TEMPORARY DRAINAGE PROPOSAL

TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES

ISSUE 1 (AUGUST 2026)

Content Page

Appendix

1. Introduction

This report presents temporary drainage proposal for the proposed temporary shop and services and associated filling of land for a period of 3 years in lots 428 S.A, 428 S.B, 428 S.C And 428 S.D In D.D 112, Shek Kong, Yuen Long, New Territories. The site location is shown in **Appendix A**.

1.1. Objectives of the Report

This report shall be prepared to include the following:

- Identify the potential drainage impact from the proposed Application Site
- Recommend and implement all necessary measures to mitigate adverse drainage impacts arising from the application site

1.2. Report Structure

The report contains the following sections:

- Section 1 on Introduction;
- Section 2 on Development Proposal;
- Section 3 on Assessment Methodology;
- Section 4 on Potential Drainage Impact; and /
- Section 5 on Conclusion

1.3. References

This report has been prepared with reference to the following documents:

- Stormwater Drainage Manual: Planning, Design and Management (Fifth Edition, January 2018)
- Technical Note No.1 Technical Note to Prepare a Drainage Submission (December 2024)
- Stormwater Drainage Manual – Corrigendum No. 1/2022
- Stormwater Drainage Manual – Corrigendum No. 1/2024

2. Development Proposal

2.1. Existing Site Conditions

The application site is located in Shek Kong, Yuen Long, New Territories. The total area of approximately 780 m^2. The site layout plan is provided in **Appendix B**.

The applied development is a temporary shop and services and associated filling land for a period of 3 years. The zonings are under "Agriculture". The application site is located at lots 428 S.A, 428 S.B, 428 S.C And 428 S.D In D.D 112, Shek Kong, Yuen Long, New Territories.

The application site is less than 1 ha in size and neither fall within flood prone areas such as lowlying areas and flooding blackspots nor involve pond filling and substantial earth filling, so it is regarded as simple site.

Existing 300 mm wide surface channels are located along the boundary of the application site. An existing 600 mm wide village surface channel connects to the existing 1200 mm government nullah (SCP1007961), which serves as the ultimate discharge point adjacent to the application site. The location and pictures of the existing surface channel are shown in **Appendix C**.

3. Assessment Methodology

3.1. Calculation Methodology for Runoff

According to Section 6.6.2 of *the Stormwater Drainage Manual***,** an "Urban Drainage Branch System" refers to a network of interconnected drains that collect rainwater runoff from an urban area and transport it to a trunk drain, river, or sea. In simpler terms, the largest pipe size or the equivalent diameter in case of a box culvert in a branch system will normally be less than 1.8m.

Referring to Stormwater Drainage Manual, since the proposed U-channels have dimensions smaller than 1.8m, the drainage system would be classified as an urban drainage branch. In consideration of the effect of recent climate change in the drainage design, the return period is 50 years with the storm constraints specified in *Stormwater Drainage Manual – Corrigendum No. 1/2024.*

To calculate the peak instantaneous runoff values before and after the development, the Rational Method with recommended physical parameters including runoff coefficient (C) and storm constants for different return periods are adopted referred to the SDM.

The Rational Method is adopted for hydraulic analysis and the peak runoff is calculated based on the following equation:

$$Q_p = 0.278\ Ci\ A$$

where Qp = Peak Runoff, m^3/s
C = Runoff Coefficient
i = Rainfall Intensity, mm/hr
A = Catchment Area, km^2

The runoff coefficient of 0.85 is assumed. Based on the storm constants for the 50-year return period recommended in the SDM, the appropriate rainfall intensities (i) are calculated as detailed in **Appendix E**.

3.2. Calculation Methodology for Capacity Checking

Since the catchment areas are less than 1ha, peripheral surface U-channels are recommended to be constructed to collect the stormwater runoff within the site and to intercept the overland flow from the adjacent lands.

In this scenario, fair condition of concrete U-channel is assumed for the Manning's roughness coefficient i.e coefficient value is 0.015 for calculating capacities of concrete U-channel using Manning's Equation. The recommended roughness values ks for concrete is 0.6 mm under normal condition.

Manning's Equation for calculating the channel and pipe capacities is adopted for this analysis:

$$\frac{V = R^{2/3} S^{1/2}}{n}$$

where V = mean velocity, m/s
S = slope of the total energy line
n = Manning's roughness coefficient
R = hydraulic radius, m

Deposition of sediment in stormwater drainage system is considered in the hydraulic calculation as required by the SDM. 10% reduction in flow area is adopted to consider the effects to flow capacity due to materials deposited on the bed.

3.3. Summary of Assessment Assumptions

The assumptions of the Drainage Proposal are summarized below for ease of reference:

- Runoff coefficient of 0.85 for the paved area is assumed;
- Storm constants for 50 years return periods of HKO Headquarters
- Manning's roughness coefficient of 0.015 for the proposed concrete U-channels and concrete pipe are adopted; and
- Roughness values ks of 0.6 mm for concrete is adopted.

4. Potential Drainage Impact

4.1. Change in Drainage Characteristics

The adjacent sites have no record of flooding. Peripheral surface channels are designed to collect the surface runoff accrued on the site and to intercept the overland flow from the adjacent lands. Hoardings are erected with adequate opening to allow existing overland flow passing through the site.

To manage the stormwater flows after developing the site, this drainage proposal detailed the proposed drainage system consisting of a set of U-channels for diverting stormwater flows to avoid causing flooding to the site.

4.2. Proposed Drainage Works

The runoff from the application site is proposed to be collected by U-channels along the site boundary and discharged to the terminal catchpit with sand trap and eventually discharge to the existing drainage system in vicinity of the site.

There are existing surface U-channel with 300 mm width, which are shown in **Appendix C** and **Appendix D**. Hydraulic calculations proved that they are adequate for this site. The collected stormwater will be diverted to the existing 600 mm village drain and 12000 mm nullah as ultimate discharge point in vicinity of the site.

Cover levels and invert levels of existing drainage facilities were shown on the drainage plan. The invert levels of the upstream drainage facilities were higher than those at the downstream to ensure proper flow direction. In addition, the gradients and sizes of the proposed and existing drainage facilities were also indicated on the drainage plan. The detail of the proposed drainage works in drainage plan are illustrated in **Appendix D1**.

Cross sections showing the proposed drainage facilities and the existing and proposed ground levels of the captioned site with respect to the adjacent areas were provided in **Appendix D2**.

For a conservative approach, the entire site area was considered as a single catchment in the hydraulic assessment, as presented in **Appendix E1**. In addition, an external catchment area of 780 m², including potential overflow from adjacent sites, was also taken

into account, resulting in a total contributing catchment area of 1560 m², as shown in **Appendix E2**.

The hydraulic performance of the existing terminal drainage facilities of the village drain and river is also checked under a separate calculation in **Appendix F**. The concerned development will not adversely existing drainage facilities.

The typical designs for the U-channels and catchpits are provided in **Appendix G** as a reference.

4.3. Design Calculation and Result

The design runoff arising from the proposed application site will be discharged into the existing 300 mm U-channel. The hydraulic calculations for U-channel with surface runoff from the application site and adjacent site areas are summarized in **Table 1** and appended in **Appendix E1** and **Appendix E2**.

From	To	U.S I.L	D.S I.L	Width (mm)	Length (m)	Grad.	Vel. Full Bore (m/s)	Capacity (Application Site)	Capacity (Application Site and Adjacent Site)	Check
-	CP1	23.45	22.85	300	19	32	2.44	35.3%	71.1%	OK
CP1	TCP3	22.85	21.70	300	53	46	2.03	41.3%	83.0%	OK
-	CP2	23.45	22.50	300	44	46	2.02	40.4%	81.2%	OK
CP2	TCP3	22.50	22.20	300	15	50	1.95	41.6%	83.7%	OK

Table 1: Drainage Schedule of Proposed U-channel Size

The hydraulic performance of the existing terminal drainage facilities of 600 mm village surface channel was also checked. The concerned development only occupies 8.5% of the capacity of the existing village drain which will not adversely affect the existing drainage facilities. The design checking is appended in **Appendix F**.

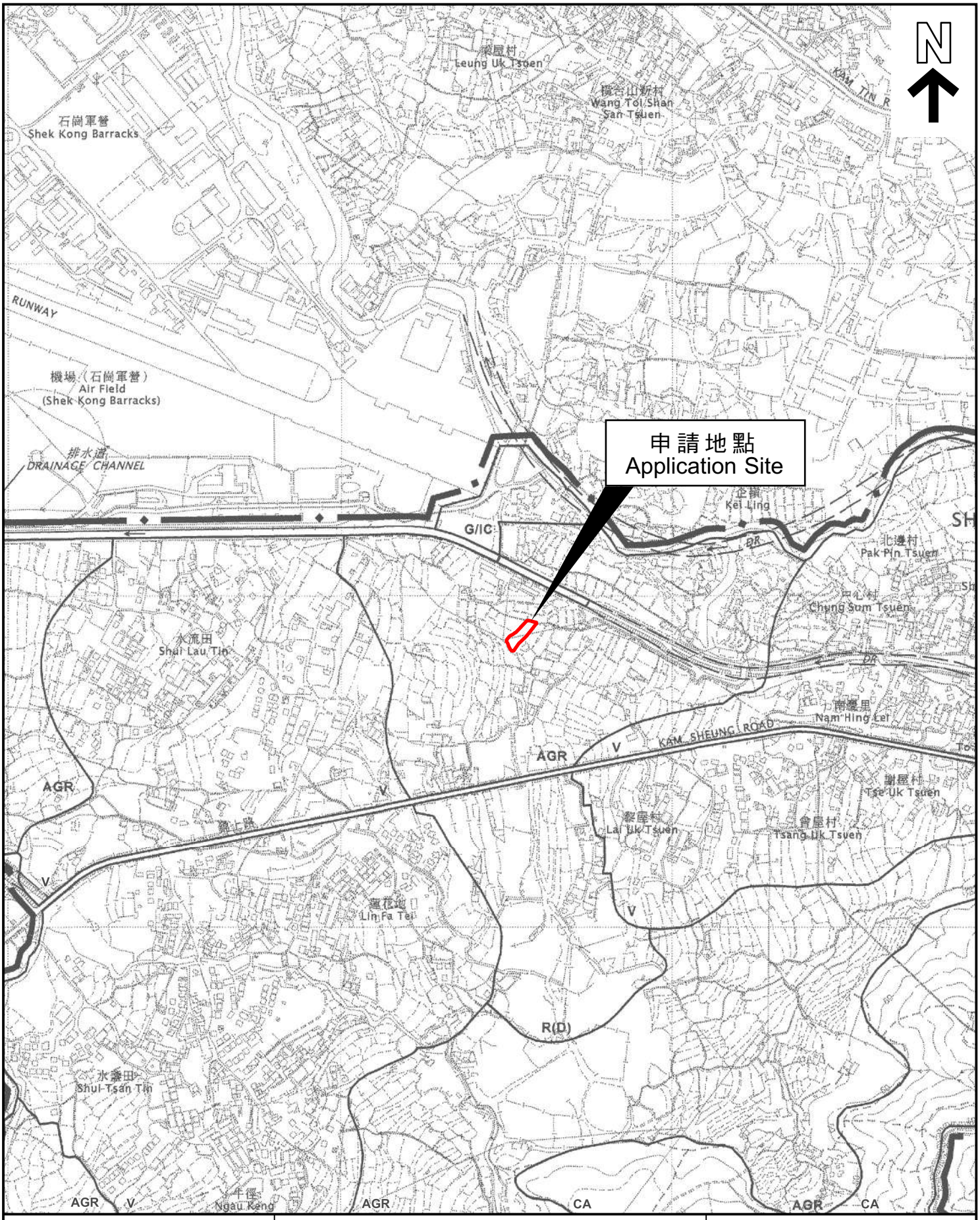
5. Conclusion

A temporary drainage proposal has been designed for the proposed temporary shop and services and associated filling of land for a period of 3 years in lots 428 S.A, 428 S.B, 428 S.C And 428 S.D In D.D 112, Shek Kong, Yuen Long, New Territories.

Based on the design calculations, a set U-channel with width of 300 mm has been deemed sufficient to convey peak runoff under a 50-year return period from the application site. The stormwater collected from the site will be discharged into the nearby existing 600 mm village surface channel and the 12000 mm government nullah as ultimate discharge point.

Coordination will be undertaken with relevant stakeholders, and feedback will be sought from appropriate government departments regarding temporary drainage arrangements to ensure the system operates effectively.

Appendix A
Location Plan of Application Site



本摘要圖於2025年7月24日擬備，
所根據的資料為於2006年10月17日
核准的分區計劃大綱圖編號S/YL-SK/9

EXTRACT PLAN PREPARED ON
24.7.2025 BASED ON OUTLINE ZONING
PLAN No. S/YL-SK/9 APPROVED ON
17.10.2006

位置圖 LOCATION PLAN

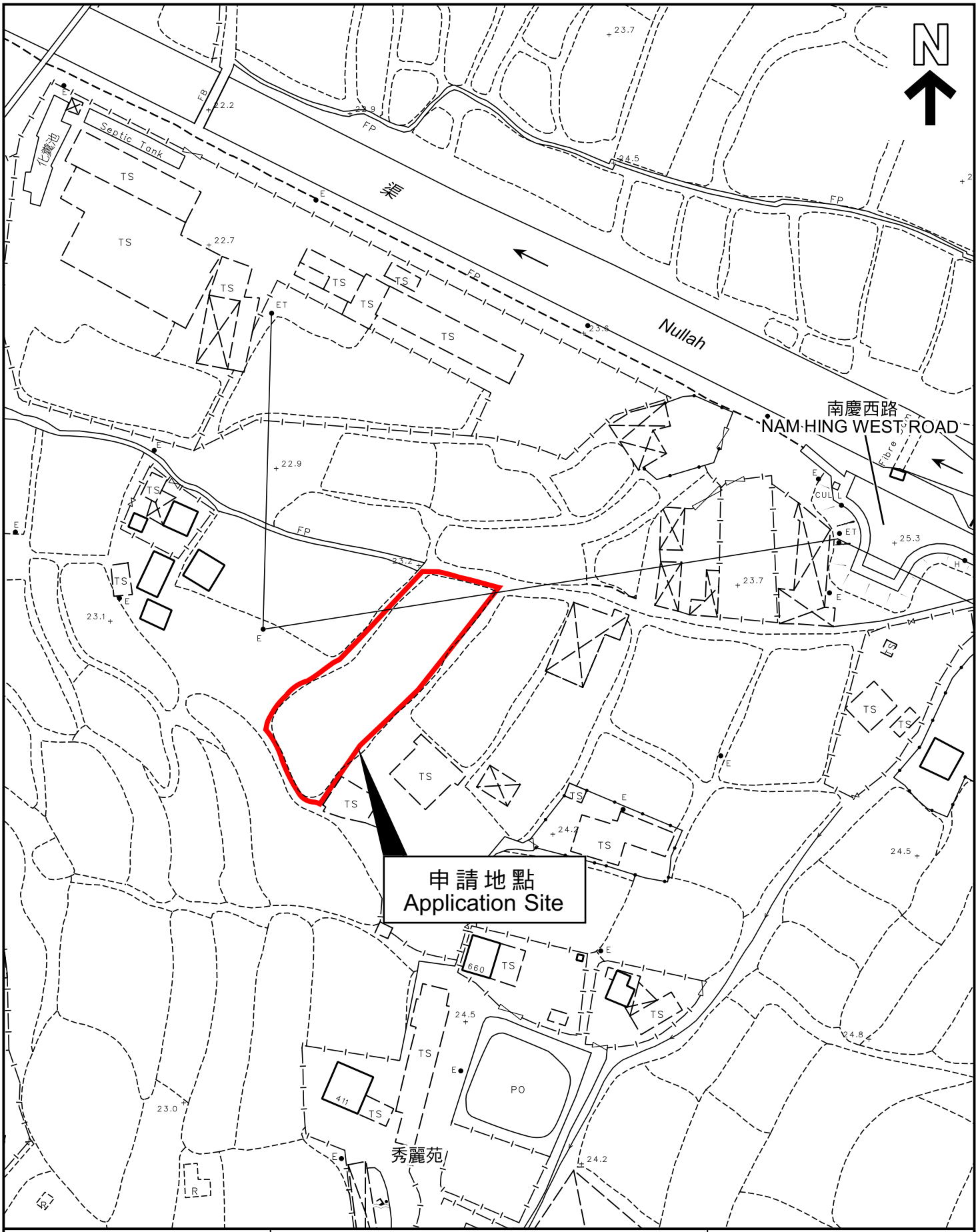
SCALE 1 : 7 500 比例尺

米 METRES 100 0 100 200 300 米 METRES

申請地點界線只作識別用
APPLICATION SITE BOUNDARY
FOR IDENTIFICATION PURPOSE ONLY

參考編號
REFERENCE No.

A/YL-SK/431



本摘要圖於2025年7月25日擬備，
所根據的資料為測量圖編號6-NE-14C及19A

EXTRACT PLAN PREPARED ON
25.7.2025 BASED ON SURVEY SHEETS
No. 6-NE-14C & 19A

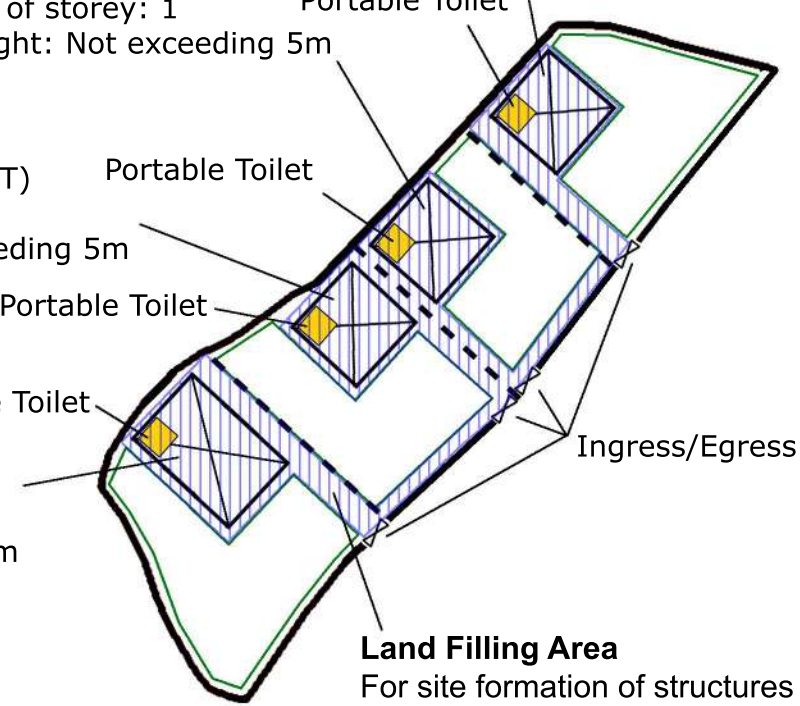
平面圖 SITE PLAN

申請地點界線只作識別用
APPLICATION SITE BOUNDARY
FOR IDENTIFICATION PURPOSE ONLY

參考編號
REFERENCE No.
A/YL-SK/431

Appendix B
Layout Plan of Application Site

N



Structure 1
Shop and service
GFA: 50㎡ (ABOUT)
No. of storey: 1
Height: Not exceeding 5m

Structure 2
Shop and service
GFA: 50㎡ (ABOUT)
No. of storey: 1
Height: Not exceeding 5m

Structure 3
Shop and service
GFA: 50㎡ (ABOUT)
No. of storey: 1
Height: Not exceeding 5m

Structure 4
Shop and service
GFA: 70㎡ (ABOUT)
No. of storey: 1
Height: Not exceeding 5m

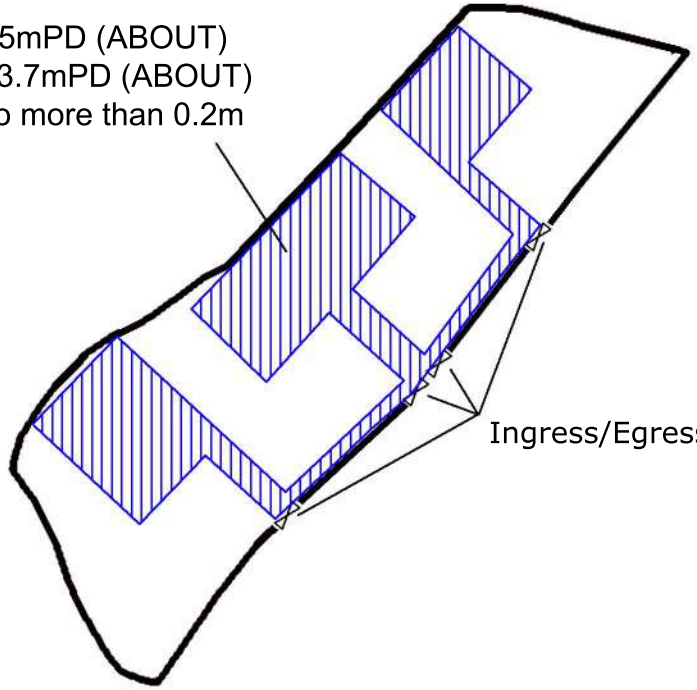
Land Filling Area
For site formation of structures and circulation path
Area: 300m² (ABOUT)
Existing site level: +23.5mPD (ABOUT)
Proposed site level: +23.7mPD (ABOUT)
Depth of land filling : No more than 0.2m

Allgain Land Planning 全堅土地規劃	Project 項目名稱: Proposed Temporary Shop and Service and Associated Filling of Land for a Period of 3 Years at Lots 428 S.A, 428 S.B, 428 S.C & 428 S.D in D.D.112, Shek Kong, Yuen Long,New Territories	Drawing Title 圖紙標題: Layout Plan Drawing No. 圖號: 20250711b	Remarks 備註: Structure; Land Filling Area

N

Land Filling Area

For site formation of structures and circulation path
Area: 300m² (ABOUT)
Existing site level: +23.5mPD (ABOUT)
Proposed site level: +23.7mPD (ABOUT)
Depth of land filling : No more than 0.2m



Allgain Land Planning
全堅土地規劃

Project 項目名稱:
Proposed Temporary Shop and Service and Associated Filling of Land for a Period of 3 Years at Lots 428 S.A, 428 S.B, 428 S.C & 428 S.D in D.D.112, Shek Kong, Yuen Long,New Territories

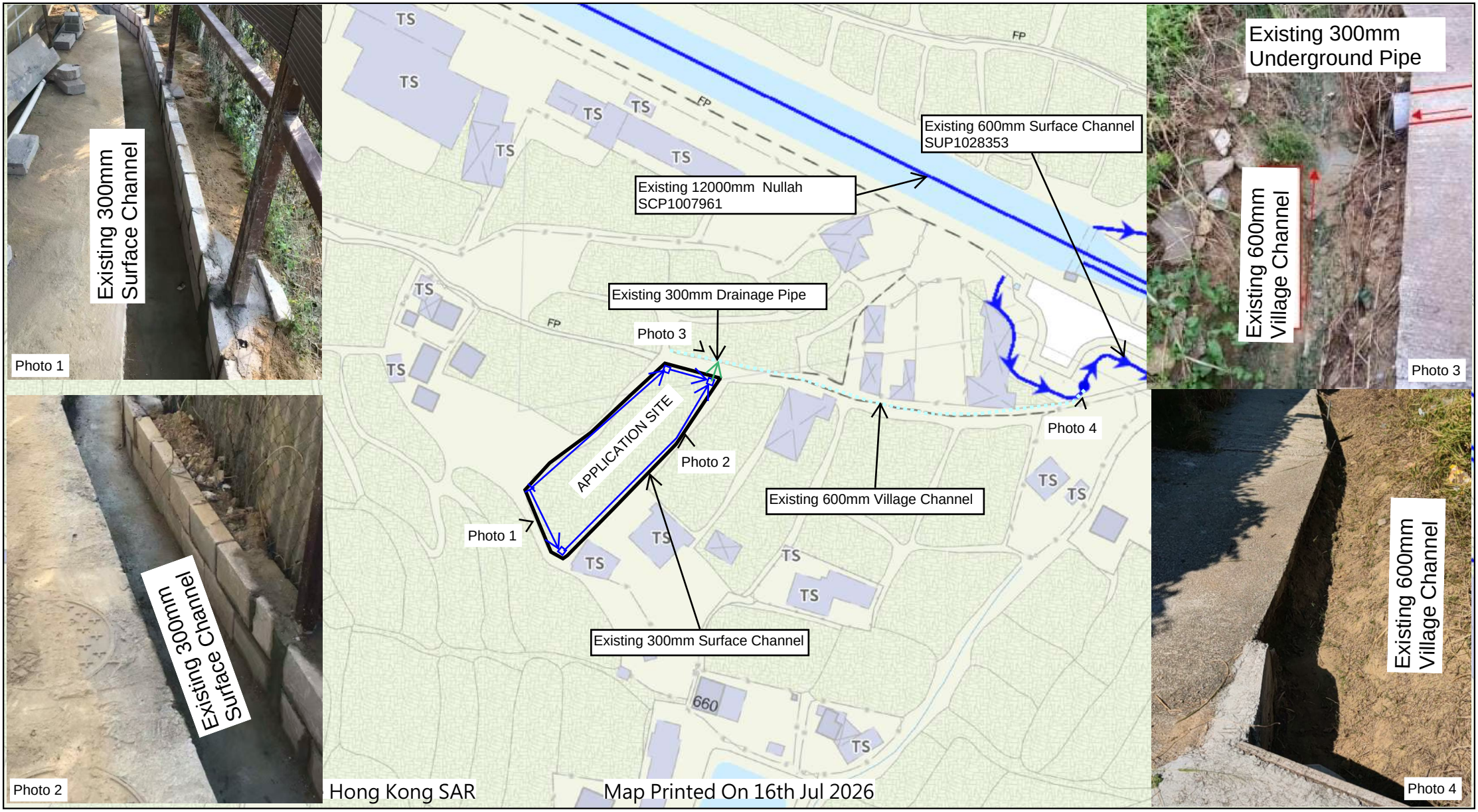
Drawing Title 圖紙標題:
Paved ratio

Drawing No. 圖號:
20250711

Remarks 備註:
Land Filling Area

Appendix C
Location Plan and Photos of the Existing Drainage

GEOINFO MAP
地理資訊地圖



TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES
JULY 2026

Appendix D
Proposed Drainage Arrangement

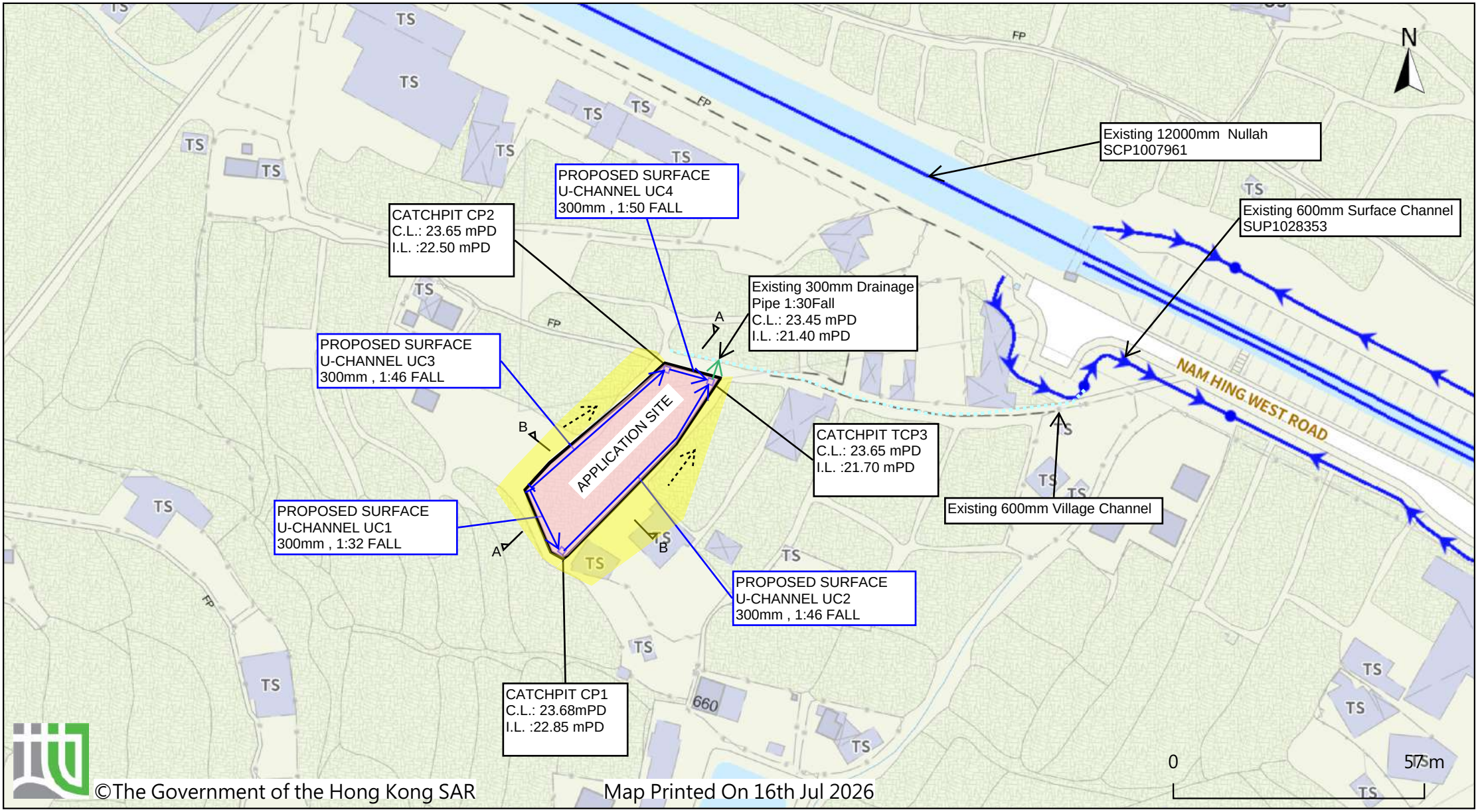
LEGEND

- SITE BOUNDARY
- FALL DIRECTION
- CATCHMENT AREA
- EXTERNAL CATCHMENT AREA
- PROPOSED U- CHANNEL
- PROPOSED CATCHPIT
- EXISTING SURFACE CHANNEL

DRAWING TITLE:

PROPOSED DRAINAGE WORKS

APPENDIX D
ISSUE 1



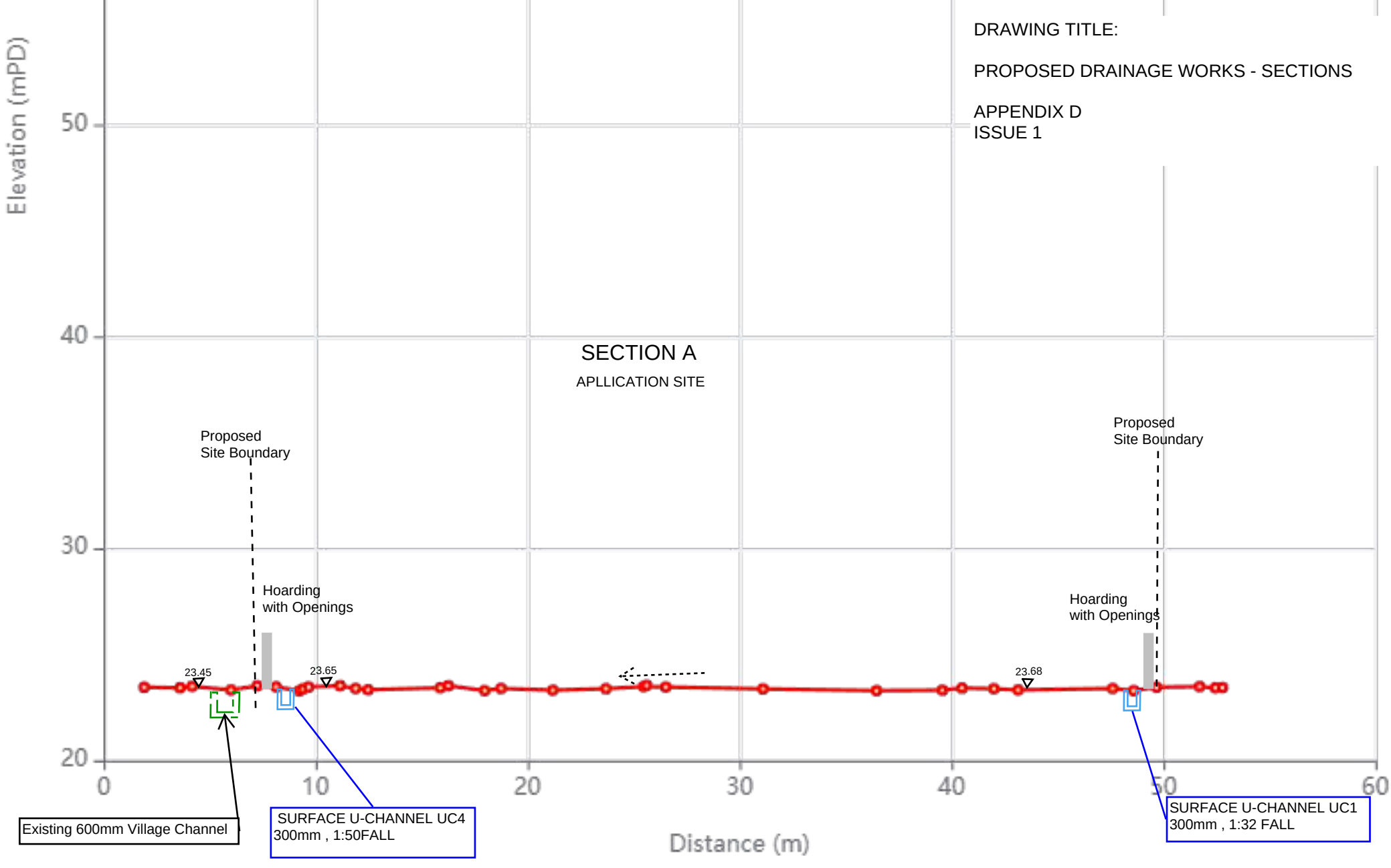
Map Printed On 16th Jul 2026

TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES
JULY 2026

DRAWING TITLE:

PROPOSED DRAINAGE WORKS - SECTIONS

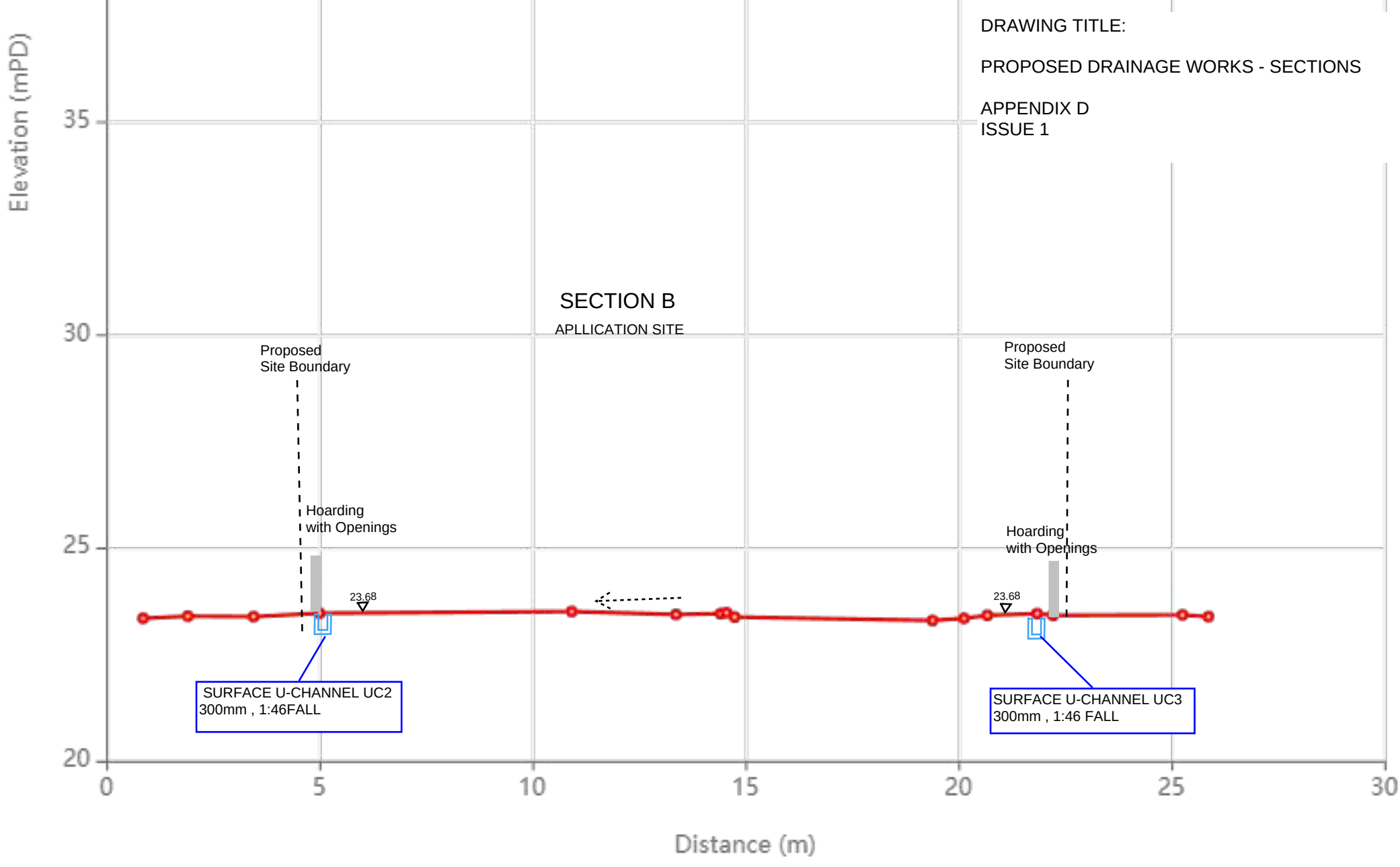
APPENDIX D
ISSUE 1



DRAWING TITLE:

PROPOSED DRAINAGE WORKS - SECTIONS

APPENDIX D
ISSUE 1



Appendix E1
Hydraulic Calculation for Proposed U Channel for Application Site

Calculation Sheet	Date:	2026-07-18
Project Title:		
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES	Designed by:	RF
	Appendix :	E1
	Sheet No.:	1

Hydraulic Design for U Channel for Development Area

Catchpit No.		Catchment				Level				U Channel								Manning's Equation								
From (U/S)	To (D/S)	Surface Channel	Catchment. Area (m^2)	Runoff Coef. C	Ave. Slope / 100m	U/S C.L. (mPD)	D/S C.L. (mPD)	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Nominal Width (mm)	Nominal Depth (mm)	Lgth (m)	Grad. (1 in)	Restricted U Channel Area Ar (m2)	Wetted Peri.P (mm)	Hyd. Radius R (mm)	Mng's Coef. n	Vel. V at Full Bore (m/s)	Cap. Q_o (m^3/s)	Velocity Check	Time of Conc. t_c (min)	Rainfall Intensity i (mm/hr)	Runoff Q (m^3/s)	Capacity % (Q/Q_o)	Capacity Check
-	CP1	UC1	780	0.85	1	23.75	23.68	23.45	22.85	CO	300	300	19	32	0.07	0.77	0.09	0.015	2.44	0.18	OK	1.412	338.47	0.06	35.3%	OK
CP1	TCP3	UC2	780	0.85	1	23.65	23.48	22.85	21.70	CO	300	300	53	46	0.07	0.77	0.09	0.015	2.03	0.15	OK	1.848	327.98	0.06	41.3%	OK
-	CP2	UC4	780	0.85	1	23.75	23.65	23.45	22.50	CO	300	300	44	46	0.07	0.77	0.09	0.015	2.02	0.15	OK	2.211	320.13	0.06	40.4%	OK
CP2	TCP3	UC5	780	0.85	1	23.65	23.48	22.50	22.20	CO	300	300	15	50	0.07	0.77	0.09	0.015	1.95	0.14	OK	2.339	317.52	0.06	41.6%	OK

Hydraulic Design for Drainage Pipe for Development Area

		Catchment					Pipe				Colebrook-White Equation							Manning's Equation								
												Pipe Flow							Pipe Flow							
From (U/S)	To (D/S)	Incre. Area (m^2)	Accum. Area (m^2)	Runoff Coef. C	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Dia. (mm)	Lgth (m)	Grad. (1 in)	Rough-ness k_s (mm)	Vel. V (m/s)	Cap. Q_o (m^3/s)	Time of Conc. t_c (min)	Rainfall Inten-sity i (mm/hr)	Runoff Q (m^3/s)	Velocit y Check	Mng's Coef. n	Vel. V (m/s)	Cap. Q_o (m^3/s)	Capacity Check	Time of Conc. t_c (min)	Rainfall Inten-sity i (mm/hr)	Runoff Q (m^3/s)	Runoff / Cap. (Q/Q_o)	Capacity Check
TCP3	DP1	780	780	1	21.70	21.40	CO	300	9	30	0.60	2.879	0.204	2.391	273	0.059	OK	0.015	2.165	0.153	OK	2.339	274	0.059	38.8%	OK

Formulae:

t_c = Time of Concentration = $t_o + t_f$

where t_o = Inlet Time = 1.412

t_f = Flow Time = å (Pipe Length / Flow Velocity)

V = Pipe Flow Velocity

= $(R)^{2/3}s^{1/2}/n$ for Manning's Equation

where g = Gravitational Acceleartion = 9.81 m/s^2

R = Hydraulic Radius

s = Frictional Slope

k_s = Surface Roughness = 0.6 mm for concrete CO — Ref. DSD SDM Table 14

= 0.06 mm for cast iron CI

= 0.6 mm for ductile iro DI

n = Kine. Viscosity = 1.141E-06 m^2/s

n = Manning's Coef. = 0.015 for concrete CO — Ref. DSD SDM Table 13

0.015 for cast iron CI

0.015 for ductile iron DI

Q_o = Pipe Flow Capacity = $(\pi D^2/4)V$

i = Rainfall Intensity — HKO Headquarters

= $a / (t_c + b)^c$ where a = 505.5 for a return period of 50 years — Ref. DSD Corrigendum No. 1/2024 SDM Table 3a

b = 3.29

c = 0.355

Rainfall Increase = 16 % due to climate change

Q = Runoff = 0.278*CiA

where C = Runoff Coefficient

A = Catchment Area

Ar = 0.9 Flow Area (10% reduction for Sedimentation) — Ref. DSD SDM Section 9.3

Appendix E2
Hydraulic Calculation with Adjacent Area

Calculation Sheet	Date:	2026-07-18
Project Title:		
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES	Designed by:	RF
	Appendix :	E2
	Sheet No.:	1

Hydraulic Design for U Channel for Development Area

Catchpit No.		Catchment				Level				U Channel									Manning's Equation								
From (U/S)	To (D/S)	Surface Channel	Catchment. Area (m^2)	Runoff Coef. C	Ave. Slope / 100m	U/S C.L. (mPD)	D/S C.L. (mPD)	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Nominal Width (mm)	Nominal Depth (mm)	Lgth (m)	Grad. (1 in)	Restricted U Channel Area Ar (m2)	Wetted Peri.P (mm)	Hyd. Radius R (mm)	Mng's Coef. n	Vel. V at Full Bore (m/s)	Cap. Q_o (m^3/s)	Velocity Check	Time of Conc. t_c (min)	Rainfall Intensity i (mm/hr)	Runoff Q (m^3/s)	Capacity % (Q/Q_o)	Capacity Check
-	CP1	UC1	1560	0.85	1	23.75	23.68	23.45	22.85	CO	300	300	19	32	0.07	0.77	0.09	0.015	2.44	0.18	OK	1.318	340.92	0.13	71.1%	OK
CP1	TCP3	UC2	1560	0.85	1	23.65	23.48	22.85	21.70	CO	300	300	53	46	0.07	0.77	0.09	0.015	2.03	0.15	OK	1.753	330.15	0.12	83.0%	OK
-	CP2	UC4	1560	0.85	1	23.75	23.65	23.45	22.50	CO	300	300	44	46	0.07	0.77	0.09	0.015	2.02	0.15	OK	2.116	322.11	0.12	81.2%	OK
Cp2	TCP3	UC5	1560	0.85	1	23.65	23.48	22.50	22.20	CO	300	300	15	50	0.07	0.77	0.09	0.015	1.95	0.14	OK	2.245	319.44	0.12	83.7%	OK

Hydraulic Design for Drainage Pipe for Development Area

		Catchment					Pipe				Colebrook-White Equation							Manning's Equation								
												Pipe Flow							Pipe Flow							
From (U/S)	To (D/S)	Incre. Area (m^2)	Accum. Area (m^2)	Runoff Coef. C	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Dia. (mm)	Lgth (m)	Grad. (1 in)	Rough-ness k_s (mm)	Vel. V (m/s)	Cap. Q_o (m^3/s)	Time of Conc. t_c (min)	Rainfall Inten-sity i (mm/hr)	Runoff Q (m^3/s)	Velocit y Check	Mng's Coef. n	Vel. V (m/s)	Cap. Q_o (m^3/s)	Capacity Check	Time of Conc. t_c (min)	Rainfall Inten-sity i (mm/hr)	Runoff Q (m^3/s)	Runoff / Cap. (Q/Q_o)	Capacity Check
TCP3	DP1	1560	1560	1	21.70	21.40	CO	300	9	30	0.60	2.879	0.204	2.297	274	0.119	OK	0.015	2.165	0.153	OK	2.245	275	0.119	78.0%	OK

Formulae:

t_c = Time of Concentration = $t_o + t_f$

where t_o = Inlet Time = 1.318

t_f = Flow Time = å (Pipe Length / Flow Velocity)

V = Pipe Flow Velocity

= $(R)^{2/3}s^{1/2}/n$ for Manning's Equation

where g = Gravitational Acceleartion = 9.81 m/s^2

R = Hydraulic Radius

s = Frictional Slope

k_s = Surface Roughness = 0.6 mm for concrete CO

= 0.06 mm for cast iron CI

= 0.6 mm for ductile iro DI

Ref. DSD SDM Table 14

n = Kine. Viscosity = 1.141E-06 m^2/s

n = Manning's Coef. = 0.015 for concrete CO

0.015 for cast iron CI

0.015 for ductile iron DI

Ref. DSD SDM Table 13

Q_o = Pipe Flow Capacity = $(\pi D^2/4)V$

i = Rainfall Intensity HKO Headquarters

= $a / (t_c + b)^c$ where a = 505.5 for a return period of 50 years

Ref. DSD Corrigendum No. 1/2024 SDM Table 3a

b = 3.29

c = 0.355

Rainfall Increase = 16 % due to climate change

Q = Runoff = 0.278*CiA

where C = Runoff Coefficient

A = Catchment Area

Ar = 0.9 Flow Area (10% reduction for Sedimentation)

Ref. DSD SDM Section 9.3

Appendix F
Design Checking for Existing Drainage System

Calculation Sheet	Date:	2026-07-18
Project Title:		
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY SHOP AND SERVICES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS IN LOTS428 S.A, 428 S.B, 428 S.C AND 428 S.D IN D.D 112, SHEK KONG, YUEN LONG, NEW TERRITORIES	Designed by:	RF
	Appendix :	F
	Sheet No.:	1

Design Checking for Existing Village Drain

Catchpit No.		Catchment				Level				U Channel							Manning's Equation								
From (U/S)	To (D/S)	Channel	Catchment. Area (m^2)	Runoff Coef. C	Ave. Slope / 100m	U/S G.L. (mPD)	D/S G.L. (mPD)	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Width (mm)	Lgth (m)	Grad. (1 in)	Restricted Flow Area A (m2)	Wetted Peri.P (mm)	Hyd. Radius R (mm)	Mng's Coef. n	Vel. V at Full Bore (m/s)	Cap. Q_o (m^3/s)	Velocity Check	Time of Conc. t_c (min)	Rainfall Intensity i (mm/hr)	Runoff Q (m^3/s)	Capacity % (Q/Q_o)	Capacity Check
DP1	EXISTING	600U	1560	0.85	1	23.48	21.80	21.40	19.90	CO	600	98	65	0.45	2.74	0.16	0.015	2.48	1.12	OK	6.796	258.15	0.10	8.5%	OK

Formulae:

t_c = Time of Concentration = $t_o + t_f$

where t_o = Inlet Time = 6.796 min

t_f = Flow Time = â (Pipe Length / Flow Velocity)

V = Pipe Flow Velocity

= $(R)^{2/3}s^{1/2}/n$ for Manning's Equation

where g = Gravitational Accelearation = 9.81 m/s^2

R = Hydraulic Radius

s = Frictional Slope

k_s = Surface Roughness = 0.6 mm for concrete CO — Ref. DSD SDM Table 14

= 0.06 mm for cast iron CI

= 0.6 mm for ductile iro DI

n = Kine. Viscosity = 1.141E-06 m^2/s

n = Manning's Coef. = 0.015 for concrete CO — Ref. DSD SDM Table 13

0.015 for cast iron CI

0.015 for ductile iro DI

Q_o = Pipe Flow Capacity = $(\pi D^2/4)V$

i = Rainfall Intensity — HKO Headquarters

= $a / (t_c + b)^c$ where a = 505.5 for a return period of 50 years — Ref. DSD Corrigendum No. 1/2024 SDM Table 3a

b = 3.29

c = 0.355

Rainfall Increase = 16 % due to climate change

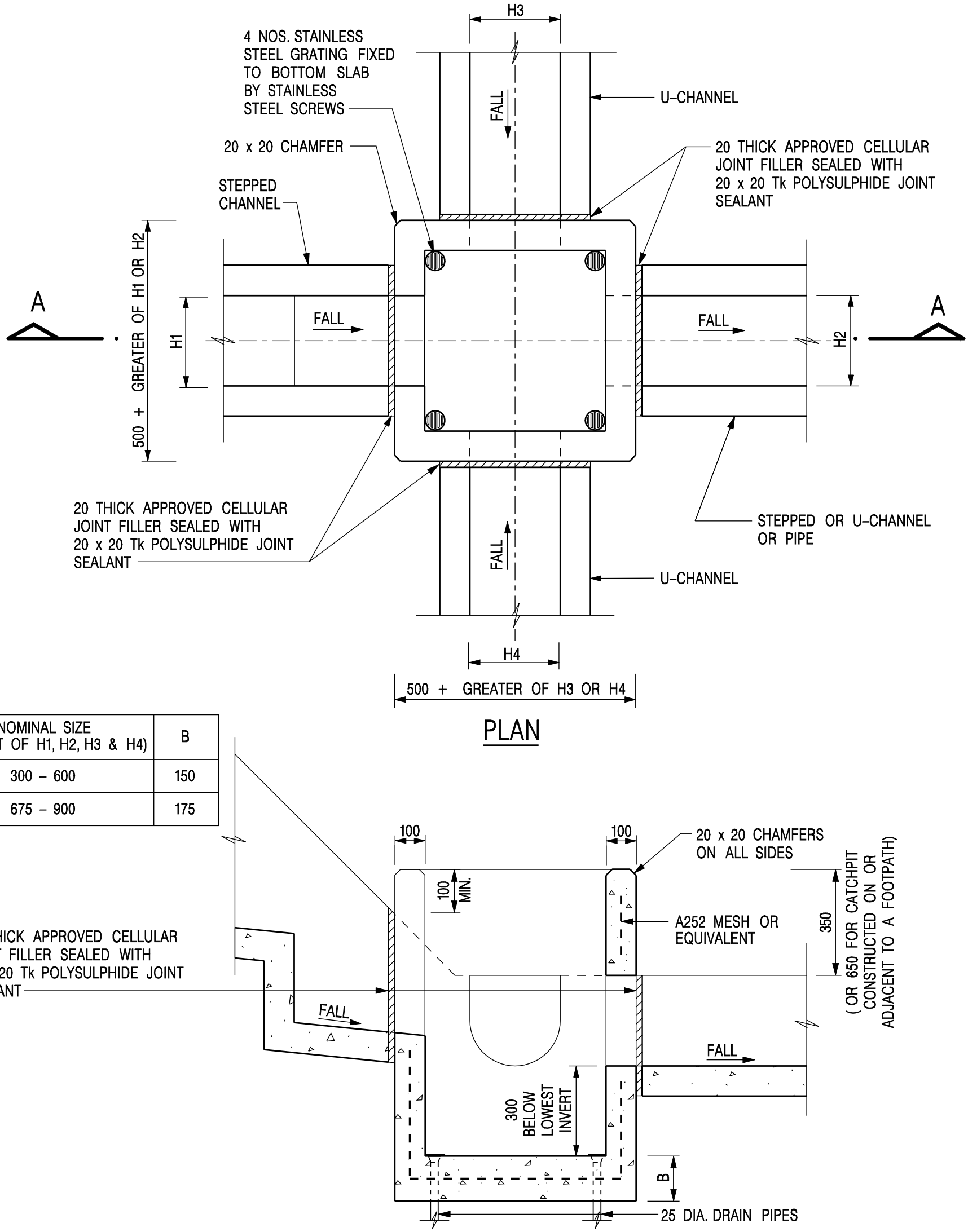
Q = Runoff = 0.278*CiA

where C = Runoff Coefficient

A = Catchment Area — Ref. DSD SDM Section 9.3

Ar = 0.9 Flow Area

Appendix G
Construction Details and
Typical designs of the U-channels and Catchpits



PLAN

NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4)	B
300 – 600	150
675 – 900	175

SECTION A – A

NOTES:

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

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

CATCHPIT WITH TRAP

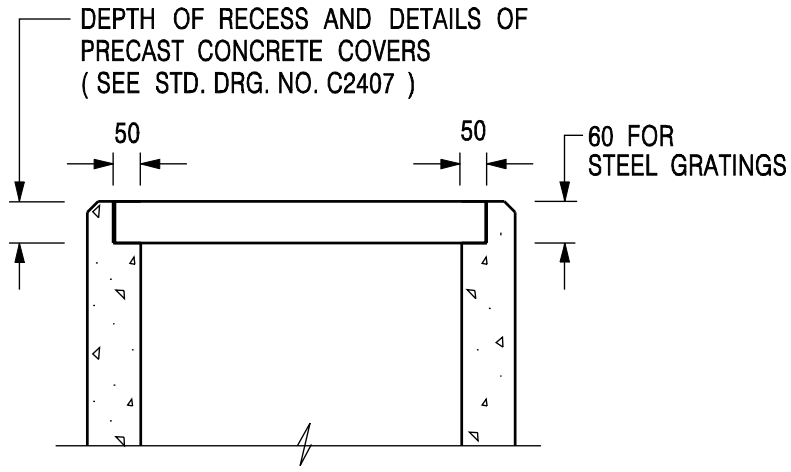
(SHEET 1 OF 2)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /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.

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

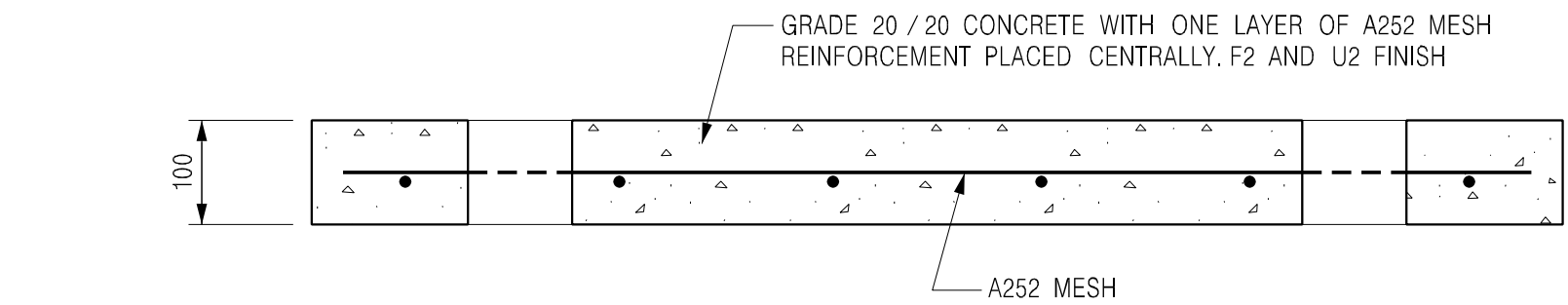
CATCHPIT WITH TRAP
(SHEET 2 OF 2)

CEDD **CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**

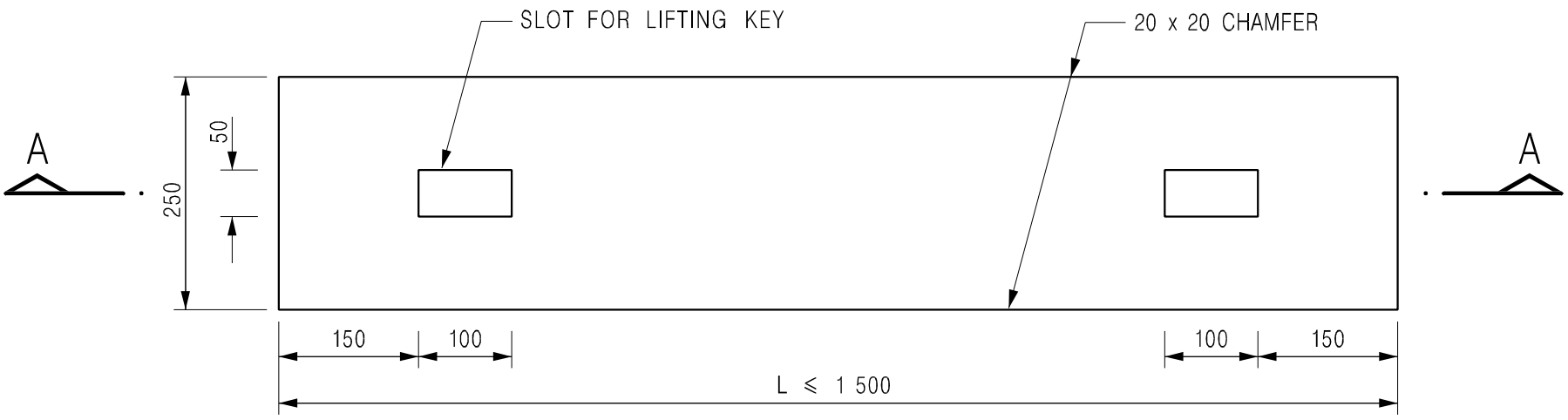
SCALE 1 : 20

DATE JAN 1991

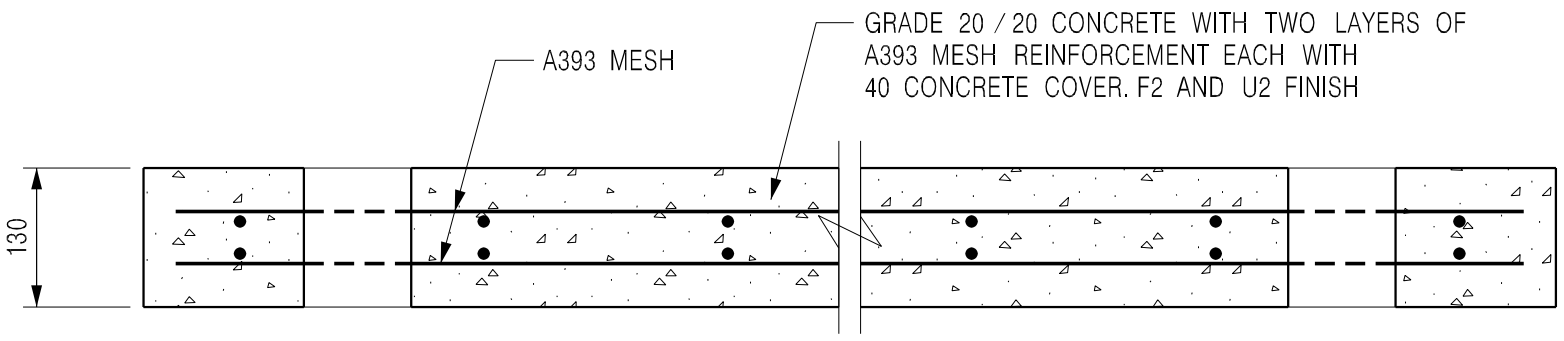
DRAWING NO. C2406 /2A



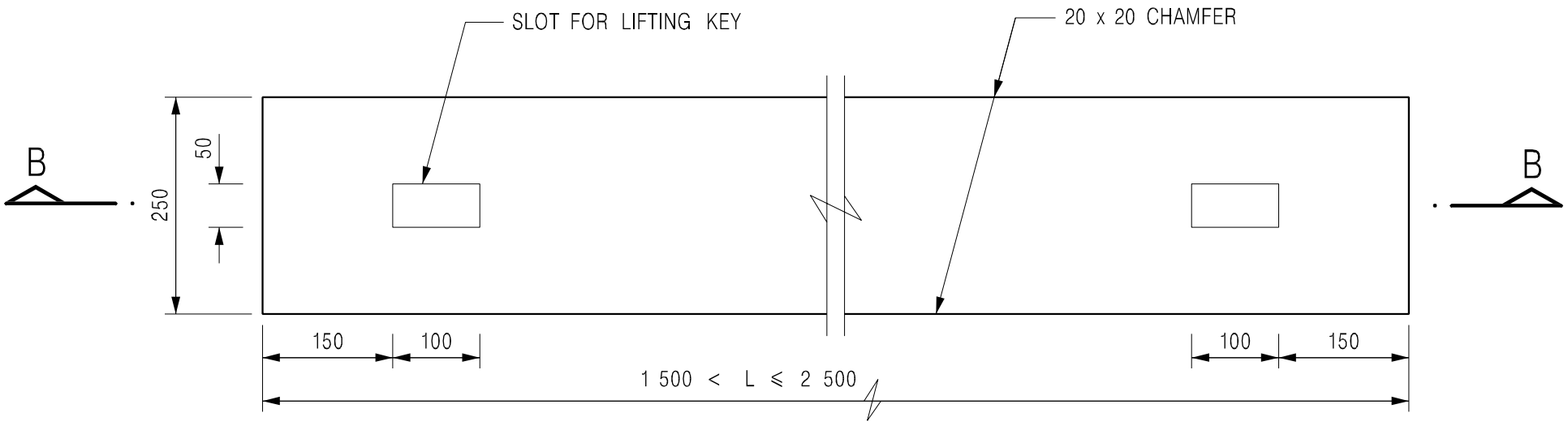
SECTION A – A



PLAN
TYPE 1 – FOR SPAN UP TO 1.5 m



SECTION B – B



PLAN
TYPE 2 – FOR SPANS 1.5 m TO 2.5 m

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL EXTERNAL EDGES OF THE COVERS SHALL BE 20mm CHAMFERED.

REF.	REVISION	SIGNATURE	DATE
B	NAME OF DEPARTMENT AMENDED.	Original Signed	01.2005
A	GENERAL REVISION	Original Signed	12.2002

PRECAST CONCRETE COVERS FOR CATCHPIT AND SAND TRAP

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

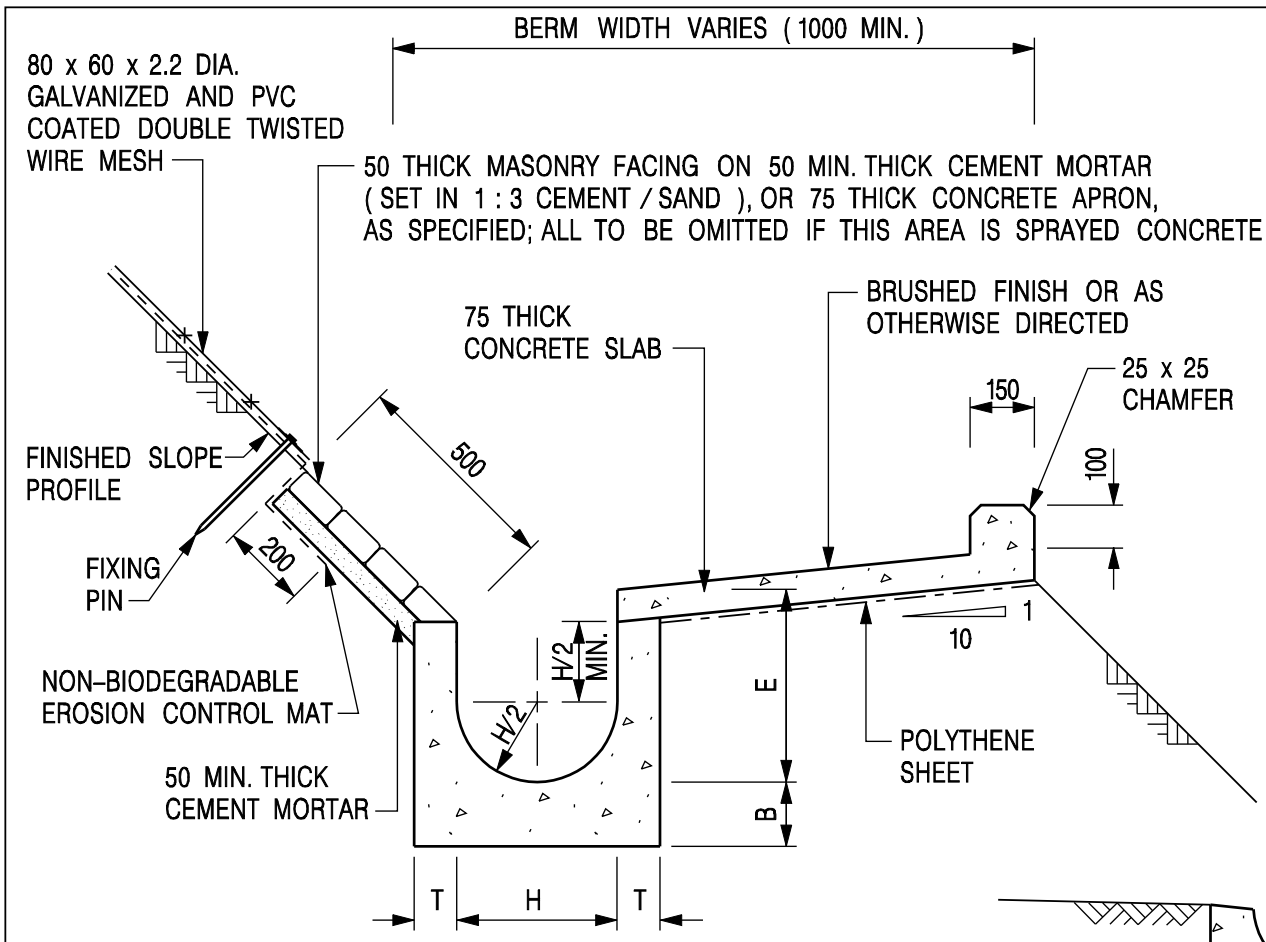
SCALE 1 : 10

DATE JAN 1991

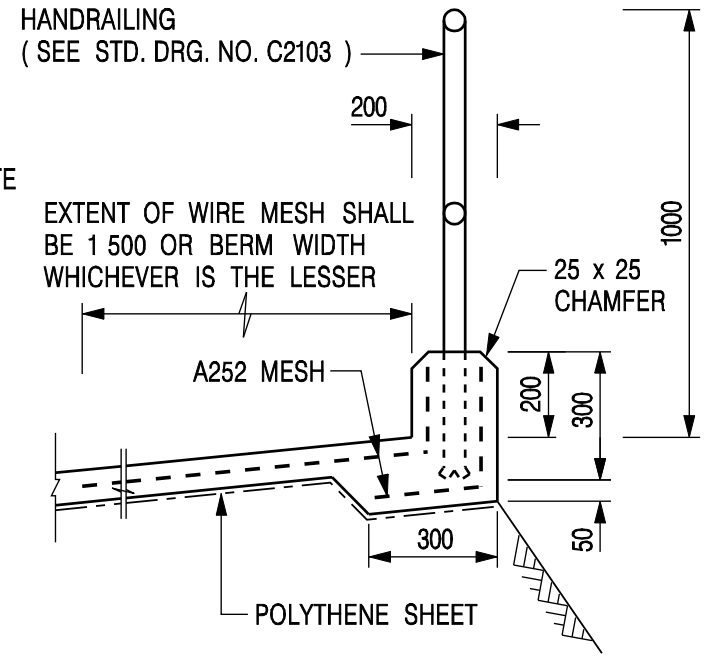
DRAWING NO. C2407B

興土木 利民生 齊拓展 創明天

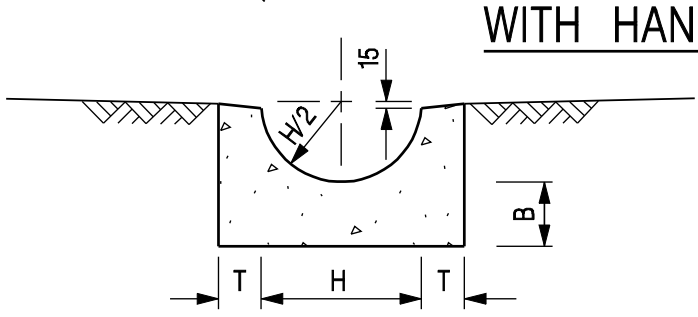
We bring the best engineering to life



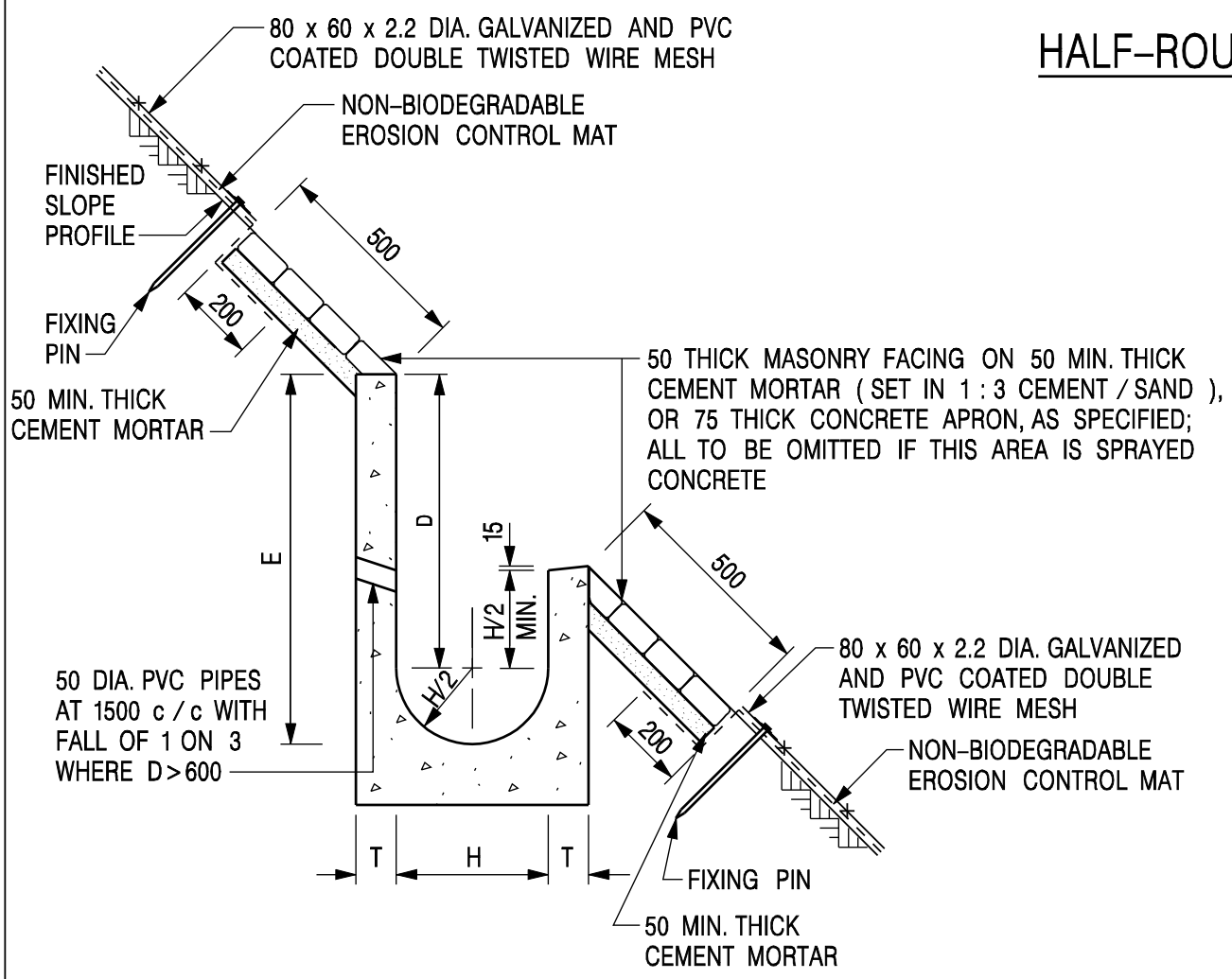
U-CHANNELS CONSTRUCTED ON BERM



DETAILS OF BERM WITH HANDRAILING



HALF-ROUND CHANNEL



U-CHANNELS NOT CONSTRUCTED ON BERM

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. C2511/1E.
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. C2511/1E)

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

REF.	REVISION	SIGNATURE	DATE
I	MINOR AMENDMENT.	Original Signed	07.2018
H	THICKNESS OF MASONRY FACING AMENDED.	Original Signed	01.2005
G	MINOR AMENDMENT.	Original Signed	01.2004
F	GENERAL REVISION.	Original Signed	12.2002
E	DRAWING TITLE AMENDED.	Original Signed	11.2001
D	MINOR AMENDMENT.	Original Signed	08.2001
C	150 x 100 UPSTAND ADDED AT BERM.	Original Signed	6.99
B	MINOR AMENDMENTS.	Original Signed	3.94

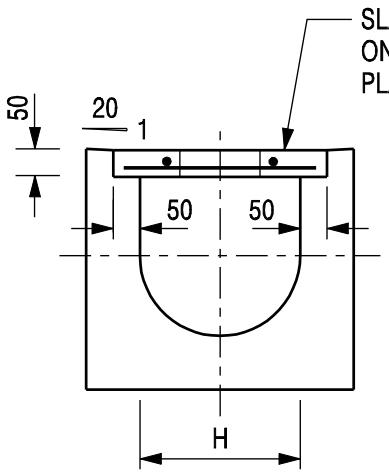
DETAILS OF HALF-ROUND AND U-CHANNELS (TYPE A - WITH MASONRY APRON)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

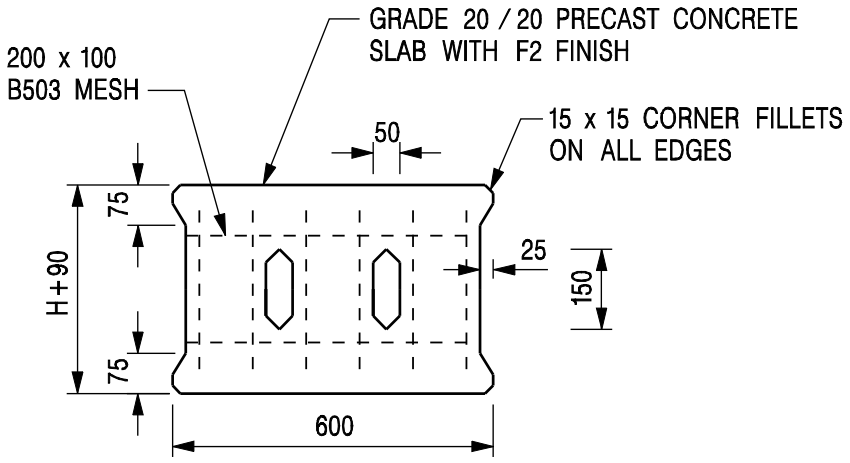
SCALE 1 : 25

DATE JAN 1991

DRAWING NO. C2409I



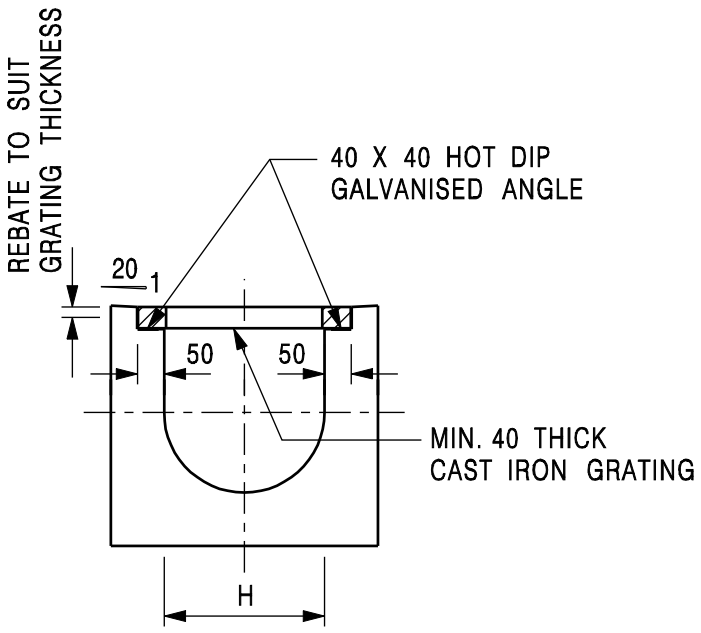
TYPICAL SECTION



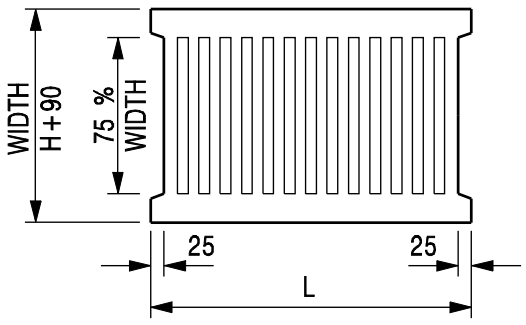
PLAN OF SLAB

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

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2412E

卓越工程 建設香港

We Engineer Hong Kong's Development