Total: 43 pages

Date: 7 October 2026

TPB Ref.: A/YL-TT/781

By Email

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

Dear Sir,

Proposed Temporary Warehouse & Open Storage (Excluding Dangerous Goods) with Ancillary Facilities & Associated Filling of Land for a Period of 3 Years at Lots 1299, 1305 S.A (Part), 1305 S.B RP (Part), 1306 S.A, 1306 S.B (Part), 1307, 1308, 1309 RP, 1310, 1317 RP, 1318, 1360 (Part), 1392 (Part), 1393 (Part), 1394, 1395, 1396, 1397, 1398 S.A & B, 1399 (Part), 1402 (Part), 1403 (Part), 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428 (Part), 1429, 1430, 1431, 1433, 1434 (Part), 1435 (Part), 1538 (Part), 1539 (Part) and 1540 in D.D.118 and Adjoining Government Land, Tai Shu Ha Road West, Tai Tong, Yuen Long, N.T.

In response to the further comments of CE/MN, DSD, we are glad to submit the response to comments and the duly signed Drainage Impact Assessment in the attachment.

Should you have any enquiries, please feel free to contact our Mr. Patrick Tsui at [redacted] at your convenience.

Yours faithfully,

Patrick Tsui

c.c. Tuen Mun and Yuen Long West District Planning Office (Attn: Mr. Kevin LAM) – By Email

Temporary Warehouse with Ancillary Facilities for a Period of Years and Associated Filling of Land at Various Lots in D.D. 118, Tai Shu Ha Road West, Yuen Long

Comments		Responses
Comments from Drainage Services Department received 30 Sep 2026 via email [Contact person: Mr. LOU Tai-yeong, Tel: 3965 8929]		
General		
1.	R-to-C item 1 – Please state who is the registered professional engineer (RPE) in charge and add the RPE number in your resubmission for clarity. Pursuant to Section 4.2 of DSD Advice Note No. 1, any submission made as part of the DIA process should be signed and certified by the RPE in charge. Please ensure your resubmission is signed by RPE in charge.	Noted.
2.	Figure 2.2a – Please state the gradient of the proposed u-channels (i.e. 1:100 in Appendix C) for clarity. It seems that the gradient of the proposed 375mm u-channel from CP17 to CP20 is not consistent with the design 1:100 in Appendix C, please review the invert levels.	The invert levels are revised accordingly.
3.	Figure 2.2a – The invert level at the sand trap (A2 = +18.95) should not be higher than the invert level at its upstream catchpit CP27 (+18.68), please review.	A1 and A2 of sand trap is revised to +18.65 mPD and 18.50 mPD respectively.
4.	Figure 2.4a – The proposed 700mm UC at the right hand side is not consistent with the proposed 375mm UC in Figure 2.2a, please review.	Figure 2.4a is revised accordingly, the cross section of site is reviewed.
5.	Appendix C – It appears that the capacity of the proposed 375mm UC is less than $0.252m^3/s$, please check against GEO Technical Guidance Note No. 43.	Revised to 450mm UC in accordance to Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600 mm in GEO Technical Guidance Note No. 43 (TGN 43).
6.	Appendix C – The proposed gutter sizes are not consistent with the depth and width in the calculation, please review.	Revised accordingly.

Issue No. : 2
Issue Date : Aug 2026
Project No. : 2287

DRAINAGE IMPACT ASSESSMENT

FOR

TEMPERORY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

Prepared by

Allied Environmental Consultants Limited

COMMERCIAL-IN-CONFIDENCE

[redacted]

Document Verification

Project Title	TEMPERORY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG	**Project No.**	2287
Document Title	DRAINAGE IMPACT ASSESSMENT		

Issue No.	Issue Date	Description	Prepared by	Checked by	Approved by	Endorsed by
1	Jun 2026	1st Submission	Various	Cathy MAN	Grace KWOK	Logan CHAN
2	Aug 2026	2nd Submission	Various	Cathy MAN	Grace KWOK	Logan CHAN

CHAN LOK HENG LOGAN
CEng MICE MHKIE RPE(CVL)

[redacted]

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Figure 2.4 Site Elevation and Connection Details
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Appendix B Peak Runoff Estimation of Catchments after the completion of Proposed Development
Appendix C Estimation of Drainage Flow from Proposed Development and Detailed Hydraulic Calculation
Appendix D Site Photo
Appendix E CEDD's Standard Drawing

1. INTRODUCTION

1.1. Background

1.1.1. Allied Environmental Consultants Limited ("AEC") has been appointed to conduct a Drainage Impact Assessment ("DIA") to support of a Section 16 application for a temporary warehouse with ancillary facilities and open storage of unlicensed vehicles, construction machinery and construction materials for a period of 3 years and associated filling of land at Various Lots in D.D. 118, Tai Shu Ha Road West, Yuen Long (hereinafter referred to as "Application Site").

1.1.2. According to the Approved Tai Tong Outline Zoning Plan (OZP No.: S/YL-TT/20) gazette on 15/12/2023, the Application Site is currently zoned as "Agriculture" ("AGR").

1.1.3. The site is accessed from Tai Shu Ha Road West and the total site area is about 23,202 m^2. The Application Site has a gentle sloping from East and Northeast to West from approximate +22.4 mPD to +19.6 mPD. ***Figure 1.1*** and ***Appendix A*** show the Site location, Layout and its environs.

1.2. Objectives

1.2.1. The objectives of this DIA are to review the proposed drainage facilities in the vicinity of the Proposed Development at the Application Site, evaluate potential impacts based on the catchment, recommend appropriate options for stormwater discharge, if necessary.

1.3. Report Structure

1.3.1. The remaining chapters of this report are shown below:

Chapter 2 – The Drainage Impact Assessment
Chapter 3 – Maintenance of the Proposed Stormwater Drainage Systems
Chapter 4 – Conclusion

2. DRAINAGE IMPACT ASSESSMENT

2.1. Site Condition

2.1.1. Based on the available information, two nearby planning applications, A/YL-TT/770 and A/YL-TT/782, have been identified. The proposed drainage discharge path of both planning applications passed through the Application Site via the existing underground drainage system.

2.1.2. As no additional site formation or levelling works are proposed under the Proposed Development, the existing ground levels and underground drainage system within the Application Site will remain unchanged. The existing underground pipes will be retained. The Proposed Development is therefore not expected to obstruct or adversely affect the existing drainage flow paths serving the Application Site and the nearby planning applications.

2.1.3. The locations of the nearby planning applications and the existing drainage flow paths within the Application Site are shown in ***Figure 2.5***. The condition of the existing drainage system is presented in ***Appendix D***.

2.2. Peak Flow Estimation

2.2.1. The main access of the site is from the southwest via accessed road connecting with Tai Shu Ha Road West. There is an existing drainage running along the west of the site, along Tai Shu Ha Road West collecting the runoff from surrounding areas. There are no major changes on the topography of the Application Site after the Proposed Development.

2.2.2. To manage the surface runoff from the Application Site, U-channel system is proposed within the Application Site to collect the runoff from the uncovered and open area. The gutter system is proposed on the covered warehouse (Structure 1, Structure 2, Structure 3 and Structure 7) and the site office with F.S. water tank and water pump (Structure 4 and Structure 5) to collect rainwater from roof of the structure. The Structure Layout are presented in ***Figure 2-1***.

2.2.3. The collected runoff from gutter system and open space will be directed to the proposed drainage system along the western and southwest boundary of the site. The overview of proposed U-channel drainage and roof gutter system are shown in ***Figure 2-2a*** and ***Figure 2-***

2b respectively.

2.2.4. Catchment areas formed and flow patterns are summarised as follows.

2.2.5. Catchment A consists of uncovered area, 2 open storage areas and the security room (Structure 6), with total area of 7,502 m^2. The runoff from northern part of this catchment will flow south and east towards the proposed drainage along the western boundary of the site. Runoff from the southwest portion of catchment will be collected by the proposed drainage along the southwest boundary of the site.

2.2.6. Catchment B1 to B4 consists of 4 covered warehouses and 2 site offices with F.S. water tank and water pump, with a total area of 15,700 m^2. Roof runoff will be collected via a proposed gutter system. Estimated half of the runoff from the roof covered area is expected to collect by the gutter along one side of the warehouse, while another half of the runoff will be collected by the gutter along the other side of the warehouse roof. The collected runoff will be combined and conveyed to the proposed drainage along the west and southwest boundary, then combined with the proposed drainage along the western boundary before discharging into the existing drainage along Tai Shu Ha Road West.

2.2.7. There are several catchments at the vicinity of the Application Site. Catchment C and Catchment D are located at the upstream of the Application Site, the runoff from the Catchment C and D are collected by the existing public drainage channel along Tai Shu Ha Road West (SHP1002203). Catchment E and Catchment F are the downstream catchments of the Application Site. The surface runoff from these catchments is collected by existing drainage channel along Tai Shu Ha Road West (SHP1003502).

2.2.8. Catchment G is located to the east of the Application Site, which the elevation level is generally higher than the Application Site. the runoff from the Catchment G is expected to overflow to the Application Site and to be collected by the proposed drainage within the Application Site.

2.2.9. The overview of catchment areas and flow pattern are shown in ***Figure 2-3***.

2.2.10. The drainage calculations can referred to ***Appendix B***, the calculations are in accordance with the Stormwater Drainage Manual (Fifth Edition, January 2018 and Corrigendum No. 1/2022) published by Drainage Services Department (DSD). Rational Method shall be applied to estimate the peak surface runoff values. The idea behind the Rational Method is that for a spatially and temporally uniform intensity *i*, which continues indefinitely, the runoff at the outlet of a catchment will increase until the time concentration t_c, when the whole catchment

is contributing flow to the outlet. The peak runoff is calculated as follows.

$$Q_P = 0.278\ C\ i\ A \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (1)$$

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

2.2.11. Runoff coefficient C depends on the permeability, slope and pond character of the surface; rainfall intensity i, is the average rainfall intensity selected on the basis of the design rainfall duration and return period.

2.3. Hydraulic Calculation

2.3.1. The hydraulic calculation of runoff from the catchment areas is calculated to assess the drainage proposal. The surface runoff from the catchment areas within the Application Site is expected to collected by proposed drainage, and discharged to existing drainage system along Tai Shu Ha Road West. The calculation is shown in ***Appendix B*** and ***Appendix C,*** summarized in ***Table 2-1***.

Table 2-1 Summary of Peak Flow and Drainage Proposal of Catchments

Catchments	Peak Runoff, Q (m^3/s)	Drainage Proposal	Remarks
Catchment A (Uncovered Area + Open Storage + Structure 6)	0.713	Provided 700mm UC (1:00)	-
Catchment B1 (Structure 1 + 4)	0.436	Provided 400mm (W) x 400mm (D) Gutter (1:100)	-
Catchment B2 (Structure 2 + 5)	0.715	Provided 500mm (W) x 450mm (D) Gutter (1:100)	-
Catchment B3 (Structure 3)	0.182	Provided 300mm (W) x 250mm (D) Gutter (1:100)	
Catchment B4 (Structure 7)	0.026	Provided 150mm (W) x 150mm (D) Gutter (1:100)	
Catchment A + B	2.071	Provided 1200mm dia. underground pipe (1:200)	Connected from Application Site to existing drainage system along Tai Shu Ha Road West
Catchment C	0.298	-	-
Catchment D	0.591	-	-
Catchment E	1.290	-	-

Catchments	Peak Runoff, Q (m^3/s)	Drainage Proposal	Remarks
Catchment F	1.540	-	-
Catchment G	0.252	-	Runoff is collected by the proposed drainage within Application Site

2.4. Potential Impact on Public Stormwater System due to Surface Runoff

2.4.1. Drainage information was obtained from the GeoInfo Map services of the Lands Department to gather the background information on drainage infrastructure in the vicinity of the Application Site. Concerned drainage network was identified for estimation of the potential impact to the downstream drainage associated with the proposed development. Stormwater runoff from Proposed Development is collected at the terminal manhole and discharged to existing public drainage (SHP1002203) along Tai Shu Ha Road West at the west of the site, flowing to northwest direction.

2.4.2. According to the calculations presented in ***Appendix B***, it is anticipated that the peak runoff from the Application Site under 1 in 200 years storm event is found to be 2.071 m^3/s. The hydraulic calculation of runoff from Application site and surrounding catchments is included in the calculation to assess the adequacy of the proposed stormwater pipe, the calculation is shown in ***Appendix C*** and summarized in ***Table 2-2***.

Table 2-2 Estimation of Peak Flow and Drainage Capacity Check

Drainage ID	Catchment	Total Flow (m^3/s)	Percentage of Capacity
SHP1002203 (Link 822042831254.1)	Application Site (Catchment A to D + G + Existing Flow)	4.47	25%
SHP1003502 (Link 822042831254.1)	Application Site (Catchment A to G + Existing Flow)	7.30	41%

2.4.3. Based on the hydraulic calculation shown in ***Appendix C*** and ***Table 2-2***, the percentage capacity of the stormwater flow for existing public drainage occupied by surface runoff from the Application Site and the surrounding catchments after proposed development ranged from 25% to 41%. The results shows that the capacity of the existing drainage is enough to cater the additional runoff induced by proposed development, thus no drainage impact is anticipated.

3. MAINTENANCE OF THE PROPOSED STORMWATER DRAINAGE SYSTEMS

3.1.1. The applicant of the Application Site will undertake the following construction/maintenance works for the proposed drainage facilities at his own costs.

3.1.2. Prior to the commencement of drainage works, the applicant will seek the consent of the District Lands Office/Yuen Long and the registered land owner for any drainage works outside the application site or outside the jurisdiction of the applicant.

3.1.3. Inspection, cleaning and desilting will be carried out regularly and before/after the rainy season each year to ensure the drainage facilities function efficiently. Since the system is designed to operate under gravity, the maintenance will be straightforward.

3.1.4. The existing underground drainage system within the application site should be properly maintained by the applicant to ensure no obstruction to nor adversely affect the existing discharge path of the upstream areas.

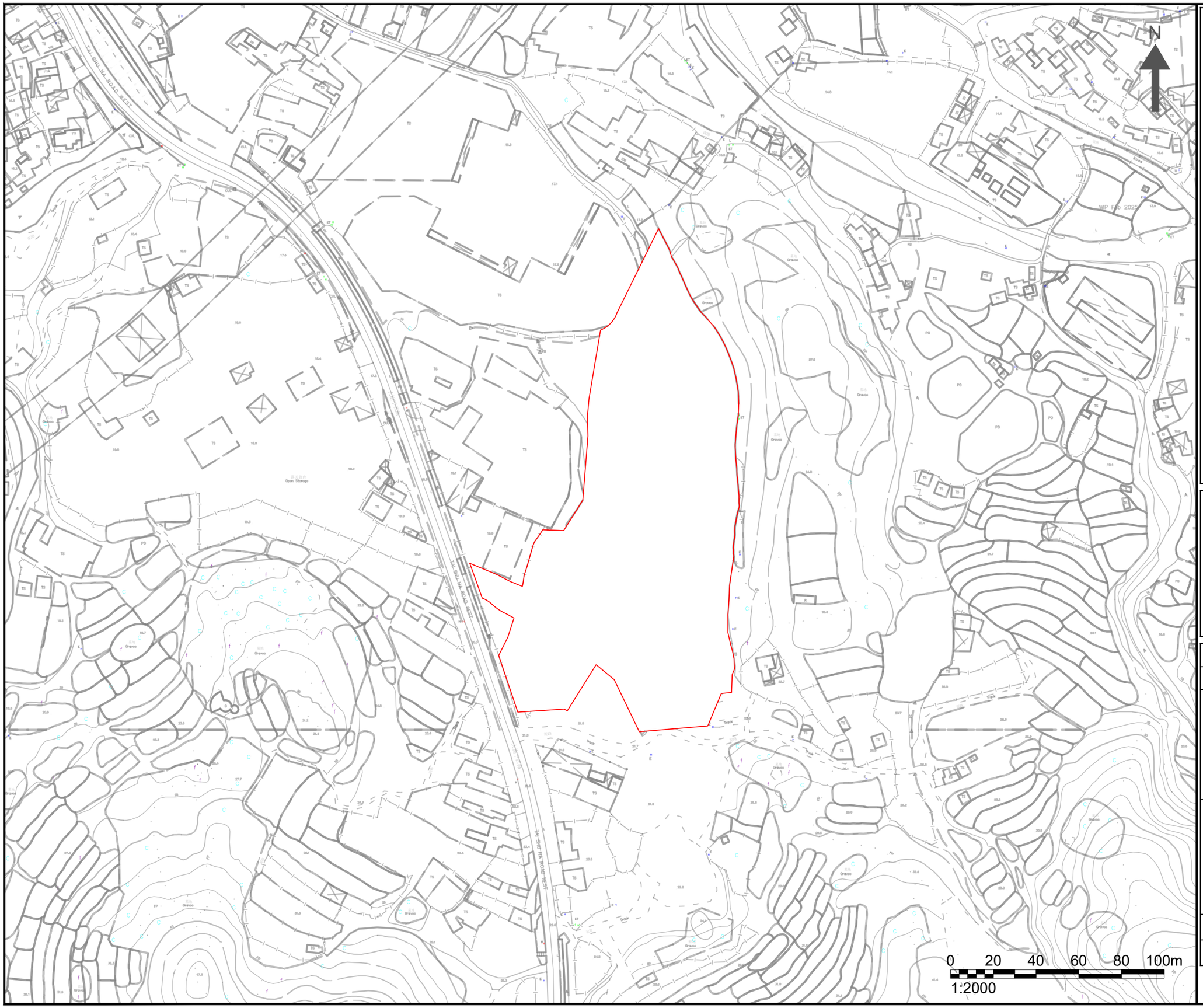
4. CONCLUSION

4.1.1. A Drainage Impact Assessment (DIA) has been conducted to evaluate the possible impacts on the public drainage network due to the proposed development. The proposed project will involve installation of proposed drainage along the western and southwest boundary of Application Site to collect stormwater from the Catchment A to G then discharged into the public channel along Tai Shu Ha Road West.

4.1.2. Based on the result, the percentage capacity of stormwater flow for existing public drainage (SHP1002203 to SHP1003502) occupied by surface runoff from the Application Site after proposed development ranged from 25% to 41%. No exceedance shown based on the assessment results, thus no drainage impact is anticipated.

4.1.3. It is concluded that the proposed drainage will have no adverse impacts to the site and surrounding areas. The drainage impact arising from the proposed development should be acceptable.

Figures



NOTES :

APPLICATION SITE

Consultant

Allied Environmental Consultants Limited

Project No. :	2287
Drawing By :	CS

Project :

TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

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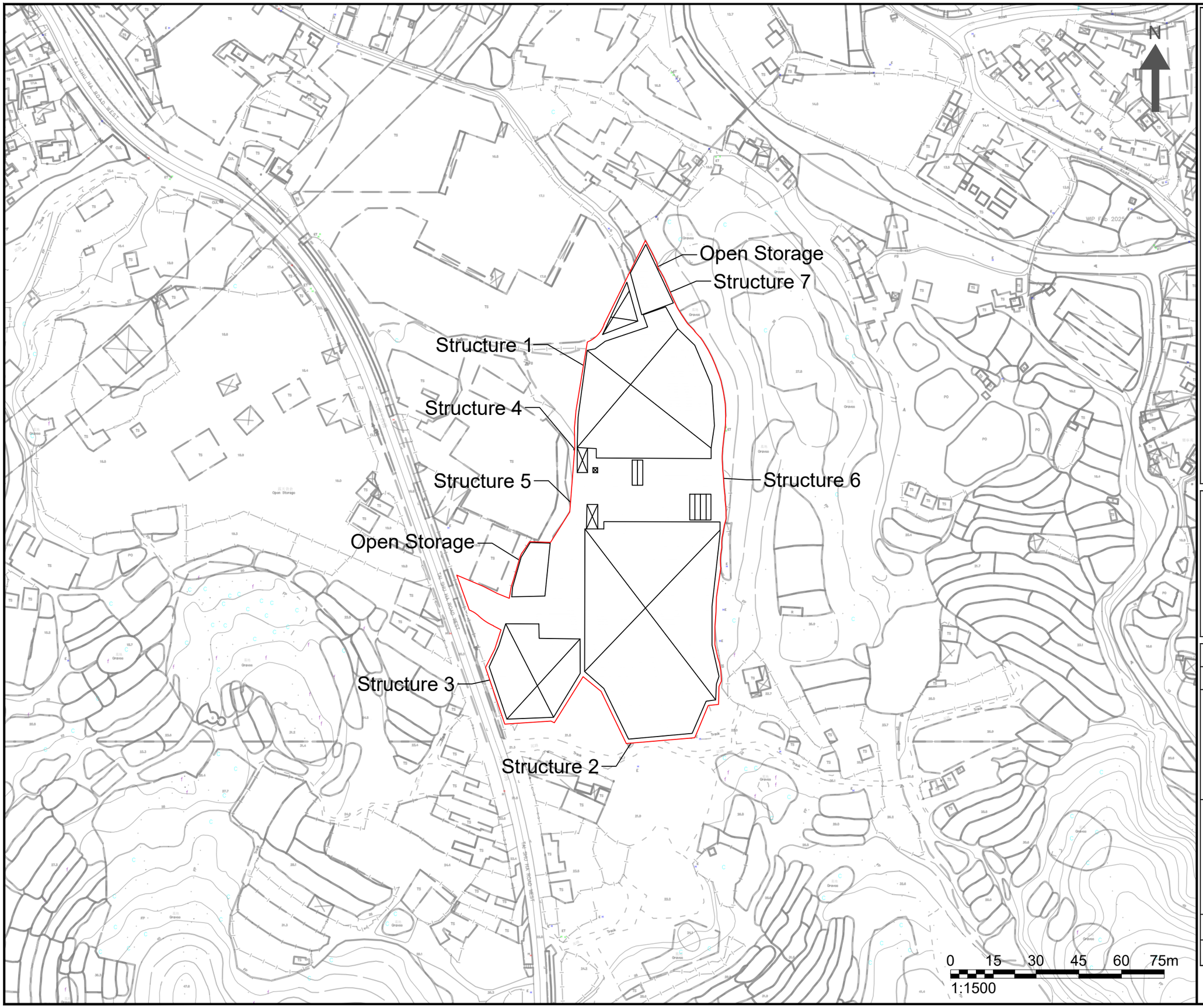
APPLICATION SITE LOCATION

Drawing No :	Revision :
FIGURE 1.1	0
Scale : AS SHOWN	Date : JUN 2026

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A3 420 x 297

C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2287 - TAI SHU HA ROAD WEST - DIA\05 REPORT\01 AEC REPORT\ISSUE 3\2287 FIG 2.1 CATCHMENT & EXISTING DRAINAGE_20260622.DWG



NOTES :

APPLICATION SITE

STRUCTURE BUILDING

Consultant

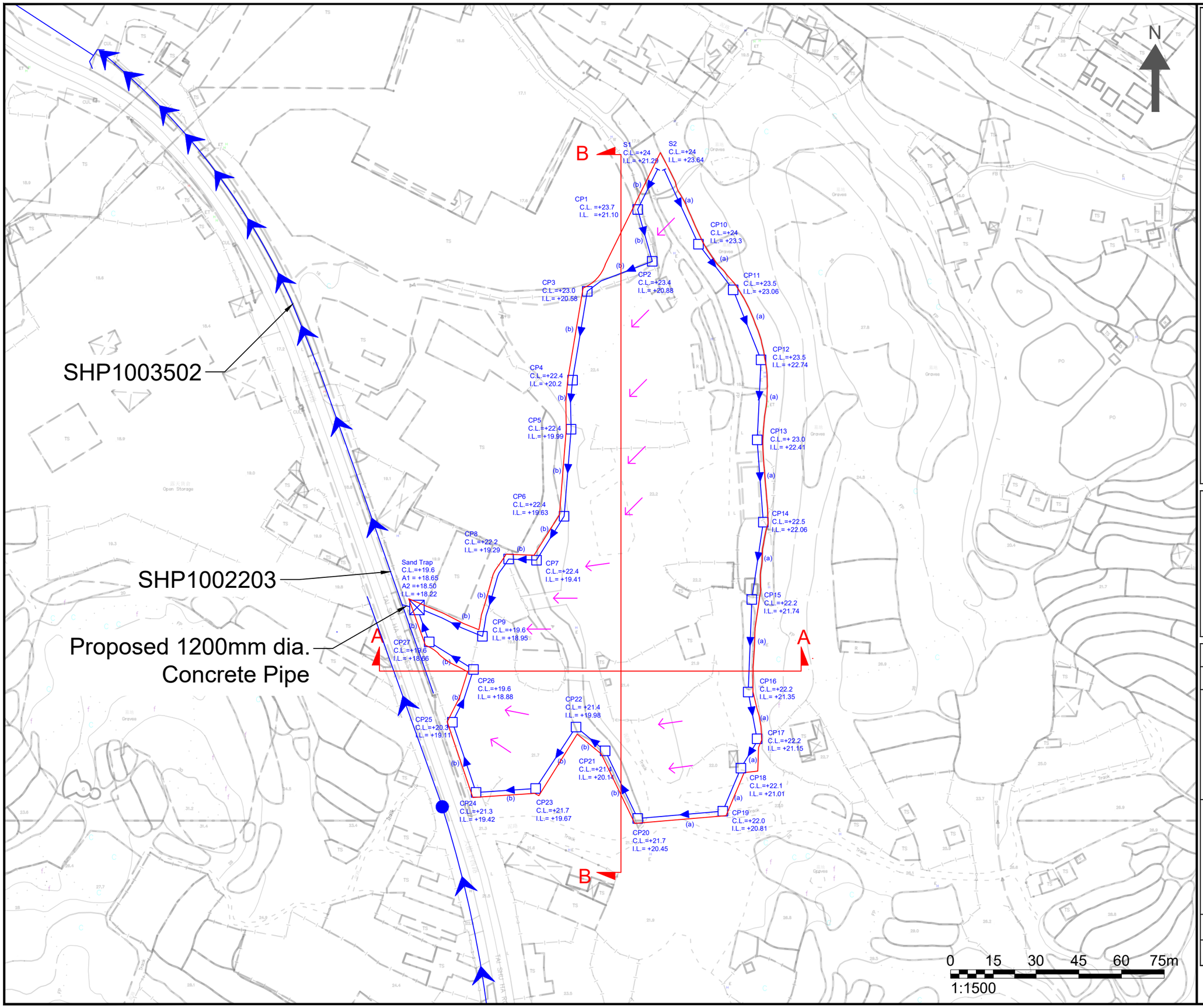
Allied Environmental Consultants Limited

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Drawing By : CS	
Project : TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG	
Drawing Title : STRUCTURE LAYOUT	
Drawing No : FIGURE 2.1	Revision : 0
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NOTES :

- APPLICATION SITE
- STRUCTURE BUILDING
- PROPOSED U-CHANNEL AND CATCHPIT
- PROPOSED SAND TRAP
- EXISTING BOX CULVERT (2M IN WIDTH; 2M IN DEPTH)
- DIRECTON OF WATER FLOW

(a) PROPOSED 450MM U CHANNEL WITH CAST IRON COVER
(b) PROPOSED 700MM U CHANNEL WITH CAST IRON COVER

Consultant

AEC

Allied Environmental Consultants Limited

Project No. :	2287
Drawing By :	CS

Project :
TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

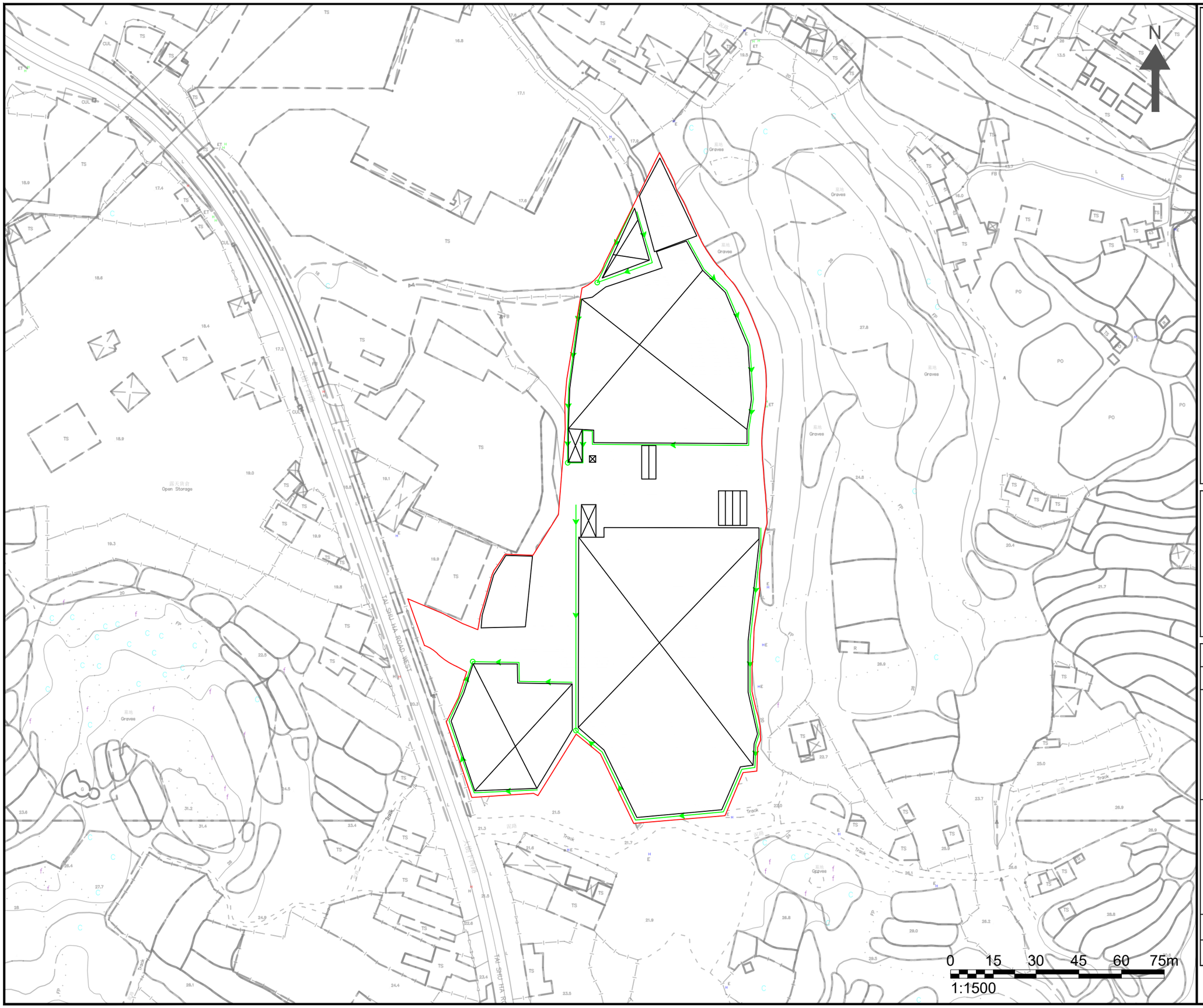
Drawing Title :
OVERVIEW OF PROPOSED DRAINAGE (U-CHANNEL)

Drawing No :	Revision :
FIGURE 2.2a	0
Scale : AS SHOWN	Date : JUN 2026

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NOTES :

APPLICATION SITE

STRUCTURE BUILDING

PROPOSED GUTTER AND DOWNPIPE LOCATION

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Allied Environmental Consultants Limited

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Drawing By :	CS

Project :

TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

Drawing Title :

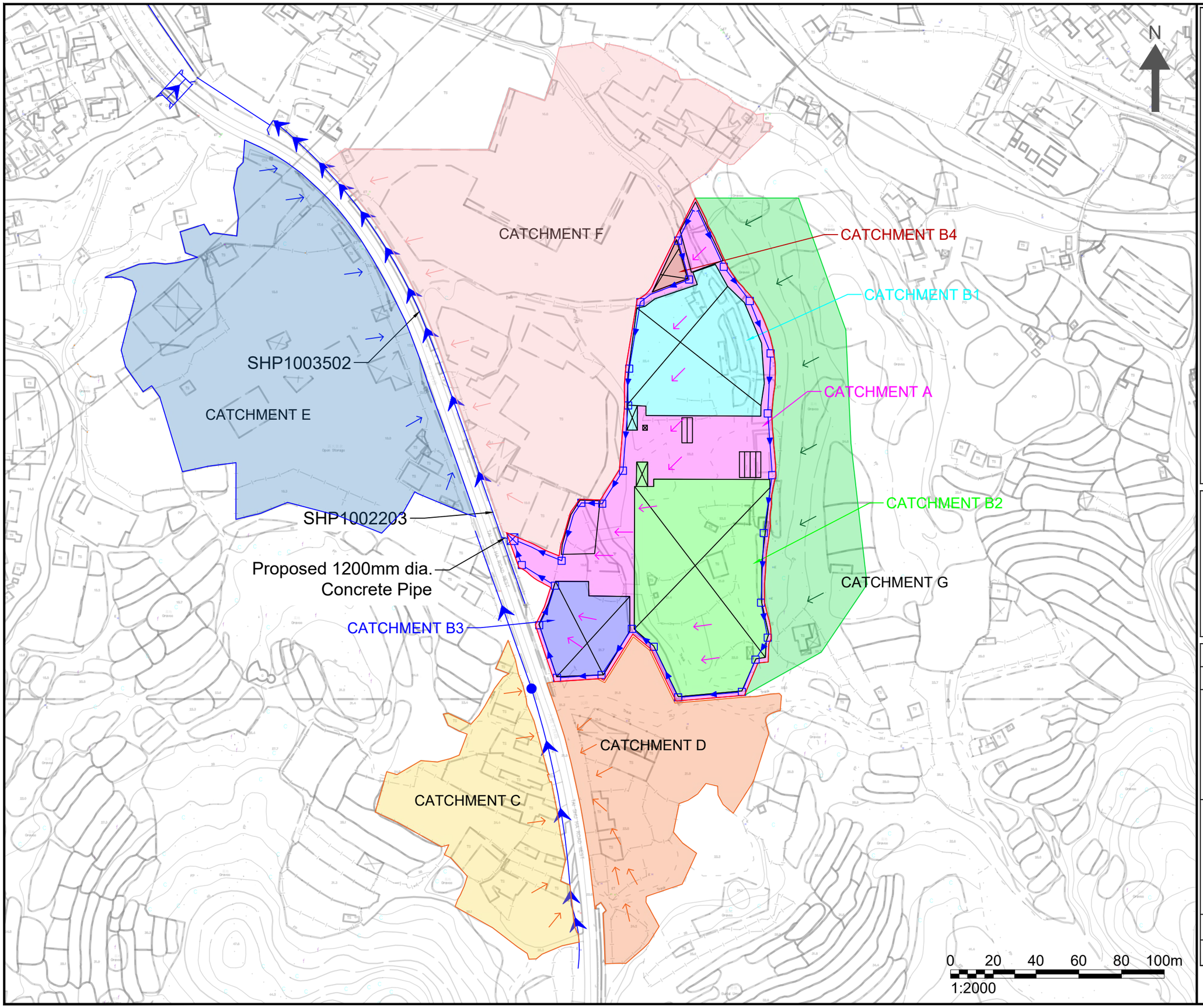
OVERVIEW OF PROPOSED DRAINAGE (GUTTER)

Drawing No :	Revision :
FIGURE 2.2b	0
Scale :	Date :
AS SHOWN	JUN 2026

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NOTES :

- APPLICATION SITE
- STRUCTURE BUILDING
- CATCHMENT A
- CATCHMENT B1
- CATCHMENT B2
- CATCHMENT B3
- CATCHMENT B4
- CATCHMENT C
- CATCHMENT D
- CATCHMENT E
- CATCHMENT F
- CATCHMENT G
- EXISTING DRAINAGE
- WATER FLOW DIRECITON

Consultant

Allied Environmental Consultants Limited

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Drawing By :	CS

Project :

TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

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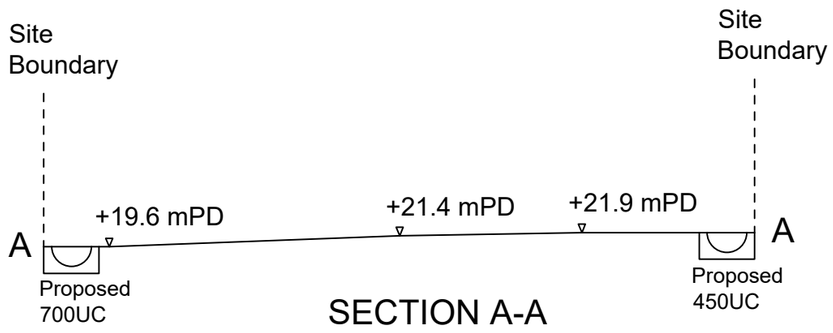
OVERVIEW OF EXISTING DRAINAGE, CATCHMENT AREA & FLOW DIRECTION

Drawing No : FIGURE 2.3	Revision : 0
Scale : AS SHOWN	Date : JUN 2026

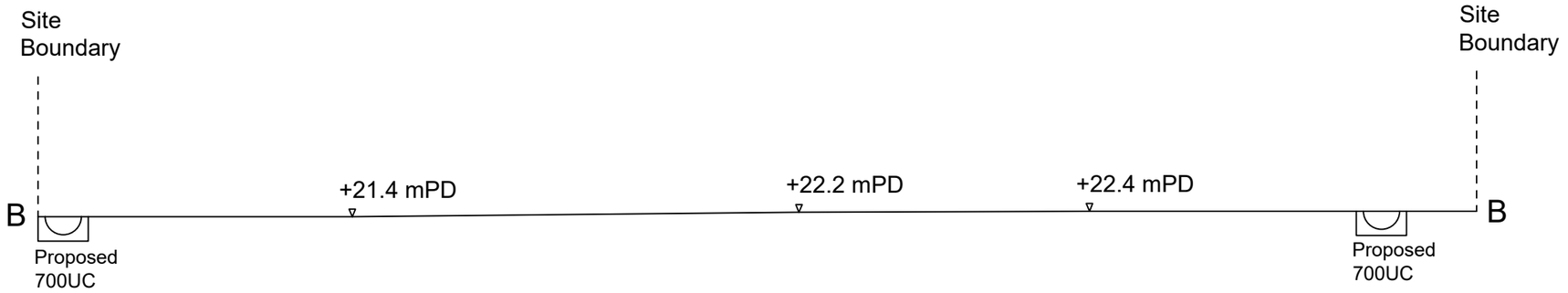
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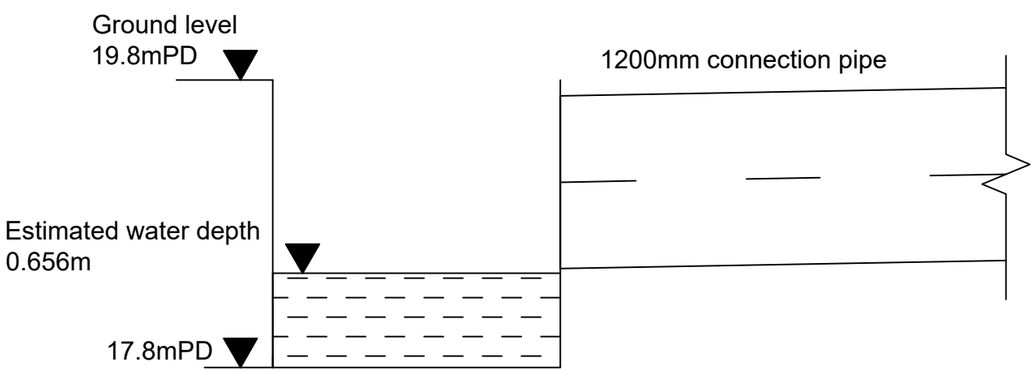
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SECTION A-A



SECTION B-B



CONNECTION DETAIL OF PROPOSED
1200MM PIPE TO EXISTING DRAINAGE

NOTES :

Consultant

Allied Environmental Consultants Limited

Project No. :	2287
Drawing By :	CS

Project :
TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

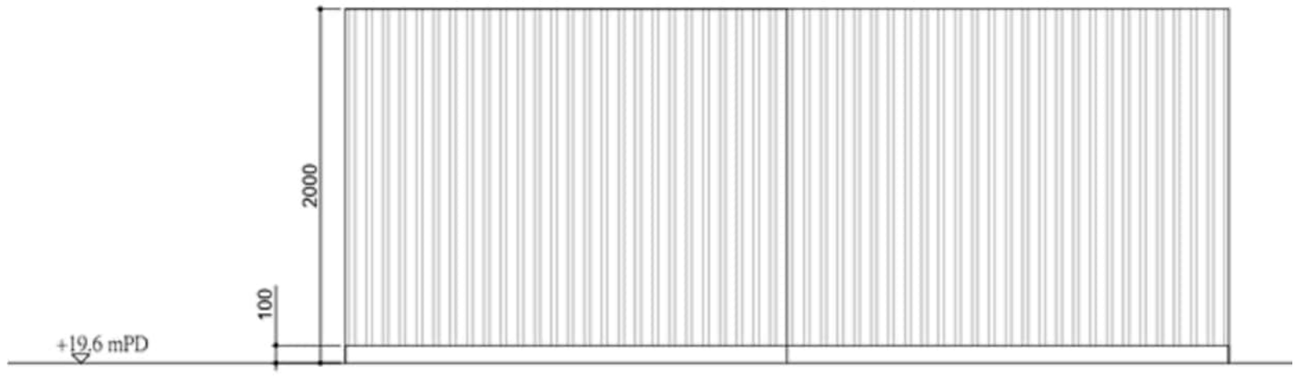
Drawing Title :
SITE ELEVATION AND CONNECTION DETAILS

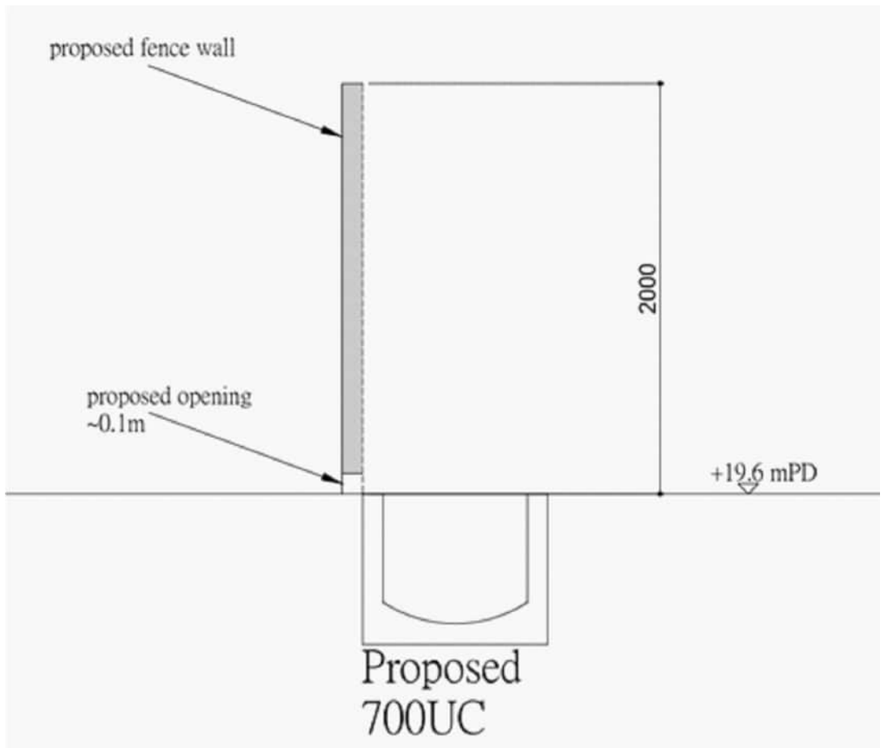
Drawing No : FIGURE 2.4a	Revision : 0
Scale : AS SHOWN	Date : JUL 2026

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DETAILS OF FENCE WALL OPENINGS

NOTES :

Consultant

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Project No. :	2287
Drawing By :	CS

Project :
TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

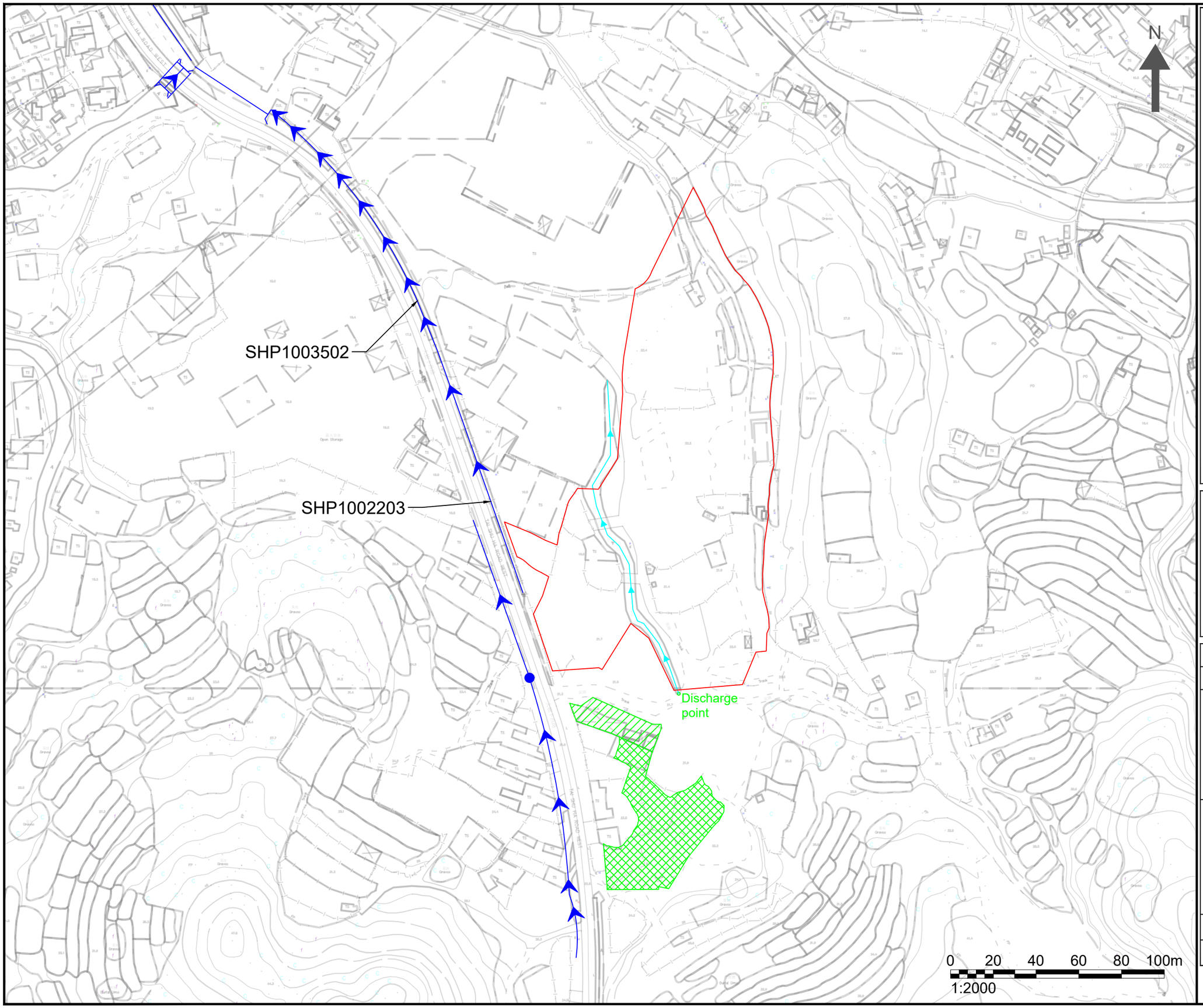
Drawing Title :
DETAILS OF FENCE WALL OPENINGS

Drawing No : FIGURE 2.4b	Revision : 0
Scale : AS SHOWN	Date : JUL 2026

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C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2287 - TAI SHU HA ROAD WEST - DIA\05 REPORT\01 AEC REPORT\20260904_ISSUE 3\FIG\2287 TAI SHU HA WEST_BASEMAP 20260922.DWG



NOTES :

APPLICATION SITE

NEARBY PLANNING APPLICATION

EXISTING UNDERGROUND DRAINAGE

Consultant

Allied Environmental Consultants Limited

Project No. :	2287
Drawing By :	CS

Project :

TEMPERARY WAREHOUSE WITH ANCILLARY FACILITIES FOR A PERIOD OF YEARS AND ASSOCIATED FILLING OF LAND AT VARIOUS LOTS IN D.D. 118, TAI SHU HA ROAD WEST, YUEN LONG

Drawing Title :

DRAINAGE PROPOSAL OF NEARBY PLANNING APPLICATION

Drawing No : FIGURE 2.5	Revision : 0
Scale : AS SHOWN	Date : JUL 2026

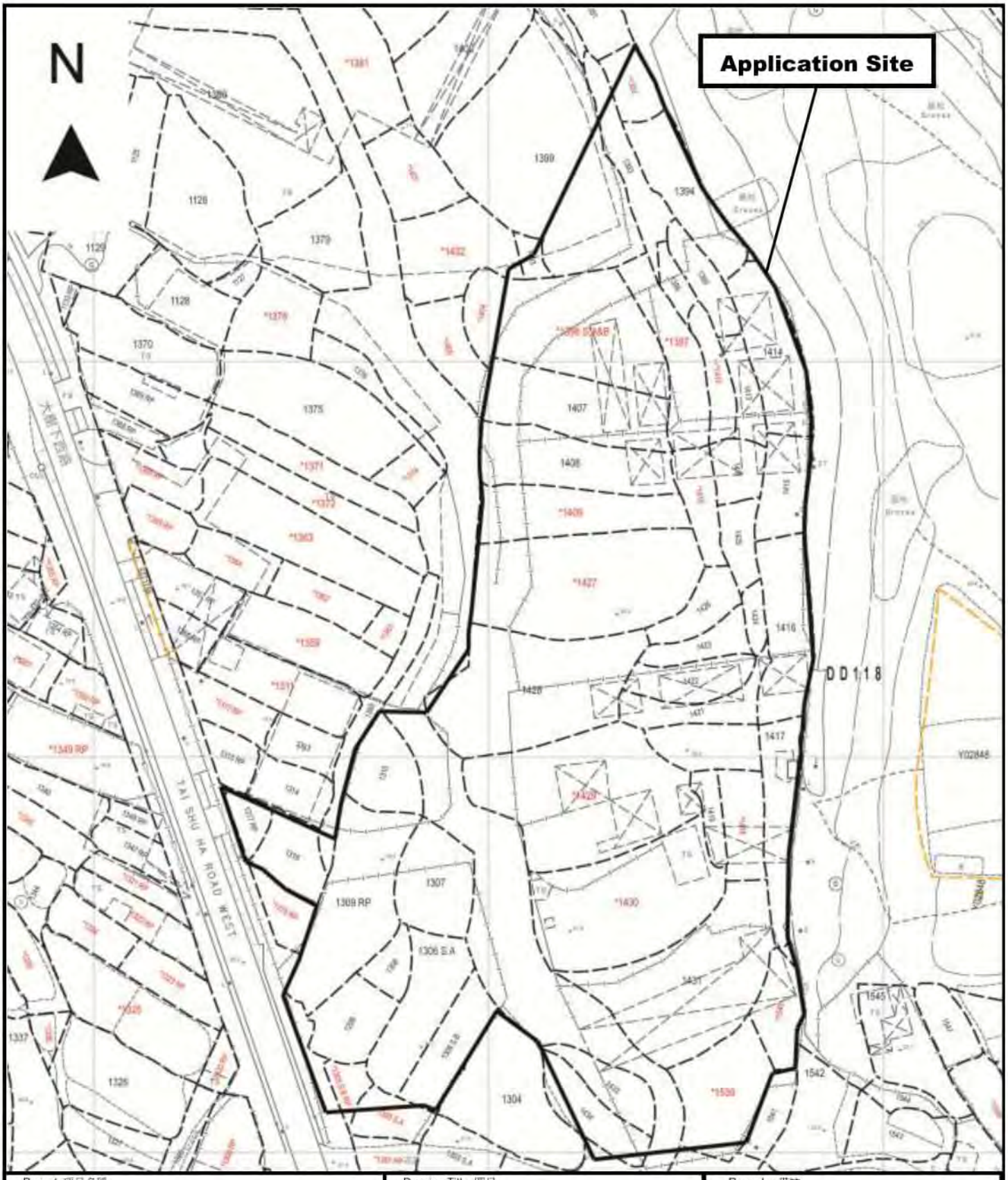
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A3 420 x 297

C:\USERS\NGANCHUNSANG\SYNOLOGYDRIVE\2287 - TAI SHU HA ROAD WEST - DIA\05 REPORT\01 AEC REPORT\20260904_ISSUE 3\FIG_CS WORKING\2287 TAI SHU HA WEST_BASEMAP 20260909.DWG

Appendix A

Layout Plan of Proposed Development



Project 項目名稱:

Proposed Temporary Open Storage & Warehouse (Excluding Dangerous Goods) & Associated Filling of Land for a Period of 3 Years at Lots 1299, 1305 S.A (Part), 1305 S.B RP (Part), 1306 S.A, 1306 S.B (Part), 1307, 1308, 1309 RP, 1310, 1317 RP, 1318, 1360 (Part), 1392 (Part), 1393 (Part), 1394, 1395, 1396, 1397, 1398 S.A & B, 1399 (Part), 1402 (Part), 1403 (Part), 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428 (Part), 1429, 1430, 1431, 1433, 1434 (Part), 1435 (Part), 1538 (Part), 1539 (Part) and 1540 in D.D.118 and Adjoining Government Land, Tai Shu Ha Road West, Tai Tong, Yuen Long, N.T.

Drawing Title 圖目:

Site Plan

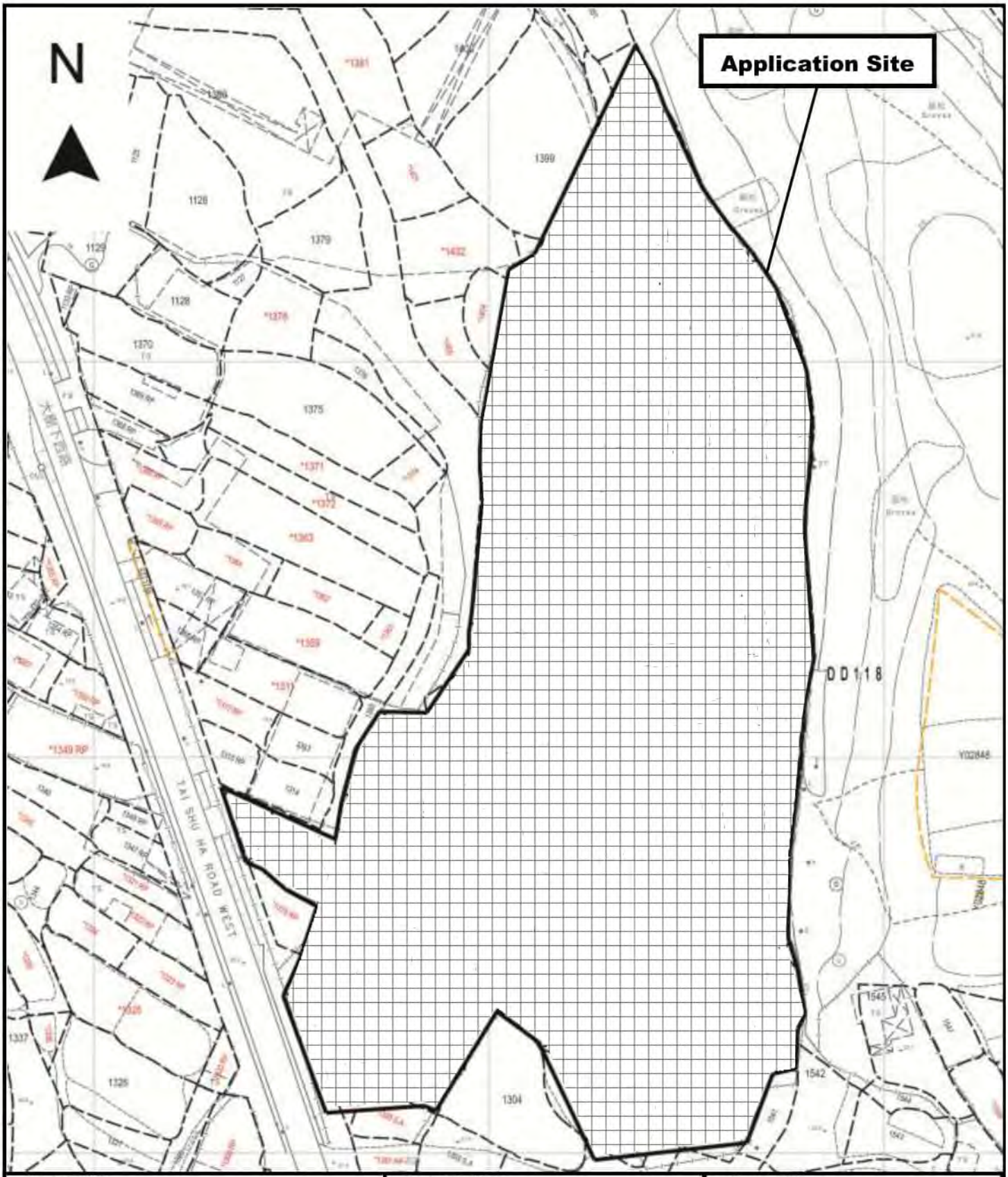
Drawing No. 圖號:

Figure 1

Remarks 備註:

Scale 比例:

1:1500



Project 項目名稱:

Proposed Temporary Open Storage & Warehouse (Excluding Dangerous Goods) & Associated Filling of Land for a Period of 3 Years at Lots 1299, 1305 S.A (Part), 1305 S.B RP (Part), 1306 S.A, 1306 S.B (Part), 1307, 1308, 1309 RP, 1310, 1317 RP, 1318, 1360 (Part), 1392 (Part), 1393 (Part), 1394, 1395, 1396, 1397, 1398 S.A & B, 1399 (Part), 1402 (Part), 1403 (Part), 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428 (Part), 1429, 1430, 1431, 1433, 1434 (Part), 1435 (Part), 1538 (Part), 1539 (Part) and 1540 in D.D.118 and Adjoining Government Land, Tai Shu Ha Road West, Tai Tong, Yuen Long, N.T.

Drawing Title 圖目:

Filling of Land Plan

Drawing No. 圖號:

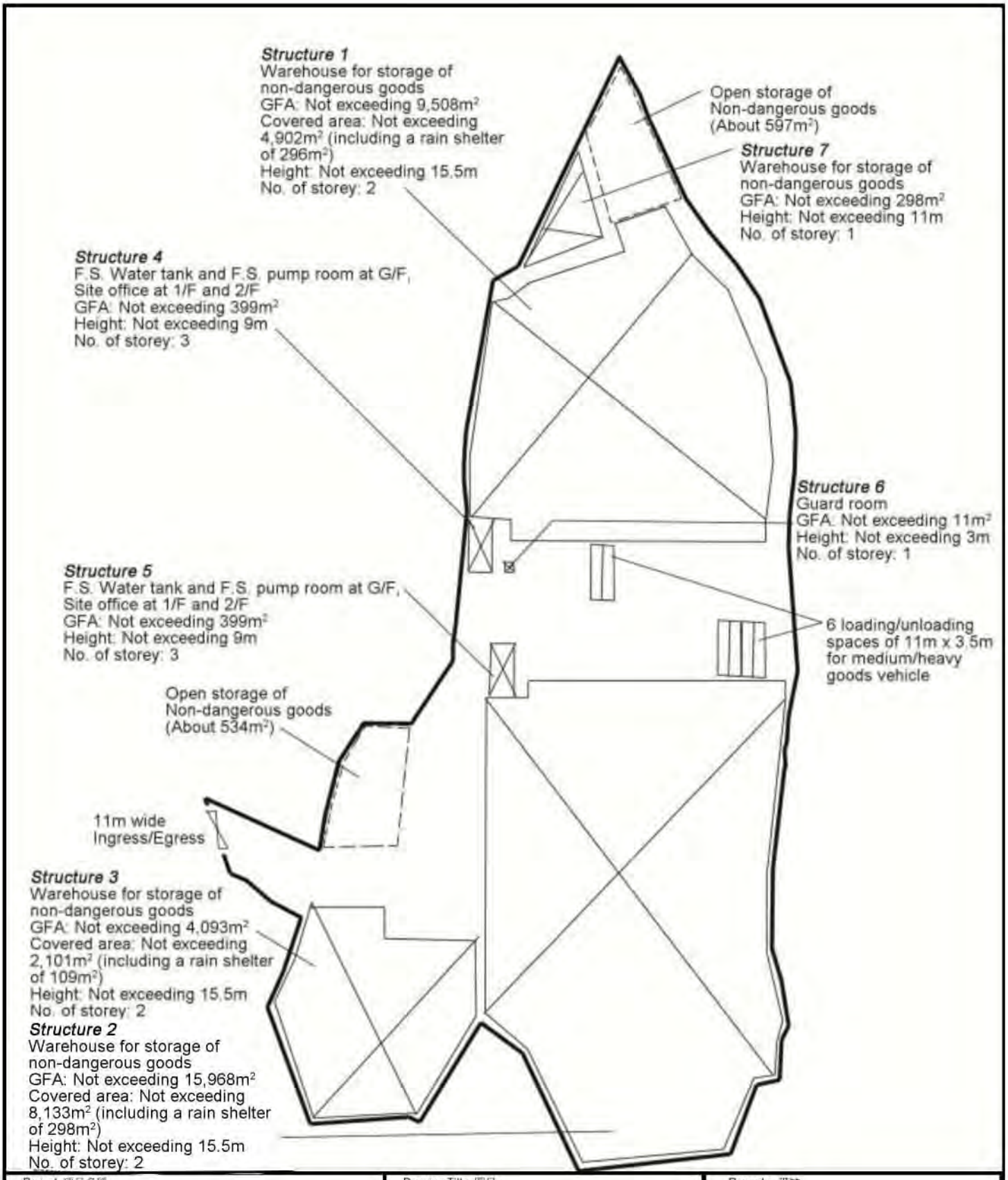
Figure 2

Remarks 備註:

Proposed filling of land (0.2m)

Scale 比例:

1:1500



Project 項目名稱:

Proposed Temporary Open Storage & Warehouse (Excluding Dangerous Goods) & Associated Filling of Land for a Period of 3 Years at Lots 1299, 1305 S.A (Part), 1305 S.B RP (Part), 1306 S.A, 1306 S.B (Part), 1307, 1308, 1309 RP, 1310, 1317 RP, 1318, 1360 (Part), 1392 (Part), 1393 (Part), 1394, 1395, 1396, 1397, 1398 S.A & B, 1399 (Part), 1402 (Part), 1403 (Part), 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428 (Part), 1429, 1430, 1431, 1433, 1434 (Part), 1435 (Part), 1538 (Part), 1539 (Part) and 1540 in D.D.118 and Adjoining Government Land, Tai Shu Ha Road West, Tai Tong, Yuen Long, N.T.

Drawing Title 圖目:

Proposed Layout Plan

Drawing No. 圖號:

Figure 3

Remarks 備註:

Scale 比例:

1:1500

Appendix B

Peak Runoff Estimation of Catchments after the completion of Proposed Development

Appendix B Peak Runoff Estiamtion

Peak Runoff Estimation of Subcatchments and Subject Site **after** the completion of Proposed Development

Catchment	Total Area of the Catchment (m^2)	Land Use		Topography		Average Slope, H (m per 100m)	Flow Distance, L (m)	Inlet Time, t_o (min) [1]	Flow Time, t_f (min) [2]	Duration, t_c (min) [3]	200 - year return period				Runoff Coefficient, C [6]	Rainfall Increase due to Climate Change, % [7]	200 - year return period	
		Surface Characteristics	Area (m^2)	Inlet invert level (mPD)	Outlet invert level (mPD)						Storm Constant, a [4]	Storm Constant, b [4]	Storm Constant, c [4]	Extreme Mean Intensity, i (mm/hr) [5]			Peak Runoff, Qp (m3/s) [8]	Total Peak Runoff, Qp (m3/s) [8]
Application Site																		
Catchment A (Uncovered Area + Open Storages+ Structure 6)	7502	Concrete	7502	22.4	19.6	4.31	65	2.88	0	2.88	508.8	3.46	0.322	280.77	0.95	28.1	0.713	0.713
		Grass	0												0.35		0.000	
Catchment B1 (Structure 1 + Structure 4)	5035	Concrete	5035	-	-	-	-	-	0	5.00	508.8	3.46	0.322	255.82	0.95	28.1	0.436	0.436
		Grass	0												0.35		0.000	
Catchment B2 (Structure 2 + Structure 5)	8266	Concrete	8266	-	-	-	-	-	0	5.00	508.8	3.46	0.322	255.82	0.95	28.1	0.715	0.715
		Grass	0												0.35		0.000	
Catchment B3 (Structure 3)	2101	Concrete	2101	-	-	-	-	-	0	5.00	508.8	3.46	0.322	255.82	0.95	28.1	0.182	0.182
		Grass	0												0.35		0.000	
Catchment B4 (Structure 7)	298	Concrete	298	-	-	-	-	-	0	5.00	508.8	3.46	0.322	255.82	0.95	28.1	0.026	0.026
		Grass	0												0.35		0.000	
Nearby Catchment																		
Catchment C	9103	Concrete	1577	29.1	21.3	4.38	178	7.70	0	7.70	501.4	2.45	0.348	223.84	0.95	16.0	0.108	0.298
		Grass	7526												0.35		0.190	
Catchment D	11016	Concrete	7993	24.2	21.3	1.59	182	9.46	0	9.46	501.4	2.45	0.348	211.75	0.95	16.0	0.519	0.591
		Grass	3023												0.35		0.072	
Catchment E	24666	Concrete	19924	19.9	17.4	1.02	244	12.78	0	12.78	501.4	2.45	0.348	194.38	0.95	16.0	1.186	1.290
		Grass	4742												0.35		0.104	
Catchment F	32163	Concrete	23980	19.9	17.2	0.95	285	14.76	0	14.76	501.4	2.45	0.348	186.26	0.95	16.0	1.368	1.540
		Grass	8183												0.35		0.172	
Catchment G	12326	Concrete	0	19.9	17.2	0.95	285	16.25	0	16.25	501.4	2.45	0.348	180.97	0.95	16.0	0.000	0.252
		Grass	12326												0.35		0.252	

Note:

[1] Brandsby William's equation is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition).

$$t_o = \frac{0.14469L}{H^{0.2}A^{0.1}}$$

where t_o – time of concentration of a natural catchment (min.)

A – catchment area (m^2)

H – average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration

L – distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

Time of concentration for subject site is assumed as 5 min.

[2] t_f is assumed to be 0 for conservative estimation.

[3] $t_c = t_o + t_f$

[4] Storm constants are referenced to Table 3d in DSD Stormwater Drainage Manual (Fifth Edition) and its Corrigendum No. 1/2024 based on corresponding return periods.

[5] Intensity-Duration-Frequency calculation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition) and its Corrigendum 1/2024.

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

where i = extreme mean intensity in mm/hr,
t_d = duration in minutes ($t_d \leq 240$), and
a, b, c = storm constants given in Tables 3a, 3b, 3c and 3d.

[6] Runoff coefficient is referenced from Section 7.5.2 in DSD Stormwater Drainage Manual (Fifth Edition). For conservative estimation, coefficient of 0.35 is assumed for unpaved area while that of 0.95 for paved area.

[7] Rainfall increase precentage due to climate change is referenced from Table 28 in DSD Stormwater Drainage Manual (Fifth Edition) and Corrigendum No. 1/2022. 16.0% for End of 21st Century is adopted as worst case scenario.

[8] Rational method for peak runoff estimation is referenced from Section 4.3.3 in DSD Stormwater Drainage Manual (Fifth Edition).

$$Q_p = 0.278 C i A$$

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

Appendix C

Estimation of Drainage Flow from Proposed Development and Detailed Hydraulic Calculation

Appendix C Hydraulic Calculation

Runoff of external Catchment G
collected via CP10 - CP20

Peak Runoff	0.252	m^3/s	
	15106	L/min	
Slope, s	0.010		
Provided 450mm UC (1:100) is acceptable			According to Figure 7.1 Chart for the Rapid Design of U-shaped and Half-round Channels up to 600 mm in GEO Report No. 320 Review of Hydraulic Design of U-shaped and Half-round Channels on Slopes

Runoff of Proposed Development (Catchment B2) + external Catchment G
via CP20 - CP24

Height, H	0.700	m	
Cross-section Area, A [2]	0.394	m^2	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Wetted Perimeter, P [2]	1.800	m	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Hydraulic radius, R [3]	0.219	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Pipe Roughnss, k	0.00015	m	Surface roughness is assumed to be 0.15mm for prestressed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	3.53	m/s	Velocity is calculated based on Colebrook-White equations. With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition), surface roughness is assumed to be 0.15mm. Kinematic viscosity is 0.000001306 m/s. Gravitational acceleration is $9.8m/s^2$.
Full Capacity, Q	1.388	m^3/s	Capacity = Cross-sectional Area × Velocity
Return Periods (Year) [9]	200	Year	With reference to Table 10 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 200 years of return period has been adopted.
Total Peak Runoff	0.967	m^3/s	
Occupancy(%)	69.7%		
Provided 700mm UC (1:100) is acceptable			

Runoff of Proposed Development (Catchment B2 + B3) + external Catchment G
via CP24 - Sand Trap

Height, H	0.700	m	
Cross-section Area, A [2]	0.394	m^2	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Wetted Perimeter, P [2]	1.800	m	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Hydraulic radius, R [3]	0.219	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Pipe Roughnss, k	0.00015	m	Surface roughness is assumed to be 0.15mm for prestressed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	3.53	m/s	Velocity is calculated based on Colebrook-White equations. With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition), surface roughness is assumed to be 0.15mm. Kinematic viscosity is 0.000001306 m/s. Gravitational acceleration is $9.8m/s^2$.
Full Capacity, Q	1.388	m^3/s	Capacity = Cross-sectional Area × Velocity
Return Periods (Year) [9]	200	Year	With reference to Table 10 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 200 years of return period has been adopted.
Total Peak Runoff	1.149	m^3/s	
Occupancy(%)	82.8%		
Provided 700mm UC (1:100) is acceptable			

Runoff of Proposed Development (Catchment A + B1 + B4) + external Catchment G
via CP1 - Sand Trap

Height, H	0.700	m	
Cross-section Area, A [2]	0.394	m^2	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Wetted Perimeter, P [2]	1.800	m	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Hydraulic radius, R [3]	0.219	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Pipe Roughnss, k	0.00015	m	Surface roughness is assumed to be 0.15mm for prestressed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	3.53	m/s	Velocity is calculated based on Colebrook-White equations. With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition), surface roughness is assumed to be 0.15mm. Kinematic viscosity is 0.000001306 m/s. Gravitational acceleration is $9.8m/s^2$.
Full Capacity, Q	1.388	m^3/s	Capacity = Cross-sectional Area × Velocity
Return Periods (Year) [9]	200	Year	With reference to Table 10 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 200 years of return period has been adopted.
Total Peak Runoff	1.174	m^3/s	
Occupancy(%)	84.6%		
Provided 700mm UC (1:100) is acceptable			

Catchment B1 (Half of Structure 1 + Half of Structure 4)

Peak Runoff	0.218	m^3/s	
	13073	L/min	
Width, W	0.40	m	
Depth, D	0.40	m	
Cross-section Area, A [2]	0.160	m^2	
Hydraulic radius, R [3]	0.133	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Mannig Coefficient, n	0.014		With reference to Table 13 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	1.86	m/s	Velocity is calculated based on Manning equations.
Full Capacity, Q	0.298	m^3/s	Capacity = Cross-sectional Area × Velocity

0.298 > 0.218

Occupancy 73%

Provided 400mm (W) x 400mm (D) Gutter (1:100) is acceptable

Catchment B2 (Half of Structure 2 + Half of Structure 5)

Peak Runoff	0.358	m^3/s	
	21462	L/min	
Width, W	0.50	m	
Depth, D	0.45	m	
Cross-section Area, A [2]	0.225	m^2	
Hydraulic radius, R [3]	0.161	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Mannig Coefficient, n	0.014		With reference to Table 13 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	2.11	m/s	Velocity is calculated based on Manning equations.
Full Capacity, Q	0.475	m^3/s	Capacity = Cross-sectional Area × Velocity

0.475 > 0.358

Occupancy 75%

Provided 500mm (W) x 450mm (D) Gutter (1:100) is acceptable

Catchment B3 (Half of Structure 3)

Peak Runoff	0.091	m^3/s	
	5455	L/min	
Width, W	0.30	m	
Depth, D	0.25	m	
Cross-section Area, A [2]	0.075	m^2	
Hydraulic radius, R [3]	0.094	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Mannig Coefficient, n	0.014		With reference to Table 13 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	1.47	m/s	Velocity is calculated based on Manning equations.
Full Capacity, Q	0.111	m^3/s	Capacity = Cross-sectional Area × Velocity

0.111 > 0.091

Occupancy 82%

Provided 300mm (W) x 250mm (D) Gutter (1:100) is acceptable

Catchment B4 (Half of Structure 7)

Peak Runoff	0.013	m^3/s	
	774	L/min	
Width, W	0.15	m	
Depth, D	0.15	m	
Cross-section Area, A [2]	0.023	m^2	
Hydraulic radius, R [3]	0.050	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Slope, s	0.010		
Mannig Coefficient, n	0.014		With reference to Table 13 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	0.97	m/s	Velocity is calculated based on Manning equations.
Full Capacity, Q	0.022	m^3/s	Capacity = Cross-sectional Area × Velocity

0.022 > 0.013

Occupancy 59%

Provided 150mm (W) x 150mm (D) Gutter (1:100) is acceptable

Catchment A + B + external Catchment G

Diameter, D	1.200	m	
Cross-section Area, A [2]	1.018	m^2	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Wetted Perimeter, P [2]	3.770	m	According to Section 9.3 in DSD Stormwater Drainage Manual (Fifth Edition), 5% / 10% reduction in flow area based on channel gradient is taken into account for the effects to flow capacity due to materials deposited on the bed.
Hydraulic radius, R [3]	0.270	m	Hydraulic Radius = Cross-section Area / Wetted Perimeter
Length of Pipe, L	6.200	m	
Slope, s	0.005		
Pipe Roughnss, k	0.00015	m	Surface roughness is assumed to be 0.15mm for prestressed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).
Velocity, V (m/s) [6]	2.82	m/s	Velocity is calculated based on Colebrook-White equations. With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition), kinematic viscosity is 0.000001306 m/s.
Full Capacity, Q	2.867	m^3/s	Capacity = Cross-sectional Area × Velocity
Return Periods (Year) [9]	200	Year	With reference to Table 3 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 50 years of return period has been adopted.
Total Peak Runoff	2.323	m^3/s	
Occupancy(%)	81.0%		

Provided 1200mm dia. underground pipe (1:200) is acceptable

Calculation for Depth of Flow, y

With reference to Table 11 of DSD's Stormwater Drainage Manual, 200-year rain + 10-year sea level design return period are adopted.
With reference to Table 8 of DSD' Stormwater Drainage Manual, the design 10-year extreme sea level at Tsim Bei Tsui of +3.52 mPD is adopted (Yuen Long Area)

Site Elevation Level = Approximately +19 to +22 mPD
Based on the elevation level, no tidal backwater effect is expecetd at Application Site.

The depth of flow is calculated based on Manning's formula.

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

Manning's roughness coefficient, n	0.016		Assumed concrete surface with "bad" condition)
Width, B	2	m	
Slope, S	0.018		
Cross Sectional Area, A = By			
Hydrualic Radius, R = A/P			
Wetted perimeter, P = B+2y			
Flow Rate, Q of Catchment A-D + G	**3.212**	**m^3/s**	
Depth of Flow, y	**0.427**	**m**	
Flow Rate, Q of Catchmetn A-G	**6.043**	**m^3/s**	
Depth of Flow, y	**0.663**	**m**	

Peak Runoff Estimation of Subcatchments and Subject Site & Occupancy of Existing Drainage after the completion of Proposed Development

Maximum depth of Drainage	2.000	m	Assumed based on Site Photo and Water Level Information provided by DSD (*attachment (Water levels).xlsx*)
Freeboard	0.500	m	
Allowable flow depth	1.500	m	
Highest Water Depth at Link 822042831254.1	0.229	m	Reffered to Water Level Information provided by DSD (*attachment (Water levels).xlsx*)
Existing Flow Rate,Q	1.258	m^3/s	Calculated based on Manning's Formula, derived based on existing depth of flow
Depth of Flow of Catchment A-D + G + Existing water level	0.656	m	
Depth Occupancy	**44%**		
Depth of Flow of Catchment A-G + Existing Water Level	0.892	m	
Depth Occupancy	**59%**		
Flow Area, A	3.000	m^2	
Wetted Parameter, P	5.000	m	
Hydraulic Radius, R	0.600	m	
Max Flow Rate, Qmax	17.963	m^3/s	
Total flow of Catchment A-D + G + Existing Flow	4.470	m^3/s	
Occupancy	**25%**	**acceptable**	
Total flow of Catchment A-G + Existing Flow	7.301	m^3/s	
Occupancy	**41%**	**acceptable**	

Peak Runoff Estimation of Subcatchments and Subject Site **after** the completion of Proposed Development

ID	From	ID	To	Diameter, D (m)	Width, B (m) [1]	Depth of Flow, y	Manning's roughness coefficient, n [3] [4]	Inlet Invert Level (mPD) [1]	Outlet Invert Level (mPD) [1]	Slope, S [5]	Length of Pipe, L (m) [1]	Cross Sectional Area, A [6]	Wetted Perimeter, P (m) [7]	Hydraulic Radius, R [8]	Velocity, V (m/s) [11]	Max Flow Rate, Q (m3/s) [9]	Existing Flow Rate (m3/s)	Contributing Catchment Area	Return Periods (Year) [10]	Total Flow from All Catch-ment Area (m^3/s)	Occupancy (%)
Trapezoidal channel																					
P1	Proposed Sand Trap	D2	SHP1003502	1.2	-	-	0.00015	18.11	18.08	0.005	6.20	1.02	3.77	0.27	2.82	2.87	-	Catchment A + B + G	200	2.323	81%
Node 1	822042831254	Node 2	821974831446	-	2.0	0.427	0.016	18.5	14.8	0.018	204.0	3.00	5.00	0.60	5.99	17.96	1.26	Catchment A to D, Catchment G + Existing Flow	200	3.212	25%
Node 1	822042831254	Node 2	821974831446	-	2.0	0.663	0.016	18.5	14.8	0.018	204.0	3.00	5.00	0.60	5.99	17.96	1.26	Catchment A to F + Existing Flow	200	6.044	41%

Note:

[1] With reference to Geoinfo Map and assumption from site photo.

[2] The information for max depth of flow is unavailable, assumed ymax to be 1m.

[3] With reference to table 13 of DSD's Stormwater Drainage Manual, Manning's roughness coefficient , n = 0.016 (assumed concrete surface with "bad" condition)

[4] Surface roughness is assumed to be 0.15mm for prestressed concrete pipe with poor condition as worst case scenario, with reference to Table 14 in DSD Stormwater Drainage Manual (Fifth Edition).

[5] Slope =1/200 (assumed based on DSD Drainage Submission Technical Note 1)

[6] Cross sectional area, A
A =y(B +zy), for trapezoidal channel)
z = side slope (assume 1:1)

[7] Wetted perimeter, P
P = B+(2y x SQRT(1 + z^2))(trapezoidal channel)

[8] Hydrualic Radius, R = Area /Wetted Perimeter

[9] Flow rate of channel is calculated based on Manning's formula

$$Q = \frac{1}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

[10] With reference to Table 3 of Section 6.6.2 in DSD Stormwater Drainage Manual (Fifth Edition), 200 years of return period has been adopted.

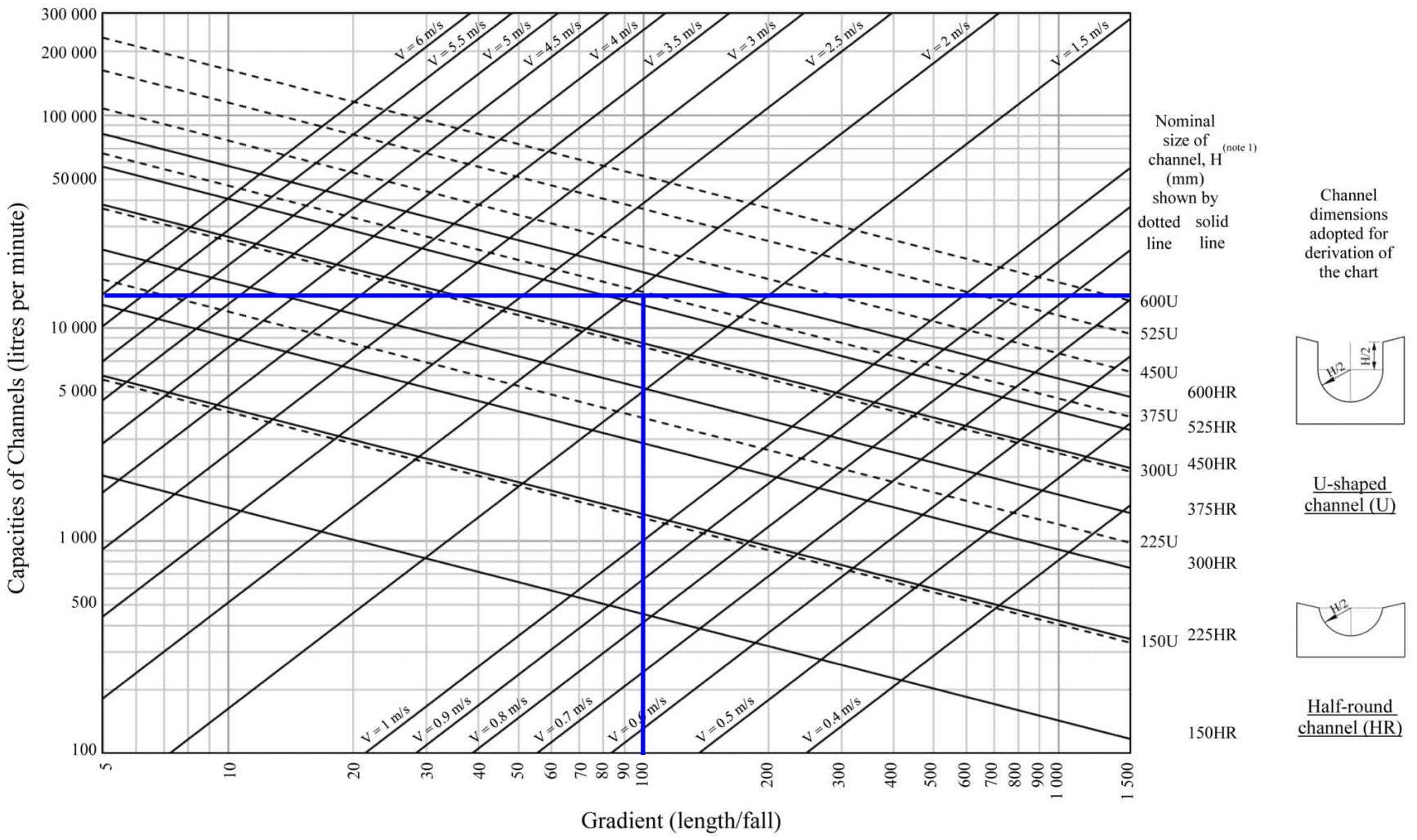
[11] Velocity is calculated based on Colebrook-White equations.
By Colebrook-White Equation,

$$V = -\sqrt{32gRS_f}\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$

Where

V = [illegible]
k_s = [illegible]
R = [illegible]
C = [illegible]
n = [illegible]
g = [illegible]
ν = [illegible]
S_f = [illegible]

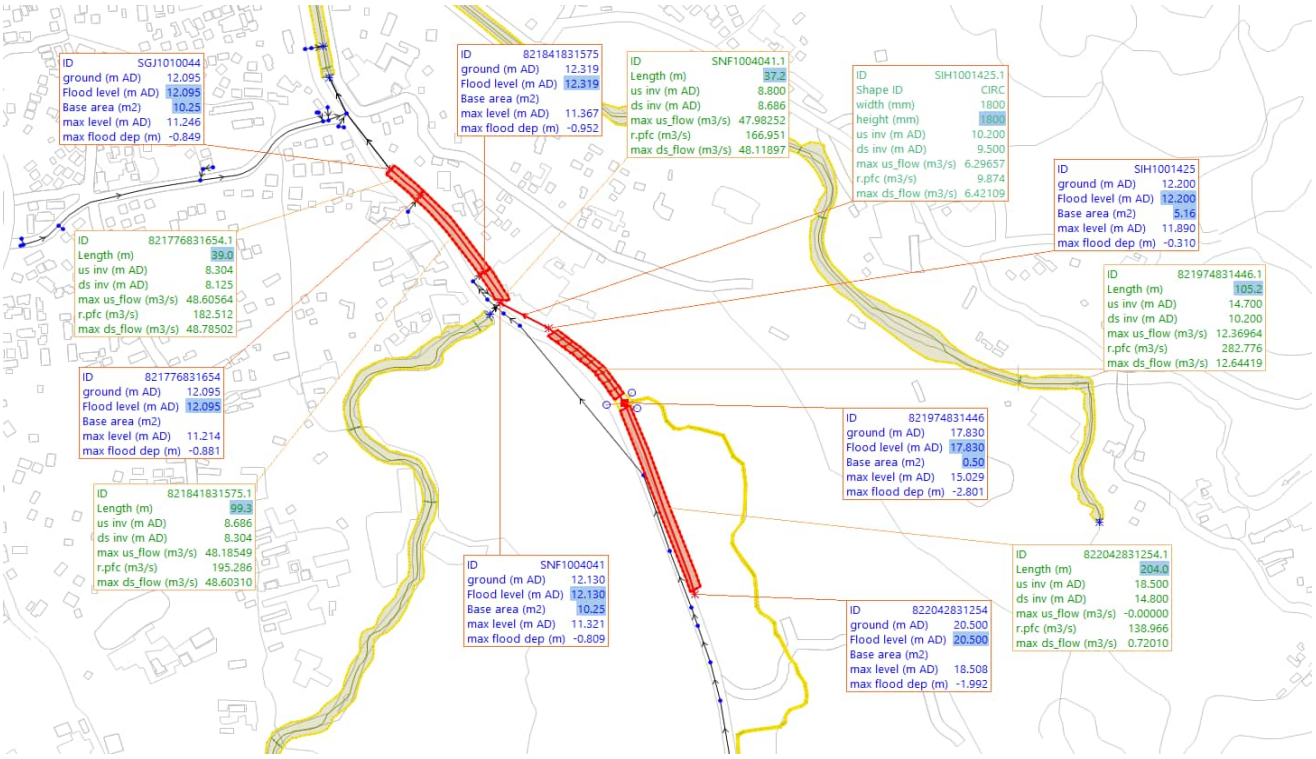
With Reference to Table 14 in DSD Stromwater Drainage Manual (Fifth Edition), surface roughness is assumed to be 0.15mm.
Kinematic viscosity is 0.000001306 m/s.
Gravitational acceleration is 9.8m/s^2.

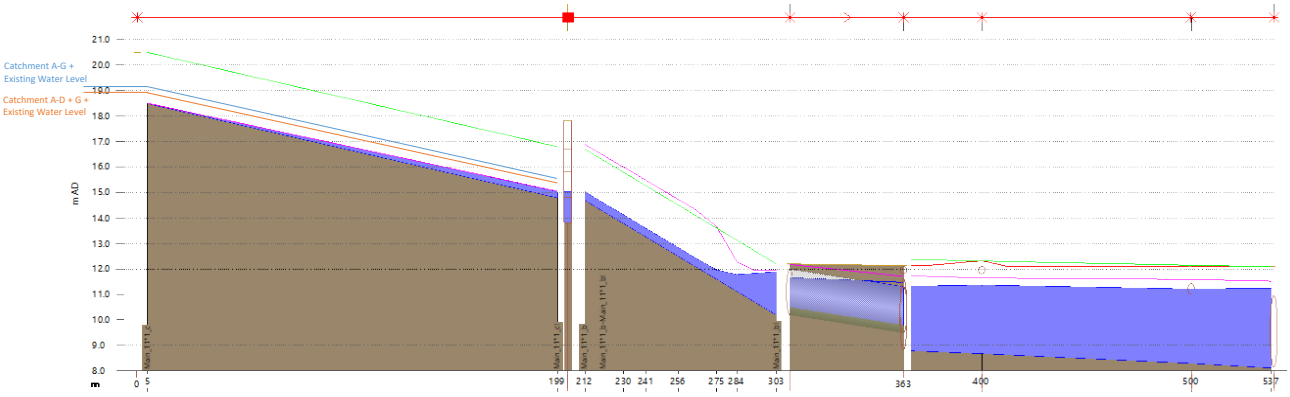


Note: (1) Refer to the latest CEDD Standard Drawings for the details of U-shaped (U) and half-round (HR) channels.

Figure 7.1 Chart for the Rapid Design of U-shaped and Half-round Channels up to 600 mm

200A case

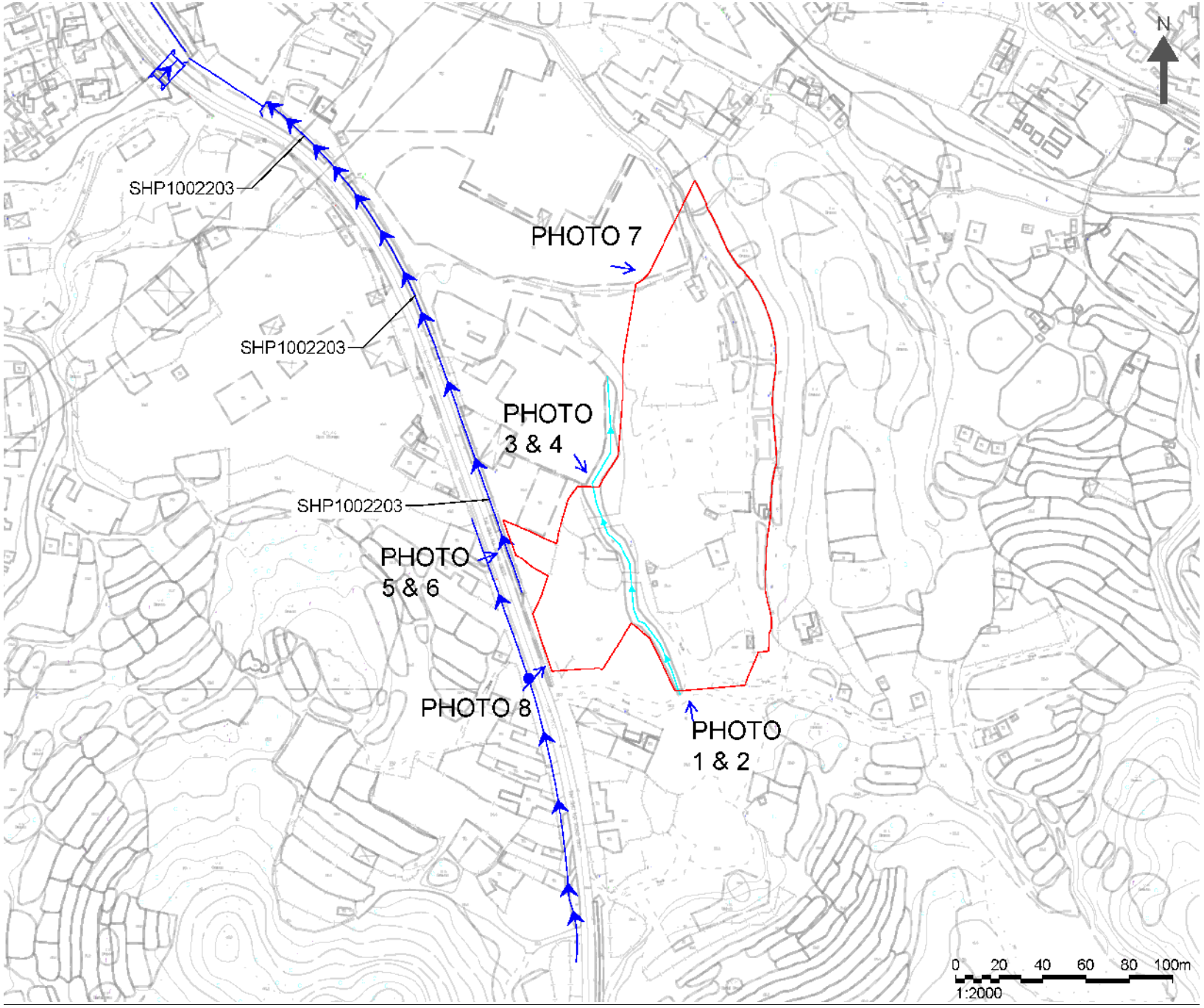




Link		822042831254.1		821974831446.1		SIH1001425.1	SNF1004041.1	821841831575.1		821776831654.1	
Shape ID						CIRC					
Width (mm)						1800					
Height (mm)						1800					
Gradient (m/m)						0.01298					
Full capacity (m3/s)						9.874					
US invert level (m AD)		18.500		14.700		10.200	8.800	8.686		8.304	
DS invert level (m AD)		14.800		10.200		9.500	8.686	8.304		8.125	
Pipe full capacity (m3/s)		138.966		282.776		9.874	166.951	195.286		182.512	
Surcharge state		0.11		0.85		1.00	0.74	0.76		0.79	
US depth (m)		0.008		0.329		1.458	2.521	2.681		2.910	
US flow (m3/s)		-0.00000		12.36964		6.29657	47.98252	48.18549		48.60564	
DS depth (m)		0.229		1.690		1.975	2.681	2.910		3.121	
DS flow (m3/s)		0.72010		12.64419		6.42109	48.11897	48.60310		48.78502	
Max DS velocity (m/s)		1.023		0.966		4.004	2.530	3.175		2.596	
Length (m)		204.0		105.2			37.2	99.3		39.0	
Max US flow (m3/s)		-0.00000		12.36964		6.29657	47.98252	48.18549		48.60564	
Max DS flow (m3/s)		0.72010		12.64419		6.42109	48.11897	48.60310		48.78502	
Node	822042831254		821974831446		SIH1001425	SNF1004041	821841831575		821776831654		-
Ground level (m AD)	20.500		17.830		12.200	12.130	12.319		12.095		12.095
Flood depth (m)	-1.992		-2.801		-0.310	-0.809	-0.952		-0.881		-0.849
Max Level (m AD)	18.508		15.029		11.890	11.321	11.367		11.214		11.246
Max Flood depth (m)	-1.992		-2.801		-0.310	-0.809	-0.952		-0.881		-0.849

Appendix D

Site Photo


N
SHP1002203
SHP1002203
SHP1002203
PHOTO 7
PHOTO
3 & 4
PHOTO
5 & 6
PHOTO 8
PHOTO
1 & 2
0 20 40 60 80 100m
1:2000

Appendix D



Photo 1



Photo 2

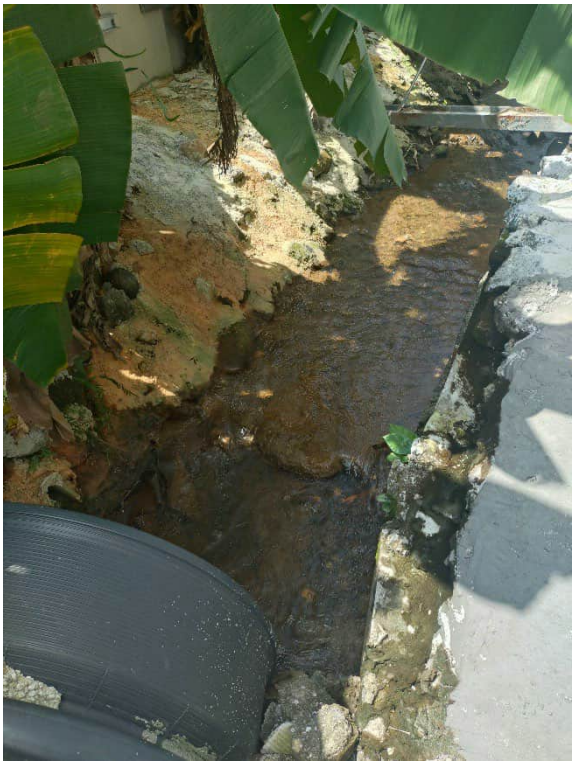


Photo 3



Photo 4



Photo 5



Photo 6

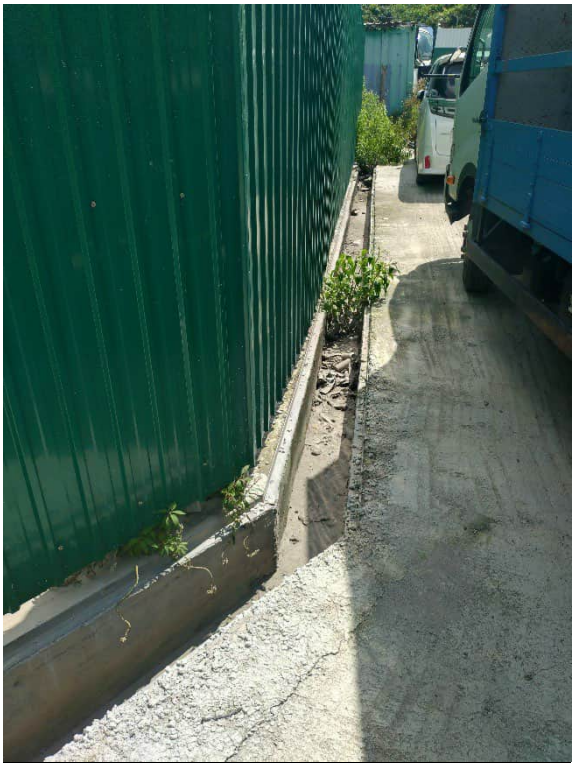


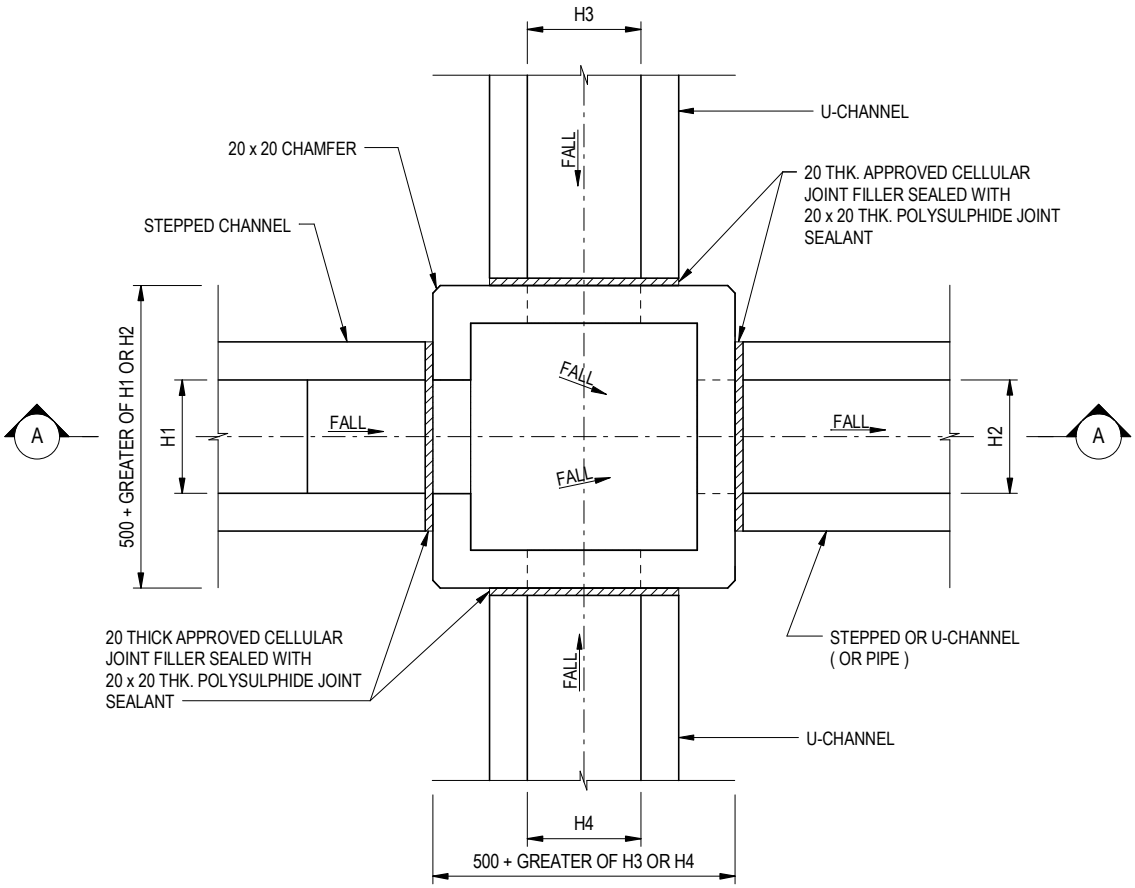
Photo 7



Photo 8

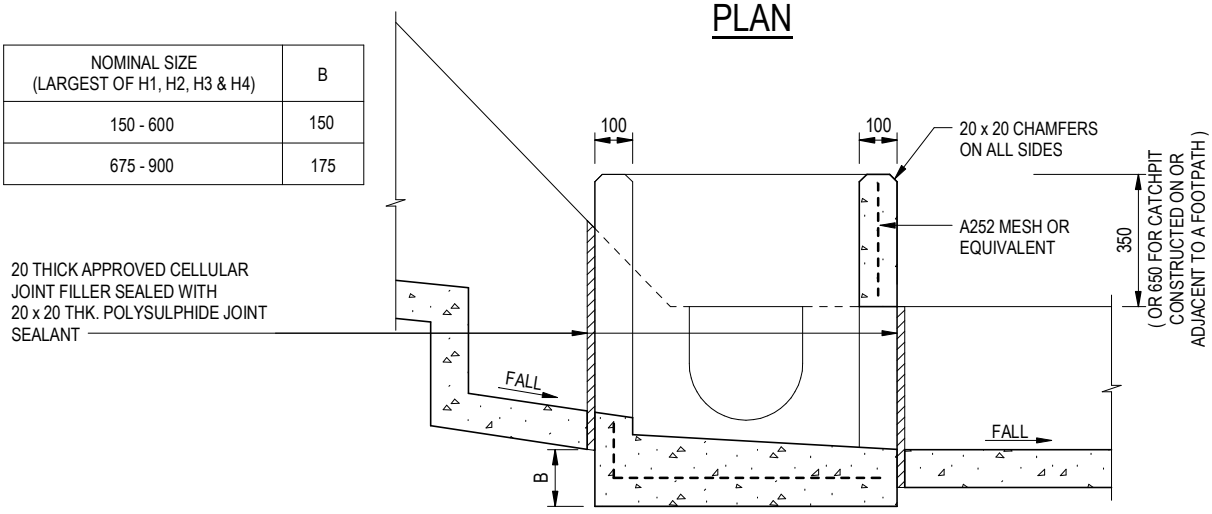
Appendix E

CEDD's Standard Drawing

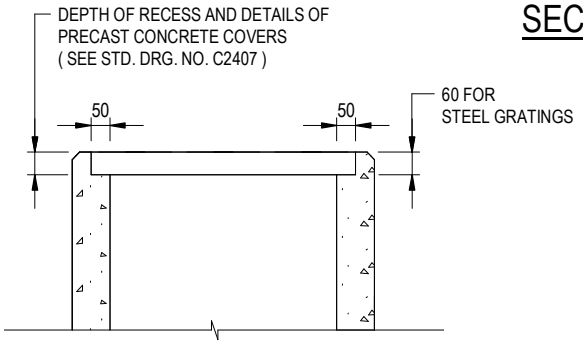


PLAN

NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4)	B
150 - 600	150
675 - 900	175



SECTION A - A



ALTERNATIVE TOP SECTION FOR PRECAST CONCRETE COVERS / GRATINGS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 5 FOR OTHER NOTES.

REF.	REVISION	SIGNATURE	DATE
A	BIM OBJECT REVISION.	Original Signed	12.2025
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

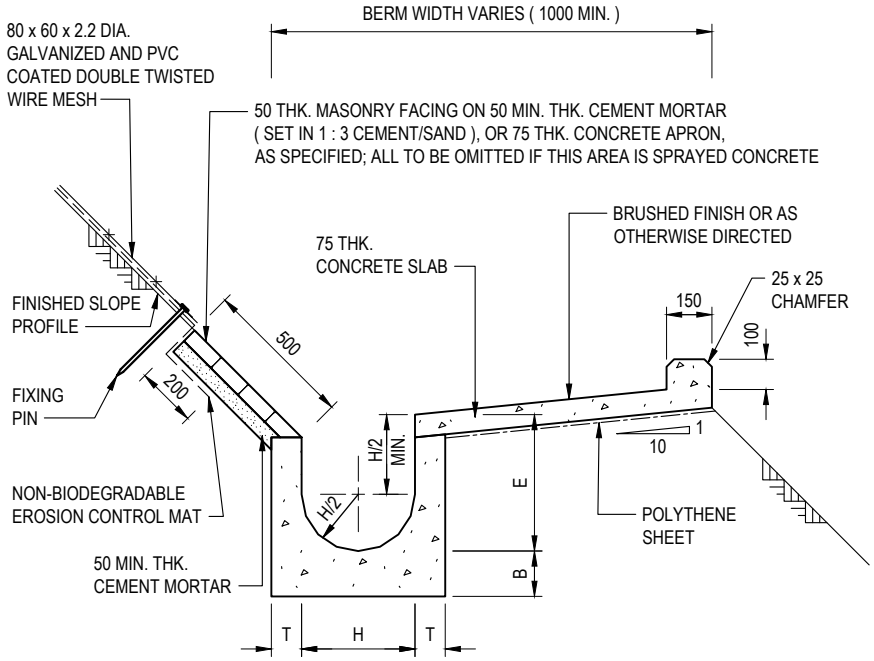
STANDARD CATCHPIT DETAILS (SHEET 1 OF 5)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

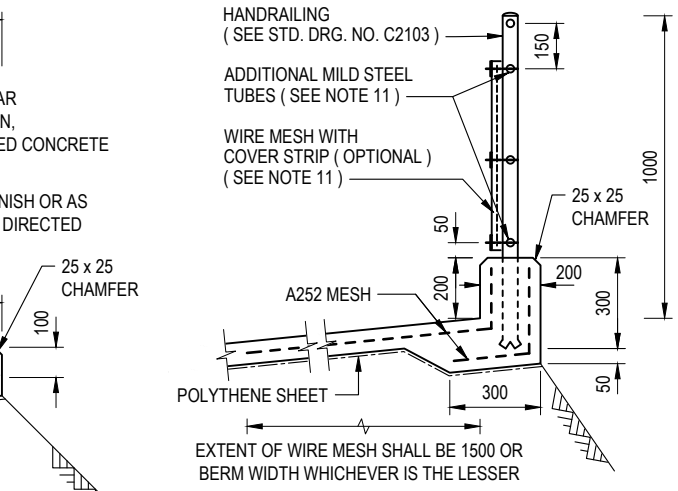
SCALE 1 : 20

DATE JAN 1991

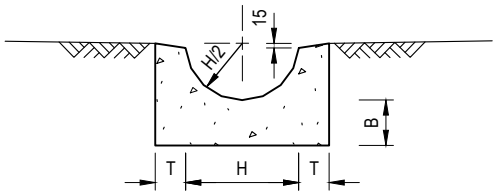
DRAWING NO. C2405 /1A



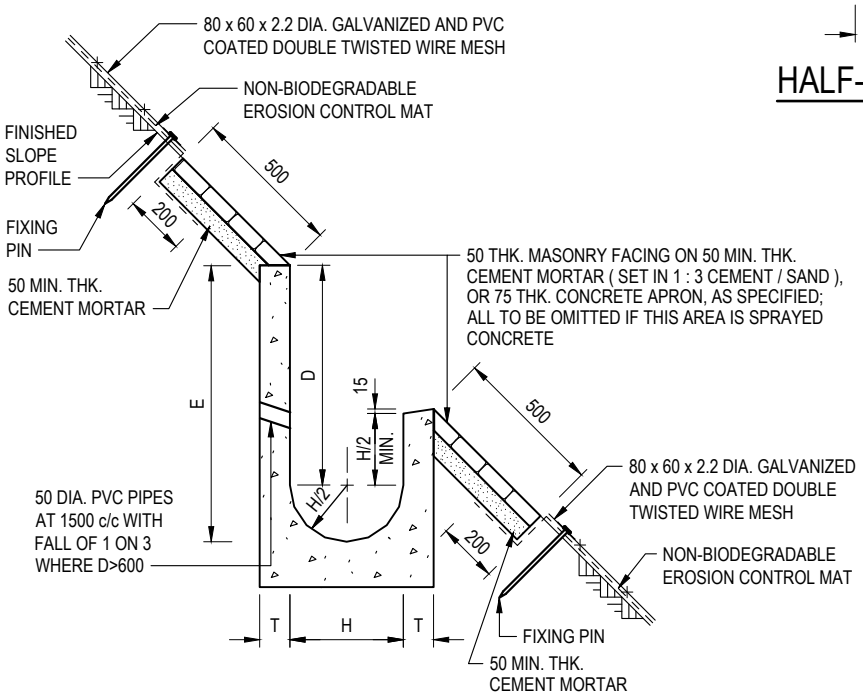
U-CHANNELS CONSTRUCTED ON BERM



DETAILS OF BERM WITH HANDRAILING



HALF-ROUND CHANNEL



U-CHANNELS NOT CONSTRUCTED ON BERM

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

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 /1.
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 WIRE MESH ON BERM. (SEE STD DRG. NO. C2511 /1)
11. THE WIRE MESH ON HANDRAILING IS OPTIONAL. THE COVER STRIP AND ADDITIONAL MILD STEEL TUBES ARE NEEDED ONLY IF WIRE MESH IS PROVIDED. (SEE STD. DRG. NO. C2103)

REF.	REVISION	SIGNATURE	DATE
K	BIM OBJECT REVISION.	Original Signed	12.2025
J	DETAILS OF HANDRAILING AMENDED.	Original Signed	08.2024
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

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

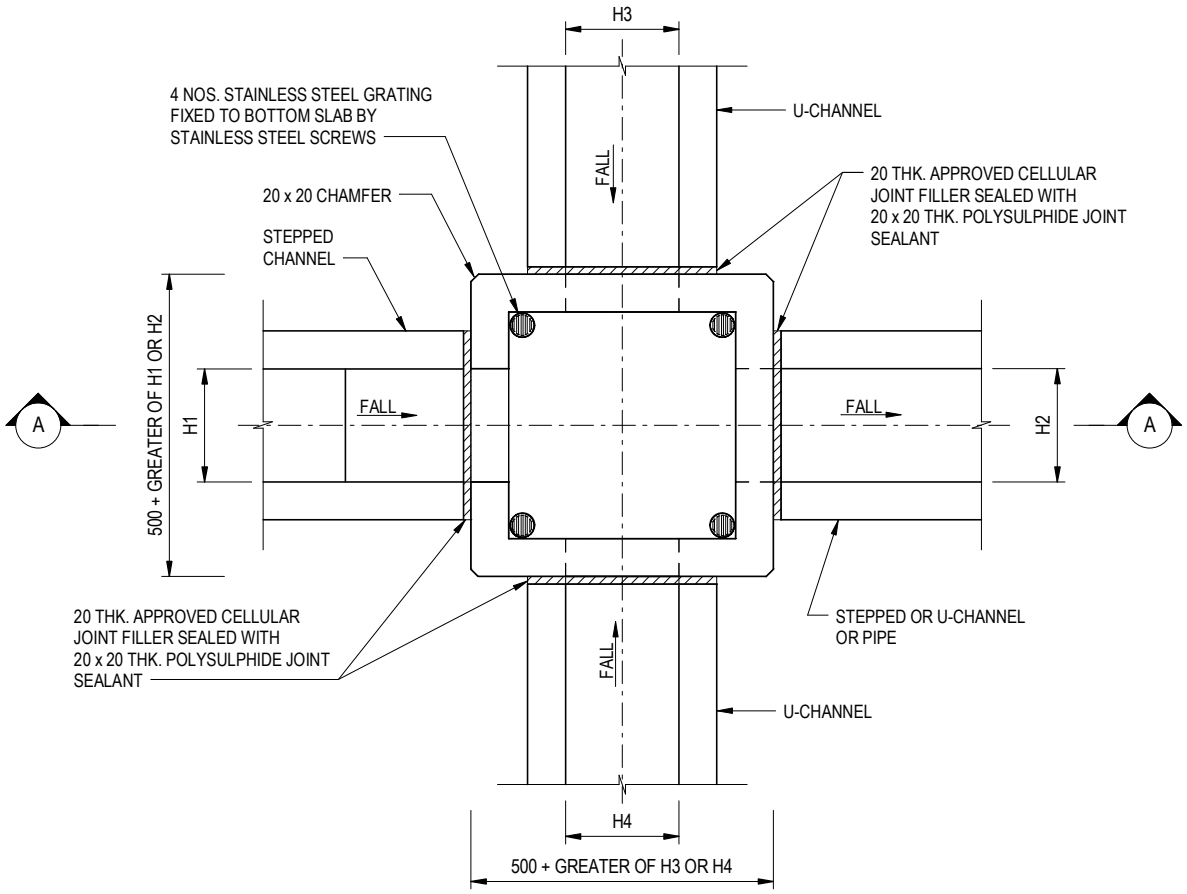
CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 25

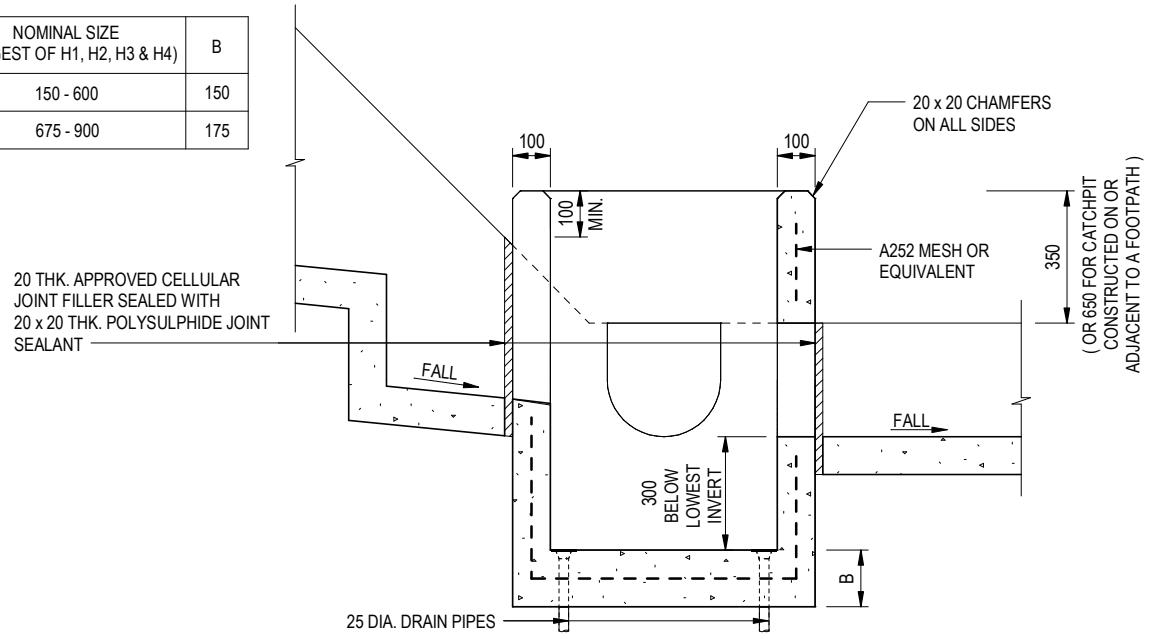
DATE JAN 1991

DRAWING NO. C2409K



PLAN

NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4)	B
150 - 600	150
675 - 900	175



SECTION A - A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 2 FOR OTHER NOTES.

REF.	REVISION	SIGNATURE	DATE
A	BIM OBJECT REVISION.	Original Signed	12.2025
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP (SHEET 1 OF 2)

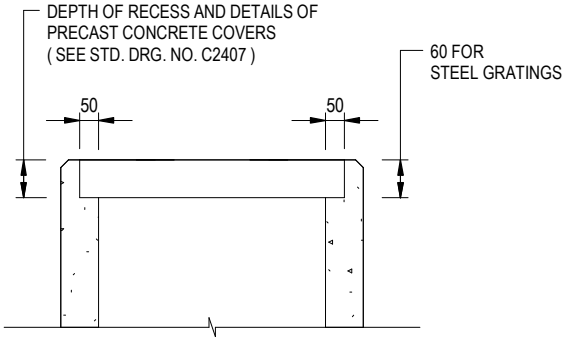
CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /1A



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 1000 mm MIN. MEASURED FROM THE ADJACENT GROUND LEVEL.

10. MINIMUM INTERNAL CATCHPIT WIDTH SHALL BE 1000 mm FOR CATCHPITS WITH A HEIGHT EXCEEDING 1000 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.

REF.	REVISION	SIGNATURE	DATE
B	BIM OBJECT REVISION.	Original Signed	12.2025
A	MINOR AMENDMENT.	Original Signed	04.2016
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP
(SHEET 2 OF 2)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.
C2406 /2B