NO. C2511/1.

NOMINAL SIZE H	T	B	REINFORCEMENT
300	80	100	A252 MESH PLACED CENTRALLY AND T=100 WHEN E > 650
375 - 600	100	150	
675 - 900	125	175	A252 MESH PLACED CENTRALLY

REF.	REVISION	SIGNATURE	DATE
I	MINOR AMENDMENT.	Original Signed	07.2018
H	FIXING DETAILS OF BIODEGRADABLE EROSION CONTROL MAT ADDED.	Original Signed	12.2017
G	DIMENSION TABLE AMENDED.	Original Signed	01.2005
F	MINOR AMENDMENT.	Original Signed	01.2004
E	GENERAL REVISION.	Original Signed	12.2002
D	MINOR AMENDMENT.	Original Signed	08.2001
C	150 x 100 UPSTAND ADDED AT BERM.	Original Signed	6.99
B	MINOR AMENDMENT.	Original Signed	3.94
A	MINOR AMENDMENT.	Original Signed	10.92

**DETAILS OF HALF-ROUND AND
U-CHANNELS (TYPE B - WITH
EROSION CONTROL MAT APRON)**



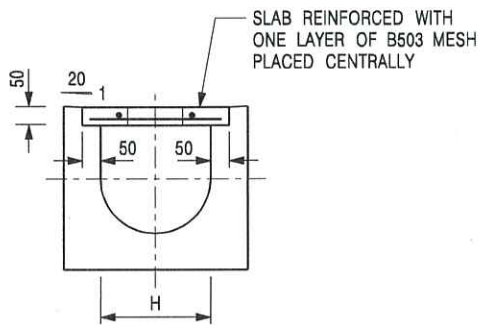
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE DIAGRAMMATIC

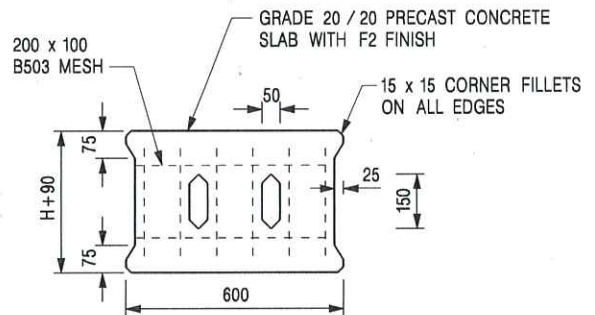
DRAWING NO.

DATE JAN 1991

C24101



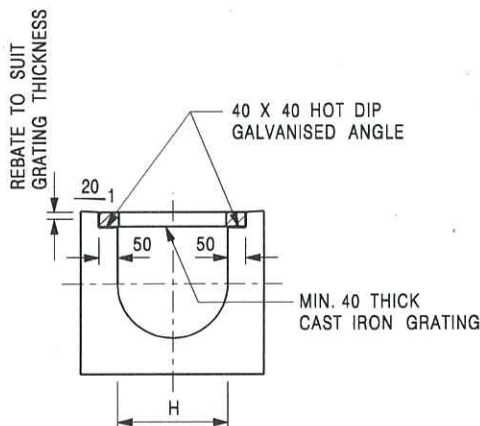
TYPICAL SECTION



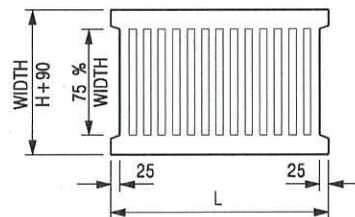
PLAN OF SLAB

U-CHANNELS WITH PRECAST CONCRETE SLABS

(UP TO H OF 525)



TYPICAL SECTION



L = 600mm FOR H ≤ 375mm
L = 400mm FOR H > 375mm

CAST IRON GRATING

(DIMENSIONS ARE FOR GUIDANCE ONLY, CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)

U-CHANNEL WITH CAST IRON GRATING

(UP TO H OF 525)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. H=NOMINAL CHANNEL SIZE.
3. ALL CAST IRON FOR GRATINGS SHALL BE GRADE EN-GJL-150 COMPLYING WITH BS EN 1561.
4. FOR COVERED CHANNELS TO BE HANDED OVER TO HIGHWAYS DEPARTMENT FOR MAINTENANCE, THE GRATING DETAILS SHALL FOLLOW THOSE AS SHOWN ON HyD STD. DRG. NO. H3156.

E	NOTES 3 & 4 AMENDED.	Original Signed	12.2014
D	NOTE 4 ADDED.	Original Signed	06.2008
C	MINOR AMENDMENT. NOTE 3 ADDED.	Original Signed	12.2005
B	NAME OF DEPARTMENT AMENDED.	Original Signed	01.2005
A	CAST IRON GRATING AMENDED.	Original Signed	12.2002
REF.	REVISION	SIGNATURE	DATE

COVER SLAB AND CAST IRON
GRATING FOR CHANNELS



**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2412E