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附件: TEMPORARY DRAINAGE PROPOSAL_SK439_FULLSET.pdf

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大家好。

有關 **s16 No.A/YL-SK/439**，現附上申請人回應部門意見，請查收。

如有什麼問題，請隨時聯絡我。

謝謝。

Ms Chong
[REDACTED]

TEMPORARY DRAINAGE PROPOSAL



**TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY PLACE OF RECREATION SPORTS OR CULTURE (HOBBY FARM) AND ASSOCIATED LAND FILLING FOR A PERIOD OF 3 YEARS AT LOTS 1430 (PART), 1431 (PART), 1439(PART) AND 1440 (PART) IN D.D.114, SHEK KONG, YUEN LONG
A/YL-SK-439**

ISSUE 2 (June 2026)

Comments from Chief Engineer/Mainland North, Drainage Services Department (Contact Person:- Mr. Jeff TSE C.W., Tel: 3965 8921)

Comment	Response
i) Please indicate clearly the full alignment of the discharge path via the existing 1200mm width village drain from the application site all the way down to the ultimate discharge point (e.g. a well-established stream course/public drainage system). Since there is no record of the said discharge path of the said 1200mm width village drain, please provide more site photos at different locations and views along the discharge path to demonstrate its presence and existing condition.	Noted, site photos at different locations and views are added in Appendix C.
ii) Please advise and indicate the locations of photos taken for review.	Noted, locations of site photos taken are added in Appendix C.
iii) Please advise if any site formation/levelling works to be carried out under this application. Cross sections showing the existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given. Please be reminded that peripheral surface channels shall be provided along the site boundary at the existing/original ground level (instead of the revised ground level) to collect the surface runoff accrued on the application site and to intercept the overland flow from the adjacent lands.	Noted, there is no site formation in this application site. Peripheral surface channels will be provided along the site boundary at the existing/original ground level.
iv) According to cross section provided, it is noted that openings will be provided at the proposed fence. Please provide its details for comments and adequate opening/ gap should be provided to intercept the existing overland flow passing through the site.	Noted, drawing of the proposed fence with opening is attached in Appendix G.
v) Catchpit should be provided at the turning point of the proposed u-channel.	Noted, catchpits are added at the turning point.
vi) Separation should be provided at the start point(s) of the proposed peripheral surface channel. Please review.	Noted, original CP1 is relocated and proposed peripheral surface channels are separated.
vii) According to the drainage plan in Appendix D, it is noted that the proposed invert level of CP6 at upstream (+41.32 mPD) is lower than the downstream catchpit CP7 (+41.44 PmD), which is not desirable from drainage point of view. Please review	Noted, the invert levels of catchpit are reviewed and updated in Appendix D and Appendix E.

Comment	Response
the invert level of all the proposed catchpit with adequate gradient.	
viii) As noted, the gradient of the proposed 375mm pipe connection from the last catchpit with sand trap (TCP 8) to the existing village drain is 1:10, which is quite steep. Please check its velocity and review the gradient and the size of the proposed drainage facility accordingly.	Noted, the gradient of the proposed pipe connection is reviewed and updated in Appendix D and Appendix E.
ix) Please indicate the size of all the existing village drain on the drainage plan for review.	Noted, the size of the existing village drain is indicated in Appendix D.
x) Please provide the connection details at the proposed discharge point with relevant levels (i.e. C.L., I.L., catchpit/watercourse bottom level, etc.) on the drainage plan for review.	Noted, the connection details are added in Appendix D.
xi) The existing village drain, to which the applicant proposed to discharge the stormwater from the subject site was not maintained by this office. The applicant(s) shall resolve any conflict/disagreement arisen for discharging the runoff from the application site(s) to the proposed discharge point(s). In the case that it is a local village drains, DO/YL should be consulted. Moreover, the applicant(s) should ensure that this drainage system and the existing downstream drains/channels/streams have adequate capacity to convey the additional runoff from the application site(s). Regular maintenance should be carried out by the applicant(s) to avoid blockage of the system.	Noted with thanks.
xii) The development should neither obstruct overland flow and nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc.	Noted with thanks.
xiii) The applicant should resolve any conflict/disagreement with relevant lot owner(s) and seek permission from DLO/YL for laying new drains/channels and/or modifying/upgrading existing ones in other private lots or on Government Land, where required, outside the application site(s).	Noted with thanks.

Content Page

Content Page	2
1. Introduction	3
1.1. Objectives of the Report	3
1.2. Report Structure	3
1.3. References	3
2. Development Proposal	4
2.1. Existing Site Conditions	4
3. Assessment Methodology	5
3.1. Calculation Methodology for Runoff	5
3.2. Calculation Methodology for Capacity Checking	5
3.3. Summary of Assessment Assumptions	6
4. Potential Drainage Impact	7
4.1. Change in Drainage Characteristics	7
4.2. Proposed Drainage Works	7
4.3. Calculation and Result	8
5. Conclusion	10

Appendix

Appendix A Location Plan of Application Site
Appendix B Layout Plan of Application Site
Appendix C Location Plan of the Existing Drainage
Appendix D Proposed Drainage Arrangement
Appendix E Design Calculation for Proposed Drainage Arrangement
Appendix F Design Checking for Existing Drainage System
Appendix G Typical designs of the Fence,U-channels and Catchpits

1. Introduction

This report presents the temporary drainage proposal for the proposed temporary place of recreation sports or culture (hobby farm) and associated land filling for a period of 3 years at lots 1430 (part), 1431 (part), 1439(part) and 1440 (part) in D.D.114, Shek Kong, Yuen Long. 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 assessment 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 Mote 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 in Yuen Long, New Territories. The total area of approximately 1500 m^2 and the existing ground level is approximately 44.0 mPD. The site layout plan is provided in **Appendix B**.

The applied development is a temporary place of recreation sports or culture (hobby farm) and associated land filling for 3 years. The zonings are under "Agriculture". The application site is located at lots 1430 (part), 1431 (part), 1439(part) and 1440 (part) in D.D.114, 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. There are no existing stormwater drains within the application site. There is an existing 1200 mm village drain in vicinity of the site that proposed be connected to, the location and picture of the existing village surface channel and underground pipe are shown in **Appendix C**.

3. Assessment Methodology

3.1. Calculation Methodology for Runoff

According to Section 6.6.2 of *the Storm 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 Q_p = Peak Runoff, m^3/s

C = Runoff Coefficient

i = Rainfall Intensity, mm/hr

A = Catchment Area, km^2

The runoff coefficient of 1 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 E1** and **Appendix E2**.

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. The surface U-channel are proposed to be 400 mm width. The collected stormwater will be diverted to the existing 1200mm village drain in vicinity of the site.

For the worst-case scenario, bad condition of concrete u channel is assumed for the Manning's roughness coefficient i.e coefficient value is 0.016 for calculating capacities of concrete U-channel using Manning's Equation. The recommended roughness values ks for concrete channels is 0.6 mm.

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

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

where V = mean velocity, m/s

S = slope of the total energy line

n = Manning's roughness coefficient

R = hydraulic radius, m

3.3. Summary of Assessment Assumptions

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

- Runoff coefficient of 1 for the paved area is assumed
- Storm constants for 50 years return periods of HKO Headquarters
- Manning's roughness coefficient of 0.016 for the proposed concrete U-channels and concrete pipe are adopted
- Roughness values ks of 0.6 mm for concrete channels is adopted.
- 16% of rainfall increase due to climate change
- 10 % reduction in U-channel and pipe area is assumed for sedimentation

4. Potential Drainage Impact

4.1. Change in Drainage Characteristics

There is no existing drainage provision for the current site, the collected stormwater was discharged as surface runoff and infiltration leading to the natural stream or river.

For conservative approach, the total area of the site for 1500 m^2 will be accounted for one catchment area. The external catchment area of 600 m^2 are also considered in the design calculation.

The adjacent sites have no record of flooding. Peripheral surface channels are proposed 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 terminate catchpit with sand trap and eventually lead to the existing village surface channel in vicinity of the site. The details of the proposed drainage works are illustrated in **Appendix D**.

To ensure a conservative approach, the critical scenario has been considered, involving the collection of all flow within the catchment area of 1500 m^2 . Surface U-channels with a width of 400mm are proposed for this purpose. Design calculations for the proposed U-channel are presented in **Appendix E1**. A separate design check has been undertaken using an enlarged catchment area of 600 m^2 that includes the overflow from adjacent sites. These calculations are provided in **Appendix E2**.

The hydraulic performance of the existing terminal drainage facilities of 1200 mm open channel and the connected 500mm underground drainage pipe are also checked under a separate calculation in **Appendix F**. The concerned development is not adversely existing drainage facilities.

The typical designs for the U-channels and catchpits, as well as the fence with opening 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 proposed 400mm U-channel and then connect with the existing 1200 village drain in adjacent to site. The design calculations for U-channel with 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.	Capacity (Application Site)	Capacity (Application Site and Adjacent Site)	Check
-	CP1	42.11	41.92	400	9.5	50	52.9%	74.1%	OK
CP1	CP2A	41.92	41.47	400	22.6	50	52.1%	73.0%	OK
CP2A	CP2	41.47	41.33	400	7.0	50	51.8%	72.7%	OK
CP2	CP3	41.33	40.84	400	24.6	50	51.0%	71.6%	OK
CP3	TCP8	40.84	40.58	400	12.6	50	50.6%	71.0%	OK
-	CP4	42.10	41.66	400	22.2	50	50.0%	70.1%	OK
CP4	CP5	41.66	41.04	400	30.6	50	49.1%	68.9%	OK
CP5	CP5A	41.04	40.86	400	9.1	50	48.9%	68.5%	OK
CP5A	CP6	40.86	40.29	400	28.8	50	48.1%	67.5%	OK
CP6	CP7	40.29	40.14	400	7.5	50	48.0%	67.2%	OK
CP7	TCP8	40.14	39.55	400	29.1	50	47.3%	66.3%	OK

Table 1: Drainage Schedule of Proposed U-channel Size

The design calculations for the pipe connect the u channel with the application site and adjacent site areas are summarized in **Table 2**, and appended in **Appendix E1** and **Appendix E2**.

From	To	U.S I.L	D.S I.L	Width (mm)	Length (m)	Grad.	Capacity (Application Site)	Capacity (Application Site and Adjacent Site)	Check
TCP8	DP1	39.550	39.190	400	8	22	28%	39%	OK

The hydraulic performance of the existing drainage facilities of 1200 mm open channel and 500mm underground pipe are also checked. The concerned development will occupy 5.6 % of the capacity of the existing 1200 mm village drain and 29% of the 500mm underground pipe. The design checking is appended in **Appendix F**.

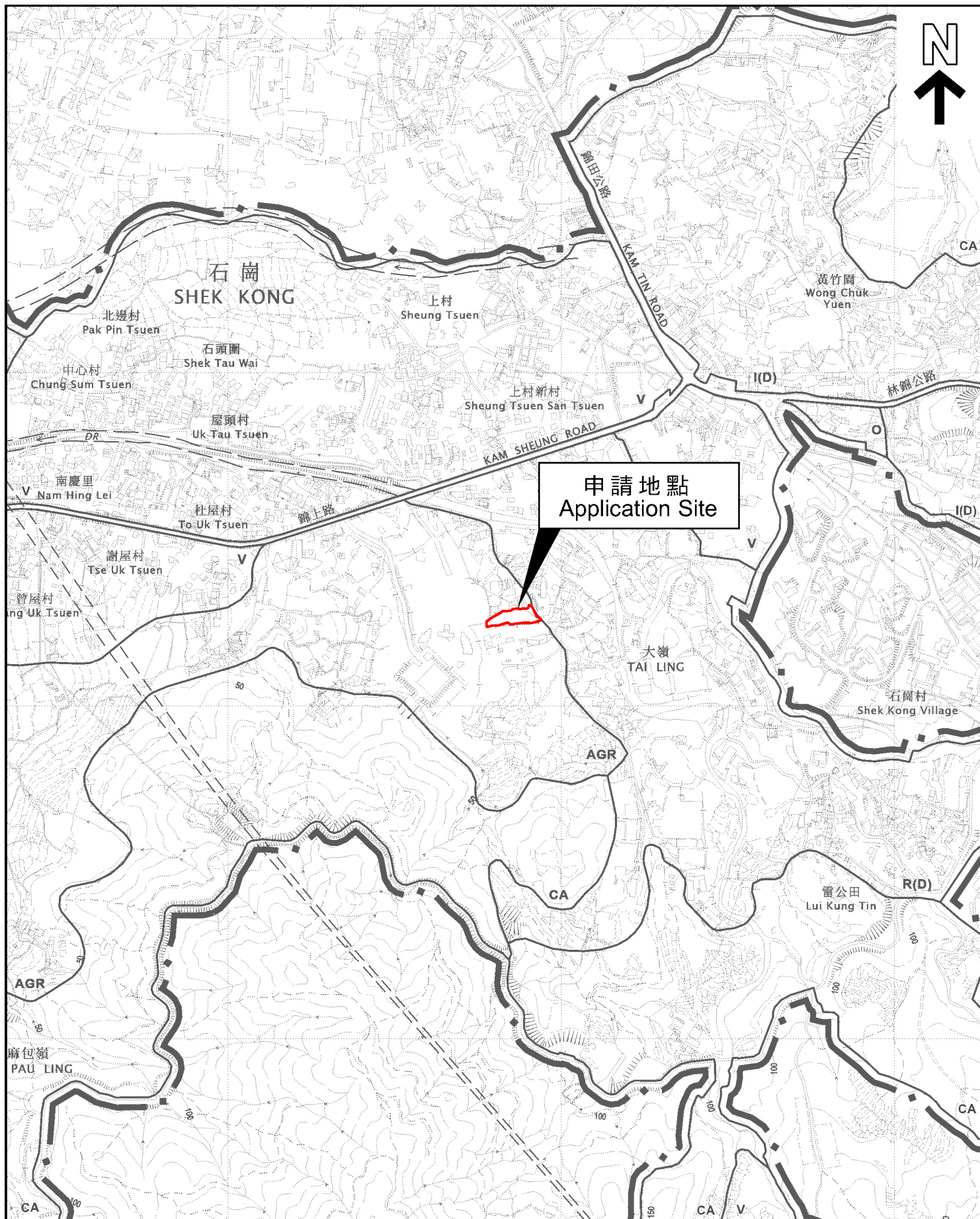
5. Conclusion

A temporary drainage proposal has been designed for temporary place of recreation sports or culture (hobby farm) and associated land filling for a period of 3 years. The zonings are under "Village type Development". The application site is located at lots 1430 (part), 1431 (part), 1439(part) and 1440 (part) in D.D.114, Shek Kong, Yuen Long, New Territories.

Based on the design calculations, a set U-channel with width of 400 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 1200mm village drain.

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



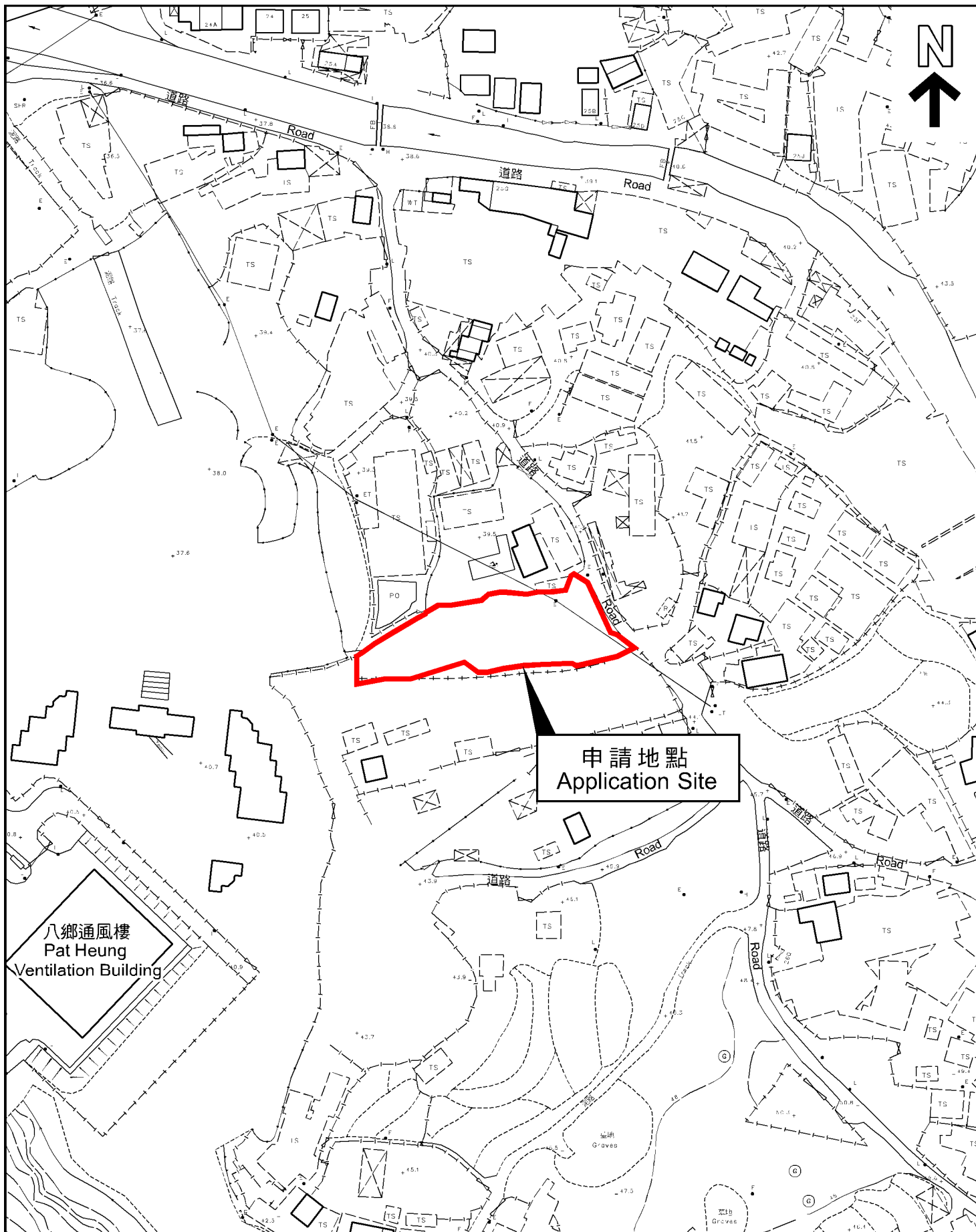
本摘要圖於2025年11月28日擬備，
所根據的資料為於2025年10月17日
展示的分區計劃大綱圖編號S/YL-SK/10
EXTRACT PLAN PREPARED ON
28.11.2025 BASED ON OUTLINE ZONING
PLAN No. S/YL-SK/10 EXHIBITED ON
17.10.2025

位置圖 LOCATION PLAN

SCALE 1:7 500 比例尺
米 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/439



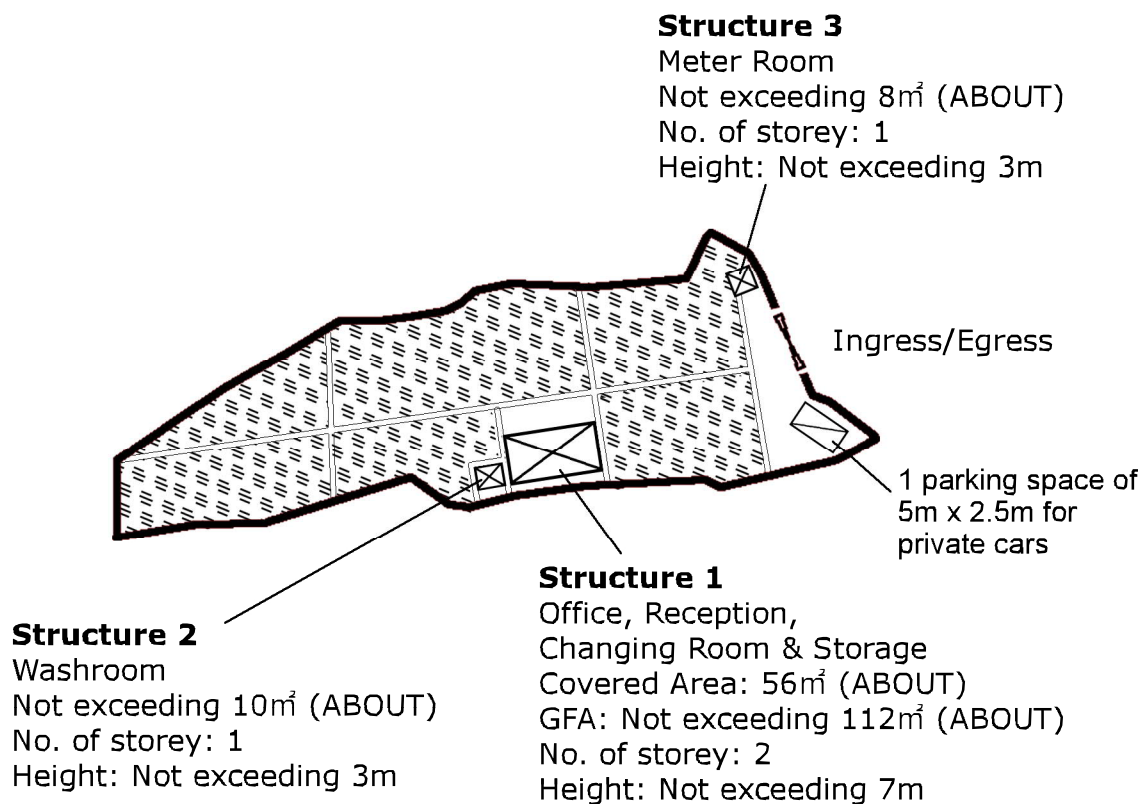
本摘要圖於2025年11月28日擬備，
所根據的資料為測量圖編號6-NE-19B及20A
EXTRACT PLAN PREPARED ON
28.11.2025 BASED ON SURVEY SHEETS
No. 6-NE-19B & 20A

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/439

Appendix B
Layout Plan of Application Site



Project 項目名稱:

Proposed Temporary Place of Recreation, Sports or Culture (Hobby Farm) and Associated land filling for a Period of 3 Years at Lots 1430(Part), 1431(Part), 1439(Part) and 1440(Part) in D.D. 114, Shek Kong, Yuen Long

Drawing Title 圖紙標題:

Layout Plan



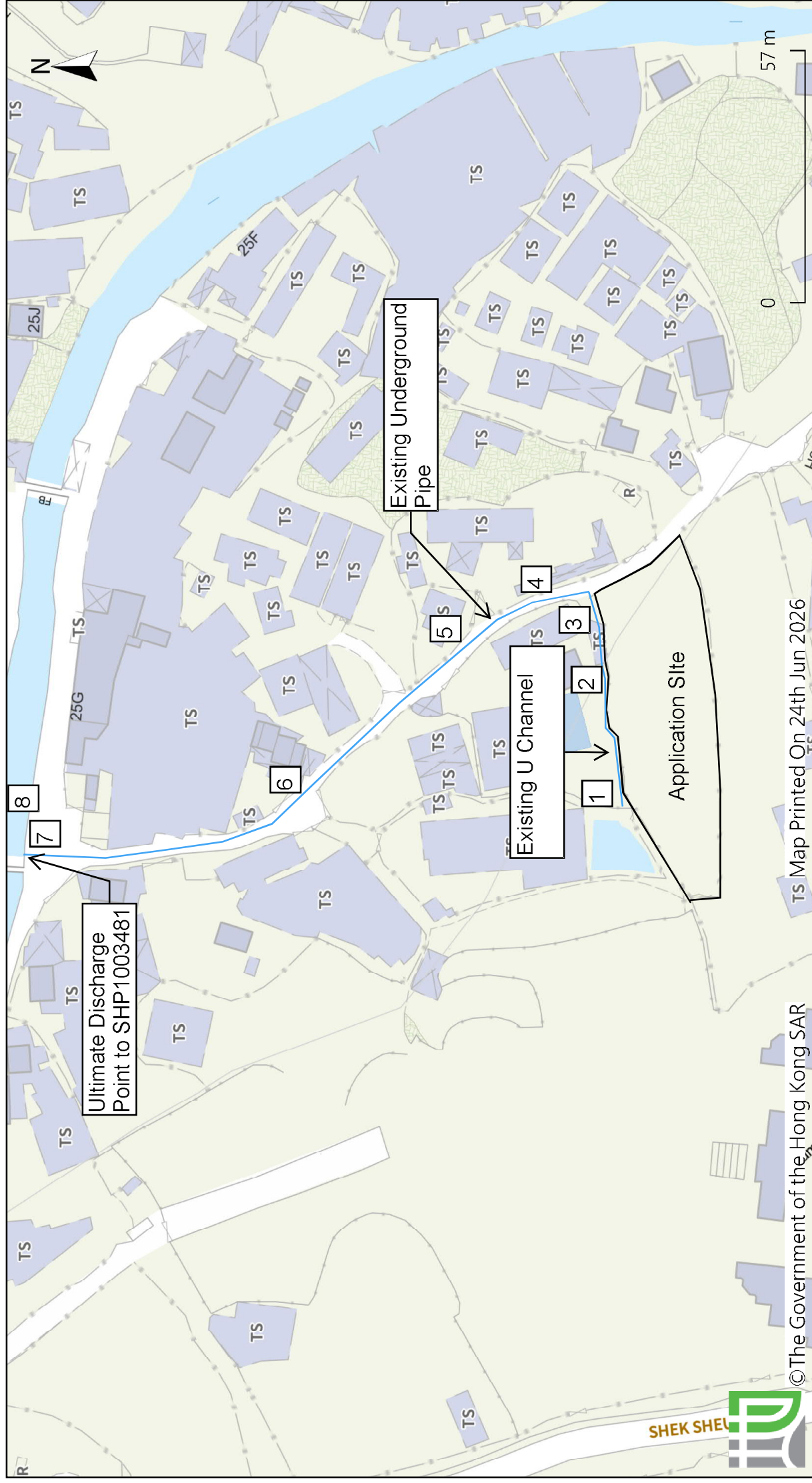
Drawing No. 圖號:

Remarks 備註:

-  Private car parking Space
-  Farmland
-  Structure

Scale 比例:

Appendix C
Location Plan and Photos of the Existing Drainage



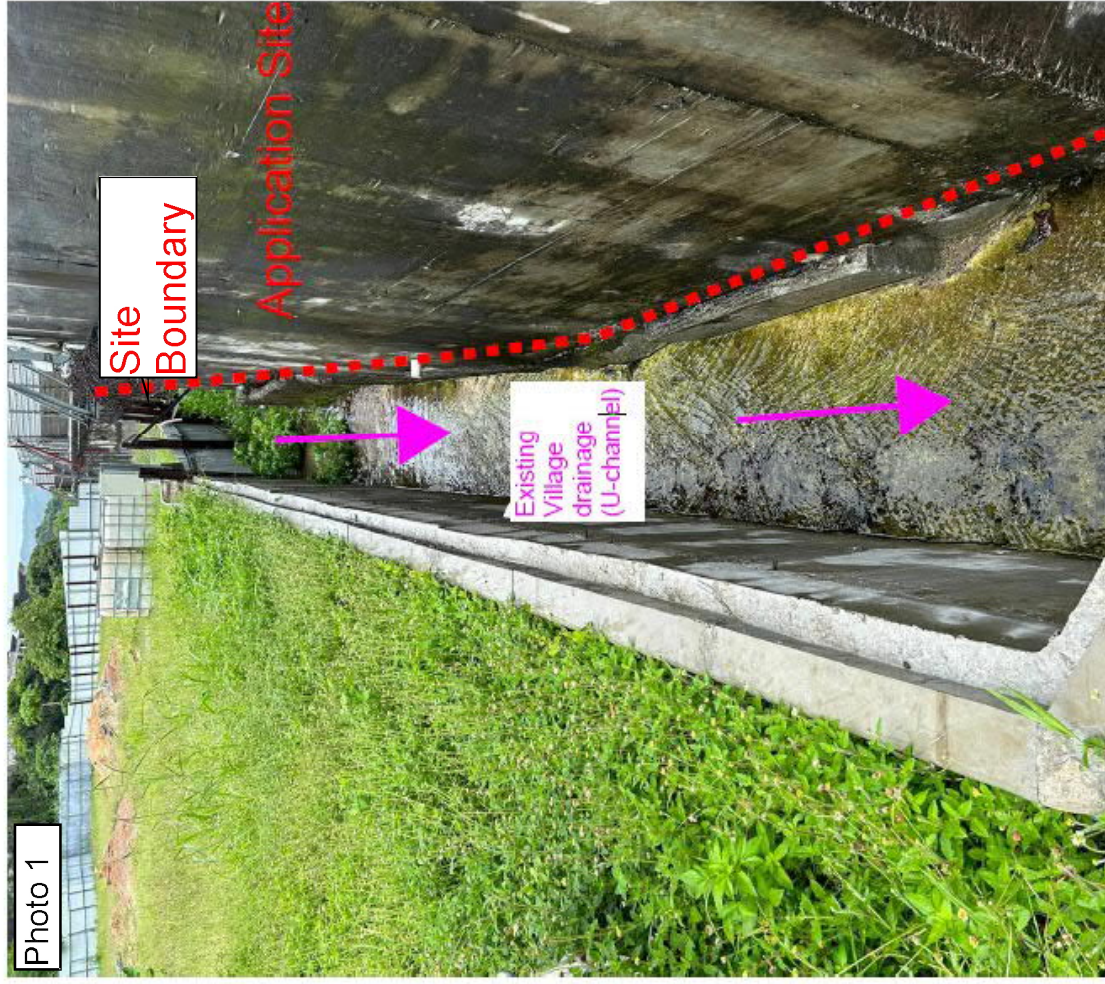






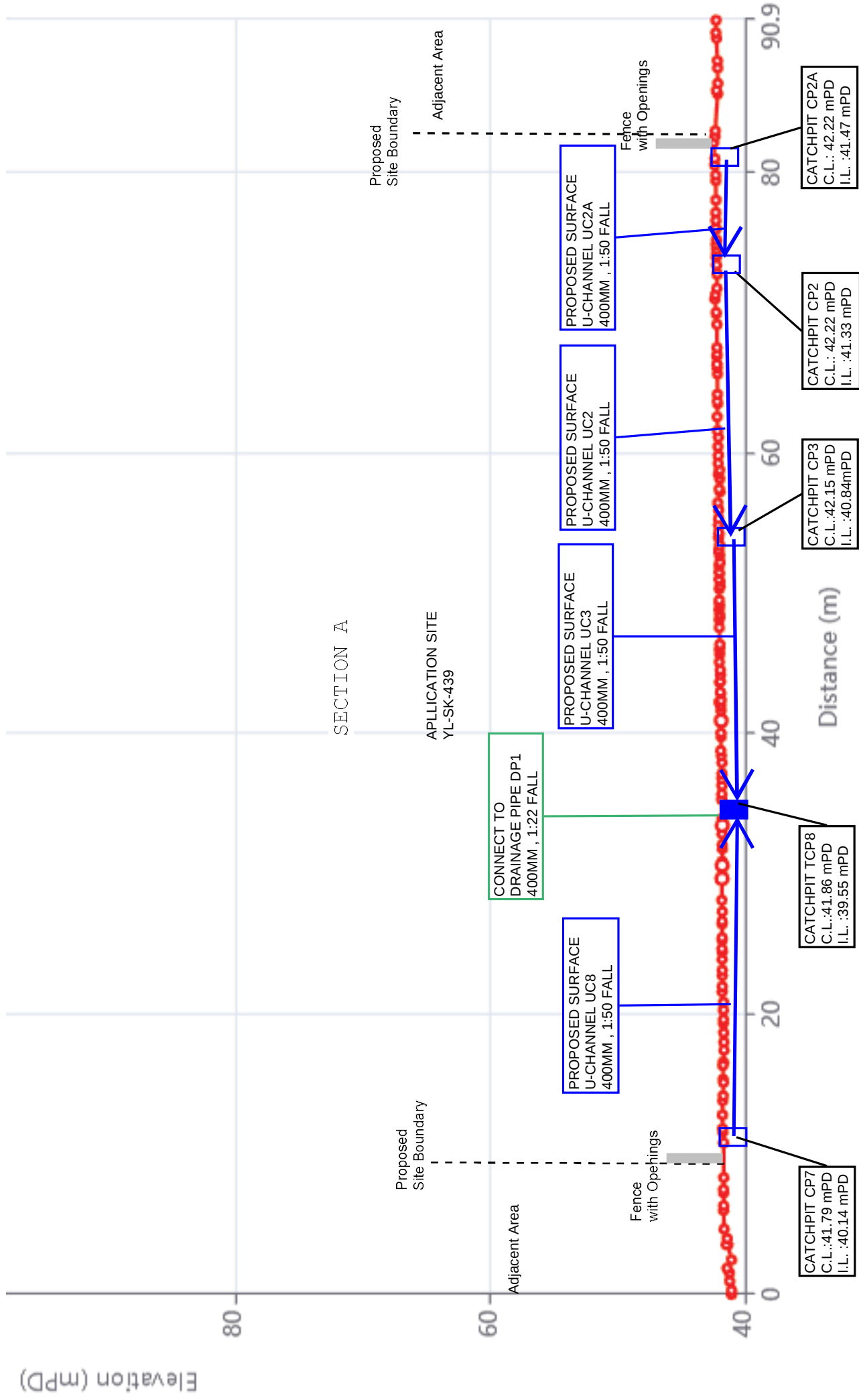


Photo 7



Photo 8

Appendix D
Proposed Drainage Arrangement



Appendix E1

Design Checking for Proposed U Channel for Application Site

Project Title:		Calculation Sheet		Date:	2026.06.26
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY PLACE OF RECREATION, SPORTS OR CULTURE (HOBBY FARM) AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS				Project No.:	YL-SK-419
				Designed by:	RF
				Appendix :	E1
				Sheet No.:	1

Design for Proposed 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)	Ave. Slope / 100m	U/S G.L. (mPD)	D/S G.L. (mPD)	U/S I.L. (mPD)	D/S I.L. (mPD)	Material	Width (mm)	Depth (mm)	Lgth (m)	Grad. (1 in)	U Channel Area A (m ²)	Wetted Peri.P (mm)	Hyd. Radius R (mm)	Mng's Coef. n	Vel. V at Full Bore (m/s)	Cap. Q ₀ (m ³ /s)	Velocity Check	Time of Conc. t _c (min)	Rainfall Intensity i (mm/hr)	Runoff Q (m ³ /s)	Capacity % (Q/Q ₀)	Capacity Check	
-	CP1	UC1	1500	1	42.51	42.50	42.11	41.92	CO	400	400	9.5	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	0.661	360.03	0.15	52.9%	OK
	CP1A	UC1A	1500	1	42.50	42.22	41.92	41.47	CO	400	400	22.6	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	0.832	354.67	0.15	52.1%	OK
	CP2A	UC2	1500	1	42.22	42.22	41.47	41.33	CO	400	400	7	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	0.885	353.07	0.15	51.8%	OK
	CP2	UC2A	1500	1	42.22	42.15	41.33	40.84	CO	400	400	24.6	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.070	347.66	0.14	51.0%	OK
	CP3	UC3	1500	1	42.15	41.86	40.84	40.58	CO	400	400	12.6	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.165	345.01	0.14	50.6%	OK
	-	UC4	1500	1	42.50	42.32	42.10	41.66	CO	400	400	22.2	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.333	340.52	0.14	50.0%	OK
	CP4	UC5	1500	1	42.32	42.27	41.66	41.04	CO	400	400	30.6	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.563	334.68	0.14	49.1%	OK
	CP5	UC5A	1500	1	42.27	42.20	41.04	40.86	CO	400	400	9.1	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.632	333.02	0.14	48.9%	OK
CP5A	UC6	1500	1	42.27	41.96	40.86	40.29	CO	400	400	28.8	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.849	327.95	0.14	48.1%	OK	
CP6	CP7	UC7	1500	1	41.96	41.79	40.29	40.14	CO	400	400	7.5	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	1.906	326.68	0.14	48.0%	OK
CP7	CP8	UC8	1500	1	41.79	41.86	40.14	39.55	CO	400	400	29.1	50	0.13	1.03	1.03	0.13	0.016	2.21	0.28	OK	2.125	321.92	0.13	47.3%	OK

Design for Proposed Drainage Pipe for Development Area

Manhole		Catchment		Pipe			Colebrook-White Equation			Manning's Equation			Capacity Check									
From (U/S)	To (D/S)	Incr. Area (m ²)	Accum. Area (m ²)	U/S I.L. (mPD)	D/S I.L. (mPD)	Mat-erial	Dia. (mm)	Lgth (m)	Grad. (1 in)	Rough-ness k _s (mm)	Pipe Flow Vel. V (m/s)	Pipe Flow Cap. Q ₀ (m ³ /s)	Time of Conc. t _c (min)	Runoff Q (m ³ /s)	Time of Conc. t _c (min)	Rainfall Inter- sity i (mm/h)	Runoff Q (m ³ /s)	Cap. (Q/Q ₀)	Capacity Check			
TCP8	DPI	1500	1500	1	39.550	39.190	CO	400	8	22	0.60	3.017	0.379	0.876	353	0.147	0.016	2.856	0.359	0.099	28%	OK

Formulae:

$t_c =$ Time of Concentration where $t_c = t_e + t_f$
 $t_e =$ Inlet Time $t_f =$ Flow Time $t_f = \frac{0.832}{\bar{a}}$ (Pipe Length / Flow Velocity) min

$V =$ Pipe Flow Velocity $(R)^{2/3} / (48.3n)$ where $R =$ Hydraulic Radius $n =$ Manning's Coef. $n =$ Surface Roughness $n =$ Kine Viscosity $n =$ Manning's Coef. $n = (\pi D^4 / 4V)$

Ref. DSD SDM Table 14

concrete	CO
cast iron	CI
ductile iron	DI

Ref. DSD SDM Table 13

concrete	CO
cast iron	CI
ductile iron	DI

$Q_0 =$ Pipe Flow Capacity $= (\pi D^4 / 4V)$

$i =$ Rainfall Intensity where $a =$ HKO Headquarters for a return period of 50 years $b =$ 3.29 $c =$ 0.355

due to climate change

$Q =$ Runoff $= 0.278 \cdot C_i A$ where $C =$ Runoff Coefficient

Appendix E2

Design Checking for Proposed U Channel for Application Site with Adjacent Area

Project Title:		Calculation Sheet		Date:	2026.06.26
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY PLACE OF RECREATION, SPORTS OR CULTURE (HOBBY FARM) AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS				Project No.:	YL-SK-419
				Designed by:	RF
				Appendix :	E2
				Sheet No.:	1

Design for Proposed U Channel for Development Area

Catchpnt No.		Catchment			Level				U Channel					Manning's Equation												
From (U/S)	To (D/S)	Surface Channel	Catchm ent. 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)	Depth (mm)	Lgth (m)	Grad. (1 in)	U Channel Area A (m2)	Wetted Peri.P (mm)	Hyd. Radius R (mm)	Mng's Coef. n	V.el. 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	2100	1	1	42.51	42.50	42.11	41.92	CO	400	400	9.5	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	0.639	360.74	0.21	74.1%	OK
CP1	CP2A	UC1A	2100	1	1	42.50	42.22	41.92	41.47	CO	400	400	22.6	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	0.810	355.34	0.21	73.0%	OK
CP2A	CP2	UC2	2100	1	1	42.22	42.22	41.47	41.33	CO	400	400	7	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	0.863	353.73	0.21	72.7%	OK
CP2	CP3	UC2A	2100	1	1	42.22	42.15	41.33	40.84	CO	400	400	24.6	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.048	348.28	0.20	71.6%	OK
CP3	TCP8	UC3	2100	1	1	42.15	41.86	40.84	40.58	CO	400	400	12.6	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.143	345.61	0.20	71.0%	OK
-	CP4	UC4	2100	1	1	42.50	42.32	42.10	41.66	CO	400	400	22.2	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.311	341.10	0.20	70.1%	OK
CP4	UC5	UC5	2100	1	1	42.32	42.27	41.66	41.04	CO	400	400	30.6	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.542	335.22	0.20	68.9%	OK
CP5	CP5A	UC5A	2100	1	1	42.27	42.20	41.04	40.86	CO	400	400	9.1	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.610	333.55	0.19	68.5%	OK
CP5A	CP6	UC6	2100	1	1	42.27	41.96	40.86	40.29	CO	400	400	28.8	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.827	328.45	0.19	67.5%	OK
CP6	CP7	UC7	2100	1	1	41.96	41.79	40.29	40.14	CO	400	400	7.5	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	1.884	327.17	0.19	67.2%	OK
CP7	TCP8	UC8	2100	1	1	41.79	41.86	40.14	39.55	CO	400	400	29.1	50	0.13	1.03	0.13	0.016	2.21	0.28	OK	2.103	322.38	0.19	66.3%	OK

Design for Proposed Drainage Pipe for Development Area

Manhole		Catchment		Pipe		Colebrook-White Equation					Manning's Equation										
From (U/S)	To (D/S)	Incr. 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)	Pipe Flow Vel. V (m/s)	Pipe Flow Cap. Q _o (m ³ /s)	Time of Conc. t _c (min)	Rainfall Inten-sity i (mm)	Runoff Q (m ³ /s)	Time of Conc. t _c (min)	Rainfall Inten-sity i (mm)	Runoff Q (m ³ /s)	Capacity Check		
TCPP8	DPI	2100	2100	1	39.550	39.190	CO	400	8	22	0.60	3.017	0.379	0.854	354	0.206		0.016	2.856	0.359	OK

Formulae:

$t_c =$ Time of Concentration where $t_c =$ Inlet Time Flow Time $= \frac{L}{V}$ (Pipe Length / Flow Velocity)

$V =$ Pipe Flow Velocity $(R)^{2/3} / n$ where $R =$ Hydraulic Radius $n =$ Frictional Slope $k_s =$ Surface Roughness

0.6	mm for concrete cast iron ductile iron
0.06	mm for concrete cast iron ductile iron
0.6	mm for concrete cast iron ductile iron

Ref. DSD SDM Table 14

0.016	for concrete ductile iron
0.015	for concrete ductile iron
0.015	for concrete ductile iron

Ref. DSD SDM Table 13

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

$i =$ Rainfall Intensity where $a =$ HKO Headquarters for a return period of 50 years $b =$ 3.29 $c =$ 0.355 due to climate change

$Q =$ Runoff where $C =$ Runoff Coefficient $= 0.278 * C_i A$

Appendix F
Design Checking for Existing Drainage System

Project Title:		Calculation Sheet		Date:	2026-06-27
TEMPORARY DRAINAGE PROPOSAL FOR THE PROPOSED TEMPORARY PLACE OF RECREATION, SPORTS OR CULTURE (HOBBY FARM) AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS				Project No.:	YL-SK-439
				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)	D/S I.L. (mPD)	U/S I.L. (mPD)	Mat- erial	Width (mm)	Lgth (m)	Grad. (1 in)	U Channel Area A (m ²)	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
TCP8	EXISTING	DP1	2100	1	1	41.86	41.73	39.55	39.06	CO	1200	30	125	1.16	3.08	0.38	0.016	2.91	3.36	OK	2.019	324.18	0.19	5.6%	OK

Checking for Existing Storm Drain

Manhole		Catchment		Pipe			Colebrook-White Equation				Manning's Equation											
From (U/S)	To (D/S)	Incr. Area (m ²)	Accum. Area (m ²)	Runoff Coef. C	U/S LL (mPD)	D/S LL (mPD)	Mat-erial	Dia. (mm)	Lgth (m)	Grad. (1 in)	Rough-ness k _s	Pipe Cap. Q _o (m ³ /s)	Time of Conc. t _c (min)	Rainfall Inten-sity i (mm/hr)	Runoff Q (m ³ /s)	Mng's Coef. n	Pipe Flow 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)	Runoff/ Cap. (Q/Q _o)
EXISTING	EXISTING	2100	2100	1	39.060	35.800	CO	500	140	43	0.60	0.652	2.722	267	0.156	0.016	2.384	0.468	5.979	229	0.134	29%

Formulae:

t_c
=
Time of Concentration where
 t_c
=
 $t_o + t_f$
Inlet Time
 t_f
=
 $\frac{L}{V}$
(Pipe Length / Flow Velocity)

V
=
Pipe Flow Velocity
 $V = \left(\frac{R}{n} \right)^{2/3} S^{1/2}$
where
 g
=
Gravitational Acceleration
 R
=
Hydraulic Radius
 S
=
Frictional Slope
 k_s
=
Surface Roughness

n
=
Kine. Viscosity
=
 $1.14 \times 10^{-6} \text{ m}^2/\text{s}$

n
=
Manning's Coef.
=

0.6

0.06

0.6

concrete

cast iron

ductile irc

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

i
=
Rainfall Intensity where
 $a = 505.5$
for a return period of

50

years
Ref. HKO Headquarters

Q
=
Runoff
 $Q = 0.278 \times C_i A$
where
 C
=
Runoff Coefficient

3.29

0.355

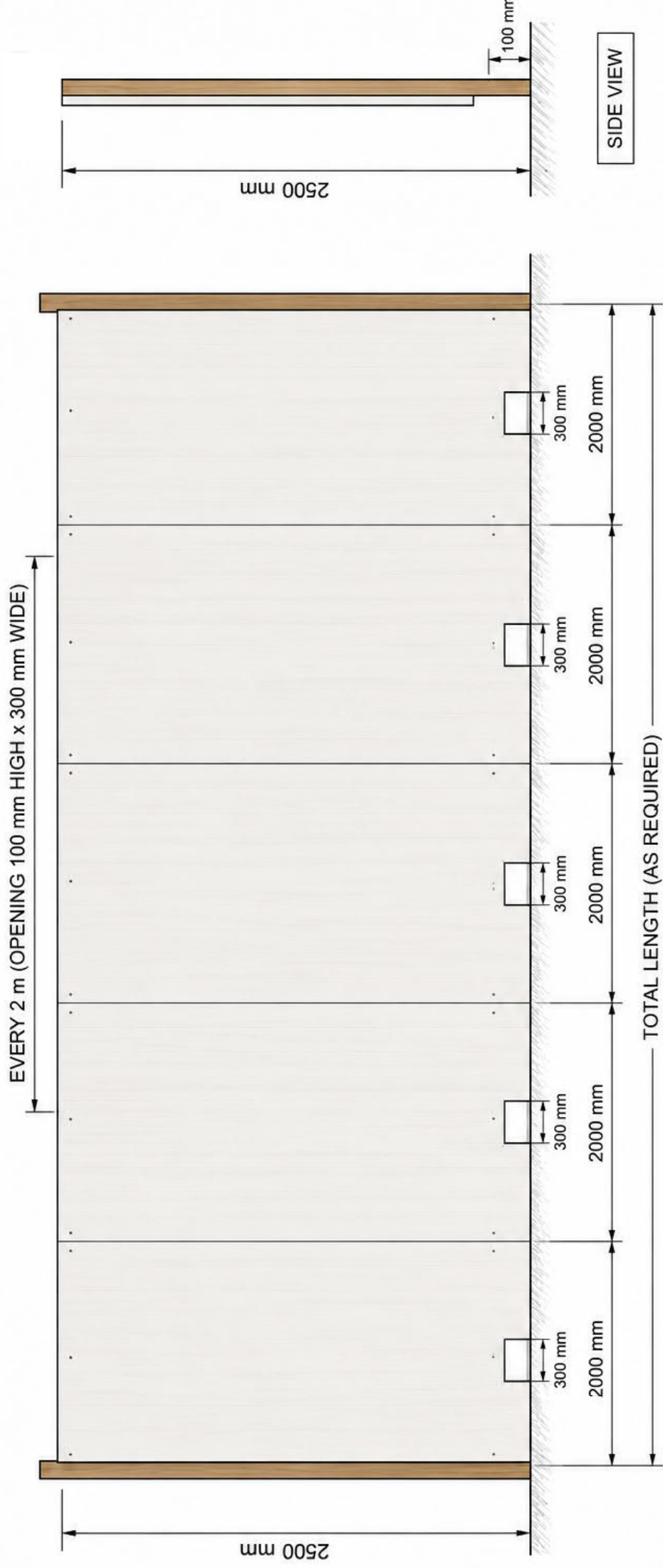
16

%

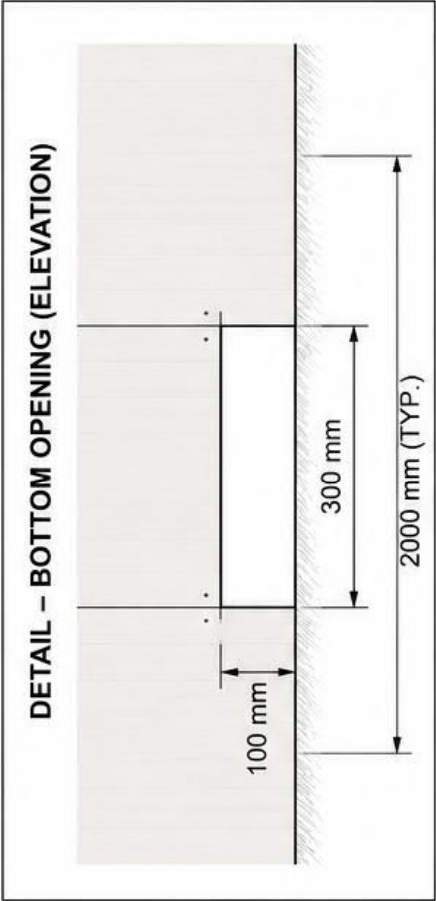
due to climate change

Appendix G

Typical designs of the Fence, U-channels and Catchpits

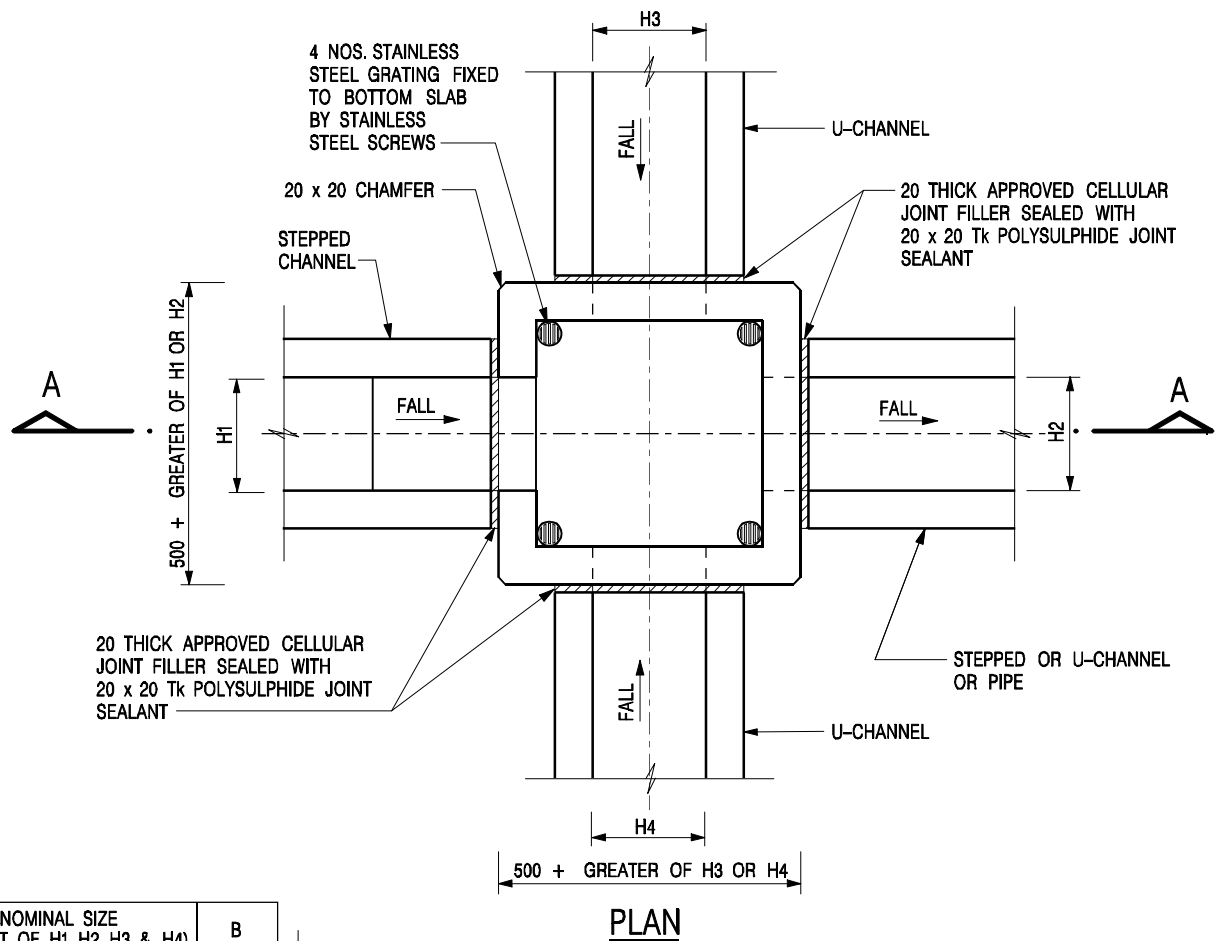


SIDE VIEW



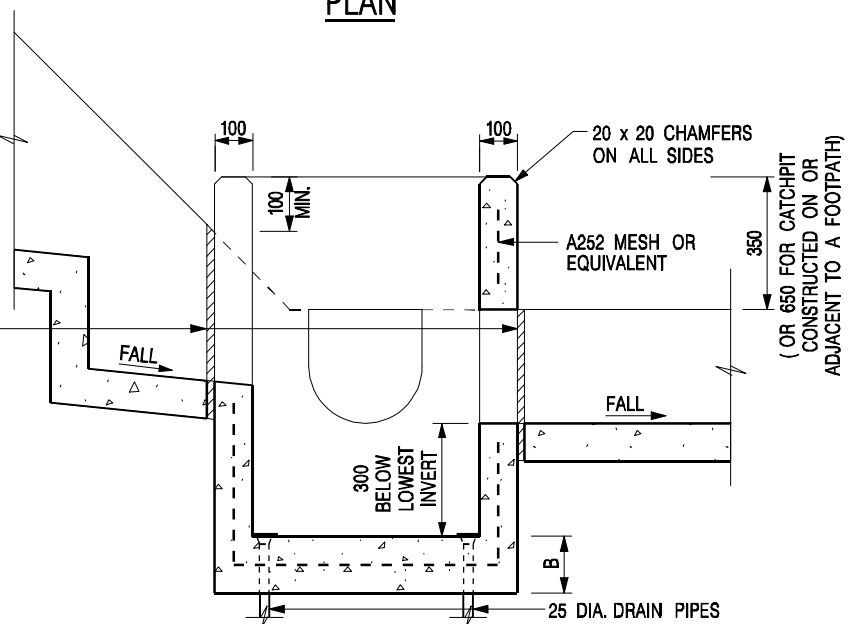
ALL DIMENSIONS ARE IN MILLIMETERS (mm)

- NOTES:**
- HOARDING HEIGHT: 2500 mm
 - BOTTOM OPENING HEIGHT: 100 mm
 - OPENING WIDTH: 300 mm
 - OPENING EVERY: 2 m (CENTER TO CENTER)



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

20 THICK APPROVED CELLULAR JOINT FILLER SEALED WITH 20 x 20 Tk POLYSULPHIDE JOINT SEALANT

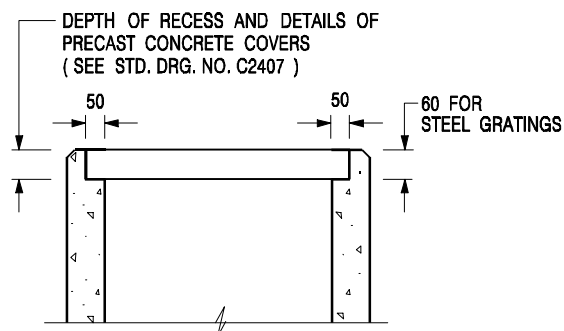


NOTES:

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

CATCHPIT WITH TRAP
(SHEET 1 OF 2)

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



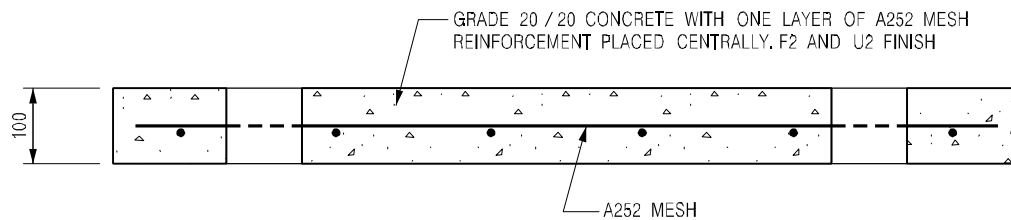
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

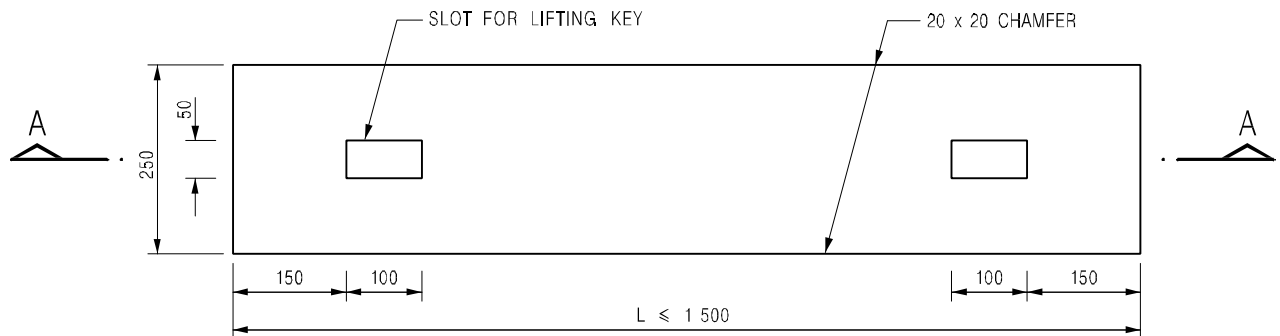
DATE JAN 1991

DRAWING NO.

C2406 /2A

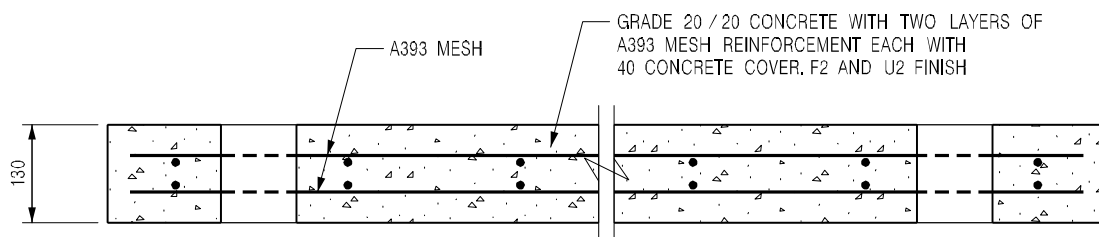


SECTION A - A

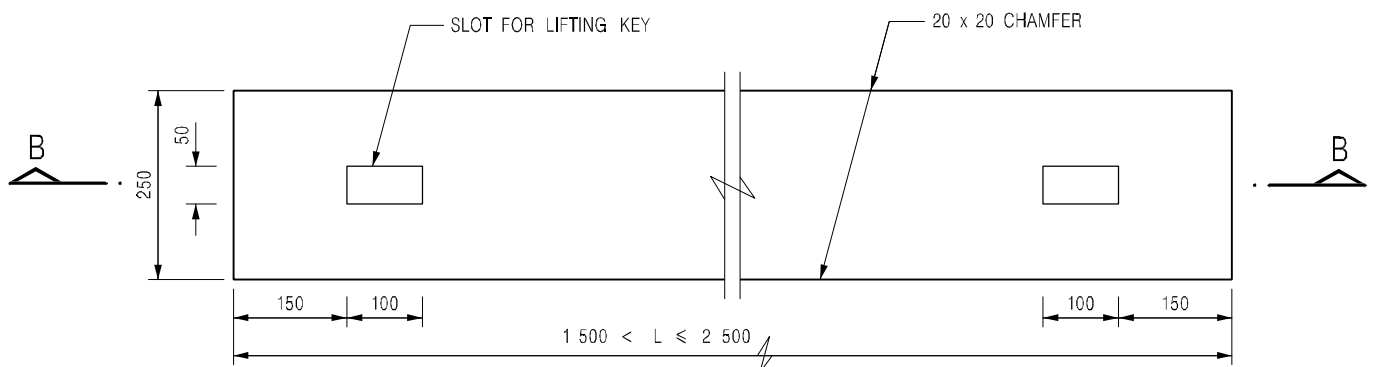


PLAN

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.

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

**PRECAST CONCRETE COVERS
FOR CATCHPIT AND SAND TRAP**

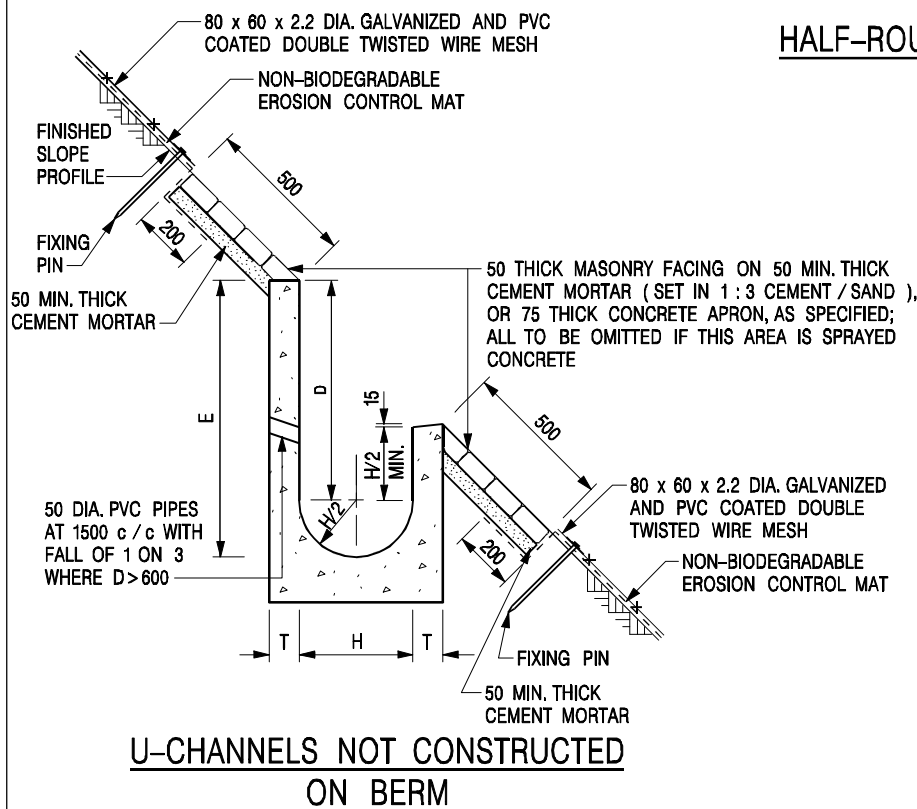
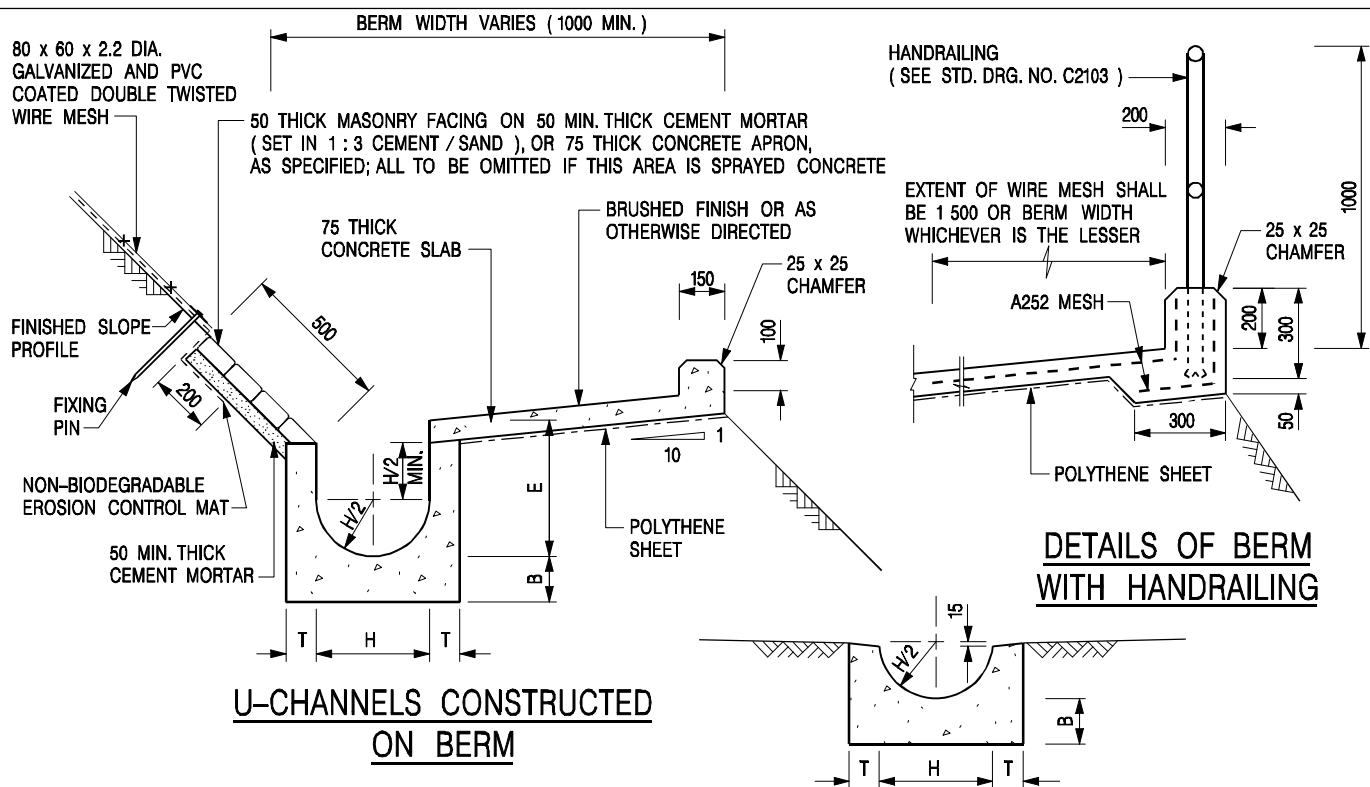


**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 10

DATE JAN 1991

DRAWING NO.
C2407B



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)

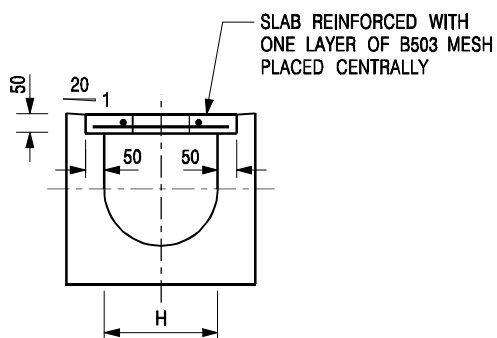


CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

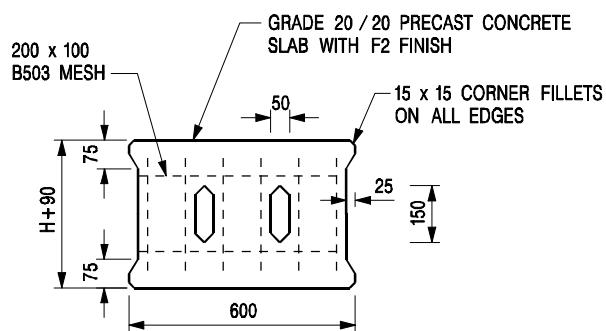
SCALE 1 : 25

DATE JAN 1991

DRAWING NO.
C2409I



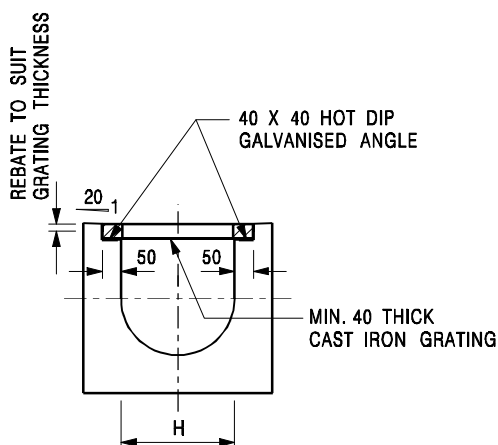
TYPICAL SECTION



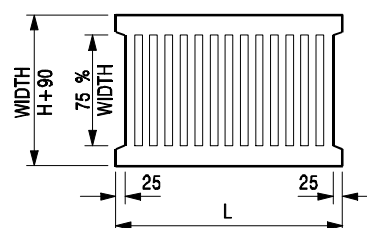
PLAN OF SLAB

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:

- ALL DIMENSIONS ARE IN MILLIMETRES.
- H=NOMINAL CHANNEL SIZE.
- ALL CAST IRON FOR GRATINGS SHALL BE GRADE EN-GJL-150 COMPLYING WITH BS EN 1561.
- 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