

ISSUE 2

## **TEMPORARY DRAINAGE PROPOSAL**

APPLICATION SITE OF PROPOSED TEMPORARY PUBLIC VEHICLE PARK FOR MEDIUM GOODS VEHICLES FOR A PERIOD OF 3 YEARS AT LOTS 1621, 1623 (PART), 2700, 2703, 2704 (PART), 2705 (PART), 2706, 2707, 2708 (PART), 2709 (PART), 2710 (PART), 2711 (PART) AND 2713 (PART) IN D.D. 129, LAU FAU SHAN, YUEN LONG, NEW TERRITORIES.

**PROJECT NO. TDM/011\_TOP**

**PREPARED FOR A\_YL-LFS\_512**

30 APRIL 2024

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Background.....	1
1.2	Objectives of the Report.....	1
1.3	Report Structure .....	1
<b>2</b>	<b>Development Proposal .....</b>	<b>1</b>
2.1	Location of the Application Site.....	1
<b>3</b>	<b>Assessment Criteria.....</b>	<b>2</b>
3.1	Design Return Periods .....	2
3.2	Calculation Methodology for Runoff.....	2
3.3	Calculation Methodology for Pipe Capacity Checking.....	3
<b>4</b>	<b>Potential Drainage Impact .....</b>	<b>3</b>
4.1	Changes in Drainage Characteristics.....	3
4.2	Potential Drainage Impact.....	4
<b>5</b>	<b>Construction Stage .....</b>	<b>4</b>
5.1	Temporary Drainage Arrangements .....	4
<b>6</b>	<b>Conclusions.....</b>	<b>5</b>
6.1	Conclusion.....	5

## LIST OF APPENDICES

- A. Location Plan
- B. Layout Plan
- C. Proposed Drainage Plan
- D. Design Calculation of the Proposed Drainage
- E. Typical Standard Drawings Of U-Channel and Catchpit
- F. RtC

## LIST OF TABLES

Table 3-1	Recommended Design Return Periods based on Flood Levels .....	2
Table 4-1	Change in sub-catchment within the site .....	3
Table 4-2	Design calculation of the proposed drainage work.....	4

# 1 Introduction

## 1.1 Background

1.1.1 This report presents the Drainage Proposal for supporting the application site of Proposed Temporary Public Vehicle Park for Medium Goods Vehicles for a Period of 3 Years at Lots 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories.

## 1.2 Objectives of the Report

1.2.1 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

## 1.3 Report Structure

1.3.1 The report contains the following sections:

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

# 2 Development Proposal

## 2.1 Location of the Application Site

2.1.1 The application Site is located within the Lau Fau Shan, Yuen Long, with an area of around 5,100m<sup>2</sup> and ground level varying between + 7.6mPD and + 6.4mPD. The layout plan is provided in **Appendix B**.

### 3 Assessment Criteria

#### 3.1 Design Return Periods

3.1.1 The drainage system in the Application site is to collect surface flows and convey to downstream village drain. The recommended design return periods based on the flood levels for the various drainage systems depend on the drainage system, land use, hazard to public safety and community expectations. The recommended design return period is reproduced in Table 3-1 below:

**Table 3-1 Recommended Design Return Periods based on Flood Levels**

DESCRIPTION	DESIGN RETURN PERIODS
Intensively Used Agricultural Land	2 – 5 Years
Village Drainage including internal Drainage System under a polder Scheme	10 Years
Main Rural Catchment Drainage Channels	50 Years
Urban Drainage Trunk System	200 Years
Urban Drainage Branch System	50 Years

3.1.2 As per Storm Drainage Manuel (SDM) Section 6.6.2 Urban Drainage Branch and Urban Drainage Trunk Systems *“An ‘Urban Drainage Branch System’ is defined as a group or network of connecting drains collecting runoff from the urban area and conveying stormwater to a trunk drain, river or sea. For a simple definition, 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.*

3.1.3 *An ‘Urban Drainage Trunk System’ collects stormwater from branch drains and/or river inlets, and conveys the flow to outfalls in river or sea. Pipes with size or diameter equal to or larger than 1.8m are normally considered as trunk drains.”*

3.1.4 As per SDM, since the proposed U-channels are sized smaller than 1.8m, the drainage system would be defined as an urban drainage branch with recommended design return period of 50 years.

3.1.5 The 50 years design return period will be considered to ensure adequacy of the stormwater drainage system.

#### 3.2 Calculation Methodology for Runoff

3.2.1 Peak instantaneous runoff values before and after the development were calculated based on the Rational Method and with recommended physical parameters including runoff coefficient (C) and storm constants for different return periods referred to the SDM, based on the following equation:

$$Q_p = 0.278 C i A$$

- where
- $Q_p$  = Peak Runoff, m<sup>3</sup>/s
  - $C$  = Runoff Coefficient
  - $i$  = Rainfall Intensity, mm/hr
  - $A$  = Catchment Area, km<sup>2</sup>

- 3.2.2 For conservative, the runoff coefficient of 1.0 is assumed, such that the all the run-off would be collected from the catchment area without any infiltration as the critical scenario.
- 3.2.3 Based on the storm constants for 50-year return period recommended in the SDM, the appropriate rainfall intensities (i) are calculated as detailed in **Appendix D**

**3.3 Calculation Methodology for Pipe Capacity Checking**

- 3.3.1 Because the catchment areas are less than 1ha, U-channels are recommended to be constructed to collect the stormwater runoff within the site. The collected stormwater should finally be diverted to the downstream via the proposed U-channel system.
- 3.3.2 For the worst-case scenario, bad condition of concrete pipe is assumed for the Manning's roughness coefficient (coefficient value is 0.016) for calculating capacities of concrete U-channel using Manning's Equation.
- 3.3.3 Manning's Equation for calculating the channel and pipe capacities is adopted.

**4 Potential Drainage Impact**

**4.1 Changes in Drainage Characteristics**

- 4.1.1 The analysed catchment area of 12,060 m<sup>2</sup> consists of the site area of the proposed Application Site and the external catchment area EC1, EC2 and EC3 at eastern, western and western direction respectively.
- 4.1.2 The characteristics of the sub-catchment areas are remained unchanged due to the proposed application, which are paved area. The sub-catchment is summarized in Table 4-2.

**Table 4-1 Sub-catchment within the site**

CATCHMENT	K	AREA (A)	
Application Site Area	1.00	5100.0	m <sup>2</sup>
External Catchment Area EC1	1.00	2500.0	m <sup>2</sup>
External Catchment Area EC2	1.00	1500.0	m <sup>2</sup>
External Catchment Area EC3	0.40	4600.0	m <sup>2</sup>
Total Catchment Area	1.00	10940.0	m <sup>2</sup>

## 4.2 Potential Drainage Impact

- 4.2.1 The details of the proposed drainage works are illustrated in **Appendix C**.
- 4.2.2 To effectively convey stormwater away from the application site and minimize the potential impact to the drainage infrastructure of the village area, drainage works consists of U-channels, are proposed to convey the stormwater runoff to the terminate catchpit with sand trap (TCP).
- 4.2.3 The runoff from the Application site is collected by 900mm U-channels along the boundary and convey to the terminate catchpit with sand trap (TCP), before discharge to the village drainage discharge point at the northern side of the application site, and eventually discharge to the further downstream as indicated in the Appendix C.
- 4.2.4 For Conservative, the critical scenario is considered for collecting all the flow leading to the 900mm U-channel. The design calculation of the proposed drainage is provided in **Appendix D**. The design calculation is summarized in Table 4-2.

**Table 4-2 Design calculation of the proposed drainage work**

DRAINAGE SYSTEM	ESTIMATED FLOW (M <sup>3</sup> /S)	CAPACITY (M <sup>3</sup> /S)	RESERVE CAPACITY
900mm UC	0.613	2.081	71%

Note:

[1] Rainfall increase due to climate change at the end of 21<sup>st</sup> century is considered according to stormwater drainage manual Table 28.

[2] The reserve capacity is calculated by assuming that the U-channel reach its full capacity.

- 4.2.5 The design runoff arise from the proposed Application Site is to be discharged into the proposed terminate catchpit with the runoff anticipated to be 0.613m<sup>3</sup>/s, which is within the drainage capacity of the proposed 900mm u-channel of 2.081 m<sup>3</sup>/s with gradient 1:100, the reserve capacity is 71%.
- 4.2.6 It is considered that the drainage discharge from the Application Site will not cause adverse impact to the entire downstream drainage system.
- 4.2.7 All u-channels & catch pits will be constructed according to the CEDD's standard drawings, please refer to the **Appendix E**.

## 5 Construction Stage

### 5.1 Temporary Drainage Arrangements

- 5.1.1 Proper measures shall be taken to maintain the existing drainage characteristics of the catchment areas and to minimize drainage impacts associated with the construction works. The principal drainage impacts which are associated with construction of the works have been identified as follows:
- (a) Erosion of ground materials;
  - (b) Sediment transportation to existing downstream drainage system; and
  - (c) Obstruction to drainage systems.
- 5.1.2 Regular inspections shall be carried out to ensure integrity of the works. These inspections shall cover works under construction as well as recently completed areas.

- 5.1.3 To ensure proper operation of the site drainage channels and desilting facilities, inspection of the perimeter drains shall be carried out on a weekly basis and the desilting facilities shall be cleaned on a daily basis.
- 5.1.4 If excavated materials are not possible to transport away the excavated material within the same day, the material should be covered by tarpaulin/impervious sheets. Stockpiles of construction materials (for examples aggregate, fill materials) of more than 50 m<sup>3</sup> in an open area shall also be covered with tarpaulin or similar fabric during rainstorms.
- 5.1.5 All runoff discharged into the existing drainage system will be settled in a silt trap to ensure no sediment will be discharged into the channel. Silt traps will normally be provided along the site drainage immediately upstream of the proposed discharge point to the existing Site. The silt traps will be inspected daily and immediately after each rainstorm.
- 5.1.6 Liaison will be carried out with relevant parties regarding temporary drainage arrangements to ensure that the drainage system is functioning adequately.

## 6 Conclusions

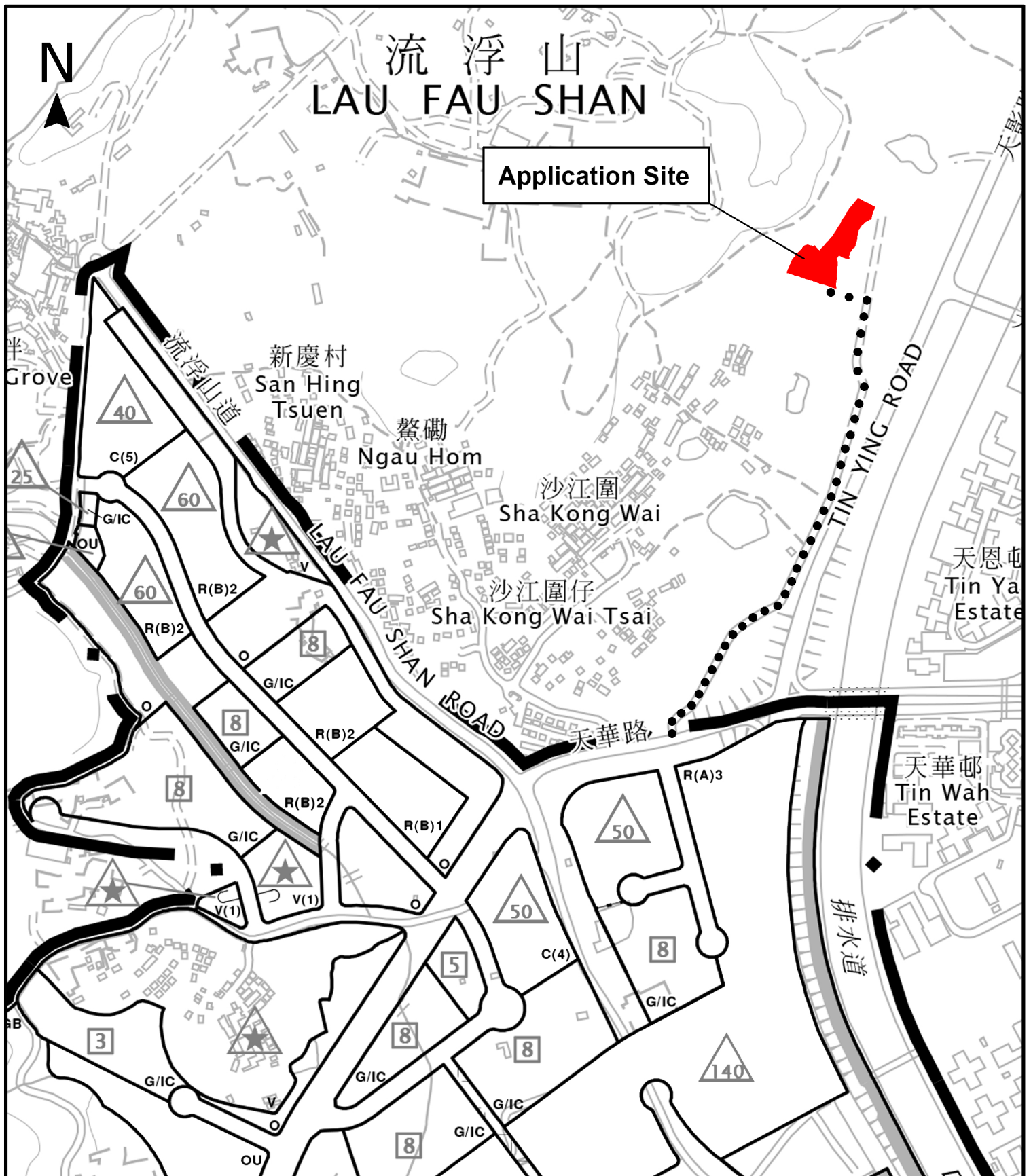
### 6.1 Conclusion

- 6.1.1 The analysed catchment area of 12,060 m<sup>2</sup> consists of the site area of the proposed Application Site and the external catchment area EC1, EC2 and EC3 at eastern, western and western direction respectively.
- 6.1.2 U-channels are proposed to convey runoff from the application site for collection. The proposed U-channels are located along left side of the catchment plant which is subject to change to suit the building layout.
- 6.1.3 The assessment reviews the drainage pipe have the sufficient capacity to cater for the drainage flow from the Application Site.
- 6.1.4 Mitigation measures are proposed during the application site proposed Application Site and to ensure that the existing drainage system within the site will not be affected during the construction stage.

**END OF TEXT**

**APPENDIX A**  
**SITE LAYOUT PLAN**





Project 項目名稱:

Proposed Temporary Public Vehicle Park for Medium Goods Vehicles for a Period of 3 Years at Lots 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories

Drawing Title 圖紙標題:

Location Plan



Drawing No. 圖號:

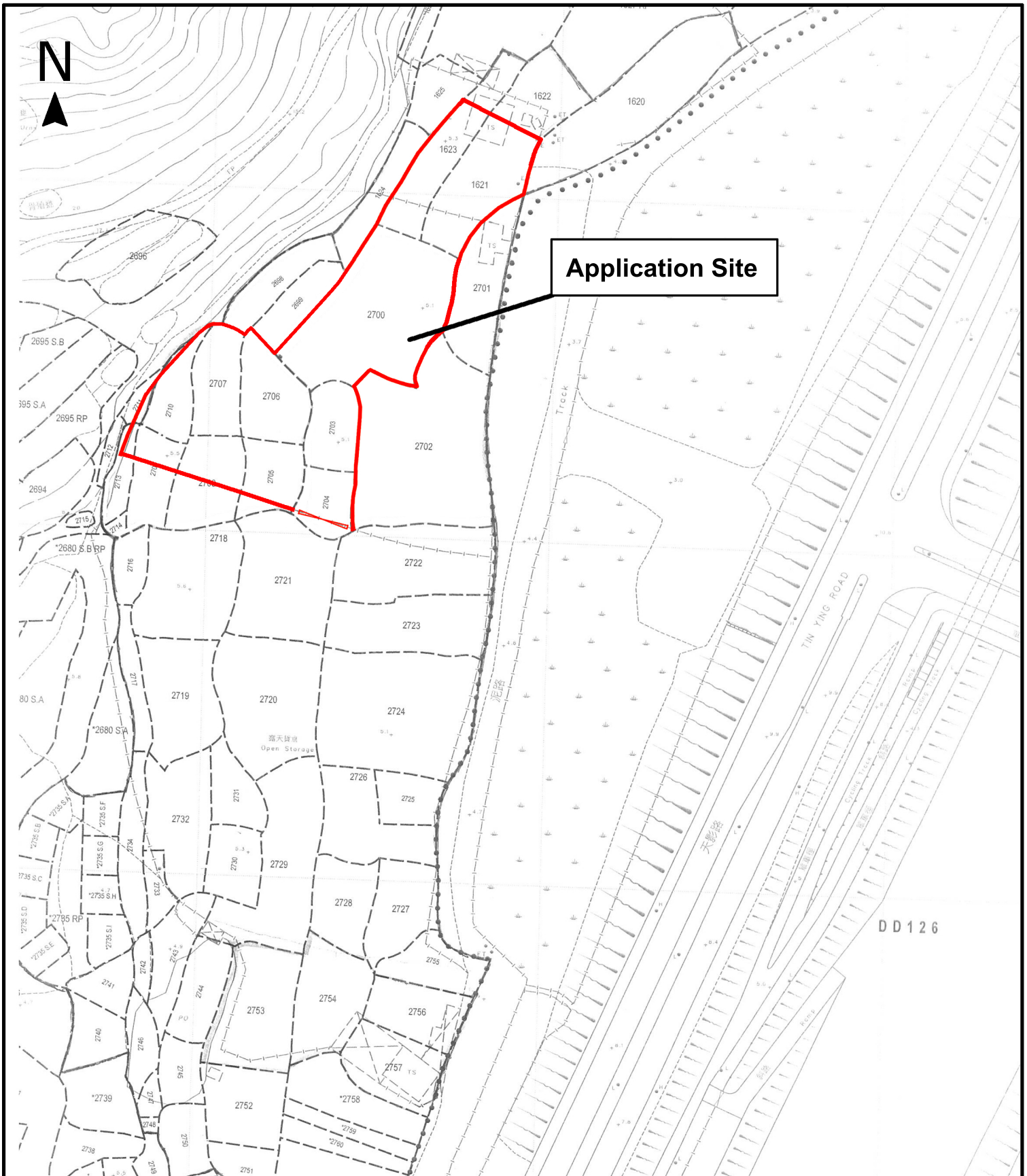
20240130

Remarks 備註:

●●● Vehicular access leading from Tin Wah Road

Scale 比例:

**APPENDIX B**  
**LAYOUT PLAN**



**Application Site**

Project 項目名稱:

Proposed Temporary Public Vehicle Park for Medium Goods Vehicles for a Period of 3 Years at Lots 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories

Drawing Title 圖紙標題:

Site Plan



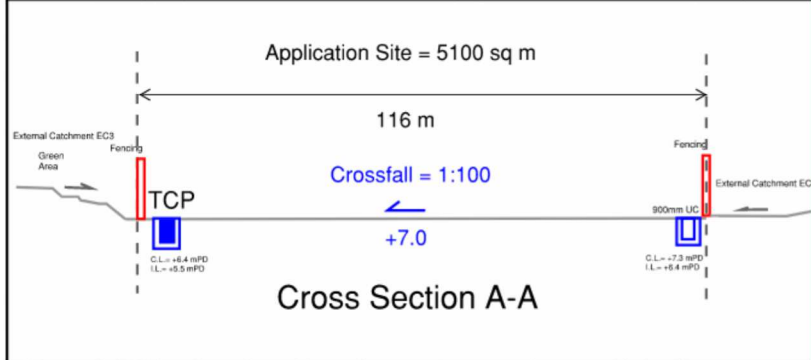
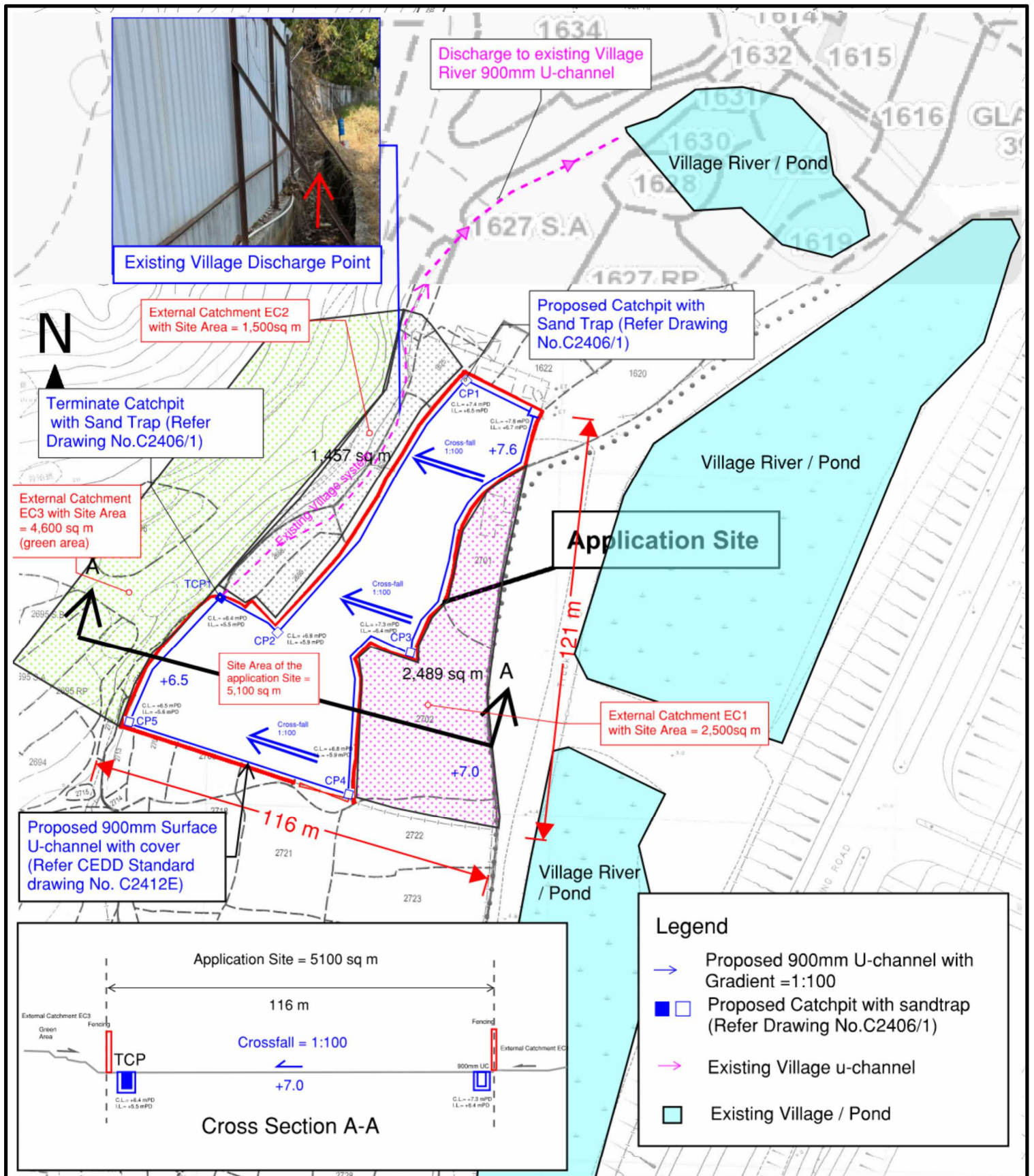
Drawing No. 圖號:

20240130

Remarks 備註:

Scale 比例:

**APPENDIX C**  
**PROPOSED DRAINAGE PLAN**



Legend	
	Proposed 900mm U-channel with Gradient = 1:100
	Proposed Catchpit with sandtrap (Refer Drawing No.C2406/1)
	Existing Village u-channel
	Existing Village / Pond

Project 項目名稱:  
**Proposed Temporary Public Vehicle Park for Medium Goods Vehicles for a Period of 3 Years at Lots 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories**

Drawing Title 圖紙標題:  
**Site Plan**

Drawing No. 圖號:  
**20240130**



Remarks 備註:  
**Appendix C - Proposed Drainage Plan**

Scale 比例:



前往地圖: <https://www.map.gov.hk/gm/geo:22.4667,113.9930?z=4514>



Existing Village Discharge Point



0 183 m  
天水圍循道衛理

©地圖權香港特別行政區政府

地圖列印於 2023 年 4 月 17 日

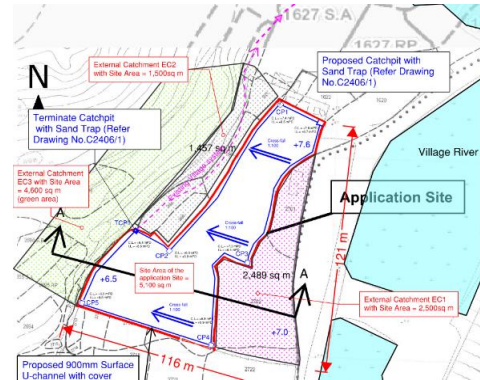
**APPENDIX D**  
**DESIGN CALCULATION OF THE PROPOSED DRAINAGE**

**Design Data**

1. Design follows the Rational Method in accordance with Stormwater Drainage Manual 2018 (DSD)
2. For conservative, Runoff coefficient for paved / unpaved land is 1.
3. Design return period is 50 years.
4. For manning's equation coefficient n is 0.016.
5. Runoff coefficient for Green area land is 0.4.

**Check for Hydraulic Capacity:**

Catchment	K	Area (A)
Application Site Area	1.00	5100.0 m <sup>2</sup>
External Catchment Area EC1	1.00	2500.0 m <sup>2</sup>
External Catchment Area EC2	1.00	1500.0 m <sup>2</sup>
External Catchment Area EC3	0.40	4600.0 m <sup>2</sup>
Total Catchment Area	1.00	10940.0 m <sup>2</sup>



Runoff estimation

Average slope, H

Catchment area, A

Distance between summit and point under consideration, L

SDM 7.5.2

Time of concentration of natural catchment, t<sub>o</sub>

Length of drain, L<sub>j</sub>

Velocity, V<sub>j</sub>

SDM 7.5.2

Flow time, t<sub>f</sub>

Time of concentration, t<sub>c</sub>

SDM Table 3

Storm constants for 50-year return period:

SDM 4.3.2

Extreme mean intensity, i<sub>50yr</sub>

GMS Fig 8.2

SDM 7.5.2

Design flow, Q

900mm u-channel capacity

Diameter

Cross-sectional area of 900mm U-channel

Gradient

Manning's Eq.

flow velocity

Design Capacity

Reserve capacity

For conservative, the U-channel shall be 900mm.

= 1 / 100m

= 13700 m<sup>2</sup>

= 50 m

= 0.14465 x L / (H<sup>0.2</sup> x A<sup>0.1</sup>)

= 2.79 min.

= 100 m

= 2.878 m/s

= Σ (L<sub>j</sub> / V<sub>j</sub>)

= 0.57904918 min.

= t<sub>o</sub> + t<sub>f</sub>

= 3.37 min.

a = 1167.7

b = 16.76

c = 0.561

= a / (t<sub>d</sub> + b)<sup>c</sup>

= 201.492704 mm/hr

< 405.000 mm/hr

= 0.278 i Σ K A

= 0.613 m<sup>3</sup>/s

= 900 mm

= 0.7231 m<sup>2</sup>

= 0.01

= 2.878 m/s

= 2.081 m<sup>3</sup>/s

> 0.613 m<sup>3</sup>/s

= 71%

OK



**APPENDIX E**  
**TYPICAL STANDARD DRAWINGS OF U-CHANNEL AND CATCHPIT**  
**(EXTRACTED FROM CEDD, FOR REFERNCE ONLY)**

**Response to Comments on Temporary Drainage Proposal (Issue 1)**

1. Comments from DSD/YL .....2

**1. Comments from DSD/MN**

<b>No.</b>	<b>Comments</b>	<b>Response</b>
1.	Peripheral surface channels shall be provided along the site boundary to collect the surface runoff accrued on the application site and to intercept the overland flow from the adjacent land.	Noted. Please refer to the revised Appendix C – Drainage Plan.
2.	The existing 900mm village channel, to which the applicant proposed to discharge the stormwater from the subject site and ultimately to the existing village pond, was not maintained by this office. Drainage impact may arise from the proposed development site to the downstream area comprising private lots. The applicant shall demonstrate that the drainage mitigation measure to address the drainage impact can be practicably implemented. In the case that it is a local village drains, DO/YL should be consult.	Noted.
3.	Further to item (ii) above, since there is no record of the said discharge path, please provide site photos to demonstrate its presence and existing condition.	Noted. Please refer to the Appendix C - Drainage Plan.
4.	The up-hill ground to the west of the application site is generally higher. Since the overland flow from the adjacent lands shall be properly intercepted, external catchment to the west of the site (other than EC1 and EC2) shall be considered in the calculation	Noted. The up-hill ground to the west of the application site was included as external catchment EC3 in the calculation. Please refer to the revised Appendix D - Drainage Calculation.
5.	Sand trap or provision alike should be provided at the immediate discharge point outside the application site boundary before the before conveying to any drainage system fall outside the application site.	Terminate Catchpit with Sand Trap is provided at the discharge point of the application site. Noted. Please refer to the revised Appendix C – Drainage Plan.
6.	Cross sections showing the existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given.	Noted and provided. Please refer to the revised Appendix C – Drainage Plan.
7.	Where walls or hoarding are erected along die site boundary, adequate opening should be provided to intercept the existing overland flow passing through the site.	Noted and provided.
8.	The development should neither obstruct overland flow nor adversely affect existing natural streams, village drains, ditches and the adjacent areas,	Noted.
9.	The applicant shall demonstrate that the proposed drainage construction works and the operation of the drainage can be practicably implemented. In the case that the drainage works to be constructed outside site boundary	Noted.

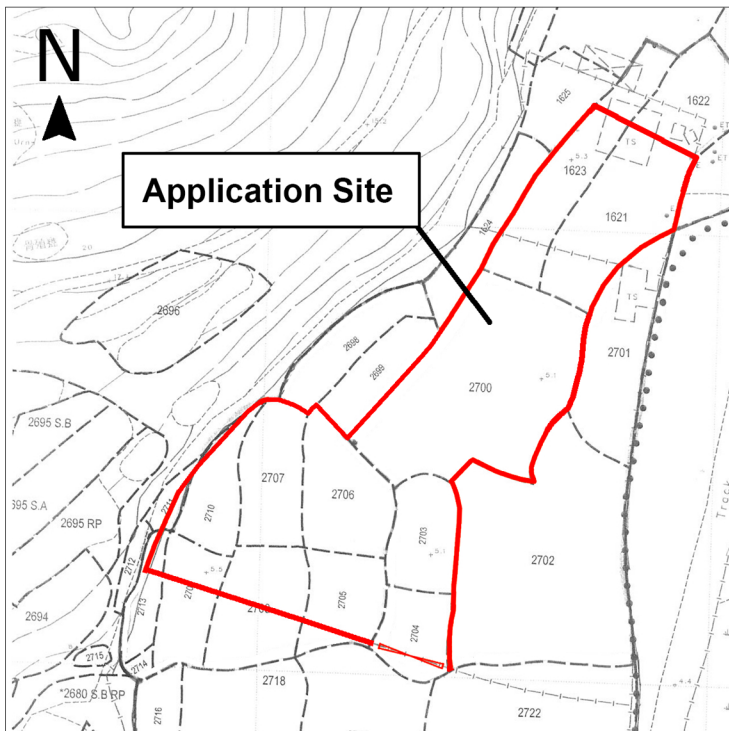
**Temporary Drainage Proposal (Issue 2)**

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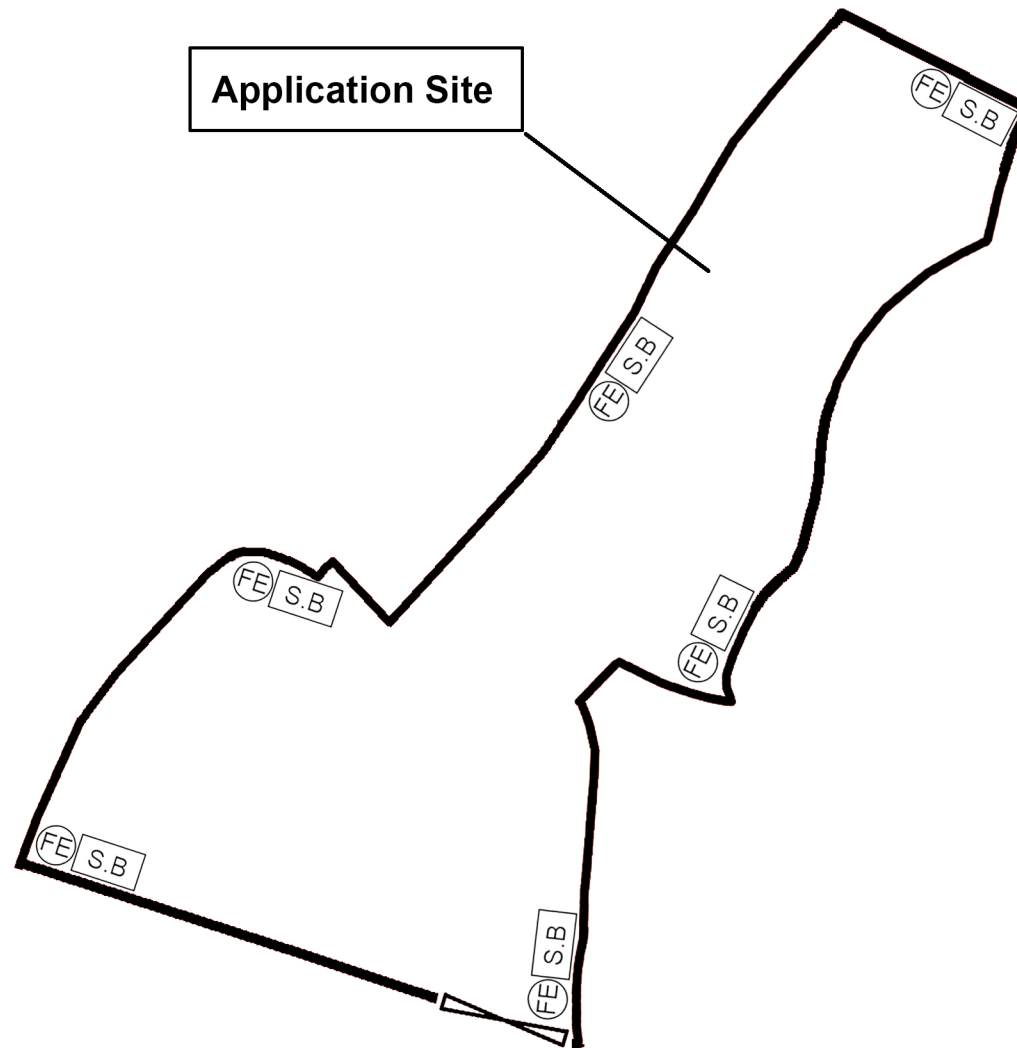
<b>No.</b>	<b>Comments</b>	<b>Response</b>
	but within government land, DLO/YL should be consult.	
10.	Despite the above, I have no objection in principle to the proposed application from a drainage point of view. Should the Town Planning Board consider that the application is acceptable from the planning point of view, I would suggest that a condition should be stipulated in the approval letter requiring the applicant to submit a revised drainage proposal, to implement and maintain the proposed drainage facilities to the satisfaction of this Division.	Noted with thanks. The revised drainage proposal is prepared for your consideration.

F.S. NOTES :  
Proposed Fire Services Installation

1. Portable fire extinguisher shall be provided throughout the application site.
2. Portable Sand Bucket shall be provided throughout the application site.



DD 129 Lot 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) , Lau Fau Shan Yuen Long



Project 項目名稱:

Proposed Temporary Public Vehicle Park for Medium Goods Vehicles for a Period of 3 Years at Lots 1621, 1623 (Part), 2700, 2703, 2704 (Part), 2705 (Part), 2706, 2707, 2708 (Part), 2709 (Part), 2710 (Part), 2711 (Part) and 2713 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, N.T.

Drawing Title 圖紙標題:

Proposed FS Plan

Drawing No. 圖號:

20240512

Remarks 備註:

⊙ FE 5kg Dry Powder Type Extinguisher

▭ S.B. Sand Bucket

## Planning Application No. A/YL-LFS/512

Table A: Responses to Departmental Comments

	Departmental Comments	Responses
	Director of Fire Services	
(a)	Regarding the submitted fire service installations proposal, the proposed emergency lighting and directional and exit sign as mentioned in the FS Notes shall be clearly marked on plan.	申請用途是停車場，按照消防指引，申請地點不用擺放緊急照明燈及逃生指示牌，申請人之前遞交的消防圖則有誤，現已重新遞交更改過的消防圖則，請看附件 1。

### 附件 2 : Temporary Drainage Proposal for LFS\_512