

Our Ref. : DD107 Lot 1434  
Your Ref. : TPB/A/YL-KTN/979

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

**By Email**

22 March 2024

Dear Sir,

**1<sup>st</sup> Further Information**

**Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities  
for a Period of 3 Years and Associated Filling of Land and Pond in “Agriculture” Zone,  
Lot 1434 (Part) in D.D. 107, Kam Tin, Yuen Long, New Territories**

**(S.16 Planning Application No. A/YL-KTN/979)**

We are writing to submit further information to address departmental comments of the subject application (**Appendix I**).

Should you require more information regarding the application, please contact our Mr. Orpheus LEE at \_\_\_\_\_ or the undersigned at your convenience. Your kind attention to the matter is much appreciated.

Yours faithfully,

For and on behalf of  
**R-riches Property Consultants Limited**

**Louis TSE**  
Town Planner

**Responses-to-Comments**

**Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land and Pond in “Agriculture” Zone, Lot 1434 (Part) in D.D. 107, Kam Tin, Yuen Long, New Territories**

**(Application No. A/YL-KTN/979)**

(i) A RtoC Table:

Departmental Comments		Applicant’s Responses
<b>1. Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD)</b> <b>(Contact Person: Mr. Terence TANG; Tel.: 2300 1257)</b>		
(a)	I have reservation on the subject development as there as proposed pond and land filling works and appears covering the whole application site but there is no substantiation show how the overland flow from adjacent areas would not be interrupted by the proposed works.	A drainage proposal, with provision of peripheral u-channel and catchpits is provided to mitigate potential drainage impact generated by the proposed development ( <b>Annex I</b> ). The applicant will implement the proposed drainage facilities at the application site (the Site) once the drainage proposal is accepted by CE/MN, DSD / Town Planning Board.
<b>2. Comments of the Director of Agriculture, Fisheries and Conservation (DAFC)</b> <b>(Contact Person: Ms. WONG Cheuk-ling; Tel: 2150 6933)</b>		
(a)	The agricultural activities are active in the vicinity, and agricultural infrastructures such as road access and water source are also available. The subject site can be used for agricultural activities such as open-field cultivation, greenhouses, plant nurseries, etc. As the subject site possesses potential for agricultural rehabilitation, the proposed development is not supported from agricultural perspective.	Please be noted that the Site is currently vacant and there is no active agricultural use within the Site. The Site is also surrounded by temporary structures for warehouse use and vacant land. As the proposed development is intended to support the warehousing and storage industry, approval of the application on a temporary basis of 3 years would not frustrate the long term planning intention of the “Agriculture” zone and better utilize deserted agricultural land. The applicant will reinstate the Site to a state that is suitable for agricultural use after the planning approval period.
(b)	Pond filling is generally not recommended from a fisheries viewpoint. Although the fish pond is currently of unknown status, it	Please be informed that the fish pond is dried for decades. The applicant submitted a drainage proposal in accordance with

**S.16 Planning Application No. A/YL-KTN/979**

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	<p>has the potential to be used for fish culture operations in the future. As such, the application is not supported from a fisheries viewpoint.”</p>	<p>requirements from DSD, including the provision of peripheral u-channels and catchpits to mitigate the potential adverse drainage impact generated by the proposed development. Therefore, direct impact to the fish pond should not be anticipated.</p>
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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 and Pond in “Agriculture” Zone, Lot 1434 (part) in D.D. 107, Kam Tin, Yuen Long, New Territories

Drainage Appraisal

March 2024

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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 Lot 1434 (part) in D.D. 107, 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 and Pond' (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 Application Site area is about 498m<sup>2</sup>, and it situates beside local tracks at the west, south and east. Those local track connect the site to Shui Mei Road in the South of the Proposed Development. The site is partly occupied by existing structures, abandoned dried pond and grassland.
- 1.2.2 The Application Site is surrounded by grassland, temporary structures and local track. It is generally flat with existing ground level of approx. +9.6 mPD and it is proposed to be filled up to +9.8 mPD after the Proposed Development.
- 1.2.3 The site location plan is shown in **Figure 1**.
- 1.2.4 Existing Drainage Plan is shown in **Figure 2** for reference.
- 1.2.5 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 498m<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> )	498
Assume all proposed site area as paved area after development for assessment purpose (m <sup>2</sup> )	498

**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 surrounding 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.

a	=	471.9
b	=	3.02
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 pipe 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:

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

where,

V = velocity of the pipe flow (m/s)

S<sub>f</sub> = hydraulic gradient

k<sub>f</sub> = roughness value (m)

ν = kinematics viscosity of fluid

D = pipe diameter (m)

R = hydraulic radius (m)

## 4. Proposed Drainage System

- 4.1.1 The Application Site and the surrounding areas are generally flat. Internal drainage system is proposed to collect the runoff from the application site and discharge to the existing drainage system under the local tracks at the south. The alignment, size and gradient of the proposed drains are shown in **Figure 3**.
- 4.1.2 The design calculations of proposed channels are shown in **Appendix A**.

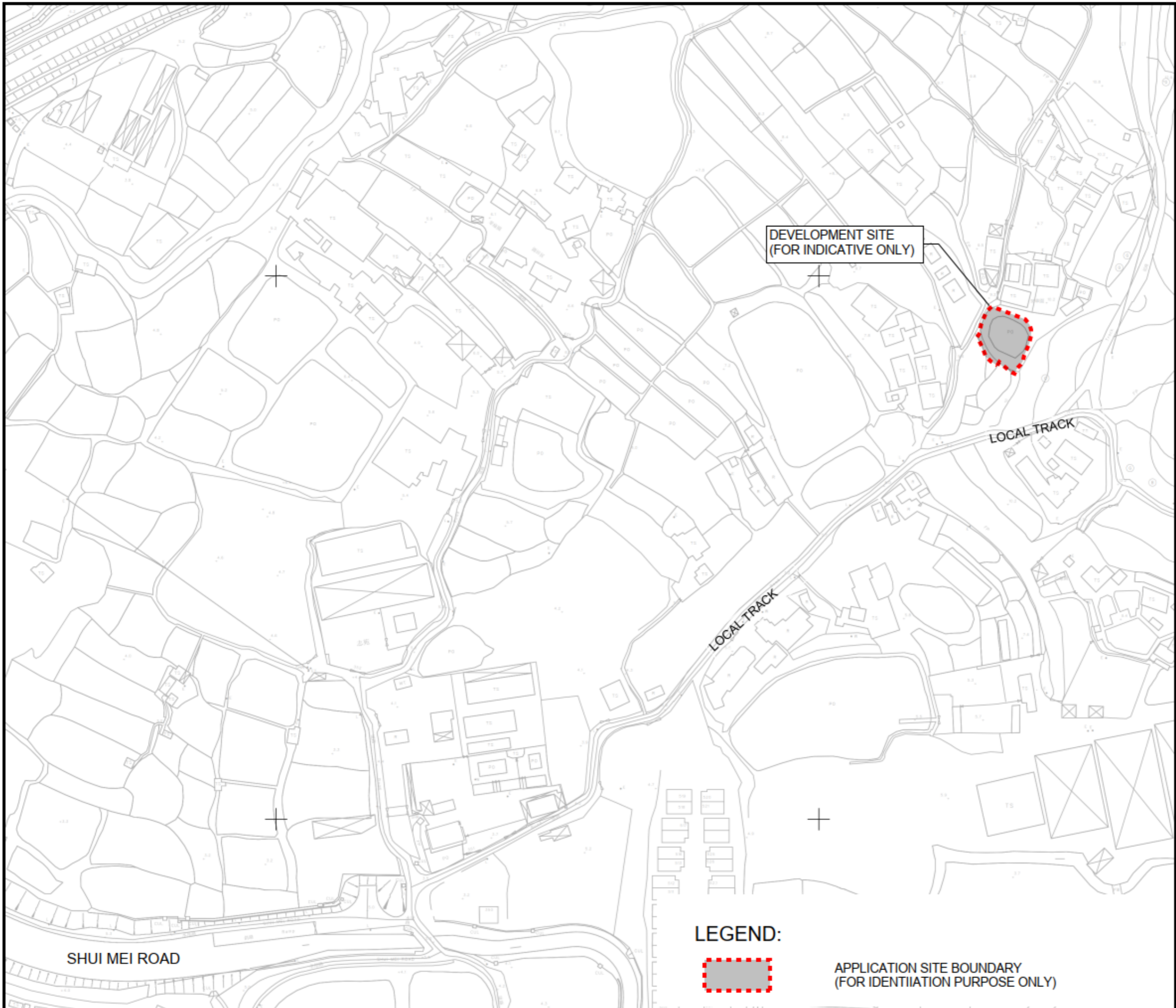
## 5. Conclusion

- 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 proposed perimeter Uchannel/drains and discharge to the existing drainage system under the southern local track.
- 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:**  
 Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land and Pond in "Agriculture" Zone, Lot 1434 (part) in D.D. 107, Kam Tin, Yuen Long, New Territories

REV	DESCRIPTION	DATE

**DRAWING TITLE:**  
 SITE LOCATION PLAN

**DRAWING NUMBER:**  
 FIGURE 1

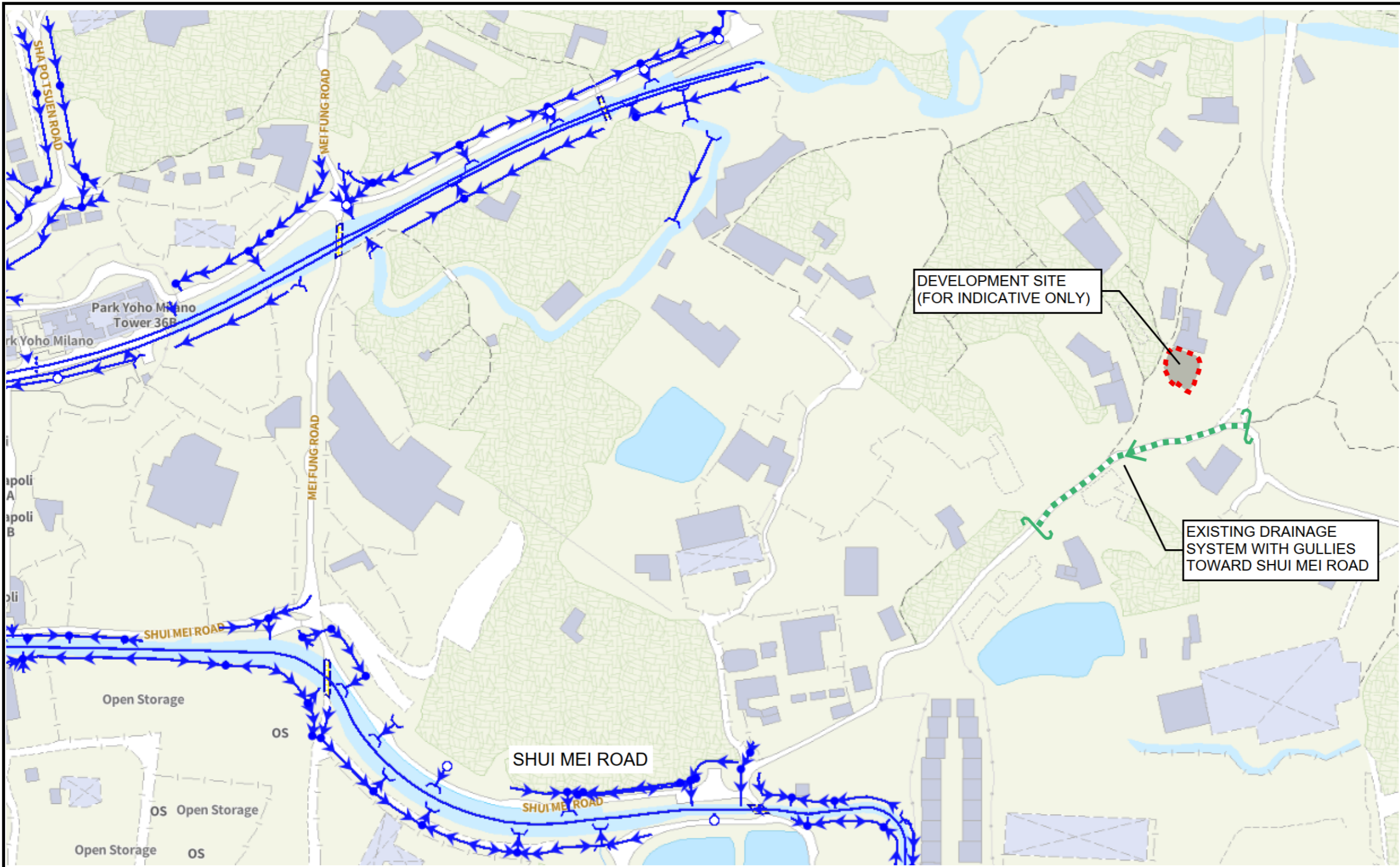
**LEGEND:**  
 APPLICATION SITE BOUNDARY (FOR IDENTIFICATION PURPOSE ONLY)

SHUI MEI ROAD

DEVELOPMENT SITE (FOR INDICATIVE ONLY)

LOCAL TRACK

LOCAL TRACK



**PROJECT:**  
 Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land and Pond in "Agriculture" Zone, Lot 1434 (part) in D.D. 107, Kam Tin, Yuen Long, New Territories

DEVELOPMENT SITE  
 (FOR INDICATIVE ONLY)

EXISTING DRAINAGE SYSTEM WITH GULLIES TOWARD SHUI MEI ROAD

**LEGEND:**

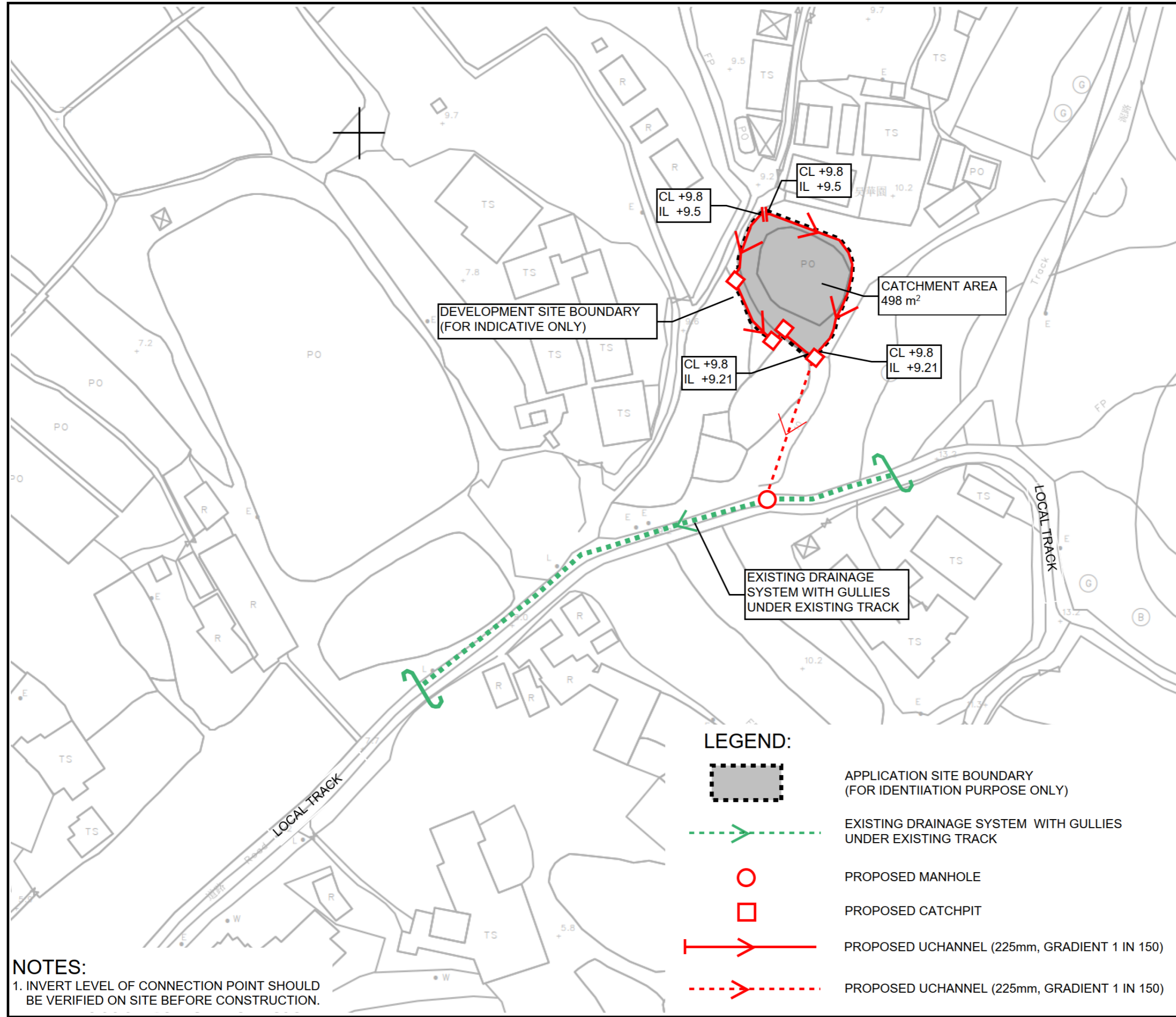
	Combined Manhole		Tapping Point (Sewer)		Tapping Point (Storm)
	Overflow (Combined)		Sewer Terminal Manhole		Storm Water Terminal Manhole
	Pipe (Combined)		Catchpit		Tunnel Protection Zone (100m / 200m)
	Interface Valve Chamber		Inlet		Tunnel Protection Zone (General Range)
	Sewer Manhole		Storm Water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

REV	DESCRIPTION	DATE

**DRAWING TITLE:**  
 EXISTING DRAINAGE PLAN

**DRAWING NUMBER:**  
 FIGURE 2

**PROJECT:**  
 Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land and Pond in "Agriculture" Zone, Lot 1434 (part) in D.D. 107, Kam Tin, Yuen Long, New Territories



DEVELOPMENT SITE BOUNDARY  
(FOR INDICATIVE ONLY)

CL +9.8  
IL +9.5

CL +9.8  
IL +9.5







CATCHMENT AREA  
498 m<sup>2</sup>

CL +9.8  
IL +9.21

CL +9.8  
IL +9.21

EXISTING DRAINAGE  
SYSTEM WITH GULLIES  
UNDER EXISTING TRACK

**LEGEND:**

-  APPLICATION SITE BOUNDARY (FOR IDENTIFICATION PURPOSE ONLY)
-  EXISTING DRAINAGE SYSTEM WITH GULLIES UNDER EXISTING TRACK
-  PROPOSED MANHOLE
-  PROPOSED CATCHPIT
-  PROPOSED UCHANNEL (225mm, GRADIENT 1 IN 150)
-  PROPOSED UCHANNEL (225mm, GRADIENT 1 IN 150)

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

REV	DESCRIPTION	DATE

DRAWING TITLE:  
**PROPOSED DRAINAGE SYSTEM**

DRAWING NUMBER:  
**FIGURE 3**

# Appendix

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# Appendix A - Design Calculation

## Channel Design

### U Channel - Internal

#### **Runoff Estimation**

Design Return Period	1 in	10	years
Paved Area*		498	(m <sup>2</sup> )
Unpaved Area*		0	(m <sup>2</sup> )
Total Equivalent Area		473	(m <sup>2</sup> )
Rainfall Intensity, I **		206	mm/hr
Design Discharge Rate, Q***		0.027	m <sup>3</sup> /s

\* Assume all the site area is paved for assessment purpose

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

$$*** Q = 0.278 \times 473 \times 206 / 1000000$$

#### **U Channel**

Channel Size		225	(mm)
Gradient	1 in	150	
Velocity		1.07	m/s
Capacity		0.048	m <sup>3</sup> /s

Utilization  $0.027 / 0.048 = 56.38 \%$  < 85 %

## PipeWorks Design

#### **Runoff Estimation**

Design Return Period	1 in	10	years
Paved Area*		498	m <sup>2</sup>
Unpaved Area*		0	m <sup>2</sup>
Total Equivalent Area		473	m <sup>2</sup>
Time of Concentration		5	min
Rainfall Intensity		206	mm/hr
Design Discharge Rate		0.027	m <sup>3</sup> /s

#### **Pipe Design**

Pipe Size		225	mm
Gradient	1 in	150	
Velocity		1.24	m/s
Capacity		0.049	m <sup>3</sup> /s

Utilization = 55.42 % <85%



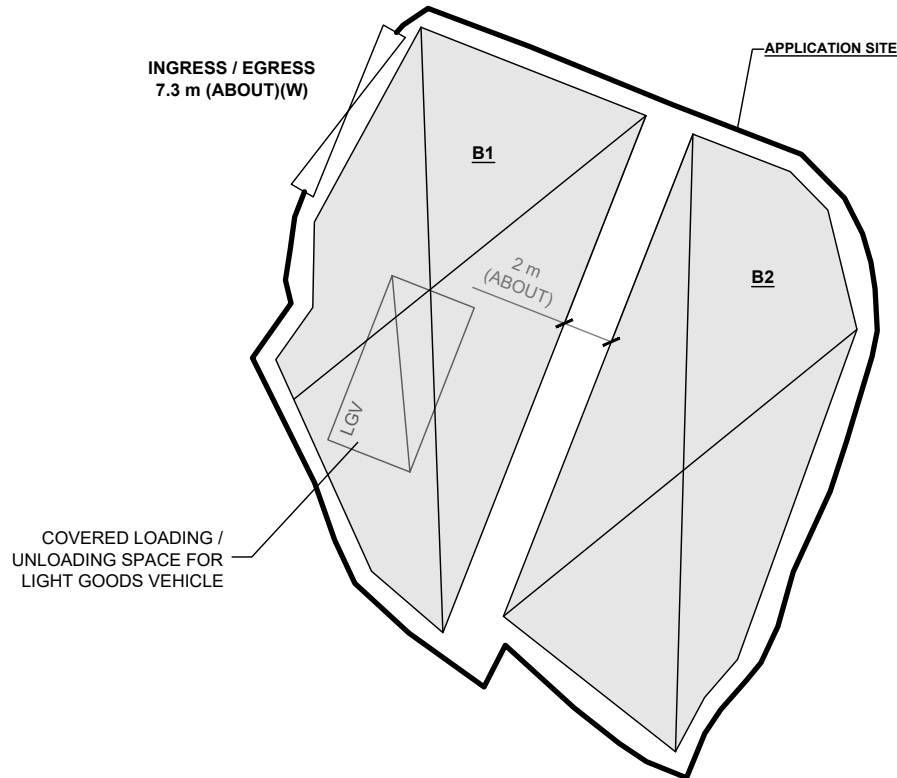
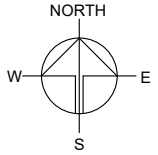
# Appendix B - Development Layout Plan

UNCOVERED AREA	: 119 m <sup>2</sup>	(ABOUT)
PLOT RATIO	: 0.76	(ABOUT)
SITE COVERAGE	: 76 %	(ABOUT)
NO. OF STRUCTURE	: 2	
DOMESTIC GFA	: NOT APPLICABLE	
NON-DOMESTIC GFA	: 379 m <sup>2</sup>	(ABOUT)
TOTAL GFA	: 379 m <sup>2</sup>	(ABOUT)
BUILDING HEIGHT	: 7 m	(ABOUT)
NO. OF STOREY	: 1	

B2	COVERED LOADING / UNLOADING AREA WAREHOUSE (EXCLUDING D.G.G.)	188 m <sup>2</sup> (ABOUT)
<b>TOTAL</b>		<b>379 m<sup>2</sup> (ABOUT)</b>

\*D.G.G. - DANGEROUS GOODS GODOWN





GFA	BUILDING HEIGHT
191 m <sup>2</sup> (ABOUT)	7 m (ABOUT)(1-STOREY)
188 m <sup>2</sup> (ABOUT)	7 m (ABOUT)(1-STOREY)
<b>379 m<sup>2</sup> (ABOUT)</b>	



### LOADING / UNLOADING PROVISIONS

NO. OF L/UL SPACE FOR LIGHT GOODS VEHICLE	: 1
DIMENSION OF L/UL SPACE	: 7 m (L) x 3.5 m (W)

### LEGEND

-  APPLICATION SITE
-  STRUCTURE
-  LOADING / UNLOADING SPACE
-  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 AND POND

SITE LOCATION

LOT 1434 (PART) IN D.D. 107, KAM TIN, YUEN LONG, NEW TERRITORIES

SCALE

1 : 300 @ A4

DRAWN BY	DATE
MN	21.11.2023

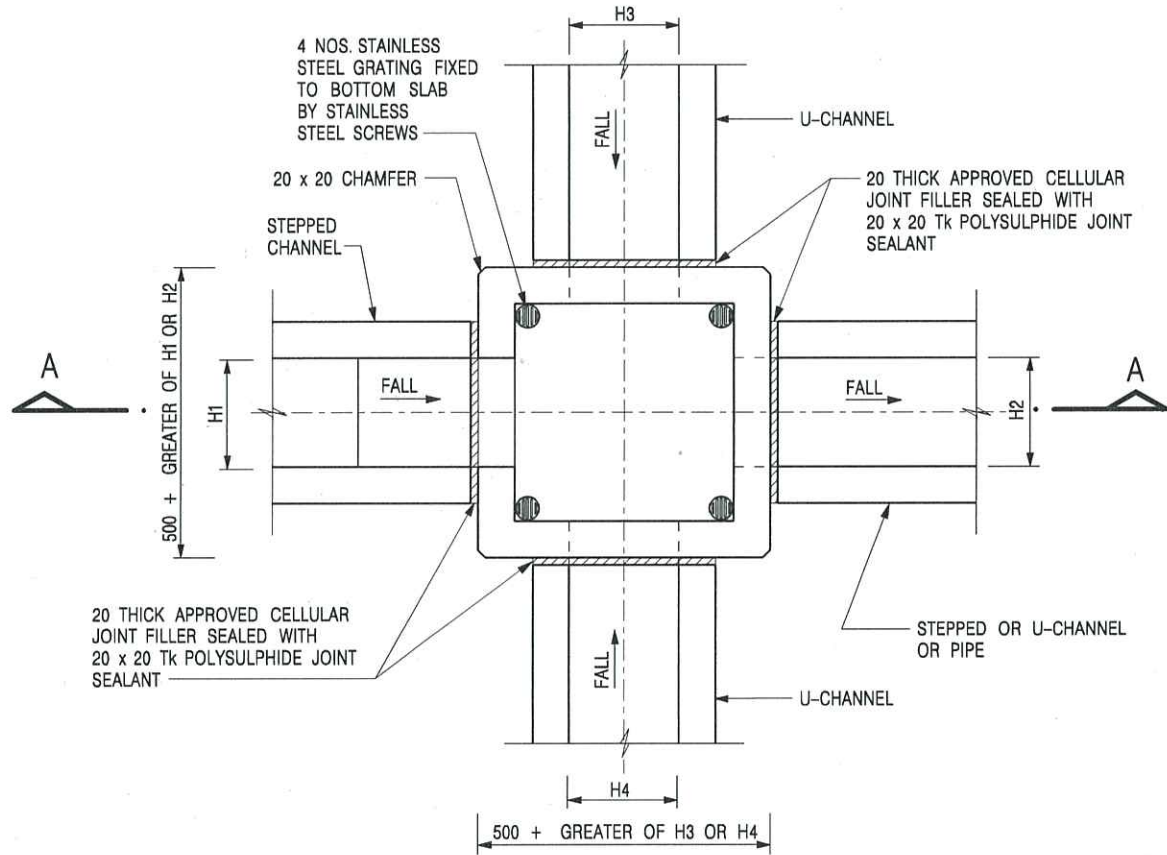
REVISED BY	DATE

APPROVED BY	DATE

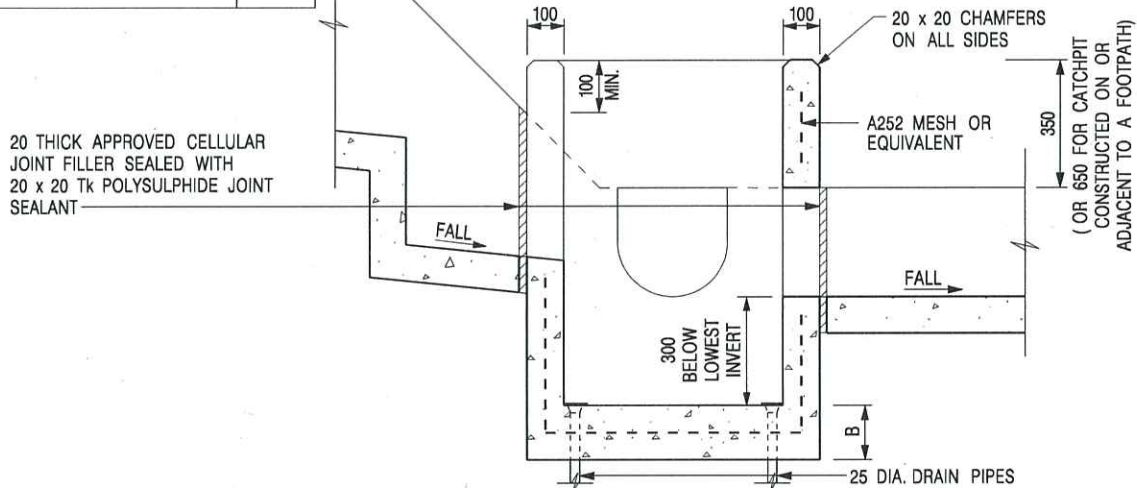
DWG. TITLE  
LAYOUT PLAN

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



SECTION A - A

**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)



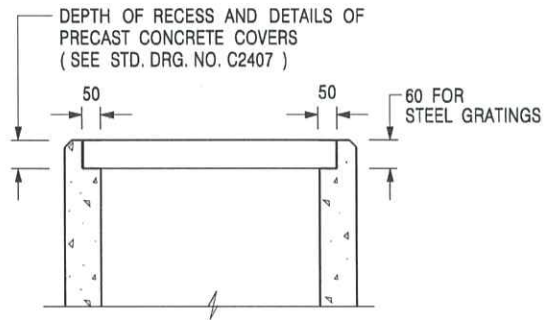
**CIVIL ENGINEERING AND  
DEVELOPMENT DEPARTMENT**

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)



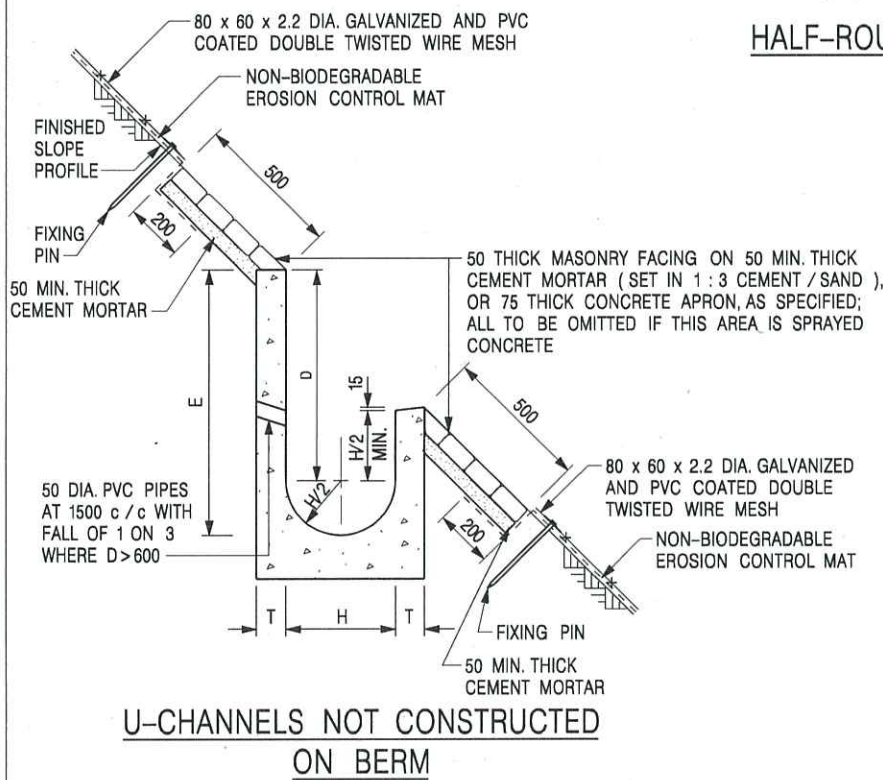
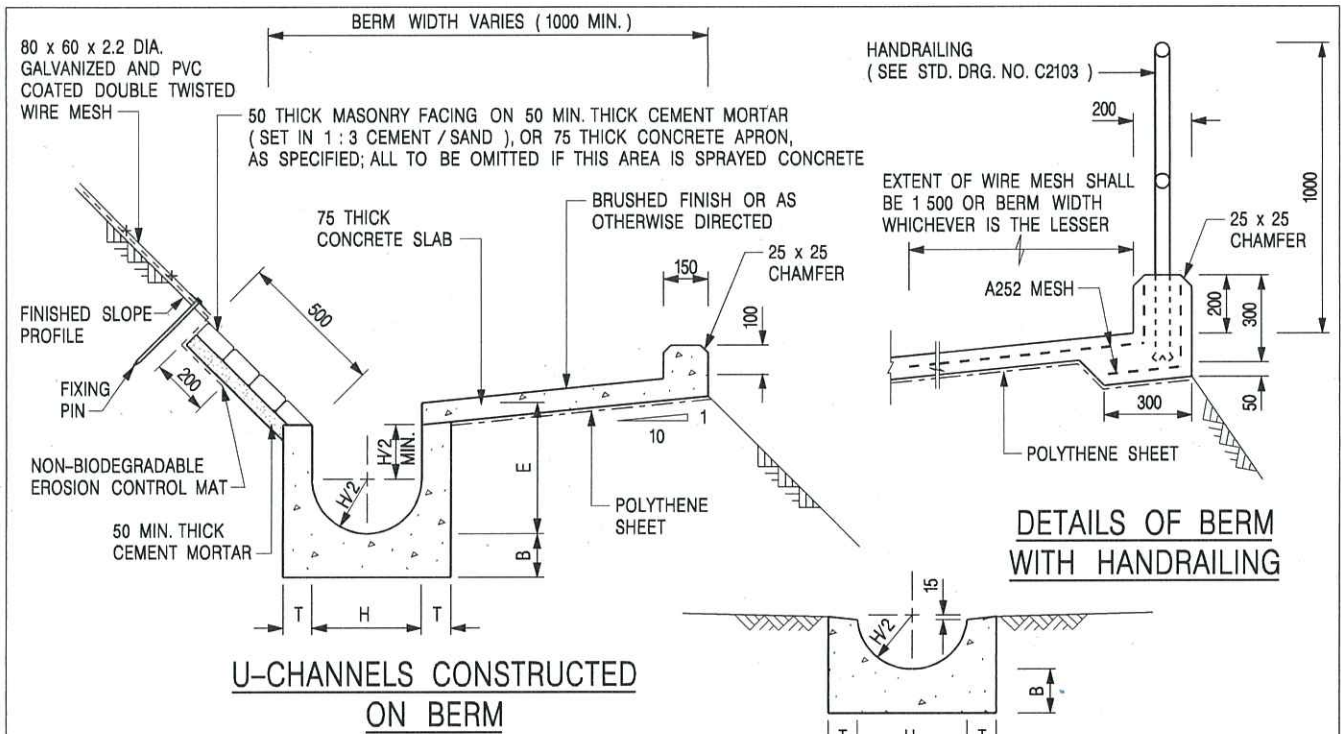
**CIVIL ENGINEERING AND  
DEVELOPMENT DEPARTMENT**

**SCALE** 1 : 20

**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

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
REF.	REVISION	SIGNATURE	DATE

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



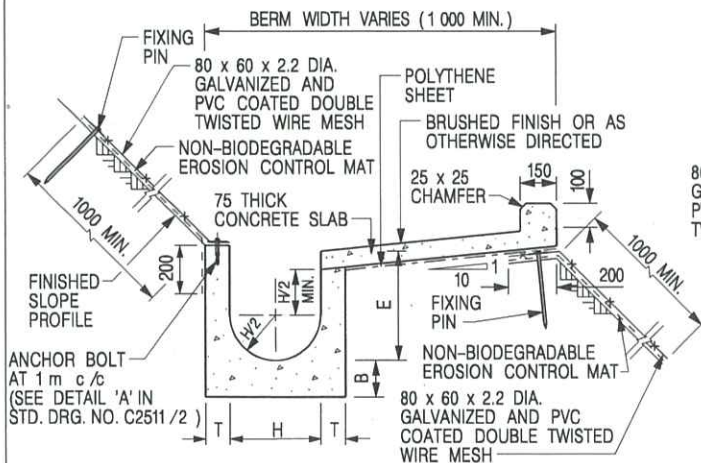
**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**

**SCALE** 1 : 25

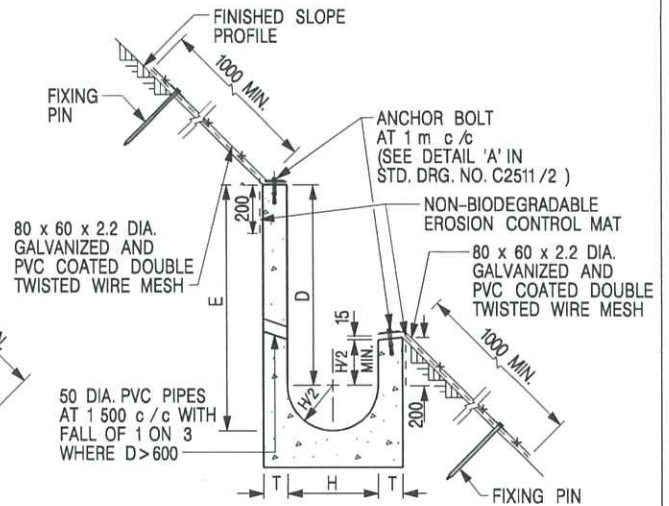
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**DATE** JAN 1991

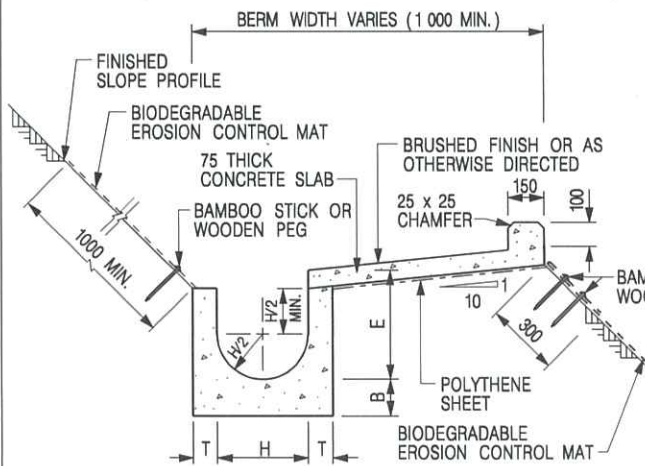
**C24091**



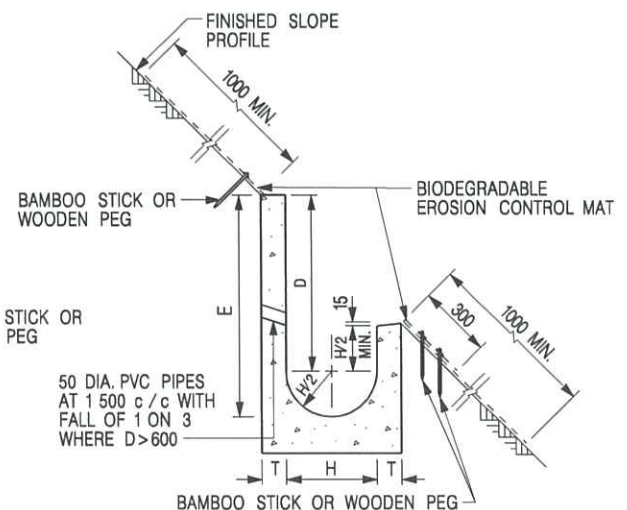
**U-CHANNELS CONSTRUCTED ON BERM WITH NON-BIODEGRADABLE EROSION CONTROL MAT**



**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:**

- 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)**



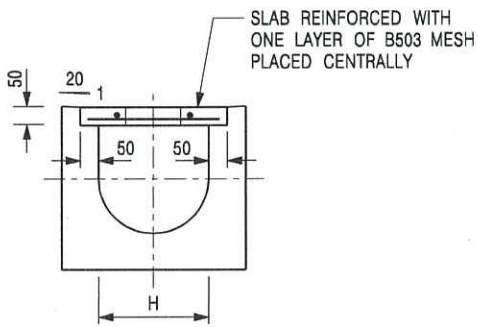
**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**

**SCALE** DIAGRAMMATIC

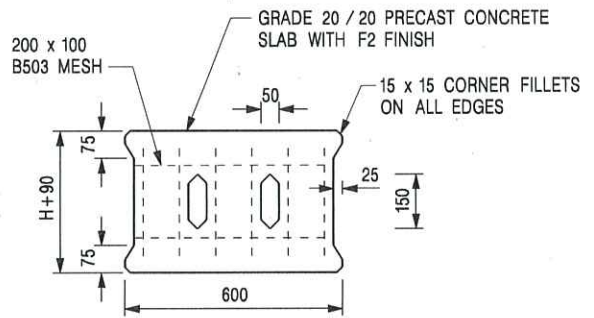
**DRAWING NO.**

**DATE** JAN 1991

**C24101**



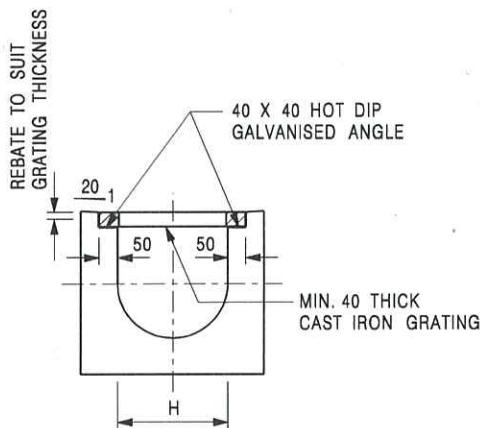
TYPICAL SECTION



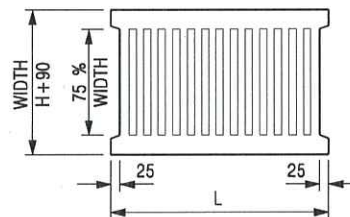
PLAN OF SLAB

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.

REF.	REVISION	SIGNATURE	DATE
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

COVER SLAB AND CAST IRON  
GRATING FOR CHANNELS



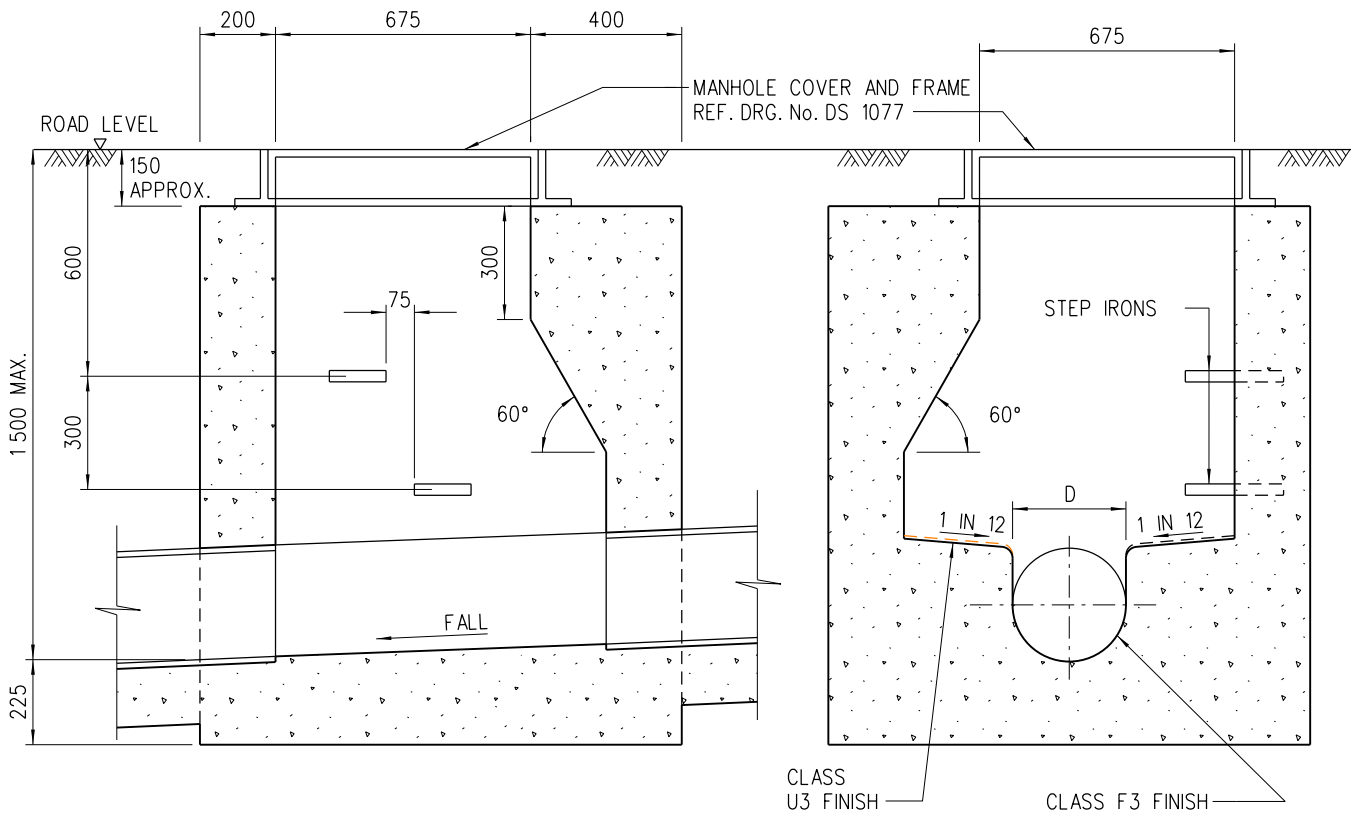
CIVIL ENGINEERING AND  
DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DRAWING NO.

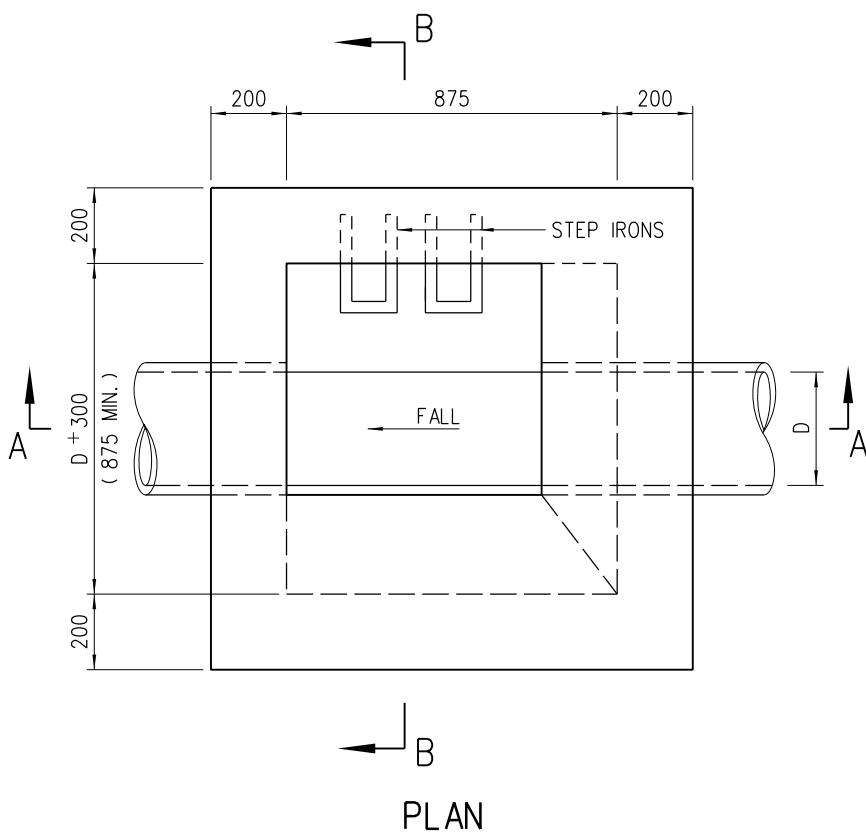
DATE JAN 1991

C2412E



**SECTION A-A**

**SECTION B-B**



**PLAN**

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. PIPE DIAMETER : 150 TO 675 mm
3. NORMAL RANGE : 1 000 TO 1 500 mm  
(FROM ROAD LEVEL TO LOWEST INVERT)
4. USED IN : STORMWATER DRAIN AND SEWER
5. JUNCTION : POSITION OF JUNCTION TO BE DETERMINED IN EACH INDIVIDUAL CASE. CHANNELS IMMEDIATELY UNDER ACCESS TO MANHOLE SHOULD BE AVOIDED.
6. TOP TREATMENT: SEE DRG. No. DS 1032
7. FOUNDATION : FOUNDATION OF MANHOLE VARIES WITH SITE CONDITION. THEREFORE, IT SHOULD BE DETERMINED ON SITE BY THE ENGINEER.
8. CONCRETE : GRADE 30/20
9. COVER AND FRAME NOT SHOWN ON PLAN FOR CLARITY.
10. RECESS WITH SQUARE STEEL ROD SHALL BE PROVIDED AT TOP OF MANHOLE CHAMBER FOR INSTALLING MONITORING DEVICE(S). DETAILS REFER TO DSD STANDARD DRAWING NO. DS 1099.

A	NOTE 10 ADDED	ORIGINAL SIGNED	2.8.2022
	NEW ISSUE	ORIGINAL SIGNED	15.8.2007
REV.	DESCRIPTION	SIGNATURE	DATE

STANDARD MANHOLE  
TYPE D1

**DRAINAGE SERVICES DEPARTMENT**

REFERENCE

DRAWING No.

SCALE

1 : 20

**DS 1079A**