

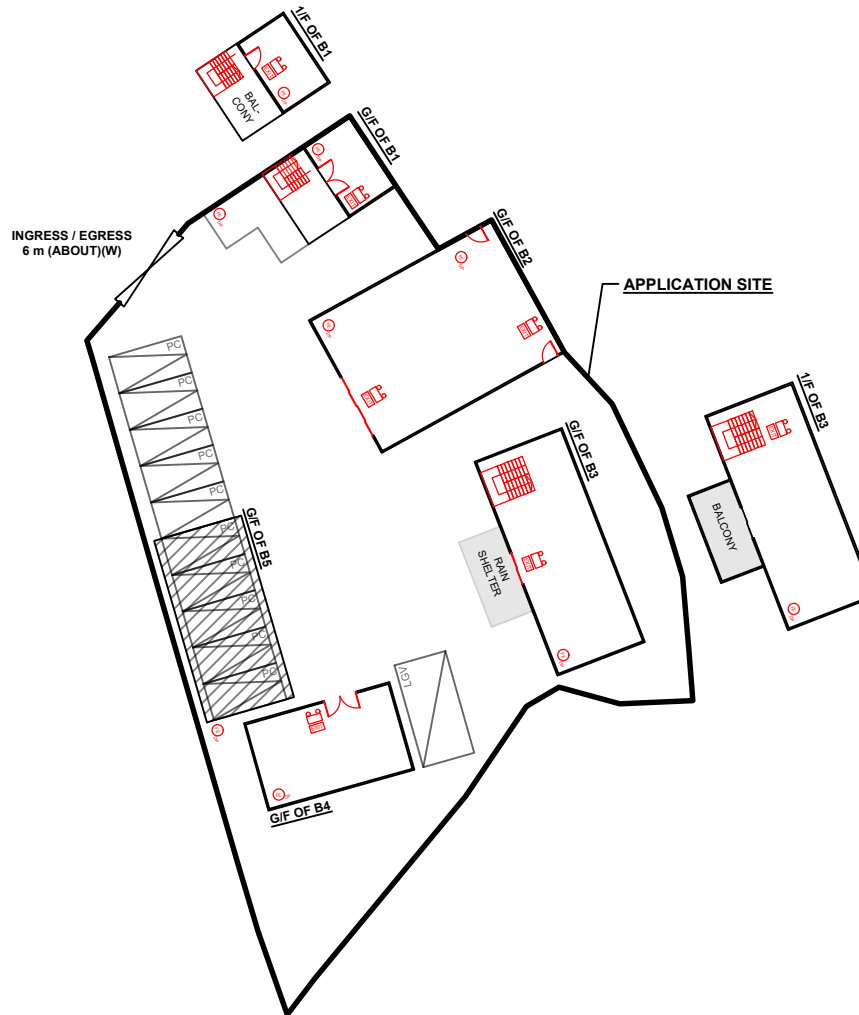
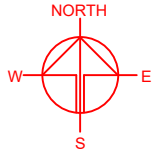
**DEVELOPMENT PARAMETERS**

APPLICATION SITE AREA	: 1,298 m <sup>2</sup>	(ABOUT)
COVERED AREA	: 441 m <sup>2</sup>	(ABOUT)
UNCOVERED AREA	: 857 m <sup>2</sup>	(ABOUT)
PLOT RATIO	: 0.45	(ABOUT)
SITE COVERAGE	: 34 %	(ABOUT)
NO. OF STRUCTURE	: 5	
DOMESTIC GFA	: NOT APPLICABLE	
NON-DOMESTIC GFA	: 589 m <sup>2</sup>	(ABOUT)
TOTAL GFA	: 589 m <sup>2</sup>	(ABOUT)
BUILDING HEIGHT	: 3 - 8 m	(ABOUT)
NO. OF STOREY	: 1 - 2	




**PARKING AND LOADING/UNLOADING PROVISIONS**

NO. OF PRIVATE CAR PARKING SPACE	: 10
DIMENSION OF PARKING SPACE	: 5m (L) X 2.5m (W)
NO. OF L/UL SPACE FOR LIGHT GOODS VEHICLE	: 1
DIMENSION OF L/UL SPACE	: 7m (L) X 3.5m (W)

STRUCTURE	USE	COVERED AREA	GFA	BUILDING HEIGHT
B1	(G/F) (1/F)	RESTAURANT AND OUTSIDE SEATING ACCOMMODATION OF RESTAURANT RESTAURANT AND WASHROOM	60 m <sup>2</sup> (ABOUT) 40 m <sup>2</sup> (ABOUT)	7 m (ABOUT)(2-STOREY)
B2		RESTAURANT, KITCHEN & WASHROOM	138 m <sup>2</sup> (ABOUT)	3.5m (ABOUT)(1-STOREY)
B3	(G/F) (1/F)	SHOP AND SERVICES OFFICE AND WASHROOM	108 m <sup>2</sup> (ABOUT) 108 m <sup>2</sup> (ABOUT)	8m (ABOUT)(2-STOREY)
B4		SHOP AND SERVICES	60 m <sup>2</sup> (ABOUT)	3m (ABOUT)(1-STOREY)
B5		RAIN SHELTER FOR PARKING SPACE	75 m <sup>2</sup> (ABOUT)	3m (ABOUT)(1-STOREY)
<b>TOTAL</b>		<b>441 m<sup>2</sup> (ABOUT)</b>	<b>589 m<sup>2</sup> (ABOUT)</b>	








**FIRE SERVICE INSTALLATIONS**

-  EMERGENCY LIGHT
-  EXIT SIGN
-  4 KG DRY POWDER TYPE FIRE EXTINGUISHER

**FS NOTES:**

- SUFFICIENT EMERGENCY LIGHTING SHALL BE PROVIDED THROUGHOUT THE ENTIRE BUILDING IN ACCORDANCE WITH BS5266-1:2016 AND BS EN1838:2013 AND FSD CIRCULAR LETTER 6/2021
- SUFFICIENT DIRECTIONAL AND EXIT SIGN SHALL BE PROVIDED IN ACCORDANCE WITH BS5266: PART 1 AND FSD CIRCULAR LETTER 5/2008.
- PORTABLE HAND-OPERATED APPROVED APPLIANCE SHALL BE PROVIDED AS REQUIRED BY OCCUPANCY.
- ACCESS IS PROVIDED FOR EMERGENCY VEHICLE TO REACH 30m OF ALL PART OF STRUCTURES.

**LEGEND**

-  APPLICATION SITE
-  STRUCTURE
-  PARKING SPACE
-  LOADING / UNLOADING SPACE
-  INGRESS / EGRESS

PLANNING CONSULTANT



PROJECT

PROPOSED TEMPORARY SHOP AND SERVICES AND EATING PLACE WITH ANCILLARY FACILITIES FOR A PERIOD OF 5 YEARS

SITE LOCATION

LOT 390 RP (PART) IN D.D. 106, KAM SHEUNG ROAD, YUEN LONG, NEW TERRITORIES

SCALE

1 : 500 @ A4

DRAWN BY	DATE
MN	12.9.2024

REVISED BY	DATE

APPROVED BY	DATE

DWG. TITLE  
FSIs PROPOSAL

DWG NO.	VER.
APPENDIX I	001

Temporary Shop and Services and Eating Place for a Period of 5 Years in “Village Type Development” zone,  
Lot 390 RP (Part) in D.D. 106, Kam Sheung Road, Yuen Long, New Territories

Drainage Appraisal

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Temporary Shop and Services and Eating Place  
for a Period of 5 Years in “Village Type  
Development” zone, Lot 390 RP (Part) in D.D.  
106, Kam Sheung Road, Yuen Long, New  
Territories

Drainage Appraisal

September 2024

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4. Existing and Proposed Drainage System .....	5
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Figure 2 - Existing Drainage Plan
Figure 3 – Existing Internal Drainage System
Figure 4 – Catchment Plan

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Appendix A – Existing U Channel Design Checking
Appendix B - Development Layout Plan
Appendix C – Reference Drawings for UChannel and Catchpit

# 1. Introduction

## 1.1 Background

- 1.1.1 The applicant seeks to use Lot 390 RP (Part) in D.D. 106, Kam Sheung Road, Yuen Long, New Territories (the Site) for 'Temporary Shop and Services and Eating Place for a Period of 5 Years (Proposed Development).
- 1.1.2 This Drainage Proposal is to support the planning application for the proposed use.

## 1.2 The Site

- 1.2.1 The major portion of the area was approved site under A/YL-KTS/990. The Application Site area is about 1,298m<sup>2</sup>, and it situates beside Kam Sheung Road to the west. The site is currently paved and occupied by existing structures. The site location plan is shown in **Figure 1**.
- 1.2.2 The Application Site is surrounded by temporary structures. It is generally flat with existing ground level of approx. +9.8 mPD.
- 1.2.3 There is an existing public drainage and ditch along Kam Sheung Road. Existing Drainage Plan is shown in **Figure 2** for reference. There are existing internal drainage channels within site area, the existing internal drainage system is shown in **Figure 3**.
- 1.2.4 Proposed Development Layout plan is shown in **Appendix B** for reference.

## 2. Development Proposal

### 2.1 The Proposed Development

2.1.1 The total site area is approximately 1,298m<sup>2</sup>. The indicative development schedule is summarized in **Table 1** below for technical assessment purpose.

Proposed Development	
Total Site Area (m <sup>2</sup> )	1,298
Assume all proposed site area as paved area after development for assessment purpose (m <sup>2</sup> )	1,298

**Table 1 - Key Development Parameters**

## 3. Assessment Criteria

3.1.1 The Recommended Design Return Period based on Flood Level from SDM (Table 10) is adopted for this DIA. 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 site and the surroundings are generally flat. The proposed village drainage system intended to collect runoff from the internal site and discharge to existing nearby public drainage system. 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 Headquarters Rainfall Zone. Therefore, for 10 years return period, the following values are adopted.

(up to Corrigendum No.1/2024)

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:

- Paved Area: C = 0.95
- 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 flow (m/s)

S<sub>f</sub> = 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:

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

where,

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

## 4. Existing and Proposed Drainage System

- 4.1.1 The Application Site and the surrounding areas are generally flat. There are existing internal Uchannels and catchpit within Application Site. Design review on existing Uchannels has been conducted. Most of the existing channels are capable of carrying the runoff from the Application Site. Two of the channels are proposed to be updated. The alignment, size and gradient of the existing internal drains and proposed channels are shown in **Figure 3**. The catchment plan is shown in **Figure 4**. The checking of channels are shown in **Appendix A**.
- 4.1.2 There is no change in drainage characteristics of the site, it is anticipated that there will be no significant drainage impact to the area.
- 4.1.3 The reference standard drawings of existing drains are shown in **Appendix C**.

## 5. Conclusion

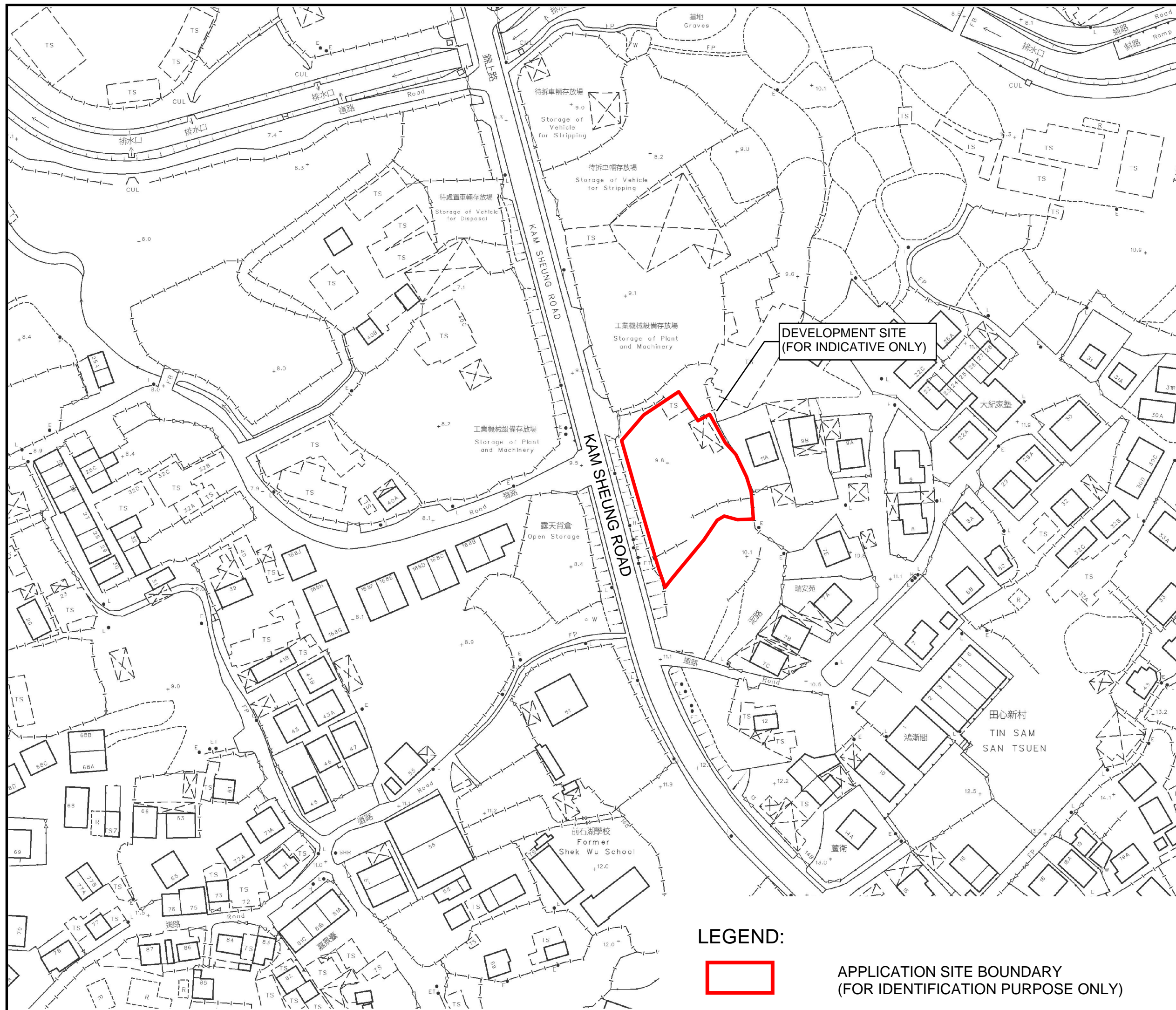
- 5.1.1 A drainage appraisal has been conducted for the Proposed Development. The surface runoff from the Application Site will be collected by the existing/proposed internal Uchannels and discharged to the existing ditch/ drainage system beside Kam Sheung Road.
- 5.1.2 With the proposed drainage system, it is anticipated that there will be no significant drainage impact to the area after the implementation of the development.

- End of Text -



# FIGURES

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**PROJECT:**  
 Temporary Shop and Services and Eating Place for a Period of 5 Years in "Village Type Development" zone, Lot 390 RP (Part) in D.D. 106 , Kam Sheung Road, Yuen Long, New Territories

**DEVELOPMENT SITE  
 (FOR INDICATIVE ONLY)**

**LEGEND:**



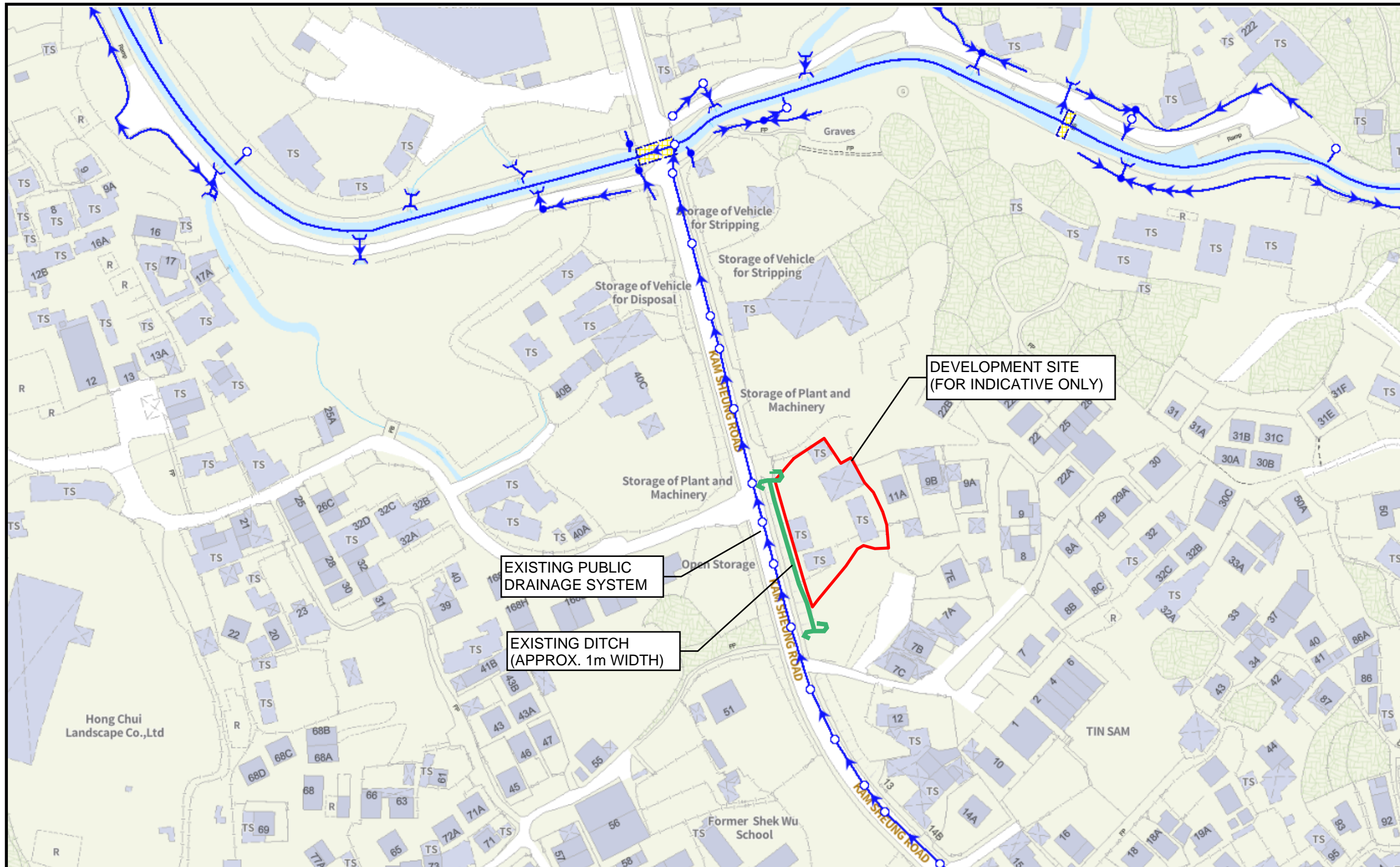
**APPLICATION SITE BOUNDARY  
 (FOR IDENTIFICATION PURPOSE ONLY)**

REV	DESCRIPTION	DATE

**DRAWING TITLE  
 SITE LOCATION PLAN**

**DRAWING NUMBER  
 FIGURE 1**





PROJECT:  
 Temporary Shop and Services and Eating Place for a Period of 5 Years in "Village Type Development" zone, Lot 390 RP (Part) in D.D. 106 , Kam Sheung Road, Yuen Long, New Territories

LEGEND:

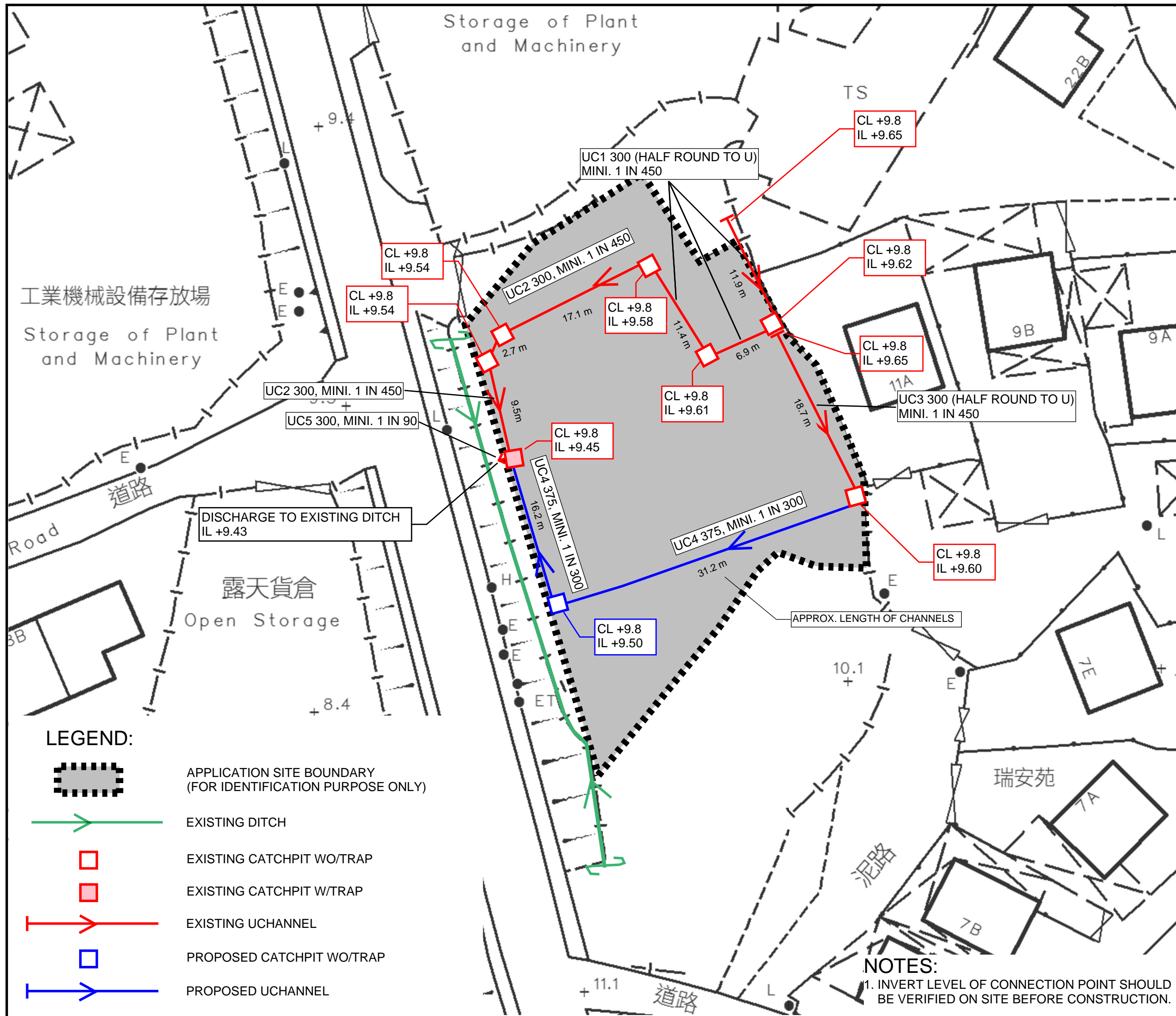
	Combined Manhole		Tapping Point (Sewer)		Tapping Point (Storm)
	Overflow (Combined)		Sewer Terminal Manhole		Storm Water Terminal Manhole
	Pipe (Combined)		Catchpit		Tunnel Protection Zone (100m / 200m)
	Interface Valve Chamber		Inlet		Tunnel Protection Zone (General Range)
	Sewer Manhole		Storm Water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

REV	DESCRIPTION	DATE

DRAWING TITLE  
**EXISTING DRAINAGE PLAN**

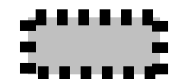






DRAWING NUMBER  
**FIGURE 2**





PROJECT:  
 Temporary Shop and Services and Eating Place for a Period of 5 Years in "Village Type Development" zone, Lot 390 RP (Part) in D.D. 106 , Kam Sheung Road, Yuen Long, New Territories

LEGEND:

-  APPLICATION SITE BOUNDARY (FOR IDENTIFICATION PURPOSE ONLY)
-  EXISTING DITCH
-  EXISTING CATCHPIT WO/TRAP
-  EXISTING CATCHPIT W/TRAP
-  EXISTING UCHANNEL
-  PROPOSED CATCHPIT WO/TRAP
-  PROPOSED UCHANNEL

APPROX. LENGTH OF CHANNELS

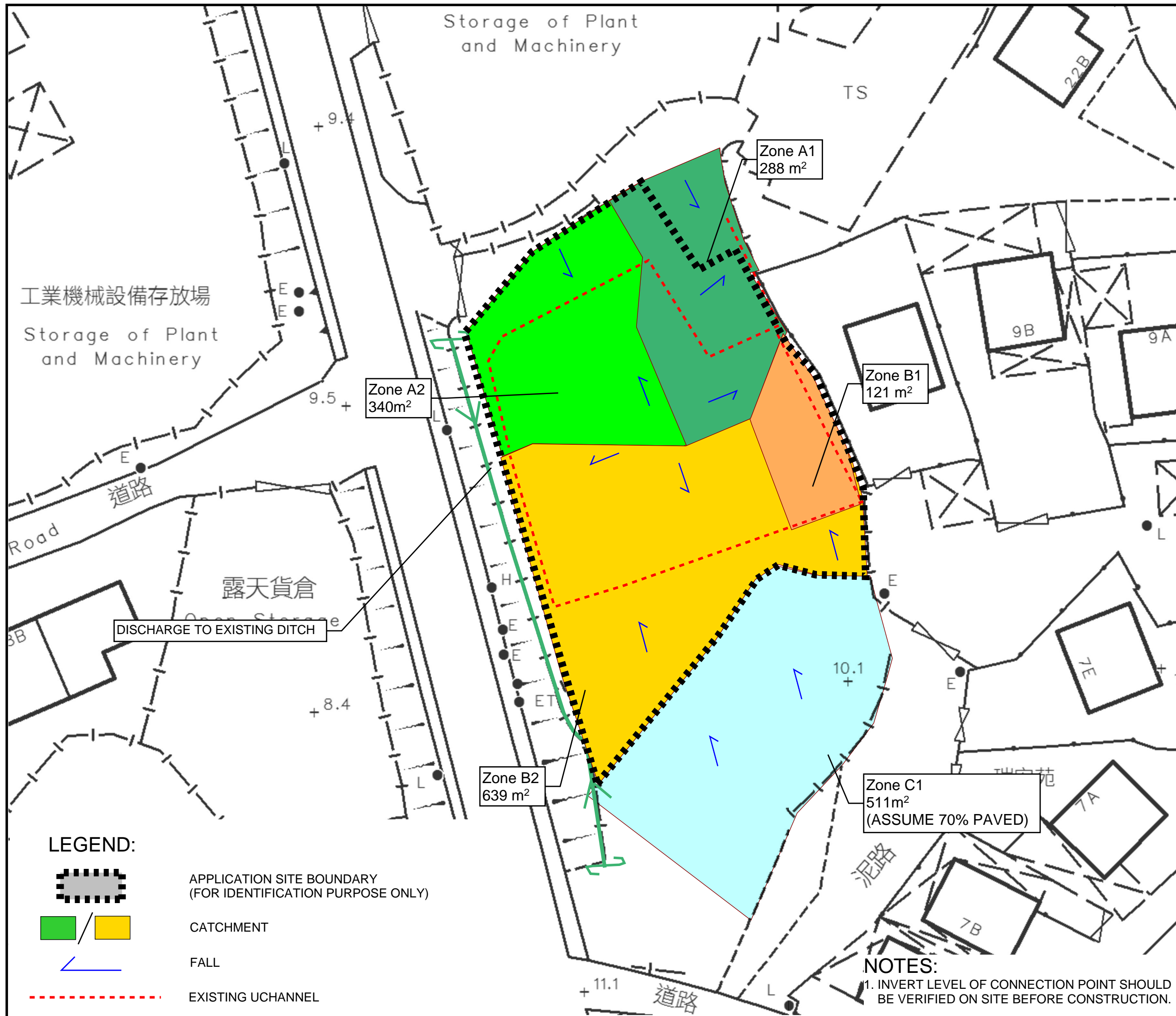
NOTES:

1. INVERT LEVEL OF CONNECTION POINT SHOULD BE VERIFIED ON SITE BEFORE CONSTRUCTION.

REV	DESCRIPTION	DATE

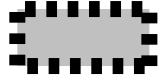



DRAWING TITLE  
**EXISTING DRAINAGE SYSTEM IN SITE**

DRAWING NUMBER  
**FIGURE 3**



**PROJECT:**  
 Temporary Shop and Services and Eating Place for a Period of 5 Years in "Village Type Development" zone, Lot 390 RP (Part) in D.D. 106, Kam Sheung Road, Yuen Long, New Territories

**LEGEND:**

-  APPLICATION SITE BOUNDARY (FOR IDENTIFICATION PURPOSE ONLY)
-  CATCHMENT
-  FALL
-  EXISTING UCHANNEL

**NOTES:**

1. INVERT LEVEL OF CONNECTION POINT SHOULD BE VERIFIED ON SITE BEFORE CONSTRUCTION.

REV	DESCRIPTION	DATE
DRAWING TITLE CATCHMENT PLAN		
DRAWING NUMBER FIGURE 4		

# Appendix

---

# Appendix A - Existing U Channel Design Checking

## U Channel 1 (Zone A1)

### Runoff Estimation

Design Return Period		1 in	10	years
Paved Area	288 =		288	(m2)
Unpaved Area			0	(m2)
Total Equivalent Area	288 x 0.95 + 0 x 0.35 =		274	(m2)
Time of Concentration			2.68	min
Rainfall Intensity, I *			242	mm/hr
Design Discharge Rate, Q	0.278 x 274 x 242 / 1000000 =		0.018	m3/s

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

$$a=485, b=3.11, c=0.397$$

### U Channel (Half round to U)

Channel Size		1 in	300	(mm)
Gradient, Sf			450	
Area (Half Round)			0.035	(m2)
Wetted Perimeter			0.471	(m)
R			0.075	(m)
Velocity**			0.60	m/s
Capacity			0.021	m3/s

$$v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$$

$$n=0.014$$

Utilization 0.018 / 0.021 = **86.80** % OK (allowed for 10% for siltation)

## U Channel 2 (Zone A1 + A2)

### Runoff Estimation

Design Return Period		1 in	10	years
Paved Area	629 =		629	(m2)
Unpaved Area			0	(m2)
Total Equivalent Area	629 x 0.95 + 0 x 0.35 =		598	(m2)
Time of Concentration			2.68	min
Rainfall Intensity, I *			242	mm/hr
Design Discharge Rate, Q	0.278 x 0 x 242 / 1000000 =		0.040	m3/s

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

$$v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$$

$$n=0.014$$

Utilization 0.04 / 0.06 = **66.99** % OK (allowed for 10% for siltation)

## U Channel 3 (Zone B1)

### Runoff Estimation

Design Return Period		1 in	10	years
Paved Area	121 =		121	(m2)
Unpaved Area			0	(m2)
Total Equivalent Area	121 x 0.95 + 0 x 0.35 =		115	(m2)
Time of Concentration			2.68	min
Rainfall Intensity, I *			242	mm/hr
Design Discharge Rate, Q	0.278 x 115 x 242 / 1000000 =		0.008	m3/s

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

$$v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$$

$$n=0.014$$

Utilization 0.008 / 0.021 = **36.47** % OK (allowed for 10% for siltation)

### U Channel (Half round to U)

Channel Size		1 in	300	(mm)
Gradient			450	
Area (Half Round)			0.035	(m2)
Wetted Perimeter			0.471	(m)
R			0.075	(m)
Velocity**			0.60	m/s
Capacity			0.021	m3/s

### U Channel 4 (Zone B1 + B2 + C1)

#### Runoff Estimation

Design Return Period		1 in	10	years
Paved Area	760 + 511 x 0.7 =		1118	(m2)
Unpaved Area	511 x 0.3 =		153	(m2)
Total Equivalent Area	1118 x 0.95 + 153 x 0.35 =		1115	(m2)
Time of Concentration			2.68	min
Rainfall Intensity, I *			242	mm/hr
Design Discharge Rate, Q	0.278 x 1115 x 242 / 1000000 =		0.075	m3/s

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

#### U Channel

Channel Size		1 in	375	(mm)
Gradient			300	
Area			0.126	(m2)
Wetted Perimeter			0.964	(m)
R			0.130	(m)
Velocity**			1.06	m3/s
Capacity			0.133	m3/s

$$v = \frac{R^{\frac{1}{6}}}{n} S_f^{\frac{1}{2}}$$

n=0.014

Utilization 0.075 / 0.133 = **56.31** % OK (allowed for 10% for siltation)

### U Channel 5 (Zone [A1 + A2] + [B1 + B2 + C1])

#### Runoff Estimation

Design Return Period		1 in	10	years
Paved Area	629 + 1118 =		1747	(m2)
Unpaved Area			153	(m2)
Total Equivalent Area	1747 x 0.95 + 153 x 0.35 =		1713	(m2)
Time of Concentration			2.68	min
Rainfall Intensity, I *			242	mm/hr
Design Discharge Rate, Q	0.278 x 1713 x 242 / 1000000 =		0.115	mm/hr

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

#### U Channel

Channel Size		1 in	300	(mm)
Gradient			90	
Area			0.080	(m2)
Wetted Perimeter			0.771	(m)
R			0.104	(m)
Velocity**			1.67	m3/s
Capacity			0.134	m3/s

$$v = \frac{R^{\frac{1}{6}}}{n} S_f^{\frac{1}{2}}$$

n=0.014

Utilization 0.115 / 0.134 = **85.88** % OK (allowed for 10% for siltation)

### Time of Concentration

Catchment	Flow Distance	Highest Level	Lowest Level	Gradient (per 100m) = (H1-H2)/L x 100	to (min) = 0.14465L / (H <sup>0.2</sup> A <sup>0.1</sup> )	tc = to + tf
A	L			H		
(m2)	(m)	(mPD)	(mPD)		(min)	(min)
551	34	10.1	9.8	0.882	2.68	2.68

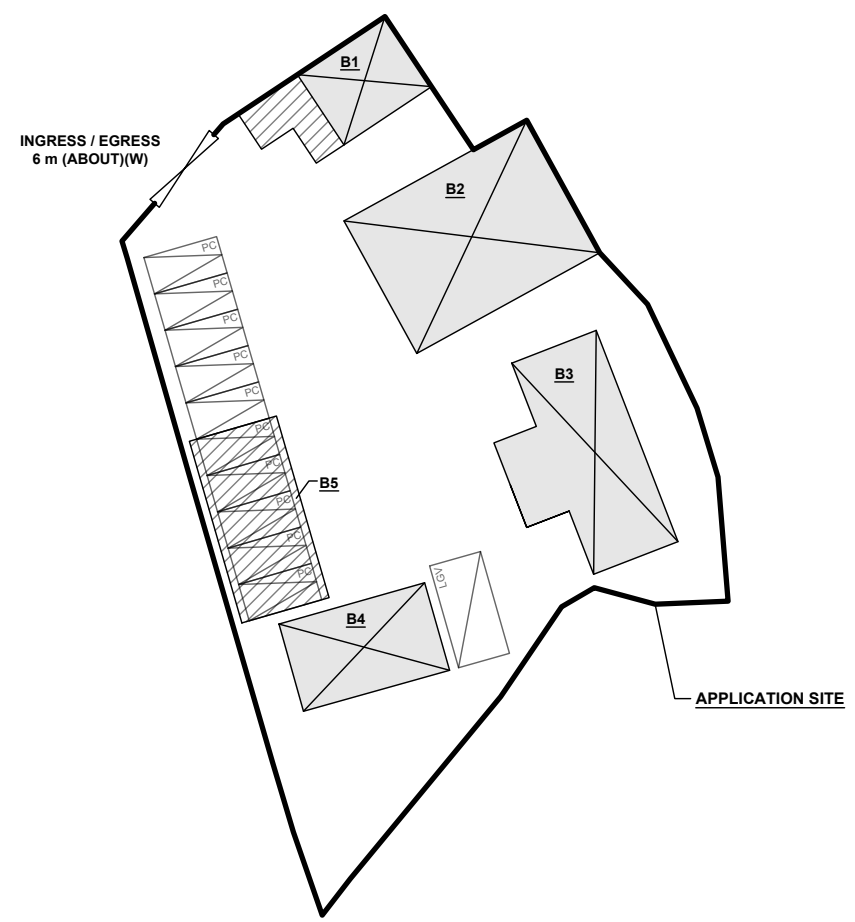
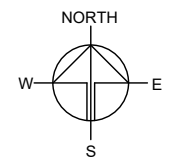
The calculated inlet time from the only external catchment (B1) is 2.68 min.



# Appendix B - Proposed Development Layout Plan

APPLICATION SITE AREA	: 1,298 m <sup>2</sup>	(ABOUT)
COVERED AREA	: 441 m <sup>2</sup>	(ABOUT)
UNCOVERED AREA	: 857 m <sup>2</sup>	(ABOUT)
PLOT RATIO	: 0.45	(ABOUT)
SITE COVERAGE	: 34 %	(ABOUT)
NO. OF STRUCTURE	: 5	
DOMESTIC GFA	: NOT APPLICABLE	
NON-DOMESTIC GFA	: 589 m <sup>2</sup>	(ABOUT)
TOTAL GFA	: 589 m <sup>2</sup>	(ABOUT)
BUILDING HEIGHT	: 3 - 8 m	(ABOUT)
NO. OF STOREY	: 1 - 2	

			COVERED AREA	GFA	BUILDING HEIGHT
B1	(G/F) (1/F)	RESTAURANT AND OUTSIDE SEATING ACCOMMODATION OF RESTAURANT RESTAURANT AND WASHROOM	60 m <sup>2</sup> (ABOUT)	60 m <sup>2</sup> (ABOUT) 40 m <sup>2</sup> (ABOUT)	7 m (ABOUT)(2-STOREY)
B2		RESTAURANT, KITCHEN & WASHROOM	138 m <sup>2</sup> (ABOUT)	138 m <sup>2</sup> (ABOUT)	3.5m (ABOUT)(1-STOREY)
B3	(G/F) (1/F)	SHOP AND SERVICES OFFICE AND WASHROOM	108 m <sup>2</sup> (ABOUT)	108 m <sup>2</sup> (ABOUT) 108 m <sup>2</sup> (ABOUT)	8m (ABOUT)(2-STOREY)
B4		SHOP AND SERVICES	60 m <sup>2</sup> (ABOUT)	60 m <sup>2</sup> (ABOUT)	3m (ABOUT)(1-STOREY)
B5		RAIN SHELTER FOR PARKING SPACE	75 m <sup>2</sup> (ABOUT)	75 m <sup>2</sup> (ABOUT)	3m (ABOUT)(1-STOREY)
<b>TOTAL</b>			<b>441 m<sup>2</sup> (ABOUT)</b>	<b>589 m<sup>2</sup> (ABOUT)</b>	



**PARKING AND LOADING/UNLOADING PROVISIONS**

NO. OF PRIVATE CAR PARKING SPACE	: 10
DIMENSION OF PARKING SPACE	: 5m (L) X 2.5m (W)
NO. OF L/UL SPACE FOR LIGHT GOODS VEHICLE	: 1
DIMENSION OF L/UL SPACE	: 7m (L) X 3.5m (W)

**LEGEND**

- APPLICATION SITE
- STRUCTURE (ENCLOSED)
- STRUCTURE (CANOPY)
- PARKING SPACE
- LOADING / UNLOADING SPACE
- INGRESS / EGRESS

PLANNING CONSULTANT

PROJECT

TEMPORARY SHOP AND SERVICES AND EATING PLACE FOR A PERIOD OF 5 YEARS

SITE LOCATION

LOT 390 RP (PART) IN D.D. 106, KAM SHEUNG ROAD, YUEN LONG, NEW TERRITORIES

SCALE

1 : 500 @ A4

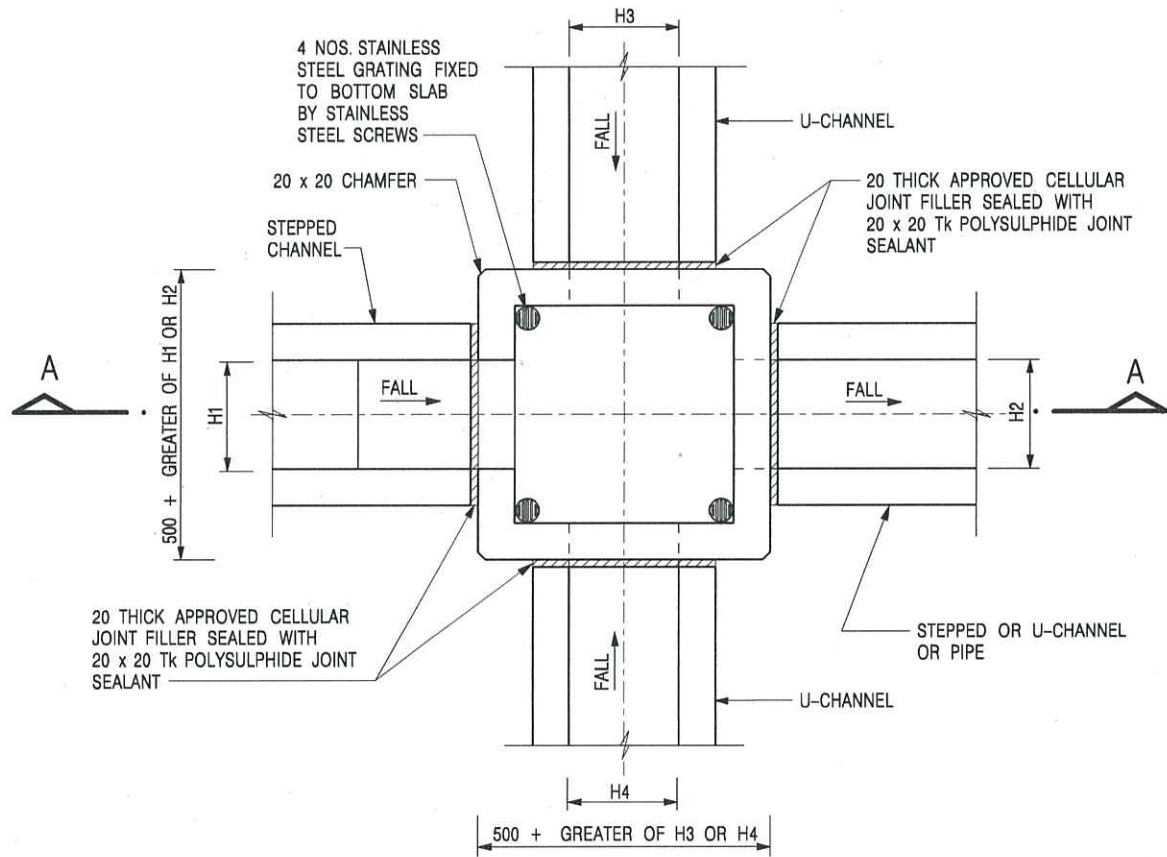
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MN	12.9.2024
REVISED BY	DATE
APPROVED BY	DATE

DWG. TITLE

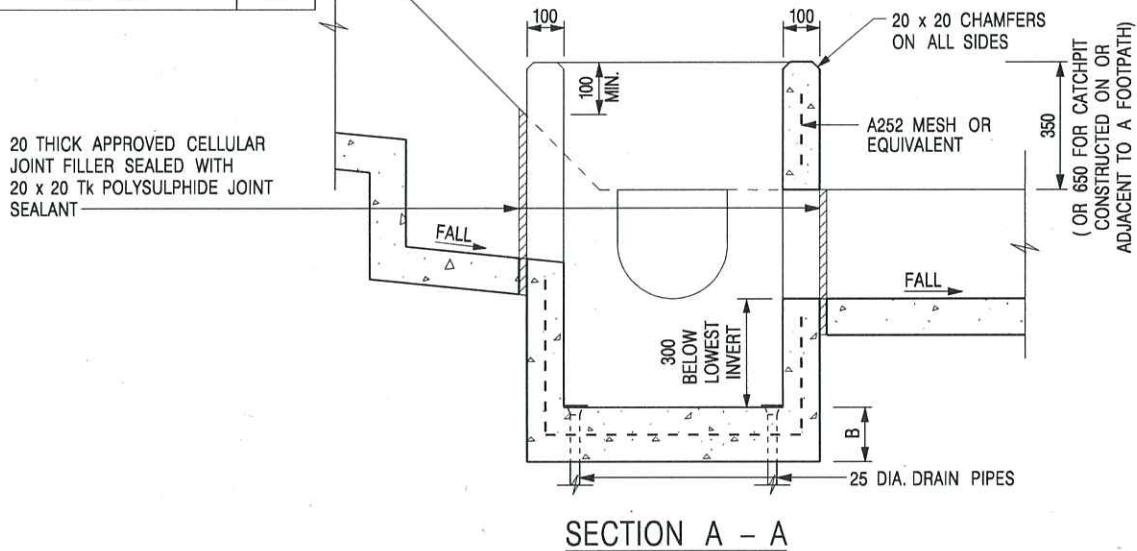
LAYOUT PLAN

DWG NO.	VER.
PLAN 4	001

# Appendix C - Reference Drawings



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.

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

CATCHPIT WITH TRAP  
(SHEET 1 OF 2)



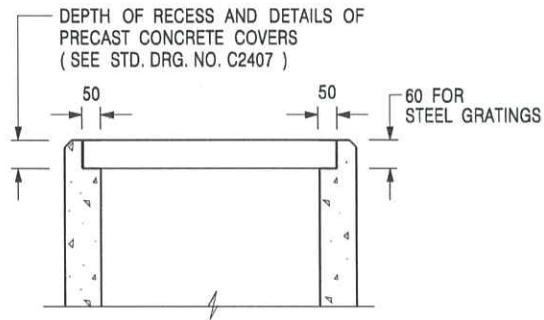
CIVIL ENGINEERING AND  
DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DRAWING NO.

DATE JAN 1991

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
<b>REF.</b>	<b>REVISION</b>	<b>SIGNATURE</b>	<b>DATE</b>

CATCHPIT WITH TRAP  
(SHEET 2 OF 2)



**CIVIL ENGINEERING AND  
DEVELOPMENT DEPARTMENT**

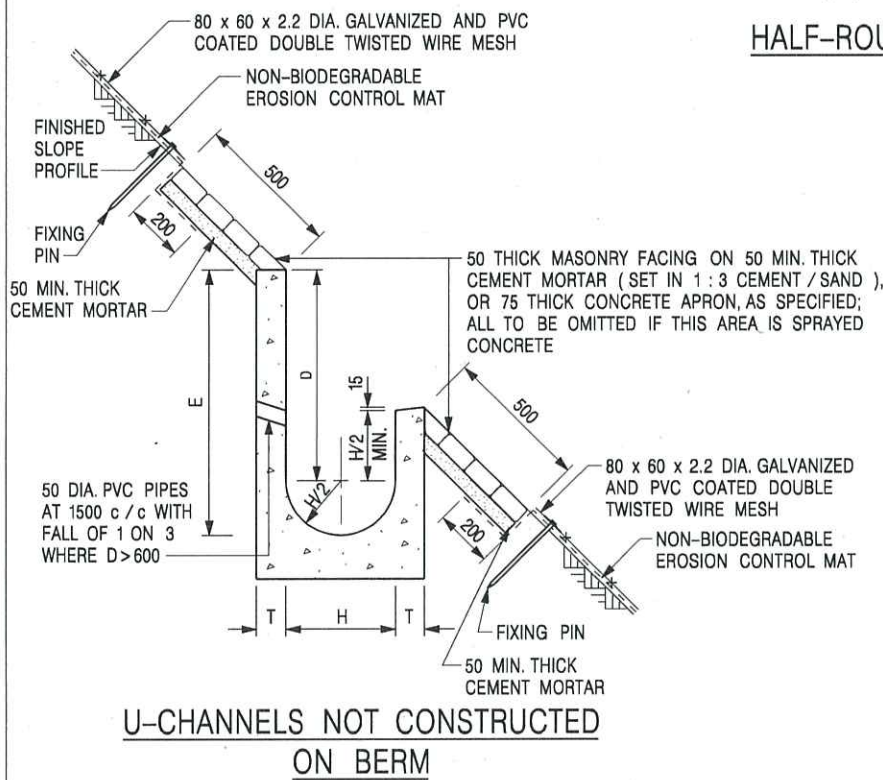
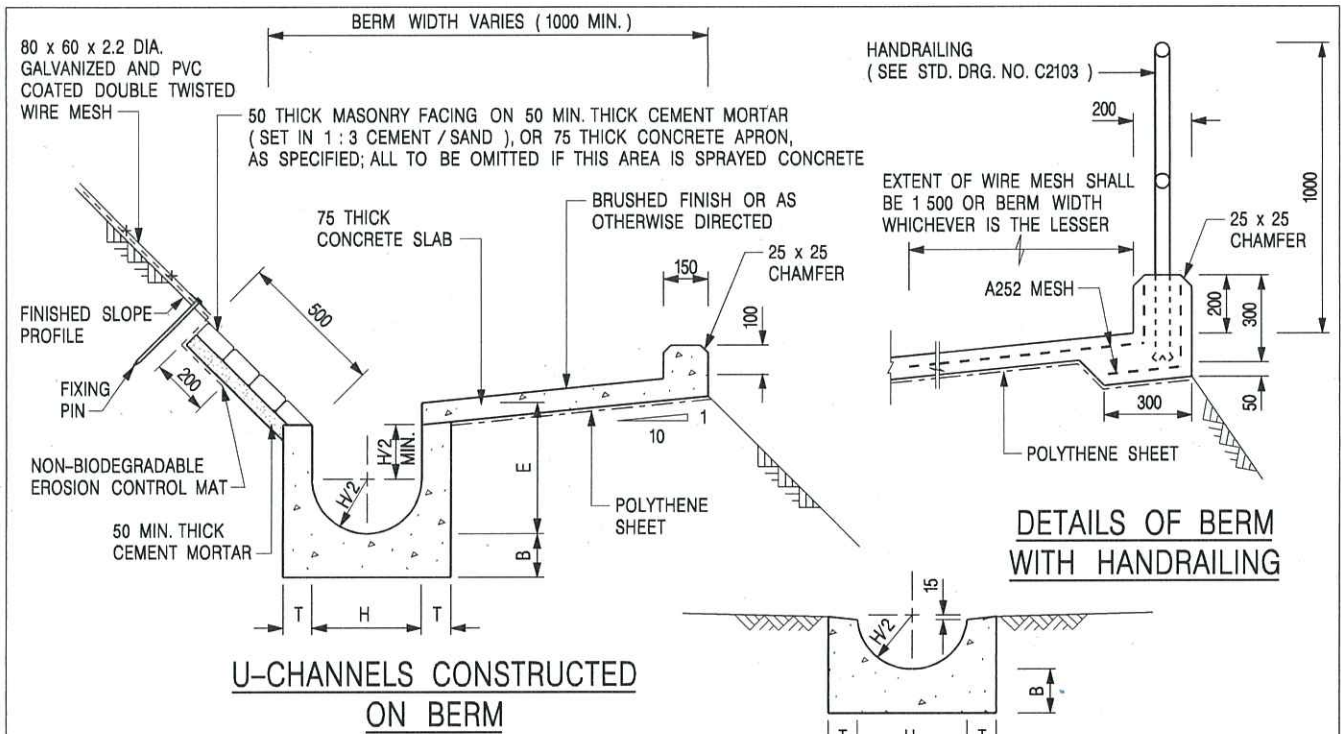
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**DRAWING NO.**

**DATE** JAN 1991

**C2406 /2A**





**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE TO BE GRADE 20 / 20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2, F2 OR BRUSHED FINISH AS DIRECTED.
4. SPACING OF EXPANSION JOINT IN CHANNELS, BERM SLABS AND APRONS TO BE 10 METRES MAXIMUM, SEE STD. DRG. NO. C2413 FOR DETAILS.
5. JOINTS FOR CHANNELS, BERM SLABS, APRONS AND WALLS, ETC. TO BE ON THE SAME ALIGNMENT.
6. FOR DIMENSIONS T, H, & B, SEE TABLE BELOW.
7. BIODEGRADABLE EROSION CONTROL MAT IF REQUIRED, SEE STD. DRG. NO. C2511/E.
8. CONCRETE TO BE COLOURED AS SPECIFIED.
9. CONCRETE U-CHANNEL CAN BE CAST IN-SITU OR PRECAST CONCRETE SUBJECT TO THE ENGINEER'S AGREEMENT ON THE DETAILS.
10. DETAILS OF EROSION CONTROL MAT AND WESH MESH ON BERM. (SEE STD DRG. NO. C2511/E)

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	THICKNESS OF MASONRY FACING AMENDED.	Original Signed	01.2005
G	MINOR AMENDMENT.	Original Signed	01.2004
F	GENERAL REVISION.	Original Signed	12.2002
E	DRAWING TITLE AMENDED.	Original Signed	11.2001
D	MINOR AMENDMENT.	Original Signed	08.2001
C	150 x 100 UPSTAND ADDED AT BERM.	Original Signed	6.99
B	MINOR AMENDMENTS.	Original Signed	3.94

**DETAILS OF HALF-ROUND AND U-CHANNELS (TYPE A WITH MASONRY APRON)**



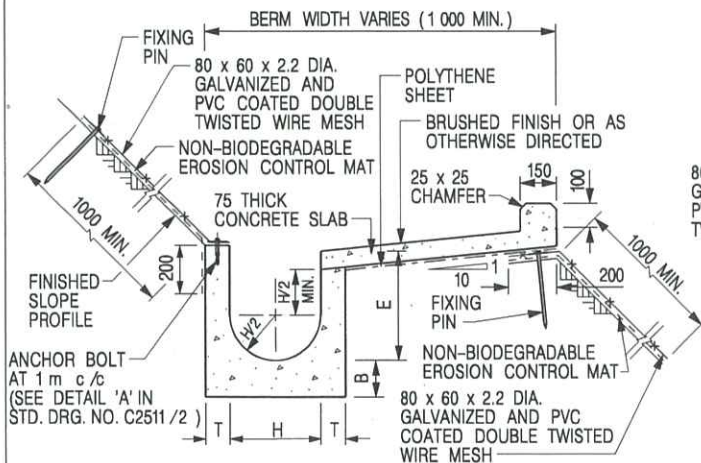
**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**

**SCALE** 1 : 25

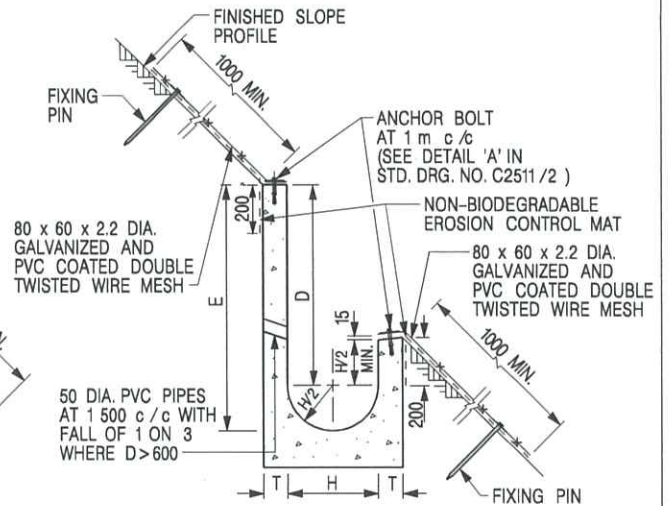
**DRAWING NO.**

**DATE** JAN 1991

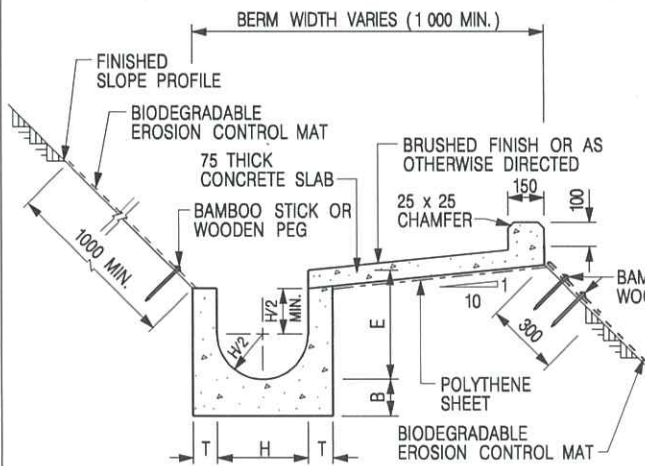
**C24091**



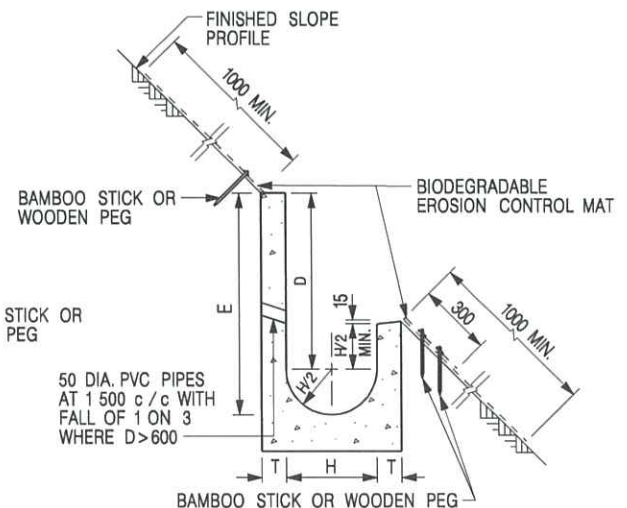
**U-CHANNELS CONSTRUCTED ON BERM WITH NON-BIODEGRADABLE EROSION CONTROL MAT**



**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:**

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

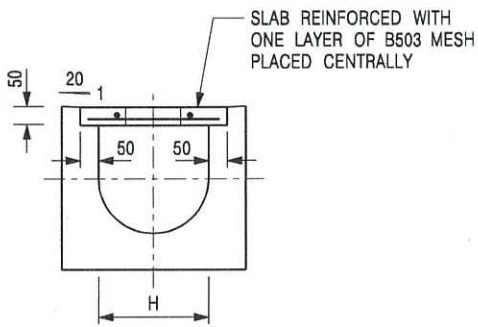
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**DRAWING NO.**

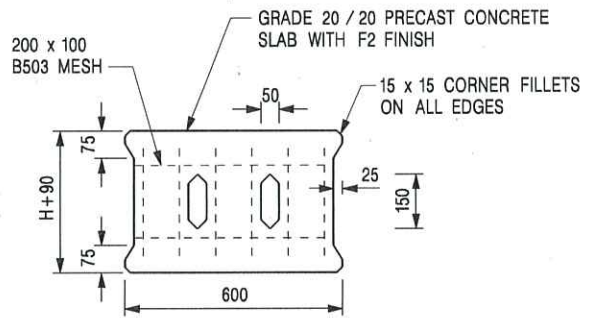
**DATE** JAN 1991

**C24101**





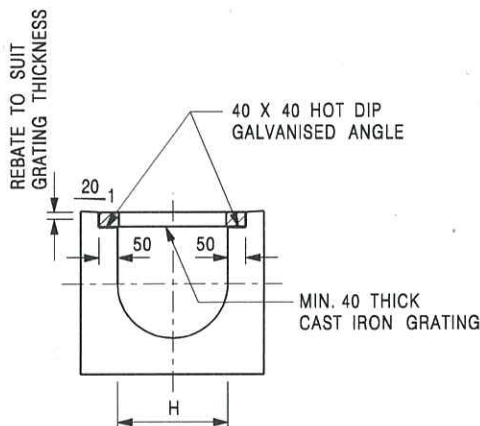
TYPICAL SECTION



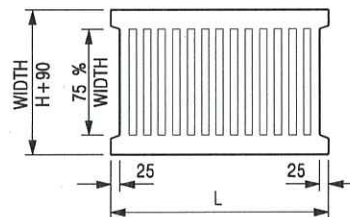
PLAN OF SLAB

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

DRAWING NO.

DATE JAN 1991

C2412E