

Appendix I

Accepted drainage proposal under the previous application

規劃署

粉嶺、上水及元朗東規劃處
新界荃灣青山公路388號
中環大廈22樓2202室

**Planning Department**

Fanling, Sheung Shui & Yuen Long East
District Planning Office
Unit 2202, 22/F, CDW Building,
388 Castle Peak Road, Tsuen Wan, N.T.

來函檔號 Your Reference:
本署檔號 Our Reference TPB/A/YL-SK/395
電話號碼 Tel. No.: 3168 4047/ 3168 4072
傳真機號碼 Fax No.: 3168 4074/ 3168 4075

By Post & Fax (2323 3662)

R-riches Property Consultants Ltd.
Block D, The Richfield
236 Kat Hing Wai, Kam Tin
Yuen Long, New Territories
(Attn.: Louis Tse / Christian Chim / Danny Ng)

17 June 2025

Dear Sir/Madam,

**Submission for Compliance with Approval Condition (a) –
the Submission of a Drainage Proposal**

**Proposed Temporary Open Storage of Construction Materials and
Machineries for a Period of 3 Years and Associated Filling of Land in
“Agriculture” Zone, Lot 1110 S.C-H (Part) in D.D.106, Kam Tin, Yuen Long**
(Application No. A/YL-SK/395)

I refer to your submission dated 6.5.2025 for compliance with the captioned approval condition. The relevant department has been consulted on your submission. Your submission is considered:

- ☒ Acceptable. The captioned condition **has been complied with**. Please find detailed departmental comments in *Appendix*.
- ☐ Acceptable. Since the captioned condition requires both the submission and implementation of the proposal, it **has not been fully complied with**. Please proceed to implement the accepted proposal for full compliance with the approval condition.
- ☐ Not acceptable. The captioned condition **has not been complied with**. Please find detailed departmental comments in *Appendix*.

Should you have any queries, please contact Mr. Kenneth Y L Chan (Tel: 2300 1259) of the Drainage Services Department directly.

Yours faithfully,

(Josephine LO)
District Planning Officer/
Fanling Sheung Shui & Yuen Long East
Planning Department



規劃署35周年
Planning Department 35th Anniversary

劃出更多可能 · 創造無限機遇
Planning a Future of Boundless Opportunities

- 2 -

C.C.
CE/MN, DSD

(Attn.: Mr. Kenneth Y L Chan)

Internal
CTP/TPB

JL/SS/cc

Appendix

Comments of the Chief Engineer/Mainland North Drainage Services Department:

- The applicant is reminded to implement the drainage facilities on site in accordance with the agreed drainage proposal. The applicant is required to maintain all the drainage facilities in good condition and ensure that the proposed development would neither obstruct overland flow nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc. The applicant is required to rectify the drainage system at their own expense to the satisfaction of government parties concerned if they are found to be inadequate or ineffective during operation.
- The applicant is reminded to submit form HBP1 to this Division for application of technical audit for any proposed connection to Drainage Services Department's drainage facilities.

Our Ref.: DD 106 Lot 1110 S.C-H
Your Ref.: TPB/A/YL-SK/395

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

By Email

6 May 2025

Dear Sir,

Compliance with Approval Condition (a)

**Proposed Temporary Open Storage of Construction Materials and Machineries
for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone,
Lot 1110 S.C-H (Part) in D.D.106, Kam Tin, Yuen Long**

(S.16 Planning Application No. A/YL-SK/395)

We write to submit a drainage proposal for compliance with approval condition (a) of the subject application, i.e. *the submission of a drainage proposal* (**Appendix I**).

Should you require more information regarding the application, please contact our Mr. Danny NG at (852) 2339 0884 / dannyng@r-riches.com.hk or the undersigned at your convenience. Thank you for your kind attention.

Yours faithfully,

For and on behalf of
R-riches Property Consultants Limited



Kevin LAM
Planning Assistant

cc DPO/FSYLE, PlanD

(Attn.: Ms. Charlotte CHI

email: ylchi@pland.gov.hk)



Proposed Temporary Open Storage of Construction Materials and Machinery for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone, Lot 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories

Drainage Proposal

April 2025



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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 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories (the Site) for 'Proposed Temporary Open Storage of Construction Materials and Machinery 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 beside locate track at opposite of existing nullah of Kam Shui South Road. It has an area of approx. 1,626 m². The site location is shown in **Figure 1**.
- 1.2.2 The existing site is mainly unpaved. The existing site levels are proposed to be raised not more than 0.1m for formation of open storage use and circulation area. The existing site levels are shown in **Figure 4**.
- 1.2.3 There is an existing approx. 20m width nullah at the south. **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 1,626 m². After the development 98% of the site would be paved. The catchment plan is shown in **Figure 4**.

Proposed Development	
Total Site Area (m ²)	1,626
Paved Area after Development (m ²)	1,594

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 50 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	=	505.5
b	=	3.29
c	=	0.355

(Corrigendum No.1/2024)

The development is proposed for temporary use for a period of 3 years. 11.1% rainfall increase due to climate change is considered.

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:

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

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

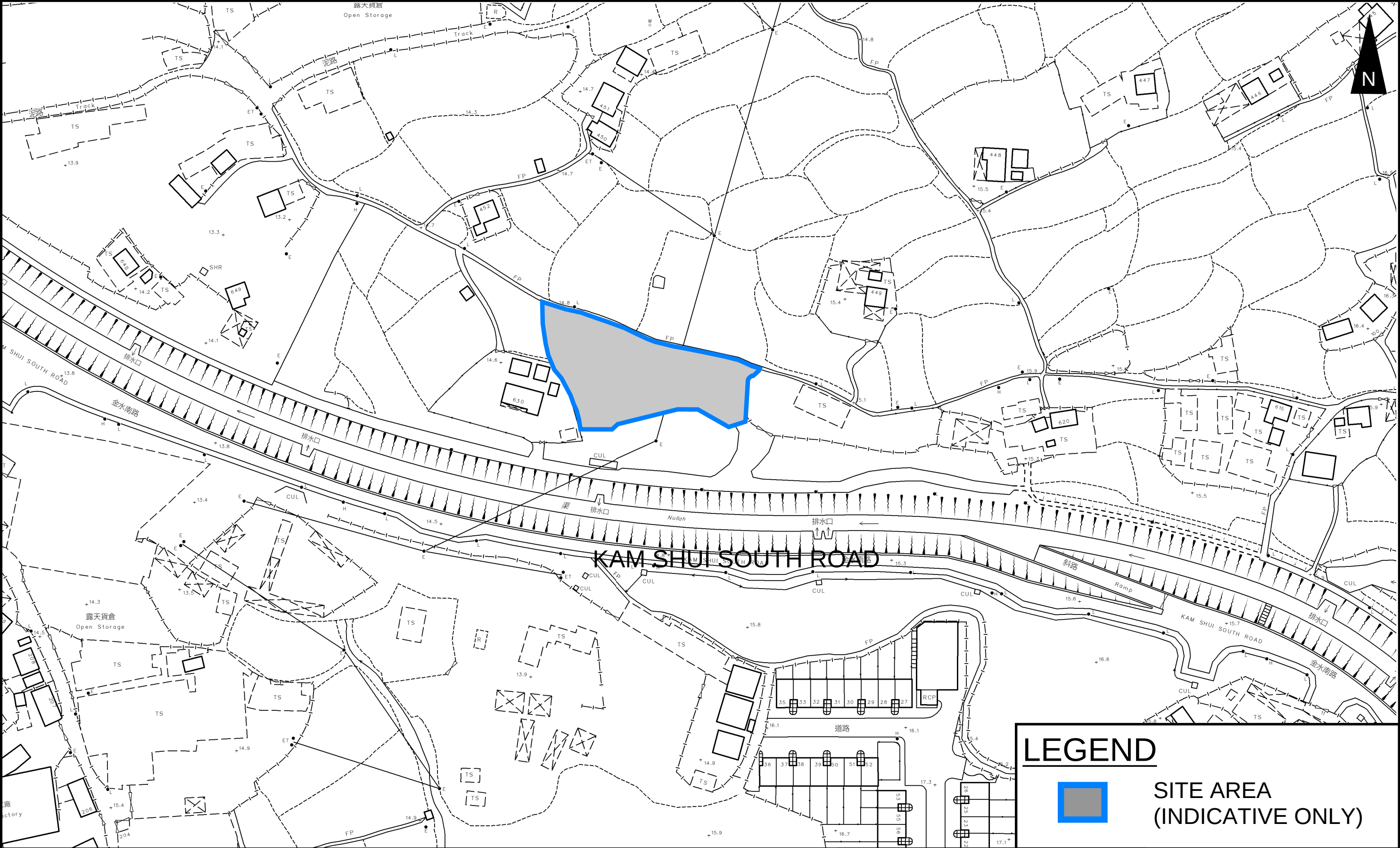
- 4.1.1 Proposed Channels are designed for collection of runoff for internal and external catchment. They are proposed to connect to existing nullah at the south. The utilization of the nullah due to the site is about 0.2% according to checking in **Appendix A**.
- 4.1.2 The design calculations of proposed UChannel are shown in **Appendix A**.
- 4.1.3 The alignment, size, gradient and details of the proposed drains are shown in **Figure 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, no unacceptable drainage impact is anticipated.

- End of Text -

FIGURES



LEGEND

SITE AREA
(INDICATIVE ONLY)

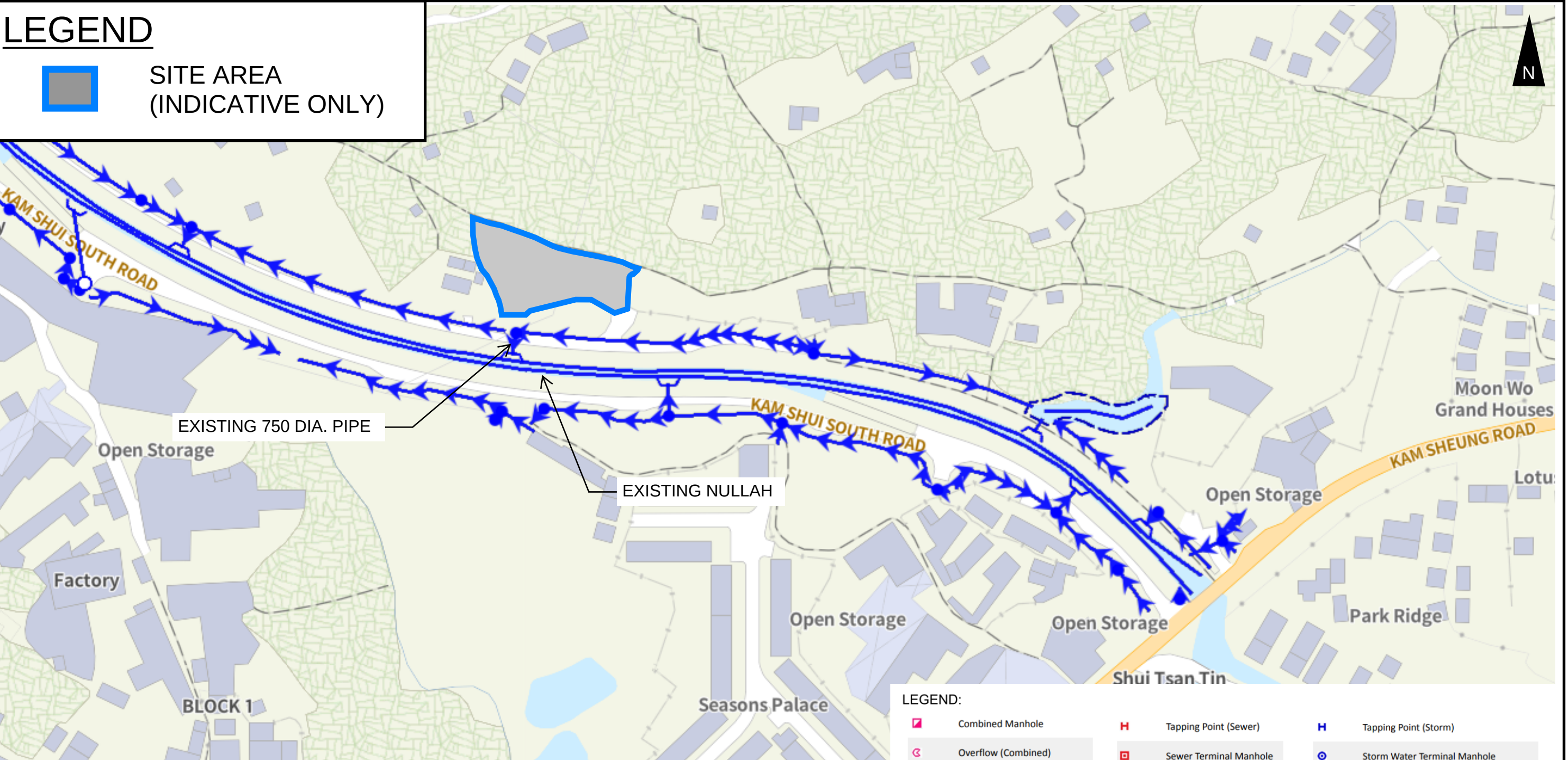
PROJECT:
Proposed Temporary Open Storage of Construction Materials and Machinery for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

TITLE
SITE LOCATION PLAN

FIGURE NUMBER
FIGURE 1

LOCATION:
Lot 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories

VER	DESCRIPTION	DATE
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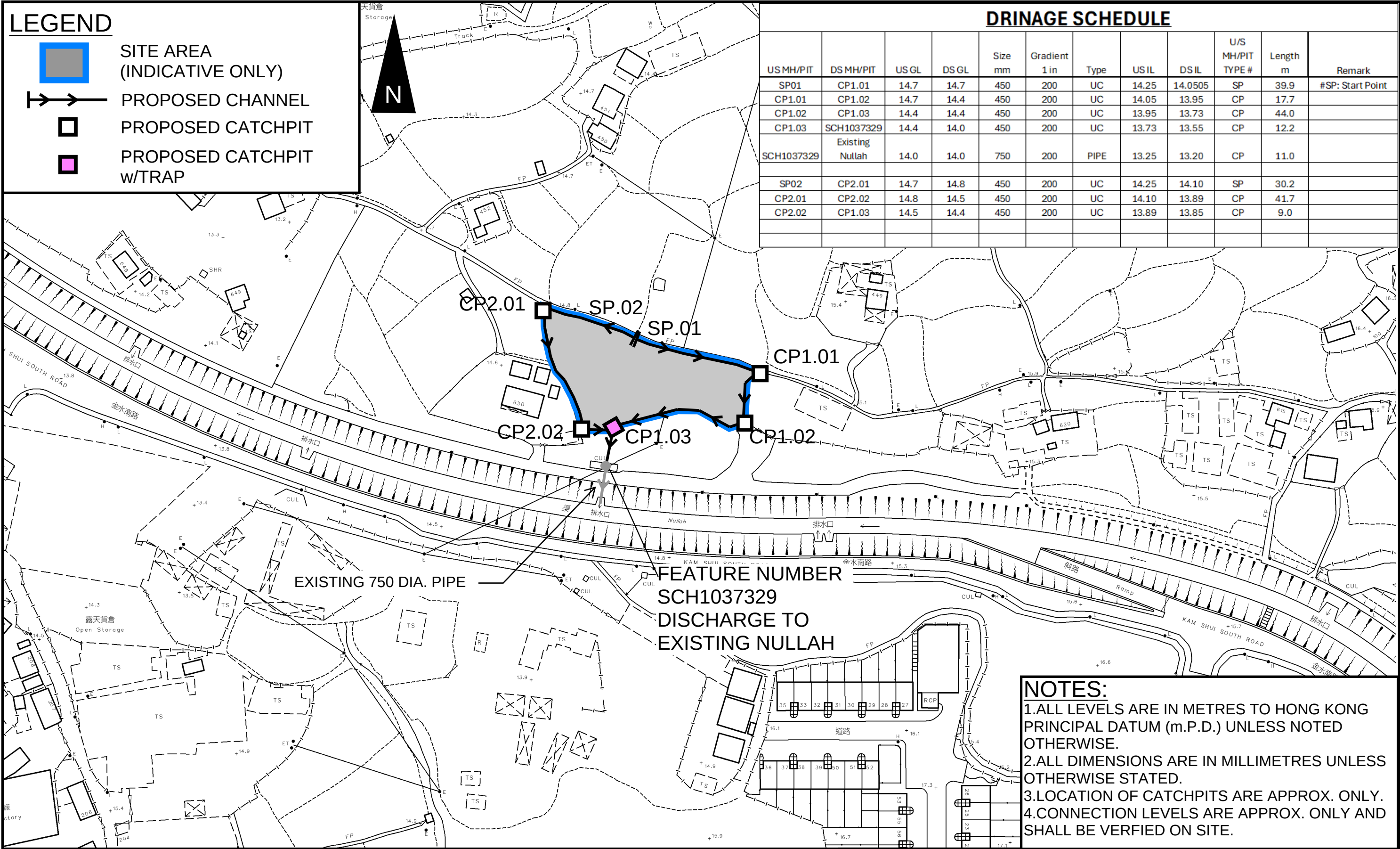


LEGEND

- SITE AREA
(INDICATIVE ONLY)
- PROPOSED CHANNEL
- PROPOSED CATCHPIT
- PROPOSED CATCHPIT
w/TRAP

DRINAGE SCHEDULE

US MH/PIT	DS MH/PIT	US GL	DS GL	Size mm	Gradient 1 in	Type	US IL	DS IL	U/S MH/PIT TYPE #	Length m	Remark
SP01	CP1.01	14.7	14.7	450	200	UC	14.25	14.0505	SP	39.9	#SP: Start Point
CP1.01	CP1.02	14.7	14.4	450	200	UC	14.05	13.95	CP	17.7	
CP1.02	CP1.03	14.4	14.4	450	200	UC	13.95	13.73	CP	44.0	
CP1.03	SCH1037329	14.4	14.0	450	200	UC	13.73	13.55	CP	12.2	
SCH1037329	Existing Nullah	14.0	14.0	750	200	PIPE	13.25	13.20	CP	11.0	
SP02	CP2.01	14.7	14.8	450	200	UC	14.25	14.10	SP	30.2	
CP2.01	CP2.02	14.8	14.5	450	200	UC	14.10	13.89	CP	41.7	
CP2.02	CP1.03	14.5	14.4	450	200	UC	13.89	13.85	CP	9.0	



- 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.LOCATION OF CATCHPITS ARE APPROX. ONLY.
 - 4.CONNECTION LEVELS ARE APPROX. ONLY AND SHALL BE VERFIED ON SITE.

PROJECT:
Proposed Temporary Open Storage of Construction Materials and Machinery for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

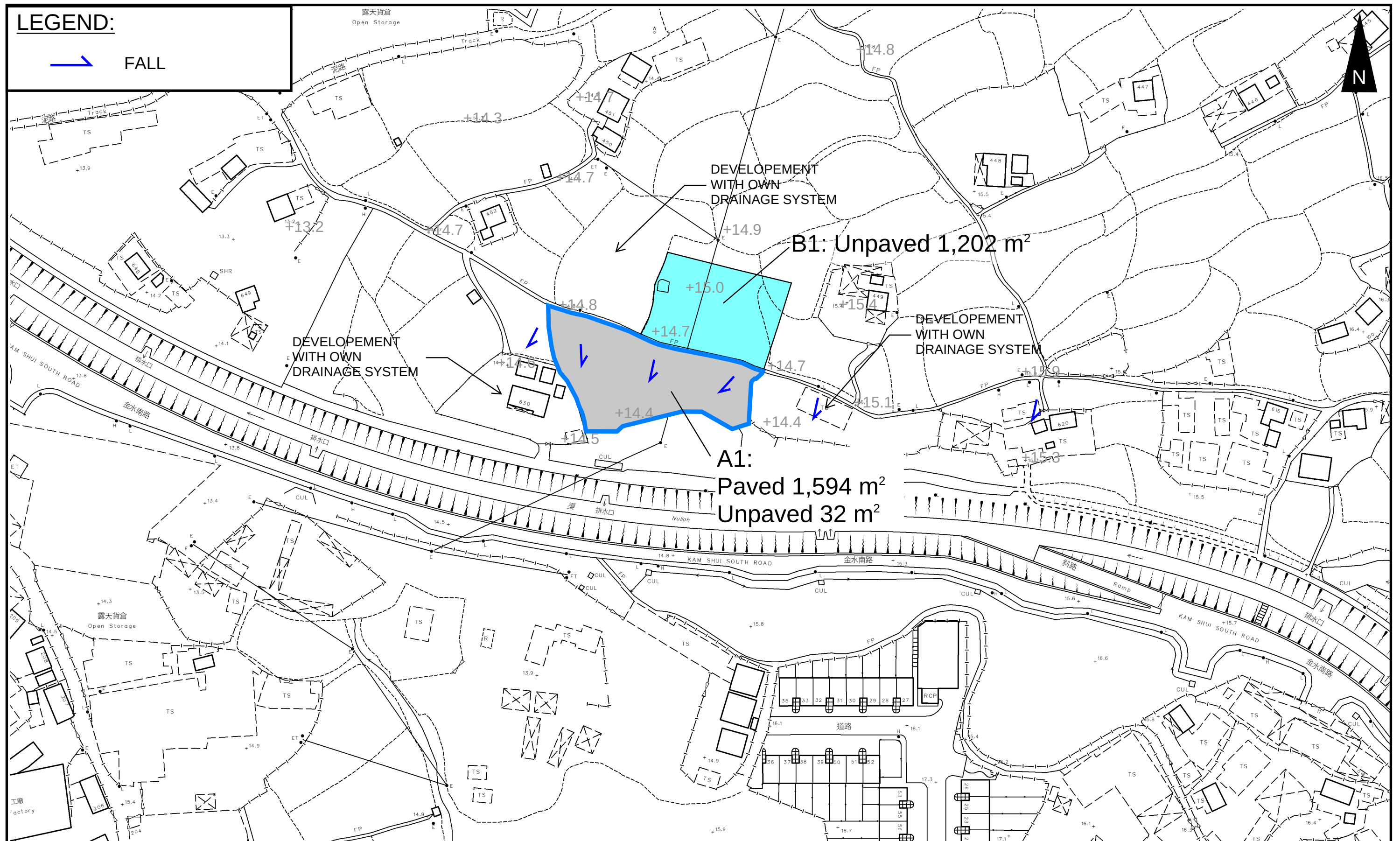
TITLE
PROPOSED DRAINAGE SYSTEM

FIGURE NUMBER
FIGURE 3

LOCATION:
Lot 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories

VER	DESCRIPTION	DATE
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LEGEND:



PROJECT:

Proposed Temporary Open Storage of Construction Materials and Machinery for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

TITLE
CATCHMENT PLAN

FIGURE 4

LOCATION:

Lot 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories

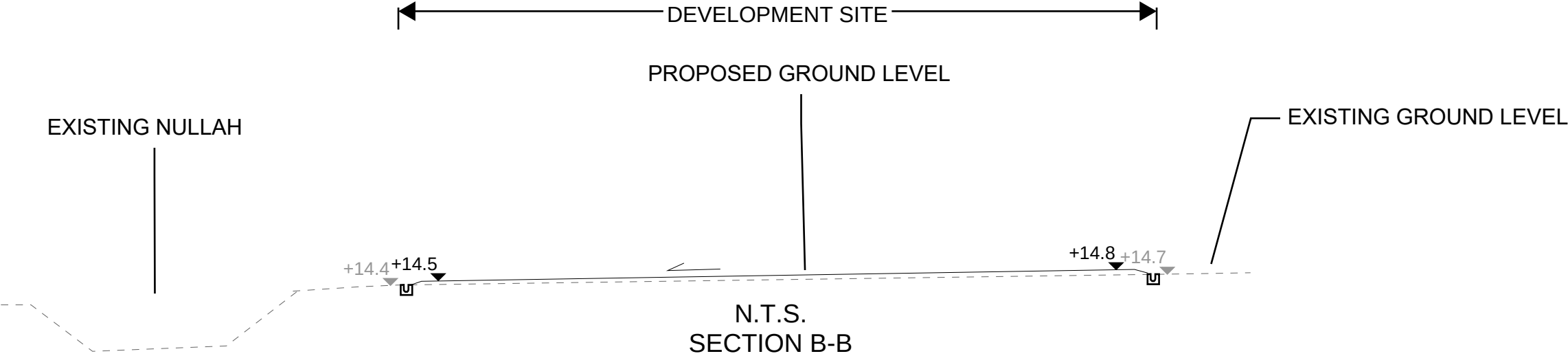
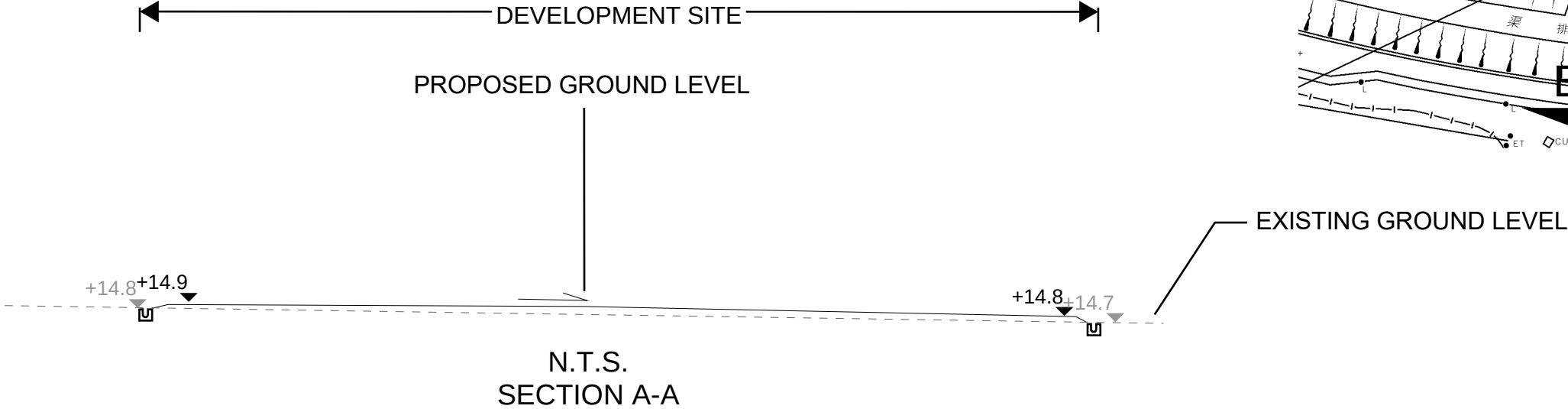
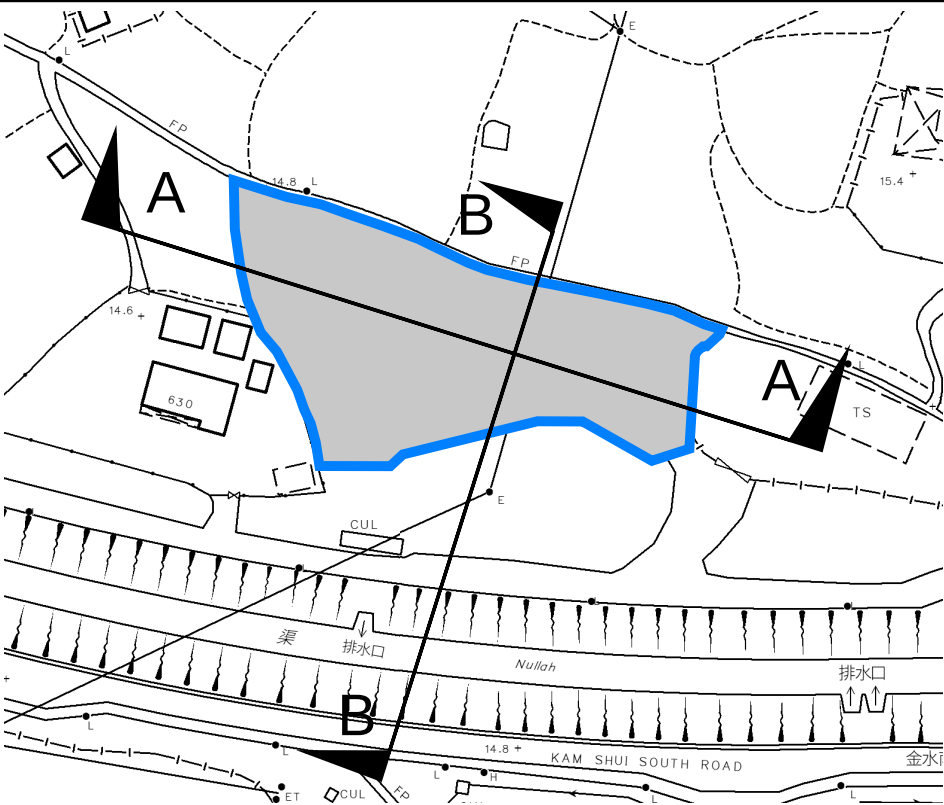
VER

DESCRIPTION

DATE

LEGEND

SITE AREA
(INDICATIVE ONLY)



PROJECT:
Proposed Temporary Open Storage of Construction Materials and Machinery for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone

TITLE
SECTIONS

FIGURE NUMBER
FIGURE 5

LOCATION:
Lot 1110 S.C-H (Part) in D.D. 106, Kam Tin, Yuen Long, New Territories

VER	DESCRIPTION	DATE

APPENDIX

Appendix A: Design Calculation

Zone	HKO	Return Period	1 in	50	years	n	0.014	Storm Constant	HKO a	505.5
						Ks	0.15		HKO b	3.29
						Viscosity	0.000001		HKO c	0.355

Catchment Area Table (Area in m²)

Catchment	A1	B1																	
Total Area	1626	1202																	
Hard Paved Area	1594	0																	
Unpaved Area	32	1202																	
Equival. Area	1525.5	420.7																	

Pavement Type	Hard Paved	Unpaved
Runoff Coefficient	0.95	0.35

Calculation Table of Drainage System

US MH/PIT	DS MH/PIT	US GL	DS GL	Size mm	Gradient 1 in	Type	US IL	DS IL	U/S MH/PIT TYPE #	Length m	V m/s##	Capacity m³/s	Catchment ID1	Catchment ID2	Catchment ID3	Catchment ID4	Catchment ID5	Catchment ID6	Catchment ID7	Catchment ID8	Catchment ID9	Total Equivalent Area m²	ToC min	Intensity mm/hr ##	Total Discharge m³/s	Utilitization
SP01	CP1.01	14.70	14.70	450	200	UC	14.25	14.05	SP	39.9	1.47	0.26	A1	B1								1946.20	2.00	311	0.17	63.5%
CP1.01	CP1.02	14.70	14.40	450	200	UC	14.05	13.95	CP	17.7	1.47	0.26	A1	B1								1946.20	2.45	302	0.16	61.7%
CP1.02	CP1.03	14.40	14.40	450	200	UC	13.95	13.73	CP	44	1.47	0.26	A1	B1								1946.20	2.66	298	0.16	60.9%
CP1.03	SCH1037329	14.40	14.00	450	200	UC	13.73	13.55	CP	12.2	1.47	0.26	A1	B1								1946.20	3.16	290	0.16	59.2%
SCH1037329	Existing Nullah	14.00	14.00	750	200	PIPE	13.25	13.20	CP	11	2.27	1.00	A1	B1								1946.20	3.29	288	0.16	15.5%
SP02	CP2.01	14.70	14.80	450	200	UC	14.25	14.10	SP	30.2	1.47	0.26	A1									1525.50	2.00	311	0.13	49.8%
CP2.01	CP2.02	14.80	14.50	450	200	UC	14.10	13.89	CP	41.7	1.47	0.26	A1									1525.50	2.34	304	0.13	48.7%
CP2.02	CP1.03	14.50	14.40	450	200	UC	13.89	13.85	CP	9	1.47	0.26	A1									1525.50	2.82	295	0.13	47.3%

#SP: Start Point
: With 11.1% rainfall increase as per Table 28 of SDM Corrigendum No. 1/2022.

Capacity Checking of Existing Nullah

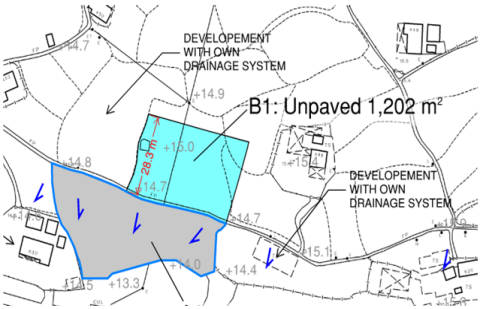
a1	1	
b1	2.0	
a2	1	
b2	2.0	
Total Depth	2.70	m
Base Width	10.00	m
Assumed Water Depth	2.40	m
Freeboard	0.30	m

Assumed Water Depth	Freeboard	Base Width	Width of Water Surface	Flow Area	Wetted Perimeter	Hydraulic Radius	Manning's Roughness	Gradient	Velocity	Capacity
m	m	m	m	m²	m	m		1 in	m/s	m³/s
2.40	0.30	10.00	19.60	35.52	20.73	1.71	0.035	200	2.89	102.75

Total Flow from The Application Site = 0.16 m³/s
Utilization Rate = 0.2%
Total flow from Application Site only occupy 0.2% of the existing stream.

Time of Concentration Checking

Catchment	Flow Distance	Highest Level	Lowest Level	Gradient (per 100m) = (H1-H2)/L x 100	to (min) = 0.14465L/ (H ^{0.2} A ^{0.1})	tc = to + tf
A	L	H1	H2			
(m2)	(m)	(mPD)	(mPD)		(min)	(min)
1202	28.3	15	14.7	1.060	2.0	2.0



APPENDIX B - PROPOSED SITE LAYOUT PLAN

DEVELOPMENT PARAMETERS

APPLICATION SITE AREA : 1,626 m² (ABOUT)
COVERED AREA : NOT APPLICABLE
UNCOVERED AREA : 1,626 m² (ABOUT)

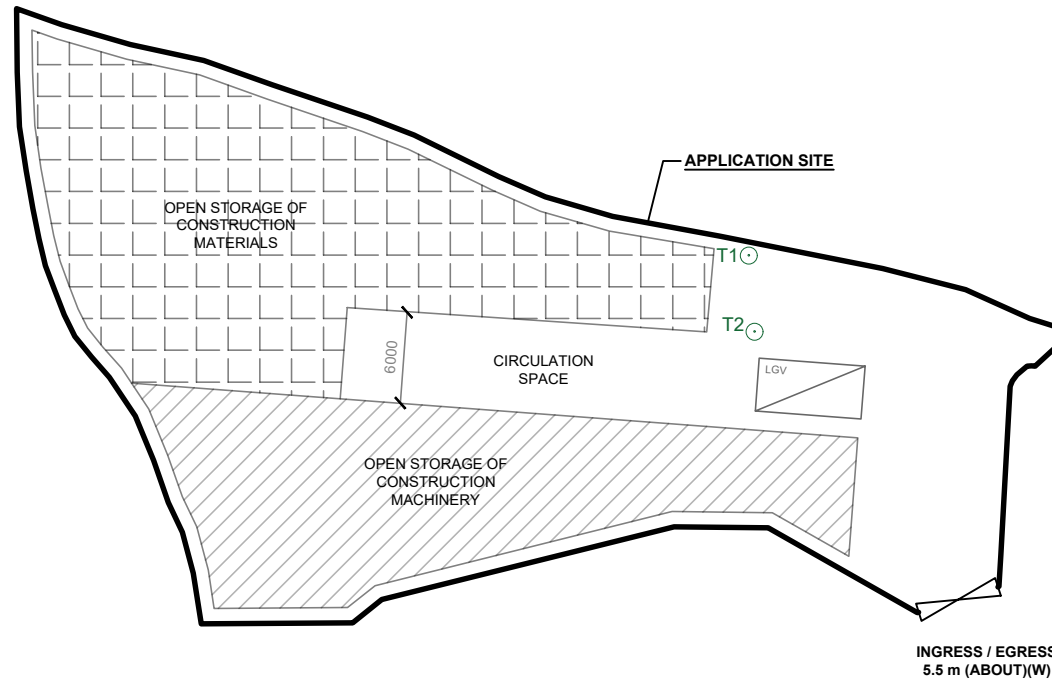
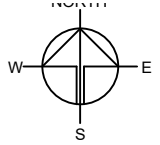
AREA DESIGNATED FOR OS
OF CONSTRUCTION MATERIALS : 582 m² (ABOUT)

AREA DESIGNATED FOR OS
OF CONSTRUCTION MACHINERY : 428 m² (ABOUT)

* NO STRUCTURE IS PROPOSED AT THE APPLICATION SITE.

NOS. OF EXISTING TREES: 2
TREE SPECIES: T1 (*Dimocarpus longan*)
T2 (*Celtis sinensis*)

- 1) THE APPLICANT WILL MAINTAIN TREES IN GOOD CONDITION DURING THE PLANNING APPROVAL PERIOD.
- 2) THE APPLICANT WILL REPLACE TREES WHICH ARE DYING OR DEAD DURING THE PLANNING APPROVAL PERIOD.
- 3) THE APPLICANT WILL PROVIDE ADEQUATE IRRIGATION FOR TREES.



LEGEND

- APPLICATION SITE
- OS OF CONSTRUCTION MATERIALS
- OS OF CONSTRUCTION MACHINERY
- L/UL SPACE (LIGHT GOODS VEHICLE)
- INGRESS / EGRESS
- EXISTING TREES

LOADING / UNLOADING (L/UL) PROVISIONS

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

PLANNING CONSULTANT



PROJECT

PROPOSED TEMPORARY OPEN
STORAGE OF CONSTRUCTION
MATERIALS AND MACHINERY
FOR A PERIOD OF 3 YEARS AND
ASSOCIATED FILLING OF LAND

SITE LOCATION

LOT 1110 S.C-H (PART) IN D.D.
106, KAM TIN, YUEN LONG, NEW
TERRITORIES

SCALE

1 : 500 @ A4

DRAWN BY CC DATE 29.11.2024

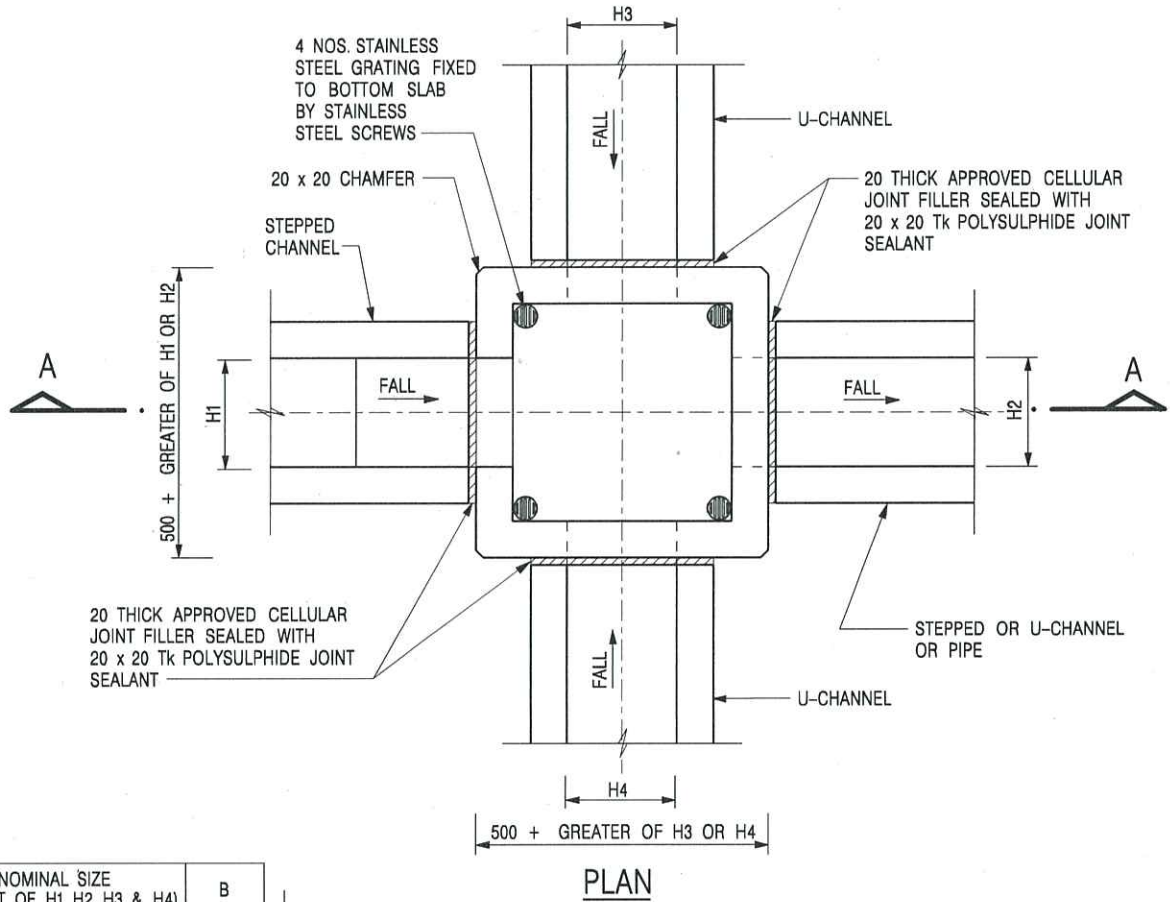
CHECKED BY DATE

APPROVED BY DATE

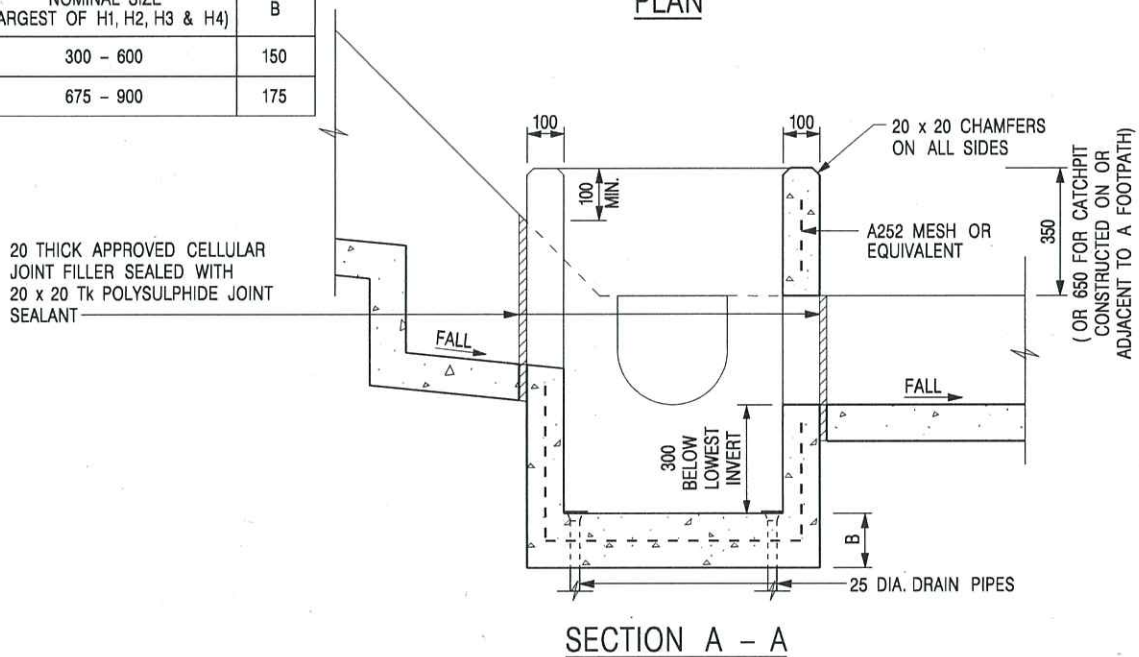
DWG. TITLE
LAYOUT PLAN

DWG NO. VER.
PLAN 1 001

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

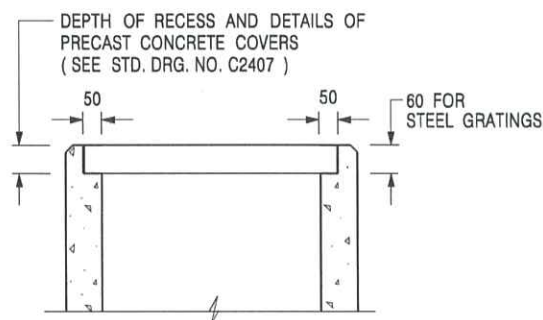
DATE	JAN 1991
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DRAWING NO.

C2406 /1

卓越工程 建設香港

We Engineer Hong Kong's Development



**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)**



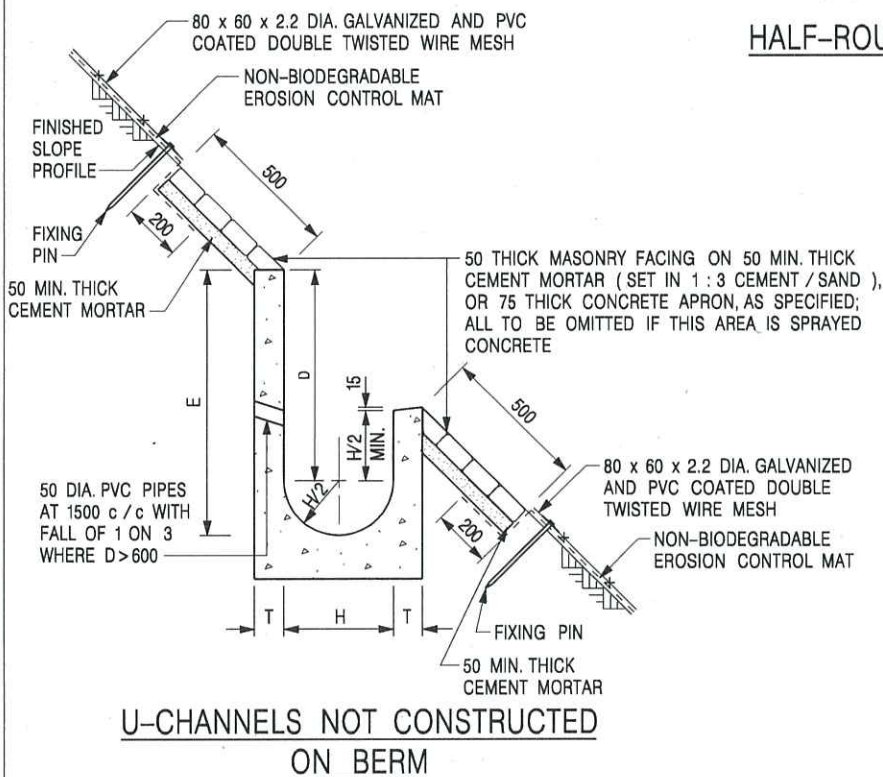
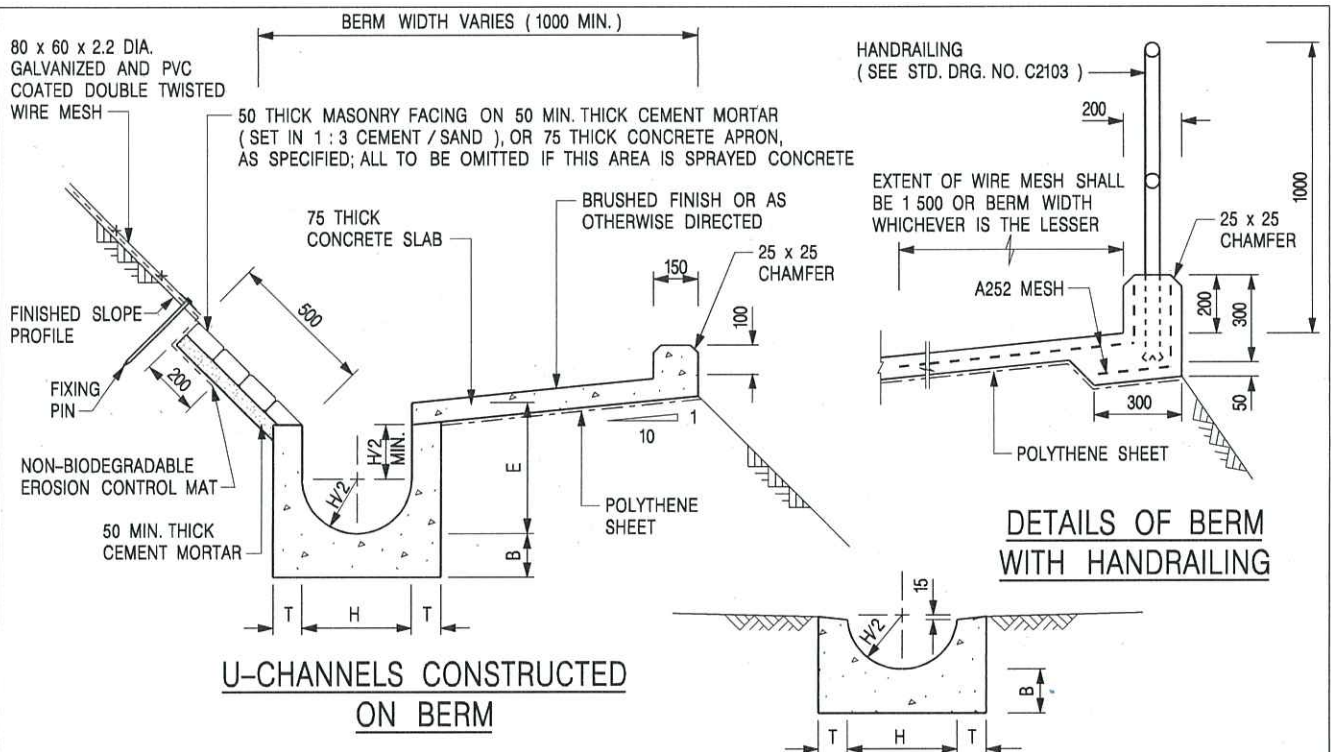
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

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)



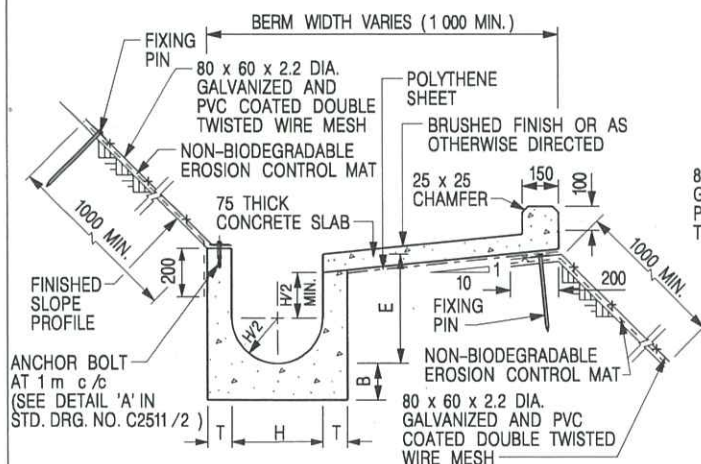
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 25

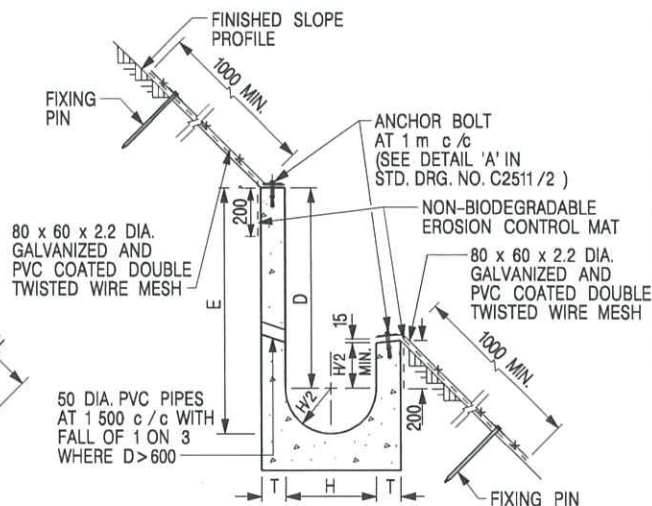
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DATE JAN 1991

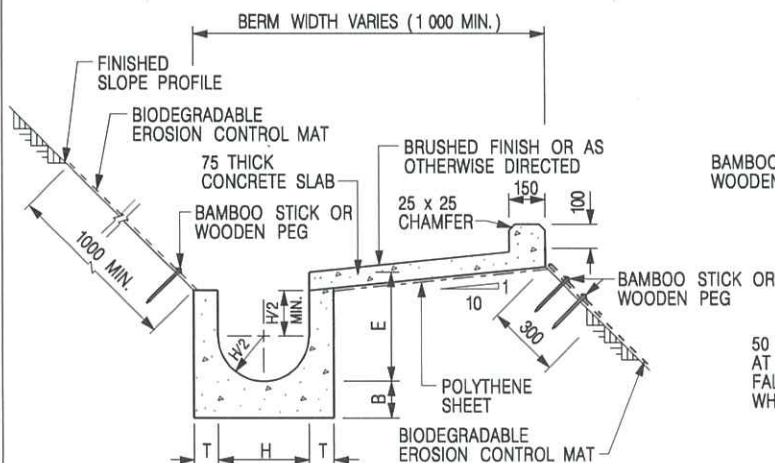
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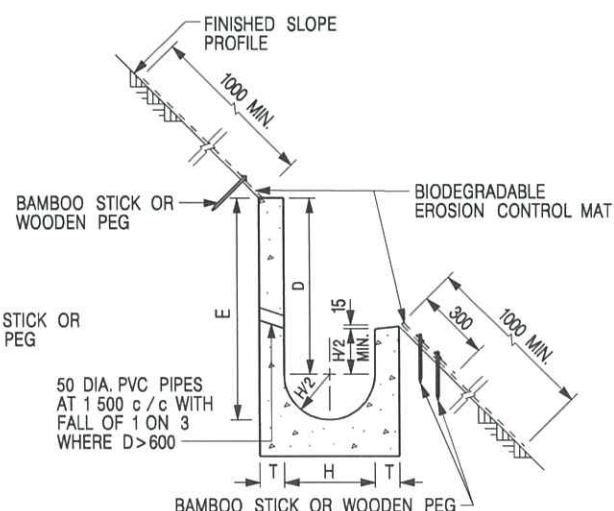
**U-CHANNELS CONSTRUCTED ON BERM
WITH NON-BIODEGRADABLE
EROSION CONTROL MAT**



**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)**



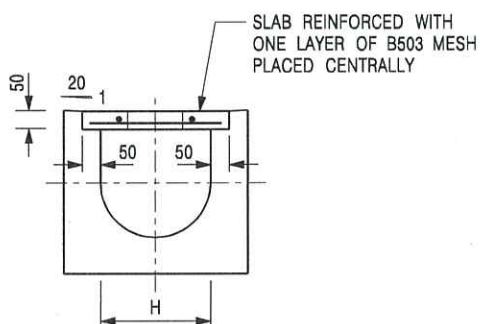
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE DIAGRAMMATIC

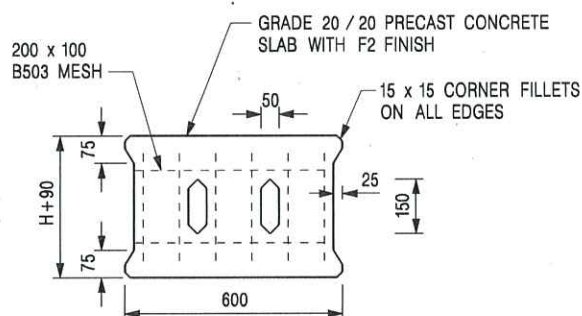
DRAWING NO.

DATE JAN 1991

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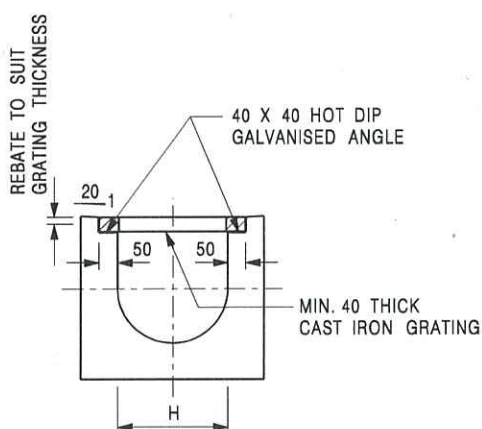
TYPICAL SECTION



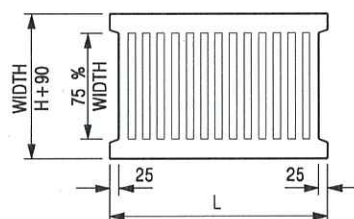
PLAN OF SLAB

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