Form No. S16-I
表格第 S16-I 號

APPLICATION FOR PERMISSION
UNDER SECTION 16 OF
THE TOWN PLANNING ORDINANCE
(CAP. 131)

根據《城市規劃條例》(第131章)
第16條遞交的許可申請

Applicable to proposals not involving or not only involving:
適用於建議不涉及或不祇涉及:

(i) Construction of "New Territories Exempted House(s)";
興建「新界豁免管制屋宇」;

(ii) Temporary use/development of land and/or building not exceeding 3 years in rural areas or Regulated Areas; and
位於鄉郊地區或受規管地區土地上及/或建築物內進行為期不超過三年的臨時用途/發展;及

(iii) Renewal of permission for temporary use or development in rural areas or Regulated Areas
位於鄉郊地區或受規管地區的臨時用途或發展的許可續期

Applicant who would like to publish the notice of application in local newspapers to meet one of the Town Planning Board's requirements of taking reasonable steps to obtain consent of or give notification to the current land owner, please refer to the following link regarding publishing the notice in the designated newspapers: https://www.tpb.gov.hk/en/plan_application/apply.html

申請人如欲在本地報章刊登申請通知,以採取城市規劃委員會就取得現行土地擁有人的同意或通知現行土地擁有人所指定的其中一項合理步驟,請瀏覽以下網址有關在指定的報章刊登通知:
https://www.tpb.gov.hk/tc/plan_application/apply.html

General Note and Annotation for the Form
填寫表格的一般指引及註解

\# "Current land owner" means any person whose name is registered in the Land Registry as that of an owner of the land to which the application relates, as at 6 weeks before the application is made
「現行土地擁有人」指在提出申請前六星期,其姓名或名稱已在土地註冊處註冊為該申請所關乎的土地的擁有人的人

& Please attach documentary proof 請夾附證明文件

^ Please insert number where appropriate 請在適當地方註明編號

Please fill "NA" for inapplicable item 請在不適用的項目填寫「不適用」

Please use separate sheets if the space provided is insufficient 如所提供的空間不足,請另頁說明

Please insert a「✔」at the appropriate box 請在適當的方格內上加上「✔」號

2400903 9/4 by hand

Form No. S16-I 表格第 S16-I 號

For Official Use Only 請勿填寫此欄	Application No. 申請編號	A/YL-PH/1013
	Date Received 收到日期	14 MAY 2024

1. The completed form and supporting documents (if any) should be sent to the Secretary, Town Planning Board (the Board), 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
申請人須把填妥的申請表格及其他支持申請的文件 (倘有)，送交香港北角渣華道 333 號北角政府合署 15 樓城市規劃委員會(下稱「委員會」)秘書收。

2. Please read the "Guidance Notes" carefully before you fill in this form. The document can be downloaded from the Board's website at http://www.tpb.gov.hk/. It can also be obtained from the Secretariat of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong (Tel: 2231 4810 or 2231 4835), and the Planning Enquiry Counters of the Planning Department (Hotline: 2231 5000) (17/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong and 14/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin, New Territories).
請先細閱《申請須知》的資料單張，然後填寫此表格。該份文件可從委員會的網頁下載 (網址：http://www.tpb.gov.hk/)，亦可向委員會秘書處 (香港北角渣華道 333 號北角政府合署 15 樓 – 電話：2231 4810 或 2231 4835)及規劃署的規劃資料查詢處(熱線：2231 5000) (香港北角渣華道 333 號北角政府合署 17 樓及新界沙田上禾輋路 1 號沙田政府合署 14 樓)索取。

3. This form can be downloaded from the Board's website, and obtained from the Secretariat of the Board and the Planning Enquiry Counters of the Planning Department. The form should be typed or completed in block letters. The processing of the application may be refused if the required information or the required copies are incomplete.
此表格可從委員會的網頁下載，亦可向委員會秘書處及規劃署的規劃資料查詢處索取。申請人須以打印方式或以正楷填寫表格。如果申請人所提交的資料或文件副本不齊全，委員會可拒絕處理有關申請。

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1. Name of Applicant 申請人姓名/名稱

(☐ Mr. 先生 / ☐ Mrs. 夫人 / ☐ Miss 小姐 / ☐ Ms. 女士 / ☑ Company 公司 / ☐ Organisation 機構)

Super Wise (HK) Limited

2. Name of Authorised Agent (if applicable) 獲授權代理人姓名/名稱（如適用）

(☐ Mr. 先生 / ☐ Mrs. 夫人 / ☐ Miss 小姐 / ☐ Ms. 女士 / ☑ Company 公司 / ☐ Organisation 機構)

Lanbase Surveyors Limited

3. Application Site 申請地點

(a) Full address / location / demarcation district and lot number (if applicable) 詳細地址／地點／丈量約份及地段號碼（如適用）	Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land, Pat Heung, Yuen Long
(b) Site area and/or gross floor area involved 涉及的地盤面積及／或總樓面面積	☑ Site area 地盤面積 21,586 sq.m 平方米 ☑ About 約 ☑ Gross floor area 總樓面面積 15,916 sq.m 平方米 ☑ About 約
(c) Area of Government land included (if any) 所包括的政府土地面積（倘有）	1,530 sq.m 平方米 ☑ About 約

(d) Name and number of the related statutory plan(s) 有關法定圖則的名稱及編號	Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11
(e) Land use zone(s) involved 涉及的土地用途地帶	Open Storage
(f) Current use(s) 現時用途	Vacant (If there are any Government, institution or community facilities, please illustrate on plan and specify the use and gross floor area) (如有任何政府、機構或社區設施，請在圖則上顯示，並註明用途及總樓面面積)

4. "Current Land Owner" of Application Site 申請地點的「現行土地擁有人」

The applicant 申請人 –

☑ is the sole "current land owner"#& (please proceed to Part 6 and attach documentary proof of ownership).
是唯一的「現行土地擁有人」#& (請繼續填寫第 6 部分，並夾附業權證明文件)。

☐ is one of the "current land owners"#& (please attach documentary proof of ownership).
是其中一名「現行土地擁有人」#& (請夾附業權證明文件)。

☐ is not a "current land owner"#.
並不是「現行土地擁有人」#。

☐ The application site is entirely on Government land (please proceed to Part 6).
申請地點完全位於政府土地上（請繼續填寫第 6 部分）。

5. Statement on Owner's Consent/Notification
就土地擁有人的同意/通知土地擁有人的陳述

(a) According to the record(s) of the Land Registry as at ..... (DD/MM/YYYY), this application involves a total of ..... "current land owner(s)"#.
根據土地註冊處截至 ..... 年 ..... 月 ..... 日的記錄，這宗申請共牽涉 ..... 名「現行土地擁有人」#。

(b) The applicant 申請人 –

☐ has obtained consent(s) of ..... "current land owner(s)"#.
已取得 ..... 名「現行土地擁有人」#的同意。

Details of consent of "current land owner(s)"# obtained 取得「現行土地擁有人」#同意的詳情		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where consent(s) has/have been obtained 根據土地註冊處記錄已獲得同意的地段號碼／處所地址	Date of consent obtained (DD/MM/YYYY) 取得同意的日期 (日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has notified ..... "current land owner(s)"#
已通知 ..... 名「現行土地擁有人」#。

Details of the "current land owner(s)"# notified 已獲通知「現行土地擁有人」#的詳細資料		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where notification(s) has/have been given 根據土地註冊處記錄已發出通知的地段號碼／處所地址	Date of notification given (DD/MM/YYYY) 通知日期(日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has taken reasonable steps to obtain consent of or give notification to owner(s):
已採取合理步驟以取得土地擁有人的同意或向該人發給通知。詳情如下：

Reasonable Steps to Obtain Consent of Owner(s) 取得土地擁有人的同意所採取的合理步驟

☐ sent request for consent to the "current land owner(s)" on _____ (DD/MM/YYYY)#&
於_____(日/月/年)向每一名「現行土地擁有人」#郵遞要求同意書&

Reasonable Steps to Give Notification to Owner(s) 向土地擁有人發出通知所採取的合理步驟

☐ published notices in local newspapers on _____ (DD/MM/YYYY)&
於_____(日/月/年)在指定報章就申請刊登一次通知&

☐ posted notice in a prominent position on or near application site/premises on _____ (DD/MM/YYYY)&
於_____(日/月/年)在申請地點／申請處所或附近的顯明位置貼出關於該申請的通知&

☐ sent notice to relevant owners' corporation(s)/owners' committee(s)/mutual aid committee(s)/management office(s) or rural committee on _____ (DD/MM/YYYY)&
於_____(日/月/年)把通知寄往相關的業主立案法團/業主委員會/互助委員會或管理處，或有關的鄉事委員會&

Others 其他

☐ others (please specify)
其他（請指明）

_____

_____

_____

_____

Note: May insert more than one「✔」.
Information should be provided on the basis of each and every lot (if applicable) and premises (if any) in respect of the application.
註: 可在多於一個方格內加上「✔」號
申請人須就申請涉及的每一地段（倘適用）及處所（倘有）分別提供資料

6. Type(s) of Application 申請類別

☐ Type (i) 第(i)類 Change of use within existing building or part thereof 更改現有建築物或其部分內的用途

☐ Type (ii) 第(ii)類 Diversion of stream / excavation of land / filling of land / filling of pond as required under Notes of Statutory Plan(s) 根據法定圖則《註釋》內所要求的河道改道／挖土／填土／填塘工程

☐ Type (iii) 第(iii)類 Public utility installation / Utility installation for private project 公用事業設施裝置/私人發展計劃的公用設施裝置

☐ Type (iv) 第(iv)類 Minor relaxation of stated development restriction(s) as provided under Notes of Statutory Plan(s) 略為放寬於法定圖則《註釋》內列明的發展限制

☑ Type (v) 第(v)類 Use / development other than (i) to (iii) above 上述的(i)至(iii)項以外的用途／發展

Note 1: May insert more than one「✓」.
註 1： 可在多於一個方格內加上「✓」號
Note 2: For Development involving columbarium use, please complete the table in the Appendix.
註 2： 如發展涉及靈灰安置所用途，請填妥於附件的表格。

(i) For Type (i) application 供第(i)類申請

(a) Total floor area involved 涉及的總樓面面積	sq.m 平方米		
(b) Proposed use(s)/development 擬議用途/發展	(If there are any Government, institution or community facilities, please illustrate on plan and specify the use and gross floor area) (如有任何政府、機構或社區設施，請在圖則上顯示，並註明用途及總樓面面積)		
(c) Number of storeys involved 涉及層數		Number of units involved 涉及單位數目	
(d) Proposed floor area 擬議樓面面積	Domestic part 住用部分 ..... sq.m 平方米 ☐About 約		
	Non-domestic part 非住用部分..... sq.m 平方米 ☐About 約		
	Total 總計 ..... sq.m 平方米 ☐About 約		

(e) Proposed uses of different floors (if applicable) 不同樓層的擬議用途(如適用) (Please use separate sheets if the space provided is insufficient) (如所提供的空間不足，請另頁說明)	Floor(s) 樓層	Current use(s) 現時用途	Proposed use(s) 擬議用途

(ii) For Type (ii) application 供第(ii)類申請	
(a) Operation involved 涉及工程	☐ Diversion of stream 河道改道 ☐ Filling of pond 填塘 Area of filling 填塘面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填塘深度 ..... m 米 ☐About 約 ☐ Filling of land 填土 Area of filling 填土面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填土厚度 ..... 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 (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) (請用圖則顯示有關土地／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))
(b) Intended use/development 有意進行的用途／發展	

(iii) For Type (iii) application 供第(iii)類申請	
(a) Nature and scale 性質及規模	☐ Public utility installation 公用事業設施裝置 ☐ Utility installation for private project 私人發展計劃的公用設施裝置 Please specify the type and number of utility to be provided as well as the dimensions of each building/structure, where appropriate 請註明有關裝置的性質及數量，包括每座建築物/構築物(倘有)的長度、高度和闊度

Name/type of installation 裝置名稱／種類	Number of provision 數量	Dimension of each installation /building/structure (m) (LxWxH) 每個裝置／建築物／構築物的尺寸 (米) (長 x 闊 x 高)

(Please illustrate on plan the layout of the installation 請用圖則顯示裝置的布局)

(iv) For Type (iv) application 供第(iv)類申請

(a) Please specify the proposed minor relaxation of stated development restriction(s) and **also fill in the proposed use/development and development particulars in part (v) below** –
請列明擬議略為放寬的發展限制**並填妥於第(v)部分的擬議用途/發展及發展細節** –

☐ Plot ratio restriction 地積比率限制 — From 由 ..... to 至 .....

☐ Gross floor area restriction 總樓面面積限制 — From 由 .....sq. m 平方米 to 至 .....sq. m 平方米

☐ Site coverage restriction 上蓋面積限制 — From 由 .....% to 至 ..... %

☐ Building height restriction 建築物高度限制 — From 由 .....m 米 to 至 ..... m 米

From 由 ..... mPD 米 (主水平基準上) to 至 .....mPD 米 (主水平基準上)

From 由 ..... storeys 層 to 至 ..... storeys 層

☐ Non-building area restriction 非建築用地限制 — From 由 .....m to 至 ..... m

☐ Others (please specify) 其他（請註明） .....

.....

(v) For Type (v) application 供第(v)類申請

(a) Proposed use(s)/development 擬議用途/發展	Temporary Wholesale Trade (Food) for a period of 5 years (Please illustrate the details of the proposal on a layout plan 請用平面圖說明建議詳情)

(b) Development Schedule 發展細節表

Proposed gross floor area (GFA) 擬議總樓面面積	15,916 sq.m 平方米	☑About 約
Proposed plot ratio 擬議地積比率	0.7373	☑About 約
Proposed site coverage 擬議上蓋面積	73.73 %	☑About 約
Proposed no. of blocks 擬議座數	2	
Proposed no. of storeys of each block 每座建築物的擬議層數	1 storeys 層	
	☐ include 包括.....storeys of basements 層地庫	
	☐ exclude 不包括.....storeys of basements 層地庫	
Proposed building height of each block 每座建築物的擬議高度	..... mPD 米(主水平基準上)	☐About 約
	18 m 米	☑About 約

☐ Domestic part 住用部分

GFA 總樓面面積 ..... sq. m 平方米 ☐About 約

number of Units 單位數目 .....

average unit size 單位平均面積 .....sq. m 平方米 ☐About 約

estimated number of residents 估計住客數目 .....

☑ Non-domestic part 非住用部分 GFA 總樓面面積

☐ eating place 食肆 ..... sq. m 平方米 ☐About 約

☐ hotel 酒店 ..... sq. m 平方米 ☐About 約

(please specify the number of rooms 請註明房間數目) .....

☐ office 辦公室 ..... sq. m 平方米 ☐About 約

☐ shop and services 商店及服務行業 ..... sq. m 平方米 ☐About 約

☐ Government, institution or community facilities 政府、機構或社區設施 (please specify the use(s) and concerned land area(s)/GFA(s) 請註明用途及有關的地面面積／總樓面面積)

.....

.....

.....

☑ other(s) 其他 (please specify the use(s) and concerned land area(s)/GFA(s) 請註明用途及有關的地面面積／總樓面面積)

.....

Temporary Wholesale Trade (Food) : 15,916 square metres

.....

.....

☐ Open space 休憩用地 (please specify land area(s) 請註明地面面積)

☐ private open space 私人休憩用地 ..... sq. m 平方米 ☐ Not less than 不少於

☐ public open space 公眾休憩用地 ..... sq. m 平方米 ☐ Not less than 不少於

(c) Use(s) of different floors (if applicable) 各樓層的用途 (如適用)

[Block number] [座數]	[Floor(s)] [層數]	[Proposed use(s)] [擬議用途]
Structure A&B	G/F	Temporary Wholesale Trade (Food)
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

(d) Proposed use(s) of uncovered area (if any) 露天地方（倘有）的擬議用途

.....

Nil

.....

.....

.....

.....

7. Anticipated Completion Time of the Development Proposal
擬議發展計劃的預計完成時間

Anticipated completion time (in month and year) of the development proposal (by phase (if any)) (e.g. June 2023)
擬議發展計劃預期完成的年份及月份 (分期 (倘有)) (例：2023 年 6 月)
(Separate anticipated completion times (in month and year) should be provided for the proposed public open space and Government, institution or community facilities (if any))
(申請人須就擬議的公眾休憩用地及政府、機構或社區設施 (倘有) 提供個別擬議完成的年份及月份)

December 2025

8. Vehicular Access Arrangement of the Development Proposal
擬議發展計劃的行車通道安排

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)) A local track from Fan Kam Road ☐ 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	☐
Any provision of parking space for the proposed use(s)? 是否有為擬議用途提供停車位？	Yes 是	☐ (Please specify type(s) and number(s) and illustrate on plan) 請註明種類及數目並於圖則上顯示) Private Car Parking Spaces 私家車車位 _____ Motorcycle Parking Spaces 電單車車位 _____ Light Goods Vehicle Parking Spaces 輕型貨車泊車位 _____ Medium Goods Vehicle Parking Spaces 中型貨車泊車位 _____ Heavy Goods Vehicle Parking Spaces 重型貨車泊車位 _____ Others (Please Specify) 其他 (請列明) _____ _____ _____ _____ _____
	No 否	☑
Any provision of loading/unloading space for the proposed use(s)? 是否有為擬議用途提供上落客貨車位？	Yes 是	☑ (Please specify type(s) and number(s) and illustrate on plan) 請註明種類及數目並於圖則上顯示) Taxi Spaces 的士車位 _____ Coach Spaces 旅遊巴車位 _____ Light Goods Vehicle Spaces 輕型貨車車位 _____ Medium Goods Vehicle Spaces 中型貨車車位 _____ Heavy Goods Vehicle Spaces 重型貨車車位 _____ Others (Please Specify) 其他 (請列明) _____ Container Vehicle Spaces 8 _____ _____
	No 否	☐

9. 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。

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	☑
Does the development proposal involve the operation on the right? 擬議發展是否涉及右列的工程? (Note: where Type (ii) application is the subject of application, please skip this section. 註：如申請涉及第(ii)類申請，請跳至下一條問題。)	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 ..... sq.m 平方米 ☐About 約 Depth of filling 填塘深度 ..... m 米 ☐About 約 ☐ Filling of land 填土 Area of filling 填土面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填土厚度 ..... 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	☑

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 ☑
	_____		
	_____		
	Please state measure(s) to minimise the impact(s). For tree felling, please state the number, diameter at breast height and species of the affected trees (if possible) 請註明盡量減少影響的措施。如涉及砍伐樹木，請說明受影響樹木的數目、及胸高度的樹幹直徑及品種(倘可)		

10. Justifications 理由

The applicant is invited to provide justifications in support of the application. Use separate sheets if necessary.
現請申請人提供申請理由及支持其申請的資料。如有需要，請另頁說明。

Please see attached planning statement.

11. Declaration 聲明

I hereby declare that the particulars given in this application are correct and true to the best of my knowledge and belief.
本人謹此聲明，本人就這宗申請提交的資料，據本人所知及所信，均屬真實無誤。

I hereby grant a permission to the Board to copy all the materials submitted in this application and/or to upload such materials to the Board's website for browsing and downloading by the public free-of-charge at the Board's discretion. 本人現准許委員會酌情將本人就此申請所提交的所有資料複製及/或上載至委員會網站，供公眾免費瀏覽或下載。

Signature 簽署 ..... ☐ Applicant 申請人 / ☑ Authorised Agent 獲授權代理人

ROCK TSANG ..... Director .....

Name in Block Letters 姓名（請以正楷填寫） ..... Position (if applicable) 職位 （如適用）

Professional Qualification(s) 專業資格
☐ Member 會員 / ☐ Fellow of 資深會員
☐ HKIP 香港規劃師學會 / ☐ HKIA 香港建築師學會 /
☑ HKIS 香港測量師學會 / ☐ HKIE 香港工程師學會 /
☐ HKILA 香港園境師學會/ ☐ HKIUD 香港城市設計學會
☐ RPP 註冊專業規劃師
Others 其他 .....

on behalf of 代表 LANBASE SURVEYORS LIMITED .....

☑ Company 公司 / ☐ Organisation Name and Chop (if applicable) 機構名稱及蓋章（如適用）

Date 日期 9/4/2024 ..... (DD/MM/YYYY 日/月/年)

Remark 備註

The materials submitted in this application and the Board's decision on the application would be disclosed to the public. Such materials would also be uploaded to the Board's website for browsing and free downloading by the public where the Board considers appropriate.
委員會會向公眾披露申請人所遞交的申請資料和委員會對申請所作的決定。在委員會認為合適的情況下，有關申請資料亦會上載至委員會網頁供公眾免費瀏覽及下載。

Warning 警告

Any person who knowingly or wilfully makes any statement or furnish any information in connection with this application, which is false in any material particular, shall be liable to an offence under the Crimes Ordinance.
任何人在明知或故意的情況下，就這宗申請提出在任何要項上是虛假的陳述或資料，即屬違反《刑事罪行條例》。

Statement on Personal Data 個人資料的聲明

1. The personal data submitted to the Board in this application will be used by the Secretary of the Board and Government departments for the following purposes:
委員會就這宗申請所收到的個人資料會交給委員會秘書及政府部門，以根據《城市規劃條例》及相關的城市規劃委員會規劃指引的規定作以下用途：
   (a) the processing of this application which includes making available the name of the applicant for public inspection when making available this application for public inspection; and
   處理這宗申請，包括公布這宗申請供公眾查閱，同時公布申請人的姓名供公眾查閱；以及
   (b) facilitating communication between the applicant and the Secretary of the Board/Government departments.
   方便申請人與委員會秘書及政府部門之間進行聯絡。

2. The personal data provided by the applicant in this application may also be disclosed to other persons for the purposes mentioned in paragraph 1 above.
申請人就這宗申請提供的個人資料，或亦會向其他人士披露，以作上述第 1 段提及的用途。

3. An applicant has a right of access and correction with respect to his/her personal data as provided under the Personal Data (Privacy) Ordinance (Cap. 486). Request for personal data access and correction should be addressed to the Secretary of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
根據《個人資料(私隱)條例》(第 486 章)的規定，申請人有權查閱及更正其個人資料。如欲查閱及更正個人資料，應向委員會秘書提出有關要求，其地址為香港北角渣華道 333 號北角政府合署 15 樓。

For Developments involving Columbarium Use, please also complete the following:
如發展涉及靈灰安置所用途，請另外填妥以下資料:

Ash interment capacity 骨灰安放容量@

Maximum number of sets of ashes that may be interred in the niches
在龕位內最多可安放骨灰的數量 _____

Maximum number of sets of ashes that may be interred other than in niches
在非龕位的範圍內最多可安放骨灰的數量 _____

Total number of niches 龕位總數 _____

Total number of single niches
單人龕位總數 _____

Number of single niches (sold and occupied)
單人龕位數目 (已售並佔用) _____

Number of single niches (sold but unoccupied)
單人龕位數目 (已售但未佔用) _____

Number of single niches (residual for sale)
單人龕位數目 (待售) _____

Total number of double niches
雙人龕位總數 _____

Number of double niches (sold and fully occupied)
雙人龕位數目 (已售並全部佔用) _____

Number of double niches (sold and partially occupied)
雙人龕位數目 (已售並部分佔用) _____

Number of double niches (sold but unoccupied)
雙人龕位數目 (已售但未佔用) _____

Number of double niches (residual for sale)
雙人龕位數目 (待售) _____

Total no. of niches other than single or double niches (please specify type)
除單人及雙人龕位外的其他龕位總數 (請列明類別)
_____

Number. of niches (sold and fully occupied)
龕位數目 (已售並全部佔用) _____

Number of niches (sold and partially occupied)
龕位數目 (已售並部分佔用) _____

Number of niches (sold but unoccupied)
龕位數目 (已售但未佔用) _____

Number of niches (residual for sale)
龕位數目 (待售) _____

Proposed operating hours 擬議營運時間 _____
_____

@ Ash interment capacity in relation to a columbarium means –
就靈灰安置所而言，骨灰安放容量指：
- the maximum number of containers of ashes that may be interred in each niche in the columbarium;
每個龕位內可安放的骨灰容器的最高數目;
- the maximum number of sets of ashes that may be interred other than in niches in any area in the columbarium; and
在該靈灰安置所並非龕位的範圍內，總共最多可安放多少份骨灰；以及
- the total number of sets of ashes that may be interred in the columbarium.
在該骨灰安置所內，總共最多可安放多少份骨灰。

Gist of Application 申請摘要

(Please provide details in both English and Chinese as far as possible. This part will be circulated to relevant consultees, uploaded to the Town Planning Board's Website for browsing and free downloading by the public and available at the Planning Enquiry Counters of the Planning Department for general information.)
(請盡量以英文及中文填寫。此部分將會發送予相關諮詢人士、上載至城市規劃委員會網頁供公眾免費瀏覽及下載及於規劃署規劃資料查詢處供一般參閱。)

Application No. 申請編號	(For Official Use Only) (請勿填寫此欄)
Location/address 位置／地址	Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land, Pat Heung, Yuen
Site area 地盤面積	21, 586 sq. m 平方米 ☑ About 約 (includes Government land of 包括政府土地 1, 530 sq. m 平方米 ☑ About 約)
Plan 圖則	Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11
Zoning 地帶	Open Storage
Applied use/ development 申請用途/發展	Temporary Wholesale Trade (Food) for a period of 5 years

		sq.m 平方米	Plot Ratio 地積比率
(i) Gross floor area and/or plot ratio 總樓面面積及／或地積比率	Domestic 住用	☐ About 約 ☐ Not more than 不多於	☐About 約 ☐Not more than 不多於
	Non-domestic 非住用	15, 916 ☑ About 約 ☐ Not more than 不多於	0.7373 ☑About 約 ☐Not more than 不多於
(ii) No. of blocks 幢數	Domestic 住用		
	Non-domestic 非住用	2	
	Composite 綜合用途		

(iii)	Building height/No. of storeys 建築物高度／層數	Domestic 住用	m 米 ☐ (Not more than 不多於)
			mPD 米(主水平基準上) ☐ (Not more than 不多於)
			Storeys(s) 層 ☐ (Not more than 不多於) *(☐Include 包括/☐ Exclude 不包括* ☐ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台)*
		Non-domestic 非住用	18 m 米 ☐ (Not more than 不多於)
			mPD 米(主水平基準上) ☐ (Not more than 不多於)
			1 Storeys(s) 層 ☐ (Not more than 不多於) *(☐Include 包括/☐ Exclude 不包括* ☐ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台)*
		Composite 綜合用途	m 米 ☐ (Not more than 不多於)
			mPD 米(主水平基準上) ☐ (Not more than 不多於)
			Storeys(s) 層 ☐ (Not more than 不多於) *(☐Include 包括/☐ Exclude 不包括* ☐ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台)*
(iv)	Site coverage 上蓋面積	73.73 % ☑ About 約	
(v)	No. of units 單位數目	Not Applicable	
(vi)	Open space 休憩用地	Private 私人	sq.m 平方米 ☐ Not less than 不少於
		Public 公眾	sq.m 平方米 ☐ Not less than 不少於

(vii) No. of parking spaces and loading / unloading spaces 停車位及上落客貨車位數目	Total no. of vehicle parking spaces 停車位總數 Private Car Parking Spaces 私家車車位 Motorcycle Parking Spaces 電單車車位 Light Goods Vehicle Parking Spaces 輕型貨車泊車位 Medium Goods Vehicle Parking Spaces 中型貨車泊車位 Heavy Goods Vehicle Parking Spaces 重型貨車泊車位 Others (Please Specify) 其他 (請列明) _____ _____	
	Total no. of vehicle loading/unloading bays/lay-bys 上落客貨車位／停車處總數 Taxi Spaces 的士車位 Coach Spaces 旅遊巴車位 Light Goods Vehicle Spaces 輕型貨車車位 Medium Goods Vehicle Spaces 中型貨車位 Heavy Goods Vehicle Spaces 重型貨車車位 Others (Please Specify) 其他 (請列明) Container Vehicle Spaces _____	8 8

Submitted Plans, Drawings and Documents 提交的圖則、繪圖及文件

	Chinese 中文	English 英文
Plans and Drawings 圖則及繪圖		
Master layout plan(s)/Layout plan(s) 總綱發展藍圖／布局設計圖	☐	☑
Block plan(s) 樓宇位置圖	☐	☐
Floor plan(s) 樓宇平面圖	☐	☐
Sectional plan(s) 截視圖	☐	☐
Elevation(s) 立視圖	☐	☐
Photomontage(s) showing the proposed development 顯示擬議發展的合成照片	☐	☐
Master landscape plan(s)/Landscape plan(s) 園境設計總圖／園境設計圖	☐	☐
Others (please specify) 其他（請註明）	☐	☐
Location Plan, Extract of OZP, Access Road Plan		
_____		
Reports 報告書		
Planning Statement/Justifications 規劃綱領/理據	☐	☑
Environmental assessment (noise, air and/or water pollutions) 環境評估（噪音、空氣及／或水的污染）	☐	☐
Traffic impact assessment (on vehicles) 就車輛的交通影響評估	☐	☐
Traffic impact assessment (on pedestrians) 就行人的交通影響評估	☐	☐
Visual impact assessment 視覺影響評估	☐	☐
Landscape impact assessment 景觀影響評估	☐	☐
Tree Survey 樹木調查	☐	☐
Geotechnical impact assessment 土力影響評估	☐	☐
Drainage impact assessment 排水影響評估	☐	☐
Sewerage impact assessment 排污影響評估	☐	☐
Risk Assessment 風險評估	☐	☐
Others (please specify) 其他（請註明）	☐	☐
_____		
_____		

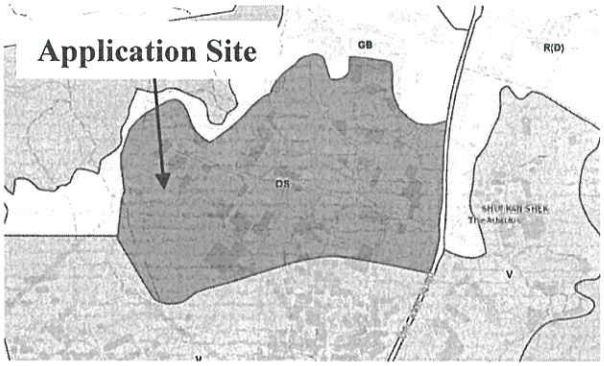
Note: May insert more than one「✔」. 註：可在多於一個方格內加上「✔」號

L | A | N | B | A | S | E

Planning Application
Under Section 16
of the Town Planning Ordinance
(Cap. 131)

Planning Application for
Temporary Wholesale Trade (Food)
for a Period of Five Years
Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land

Pat Heung, Yuen Long, New Territories



Prepared by

LANBASE Surveyors Limited

April 2024

EXECUTIVE SUMMARY

The application site ('the Site') comprises Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and the adjoining government land. It is located in Pat Heung, Yuen Long and measures about 21,586 m^2.

The Site is within "Open Storage" ("OS") zone under the Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11 gazetted on 27 October 2006. The proposed use under this application is "Temporary Wholesale Trade (Food) for a period of 5 years". Under the OZP, "Wholesale Trade" is under Column 2 which may be permitted on application to the Town Planning Board.

The Site is the subject of a previously approved planning applications for the same use approved on 12 April 2019 (No. A/YL-PH/804) on a temporary basis until 12 April 2024. While the planning conditions regarding the submission of drainage proposal and fire service installations proposal have been complied with, their implementation have not been complied with due to the fact that construction of the proposed development had not been commenced. Therefore, the planning approval has been revoked.

The applicant of this application, being the current registered owner of the Site, Super Wise (HK) Limited, acquired the ownership of the Site on 24 May 2022 from Ha Che Development Limited, the applicant of the previous revoked planning application. Super Wise (HK) Limited is committed to fulfilling all the planning condition if the subject application is approved by the Town Planning Board.

The subject application is justified on the following grounds:

1) Previous Planning Permission for Same Use;
2) Not in Conflict with Long-Term Planning Intention;
3) Compatibility with Surrounding Land Uses; and
4) No Substantial Environmental and Traffic Adverse Impacts.

申請摘要

申請場地乃丈量約份第111約地段第872號、第873號、第875號、第876號、第877號、第878號、第880號、第881號、第882號、第883號、第884號、第885號、第886號、第887號、第888號、第889號、第890號、第891號A分段、第892號A分段、第893號A分段、第3049號及第3050號及毗鄰政府土地。申請場地位於元朗八鄉，佔地約21,586平方米。

是項申請地段位於八鄉分區計劃大綱核准圖編號 S/YL-PH/11（於 2006 年 10 月 27 日公佈)內之「露天貯物」地帶。是項臨時許可申請把場地申請用作「臨時批發行業（食品）（為期 5 年）」。根據分區計劃大綱圖，「批發行業」位於第二欄，即可能經申請獲城市規劃委員會准許。

是項申請與早前在2019年4月12日在申請場地獲批臨時5年至2024年4月12日前的規劃申請之用途相同。雖然早前獲批就提交排水及消防設置建議的附帶規劃條款已全部履行，但因其擬議發展的工程尚未開展，就落實有關建議的附帶規劃條款則未能履行，早前的規劃許可因而已被撤銷。

是次申請的申請人為Super Wise (HK) Limited，其在2022年5月24日從Ha Che Development Limited購入申請場地的業權。而Ha Che Development Limited實為早前已被撤銷的規劃許可的申請人。就是次申請，如城市規劃委員會批准有關用途，Super Wise (HK) Limited將致力履行附帶規劃條款。

是項申請的理由如下：

1)跟以前獲批准的用途相同；
2)非與長期規劃意向相違背；
3)符合附近的土地用途；及
4)沒有嚴重環境和交通影響。

CONTENTS Page

APPENDICES

1. BACKGROUND

1.1 Previous Planning Application

The Site is the subject of a previously approved planning applications for the same use approved on 12 April 2019 (No. A/YL-PH/804) on a temporary basis until 12 April 2024. While the planning conditions regarding the submission of drainage proposal and fire service installations proposal have been complied with, their implementation have not been complied with due to the fact that construction of the proposed development had not been commenced. Therefore, the planning approval has been revoked.

The applicant of this application, being the current registered owner of the Site, Super Wise (HK) Limited, acquired the ownership of the Site on 24 May 2022 from Ha Che Development Limited, the applicant of the previous revoked planning application. Super Wise (HK) Limited is committed to fulfilling all the planning condition if the subject application is approved by the Town Planning Board.

1.2 Location

The Site comprises Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and the adjoining government land. It is located in Pat Heung, Yuen Long. Please refer to the location plan at **Appendix 1**.

1.3 Site Area

The site measures about 21,586m^2 (including government land of about 1,530m^2).

1.4 Proposed Use

It is proposed that the site be used for "Temporary Wholesale Trade (Food) for a period of 5 years".

1.5 The Applicant

The applicant of the application is Super Wise (HK) Limited, the current registered owner of the Site.

1.6 Instruction

The applicant has commissioned Lanbase Surveyors Limited on his behalf to submit a planning application to apply for the use of "Temporary Wholesale Trade (Food) for a period of 5 years" under Section 16 of the Town Planning Ordinance (Cap. 131). The Planning Statement serves to describe the existing condition of the Site and its surrounding land uses, to give details of the proposed development, and to provide justifications for the Board's consideration.

2. SITE CONTEXT

2.1 Lease Particulars

The subject lots are held under Block Crown Lease and demised as agricultural land. The lease is virtually unrestricted apart from the offensive trade clause and will expire on 30th June 2047.

2.2 Site Condition

The Site is currently vacant.

2.3 Surrounding Land Uses

The Site is surrounded by port back-up uses including container tractor/trailer parks, vehicle repair workshops and open storages.

2.4 Accessibility

The Site is accessible from Fan Kam Road by an access road.

3. TOWN PLANNING

3.1 The Site falls within "Open Storage" ("OS") zone under the Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11 gazetted on 27 October 2006. Under the OZP, the proposed "Wholesale Trade" is under Column 2 which may be permitted with or without condition on application to the Town Planning Board. Please refer to the notes of the OZP at **Appendix 2**.

3.2 The Site is the subject of a previously approved planning applications for the same use approved on 12 April 2019 (No. A/YL-PH/804) on a temporary basis until 12 April 2024. While the planning conditions regarding the submission of drainage proposal and fire service installations proposal have been complied with, their implementation have not been complied with due to the fact that construction of the proposed development had not been commenced. Therefore, the planning approval has been revoked.

3.3 In accordance with the Town Planning Board Guidelines No. 13G (TPB PG-NO. 13G) for Application for Open Storage and Port Back-up Uses, the Site falls within "Category 1" area, which is considered suitable for open storage and port back-up uses.

4. PROPOSED DEVELOPMENT

4.1 Applied Use

The proposed use is "Temporary Wholesale Trade (Food) for a period of 5 years". The proposed layout plan is at **Appendix 3**. The proposed development is intended to be the same with the last approved planning application.

4.2 Proposed Development Parameters

Proposed GFA/ Built Over Area	15,916m^2 (about)
Proposed Number of Storey	1
Proposed Number of Structure	2
Proposed Building Height	18m (about)

4.3 Operation Mode

The operator of the development would be a food wholesaler who supplies a variety of packaged food product including snacks and dried seafood to retailers. Goods will be stored vertically on pallet racks and movement of goods within the structures will be carried out by robotic machines.

There would be no food manufacturing, retail or workshop activities. The development would not be open to the public. It is estimated that the development would accommodate 10 workers.

4.4 Operation Hours

Identical to the previously approved planning application (No. A/YL-PH/804), the proposed development would operate from 10am to 5pm (e.g. no night-time operation between 5pm and 10am) from Monday to Sunday (including public holiday) during the planning approval period.

4.5 Traffic

The Site is accessible from Fan Kam Road by an access road. A plan showing the access road is at **Appendix 4**. The entire access road is at least 6m wide, whereas the vehicular access of the Site would be 7.3m wide.

The Site staff can access the Site on foot through the access road after they reach Fan Kam Road by public transportation. No car parking spaces would be provided within the Site for the staff.

8 loading/ unloading spaces would be provided within the Site underneath the two proposed structures. The minimum headroom provided for the loading/ unloading spaces would be 9m. Sufficient space would be provided within the Site for maneuvering of vehicles and no vehicles would queue back to or reverse onto/from public road anytime.

The estimated trips generation of the Site is illustrated below :-

Time	Estimated Vehicular Trips				
	Structure A (4 spaces)		Structure B (4 spaces)		Total Trips
	Container Vehicle				
	In	Out	In	Out	
10:00 – 12:00	2	0	2	0	4
12:00 – 14:00	2	1	2	1	6
14:00 – 16:00	1	2	1	2	6
16:00 – 17:00	0	2	0	2	4

4.6 Drainage

A drainage proposal has once been submitted and approved by the relevant government department in the last planning application. The applicant will further submit an updated proposal, if required, for implementation if the application is approved by the Town Planning Board.

4.7 Fire Precaution Measures

A fire service installation proposal has once been submitted and approved by the relevant government department in the last planning application. The applicant will further submit an updated proposal, if required, for implementation if the application is approved by the Town Planning Board.

4.8 Environment

No car washing or maintenance activities and no parking of vehicles at night will be allowed within the Site to minimize the environmental impact on the surrounding area.

5. JUSTIFICATIONS

5.1 Previous Planning Permissions for Same Use

The Site is the subject of a previously approved planning applications for the same use approved on 12 April 2019 (No. A/YL-PH/804) on a temporary basis until 12 April 2024. While the planning conditions regarding the submission of drainage proposal and fire service installations proposal have been complied with, their implementation have not been complied with due to the fact that construction of the proposed development had not been commenced. Therefore, the planning approval has been revoked.

The applicant of this application, being the current registered owner of the Site, Super Wise (HK) Limited, acquired the ownership of the Site on 24 May 2022 from Ha Che Development Limited, the applicant of the previous revoked planning application. Super Wise (HK) Limited is committed to fulfilling all the planning condition if the subject application is approved by the Town Planning Board.

5.2 Not in Conflict with the Long-Term Planning Intention

The Site is is zoned "OS" on the OZP. The planning intention of the "OS" zone is primarily intended for the provision of land for appropriate open storage uses and to regularize the already haphazard proliferation of open storage uses. It provides for the orderly development of land for open storage uses that cannot be accommodated in conventional godown premises. The proposed use mainly involves storage of food for supply to retailers. Approval of the application on a temporary basis would not jeopardize the long-term planning intention of the "OS" zone.

5.3 Compatibility with Surrounding Land Uses

The proposed development involving the erection of two single-storey structures of 18m in height is not incompatible with the surrounding area which is mixed with open storage/storage yards, workshops, container trailers/tractors park, parking of vehicles and trailers, scattered residential dwellings/structures and vacant/unused land.

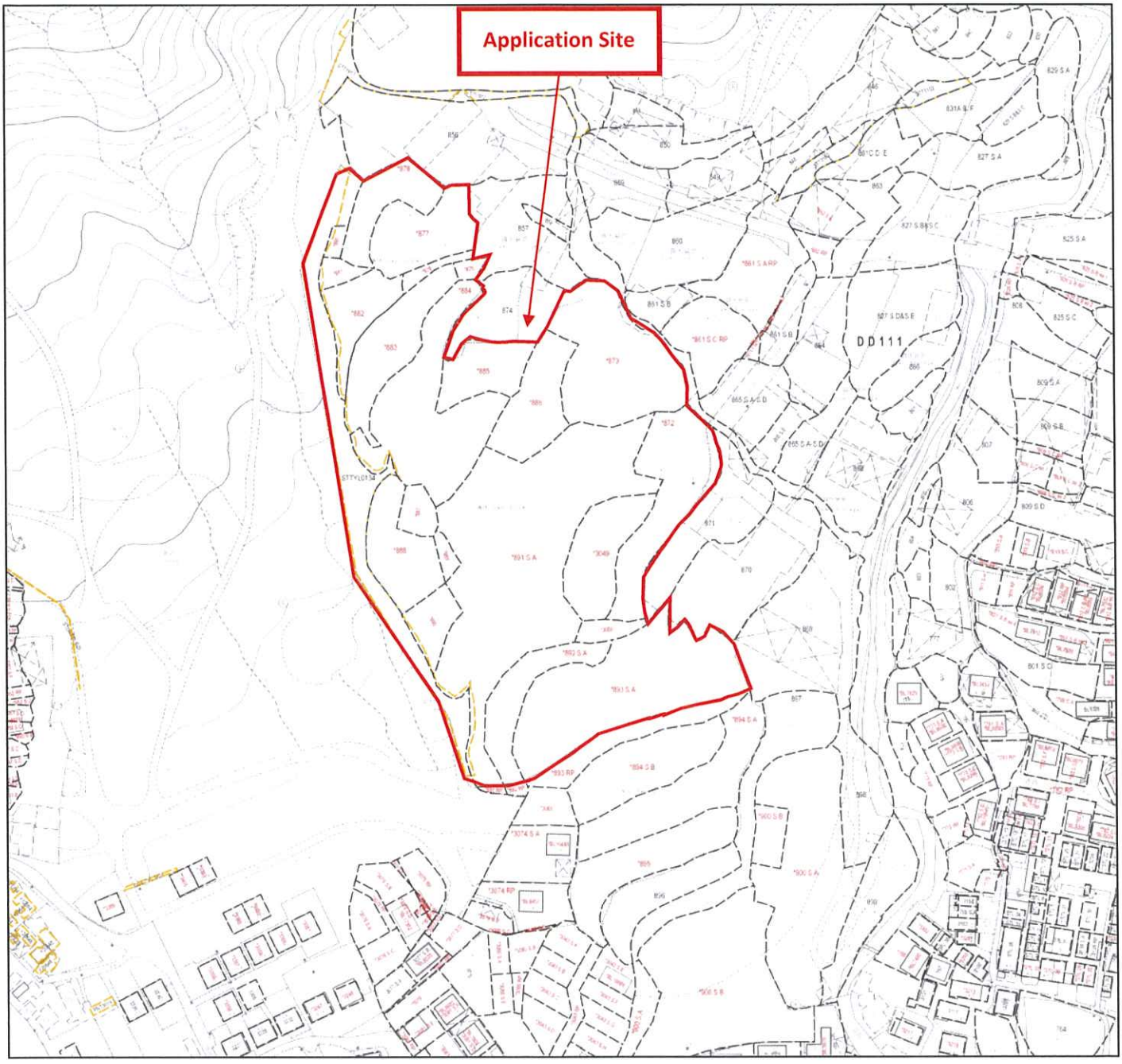
5.4 No Substantial Environmental and Traffic Adverse Impacts

The proposed development would operate from 10am to 5pm (e.g. no night-time operation between 5pm and 10am) from Monday to Sunday (including public holiday) during the planning approval period in order to minimize the environmental and traffic adverse impact on the surrounding. It is believed that the proposed development would not cause substantial environmental and traffic impact.

Appendix 1

Location Plan

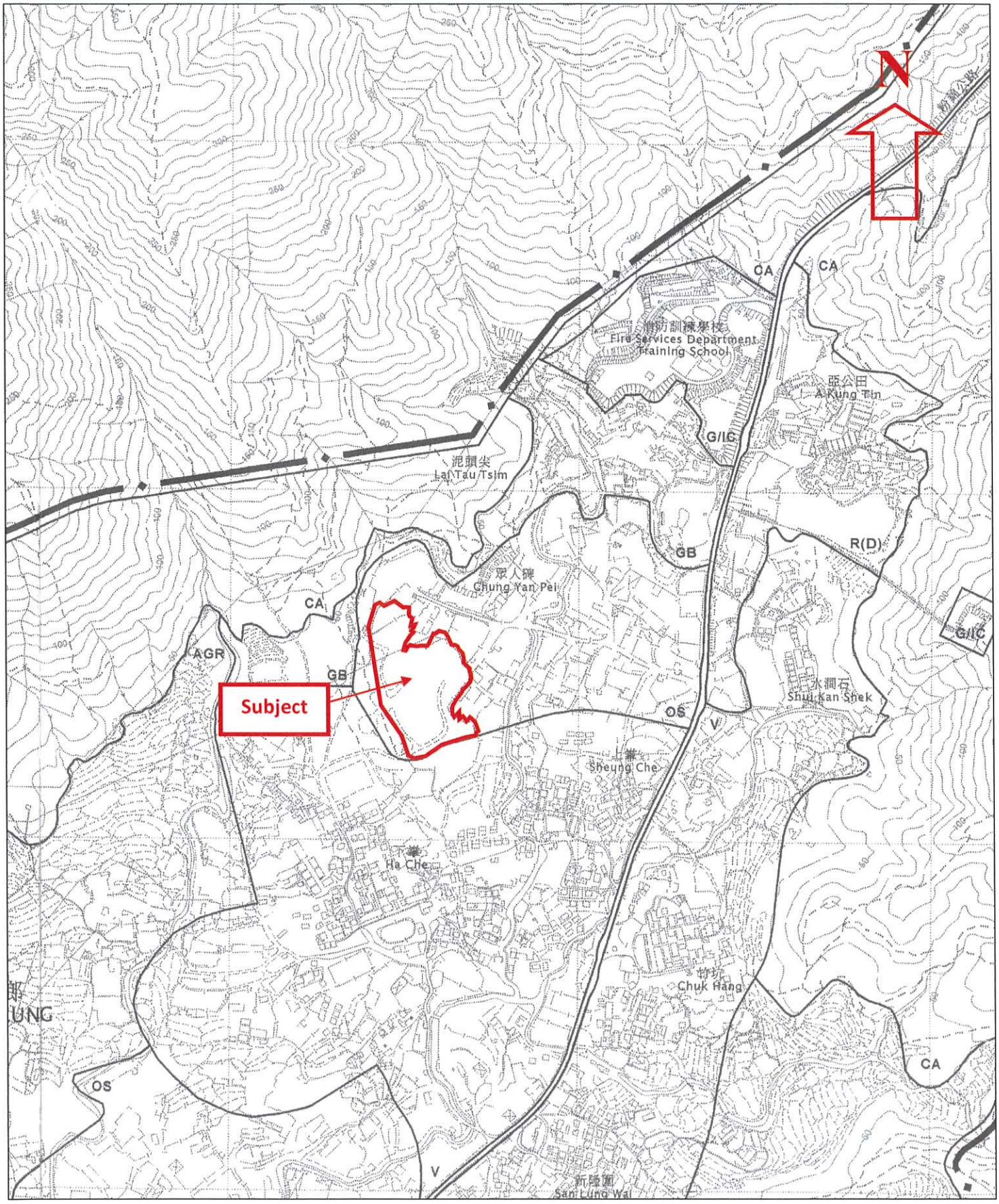
L | A | N | B | A | S | E



Appendix 2

Extract of OZP and the Relevant Notes

L | A | N | B | A | S | E



For Identification Purposes Only

OPEN STORAGE

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen only) Government Refuse Collection Point Government Use (not elsewhere specified) On-Farm Domestic Structure Open Storage (not elsewhere specified) Public Convenience Public Utility Installation Public Vehicle Park (excluding container vehicle) Rural Workshop Shop and Services (Service Trades only) Utility Installation for Private Project Vehicle Repair Workshop Warehouse (excluding Dangerous Goods Godown)	Cargo Handling and Forwarding Facility (Container Freight Station, Logistics Centre only) Cement Manufacturing Concrete Batching Plant Container Storage/Repair Yard Container Vehicle Park/Container Vehicle Repair Yard Dangerous Goods Godown Eating Place (not elsewhere specified) Industrial Use (not elsewhere specified) Open Storage of Cement/Sand Open Storage of Chemical Products/ Dangerous Goods Petrol Filling Station Shop and Services (not elsewhere specified) Vehicle Stripping/Breaking Yard Wholesale Trade

Planning Intention

This zone is intended primarily for the provision of land for appropriate open storage uses and to regularize the already haphazard proliferation of open storage uses. It provides for the orderly development of land for open storage uses that cannot be accommodated in conventional godown premises.

Appendix 3

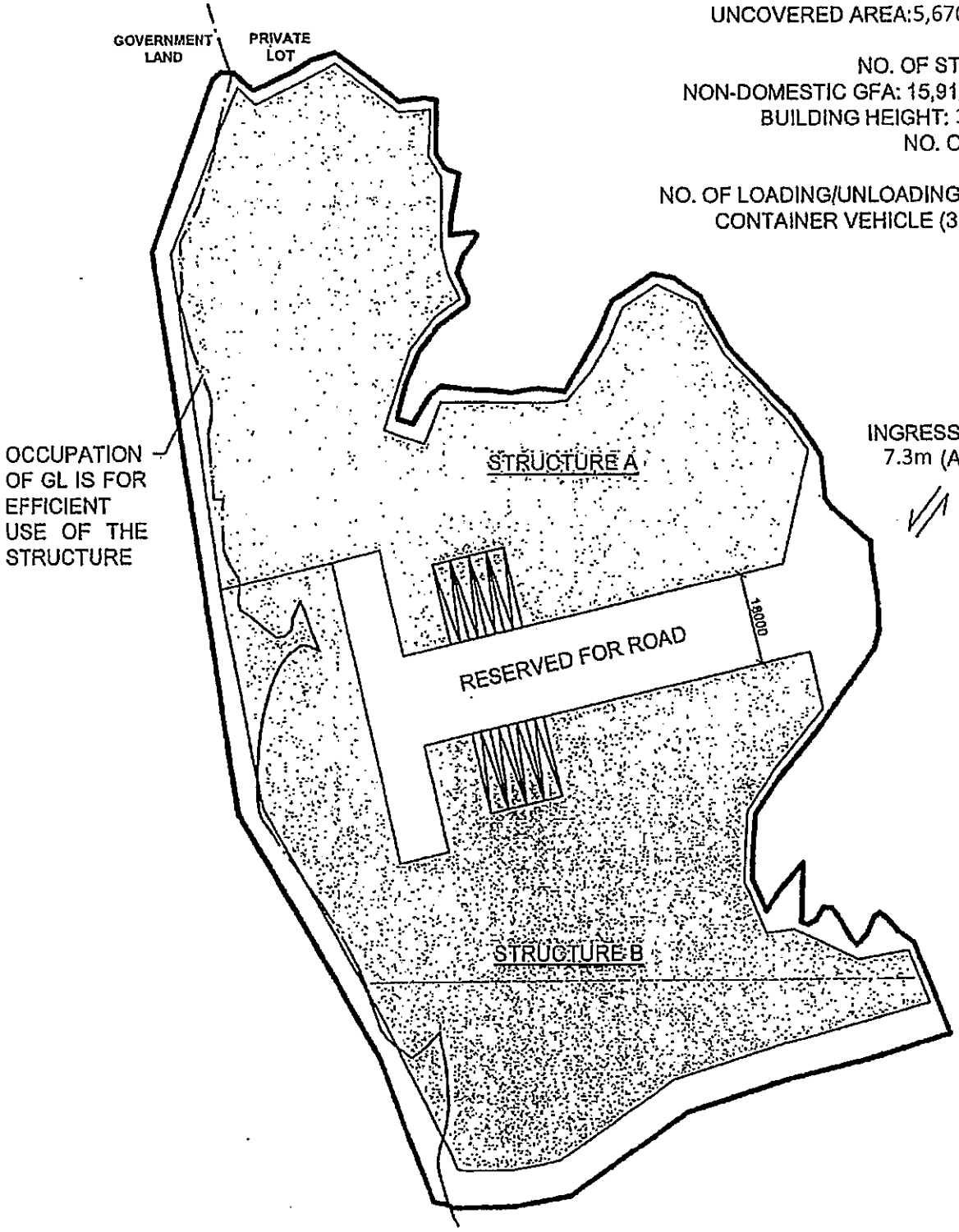
Proposed Layout Plan

DEVELOPMENT PARAMETERS

APPLICATION SITE AREA: 21,586m^2 (ABOUT)
COVERED AREA: 15,916m^2 (ABOUT)
UNCOVERED AREA: 5,670m^2 (ABOUT)

NO. OF STRUCTURE: 2
NON-DOMESTIC GFA: 15,916m^2 (ABOUT)
BUILDING HEIGHT: 18m (ABOUT)
NO. OF STOREY: 1

NO. OF LOADING/UNLOADING SPACE FOR CONTAINER VEHICLE (3.5m X 16m): 8



Appendix 4

Access Road Plan

Fan Kam Road

Application Site

Access Road

DD 111

Fan Kam Road

L A N B A S E
Surveyors Limited

宏 基 測 量 師 行

Our Ref.: YL/TPN/2529C/L03

23 May 2024

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

By Email and by Post

Dear Sir/Madam,

Planning Application (No. A/YL-PH/1013) for
Temporary Wholesale Trade (Food) for a Period of Five Years
Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land
Pat Heung, Yuen Long, New Territories

We write to supplement our captioned planning application with the following information for your further consideration.

(i) A fire service installation proposal in respect of the planning application is at **Appendix 1**. The proposal is the same with that the version approved in the last planning application (No. A/YL-PH/804).

(ii) A drainage proposal in respect of the planning application is at **Appendix 2**. The proposal is the same with that the version approved in the last planning application (No. A/YL-PH/804).

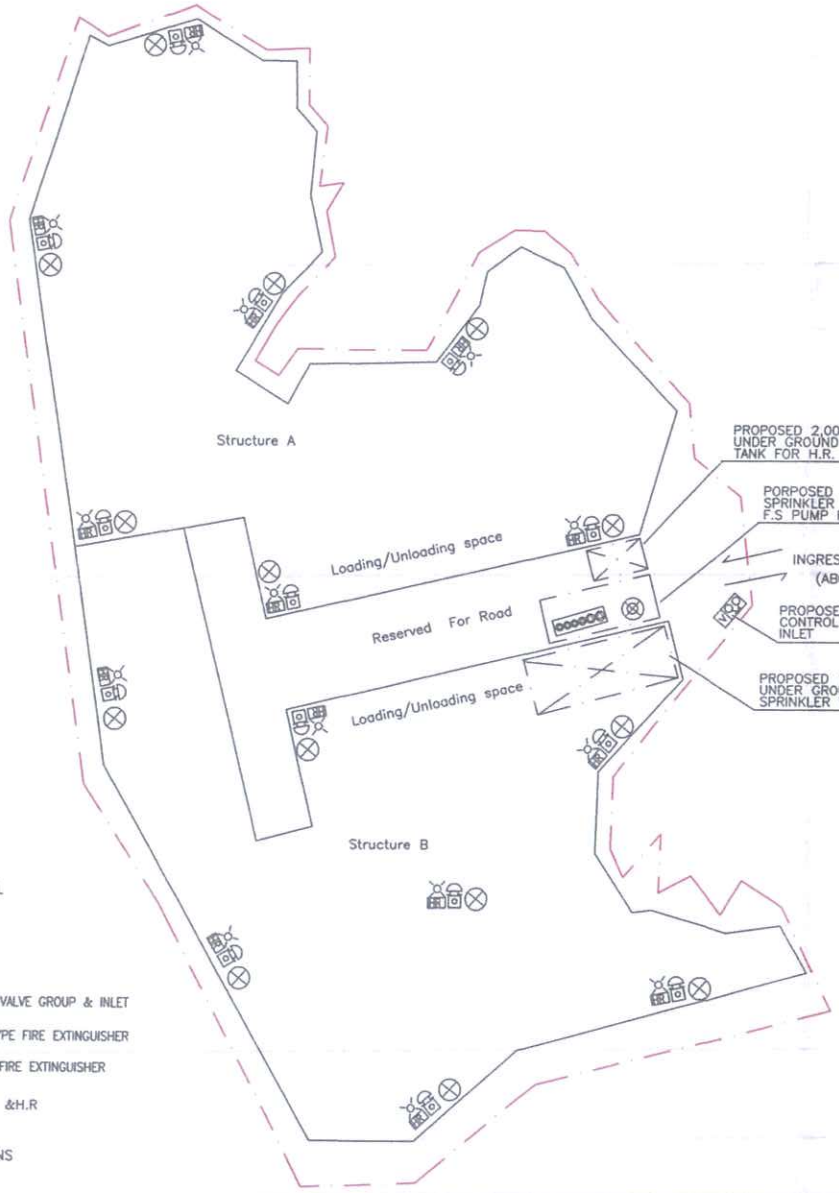
Should you have any queries, please contact our Mr. Wesley Tang at [redacted]. Thank you.

Yours faithfully,
For and on behalf of
LANBASE SURVEYORS LIMITED

Rock K.M. Tsang
Director
RK/WT
Encl.

Appendix 1

Fire Service Installation Proposal



LEGEND

- FLASHING LIGHT
- FIRE ALARM BELL
- MFA CALL POINT
- HR — HOSE REEL SET (30M LENGTH)
- SPRINKLER CONTROL VALVE GROUP & INLET
- 4KG DRY POWDER TYPE FIRE EXTINGUISHER
- 5KG CO2 GAS TYPE FIRE EXTINGUISHER
- SPRINKLER PUMP &H.R PUMP SET
- NEW INSTALLATIONS
- BOUNDARY LINE

NATURE OCCUPANCY:

Structure A: Single storey structure for wholesale trade (food)
(GFA:7888 sq.m,Height:18m)
The aggregate area of openable window about 500 s.q.m exceeding 6.25% of the floor area of the Structure A.(7888sq.m x 6.25% =493sq.m)

Structure B: Single storey structure for wholesale trade (food)
(GFA:8028 sq.m,Height:18m)
The aggregate area of openable window about 520 s.q.m exceeding 6.25% of the floor area of the Structure B.(8028sq.m x 6.25% =501.75sq.m)

Fire Notes:

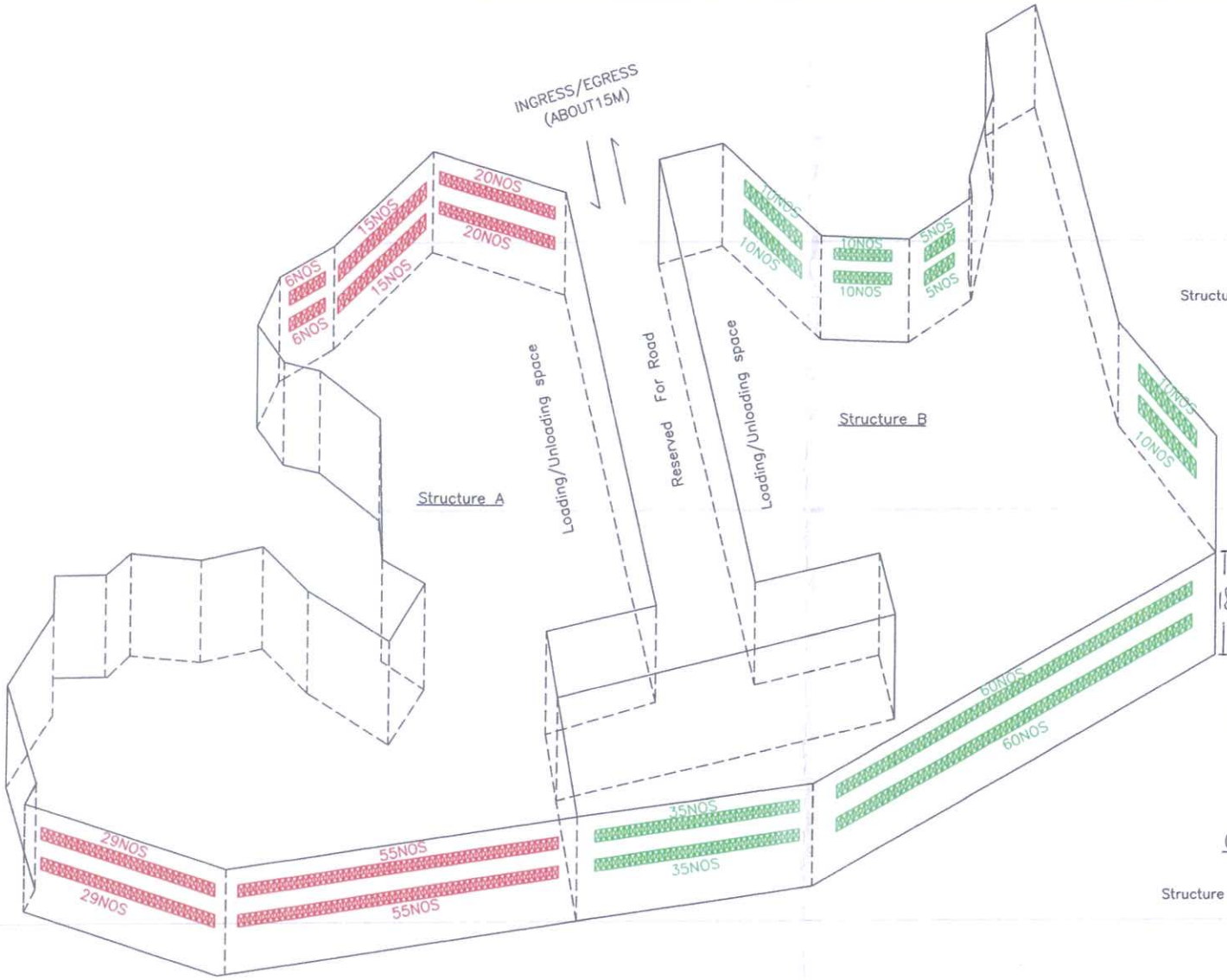
1. Sufficient emergency lighting shall be provided throughout the entire building in accordance with BS5266:Part 1 and BS EN 1838.
2. Sufficient directional and exit sign shall be provided in accordance with BS 5266: Part 1 and FSD Circulasr letter 5/2008.
3. Sufficient portable hand-operated approved appliance shall be provided as required by occupancy and as marked on plans.
4. An Automatic Sprinkler System Supplied by existing 135 m3 Sprinkler Water Tank and Hazard Class OH 3 shall be provided to the building/structure A & B in accordance with BS EN 12845:2015 and FSD Circular Letter No.5/2020. The Sprinkler Water Tank,Sprinkler Pump Room,Sprinkler Inlet and Sprinkler Control Valve Group shall be clearly marked on plans.
5. The storage configuration is ST1:free standing or block stacking with reference to the section 6.3.2 of B.S 12845.and storage pattern is the maximum storage heights shall not exceed 4 m & the maximum storage areas shall be 50m2 for any single block.with no less than 2.4m clearance around the block as Ordinary Hazard Group 3 in accordance with LPC BS EN 12845.(Storage Category : Category I)
6. A hose reel system should be supplied by a 2.0m3 F.S Water tank. There shall be sufficient hose reel to ensure that every part of each buillding can be reached by a length of not more than 30m of hose reel tubing.The F.S water tank, F.S pump room and hose reel shall be clearly marked on plans.
7. Fire alarm system shall be provided throughout the entire building in accordance with BS 5839:PART 1:2002+A2;2008 and FSD Circular Letter 1/2009. One actuation point and one audio warning device to be located at each hose reel point.The actuation point should include facilities for fire pump start and audio/visual warning device initiation.
8. One no.5.0 kg CO2 F.E. shall be provided at spinkler pump room & F.S pump room.
9. Sprinkler Tank water supply pipe should be connected to Town Main.
10. A Secondary electrical supply tee-off before main switch will be provided to maintain operation of fire service system in the event of normal power fuilure.
11. No Smoke extraction system will be provided for the structure A & B as the aggregate area of openable windows of structure A&B exceeding 6.25% of the floor area of the structure A&B. (Detail see Drawing No. 2021-FS/24-02)

INTERCEPT FIRE & SECURITY TECHNICIANS LIMITED
[redacted]

Project :
PROPOSED TEMPORARY WHOLESALE TRADE(FOOD) FOR A PERIOD OF 5 YEARS AT LOTS 872,873,875,876,877,878,880,881,882,883,884,885,886, 887,888,889,890,891(PART),892(PART),893(PART),3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND ,PAT HEUNG ,YUEN LONG.

TITLE :
PROPOSED FIRE SERVICE INSTALLATION LAYOUT PLAN.

Drawn By:	W.C WONG
Date:	31-12-2021
Scale:	1:1000 @ A3
Ref No:	TPB/A/YL-PH/804
Drawing No:	2021-FS/24-01



OPENABLE WINDOWS OF STRUCTURE A & B LAYOUT PLAN

LEGEND

OPENABLE WINDOW (Area:1m x 2m=2sq.m)

CALCULATE:

Structure A: The aggregate area of openable window is:

2sq.m x 250nos =500sq.m

6.25% of the floor area is:

7888sq.m x 6.25% =493sq.m

500sq.m > 493sq.m

LEGEND

OPENABLE WINDOW (Area:1m x 2m=2sq.m)

CALCULATE:

Structure B: The aggregate area of openable window is:

2sq.m x 260nos =520sq.m

6.25% of the floor area is:

8028sq.m x 6.25% =501.75sq.m

520sq.m > 501.75sq.m

INTERCEPT FIRE & SECURITY TECHNICIANS LIMITED [redacted]	Project : PROPOSED TEMPORARY WHOLESALE TRADE(FOOD) FOR A PERIOD OF 5 YEARS AT LOTS 872,873,875,876,877,878,880,881,882,883,884,885,886, 887,888,889,890,891(PART),892(PART),893(PART),3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND ,PAT HEUNG ,YUEN LONG.
TITLE : PROPOSED FIRE SERVICE INSTALLATION LAYOUT PLAN.	Drawn By: W.C WONG Date: 31-12-2021 Scale: A3 (NO SCALE) Ref No: TPB/A/YL-PH/804 Drawing No: 2021-FS/24-02

Appendix 2

Drainage Proposal

SMEC

Member of the Surbana Jurong Group

local people
global experience

D01 – Drainage Proposal

Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long

Reference No. PLG10195
Prepared for Ha Che Development Limited
7 October 2021

SMEC INTERNAL REF. 7076764

Document Control

Document:	D01 – Drainage Proposal
File Location:	Z:\Jobs\7076764 - ForeVision - Pat Heung DD111\08 Submission
Project Name:	Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long
Project Number:	7076764
Revision Number:	2

Revision History

REVISION NO.	DATE	PREPARED BY	REVIEWED BY	APPROVED FOR ISSUE BY
0	17 June 2020	Arthur CHIU	Antony WONG	Jacky YAU
1	7 May 2021	Arthur CHIU	Antony WONG	Jacky YAU
2	7 October 2021	Kitty LEE	Antony WONG	Jacky YAU

Issue Register

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SMEC Company Details

Approved by:	Alexi BHANJA		
Address:			
Signature:			
Tel:		Fax:	
Email:		Website:	

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This report is confidential and is provided solely for the purposes of supporting Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long. This report is provided pursuant to a Consultancy Agreement between SMEC Asia Limited ("SMEC") and Ha Che Development Limited, under which SMEC undertook to perform specific and limited tasks for Ha Che Development Limited. This report is strictly limited to the matters stated in it and subject to the various assumptions, qualifications and limitations in it and does not apply by implication to other matters. SMEC makes no representation that the scope, assumptions, qualifications and exclusions set out in this report will be suitable or sufficient for other purposes nor that the content of the report covers all matters which you may regard as material for your purposes.

This report must be read as a whole. Any subsequent report must be read in conjunction with this report.

The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters that might have a material effect on its contents or which come to light after the date of the report. SMEC is not obliged to inform you of any such event, transaction or matter nor to update the report for anything that occurs, or of which SMEC becomes aware, after the date of this report.

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1 PROJECT BACKGROUND

1.1 Introduction

1.1.1 A temporary wholesale trade (food) development (the Proposed Use) has been proposed for a period of five years at Lots 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 (Part), 892 (Part), 893 (Part), 3049 and 3050 in DD 111 and adjoining government land, Pat Heung, Yuen Long ("the Site"). The Site is zoned "Open Storage" (OS) on the Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11. A planning application (no. A/YL-PH/804) for the Proposed Use was submitted under Section 16 of the Town Planning Ordinance (TPO) and was approved with conditions by the Town Planning Board (TPB) on 12 April 2019. Two of the approval conditions related to drainage issues are as follows:

(c) *The submission of drainage proposal within 6 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019; and*

(d) *In relation to (c) above, the implementation of drainage proposal within 9 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019.*

1.1.2 Subsequently, an application for Class B Amendment – Extension of Time Limit (no. A/YL-PH/804-2) under Section 16A of the TPO and was approved with conditions by the TPB in which the approval conditions related to drainage issues are summarised as follows:

- *The submission of drainage proposal to the satisfaction of the Director of Drainage Services or of the TPB as required under planning condition (c) by 12.4.2020.*
- *The implementation of drainage proposal to the satisfaction of the Director of Drainage Services or of the TPB as required under planning condition (d) by 12.4.2020.*

1.1.3 SMEC Asia Limited (SMEC) has been commissioned to prepare this Drainage Proposal to discharge the abovementioned approval condition (c).

1.2 Site Description

1.2.1 The Site location and its environs are shown on ***Figure 1.1*** which the uses surrounding the Site include:

- To the North and East: Various open storage / storage yards, workshops, container trailers / tracker park.
- To the South: Village houses in Fu Shing Garden and Ha Che.
- To the West: Vacant land covered with vegetation under "Green Belt" zone.

1.2.2 The Site area is approximately 21,006m^2 and its layout plans can be referred to the Planning Statement.

1.3 Objectives of this Report

1.3.1 The objectives of this Drainage Proposal are to:

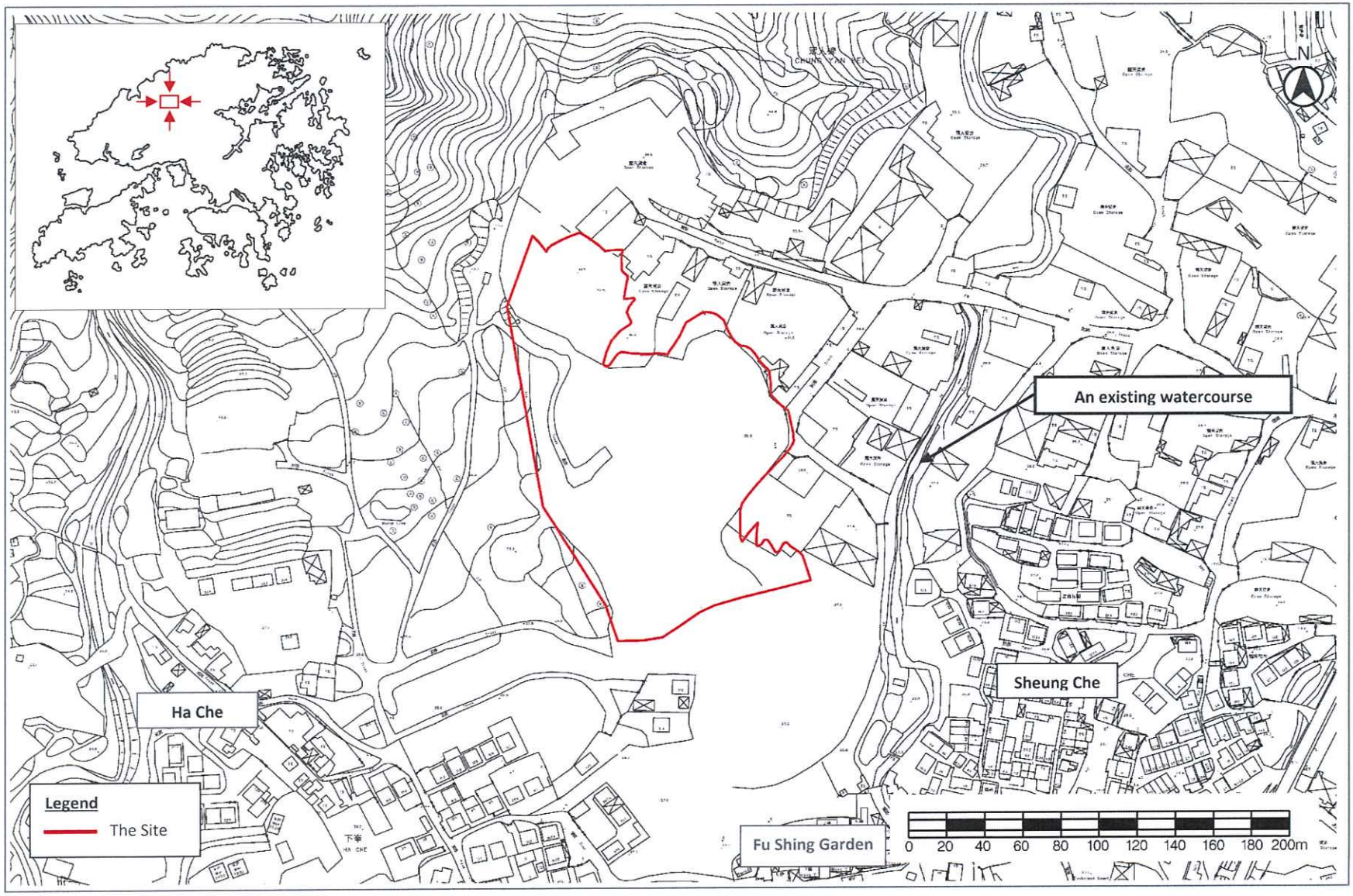
- Assess the potential drainage impacts arising from the Site.
- Recommend the necessary mitigation measures to alleviate any impacts.

1.4 Reference Materials

1.4.1 In evaluating the drainage impact arising from the Proposed Use, the following materials have been referred to:

- Drainage Services Department (DSD) publication Stormwater Drainage Manual (with Eurocodes incorporated) – Planning, Design and Management (2018 Edition).
- DSD Advice Note No. 1 – Application of the Drainage Impact Assessment Process to Private Sector Projects.
- DSD publication Technical Note to prepare a "Drainage Submission".
- GeoInfo Map reviewed on 21 May 2020.

Figure 1.1: Site Location and its Environs



2 DESCRIPTION OF EXISTING ENVIRONMENT AND DRAINAGE CONDITIONS

2.1 Site Location and Topography

2.1.1 As illustrated on ***Figure 1.1***, the Site is situated on a vacant land to the north of Ha Che in Pat Heung, Yuen Long and surrounded by various open storage / storage yards, workshops, container trailers / tracker park, village houses and vacant land.

2.2 Existing Baseline Conditions

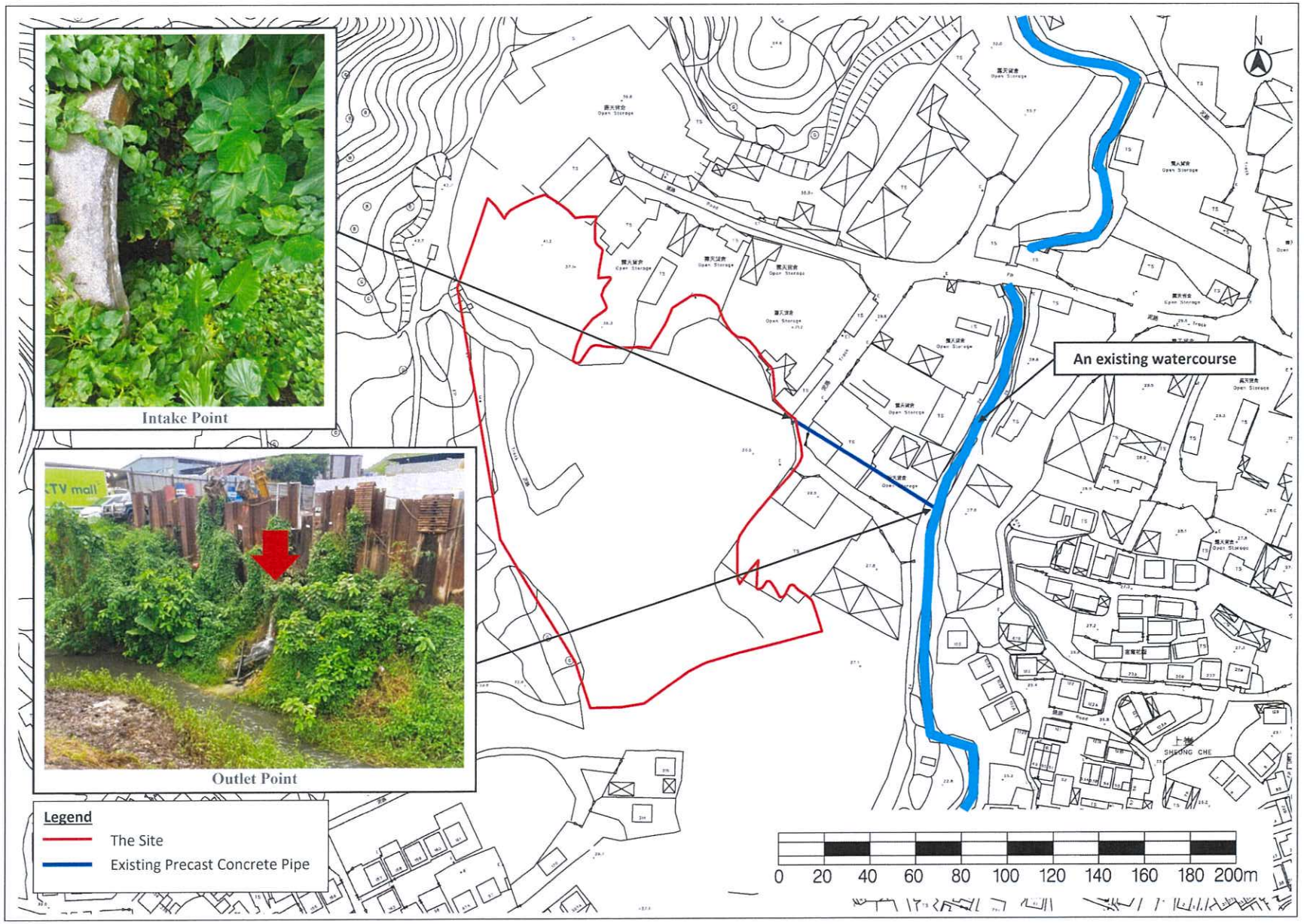
2.2.1 Majority of the Site area is currently unpaved and covered with vegetation.

2.2.2 With reference to GeoInfo Map and review on drainage layout records in DSD drawing office in May 2020, there is no municipal drainage system in the vicinity of the Site.

2.2.3 Based on the site observation and CCTV pipe inspection, there is an existing precast concrete pipe connecting the eastern boundary of the Site to an existing watercourse to the east of the Site as shown on ***Figure 2.1***. The dimension of the precast concrete pipe is Ø1,800mm in diameter starting from the Site and then change to Ø600mm in diameter near the outlet at the watercourse. Hence, it is proposed to divert the site runoff to the existing watercourse to the east of the Site following the current drainage arrangement. However, siltation and collapse of existing pipe was observed in some sections of the pipe. Therefore, the Applicant commits to repair and upgrade the existing pipe, if necessary.

2.2.4 The CCTV pipe inspection report is provided in ***Appendix A***. The photos of the pipe intake point and outlet point are shown on ***Figure 2.1.***

Figure 2.1: Existing Precast Concrete Pipe of the Site



3 DRAINAGE ANALYSIS

3.1 Assumptions and Methodology

3.1.1 Peak instantaneous runoff before and after the Proposed Use was calculated based on the Rational Method. The recommended physical parameters, including runoff coefficient (C) and storm constants for different return periods, are as per the *Stormwater Drainage Manual*.

3.1.2 The Rational Method has been adopted for hydraulic analysis and the peak runoff is given by the following expression:

$$Q_p = 0.278\ C\ i\ A \qquad \text{--- Equation 1}$$

where Q_p = peak runoff in m^3/s
C = runoff coefficient
i = rainfall intensity in mm/hr
A = catchment area in km^2

3.1.3 Rainfall intensity is calculated using the following expression:

$$i = \frac{a}{(t_d + b)^c} \qquad \text{--- Equation 2}$$

where i = rainfall intensity in mm/hr
t_d = duration in minutes ($t_d \leq 240$)
a, b, c = storm constants given in Table 3 of SDM

3.1.4 For a single catchment, duration (t_d) can be assumed equal to the time of concentration (t_c) which is calculated as follows:

$$t_c = t_0 + t_f \qquad \text{--- Equation 3}$$

where t_c = time of concentration
t_0 = 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

3.1.5 Generally, t_0 is much larger than t_f. As shown in Equation 2, t_d is the divisor. Therefore, larger t_d will result in smaller rainfall intensity (i) as well as smaller Q_p. For the worst-case scenario, t_f is assumed to be negligible and so:

$$t_d = t_c = t_0$$

$$t_0 = \frac{0.14465\ L}{H^{0.2} A^{0.1}} \qquad \text{--- Equation 4}$$

where A = catchment area (m^2)
H = average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration
L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

3.1.6 The capacities of the drains have been calculated using the Colebrook-White Equation, assuming full bore flow with no surcharge, as follows, incorporating 10% sedimentation in the calculation of drainage flow capacity in accordance with the Stormwater Drainage Manual:

$$V = -\sqrt{32gRs} \times \log\left(\frac{k_s}{14.8R} + \frac{1.25\upsilon}{R\sqrt{32gRs}}\right) \quad \text{--- Equation 5}$$

where
- V = mean velocity (m/s)
- g = gravitational acceleration (m/s^2)
- R = hydraulic radius (m)
- k_s = hydraulic pipeline roughness (m)
- υ = kinematic viscosity of fluid (m^2/s)
- s = hydraulic gradient (energy loss per unit length due to friction)

3.1.7 On the other hand, the capacity of open channel has been calculated using the Manning's Equation:

$$V = \frac{R^{1/6}}{n} \times \sqrt{Rs} \quad \text{--- Equation 6}$$

where
- V = mean velocity (m/s)
- R = hydraulic radius (m)
- n = Manning coefficient (s/m$^{1/3}$)
- s = hydraulic gradient (energy loss per unit length due to friction)

3.2 Assessment Assumptions

Identification of Catchments

3.2.1 Catchment Areas A to K were identified in accordance with the topographical data on the basemap obtained from the Survey and Mapping Office (SMO) in May 2020. The identified catchment areas is shown on ***Figure 3.1***. Based on the design of the rooftop and internal drainage system of the Site, Catchment A (i.e. the Site) was further divided into 12 sub-catchments, namely Catchment Areas A1 to A12. The sub-catchment areas A1 to A12 are shown on ***Figure 3.2***. The layouts of the Proposed Development are provided in ***Appendix B***. The photos showing the condition of the Site and the surrounding catchment areas are provided in ***Appendix C***.

3.2.2 The runoff from Catchments B, C, D, E and F will pass through the Site (i.e. Catchment A). Details are descripted in below paragraph. The cross sections of the Site and the surrounding area after the Proposed Development are provided in ***Appendix D***.

3.2.3 Based on the CCTV report, there are two connection point between the manhole within the Site and the outlet of the existing precast concrete pipe. As advised by the Applicant, the intake points of these connection points are within Catchment I. Hence, the Catchment I is also considered as the cumulative catchment of the Site.

Project Site (Internal Catchment)

3.2.4 The Site is located at Catchment A comprising 12 sub-catchments, namely Catchments A1 to A12.

3.2.5 Based on the Site visit on 28 May 2020 and 18 September 2020, majority of the Site is currently vacant and covered with vegetation while the northern part of the Site is occupied by parking of vehicles and trailers without valid planning permission. As such, for conservative approach, it is assumed that the Site is currently 100% grassland.

3.2.6 For the Proposed Development, two single storey structure with a total floor area of about 15,916m^2 (about 76% of the site area) for a wholesale trade use and eight loading / unloading spaces for container vehicles will be provided within in the Site. Hence, it is assumed that the Site will be 100% paved as a conservative approach.

3.2.7 The Site is relatively flat. With reference to the SDM, the runoff coefficients of grassland and paved surface are 0.25 and 0.95, respectively. As a result, the respective average runoff coefficient of 0.25

and 0.95 were adopted for the Site before and after the proposed development, respectively, as summarised in ***Table 3.1***.

Table 3.1: Surface Characteristics and Runoff Coefficients of the Site

Scenario Of Project	Area (m^2)	Surface Characteristics	Runoff Coefficient
Before Development	21,006	100% grassland	0.25
After Development		100% paved	0.95

3.2.8 There is no internal drainage system within the Site. A proper internal drainage system should be provided for collecting or diverting the runoff. The design of the internal drainage system will be discussed in the subsequent paragraphs below. The collected runoff will be then discharged to the existing watercourse to the east of the Site through the existing precast concrete pipe at the eastern boundary of the Site.

Cumulative Runoff (Surrounding Catchments)

3.2.9 The surrounding Catchment Areas B to K have been identified based on the topographical data as shown on ***Figure 3.1***.

3.2.10 Catchment B, C and D are relatively steep slopes, which are covered with vegetation, to the northwest of the Site. Based on the topographical data, the runoff from Catchment B, C and D will flow from northwest to southeast and pass through the northern part of the Site before discharging to the existing watercourse to the east of the Site.

3.2.11 Catchment E and F are relatively flat vacant land fully covered with vegetation to the west of the Site. Based on the topographical data, the runoff from Catchment E and F will flow from west to east and pass through southern part of the Site before discharge to the existing watercourse to the east of the Site.

3.2.12 Catchments G to J are paved areas occupied by open storages, temporary structures or access road. The runoff from these catchments will flow towards east, northeast or southeast and would be discharged to the existing watercourse to the east of the Site directly or indirectly though their internal drainage system. The runoff from these catchments will not pass though the Site. However, there are two intake points of the connection pipe to the existing precast concrete pipe within Catchment I. Therefore, Catchment I is also considered as the cumulative catchment of the Site.

3.2.13 Catchment K is a vacant land mainly covered with vegetation to the south of the Site. The runoff from Catchment K will flow from west to east and would be discharged to the existing watercourse to the east of Catchment K without passing through the Site.

3.2.14 Therefore, Catchment B, C, D, E and F are identified as the upper catchments to the Site. Catchment I is identified as the downstream catchment. With reference to the SDM, Catchment B, C and D are relatively steep covered with vegetation and the runoff coefficient is therefore assumed to be steep grassland of 0.35. On the other hand, Catchment E and F are relatively flat vacant land covered with vegetation and the runoff coefficient is therefore assumed to be flat grassland of 0.25. Catchment I is relatively flat fully paved area and the runoff coefficient is therefore assumed to be flat grassland of 0.95. The aforementioned runoff coefficients are summarised in ***Table 3.2***.

Table 3.2: Surface Characteristics and Runoff Coefficients of Surrounding Catchments

Catchment	Area (m^2)	Surface Characteristics	Runoff Coefficient
Catchment B	9,855	100% steep grassland	0.35
Catchment C	1,451	100% steep grassland	0.35
Catchment D	31,423	100% steep grassland	0.35
Catchment E	7,354	100% flat grassland	0.25
Catchment F	3,528	100% flat grassland	0.25
Catchment I	5,257	100% paved	0.95

3.3 Estimated Existing and Future Runoff

Peak Runoff from the Site

3.3.1 Based on the assumptions as described in ***paragraphs 3.2.1*** to ***3.2.7***, the runoff from the Site before and after development has been estimated based on the return periods of 2, 10 and 50 years.

3.3.2 As shown in ***Table 3.3***, the estimated peak runoff generated from the Site before development is 0.369 m^3/s under 50 years return period, while it is 1.275 m^3/s after the development with 100% paving condition. There will be 246% increment in the estimated peak runoff after the proposed development under all assessed return periods. Detailed calculations are provided in ***Appendix E***.

Table 3.3: Estimated Peak Runoff of the Site

Return Period	Estimated Peak Runoff (m^3/s)		% Change
	Before Development	After Development	
2 Years	0.273	0.925	239%
10 Years	0.335	1.148	243%
50 Years	0.369	1.275	246%

Peak Runoff from Surrounding Catchments

3.3.3 In addition to the runoff generated from the Site, runoff from surrounding Catchments should also be considered, as mentioned in ***paragraphs 3.2.9 to 3.2.14***. The runoff from the surrounding catchments is summarised in ***Table 3.4***.

Table 3.4: Estimated Peak Runoff from Surrounding Catchments

Return Period	Estimated Peak Runoff After Development (m^3/s)						
	Catchment B	Catchment C	Catchment D	Catchment E	Catchment F	Catchment I	Total
2 Years	0.167	0.027	0.393	0.077	0.039	0.220	0.923
10 Years	0.206	0.033	0.501	0.096	0.048	0.274	1.158
50 Years	0.228	0.037	0.570	0.108	0.054	0.305	1.302

Cumulative Peak Runoff

3.3.4 The estimated cumulative runoff from surrounding Catchments is approximately 2.577m^3/s under worst case scenario, i.e. 50 years return period, as shown in ***Table 3.5.*** Detailed calculations are provided in ***Appendix E***.

Table 3.5: Estimated Cumulative Runoff of the Site and Surrounding Catchments

Return Period	Estimated Peak Runoff after Development (m^3/s)		
	Site	Surrounding Catchments	Cumulative
2 Years	0.925	0.923	1.848
10 Years	1.148	1.158	2.306
50 Years	1.275	1.302	2.577

3.4 Proposed Drainage Layout

Internal Drainage System

3.4.1 As shown in ***Figure 3.1***, runoff from Catchment B to F will pass through the Site before discharging into the existing watercourse to the east of the Site as follows:

- Runoff from Catchment B will flow towards the southeast direction and pass though Catchment A5.
- Runoff from Catchment C will flow towards the east direction and pass though Catchment A4.
- Runoff from Catchment D will flow towards the southeast direction and pass though Catchment A3.
- Runoff from Catchment E will flow towards the east direction and pass though Catchment A2.
- Runoff from Catchment F will flow towards the east direction and pass though Catchment A1

3.4.2 A series of U-channel, as shown ***Figure 3.3*** and ***Figure 3.4***, should be constructed along the periphery of the Site to collect the runoff arising from Site and the cumulative catchments. The collected runoff by the U-channel will be further collected by series of internal underground circular drainage pipe. All the runoff would be flow to the sand trap before discharging out of the Site. The details of the U-channel and underground circular drainage pipe are summarised in ***Table 3.6*** and ***Table 3.7***, respectively.

Table 3.6: Summary of Proposed U-channels

U-Channel ID	Description	Size, mm	Gradient
UC01	Collecting runoff from Catchments A1 + F	Ø450	1:150
UC02	Collecting runoff from Catchments A2 + E	Ø450	1:150
UC03	Collecting runoff from Catchments A3 + D	Ø750	1:150
UC04	Collecting runoff from Catchments A4 + C	Ø450	1:150
UC05	Collecting runoff from Catchments A5 + B	Ø500	1:150
UC06-1	Collecting runoff from Catchment A6	Ø500	1:150
UC06-2	Collecting runoff from Catchment A6	Ø600	1:200
UC07-1	Collecting runoff from Catchment A7	Ø500	1:150
UC07-2	Collecting runoff from Catchment A7	Ø600	1:200
UC08-1	Collecting runoff from Catchment A8	Ø300	1:150
UC08-2	Collecting runoff from Catchment A8	Ø450	1:150
UC09-1	Collecting runoff from Catchment A9	Ø300	1:150
UC09-2	Collecting runoff from Catchment A9	Ø450	1:150
UC10-1	Collecting runoff from Catchment A10	Ø450	1:150
UC10-2	Collecting runoff from Catchment A10	Ø450	1:200
UC11	Collecting runoff from Catchment A11	Ø300	1:150

Table 3.7: Summary of Proposed Circular Drainage Pipe

Pipe ID	Description	Size, mm	Gradient
DP01	Collecting runoff from UC01 and UC06	Ø600	1:200
DP02	Collecting runoff from UC02 and UC03	Ø900	1:200
DP 03	Collecting runoff from UC04 and UC05	Ø600	1:200
DP04	Collecting runoff from UC08 and UC09	Ø600	1:200
DP05	Collecting runoff from UC03 and UC04	Ø750	1:200
DP06	Collecting runoff from DP02 and DP05	Ø1,000	1:200
DP07-1	Collecting runoff from DP01 and DP06	Ø1,200	1:200
DP07-2	Collecting runoff from DP01 and DP06	Ø1,200	1:20
DP08	Collecting runoff from UC07 and UC12	Ø600	1:200
DP09	Collecting runoff from UC10 and UC11	Ø450	1:200
DP10	Discharge the collected runoff from final sand trap to manhole	Ø1,000	1:200

3.4.3 Assessment on the flow capacity of the internal U-channel and circular drainage pipe have been conducted as shown in ***Table 3.8***. The typical details of U-channel is shown in ***Appendix F***, and detailed assessment is provided in ***Appendix G***.

Table 3.8: Summary of Flow Capacity of Proposed U-channel and Circular Drainage Pipe

U-Channel / Pipe ID	Size, mm	Gradient	Runoff, m^3/s	Capacity, m^3/s	% Of Capacity Used	Sufficient Capacity?
UC01	Ø450	1:150	0.075	0.268	28.0%	Yes
UC02	Ø450	1:150	0.186	0.268	69.5%	Yes
UC03	Ø750	1:150	0.743	1.045	71.1%	Yes
UC04	Ø450	1:150	0.112	0.268	41.8%	Yes
UC05	Ø500	1:150	0.267	0.354	75.3%	Yes
UC06-1	Ø500	1:150	0.294	0.354	82.9%	Yes
UC06-2	Ø600	1:200	0.294	0.499	58.9%	Yes
UC07-1	Ø500	1:150	0.285	0.354	80.4%	Yes
UC07-2	Ø600	1:200	0.285	0.499	57.1%	Yes
UC08-1	Ø300	1:150	0.075	0.091	82.6%	Yes
UC08-2	Ø450	1:150	0.075	0.268	28.0%	Yes
UC09-1	Ø300	1:150	0.063	0.091	69.4%	Yes
UC09-2	Ø450	1:150	0.063	0.268	23.5%	Yes
UC10-1	Ø450	1:150	0.103	0.268	38.5%	Yes
UC10-2	Ø450	1:200	0.103	0.232	44.4%	Yes
UC11	Ø300	1:150	0.061	0.091	67.2%	Yes
DP01	Ø600	1:200	0.369	0.438	84.3%	Yes
DP02	Ø900	1:200	0.929	1.266	73.4%	Yes
DP03	Ø600	1:200	0.379	0.438	86.5%	Yes
DP04	Ø600	1:200	0.138	0.438	31.5%	Yes
DP05	Ø750	1:200	0.517	0.786	65.8%	Yes
DP06	Ø1,000	1:200	1.446	1.667	86.7%	Yes
DP07-1	Ø1,200	1:200	1.815	2.689	67.5%	Yes
DP07-2	Ø1,200	1:20	1.815	8.533	21.3%	Yes
DP08	Ø600	1:200	0.293	0.438	66.9%	Yes
DP09	Ø450	1:200	0.111	0.209	53.2%	Yes
DP10	Ø1000	1:200	1.196	1.667	71.7%	Yes

Drainage Point

3.4.4 The collected runoff from the proposed internal U-channel and circular pipe would be diverted to the east of the Site and discharged to the existing watercourse through an existing precast concrete pipe, as shown on ***Figure 3.3*** and ***Figure 3.4***.

3.4.5 Flow capacities of existing precast concrete pipe has been assessed. The assessment results of the maximum estimated discharge based on the return period of 50 years are summarised in ***Table 3.9***, and the detailed assessment is provided in ***Appendix G***.

Table 3.9: Drainage Capacity of Existing Precast Concrete Pipe before Upgrading Works

Description	Size, mm	Related Catchment	Runoff, m^3/s	Capacity, m^3/s	% Of Capacity Used	Sufficient Capacity?
Existing Precast Concrete Pipe – Section near the Inlet	Ø1,800	Catchments A1, A2, B and C	2.577	21.996	11.7	Yes
Existing Precast Concrete Pipe – Section near the Outlet	Ø600	Catchments A1, A2, B and C	2.577	1.392	185.1	No

3.4.6 As shown in ***Table 3.9***, the section of existing precast concrete pipe near the outlet at the watercourse would exceed 100% drainage capacity. Mitigation measures shall be considered to alleviate impact on the on the existing precast concrete pipe resulting from the Proposed Development.

Proposed Mitigation Measures – Upgrading Drainage Works

3.4.7 In order to mitigate the adverse drainage impact, the precast concrete pipe with exceedance shall be upgraded as practicable, subject to the liaison with the relevant Authorities in the future. Two options of upgrading drainage works are proposed and described in subsequent sections.

Option 1 – Upgrading the precast concrete pipe to a diameter of 1,800mm

3.4.8 The concerned section of precast concrete pipe would be upgraded from a diameter of 600mm to a diameter of 1,800mm with a gradient of between 1:260 and 1:500. The proposed upgrade works are shown in ***Table 3.10*** and detailed in ***Appendix G***.

Table 3.10: Drainage Capacity of Existing Precast Concrete Pipe after Upgrading Works (Option 1)

Description	Size, mm	Related Catchment	Runoff, m^3/s	Capacity, m^3/s	% Of Capacity Used	Sufficient Capacity?
Existing Precast Concrete Pipe – Section near the Site	Ø1,800	Catchments A1, A2, B and C	2.577	21.996	11.7	Yes
Existing Precast Concrete Pipe – Section near the Outlet	Ø1,800 in gradient of 1:260; or	Catchments A1, A2, B and C	2.577	6.800	37.9	Yes
	Ø1,800 in gradient of 1:500			4.985	52.6	

3.4.9 As shown in ***Table 3.10***, the utilisations of the precast concrete pipe range between 11.7% and 37.9% or between 11.7% and 52.6% of the available sewerage capacity after the drainage system upgrading works depending on the gradient to be determined due to the site constraint in the future. Therefore, there should be no adverse impact on the precast concrete pipe due to the Proposed Development with the proposed upgrading works.

Option 2 – Upgrading the precast concrete pipe to a diameter of 1,200mm

3.4.10 The concerned section of precast concrete pipe would be upgraded from a diameter of 600mm to a diameter of 1,200mm with a gradient of 1:160. The proposed upgrade works are shown in ***Table 3.11*** and detailed in ***Appendix G***.

Table 3.11: Drainage Capacity of Existing Precast Concrete Pipe after Upgrading Works (Option 2)

Description	Size, mm	Related Catchment	Runoff, m^3/s	Capacity, m^3/s	% Of Capacity Used	Sufficient Capacity?
Existing Precast Concrete Pipe – Section near the Site	Ø1,800	Catchments A1, A2, B and C	2.577	21.996	11.7	Yes
Existing Precast Concrete Pipe – Section near the Outlet	Ø1,200 in gradient of 1:160; or	Catchments A1, A2, B and C	2.577	3.008	85.7	Yes

3.4.11 As shown in ***Table 3.11***, the utilisations of the precast concrete pipe range between 11.7% and 85.7% of the available sewerage capacity after the drainage system upgrading. Therefore, there should be no adverse impact on the precast concrete pipe due to the Proposed Development with the proposed upgrading works.

Preferred Option

3.4.12 The maximum utilisation of the precast concrete pipe under Option 1 and Option 2 will be about 52.6% and 85.7%, respectively. Compared with Option 2 in which there is only 14.3% spare capacity, Option 1 is more preferable option due to there is at least 47.6% spare capacity of the precast concrete pipe after upgrading works.

3.4.13 Nevertheless, the actual option to be adopted will be determined in the future due to the site constraints. The final design and construction of the upgraded precast concrete pipe will be provided to the satisfaction of the relevant government departments.

Existing Watercourse

3.4.14 Assessment on the flow capacity of the existing watercourse has been conducted as shown in ***Table 3.12***. Based on the Site visit on 28 May 2020 and 18 September 2020, the section of the downstream watercourse at Sheung Che is narrower and shallower than the watercourse upstream and at the discharge point of the existing precast concrete pipe. Hence, the drainage capacity of the existing watercourse in the vicinity of the Site is limited by the capacity of this section of downstream watercourse at Sheung Che. As a conservative approach, the capacity of the existing watercourse is assumed to be the same as the capacity of the downstream watercourse at Sheung Che for assessment purpose. The photos of the upstream watercourse of the Site, watercourse at the discharge point of existing precast concrete pipe and downstream watercourse at Sheung Che Tsuen are shown on ***Figure 3.5***.

3.4.15 The maximum occupied capacity of watercourse by the cumulative runoff from the upstream and downstream catchment before the development are estimated by site observations on the high water level marks of the watercourse. Based on the site visit on 28 May 2020 and 18 September 2020, the maximum occupied capacity of the watercourse by the cumulative runoff from the upstream and downstream catchment before the development is about 20% of the watercourse. As a conservative approach, the maximum occupied capacity of watercourse by the cumulative runoff from the upstream and downstream catchment before the development is assumed as 25% for assessment purpose. The photos of the watercourse at assessment point are shown in ***Figure 3.5*** for reference.

3.4.16 As shown in ***Table 3.3***, the estimated peak runoff generated from the Site before development is 0.369 m^3/s under 50 years return period, while it is 1.275 m^3/s after the development with 100% paving condition. Therefore, additional runoff of 0.906 m^3/s will be generated from the Proposed Development, which contribute to 2.6% of capacity of the existing watercourse as shown in the calculation in ***Appendix G***. Together with 25% occupied capacity of watercourse by the cumulative

runoff from the upstream and downstream catchment, the occupied capacity of watercourse after the Proposed Development will be 27.6%. As there is sufficient spare capacity of the watercourse after development, no adverse drainage impact arising from the Proposed Development is anticipated.

Table 3.12: Drainage Capacity of Existing Watercourse

Description	Size	Related Catchment	Runoff, m^3/s	Capacity, m^3/s	% Of Capacity Used
Existing Watercourse at Downstream	3.56m (w) x 2.42m (h)	Additional Runoff from Site	0.906	34.393	2.6%
		All other cumulative catchment in upstream and downstream	--		25.0%
			Total % of Capacity Used		**27.6%**

3.5 Additional Mitigation Measure - Retention Tank

3.5.1 In addition to the upgrade of 1800mm dia. pipe proposed in Option 1 mentioned in ***para3.4.8*** and ***para3.4.9*** , a retention tank of about $1000m^3$ for 30-minutes retention time is proposed to be included within the site as an additional mitigation measure. The retention tank is proposed to store the additional runoff of $0.906m^3/s$ due to the proposed development. With the storage tank, additional runoff can be stored offline and to be discharged at a controlled manner during non-peak hours. The retention tank will be connected to a sandtrap which can help to filter out sand and silts before discharge. Device such as valve/ weir will be adopted as necessary to maintain the flow discharge rate no more than that of the discharge flow rate before development. Pumps will be added to empty the tank under regular maintenance. Calculations for sizing of the tank is presented in ***Appendix H*** Summary of the tank dimensions is presented in Table 3.13 below.

Table 3.13 Retention Tank Sizing

Description	Retention Time t (min)	Additional Runoff, m^3/s	Volume = Q x t	% time under peak flow	Tank capacity required m^3	Tank dimensions (LxWxH)	Tank capacity required m^3
Retention Tank	30	0.906	1630	60%	980	16x25x2.5	1000

3.6 Summary

3.6.1 Flow capacities of the internal drainage system (i.e. proposed U-channels and circular drainage pipe) and existing precast concrete pipe were calculated. Runoff from the corresponding catchment(s) (calculated based on a return period of 50 years) will account for 8.8% to 86.7% and 11.7% to 185.1% of their corresponding capacities, respectively. Therefore, upgrading the existing precast concrete pipe is required.

3.6.2 In order to mitigate the adverse drainage impact, the section of precast concrete pipe with surcharge shall be upgraded as practicable, subject to the liaison with the relevant authorities in the future. Two options of upgrading works are proposed and described as follow:

- Option 1 – Upgrading the section of precast concrete pipe with a diameter of 600mm into a diameter of 1,800mm with a gradient of at least 1:500 and no more than 1:260; or

- Option 2 – Upgrading the section of precast concrete pipe with a diameter of 600mm into a diameter of 1,200mm with a gradient of 1:160.

3.6.3 Under Option 1, the utilisations of the precast concrete pipe will range between 11.7% and 37.9% with a gradient of 1:260;or between 11.7% and 52.6% of the available drainage capacity with a gradient of 1:500.

3.6.4 Under Option 2 with a gradient of 1:160, the utilisations of the precast concrete pipe will range between 11.7% and 85.7%.

3.6.5 With the provision of the proposed drainage upgrading works, either Option 1 or Option 2, there should be no adverse impact on the precast concrete pipe due to the Proposed Development. Based on analysis, Option 1 is more preferable option due to there is at least 47.6% spare capacity of the precast concrete pipe after upgrading works

3.6.6 Nevertheless, the actual option to be adopted will be determined in the future due to the site constraints. The final design and construction of the upgraded precast concrete pipe will be provided to the satisfaction of the relevant government departments.

3.6.7 In addition to the upgrade of 1800mm dia. pipe proposed in Option 1, a retention tank of about 1,000m^3 for 30minutues retention time is proposed to be included within the site to store the additional runoff due to the proposed development. With the storage tank, excessive runoff can be stored offline and to be discharged at a controlled manner during non-peak hours.

3.6.8 Thus, the proposed drainage system and retention tank, the existing watercourse will have sufficient capacity to receive stormwater runoff from the Proposed Development and surrounding catchments with the proposed drainage system upgrading works. As a result, no adverse drainage impact is anticipated after the development of the Site

Figure 3.1: Identification of Catchments

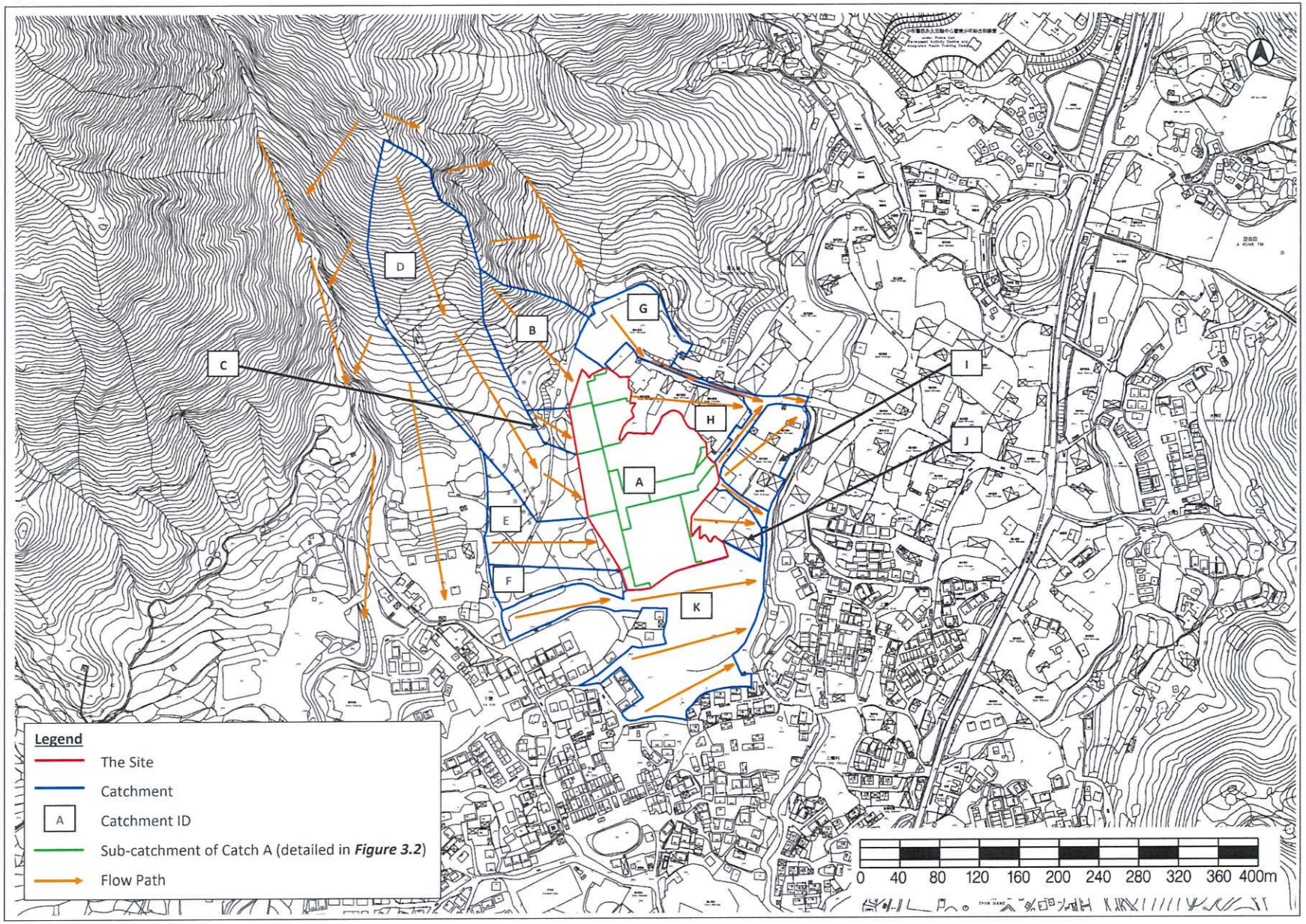


Figure 3.2: Sub-Catchment Areas A1 to A12

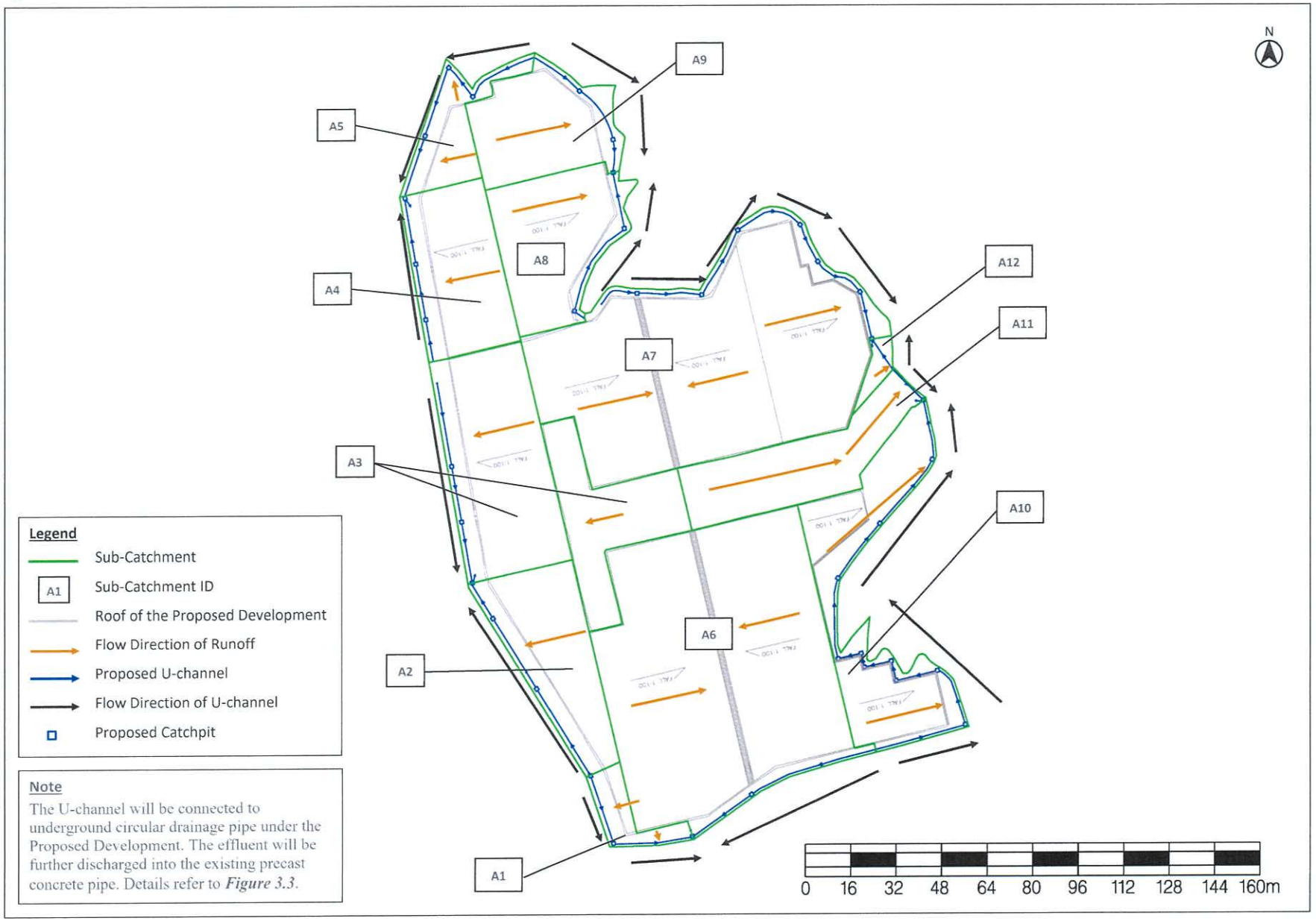


Figure 3.3: Proposed Drainage Diversion Layout (Sheet 1 of 2)

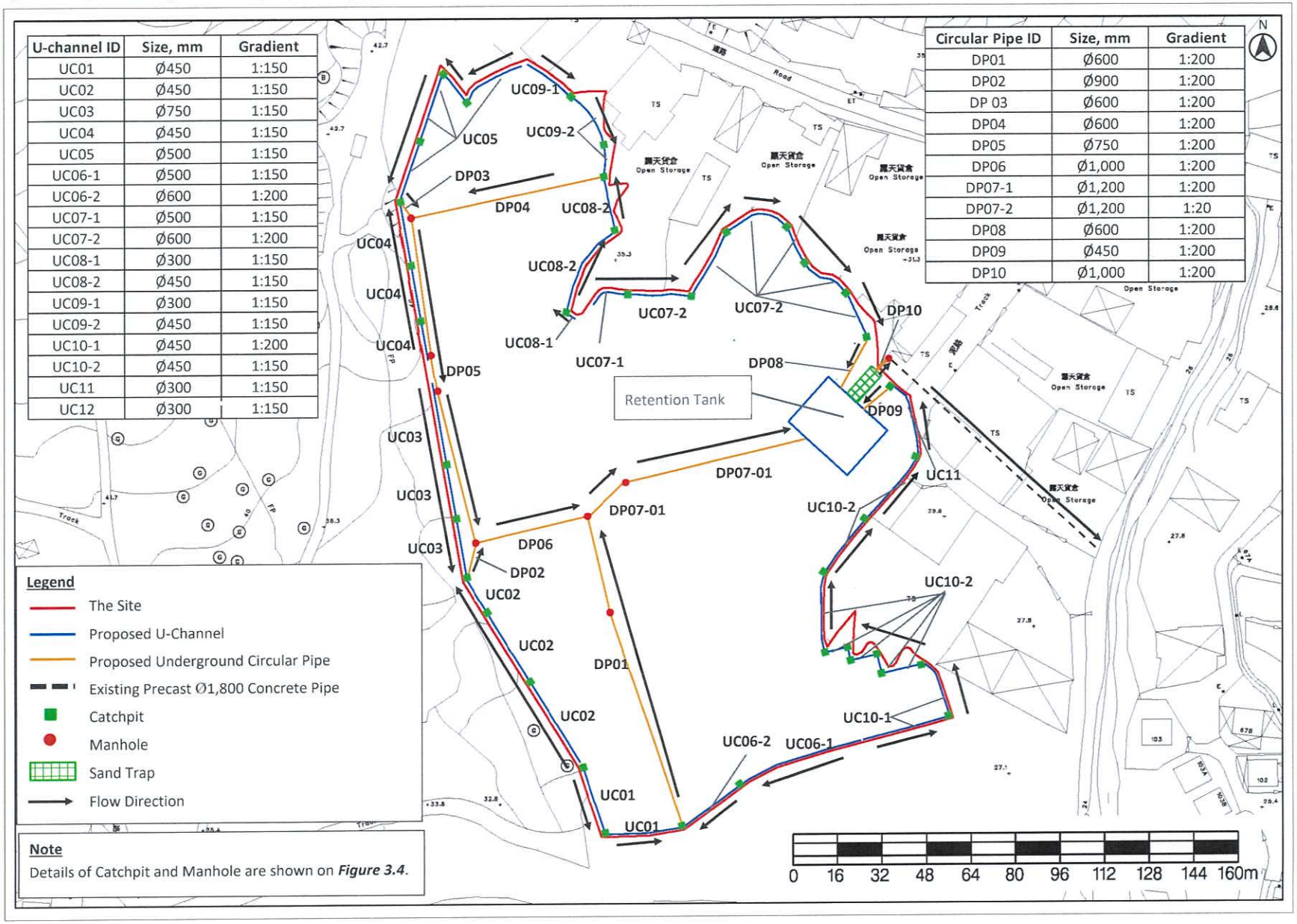


Figure 3.4: Proposed Drainage Diversion Layout (Sheet 2 of 2)

Manhole ID	Cover Level (mPD)	Invert Level (mPD)
SMH01	37.325	36.48
SMH02	37.325	35.925
SMH03	33.50	32.30
SMH04	33.50	32.07
SMH05	33.50	32.32
SMH06	33.50	31.65
SMH07	33.50	31.50
SMH08	31.00	28.74

Catch Pit ID	Cover Level (mPD)	Invert Level (mPD)
CP01	33.50	33.05
CP02	33.50	32.91
CP03	33.50	32.64
CP04	33.50	32.75
CP05	33.50	32.98
CP06	33.50	32.84
CP07	33.50	32.75
CP08	33.50	32.72
CP09	33.50	32.62
CP10	33.50	32.60
CP11	33.50	32.56
CP12	33.50	32.42
CP13	33.50	32.32
CP14	32.00	31.50
CP15	31.00	30.50
CP16	31.00	30.50
CP17	32.00	31.60
CP18	32.00	31.70
CP19	33.70	32.45
CP20	33.20	32.55
CP21	33.50	32.65
CP22	33.50	32.75
CP23	37.325	37.05
CP24	37.325	36.87
CP25	37.325	36.77
CP26	37.325	36.875
CP27	37.325	36.975
CP28	37.325	36.93
CP29	37.325	36.85
CP30	37.325	36.71
CP31	37.325	36.59
CP32	37.325	36.87
CP33	37.325	36.99
CP34	33.50	33.09
CP35	33.50	32.97
CP36	33.50	32.85
CP37	33.50	32.97
CP38	33.50	33.13

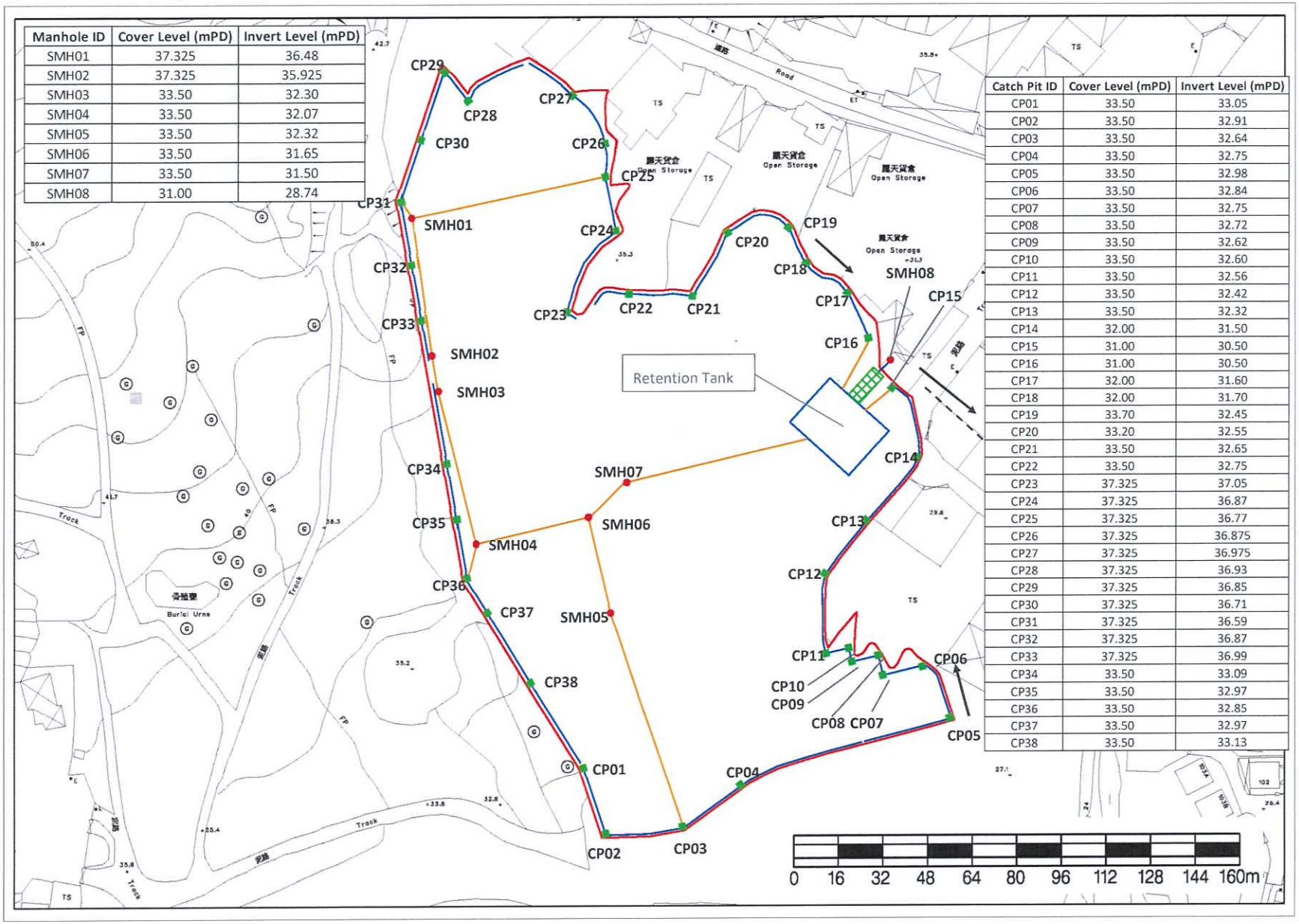
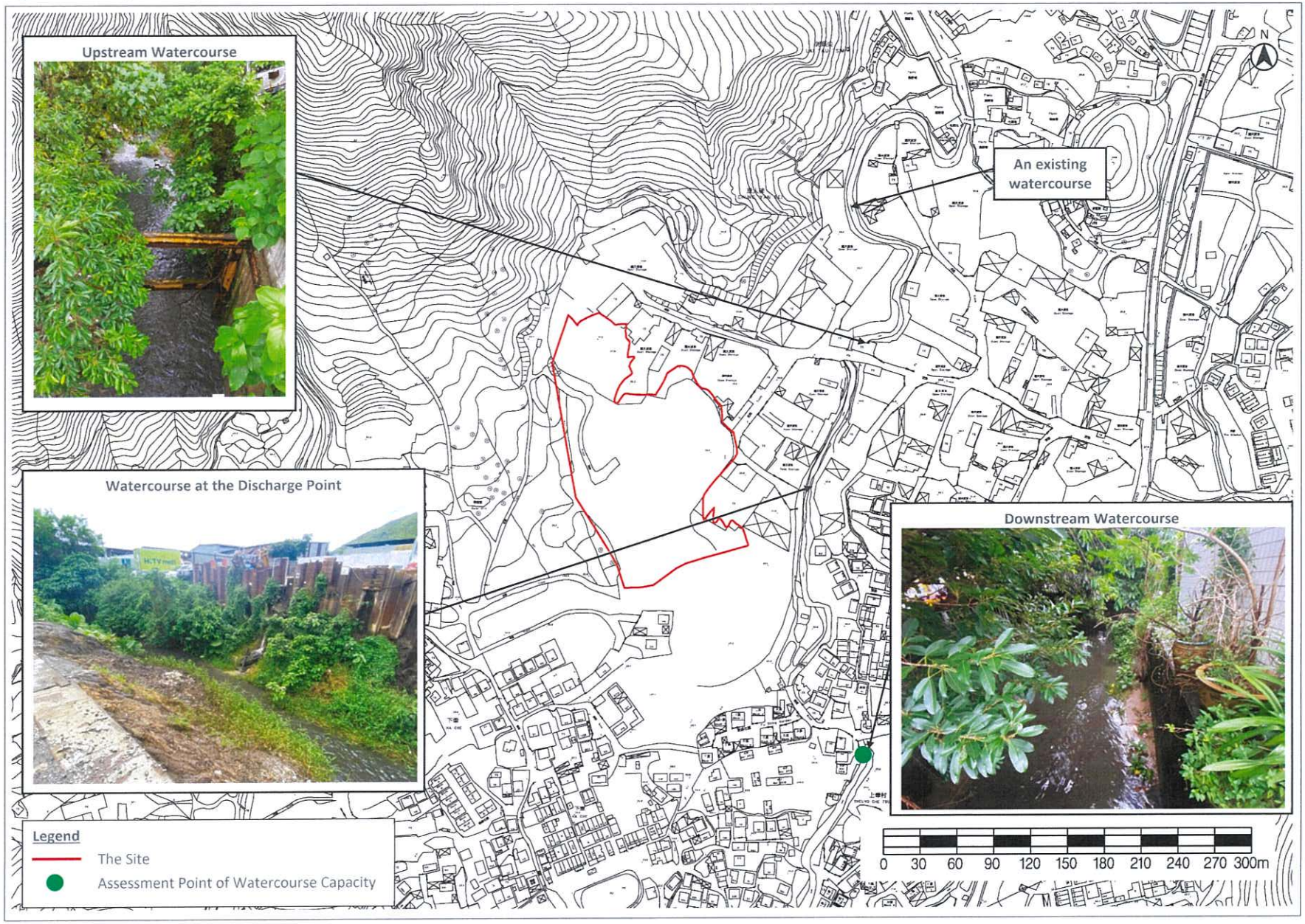


Figure 3.5: Photos of the Existing Watercourse



4 CONCLUSION

4.1.1 Potential drainage impacts that may arise from the Site after construction of the Proposed Development have been assessed.

4.1.2 The peak runoff before and after the development of the Site has been estimated using Rational Method and based on the catchment surface characteristics for the existing environment and the Proposed Development. The estimated peak runoff generated from the Site and the surrounding catchments are 2.577m3/s under 50 years return period.

4.1.3 Flow capacities of the internal drainage system (i.e. proposed U-channels and circular drainage pipe) and existing precast concrete pipe were calculated. Runoff from corresponding catchment(s) (calculated based on a return period of 50 years) will account for 8.8% to 86.7% and 11.7% to 185.1% of their corresponding capacities, respectively. Therefore, upgrading the existing precast concrete pipe is required.

4.1.4 In order to mitigate the adverse drainage impact, the section of precast concrete pipe with surchage shall be upgraded as practicable, subject to the liaison with the relevant Authorities in the future. Two options of upgrading works are proposed and described as follow:

- Option 1 – Upgrading the section of precast concrete pipe with a diameter of 600mm into a diameter of 1,800mm with a gradient of at least 1:500 and no more than 1:260; ; or
- Option 2 – Upgrading the section of precast concrete pipe with a diameter of 600mm into a diameter of 1,200mm with a gradient of 1:160.

4.1.5 Under Option 1, the utilisations of the precast concrete pipe will range between 11.7% and 37.9% with a gradient of 1:260;or between 11.7% and 52.6% of the available drainage capacity with a gradient of 1:500.

4.1.6 Under Option 2 with a gradient of 1:160, the utilisations of the precast concrete pipe will range between 11.7% and 85.7%.

4.1.7 With the provision of the proposed drainage upgrading works, either Option 1 or Option 2, there should be no adverse impact on the precast concrete pipe due to the Proposed Development. Based on analysis, Option 1 is more preferable option due to there is at least 47.6% spare capacity of the precast concrete pipe after upgrading works

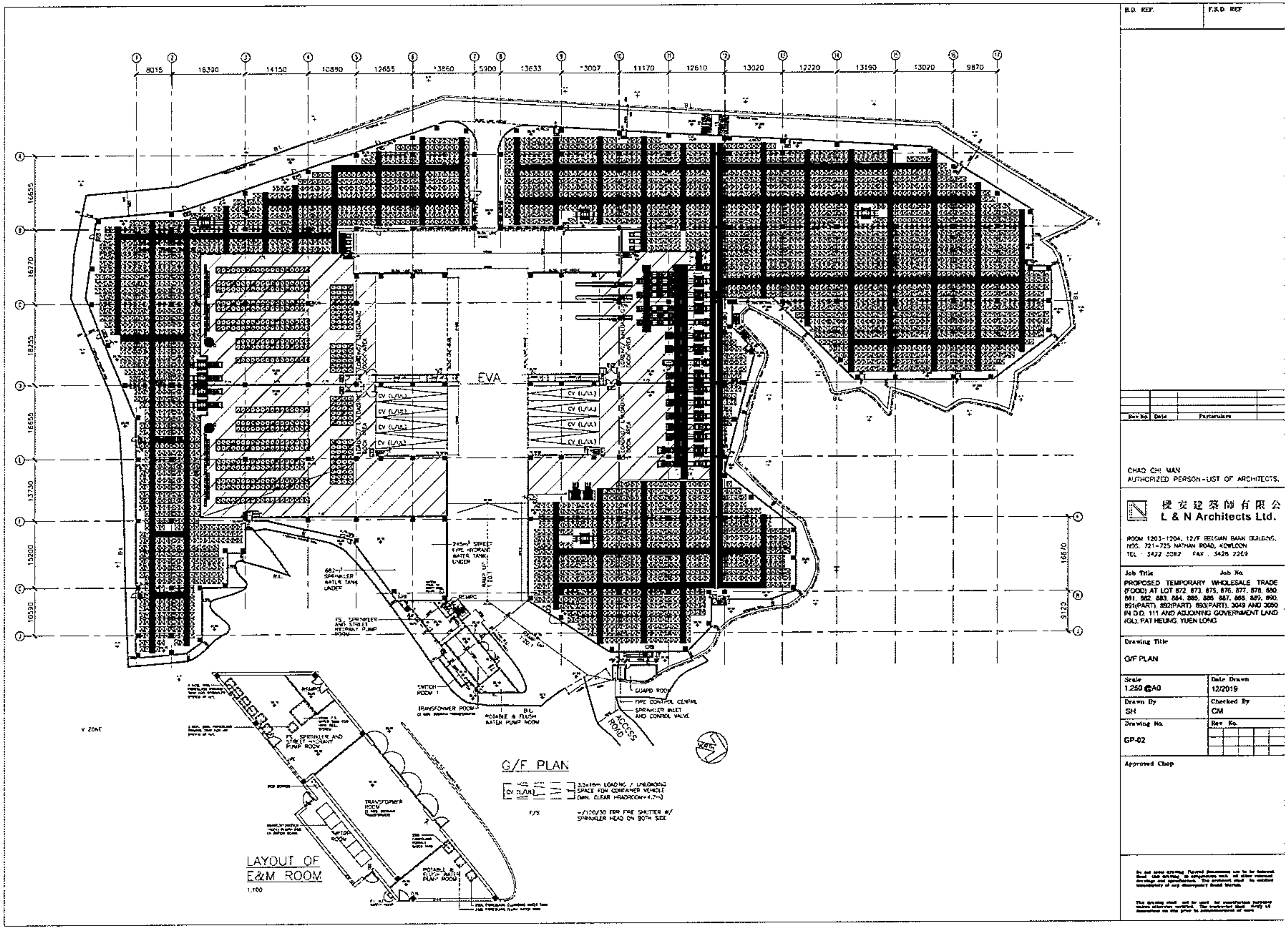
4.1.8 The actual option to be adopted will be determined in the future due to the site constraints. The final design and construction of the upgraded precast concrete pipe will be provided to the satisfaction of the relevant government departments.

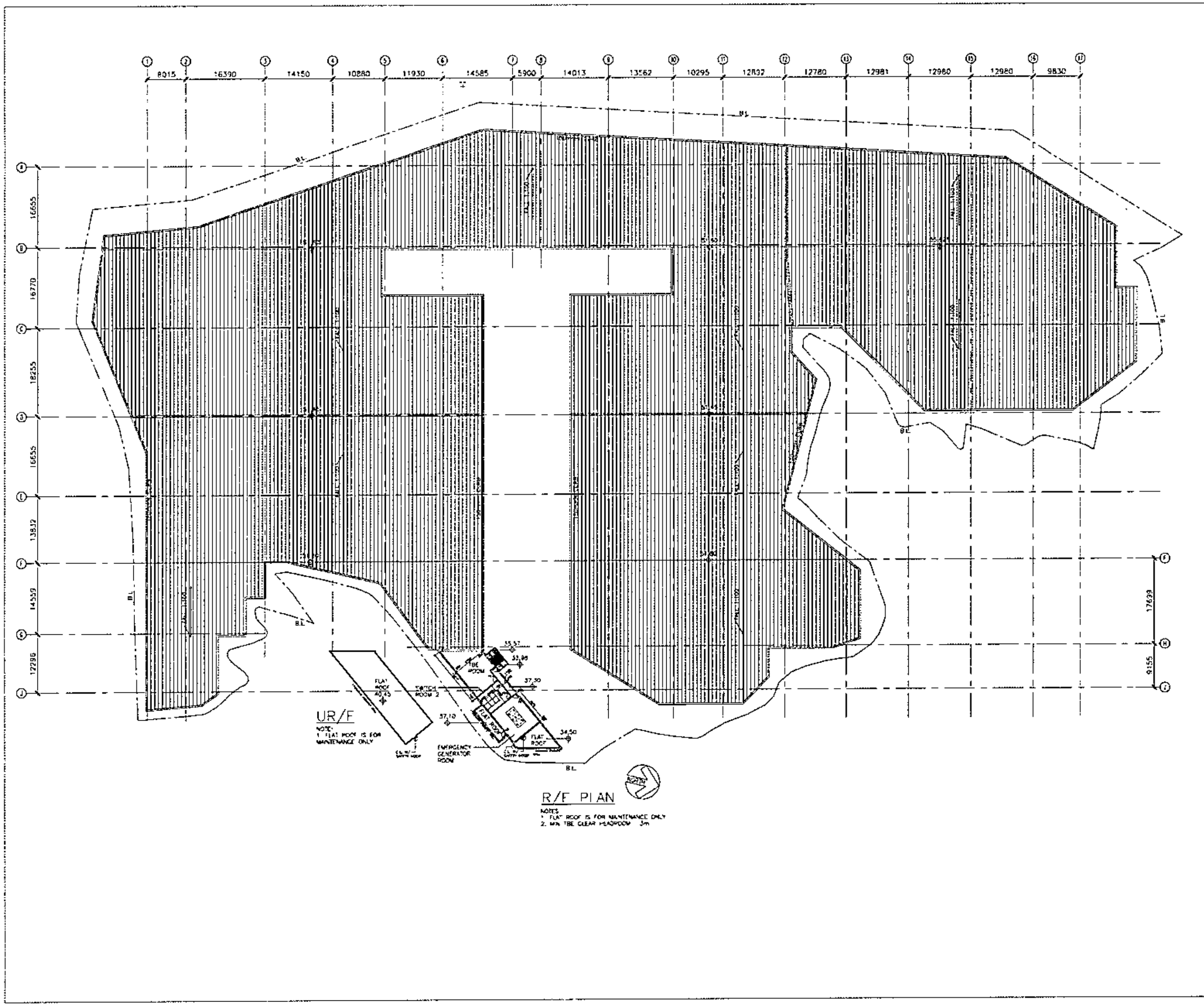
4.1.9 In addition to the upgrade of 1800mm dia. pipe proposed in Option 1, a retention tank of about 1,000m3 for 30minutues retention time is proposed to be included within the site to store the additional runoff due to the proposed development. With the storage tank, excessive runoff can be stored offline and to be discharged at a controlled manner during non-peak hours.

4.1.10 Thus, with the proposed drainage system and retention tank, the existing watercourse will have sufficient capacity to receive stormwater runoff from the Proposed Development and surrounding catchments with the proposed drainage system upgrading works. As a result, no adverse drainage impact is anticipated after the development of the Site.

Appendix A **CCTV PIPE INSPECTION REPORT**

Appendix B LAYOUT OF THE PROPOSED DEVELOPMENT


B.D. REF.
F.S.D. REF
EVA
G/F PLAN
LAYOUT OF E&M ROOM
ACCESS ROAD
GUARD ROOM
SWITCH ROOM 1
TRANSFORMER ROOM
POTABLE & FLUSH WATER PUMP ROOM
F.S. SPRINKLER AND STREET HYDRANT PUMP ROOM
3.5x16m LOADING / UNLOADING SPACE FOR CONTAINER VEHICLE (MIN. CLEAR HEADROOM=4.7m)
Rev No.
Date
Particulars
CHAO CHI MAN
AUTHORIZED PERSON-LIST OF ARCHITECTS.
樑安建築師有限公
L & N Architects Ltd.
ROOM 1203-1204, 12/F BELGIAN BANK BUILDING, NOS. 721-725 NATHAN ROAD, KOWLOON
TEL : 3427 5082 FAX : 3426 2269
Job Title
Job No.
PROPOSED TEMPORARY WHOLESALE TRADE (FOOD) AT LOT 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891(PART), 892(PART), 893(PART), 3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND (GL), PAT HEUNG, YUEN LONG
Drawing Title
G/F PLAN
Scale
1:250 @A0
Date Drawn
12/2019
Drawn By
SH
Checked By
CM
Drawing No.
GP-02
Rev. No.
Approved Chop



B.D. REF | F.S.D. REF

Rev No	Date	Particulars

CHAO CHI MAN
AUTHORIZED PERSON-LIST OF ARCHITECTS.

樑安建築師有限公
L & N Architects Ltd.

ROOM 1203-1204, 12/F BELGIAN BANK BUILDING,
NOS. 721-725 NATHAN ROAD, KOWLOON
TEL 3422 3082 FAX 3428 2269

Job Title | Job No.

PROPOSED TEMPORARY WHOLESALE TRADE (FOOD) AT LOT 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891(PART), 892(PART), 893(PART), 3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND (GL), PAT HEUNG, YUEN LONG

Drawing Title

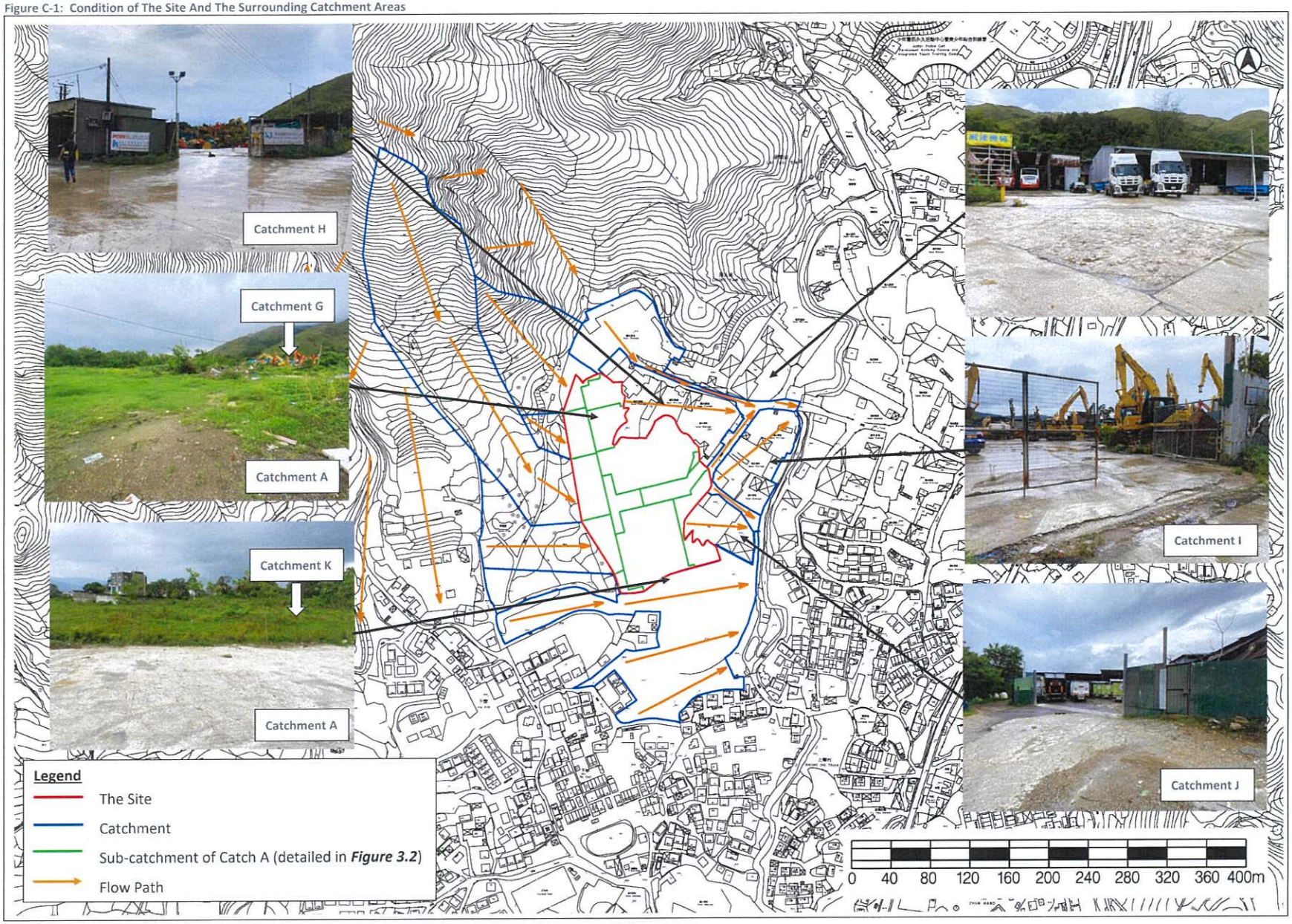
UPPER PART OF E&M ROOM AND R/F PLAN

Scale	Date Drawn
1:250 @A0	12/2019
Drawn By	**Checked By**
SH	CM
Drawing No.	**Rev. No**
GP-03	

Approved Chop

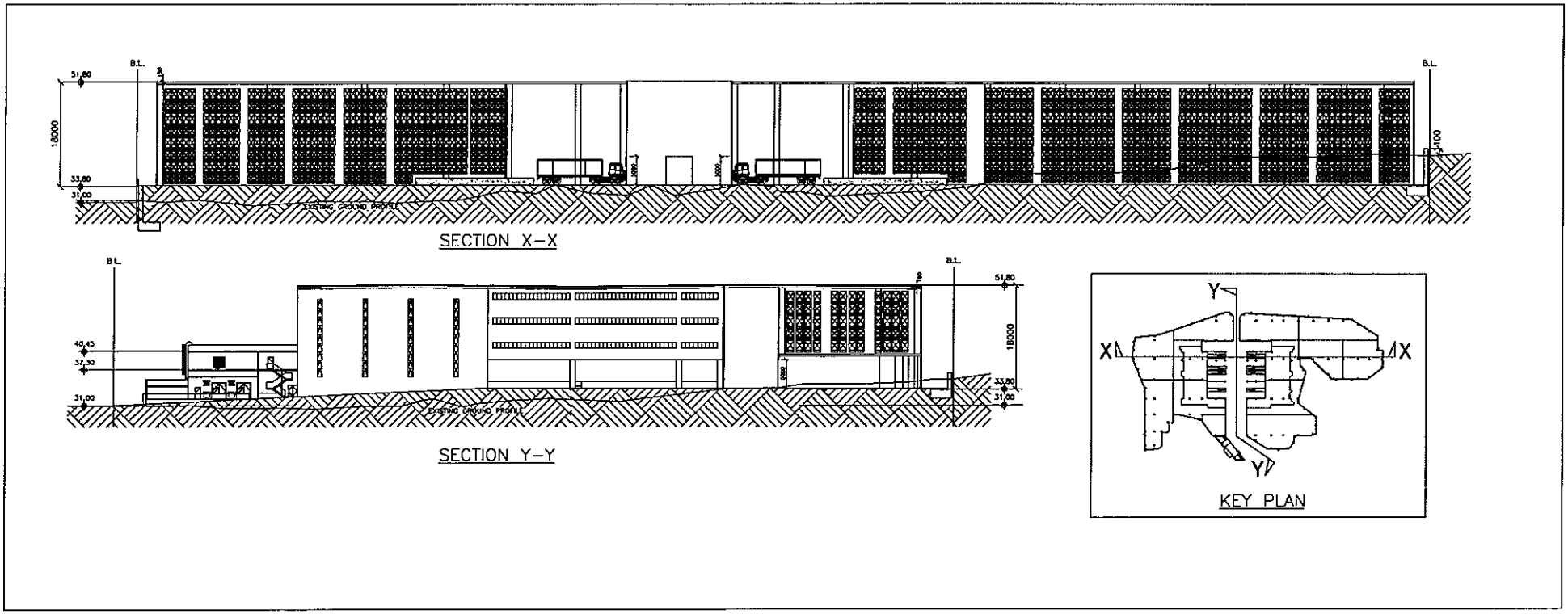
Appendix C CONDITION OF THE SITE AND THE SURROUNDING CATCHMENT AREAS

Figure C-1: Condition of The Site And The Surrounding Catchment Areas



Appendix D CROSS SECTION OF THE SITE AND THE SURROUNDING AREA AFTER THE PROPOSED DEVELOPMENT

Figure D-1: Cross Section



Appendix E **RUNOFF CALCULATION**

Calculation of Runoff for Return Period of 2 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_o), min	Duration (t_d), min	Storm Constants			Runoff intensity (i), mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Site Area (Catchment A1)	0.0003	9.09	11.0	0.58	0.58	499.8	4.26	0.494	229.29	0.25	0.0001	0.004
Site Area (Catchment A2)	0.0012	6.39	61.0	2.99	2.99	499.8	4.26	0.494	187.82	0.25	0.0003	0.016
Site Area (Catchment A3)	0.0028	7.82	78.0	3.38	3.38	499.8	4.26	0.494	183.03	0.25	0.0007	0.036
Site Area (Catchment A4)	0.0012	7.45	51.0	2.43	2.43	499.8	4.26	0.494	195.44	0.25	0.0003	0.016
Site Area (Catchment A5)	0.0006	1.61	31.0	2.17	2.17	499.8	4.26	0.494	199.36	0.25	0.0001	0.008
Site Area (Catchment A6)	0.0048	4.17	84.0	3.91	3.91	499.8	4.26	0.494	177.08	0.25	0.0012	0.060
Site Area (Catchment A7)	0.0048	6.34	71.0	3.04	3.04	499.8	4.26	0.494	187.18	0.25	0.0012	0.062
Site Area (Catchment A8)	0.0013	9.61	43.7	1.96	1.96	499.8	4.26	0.494	202.55	0.25	0.0003	0.018
Site Area (Catchment A9)	0.0011	8.52	41.1	1.92	1.92	499.8	4.26	0.494	203.24	0.25	0.0003	0.016
Site Area (Catchment A10)	0.0017	4.26	72.8	3.75	3.75	499.8	4.26	0.494	178.76	0.25	0.0004	0.021
Site Area (Catchment A11)	0.0012	2.46	69.0	4.12	4.12	499.8	4.26	0.494	174.92	0.25	0.0003	0.014
Site Area (Catchment A12)	0.0001	3.13	16.0	1.16	1.16	499.8	4.26	0.494	216.88	0.25	0.0000	0.002
Catchment B	0.0099	39.87	153.0	4.22	4.22	499.8	4.26	0.494	173.83	0.35	0.0034	0.167
Catchment C	0.0015	13.69	65.0	2.69	2.69	499.8	4.26	0.494	191.80	0.35	0.0005	0.027
Catchment D	0.0314	28.82	432.0	11.33	11.33	499.8	4.26	0.494	128.70	0.35	0.0110	0.393
Catchment E	0.0074	7.91	182.0	7.15	7.15	499.8	4.26	0.494	150.16	0.25	0.0018	0.077
Catchment F	0.0035	3.63	124.0	6.12	6.12	499.8	4.26	0.494	157.29	0.25	0.0009	0.039
Catchment I	0.0053	1.82	110.0	5.99	5.99	499.8	4.26	0.494	158.28	0.95	0.0050	0.220
											Total (General Scenario)	**1.196**
After the Proposed Development												
Site Area (Catchment A1)	0.0003	0.01	7.8	1.61	1.61	499.8	4.26	0.494	208.45	0.95	0.0003	0.015
Site Area (Catchment A2)	0.0012	0.01	22.0	3.93	3.93	499.8	4.26	0.494	176.88	0.95	0.0012	0.057
Site Area (Catchment A3)	0.0028	0.01	27.9	4.58	4.58	499.8	4.26	0.494	170.28	0.95	0.0027	0.126
Site Area (Catchment A4)	0.0012	0.01	23.0	4.12	4.12	499.8	4.26	0.494	174.92	0.95	0.0011	0.055
Site Area (Catchment A5)	0.0006	0.01	11.8	2.28	2.28	499.8	4.26	0.494	197.65	0.95	0.0005	0.029
Site Area (Catchment A6)	0.0048	0.01	31.9	4.96	4.96	499.8	4.26	0.494	166.80	0.95	0.0046	0.214
Site Area (Catchment A7)	0.0048	0.01	34.5	5.37	5.37	499.8	4.26	0.494	163.25	0.95	0.0045	0.206
Site Area (Catchment A8)	0.0013	0.01	33.0	5.86	5.86	499.8	4.26	0.494	159.33	0.95	0.0012	0.054
Site Area (Catchment A9)	0.0011	0.01	37.5	6.76	6.76	499.8	4.26	0.494	152.76	0.95	0.0011	0.045
Site Area (Catchment A10)	0.0017	0.01	26.0	4.50	4.50	499.8	4.26	0.494	171.08	0.95	0.0016	0.075
Site Area (Catchment A11)	0.0012	0.05	69.6	9.05	9.05	499.8	4.26	0.494	139.14	0.95	0.0011	0.043
Site Area (Catchment A12)	0.0001	0.05	8.0	1.33	1.33	499.8	4.26	0.494	213.67	0.95	0.0001	0.006
Catchment B	0.0099	39.87	153.0	4.22	4.22	499.8	4.26	0.494	173.83	0.35	0.0034	0.167
Catchment C	0.0015	13.69	65.0	2.69	2.69	499.8	4.26	0.494	191.80	0.35	0.0005	0.027
Catchment D	0.0314	28.82	432.0	11.33	11.33	499.8	4.26	0.494	128.70	0.35	0.0110	0.393
Catchment E	0.0074	7.91	182.0	7.15	7.15	499.8	4.26	0.494	150.16	0.25	0.0018	0.077
Catchment F	0.0035	3.63	124.0	6.12	6.12	499.8	4.26	0.494	157.29	0.25	0.0009	0.039
Catchment I	0.0053	1.82	110.0	5.99	5.99	499.8	4.26	0.494	158.28	0.95	0.0050	0.220
											Total (General Scenario)	**1.848**

Calculation of Runoff for Return Period of 10 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_o), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Site Area (Catchment A1)	0.0003	9.09	11.0	0.58	0.58	471.9	3.02	0.397	283.72	0.25	0.0001	0.006
Site Area (Catchment A2)	0.0012	6.39	61.0	2.99	2.99	471.9	3.02	0.397	231.52	0.25	0.0003	0.020
Site Area (Catchment A3)	0.0028	7.82	78.0	3.38	3.38	471.9	3.02	0.397	225.83	0.25	0.0007	0.044
Site Area (Catchment A4)	0.0012	7.45	51.0	2.43	2.43	471.9	3.02	0.397	240.70	0.25	0.0003	0.020
Site Area (Catchment A5)	0.0006	1.61	31.0	2.17	2.17	471.9	3.02	0.397	245.48	0.25	0.0001	0.009
Site Area (Catchment A6)	0.0048	4.17	84.0	3.91	3.91	471.9	3.02	0.397	218.83	0.25	0.0012	0.074
Site Area (Catchment A7)	0.0048	6.34	71.0	3.04	3.04	471.9	3.02	0.397	230.75	0.25	0.0012	0.077
Site Area (Catchment A8)	0.0013	9.61	43.7	1.96	1.96	471.9	3.02	0.397	249.41	0.25	0.0003	0.022
Site Area (Catchment A9)	0.0011	8.52	41.1	1.92	1.92	471.9	3.02	0.397	250.26	0.25	0.0003	0.019
Site Area (Catchment A10)	0.0017	4.26	72.8	3.75	3.75	471.9	3.02	0.397	220.79	0.25	0.0004	0.025
Site Area (Catchment A11)	0.0012	2.46	69.0	4.12	4.12	471.9	3.02	0.397	216.29	0.25	0.0003	0.017
Site Area (Catchment A12)	0.0001	3.13	16.0	1.16	1.16	471.9	3.02	0.397	267.47	0.25	0.0000	0.002
Catchment B	0.0099	39.87	153.0	4.22	4.22	471.9	3.02	0.397	215.02	0.35	0.0034	0.206
Catchment C	0.0015	13.69	65.0	2.69	2.69	471.9	3.02	0.397	236.30	0.35	0.0005	0.033
Catchment D	0.0314	28.82	432.0	11.33	11.33	471.9	3.02	0.397	163.91	0.35	0.0110	0.501
Catchment E	0.0074	7.91	182.0	7.15	7.15	471.9	3.02	0.397	187.93	0.25	0.0018	0.096
Catchment F	0.0035	3.63	124.0	6.12	6.12	471.9	3.02	0.397	196.01	0.25	0.0009	0.048
Catchment I	0.0053	1.82	110.0	5.99	5.99	471.9	3.02	0.397	197.13	0.95	0.0050	0.274
											Total (General Scenario)	**1.493**
After the Proposed Development												
Site Area (Catchment A1)	0.0003	0.01	7.8	1.61	1.61	471.9	3.02	0.397	256.75	0.95	0.0003	0.019
Site Area (Catchment A2)	0.0012	0.01	22.0	3.93	3.93	471.9	3.02	0.397	218.59	0.95	0.0012	0.070
Site Area (Catchment A3)	0.0028	0.01	27.9	4.58	4.58	471.9	3.02	0.397	210.91	0.95	0.0027	0.156
Site Area (Catchment A4)	0.0012	0.01	23.0	4.12	4.12	471.9	3.02	0.397	216.30	0.95	0.0011	0.068
Site Area (Catchment A5)	0.0006	0.01	11.8	2.28	2.28	471.9	3.02	0.397	243.40	0.95	0.0005	0.036
Site Area (Catchment A6)	0.0048	0.01	31.9	4.96	4.96	471.9	3.02	0.397	206.89	0.95	0.0046	0.265
Site Area (Catchment A7)	0.0048	0.01	34.5	5.37	5.37	471.9	3.02	0.397	202.80	0.95	0.0045	0.256
Site Area (Catchment A8)	0.0013	0.01	33.0	5.86	5.86	471.9	3.02	0.397	198.33	0.95	0.0012	0.068
Site Area (Catchment A9)	0.0011	0.01	37.5	6.76	6.76	471.9	3.02	0.397	190.86	0.95	0.0011	0.056
Site Area (Catchment A10)	0.0017	0.01	26.0	4.50	4.50	471.9	3.02	0.397	211.83	0.95	0.0016	0.093
Site Area (Catchment A11)	0.0012	0.05	69.6	9.05	9.05	471.9	3.02	0.397	175.55	0.95	0.0011	0.054
Site Area (Catchment A12)	0.0001	0.05	8.0	1.33	1.33	471.9	3.02	0.397	263.36	0.95	0.0001	0.007
Catchment B	0.0099	39.87	153.0	4.22	4.22	471.9	3.02	0.397	215.02	0.35	0.0034	0.206
Catchment C	0.0015	13.69	65.0	2.69	2.69	471.9	3.02	0.397	236.30	0.35	0.0005	0.033
Catchment D	0.0314	28.82	432.0	11.33	11.33	471.9	3.02	0.397	163.91	0.35	0.0110	0.501
Catchment E	0.0074	7.91	182.0	7.15	7.15	471.9	3.02	0.397	187.93	0.25	0.0018	0.096
Catchment F	0.0035	3.63	124.0	6.12	6.12	471.9	3.02	0.397	196.01	0.25	0.0009	0.048
Catchment I	0.0053	1.82	110.0	5.99	5.99	471.9	3.02	0.397	197.13	0.95	0.0050	0.274
											Total (General Scenario)	**2.306**

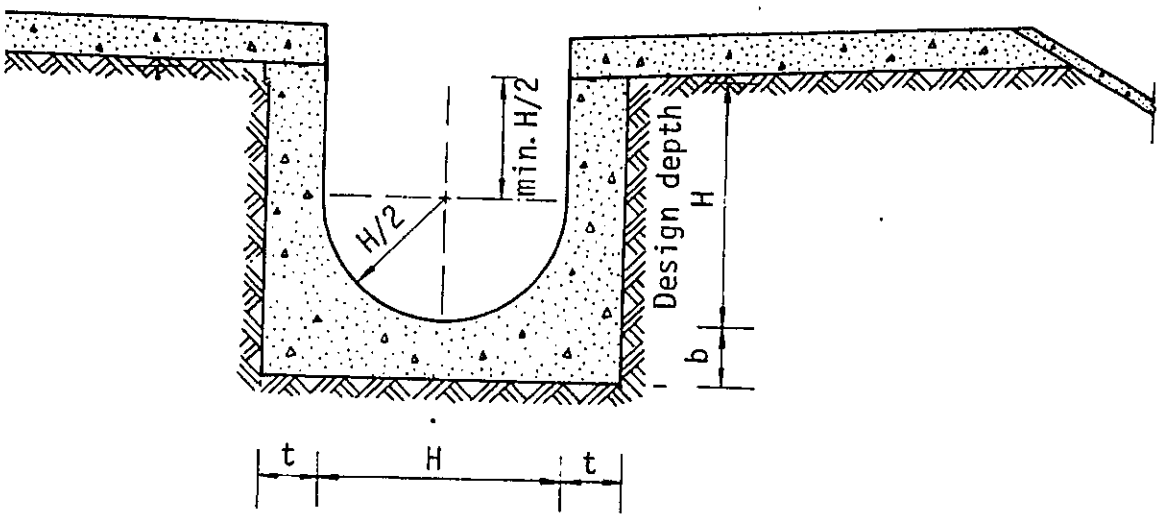
Calculation of Runoff for Return Period of 50 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_0), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Site Area (Catchment A1)	0.0003	9.09	11.0	0.58	0.58	451.3	2.46	0.337	310.19	0.25	0.0001	0.006
Site Area (Catchment A2)	0.0012	6.39	61.0	2.99	2.99	451.3	2.46	0.337	254.83	0.25	0.0003	0.022
Site Area (Catchment A3)	0.0028	7.82	78.0	3.38	3.38	451.3	2.46	0.337	248.98	0.25	0.0007	0.048
Site Area (Catchment A4)	0.0012	7.45	51.0	2.43	2.43	451.3	2.46	0.337	264.33	0.25	0.0003	0.022
Site Area (Catchment A5)	0.0006	1.61	31.0	2.17	2.17	451.3	2.46	0.337	269.31	0.25	0.0001	0.010
Site Area (Catchment A6)	0.0048	4.17	84.0	3.91	3.91	451.3	2.46	0.337	241.82	0.25	0.0012	0.081
Site Area (Catchment A7)	0.0048	6.34	71.0	3.04	3.04	451.3	2.46	0.337	254.04	0.25	0.0012	0.085
Site Area (Catchment A8)	0.0013	9.61	43.7	1.96	1.96	451.3	2.46	0.337	273.42	0.25	0.0003	0.025
Site Area (Catchment A9)	0.0011	8.52	41.1	1.92	1.92	451.3	2.46	0.337	274.31	0.25	0.0003	0.021
Site Area (Catchment A10)	0.0017	4.26	72.8	3.75	3.75	451.3	2.46	0.337	243.83	0.25	0.0004	0.028
Site Area (Catchment A11)	0.0012	2.46	69.0	4.12	4.12	451.3	2.46	0.337	239.24	0.25	0.0003	0.019
Site Area (Catchment A12)	0.0001	3.13	16.0	1.16	1.16	451.3	2.46	0.337	292.56	0.25	0.0000	0.002
Catchment B	0.0099	39.87	153.0	4.22	4.22	451.3	2.46	0.337	237.94	0.35	0.0034	0.228
Catchment C	0.0015	13.69	65.0	2.69	2.69	451.3	2.46	0.337	259.77	0.35	0.0005	0.037
Catchment D	0.0314	28.82	432.0	11.33	11.33	451.3	2.46	0.337	186.40	0.35	0.0110	0.570
Catchment E	0.0074	7.91	182.0	7.15	7.15	451.3	2.46	0.337	210.54	0.25	0.0018	0.108
Catchment F	0.0035	3.63	124.0	6.12	6.12	451.3	2.46	0.337	218.68	0.25	0.0009	0.054
Catchment I	0.0053	1.82	110.0	5.99	5.99	451.3	2.46	0.337	219.81	0.95	0.0050	0.305
											Total (General Scenario)	**1.671**
After the Proposed Development												
Site Area (Catchment A1)	0.0003	0.01	7.8	1.61	1.61	451.3	2.46	0.337	281.15	0.95	0.0003	0.021
Site Area (Catchment A2)	0.0012	0.01	22.0	3.93	3.93	451.3	2.46	0.337	241.58	0.95	0.0012	0.078
Site Area (Catchment A3)	0.0028	0.01	27.9	4.58	4.58	451.3	2.46	0.337	233.76	0.95	0.0027	0.173
Site Area (Catchment A4)	0.0012	0.01	23.0	4.12	4.12	451.3	2.46	0.337	239.24	0.95	0.0011	0.075
Site Area (Catchment A5)	0.0006	0.01	11.8	2.28	2.28	451.3	2.46	0.337	267.13	0.95	0.0005	0.039
Site Area (Catchment A6)	0.0048	0.01	31.9	4.96	4.96	451.3	2.46	0.337	229.68	0.95	0.0046	0.294
Site Area (Catchment A7)	0.0048	0.01	34.5	5.37	5.37	451.3	2.46	0.337	225.54	0.95	0.0045	0.285
Site Area (Catchment A8)	0.0013	0.01	33.0	5.86	5.86	451.3	2.46	0.337	221.02	0.95	0.0012	0.075
Site Area (Catchment A9)	0.0011	0.01	37.5	6.76	6.76	451.3	2.46	0.337	213.49	0.95	0.0011	0.063
Site Area (Catchment A10)	0.0017	0.01	26.0	4.50	4.50	451.3	2.46	0.337	234.69	0.95	0.0016	0.103
Site Area (Catchment A11)	0.0012	0.05	69.6	9.05	9.05	451.3	2.46	0.337	198.09	0.95	0.0011	0.061
Site Area (Catchment A12)	0.0001	0.05	8.0	1.33	1.33	451.3	2.46	0.337	288.17	0.95	0.0001	0.008
Catchment B	0.0099	39.87	153.0	4.22	4.22	451.3	2.46	0.337	237.94	0.35	0.0034	0.228
Catchment C	0.0015	13.69	65.0	2.69	2.69	451.3	2.46	0.337	259.77	0.35	0.0005	0.037
Catchment D	0.0314	28.82	432.0	11.33	11.33	451.3	2.46	0.337	186.40	0.35	0.0110	0.570
Catchment E	0.0074	7.91	182.0	7.15	7.15	451.3	2.46	0.337	210.54	0.25	0.0018	0.108
Catchment F	0.0035	3.63	124.0	6.12	6.12	451.3	2.46	0.337	218.68	0.25	0.0009	0.054
Catchment I	0.0053	1.82	110.0	5.99	5.99	451.3	2.46	0.337	219.81	0.95	0.0050	0.305
											Total (General Scenario)	**2.577**

Note:

1) Runoff is calculated in accordance with DSD's "*Stormwater Drainage Manual (with Eurocodes incorporated) - Planning, Design and Monagemen* t" (SDM), fifth edition, January 2018.

Appendix F DRAWING OF TYPICAL DETAILS OF U-CHANNEL


min. H/2
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Design depth
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Appendix G **CALCULATION OF DRAINAGE CAPACITY**

Calculation of Drainage Capacity for Return Period of 50 Years

Drainage Capacity of Internal Drainage System (U-channel)

Description	Shape	Depth (m)	Diameter (m)	s	A_w	P_w	R	n	V	Q_c	Total Runoff (m3/s)	% of capacity	Remark
Proposed U-shape channel UC01 (For collecting runoff from Catchments A1 + F)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.075	28.0%	OK
Proposed U-shape channel UC02 (For collecting runoff from Catchments A2 + E)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.186	69.5%	OK
Proposed U-shape channel UC03 (For collecting runoff from Catchments A3 + D)	U-Shape	0.38	0.75	0.0067	0.50	1.93	0.26	0.016	2.08	1.045	0.743	71.1%	OK
Proposed U-shape channel UC04 (For collecting runoff from Catchments A4 + C)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.112	41.8%	OK
Proposed U-shape channel UC05 (For collecting runoff from Catchments A5 + B)	U-Shape	0.25	0.50	0.0067	0.22	1.29	0.17	0.016	1.59	0.354	0.267	75.3%	OK
Proposed U-shape channel UC06-1 (For collecting runoff from Catchment A6)	U-Shape	0.25	0.50	0.0067	0.22	1.29	0.17	0.016	1.59	0.354	0.294	82.9%	OK
Proposed U-shape channel UC06-2 (For collecting runoff from Catchment A6)	U-Shape	0.30	0.60	0.0050	0.32	1.54	0.21	0.016	1.55	0.499	0.294	58.9%	OK
Proposed U-shape channel UC07-1 (For collecting runoff from Catchment A7)	U-Shape	0.25	0.50	0.0067	0.22	1.29	0.17	0.016	1.59	0.354	0.285	80.4%	OK
Proposed U-shape channel UC07-2 (For collecting runoff from Catchment A7)	U-Shape	0.30	0.60	0.0050	0.32	1.54	0.21	0.016	1.55	0.499	0.285	57.1%	OK
Proposed U-shape channel UC08-1 (For collecting runoff from Catchment A8)	U-Shape	0.15	0.30	0.0067	0.08	0.77	0.10	0.016	1.13	0.091	0.075	82.6%	OK
Proposed U-shape channel UC08-2 (For collecting runoff from Catchment A8)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.075	28.0%	OK
Proposed U-shape channel UC09-1 (For collecting runoff from Catchment A9)	U-Shape	0.15	0.30	0.0067	0.08	0.77	0.10	0.016	1.13	0.091	0.063	69.4%	OK
Proposed U-shape channel UC09-2 (For collecting runoff from Catchment A9)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.063	23.5%	OK
Proposed U-shape channel UC10-1 (For collecting runoff from Catchment A10)	U-Shape	0.23	0.45	0.0067	0.18	1.16	0.16	0.016	1.48	0.268	0.103	38.5%	OK
Proposed U-shape channel UC10-2 (For collecting runoff from Catchment A10)	U-Shape	0.23	0.45	0.0050	0.18	1.16	0.16	0.016	1.28	0.232	0.103	44.4%	OK
Proposed U-shape channel UC11 (For collecting runoff from Catchment A11)	U-Shape	0.15	0.30	0.0067	0.08	0.77	0.10	0.016	1.13	0.091	0.061	67.2%	OK

Legend

D = diameter, m
A_w = Cross Section Area of Flow, m^2
P_w = Wetted Perimeter, m
R = Hydraulic Radius = A_w/P_w, m
s = Hydraulic Gradient
n = Manning's roughness coefficient
V = Mean Velocity, m/s
Q_c = Flow Capacity, m^3/s
Q_p = Estimated Peak Flow, m^3/s

Drainage Capacity of Internal Drainage System (Circular Pipe)

Description	Length	d	r	A_w	P_w	R	s	k_s	V	Q_c	Total Runoff	% of capacity	Remark
	m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m^3/s	%	
Proposed Underground Circular Pipe DP01 (For collecting runoff from UC01+UC06)	-	0.60	0.30	0.28	1.89	0.15	0.005	0.60	1.72	0.438	0.369	84.3%	OK
Proposed Underground Circular Pipe DP02 (For collecting runoff from UC02+UC03)	-	0.90	0.45	0.64	2.83	0.22	0.005	0.60	2.21	1.266	0.929	73.4%	OK
Proposed Underground Circular Pipe DP03 (For collecting runoff from UC04+UC05)	-	0.60	0.30	0.28	1.89	0.15	0.005	0.60	1.72	0.438	0.379	86.5%	OK
Proposed Underground Circular Pipe DP04 (For collecting runoff from UC08+UC09)	-	0.60	0.30	0.28	1.89	0.15	0.005	0.60	1.72	0.438	0.138	31.5%	OK
Proposed Underground Circular Pipe DP05 (For collecting runoff from DP03+DP04)	-	0.75	0.38	0.44	2.36	0.19	0.005	0.60	1.98	0.786	0.517	65.8%	OK
Proposed Underground Circular Pipe DP06 (For collecting runoff from DP02+DP05)	-	1.00	0.50	0.79	3.14	0.25	0.005	0.60	2.36	1.667	1.446	86.7%	OK
Proposed Underground Circular Pipe DP07-1 (For collecting runoff from DP01+DP06)	-	1.20	0.60	1.13	3.77	0.30	0.005	0.60	2.64	2.689	1.815	67.5%	OK
Proposed Underground Circular Pipe DP07-2 (For collecting runoff from DP01+DP06)	-	1.20	0.60	1.13	3.77	0.30	0.050	0.60	8.38	8.533	1.815	21.3%	OK
Proposed Underground Circular Pipe DP08 (For collecting runoff from UC07+runoff from Catchment A12)	-	0.60	0.30	0.28	1.89	0.15	0.005	0.60	1.72	0.438	0.293	66.9%	OK
Proposed Underground Circular Pipe DP09 (For collecting runoff from UC10+UC11)	-	0.45	0.23	0.16	1.42	0.11	0.005	0.60	1.44	0.209	0.164	78.6%	OK
Proposed Underground Circular Pipe DP10 (For For discharging the collected runoff)	-	1.00	0.50	0.79	3.14	0.25	0.005	0.60	2.36	1.667	1.196	71.7%	OK

Legend

d = pipe diameter, m
r = pipe radius (m) = 0.5d
A_w = wetted area (m^2) = πr^2
P_w = wetted perimeter (m) = $2\pi r$
R = Hydraulic radius (m) = A_w/P_w
s = Slope of the total energy line
k_s = equivalent sand roughness, mm
V = Velocity of flow calculated based on Colebrook White Equation, m/s
Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s
Q_p = Estimated total peak flow from the Site during peak season, m^3/s

Drainage Capacity of Existing Precast Concrete Pipe before Upgrading Works

From	To	Description	Length	d	r	A_w	P_w	R	s	k_s	V	Q_c	Total Runoff	% of capacity	Remark
			m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m^3/s	%	
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Intake within the Site	-	1.8	0.90	2.545	5.655	0.450	0.040	0.60	9.60	21.996	2.577	11.7%	OK
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Outlet at the watercourse	-	0.6	0.30	0.283	1.885	0.150	0.050	0.60	5.46	1.392	2.577	185.1%	*NOTOK

Legend

d = pipe diameter, m
r = pipe radius (m) = 0.5d
A_w = wetted area (m^2) = πr^2
P_w = wetted perimeter (m) = $2\pi r$
R = Hydraulic radius (m) = A_w/P_w
s = Slope of the total energy line
k_s = equivalent sand roughness, mm
V = Velocity of flow calculated based on Colebrook White Equation, m/s
Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s
Q_p = Estimated total peak flow from the Site during peak season, m^3/s

Remark

1. The gradinet of the exising precast concentrate pipe is based on the CCTV inspection report. The lowest gradients of each section are adotped for assessment as a conservative approach.

Drainage Capacity of Existing Precast Concrete Pipe after Upgrading Works (Option 1)

From	To	Description	Length	d	r	A_w	P_w	R	s	k_s	V	Q_c	Total Runoff	% of capacity	Remark
			m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m^3/s	%	
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Intake within the Site	-	1.8	0.90	2.545	5.655	0.450	0.040	0.60	9.60	21.996	2.577	11.7%	OK
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Outlet at the watercourse	-	1.8	0.90	2.545	5.655	0.450	0.004	0.60	2.97	6.800	2.577	37.9%	OK
			-	1.8	0.90	2.545	5.655	0.450	0.002	0.60	2.14	4.895	2.577	52.6%	OK

Legend

d = pipe diameter, m
r = pipe radius (m) = 0.5d
A_w = wetted area (m^2) = πr^2
P_w = wetted perimeter (m) = $2\pi r$
R = Hydraulic radius (m) = A_w/P_w
s = Slope of the total energy line
k_s = equivalent sand roughness, mm
V = Velocity of flow calculated based on Colebrook White Equation, m/s
Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s
Q_p = Estimated total peak flow from the Site during peak season, m^3/s

Drainage Capacity of Existing Precast Concrete Pipe after Upgrading Works (Option 2)

From	To	Description	Length	d	r	A_w	P_w	R	s	k_s	V	Q_c	Total Runoff	% of capacity	Remark
			m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m^3/s	%	
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Intake within the Site	-	1.8	0.90	2.545	5.655	0.450	0.040	0.60	9.60	21.996	2.577	11.7%	OK
Sand Trap / Manhole	Existing Stream	Exising Precast Concentrate Pipe (Circular) - Section near the Outlet at the watercourse	-	1.2	0.60	1.131	3.77	0.300	0.006	0.60	2.96	3.008	2.577	85.7%	OK

Legend

d = pipe diameter, m
r = pipe radius (m) = 0.5d
A_w = wetted area (m^2) = πr^2
P_w = wetted perimeter (m) = $2\pi r$
R = Hydraulic radius (m) = A_w/P_w
s = Slope of the total energy line
k_s = equivalent sand roughness, mm
V = Velocity of flow calculated based on Colebrook White Equation, m/s
Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s
Q_p = Estimated total peak flow from the Site during peak season, m^3/s

Drainage Capacity of Watercourse at the Assessment Point

Description	Description	Shape	Width	Depth	Leg	Radius	Start Level	End Level	Slope (s)	Cross Section Area, m2	Wetted Perimeter	Hydaralius Radius, m	Manning Roughness Coefficient	Mean Velocity, m/s	Capacity Flow, m3/s	Total Runoff, m3/s	% of capacity	Remark
Catchment A	Capalcty of the Channel	Rectangular	3.56	2.42	--	--	--	--	0.01	8.61	8.40	1.03	0.018	3.99	34.393	0.906	2.6%	OK

Appendix H **SIZING OF RETENTION TANK**

Design Parameters			Remarks
Return Period	50	years	
Q=0.278CiA			
Catchment surface area (Site only)	21000	m^2	
Peak Surface Runoff from Site			
Before Development	0.369	m^3/s	
After Development	1.275	m^3/s	
Increment of runoff Q1	0.906	m^3/s	
Duration of storm event= time t	30	min	
			30min is assumed as the retention time
Volume = Q1x t			
Volume=	1630.8	m^3	
Required Volume	978.48	m^3	
L	16	m	Assume 60% of the time at peak flow
D	25	m	
W	2.5	m	
Design Volume	1000	m^3	

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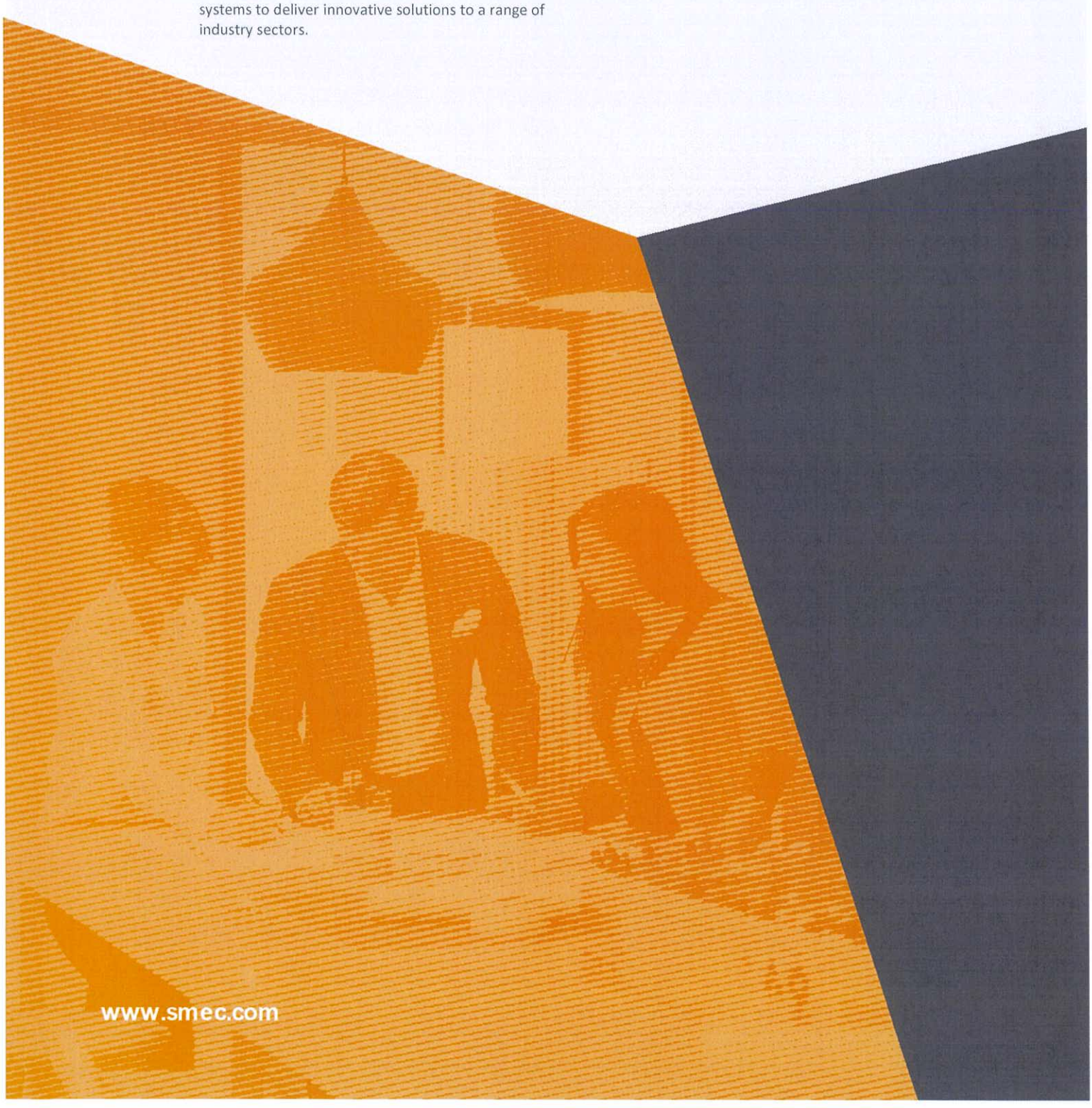

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L A N B A S E
Surveyors Limited
宏 基 測 量 師 行

Our Ref.: YL/TPN/2529C/L04

5 July 2024

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

By Email and by Post

Dear Sir/Madam,

Planning Application (No. A/YL-PH/1013) for
Temporary Wholesale Trade (Food) for a Period of Five Years
Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land
Pat Heung, Yuen Long, New Territories

We would like to respond to the departmental comments received on the captioned planning application as follows:-

	Departmental Comments	**Response**
-	**Environmental Protection Department**	
(i)	the sewerage arrangement of the proposed use. If septic tank and soakaway system would be used, whether the requirements set out in *Professional Persons Environmental Consultative Committee Practice Notes 1/23 (Drainage Plans subject to Comment by the Environmental Protection Department -Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations)* would be followed.	If septic tank and soakaway system is used, the requirements set out in *Professional Persons Environmental Consultative Committee Practice Notes 1/23 (Drainage Plans subject to Comment by the Environmental Protection Department -Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations)* **will be followed**.

Our Ref.: YL/TPN/2529C/L04

	Departmental Comments	Response
-	**Environmental Protection Department**	
(ii)	whether public announcement system, portable loudspeakers or any form of audio amplification system would be used at the application site	**No** public announcement system, portable loudspeakers or any form of audio amplification system will be used at the application site.
(iii)	any mitigation measures for minimising the potential environmental impacts arising from the proposed use.	The mitigation measures as stipulated in the "Code of Practice on Handling the Environmental Aspects of Temporary Uses and Open Storage Sites" issued by the Environmental Protection Department will be adopted to minimize the potential environmental impacts arising from the proposed use, if any.
-	**Transport Department**	
(a)	The applicant should demonstrate the smooth manoeuvring of vehicles to / from Fan Kam Road, along the local access and within the site;	Please see the swept path along the local access and within the site at **Appendix 1**.
(b)	The applicant should indicate the clear width of the vehicular ingress / egress on the layout plan;	Please see the revised layout plan with the about 9m clear width of the ingress/ egress including 7.3m for vehicular access and 1.7m for pedestrian access at **Appendix 2**.

Our Ref.: YL/TPN/2529C/L04

	Departmental Comments	Response
-	**Transport Department**	
(c)	The applicant should note the local access between Fan Kam Road and the site is not managed by this Department.	Noted.
-	**Fire Services Department**	
(i)	The standards and specifications of the proposed emergency lighting shall be revised to "BS 5266-1:2016, BS EN 1838:2013 and the FSD Circular Letter No. 4/2021";	Please see the revised fire services installation proposal (revised fire notes no. 1) at **Appendix 3**.
(ii)	The standards and specifications of the proposed fire alarm system shall be revised to 'BS 5839-1:2017 and the FSD Circular Letter No. 6/2021'; and	Please see the revised fire services installation proposal (revised fire notes no. 7) at **Appendix 3**.
(iii)	Sufficient directional and exit signs shall be provided in accordance with BS 5266-1:2016 and the FSD Circular Letter No. 5/2008.	Please see the revised fire services installation proposal (revised fire notes no. 2) at **Appendix 3**.

Our Ref.: YL/TPN/2529C/L04

	Departmental Comments	Response
-	**Drainage Services Department**	
(a)	The applicant should confirm whether they are committed to implement the proposed retention drainage system.	Having reviewed the available capacity of the watercourse after receiving the boundary condition provided by DSD in February 2024 (refer to DSD"s email at **Appendix 4**), based on the estimation of watercourse capacity, we found that there is sufficient capacity to support and therefore the proposed retention drainage system is not necessary. Therefore, the proposed retention drainage system will not be implemented. On the other hand, there is a rainwater harvest recycling system on-site which also supports to reduce discharge of surface runoff. Please see the revised DIA Report at **Appendix 5**.
(b)	Supporting calculation and documents to justify the applicant's assumption on the existing watercourse capacity should be given. The drainage impact caused to the existing watercourse by the proposed development, for both option 1 and option 2 without the retention tank, have yet been ascertained.	Having reviewed the available capacity of the watercourse after receiving the boundary condition provided by DSD in February 2024 (refer to DSD"s email at **Appendix 4**), we have prepared the supporting calculations for estimation of watercourse capacity. Please see the revised DIA Report at **Appendix 5**.
(c)	30 minutes retention time is proposed for storage of the addition runoff on site. Please justify with supporting calculation and documents.	Based on the calculations of the existing watercourse capacity, it shows that there is adequate capacity to support the proposed development, 30 min retention time is no longer required.

L | A | N | B | A | S | E

Our Ref.: YL/TPN/2529C/L04

Should you have any queries, please contact our Mr. Wesley Tang [redacted] Thank you.

Yours faithfully,
For and on behalf of
LANBASE SURVEYORS LIMITED

Rock K.M. Tsang
Director
RK/WT
Encl.

Appendix 1

Swept Path

Project Title: COMBOXX

Figure Title: SWEPT PATH OF CONTAINER VEHICLE TRAVELING ALONG THE RIGHT-OF-WAY FROM FAN KAM ROAD

Figure No.	Revision
R1	A

Designed by	Drawn by	Checked by
L C H	N C M	K C

Scale in A3	Date
1 : 1000	21 SEP 2023

CKM Asia Limited
Traffic and Transportation Planning Consultants

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Project Title

COMBOXX

Figure Title

SWEPT PATH OF CONTAINER VEHICLE TRAVELING ALONG THE RIGHT-OF-WAY TO FAN KAM ROAD

Figure No.	Revision
R2	A

Designed by	Drawn by	Checked by
L C H	N C M	K C

Scale in A3	Date
1 : 1000	21 SEP 2023

CKM Asia Limited
Traffic and Transportation Planning Consultants

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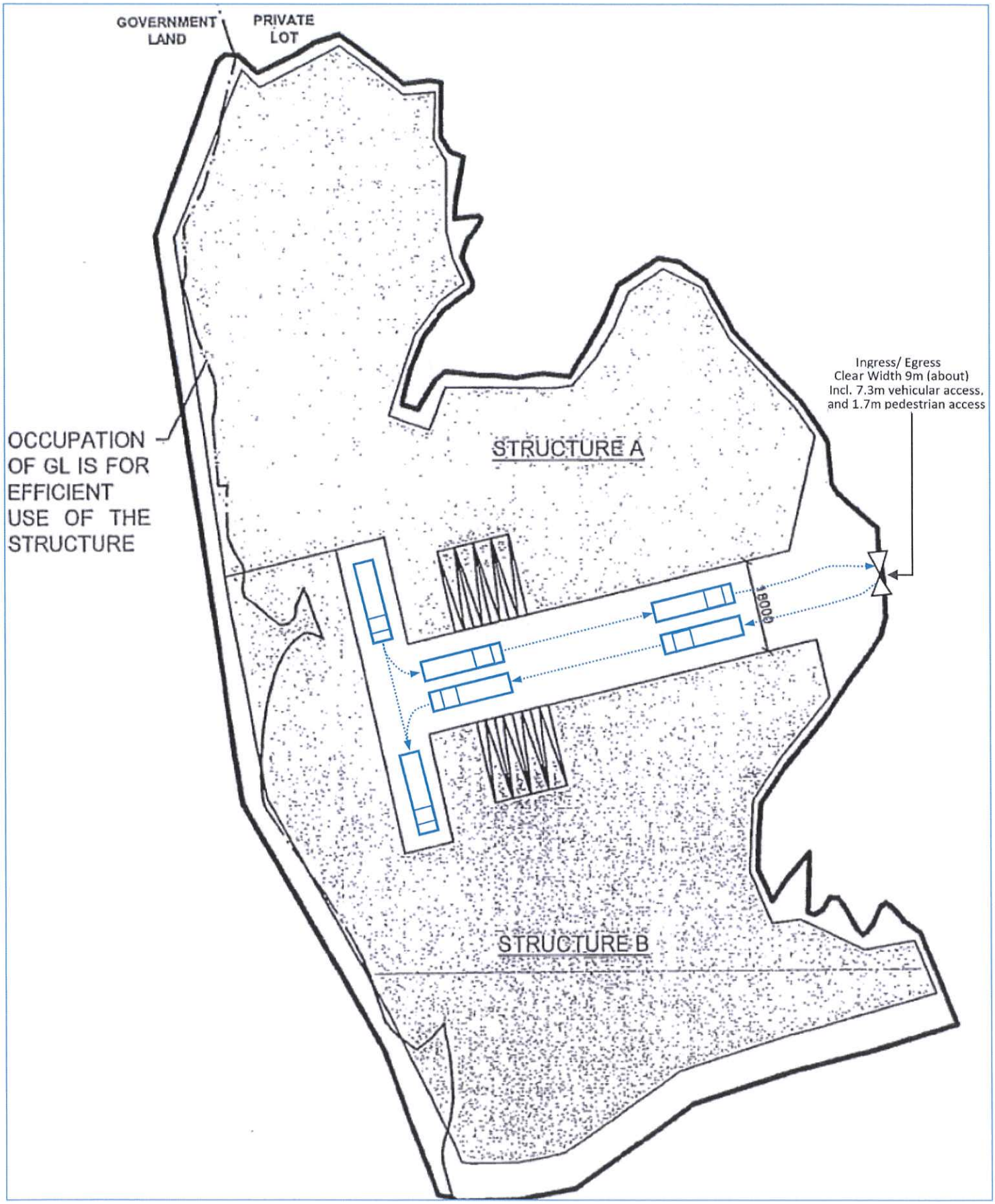
Swept Path of Container Vehicle (within Site)



Appendix 2

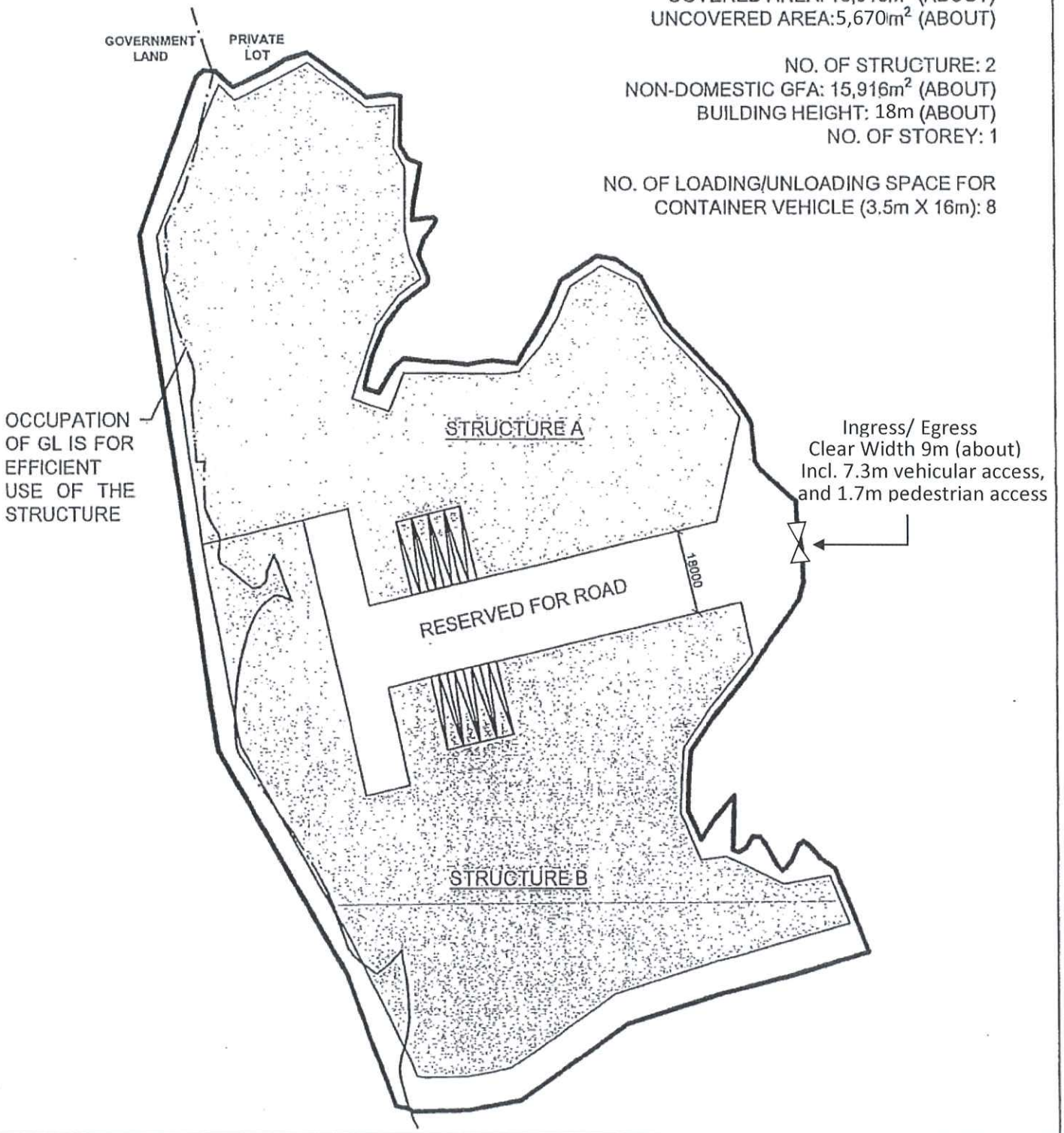
Revised layout plan

DEVELOPMENT PARAMETERS

APPLICATION SITE AREA:21,586m^2 (ABOUT)
COVERED AREA: 15,916m^2 (ABOUT)
UNCOVERED AREA:5,670m^2 (ABOUT)

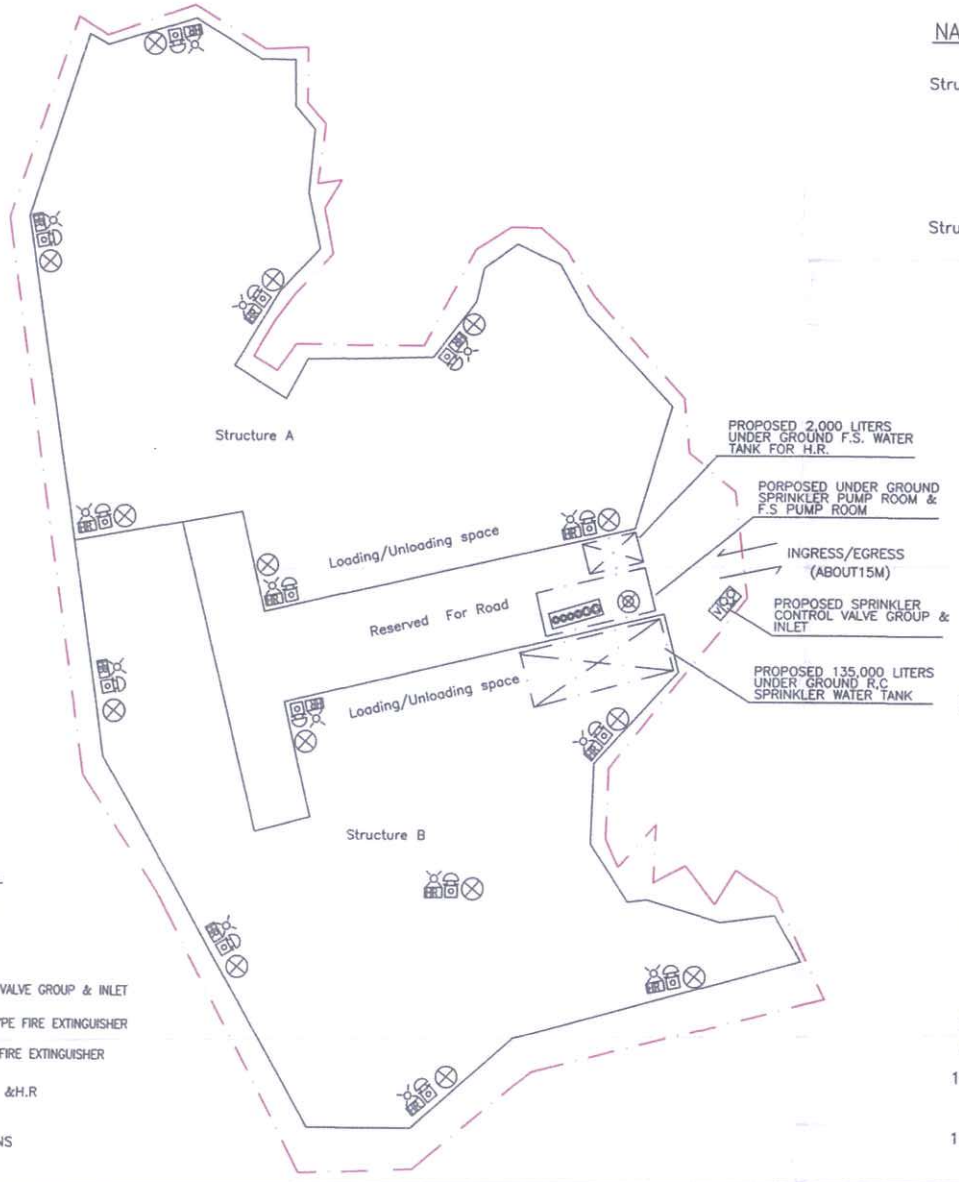
NO. OF STRUCTURE: 2
NON-DOMESTIC GFA: 15,916m^2 (ABOUT)
BUILDING HEIGHT: 18m (ABOUT)
NO. OF STOREY: 1

NO. OF LOADING/UNLOADING SPACE FOR CONTAINER VEHICLE (3.5m X 16m): 8



Appendix 3

Revised Fire Services Installation Proposal



LEGEND

- FLASHING LIGHT
- FIRE ALARM BELL
- MFA CALL POINT
- HR — HOSE REEL SET (30M LENGTH)
- SPRINKLER CONTROL VALVE GROUP & INLET
- 4KG DRY POWDER TYPE FIRE EXTINGUISHER
- 5KG CO2 GAS TYPE FIRE EXTINGUISHER
- SPRINKLER PUMP &H.R PUMP SET
- NEW INSTALLATIONS
- BOUNDARY LINE

NATURE OCCUPANCY:

Structure A: Single storey structure for wholesale trade (food)
(GFA:7888 sq.m,Height:18m)
The aggregate area of openable window about 500 s.q.m exceeding 6.25% of the floor area of the Structure A.(7888sq.m x 6.25% =493sq.m)

Structure B: Single storey structure for wholesale trade (food)
(GFA:8028 sq.m,Height:18m)
The aggregate area of openable window about 520 s.q.m exceeding 6.25% of the floor area of the Structure B.(8028sq.m x 6.25% =501.75sq.m)

Fire Notes:

1. Sufficient emergency lighting shall be provided throughout the entire building in accordance with BS5266-1:2016, BS EN 1838:2013 and FSD Circular Letter No. 4/2021.
2. Sufficient directional and exit sign shall be provided in accordance with BS 5266-1:2016 and FSD Circular letter 5/2008.
3. Sufficient portable hand-operated approved appliance shall be provided as required by occupancy and as marked on plans.
4. An Automatic Sprinkler System Supplied by existing 135 m3 Sprinkler Water Tank and Hazard Class OH 3 shall be provided to the building/structure A & B in accordance with BS EN 12845:2015 and FSD Circular Letter No.5/2020. The Sprinkler Water Tank,Sprinkler Pump Room,Sprinkler Inlet and Sprinkler Control Valve Group shall be clearly marked on plans.
5. The storage configuration is ST1:free standing or block stacking with reference to the section 6.3.2 of B.S 12845.and storage pattern is the maximum storage heights shall not exceed 4 m & the maximum storage areas shall be 50m2 for any single block.with no less than 2.4m clearance around the block as Ordinary Hazard Group 3 in accordance with LPC BS EN 12845.(Storage Category : Category I)
6. A hose reel system should be supplied by a 2.0m3 F.S Water tank. There shall be sufficient hose reel to ensure that every part of each buillding can be reached by a length of not more than 30m of hose reel tubing.The F.S water tank, F.S pump room and hose reel shall be clearly marked on plans.
7. Fire alarm system shall be provided throughout the entire building in accordance with BS 5839-1:2017 and FSD Circular Letter 6/2021 . One actuation point and one audio warning device to be located at each hose reel point.The actuation point should include facilities for fire pump start and audio/visual warning device initiation.
8. One no.5.0 kg CO2 F.E. shall be provided at spinkler pump room & F.S pump room.
9. Sprinkler Tank water supply pipe should be connected to Town Main.
10. A Secondary electrical supply tee-off before main switch will be provided to maintain operation of fire service system in the event of normal power fuilure.
11. No Smoke extraction system will be provided for the structure A & B as the aggregate area of openable windows of structure A&B exceeding 6.25% of the floor area of the structure A&B. (Detail see Drawing No. 2021-FS/SP-02)

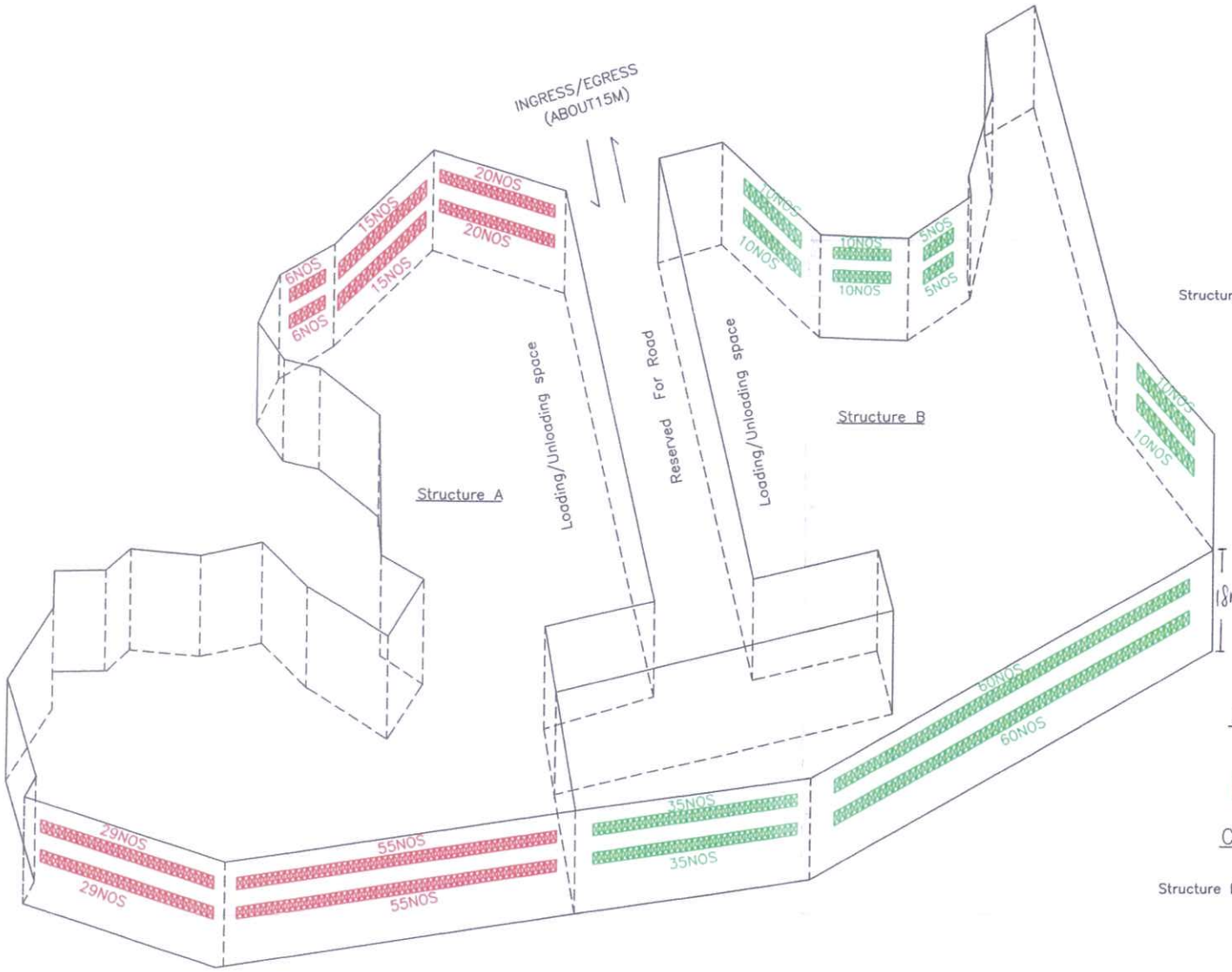
Project :

PROPOSED TEMPORARY WHOLESALE TRADE(FOOD) FOR A PERIOD OF 5 YEARS AT LOTS 872,873,875,876,877,878,880,881,882,883,884,885,886, 887,888,889,890,891(PART),892(PART),893(PART),3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND ,PAT HEUNG ,YUEN LONG.

TITLE :

PROPOSED FIRE SERVICE INSTALLATION LAYOUT PLAN.

Date:	26/6/2024
Scale:	1:1000 @ A3
Ref No:	A/YL-PH/1013
Drawing No:	2021-FS/24-01



OPENABLE WINDOWS OF STRUCTURE A & B LAYOUT PLAN

LEGEND

OPENABLE WINDOW (Area:1m x 2m=2sq.m)

CALCULATE:

Structure A: The aggregate area of openable window is:

2sq.m x 250nos =500sq.m

6.25% of the floor area is:

7888sq.m x 6.25% =493sq.m

500sq.m > 493sq.m

LEGEND

OPENABLE WINDOW (Area:1m x 2m=2sq.m)

CALCULATE:

Structure B: The aggregate area of openable window is:

2sq.m x 260nos =520sq.m

6.25% of the floor area is:

8028sq.m x 6.25% =501.75sq.m

520sq.m > 501.75sq.m

Project :

PROPOSED TEMPORARY WHOLESALE TRADE(FOOD) FOR A PERIOD OF 5 YEARS AT LOTS 872,873,875,876,877,878,880,881,882,883,884,885,886, 887,888,889,890,891(PART),892(PART),893(PART),3049 AND 3050 IN D.D. 111 AND ADJOINING GOVERNMENT LAND ,PAT HEUNG ,YUEN LONG.

TITLE :

PROPOSED FIRE SERVICE INSTALLATION LAYOUT PLAN.

Date:	26/6/2024
Scale:	A3 (NO SCALE)
Ref No:	A/YL-PH/1013
Drawing No:	2021-FS/24-02

Appendix 4

DSD's Email in 2/2024

[redacted]

寄件者:
寄件日期: 2024年2月21日星期三 10:34
收件者: [redacted]
副本:
主旨: Re: [Internet]7076764 - Request for Information - Watercourse Boundary Condition at Pat Heung (Planning Application No.: A/YL-PH/804)
附件: Pat Heung Boundary Condition A-YL-PH-804(M2024-11).xlsx

Dear Tommy,

Please find the boundary conditions as attached.

Regards,
William CY Wong
E/DSP3
Land Drainage Division, DSD

Zero "O" 意外
ACCIDENT
地盤零意外 關懷建未來
Zero Accident, we Build, we Care

From: [redacted]
To:
Cc:
Date: 30/01/2024 16:19
Subject: [Internet]7076764 - Request for Information - Watercourse Boundary Condition at Pat Heung (Planning Application No.: A/YL-PH/804)
Serial No.:

Dear Mr. Wong,

As discussed yesterday, we have been appointed to conduct a Drainage Impact Assessment (DIA) for a

development on Pat Heung, Yuen Long. The location of the proposed site (https://www.map.gov.hk/gm/s/hk80/834717/827782) and existing watercourse (https://www.map.gov.hk/gm/s/hk80/834698/827903) is shown in the attached location plan.

Could you please provide the condition of the existing watercourse near the proposed site with the return periods of 2, 10, and 50 years in support of the DIA? We would like to have the following information to support our DIA:

1. Cross-section of the watercourse;
2. Section flows;
3. Section water level;
4. Section flow velocity;
5. Surface runoff from the nearby catchment to the watercourse.

Should you have any enquiries regarding the above, please do not hesitate to contact the undersigned [redacted] or our Ms Kitty Lee

Thank you.

Regards,

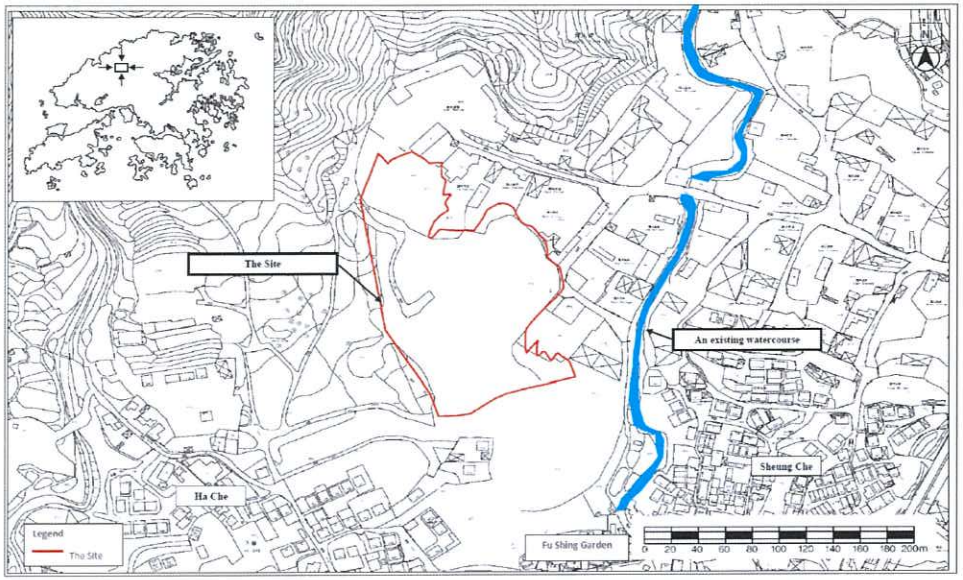
Tommy KONG
Assistant Environmental Consultant

[redacted]

SMEC Hong Kong

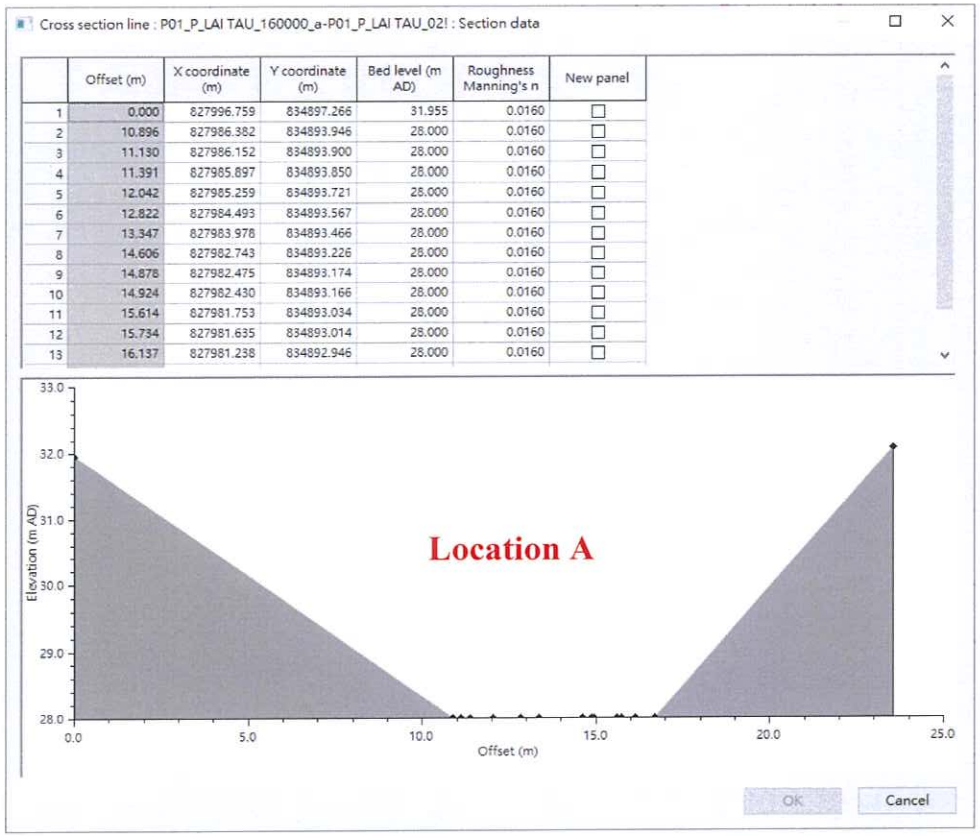
[redacted]

[attachment "240201_Location Plan.pdf" deleted by Ching Yu WONG/LDD/DSD/HKSARG]



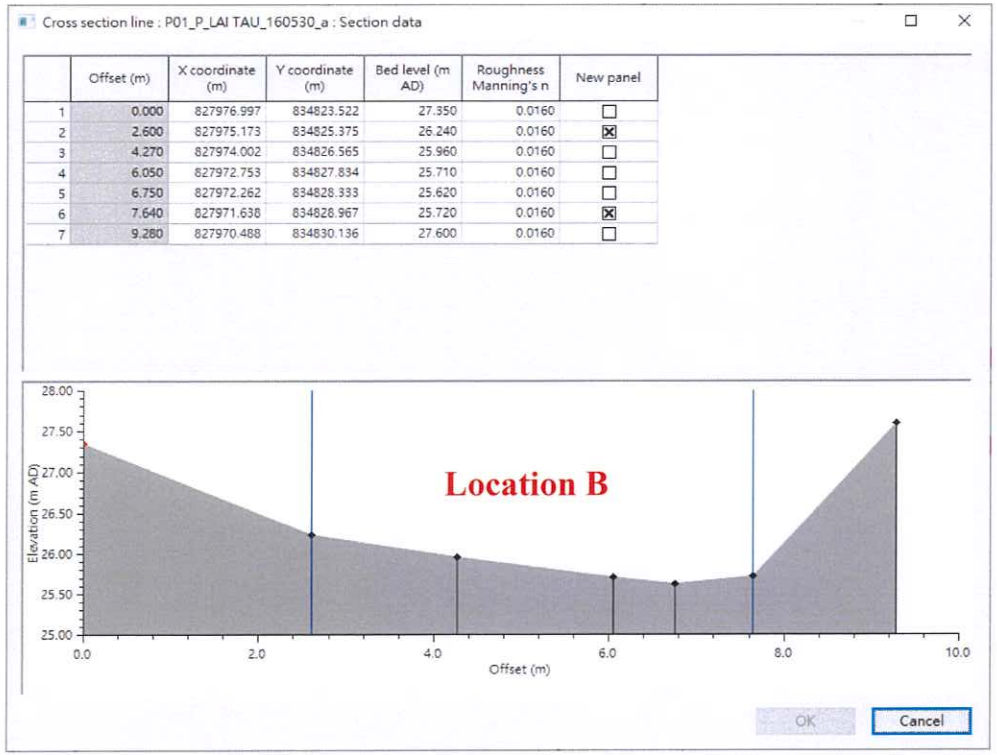
Location Plan provided by Consultant

Loation Reference for Boundary Conditon



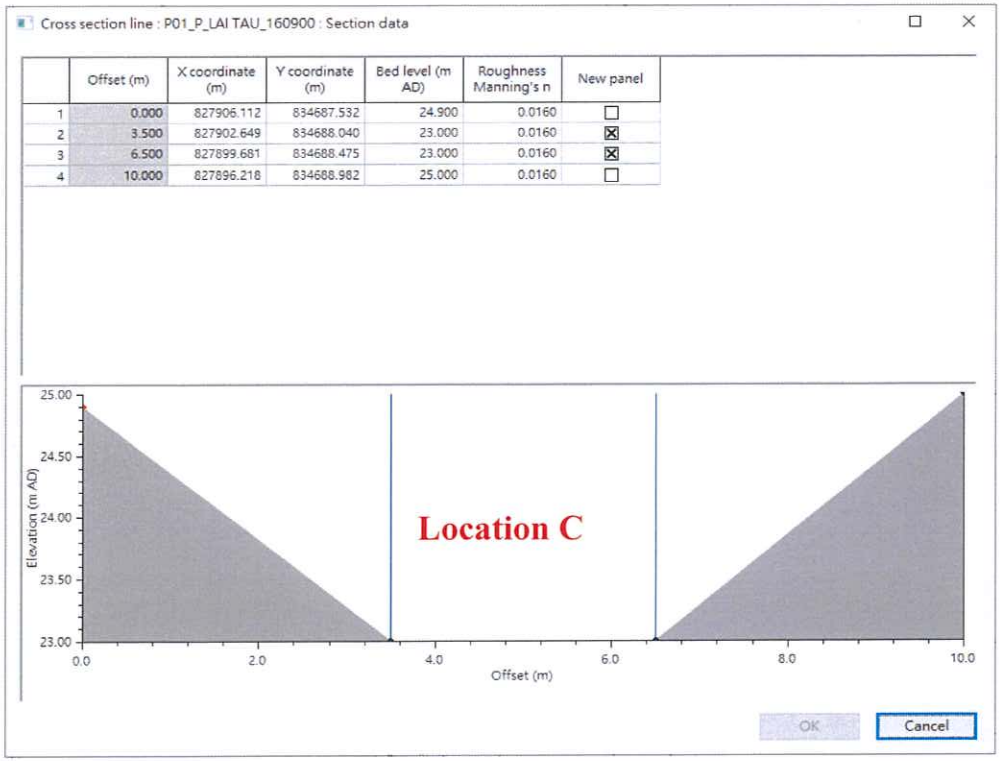
Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m PD)
0.00	827996.76	834897.27	31.96
10.90	827986.38	834893.95	28.00
11.13	827986.15	834893.90	28.00
11.39	827985.90	834893.85	28.00
12.04	827985.26	834893.72	28.00
12.82	827984.49	834893.57	28.00
13.35	827983.98	834893.47	28.00
14.61	827982.74	834893.23	28.00
14.88	827982.48	834893.17	28.00
14.92	827982.43	834893.17	28.00
15.61	827981.75	834893.03	28.00
15.73	827981.64	834893.01	28.00
16.14	827981.24	834892.95	28.00
16.69	827980.69	834892.85	28.00
23.54	827974.06	834891.14	32.08

Location A : Section ID - P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02!



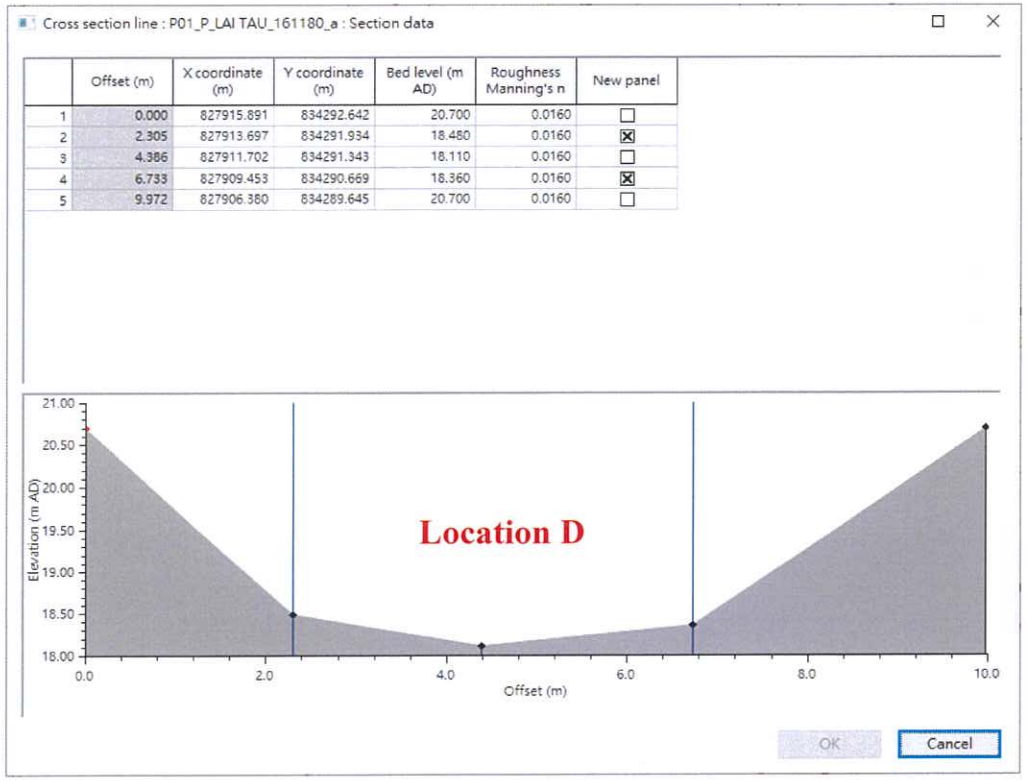
Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m PD)
0.00	827976.997	834823.522	27.35
2.60	827975.173	834825.375	26.24
4.27	827974.002	834826.565	25.96
6.05	827972.753	834827.834	25.71
6.75	827972.262	834828.333	25.62
7.64	827971.638	834828.967	25.72
9.28	827970.488	834830.136	27.60

Location B : Section ID - P01_P_LAI TAU_160530_a



Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m PD)
0.00	827906.112	834687.532	24.90
3.50	827902.649	834688.04	23.00
6.50	827899.681	834688.475	23.00
10.00	827896.218	834688.982	25.00

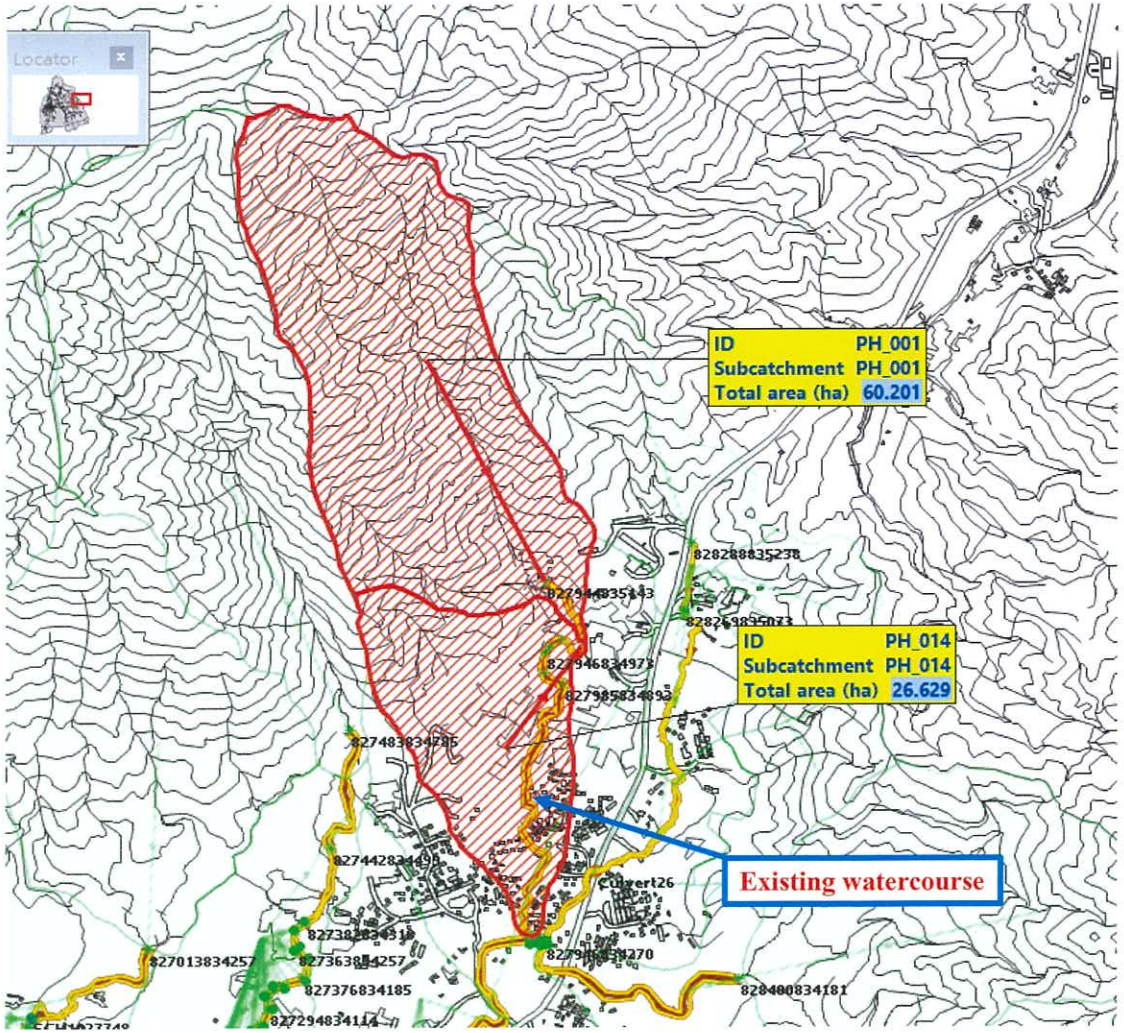
Location C : Section ID - P01_P_LAI TAU_160900



Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m PD)
0.00	827915.89	834292.64	20.70
2.31	827913.70	834291.93	18.48
4.39	827911.70	834291.34	18.11
6.73	827909.45	834290.67	18.36
9.97	827906.38	834289.65	20.70

Location D : Section ID - P01_P_LAI TAU_161180_a

Location	Section ID	Return Period														
		2AB			10A			10B			50A			50B		
		Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)
A	P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02!	28.413	14.807	5.250	28.534	22.903	6.066	28.413	14.807	5.250	28.596	28.076	6.540	28.534	22.903	6.066
B	P01_P_LAI TAU_160530_a	26.415	14.807	4.864	26.578	21.151	5.682	26.415	14.806	4.864	26.673	28.825	6.121	26.578	23.151	5.682
C	P01_P_LAI TAU_160900	23.756	14.803	4.428	23.959	23.146	5.055	23.756	14.803	4.428	24.074	28.848	5.399	23.959	23.147	5.055
D	P01_P_LAI TAU_161180_a	19.534	14.849	2.118	19.966	23.219	2.395	19.534	14.850	2.118	20.232	28.989	2.543	19.966	23.220	2.395



Return Period	Runoff Flow (m3/s)	
	Sub-catchment : PH_001	Sub-catchment : PH_014
2AB	7.478	7.498
10A	13.813	10.945
10B	7.478	7.498
50A	18.796	13.157
50B	13.813	10.945

Appendix 5

Revised DIA Report

SMEC

Member of the Surbana Jurong Group

local people
global experience

D01 – Drainage Impact Assessment

Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long

Reference No. 7076764
Prepared for Reitar Logtech Group Ltd
1 March 2024

SMEC INTERNAL REF. 7076764

Document Control

Document:	D01 – Drainage Impact Assessment
Project Name:	Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, Pat Heung, Yuen Long
Project Number:	7076764
Revision Number:	0

Revision History

REVISION NO.	DATE	PREPARED BY	REVIEWED BY	APPROVED FOR ISSUE BY
0	1 March 2024	LUO, KAICHAO	Tommy KONG	Kitty LEE

Issue Register

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The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters that might have a material effect on its contents or which come to light after the date of the report. SMEC is not obliged to inform you of any such event, transaction or matter nor to update the report for anything that occurs, or of which SMEC becomes aware, after the date of this report.

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1 PROJECT BACKGROUND

1.1 Introduction

1.1.1 A temporary wholesale trade (food) development (the Proposed Use) has been proposed for a period of five years at Lots 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 (Part), 892 (Part), 893 (Part), 3049 and 3050 in DD 111 and adjoining government land, Pat Heung, Yuen Long ("the Site"). The Site is zoned "Open Storage" (OS) on the Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11. A planning application (no. A/YL-PH/804) for the Proposed Use was submitted under Section 16 of the Town Planning Ordinance (TPO) and was approved with conditions by the Town Planning Board (TPB) on 12 April 2019. Two of the approval conditions related to drainage issues are as follows:

(c) The submission of drainage proposal within 6 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019; and

(d) In relation to (c) above, the implementation of drainage proposal within 9 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019.

1.1.2 A drainage proposal has been submitted to Drainage Service Department (DSD) to discharge Approval condition (c). The submitted drainage proposal with a commitment made in the RtC was considered acceptable by DSD on 11 October 2021.

1.1.3 Further to the commitment in providing supplementary information to address comments from DSD (dated on 29 August 2023) and the comment from DSD dated 6 October 2023, the applicant is required to justify the capacity of the existing watercourse and taking into account the current revised design of the Proposed Development. SMEC Asia Ltd has been commissioned by Reitar Logtech Group Ltd to prepare a new Drainage Impact Assessment for the current revised design of the Proposed Development and justify the capacity of the existing watercourse

1.2 Site Description

1.2.1 The Site location and its environs are shown on ***Figure 1-1*** which the uses surrounding the Site include:

- To the North and East: Various open storage / storage yards, workshops, container trailers / tracker park.
- To the South: Village houses in Fu Shing Garden and Ha Che.
- To the West: Vacant land covered with vegetation under "Green Belt" zone.

1.2.2 The Site area is 21,586m^2 and the General Building Plan (GBP) has been submitted to Building Department in January 2024.

1.3 Objectives of this Report

1.3.1 The objectives of this new Drainage Impact Assessment are to:

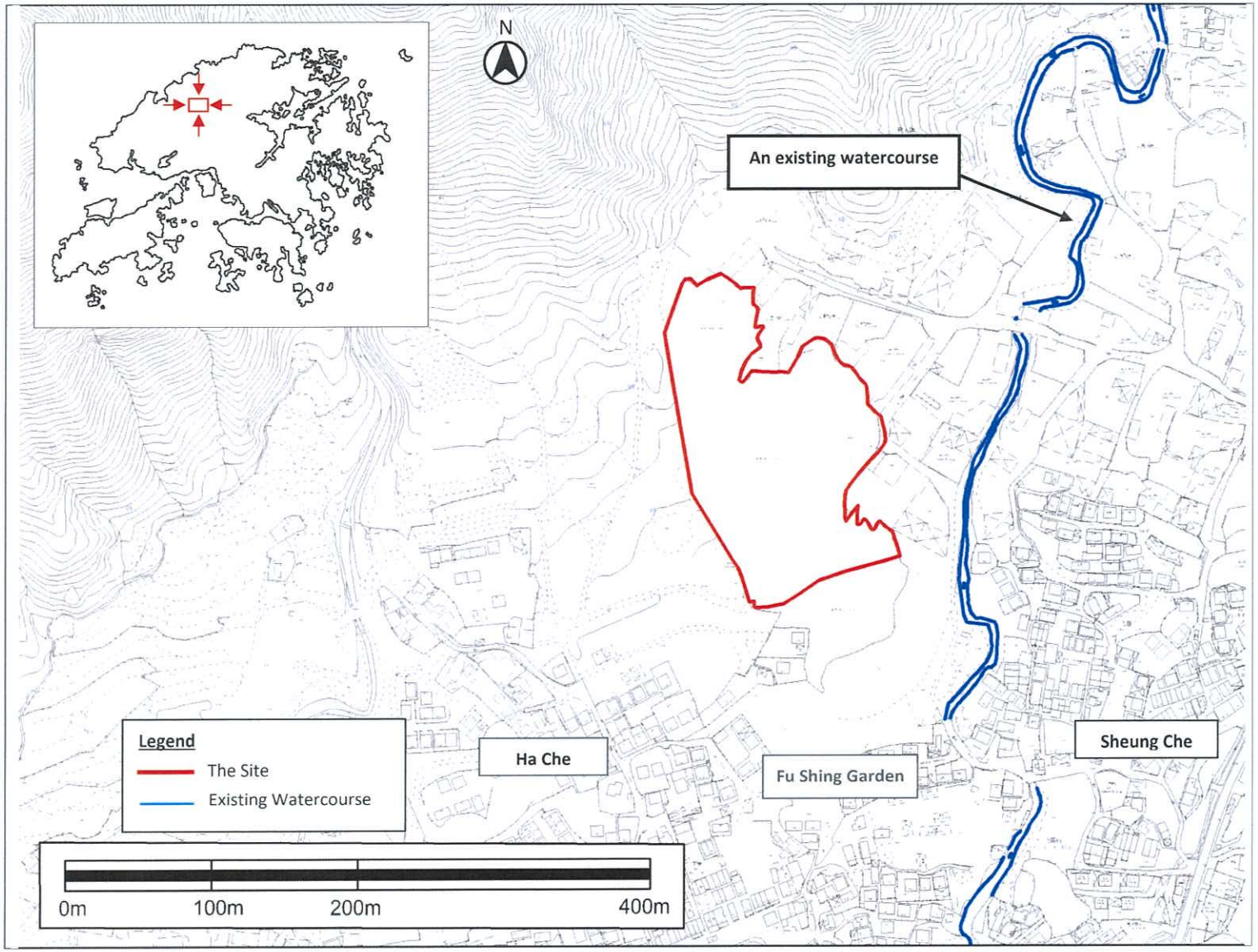
- Assess the potential drainage impacts arising from the Proposed Development taking in account the current revised design and justify the capacity of the existing watercourse.
- Recommend the necessary mitigation measures to alleviate any impacts.

1.4 Reference Materials

1.4.1 In evaluating the drainage impact arising from the Proposed Use, the following materials have been referred to:

- Drainage Services Department (DSD) publication Stormwater Drainage Manual (with Eurocodes incorporated) – Planning, Design and Management (2018 Edition).
- DSD Stormwater Drainage Manual Corrigendum No. 1/2022
- DSD Advice Note No. 1 – Application of the Drainage Impact Assessment Process to Private Sector Projects.
- DSD publication Technical Note to prepare a "Drainage Submission".
- GeoInfo Map reviewed on 05 February 2024.
- Boundary conditions of the existing watercourse provided by DSD on 21 February 2024.
- Pre-CCTV Survey Report carried by Pipeline Drainage Ltd. conducted on 23 September 2020 for the existing pipe near the Site.
- Topographical Survey near Lot No. 858, 861 S. A, 864 S.C, 862, 872-873, 875-878, 880-893, 894 S. A & S. B, 895, 3049-3050, 3083 in D.D.111, Ha Che, Yuen Long, prepared by Keyland Surveying, Planning & GIS Co. Ltd on 24 January 2019.

Figure 1-1: Site Location and its Environs



2 DESCRIPTION OF EXISTING ENVIRONMENT AND DRAINAGE CONDITIONS

2.1 Site Topography and Characteristics

2.1.1 As illustrated on ***Figure 1-1***, the Site is situated on a vacant land to the north of Ha Che in Pat Heung, Yuen Long and surrounded by various open storage / storage yards, workshops, container trailers / tracker park, village houses and vacant land. As the planning application has been approved in 2019, the construction works has already commenced. The site is currently undergoing site formation in February 2024.

2.1.2 The land survey conducted before the commencement of construction indicated that the site surface before proposed development was generally coarse and uneven with small gradient. The elevation ranged from the highest 39.33mPD at the north west corner of the site to the lowest 28.13mPD was at the south east corner. Referring to the site investigation in 2020, the Site was covered with mostly grassland.

2.1.3 After the proposed development, the site will experience excavation and backfilling to enable the construction of power cap and superstructure. Within the building line, the ground level will be flattened to 34.0mPD while the uneven topographic level along the site boundary will be constructed as an emergency vehicle access (EVA) ramp, enclosing the superstructure of the proposed development. 1,058m^2 of the site area will be reserved for greenery. The 1st floor layout plan and section plan of the proposed project has been extracted from the submitted GBP and presented as ***Appendix A***.

2.2 Baseline Drainage Conditions

2.2.1 With reference to GeoInfo Map and review on drainage layout records in DSD drawing office in May 2020 and February 2024, there is no municipal drainage system in the vicinity of the Site.

2.2.2 Based on the site observation and CCTV pipe inspection provided as ***Appendix B*** in this report, there is an existing precast concrete pipe connecting the eastern boundary of the Site to an existing watercourse to the east of the Site as shown on ***Figure 2-1***. The dimension of the precast concrete pipe is Ø1,800mm in diameter starting from the Site and then change to Ø600mm in diameter near the outlet at the watercourse. Hence, under the past drainage arrangement of the site, the runoff collected in site would be conveyed to by the precast concrete pipe, and discharged to the existing watercourse at the east of the Site. Siltation and collapse of the existing pipe was observed during the CCTV inspection.

Figure 2-1: Existing Drainage Arrangement of the Site

3 DRAINAGE IMPACT

3.1 Assumptions and Methodology

3.1.1 Peak instantaneous runoff before and after the Proposed Use was calculated based on the Rational Method. The recommended physical parameters, including runoff coefficient (C) and storm constants for different return periods, are as per the *Stormwater Drainage Manual*.

3.1.2 The Rational Method has been adopted for hydraulic analysis and the peak runoff is given by the following expression:

$$Q_p = 0.278\, C\, i\, A \qquad \text{--- Equation 1}$$

where Q_p = peak runoff in m^3/s
C = runoff coefficient
i = rainfall intensity in mm/hr
A = catchment area in km^2

3.1.3 Rainfall intensity is calculated using the following expression:

$$i = \frac{a}{(t_d + b)^c} \qquad \text{--- Equation 2}$$

where i = rainfall intensity in mm/hr
t_d = duration in minutes ($t_d \leq 240$)
a, b, c = storm constants given in Table 3 of SDM

3.1.4 For a single catchment, duration (td) can be assumed equal to the time of concentration (tc) which is calculated as follows:

$$t_c = t_0 + t_f \qquad \text{--- Equation 3}$$

where t_c = time of concentration
t_0 = 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

3.1.5 Generally, t0 is much larger than tf. As shown in Equation 2, td is the divisor. Therefore, larger td will result in smaller rainfall intensity (i) as well as smaller Qp. For the worst-case scenario, tf is assumed to be negligible and so:

$$t_d = t_c = t_0$$

$$t_0 = \frac{0.14465\, L}{H^{0.2} A^{0.1}} \qquad \text{--- Equation 4}$$

where A = catchment area (m^2)
H = average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration
L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

3.1.6 The capacities of the drainage pipes have been calculated using the Colebrook-Whit Equation, assuming full bore flow with no surcharge, as follows, in accordance with the Stormwater Drainage Manual:

$$V = -\sqrt{32gRs} \times \log\left(\frac{k_s}{14.8R} + \frac{1.25\upsilon}{R\sqrt{32gRs}}\right) \qquad \textbf{--- Equation 5}$$

where
- V = mean velocity (m/s)
- g = gravitational acceleration (m/s^2)
- R = hydraulic radius (m)
- k_s = hydraulic pipeline roughness (m)
- υ = kinematic viscosity of fluid (m^2/s)
- s = hydraulic gradient (energy loss per unit length due to friction)

3.1.7 On the other hand, the capacity of open channel has been calculated using the Manning's Equation:

$$V = \frac{R^{2/3} \times S^{1/2}}{n} \qquad \textbf{--- Equation 6}$$

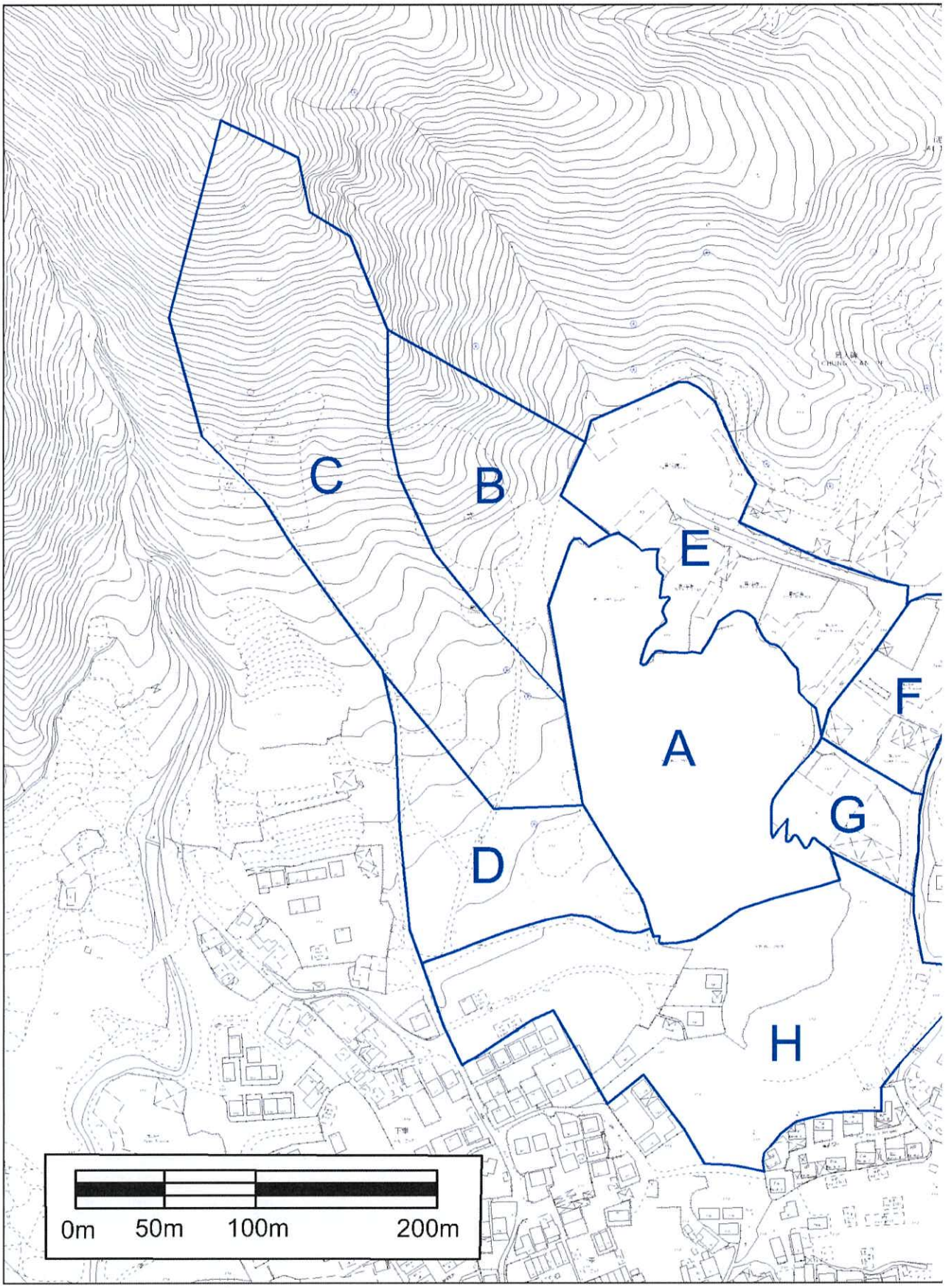
where
- V = mean velocity (m/s)
- R = hydraulic radius (m)
- n = Manning coefficient ($s/m^{1/3}$)
- s = hydraulic gradient (energy loss per unit length due to friction)

3.1.8 Since ***Equation 4*** is derived for natural catchment. It will no longer be valid for the site after the proposed development. Making reference to the rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design*, an arbitrary 5 minutes inlet time will be adopted for the calculation of runoff from the Site after proposed development.

3.2 Assessment Assumptions

Identification of Catchments

3.2.1 A total of 8 Catchments were identified in reference to the basemap obtained from Lands Department Hong Kong Map Service website in February 2024. The identified catchments as well as their flow paths has been drawn in ***Figure 3-1: Identified Catchments***



3.2.2 As no other identified stream or drainage system at the vicinity of the Site, it is anticipated all the

runoff from the identified catchments is collected through the nearby watercourse described in ***Section 2.2*** and presented in ***Figure 2-1***.

3.2.3 Catchment A is the Site. Before the proposed development, its central and south eastern corner was at lower elevation than its edge. The runoff collected in Catchment A was conveyed through the precast concrete pipe. Catchment B, C and D are the hillside and footing of Kai Kung Leung. It is estimated that the runoff generated from Catchment B, C, D will be intercepted by Catchment A. Catchment E, F, G is the open storage area at the vicinity of the site. Since the precast concrete pipe passes through Catchment G and two connection points to the pipe is found within Catchment F. The runoff from Catchment F is very likely conveyed through the concrete pipe to the watercourse. The Catchment H is currently a construction site embraced by large area of greenery before development. Based on desktop study, the site formation on the Site has already commenced, and there is concurrent construction activity within Catchment H. The photo taken in September 2020 showing the previous condition of the Site and the surrounding catchments before commencement of construction are provided in ***Appendix C***.

3.2.4 After the Proposed Development, it is anticipated that surface characteristic of the Site will be changed. After the Proposed Development, the Site will become mostly paved. The runoff coefficient of the Site will change from 0.15 to 0.91 accordingly. Even though there is concurrent construction activity on Catchment H, as a conservative approach, the surface characteristic of the construction area within Catchment H (around 30% of the Catchment H area) is assumed to be paved area. Making reference to *Stormwater Drainage Manual*, the runoff coefficient of each identified catchment at the vicinity of the site is calculated and shown in ***Table 3-1***.

Table 3-1: Surface Characteristic of Identified Catchments

Catchment ID	Area (km^2)	Surface Characteristics	Runoff Coefficient
A (before proposed development)	21586	100% flat grassland	0.15
A (after proposed development)	21586	5% flat grassland + 95% paved	0.91
B	11806	100% steep grassland	0.2
C	31282	100% steep grassland	0.2
D	10335	100% flat grassland	0.15
E	14805	100% concrete paved	0.95
F	5783	100% concrete paved	0.95
G	4190	100% concrete paved	0.95
H	27154	70% flat grassland + 30% paved	0.39

3.3 Estimation of Runoff

3.3.1 To access the drainage impact of the proposed development, the runoff generated from each catchment has been calculated with rainfall intensity of 2 years, 10 years and 50 years return period coupled with 11.1% rainfall increase projection at the middle 21st century. The design allowance is not considered in this DIA because of the temporary usage nature of the proposed development. The calculation result is shown in ***Table 3-2***. It is estimated that the proposed development will increase the runoff from the Site by 1.194m^3/s, from 0.197m^3/s to 1.391m^3/s under rainfall of 50 years returning period. The detailed calculation of runoff from each catchment under different returning period is provided in ***Appendix D***.

Table 3-2: Runoff from each Identified Catchment

Catchment	Runoff during Rainfall of each Returning Period (m^3/s)		
	2 years	10 years	50 years
A (before proposed development)	0.139	0.175	0.197

A (after proposed development)	1.01	1.253	1.391
B	0.122	0.152	0.168
C	0.25	0.318	0.361
D	0.07	0.087	0.098
E	0.649	0.813	0.911
F	0.328	0.404	0.444
G	0.225	0.278	0.307
H	0.468	0.589	0.662

3.4 Proposed Drainage Layout

Internal Drainage System

3.4.1 As mentioned in Section 3.2.3, the runoff generated in Catchment B, C, D are intercepted by Catchment A, the Site. Beside the runoff generated on site after proposed development, the internal drainage design should also take the runoff from Catchment B, C, D into consideration. Therefore, the peak runoff that will be sustained by the internal drainage system of the Site is estimated to be 2.018m^3/s.

3.4.2 In order to intercept the overland flow from the nearby catchments and convey the collected runoff to terminal manhole, two series of U-channel will be constructed along the periphery of the Site from the high point of the EVA ramp to the proposed Site entrance which is at the lowest elevation. And one additional U-channel will be constructed on the open yard of the proposed development to help convey the runoff collected in roof and rain gutters. The layout of the proposed internal drainage system has been shown in ***Figure 3-2***.

3.4.3 Based on the post development topographic level as well as the proposed U-channel layout, the site, Catchment A, can be split into 4 sub-catchments. Assuming that the distribution of runoff into each section of U-channel approximately follows the projection of catchment area on each section of channels, the required dimensions of U-channel for the internal drainage system can be estimated by the catchments they serve. The schedule of all U-channel for the proposed internal drainage system is presented in ***Table 3-3***. The sub-catchments within the Site as well as the dimension and gradient of each U-channel section is shown in ***Figure 3-3***. The typical details of the U-channel are referred to *Technical Note to Prepare a Drainage Submission* and have been provided in ***Appendix E***. The calculation of channel capacity is provided in ***Appendix F***.

Table 3-3: Channel Schedule of Proposed Internal Drainage System

Channel	Channel Section	Upstream Catchpit	Downstream Catchpit	Diameter (m)	Gradient (1 over)	Utilisation Rate
Northern Channel	01	Catchpit 09	Catchpit 08	0.225	40	61%
	02	Catchpit 08	Catchpit 07	0.225	40	61%
	03	Catchpit 07	Catchpit 06	0.225	30	53%
	04	Catchpit 06	Catchpit 05	0.3	30	64%
	05	Catchpit 05	Catchpit 04	0.3	30	64%
	06	Catchpit 04	Catchpit 03	0.375	30	61%
	07	Catchpit 03	Catchpit 02	0.375	25	55%
	08	Catchpit 02	Catchpit 01	0.375	25	55%
Southern Channel	09	Catchpit 09	Catchpit 10	0.375	30	45%
	10	Catchpit10	Point 1	0.375	30	55%
	11	Point 1	Catchpit 11	0.375	21	46%
	12	Catchpit 11	Point 2	0.45	21	39%
	13	Point 2	Catchpit 12	0.525	200	79%
	14	Catchpit 12	Catchpit 13	0.525	200	79%

	15	Catchpit 13	Catchpit 14	0.525	200	79%
	16	Catchpit 14	Catchpit 15	0.525	150	88%
	17	Catchpit 15	Catchpit 16	0.525	150	88%
Central Channel	18	Catchpit 19	Point 3	0.45	100	85%
	19	Point 3	Catchpit 18	0.45	37	52%
	20	Catchpit 18	Catchpit 17	0.45	40	54%
	21	Catchpit 17	Catchpit 16	0.45	40	54%

Note: Point 1, 2, 3 indicated the change of EVA ramp gradient. The gradient of channel is therefore changed accordingly.

External Drainage System

3.4.4 The proposed external drainage system has been drawn in ***Figure 3-4***. As mentioned in previous section, the runoff generated on site as well as the intercepting catchments will be collected by the three U-channels in the internal drainage system. The runoff collected in the U-channels will later flow through internal underground connection pipes to the terminal manhole, and will eventually flow through the external drainage system and discharge to the nearby watercourse. Since the existing precast concrete pipe on Site was found damaged during the CCTV inspection, a new external drainage system is proposed. The new discharge point is right under the footbridge across the watercourse.

3.4.5 The proposed external drainage system consists of a 1500mm underground circular precast concrete pipe in a gradient of 1:200. Because the proposed external drainage system will pass through Catchment E, the runoff generated on Catchment E will be taken into consideration in the hydraulic assessment of the external drainage system. In this regard, the total runoff flow through the 1500mm pipe will be 2.929m3/s. The calculation of flow capacity of the external drainage system is provided in **Appendix F**.

Table 3-4: Hydraulic Assessment Result of Proposed External Drainage System

From	To	Length (m)	Diameter (m)	Flow Capacity (m^3/s)	Total Runoff (m^3/s)	Utilisation Rate
Catchpit 01	Terminal Manhole	9.04	0.75	0.902	0.602	67%
Catchpit 16	Terminal Manhole	3.46	1.05	2.170	1.416	65%
Terminal Manhole	RMH-X1	1.36	1.50	5.494	2.929	53%
RMH-X1	RMH-X2	24.82	1.50	5.494	2.929	53%
RMH-X2	RMH-X3	34.09	1.50	5.494	2.929	53%
RMH-X3	RMH-X4	47.65	1.50	5.494	2.929	53%
RMH-X4	Discharge Point	6.41	1.50	5.494	2.929	53%

Existing Watercourse

3.4.6 The photos of the existing watercourse are presented in ***Figure 3-5***. The information of the existing watercourse shown in ***Appendix G*** are obtained from DSD.

3.4.7 As the proposed storm water discharge point of the proposed development is at the downstream of Location A and Location B, and at the upstream of Location C and Location D, the hydraulic assessment of the watercourse will be conducted by the estimation of available flow capacity at Location C and Location D under a 10-year sea level in conjunction with a 50-year rainfall, which is the scenario generating the maximum amount of runoff, and resulting in the highest water level in the watercourse.

3.4.8 As shown in ***Appendix G***, the peak water level at Location C of the watercourse is at 24.074mPD, and at Location D is at 20.232mPD, and the peak flow is 28.848 m^3/s and 28.990 m^3/s respectively.

The bank level of the watercourse at Location C and Location D is at 24.90mPD and 20.70mPD. Under the uniform flow condition, the velocity of an open channel depends on hydraulic radius, surface roughness, and channel gradient. With the information provided by DSD, the peak velocity and the corresponding peak water level is given, the hydraulic property of the watercourse at Location C and D can therefore be back calculated, enabling the estimation of watercourse capacity under different water level. Reserving a 300mm freeboard in reference *to Stormwater Drainage Manual*, the maximum capacity of watercourse has been calculated to be 62.72 m^3/s at Location C and 37.78 m^3/s at Location D as shown in ***Table 3-5***. The detailed calculation breakdown is shown in ***Appendix H***. Under the scenario of a 10-year sea level in conjunction with a 50-year rainfall, the available flow capacity of the watercourse at Location C and D is 33.88m^3/s and 8.8m^3/s. As Location D is at the downstream of Location C, the maximum allowable stormwater discharge to the watercourse will be 8.8m^3/s.

Table 3-5: Capacity of Watercourse at Location C and D

Location C	Water Level (mPD)	Hydraulic Radius (m)	Peak Velocity (m/s)	Peak Flow (m^3/s)	Available Capacity (m^3/s)
Existing Boundary Condition	24.074	0.71	5.40	28.85	-
300mm freeboard	24.600	0.98	6.67	62.72	33.88
Location D	**Water Level (mPD)**	**Hydraulic Radius (m)**	**Peak Velocity (m/s)**	**Peak Flow (m^3/s)**	**Available Capacity (m^3/s)**
Existing Boundary Condition	20.232	1.25	2.54	28.99	-
300mm freeboard	20.400	1.33	2.65	37.78	8.80

3.4.9 Mentioned in ***Section 3.3.1***, the additional runoff generated from the change of site characteristic during the proposed development has been estimated to be 1.194m^3/s, which is far lower than the allowable discharge 8.8m^3/s. Based on the analysis, the existing watercourse has sufficient capacity to sustain the drainage impact from the proposed development, and no adverse flooding risk due to the proposed development will be anticipated.

3.5 Summary

3.5.1 The runoff generated from the site before and after the proposed development as well as the nearby catchments has been calculated. Under rainfall intensity of 50 years returning period with consideration of climate change effect at the middle 21st century, a total of 2.018m^3/s of runoff will be intercepted by the Site, including the runoff generated on site and the adjacent hillside catchments.

3.5.2 To mitigate the drainage impact from the proposed development, three series of U-channels have been proposed as the internal drainage system to intercept overland flow and collect storm water before discharging to the existing watercourse through underground pipes.

3.5.3 The available capacity of the existing watercourse has been assessed from the information provided by DSD. It is expected that the watercourse can handle the increment of runoff caused by the proposed development.

3.5.4 No adverse impact is anticipated from the proposed development after the provision of 3 series of U-channel as internal drainage system and the proposed 1500mm underground pipe as external drainage system.

Figure 3-1: Identified Catchments

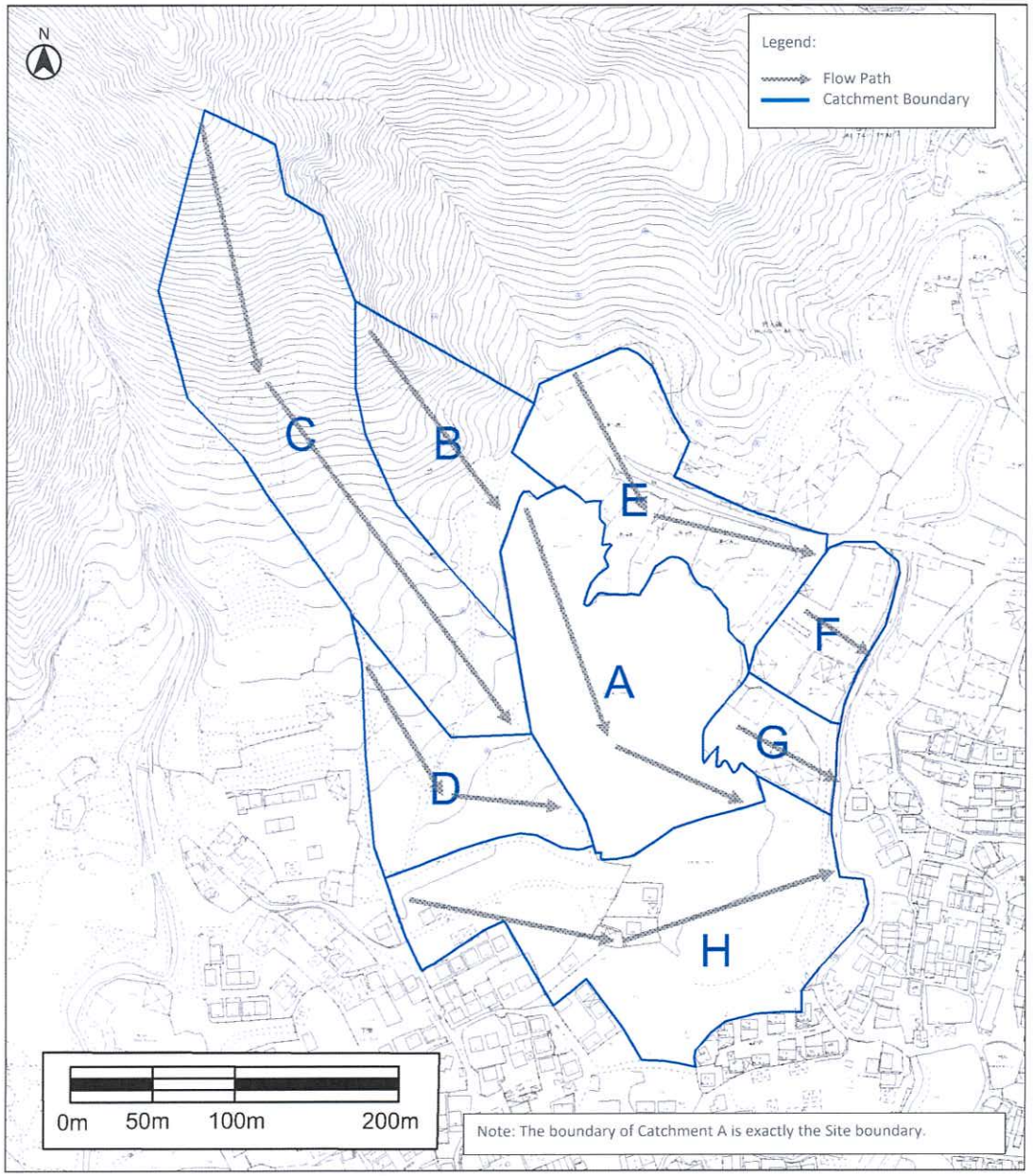


Figure 3-2: Proposed Internal Drainage System

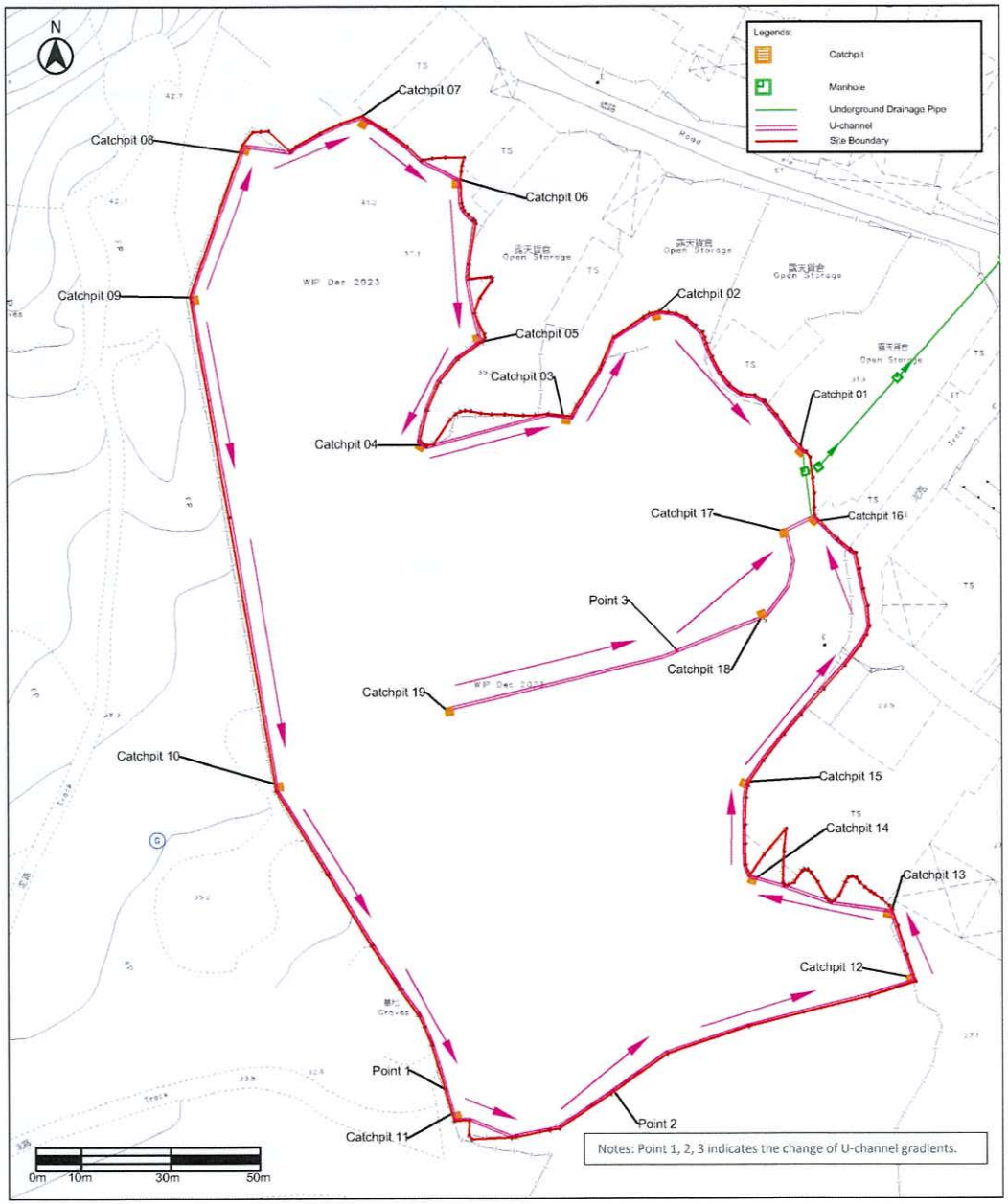


Figure 3-3: Sub-catchments within the Site

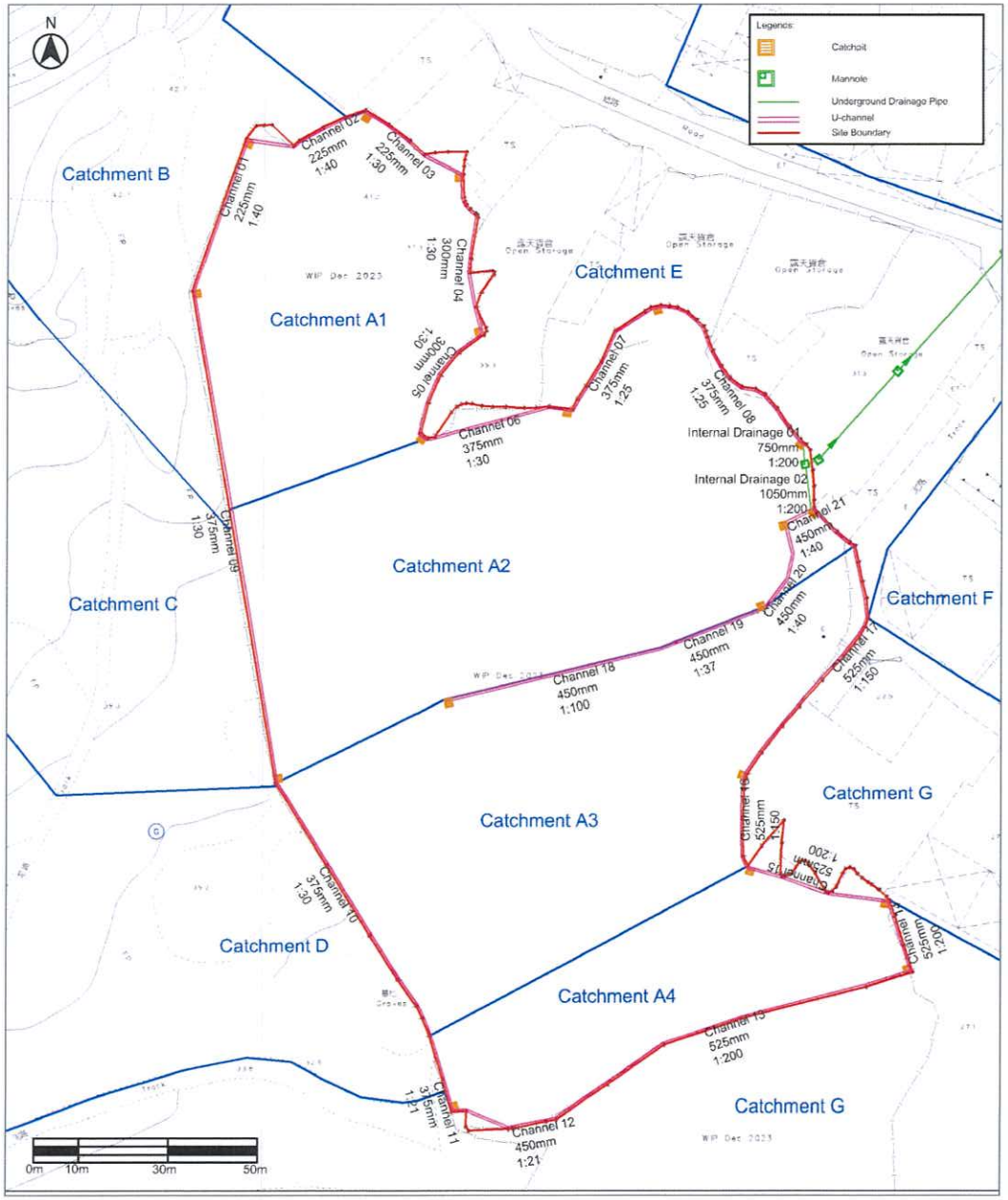


Figure 3-4: Proposed External Drainage System

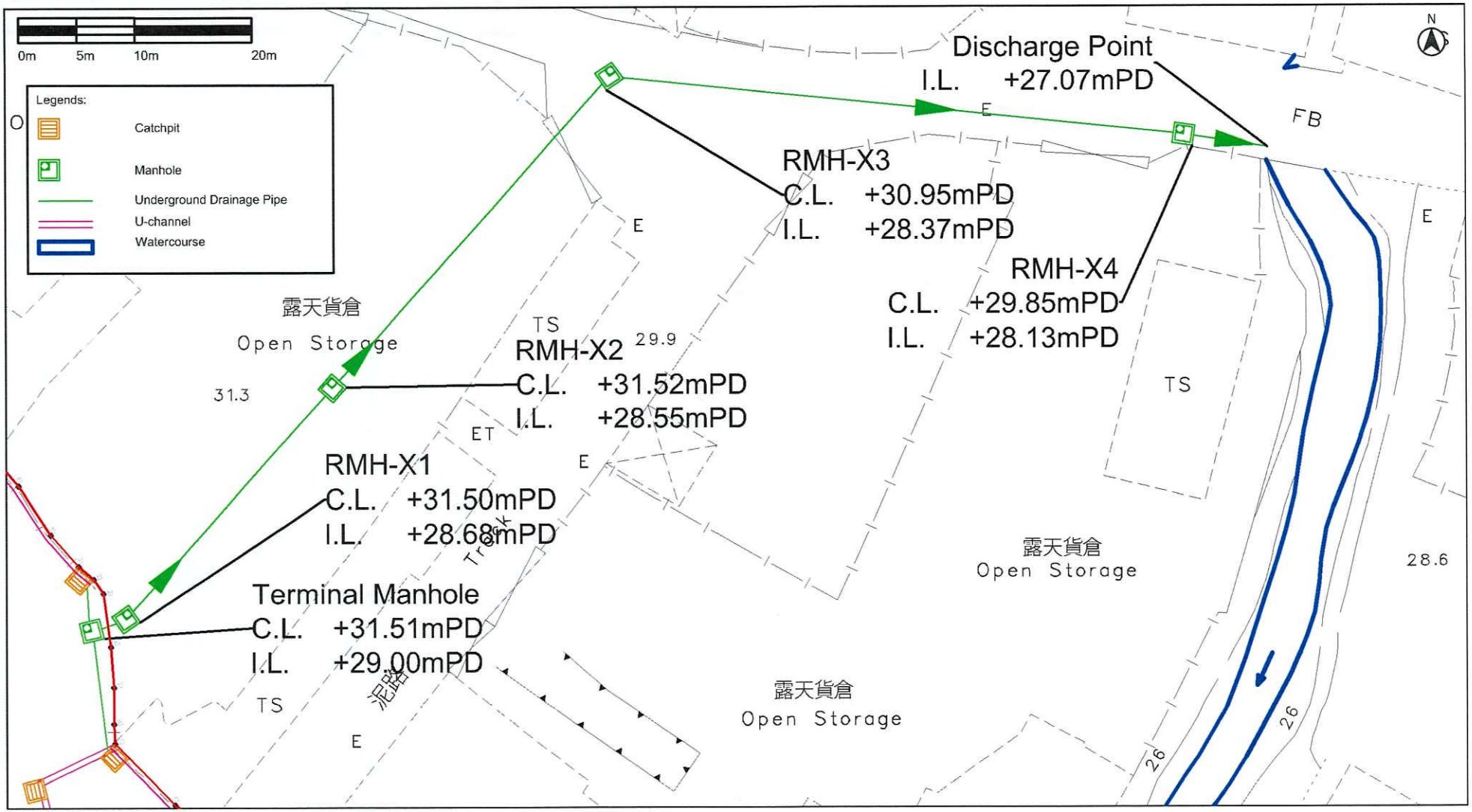
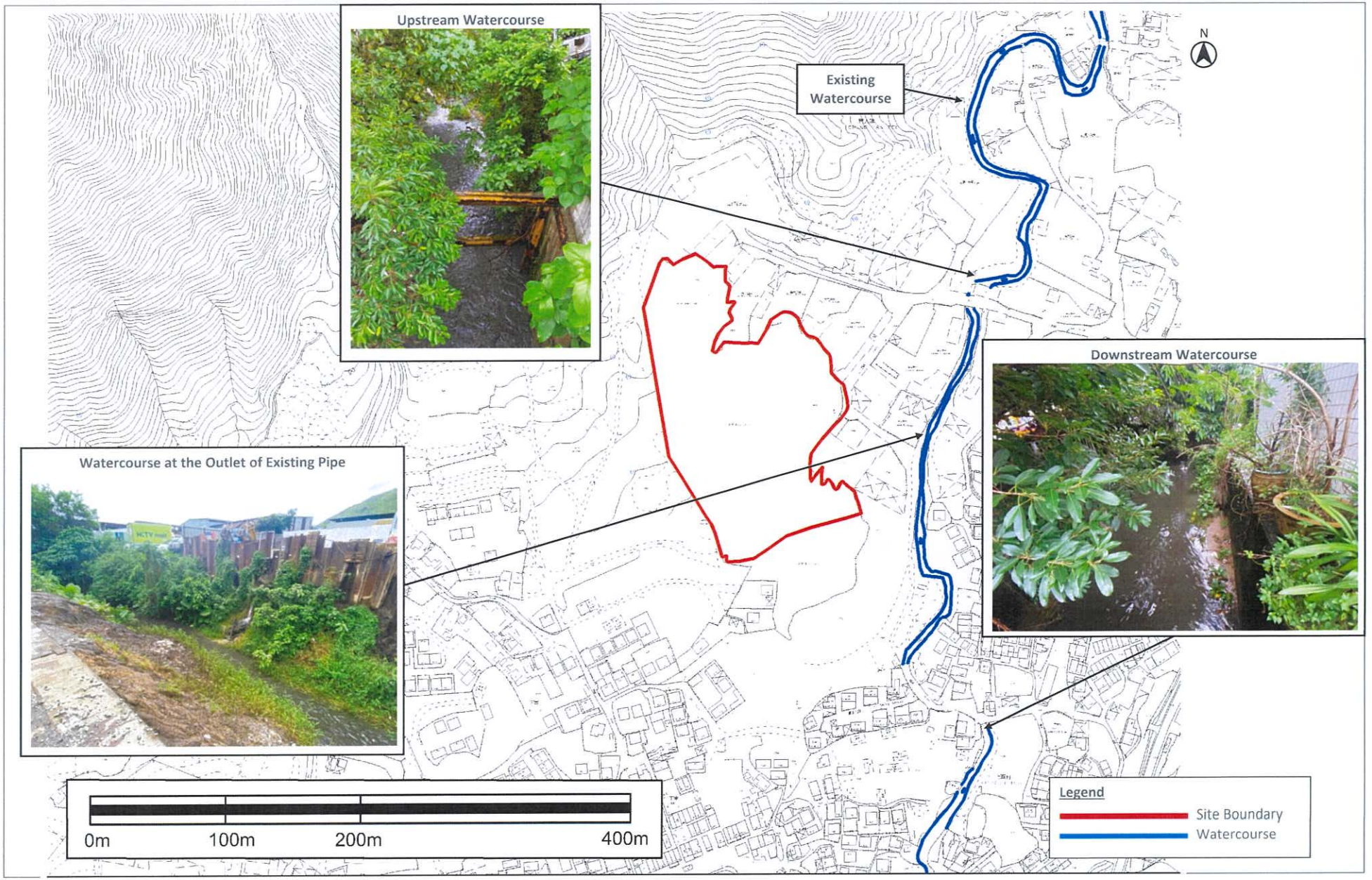


Figure 3-5: Photos of the Existing Watercourse



4 CONCLUSION

4.1.1 The surface characteristic and the drainage arrangement of the site and the nearby catchments has been discussed in this report. Potential drainage impacts that may arise from the Site after construction of the Proposed Development have been assessed.

4.1.2 The peak runoff before and after the development of the Site has been estimated using Rational Method and based on the catchment surface characteristics for the existing environment and the Proposed Development. The total runoff generated from the Site and the intercepting catchments has been estimated to be 2.018 m^3/s under the rainfall intensity of 50 years returning period with the consideration of 11.1 rainfall increase projection at the middle 21st century.

4.1.3 To mitigate the drainage impact from the proposed development, three series of U-channels have been proposed as the internal drainage system to intercept overland flow and collect storm water before discharging to the existing watercourse through underground pipes.

4.1.4 Based on the information provided by DSD, the available capacity of the existing watercourse has been assessed. It is expected that the watercourse can handle the increment of runoff caused by the proposed development.

4.1.5 No adverse impact is anticipated from the proposed development after the provision of 3 series of U-channel as internal drainage system and the construction of 1500mm underground pipe as external drainage system.

Appendix A LAYOUT PLAN OF THE PROPOSED DEVELOPMENT

WESTERN ELEVATION
EASTERN ELEVATION
SOUTHERN ELEVATION
NORTHERN ELEVATION
LEVEL-2 KEY PLAN
GYU Limited
Gabriel Yu
KAMUI
"We Built It."
LEVEL-2 KEY PLAN
1 : 350
G04

Appendix B CCTV PIPE INSPECTION REPORT

高寶渠務工程有限公司
Pipeline Drainage Ltd.

PRE-CCTV SURVEY REPORT

Work Location: Fan Kam Road,
Fanling, N.T.

CCTV Survey Date: September 23, 2020

地點 : LOCATION	**PD796 Fan Kam Road,Fanling N.T.** 新界 粉嶺 粉錦公路	PROJECT TITLE 工程名稱 : **PRE-CCTV**	DATE 日期 : **22-09-2020**	SCALE 比例: N.T.S. ■

Summary of Defects

Works Order No.					Colour CCTV Drainage Survey																		
					Pipe									Service Condition								MISC	
Item No.	Manhole		Meters (m)	Urgent	Cracked	Fractured	Broken	Deformed	Collapsed	Hole	Surface Spalling/Wear	Joint Displaced	Open Joint	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Line	Line	Survey Abandoned	camera Under Water
	From	To																					
001	S1	S2	098.8	**2**					**2**			**1**	**1**				**7**			**1**			
		Total	98.8	**2**					**2**			**1**	**1**				**7**			**1**			

Summary of Pipelines

Project/Contract/Wo No. | Slope Reference No. -

Date : 23.09.20

Location : FANLING

Drain / Sewer use : Surface water

Item	Manhole		Pipe			Manhole(From)			Grades			Remarks
	From	To	Lengths(m)	Size(mm)	Material	I.L.	C.L.	Depths(m)	SCG	ICG	SPG	
1	S1	S2	098.8	1800	CO				1	5	5	

Contract No. :
PRE-CCTV SURVEY REPORT AT
FAN KAM ROAD DD111
FANLING, N.T.

CCTV SURVEY

Works Order No. :

Summary of CCTV Survey Results:

ID	Pipe Length Ref.	Start MH	Finish MH	Survey Area	Function	Size	Grade	Length	Clean	Remarks
1	S1X	S1	S2	NT	S	1800	5	98.8m	N	FH

CCTV Survey Report

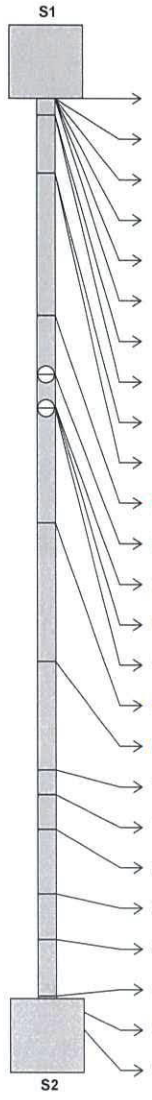
Heading

Contract No.		Operator	KELVIN LING	Date	23.09.20	ID	001
Purpose	Structural defects	Job No.		Time		PLR	S1X
Start MH	S1	Finish MH	S2	Weather	Dry	Use	Surface water
Depth		Depth		Cleaned	No	Direction	Downstream
Cover Level		Cover Level		Score	165	Pipe Length	
Invert Level		Invert Level		Grade	5	Total Length	98.8

Road	FAN KIM ROAD DD111	Size	1800 mm
Location	FANLING	Shape	Circular
Loc. Code	Light road	Material	Concrete
Area Code	-	Lining	Nil
District	NT	Comment	
Division	-	Loc. Details	
Category	Z	Tape	0001

Coding

FLOW



Video No.	1:800	Chainage	Code	Observation	Photo	Grade
0:00:00		0.0	ST	Start Of Survey		0
		0.0	MH	Manhole Remark : S1		0
		0.0	WL	Water Level, 0 % height/diameter		0
0:01:20		0.0	GP	General Photograph	001	0
		0.0	**X**	**Collapse, 15 % cross-sectional area loss, Start**		**5**
		0.0	DES	Debris Silt, 25 % cross-sectional area loss, Start		1
0:01:33		**1.8**	**X**	**Collapse, 15 % cross-sectional area loss, Finish**	**002**	**5**
		1.8	DES	Debris Silt, 25 % cross-sectional area loss, Finish		1
0:01:51		8.2	JDM	Joint Displaced Medium	003	1
		8.2	DES	Debris Silt, 05 % cross-sectional area loss		1
0:02:45		23.8	OJL	Open Joint Large	004	2
0:03:09		30.3	CN	Connection, at 12 o'clock, dia 150 mm	005	0
0:03:23		33.7	DES	Debris Silt, 05 % cross-sectional area loss	006	1
		33.7	DES	Debris Silt, 05 % cross-sectional area loss, Start		1
0:03:29		34.0	CN	Connection, at 12 o'clock, dia 150 mm	007	0
0:04:08		46.6	DES	Debris Silt, 35 % cross-sectional area loss, Change	008	1
0:04:55		61.8	DE	Debris, 40 % cross-sectional area loss	009	1
0:05:52		73.7	DES	Debris Silt, 35 % cross-sectional area loss, Finish	010	1
0:06:18		76.4	DC	Dimension Change Remark : 600MM	011	0
0:08:26		80.2	GP	General Photograph	012	0
0:09:11		87.3	GP	General Photograph	013	0
0:09:36		92.3	GP	General Photograph	014	0
0:10:06		98.5	GP	General Photograph	015	0
0:10:58		98.8	MH	Manhole Remark : S2	016	0
0:11:05		98.8	FH	Finished Survey		0

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 001 **Video Tape :** 0001, 0:01:20
Observation : General Photograph

Photo Ref. : 002 **Video Tape :** 0001, 0:01:33
Observation : Collapse, 15 % cross-sectional area loss, Finish

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 003 **Video Tape :** 0001, 0:01:51
Observation : Joint Displaced Medium

Photo Ref. : 004 **Video Tape :** 0001, 0:02:45
Observation : Open Joint Large

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 005 **Video Tape :** 0001, 0:03:09
Observation : Connection, at 12 o'clock, dia 150 mm

Photo Ref. : 006 **Video Tape :** 0001, 0:03:23
Observation : Debris Silt, 05 % cross-sectional area loss

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 007 **Video Tape :** 0001, 0:03:29
Observation : Connection, at 12 o'clock, dia 150 mm

Photo Ref. : 008 **Video Tape :** 0001, 0:04:08
Observation : Debris Silt, 35 % cross-sectional area loss, Change

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 009 **Video Tape :** 0001, 0:04:55
Observation : Debris, 40 % cross-sectional area loss

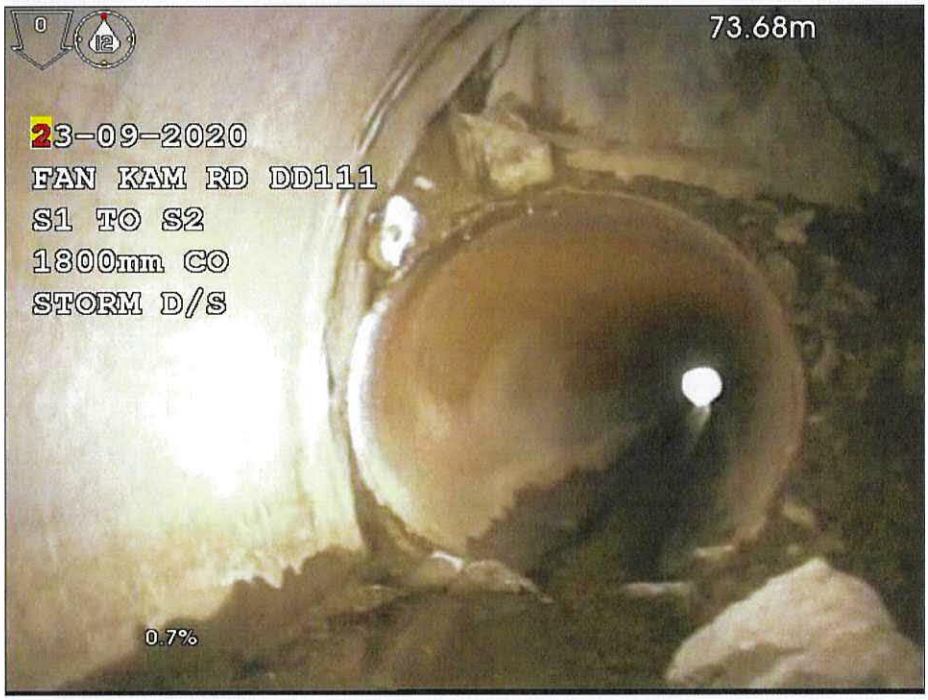


Photo Ref. : 010 **Video Tape :** 0001, 0:05:52
Observation : Debris Silt, 35 % cross-sectional area loss, Finish

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 011 **Video Tape :** 0001, 0:06:18
Observation : Dimension Change
Remark : 600MM

Photo Ref. : 012 **Video Tape :** 0001, 0:08:26
Observation : General Photograph

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

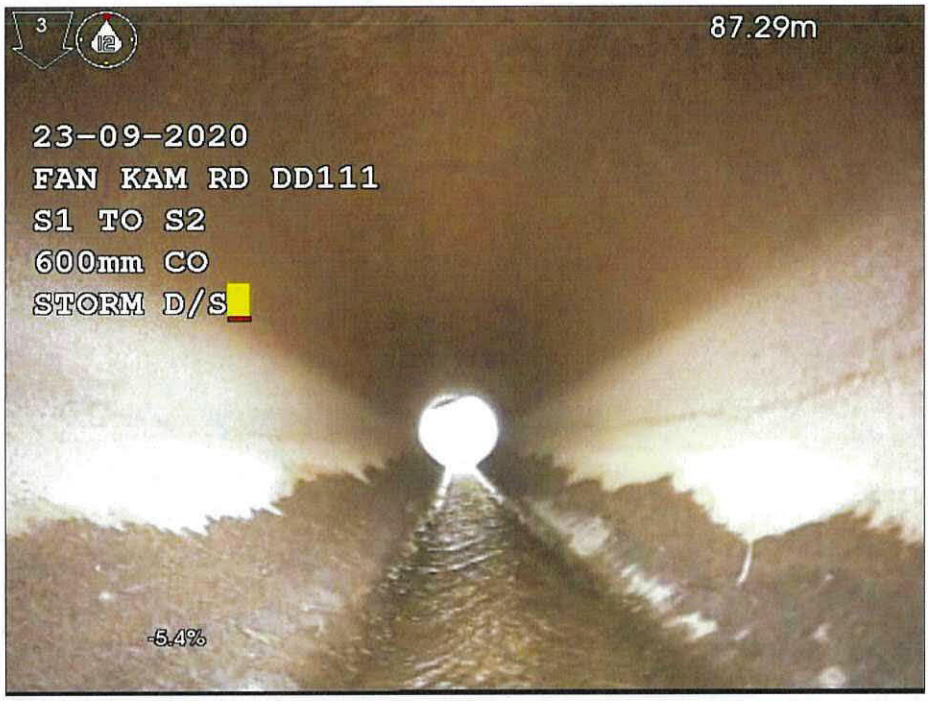


Photo Ref. : 013 **Video Tape :** 0001, 0:09:11
Observation : General Photograph

Photo Ref. : 014 **Video Tape :** 0001, 0:09:36
Observation : General Photograph

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

CCTV Photographs

Road	FAN KIM ROAD DD111	Start MH	S1	Size	1800 mm	ID	001
Location	FANLING	Finish Pt.	S2	Shape	Circular	PLR	S1X
				Material	Concrete		

Photo Ref. : 015 **Video Tape :** 0001, 0:10:06
Observation : General Photograph

Photo Ref. : 016 **Video Tape :** 0001, 0:10:58
Observation : Manhole
Remark : S2

- Structural Defects
- Service Defects
- **Structural Defects with Grade 4 or 5**
- **Service Defects with Grade 4 or 5**
- Constructional Features
- Miscellaneous Features

SUMMARY OF CODES IN ENGLISH & CHINESE

Codes for Service Condition Grade (SCG)

Type	Code	Description	註解	Grade
Service	DE G	Deposits Attached Grease	依附物- 油脂	#1
	DE S	Deposits Settled Debris / silt	依附物- 垃圾碎 / 淤泥	#1
	DE	Deposits Settled Others	依附物- 硬物 及 其他	#1
	E L (J)	Encrustation Light (<5%) (at joint)	輕微凝結物 (<5%)	2
	E M (J)	Encrustation Medium (5% - 20%) (at joint)	中度凝結物 (5% - 20%)	4
	E H (J)	Encrustation Heavy (>20%) (at joint)	嚴重凝結物 (>20%)	5
	I S (J)	Infiltration Seeping (at joint)	滲漏	2
	I D (J)	Infiltration Dripping (at joint)	滴漏	2
	I R (J)	Infiltration Running (at joint)	湧漏	4
	I G (J)	Infiltration Gushing (at joint)	噴漏	5
	CU	Loss of Vision Camera Under Water	失去影像	0
	OB	Obstacles	阻塞	5
	R F (J)	Roots Fine (at joint)	根鬚	2
	R T (J)	Roots Tap (>10mm) (at joint)	根枝 (>10mm)	3
	R M (J)	Roots Mass (at joint)	根堆	#2

#1 The grade for the these defects follows the % cross section loss:
≦ 5%: Grade 1 >5% and <25%: Grade 2 ≧ 25% and ≦ 50%: Grade 3
>50% and ≦ 75%: Grade 4 >75% and ≦ 100%: Grade 5

#2 The grade for Roots Mass follows the % of cross section loss:
≦ 5%: Grade 3 >5% and <25%: Grade 4 ≧ 25% and ≦ 100%: Grade 5

Codes for Internal (Structural) Condition Grade (ICG)

Type	Code	Description	註解	Grade
Structure	B	Broken Pipework	管道破裂	4
	C L	Crack Longitudinal	直裂紋	1
	C C	Crack Circumferential	環形裂紋	1
	C M	Crack Multiple	複合裂紋	2
	D V	Deformation Vertical (more than 25% as Collapse)	管道變形垂直 (多於 25%給予 Collapse)	#3
	D H	Deformation Horizontal (more than 25% as Collapse)	管道變形水平 (多於 25%給予 Collapse)	#3
	D B	Displaced Bricks	磚塊移位	3
	D I	Dropped Invert	行水沉降	3
	F L	Fracture Longitudinal	直裂縫	3
	F C	Fracture Circumferential	環形裂縫	3
	F M	Fracture Multiple	複合裂縫	4
	H	Hole	管道穿孔	4
	JD (M)	Joint Displaced Medium (1-1.5 pipe	接口移位中型 (1-1.5t)	2
	JD (L)	Joint Displaced Large (>1.5 Pipe thickness)	接口移位大型 (>1.5t)	3
	M S	Mortar missing Surface	表面沙漿丟失輕度	1
	M M	Mortar missing Medium	表面沙漿丟失中度	2
	M T	Mortar missing Total	表面沙漿丟失深度	3
	OJ (M)	Open Joint Medium (1-1.5 Pipe thickness)	接口離位中型 (1-1.5t)	1
	OJ (L)	Open Joint Large (>1.5 Pipe thickness)	接口離位大型 (>1.5t)	2
	SS S	Surface Spalling Slight	表面剝落輕度	1
	SS M	Surface Spalling Medium	表面剝落中度	2
	SS L	Surface Spalling Large	表面剝落深度	3
	SW S	Surface Wear Slight	表面磨損輕度	1
	SW M	Surface Wear Medium	表面磨損中度	2
	SW L	Surface Wear Large	表面磨損深度	3
	X	Collapse Pipe	管道倒塌	5

#3 The grade for DV and DH follows the % deformation:
≦ 5%: Grade 3 >5% and <25%: Grade 4

Codes for Internal (Structural) Condition Grade (ICG)				
Type	Code	Description	註解	Grade
Junction & Connection	CN	Connection	分支連接 (後加)	0
	CX	Collection Defective	分支連接	3
	CX I	Collection Defective Pipe Intruding	分支連接插入	4
	JN	Junction	分支連駁 (預製)	0
	JX	Junction Defective	分支連駁損壞	4
Repair DF	LN	Lining Defect	管道內套缺損	4

Others Codes				
Type	Code	Description	註解	Grade
Nodes	MH	Manhole	沙井	0
	BR	Major Branch (Without Cover)	主要分支 (暗井)	0
	GY	Gully	集水沟	0
	CP	Catchpit	截留井	0
	OS	Oil Separator	隔油井	0
Miscellaneous	SC	Shape Change	形狀改變	0
	DC	Dimension Change	尺寸改變	0
	MC	Material Change	物料改變	0
	PC	Pipe Unit Length Change	管道基本長度改變	0
	FH	Finish Survey	完成查勘	0
	GP	General Photograph	一般影相位	0
	L L	Line Deviates Left	管道轉向左	0
	L R	Line Deviates Right	管道轉向右	0
	L U	Line Deviates Up	管道轉向上	0
	L D	Line Deviates Down	管道轉向下	0
	WL	Water Level	水位	0
	V	Vermin	害蟲	0
	ST	Start Survey / Inspection	開始查勘	0
	SA	Survey Abandoned	放棄查勘	0
	UTS	Unable To Survey	沙井滿水/滿料/渠道已經作廢	0
	UTR	Unable To Raise Manhole Cover	沙井蓋不能提起	0
	UTL	Unable To Locate Manhole	找不到沙井	0

Defect Grade Description

Structural & Service Grade for pipeline		
Grade	Appropriate response in normal circumstances	Mean Score
0	No defect was found	0
1	Normal condition	<5
2	Acceptable condition	5 to 19.9
3	Need to consider the area surrounding the sewer and the probability of environmental impact if no action taken	20 to 39.9
4	Fairly urgent, look at the sewer briefly, engineering and environmental improvement are needed	40 to 82
5	Urgent, look at the sewer, and add engineering and environmental improvements immediately	>82

DEVELOP

This is to certify that

Lam Wai Keung

attended the course

Pipe Sewer Condition Classification
and successfully passed the examination
to MSCC5

at

Hong Kong

on

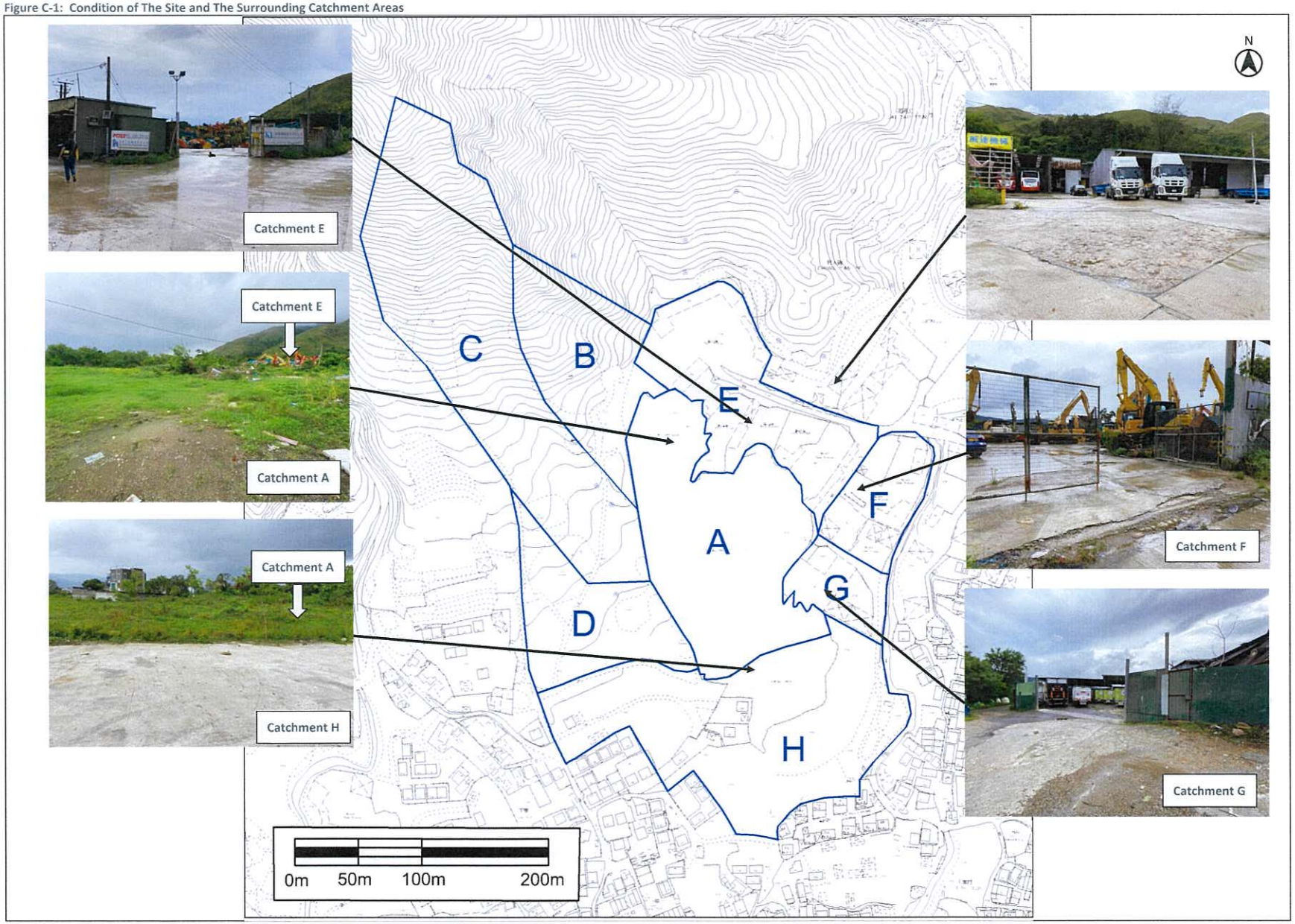
8th to 12th April 2019

Certificate No. 2740/19

00058278

Appendix C CONDITION OF THE SITE AND THE SURROUNDING CATCHMENTS

Figure C-1: Condition of The Site and The Surrounding Catchment Areas



Appendix D RUNOFF CALCULATION

Calculation of Runoff for Return Period of 2 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_0), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Catchment A (Site)	0.0216	4.77	234.9	9.16	9.16	499.8	4.26	0.494	138.56	0.15	0.0032	0.139
Catchment B	0.0118	36.14	175.0	4.84	4.84	499.8	4.26	0.494	167.93	0.20	0.0024	0.122
Catchment C	0.0313	28.94	427.0	11.19	11.19	499.8	4.26	0.494	129.25	0.20	0.0063	0.250
Catchment D	0.0103	7.66	206.6	7.89	7.89	499.8	4.26	0.494	145.54	0.15	0.0016	0.070
Catchment E	0.0148	5.40	183.4	7.25	7.25	499.8	4.26	0.494	149.51	0.95	0.0141	0.649
Catchment F	0.0058	6.51	61.5	2.57	2.57	499.8	4.26	0.494	193.45	0.95	0.0055	0.328
Catchment G	0.0042	7.82	80.6	3.35	3.35	499.8	4.26	0.494	183.35	0.95	0.0040	0.225
Catchment H	0.0272	4.61	216.7	8.32	8.32	499.8	4.26	0.494	143.09	0.39	0.0106	0.468
											Total (General Scenario)	**2.251**

After the Proposed Development												
Catchment A (Site)	0.0216	-	-	5.00	5.00	499.8	4.26	0.494	166.45	0.91	0.0196	1.010
Catchment B	0.0118	36.14	175.0	4.84	4.84	499.8	4.26	0.494	167.93	0.20	0.0024	0.122
Catchment C	0.0313	28.94	427.0	11.19	11.19	499.8	4.26	0.494	129.25	0.20	0.0063	0.250
Catchment D	0.0103	7.66	206.6	7.89	7.89	499.8	4.26	0.494	145.54	0.15	0.0016	0.070
Catchment E	0.0148	5.40	183.4	7.25	7.25	499.8	4.26	0.494	149.51	0.95	0.0141	0.649
Catchment F	0.0058	6.51	61.5	2.57	2.57	499.8	4.26	0.494	193.45	0.95	0.0055	0.328
Catchment G	0.0042	7.82	80.6	3.35	3.35	499.8	4.26	0.494	183.35	0.95	0.0040	0.225
Catchment H	0.0272	4.61	216.7	8.32	8.32	499.8	4.26	0.494	143.09	0.39	0.0106	0.468
											Total (General Scenario)	**3.122**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018* and *Stormwater Drainage Manual Corrigendum No.1/2022*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Calculation of Runoff for Return Period of 10 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_o), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Catchment A (Site)	0.0216	4.77	234.9	9.16	9.16	471.9	3.02	0.397	174.90	0.15	0.0032	0.175
Catchment B	0.0118	36.14	175.0	4.84	4.84	471.9	3.02	0.397	208.19	0.20	0.0024	0.152
Catchment C	0.0313	28.94	427.0	11.19	11.19	471.9	3.02	0.397	164.53	0.20	0.0063	0.318
Catchment D	0.0103	7.66	206.6	7.89	7.89	471.9	3.02	0.397	182.72	0.15	0.0016	0.087
Catchment E	0.0148	5.40	183.4	7.25	7.25	471.9	3.02	0.397	187.20	0.95	0.0141	0.813
Catchment F	0.0058	6.51	61.5	2.57	2.57	471.9	3.02	0.397	238.29	0.95	0.0055	0.404
Catchment G	0.0042	7.82	80.6	3.35	3.35	471.9	3.02	0.397	226.20	0.95	0.0040	0.278
Catchment H	0.0272	4.61	216.7	8.32	8.32	471.9	3.02	0.397	179.98	0.39	0.0106	0.589
											Total (General Scenario)	**2.816**

After the Proposed Development												
Catchment A (Site)	0.0216	-	-	5.00	5.00	471.9	3.02	0.397	206.49	0.91	0.0196	1.253
Catchment B	0.0118	36.14	175.0	4.84	4.84	471.9	3.02	0.397	208.19	0.20	0.0024	0.152
Catchment C	0.0313	28.94	427.0	11.19	11.19	471.9	3.02	0.397	164.53	0.20	0.0063	0.318
Catchment D	0.0103	7.66	206.6	7.89	7.89	471.9	3.02	0.397	182.72	0.15	0.0016	0.087
Catchment E	0.0148	5.40	183.4	7.25	7.25	471.9	3.02	0.397	187.20	0.95	0.0141	0.813
Catchment F	0.0058	6.51	61.5	2.57	2.57	471.9	3.02	0.397	238.29	0.95	0.0055	0.404
Catchment G	0.0042	7.82	80.6	3.35	3.35	471.9	3.02	0.397	226.20	0.95	0.0040	0.278
Catchment H	0.0272	4.61	216.7	8.32	8.32	471.9	3.02	0.397	179.98	0.39	0.0106	0.589
											Total (General Scenario)	**3.894**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018* and *Stormwater Drainage Manual Corrigendum No.1/2022*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Calculation of Runoff for Return Period of 50 Years

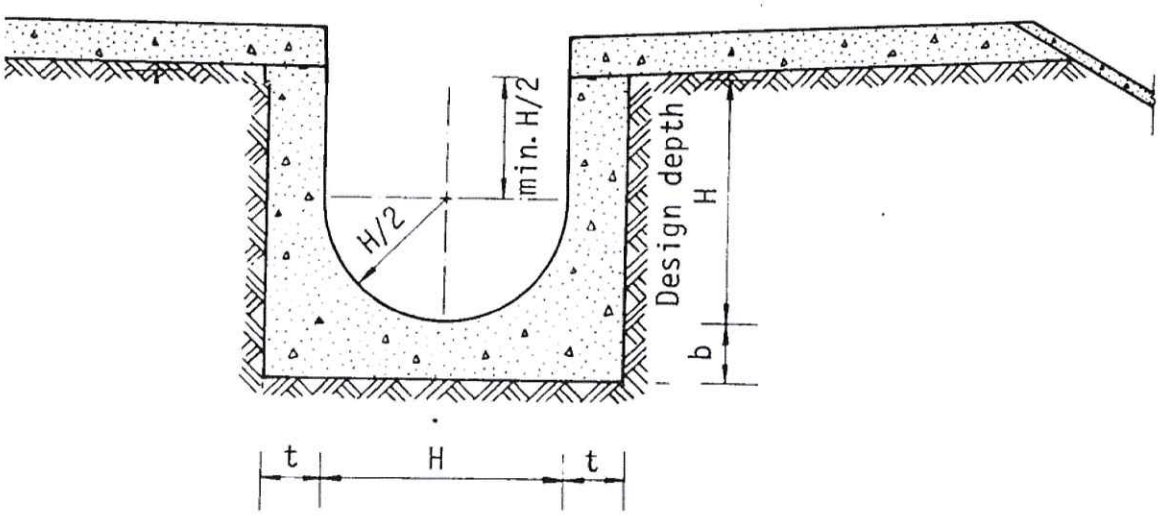
Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_o), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Catchment A (Site)	0.0216	4.77	234.9	9.16	9.16	451.3	2.46	0.337	197.44	0.15	0.0032	0.197
Catchment B	0.0118	36.14	175.0	4.84	4.84	451.3	2.46	0.337	231.00	0.20	0.0024	0.168
Catchment C	0.0313	28.94	427.0	11.19	11.19	451.3	2.46	0.337	187.02	0.20	0.0063	0.361
Catchment D	0.0103	7.66	206.6	7.89	7.89	451.3	2.46	0.337	205.30	0.15	0.0016	0.098
Catchment E	0.0148	5.40	183.4	7.25	7.25	451.3	2.46	0.337	209.80	0.95	0.0141	0.911
Catchment F	0.0058	6.51	61.5	2.57	2.57	451.3	2.46	0.337	261.83	0.95	0.0055	0.444
Catchment G	0.0042	7.82	80.6	3.35	3.35	451.3	2.46	0.337	249.36	0.95	0.0040	0.307
Catchment H	0.0272	4.61	216.7	8.32	8.32	451.3	2.46	0.337	202.54	0.39	0.0106	0.662
											Total (General Scenario)	**3.148**

After the Proposed Development												
Catchment A (Site)	0.0216	-	-	5.00	5.00	451.3	2.46	0.337	229.27	0.91	0.0196	1.391
Catchment B	0.0118	36.14	175.0	4.84	4.84	451.3	2.46	0.337	231.00	0.20	0.0024	0.168
Catchment C	0.0313	28.94	427.0	11.19	11.19	451.3	2.46	0.337	187.02	0.20	0.0063	0.361
Catchment D	0.0103	7.66	206.6	7.89	7.89	451.3	2.46	0.337	205.30	0.15	0.0016	0.098
Catchment E	0.0148	5.40	183.4	7.25	7.25	451.3	2.46	0.337	209.80	0.95	0.0141	0.911
Catchment F	0.0058	6.51	61.5	2.57	2.57	451.3	2.46	0.337	261.83	0.95	0.0055	0.444
Catchment G	0.0042	7.82	80.6	3.35	3.35	451.3	2.46	0.337	249.36	0.95	0.0040	0.307
Catchment H	0.0272	4.61	216.7	8.32	8.32	451.3	2.46	0.337	202.54	0.39	0.0106	0.662
											Total (General Scenario)	**4.342**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018* and *Stormwater Drainage Manual Corrigendum No.1/2022*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Appendix E DRAWING OF TYPICAL DETAILS OF U-CHANNEL


min. H/2
H/2
Design depth
H
b
t
H
t

Appendix F CALCULATION OF PROPSED DRAINAGE SYSTEM CAPACITY

Calculation of Proposed Channel Capacity for Return Period of 50 Years

Drainage Capacity of Internal Drainage System (U-channel)

Channel	Channel Section	Upstream Catchpit	Downstream Catchpit	Shape	Depth (m)	Diameter (m)	gradient (1 over)	Length (m)	s	A_w	P_w	R	n	V	Q_C	Involved Catchment	Qn (m^3/s)	% of capacity	Remark
Northern Channel	Channel 01	Catchpit 09	Catchpit 08	U-Shape	0.1125	0.225	40	35.37	0.0250	0.0452	0.5784	0.0781	0.016	1.806	0.073	80%B	0.134	61%	OK
	Channel 02	Catchpit 08	Catchpit 07	U-Shape	0.1125	0.225	40	28.26	0.0250	0.0452	0.5784	0.0781	0.016	1.806	0.073	80%B	0.134	61%	OK
	Channel 03	Catchpit 07	Catchpit 06	U-Shape	0.1125	0.225	30	25.81	0.0333	0.0452	0.5784	0.0781	0.016	2.085	0.085	80%B	0.134	53%	OK
	Channel 04	Catchpit 06	Catchpit 05	U-Shape	0.15	0.3	30	37.08	0.0333	0.0803	0.7712	0.1042	0.016	2.526	0.183	80%A1 + 80%B	0.350	64%	OK
	Channel 05	Catchpit 05	Catchpit 04	U-Shape	0.15	0.3	30	28.90	0.0333	0.0803	0.7712	0.1042	0.016	2.526	0.183	80%A1 + 80%B	0.350	64%	OK
	Channel 06	Catchpit 04	Catchpit 03	U-Shape	0.1875	0.375	30	33.66	0.0333	0.1255	0.9640	0.1302	0.016	2.932	0.331	80%A1 + 50%A2 + 80%B	0.602	61%	OK
	Channel 07	Catchpit 03	Catchpit 02	U-Shape	0.1875	0.375	25	33.07	0.0400	0.1255	0.9640	0.1302	0.016	3.211	0.363	80%A1 + 50%A2 + 80%B	0.602	55%	OK
	Channel 08	Catchpit 02	Catchpit 01	U-Shape	0.1875	0.375	25	45.66	0.0400	0.1255	0.9640	0.1302	0.016	3.211	0.363	80%A1 + 50%A2 + 80%B	0.602	55%	OK
Southern Channel	Channel 09	Catchpit 09	Catchpit 10	U-Shape	0.1875	0.375	30	111.78	0.0333	0.1255	0.9640	0.1302	0.016	2.932	0.331	20%A1 + 20%B + 100%C	0.449	45%	OK
	Channel 10	Catchpit10	Point 1	U-Shape	0.1875	0.375	30	74.55	0.0333	0.1255	0.9640	0.1302	0.016	2.932	0.331	20%A1 + 20%B + 100%C + 100%D	0.547	55%	OK
	Channel 11	Point 1	Catchpit 11	U-Shape	0.1875	0.375	21	7.20	0.0476	0.1255	0.9640	0.1302	0.016	3.504	0.396	20%A1 + 20%B + 100%C + 100%D	0.547	46%	OK
	Channel 12	Catchpit 11	Point 2	U-Shape	0.225	0.45	21	38.12	0.0476	0.1808	1.1569	0.1563	0.016	3.957	0.644	20%A1 + 100%A4 + 20%B + 100%C + 100%D	0.744	39%	OK
	Channel 13	Point 2	Catchpit 12	U-Shape	0.2625	0.525	200	72.49	0.0050	0.2461	1.3497	0.1823	0.016	1.421	0.315	20%A1 + 100%A4 + 20%B + 100%C + 100%D	0.744	79%	OK
	Channel 14	Catchpit 12	Catchpit 13	U-Shape	0.2625	0.525	200	15.95	0.0050	0.2461	1.3497	0.1823	0.016	1.421	0.315	20%A1 + 100%A4 + 20%B + 100%C + 100%D	0.744	79%	OK
	Channel 15	Catchpit 13	Catchpit 14	U-Shape	0.2625	0.525	200	32.63	0.0050	0.2461	1.3497	0.1823	0.016	1.421	0.315	20%A1 + 100%A4 + 20%B + 100%C + 100%D	0.744	79%	OK
	Channel 16	Catchpit 14	Catchpit 15	U-Shape	0.2625	0.525	150	20.91	0.0067	0.2461	1.3497	0.1823	0.016	1.641	0.363	20%A1 + 25%A3 + 100%A4 + 20%B + 100%C + 100%D	0.849	78%	OK
	Channel 17	Catchpit 15	Catchpit 16	U-Shape	0.2625	0.525	150	73.86	0.0067	0.2461	1.3497	0.1823	0.016	1.641	0.363	20%A1 + 25%A3 + 100%A4 + 20%B + 100%C + 100%D	0.849	78%	OK
Central Channel	Channel 18	Catchpit 19	Point 3	U-Shape	0.225	0.45	100	53.35	0.0100	0.1808	1.1569	0.1563	0.016	1.813	0.295	50%A2 + 75%A3	0.567	64%	OK
	Channel 19	Point 3	Catchpit 18	U-Shape	0.225	0.45	37	21.63	0.0270	0.1808	1.1569	0.1563	0.016	2.981	0.485	50%A2 + 75%A3	0.567	39%	OK
	Channel 20	Catchpit 18	Catchpit 17	U-Shape	0.225	0.45	40	21.02	0.0250	0.1808	1.1569	0.1563	0.016	2.867	0.466	50%A2 + 75%A3	0.567	41%	OK
	Channel 21	Catchpit 17	Catchpit 16	U-Shape	0.225	0.45	40	6.64	0.0250	0.1808	1.1569	0.1563	0.016	2.867	0.466	50%A2 + 75%A3	0.567	41%	OK

Remark: In reference to *Stormwater Drainage Manual* Table 13, the manning's roughness coefficient is taken as concrete line surface under fair condition, the effect of sedimentation is considered through deducting flow capacity by 10%.

Legend

D = diameter, m
A_w = Cross Section Area of Flow, m^2
P_w = Wetted Perimeter, m
R = Hydraulic Radius = A_w/P_w, m
s = Hydraulic Gradient
n = Manning's roughness coefficient
V = Mean Velocity, m/s
Q_C = Flow Capacity, m^3/s
Q_p = Estimated Peak Flow, m^3/s

Calculation of Proposed Pipe Capacity for Return Period of 50 Years

Drainage Capacity of Proposed External Drainage System

From	To	Description	Length	d	r	A_w	P_w	R	s	k_s	V	Q_c	Q_p	% of capacity	Remark
			m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m^3/s	%	
Catchpit 01	Terminal Manhole	Internal drainage 01	9.04	0.75	0.375	0.442	2.356	0.188	0.005	0.15	2.267	0.902	0.6019	67%	OK
Catchpit 16	Terminal Manhole	Internal drainage 02	3.46	1.05	0.525	0.866	3.299	0.263	0.005	0.15	2.784	2.17	1.4161	65%	OK
Terminal Manhole	RMH-X1	external drainage 01	1.36	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.929	53%	OK
RMH-X1	RMH-X2	external drainage 02	24.82	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.929	53%	OK
RMH-X2	RMH-X3	external drainage 03	34.09	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.929	53%	OK
RMH-X3	RMH-X4	external drainage 04	47.65	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.929	53%	OK
RMH-X4	Discharge Point	external drainage 05	6.41	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.929	53%	OK

Remark: In reference to *Stormwater Drainage Manual* Table 14, the surface roughness value is taken as precast concrete pipe with 'O' ring joints under poor condition, the effect of sedimentation is considered by deducting flow capacity by 10%.

Legend

d = pipe diameter, m

r = pipe radius (m) = 0.5d

A_w = wetted area (m^2) = πr^2

P_w = wetted perimeter (m) = $2\pi r$

R = Hydraulic radius (m) = A_w/P_w

s = Slope of the total energy line

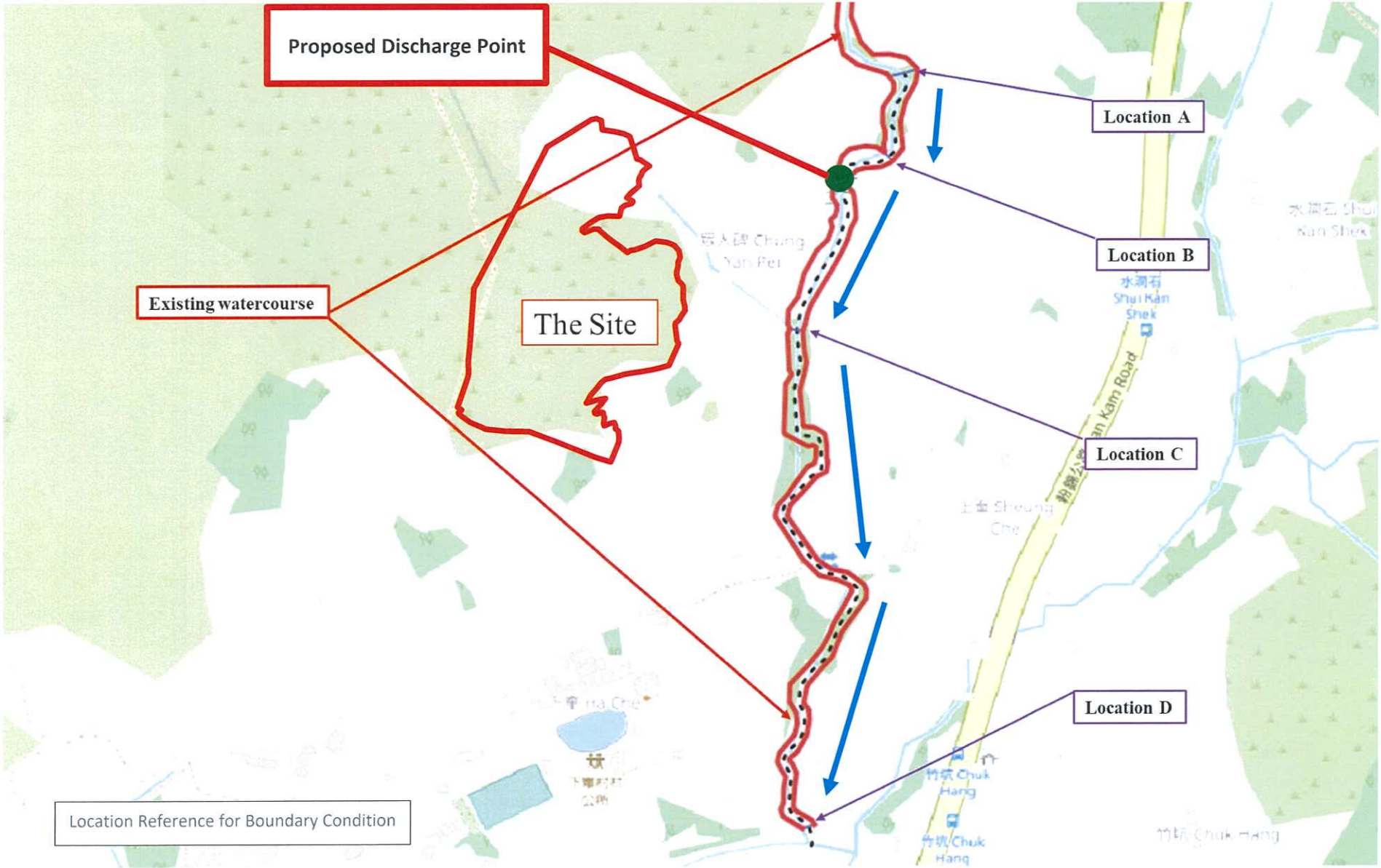
k_s = equivalent sand roughness, mm

V = Velocity of flow calculated based on Colebrook White Equation, m/s

Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s

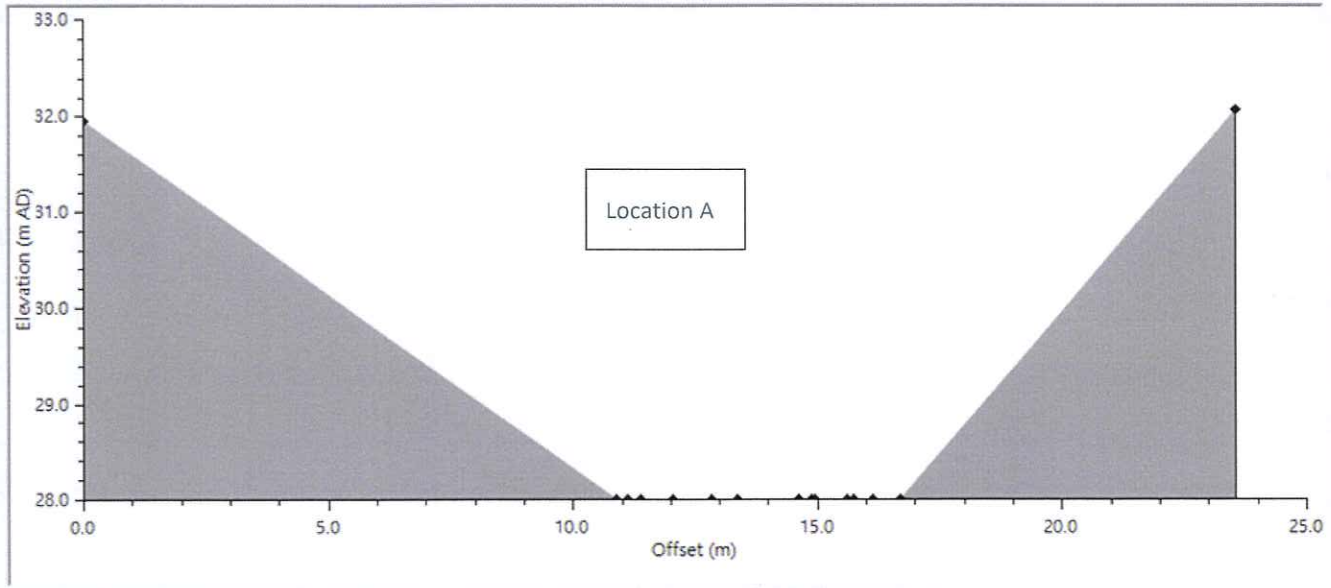
Q_p = Estimated total peak flow from the pipe

Appendix G INFORMATION OF EXISTING WATERCOURSE


Proposed Discharge Point
Existing watercourse
The Site
Location A
Location B
Location C
Location D
Location Reference for Boundary Condition

Cross section line : P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02! : Section data

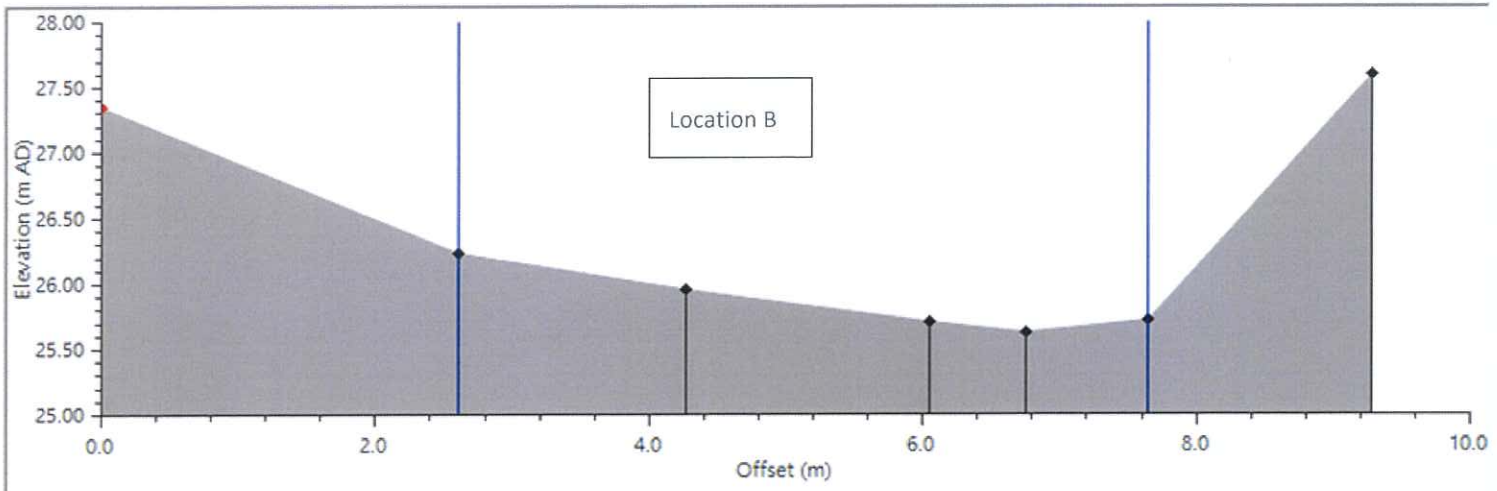
	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827996.759	834897.266	31.955	0.0160	☐
2	10.896	827986.382	834893.946	28.000	0.0160	☐
3	11.130	827986.152	834893.900	28.000	0.0160	☐
4	11.391	827985.897	834893.850	28.000	0.0160	☐
5	12.042	827985.259	834893.721	28.000	0.0160	☐
6	12.822	827984.493	834893.567	28.000	0.0160	☐
7	13.347	827983.978	834893.466	28.000	0.0160	☐
8	14.606	827982.743	834893.226	28.000	0.0160	☐
9	14.878	827982.475	834893.174	28.000	0.0160	☐
10	14.924	827982.430	834893.166	28.000	0.0160	☐
11	15.614	827981.753	834893.034	28.000	0.0160	☐
12	15.734	827981.635	834893.014	28.000	0.0160	☐
13	16.137	827981.238	834892.946	28.000	0.0160	☐



OK Cancel

Cross section line : P01_P_LAI TAU_160530_a : Section data

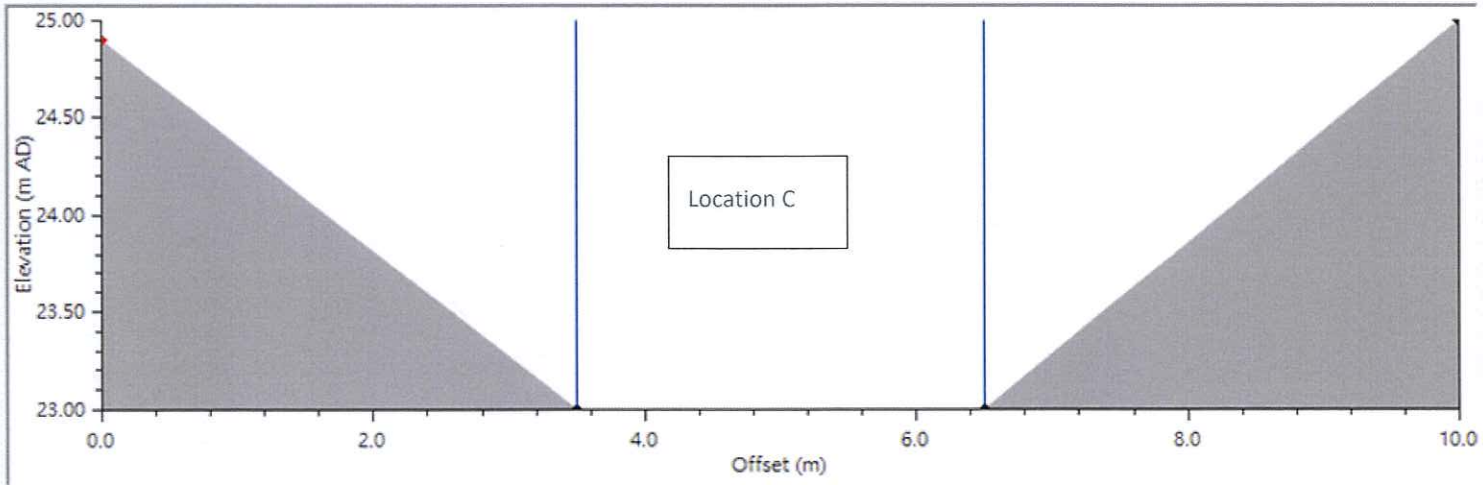
	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827976.997	834823.522	27.350	0.0160	☐
2	2.600	827975.173	834825.375	26.240	0.0160	☒
3	4.270	827974.002	834826.565	25.960	0.0160	☐
4	6.050	827972.753	834827.834	25.710	0.0160	☐
5	6.750	827972.262	834828.333	25.620	0.0160	☐
6	7.640	827971.638	834828.967	25.720	0.0160	☒
7	9.280	827970.488	834830.136	27.600	0.0160	☐



OK Cancel

Cross section line : P01_P_LAI TAU_160900 : Section data

	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827906.112	834687.532	24.900	0.0160	☐
2	3.500	827902.649	834688.040	23.000	0.0160	☒
3	6.500	827899.681	834688.475	23.000	0.0160	☒
4	10.000	827896.218	834688.982	25.000	0.0160	☐



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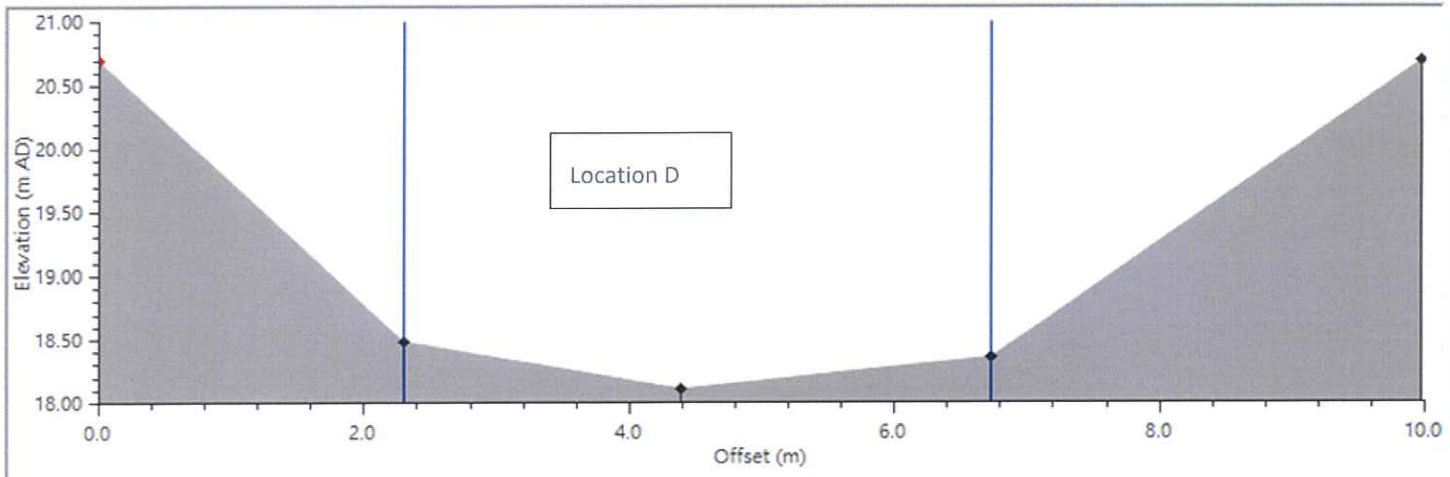
Cross section line : P01_P_LAI TAU_161180_a : Section data

	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827915.891	834292.642	20.700	0.0160	☐
2	2.305	827913.697	834291.934	18.480	0.0160	☒
3	4.386	827911.702	834291.343	18.110	0.0160	☐
4	6.733	827909.453	834290.669	18.360	0.0160	☒
5	9.972	827906.380	834289.645	20.700	0.0160	☐



OK Cancel

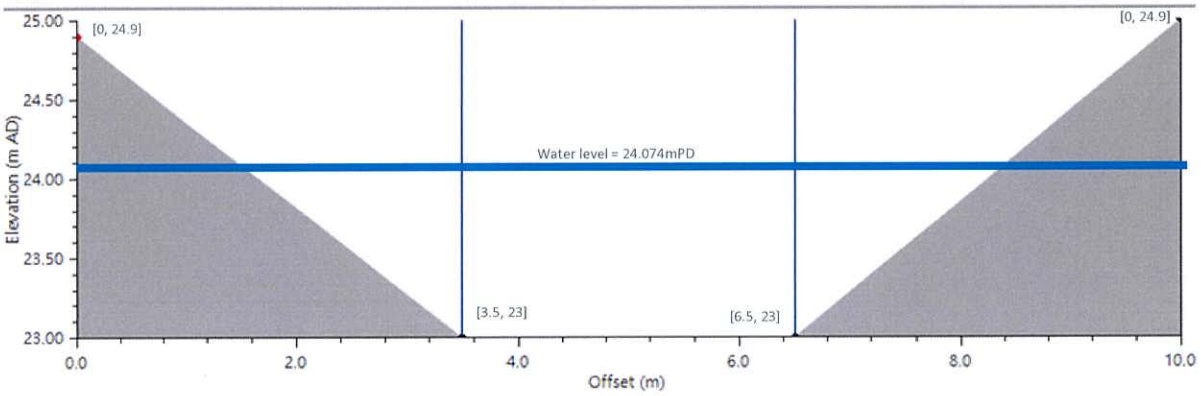
Boundary Condition at Each Section of Watercourse

Location	Section ID	Return Period															
		2AB			10A			10B			50A			50B			
		Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)
A	P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02!	28.41300	14.80727	5.25000	28.53400	22.90300	6.06600	28.41300	14.80724	5.25000	28.59600	28.07553	6.54000	28.53400	22.90267	6.06600
B	P01_P_LAI TAU_160530_a	26.41500	14.80655	4.86400	26.57800	21.15100	5.68200	26.41500	14.80648	4.86400	26.67300	28.82516	6.12100	26.57800	23.15104	5.68200
C	P01_P_LAI TAU_160900	23.75600	14.80303	4.42800	23.95900	23.14600	5.05500	23.75600	14.80309	4.42800	24.07400	28.84762	5.39900	23.95900	23.14692	5.05500
D	P01_P_LAI TAU_161180_a	19.53400	14.84949	2.11800	19.96600	23.21900	2.39500	19.53400	14.85032	2.11800	20.23200	28.98928	2.54300	19.96600	23.21988	2.39500

Appendix H CALCULATION OF WATERCOURSE CAPACITY

Calculation of Flow Capacity of Watercourse at Location C

Referring to the information provided by DSD, the peak water level at Location C has reached 24.074mPD under the scenario of a 10-year sea level in conjunction with a 50-year rainfall. The flow area as well as the hydraulic radius at the peak water level can be calculated from the geometry of the cross section of the watercourse at Location C:



As shown, the geometry of the watercourse cross-section at Location C can be portrayed by its bed level and the corresponding offset from shore line. Listed in the format as [offset, bed level], the 4 points used for describing cross-section geometry are:

[0, 24.9]; [3.5, 23]; [6.5, 23]; [10, 25].

Therefore,

$$flow\ area = (\frac{24.074 - 23.0}{24.9 - 23.0})^2 \times (24.9 - 23.0) \times (3.5 - 0) \times 0.5 + (24.074 - 23.0) \times (6.5 - 3.5) + \left(\frac{24.074 - 23.0}{25.0 - 23.0}\right)^2 \times (25.0 - 23.0) \times (10.0 - 6.5) \times 0.5 = 5.29370(m^2)$$

$$wet\ perimeter = \frac{24.074 - 23.0}{24.9 - 23.0} \times \sqrt[2]{(24.9 - 23.0)^2 + (3.5 - 0)^2} + (6.5 - 3.5) + \frac{24.074 - 23.0}{25.0 - 23.0} \times \sqrt[2]{(25.0 - 23.0)^2 + (10.0 - 6.5)^2} = 7.41585\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{5.29370}{7.41585} = 0.71384\ (m)$$

Under assumption of uniform flow condition, the flow velocity of an open channel will subject to its roughness, channel gradient, and hydraulic radius as express as Manning's equation:

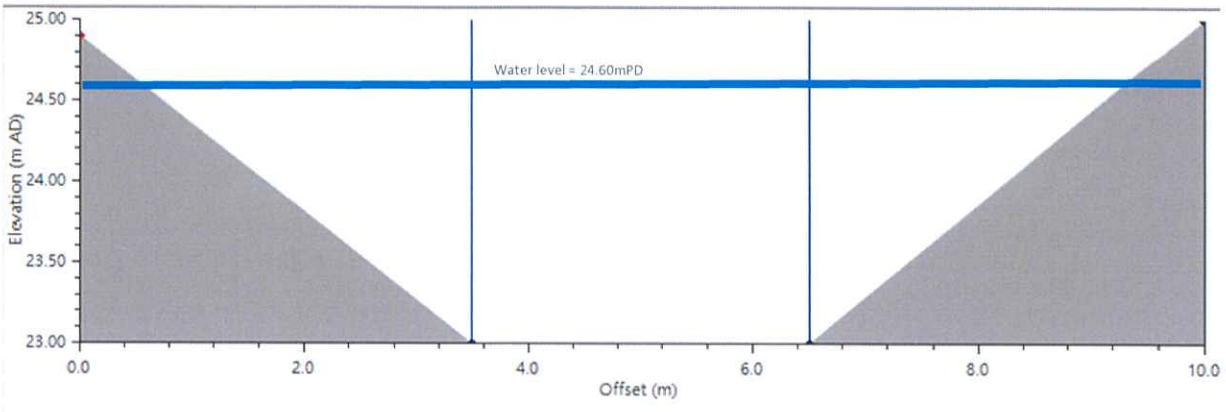
$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}}$$

The peak velocity of watercourse at Location C corresponding to the water level of 24.074m has been given by DSD as 5.399m/s. The hydraulic property of watercourse at Location C can be back calculated as a constant.

$$5.399 = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times 0.71384^{\frac{2}{3}}$$

$$\frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} = \frac{5.399}{0.71384^{\frac{2}{3}}} = 6.75947\ (m^{\frac{1}{3}}/s)$$

When a 300mm freeboard is reserved, the water level at Location C will reach 24.6mPD.



The corresponding flow area and hydraulic radius can be calculated.

$$flow\ area = \left(\frac{24.60 - 23.0}{24.9 - 23.0}\right)^2 \times (24.9 - 23.0) \times (3.5 - 0) \times 0.5 + (24.60 - 23.0) \times (6.5 - 3.5) + \left(\frac{24.60 - 23.0}{25.0 - 23.0}\right)^2 \times (25.0 - 23.0) \times (10.0 - 6.5) \times 0.5 = 9.39790\ (m^2)$$

$$wet\ perimeter = \frac{24.60 - 23.0}{24.9 - 23.0} \times \sqrt[2]{(24.9 - 23.0)^2 + (3.5 - 0)^2} + (6.5 - 3.5) + \frac{24.60 - 23.0}{25.0 - 23.0} \times \sqrt[2]{(25.0 - 23.0)^2 + (10.0 - 6.5)^2} = 9.57855\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{9.39790}{9.57855} = 0.98114\ (m)$$

With the hydraulic radius and flow area known, the capacity of watercourse at Location C when a 300mm freeboard is reserved can be estimated as below:

$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}} = 6.75947 \times 0.98114^{\frac{2}{3}} = 6.67421\ (m/s)$$

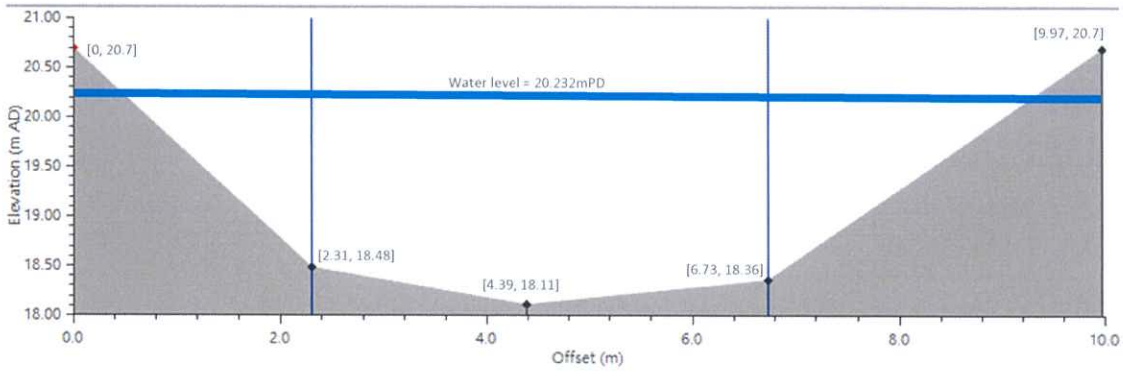
$$flow\ capacity = flow\ area \times flow\ velocity = 9.39790 \times 6.67421 = 62.72357\ (m^3/s)$$

Comparing the peak flow under current boundary condition, 28.84762m³/s, and the flow capacity under 300mm freeboard, the available capacity of watercourse at Location C can be estimated:

$$available\ capacity = 62.72357 - 28.84762 = 33.87595\ (m^3/s)$$

Calculation of Watercourse Capacity at Location D

Referring to the information provided by DSD, the peak water level at Location D has reached 20.232mPD under the scenario of a 10-year sea level in conjunction with a 50-year rainfall. The flow area as well as the hydraulic radius at the peak water level can be calculated from the geometry of the cross section of the watercourse at Location D:



As shown, the geometry of the watercourse cross-section at Location D can be portrayed by its bed level and the corresponding offset from shore line. Listed in the format as [offset, bed level], the 5 points used for describing cross-section geometry are:

[0, 20.7]; [2.31, 18.48]; [4.39, 18.11]; [6.73, 18.36]; [9.97, 20.7].

Therefore,

$$flow\ area = (\frac{20.232 - 18.48}{20.70 - 18.48})^2 \times (20.70 - 18.48) \times (2.31 - 0) \times 0.5 + (20.232 - 18.48) \times (4.39 - 2.31) + (18.48 - 18.11) \times (4.39 - 2.31) \times 0.5 + (20.232 - 18.36) \times (6.73 - 4.39) \times 0.5 + (18.36 - 18.11) \times (6.73 - 4.39) \times 0.5 + \left(\frac{20.232 - 18.36}{20.70 - 18.36}\right)^2 \times (20.70 - 18.36) \times (9.97 - 6.73) \times 0.5 = 12.73673(m^2)$$

$$wet\ perimeter = \frac{20.232 - 18.48}{20.70 - 18.48} \times \sqrt[2]{(20.70 - 18.48)^2 + (2.31 - 0)^2} + \sqrt[2]{(18.48 - 18.11)^2 + (4.39 - 2.31)^2} + \sqrt[2]{(18.36 - 18.11)^2 + (6.73 - 4.39)^2} + \frac{20.232 - 18.36}{20.70 - 18.36} \times \sqrt[2]{(20.70 - 18.36)^2 + (9.97 - 6.73)^2} = 10.19617\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{12.73673}{10.19617} = 1.24917\ (m)$$

Under assumption of uniform flow condition, the flow velocity of an open channel will subject to its roughness, channel gradient, and hydraulic radius as express as Manning's equation:

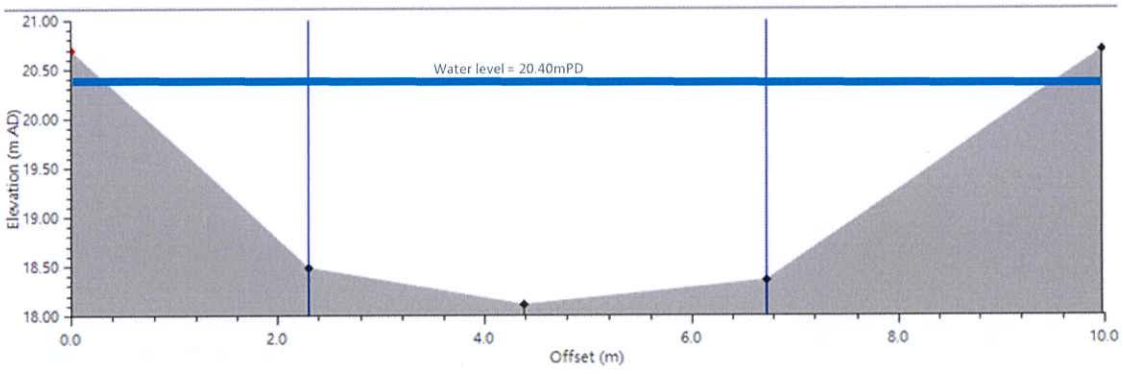
$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}}$$

The peak velocity of watercourse at Location D corresponding to the water level of 20.232m has been given by DSD as 2.543m/s. The hydraulic property of watercourse at Location D can be back calculated as a constant.

$$2.543 = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times 1.24917^{\frac{2}{3}}$$

$$\frac{channel\ gradient^{\frac{1}{2}}}{surface\ roughness} = \frac{2.543}{1.24917^{\frac{2}{3}}} = 2.19246\ (m^{\frac{1}{3}}/s)$$

When a 300mm freeboard is reserved, the water level at Location D will reach 20.40mPD.



The corresponding flow area and hydraulic radius can be calculated.

$$flow\ area = (\frac{20.40 - 18.48}{20.70 - 18.48})^2 \times (20.70 - 18.48) \times (2.31 - 0) \times 0.5 + (20.40 - 18.48) \times (4.39 - 2.31) + (18.48 - 18.11) \times (4.39 - 2.31) \times 0.5 + (20.40 - 18.36) \times (6.73 - 4.39) \times 0.5 + (18.36 - 18.11) \times (6.73 - 4.39) \times 0.5 + \left(\frac{20.40 - 18.36}{20.70 - 18.36}\right)^2 \times (20.70 - 18.36) \times (9.97 - 6.73) \times 0.5 = 14.25575\ (m^2)$$

$$wet\ perimeter = \frac{20.40 - 18.48}{20.70 - 18.48} \times \sqrt[2]{(20.40 - 18.48)^2 + (2.31 - 0)^2} + \sqrt[2]{(18.48 - 18.11)^2 + (4.39 - 2.31)^2} + \sqrt[2]{(18.36 - 18.11)^2 + (6.73 - 4.39)^2} + \frac{20.40 - 18.36}{20.70 - 18.36} \times \sqrt[2]{(20.70 - 18.36)^2 + (9.97 - 6.73)^2} = 10.72523\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{14.25575}{10.72523} = 1.32918\ (m)$$

With the hydraulic radius and flow area known, the capacity of watercourse at Location D when a 300mm freeboard is reserved can be estimated as below:

$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}} = 2.19246 \times 1.32918^{\frac{2}{3}} = 2.65046\ (m/s)$$

$$flow\ capacity = flow\ area \times flow\ velocity = 14.25575 \times 2.65046 = 37.78431\ (m^3/s)$$

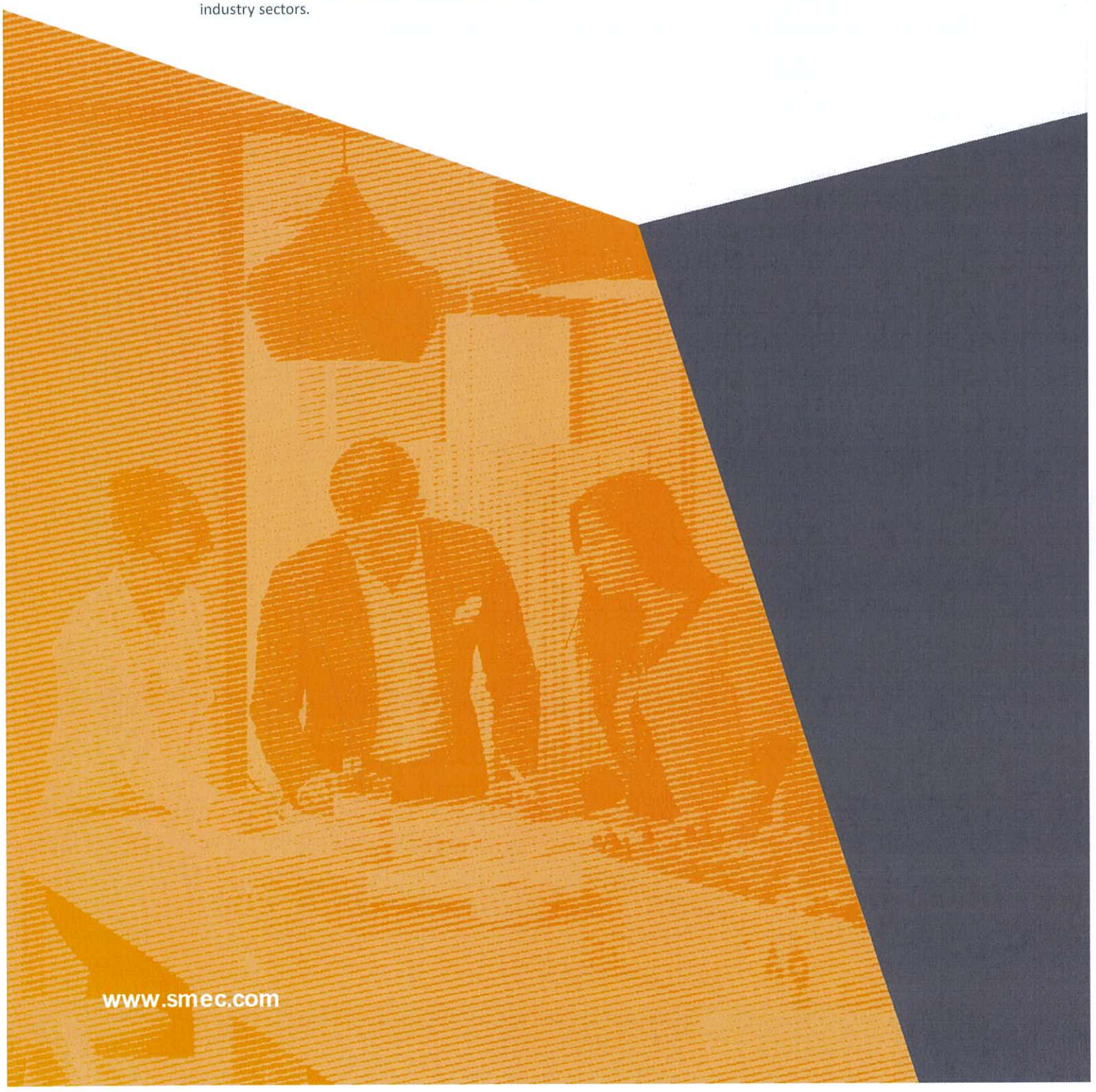
In summary, the flow capacity of watercourse at Location D with 300mm freeboard is estimated to be 37.78m^3/s.

Comparing the peak flow under current boundary condition, 28.98928m^3/s, and the flow capacity under 300mm freeboard, the available capacity of watercourse at Location D can be estimated:

$$available\ capacity = 37.78431 - 28.98928 = 8.79503\ (m^3/s)$$

local people
global experience

SMEC is recognised for providing technical excellence and consultancy expertise in urban, infrastructure and management advisory. From concept to completion, our core service offering covers the life-cycle of a project and maximises value to our clients and communities. We align global expertise with local knowledge and state-of-the-art processes and systems to deliver innovative solutions to a range of industry sectors.



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L A N B A S E
Surveyors Limited

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Estate Agent Licence (Company) No. C-006243 地產代理(公司)牌照號碼:C-006243

Our Ref.: YL/TPN/2529C/L05

23 October 2024

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

By Email and by Post

Dear Sir/Madam,

Planning Application (No. A/YL-PH/1013) for
Temporary Wholesale Trade (Food) for a Period of Five Years
Lot Nos. 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 s.A, 892 s.A, 893 s.A, 3049 and 3050 in DD 111 and Adjoining Government Land
Pat Heung, Yuen Long, New Territories

We refer to the comments by the Drainage Services Department conveyed to us.

Enclosed please find our response to the comments together with the revised Drainage Impact Assessment for your consideration and for re-activating he captioned planning application.

Should you have any queries, please contact our Mr. Wesley Tang [redacted]. Thank you.

Yours faithfully,
For and on behalf of
LANBASE SURVEYORS LIMITED

Rock K.M. Tsang
Director
RK/WT
Encl.

Proposed Temporary Wholesale Trade (Food) for a Period of 5 Years in "Open Storage ("OS") Zone, Lots 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 (Part), 892 (Part), 893 (Part), 3049 and 3050 in D.D. 111 and adjoining Government Land, Pat Heung, Yuen Long

Responses-to-Comments

Item	Departmental Comments	Applicant's Responses
Comments from Drainage Service Department (received on 24 September 2024) Contact Officer: Mr Kenneth CHAN Tel.: 2300 1259		
(a) General		
(i)	Cross sections showing the existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given.	Cross sections showing the existing and proposed ground levels of the captioned site are presented in Appendix A.
(ii)	Standard details should be provided to indicate the sectional details of the proposed u-channel and the catchpit/sand trap	The standard drawings of the channel, catchpit, and sand trap are now attached in Appendix E.
(iii)	Where walls or hoarding are erected or laid along the site boundary, adequate opening should be provided to intercept the existing overland flow passing through the site.	Noted.
(iv)	Sandtrap or provision alike should be provided before the collect runoff is discharged to the public drainage facilities.	Sand trap would be provided before discharging to public drainage.
(v)	For ease of reference, please include a drainage schedule in the submission.	The drainage schedule can refer to Appendix F of the DIA report.
(b) Section 3.1.3		
	Please refer to the storm constants given in Stormwater Drainage Manual Corrigendum Nos. 1/2024 and revise the calculation.	Calculation of runoff has been updated to adopt the new storm constant. Please refer to Appendix D for the updated runoff calculation.
(c) Section 3.4.1		
	The estimated peak runoff for 50 year returning period is	In the previous drainage proposal submitted in October 2021, 2.577 m^3/s was the

	2.018 m^3/s, which is much lesser than the 2.577 m^3/s in the previous submission, please clarify.	estimated cumulative runoff from all identified surrounding catchments and the Site under 50 years returning period, it includes the runoff generated on site, runoff intercepted by the proposed internal drainage system within the site from upstream catchments, and runoff generated in the downstream catchments collected by the proposed drainage system. The runoff generated in the downstream catchments will not intercept by the internal drainage system of the Site. The estimated peak runoff for 50 year returning period 2.018m^3/s in the section 3.4.1 of the previous drainage proposal submitted in March 2024 is the peak runoff that will be intercepted by the internal drainage system of the Site (only include the Site and Catchment B, C and D), not the overall runoff from the identified surrounding catchments. Therefore, the estimated peak runoff is lesser. In this revision, this value in section 3.4.1 have been updated 2.103m^3/s after adopting the new storm constants in Corrigendum No. 1/2024.
(d)	Section 3.4.4	
	A discharge point is proposed under the footbridge. Please submit color photos to indicate the current conditions at the proposed discharge point. Please also include the proposed connection details at discharge point in the submission.	The connection details have been attached as Figure 3-5, and the photo of the discharge point has been attached as Figure 3-7 in the updated DIA.
(e)	Section 3.4.5 (table 3.4)	
	The total flow from Catchpit 01 and 16 are different to the flow at terminal manhole, please clarify.	There was a typo. Section 3.4.5 has been updated.
(f)	Figure 3.3	
(i)	Please indicate the C.L. and I.L. etc., of the proposed	Please refer to the updated Figure 3.2 for the cover level and invert level of the proposed

	catchpits and channels in the drawing.	catchpits.
(ii)	Please advise the function of the underground pipes and include the relevant hydraulic calculation in the submission, as necessary.	The underground pipes shown in Figure 3-3 were to convey the runoff from channels to the terminal manhole. Hydraulic calculation has been checked and presented in Appendix G.
(g) Appendix F		
(i)	The proposed u-channels are undersized and unable to cater for the surface runoff discharge from the application site, please check and revise the calculation.	The calculation in Appendix F has been revised in the updated DIA report. The sizes of proposed drainage channels have been updated accordingly.
(ii)	According to the calculations, the velocity of stormwater flow in some of the channels/pipes are higher than 3 m/s. Please be reminded that drainage channels/conduits should be designed to resist possible erosion under the anticipated velocities, undermining by scour and uplift forces due to high velocity over the channel/conduit surface.	The drainage network proposed had been revised. Velocity of the flow in channel/ pipes are checked and they are maintained to be not higher than 3m/s.

D01 - Drainage Impact Assessment

Proposed Temporary Wholesales Trade (Food) in D.D. 111 and Adjoining Government Land, pat Heung, Yuen Long

Prepared for: Reitar Logtech Group Ltd
21 October 2024
Client Reference No. A/YL-PH/1013

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1. Project Background

1.1 Introduction

1.1.1 A temporary wholesale trade (food) development (the Proposed Use) has been proposed for a period of five years at Lots 872, 873, 875, 876, 877, 878, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891 (Part), 892 (Part), 893 (Part), 3049 and 3050 in DD 111 and adjoining government land, Pat Heung, Yuen Long ("the Site"). The Site is zoned "Open Storage" (OS) on the Approved Pat Heung Outline Zoning Plan (OZP) No. S/YL-PH/11. A planning application (no. A/YL-PH/804) for the Proposed Use was submitted under Section 16 of the Town Planning Ordinance (TPO) and was approved with conditions by the Town Planning Board (TPB) on 12 April 2019. Two of the approval conditions related to drainage issues are as follows:

(c) The submission of drainage proposal within 6 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019; and

(d) In relation to (c) above, the implementation of drainage proposal within 9 months from the date of planning approval to the satisfaction of the Director of Drainage Services or of the Town Planning Board by 12.10.2019.

1.1.2 A drainage proposal has been submitted to Drainage Service Department (DSD) to discharge Approval condition (c). The submitted drainage proposal with a commitment made in the RtC was considered acceptable by DSD on 11 October 2021.

1.1.3 Further to the commitment in providing supplementary information to address comments from DSD (dated on 29 August 2023) and the comment from DSD dated 6 October 2023, the applicant is required to justify the capacity of the existing watercourse and taking into account the current revised design of the Proposed Development. SMEC Asia Ltd has been commissioned by Reitar Logtech Group Ltd to prepare a new Drainage Impact Assessment for the current revised design of the Proposed Development and justify the capacity of the existing watercourse.

1.2 Site Description

1.2.1 The Site location and its environs are shown on ***Figure 1-1*** in which the uses surrounding the Site include:

- To the North and East: Various open storage / storage yards, workshops, container trailers / tracker park.
- To the South: Village houses in Fu Shing Garden and Ha Che.
- To the West: Vacant land covered with vegetation under "Green Belt" zone.

1.2.2 The Site area is 21,586 m^2 and the General Building Plan (GBP) has been submitted to Building Department in January 2024.

1.3 Objectives of this Report

1.3.1 The objectives of this new Drainage Impact Assessment are to:

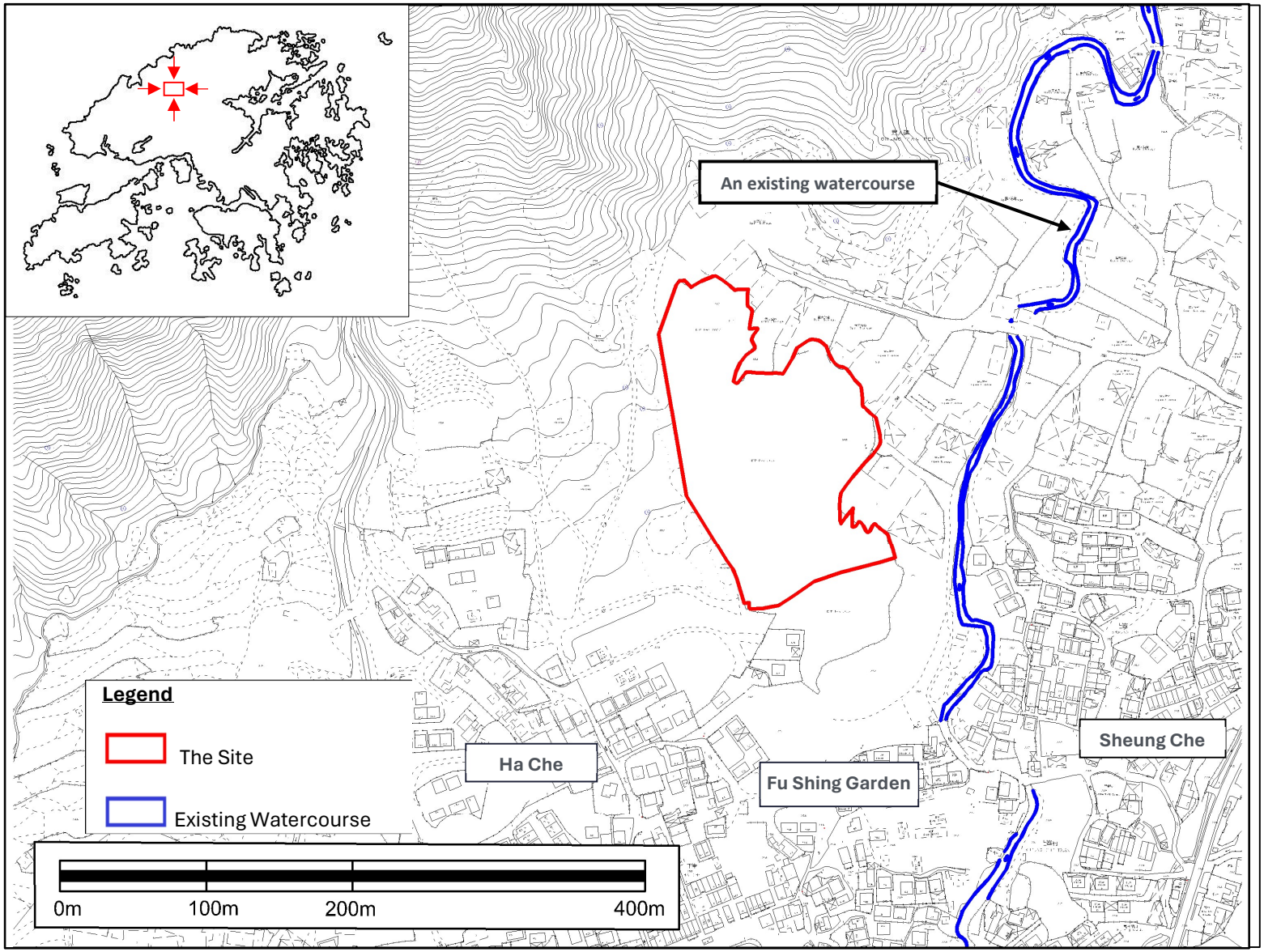
- Assess the potential drainage impact arising from the Proposed Development taking in account the current revised design and justify the capacity of the existing watercourse.
- Recommend the necessary mitigation measures to alleviate any impacts.

1.4 Reference materials

1.4.1 In evaluating the drainage impact arising from the Proposed Use, the following materials have been referred to:

- Drainage Services Department (DSD) publication Stormwater Drainage Manual (with Eurocodes incorporated) – Planning, Design and Management (2018 Edition).
- DSD Stormwater Drainage Manual Corrigendum No. 1/2022.
- DSD Stormwater Drainage Manual Corrigendum No. 1/2024.
- DSD Advice Note No. 1 – Application of the Drainage Impact Assessment Process to Private Sector Projects.
- DSD publication Technical Note to prepare a "Drainage Submission".
- GeoInfo Map reviewed on 05 February 2024.
- Boundary conditions of the existing watercourse provided by DSD on 21 February 2024.
- Pre-CCTV Survey Report carried by Pipeline Drainage Ltd. conducted on 23 September 2020 for the existing pipe near the Site.
- Topographical Survey near Lot No. 858, 861 S. A, 864 S.C, 862, 872-873, 875-878, 880-893, 894 S. A & S. B, 895, 3049-3050, 3083 in D.D.111, Ha Che, Yuen Long, prepared by Keyland Surveying, Planning & GIS Co. Ltd on 24 January 2019.

Figure 1-1: Site Location and its Environs



2. DESCRIPTION OF EXISTING ENVIRONMENT AND DRAINAGE CONDITIONS

2.1 Site Topography and Characteristics

2.1.1 As illustrated on ***Figure 1-1***, the Site is situated on a vacant land to the north of Ha Che in Pat Heung, Yuen Long and surrounded by various open storage / storage yards, workshops, container trailers / tracker park, village houses and vacant land. As the planning application has been approved in 2019, the construction works has already commenced. The site is currently undergoing site formation in February 2024.

2.1.2 The land survey conducted before the commencement of construction indicated that the site surface before proposed development was generally coarse and uneven with small gradient. The elevation ranged from the highest 39.33mPD at the north west corner of the site to the lowest 28.13mPD was at the south east corner. Referring to the site investigation in 2020, the Site was covered with mostly grassland.

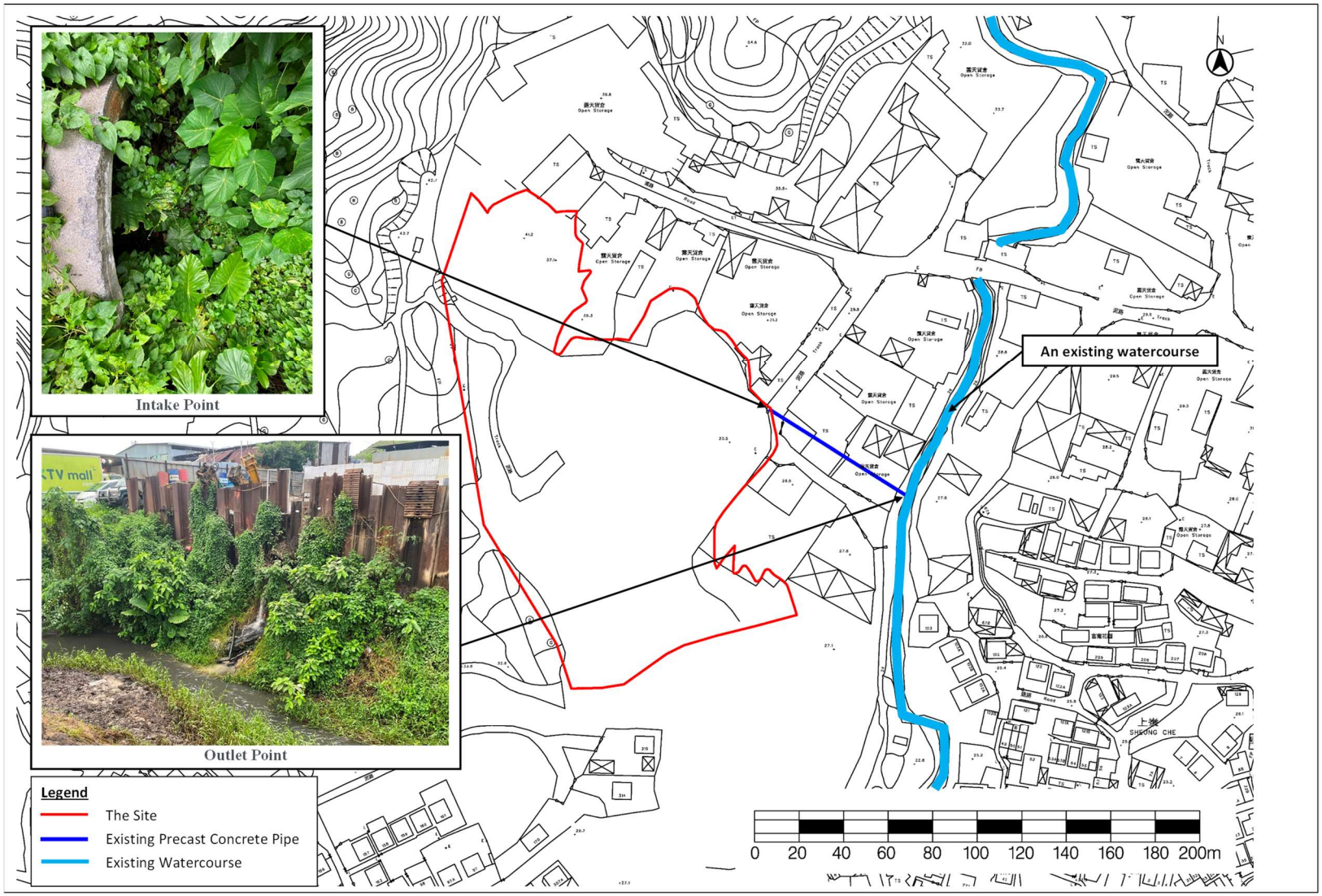
2.1.3 After the proposed development, the site will experience excavation and backfilling to enable the construction of power cap and superstructure. Within the building line, the ground level will be flattened to 34.0mPD while the uneven topographic level along the site boundary will be constructed as an emergency vehicle access (EVA) ramp, enclosing the superstructure of the proposed development. 1,058m^2 of the site area will be reserved for greenery. As reference, the cross sections showing the existing and proposed ground levels of the captioned site are presented as ***Appendix A***.

2.2 Baseline Drainage Conditions

2.2.1 With reference to GeoInfo Map and review on drainage layout records in DSD drawing office in May 2020 and February 2024, there is no municipal drainage system in the vicinity of the Site.

2.2.2 Based on the site observation and CCTV pipe inspection provided as ***Appendix B*** in this report, there is an existing precast concrete pipe connecting the eastern boundary of the Site to an existing watercourse to the east of the Site as shown on ***Figure 2-1***. The dimension of the precast concrete pipe is Ø1,800mm in diameter starting from the Site and then change to Ø600mm in diameter near the outlet at the watercourse. Hence, under the past drainage arrangement of the site, the runoff collected in site would be conveyed to by the precast concrete pipe, and discharged to the existing watercourse at the east of the Site. Siltation and collapse of the existing pipe was observed during the CCTV inspection.

Figure 2-1: Existing Drainage Arrangement of the Site



3. Drainage Impact

3.1 Assumptions and Methodology

3.1.1 Peak instantaneous runoff before and after the Proposed Use was calculated based on the Rational Method. The recommended physical parameters, including runoff coefficient (C) and storm constants for different return periods, are as per the *Stormwater Drainage Manual, and Stormwater Drainage Manual Corrigendum No. 1/2024*.

3.1.2 The Rational Method has been adopted for hydraulic analysis and the peak runoff is given by the following expression:

$$Q_p = 0.278\ C\ i\ A \qquad \text{--- Equation 1}$$

where Q_p = peak runoff in m^3/s
C = runoff coefficient
i = rainfall intensity in mm/hr
A = catchment area in km^2

3.1.3 Rainfall intensity is calculated using the following expression:

$$i = \frac{a}{(t_d + b)^c} \qquad \text{--- Equation 2}$$

where i = rainfall intensity in mm/hr
t_d = duration in minutes ($t_d \leq 240$)
a, b, c = storm constants given in Table 3 of *Stormwater Drainage Manual Corrigendum No. 1/2024*

3.1.4 For a single catchment, duration (t_d) can be assumed equal to the time of concentration (tc) which is calculated as follows:

$$t_c = t_0 + t_f \qquad \text{--- Equation 3}$$

where t_c = time of concentration
t_0 = 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

3.1.5 Generally, t_0 is much larger than t_f. As shown in Equation 2, td is the divisor. Therefore, larger td will result in smaller rainfall intensity (i) as well as smaller Q_p. For the worst-case scenario, tf is assumed to be negligible and so:

$$t_d = t_c = t_0$$

$$t_0 = \frac{0.14465\ L}{H^{0.2}\ A^{0.1}} \qquad \text{--- Equation 4}$$

where A = catchment area (m^2)
H = average slope (m per 100 m), measured along the line of natural flow, from the summit of the catchment to the point under consideration
L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)

3.1.6 The capacities of the drainage pipes have been calculated using the Colebrook-Whit Equation, assuming full bore flow with no surcharge, as follows, in accordance with the Stormwater Drainage Manual:

$$V = -\sqrt{32gRs} \times \log\left(\frac{k_s}{14.8R} + \frac{1.25}{R\sqrt{32gRs}}\right) \qquad \text{--- Equation 5}$$

where V = mean velocity (m/s)
g = gravitational acceleration (m/s^2)

R = hydraulic radius (m)
k_s = hydraulic pipeline roughness (m)
υ = kinematic viscosity of fluid (m^2/s)
s = hydraulic gradient (energy loss per unit length due to friction)

3.1.7 On the other hand, the capacity of open channel has been calculated using the Manning's Equation:

$$V = \frac{R^{2/3} \times S^{1/2}}{n}$$ ***--- Equation 6***

where
V = mean velocity (m/s)
R = hydraulic radius (m)
n = Manning coefficient ($s/m^{1/3}$)
s = hydraulic gradient (energy loss per unit length due to friction)

3.1.8 Since ***Equation 4*** is derived for natural catchment. It will no longer be valid for the site after the proposed development. Making reference to the rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design*, an arbitrary 5 minutes inlet time will be adopted for the calculation of runoff from the Site after proposed development.

3.2 Assessment Assumption

Identification of Catchment

3.2.1 A total of 8 Catchments were identified in reference to the basemap obtained from Lands Department Hong Kong Map Service website in February 2024. The identified catchments as well as their flow paths has been drawn in ***Figure 3-1***.

3.2.2 As no other identified stream or drainage system at the vicinity of the Site, it is anticipated all the runoff from the identified catchments is collected through the nearby watercourse described in ***Section 2.2*** and presented in ***Figure 2-1***.

3.2.3 Catchment A is the Site. Before the proposed development, its central and south eastern corner was at lower elevation than its edge. The runoff collected in Catchment A was conveyed through the precast concrete pipe. Catchment B, C and D are the hillside and footing of Kai Kung Leung. It is estimated that the runoff generated from Catchment B, C, D will be intercepted by Catchment A. Catchment E, F, G is the open storage area at the vicinity of the site. Since the precast concrete pipe passes through Catchment G and two connection points to the pipe is found within Catchment F. The runoff from Catchment F is very likely conveyed through the concrete pipe to the watercourse. The Catchment H is currently a construction site embraced by large area of greenery before development. Based on desktop study, the site formation on the Site has already commenced, and there is concurrent construction activity within Catchment H. The photo taken in September 2020 showing the previous condition of the Site and the surrounding catchments before commencement of construction are provided in ***Appendix C***.

3.2.4 After the Proposed Development, it is anticipated that surface characteristic of the Site will be changed. After the Proposed Development, the Site will become mostly paved. The runoff coefficient of the Site will change from 0.15 to 0.91 accordingly. Even though there is concurrent construction activity on Catchment H, as a conservative approach, the surface characteristic of the construction area within Catchment H (around 30% of the Catchment H area) is assumed to be paved area. Making reference to Stormwater Drainage Manual, the runoff coefficient of each identified catchment at the vicinity of the site is calculated and shown in ***Table 3.1***.

Table 3.1: Surface Characteristic of Identified Catchments

Catchment ID	Area (km^2)	Surface Characteristics	Runoff Coefficient
A (before proposed development)	21586	100% flat grassland	0.15
A (after proposed development)	21586	5% flat grassland + 95% paved	0.91
B	11806	100% steep grassland	0.2
C	31282	100% steep grassland	0.2
D	10335	100% flat grassland	0.15
E	14805	100% concrete paved	0.95
F	5783	100% concrete paved	0.95
G	4190	100% concrete paved	0.95
H	27154	70% flat grassland + 30% paved	0.39

3.3 Estimation of Runoff

3.3.1 To access the drainage impact of the proposed development, the runoff generated from each catchment has been calculated with rainfall intensity of 2 years, 10 years and 50 years return period coupled with 11.1% rainfall increase projection at the middle 21st century. The design allowance is not considered in this DIA because of the temporary usage nature of the proposed development. The calculation result is shown in ***Table 3.2***. It is estimated that the proposed development will increase the runoff from the Site by 1.241m^3/s, from 0.206m^3/s to 1.447m^3/s under rainfall of 50 years returning period. The detailed calculation of runoff from each catchment under different returning period is provided in ***Appendix D***.

Table 3.2: Runoff from each Identified Catchment

Catchment	Runoff during Rainfall of each Returning Period (m^3/s)		
	2 years	10 years	50 years
A (before proposed development)	0.138	0.179	0.206
A (after proposed development)	1.011	1.282	1.447
B	0.123	0.155	0.175
C	0.249	0.326	0.378
D	0.070	0.090	0.103
E	0.649	0.833	0.952
F	0.331	0.413	0.458
G	0.227	0.284	0.317
H	0.467	0.603	0.692

3.4 Proposed Drainage Layout

Internal Drainage System

3.4.1 As mentioned in ***Section 3.2.3***, the runoff generated in Catchment B, C, D are intercepted by Catchment A, the Site. Beside the runoff generated on site after proposed development, the internal drainage design should also take the runoff from Catchment B, C, D into consideration. Therefore, the peak runoff that will be sustained by the internal drainage system of the Site is estimated to be 2.104m^3/s.

3.4.2 In order to intercept the overland flow from the nearby catchments and convey the collected runoff to terminal manhole, series of channels will be constructed along the periphery of the Site, one from CP09 to CP01 and the other series from CP19 to CP16. One

additional channel will be from CP9 to CP10 and will be connected to CP19 via a pipe, and eventually connect to another channel which is to be constructed on the open yard of the proposed development to help convey the runoff collected in roof and rain gutters. The layout of the proposed internal drainage system as well as the cover levels and invert levels of drainage provisions has been shown in ***Figure 3-2***.

3.4.3 Based on the post development topographic level, the site, Catchment A, can be split into 4 sub-catchments. The sub-catchments within the Site are shown in ***Figure 3-3***. Assuming that the distribution of runoff into each section of channels approximately follows the projection of catchment area on each section of channels, the required dimensions of drainage channels/ pipes for the internal drainage system can be estimated. As the lowest level based on topography is at 29.05mPD while the terminal manhole invert level is 29.0mPD, it will require an underground retention tank to collect the stormwater from two other series channels, one from CP10 to CP12 and the other is from CP15 to CP 13. Runoff collected in these two series of channel will eventually discharge to Terminal Manhole via a 400mm diameter underground pipe. The schedule of channels and pipe for the proposed internal drainage system is presented in ***Appendix F***. Sand trap will be provided before the discharge to public drainage facilities. See ***Figure 3-2***. The typical details of the U-channel are referred to the corresponding Civil Engineering Development Department (CEDD) and DSD standard drawings and have been attached in ***Appendix E***. The calculation of channel capacity and sizing of the retention tank is provided in ***Appendix F***. In addition to the proposed internal drainage system, weephole on the retaining walls will be provided in accordance to Geoguide 1 and openings on fence wall will be reserved along the site boundary to intercept the overland flow passing through the site.

External Drainage System

3.4.4 The proposed external drainage system has been drawn in ***Figure 3-4***. As mentioned in previous section, the runoff generated on site as well as the intercepting catchments will be collected by the internal drainage system. The runoff collected in the U-channels will later flow through internal underground connection pipes from CP 16, CP 01 and an underground retention tank to the Terminal Manhole, and will eventually flow through the external drainage system and discharge to the nearby watercourse. Since the existing precast concrete pipe on Site was found damaged during the CCTV inspection, a new external drainage system is proposed. The new discharge point is right under the footbridge across the watercourse. The connection details of the discharge point is shown at ***Figure 3-5***.

3.4.5 The proposed external drainage system consists of a 1500mm underground circular precast concrete pipe in a gradient of 1:200. Because the proposed external drainage system will pass through Catchment E, the runoff generated on Catchment E will be taken into consideration in the hydraulic assessment of the external drainage system at the downstream of manhole RMH-X1. In this regard, the total runoff flow through the 1500mm pipe will be 3.056m^3/s. The calculation of flow capacity of the external drainage system is ***Appendix G***.

Existing Watercourse

3.4.6 The photos of the existing watercourse are presented in ***Figure 3-6***. And the photo of the discharge point underneath the footbridge is presented as ***Figure 3-7***Figure 3-7. The information of the existing watercourse shown in ***Appendix G*** are obtained from DSD.

3.4.7 As the proposed storm water discharge point of the proposed development is at the downstream of Location A and Location B, and at the upstream of Location C and Location D, the hydraulic assessment of the watercourse will be conducted by the estimation of available flow capacity at Location C and Location D under a 10-year sea

level in conjunction with a 50-year rainfall, which is the scenario generating the maximum amount of runoff, and resulting in the highest water level in the watercourse.

3.4.8 As shown in ***Appendix G***, the peak water level at Location C of the watercourse is at 24.074mPD, and at Location D is at 20.232mPD, and the peak flow is 28.848 m^3/s and 28.990 m^3/s respectively. The bank level of the watercourse at Location C and Location D is at 24.90mPD and 20.70mPD. Under the uniform flow condition, the velocity of an open channel depends on hydraulic radius, surface roughness, and channel gradient. With the information provided by DSD, the peak velocity and the corresponding peak water level is given, the hydraulic property of the watercourse at Location C and D can therefore be back calculated, enabling the estimation of watercourse capacity under different water level. Reserving a 300mm freeboard in reference to Stormwater Drainage Manual, the maximum capacity of watercourse has been calculated to be 62.72 m^3/s at Location C and 37.78 m^3/s at Location D as shown in ***Table 3.3***. The detailed calculation breakdown is shown in ***Appendix H***. Under the scenario of a 10-year sea level in conjunction with a 50-year rainfall, the available flow capacity of the watercourse at Location C and D is 33.88m^3/s and 8.8m^3/s. As Location D is at the downstream of Location C, the maximum allowable stormwater discharge to the watercourse will be 8.8m^3/s.

Table 3.3: Capacity of Watercourse at Location C and D

Location C	Water Level (mPD)	Hydraulic Radius (m)	Peak Velocity (m/s)	Peak Flow (m^3/s)	Available Capacity (m^3/s)
Existing Boundary Condition	24.074	0.71	5.40	28.85	-
300mm freeboard	24.600	0.98	6.67	62.72	33.88
Location D	**Water Level (mPD)**	**Hydraulic Radius (m)**	**Peak Velocity (m/s)**	**Peak Flow (m^3/s)**	**Available Capacity (m^3/s)**
Existing Boundary Condition	20.232	1.25	2.54	28.99	-
300mm freeboard	20.400	1.33	2.65	37.78	8.80

3.4.9 Mentioned in ***Section 3.3.1***, the additional runoff generated from the change of site characteristic during the proposed development has been estimated to be 1.241m^3/s, which is far lower than the allowable discharge 8.8m^3/s. Based on the analysis, the existing watercourse has sufficient capacity to sustain the drainage impact from the proposed development, and no adverse flooding risk due to the proposed development will be anticipated.

3.5 Summary

3.5.1 The runoff generated from the site before and after the proposed development as well as the nearby catchments has been calculated. Under rainfall intensity of 50 years returning period with consideration of climate change effect at the middle 21st century, a total of 2.104m^3/s of runoff will be intercepted by the Site, including the runoff generated on site and the adjacent hillside catchments.

3.5.2 To mitigate the drainage impact from the proposed development, series of channels have been proposed as the internal drainage system to intercept overland flow and collect storm water before discharging to the existing watercourse through underground pipes and retention tank. The total runoff that would be discharged to the watercourse through the proposed external underground pipes is estimated to be 3.056m^3/s under rainfall intensity of 50 years returning period with consideration of climate change effect at the middle 21st century.

3.5.3 The available capacity of the existing watercourse has been assessed from the information provided by DSD. It is expected that the watercourse can handle the increment of runoff caused by the proposed development.

3.5.4 No adverse impact is anticipated from the proposed development after the provision of series of channels and pipes together with a retention tank as internal drainage system and the proposed 1500mm underground pipe as external drainage system.

Figure 3-1: Identified Catchments

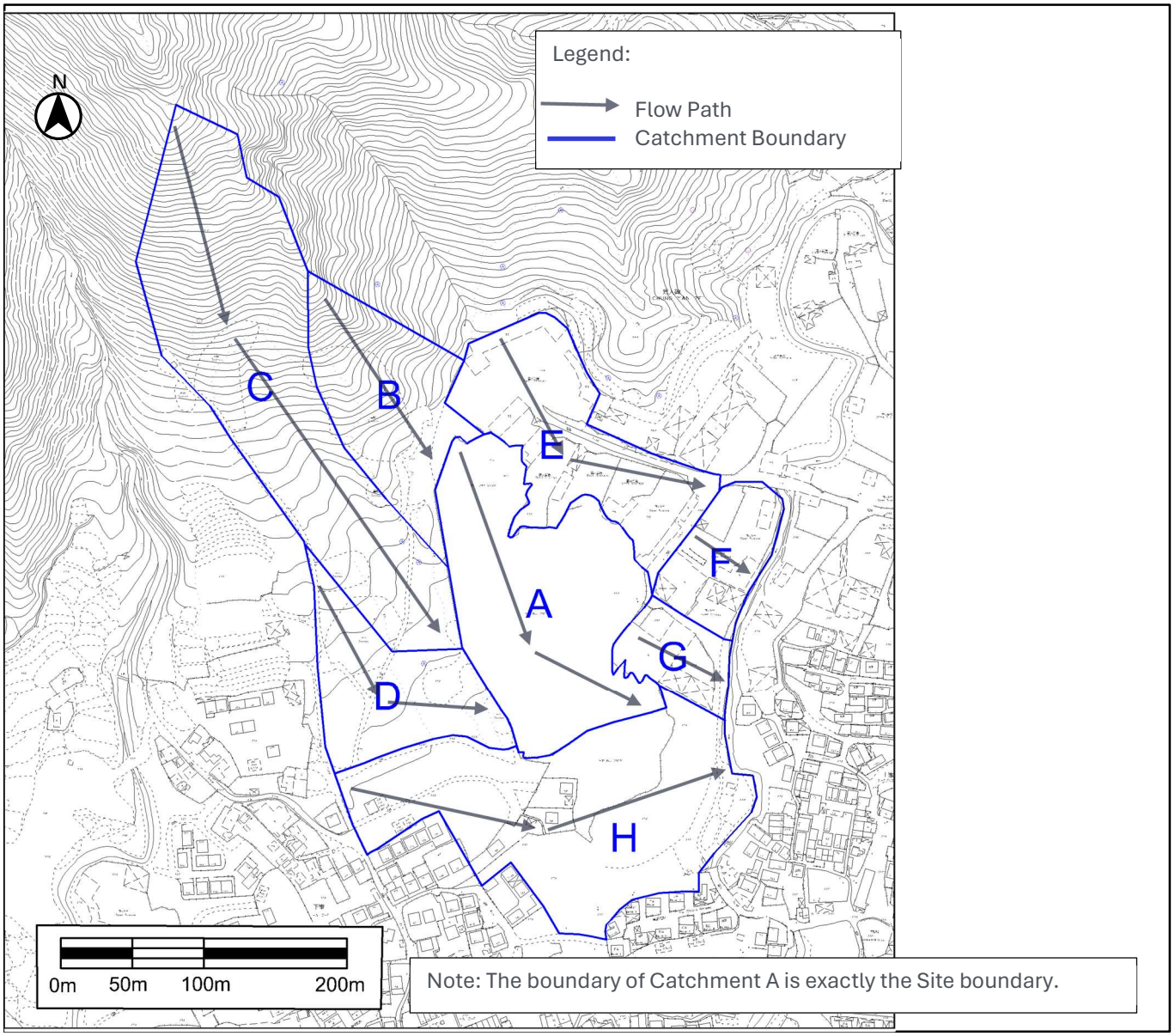


Figure 3-2: Proposed Internal Drainage System

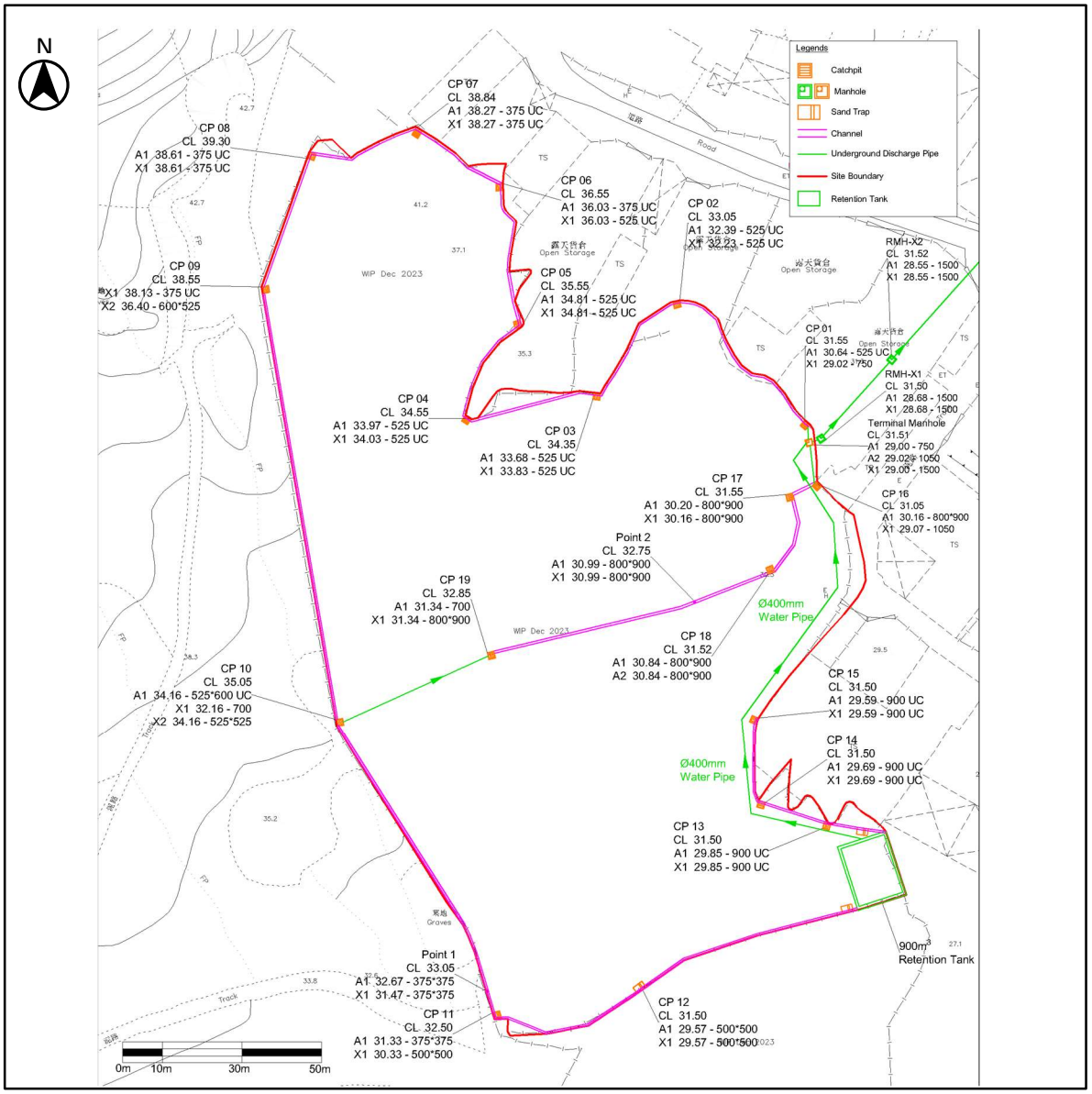


Figure 3-3: Sub-catchment within the Site

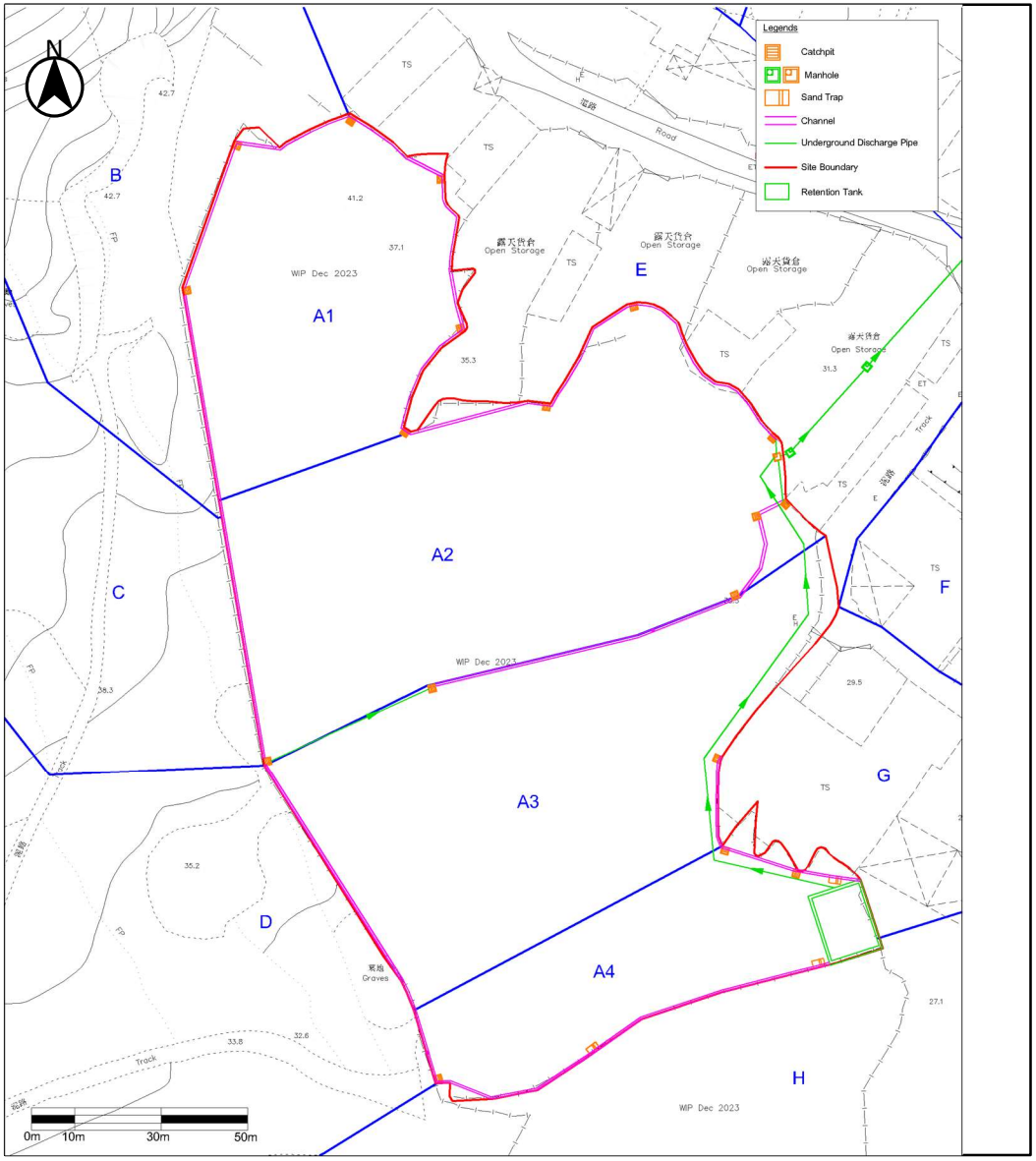


Figure 3-4: Proposed External Drainage System

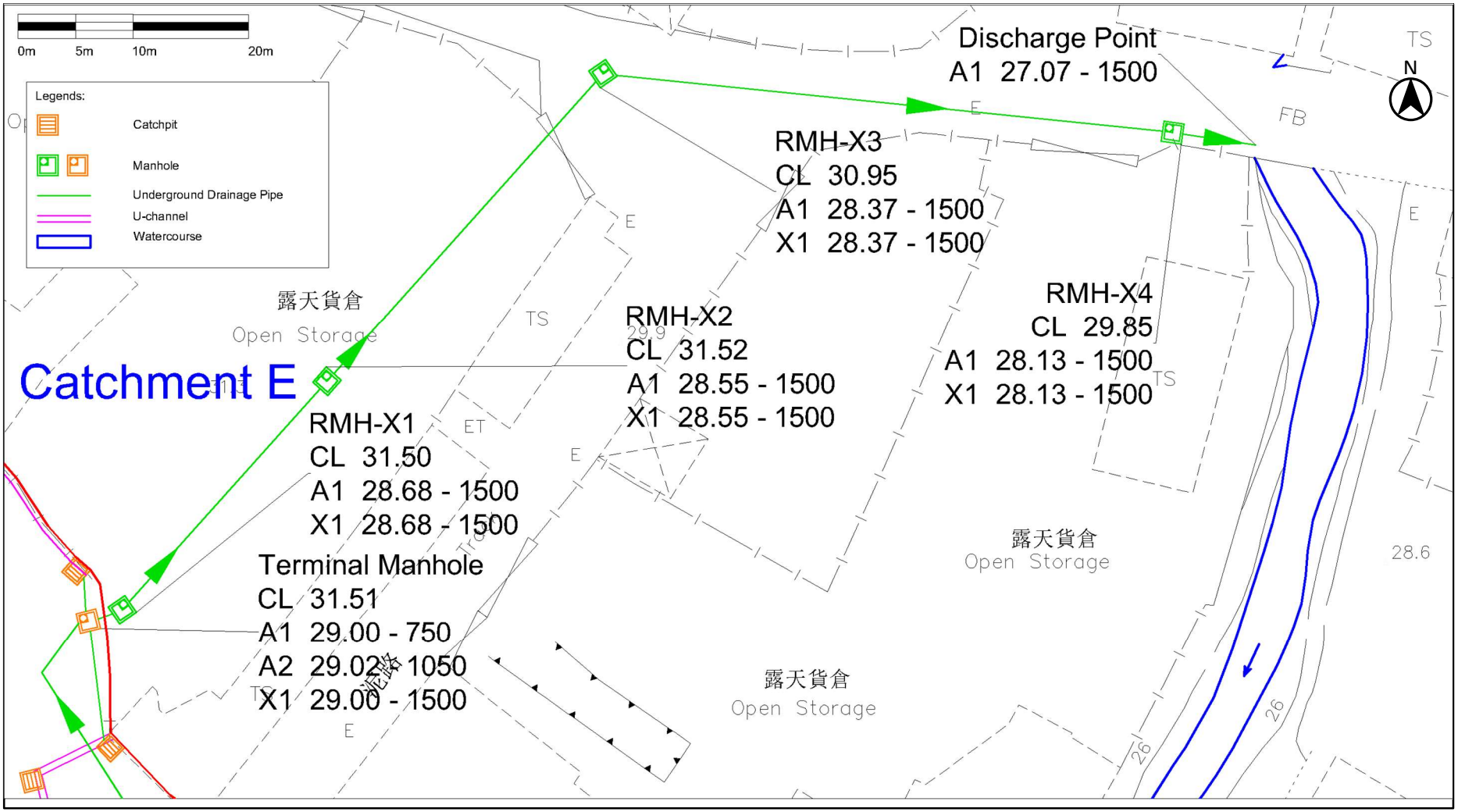


Figure 3-5: Connection Detail of Footbridge

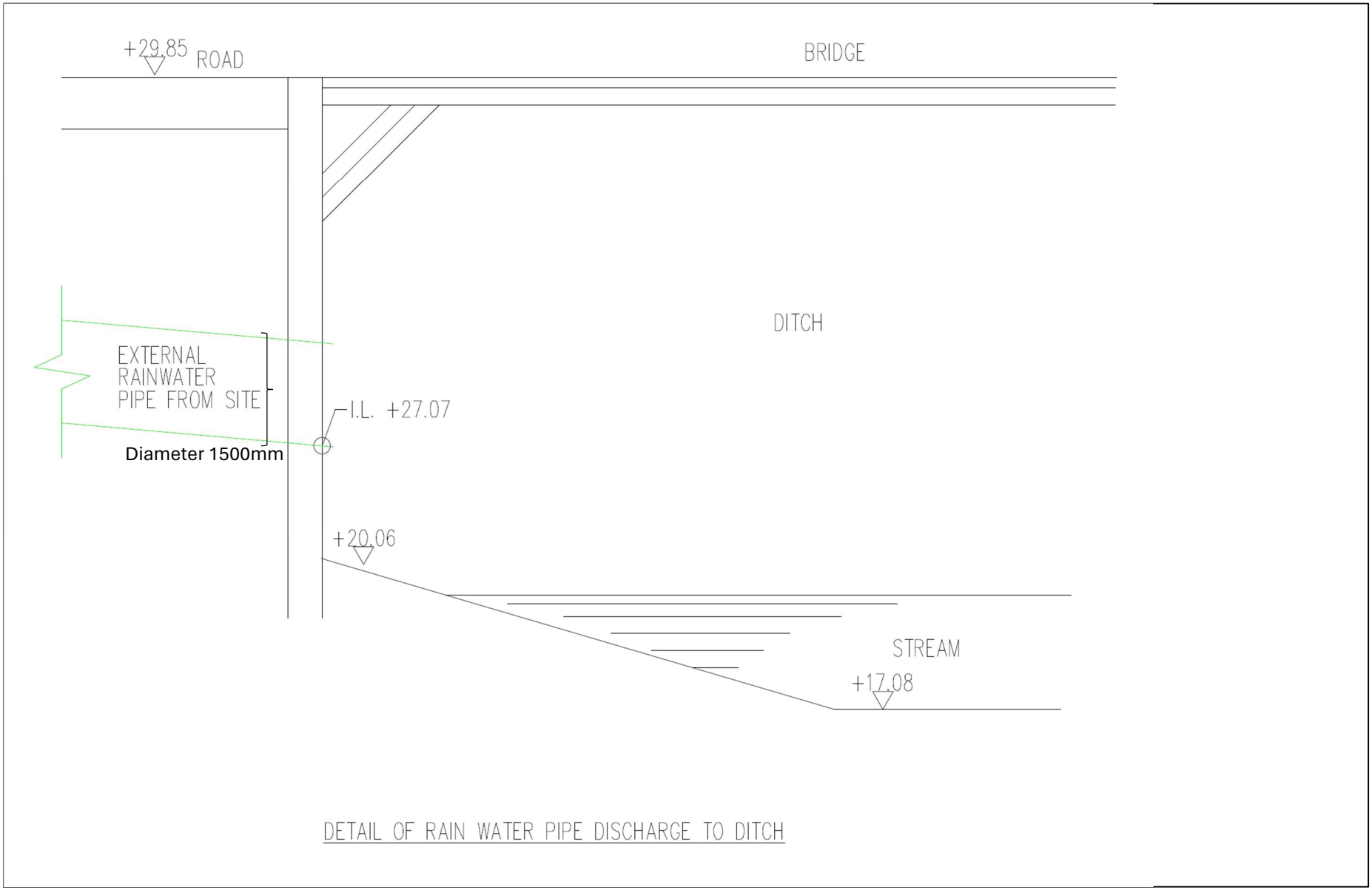


Figure 3-6: Photos of the Existing Watercourse

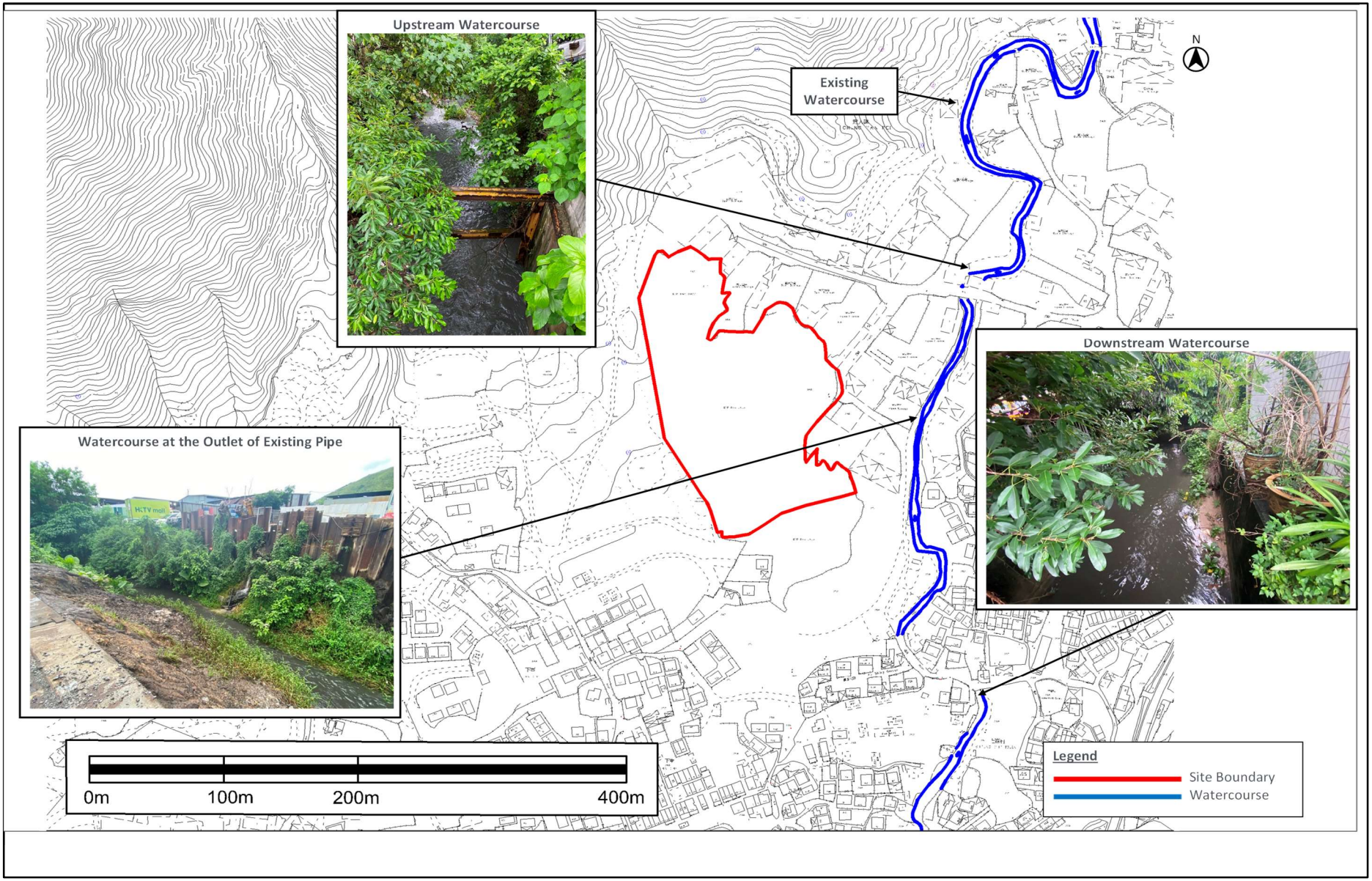


Figure 3-7: Photo of the Existing Watercourse underneath Footbridge

4. Conclusion

4.1.1 The surface characteristic and the drainage arrangement of the site and the nearby catchments has been discussed in this report. Potential drainage impacts that may arise from the Site after construction of the Proposed Development have been assessed.

4.1.2 The peak runoff before and after the development of the Site has been estimated using Rational Method and based on the catchment surface characteristics for the existing environment and the Proposed Development. The total runoff generated from the Site and the intercepting catchments has been estimated to be 2.104m^3/s under the rainfall intensity of 50 years returning period with the consideration of 11.1% rainfall increase projection at the middle 21st century.

4.1.3 To mitigate the drainage impact from the proposed development, series of channels, pipes and a retention tank system have been proposed as the internal drainage system to intercept overland flow and collect storm water before discharging to the existing watercourse through underground pipes. The total runoff that would be discharged through the external underground pipes is estimated to be 3.056m^3/s under rainfall intensity of 50 years returning period with consideration of climate change effect at the middle 21st century.

4.1.4 Based on the information provided by DSD, the available capacity of the existing watercourse has been assessed. It is expected that the watercourse can handle the increment of runoff caused by the proposed development.

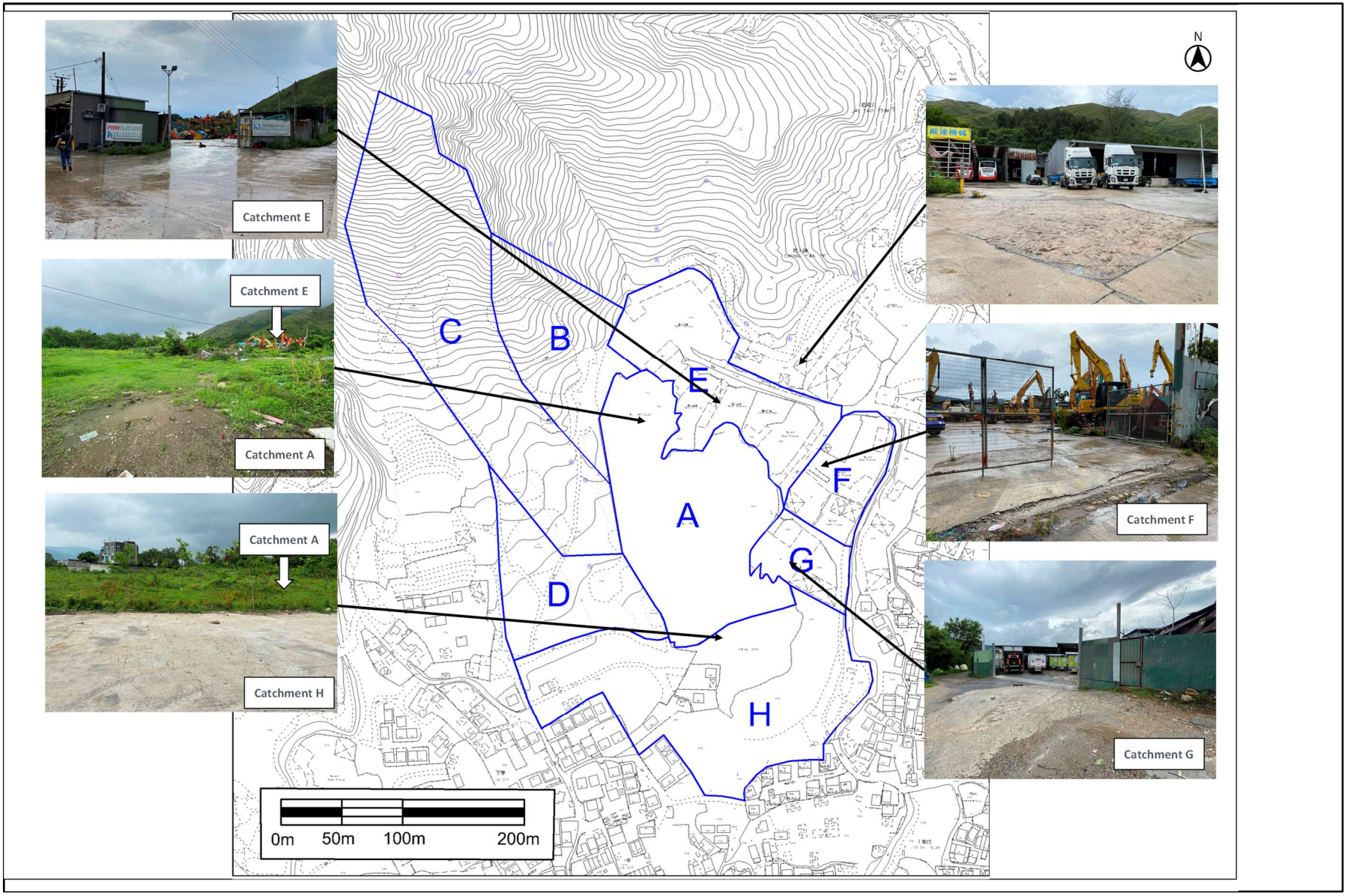
4.1.5 No adverse impact is anticipated from the proposed development after the provision of 3 series of U-channel as internal drainage system and the construction of 1500mm underground pipe as external drainage system.

Appendix A Cross-section of the Site

Appendix B CCTV Pipe Inspection Report

Appendix C Condition of the Site and the Surrounding Catchments

Figure 4-1: Condition of the Site and the Surrounding Catchment Areas



Appendix D Runoff Calculation

Calculation of Runoff for Return Period of 2 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_0), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
A (Site)	0.0216	4.77	234.9	9.16	9.16	446.1	3.38	0.463	138.31	0.15	0.0032	0.138
B	0.0118	36.14	175.0	4.84	4.84	446.1	3.38	0.463	168.25	0.20	0.0024	0.123
C	0.0313	28.94	427.0	11.19	11.19	446.1	3.38	0.463	129.04	0.20	0.0063	0.249
D	0.0103	7.66	206.6	7.89	7.89	446.1	3.38	0.463	145.33	0.15	0.0016	0.070
E	0.0148	5.40	183.4	7.25	7.25	446.1	3.38	0.463	149.35	0.95	0.0141	0.649
F	0.0058	6.51	61.5	2.57	2.57	446.1	3.38	0.463	195.35	0.95	0.0055	0.331
G	0.0042	7.82	80.6	3.35	3.35	446.1	3.38	0.463	184.47	0.95	0.0040	0.227
H	0.0272	4.61	216.7	8.32	8.32	446.1	3.38	0.463	142.86	0.39	0.0106	0.467
											Total (General Scenario)	**2.254**

After the Proposed Development												
A (Site)	0.0216	-	-	5.00	5.00	446.1	3.38	0.463	166.71	0.91	0.0196	1.011
B	0.0118	36.14	175.0	4.84	4.84	446.1	3.38	0.463	168.25	0.20	0.0024	0.123
C	0.0313	28.94	427.0	11.19	11.19	446.1	3.38	0.463	129.04	0.20	0.0063	0.249
D	0.0103	7.66	206.6	7.89	7.89	446.1	3.38	0.463	145.33	0.15	0.0016	0.070
E	0.0148	5.40	183.4	7.25	7.25	446.1	3.38	0.463	149.35	0.95	0.0141	0.649
F	0.0058	6.51	61.5	2.57	2.57	446.1	3.38	0.463	195.35	0.95	0.0055	0.331
G	0.0042	7.82	80.6	3.35	3.35	446.1	3.38	0.463	184.47	0.95	0.0040	0.227
H	0.0272	4.61	216.7	8.32	8.32	446.1	3.38	0.463	142.86	0.39	0.0106	0.467
											Total (General Scenario)	**3.127**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018, Stormwater Drainage Manual Corrigendum No.1/2022, and Stormwater Drainage Manual Corrigendum No.1/2024.*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Calculation of Runoff for Return Period of 10 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_0), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
A (Site)	0.0216	4.77	234.9	9.16	9.16	485.0	3.11	0.397	179.23	0.15	0.0032	0.179
B	0.0118	36.14	175.0	4.84	4.84	485.0	3.11	0.397	213.00	0.20	0.0024	0.155
C	0.0313	28.94	427.0	11.19	11.19	485.0	3.11	0.397	168.67	0.20	0.0063	0.326
D	0.0103	7.66	206.6	7.89	7.89	485.0	3.11	0.397	187.19	0.15	0.0016	0.090
E	0.0148	5.40	183.4	7.25	7.25	485.0	3.11	0.397	191.73	0.95	0.0141	0.833
F	0.0058	6.51	61.5	2.57	2.57	485.0	3.11	0.397	243.36	0.95	0.0055	0.413
G	0.0042	7.82	80.6	3.35	3.35	485.0	3.11	0.397	231.19	0.95	0.0040	0.284
H	0.0272	4.61	216.7	8.32	8.32	485.0	3.11	0.397	184.39	0.39	0.0106	0.603
											Total (General Scenario)	**2.883**

After the Proposed Development												
A (Site)	0.0216	-	-	5.00	5.00	485.0	3.11	0.397	211.28	0.91	0.0196	1.282
B	0.0118	36.14	175.0	4.84	4.84	485.0	3.11	0.397	213.00	0.20	0.0024	0.155
C	0.0313	28.94	427.0	11.19	11.19	485.0	3.11	0.397	168.67	0.20	0.0063	0.326
D	0.0103	7.66	206.6	7.89	7.89	485.0	3.11	0.397	187.19	0.15	0.0016	0.090
E	0.0148	5.40	183.4	7.25	7.25	485.0	3.11	0.397	191.73	0.95	0.0141	0.833
F	0.0058	6.51	61.5	2.57	2.57	485.0	3.11	0.397	243.36	0.95	0.0055	0.413
G	0.0042	7.82	80.6	3.35	3.35	485.0	3.11	0.397	231.19	0.95	0.0040	0.284
H	0.0272	4.61	216.7	8.32	8.32	485.0	3.11	0.397	184.39	0.39	0.0106	0.603
											Total (General Scenario)	**3.986**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018, Stormwater Drainage Manual Corrigendum No.1/2022, and Stormwater Drainage Manual Corrigendum No.1/2024.*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Calculation of Runoff for Return Period of 50 Years

Catchment ID	Catchment Area (A), km^2	Average slope (H), m/100m	Flow path length (L), m	Inlet time (t_o), min	Duration (t_d), min	Storm Constants			Runoff intensity (i) mm/hr	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s
						a	b	c				
Before the Proposed Development												
Catchment A (Site)	0.0216	4.77	234.9	9.16	9.16	505.5	3.29	0.355	206.49	0.15	0.0032	0.206
Catchment B	0.0118	36.14	175.0	4.84	4.84	505.5	3.29	0.355	240.28	0.20	0.0024	0.175
Catchment C	0.0313	28.94	427.0	11.19	11.19	505.5	3.29	0.355	195.71	0.20	0.0063	0.378
Catchment D	0.0103	7.66	206.6	7.89	7.89	505.5	3.29	0.355	214.53	0.15	0.0016	0.103
Catchment E	0.0148	5.40	183.4	7.25	7.25	505.5	3.29	0.355	219.11	0.95	0.0141	0.952
Catchment F	0.0058	6.51	61.5	2.57	2.57	505.5	3.29	0.355	269.84	0.95	0.0055	0.458
Catchment G	0.0042	7.82	80.6	3.35	3.35	505.5	3.29	0.355	258.08	0.95	0.0040	0.317
Catchment H	0.0272	4.61	216.7	8.32	8.32	505.5	3.29	0.355	211.71	0.39	0.0106	0.692
											Total (General Scenario)	**3.281**

After the Proposed Development												
Catchment A (Site)	0.0216	-	-	5.00	5.00	505.5	3.29	0.355	238.58	0.91	0.0196	1.447
Catchment B	0.0118	36.14	175.0	4.84	4.84	505.5	3.29	0.355	240.28	0.20	0.0024	0.175
Catchment C	0.0313	28.94	427.0	11.19	11.19	505.5	3.29	0.355	195.71	0.20	0.0063	0.378
Catchment D	0.0103	7.66	206.6	7.89	7.89	505.5	3.29	0.355	214.53	0.15	0.0016	0.103
Catchment E	0.0148	5.40	183.4	7.25	7.25	505.5	3.29	0.355	219.11	0.95	0.0141	0.952
Catchment F	0.0058	6.51	61.5	2.57	2.57	505.5	3.29	0.355	269.84	0.95	0.0055	0.458
Catchment G	0.0042	7.82	80.6	3.35	3.35	505.5	3.29	0.355	258.08	0.95	0.0040	0.317
Catchment H	0.0272	4.61	216.7	8.32	8.32	505.5	3.29	0.355	211.71	0.39	0.0106	0.692
											Total (General Scenario)	**4.522**

Note:

1) Runoff is calculated in accordance with DSD *Stormwater Drainage Manual Planning, Design and Management Fifth Edition, January 2018* and *Stormwater Drainage Manual Corrigendum No.1/2022*
2) The inlet time of Catchment A after the proposed development is arbitratily taken as 5 minutes in reference to rainfall intensity estimation approach in Highway Department *Guidance Notes on Road Pavement Drainage Design* .

Appendix E Standard Details of U-Channel, Catchpit, and Sand Trap

Appendix F Calculation of Proposed Drainage System Capacity

Calculation of Proposed Channel Capacity for Return Period of 50 Years

Drainage Capacity of Internal Drainage System (U-channel)

Channel	Upstream Catchpit	Downstream Catchpit	Upstream Ground Level (mPD)	Upstream Invert Level (mPD)	Downstream Ground Level (mPD)	Downstream Invert Level (mPD)	Shape	Depth (m)	Width	Diameter (m)	gradient (1 over)	Length (m)	s	A_w	P_w	R	n	V	Q_C	Involved Catchment	Q_p (m^3/s)	% of capacity	Remark
Northern Channel	CP 09	CP 08	38.55	38.13	39.30	38.61	U-Shape	0.375	Not Applicable	0.375	50	34.4	0.0200	0.1255	0.9640	0.1302	0.016	2.271	0.257	B	0.140	55%	OK
	CP 08	CP 07	39.30	38.61	38.84	38.27	U-Shape	0.375		0.375	50	28.3	0.0200	0.1255	0.9640	0.1302	0.016	2.271	0.257	B	0.140	55%	OK
	CP 07	CP 06	38.84	38.27	36.55	36.03	U-Shape	0.375		0.375	50	25.8	0.0200	0.1255	0.9640	0.1302	0.016	2.271	0.257	B	0.140	55%	OK
	CP 06	CP 05	36.55	36.03	35.55	34.81	U-Shape	0.525		0.525	50	37.1	0.0200	0.2461	1.3497	0.1823	0.016	2.842	0.629	A1,B	0.365	58%	OK
	CP 05	CP 04	35.55	34.81	34.55	33.97	U-Shape	0.525		0.525	50	28.9	0.0200	0.2461	1.3497	0.1823	0.016	2.842	0.629	A1,B	0.365	58%	OK
	CP 04	CP 03	34.55	33.97	34.35	33.68	U-Shape	0.7		0.525	50	33.7	0.0200	0.2920	1.5247	0.1915	0.016	2.937	0.772	A1, A2, B	0.627	81%	OK
	CP 03	CP 02	34.35	33.68	33.05	32.39	U-Shape	0.7		0.525	50	33.1	0.0200	0.2920	1.5247	0.1915	0.016	2.937	0.772	A1, A2, B	0.627	81%	OK
	CP 02	CP 01	33.05	32.39	31.55	30.64	U-Shape	0.7		0.525	50	45.7	0.0200	0.2920	1.5247	0.1915	0.016	2.937	0.772	A1, A2, B	0.627	81%	OK
Southern Channel	CP 10	Point 1	35.05	34.16	33.05	32.67	rectangular	0.375	0.375	Not Applicable	50	74.5	0.0200	0.1406	1.1250	0.1250	0.016	2.210	0.280	D	0.103	37%	OK
	Point 1	CP11	33.05	31.47	32.50	31.33	rectangular	0.375	0.375		50	7.2	0.0200	0.1406	1.1250	0.1250	0.016	2.210	0.280	D	0.103	37%	OK
	CP11	CP12	32.50	30.33	31.05	29.57	rectangular	0.5	0.5		50	38.1	0.0200	0.2500	1.5000	0.1667	0.016	2.677	0.602	A4,D	0.308	51%	OK
	CP12	Tank	31.05	29.57	29.05	28.12	rectangular	0.5	0.5		50	72.5	0.0200	0.2500	1.5000	0.1667	0.016	2.677	0.602	A4,D	0.308	51%	OK
	CP15	CP14	34.05	32.40	32.50	31.98	rectangular	0.4	0.3		50	20.9	0.0200	0.1200	1.1000	0.1091	0.016	2.018	0.218	A3	0.110	50%	OK
	CP14	CP13	32.50	31.98	31.50	31.33	rectangular	0.4	0.3		50	32.6	0.0200	0.1200	1.1000	0.1091	0.016	2.018	0.218	A3	0.110	50%	OK
	CP13	Tank	31.50	29.33	29.05	28.93	rectangular	0.4	0.3		50	20.0	0.0200	0.1200	1.1000	0.1091	0.016	2.018	0.218	A3	0.110	50%	OK
Central Channel	CP 09	CP 10	38.55	36.40	35.05	34.16	rectangular	0.6	0.525		50	111.8	0.0200	0.3150	1.7250	0.1826	0.016	2.845	0.807	A1,B,C	0.469	58%	OK
	CP10	CP19	35.05	32.16	32.85	31.34	circular pipe	Not Applicable		0.7	50	41.0	0.0200	0.3848	2.1991	0.1750	0.016	2.765	0.958	A1,B,C	0.469	49%	OK
	CP19	Point 2	32.85	31.34	32.75	30.99	rectangular	0.9	0.8	Not Applicable	150	53.4	0.0067	0.7200	2.6000	0.2769	0.016	2.168	1.405	A1,A2,A3,B,C	1.060	75%	OK
	Point 2	CP18	32.75	30.99	31.52	30.84	rectangular	0.9	0.8		150	21.6	0.0067	0.7200	2.6000	0.2769	0.016	2.168	1.405	A1,A2,A3,B,C	1.060	75%	OK
	CP18	CP17	31.52	30.84	31.55	30.70	rectangular	0.9	0.8		150	21.0	0.0067	0.7200	2.6000	0.2769	0.016	2.168	1.405	A1,A2,A3,B,C	1.060	75%	OK
	CP17	CP16	31.55	30.20	31.05	30.16	rectangular	0.9	0.8		150	6.6	0.0067	0.7200	2.6000	0.2769	0.016	2.168	1.405	A1,A2,A3,B,C	1.060	75%	OK

Remark: In reference to *Stormwater Drainage Manual* Table 13, the manning's roughness coefficient 0.016 is taken as concrete line surface under fair condition, the effect of sedimentation is considered through deducting flow capacity by 10%.

Legend

D = diameter, m
A_w = Cross Section Area of Flow, m^2
P_w = Wetted Perimeter, m
R = Hydraulic Radius = A_w/P_w, m
s = Hydraulic Gradient
n = Manning's roughness coefficient
V = Mean Velocity, m/s
Q_c = Flow Capacity, m^3/s
Q_p = Estimated Peak Flow, m^3/s

Calculation of Proposed Pipe Capacity for Return Period of 50 Years

Drainage Capacity of Proposed External Drainage System

From	To	Upstream Invert Level	Downstream Invert Level	Description	length	d	r	Aw	Pw	R	s	ks	V	Q_c	Q_p	% of capacity	Remark
		mPD	mPD		m	m	m	m^2	m	m	-	mm	m/s	m^3/s	m3/s	%	
Catchpit 01	Terminal Manhole	29.02	29	Internal drainage 01	2.96	0.75	0.375	0.442	2.356	0.188	0.005	0.15	2.267	0.9019	0.6268	70%	OK
Catchpit 16	Terminal Manhole	29.07	29.02	Internal drainage 02	9.50	1.05	0.525	0.866	3.299	0.263	0.005	0.15	2.784	2.1695	1.0597	49%	OK
Terminal Manhole	RMH-X1	29	28.68	external drainage 01	1.36	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	2.104	38%	OK
RMH-X1	RMH-X2	28.68	28.55	external drainage 02	24.82	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	3.056	56%	OK
RMH-X2	RMH-X3	28.55	28.37	external drainage 03	34.09	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	3.056	56%	OK
RMH-X3	RMH-X4	28.37	28.13	external drainage 04	47.65	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	3.056	56%	OK
RMH-X4	Discharge Point	28.13	27.07	external drainage 05	6.41	1.5	0.75	1.767	4.712	0.375	0.005	0.15	3.455	5.494	3.056	56%	OK

Remark: In reference to *Stormwater Drainage Manual* Table 14, the surface roughness value is taken as precast concrete pipe with 'O' ring joints under normal condition, the effect of sedimentation is considered by deducting flow capacity by 10%.

Legend

d = pipe diameter, m

r = pipe radius (m) = 0.5d

A_w = wetted area (m^2) = p r^2

P_w = wetted perimeter (m) = 2pr

R = Hydraulic radius (m) = A_w/P_w

s = Slope of the total energy line

k_s = equivalent sand roughness, mm

V = Velocity of flow calculated based on Colebrook White Equation, m/s

Q_c = Flow Capacity (10% sedimentation incorporated), m^3/s

Q_p = Estimated total peak flow from the pipe

Tank Sizing for Stormwater Storage Tank

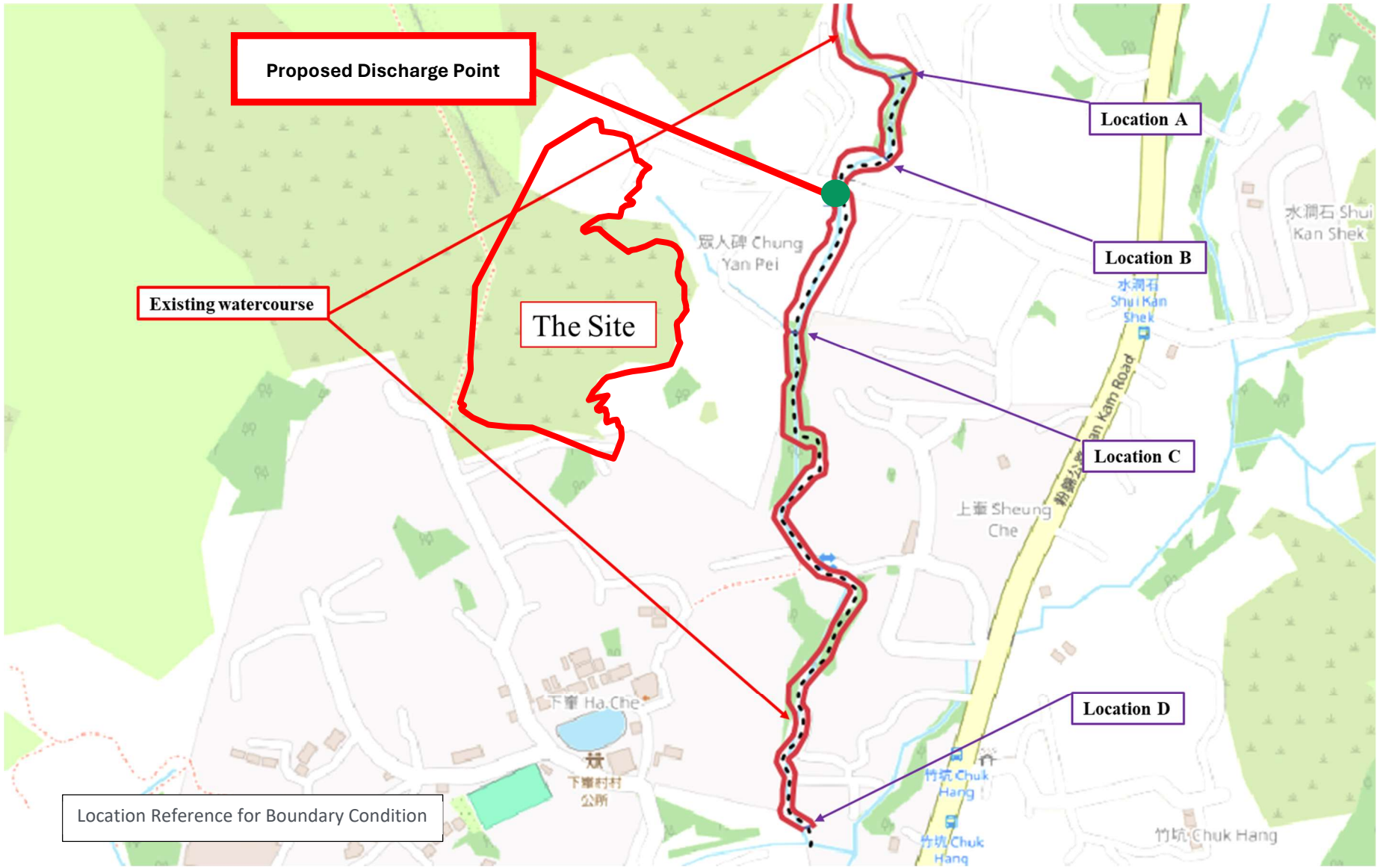
Description	Catchment Area (A), km^2	Runoff intensity (i), mm/hr [2]	Runoff coefficient (C)	C x A	Peak runoff (Q_p), m^3/s	Duration of Storm, hours	Runoff Volume, m^3	Length (L)	Width (W)	Depth (D)	Design Volume
From CP10 to Tank (Catchment D)	**0.01034**	134.00	0.15	0.0016	0.058	1.0	233				
From CP10 to Tank (Catchment A4)	**0.00305**	134.00	0.91	0.0028	0.103	1.0	411				
From CP15-13 (25% Catchment A3)	**0.00653**	134.00	0.91	0.0059	0.055	1.0	222				
						Total runoff volume needs to be stored	**867**	20.0	15.0	3.0	900

Note:

1) Runoff is calculated in accordance with DSD's "*Stormwater Drainage Manual (with Eurocodes incorporated) - Planning, Design and Management*" (SDM), fifth edition, January 2018.

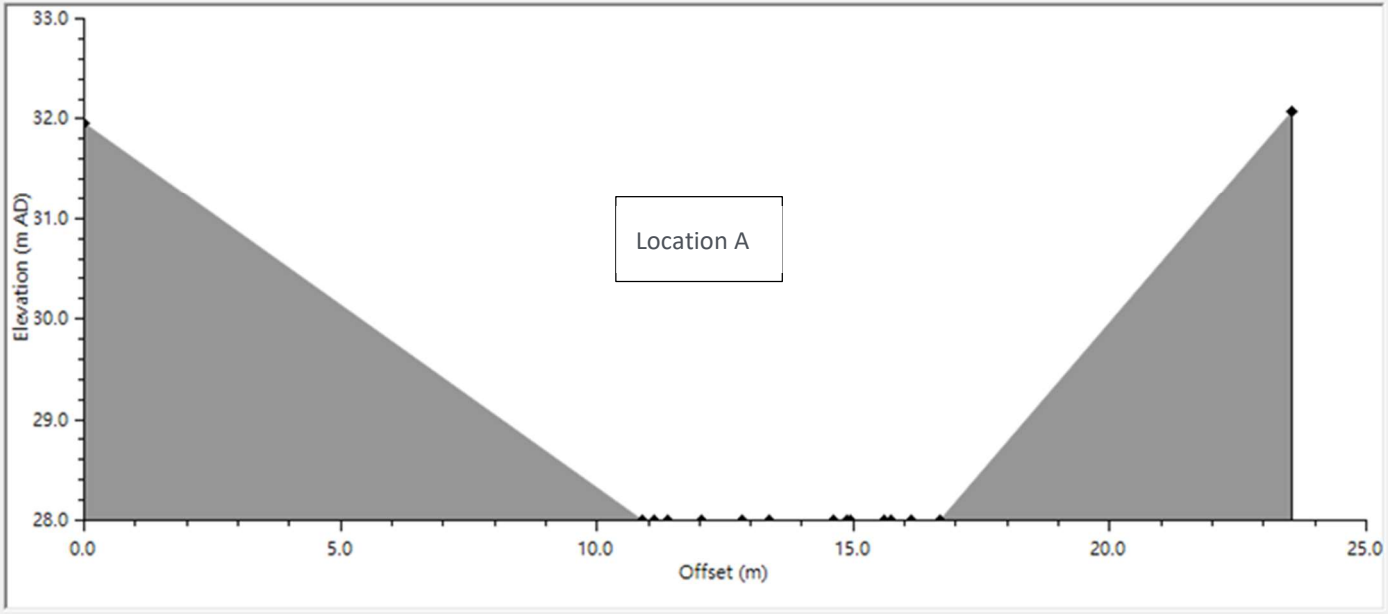
2) Extreme intensity under 50 years return period is based on Table 3a of Corrigendum 1/2024.

Appendix G Information of Existing Watercourse


Proposed Discharge Point
Existing watercourse
The Site
Location A
Location B
Location C
Location D
Location Reference for Boundary Condition
冠人碑 Chung Yan Pei
水潤石 Shui Kan Shek
上蚕 Sheung Che
下輋 Ha Che
竹坑 Chuk Hang

Cross section line : P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02! : Section data

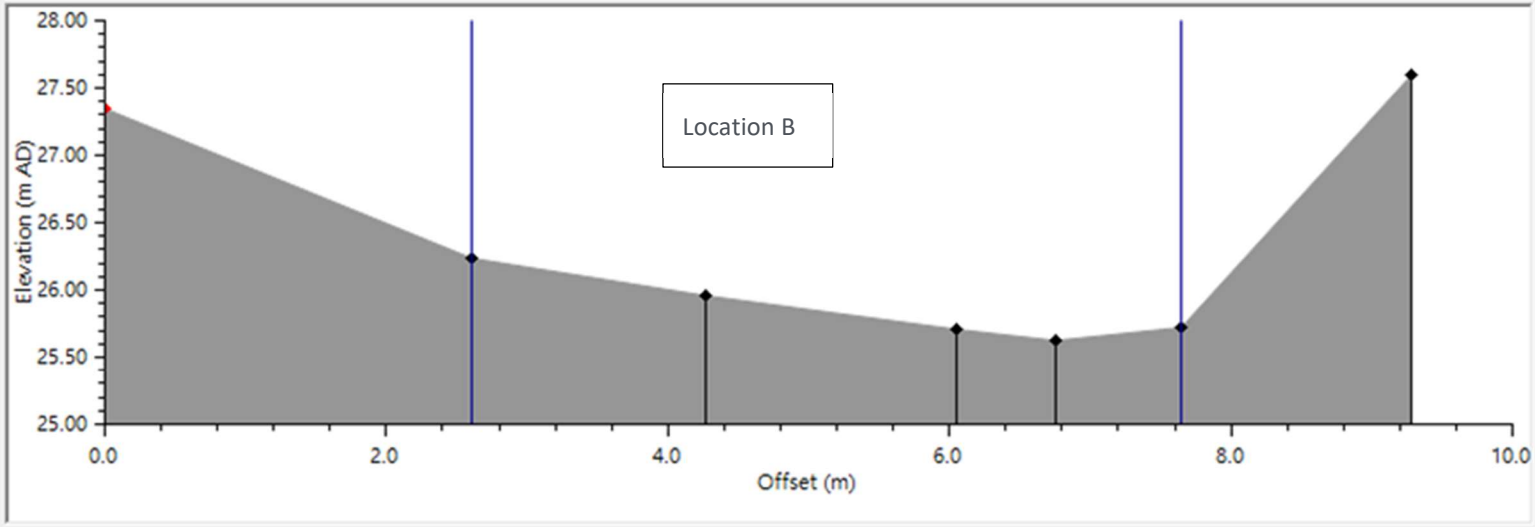
	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827996.759	834897.266	31.955	0.0160	☐
2	10.896	827986.382	834893.946	28.000	0.0160	☐
3	11.130	827986.152	834893.900	28.000	0.0160	☐
4	11.391	827985.897	834893.850	28.000	0.0160	☐
5	12.042	827985.259	834893.721	28.000	0.0160	☐
6	12.822	827984.493	834893.567	28.000	0.0160	☐
7	13.347	827983.978	834893.466	28.000	0.0160	☐
8	14.606	827982.743	834893.226	28.000	0.0160	☐
9	14.878	827982.475	834893.174	28.000	0.0160	☐
10	14.924	827982.430	834893.166	28.000	0.0160	☐
11	15.614	827981.753	834893.034	28.000	0.0160	☐
12	15.734	827981.635	834893.014	28.000	0.0160	☐
13	16.137	827981.238	834892.946	28.000	0.0160	☐



OK Cancel

Cross section line : P01_P_LAI TAU_160530_a : Section data

	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827976.997	834823.522	27.350	0.0160	☐
2	2.600	827975.173	834825.375	26.240	0.0160	☒
3	4.270	827974.002	834826.565	25.960	0.0160	☐
4	6.050	827972.753	834827.834	25.710	0.0160	☐
5	6.750	827972.262	834828.333	25.620	0.0160	☐
6	7.640	827971.638	834828.967	25.720	0.0160	☒
7	9.280	827970.488	834830.136	27.600	0.0160	☐



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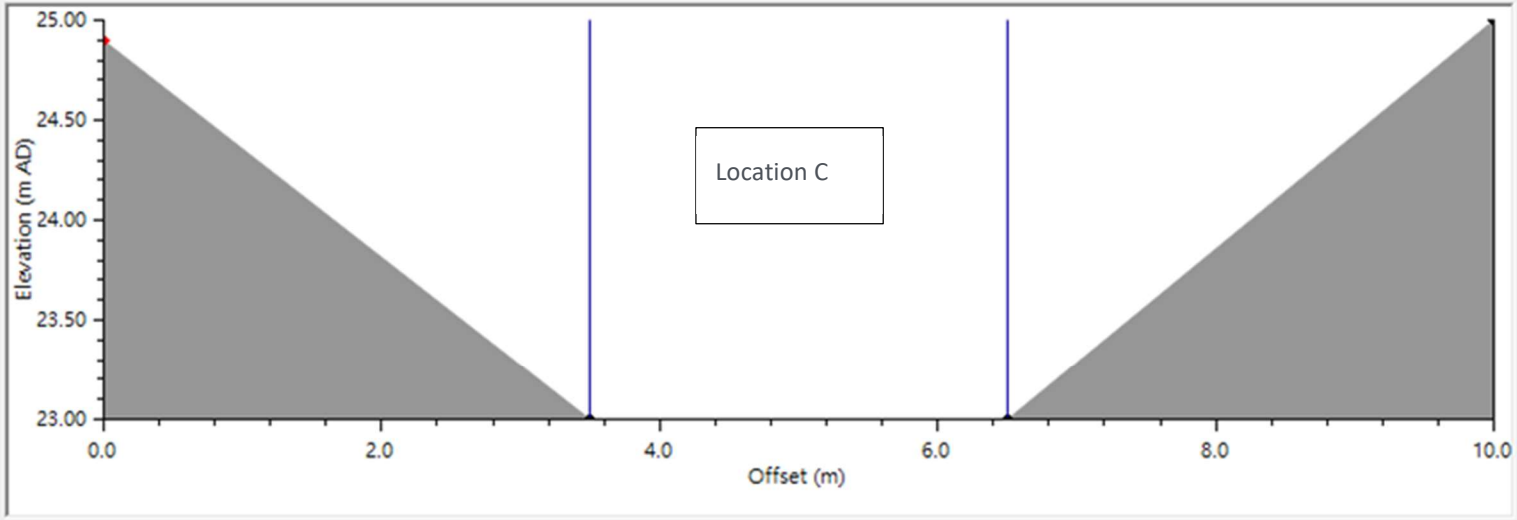
Cross section line : P01_P_LAI TAU_160900 : Section data

	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827906.112	834687.532	24.900	0.0160	☐
2	3.500	827902.649	834688.040	23.000	0.0160	☒
3	6.500	827899.681	834688.475	23.000	0.0160	☒
4	10.000	827896.218	834688.982	25.000	0.0160	☐



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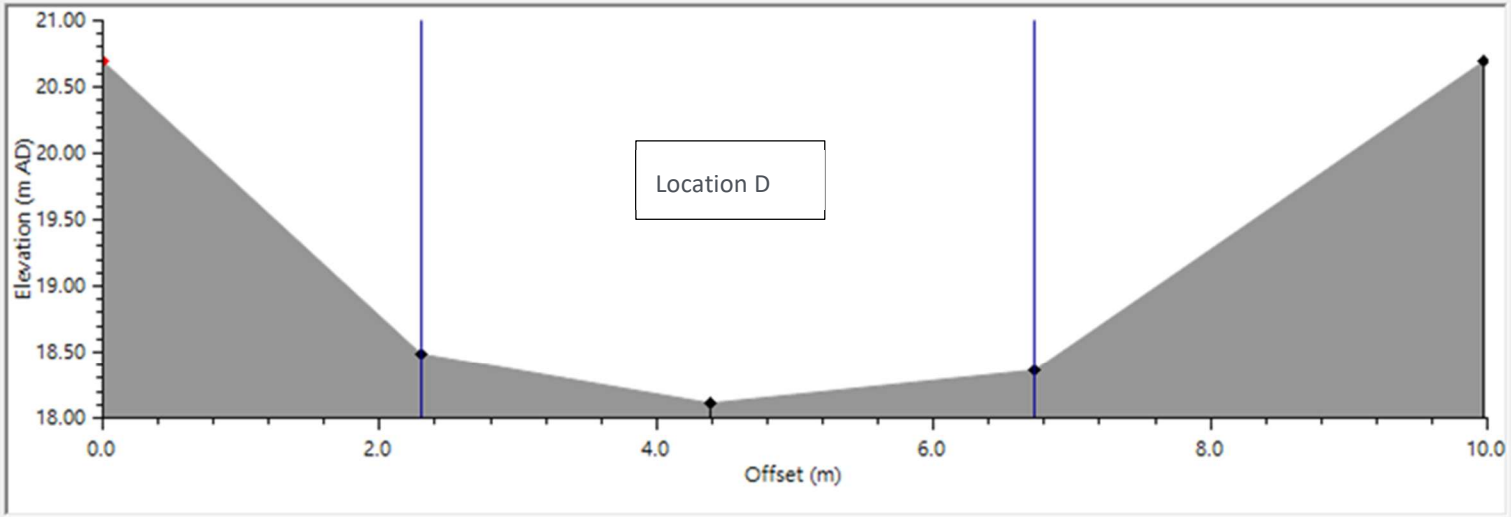
Cross section line : P01_P_LAI TAU_161180_a : Section data

	Offset (m)	X coordinate (m)	Y coordinate (m)	Bed level (m AD)	Roughness Manning's n	New panel
1	0.000	827915.891	834292.642	20.700	0.0160	☐
2	2.305	827913.697	834291.934	18.480	0.0160	☒
3	4.386	827911.702	834291.343	18.110	0.0160	☐
4	6.733	827909.453	834290.669	18.360	0.0160	☒
5	9.972	827906.380	834289.645	20.700	0.0160	☐



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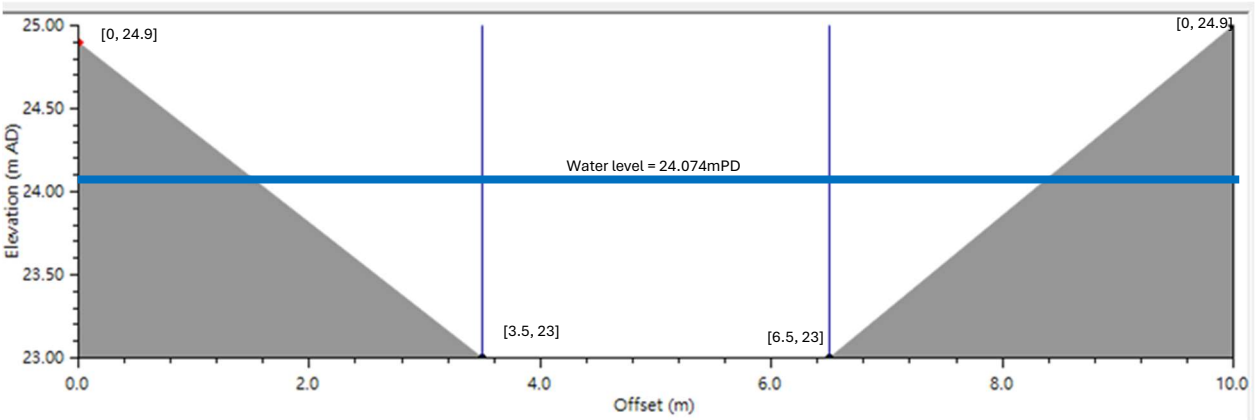
Boundary Condition at each Section of Watercourse

Location	Section ID	Return Period															
		2AB			10A			10B			50A			50B			
		Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)	Peak Water Level (mPD)	Peak Flow (m3/s)	Peak Velocity (m/s)
A	P01_P_LAI TAU_160000_a-P01_P_LAI TAU_02!	28.41300	14.80727	5.25000	28.53400	22.90300	6.06600	28.41300	14.80724	5.25000	28.59600	28.07553	6.54000	28.53400	22.90267	6.06600
B	P01_P_LAI TAU_160530_a	26.41500	14.80655	4.86400	26.57800	21.15100	5.68200	26.41500	14.80648	4.86400	26.67300	28.82516	6.12100	26.57800	23.15104	5.68200
C	P01_P_LAI TAU_160900	23.75600	14.80303	4.42800	23.95900	23.14600	5.05500	23.75600	14.80309	4.42800	24.07400	28.84762	5.39900	23.95900	23.14692	5.05500
D	P01_P_LAI TAU_161180_a	19.53400	14.84949	2.11800	19.96600	23.21900	2.39500	19.53400	14.85032	2.11800	20.23200	28.98928	2.54300	19.96600	23.21988	2.39500

Appendix H Calculation of Watercourse Capacity

Calculation of Flow Capacity of Watercourse at Location C

Referring to the information provided by DSD, the peak water level at Location C has reached 24.074mPD under the scenario of a 10-year sea level in conjunction with a 50-year rainfall. The flow area as well as the hydraulic radius at the peak water level can be calculated from the geometry of the cross section of the watercourse at Location C:



As shown, the geometry of the watercourse cross-section at Location C can be portrayed by its bed level and the corresponding offset from shore line. Listed in the format as [offset, bed level], the 4 points used for describing cross-section geometry are:

[0, 24.9]; [3.5, 23]; [6.5, 23]; [10, 25].

Therefore,

$$flow\ area = (\frac{24.074-23.0}{24.9-23.0})^2 \times (24.9-23.0) \times (3.5-0) \times 0.5 + (24.074-23.0) \times (6.5-3.5) + \left(\frac{24.074-23.0}{25.0-23.0}\right)^2 \times (25.0-23.0) \times (10.0-6.5) \times 0.5 = 5.29370(m^2)$$

$$wet\ perimeter = \frac{24.074-23.0}{24.9-23.0} \times \sqrt[2]{(24.9-23.0)^2+(3.5-0)^2} + (6.5-3.5) + \frac{24.074-23.0}{25.0-23.0} \times \sqrt[2]{(25.0-23.0)^2+(10.0-6.5)^2} = 7.41585\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{5.29370}{7.41585} = 0.71384\ (m)$$

Under assumption of uniform flow condition, the flow velocity of an open channel will subject to its roughness, channel gradient, and hydraulic radius as express as Manning's equation:

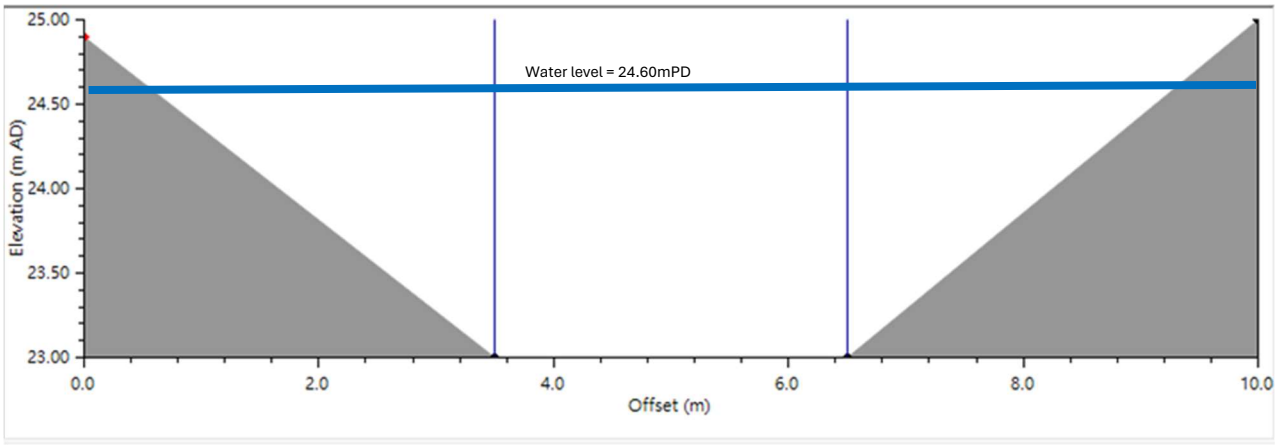
$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}}$$

The peak velocity of watercourse at Location C corresponding to the water level of 24.074m has been given by DSD as 5.399m/s. The hydraulic property of watercourse at Location C can be back calculated as a constant.

$$5.399 = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times 0.71384^{\frac{2}{3}}$$

$$\frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} = \frac{5.399}{0.71384^{\frac{2}{3}}} = 6.75947\ (m^{\frac{1}{3}}/s)$$

When a 300mm freeboard is reserved, the water level at Location C will reach 24.6mPD.



The corresponding flow area and hydraulic radius can be calculated.

$$flow\ area = \left(\frac{24.60-23.0}{24.9-23.0}\right)^2 \times (24.9-23.0) \times (3.5-0) \times 0.5 + (24.60-23.0) \times (6.5-3.5) + \left(\frac{24.60-23.0}{25.0-23.0}\right)^2 \times (25.0-23.0) \times (10.0-6.5) \times 0.5 = 9.39790\ (m^2)$$

$$wet\ perimeter = \frac{24.60-23.0}{24.9-23.0} \times \sqrt[2]{(24.9-23.0)^2+(3.5-0)^2} + (6.5-3.5) + \frac{24.60-23.0}{25.0-23.0} \times \sqrt[2]{(25.0-23.0)^2+(10.0-6.5)^2} = 9.57855\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{9.39790}{9.57855} = 0.98114\ (m)$$

With the hydraulic radius and flow area known, the capacity of watercourse at Location C when a 300mm freeboard is reserved can be estimated as below:

$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}} = 6.75947 \times 0.98114^{\frac{2}{3}} = 6.67421\ (m/s)$$

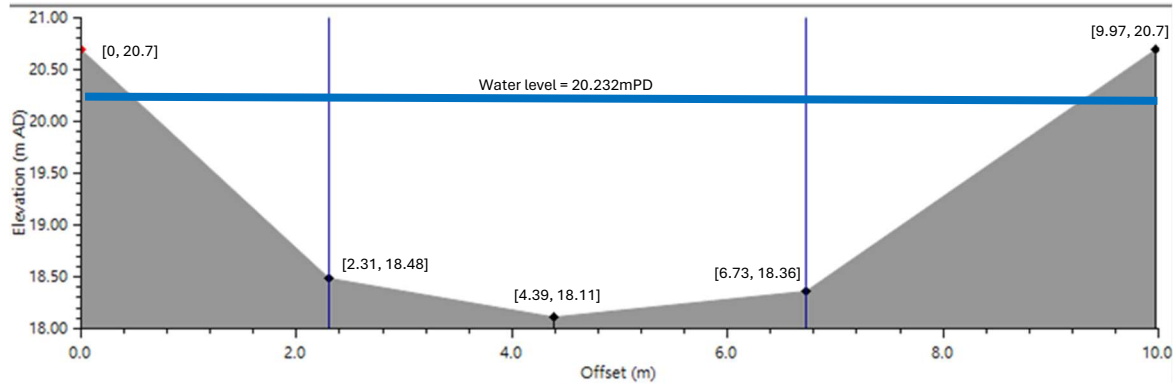
$$flow\ capacity = flow\ area \times flow\ velocity = 9.39790 \times 6.67421 = 62.72357\ (m^3/s)$$

Comparing the peak flow under current boundary condition, 28.84762m³/s, and the flow capacity under 300mm freeboard, the available capacity of watercourse at Location C can be estimated:

$$available\ capacity = 62.72357 - 28.84762 = 33.87595\ (m^3/s)$$

Calculation of Watercourse Capacity at Location D

Referring to the information provided by DSD, the peak water level at Location D has reached 20.232mPD under the scenario of a 10-year sea level in conjunction with a 50-year rainfall. The flow area as well as the hydraulic radius at the peak water level can be calculated from the geometry of the cross section of the watercourse at Location D:



As shown, the geometry of the watercourse cross-section at Location D can be portrayed by its bed level and the corresponding offset from shore line. Listed in the format as [offset, bed level], the 5 points used for describing cross-section geometry are:

[0, 20.7]; [2.31, 18.48]; [4.39, 18.11]; [6.73, 18.36]; [9.97, 20.7].

Therefore,

$$flow\ area = (\frac{20.232-18.48}{20.70-18.48})^2 \times (20.70-18.48) \times (2.31-0) \times 0.5 + (20.232-18.48) \times (4.39-2.31) + (18.48-18.11) \times (4.39-2.31) \times 0.5 + (20.232-18.36) \times (6.73-4.39) \times 0.5 + (18.36-18.11) \times (6.73-4.39) \times 0.5 + \left(\frac{20.232-18.36}{20.70-18.36}\right)^2 \times (20.70-18.36) \times (9.97-6.73) \times 0.5 = 12.73673(m^2)$$

$$wet\ perimeter = \frac{20.232-18.48}{20.70-18.48} \times \sqrt[2]{(20.70-18.48)^2+(2.31-0)^2} + \sqrt[2]{(18.48-18.11)^2+(4.39-2.31)^2} + \sqrt[2]{(18.36-18.11)^2+(6.73-4.39)^2} + \frac{20.232-18.36}{20.70-18.36} \times \sqrt[2]{(20.70-18.36)^2+(9.97-6.73)^2} = 10.19617\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{12.73673}{10.19617} = 1.24917\ (m)$$

Under assumption of uniform flow condition, the flow velocity of an open channel will subject to its roughness, channel gradient, and hydraulic radius as express as Manning's equation:

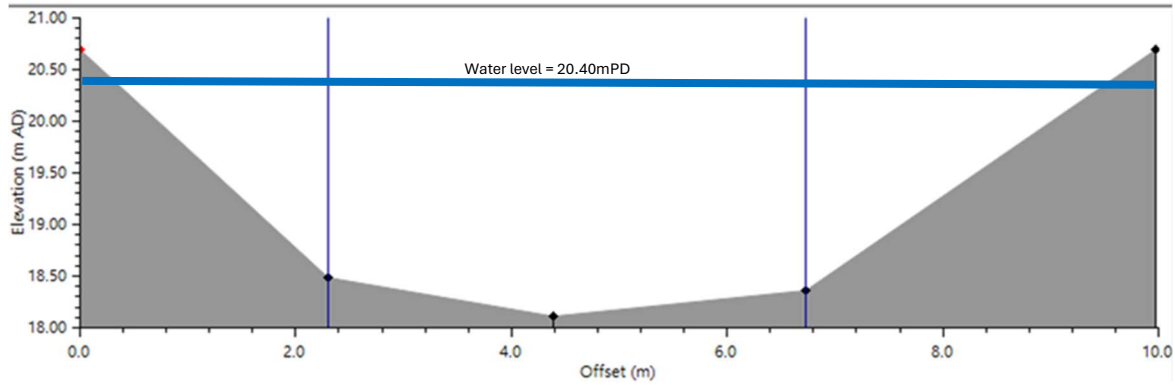
$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}}$$

The peak velocity of watercourse at Location D corresponding to the water level of 20.232m has been given by DSD as 2.543m/s. The hydraulic property of watercourse at Location D can be back calculated as a constant.

$$2.543 = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times 1.24917^{\frac{2}{3}}$$

$$\frac{channel\ gradient^{\frac{1}{2}}}{surface\ roughness} = \frac{2.543}{1.24917^{\frac{2}{3}}} = 2.19246\ (m^{\frac{1}{3}}/s)$$

When a 300mm freeboard is reserved, the water level at Location D will reach 20.40mPD.



The corresponding flow area and hydraulic radius can be calculated.

$$flow\ area = (\frac{20.40-18.48}{20.70-18.48})^2 \times (20.70-18.48) \times (2.31-0) \times 0.5 + (20.40-18.48) \times (4.39-2.31) + (18.48-18.11) \times (4.39-2.31) \times 0.5 + (20.40-18.36) \times (6.73-4.39) \times 0.5 + (18.36-18.11) \times (6.73-4.39) \times 0.5 + \left(\frac{20.40-18.36}{20.70-18.36}\right)^2 \times (20.70-18.36) \times (9.97-6.73) \times 0.5 = 14.25575\ (m^2)$$

$$wet\ perimeter = \frac{20.40-18.48}{20.70-18.48} \times \sqrt[2]{(20.40-18.48)^2+(2.31-0)^2} + \sqrt[2]{(18.48-18.11)^2+(4.39-2.31)^2} + \sqrt[2]{(18.36-18.11)^2+(6.73-4.39)^2} + \frac{20.40-18.36}{20.70-18.36} \times \sqrt[2]{(20.70-18.36)^2+(9.97-6.73)^2} = 10.72523\ (m)$$

$$hydraulic\ radius = \frac{flow\ area}{wet\ perimeter} = \frac{14.25575}{10.72523} = 1.32918\ (m)$$

With the hydraulic radius and flow area known, the capacity of watercourse at Location D when a 300mm freeboard is reserved can be estimated as below:

$$flow\ velocity = \frac{channel\ gradient^{\frac{1}{2}}}{Manning\ coefficient} \times hydraulic\ radius^{\frac{2}{3}} = 2.19246 \times 1.32918^{\frac{2}{3}} = 2.65046\ (m/s)$$
$$flow\ capacity = flow\ area \times flow\ velocity = 14.25575 \times 2.65046 = 37.78431\ (m^3/s)$$

In summary, the flow capacity of watercourse at Location D with 300mm freeboard is estimated to be 37.78m^3/s.

Comparing the peak flow under current boundary condition, 28.98928m^3/s, and the flow capacity under 300mm freeboard, the available capacity of watercourse at Location D can be estimated:

$$available\ capacity = 37.78431 - 28.98928 = 8.79503\ (m^3/s)$$

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Previous Applications involving the Site

Approved Applications

Application No.	Proposed Uses/Developments	Date of Consideration (RNTPC)
A/YL-PH/133	Temporary Open Storage or Wrecked Vehicles (Cars and Vans) for Import/Export with Cargo Handling Operation for a Period of 12 Months	7.11.1997
A/YL-PH/142	Open Storage of Construction Machinery for Re-export with Ancillary Workshop	21.11.1997
A/YL-PH/249	Temporary Open Storage or Wrecked Vehicles (Cars and Vans) for Import/Export with Cargo Handling Operation for a Period of 12 Months	11.12.1998
A/YL-PH/276	Pond Filling for Open Storage Use	14.5.1999
A/YL-PH/804	Proposed Temporary Wholesale Trade (Food) for a Period of 5 Years	12.4.2019 (Revoked on 12.3.2023)

Similar Application within the "Open Storage" Zone
in the Vicinity of the Site in the Past Five Years

Approved Application

Application No.	Proposed Uses/Developments	Date of Consideration (RNTPC)
A/YL-PH/846	Proposed Temporary Wholesale Trade (Food) for a Period of 5 Years	1.9.2020 (Revoked on 1.3.2022)

Government Departments' General Comments

1. Land Administration

Comments of the District Lands Officer/Yuen Long, Lands Department (DLO/YL, LandsD):

- no adverse comment on the application;
- the application site (the Site) comprises Government land (GL) and various Old Schedule Agricultural Lots in D.D. 111 held under the Block Government Lease which contains restriction that no structures are allowed to be erected without the prior approval of the Government;
- the private lots except Lot 889 in D.D. 111 and the GL in the Site are covered by Short Term Waiver No. 5548 and Short Term Tenancy No. STTYL0212 for the purpose of temporary wholescale trade (food) and ancillary uses as may be approved by DLO/YL; and
- advisory comments are at **Appendix V**.

2. Traffic

(i) Comments of the Commissioner for Transport:

- no adverse comment on the application from traffic engineering perspective; and
- advisory comments are at **Appendix V**.

(ii) Comments of the Chief Highway Engineer/New Territories West, Highways Department (HyD):

- no adverse comment on the application from highways maintenance perspective; and
- advisory comments are at **Appendix V**.

3. Drainage

Comments of the Chief Engineer/Mainland North, Drainage Services Department:

- no objection to the application from public drainage point of view;
- should the application be approved, approval conditions requiring the submission of a drainage impact assessment, and implementation and maintenance of the drainage proposal for the development should be included in the planning permission; and
- advisory comments are at **Appendix V**.

4. Fire Safety

Comments of the Director of Fire Services:

- no in-principle objection to the application subject to fire service installations being provided to the satisfaction of his department;
- the submitted fire service installations proposal is considered acceptable; and
- advisory comments are at **Appendix V**.

5. Landscape Aspect

Comments of the Chief Town Planner/ Urban Design and Landscape, Planning Department:

- the Site is within the "Open Storage" zone which is non-landscape sensitive zoning and no significant landscape impact arising from the proposed use is anticipated.

6. Building Matters

Comments of the Chief Building Surveyor/New Territories West, Buildings Department:

- no objection to the application; and
- advisory comments are at **Appendix V**.

7. District Office's Comments

Comments of the District Officer (Yuen Long), Home Affairs Department:

- no particular comment on the application and no comment received from the locals upon close of consultation.

8. Other Departments

The following government departments have no objection to/no adverse comment/no comment on the application and their advisory comments, if any, are in **Appendix V**:

- Director of Food and Environmental Hygiene;
- Chief Engineer/Construction, Water Supplies Department;
- Chief Engineer/Railway Development 1-1, HyD; and
- Project Manager (West), Civil Engineering and Development Department.

Recommended Advisory Clauses

(a) to note the comments of the District Lands Officer/Yuen Long, Lands Department (LandsD) that the Short Term Waiver (STW) and Short Term Tenancy (STT) holder(s) will need to apply to his Office for modification of the STW and STT conditions where appropriate and the lot owner shall apply to his office for a STW to permit the structure(s) erected within Lot 889 in D.D 111. The applications(s) for STW and STT will be considered by the Government in its capacity as a landlord and there is no guarantee that it will be approved. The STW and STT, if approved, will be subject to such terms and conditions including the payment of waiver fee, rent, and administrative fee as considered appropriate by LandsD. Besides, given the proposed use is temporary in nature, only erection of temporary structure(s) will be considered. There is no guarantee of any right of access to the application site (the Site), the applicant shall make its own arrangement for acquiring access;

(b) to note the comments of the Commissioner for Transport that the Site is connected to the public road network via a section of a local access road which is not managed by the Transport Department (TD). The land status of the local access road should be checked with LandsD. Moreover, the management and maintenance responsibilities of the local access road should be clarified with the relevant lands and maintenance authorities accordingly. Sufficient manoeuvring space shall be provided within the Site. No vehicle is allowed to queue back to or reverse onto/from public road at any time during the planning approval period;

(c) to note the comments of the Chief Highway Engineer/New Territories West, Highways Department (HyD) that:

  (i) the access arrangement to the Site from Fan Kam Road should be commented by TD;

  (ii) HyD is not responsible for the maintenance of any access connecting the Site and Fan Kam Road; and

  (iii) adequate drainage measures should be provided to prevent surface water flowing from the Site to nearby public road and drains;

(d) to note the comments of the Chief Engineer/Mainland North, Drainage Services Department that the retention tank has been proposed to store part of the intercepted surface runoff from the Site. The control of the intake and discharge details of the retention tank should be elaborated. If pumping system is required, the details in the submission should be included. In particular, the details of the discharge rate of the retention tank in the assessment should be advised;

(e) to note the comments of the Director of Environmental Protection that the applicant is advised to follow the relevant mitigation measures and requirements in the revised "Code of Practice on Handling the Environmental Aspects of Temporary Uses and Open Storage Sites" issued by the Environmental Protection Department to minimise any potential environmental nuisance;

(f) to note the comments of the Director of Fire Services (D of FS) that the installation/maintenance/modification/repair work of fire service installations shall be undertaken by a Registered Fire Service Installation Contractor (RFSIC). The RFSIC shall after completion of the installation/maintenance/modification/repair work issue to the person on whose instruction the work was undertaken a certificate (F.S. 251) and forward a copy of the certificate to D of FS;

(g) to note the comments of the Chief Building Surveyor/New Territories West, Buildings Department (BD) that:

(i) it is noted that two structures are proposed in the application. Before any new building works (including containers/open sheds as temporary buildings, demolition and land filling, etc.) are to be carried out on the Site, prior approval and consent of the Building Authority should be obtained, otherwise they are unauthorised building works (UBW) under the Buildings Ordinance (BO). An Authorised Person should be appointed as the coordinator for the proposed building works in accordance with the BO;

(ii) the Site shall be provided with means of obtaining access thereto from a street and emergency vehicular access in accordance with Regulations 5 and 41D of the Building (Planning) Regulations (B(P)R) respectively;

(iii) the Site does not abut on a specified street of not less than 4.5m wide and its permitted development intensity shall be determined under Regulation 19(3) of the B(P)R at building plan submission stage;

(iv) for UBW erected on leased land, enforcement action may be taken by BD to effect their removal in accordance with the prevailing enforcement policy against UBW as and when necessary. The granting of any planning approval should not be construed as an acceptance of any existing building works or UBW on the Site under the BO;

(v) any temporary shelters or converted containers for office, storage, washroom or other uses are considered as temporary buildings are subject to the control of Part VII of the B(P)R; and

(vi) detailed checking under the BO will be carried out at the building plan submission stage; and

(h) to note the comments of Director of Food and Environmental Hygiene (DFEH) that:

(i) proper licence/permit issued by the Food and Environmental Hygiene Department (FEHD) is required if there is any catering service/activities regulated by DFEH under the Public Health and Municipal Services Ordinance (Cap. 132) and other relevant legislation for the public. Under the Food Business Regulation, Cap. 132X, a food business licence is required for the operation of the relevant type of food businesses listed in the Regulation. For example, if a food business involves the storage of articles of food under refrigeration in any warehouse in the territory, a cold store licence must be obtained from the DFEH before commencement of such business. For the operation of other types of food business, relevant food

licences should also be obtained from FEHD in accordance with Cap. 132; and

(ii) the operation must not cause any environmental nuisance to the surrounding. The refuse generated by the proposed development are regarded as trade refuse. The management or owner of the site is responsible for its removal and disposal at their expenses. The operation of any business should not cause any obstruction or environmental nuisance in the vicinity.

☐Urgent ☐Return receipt ☐Expand Group ☐Restricted ☐Prevent Copy

From: [redacted]
Sent: 2024-05-28 星期二 03:05:09
To: tpbpd/PLAND <tpbpd@pland.gov.hk>
Subject: A/YL-PH/1013 DD 110 Tsat Sing Kong

A/YL-PH/1013

Lots 239 (Part), 240 (Part), 241 (Part), 242, 243 (Part), 244 (Part), 245 RP (Part) and 248 (Part) in D.D. 110, Tsat Sing Kong, Pat Heung

Site area: About 1,050sq.m

Zoning: "Agriculture"

Applied use: Vehicles Showroom, Sales of Vehicle Parts and Local Provision Store / Open Storage / 15 Vehicle Parking / **Filling of Land**

Dear TPB Members,

Objections, this is an extension to the very large open storage approved under 960 that is gradually transforming the district into a massive brownfield zone.

This is the opposite to what the administration has promised for years, that brownfield activities would be phased out.

No consideration has been given to the impact on the village that is effectively being walled in by polluting activities.

Mary Mulvihill