寄件者:	Louis Tse [redacted]
寄件日期:	2026年02月04日星期三 18:11
收件者:	tpbpd/PLAND
副本:	Andrea Wing Yin YAN/PLAND; Ivan Sze Yuet FUNG/PLAND; Bon Tang; Matthew Ng; Christian Chim; Danny Ng; Grace Wong
主旨:	[FI] S.16 Application No. A/YL-KTN/1180 - FI to address departmental comments
附件:	FI2 for A_YL-KTN_1180 (20260204).pdf
類別:	Internet Email

Dear Sir,

Attached herewith the further information to address departmental comments of the subject application.

Should you require more information, please do not hesitate to contact me. Thank you for your kind attention.

Kind Regards,

Louis TSE | Town Planner
R-riches Group (HK) Limited

R-riches Property Consultants Limited | R-riches Planning Limited | R-riches Construction Limited
[redacted]

Our Ref. : DD107 Lot 1505 RP & VL
Your Ref. : TPB/A/YL-KTN/1180

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

By Email

4 February 2026

Dear Sir,

2nd Further Information

Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities and Associated Filling of Land and Pond for a Period of 3 Years in "Agriculture" Zone, Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, N.T.

(S.16 Planning Application No. A/YL-KTN/1180)

We are writing to submit further information to address departmental comments of the subject application (**Appendix I**).

Should you require more information regarding the application, please contact our Mr. Danny NG at [redacted] or the undersigned at your convenience. Thank you for your kind attention.

Yours faithfully,

For and on behalf of
R-riches Planning Limited

Louis TSE
Town Planner

cc DPO/FSYLE, PlanD (Attn.: Ms. Andrea YAN email: awyyan@pland.gov.hk)
(Attn.: Mr. Ivan FUNG email: isyfung@pland.gov.hk)

Response to Comment

Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities and Associated Filling of Land and Pond for a Period of 3 Years in "Agriculture" Zone, Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, N.T.

(Application No. A/YL-KTN/1180)

(i) The current application serves to regularise the existing filling of land and pond on the application site (the Site). The Site is proposed to be filled with concrete of not more than 1.4 m (about) in depth, ranging from +3.7mPD to +4.9mPD, within which the entire Site has already been filled with 0.2 m of concrete in depth to provide a flat surface for site formation of structure, loading/unloading level and circulation space (**Plans 1** to **2** and **Annex I**). As structures B1 to B4 are proposed for warehouse (excluding dangerous goods godown) use, additional 1.2m of concrete has been filled at structure B3 and will be filled at structures B1, B2 and B4 to form the loading docks for loading/unloading area of the proposed structures.

(ii) Regarding the public comment concerning the owner's consent on the proposed development, the applicant has complied with the requirements as set out in the Town Planning Board Guidelines on satisfying the "Owner's Consent / Notification" requirements under S.12A and 16 of the Town Planning Ordinance (TPB PG-No. 31B) by sending notice to the Kam Tin Rural Committee on 26.09.2025 and publishing notice in local newspapers on 30.09.2025. The applicant has also obtained consent from the stakeholders of the concerned lots (i.e. *Lots 1510 and 1511 in D. D. 107*) for the proposed development (**Annex II**). The applicant will liaise with the relevant parties/lot owner(s) to resolve the land issue after planning permission has been obtained from the Town Planning Board (the Board).

(iii) A RtoC Table:

	Departmental Comments	Applicant's Responses
1.	**Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD) (Contact Person: Ms. Jessica KWAN; Tel: 2300 1444)**	
(A)	Specific Comments	
(1)	The ground to the north and northeast of the application site is generally higher. According to the topography around the subject site, external catchment area shall be greater than the one adopted in the submitted hydraulic calculation. The applicant should update hydraulic calculation.	A revised drainage impact assessment (DIA) is provided by the applicant to review the drainage arrangement for the proposed development (**Annex III**). We have further expanded the catchment area in this study to cope with the site at the north and northeast of the project site based on the available topographic information. The corresponding hydraulic calculation in Appendix B has been also updated based on this revised catchment area, which it is shown in the drawing nos. W1010/115 & 116.
(2)	Cross sections showing the proposed drainage facilities and existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given. Some information is missing in the submitted cross sections. Also, the applicant should clarify discrepancy of the proposed surface channels shown in the submitted drainage plan and Section C.	The cross sections in drawing no. W1010/112 have been revised to show the proposed drainage facilities along with the existing and future ground levels of the captioned site with respect to the adjacent areas. The surface channel presented in Section C has been deleted to be consistent with the proposed drainage plan.

(3)	It is noted that there is proposed land filling works for the development. Proper surface channels should be provided at the lower level to collect the surface runoff of both the application site and the overland flow from the adjacent lands. The applicant should review the proposed drainage system.	Surface channels have been provided at the lower level to collect the surface runoff of both the application site and the overland flow from the adjacent lands. The invert levels of the proposed catchpit nos. CP10 and CP10a have been revised which they are demonstrated in the revised manhole schedule in the drawing no. W1010/311.
(4)	The applicant should clarify invert levels at the starting point of the proposed surface channels.	The invert levels at the starting point of the proposed surface channels are shown on the drawing no. W1010/113.
(5)	The applicant should provide details for the connection of the proposed and existing drainage system at outfalls A, B and C.	Details of the connection of outlets A, B and C to the existing drainage system are shown in drawing nos. W1010/113 and W1010/114.
(6)	The applicant should demonstrate with hydraulic calculation that the proposed drainage facilities are adequate to collect, convey and discharge the surface runoff accrued on the application site and the overland flow intercepted from the adjacent lands.	The hydraulic calculation has been revised and shown in Appendix B to demonstrate that the proposed drainage facilities are adequate to collect, convey and discharge surface runoff accumulating at the application site, as well as intercept surface water flows originating from adjacent land.
(7)	Section 4 & Appendix B: In the assessment, the tidal effect should be taken into consideration, particularly include the "50B" case.	The ground levels of the existing drainage system are at around +3.0 mPD. The design extreme sea levels under “50A” and “50B” scenarios are at +3.52 mPD and +4.09 mPD at Tsim Bei Tsui. This implies that the sea water levels will be higher than the existing ground surface under 50A and 50B respectively and sea water will overflow to the ground.
(8)	Table 4.1 & Appendix B: The applicant should advise the source of Peak Flow Before Development.	The peak flow before development peak in Table 4.1 is based on the calculation in “Existing Stormwater Drainage Checking” illustrated in Appendix B.

(9)	Section 2.2.1 & Appendix B: The applicant should review roughness coefficient of the proposed and existing stormwater pipes and manhole spacing requirement. Reference should be made to Stormwater Drainage Manual (SDM) published by DSD.	For the proposed and existing concrete storm drains, a roughness coefficient ks= 0.6 has been used. For uPVC pipes, a roughness coefficient ks =0.06 is adopted. The catchpit spacing of the proposed U-channel length are within 80m which this fulfills the requirement of manhole spacing in accordance with the Stormwater Drainage Manual.
(10)	Drawing (No.: W1010/113) & Appendix B: The applicant should clarify discrepancy of invert level of the proposed 600mm dia. stormwater pipe at the connection to existing catchpit SCH1028774.	The invert level of the proposed 600mm dia. stormwater pipe at the connection to the existing catchpit SCH1028774 is +1.95 mPD, which it is shown in the drawing no. W1010/113.
(11)	Sand trap or provision alike should be clearly indicated on the proposed drainage plan and provided before the collected runoff is discharged to the public drainage facilities.	The catchpits/manhole with sand trap before the collected runoff is discharged to the public drainage facilities which they are indicated on the drawing nos. W1010/113 & 114.
(12)	Drawing (No: W1010/113): The applicant should review invert level of surface channels at the connection to the proposed catchpit CP 10a. Invert level of drainage facilities at the upstream should be higher than that at the downstream.	Please note that the invert level of the drainage facilities at the upstream are higher than that at the downstream catchpit CP 10a, which they have been shown in the drawing no. W1010/113 of the previous submission.

(13)	Section 5: The applicant should provide details on whether the proposed application would result in adverse drainage impacts to adjacent areas, including recommendations for mitigation measures, improvement works, and other necessary actions.	Section 5 has been revised to mention that the proposed drainage system is designed to collect the surface runoff of the adjacent areas at the north portion. For eastern, southern and western of site, the runoff of adjacent areas will not flow into the site based on the topography. Hence, there is no drainage impact to these adjacent areas.
General Comments		
(1)	The proposed development should neither obstruct overland flow nor adversely affect any existing natural streams, village drains, ditches and the adjacent areas, etc.	Noted.
(2)	Where walls or hoarding are erected are laid along the site boundary, adequate openings should be provided to intercept the existing overland flow passing through the site.	Noted.
(3)	The existing watercourse within/outside the application site should not be disturbed or interfered with until any necessary diversion works, which have been accepted by the owner of the existing watercourse, have been satisfactorily completed. Such diversion works should be carried out by the applicant at his/her own cost. Moreover, sufficient allowance for future maintenance of the existing watercourse should be provided.	Noted.
(4)	The applicant is required to rectify/modify the drainage system if they are found to be inadequate or ineffective during operation. The applicant shall also be liable for and shall indemnify claims and demands arising out of damage or nuisance caused by a failure of the drainage system.	Noted.

(5)	The applicant should submit form HBP1 to this Division for application of technical audit for any proposed connection to DSD's drainage facilities.	Noted.
(6)	The applicant should consult DLO/YL and seek consent from the relevant owners for any drainage works to be carried out outside his lot boundary before commencement of the drainage works.	Noted.
(7)	For the construction details of the proposed drainage facilities, reference should be made to current CEDD's standard drawings.	Noted.
(8)	Precast concrete pipe should generally be used for stormwater connection.	Noted.
(9)	The flow velocity is suggested to be within a range, i.e. 0.75 m/s to 3.0 m/s.	Noted.
(10)	The applicant should ensure that the proposed development must not obstruct overland flow or existing flow paths. All existing flow paths as well as the runoff falling onto and passing though the site will be intercepted and disposed of via proper discharge points. Free flow condition of the adjacent drains, channels and watercourses should be maintained at all time during and after the development.	The proposed development will not impede land-based movement or existing flow paths. All existing watercourses, along with runoff entering the site will be intercepted and managed via appropriate discharge points.
(11)	The applicant should be reminded to comply with "DSD Technical Circular No. 1/2017 Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage Systems" if the proposed works under the application involve the construction of permanent or temporary works within, over or adjacent to DSD's stormwater drainage systems.	Noted.

(12)	The applicant should take all precautionary measures to prevent any disturbance, damage and pollution from the site area to any parts of the existing drainage facilities in the vicinity of the lot. In the event of any damage to the existing drainage facilities, the applicant would be held responsible for the cost of all necessary repair works, compensation and any other consequences arising therefrom.	Noted.
2.	**Comments of the Director of Fire Services (D of FS) (Contact Person: Mr. CHEUNG Wing-hei; Tel: 2733 7737)**	
(1)	Sufficient number of wheeled type dry chemical fire extinguisher shall be provided so that a 20-35 kg wheeled type dry chemical fire extinguisher shall be provided in every 500 m^2 on every floor of the premises and ensure that every part of the premises can be reached from a distance of not more than 30 m; and	Please refer to the revised fire service installations (FSIs) proposal (**Annex IV**). Sufficient number of wheeled type dry chemical fire extinguisher are provided.
(2)	For ordinary hazard group III, an automatic sprinkler system supplied by a 135,000 L water tank shall be provided.	An automatic sprinkler system supplied by a 135,000 L water tank is provided.

ANNEXES

Annex I	Revised Application Form
Annex II	Consent Letter
Annex III	Revised Drainage Impact Assessment
Annex IV	Revised Fire Service Installations Proposal

Annex I

Revised Application Form

Proposed operating hours 擬議營運時間
Monday to Saturday from 09:00 to 19:00. No operation on Sunday and public holidays

(d) Any vehicular access to the site/subject building? 是否有車路通往地盤／有關建築物？	Yes 是	☑ There is an existing access. (please indicate the street name, where appropriate) 有一條現有車路。(請註明車路名稱(如適用)) Accessible from San Tam Road via Shui Mei Road and a local access. ☐ There is a proposed access. (please illustrate on plan and specify the width) 有一條擬議車路。（請在圖則顯示，並註明車路的闊度）
	No 否	☐

(e) Impacts of Development Proposal 擬議發展計劃的影響
(If necessary, please use separate sheets to indicate the proposed measures to minimise possible adverse impacts or give justifications/reasons for not providing such measures. 如需要的話，請另頁註明可盡量減少可能出現不良影響的措施，否則請提供理據/理由。)

(i) Does the development proposal involve alteration of existing building? 擬議發展計劃是否包括現有建築物的改動?	Yes 是 ☐	Please provide details 請提供詳情
	No 否 ☑	
(ii) Does the development proposal involve the operation on the right? 擬議發展是否涉及右列的工程?	Yes 是	☑ (Please indicate on site plan the boundary of concerned land/pond(s), and particulars of stream diversion, the extent of filling of land/pond(s) and/or excavation of land) (請用地盤平面圖顯示有關土地／池塘界線，以及河道改道、填塘、填土及／或挖土的細節及/或範圍) ☐ Diversion of stream 河道改道 ☑ Filling of pond 填塘 Area of filling 填塘面積 1,623 sq.m 平方米 ☑About 約 Depth of filling 填塘深度 0.5 m 米 ☑About 約 ☑ Filling of land 填土 Area of filling 填土面積 25,206 sq.m 平方米 ☑About 約 Depth of filling 填土厚度 not more than 1.4 m 米 ☐About 約 ☐ Excavation of land 挖土 Area of excavation 挖土面積…………… sq.m 平方米 ☐About 約 Depth of excavation 挖土深度 …………………m 米 ☐About 約
	No 否	☐

(iii) Would the development proposal cause any adverse impacts? 擬議發展計劃會否造成不良影響？		
On environment 對環境	Yes 會 ☐	No 不會 ☑
On traffic 對交通	Yes 會 ☐	No 不會 ☑
On water supply 對供水	Yes 會 ☐	No 不會 ☑
On drainage 對排水	Yes 會 ☐	No 不會 ☑
On slopes 對斜坡	Yes 會 ☐	No 不會 ☑
Affected by slopes 受斜坡影響	Yes 會 ☐	No 不會 ☑
Landscape Impact 構成景觀影響	Yes 會 ☐	No 不會 ☑
Tree Felling 砍伐樹木	Yes 會 ☐	No 不會 ☑
Visual Impact 構成視覺影響	Yes 會 ☐	No 不會 ☑
Others (Please Specify) 其他 (請列明)	Yes 會 ☐	No 不會 ☑

Annex II

Consent Letter

致城市規劃委員會：

本人是鄧雲谷祖的司理鄧仲怡。

根據本人所知，本祖堂鄧雲谷祖是天后公 (Tin Hau Kung) 之持份者之一。本祖堂不反對（駿匯發展有限公司）在DD107 Lot 1510 和1511號兩個地段上作出規劃申請（編號:A/YL-KTN/1180），把上述地段用作擬議臨時貨倉（危險品倉庫除外）連附屬設施和相關的填土和填塘工程（為期 3 年）。

此外，據本人所知，天后公 (Tin Hau Kung) 是由錦田鄉之相關人士持有，TANG Ching Cheung Tso 和 TANG Wai Hing Tso 並非天后公 (Tin Hau Kung) 之持份者之一。

現望此正視聽。

[redacted]

鄧雲谷祖司理 鄧仲怡

二零二六年二月四日

Annex III

Revised Drainage Impact Assessment

Excel Link Development Limited

Proposed Temporary Warehouse (Excluding Dangerous Godown) with Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories

Drainage Impact Assessment Report

Document No. W1010/03
Issue 2

February 2026

MANNINGS
(Asia) Consultants Limited

W1010/03
Issue 2
February 2026

Proposed Temporary Warehouse (Excluding Dangerous Godown) with Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories

Drainage Impact Assessment Report

Approved for Issue by:

Simon Chan RPE (Civil)
RP0370071

Position: Project Manager

Date: 4 February 2026

Excel Link Development Ltd
205A Sik Kong Tsuen
Ha Tsuen, Yuen Long
New Territories

Mannings (Asia) Consultants Ltd
5/F, Winning Commercial Building
46-48 Hillwood Road
Tsim Sha Tsui
Kowloon

W1010/03
Issue 2
February 2026

Proposed Temporary Warehouse (Excluding Dangerous Godown) with Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories

Drainage Impact Assessment Report

Issue	Prepared by	Reviewed by	Date
1	EM	BLE	21 Oct 2025
2	BH	SC	4 Feb 2026

Content

List of Appendix

Drawing List of Appendix A

Drawing No.	Revision	Drawing Title
W1010/111	A	Layout Plan
W1010/112	A	Cross Section
W1010/113	A	Drainage Layout Plan
W1010/114	A	Drainage Layout Plan – Structure Roofing
W1010/115	A	Catchment Plan – Before Development
W1010/116	A	Catchment Plan – After Development
W1010/211	-	Typical Details of Drainage (Sheet 1 of 2)
W1010/212	A	Typical Details of Drainage (Sheet 2 of 2)
W1010/311	A	Manhole Schedule

List of Tables

Abbreviations

D.D.	Demarcation District
DIA	Drainage Impact Assessment
DSD	Drainage Services Department
GFA	Gross Floor Area
MACL	Mannings (Asia) Consultants Limited
PlanD	Planning Department
SDM	Stormwater Drainage Manual

1.0 Introduction

1.1 Background

1.1.1 The proposed development consists of proposed temporary warehouse (excluding dangerous godown) with ancillary facilities and associated filling of land and Pond for a period of 3 years at various lots in D.D. 107 and the adjoining government land, Kam Tin, Yuen Long, New Territories ("the Site"). The Section 16 application of the proposed development was approved on 8 December 2023.

1.1.2 Due to the concerns of possible drainage impacts arising from the change in land use, Mannings (Asia) Consultants Limited (MACL) was appointed by Excel Link Development Limited to undertake a Drainage Impact Assessment (DIA).

1.1.3 The Site has an area of about 25,206m^2 and it is currently covered by bituminous materials for open storage of vehicles. 6 nos. of structures are proposed for warehouses (excl. D.G.G.), site offices, washrooms, FS pump room and FS water tank with total GFA of 13,453 m^2. The general layout plan and cross sections of the Site are shown in **Drawing Nos. W1010/111** and **W1010/112** enclosed in **Appendix A**.

1.2 Objective of this submission

1.2.1 This submission presents the DIA for the Site. The objective of this assessment is to demonstrate the acceptability of any drainage impacts on the surrounding environment arising from the proposed development.

2.0 Design Methodology and Assumptions

2.1 Design Code

2.1.1 The below design codes are to be followed for this design assessment:

- Stormwater Drainage Manual (DSD) - Fifth Edition, January 2018;
- Stormwater Drainage Manual (DSD) - Corrigendum No. 1/2022;
- Stormwater Drainage Manual (DSD) - Corrigendum No. 1/2024;
- Stormwater Drainage Manual (DSD) - Corrigendum No. 2/2024;
- BS 5911 Code of Practice for Precast Concrete Pipe Design
- DSD Standard Drawings

2.2 Design Parameters

2.2.1 The following design parameters are adopted for this design assessment:

a) Runoff Coefficient

Table 2.1 – Runoff Coefficients

Surface Characteristic	Runoff Coefficient, C
Roof of Structure	1.00
Asphalt	0.90
Concrete	0.90
Grassland (heavy soil Flat), Unpaved Area	0.25

Note: Roughness Coefficient for concrete pipe flow k_s=0.6 and uPVC pipe k_s= 0.06.

b) Minimum Pipeline Cover and Manhole Spacing Requirements

Table 2.2 – Minimum Pipeline Cover and Manhole Spacing Requirements

Minimum pipeline cover	
In Roads	0.9 m
In footways and verges	0.45 m
Manhole spacing requirements	
Pipe Diameter < 675 mm	80 m
675 < Pipe Diameter < 1050	100 m
Pipe Diameter > 1050	120 m

c) Bedding factors

- Granular bedding : 1.9
- Plain concrete bedding : 2.6
- Reinforced concrete bedding with allowance for minimum steel area : 3.4
- Concrete Surround : 4.5

d) Design Flow Velocity

- Minimum : 1 m/s
- Maximum : 3 m/s (desirable)
  : 6 m/s (absolute)

2.2.2 The return period of 1 in 50 years is adopted for this DIA for conservative purpose.

2.3 Description of Analysis Method

2.3.1 Rational method is adopted for calculation of the peak runoff. The formula is extracted from Section 7.5.2(a) of Stormwater Drainage Manual (SDM) which is to estimate the stormwater runoff as shown below:

$$Q_p = 0.278\ CiA$$

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

2.3.2 10% reduction of the flow area is allowed taken into account of the decomposition of siltation as per DSD's SDM 2018.

2.3.3 The time of concentration used for determining the duration of the design storm is considered by the time of entry and the time of flow,

$$t_c = t_o + t_f \qquad t_f = L/V$$

where
t_o = inlet time (time taken for flow from the remotest point to reach the most upstream point of the urban drainage system)
t_f = flow time
L = length of drain
V = flow velocity

2.3.4 The time of entry or time of flow in the hinterland is calculated using the Bransby William's Equation.

$$t_e = \frac{0.14465\ L}{A^{0.1} H^{0.2}}$$

where
t = time of concentration (min)
L = catchment length (m)
A = catchment area (m^2)
H = average catchment slope (m/100m)

2.3.5 The rainfall intensity is extracted from the Section 4.3.2 of SDM which is to estimate the Intensity-Duration –Frequency (IDF) Relationship.

$$i = a /(t_d+b)^c$$

where
- i = extreme mean intensity in mm/hr
- t_d = duration in minutes (t_d<240), and
- a,b,c = storm constants given in table 3 of SDM as below

Table 2.3 – Storm Constant of SDM

Return Period T (years)	50
a	505.5
b	3.29
c	0.355

2.3.6 Colebrook-White Equation is used in hydraulic design for pipe flow.

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

where:

- $\bar{V}$ = cross-sectional mean velocity (m/s)
- g = acceleration due to gravity (m/s^2)
- R = hydraulic radius = A/P
- D = pipe diameter (m)
- k_s = surface roughness (m)
- ν = kinematic viscosity (m^2/s) = 1e-6 m^2/s for storm water
- S_f = friction gradient (dimensionless)

2.3.7 Manning's formula is used in hydraulic design for open channel flow.

$$\bar{V} = \frac{R^{1/6}}{n}\sqrt{RS_f}$$

where:

- $\bar{V}$ = cross-sectional mean velocity (m/s)
- n = Manning coefficient ($s/m^{1/3}$)
- R = hydraulic radius = A/P
- A = wetted cross-sectional area (m^2)
- P = wetted perimeter (m)
- S_f = gradient of channel

3.0 Existing and Proposed Drainage Condition

3.1 Existing Site Condition and Existing Drainage System

3.1.1 The topography of the Site is generally flat, with current levels ranging from +3.5 mPD to +4.0 mPD. In general, the direction of existing surface runoff flows from north to south across the Site. Given that the ground levels of the Site are lower than those of the northern area, the Site is considered to have a moderate susceptibility to flooding. This report will evaluate any drainage impacts and propose necessary drainage controls to address and mitigate potential flood risks.

3.1.2 The catchment plan before the proposed development is shown in **Drawing No. W1010/115** enclosed in **Appendix A**.

3.1.3 Surface runoff collected from the catchments is discharged to the existing nullah (feature no. SCP1009603) via three drainage outfalls (feature nos. SWD1065688, SWD1065692 and SWD1065695) and, eventually to Kam Tin River.

Table 3.1 – Existing Drainage System in Vicinity of the Site

DSD Feature No.	Description	Size (mm)	Main Channel Downstream
SCP1009603	Nullah	7500	Kam Tin River (SCP1006201)
SWD1065685	Pipeline	750	Nullah (SCP1009603)
SWD1065688	Pipeline	600	Nullah (SCP1009603)
SWD1065692	Pipeline	750	Nullah (SCP1009603)
SWD1065695	Pipeline	600	Nullah (SCP1009603)

3.1.4 The hydraulic assessment for the existing drainage system is presented in **Appendix B**.

3.2 Drainage Condition with the Proposed Development

3.2.1 The proposed development consists of 6 nos. of structures for warehouses (excl. D.G.G.), site offices, washrooms, FS pump room and FS water tank. Upon project completion, the finished ground level of the Site will be raised to approximately +3.7 mPD to +4.9 mPD. Part of the Site area will be designated for 6 new covered structures, while the remaining open area will be paved completely by concrete and continued to be an opened space area. Additionally, some of these open areas are proposed to be served as access roads and parking spaces. A layout plan of the proposed development with **Drawing No. W1010/111** is enclosed in **Appendix A**.

3.2.2 The catchment plan upon completion of the proposed development is demonstrated in the **Drawing No. W1010/116** enclosed in **Appendix A**.

3.2.3 Surface runoff within the Site will be collected by the proposed drainage systems and discharged into the existing drains. The proposed drainage system consists of elevated pipes, U-channels and underground pipes. Drainage layout plan and details of the drainage are shown in **Drawing Nos. W1010/113, W1010/114, W1010/211, W1010/212 and W1010/311** enclosed in **Appendix A**.

3.2.4 The proposed U-channels and drainage pipes are designed to have sufficient capacities for the estimated runoff collected from the Site.

3.2.5 The hydraulic assessment for the proposed drainage system is presented in **Appendix B**.

3.3 Changes in Land Use and Planned Drainage Works in Adjacent Area

3.3.1 There is no changes of land use and planned drainage works in adjacent area of the site.

4.0 Potential Drainage Impact

4.1 Changes in Land Use and Surface Runoff Characteristics

4.1.1 The Site is currently covered by bituminous materials for open storage of vehicles. Upon completion of the proposed development, the Site will be paved completely by concrete.

4.2 Changes to Surface Runoff Hydrographs

4.2.1 Changes in surface from asphalt to concrete are considered to be negligible since the surface runoff coefficients of asphalt and concrete are the same. Thus, the impact on surface runoff hydrographs is also considered negligible.

4.3 Changes in Flood Storage

4.3.1 According to the site survey and observations, no flood storage was found near the Site.

4.4 Hydraulic Bankfull Capacity of the Proposed Drainage System

4.4.1 The proposed drainage system is designed with sufficient capacity to cater the flow from the Site. Detailed calculations are attached in **Appendix B**.

4.5 Potential Drainage Impact to Existing Drainage System

4.5.1 The table below shows the comparison of the peak runoff of the three outfalls before and after the development. Detailed calculations are attached in **Appendix B**.

Table 4.1 – Changes in Peak Runoff and Peak Velocity of Outfalls

Existing Drainage	Peak Flow Before Development (m^3/s)	Peak Flow After Development (m^3/s)	Capacity (m^3/s)	Flow Difference	Utilization After Development
Outfall A (SNF1009827)	0.261	0.315	0.615	+21%	0.51
Outfall B (SNF1009826)	0.312	1.001	1.473	+221%	0.68
Outfall C (SNF1009823)	0.231	0.244	0.417	+5.6%	0.59
Total	**0.804**	**1.56**		**+247.6%**	

4.6 Temporary Drainage during Construction

4.6.1 According to the site survey and observations, there is no existing drainage system in the Site. Therefore, no existing drainage system would be impacted during the construction phase. As a result, temporary drainage measures are considered unnecessary.

4.7 Details of Works to Existing Drainage System

4.7.1 The proposed drainage systems within the site will be connected to outfall A, outfall B and outfall C as shown in **Drawing Nos. W1010/113 and W1010/114 in Appendix A**.

4.8 Potential Drainage Impacts to Other Land Users

4.8.1 All runoff on the Site will be collected and drained into the existing drainage system. No drainage impact on other land users is anticipated.

5.0 Mitigation Measures for Drainage Impact

5.1 Proposed Mitigation Measures

5.1.1 In view of change in the ground surface of the site, U-channels are designed around the site boundary to collect the surface runoff of the adjacent areas. The proposed drainage system is designed to have enough capacity to convey the surface runoff. Hence, there is no drainage impact to adjacent areas.

5.1.2 The existing drains are checked and they have enough capacity to convey the design flow and there is no impact on the existing drainage system.

5.1.3 The Contractor would monitor the site conditions during construction to ensure that there is no adverse drainage impact to the nearby drainage systems and adjacent land users.

6.0 Monitoring Requirements

6.1 Monitoring During Construction

6.1.1 Monitoring of the drainage system is required during construction to ensure that there are no adverse impacts that could lead to flooding or deterioration in water quality.

6.1.2 Monitoring shall include:

- any siltation or blockages in channels, slit traps or sediment basins;
- checking the drainage is performing in accordance with the design;
- checking for damage; and
- visual inspection of any high sediment levels.

6.1.3 The detailed requirements for drainage monitoring should be as shown in the following table:

Table 6.1 – Detailed Requirements for Drainage Monitoring

Type / location of monitoring	Minimum Frequency	Action by
Prepare method statements	Before the start of any works that could impact on drainage	Contractor
Inspect existing drainage systems and all construction drainage systems for blockages or breakages	Daily, Weekly, Before every rainstorm warning	Contractor
	After every rainstorm	Contractor
Inspect sedimentation basins and silt traps	Daily, Weekly, Before every rainstorm warning	Contractor
	After every rainstorm	Contractor

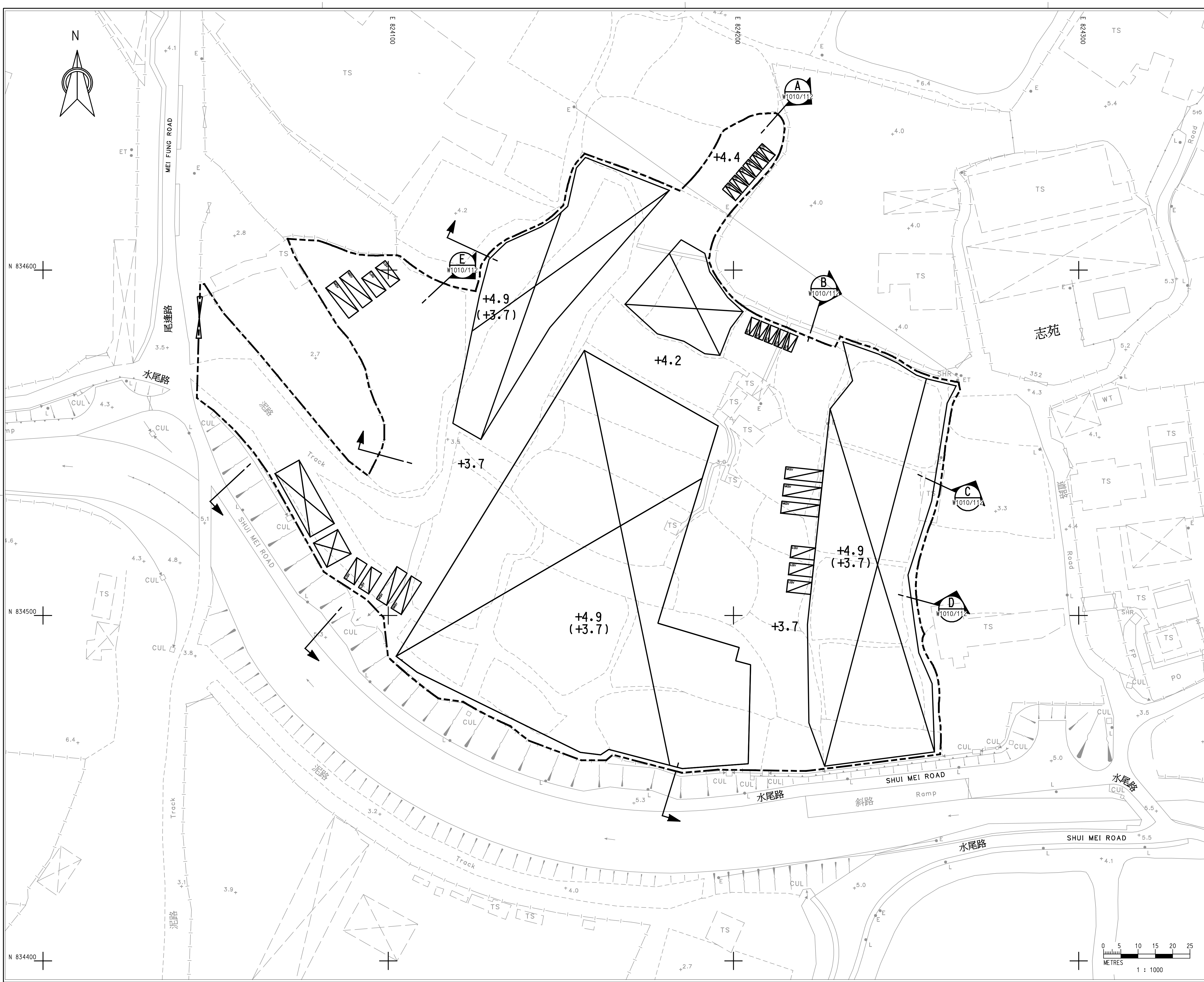
7.0 Conclusion

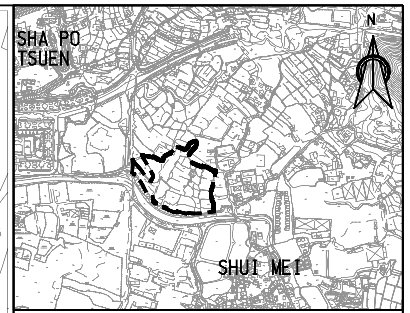
7.1 Conclusion

7.1.1 The drainage impact assessment has been conducted for the proposed land use changes in Fung Kat Heung. The existing drainage system has been assessed for the increased runoff from the catchment area. Based on our assessment, the existing drainage system would provide sufficient capacity to cater for the additional stormwater. No adverse drainage impact due to the development is expected.

Appendix A

Drawings





KEY PLAN

SCALE 1:20000

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- APPLICATION SITE
- STRUCTURE
- PARKING SPACE (PC)
- LOADING / UNLOADING SPACE (LGV)
- LOADING / UNLOADING SPACE (MGV)
- INGRESS / EGRESS
- +3.7 PROPOSED SITE LEVEL (WITH LOADING/UNLOADING PLATFORM)
- (+3.7) PROPOSED SITE LEVEL (WITHOUT LOADING/UNLOADING PLATFORM)

Rev.	Description of Revision	Date	Ckd.

Client

EXCEL LINK DEVELOPMENT LIMITED

Consultants

MANNINGS (Asia) Consultants Limited

Scale in A3: AS SHOWN	Date: AUG 2025	
Designed: EM	Drawn: KAM	Checked: BLE
Design Team Leader: SC	Date: AUG 2025	
Approved: KTC	Date: AUG 2025	

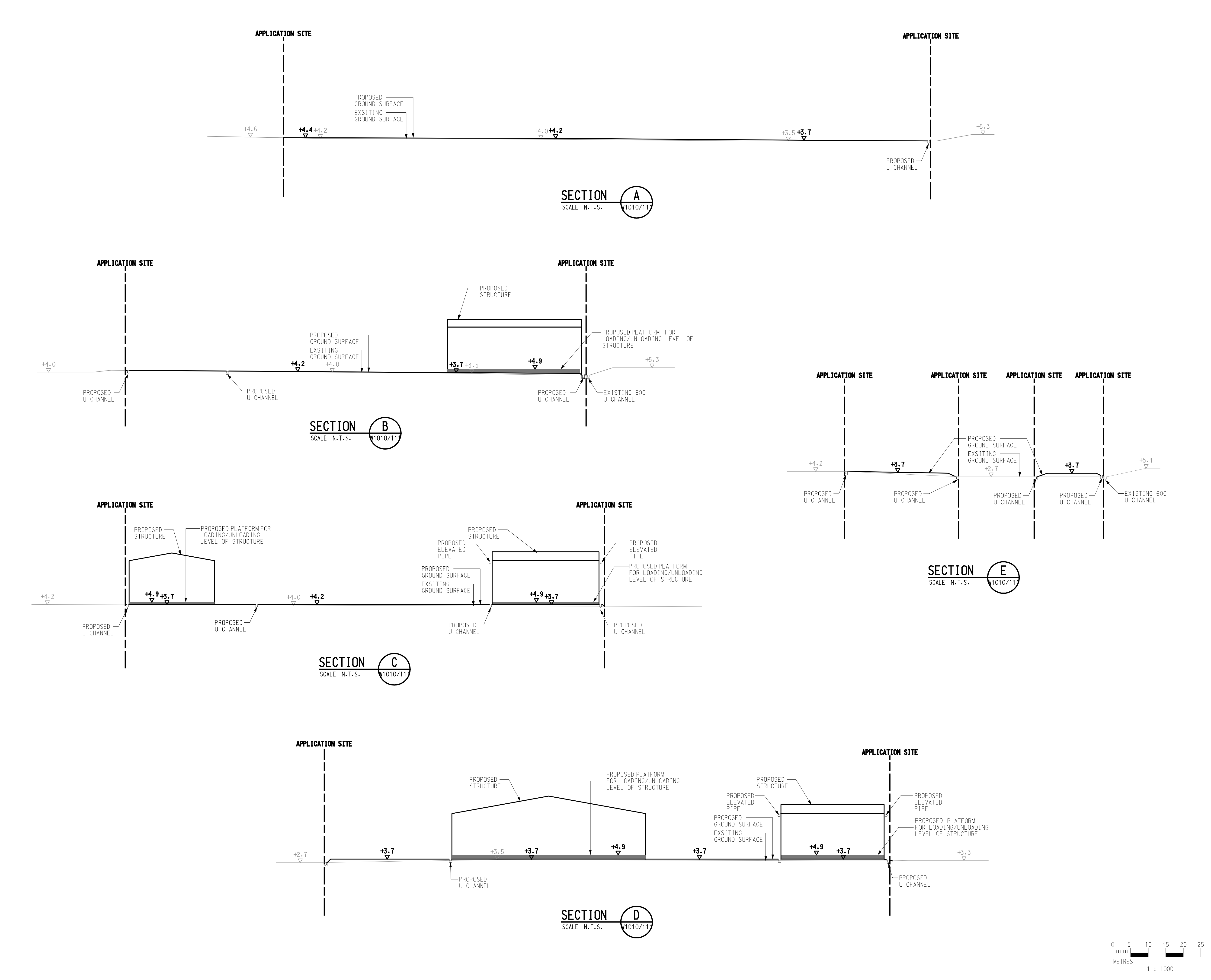
Project

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS, VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

Title

LAYOUT PLAN

Drawing No.	Stage	Rev.
W1010/111	P	A



NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
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Rev.	Description of Revision	Date	Ckd.
A	GENERAL REVISION	DEC 25	–

Client

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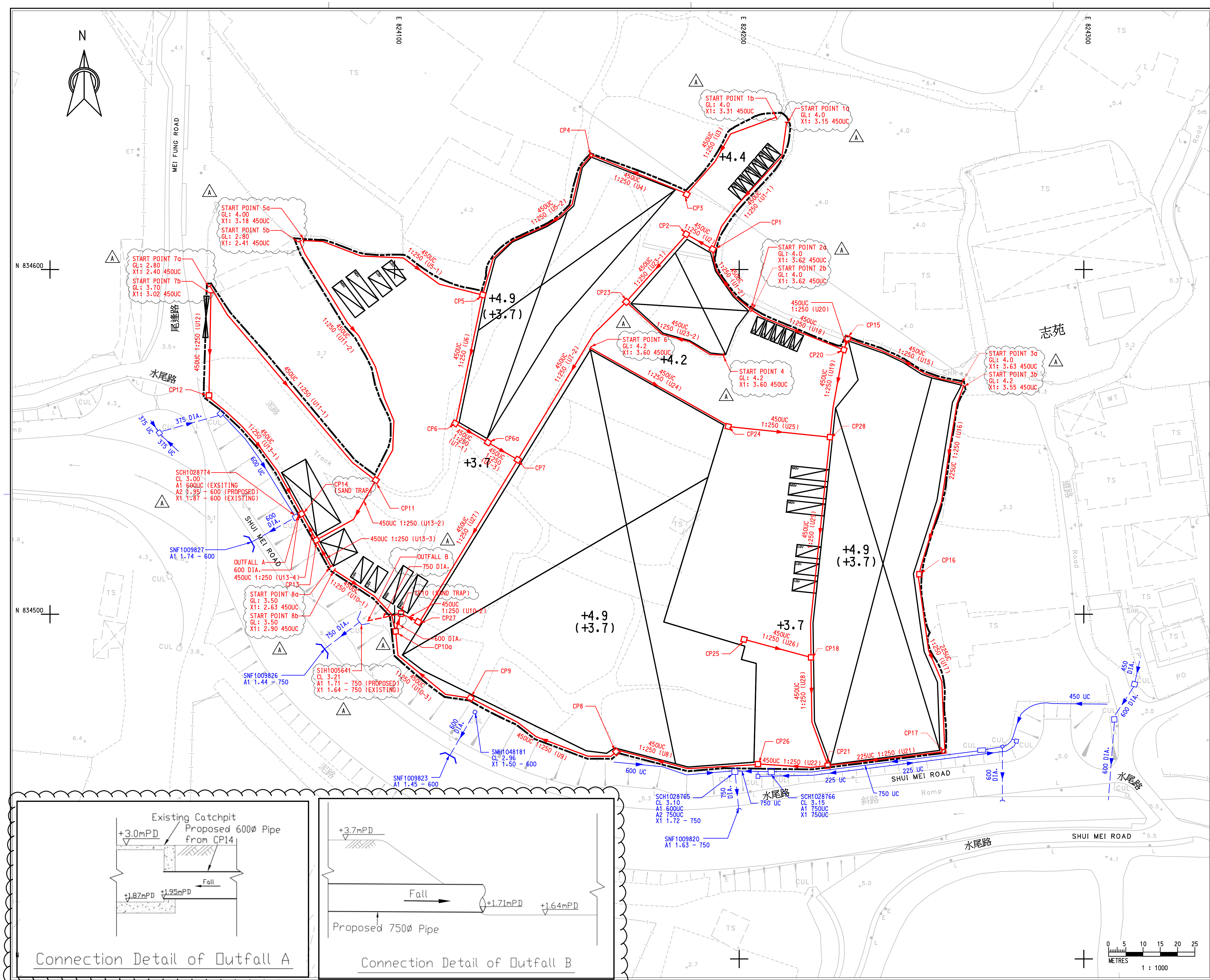
Title

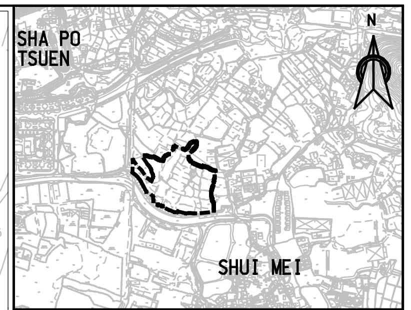
CROSS SECTION

Drawing No.	Stage	Rev.
W1010/112	P	A

4/2/2026 2:11:38 pm

K:\W1010 - DIA for Sites 1 & 2 at Kam Tin Fung Kat Heung\Ustation\W1010-112A.dgn





KEY PLAN

SCALE 1:20000

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- APPLICATION SITE
- STRUCTURE
- PARKING SPACE (PC)
- LOADING / UNLOADING SPACE (LGV)
- LOADING / UNLOADING SPACE (MGV)
- INGRESS / EGRESS
- +3.7 PROPOSED SITE LEVEL (WITH LOADING/UNLOADING PLATFORM)
- (+3.7) PROPOSED SITE LEVEL (WITHOUT LOADING/UNLOADING PLATFORM)
- EXISTING U-CHANNEL
- EXISTING PIPE
- EXISTING MANHOLE
- EXISTING CATCHPIT
- PROPOSED U-CHANNEL
- PROPOSED PIPE
- PROPOSED MANHOLE
- PROPOSED CATCHPIT

Rev.	Description of Revision	Date	Ckd.
A	GENERAL REVISION	DEC 25	-

Client

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Consultants

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Approved: KTC		Date: AUG 2025

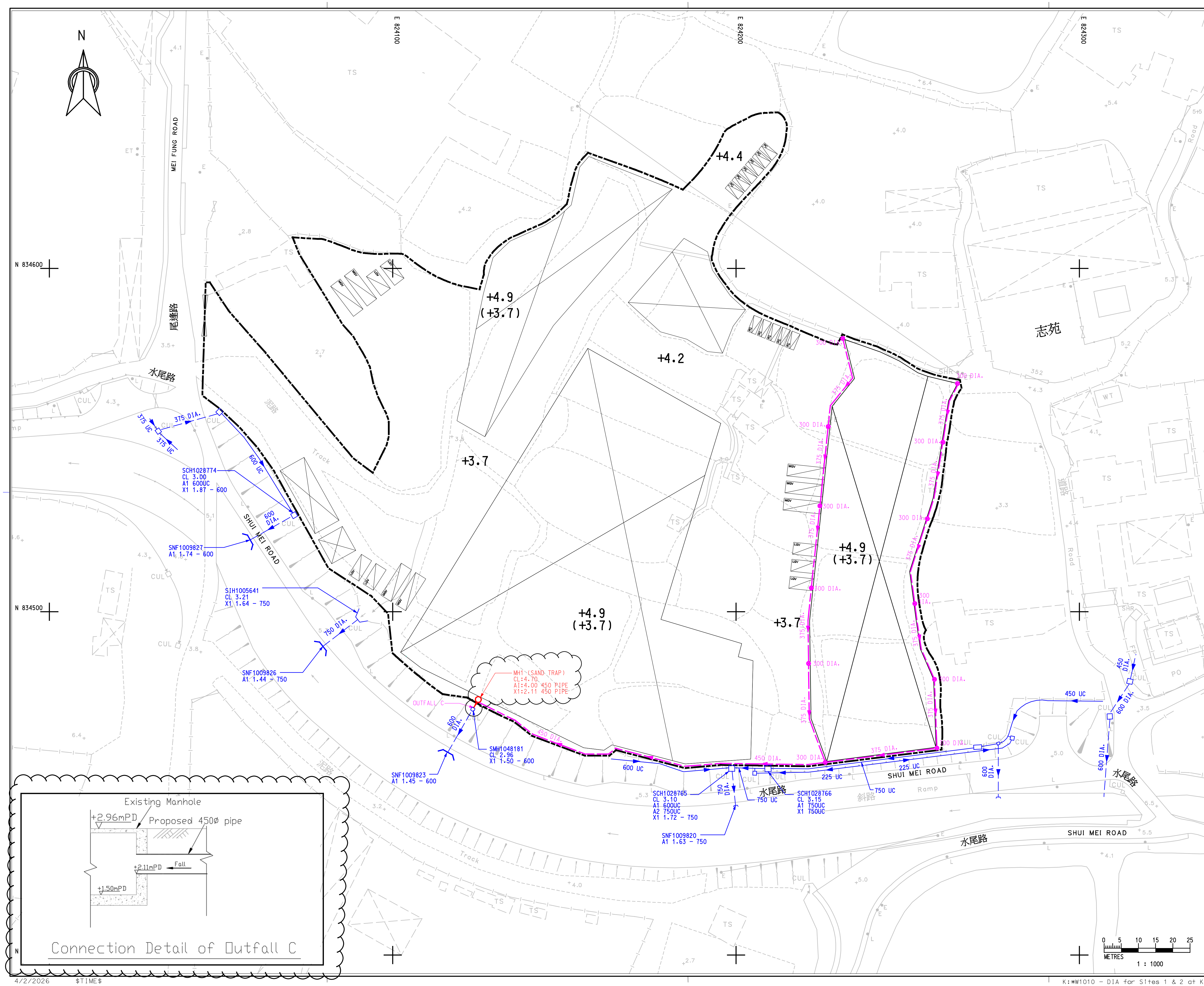
Project

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS, VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

Title

DRAINAGE LAYOUT PLAN

Drawing No.	Stage	Rev.
W1010/113	P	A



4/2/2026 $TIME$

SHA PO TSUEN

SHUI MEI

KEY PLAN
SCALE 1:20000

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- APPLICATION SITE
- STRUCTURE
- PARKING SPACE (PC)
- LOADING / UNLOADING SPACE (LGV)
- LOADING / UNLOADING SPACE (MGV)
- INGRESS / EGRESS
- +3.7 PROPOSED SITE LEVEL (WITH LOADING/UNLOADING PLATFORM)
- (+3.7) PROPOSED SITE LEVEL (WITHOUT LOADING/UNLOADING PLATFORM)
- PROPOSED DOWNPIPE (uPVC PIPE)
- PROPOSED ELEVATED PIPE (uPVC PIPE)
- EXISTING U-CHANNEL
- EXISTING PIPE
- EXISTING MANHOLE
- EXISTING CATCHPIT
- PROPOSED MANHOLE
- PROPOSED PIPE

Rev.	Description of Revision	Date	Ckd.

Client

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Scale in A3	Date	
AS SHOWN	AUG 2025	
Designed	Drawn	Checked
EM	KAM	BLE
Design Team Leader		Date
SC		AUG 2025
Approved		Date
KTC		AUG 2025

Project

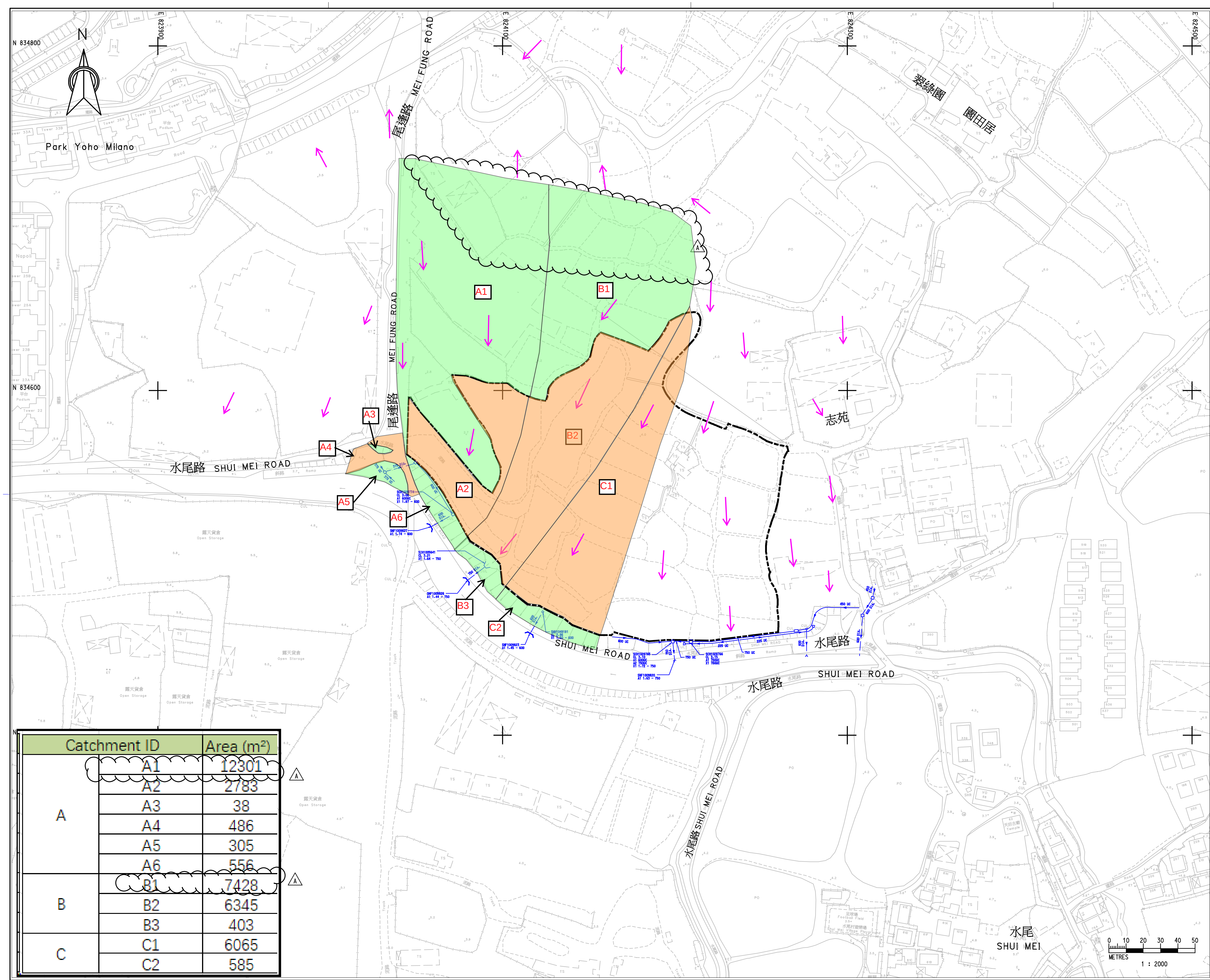
PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS, VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

Title

DRAINAGE LAYOUT PLAN - STRUCTURE ROOFING

Drawing No.	Stage	Rev.
W1010/114	P	A

K:\W1010 - DIA for Sites 1 & 2 at Kam Tin Fung Kat Heung\station\W1010-114A.dgn



Catchment ID		Area (m²)
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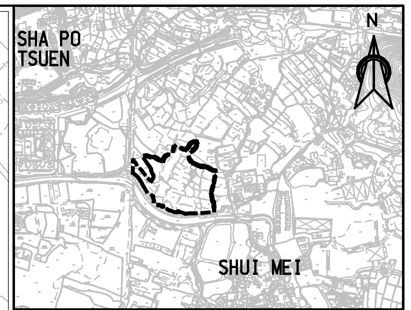
	A2	2783
	A3	38
	A4	486
	A5	305
	A6	556
B	B1	7428
	B2	6345
	B3	403
C	C1	6065
	C2	585



KEY PLAN
SCALE 1:20000

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- APPLICATION SITE
- EXISTING U-CHANNEL
- EXISTING PIPE
- EXISTING MANHOLE
- EXISTING CATCHPIT
- UNPAVED AREA
- PAVED AREA
- RUNOFF DIRECTION

Rev.	Description of Revision	Date	Ckd.

Client
EXCEL LINK DEVELOPMENT LIMITED

Consultants
MANNINGS (Asia) Consultants Limited

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Project
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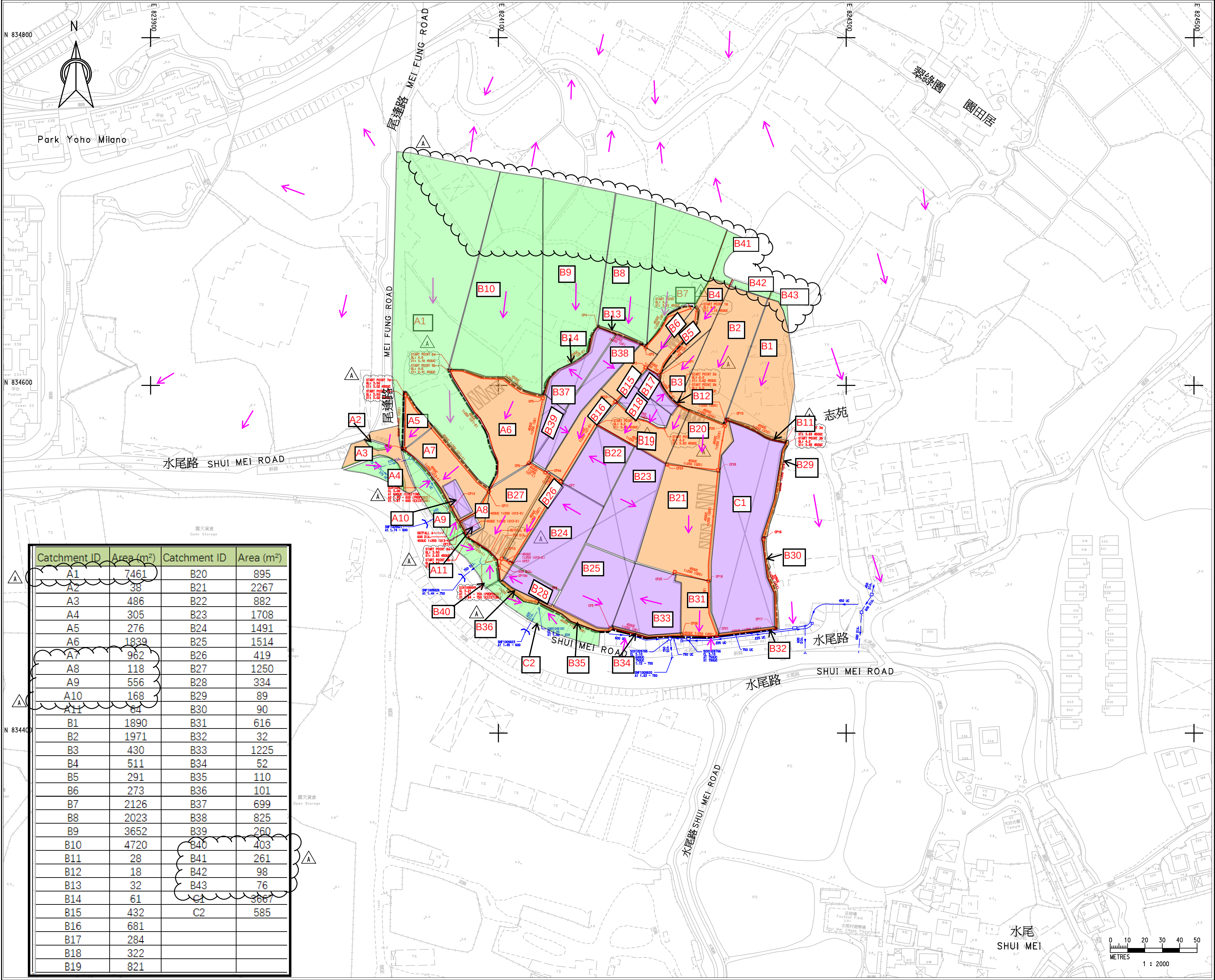
Title
CATCHMENT PLAN - BEFORE DEVELOPMENT

Drawing No.	Stage	Rev.
W1010/115	P	A



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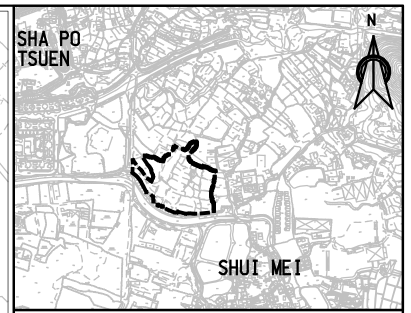
A3	486	B22	882
A4	305	B23	1708
A5	276	B24	1491
A6	1839	B25	1514
A7	962	B26	419
A8	118	B27	1250
A9	556	B28	334
A10	168	B29	89
A11	64	B30	90
B1	1890	B31	616
B2	1971	B32	32
B3	430	B33	1225
B4	511	B34	52
B5	291	B35	110
B6	273	B36	101
B7	2126	B37	699
B8	2023	B38	825
B9	3652	B39	260
B10	4720	B40	403
B11	28	B41	261
B12	18	B42	98
B13	32	B43	76
B14	61	C1	3667
B15	432	C2	585
B16	681		
B17	284		
B18	322		
B19	821		



KEY PLAN
SCALE 1:20000

NOTES :
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LEGEND :
- APPLICATION SITE
- EXISTING U-CHANNEL
- EXISTING PIPE
- EXISTING MANHOLE
- EXISTING CATCHPIT
- PROPOSED U-CHANNEL
- PROPOSED PIPE
- PROPOSED MANHOLE
- PROPOSED CATCHPIT
- UNPAVED AREA
- PAVED AREA
- ROOFING AREA
- RUNOFF DIRECTION

Rev.	Description of Revision	Date	Ckd.
A	GENERAL REVISION	DEC 25	–

Client
EXCEL LINK DEVELOPMENT LIMITED

Consultants
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Title
CATCHMENT PLAN - AFTER DEVELOPMENT

Drawing No.	Stage	Rev.
W1010/116	P	A

31/12/2025 $TIME$

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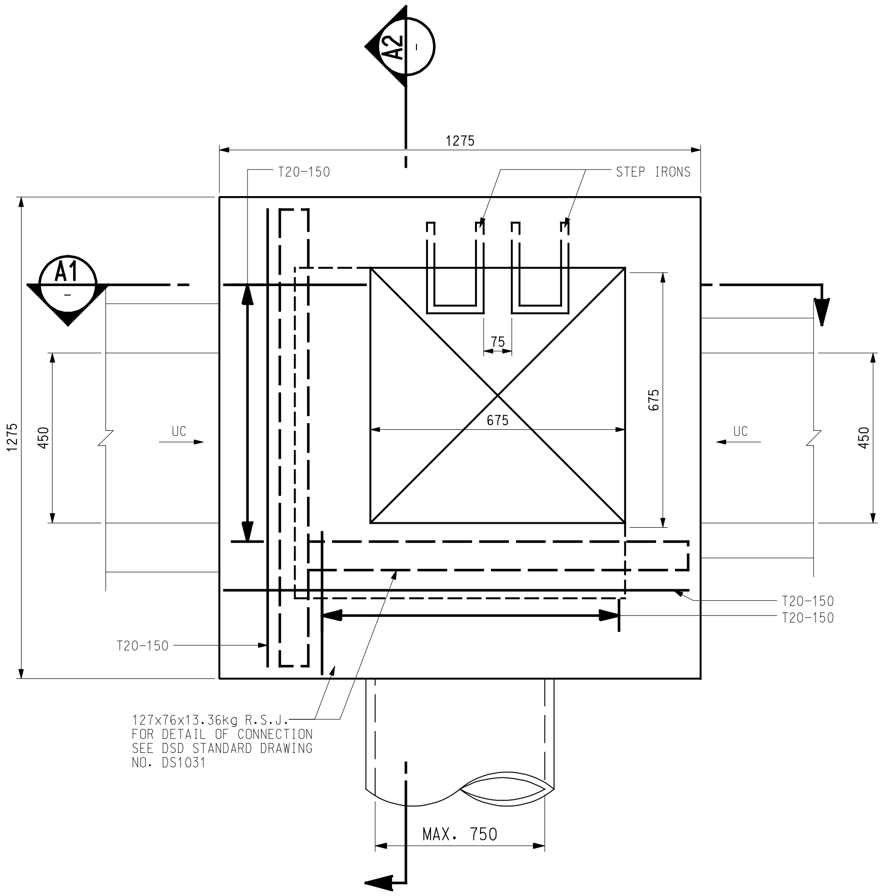
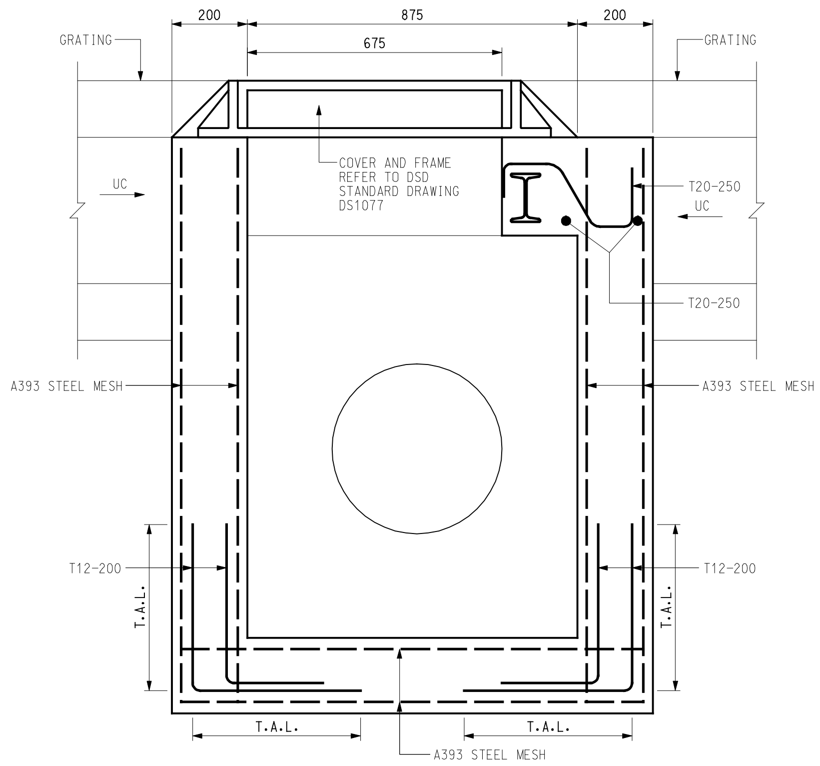
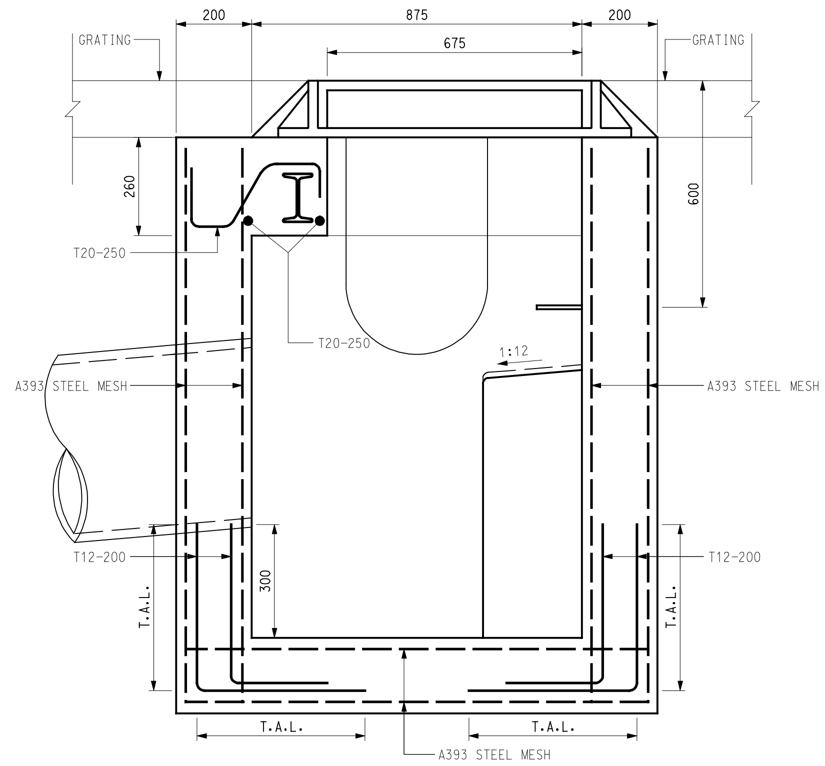


TYPICAL DETAILS OF CATCHPIT TYPE A
SCALE 1:20



SECTION A1
SCALE 1:20



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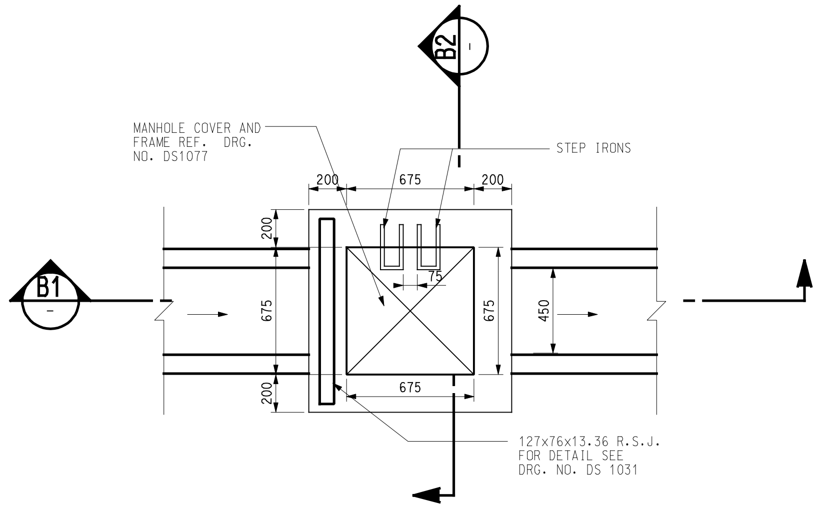
SCALE 1:20



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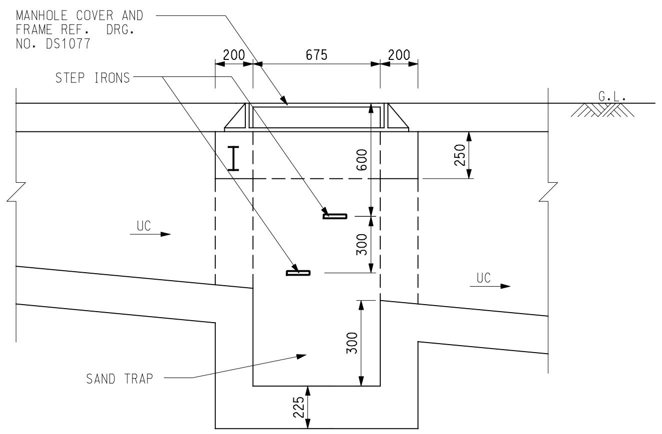

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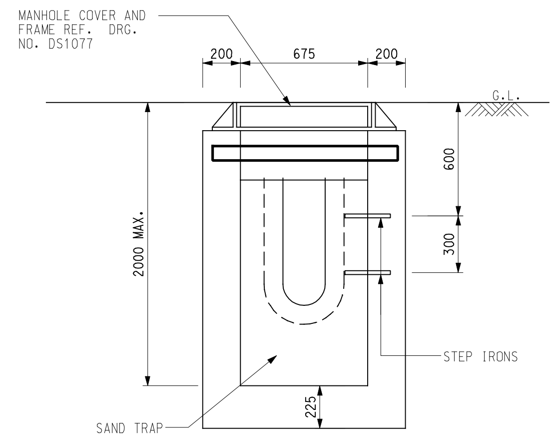

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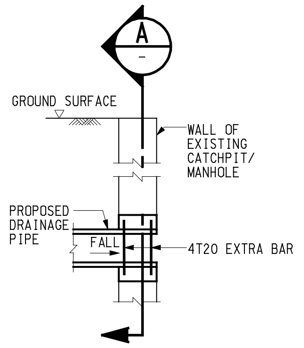
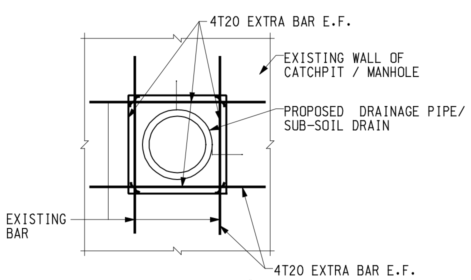
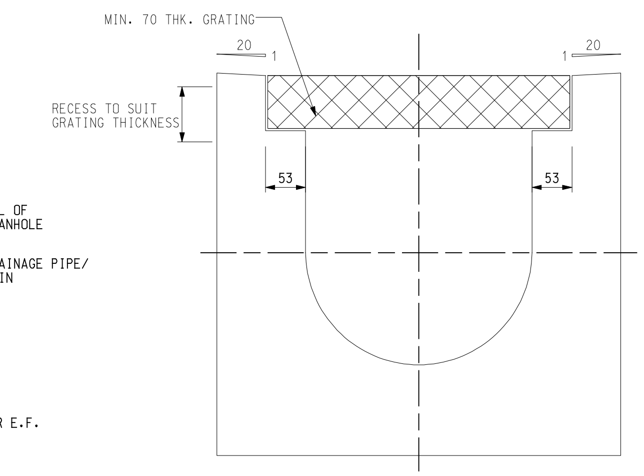


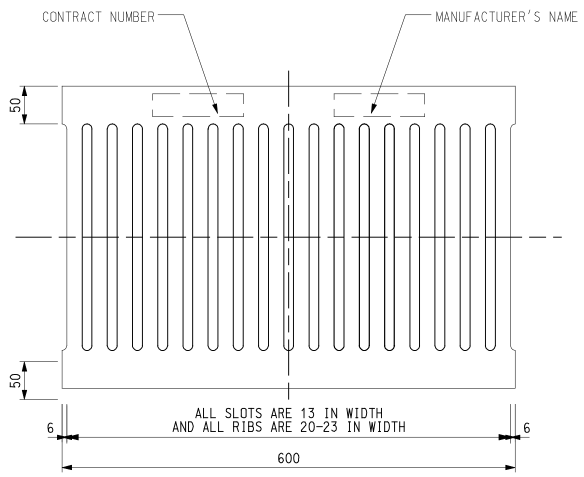
OPENING DETAIL OF
DRAINAGE PIPE INTO EXISTING
CATCHPIT / MANHOLE



SECTION A
SCALE 1:5



TYPICAL CROSS SECTION OF CHANNEL
SCALE 1:10



TYPICAL GRATING
SCALE 1:10

0 50 100 150 200 250 MILLIMETRES 1 : 10

0 100 200 300 400 500 MILLIMETRES 1 : 20

0 200 400 600 800 1000 MILLIMETRES 1 : 40

NOTES :

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Rev.	Description of Revision	Date	Ckd.

Client

EXCEL LINK DEVELOPMENT LIMITED

Consultants

MANNINGS (Asia) Consultants Limited

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Title

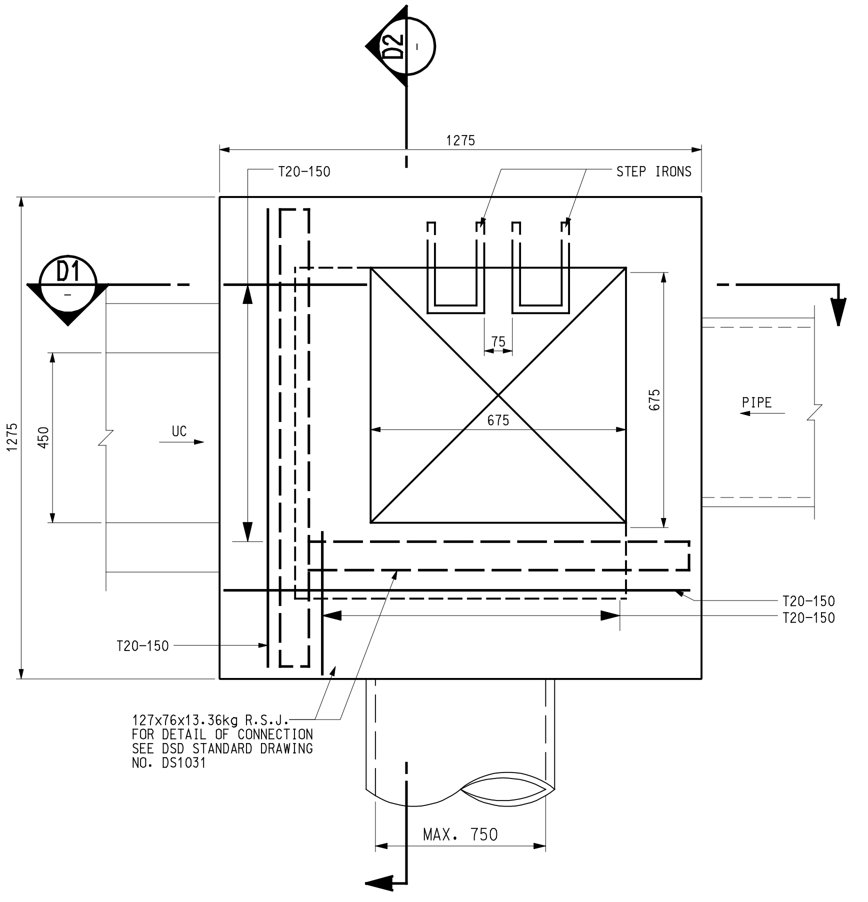
TYPICAL DETAILS OF DRAINAGE

(SHEET 1 OF 2)

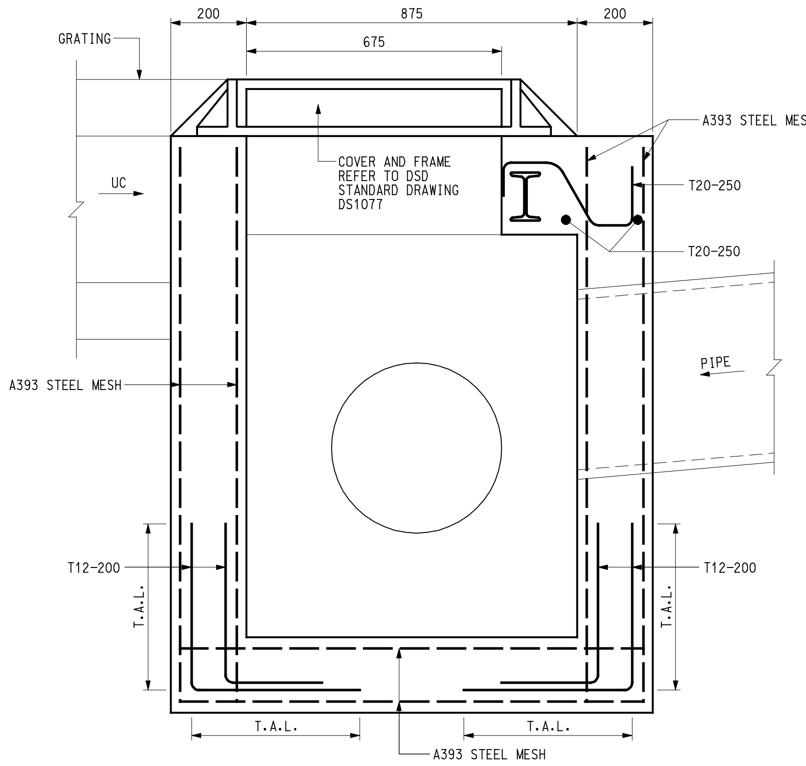
Drawing No.	Stage	Rev.
W1010/211	P	-

20 Oct 2025 15:33:00

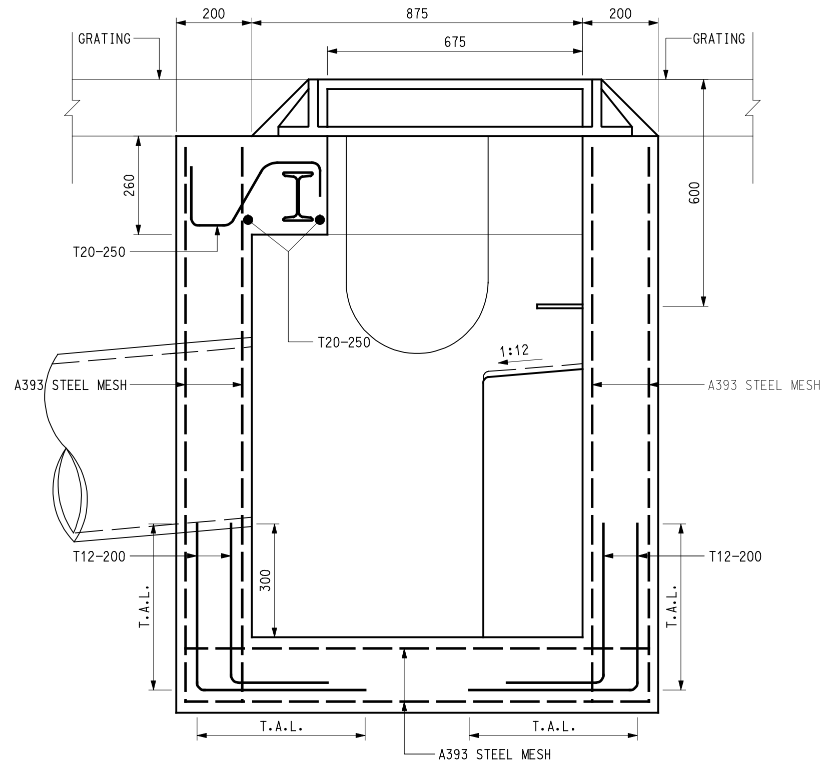
K:\W1010 - DIA for Sites 1 & 2 at Kam Tin Fung Kat Heung\Ustation\W1010-211.dgn



TYPICAL DETAILS OF CATCHPIT TYPE D
SCALE 1:20



SECTION D1
SCALE 1:20



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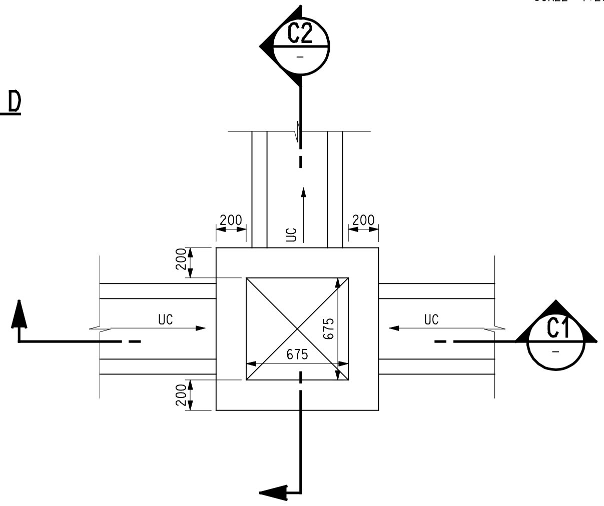
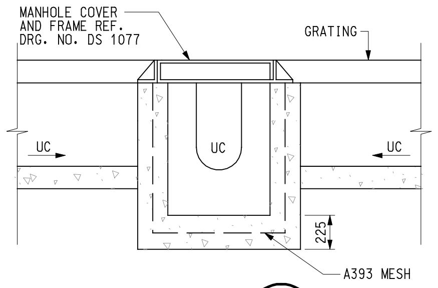


TYPICAL DETAILS OF CATCHPIT (TYPE C)
SCALE 1 : 50



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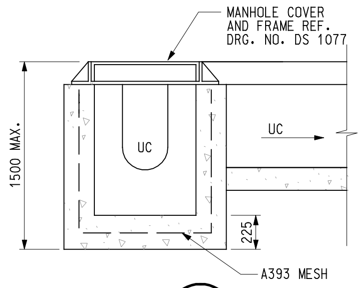
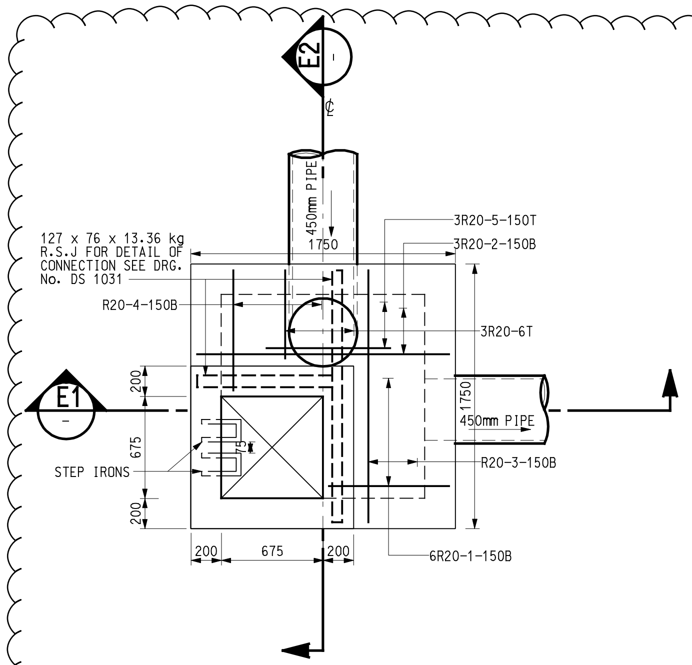
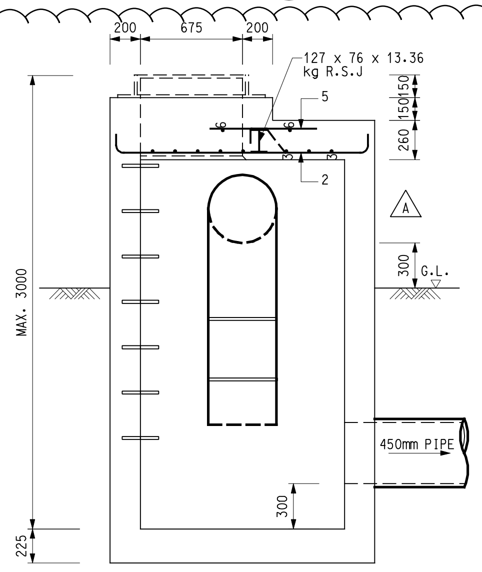
SCALE 1:50



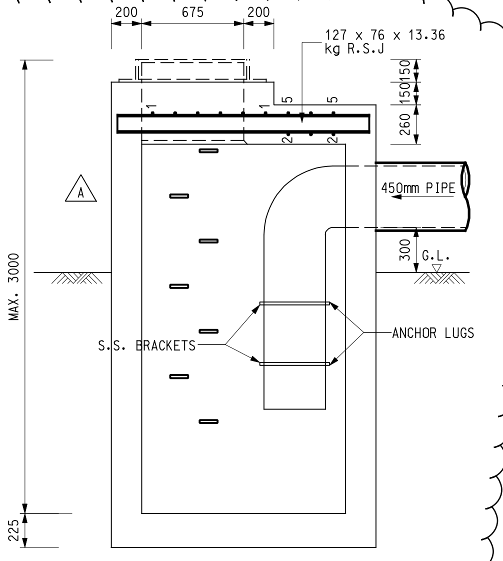
SECTION C2
SCALE 1:50



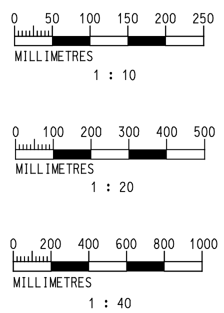
TYPICAL DETAILS OF MANHOLE TYPE E
N.T.S.



SECTION E1
SCALE 1:25



SECTION E2
SCALE 1:25



NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

Rev.	Description of Revision	Date	Ckd.

Client

EXCEL LINK DEVELOPMENT LIMITED

Consultants

MANNINGS (Asia) Consultants Limited

Scale in A3: AS SHOWN	Date: AUG 2025	
Designed: EM	Drawn: KAM	Checked: BLE
Design Team Leader: SC		Date: AUG 2025
Approved: KTC		Date: AUG 2025

Project

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS, VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

Title

TYPICAL DETAILS OF DRAINAGE

(SHEET 2 OF 2)

Drawing No.	Stage	Rev.
W1010/212	P	A

22/1/2026 11:07:59 am

K:\W1010 - DIA for Sites 1 & 2 at Kam Tin Fung Kat Heung\Ustation\W1010-212A.dgn

CATCHPIT SCHEDULE							
CATCHPIT / MANHOLE SCHEDULE	COVER LEVEL (mPD)	INLET		OUTLET		TYPE OF MANHOLE / CATCHPIT	BEDDING
		DIAMETER (mm)	I.L. (mPD)	DIAMETER (mm)	I.L. (mPD)		
CP1	4.35	450UC	2.970	450UC	2.970	TYPE B	/
		450UC	3.540				
CP2	4.35	450UC	2.940	450UC	2.940	TYPE B	/
CP3	4.35	450UC	3.170	450UC	3.170	TYPE B	/
CP4	4.35	450UC	3.050	450UC	3.050	TYPE B	/
CP5	4.20	450UC	3.180	450UC	2.840	TYPE C	/
		450UC	2.840				
CP6	3.70	450UC	2.690	450UC	2.690	TYPE B	/
CP6a	3.70	450UC	2.650	450UC	2.650	TYPE B	/
CP7	3.70	450UC	2.610	450UC	2.610	TYPE C	/
		450UC	2.620				
CP8	3.50	450UC	2.500	450UC	2.500	TYPE B	/
CP9	3.50	450UC	2.320	450UC	2.320	TYPE B	/
CP10	3.50	450UC	2.380	750	1.800	TYPE D	B
		600	2.050				
CP10a	3.50	450UC	2.800	600	2.120	TYPE A	B
		450UC	2.200				
CP11	3.50	450UC	2.100	450UC	2.100	TYPE C	/
		450UC	2.100				
CP12	3.50	450UC	2.900	450UC	2.710	TYPE B	/
CP13	3.50	450UC	2.010	450UC	2.010	TYPE C	/
		450UC	2.600				
CP14	3.50	450UC	2.560	600	1.970	TYPE A	B
		450UC	1.980				
CP15	4.30	450UC	3.490	450UC	3.220	TYPE B	/
CP16	3.70	225UC	3.280	225UC	3.270	TYPE B	/
CP17	3.50	225UC	3.060	225UC	3.050	TYPE B	/
CP18	4.30	450UC	3.020	450UC	2.860	TYPE C	/
		450UC	2.860				
CP20	4.30	450UC	3.210	450UC	3.210	TYPE C	/
		450UC	3.500				
CP21	3.50	450UC	2.740	450UC	2.740	TYPE C	/
		225UC	2.920				
CP23	4.20	450UC	2.840	450UC	2.840	TYPE C	/
		450UC	3.270				
CP24	4.20	450UC	3.420	450UC	3.420	TYPE B	/
CP25	3.70	-	-	450UC	3.100	TYPE B	/
CP26	3.50	450UC	2.660	450UC	2.660	TYPE B	/
CP27	3.50	450UC	2.400	450UC	2.400	TYPE B	/
CP28	4.20	450UC	3.310	450UC	3.110	TYPE C	/
		450UC	3.110				
MH1	4.70	450	4.000	450	2.110	TYPE E	B

A

NOTES :

1. FOR GENERAL NOTES, REFER TO DRAWING NO. W1010/113.
2. FOR DETAILS OF STANDARD MANHOLE, REFER TO DSD STANDARD DRAWINGS.
3. FOR BEDDING CLASS, REFER TO DSD STANDARD DRAWINGS NO. DS 1048B.
4. FOR DETAIL OF CATCHPIT, REFER TO DRAWING NO. W1010/211 and 212.

Rev.	Description of Revision	Date	Ckd.

Client

EXCEL LINK DEVELOPMENT LIMITED

Consultants

MANNINGS (Asia) Consultants Limited

Scale in A3 AS SHOWN		Date AUG 2025
Designed EM	Drawn KAM	Checked BLE
Design Team Leader SC		Date AUG 2025
Approved KTC		Date AUG 2025

Project

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS, VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

Title

MANHOLE SCHEDULE

Drawing No.	Stage	Rev.
W1010/311	P	A

Appendix B

Design Calculations

Mannings (Asia) Consultants Ltd.		Job No. W1010	Sheet No. 1
Calculation Sheet		Member / Location	
Job Tilte:	Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities and Associated Filling of Land for A Period of 3 Years Various Lots in D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.	
		Made By	Date

The drainage design is referring to DSD's SDM 2018 and Corrigendum No. 1/2024
1 in 50 year design return period is taken.

Rational method is used for calculation of the peak runoff. The formula is extracted from Section 7.5.2 (a) of SDM.
Qp = 0.278 C i A
Where Qp = peak runoff in m^3/s
I = rainfall intensity in mm/hr
A = catchment area in km^2

The rainfall intensity is extracted from the Section 4.3.2 of SDM which is to estimate the Intensity-Duration – Frequency (IDF) Relationship.
Use of Storm Constants for 50 years Return Periods of HKO Headquarters
$i = a / (t_d+b)^c$
i =extreme mean intensity in mm/hr
t_d =duration in minutes (td<240), and
a, b, c = storm constants given (note50 years a=505.5, b=3.29, c=0.355)

Runoff Estimation (Existing Scenario)

Location	Natural Catch. (m^2)	Longest flow path (m)	Gradient (m per 100m)	to (min) = $0.14465L/(H^{0.2}A^{0.1})$	Runoff coeff.	Total Catch. Area (m^2)	50 year Intensity (mm/hr)	50 year design runoff = 0.278CiA (m^3/s)	Total Flow(m^3/s)
To Outfall A									
Catchment A	13200	196	0.01	26.97	0.25	13200	150.66	0.138	0.261
	3269				0.90	3269		0.123	
To Outfall B									
Catchment B	7831	212	0.01	29.61	0.25	7831	146.25	0.080	0.312
	6345				0.90	6345		0.232	
To Outfall C									
Catchment C	585	190	0.01	28.09	0.25	585	148.74	0.006	0.232
	6065				0.90	6065		0.226	

Existing Stormwater Drainage Checking

Existing Scenario

Manhole		Catchment Area		Length (m)	Nominal Diameter (mm)	Gradient, S_f		Roughness Coefficient (m)	Velocity (m/s)	Time of Flow (min)	Time of Conc. (min)	Rainfall Duration (min)	50 year Intensity (mm/hr)	Runoff Coeff.	50 year Runoff (m^3/s)	Total Flow (m^3/s)	Capacity (m^3/s)	Adjusted Capacity > Total Flow ?	Cover Level		Invert Level		utilization
From	To	Increment (m^2)	Accu. (m^2)			(%)	1 in												From (mPD)	To (mPD)	From (mPD)	To (mPD)	-
Check Existing Pipe																							
To Outfall A																							
SCH1028774	SNF1009827	0	13200	12	600	1.1	92.3	0.6	2.415	0.08	27.05	27.05	150.52	0.25	0.138	0.261	0.615	Yes	3.00	3.00	1.87	1.74	0.42
		0	3269											0.90	0.123								
To Outfall B																							
SIH1005641	SNF1009826	0	7831	10	750	1.9	52	0.6	3.703	0.05	29.66	29.66	146.18	0.25	0.080	0.312	1.473	Yes	3.21	3.21	1.64	1.44	0.21
		0	6345											0.90	0.232								
To Outfall C																							
SMH1048181	SNF1009823	0	585	10	600	0.5	200.0	0.6	1.637	0.10	28.20	28.20	148.55	0.25	0.006	0.231	0.417	Yes	3.00	3.00	1.50	1.45	0.56
		0	6065											0.90	0.225								

Mean Velocity is calculated by Colebrook- White equation

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

Where:
$\bar{V}$ =Mean Velocity (m/s)
R =Hydraulic Diameter (m)
Ks =Surface Roughness (m)
V =Kinematic viscosity (kg/ms)
Sf =Slope of Hydraulic Gradient
g =Gravity (m/s^2)
The Roughness Coefficient Ks is assumed to be 0.6 for concrete.
Peak Runoff is estimated using rational method according to SDM.

The rainfall intensity is extracted from the Section 4.3.2 of SDM which is to estimate the Intensity-Duration – Frequency (IDF) Relationship.
Use of Storm Constants for 50 years Return Periods of HKO Headquarters
$i = a / (t_d+b)^c$
i =extreme mean intensity in mm/hr
t_d =duration in minutes (td<240), and
a, b, c = storm constants given (note50 years a=505.5, b=3.29, c=0.355)

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No. 1
Calculation Sheet	Member / Location	
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.	
	Made By	Date

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Where Qp = peak runoff in m^3/s
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A = catchment area in km^2

The rainfall intensity is extracted from the Section 4.3.2 of SDM which is to estimate the Intensity-Duration – Frequency (IDF) Relationship.
Use of Storm Constants for 50 years Return Periods of HKO Headquarters
$i = a / (t_d+b)^c$
i =extreme mean intensity in mm/hr
t_d =duration in minutes (td<240), and
a, b, c = storm constants given (note50 years a=505.5, b=3.29, c=0.355)

U-Channel Runoff Estimation

Location	Natural Catch. (m^2)	Catchment ID	Longest flow path (m)	Gradient (m per 100m)	to (min) = $0.14465L/(H^{0.2}A^{0.1})$	t_f = L/v (min)	tc = to + t_f (min)	Runoff coeff.	Total Catch. Area (m^2)	50 year Intensity (mm/hr)	50 year design runoff = 0.278CiA	Total Flow(m^3/s)
To Outfall A												
U11-2	1839	A6	43	0.01	7.92	0.22	8.13	0.90	1839	212.91	0.10	0.10
U11-1	7461	A1, A6	68	0.01	9.38	0.42	9.80	0.25	7461	202.88	0.11	0.11
U12	276	A5	20	0.01	4.76	0.04	4.79	0.90	276	240.72	0.02	0.02
U13-1	1238	A5, A7, A10	-	-	4.79	0.57	5.37	0.90	1238	234.93	0.07	0.08
	168							1.00	168		0.01	
U13-3	118	A8, A11	22	0.01	5.06	0.11	5.17	0.90	118	236.87	0.01	0.01
	64							1.00	64		0.00	
U13-2	7461	A1, A6	-	-	9.80	0.25	10.04	0.25	7461	201.54	0.10	0.20
	1839							0.90	1839		0.09	
U13-4	7461	A5, A6, A8, A10, A11	-	-	10.04	0.09	10.13	0.25	7461	201.08	0.10	0.21
	1957							0.90	1957		0.10	
	64							1.00	64		0.00	
To Outfall B												
U1-1	261	B4, B5,B41	50	0.00	11.18	0.48	11.66	0.25	261	193.52	0.00	0.04
	802							0.90	802		0.04	
U1-2	448	B3, B12	73	0.01	16.25	0.23	16.48	0.90	448	175.25	0.02	0.02
U2	261	B1, B3, B5, B12,B41	-	-	16.48	0.08	16.55	0.25	261	175.01	0.00	0.07
	1250							0.90	1250		0.05	
	284	B17						1.00	284		0.01	
U23-1	261	B1, B3, B5, B12, B15,B41	-	-	16.55	0.27	16.83	0.25	261	174.17	0.00	0.09
	1682							0.90	1682		0.07	
	284	B17						1.00	284		0.01	
U23-2	332	B18	8	0.04	1.25	0.35	1.60	1.00	332	287.80	0.03	0.03
U7-2	261	B1, B3, B5, B12, B15, B16,B41	-	-	16.83	0.60	17.42	0.25	261	172.37	0.00	0.22
	2363							0.90	2363		0.10	
	2323	B17, B18, B22, B38						1.00	2323		0.11	
U3	2126	B7	50	0.00	11.51	0.36	11.87	0.25	2126	192.55	0.03	0.04
	273	B6						0.90	273		0.01	
U4	4149	B7, B8	-	-	11.87	0.30	12.18	0.25	4149	191.19	0.06	0.07
	305	B6, B13						0.90	305		0.01	
U5-2	7801	B7, B8, B9	-	-	12.18	0.58	12.75	0.25	7801	188.73	0.10	0.16
	366	B6, B13						0.90	366		0.02	
	699	B37						1.00	699		0.04	
U5-1	4720	B10	117	0.00	25.97	0.58	26.55	0.25	4720	151.41	0.05	0.05
U6	12521	B7, B8, B9, B10	-	-	26.55	0.41	26.97	0.25	12521	150.67	0.13	0.19
	366	B6, B13						0.90	366		0.01	
	959	B37, B39						1.00	959		0.04	
U7-1	12521	B7, B8, B9, B10	-	-	26.97	0.10	27.07	0.25	12521	150.49	0.13	0.18
	366	B6, B13						0.90	366		0.01	
	959	B37, B39						1.00	959		0.04	
U7-3	12521	B7, B8, B9, B10	-	-	27.07	0.22	27.29	0.25	12521	150.11	0.13	0.18
	366	B6, B13						0.90	366		0.01	
	959	B37, B39						1.00	959		0.04	
U27	12782	B7, B8, B9, B10, B41	-	-	27.07	0.59	27.65	0.25	12782	149.48	0.13	0.45
	3148	B1, B3, B5, B6, B12, B13, B15, B16						0.90	3148		0.12	
	4773	B17, B18, B22, B37, B38, B39						1.00	4773		0.20	
U10-2	12782	B7, B8, B9,B10, B41	-	-	27.65	0.47	28.13	0.25	12782	148.67	0.13	0.45
	3148	B1, B3, B5, B6, B12, B13, B15, B16						0.90	3148		0.12	
	4773	B17, B18, B22, B37, B38, B39						1.00	4773		0.20	

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No. 2
Calculation Sheet	Member / Location	
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities and Associated Filling of Land Various Lots in D.D. 107 and Adjoining Government Land for A Period of 3 Years, Kam Tin, Yuen Long, New Territories	Drg. Ref.	
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U-Channel Runoff Estimation

Location	Natural Catch. (m^2)	Catchment ID	Longest flow path (m)	Gradient (m per 100m)	to (min) = $0.14465L/(H^{0.2}A^{0.1})$	t_f = L/v (min)	tc = to + t_f (min)	Runoff coeff.	Total Catch. Area (m^2)	50 year Intensity (mm/hr)	50 year design runoff = 0.278CiA (m^3/s)	Total Flow(m^3/s)
To Outfall B												
U10-1	1250	B27	55	0.00	11.99	0.29	12.28	0.90	1250	190.73	0.06	0.06
U15	76	B1, B11,B43	98	0.00	26.39	0.52	26.91	0.25	76	150.77	0.00	0.07
	1918							0.90	1918		0.07	
U20	76	B1, B11,B42	-	-	26.91	0.06	26.97	0.25	76		0.00	0.07
	1918							0.90	1918	150.67	0.07	
U18	98	B2,B42	-	-	26.97	0.40	27.37	0.25	98	149.97	0.00	0.07
	1971							0.90	1971		0.07	
U19	174	B1, B2, B11,B42,B43	-	-	27.37	0.29	27.66	0.25	174	149.47	0.00	0.15
	3889							0.90	3889		0.15	
U24	821	B19	33	0.00	7.18	0.10	7.28	0.90	821	218.87	0.04	0.04
U25	1716	B19, B20	-	-	7.28	0.33	7.61	0.90	1716	216.50	0.09	0.09
U26	2267	B19, B20, B21	19	0.01	3.43	0.24	3.66	0.90	2267	253.97	0.14	0.26
	1708	B23						1.00	1708		0.12	
U29	174	B1, B2, B11, B20,B42,B43	-	-	27.66	0.71	28.37	0.25	174	148.27	0.00	0.21
	5605							0.90	5605		0.21	
U28	174	B1, B2, B11, B19, B20, B21,B42,B43	-	-	28.37	0.71	29.07	0.25	174	147.12	0.00	0.36
	7872							0.90	7872		0.29	
	1708	B23						1.00	1708		0.07	
U16	89	B29	10	0.01	2.32	1.01	3.33	0.90	89	258.38	0.01	0.01
U17	179	B29, B30	-	-	3.33	0.94	4.27	0.90	179	246.53	0.01	0.01
U21	211	B29, B30, B31	-	-	4.27	0.64	4.90	0.90	211	239.56	0.01	0.01
U22	174	B1, B2, B11, B19, B20, B29, B30, B31, B31	-	-	29.07	0.23	29.30	0.25	174	146.75	0.00	0.39
	8699							0.90	8699		0.32	
	1708	B23						1.00	1708		0.07	
U8	174	B1, B2, B11, B19, B20, B29, B30, B31, B31, B34,B42,B43	-	-	29.30	0.45	29.75	0.25	174	146.04	0.00	0.44
	8751							0.90	8751		0.32	
	2933	B23,B33						1.00	2933		0.12	
U9	174	B1, B2, B11, B19, B20, B29, B30, B31, B31, B34, B35,B42,B43	-	-	29.75	0.51	30.25	0.25	174	145.26	0.00	0.50
	8861							0.90	8861		0.32	
	4447	B23,B25,B33						1.00	4447		0.18	
U10-3	174	B1, B2, B11, B19, B20, B29, B30, B31, B31, B34, B35, B36,B42,B43	-	-	30.25	0.35	30.60	0.25	174	144.73	0.00	0.52
	8962							0.90	8962		0.32	
	4781	B23, B25, B28, B33						1.00	4781		0.19	

Stormwater Drainage Design

Manhole / Pipe		Catchment Area		Catchment ID	Length (m)	Nominal Diameter (mm)	Gradient, S_f		Roughness Coefficient (m)	Velocity (m/s)	Time of Flow (min)	Time of Conc. (min)	Rainfall Duration (min)	50 year Intensity (mm/hr)	Runoff Coeff.	50 year Runoff (m^3/s)	Total Flow (m^3/s)	Capacity (m^3/s)	Adjusted Capacity > Total Flow ?	Cover Level		Invert Level		utilization
From	To	Increment (m^2)	Accu. (m^2)				(%)	1 in												From (mPD)	To (mPD)	From (mPD)	To (mPD)	-
To Outfall A																								
CP14	SCH1028774	0	7461	A1, A5, A6, A7, A8, A10, A11	2	600	1.0	100.0	0.6	2.320	0.01	10.15	10.15	201.00	0.25	0.104	0.278	0.590	Yes	3.50	3.00	1.97	1.95	0.47
		0	3195												0.90	0.161								
		0	232												1.00	0.013								
To Outfall B																								
CP10a	CP10	0	174	B1, B2, B11, B19, B20, B23, B25, B27, B28, B29, B30, B31, B31, B33, B34, B35, B36,B42,B43	5	600	1.4	71.4	0.6	2.747	0.03	30.63	30.63	144.68	0.25	0.002	0.564	0.699	Yes	3.50	3.50	2.12	2.05	0.81
		0	10212												0.90	0.370								
		0	4781												1.00	0.192								
CP10	SIH1005641	174	12956	B1 ~ B43	7	750	1.3	79.3	0.6	2.996	0.04	30.67	30.67	144.62	0.25	0.130	0.998	1.191	Yes	3.50	3.21	1.80	1.71	0.84
		0	13360												0.90	0.483								
		0	9554												1.00	0.384								
To Outfall C																								
375 Pipe		0	1833.5	1/2 of C1	125	375	1.0	100.0	0.06	2.154	3.97	3.97	3.97	250.12	1.00	0.127	0.127	0.214	Yes	-	-	-	-	0.60
450 Pipe		0	3667	C1	140	450	1.0	100.0	0.06	2.413	3.97	3.97	3.97	250.12	1.00	0.255	0.255	0.345	Yes	-	-	-	-	0.74
MH1	SMH1048181	0	3667	C1	2	450	2.0	50.0	0.6	2.743	3.01	3.01	3.01	262.97	1.00	0.268	0.268	0.393	Yes	4.70	2.96	2.11	2.07	0.68
Check Existing Pipe																								
To Outfall A																								
SCH1028774	SNF1009827	899	8360	A1 ~ A11	12	600	1.1	92.3	0.6	2.415	0.08	10.13	10.13	201.09	0.25	0.117	0.315	0.615	Yes	3.00	3.00	1.87	1.74	0.51
		486	3681												0.90	0.185								
		232	232												1.00	0.013								
To Outfall B																								
SIH1005641	SNF1009826	403	13359	B1 ~ B43	10	750	1.9	52.0	0.6	3.703	0.05	30.72	30.72	144.55	0.25	0.134	1.001	1.473	Yes	3.21	3.21	1.64	1.44	0.68
		0	13360												0.90	0.483								
		0	9554												1.00	0.384								
To Outfall C																								
SMH1048181	SNF1009823	585	585	C1 ~ C2	10	600	0.5	200.0	0.6	1.637	0.10	5.91	5.91	229.94	0.25	0.009	0.244	0.417	Yes	2.96	2.96	1.50	1.45	0.59
		0	3667												1.00	0.234								

Mean Velocity is calculated by Colebrook- White equation

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

Where:
$\overline{V}$ =Mean Velocity (m/s)
R =Hydraulic Diameter (m)
Ks =Surface Roughness (m)
V =Kinematic viscosity (kg/ms)
Sf =Slope of Hydraulic Gradient
g =Gravity (m/s^2)
The Roughness Coefficient Ks is assumed to be 0.6 for concrete, 0.06 for uPVC pipe.
Peak Runoff is estimated using rational method according to SDM.

The rainfall intensity is extracted from the Section 4.3.2 of SDM which is to estimate the Intensity-Duration – Frequency (IDF) Relationship.
Use of Storm Constants for 50 years Return Periods of HKO Headquarters
$i = a / (t_d+b)^c$
i =extreme mean intensity in mm/hr
t_d =duration in minutes (td<240), and
a, b, c = storm constants given (note50 years a=505.5, b=3.29, c=0.355)

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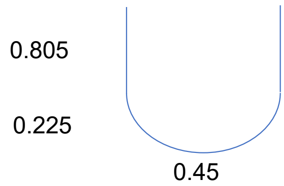
Checking of Capacity (U1-1)

Input Data

Width of UC = 0.45 m

Height of UC = 1.03 m

Design Runoff = 0.04 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.441772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.32 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.66 m^3/s **> Design runoff, OK!**

V = Q/A = 1.50 m/s

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Checking of Capacity (U1-2)

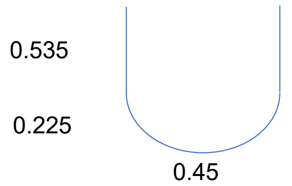
Input Data

Width of UC = 0.45 m

Height of UC = 0.76 m

Design Runoff = 0.02 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where

A = cross sectional area of flow (m^2) = 0.320272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.78 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.46 m^3/s **> Design runoff, OK!**

V = Q/A = 1.44 m/s

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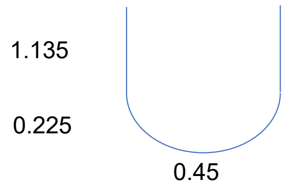
Checking of Capacity (U2)

Input Data

Width of UC = 0.45 m

Height of UC = 1.36 m

Design Runoff = 0.07 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where
- A = cross sectional area of flow (m^2) = 0.590272 m^2
- *r* = hydraulic radius (m)
- *s* = slope of the water surface or the linear hydraulic head loss (m/m)
- *n* = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.98 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.91 m^3/s **> Design runoff, OK!**

V = Q/A = 1.54 m/s

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Checking of Capacity (U3)

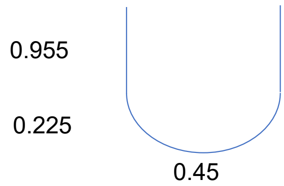
Input Data

Width of UC = 0.45 m

Height of UC = 1.18 m

Design Runoff = 0.04 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.509272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.62 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.77 m^3/s **> Design runoff, OK!**

V = Q/A = 1.52 m/s

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Checking of Capacity (U4)

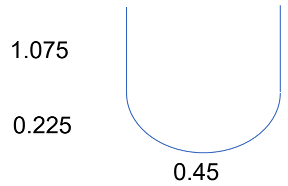
Input Data

Width of UC = 0.45 m

Height of UC = 1.30 m

Design Runoff = 0.07 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.563272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.86 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.86 m^3/s **> Design runoff, OK!**

V = Q/A = 1.53 m/s

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Checking of Capacity (U5-1)

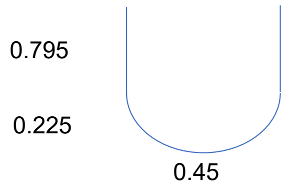
Input Data

Width of UC = 0.45 m

Height of UC = 1.02 m

Design Runoff = 0.05 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.437272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.30 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.65 m^3/s **> Design runoff, OK!**

V = Q/A = 1.50 m/s

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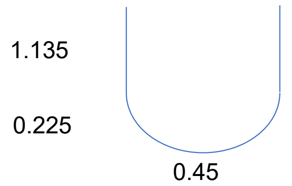
Checking of Capacity (U5-2)

Input Data

Width of UC = 0.45 m

Height of UC = 1.36 m

Design Runoff = 0.16 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.590272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.98 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.91 m^3/s **> Design runoff, OK!**

V = Q/A = 1.54 m/s

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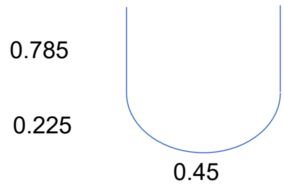
Checking of Capacity (U6)

Input Data

Width of UC = 0.45 m

Height of UC = 1.01 m

Design Runoff = 0.19 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.432772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.28 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.65 m^3/s **> Design runoff, OK!**

V = Q/A = 1.49 m/s

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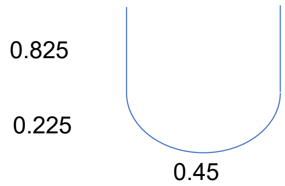
Checking of Capacity (U7-1)

Input Data



Width of UC	=	0.45	m
Height of UC	=	1.05	m
Design Runoff	=	0.18 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where

A	=	cross sectional area of flow (m^2)	=	0.450772 m^2
r	=	hydraulic radius (m)		
s	=	slope of the water surface or the linear hydraulic head loss (m/m)		
n	=	Manning coefficient of roughness		

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.36 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.68 m^3/s **> Design runoff, OK!**

V = Q/A = 1.50 m/s

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Checking of Capacity (U7-2)

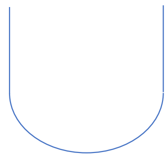
Input Data

Width of UC = 0.45 m

Height of UC = 1.08 m

Design Runoff = 0.22 m^3/s ($Q_{after,uncov.}$)

0.855



0.225

0.45

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where

A = cross sectional area of flow (m^2) = 0.464272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.42 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.70 m^3/s **> Design runoff, OK!**

V = Q/A = 1.50 m/s

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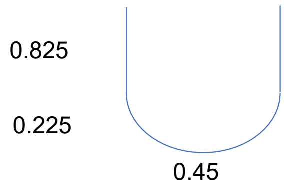
Checking of Capacity (U7-3)

Input Data

Width of UC	=	0.45	m
Height of UC	=	1.05	m
Design Runoff	=	0.18 ($Q_{after,uncov.}$)	m^3/s



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.450772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.36 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.68 m^3/s **> Design runoff, OK!**

V = Q/A = 1.50 m/s

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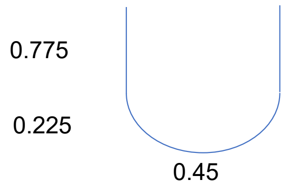
<u>Checking of Capacity (U8)</u>

Input Data

Width of UC = 0.45 m

Height of UC = 1.00 m

Design Runoff = 0.44 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.428272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$r = \frac{A}{P}$

p = wetted perimeter (m) = 2.26 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.64 m^3/s **> Design runoff, OK!**

V = Q/A = 1.49 m/s

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Calculation Sheet

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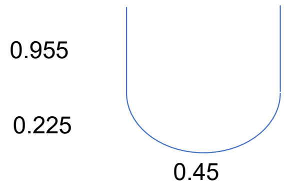
Checking of Capacity (U9)

Input Data



Width of UC	=	0.45	m
Height of UC	=	1.18	m
Design Runoff	=	0.50 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.509272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.62 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.77 m^3/s **> Design runoff, OK!**

V = Q/A = 1.52 m/s

Mannings (Asia) Consultants Ltd.

Calculation Sheet

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Checking of Capacity (U10-1)

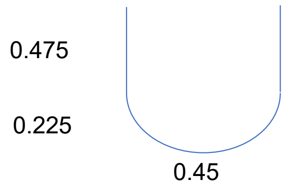
Input Data

Width of UC = 0.45 m

Height of UC = 0.70 m

Design Runoff = 0.06 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.293272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.66 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.42 m^3/s **> Design runoff, OK!**

V = Q/A = 1.42 m/s

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	Made By	Date	

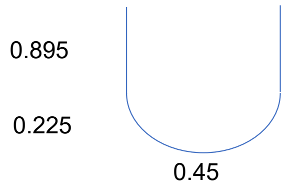
Checking of Capacity (U10-2)

Input Data

Width of UC = 0.45 m

Height of UC = 1.12 m

Design Runoff = 0.45 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.482272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.50 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.73 m^3/s **> Design runoff, OK!**

V = Q/A = 1.51 m/s

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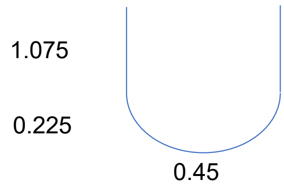
Checking of Capacity (U10-3)

Input Data

Width of UC = 0.45 m

Height of UC = 1.30 m

Design Runoff = 0.52 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.563272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.86 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.86 m^3/s **> Design runoff, OK!**

V = Q/A = 1.53 m/s

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	Made By	Date	

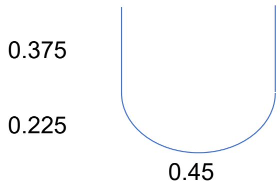
Checking of Capacity (U11-1)

Input Data

Width of UC = 0.45 m

Height of UC = 0.60 m

Design Runoff = 0.11 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.248272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.46 m

r = 0.17 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.34 m^3/s **> Design runoff, OK!**

V = Q/A = 1.39 m/s

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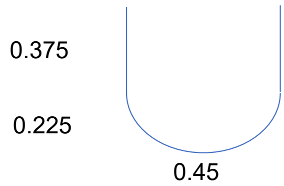
	Made By	Date	

Checking of Capacity (U11-2)

Input Data



Width of UC	=	0.45	m
Height of UC	=	0.60	m
Design Runoff	=	0.10 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where	A	=	cross sectional area of flow (m^2)	=	0.248272	m^2
	r	=	hydraulic radius (m)			
	s	=	slope of the water surface or the linear hydraulic head loss (m/m)			
	n	=	Manning coefficient of roughness			

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.46 m

r = 0.17 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.34 m^3/s **> Design runoff, OK!**

V = Q/A = 1.39 m/s

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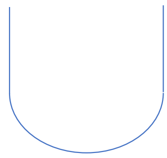
	Made By	Date	

Checking of Capacity (U12)

Input Data

Width of UC = 0.45 m
Height of UC = 0.60 m
Design Runoff = 0.02 m^3/s
($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.248272 m^2
r = hydraulic radius (m)
s = slope of the water surface or the linear hydraulic head loss (m/m)
n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.46 m

r = 0.17 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.34 m^3/s **> Design runoff, OK!**

V = Q/A = 1.39 m/s

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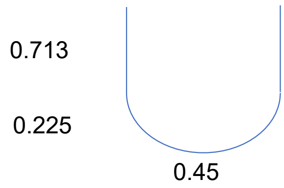
	Made By	Date	

Checking of Capacity (U13-1)

Input Data



Width of UC = 0.45 m

Height of UC = 0.94 m

Design Runoff = 0.08 m^3/s ($Q_{after,uncov.}$)

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.400372 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.13 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.59 m^3/s **> Design runoff, OK!**

V = Q/A = 1.48 m/s

Mannings (Asia) Consultants Ltd.

Calculation Sheet

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Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories

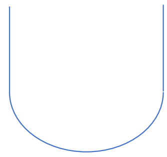
Checking of Capacity (U13-2)

Input Data

Width of UC = 0.45 m

Height of UC = 1.49 m

Design Runoff = 0.20 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.649672 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 3.24 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 1.01 m^3/s **> Design runoff, OK!**

V = Q/A = 1.55 m/s

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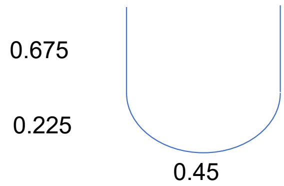
Checking of Capacity (U13-3)

Input Data



Width of UC	=	0.45	m
Height of UC	=	0.90	m
Design Runoff	=	0.01 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.383272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.06 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.56 m^3/s **> Design runoff, OK!**

V = Q/A = 1.47 m/s

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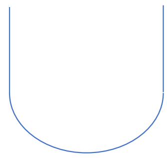
Checking of Capacity (U13-4)

Input Data

Width of UC = 0.45 m

Height of UC = 1.52 m

Design Runoff = 0.21 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where

A = cross sectional area of flow (m^2) = 0.663172 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 3.30 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 1.03 m^3/s **> Design runoff, OK!**

V = Q/A = 1.55 m/s

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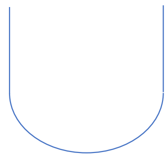
Checking of Capacity (U15)

Input Data

Width of UC = 0.45 m

Height of UC = 0.81 m

Design Runoff = 0.07 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.342772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$r = \frac{A}{P}$

p = wetted perimeter (m) = 1.88 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.50 m^3/s **> Design runoff, OK!**

V = Q/A = 1.45 m/s

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	Made By	Date	

Checking of Capacity (U16)

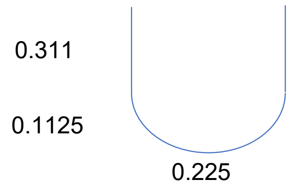
Input Data

Width of UC = 0.225 m

Height of UC = 0.42 m

Design Runoff = 0.01 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.089743 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 0.97 m

r = 0.09 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.08 m^3/s **> Design runoff, OK!**

V = Q/A = 0.92 m/s

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	Made By	Date	

Checking of Capacity (U17)

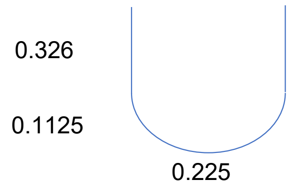
Input Data

Width of UC = 0.225 m

Height of UC = 0.44 m

Design Runoff = 0.01 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.093118 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.00 m

r = 0.09 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.09 m^3/s **> Design runoff, OK!**

V = Q/A = 0.93 m/s

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	Made By	Date	

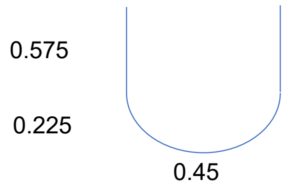
Checking of Capacity (U18)

Input Data

Width of UC = 0.45 m

Height of UC = 0.80 m

Design Runoff = 0.07 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where
- A = cross sectional area of flow (m^2) = 0.338272 m^2
- *r* = hydraulic radius (m)
- *s* = slope of the water surface or the linear hydraulic head loss (m/m)
- *n* = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.86 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.49 m^3/s **> Design runoff, OK!**

V = Q/A = 1.45 m/s

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<u>Checking of Capacity (U19)</u>

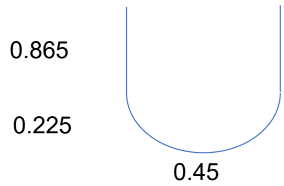
Input Data

Width of UC = 0.45 m

Height of UC = 1.09 m

Design Runoff = 0.15 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.468772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.44 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.71 m^3/s **> Design runoff, OK!**

V = Q/A = 1.51 m/s

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	Made By	Date	

Checking of Capacity (U22)

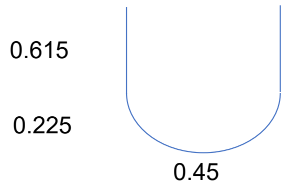
Input Data

Width of UC = 0.45 m

Height of UC = 0.84 m

Design Runoff = 0.39 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.356272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.94 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.52 m^3/s **> Design runoff, OK!**

V = Q/A = 1.46 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
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	Made By	Date	

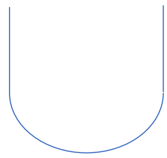
Checking of Capacity (U20)

Input Data

Width of UC = 0.45 m

Height of UC = 0.81 m

Design Runoff = 0.07 m^3/s
($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.342772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.88 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.50 m^3/s **> Design runoff, OK!**

V = Q/A = 1.45 m/s

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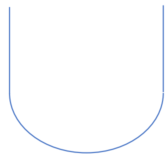
	Made By	Date	

Checking of Capacity (U21-2)

Input Data

Width of UC = 0.225 m
Height of UC = 0.58 m
Design Runoff = 0.01 m^3/s
($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.125518 m^2
r = hydraulic radius (m)
s = slope of the water surface or the linear hydraulic head loss (m/m)
n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.29 m

r = 0.10 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.12 m^3/s **> Design runoff, OK!**

V = Q/A = 0.95 m/s

Mannings (Asia) Consultants Ltd. Calculation Sheet	Job No. W1010	Sheet No.	Rev.
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Member / Location Drg. Ref. Made By	Date	

<u>Checking of Capacity (U23-1)</u>

Input Data

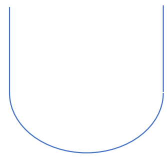
Width of UC = 0.45 m

Height of UC = 1.36 m

Design Runoff = 0.09 m^3/s

($Q_{after,uncov.}$)

1.135



0.225

0.45

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.590272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.98 m

r = 0.20 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.91 m^3/s **> Design runoff, OK!**

V = Q/A = 1.54 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

Checking of Capacity (U23-2)

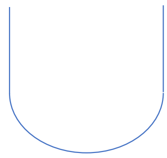
Input Data

Width of UC = 0.45 m

Height of UC = 0.73 m

Design Runoff = 0.03 m^3/s

($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.306772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.72 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

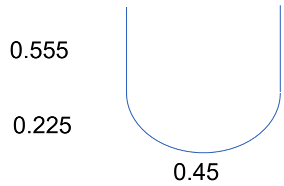
Q = 0.44 m^3/s **> Design runoff, OK!**

V = Q/A = 1.43 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

Checking of Capacity (U24)

Input Data



Width of UC	=	0.45	m
Height of UC	=	0.78	m
Design Runoff	=	0.04 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.329272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.82 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.48 m^3/s **> Design runoff, OK!**

V = Q/A = 1.45 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

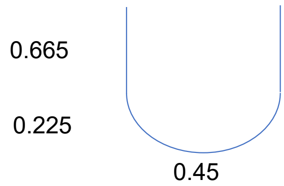
Checking of Capacity (U25)

Input Data

Width of UC = 0.45 m

Height of UC = 0.89 m

Design Runoff = 0.09 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.378772 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.04 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.56 m^3/s **> Design runoff, OK!**

V = Q/A = 1.47 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

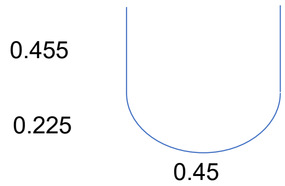
Checking of Capacity (U26)

Input Data

Width of UC = 0.45 m

Height of UC = 0.68 m

Design Runoff = 0.26 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.284272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.62 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.40 m^3/s **> Design runoff, OK!**

V = Q/A = 1.42 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

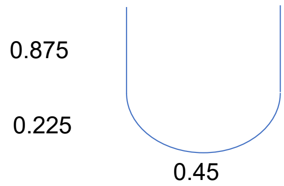
Checking of Capacity (U27)

Input Data

Width of UC = 0.45 m

Height of UC = 1.10 m

Design Runoff = 0.45 m^3/s ($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where
- A = cross sectional area of flow (m^2) = 0.473272 m^2
- *r* = hydraulic radius (m)
- *s* = slope of the water surface or the linear hydraulic head loss (m/m)
- *n* = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 2.46 m

r = 0.19 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.71 m^3/s **> Design runoff, OK!**

V = Q/A = 1.51 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

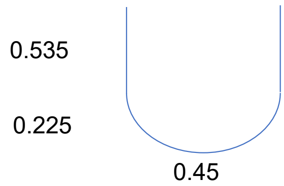
Checking of Capacity (U28)

Input Data

Width of UC = 0.45 m

Height of UC = 0.76 m

Design Runoff = 0.36 m^3/s
($Q_{after,uncov.}$)



Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.320272 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.78 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

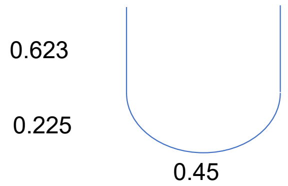
Q = 0.46 m^3/s **> Design runoff, OK!**

V = Q/A = 1.44 m/s

Mannings (Asia) Consultants Ltd.	Job No. W1010	Sheet No.	Rev.
Calculation Sheet	Member / Location		
Job Tilte: Proposed Temporary Warehouse (Excluding Dangerous Godown) With Ancillary Facilities and Associated Filling of Land and Pond for A Period of 3 Years, Various Lots In D.D. 107 and Adjoining Government Land, Kam Tin, Yuen Long, New Territories	Drg. Ref.		
	Made By	Date	

<u>Checking of Capacity (U29)</u>

Input Data



Width of UC	=	0.45	m
Height of UC	=	0.85	m
Design Runoff	=	0.21 ($Q_{after,uncov.}$)	m^3/s

Flow capacity, Q

$$Q = \frac{A \times r^{2/3} \times s^{1/2}}{n}$$

where A = cross sectional area of flow (m^2) = 0.359872 m^2

r = hydraulic radius (m)

s = slope of the water surface or the linear hydraulic head loss (m/m)

n = Manning coefficient of roughness

Hydraulic radius

$$r = \frac{A}{P}$$

p = wetted perimeter (m) = 1.95 m

r = 0.18 *m*

Slope

s = 0.004 m/m

Manning coefficient of roughness

n = 0.014

Therefore,

Q = 0.53 m^3/s **> Design runoff, OK!**

V = Q/A = 1.46 m/s

Appendix C

Site Photos

Photo 1:

Photo 2:

Photo 3:

Annex IV

Revised Fire Service Installations Proposal

F.S. NOTES:

1. GENERAL

1.1 FIRE SERVICE INSTALLATIONS SHALL BE PROVIDED IN ACCORDANCE WITH THE CODES OF PRACTICE FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT AND INSPECTION, TESTING AND MAINTENANCE OF INSTALLATIONS AND EQUIPMENT 2022 (COP 2022), FSD CIRCULAR LETTERS AND THE HONG KONG WATERWORKS STANDARD REQUIREMENTS. [SEP 2022]"

1.2 ALL TUBES AND FITTINGS SHALL BE G.M.S. TO BS1387 MEDIUM GRADE WHERE PIPEWORK UP TO ø150mm.

1.3 ALL TUBES AND FITTINGS SHALL BE DUCTILE IRON TO BS EN545 K12 WHERE PIPEWORK ABOVE ø150mm.

1.4 ALL DRAIN PIPES SHALL BE DISCHARGED TO A CONSPICUOUS POSITION WITHOUT THE POSSIBILITY OF BEING SUBMERGED.

1.5 ALL PUDDLE FLANGES SHALL BE MADE OF DUCTILE IRON

1.6 SMOKE EXTRACTION SYSTEM(S) SHALL NOT BE PROVIDED AS THE AGGREGATE AREA OF OPERABLE WINDOW OF STRUCTURE EXCEEDS 6.25% OF THE FLOOR AREA OF THE COMPARTMENT.

1.7 VENTILATION/AIR CONDITIONING SYSTEM NOT TO BE PROVIDED.

2. AUTOMATIC SPRINKLER SYSTEM

2.1 AUTOMATIC SPRINKLER SYSTEM SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH LPC RULES FOR AUTOMATIC SPRINKLER INSTALLATIONS INCORPORATING BS EN 12845: 2015 (INCLUDING TECHNICAL BULLETINS, NOTES, COMMENTAR AND RECOMMENDATIONS) AND FSD CIRCULAR LETTER NO. 5/2020. THE CLASSIFICATION OF THE OCCUPANCIES WILL BE ORDINARY HAZARD GROUP III.

2.2 ONE $135m^3$ SPRINKLER WATER TANK WILL BE PROVIDED AS INDICATED ON PLAN. THE TOWN MAIN WATER SUPPLY WILL BE FED FROM SINGLE END.

2.3 TWO SPRINKLER PUMPS (DUTY/STANDBY) AND ONE JOCKEY PUMP SHALL BE PROVIDED IN FS PUMP ROOM LOCATED AT EXTERNAL AREA.

2.4 SPRINKLER CONTROL VALVE SET AND SPRINKLER INLET SHALL BE PROVIDED AS INDICATED ON PLAN.

2.5 A TEST VALVE SHALL BE PROVIDED FOR EACH ZONE OF SPRINKLER PIPE. THIS VALVE SHALL BE AT A POSITION THAT WATER CAN BE DRAINED AWAY EASILY.

2.6 ALL SUBSIDIARY STOP VALVES TO BE ELECTRIC MONITORING TYPE.

2.7 ALL ELECTRIC TYPE VALVES SHOULD GIVE VISUAL SIGNALS TO FIRE SERVICE MAIN SUPERVISORY CONTROL PANEL TO INDICATE THE STATUS (OPEN/CLOSE) OF THE VALVES.

2.8 SECONDARY ELECTRICITY SUPPLY DIRECTLY TEE OFF BEFORE CLP'S INCOMING MAIN SWITCH SHALL BE PROVIDED FOR THE SPRINKLER PUMPS.

2.9 THE SPRINKLER SYSTEM DESIGN IS BASED ON THE FOLLOWINGS:
HAZARD CLASS : ORDINARY HAZARD GROUP III
TYPE OF STORAGE : POST-PALLET (ST2)
STORAGE CATEGORY : CATEGORY I
MAXIMUM STORAGE HIEGHT : 3.5m
SPRINKLER PROTECTION : CEILING PROTECTION ONLY
THE MAXIMUM STORAGE AREAS SHALL BE $50m^2$ FOR SINGLE BLOCK
THE MINIMUM CLEARANCE AROUND EACH SINGLE STORAGE CLOCK : 2.4m

3. FIRE DETECTOR SYSTEM

3.1 THE STAND-ALONE FIRE DETECTOR SHALL BE PROVIDED IN ACCORDANCE WITH THE "STAND-ALONE FIRE DETECTOR GENERAL GUIDELINES ON PURCHASE, INSTALLATION & MAINTENANCE [SEP 2021]"

3.2 WHERE TWO OR MORE STAND-ALONE FIRE DETECTORS ARE INSTALLED IN AN ENCLOSED STRUCTURE, ALL DETECTORS SHALL BE INTERCONNECTED (EITHER WIRED OR WIRELESSLY) SUCH THAT WHEN ONE OF THE DETECTORS IS TRIGGERED, ALL CONNECTED DETECTORS SHALL SOUND AN ALARM SIMULTANEOUSLY.

4. EMERGENCY LIGHTING

4.1 EMERGENCY LIGHTING SHALL BE PROVIDED IN ACCORDANCE WITH 'BS 5266-1 :2016 AND BS EN 1838 :2013", AND THE FSD CIRCULAR LETTER NO. 4/2021, COVERING ALL AREA. EMERGENCY LIGHTINGS SHALL BE BACKED UP BY BUILT-IN BATTERY AND CAPABLE OF MAINTAINING FUNCTION OF NOT LESS THAN 2 HOURS IN CASE OF POWER FAILURE

5. EXIT SIGN

5.1 ALL EXIT SIGNS/DIRECTIONAL EXIT SIGNS SHALL BE PROVIDED IN ACCORDANCE WITH BS 5266-1 :2016 AND FSD CIRCULAR LETTER NO. 5/2008, FOR THE BUILDING. EXIT SIGNS/DIRECTIONAL EXIT SIGNS SHALL BE BACKED UP BY BUILT-IN BATTERY AND CAPABLE OF MAINTAINING FUNCTION OF NOT LESS THAN 2 HOURS IN CASE OF POWER FAILURE.

6. PORTABLE APPLIANCES

6.1 PORTABLE HAND OPERATED APPLIANCES SHALL BE PROVIDED AS INDICATED ON PLAN.

6.2 A SUITABLE TYPE OF PORTABLE FIRE EXTINGUISHER SHALL BE PROVIDED IN LOCATIONS WHERE EASILY ACCESSIBLE BY PERSON IN CHARGE WHERE THE NO. OF F.E. SHALL BE PROVIDED ACCORDING TO THE FORMULA = [STORAGE AREA] (M^2) X (0.003]

6.3 A 20-35 KG WHEELED TYPE DRY CHEMICAL FIRE EXTINGUISHER IN EVERY $500M^2$ ON EVERY FLOOR OF THE PREMISES AND SHALL BE PROVIDED TO ENSURE THAT EVERY PART OF THE PREMISES CAN BE REACHED BY WHEELED TYPE DRY CHEMICAL FIRE EXTINGUISHER FROM A DISTANCE OF NOT MORE THAN 30M

STRUCTURE	USE	COVERED AREA	GROSS FLOOR AREA	BUILDING HEIGHT
B1	WAREHOUSE (EXCL. D.G.G.) SITE OFFICE AND WASHROOM	1,784 m2 (ABOUT)	1,784 m2 (ABOUT)	13 m (ABOUT)(1-STOREY)
B2	WAREHOUSE (EXCL. D.G.G.) SITE OFFICE AND WASHROOM	616 m2 (ABOUT)	616 m2 (ABOUT)	13 m (ABOUT)(1-STOREY)
B3	WAREHOUSE (EXCL. D.G.G.) SITE OFFICE AND WASHROOM	7,154 m2 (ABOUT)	7,154 m2 (ABOUT)	13 m (ABOUT)(1-STOREY)
B4	WAREHOUSE (EXCL. D.G.G.) SITE OFFICE AND WASHROOM	3,667 m2 (ABOUT)	3,667 m2 (ABOUT)	13 m (ABOUT)(1-STOREY)
B5	FS PUMP ROOM	64 m2 (ABOUT)	64 m2 (ABOUT)	3.5 m (ABOUT)(1-STOREY)
B6	FS WATER TANK	168 m2 (ABOUT)	168 m2 (ABOUT)	3.5 m (ABOUT)(1-STOREY)
	TOTAL	13,453 m2 (ABOUT)	13,453 m2 (ABOUT)	

*D.G.G. - DANGEROUS GOODS GODOWN

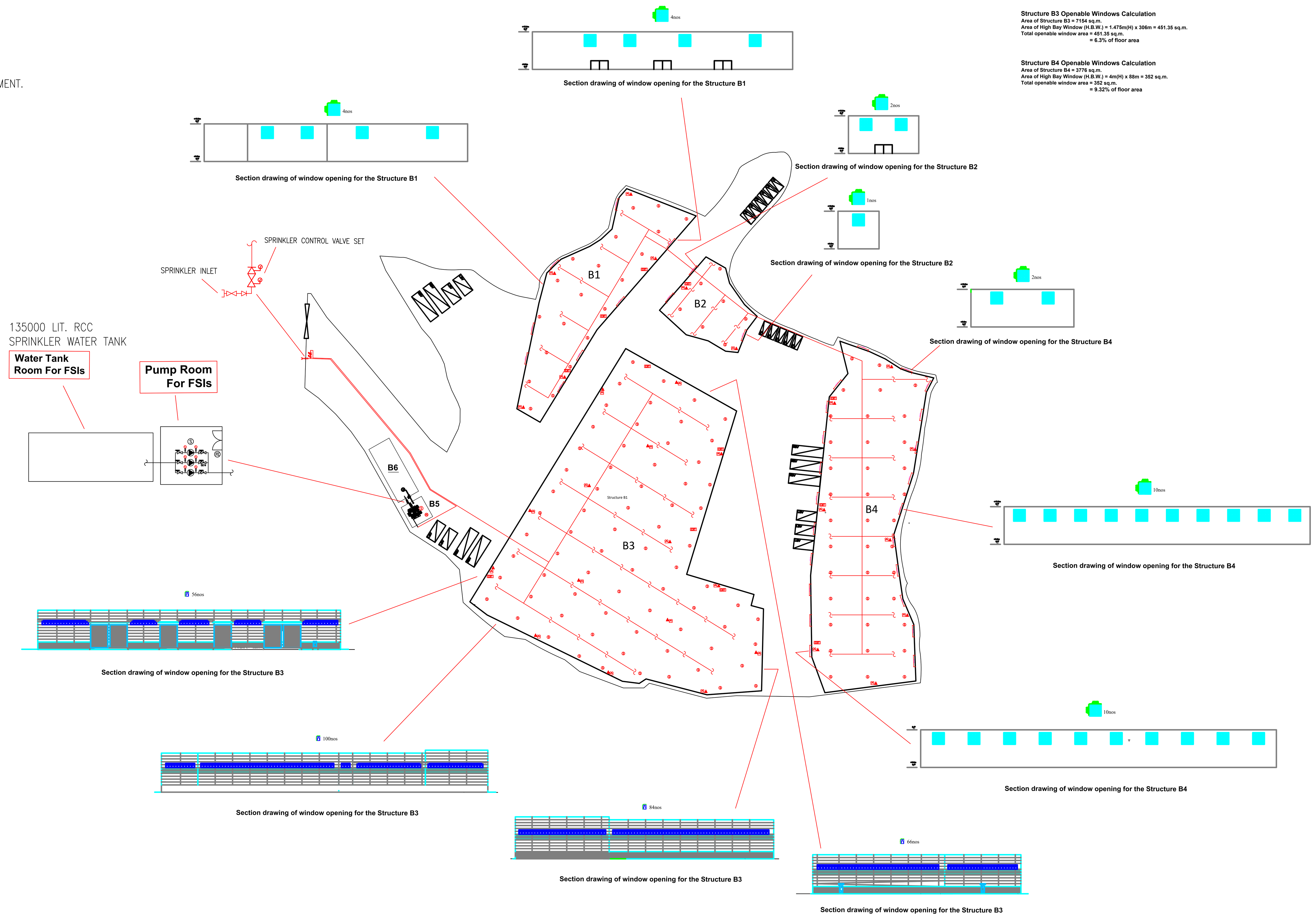
Legend:
Openable window (Area: 4m X 4m=16 sq.m)
Openable window (Area: 1m X 1.475m=1.475 sq.m)

Structure B1 Openable Windows Calculation
Area of Structure B1 = 1784 sq.m.
Area of High Bay Window (H.B.W.) = 4m(H) x 32m = 128 sq.m.
Total openable window area = 128 sq.m.
= 7.17% of floor area

Structure B2 Openable Windows Calculation
Area of Structure B2 = 616 sq.m.
Area of High Bay Window (H.B.W.) = 4m(H) x 12m = 48 sq.m.
Total openable window area = 48 sq.m.
= 7.79% of floor area

Structure B3 Openable Windows Calculation
Area of Structure B3 = 7154 sq.m.
Area of High Bay Window (H.B.W.) = 1.475m(H) x 306m = 451.35 sq.m.
Total openable window area = 451.35 sq.m.
= 6.3% of floor area

Structure B4 Openable Windows Calculation
Area of Structure B4 = 3776 sq.m.
Area of High Bay Window (H.B.W.) = 4m(H) x 88m = 352 sq.m.
Total openable window area = 352 sq.m.
= 9.32% of floor area



LEGEND
APPLICATION SITE
STRUCTURE
PARKING SPACE (PC)
LOADING / UNLOADING SPACE (LGV)
LOADING / UNLOADING SPACE (MGV)
INGRESS / EGRESS

LEGEND
- STAND ALONE BATTERY TYPE SMOKE DETECTOR
- 25KG WHEELED TYPE DRY CHEMICAL FIRE EXTINGUISHER
- EMERGENCY LIGHT
- EXIT SIGN
- NON-RETURN VALVE
- SPRINKLER CONTROL VALVE SET
- GATE VALVE
- GATE TYPE (With MONITORING)
- PUMP SET
- Y-TYPE STRAINER
- SPRINKLER INLET
- PRESSURE GAUGE
- SPRINKLER HEAD (ON PLAN)
- 5KG DRY POWDER FIRE EXTINGUISHER
- SUBSIDIARY VALVE / FLOW SWITCH
- 5KG CO2 FIRE EXTINGUISHER

PROJECT :	DRAWING TITLE :	REV	DESCRIPTION	DATE	ARCHITECT :	CONSULTANT :	FIRE SERVICE CONTRACTOR :
Proposed Temporary Warehouse (Excluding Dangerous Godown) with Ancillary Facilities and Associated Filling of Land and Pond for a period of 3 years	F.S. Notes, Legend, Fire Service Installation Layout Plan						Century Fire Service Engineering Co., Ltd.

	NAME	DATE
DRAWN BY	C.K.NG	03 Fed 2026
CHECKED BY		
APPROVED BY		

DRAWING NO : FS-01
REV. 0
SCALE : 1 : 700 (A0)
SOURCE : B.O.O. Ref. BD
F.S.D. Ref. FP

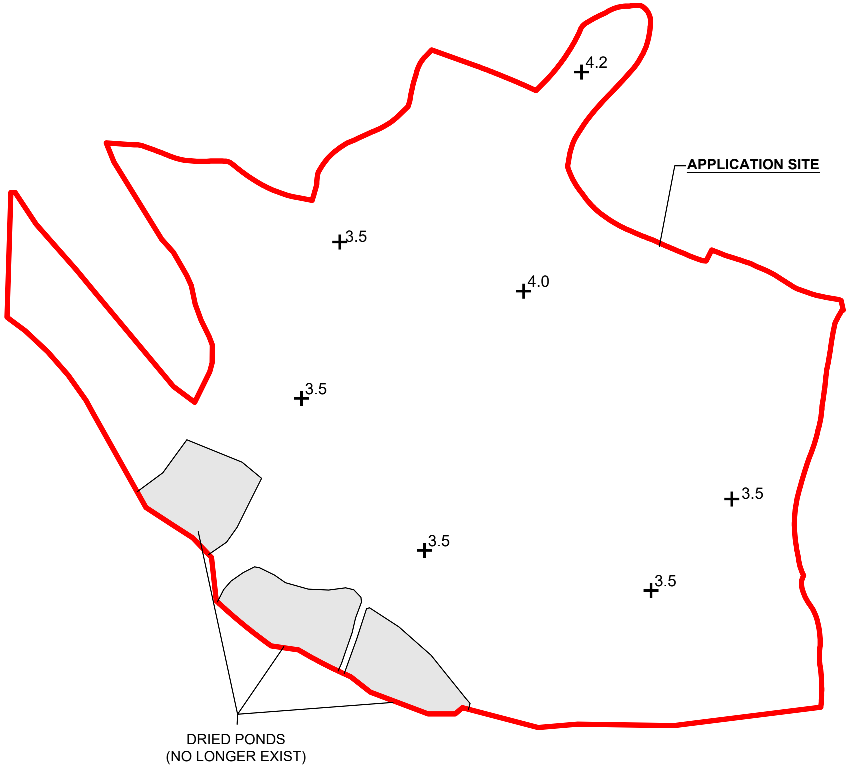
REVISED PLANS

Plan 1	Filling of Land Area (1/2)
Plan 2	Filling of Land Area (2/2)

EXISTING CONDITION OF THE APPLICATION SITE

APPLICATION SITE AREA	: 25,206 m^2	(ABOUT)
EXISTING DRIED POND AREA*	: 1,623 m^2	(ABOUT)
DEPTH OF POND	: 0.5 m	(ABOUT)
EXISTING SOILED AREA	: 23,583 m^2	(ABOUT)
EXISTING SITE LEVELS	: +3.5 mPD TO +4.2 mPD	(ABOUT)

**THE DRIED PONDS HAVE ALREADY BEEN FILLED SINCE THE 1990s. THE APPLIED 'FILLING OF POND' IS INTENDED TO REGULARIZE THE POND FILLING AREAS AT THE APPLICATION SITE.*



LEGEND

APPLICATION SITE

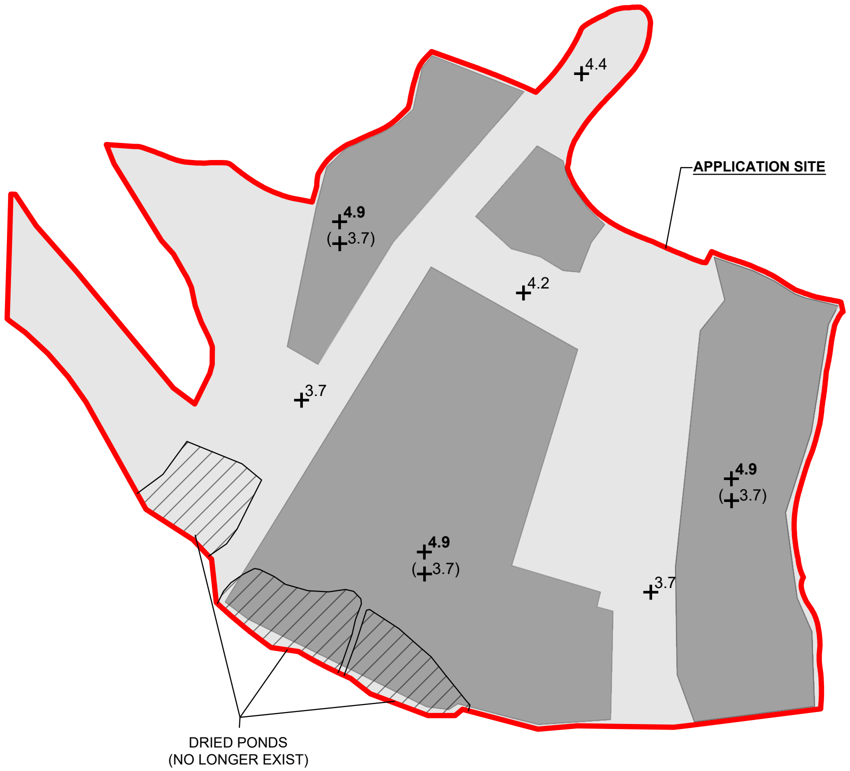
EXISTING DRIED POND

+3.5 SITE LEVEL

**SITE LEVELS ARE FOR ILLUSTRATION PURPOSE ONLY*

REGULARIZATION OF FILLING OF LAND AND POND AREA

APPLICATION SITE AREA	: 25,206 m^2	(ABOUT)
COVERED BY STRUCTURE	: 13,453 m^2	(ABOUT)
PROPOSED LAND FILLING AREA	: 25,206 m^2	(ABOUT)
DEPTH OF LAND FILLING	: NOT MORE THAN 1.4 m *(INCLUDING 1.2 m IN DEPTH FOR LOADING/UNLOADING PLATFORM CONFINED WITHIN STRUCTURES ERECTED/TO BE ERECTED)*	
PROPOSED SITE LEVELS	: +3.7 mPD TO +4.9 mPD	(ABOUT)
MATERIAL OF LAND FILLING	: CONCRETE	
USE	: SITE FORMATION OF STRUCTURES *LOADING/UNLOADING LEVEL* AND CIRCULATION AREA	
PROPOSED POND FILLING AREA	: 1,623 m^2	(ABOUT)
DEPTH OF POND FILLING	: 0.5 m	(ABOUT)



LEGEND

APPLICATION SITE

PROPOSED LAND FILLING AREA FOR CIRCULATION

PROPOSED LAND FILLING AREA FOR L/UL LEVEL OF STRUCTURE

PROPOSED POND FILLING AREA

+3.7 SITE LEVEL

(+3.7) SITE LEVEL (WITHOUT LOADING/UNLOADING PLATFORM)

NORTH

W E

S

PLANNING CONSULTANT

R-RICHES PLANNING LIMITED

PROJECT

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS

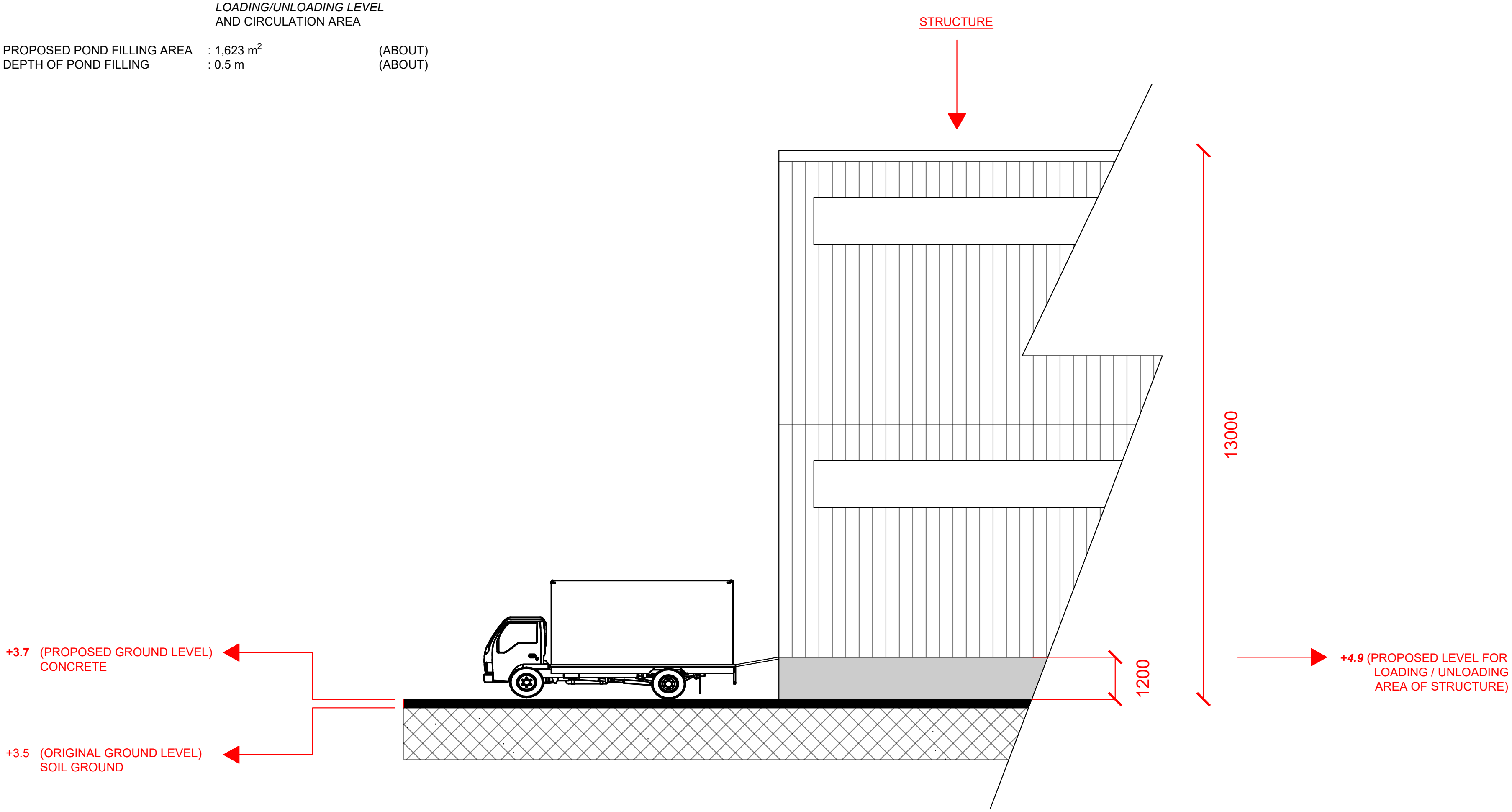
SITE LOCATION

VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

SCALE	1 : 2000 @ A4
DRAWN BY: MN	DATE: 6.8.2025
REVISED BY	DATE
APPROVED BY	DATE
DWG. TITLE	FILLING OF LAND AREA (1/2)
DWG NO.: PLAN 1	VER.: 001

REGULARIZATION OF FILLING OF LAND AND POND AREA

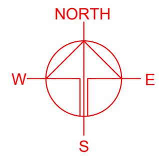
APPLICATION SITE AREA	: 25,206 m^2	(ABOUT)
COVERED BY STRUCTURE	: 13,453 m^2	(ABOUT)
PROPOSED LAND FILLING AREA	: 25,206 m^2	(ABOUT)
DEPTH OF LAND FILLING	: NOT MORE THAN 1.4 m *(INCLUDING 1.2 m IN DEPTH FOR LOADING/UNLOADING PLATFORM CONFINED WITHIN STRUCTURES ERECTED/TO BE ERECTED)*	
PROPOSED SITE LEVELS	: +4.2 mPD TO +4.9 mPD	(ABOUT)
MATERIAL OF LAND FILLING	: CONCRETE	
USE	: SITE FORMATION OF STRUCTURES, *LOADING/UNLOADING LEVEL* AND CIRCULATION AREA	
PROPOSED POND FILLING AREA	: 1,623 m^2	(ABOUT)
DEPTH OF POND FILLING	: 0.5 m	(ABOUT)



LEGEND

- PROPOSED FILLING AREA FOR LOADING/UNLOADING LEVEL OF STRUCTURE
- PROPOSED FILLING AREA FOR CIRCULATION
- EXISTING GROUND LEVEL

**SITE LEVELS ARE FOR ILLUSTRATION PURPOSE ONLY*



PLANNING CONSULTANT

R-RICHES PLANNING LIMITED

PROJECT

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND AND POND FOR A PERIOD OF 3 YEARS

SITE LOCATION

VARIOUS LOTS IN D.D. 107 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

SCALE: 1 : 150 @ A4	
DRAWN BY: MN	DATE: 2.2.2026
REVISED BY:	DATE:
APPROVED BY:	DATE:
DWG. TITLE: FILLING OF LAND AREA (2/2)	
DWG NO.: PLAN 2	VER.: 001