**寄件者:** Danny Ng <[redacted]>
**寄件日期:** 2026年08月28日星期五 16:24
**收件者:** tpbpd/PLAND
**副本:** David Chi Chiu CHENG/PLAND; Ivan Sze Yuet FUNG/PLAND; Athena Pui Yin LAI/PLAND; Bon Tang; Matthew Ng; Christian Chim; Grace Wong
**主旨:** [FI] S.16 Application No. A/YL-KTN/1253 - Further Information
**附件:** FI1 for A_YL-KTN_1253 (20260828).pdf

**類別:** Internet Email

Dear Sir,

We write to submit further information to provide clarifications for the consideration of Government departments of the subject application (*attached*).

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

Kind Regards,

**Danny NG |** Town Planner
**R-riches Group (HK) Limited**

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

R-RICHES PLANNING LIMITED

盈卓規劃有限公司

Our Ref. : DD107 Lot 1786 & VL
Your Ref. : TPB/A/YL-KTN/1235

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

**By Email**

28 August 2026

Dear Sir,

**1st Further Information**

**Temporary Holiday Camp, Place of Recreation, Sports or Culture, Barbecue Site and Eating Place with Ancillary Facilities and Associated Filling of Land and Pond for a Period of 3 Years in "Agriculture" Zone,**
**Various Lots in D.D. 107 and D.D. 109, Fung Kat Heung, Kam Tin, Yuen Long, New Territories**

**(S.16 Planning Application No. A/YL-KTN/1253)**

We write to submit further information to provide clarifications for the consideration of Government departments of the subject application (**Appendix I**).

Should you require more information regarding the application, please contact the undersigned at your convenience. Thank you for your kind attention.

Yours faithfully,

For and on behalf of
**R-riches Planning Limited**

**Danny NG**
Town Planner

cc DPO/FSYLE, PlanD (Attn.: Mr. David CHENG email: dcccheng@pland.gov.hk)
(Attn.: Mr. Ivan FUNG email: isyfung@pland.gov.hk)

[redacted]

**1st Further Information**

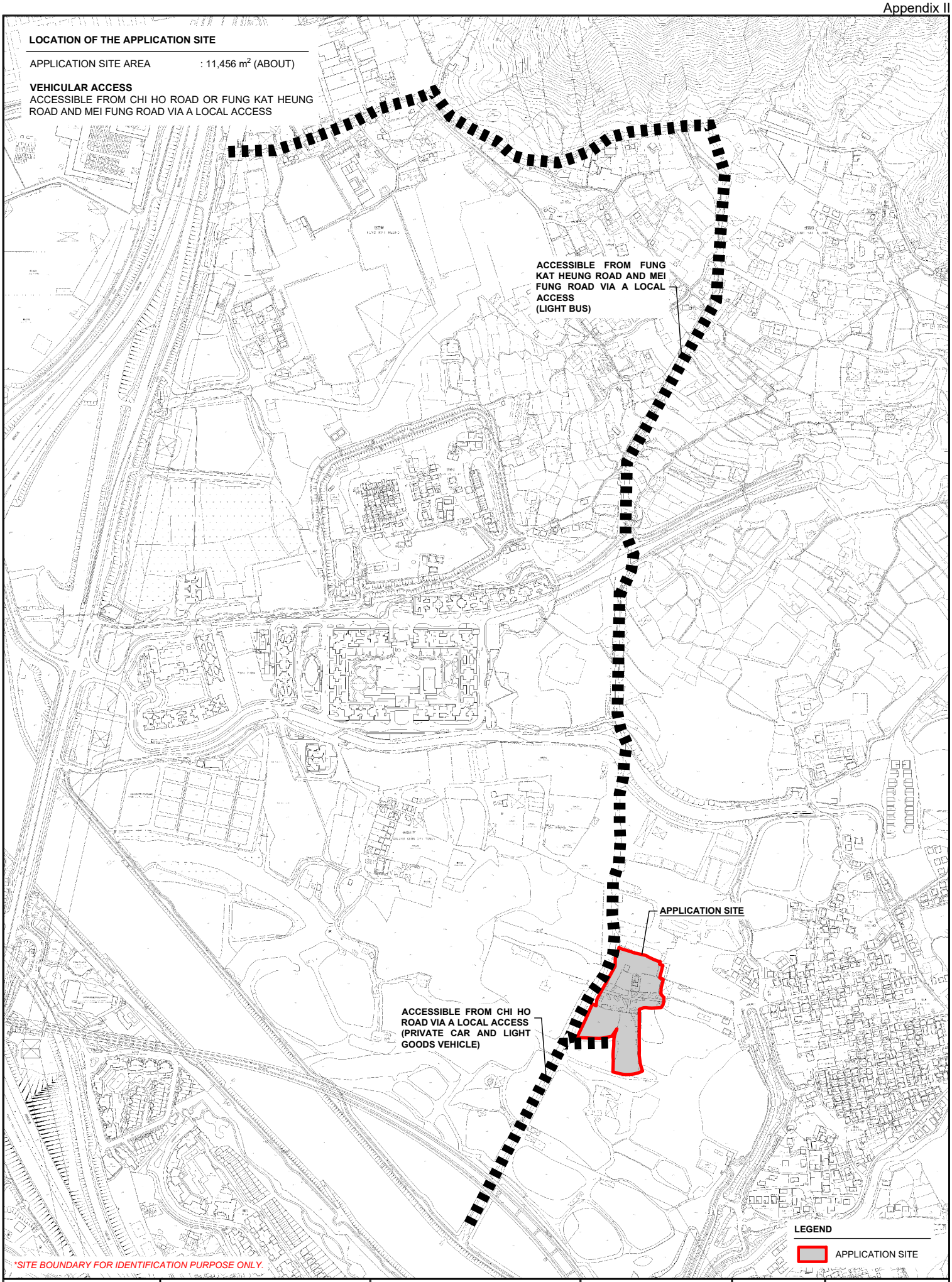
**Temporary Holiday Camp, Place of Recreation, Sports or Culture, Barbecue Site and Eating Place with Ancillary Facilities and Associated Filling of Land and Pond for a Period of 3 Years in "Agriculture" Zone,**
**Various Lots in D.D. 107 and D.D. 109, Fung Kat Heung, Kam Tin, Yuen Long, New Territories**

**(S.16 Planning Application No. A/YL-KTN/1253)**

(i) The applicant would like to provide the following clarifications for Government departments upon the subject application:

- Each caravan is equipped atop with its own solar panel installation, ensuring that every unit can independently harness solar energy for its power needs. This is to support the operation of the development; and

- The applicant would like to submit a revised location plan, layout plan, land and pond filling plan, a response-to-comments table and a revised drainage impact assessment (DIA) for the consideration of Government departments (**Appendices II** to **VI**).




| PLANNING CONSULTANT | PROJECT | ADDRESS | SCALE | TITLE |
|---|---|---|---|---|
| R-RICHES PLANNING LIMITED | TEMPORARY HOLIDAY CAMP, PLACE OF RECREATION, SPORTS OR CULTURE, BARBECUE SITE AND EATING PLACE WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS | VARIOUS LOTS IN D.D. 107 AND D.D. 109, FUNG KAT HEUNG, KAM TIN, YUEN LONG, NEW TERRITORIES | 1 : 4000 @ A4 | LOCATION PLAN |
| | | | DRAWN BY: DN; DATE: 27.8.2026 | |
| | | | REVISED BY; DATE | DWG NO.: PLAN 1; VER.: 001 |

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**DEVELOPMENT PARAMETERS**

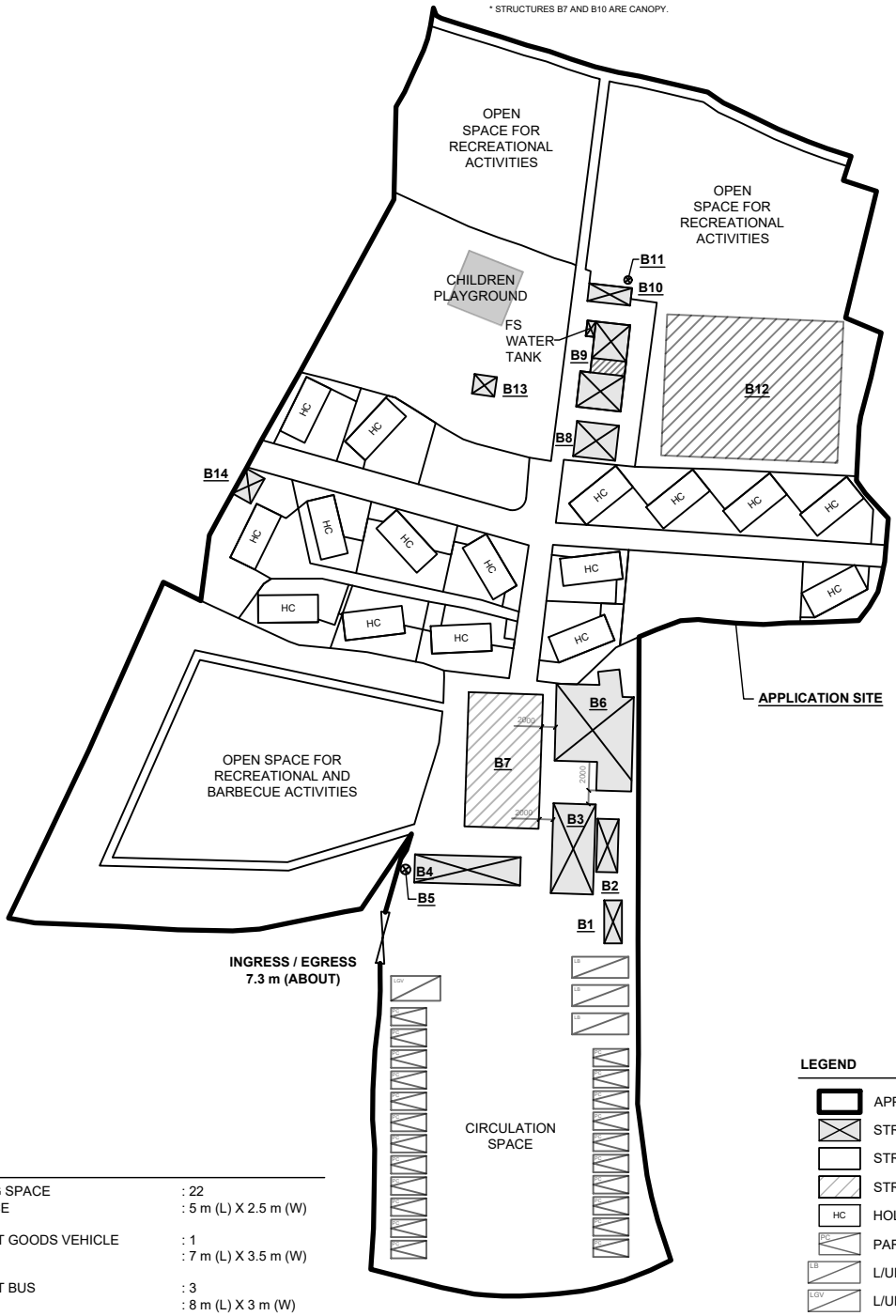
| | | |
|---|---|---|
| APPLICATION SITE AREA | : 11,456 $m^2$ | (ABOUT) |
| COVERED AREA | : 1,160 $m^2$ + 544 $m^2$ | (ABOUT) |
| UNCOVERED AREA | : 9,752 $m^2$ | (ABOUT) |
| PLOT RATIO | : 0.15 | (ABOUT) |
| SITE COVERAGE | : 15 % | (ABOUT) |
| NO. OF STRUCTURE | : 14 + 16 (HOLIDAY CAMPS) | |
| DOMESTIC GFA | : NOT APPLICABLE | |
| NON-DOMESTIC GFA | : 1,160 $m^2$ + 544 $m^2$ | (ABOUT) |
| TOTAL GFA | : 1,160 $m^2$ + 544 $m^2$ | (ABOUT) |
| BUILDING HEIGHT | : 1.9 m - 8 m | (ABOUT) |
| NO. OF STOREY | : 1 | |

**DETAILS OF HOLIDAY CAMP**

| | | |
|---|---|---|
| NO. OF HOLIDAY CAMP | : 16 | |
| COVERED AREA OF CAMP | : 34 $m^2$ EACH | (ABOUT) |
| GFA OF CAMP | : 34 $m^2$ EACH | (ABOUT) |
| TOTAL COVERED AREA OF CAMP | : 544 $m^2$ | (ABOUT) |
| TOTAL GFA OF CAMP | : 544 $m^2$ | (ABOUT) |
| BUILDING HEIGHT | : 4.5 m | (ABOUT) |

| STRUCTURE | USE | COVERED | GROSS | BUILDING |
|---|---|---|---|---|
| B1 | STORE ROOM | 20 $m^2$ (ABOUT) | 20 $m^2$ (ABOUT) | 3 m (ABOUT)(1-STOREY) |
| B2 | STORE ROOM | 23 $m^2$ (ABOUT) | 23 $m^2$ (ABOUT) | 3 m (ABOUT)(1-STOREY) |
| B3 | RECEPTION & OFFICE | 80 $m^2$ (ABOUT) | 80 $m^2$ (ABOUT) | 3.5 m (ABOUT)(1-STOREY) |
| B4 | WASHROOM | 40 $m^2$ (ABOUT) | 40 $m^2$ (ABOUT) | 3.2 m (ABOUT)(1-STOREY) |
| B5 | WATER TANK | 2 $m^2$ (ABOUT) | 2 $m^2$ (ABOUT) | 3 m (ABOUT) |
| B6 | EATING PLACE | 145 $m^2$ (ABOUT) | 145 $m^2$ (ABOUT) | 4.8 m (ABOUT)(1-STOREY) |
| B7* | RAIN SHELTER FOR BARBECUE ACTIVITIES | 200 $m^2$ (ABOUT) | 200 $m^2$ (ABOUT) | 6.5 m (ABOUT)(1-STOREY) |
| B8 | KITCHEN | 30 $m^2$ (ABOUT) | 30 $m^2$ (ABOUT) | 3 m (ABOUT)(1-STOREY) |
| B9 | FS PUMP ROOM, WATER TANK AND EATING PLACE | 76 $m^2$ (ABOUT) | 76 $m^2$ (ABOUT) | 4 m (ABOUT)(1-STOREY) |
| B10 | WASHROOM | 19 $m^2$ (ABOUT) | 19 $m^2$ (ABOUT) | 3.1 m (ABOUT)(1-STOREY) |
| B11 | WATER TANK | 1 $m^2$ (ABOUT) | 1 $m^2$ (ABOUT) | 1.9 m (ABOUT) |
| B12* | RAIN SHELTER FOR RECREATIONAL, SPORTS OR CULTURAL ACTIVITIES | 500 $m^2$ (ABOUT) | 500 $m^2$ (ABOUT) | 8 m (ABOUT)(1-STOREY) |
| B13 | WINDMILL (DECORATION) | 9 $m^2$ (ABOUT) | 9 $m^2$ (ABOUT) | 5 m (ABOUT)(1-STOREY) |
| B14 | STORE ROOM | 15 $m^2$ (ABOUT) | 15 $m^2$ (ABOUT) | 2.4 m (ABOUT)(1-STOREY) |
| | TOTAL | 1,160 $m^2$ (ABOUT) | 1,160 $m^2$ (ABOUT) | |

* STRUCTURES B7 AND B10 ARE CANOPY.




**LEGEND**

- APPLICATION SITE
- STRUCTURE (ENCLOSED)
- STRUCTURE (RETRACTABLE MARQUEE)
- STRUCTURE (CANOPY)
- HC — HOLIDAY CAMP
- PC — PARKING SPACE (PRIVATE CAR)
- LB — L/UL SPACE (LIGHT BUS)
- LGV — L/UL SPACE (LIGHT GOODS VEHICLE)
- INGRESS / EGRESS

**PARKING PROVISIONS**

| | |
|---|---|
| NO. OF PRIVATE CAR PARKING SPACE | : 22 |
| DIMENSION OF PARKING SPACE | : 5 m (L) X 2.5 m (W) |
| NO. OF L/UL SPACE FOR LIGHT GOODS VEHICLE | : 1 |
| DIMENSION OF L/UL SPACE | : 7 m (L) X 3.5 m (W) |
| NO. OF L/UL SPACE FOR LIGHT BUS | : 3 |
| DIMENSION OF L/UL SPACE | : 8 m (L) X 3 m (W) |

**SITE BOUNDARY FOR IDENTIFICATION PURPOSE ONLY.*

| PLANNING CONSULTANT | PROJECT | ADDRESS | SCALE | TITLE |
|---|---|---|---|---|
| R-RICHES PLANNING LIMITED | TEMPORARY HOLIDAY CAMP, PLACE OF RECREATION, SPORTS OR CULTURE, BARBECUE SITE AND EATING PLACE WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS | VARIOUS LOTS IN D.D. 107 AND D.D. 109, FUNG KAT HEUNG, KAM TIN, YUEN LONG, NEW TERRITORIES | 1 : 1000 @ A4 | LAYOUT PLAN |
| | | | DRAWN BY: DN; DATE: 7.8.2026 | |
| | | | REVISED BY; DATE | DWG NO.: PLAN 4; VER.: 001 |

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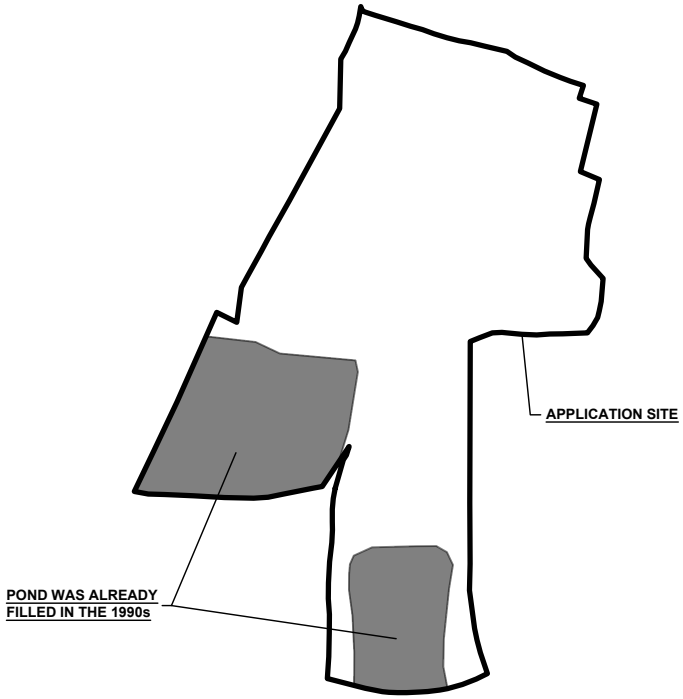
CONDITION OF THE APPLICATION SITE IN THE 1990s

| | | |
|---|---|---|
| APPLICATION SITE AREA | : 11,456 $m^2$ | (ABOUT) |
| LAND AREA | : 8,661 $m^2$ | (ABOUT) |
| POND AREA | : 2,795 $m^2$ | (ABOUT) |
| DEPTH OF POND | : NOT MORE THAN 0.5 m | |

THE APPLICATION SERVES TO REGULARISE THE FILLED POND WHICH HAS ALREADY BEEN FILLED IN THE 1990s. NO FILLING OF POND WILL BE CARRIED OUT BY THE APPLICANT AFTER OBTAINING PLANNING PERMISSION FROM THE BOARD.




**LEGEND**

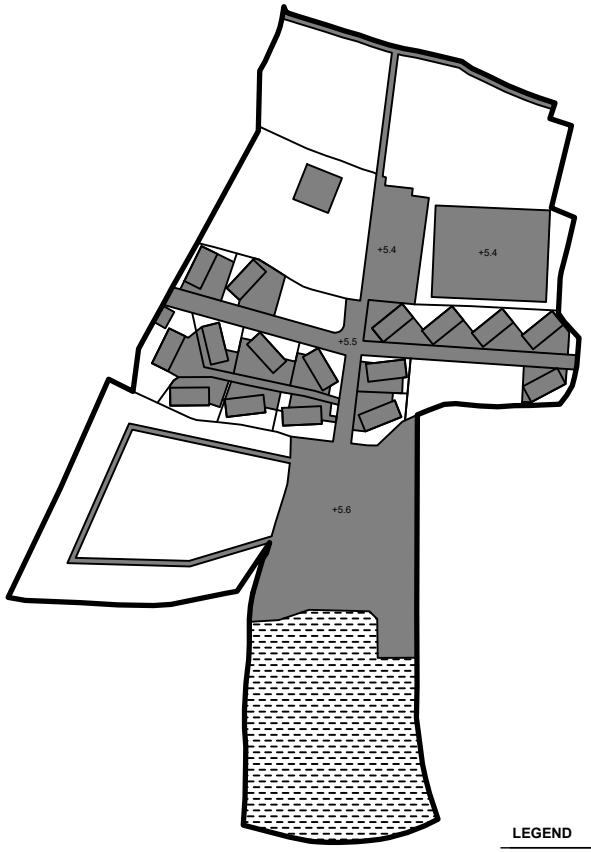
- APPLICATION SITE
- POND AREA

**SITE LEVELS ARE FOR REFERENCE ONLY.*
*EXACT SITE LEVELS ARE SUBJECT TO DETAILED SURVEY.*

**EXISTING CONDITION OF THE APPLICATION SITE**

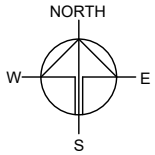
| | | |
|---|---|---|
| APPLICATION SITE AREA | : 11,456 $m^2$ | (ABOUT) |
| EXISTING HARD-PAVED AREA | : 4,110 $m^2$ | (ABOUT) |
| DEPTH OF LAND FILLING | : NOT MORE THAN 0.2 m | |
| PROPOSED SITE LEVELS | : +5.4 mPD TO +5.6 mPD | (ABOUT) |
| MATERIAL OF LAND FILLING | : CONCRETE | |
| PURPOSE OF LAND FILLING | : SITE FORMATION OF STRUCTURE AND CIRCULATION SPACE | |
| AREA COVERED BY GRAVEL | : 1,777 $m^2$ | (ABOUT) |
| PURPOSE OF COVERING BY GRAVEL | : PARKING AND LOADING / UNLOADING PURPOSES | |
| AREA OF LAWN | : 5,569 $m^2$ | (ABOUT) |
| PURPOSE OF LAWN AREA | : HOLIDAY CAMP, OPEN SPACE AND FOR RECREATIONAL, SPORTS OR CULTURAL ACTIVITIES | |

*PART THE APPLICATION SITE (5,887 $m^2$) HAS ALREADY BEEN HARD-PAVED (4,110 $m^2$) AND COVERED BY GRAVEL (1,777 $m^2$) RESPECTIVELY. NO FURTHER FILLING OF LAND WILL BE CARRIED OUT AFTER PLANNING PERMISSION HAS BEEN GRANTED FROM THE TOWN PLANNING BOARD.*




**LEGEND**

- APPLICATION SITE
- HARD PAVED AREA
- AREA COVERED BY GRAVEL
- LAWN AREA
- +5.5 EXISTING SITE LEVEL




PLANNING CONSULTANT

R-RICHES PLANNING LIMITED

PROJECT

TEMPORARY HOLIDAY CAMP, PLACE OF RECREATION, SPORTS OR CULTURE, BARBECUE SITE AND EATING PLACE WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS

SITE LOCATION

VARIOUS LOTS IN D.D. 107 AND D.D. 109, FUNG KAT HEUNG, KAM TIN, YUEN LONG, NEW TERRITORIES

SCALE

1 : 2500 @ A4

| DRAWN BY | DATE |
|---|---|
| DN | 7.8.2026 |
| REVISED BY | DATE |
| APPROVED BY | DATE |

DWG. TITLE

FILLING OF LAND AND POND

| DWG NO. | VER. |
|---|---|
| PLAN 2 | 002 |

**Appendix V - Response-to-Comments Table**

| | | |
|---|---|---|
| **Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD) (Contact Person: Mr. Fraco TSANG; Tel: 3965 8926)** | | |
| (1) | A section which discuss the proposed development should be included. Please confirm if there is no land filling works / change of ground level. The changes in paving conditions of sub-catchments and the corresponding induced surface runoff due to the proposed development, which is the drainage impact, i.e. the core of this report, should be clearly shown. It should be noted that Section 5 only demonstrates that the induced drainage impact can be catered by the existing pond. | Noted. Section 2 is revised (**Appendix VI**). |
| (2) | A section of proposed drainage system, i.e. the design of internal and peripheral channels, should be added in the text. | Noted. Section 6 is supplemented (**Appendix VI**). |
| (3) | Design flow of existing condition and after development are 0.77m3/s and 0.767m3/s respectively, please check. The calculation of retention time of existing condition (34 mins) is wrong. | Typo error is revised in Section 5 (**Appendix VI**). |
| (4) | Factor to be applied in runoff estimation for "Rainfall Increase due to Climate Change" should be 1.111 instead of 1.11. | The factor should be 1.11 instead of 1.10. The calculation is revised (**Appendix VI**). |
| **Comments of the Commissioner of Transport (C for T) (Contact Person: Mr. Phil CAI; Tel: 3965 8926)** | | |
| (1) | The applicant claimed that the site could be access from Chi Ho Road. Please clarify whether the proposed vehicle type could fulfill the length restriction of Chi Ho Road. | Noted. All private cars and light goods vehicles can be accessed from Chi Ho Road and a local access; while all visiting light bus are required to access the Site via Fung Kat Heung Road, Mei Fung Road and a local access. Such arrangement is to ensure traffic safety and to comply with all requirements (**Appendix II**). |
| (2) | The applicant should demonstrate how to handle excessive number of visitors coming | All customers are required to pre-book their sessions before arriving the Site. Ad-hoc |

| | | |
|---|---|---|
| | to the development, causing adverse traffic impact. | customers are not entertained. All parking spaces are available for reservation at first-come-first-served basis. Visiting vehicles will be asked to leave the Site when all parking spaces are full.<br><br>To avoid adverse traffic impacts, visitors are also encouraged arriving the Site by public transport which would also be convenient for visitors (e.g. taxi from MTR Kam Sheung Road Station).<br><br>The applicant will also provide free shuttle bus service to and from Yuen Long MTR Station to the Site during weekends and public holidays to cater for increasing visitors during the said time period. |
| (3) | The applicant should provide reference of the envisaged trip rates. | The Site is the subject of a previous application No. A/YL-KTN/1044. The application has a site area of 7,359 $m^2$ (about), comprises 28 parking space for private car (PC); 1 loading/unloading (L/UL) space for light goods vehicle (LGV) and 1 L/UL space for light bus (LB).<br><br>As for the current application (A/YL-KTN/1253), as the site area (11,456 $m^2$ (about)) is larger comparing with A/YL-KTN/1044, 2 more parking spaces for PC and 2 L/UL spaces for LB are included respectively.<br><br>Such addition is for accommodating an increasing number of visitors arriving the site by vehicles due to a larger site area and facilities within.<br><br>The applicant projects that visitor numbers will continue to grow in line with current flow patterns. Consequently, the trip generation rates, which referenced the previous application and reflect ongoing operational data from recent years, remain applicable to the current application. |

| | | |
|---|---|---|
| (4) | The applicant should note the local access between Chi Ho Road and the site is not managed by this Department. | Noted. |

**Appendix VI**

**Responses on DSD's Requirements and Reminders**

Planning Application No.: A/YL-KTN/1253

Location: Lots No. 1775 RP, 1785 RP, 1786, 1787 S.B., 1787, 1790 RP IN D.D.107
AND LOTS 21(PART), 22(PART), 28(PART) IN D.D.109

Site Area: 11456 $m^2$
Land filling works involved? ~~Yes~~ / No
Maximum increase in formation level: m
Maximum level difference with adjoining lot: m
Filling of pond(s) involved? ~~Yes~~ / No
Estimated size of pond to be filled: $m^3$

| No. | (A) DSD's Requirements | Fulfilled in the submission? (Yes / No) |
|---|---|---|
| 1 | For sites considered complex (those 1 hectare or larger, in flood-prone areas, or involving pond filling or major earthworks), you should hire a qualified engineer (Registered Professional Engineer in the Civil Engineering discipline) to follow DSD Advice Note No. 1 and submit a proposal signed and certified by the engineer. For other sites, it is also advisable to hire a qualified engineer to prepare your drainage proposal. | Yes |
| 2 | The proposed development should neither obstruct overland flow nor adversely affect any existing natural streams, village drains, ditches and the adjacent areas, etc., unless there is proper diversion. | Yes |
| 3 | Adequate surface channels shall be provided to collect and convey the surface runoff accrued on the application site. | Yes |
| 4 | If there is existing surface runoff flowing from the adjoining lots towards the application site, peripheral surface channels with sufficient drainage capacity, set at a level lower than the adjoining lots, should be constructed to collect and convey the runoff (See **Sketch A**). | Yes |
| 5 | Where boundary walls or hoarding are erected, adequate openings should be provided to allow existing overland flow from the adjoining lots to pass through (see **Sketch A**). | Yes |
| 6 | The applicant shall be required to place all the proposed works 3m away from the top of the bank of any existing watercourses or natural streams. All the proposed works in the vicinity of the watercourses should not create any adverse drainage impacts, both during and after construction. Adequate measures should be provided byf the applicant to DSD's satisfaction in order to prevent the subject site from being eroded and flooded and to ensure that the capacity of watercourses and the flooding susceptibility of the adjoining areas would not be adversely affected by the proposed development. | Yes |
| 7 | The applicant should indicate the proposed and existing ground levels of the application site and ground levels of adjacent areas on the drainage plan. | Yes |
| 8 | Cross sections showing the proposed drainage facilities and existing and proposed ground levels of the application site with respect to the adjacent areas should be given. | Yes |
| 9 | The proposal should indicate how the runoff (the flow direction) within the site and from the adjacent areas would be discharged to the proposed drainage system. | Yes |
| 10 | Sand trap or provision alike should be clearly indicated on the proposed drainage plan and provided before the collected runoff is discharged to the existing drainage facilities. | Yes |

| | | |
|---|---|---|
| 11 | The applicant should clearly indicate the full alignment of the discharge path from the application site all the way down to the ultimate discharge point (e.g. a well-established stream course/public drainage system). | Yes |
| 12 | The applicant should clearly indicate the existing drainage facilities on the proposed drainage plan. Site photos of existing drainage facilities including the discharge point (e.g. existing local village drain and its downstream drainage facilities) should be provided in order to demonstrate the presence and reflect condition of the existing drainage system. Also, the applicant should provide site photo(s) to demonstrate size of the existing drainage facilities. | Yes |
| 13 | Cover levels and invert levels of the proposed and existing drainage facilities should be shown on the drainage plan. Invert levels of drainage facilities at the upstream should be higher than that at the downstream. Also, gradients and sizes of the proposed and existing drainage facilities should be shown on the drainage plan. | Yes |
| 14 | The applicant should demonstrate with hydraulic calculation that the proposed drainage facilities are adequate to collect, convey and discharge the surface runoff accrued on the application site and the overland flow intercepted from the adjacent lands. External catchment shall be properly considered | Yes |
| 15 | Connection to existing drainage facilities should be designed and constructed to prevent back flows at the drainage outlet when water level at the existing drainage facilities is high. | Yes |
| 16 | Stormwater Drainage Manual (SDM) and the newly promulgated SDM - Corrigendum published by DSD shall be considered in the hydraulic calculation. Also, storm constants of HKO Headquarters shall be adopted. In generael, a 10-year design return period is sufficient for village drainage systems. | Yes |
| 17 | Deposition of sediment in stormwater drainage system should be considered in the hydraulic calculation as per the requirement in Stormwater Drainage Manual (Section 9.3). | Yes |
| 18 | The applicant should check flow velocity of the proposed drainage facilities. The flow velocity is suggested to be within a range, i.e. 0.75 m/s to 3.0 m/s. | Yes |
| 19 | Catchpit should be provided at where a proposed surface channel changes direction / gradient. | Yes |
| 20 | The applicant should provide construction details of the proposed drainage facilities. | Yes |
| 21 | The applicant should provide details for connection of the proposed and existing drainage facilities. | Yes |
| 22 | Grating should be provided for the surface channels. | Yes |
| 23 | Precast concrete pipe should generally be used for stormwater connection. | Yes |
| 24 | Connection of the proposed and existing drainage facilities shall be designed and constructed such that there is no water leakage at the proposed connection. | Yes |
| 25 | For the construction details of the proposed drainage facilities, reference should be made to current CEDD's standard drawings. | Yes |
| | (B) DSD's Reminders | Fulfilled in the submission? (Yes / No) |
| 1 | Any existing drainage facilities within/outside the application site should not be disturbed or interfered with until any necessary diversion works, which have been accepted by the owner of the existing drainage facilities, have been satisfactorily completed. Such diversion works should be carried out by the applicant at his/her own cost. Moreover, sufficient allowance for future maintenance of the existing drainage facilities should be provided. | Yes |

| | | |
|---|---|---|
| 2 | No construction debris, silt and sediments, or cementitious materials should be discharged into or deposited inside any existing natural streams, watercourses, drains, ditches or sewers from the application site without prior approval. Any blockage or damage arising from the proposed development shall be made good at the cost of the applicant and to DSD's satisfaction. The applicant shall also be liable for and shall indemnify against all claims and demands arising out of or in connection with this regard. | Yes |
| 3 | The applicant should be reminded to minimize the possible adverse environmental impacts on any existing watercourses in his design and during construction. EPD and AFCD should be consulted on possible environmental and/or ecological impacts of the proposed development which is in the vicinity of any existing watercourses. | Yes |
| 4 | The applicant is required to rectify/modify the drainage system if they are found to be inadequate or ineffective during operation. The applicant shall also be liable for and shall indemnify claims and demands arising out of damage or nuisance caused by a failure of the drainage system. | Yes |
| 5 | For any proposed connection to DSD's drainage facilities, the applicant should submit form HBP1 to this Division for application of technical audit. Upon our acceptance of the connection application, the applicant shall carry out the proposed connection works in accordance with DSD's Standard Drawings at the resources of the applicant. | Yes |
| 6 | If the existing drainage facilities, to which the applicant proposed to discharge the stormwater from the application site was not maintained by this office, the applicant should identify the owner of the existing drainage facilities and seek agreement from the owner prior to commencement of the proposed works. In the case that it is a local village drains, DO/YL should be consulted. | Yes |
| 7 | The applicant should consult DLO/YL and seek consent from the relevant owners for any drainage works to be carried out outside his lot boundary before commencement of the drainage works. | Yes |
| 8 | Comments from HyD, TD and RMO shall be sought if drainage works are proposed to be carried out within highway polygon or on carriageway. | Yes |

Our Ref: 31126

# TEMPORARY PLACE OF RECREATION, SPORTS OR CULTURE, BARBECUE SITE AND EATING PLACE

## LOTS 1775 RP, 1785 RP, 1786, 1787 S.B, 1787, 1790 RP IN D.D 107 AND LOTS 21(PART), 22(PART), 28(PART) IN DD109 FUNG KAT HENUNG KAM TIN, YUEN LONG (Application No. A/YL-KTN/1044)

# DRAINAGE IMPACT ASSESSMENT

**AUGUST 2026**

**LEE WAI HUNG DANIEL**
**CVL RP0114219**

**Henry Chan & Partners Consultant Engineering Limited**

CONTENTS

1. SYNOPSIS
2. PROPOSED DEVELOPMENT
3. SITE DESCRIPTON
4. EXISITNG DRAINAGE SYSTEM OF THE APPICATION SITE AND POND CAPACITY
5. RETENTION CAPACITY OF POND IN LOT 21
6. DRAINAGE IMPACT OF THE PROPOSED DEVELOPMENT
7. CONCLUSION

Appendix A Response to Comments (R to C) Table (DSD) for Dec 2025 Report
Appendix B The Application Site Location Plan
Appendix C The Application Site with Lots No.
Appendix D Topographic Survey Records of Existing 300 UC
Appendix E Constructed 275 UC Layout Plan
Appendix F Estimated Pond Capacity abstract from December 2025
Appendix G Estimation of Existing Pond Retention Time under existing condition
(i) Existing Catchment for Pond
(ii) Estimated on Existing Pond Retention Time
Appendix H Estimated Pond Retention Time under this Application
Figure 1 to Figure 7
Appendix I Channel Design
Figure 8 Typical Details

## 1. Synopsis

The drainage proposal for Temporary Place of Recreation, Sports or Culture, Barbecue Site and Eating place with Ancillary Facilities at lots 1786, 1787 S.B , 1787 S.B., 1787 RP in D.D 107 and lots 21(part), 22(part), 28(part) in DD109 which prepared by Wings & Associates Consulting Engineers Ltd (W&A) and submitted by R-Riches Property Consultants Ltd on 5 December 2025. The drainage proposal was rejected by Planning Department on 9 April 2026.

Subsequently, Lots 1775 RP, 1785 RP and 1790 RP in DD are included in the Application Site, hence, the Application Site area is larger than that in April 2026 submission. In May 2026, Henry Chan & Partners Consultant Engineering Ltd is engaged to carry out drainage impact assessment (DIA) to this revised Application Site Layout Plan in Appendix **B** & **C** (with Lots No.).

This DIA has been prepared taking into account the enlarged site boundary, and in response to the comments given by the Drainage Services Department (DSD) on 9 April 2026. (R to C table in Appendix **A** refers)

## 2. Proposed Development

The Applicant is operating a venue for day camping, barbecue site and recreational activities at Lots 1786, 1787 S.B & 1787 RP in DD107, subject of a previous application (Ref. No. A/TL-KTN/693) approved on 10 February 2022. The extent of this day camp area is shown on the plan attached in Appendix **E**. In this proposed development, subject Application Site further extend the camping area for temporary storage, reception of facility and car park. Hence, Lots 1775 RP, 1785 RP 1790RP in DD107, Lots 22(Part), 28(Part) in DD109 are included in this Application.

This DIA Report presents the impact of proposed additional drains due to the proposed extension of recreation, sports or culture, barbecue site, and eating place with ancillary facilities on the private lots. This Report is reference to SDM Corrigendum Nos. 1/2022 and 1/2024, and DSD's comments offered on W&A drainage proposal report in December 2025.

It should be noted that the proposed development has no land filling works and there is no change to existing ground levels.

## 3. Site Description

The Application Site is located at Fung Kat Heung, Kam Tin, Yuen Long. An unnamed road to the west that serves as the vehicle access to San Tam Road. There is a steep descent and a ponding area at Lot 21 in D.D. 109, which is used for collecting stormwater.

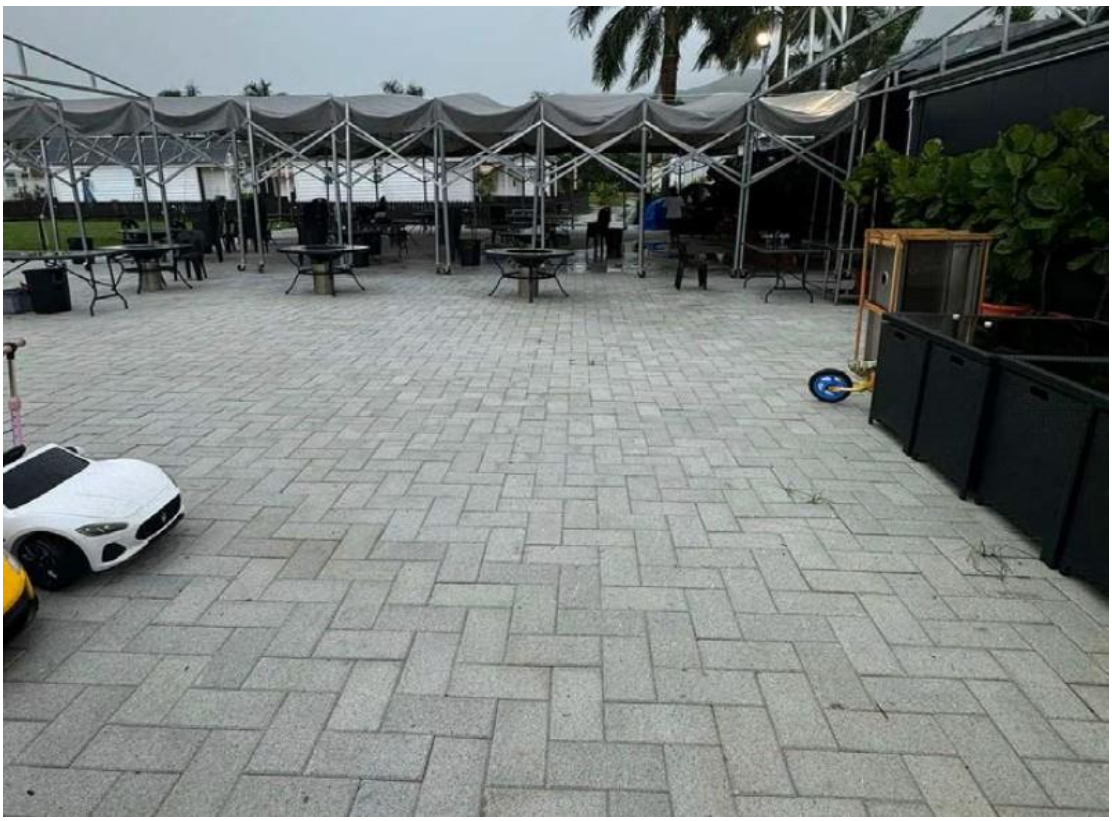
**Site Lot Plan**

The lot covers an area of about 2685m$^2$ with wooden fence wall which will not block the surface runoff in or out the Site. Approximately 3930m$^2$ of the plan area (34% of total catchment area) is covered by structures or paved by concrete. Additionally, there is about 1657m$^2$ of plan area (8% of total catchment area) consists of a pond. General views of the Application Site existing conditions are presented as follows:

**P1 - Fence Wall of Lots No.21, 22 & 28 in DD109**

**P2 – General view of Lots No.21, 22 & 28 in DD109**

**P3 –General view of Lots No.21, 22 & 28 in DD109**



**P4 – General view of Lots No.21, 22 & 28 in DD109**

**P5 - General view of Lots No.21, 22 & 28 in DD109**

**P6 & P7 Existing Pond at Lot 21 in DD109 for collecting Stormwater**

**P8 & P9 - General view of Lots No.1786, 1787 S,B & 1787 RP in DD107**

**P10 & P11 - General view of Lots No.1786, 1787 S,B & 1787 RP in DD107**

## 4. Existing Drainage System of the Application Site And Pond Capacity

4.1 As shown on previous topographic survey plan attached in Appendix **D**, there is an existing constructed 300 UC. The constructed fall directions in this channel are random. There is another set of constructed drainage system for the existing camp site consisting of a 270 UC (Appendix **E** refers). Both drainage systems serve their respective catchments and discharged into an existing pond. Despite the fact that the 300 UC is expected to be inefficient due to its random fall directions along its flow path, there has been no flooding recorded in the area.

4.2 The existing pond capacity retrieved from Dec 2025 Report is attached in Appendix **F** for reference. The pond capacity based on the GeoInfo Map and the topographic survey is estimated to be 1370.3 $m^{3.}$

## 5. Retention Capacity Of Pond In Lot 21

5.1 <u>Pond retention time for existing condition</u>
(Existing Drainage in Lots 1789, 1787 S.B and 1787 RP in DD107 only)

The existing pond in Lot 21 serves to retain all surface runoff from adjacent areas. The extent of catchment areas is shown in Appendix **G**.

The hydraulic calculation and design of the u-channel refer to the Stormwater Manual, SDM Corrigendum No.1/2024 and SDM Corrigendum No.1/2022.

<u>Design Assumption of Hydraulic Calculation:</u>

Runoff Coefficient for Hard Paved area – 0.95
Runoff Coefficient for grass area – 0.25

Return Period – 50 years

Storm Constants (HKO Headquarters)
a = 505.5, b = 3.29, c = 0.355

Design flow: = 0.659 $m^3/s$
Pond Capacity: = 1370.3$m^3$ (From Previous drainage proposal)

Retention time: = 1370.3 / 0.659 / 60 ≈ 35 mins.

5.2 <u>With Proposed Drainage System for the Application Site</u>

As shown in Figure 1 to 7, presently the catchment areas remained unchanged. However, this is due to the proposed additional drainage system for the enlarged site area. Additionally, some areas will be lawn, and gravel covered or hard paved during operation. These additional drain paths and the alternation of surface run-off coefficients will affect the retention time of the Pond. Hence, based on the following design assumptions:

Runoff coefficient for hard paved – 0.95
Runoff coefficient for gravel area – 0.65
Runoff for lawn area – 0.25

Return period and storm constants same as 5.1.

<u>Pond retention time for proposed drainage system</u>

Design flow: = 0.774 $m^3/s$
Pond Capacity: = 1370.3$m^3$ (From previous drainage proposal)

Retention time: = 1370.3 / 0.774 / 60 ≈ 30 mins.

5.3 Although the Application Site is larger in plan area, the catchment areas around the Pond in Lot 21 have not actually been altered since there was no proposed earth works or landscaping works that will alter the existing ground profile around the Pond. Only some areas will be hard paved or covered in gravel, within proposed surface channels to intercept the runoff and discharge into the Pond.

Therefore, based on the Pond retention times estimated under 5.1 & 5.2, the estimated time for the Pond to reach its full capacity under a severe storm period is marginally reduced by only 5 minutes.

## 6. Drainage Impact of the Proposed Development

The Application Site levels are generally higher than the surrounding adjacent ground levels. (Figure 1 to 7 refers)

A small proportion of the ground will be hard paved as shown on plan attached in Appendix **H**.

Therefore, the changes in paving condition and the corresponding surface run-off due to the proposed development has insignificant impact to its adjacent ground. The proposed drainage system to this Application Site is shown in Figure 1 to 7 in Appendix **H**.

## 7. Conclusion

7.1 The existing run-off of the area discharge into an existing Pond located in Lot 21. The area understudy neither fall within flood prone areas (such as low-lying areas and flooding blackspots) nor involve pond filling. There has been no report of flooding since the camp site went into operation in 2022.

7.2 The increased in site area to cater for the increase facilities to be provided for the BBQ campsite has basically not increased the catchment areas.

7.3 Two sets of hydraulic calculations based on existing ground conditions and the proposed alternations under this applications have been carried out to assess the stormwater drainage impact.

The design makes reference to current SDM Corrigendum, together with DSD comments offered under previous application in Dec 2025. The results indicate that the estimated retention time for the Pond to reach its full capacity will only decreased slightly by 4 minutes. Hence, it can be concluded that the stromwater drainage impact under this application is minimal.

7.4 Based on detailed channel design under this study, it is recommended that:

(i) Existing 270 UC be increased in size to 400UC.

(ii) The existing 300 UC, whose flow direction appears improper and inefficient be removed, and a new 325 UC be reconstruct alongside.

(iii) Proposed channels be added in the area to ensure efficient run-off into the Pond.

# APPENDIX A

## Response to Comment Table Based on Comments in Dec 2025 Report

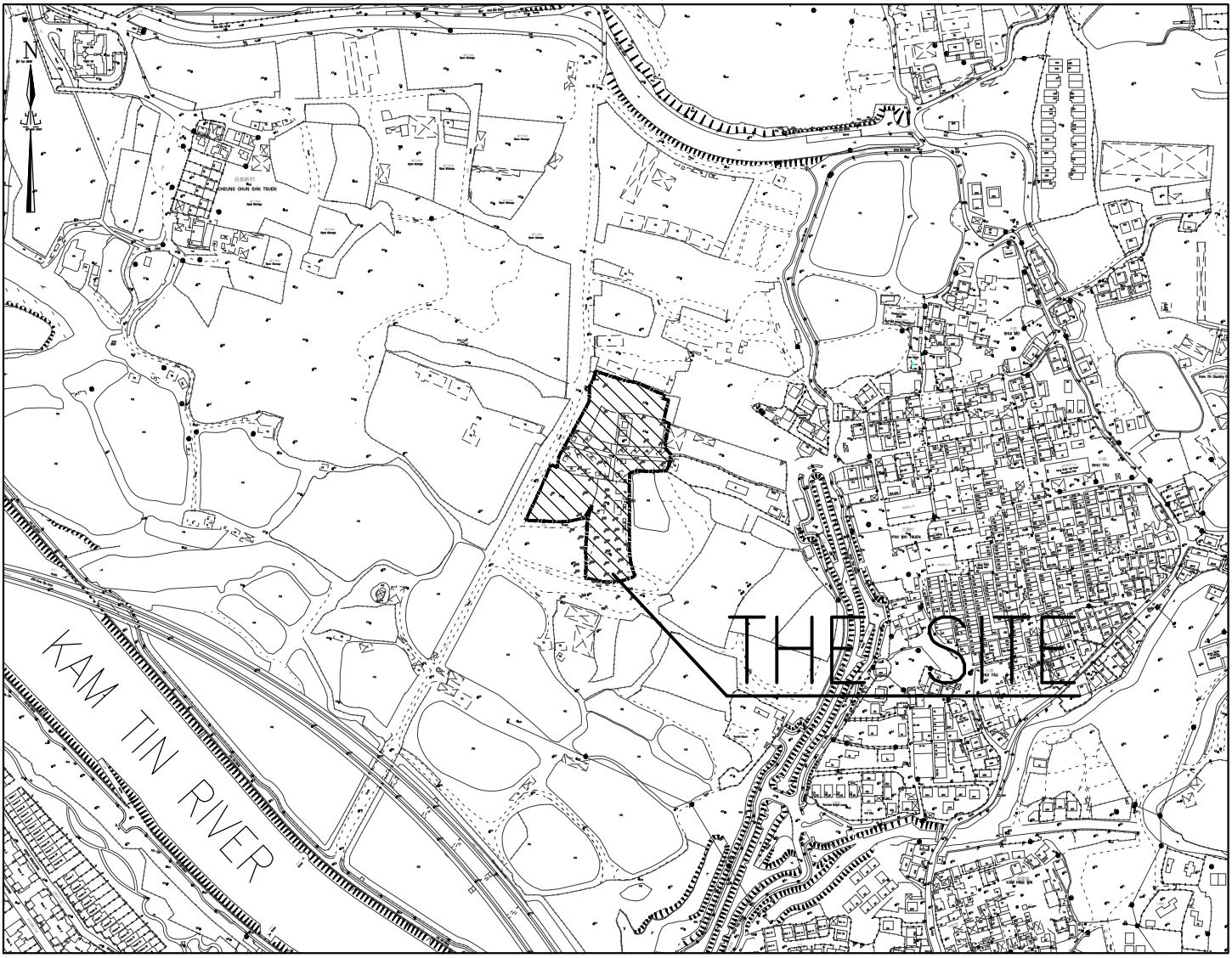
**RESPONSE TO COMMENTS for LandsD's Letter dated 9 April 2026**

| DSD/LD Comment | Response to DSD/LD Comments |
|---|---|
| (A) Specific Comments | |
| 1 The applicant should indicate the proposed and existing ground levels of the application site and ground levels of adjacent areas on the drainage plan. | Noted. The proposed level, existing ground level and ground levels of adjacent areas are shown in the drainage plan. |
| 2 Peripheral surface channels shall be provided along the site boundary to collect the surface runoff accrued on the application site and to intercept the overland flow from the adjacent lands. It is noted that there is proposed land filling works for the development. Proper surface channels should be provided at the lower level / platform and wall toe to collect the overland flow to/from adjacent areas | Noted. The peripheral surface channel is proposed at the East and South of the Application Site. The adjacent ground at the North and West of the Application Site are incline outward, hence, no peripheral surface channel is proposed. It is confirmed that no land filling works will be carried out. |
| 3 The newly promulgated Stormwater Drainage Manual - Corrigendum shall be considered in the hydraulic calculation. Also, storm constants of Hong Kong Observatory Headquarters instead of North District Area shall be adopted in the hydraulic calculation. | Noted. The hydraulic calculation has been revised according to the latest Corrigendum. The storm constants use data from the Hong Kong Observatory Headquarters in this submission. |
| 4 Section 4: The applicant should review design return period and storm constants. | Noted. Referring to Table 10 of the Stormwater Drainage Manual, the flood levels of the site location should follow the Main Rural Catchment Drainage. Hence, a 50-year return periods is adopted. The storm constants of the Hong Kong Observatory Headquarters are applied in the hydraulic calculation. |
| 5 Drawing (No.: WNG/24168/C/DRA/002) & Appendix B: The applicant should consider catchment area between Catchment 1 and existing pond. Also, the applicant should review catchment area and | Noted. The catchment area is revised to include the area between Catchment 1 and existing pond. The runoff coefficient is revised to following: Hard paved area - 0.95, |

| | |
|---|---|
| runoff coefficient adopted in the submitted hydraulic calculation. | Area covered by gravel – 0.65 & Lawn area – 0.25. |
| 6 Drawings (No.: WNG/24168/C/DRA/001 & WNG/25086/C/DRA/003) & Appendix B: The applicant should clarify size of the proposed surface channel (Branch 3). Also, the applicant should review invert levels of the proposed drainage facilities. Invert levels of drainage facilities at the upstream should be higher than that at the downstream. | Noted. The drawing is revised accordingly. |
| 7 Drawings (No.: WNG/25086/C/DRA/003 & WNG/24168/C/DRA/004): The applicant should clarify discrepancy of size and location of the proposed drainage facilities. Besides, the proposed surface channel (Branch 1) is missing in Section C-C. | Noted. The drawing is revised accordingly. |
| 8 Drawing (No.: WNG/25086/C/DRA/003): The applicant should clarify discharge point of the proposed catchpit CP.E. The applicant should provide details for the connection of the proposed and existing drainage facilities mentioned in the proposal. | Noted. Further to the revised drawing, the discharge point should be catchpit CP5.<br>The detail for the connection of the proposed and existing drainage is shown on Figure 8. |

# APPENDIX B

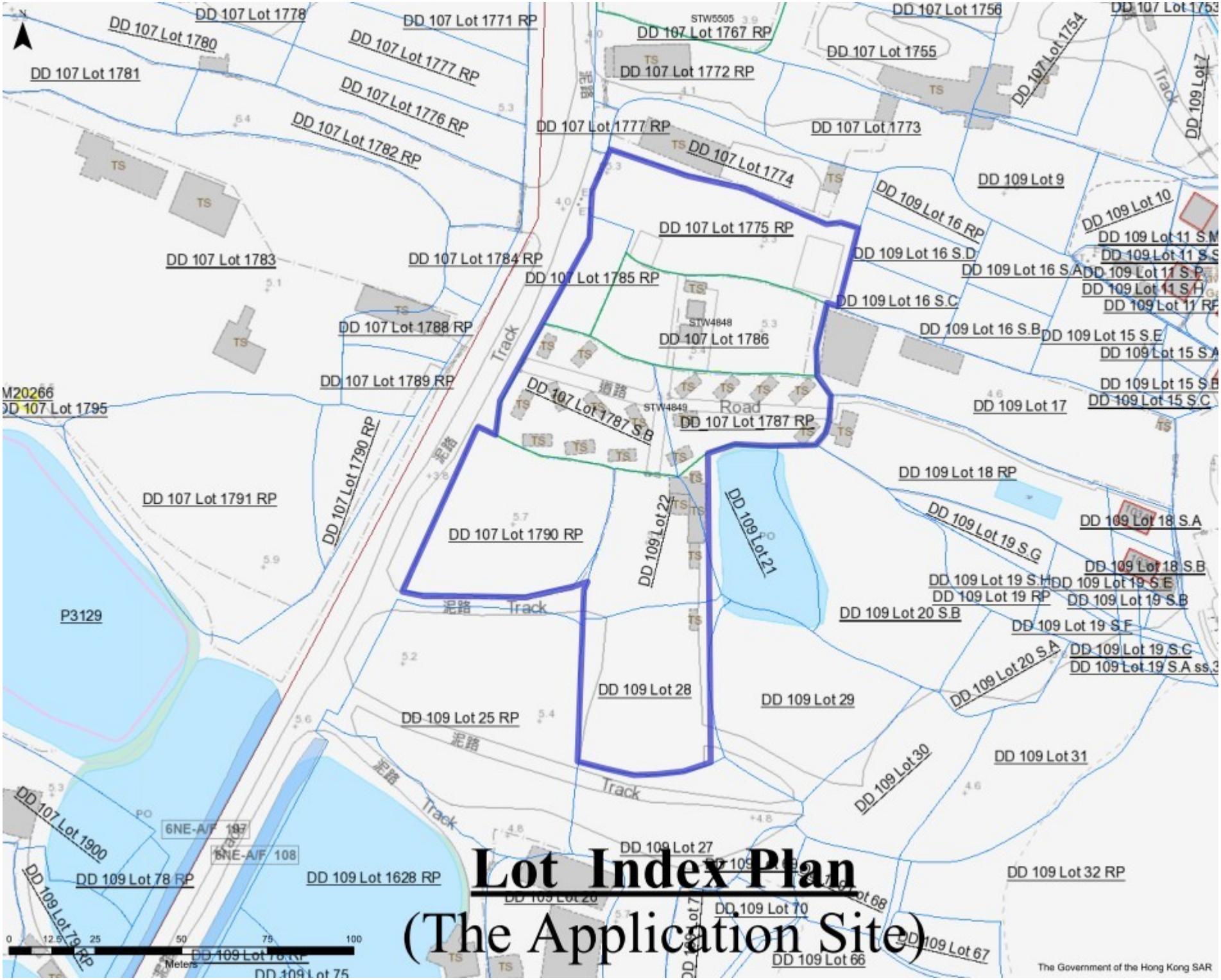
## The Application Site Location Plan




# SITE LOCATION PLAN

# APPENDIX C

## The Application Site with Lots No.

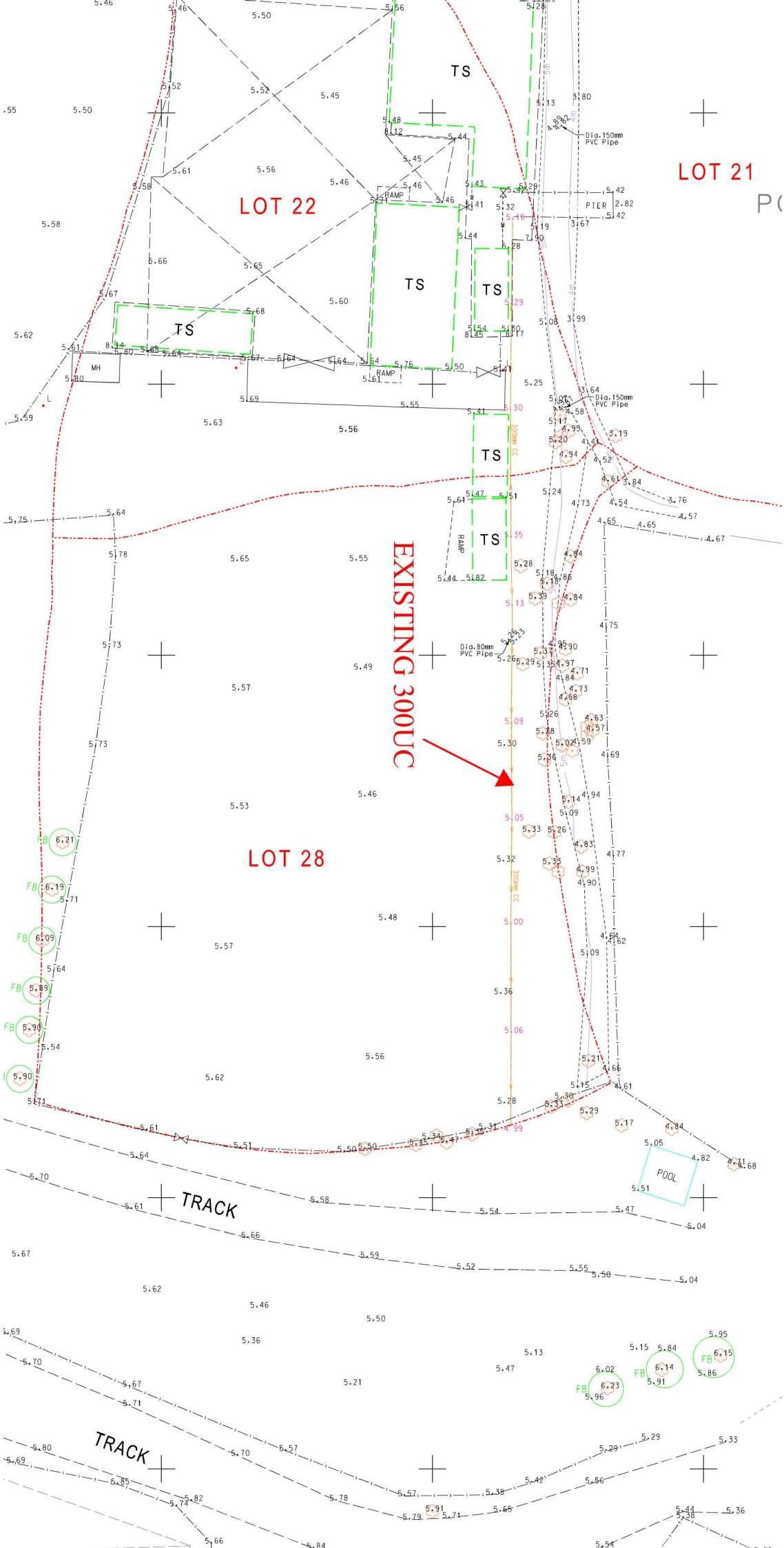



# Lot Index Plan

(The Application Site)

# APPENDIX D

## Topographic Survey Records of Existing 300 UC


LOT 22
LOT 21
LOT 28
TS
RAMP
PIER
MH
Dia.150mm PVC Pipe
Dia.80mm PVC Pipe
300mm CC
EXISTING 300UC
POOL
TRACK
TRACK

# APPENDIX E

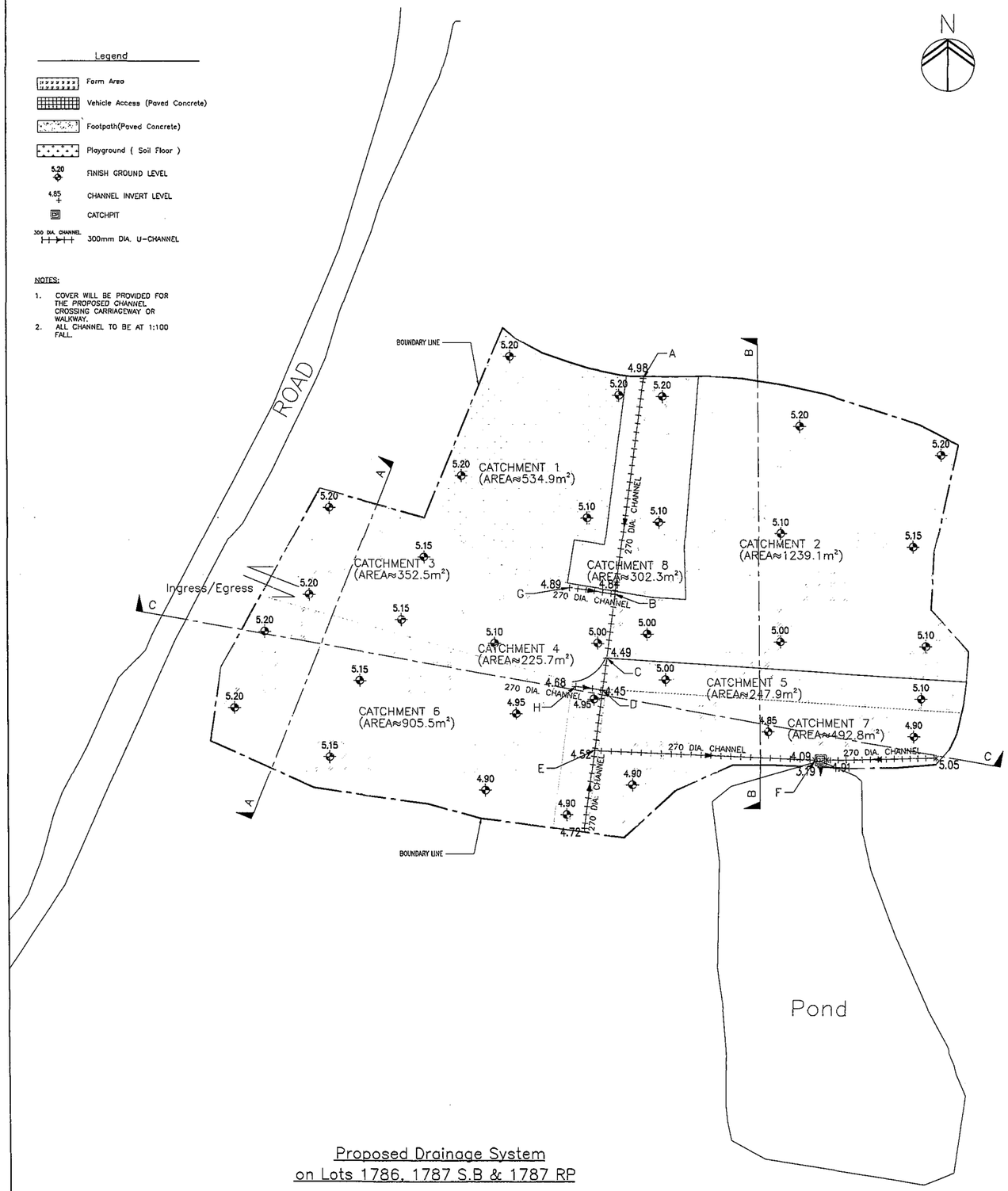
# Constructed 275UC Layout Plan

Legend

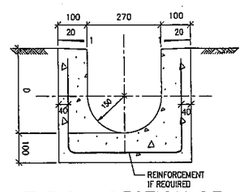
- Farm Area
- Vehicle Access (Paved Concrete)
- Footpath(Paved Concrete)
- Playground ( Soil Floor )
- 5.20 FINISH GROUND LEVEL
- 4.85 CHANNEL INVERT LEVEL
- CATCHPIT
- 300 DIA. CHANNEL 300mm DIA. U-CHANNEL

NOTES:

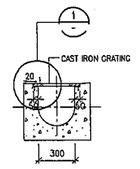
1. COVER WILL BE PROVIDED FOR THE PROPOSED CHANNEL CROSSING CARRIAGEWAY OR WALKWAY.
2. ALL CHANNEL TO BE AT 1:100 FALL.



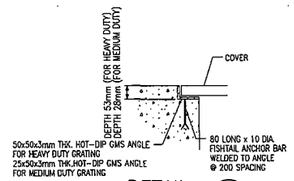

Proposed Drainage System
on Lots 1786, 1787 S.B & 1787 RP




TYPICAL SECTION OF OPEN U-CHANNEL
N.T.S.
NOTE: D, VARIES TO FALL

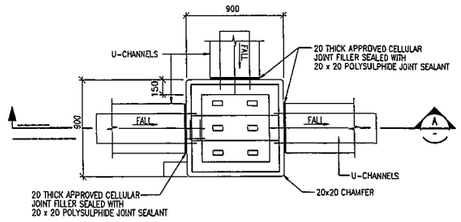



TYPICAL SECTION
SCALE 1:20

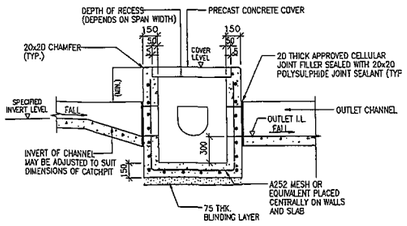



DETAIL 1
SCALE 1:5

CAST IRON GRATING FOR U-CHANNELS
(DIMENSIONS ARE FOR GUIDANCE ONLY. CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)




PLAN




SECTION A
SCALE -

TYPICAL DETAILS OF CATCH PIT
N.T.S.

| | |
|---|---|
| BD REF. | |
| F.S.D. REF. | |

| REV | DATE | DESCRIPTION | DRAWN | CHECKED | APPROVED |
|---|---|---|---|---|---|

ALL MEASUREMENTS MUST BE CHECKED AT THE SITE – DO NOT SCALE DRAWING – ALL DRAWING SPECIFICATIONS AND THEIR COPY RIGHT ARE THE PROPERTY OF ENGINEERS, ARCHITECTS, DESIGNERS AND SHALL BE RETURNED AT THE COMPLETION OF THE WORK – THIS DRAWING IS NOT VALID FOR FOR CONSTRUCTION PURPOSES UNLESS EXPRESSELY CERTIFIED.

SIGNATURE FOR SUBMISSION/ CONSTRUCTION

| | | | |
|---|---|---|---|
| PROJECT NO: | P20315 | | |
| DRAWN BY: | AW | | |
| DESIGNED BY: | RM | | |
| CHECKED BY: | AT | | |
| APPROVED BY: | VT | | |
| SCALE: | AS SHOWN | | |
| CAD FILE: | | | |

PROJECT:

Temporary Place of Recreation, Sports or Culture (Hobby Farm and Caravan Holiday Camp) at Lots No. 1786,1787 S.B and 1787 RP in D.D. 107, Fung Kat Heung, Kam Tin, Yuen Long

DRAWING TITLE:

DRAINAGE PLAN & DETALS

| DRAWING NO: | REV: |
|---|---|
| S-1 | A |

??聯陽工程師有限公司
WINGS & ASSOCIATES CONSULTING ENGINEERS LTD.

# APPENDIX F

## Estimated Pond Capacity Abstract from December 2025 Report

Storm Constants give,

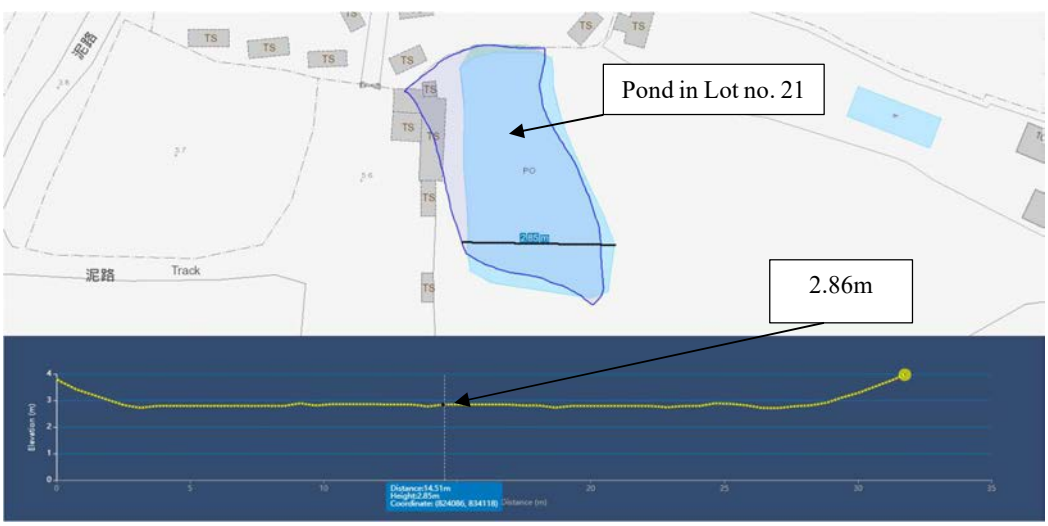
- a = 454.9, b = 3.44, c = 0.412

(From SDM CORRIGENDUM No. 1/2024,
Table 3a – Storm Constants for Different Return Periods of HKO Headquarters)

## 4.2 Design Summary

The capacity of the existing pond is calculated using the area and depth obtained from the GeoInfo Map and topographic survey. The retention time of existing pond is calculated as below.

| | | |
|---|---|---|
| Design flow from D.D. 107 (Appendix D): | | = 0.16 $m^3/s$ |
| Design flow from D.D. 109 (Appendix B): | | = 0.11 $m^3/s$ |
| Design flow from external run-off (Appendix B): | | = 0.08 $m^3/s$ |
| Maximum design flow: | = 0.16+0.11+0.08 | = 0.35 $m^3/s$ |
| Pond Capacity: | = area x depth | |
| | = area x (ground level near pier – existing water level) | |
| | = 1202m² x (4.0-2.86)m | = 1370.3 $m^3$ |
| Retention time: | = 1370.3 / 0.35 / 60 | **= 65 mins** |



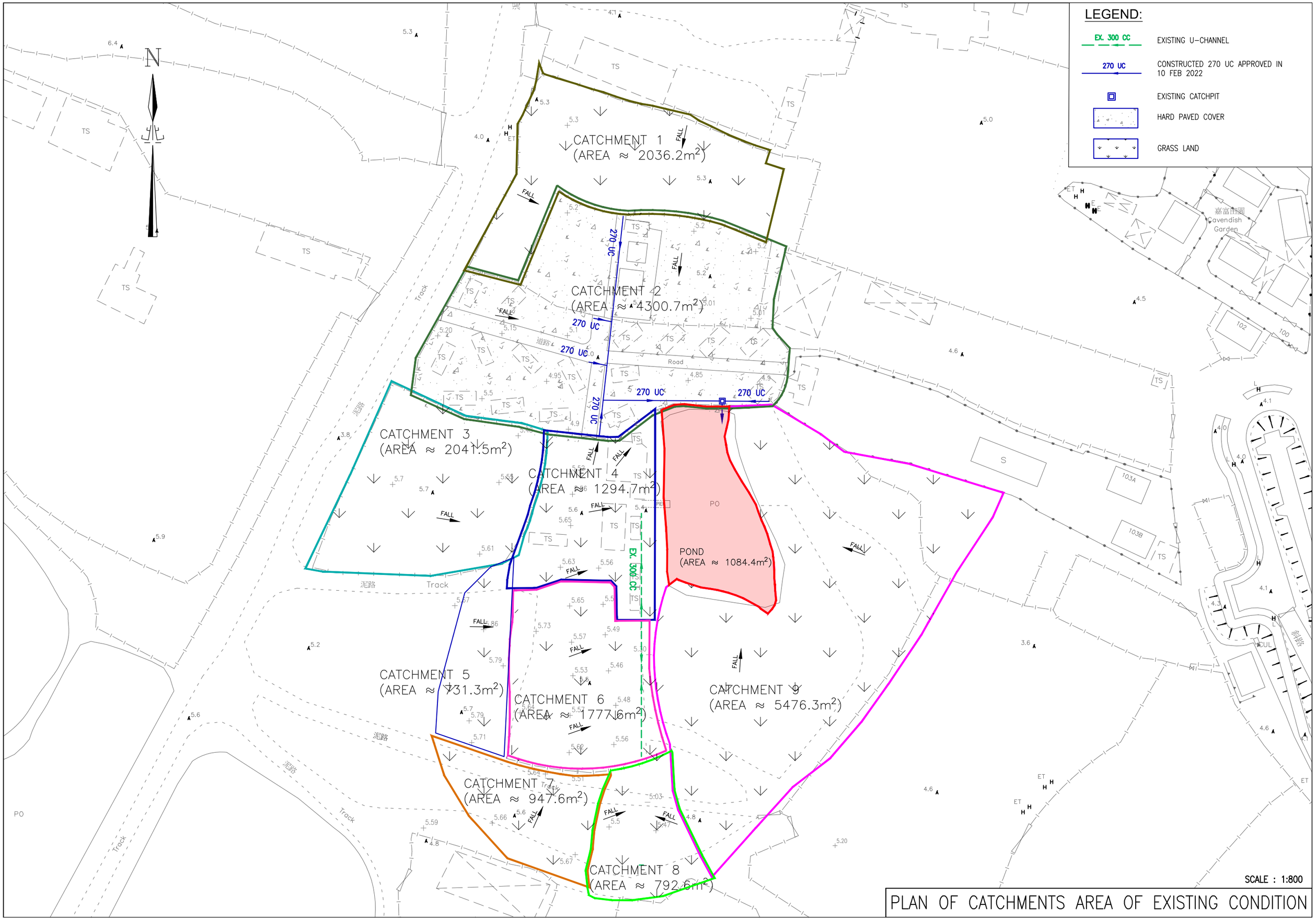

**Section of pond in Lot No.21 from Geotechnical Information Infrastructure**

# APPENDIX G

## Estimation of Existing Pond Retention Time under existing condition

(i) Existing Catchment for Pond

(ii) Estimated on Existing Pond Retention Time




PLAN OF CATCHMENTS AREA OF EXISTING CONDITION

**Estimation of Runoff:** (Existing Condition)

| Catchment Location | Catchment Area, A | Longest Distance, L | Average Fall, $H_{avg}$ | Time of Concentration, t | Runoff Coefficient, K | Rainfall Increase due to Climate Change | Rainfall Intensity, i | Design Flow | Maximum runoff, Q |
|---|---|---|---|---|---|---|---|---|---|
| | $m^2$ | (m) | (m per 100) | (min) | | | (mm/hr) | $m^3/s$ | (litre/min) |
| 1 | 2036.20 | 121.00 | 0.52 | 9.33 | 0.25 | 1.11 | 228.14 | 0.032 | 1936 |
| 2 | 4300.70 | 92.00 | 0.54 | 6.52 | 0.95 | 1.11 | 249.47 | 0.283 | 16988 |
| 3 | 2041.50 | 94.00 | 0.42 | 7.54 | 0.25 | 1.11 | 240.87 | 0.034 | 2049 |
| 4 | 1294.70 | 39.00 | 0.54 | 3.12 | 0.25 | 1.11 | 290.12 | 0.026 | 1565 |
| 5 | 731.30 | 77.00 | 0.55 | 6.50 | 0.25 | 1.11 | 249.68 | 0.013 | 761 |
| 6 | 1777.60 | 102.00 | 0.28 | 8.99 | 0.25 | 1.11 | 230.32 | 0.028 | 1706 |
| 7 | 947.60 | 105.00 | 0.27 | 9.98 | 0.25 | 1.11 | 224.10 | 0.015 | 885 |
| 8 | 792.60 | 95.00 | 0.28 | 9.12 | 0.25 | 1.11 | 229.47 | 0.013 | 758 |
| 9 | 5476.30 | 75.00 | 1.39 | 4.30 | 0.25 | 1.11 | 273.31 | 0.104 | 6236 |
| Pond | 1084.40 | 0.001 | 0.001 | 0.000 | 1.00 | 1.11 | 367.65 | 0.111 | 6645 |
| | | | | | | | | Total: | 26646 |

| | Shortest Distance | H1 | H2 |
|---|---|---|---|
| Catchment 1 | 97 | 5.3 | 4.8 |
| Catchment 2 | 74 | 5.2 | 4.8 |
| Catchment 3 | 71 | 5.7 | 5.4 |
| Catchment 4 | 28 | 5.55 | 5.4 |
| Catchment 5 | 73 | 5.8 | 5.4 |
| Catchment 6 | 71 | 5.6 | 5.4 |
| Catchment 7 | 98 | 5.66 | 5.4 |
| Catchment 8 | 98 | 5.67 | 5.4 |
| Catchment 9 | 36 | 4.5 | 4 |
| Pond | | | |

Average Fall, $H_{avg} = \frac{H1 - H2}{I \times 100}$

**Legend:**

A = area of catchment ($m^2$)

L = distance in metres measured on the line of natural flow between the design section and that point of the catchment from which water would take the longest time to reach the design section

H = average fall (m per 100m) from the summit of catchment to the point of design

$t_d$ = time of concentration (min)

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

i = design mean intensity of rainfall (mm/hr) which is dependent upon the time of concentration

The return-period of design rainfall intensity is 1 in 50 years using algebraic equation in Section 4.3.3

$$= \frac{a}{(t_d + b)^c}$$

Return Period, 50 Years

Storm Constants(HKO Headquarters): a = 505.50 b = 3.29 c = 0.355

K = runoff coefficient

= 0.25 for lawn area, 0.95 for hard paved area & 1 for pond

Q = maximum runoff (litre/min)

$$= \frac{K \; i \; A}{60}$$

**2.2 Estimation of Surface Channel Capacity:**

| Catchments Considered | Qtotal (litre/min) | Design Flow $m^3/s$ |
|---|---|---|
| 1+2+3+4+5+6+7+8+9+Pond | 26646 | 0.659 |
| | | |

**2.3 Pond Retention time**

Retention time = Pond Capacity * / 0.659 / 60

= 1370 / 0.659 / 60

= 35 Mins.

* From previous drainage proposal

# APPENDIX H

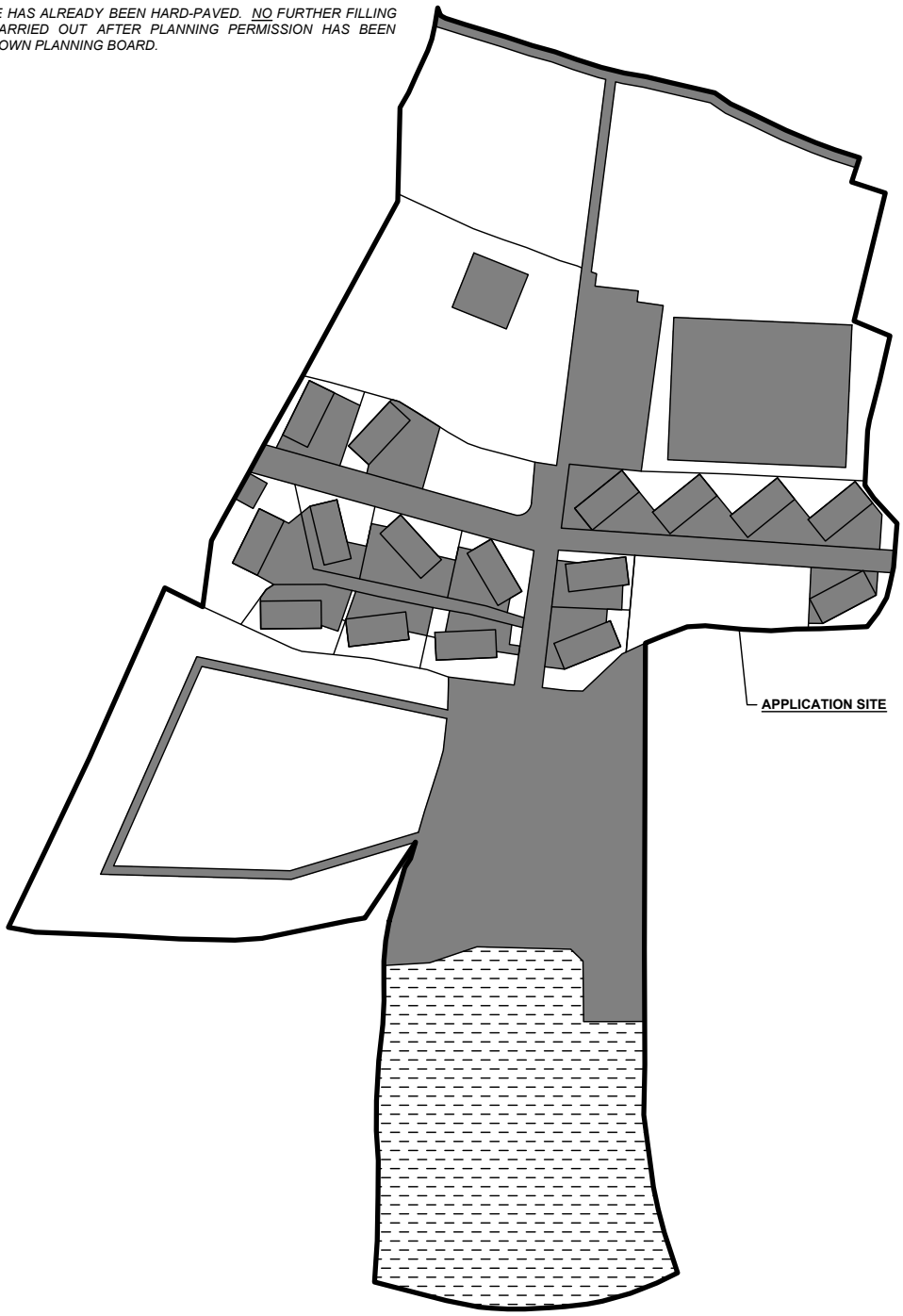
- Estimation of Existing Pond Retention Time under this Application

- Figure 1 to 7

**EXISTING CONDITION OF THE APPLICATION SITE**

| | | |
|---|---|---|
| APPLICATION SITE AREA | : 11,456 $m^2$ | (ABOUT) |
| EXISTING HARD-PAVED AREA | :4,110 $m^2$ | (ABOUT) |
| DEPTH OF LAND FILLING | : NOT MORE THAN 0.2 m | |
| PROPOSED SITE LEVELS | : +5.4 mPD TO +5.6 mPD | (ABOUT) |
| MATERIAL OF LAND FILLING | : CONCRETE | |
| PURPOSE OF LAND FILLING | : SITE FORMATION OF STRUCTURE AND CIRCULATION SPACE | |
| AREA COVERED BY GRAVEL | : 1,777 $m^2$ | (ABOUT) |
| PURPOSE OF COVERING BY GRAVEL | : PARKING AND LOADING / UNLOADING PURPOSES | |
| AREA OF LAWN | : 5,569 $m^2$ | (ABOUT) |
| PURPOSE OF LAWN AREA | : HOLIDAY CAMP, OPEN SPACE AND FOR RECREATIONAL, SPORTS OR CULTURAL ACTIVITIES | |

*THE APPLICATION SITE HAS ALREADY BEEN HARD-PAVED. NO FURTHER FILLING OF LAND WILL BE CARRIED OUT AFTER PLANNING PERMISSION HAS BEEN GRANTED FROM THE TOWN PLANNING BOARD.*




**LEGEND**

- APPLICATION SITE
- HARD PAVED AREA
- AREA COVERED BY GRAVEL
- LAWN AREA

**SITE BOUNDARY FOR IDENTIFICATION PURPOSE ONLY.*

| PLANNING CONSULTANT | PROJECT | ADDRESS | SCALE | | TITLE | |
|---|---|---|---|---|---|---|
| R-RICHES PLANNING LIMITED | TEMPORARY HOLIDAY CAMP, PLACE OF RECREATION, SPORTS OR CULTURE, BARBECUE SITE AND EATING PLACE WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS | VARIOUS LOTS IN D.D. 107 AND D.D. 109, FUNG KAT HEUNG, KAM TIN, YUEN LONG, NEW TERRITORIES | 1 : 1000 @ A4 | | FILLING OF LAND | |
| | | | DRAWN BY: MN | DATE: 28.4.2026 | | |
| | | | REVISED BY | DATE | DWG NO.: PLAN 6 | VER.: 001 |

NORTH
W E
S

**Estimation of Runoff:** (With Proposed Drainage for the Application Site)

| Catchment Location | Catchment Area, A | Longest Distance, L | Average Fall, $H_{avg}$ | Time of Concentration, t | Runoff Coefficient, | Rainfall Increase due to | Rainfall Intensity, i | Design Flow | Maximum runoff, Q |
|---|---|---|---|---|---|---|---|---|---|
| | $m^2$ | (m) | (m per 100) | (min) | K | Climate Change | (mm/hr) | $m^3/s$ | (litre/min) |
| 1 | 2036.20 | 121.00 | 0.52 | 9.33 | 0.25 | 1.11 | 228.14 | 0.032 | 1936 |
| 2 | 4300.70 | 92.00 | 0.54 | 6.52 | 0.95 | 1.11 | 249.47 | 0.283 | 16988 |
| 3 | 2041.50 | 98.00 | 0.41 | 7.92 | 0.25 | 1.11 | 237.89 | 0.034 | 2024 |
| 4 | 1294.70 | 42.00 | 0.45 | 3.47 | 0.95 | 1.11 | 284.66 | 0.097 | 5835 |
| 5 | 731.30 | 115.00 | 0.51 | 9.86 | 0.25 | 1.11 | 224.84 | 0.011 | 685 |
| 6 | 1777.60 | 102.00 | 0.28 | 8.99 | 0.65 | 1.11 | 230.32 | 0.074 | 4435 |
| 7 | 947.60 | 107.00 | 0.27 | 10.17 | 0.25 | 1.11 | 222.97 | 0.015 | 880 |
| 8 | 792.60 | 95.00 | 0.27 | 9.14 | 0.25 | 1.11 | 229.35 | 0.013 | 757 |
| 9 | 5476.30 | 75.00 | 1.39 | 4.30 | 0.25 | 1.11 | 273.31 | 0.104 | 6236 |
| Pond | 1084.40 | 0.001 | 0.001 | 0.000 | 1.00 | 1.11 | 367.65 | 0.111 | 6645 |
| | | | | | | | | Total: | 33540 |

| | Shortest Distance (I | H1 | H2 |
|---|---|---|---|
| Catchment 1 | 97 | 5.3 | 4.8 |
| Catchment 2 | 74 | 5.2 | 4.8 |
| Catchment 3 | 74 | 5.7 | 5.4 |
| Catchment 4 | 33 | 5.55 | 5.4 |
| Catchment 5 | 79 | 5.8 | 5.4 |
| Catchment 6 | 71 | 5.6 | 5.4 |
| Catchment 7 | 98 | 5.66 | 5.4 |
| Catchment 8 | 99 | 5.67 | 5.4 |
| Catchment 9 | 36 | 4.5 | 4 |
| Pond | | | |

Average Fall, $H_{avg} = \frac{H1 - H2}{I \times 100}$

**Legend:**

A = area of catchment ($m^2$)

L = distance in metres measured on the line of natural flow between the design section and that point of the catchment from which water would take the longest time to reach the design section

$H_{avg}$ = average fall (m per 100m) from the summit of catchment to the point of design

$t_d$ = time of concentration (min)

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

i = design mean intensity of rainfall (mm/hr) which is dependent upon the time of concentration
The return-period of design rainfall intensity is 1 in 50 years using algebraic equation in Section 4.3.3

$$= \frac{a}{(t_d + b)^c}$$

Return Period, 50 Years

Storm Constants(HKO Headquarters): a = 505.50 b = 3.29 c = 0.355

K = runoff coefficient

= 0.25 for lawn area, 0.65 for gravel area, 0.95 for hard paved area & 1 for pond

Q = maximum runoff (litre/min)

$$= \frac{K \; i \; A}{60}$$

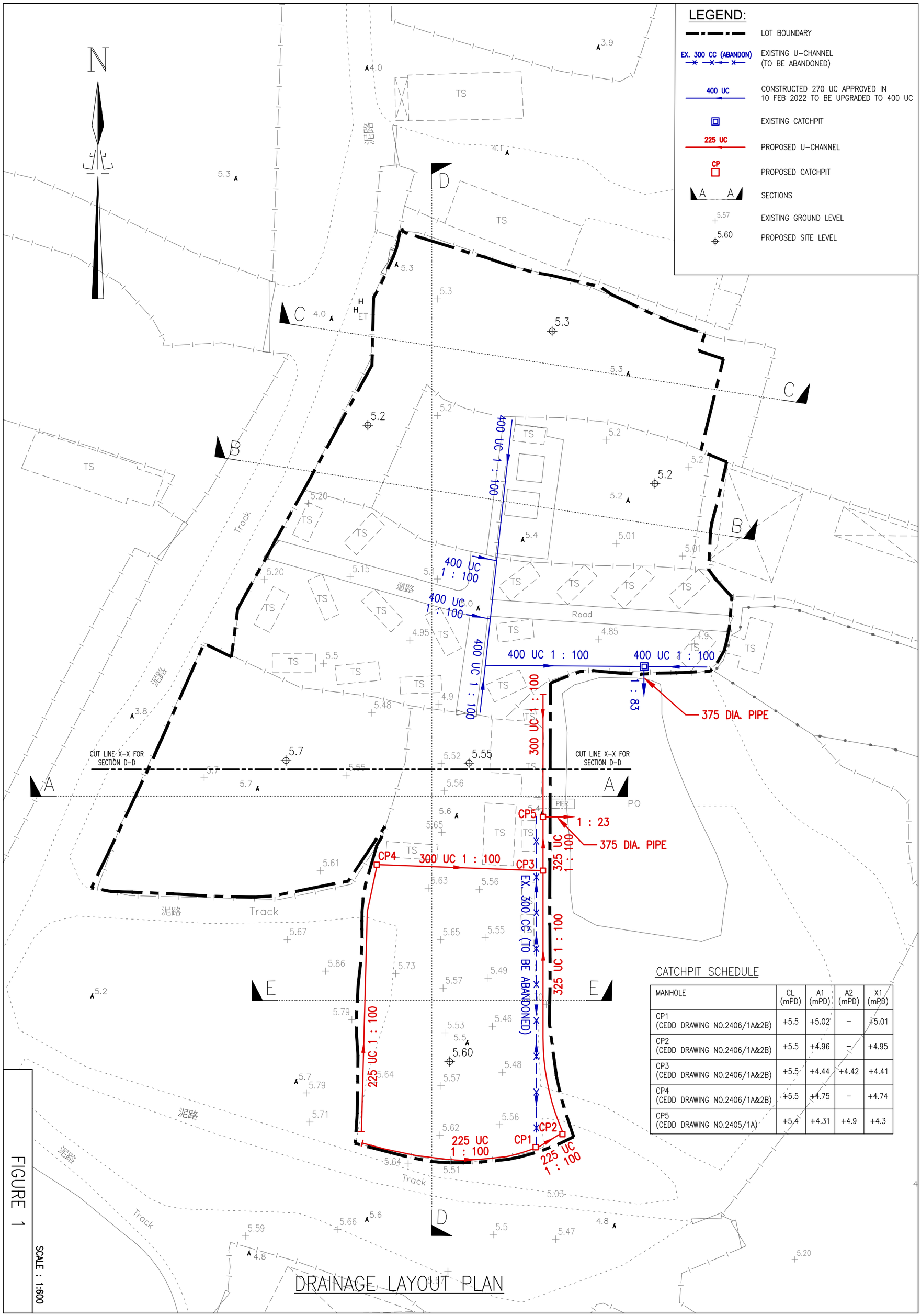
**2.2 Estimation of Surface Channel Capacity:**

| Catchments Considered | Qtotal (litre/min) | Design Flow $m^3/s$ |
|---|---|---|
| 1+2+3+4+5+6+7+8+9+Pond | 33540 | 0.774 |
| | | |

**2.3 Pond Retention time**

Retention time = Pond Capacity * / 0.774 / 60
= 1370 / 0.774 / 60
= 30 Mins.

* From previous drainage proposal




CATCHPIT SCHEDULE

| MANHOLE | CL (mPD) | A1 (mPD) | A2 (mPD) | X1 (mPD) |
|---|---|---|---|---|
| CP1 (CEDD DRAWING NO.2406/1A&2B) | +5.5 | +5.02 | – | +5.01 |
| CP2 (CEDD DRAWING NO.2406/1A&2B) | +5.5 | +4.96 | – | +4.95 |
| CP3 (CEDD DRAWING NO.2406/1A&2B) | +5.5 | +4.44 | +4.42 | +4.41 |
| CP4 (CEDD DRAWING NO.2406/1A&2B) | +5.5 | +4.75 | – | +4.74 |
| CP5 (CEDD DRAWING NO.2405/1A) | +5.4 | +4.31 | +4.9 | +4.3 |

DRAINAGE LAYOUT PLAN

FIGURE 1

SCALE : 1:600

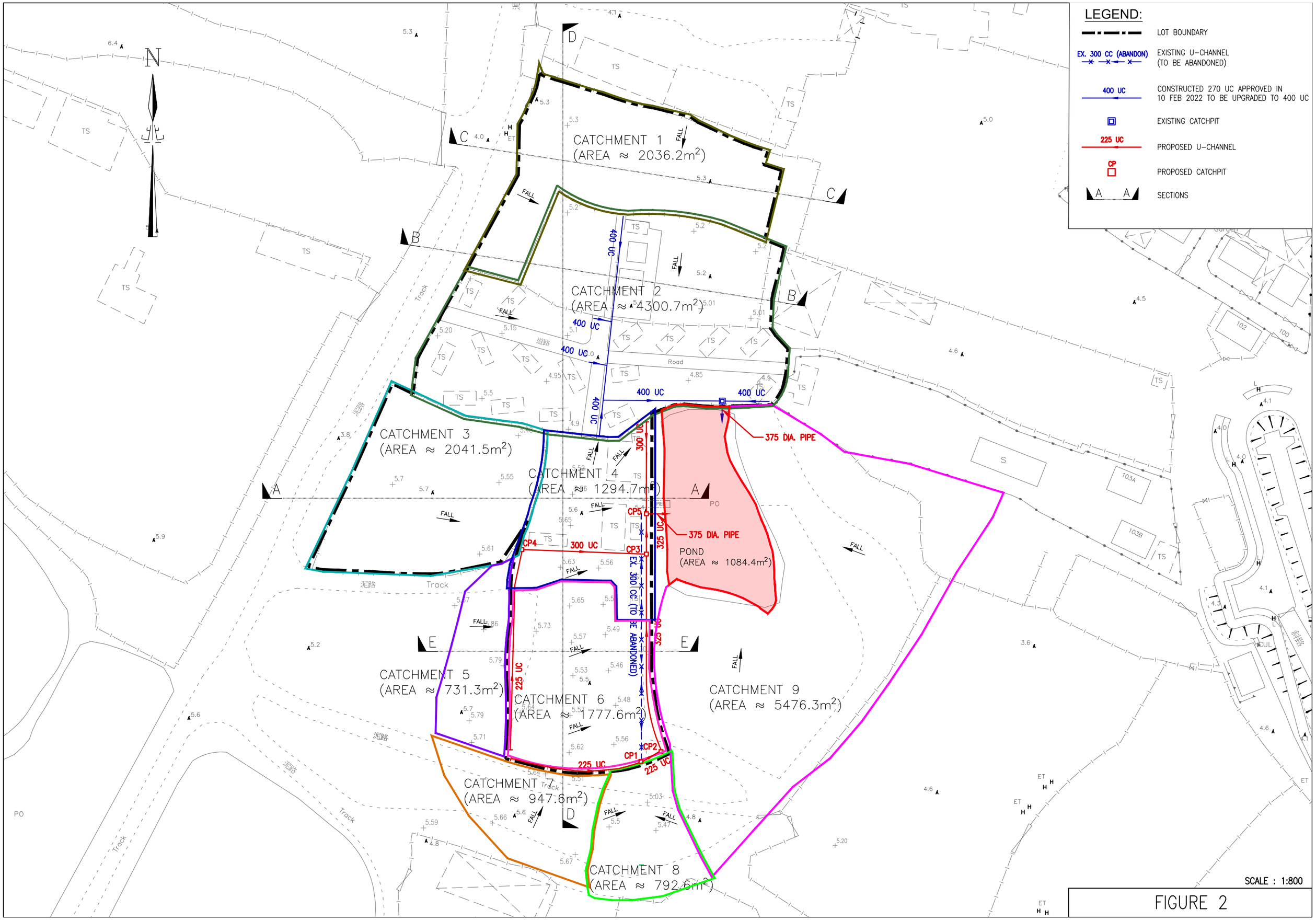
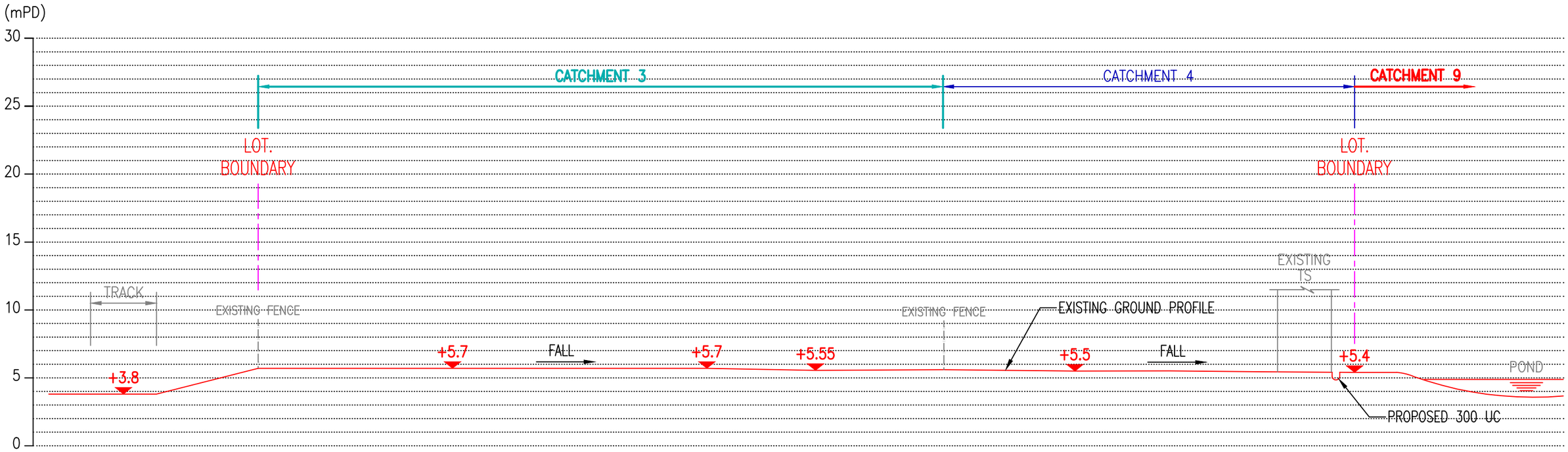

LEGEND:
LOT BOUNDARY
EX. 300 CC (ABANDON)
EXISTING U-CHANNEL (TO BE ABANDONED)
400 UC
CONSTRUCTED 270 UC APPROVED IN 10 FEB 2022 TO BE UPGRADED TO 400 UC
EXISTING CATCHPIT
225 UC
PROPOSED U-CHANNEL
CP
PROPOSED CATCHPIT
A A
SECTIONS
N
CATCHMENT 1 (AREA ≈ 2036.2m²)
CATCHMENT 2 (AREA ≈ 4300.7m²)
CATCHMENT 3 (AREA ≈ 2041.5m²)
CATCHMENT 4 (AREA ≈ 1294.7m²)
CATCHMENT 5 (AREA ≈ 731.3m²)
CATCHMENT 6 (AREA ≈ 1777.6m²)
CATCHMENT 7 (AREA ≈ 947.6m²)
CATCHMENT 8 (AREA ≈ 792.6m²)
CATCHMENT 9 (AREA ≈ 5476.3m²)
POND (AREA ≈ 1084.4m²)
375 DIA. PIPE
375 DIA. PIPE
400 UC
400 UC
400 UC
400 UC
400 UC
400 UC
300 UC
300 UC
325 UC
325 UC
225 UC
225 UC
225 UC
EX. 300 CC (TO BE ABANDONED)
CP1
CP2
CP3
CP4
CP5
FALL
Road
Track
泥路
道路
SCALE : 1:800

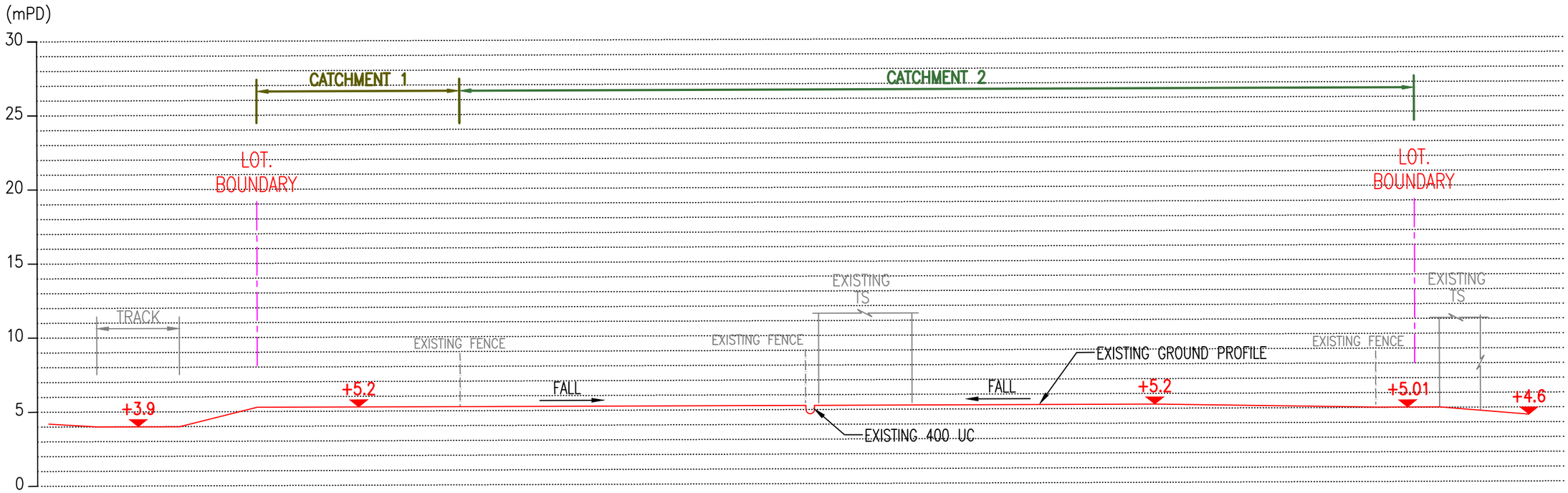
FIGURE 2




SECTION A–A

1 : 300

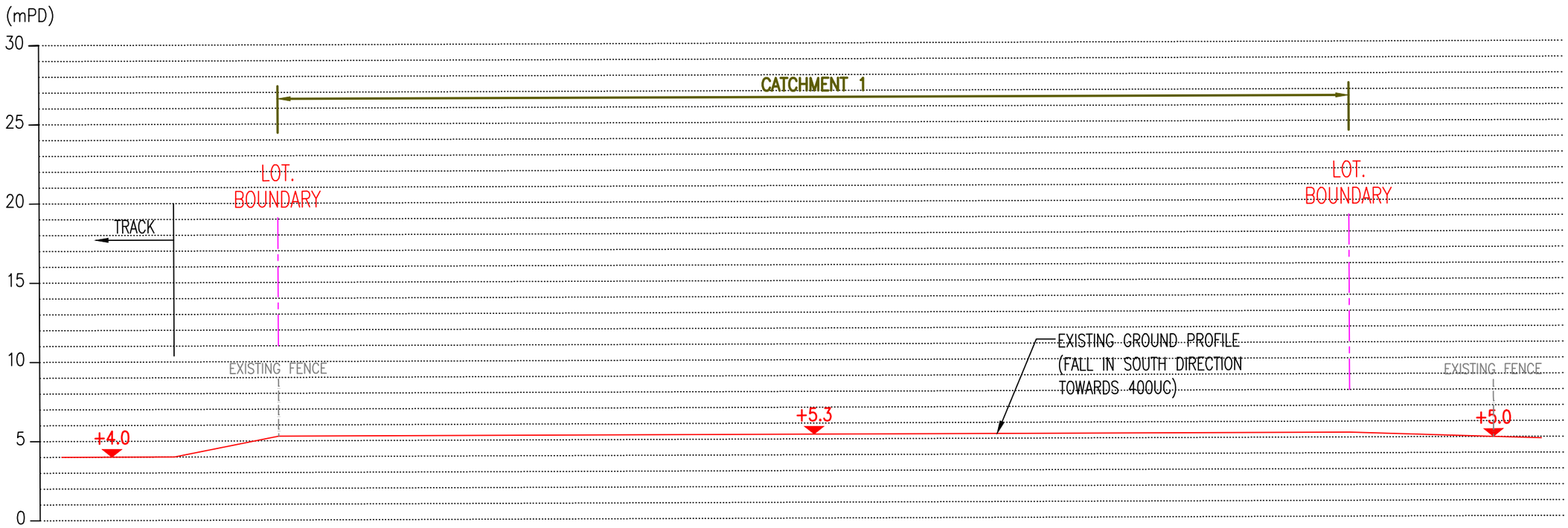
FIGURE 3




SECTION B–B

1 : 300

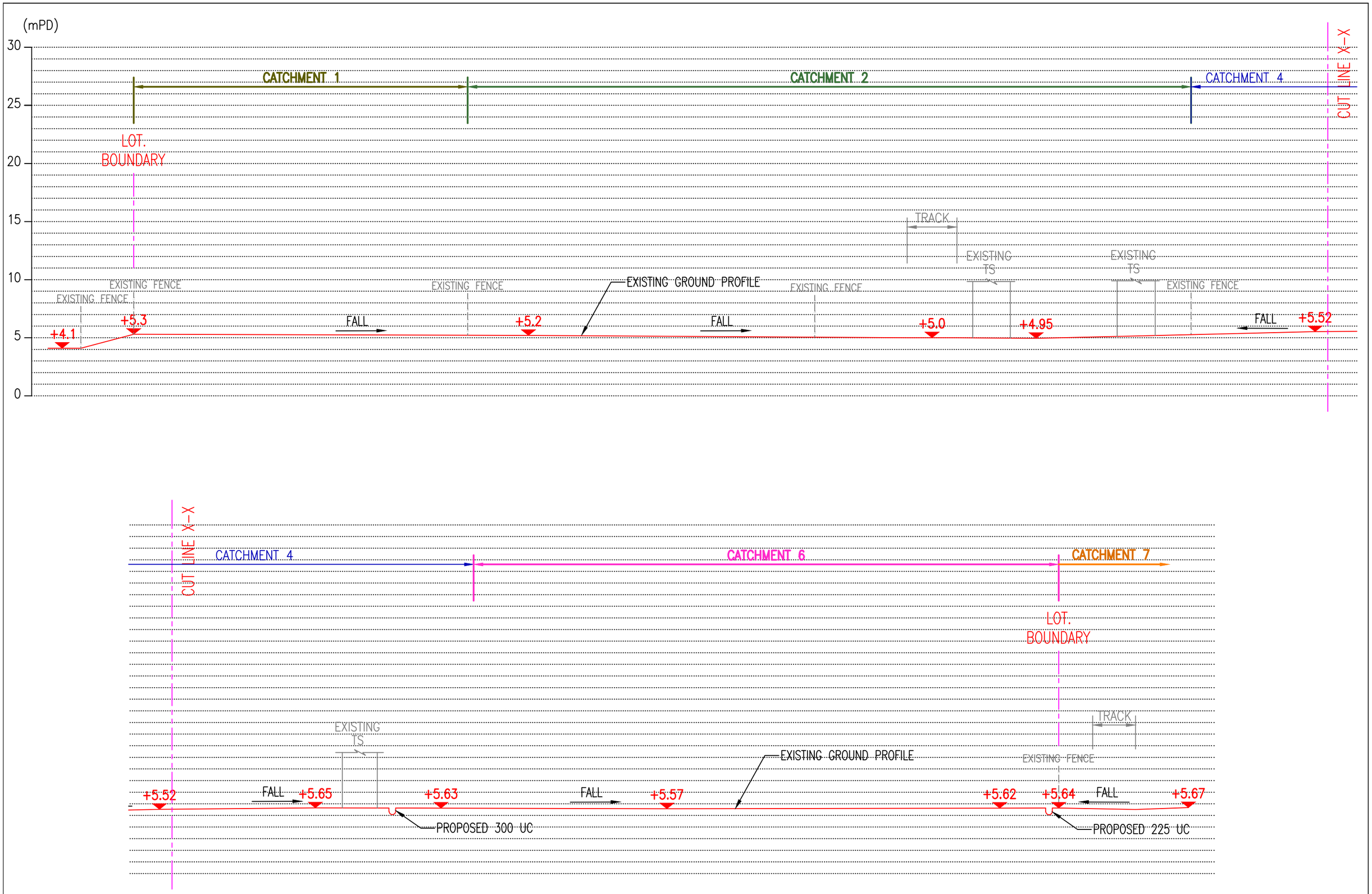
FIGURE 4




## SECTION C–C

1 : 300

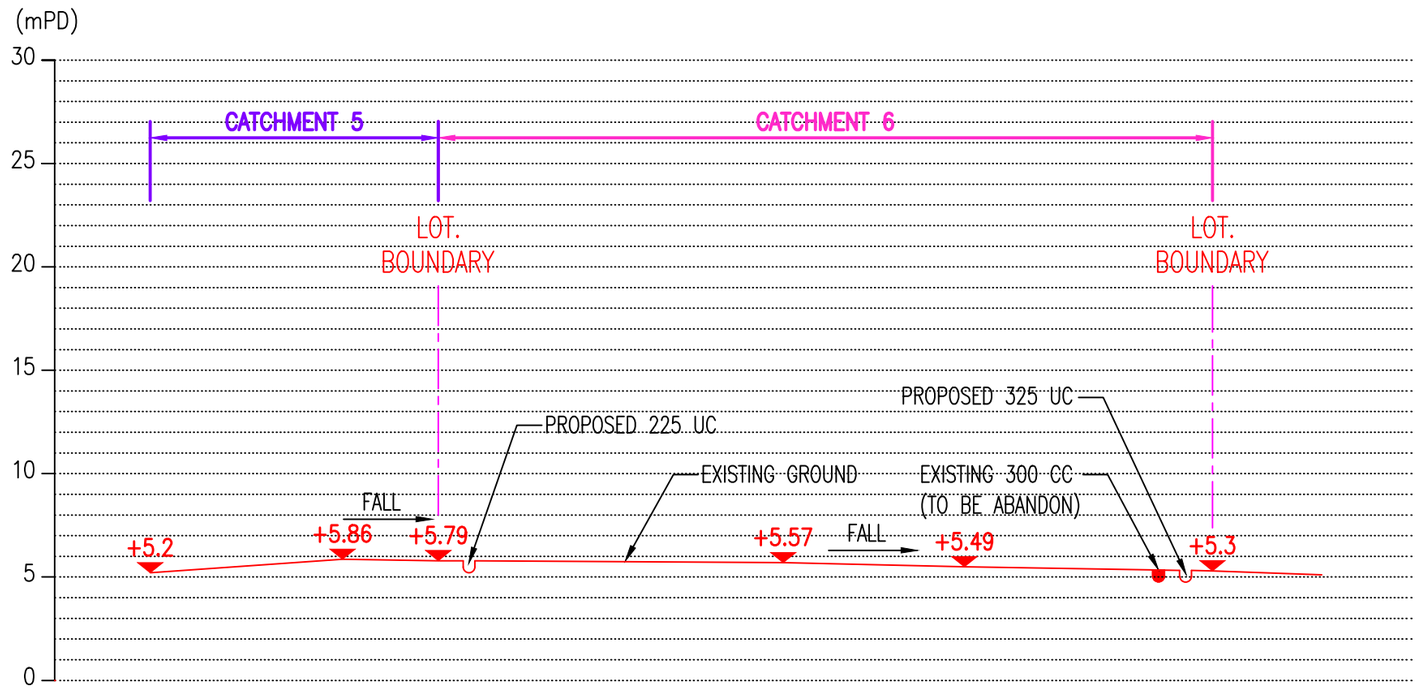
FIGURE 5




## SECTION D-D

1 : 300

FIGURE 6




SECTION E–E

1 : 300

FIGURE 7

# APPENDIX I

## Channel Design

- Figure 8

**Estimation of Runoff:** (With Proposed Drainage for the Application Site)

| Catchment Location | Catchment Area, A ($m^2$) | Longest Distance, L (m) | Average Fall, $H_{avg}$ (m per 100) | Time of Concentration, t (min) | Runoff Coefficient, K | Rainfall Increase due to Climate Change | Rainfall Intensity, i (mm/hr) | Design Flow ($m^3/s$) | Maximum runoff, Q (litre/min) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2036.20 | 121.00 | 0.52 | 9.33 | 0.25 | 1.11 | 228.14 | 0.032 | 1936 |
| 2 | 4300.70 | 92.00 | 0.54 | 6.52 | 0.95 | 1.11 | 249.47 | 0.283 | 16988 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | Total: | 18923 |

| | Shortest Distanc | H1 | H2 |
|---|---|---|---|
| Catchment 1 | 97 | 5.3 | 4.8 |
| Catchment 2 | 74 | 5.2 | 4.8 |

Average Fall, $H_{avg} = \frac{H1 - H2}{I \times 100}$

**Legend:**

A = area of catchment ($m^2$)

L = distance in metres measured on the line of natural flow between the design section and that point of the catchment from which water would take the longest time to reach the design section

$H_{avg}$ = average fall (m per 100m) from the summit of catchment to the point of design

$t_d$ = time of concentration (min)

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

i = design mean intensity of rainfall (mm/hr) which is dependent upon the time of concentration
The return-period of design rainfall intensity is 1 in 50 years using algebraic equation in Section 4.3.3

$= \frac{a}{(t_d + b)^c}$

Return Period, 50 Years

Storm Constants(HKO Headquarters) a = 505.50 b = 3.29 c = 0.355

K = runoff coefficient
= 0.25 for lawn area, 0.95 for hard paved area & 1 for pond

Q = maximum runoff (litre/min)

$= \frac{K \; i \; A}{60}$

**2.2 Estimation of Surface Channel Capacity:**

| Catchments Considered | Qtotal (litre/min) | Gradient | Size | Type | Velocity (m/s) | | Design Flow ($m^3/s$) | Capacity (litre/min) | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1936 | 1 in 100 | 225 | U | 1.48 | <4.0 O.K. | 0.032 | 4501 | O.K. |
| 1+2 | 18923 | 1 in 100 | 400 | U | 2.17 | <4.0 O.K. | 0.315 | 20879 | O.K. |
| | | | | | | | | | |
| Outlet pipe | 18923 | 1 in 83 | 375 | pipe | 2.58 | | 0.52 | 19411.8 | O.K. |
| | | | | | | | | | |
| | | | | | | | | | |

**Legends:**

n = Manning's coefficien (Table 13)
= 0.012

R = Hydraulic Radius

$= \frac{A}{P}$

V = Manning 's flow velocity equatio (m/sec)

$= \frac{R^{0.67} \times S^{0.5}}{n}$

Q = Manning 's flow capacity equatio (litre/min)
= V x A x 1000 x 60

**Estimation of Runoff:** (With Proposed Drainage for the Application Site)

| Catchment Location | Catchment Area, A ($m^2$) | Longest Distance, L (m) | Average Fall, $H_{avg}$ (m per 100) | Time of Concentration, t (min) | Runoff Coefficient, K | Rainfall Increase due to Climate Change | Rainfall Intensity, i (mm/hr) | Design Flow ($m^3/s$) | Maximum runoff, Q (litre/min) |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 2041.50 | 98.00 | 0.41 | 7.92 | 0.25 | 1.11 | 237.89 | 0.034 | 2024 |
| 4 | 1294.70 | 42.00 | 0.45 | 3.47 | 0.95 | 1.11 | 284.66 | 0.097 | 5835 |
| 5 | 731.30 | 115.00 | 0.51 | 9.86 | 0.25 | 1.11 | 224.84 | 0.011 | 685 |
| 6 | 1777.60 | 102.00 | 0.28 | 8.99 | 0.65 | 1.11 | 230.32 | 0.074 | 4435 |
| 7 | 947.60 | 107.00 | 0.27 | 10.17 | 0.25 | 1.11 | 222.97 | 0.015 | 880 |
| 8 | 792.60 | 95.00 | 0.27 | 9.14 | 0.25 | 1.11 | 229.35 | 0.013 | 757 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | Total: | 14617 |

| | Shortest Dis | H1 | H2 |
|---|---|---|---|
| Catchment 3 | 74 | 5.7 | 5.4 |
| Catchment 4 | 33 | 5.55 | 5.4 |
| Catchment 5 | 79 | 5.8 | 5.4 |
| Catchment 6 | 71 | 5.6 | 5.4 |
| Catchment 7 | 98 | 5.66 | 5.4 |
| Catchment 8 | 99 | 5.67 | 5.4 |

Average Fall, $H_{avg} = \frac{H1 - H2}{I \times 100}$

**Legend:**

A = area of catchment ($m^2$)

L = distance in metres measured on the line of natural flow between the design section and that point of the catchment from which water would take the longest time to reach the design section

$H_{avg}$ = average fall (m per 100m) from the summit of catchment to the point of design

t = time of concentration (min)

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

i = design mean intensity of rainfall (mm/hr) which is dependent upon the time of concentration
The return-period of design rainfall intensity is 1 in 10 years/1 in 200 years using Fig.8.2, Geotechnical Manual for Slope

K = runoff coefficient
= 1.0 for conservative design

Q = maximum runoff (litre/min)

$= \frac{K \quad i \quad A}{60}$

Return Period, 50 Years
Storm Constants(HKO Headquarters) a = 505.50 b = 3.29 c = 0.355

**2.2 Estimation of Surface Channel Capacity:**

| Catchments Considered | Qtotal (litre/min) | Gradient | Size | Type | Velocity (m/s) | | Design Flow ($m^3/s$) | Capacity (litre/min) | |
|---|---|---|---|---|---|---|---|---|---|
| 3+4 | 7859 | 1 in 100 | 300 | U | 1.66 | <4.0 O.K. | 0.131 | 8949 | O.K. |
| 5 | 685 | 1 in 100 | 225 | U | 1.37 | <4.0 O.K. | 0.011 | 4155 | O.K. |
| 7+8 | 1638 | 1 in 100 | 225 | U | 1.37 | <4.0 O.K. | 0.085 | 4155 | O.K. |
| 6+7+8 | 6073 | 1 in 100 | 325 | U | 1.75 | <4.0 O.K. | 0.101 | 11078 | O.K. |
| 3+4+5+6+7+8 | 14617 | 1 in 100 | 400 | U | 2.01 | <4.0 O.K. | 0.244 | 19273 | O.K. |
| | | | | | | | | | |
| Outlet pipe | 14617 | 1 in 23 | 375 | pipe | 2.24 | | 1.37 | 31270.8 | O.K. |
| | | | | | | | | | |

**Legends:**

n = Manning's coefficient
= 0.013

R = Hydraulic Radius

$= \frac{A}{P}$

V = Manning 's flow velocity equatio (m/sec)

$= \frac{R^{0.67} \times S^{0.5}}{n}$

Q = Manning 's flow capacity equatio (litre/min)
= V x A x 1000 x 60

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# APPENDIX 1 : Recommended roughness values

| Classification (assumed clean and new unless otherwise stated) | Suitable values of $k_s$ (mm) | | |
|---|---|---|---|
| | Good | Normal | Poor |
| **Smooth materials (pipes)** | | | |
| Drawn non-ferrous pipes of aluminium, brass, copper, lead etc, and non-metallic pipes of Alkathene, glass, perspex etc | -- | 0·003 | -- |
| **Asbestos-cement** | 0·015 | 0·03 | 0·06# |
| **Metal** | | | |
| Spun bitumen or concrete lined | -- | 0·03 | -- |
| # Cast iron, epoxy lining, coupling joints | -- | 0·015 | 0·03 |
| # Ductile iron, Polyethylene lining, push-fit joints | -- | 0·06 | 0·15 |
| # Ductile iron, Polyurethane lining, push-fit joints | 0·015 | 0·03 | 0·06 |
| Wrought iron | 0·03 | 0·06 | 0·15 |
| Rusty wrought iron | 0·15 | 0·6 | 3·0 |
| Uncoated steel | 0·015 | 0·03 | 0·06 |
| # Steel, epoxy lining, push-fit joints | 0·03 | 0·06 | 0·15 |
| Galvanised iron, coated cast iron generally# | 0·06 | 0·15 | 0·3 |
| Uncoated cast iron | 0·15 | 0·3 | 0·6 |
| Tate relined pipes | 0·15 | 0·3 | 0·6 |
| Old tuberculated water mains as follows: | | | |
| Slight degree of attack | 0·6 | 1·5 | 3·0 |
| Moderate degree of attack | 1·5 | 3·0 | 6·0 |
| Appreciable degree of attack | 6·0 | 15 | 30 |
| Severe degree of attack | 15 | 30 | 60 |
| (Good: up to 20 years use; Normal: 40 to 50 years use; Poor: 80 to 100 years use) | | | |
| **Wood** | | | |
| Wood stave pipes, planed plank conduits | 0·3 | 0·6 | 1·5 |
| **Concrete** | | | |
| # Prestressed | 0·03 | 0·06 | 0·15 |
| Precast concrete pipes with "O" ring joints | 0·06 | 0·15 | 0·6 |
| Spun precast concrete pipes with "O" ring joints | 0·06 | 0·15 | 0·3 |
| Monolithic construction against steel forms | 0·3 | 0·6 | 1·5 |
| Monolithic construction against rough forms | 0·6 | 1·5 | -- |
| **Clayware** | | | |
| Glazed or unglazed pipe: | | | |
| With sleeve joints | 0·03 | 0·06 | 0·15 |
| With spigot and socket joints and "O" ring seals | | | |
| -- dia < 0·150 m | -- | 0·03 | -- |
| -- dia > 0·150 m | -- | 0·06 | -- |
| **Pitch fibre** | | | |
| (lower value refers to full bore flow) | 0·003 | 0·03 | |
| # **Glass reinforced plastic (GRP)** | 0·03 | 0·06 | -- |
| **uPVC** | | | |
| # Twin-walled, with coupling joints | 0·003 | 0·006 | |
| Standard, with chemically cemented joints | -- | 0·03 | -- |
| Standard, with spigot and socket joints, "O" ring seals at 6 to 9 metre intervals | -- | 0·06 | -- |

# A15

(p.3 of 4)

$k_s$ = 0·060 mm
$S$ = 0·00400 to 0·02000

ie hydraulic gradient = 1 in 250 to 1 in 50

Water (or sewage) at 15°C; full bore conditions.

velocities in $ms^{-1}$
discharges in litres/sec

| Gradient | (Equivalent) Pipe diameters in mm | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 150 | 200 | 225 | 250 | 275 | 300 | 350 | 375 | 400 | 450 | 500 | 525 | 600 | 630 |
| 0·00400 | 0·770 | 0·929 | 1·003 | 1·074 | 1·142 | 1·207 | 1·332 | 1·392 | 1·450 | 1·562 | 1·669 | 1·721 | 1·870 | 1·928 |
| 1/ 250 | 13·599 | 29·196 | 39·889 | 52·717 | 67·823 | 85·345 | 128·17 | 153·72 | 182·20 | 248·39 | 327·66 | 372·46 | 528·81 | 601·01 |
| 0·00420 | 0·790 | 0·954 | 1·030 | 1·102 | 1·172 | 1·239 | 1·367 | 1·428 | 1·488 | 1·602 | 1·712 | 1·765 | 1·919 | 1·978 |
| 1/ 238 | 13·961 | 29·967 | 40·940 | 54·102 | 69·600 | 87·578 | 131·51 | 157·73 | 186·94 | 254·84 | 336·14 | 382·10 | 542·47 | 616·51 |
| 0·00440 | 0·810 | 0·978 | 1·055 | 1·130 | 1·201 | 1·270 | 1·401 | 1·463 | 1·524 | 1·642 | 1·754 | 1·809 | 1·966 | 2·026 |
| 1/ 227 | 14·314 | 30·720 | 41·966 | 55·455 | 71·338 | 89·760 | 134·78 | 161·64 | 191·57 | 261·14 | 344·44 | 391·52 | 555·80 | 631·66 |
| 0·00460 | 0·830 | 1·001 | 1·081 | 1·157 | 1·230 | 1·300 | 1·434 | 1·498 | 1·561 | 1·681 | 1·796 | 1·851 | 2·012 | 2·074 |
| 1/ 217 | 14·660 | 31·457 | 42·970 | 56·779 | 73·037 | 91·894 | 137·97 | 165·46 | 196·10 | 267·30 | 352·55 | 400·73 | 568·85 | 646·47 |
| 0·00480 | 0·849 | 1·024 | 1·105 | 1·183 | 1·258 | 1·330 | 1·467 | 1·532 | 1·596 | 1·719 | 1·836 | 1·893 | 2·057 | 2·120 |
| 1/ 208 | 14·998 | 32·179 | 43·953 | 58·075 | 74·701 | 93·984 | 141·10 | 169·21 | 200·53 | 273·33 | 360·48 | 409·74 | 581·62 | 660·97 |
| 0·00500 | 0·868 | 1·047 | 1·130 | 1·209 | 1·285 | 1·359 | 1·498 | 1·565 | 1·630 | 1·756 | 1·876 | 1·934 | 2·101 | 2·166 |
| 1/ 200 | 15·330 | 32·886 | 44·917 | 59·345 | 76·332 | 96·032 | 144·16 | 172·88 | 204·88 | 279·24 | 368·26 | 418·58 | 594·13 | 675·17 |
| 0·00550 | 0·913 | 1·101 | 1·188 | 1·272 | 1·352 | 1·429 | 1·575 | 1·646 | 1·714 | 1·846 | 1·971 | 2·032 | 2·208 | 2·276 |
| 1/ 182 | 16·133 | 34·597 | 47·247 | 62·417 | 80·274 | 100·98 | 151·57 | 181·75 | 215·38 | 293·52 | 387·06 | 439·93 | 624·36 | 709·51 |
| 0·00600 | 0·956 | 1·153 | 1·244 | 1·331 | 1·415 | 1·496 | 1·649 | 1·722 | 1·794 | 1·931 | 2·063 | 2·127 | 2·310 | 2·381 |
| 1/ 167 | 16·902 | 36·234 | 49·477 | 65·355 | 84·046 | 105·72 | 158·66 | 190·24 | 225·43 | 307·18 | 405·04 | 460·35 | 653·28 | 742·33 |
| 0·00650 | 0·998 | 1·203 | 1·298 | 1·389 | 1·476 | 1·560 | 1·720 | 1·796 | 1·871 | 2·014 | 2·151 | 2·217 | 2·409 | 2·482 |
| 1/ 154 | 17·640 | 37·806 | 51·618 | 68·177 | 87·668 | 110·27 | 165·47 | 198·39 | 235·07 | 320·30 | 422·30 | 479·95 | 681·03 | 773·84 |
| 0·00700 | 1·038 | 1·252 | 1·350 | 1·444 | 1·535 | 1·622 | 1·788 | 1·867 | 1·945 | 2·093 | 2·235 | 2·304 | 2·503 | 2·580 |
| 1/ 143 | 18·351 | 39·320 | 53·680 | 70·895 | 91·156 | 114·65 | 172·02 | 206·24 | 244·35 | 332·92 | 438·92 | 498·81 | 707·74 | 804·18 |
| 0·00750 | 1·077 | 1·298 | 1·400 | 1·498 | 1·591 | 1·682 | 1·854 | 1·936 | 2·016 | 2·170 | 2·317 | 2·388 | 2·594 | 2·674 |
| 1/ 133 | 19·039 | 40·783 | 55·672 | 73·520 | 94·525 | 118·88 | 178·35 | 213·81 | 253·32 | 345·11 | 454·96 | 517·03 | 733·53 | 833·46 |
| 0·00800 | 1·115 | 1·343 | 1·449 | 1·550 | 1·646 | 1·740 | 1·917 | 2·002 | 2·085 | 2·244 | 2·396 | 2·470 | 2·683 | 2·765 |
| 1/ 125 | 19·704 | 42·199 | 57·601 | 76·061 | 97·785 | 122·97 | 184·47 | 221·14 | 262·00 | 356·91 | 470·49 | 534·66 | 758·49 | 861·79 |
| 0·00850 | 1·152 | 1·387 | 1·496 | 1·600 | 1·700 | 1·796 | 1·979 | 2·067 | 2·152 | 2·316 | 2·473 | 2·549 | 2·768 | 2·853 |
| 1/ 118 | 20·350 | 43·573 | 59·471 | 78·525 | 100·95 | 126·94 | 190·41 | 228·25 | 270·41 | 368·35 | 485·54 | 551·75 | 782·69 | 889·26 |
| 0·00900 | 1·187 | 1·429 | 1·541 | 1·648 | 1·751 | 1·850 | 2·039 | 2·129 | 2·217 | 2·386 | 2·547 | 2·625 | 2·851 | 2·938 |
| 1/ 111 | 20·977 | 44·908 | 61·288 | 80·920 | 104·02 | 130·80 | 196·18 | 235·16 | 278·59 | 379·46 | 500·16 | 568·35 | 806·19 | 915·95 |
| 0·00950 | 1·222 | 1·471 | 1·586 | 1·696 | 1·802 | 1·904 | 2·097 | 2·190 | 2·280 | 2·454 | 2·620 | 2·700 | 2·932 | 3·022 |
| 1/ 105 | 21·588 | 46·207 | 63·057 | 83·250 | 107·01 | 134·55 | 201·79 | 241·88 | 286·54 | 390·27 | 514·39 | 584·51 | 829·06 | 941·91 |
| 0·01000 | 1·255 | 1·511 | 1·629 | 1·742 | 1·851 | 1·955 | 2·154 | 2·249 | 2·342 | 2·520 | 2·690 | 2·773 | 3·011 | 3·103 |
| 1/ 100 | 22·183 | 47·473 | 64·781 | 85·521 | 109·92 | 138·21 | 207·26 | 248·43 | 294·29 | 400·81 | 528·25 | 600·25 | 851·34 | 967·20 |
| 0·01100 | 1·320 | 1·589 | 1·713 | 1·831 | 1·945 | 2·055 | 2·264 | 2·364 | 2·461 | 2·648 | 2·826 | 2·913 | 3·163 | 3·259 |
| 1/ 91 | 23·332 | 49·916 | 68·106 | 89·903 | 115·54 | 145·26 | 217·81 | 261·06 | 309·24 | 421·12 | 554·98 | 630·60 | 894·30 | 1016·0 |
| 0·01200 | 1·383 | 1·663 | 1·793 | 1·917 | 2·036 | 2·151 | 2·369 | 2·473 | 2·575 | 2·770 | 2·957 | 3·047 | 3·308 | 3·409 |
| 1/ 83 | 24·431 | 52·253 | 71·287 | 94·092 | 120·92 | 152·01 | 227·90 | 273·14 | 323·53 | 440·55 | 580·54 | 659·62 | 935·37 | 1062·6 |
| 0·01300 | 1·442 | 1·735 | 1·870 | 1·999 | 2·123 | 2·242 | 2·469 | 2·578 | 2·684 | 2·887 | 3·082 | 3·176 | 3·448 | 3·552 |
| 1/ 77 | 25·486 | 54·496 | 74·340 | 98·114 | 126·08 | 158·49 | 237·58 | 284·73 | 337·24 | 459·19 | 605·06 | 687·46 | 974·78 | 1107·3 |
| 0·01400 | 1·500 | 1·803 | 1·944 | 2·078 | 2·206 | 2·330 | 2·566 | 2·679 | 2·789 | 3·000 | 3·202 | 3·300 | 3·582 | 3·690 |
| 1/ 71 | 26·503 | 56·656 | 77·280 | 101·99 | 131·05 | 164·72 | 246·91 | 295·89 | 350·44 | 477·13 | 628·67 | 714·27 | 1012·7 | 1150·4 |
| 0·01500 | 1·555 | 1·870 | 2·015 | 2·154 | 2·287 | 2·415 | 2·660 | 2·777 | 2·890 | 3·109 | 3·318 | 3·419 | 3·711 | 3·824 |
| 1/ 67 | 27·484 | 58·742 | 80·119 | 105·73 | 135·84 | 170·74 | 255·90 | 306·66 | 363·19 | 494·45 | 651·46 | 740·14 | 1049·3 | 1192·0 |
| 0·01600 | 1·609 | 1·934 | 2·084 | 2·228 | 2·365 | 2·498 | 2·750 | 2·871 | 2·988 | 3·214 | 3·430 | 3·535 | 3·837 | 3·953 |
| 1/ 63 | 28·434 | 60·761 | 82·866 | 109·34 | 140·48 | 176·56 | 264·61 | 317·09 | 375·52 | 511·21 | 673·50 | 765·17 | 1084·7 | 1232·2 |
| 0·01700 | 1·661 | 1·996 | 2·151 | 2·299 | 2·441 | 2·578 | 2·838 | 2·962 | 3·083 | 3·316 | 3·539 | 3·647 | 3·958 | 4·078 |
| 1/ 59 | 29·356 | 62·719 | 85·530 | 112·85 | 144·98 | 182·21 | 273·05 | 327·19 | 387·48 | 527·46 | 694·88 | 789·43 | 1119·1 | 1271·2 |
| 0·01800 | 1·712 | 2·057 | 2·216 | 2·368 | 2·515 | 2·655 | 2·923 | 3·051 | 3·176 | 3·416 | 3·645 | 3·756 | 4·076 | 4·199 |
| 1/ 56 | 30·251 | 64·620 | 88·118 | 116·26 | 149·35 | 187·70 | 281·25 | 337·01 | 399·09 | 543·24 | 715·63 | 813·00 | 1152·4 | 1309·0 |
| 0·01900 | 1·761 | 2·116 | 2·280 | 2·436 | 2·586 | 2·731 | 3·006 | 3·138 | 3·266 | 3·512 | 3·748 | 3·862 | 4·191 | 4·317 |
| 1/ 53 | 31·122 | 66·471 | 90·636 | 119·58 | 153·61 | 193·03 | 289·23 | 346·56 | 410·39 | 558·59 | 735·83 | 835·93 | 1184·9 | 1345·9 |
| 0·02000 | 1·809 | 2·173 | 2·341 | 2·502 | 2·656 | 2·804 | 3·087 | 3·222 | 3·353 | 3·606 | 3·848 | 3·965 | 4·302 | 4·433 |
| 1/ 50 | 31·971 | 68·274 | 93·090 | 122·81 | 157·75 | 198·23 | 297·00 | 355·86 | 421·39 | 573·55 | 755·50 | 858·26 | 1216·5 | 1381·7 |
| | 110 | 140 | 160 | 180 | 190 | 210 | 250 | 260 | 280 | 320 | 350 | 370 | 420 | 440 |

$\theta_{medial}$ for part–full circular pipes.

$k_s$ = 0·060 mm  $S$ = 0·00400 to 0·02000

$k_s$ = 0·060 mm
$S$ = 0·02000 to 0·10000

ie hydraulic gradient =
1 in 50 to 1 in 10

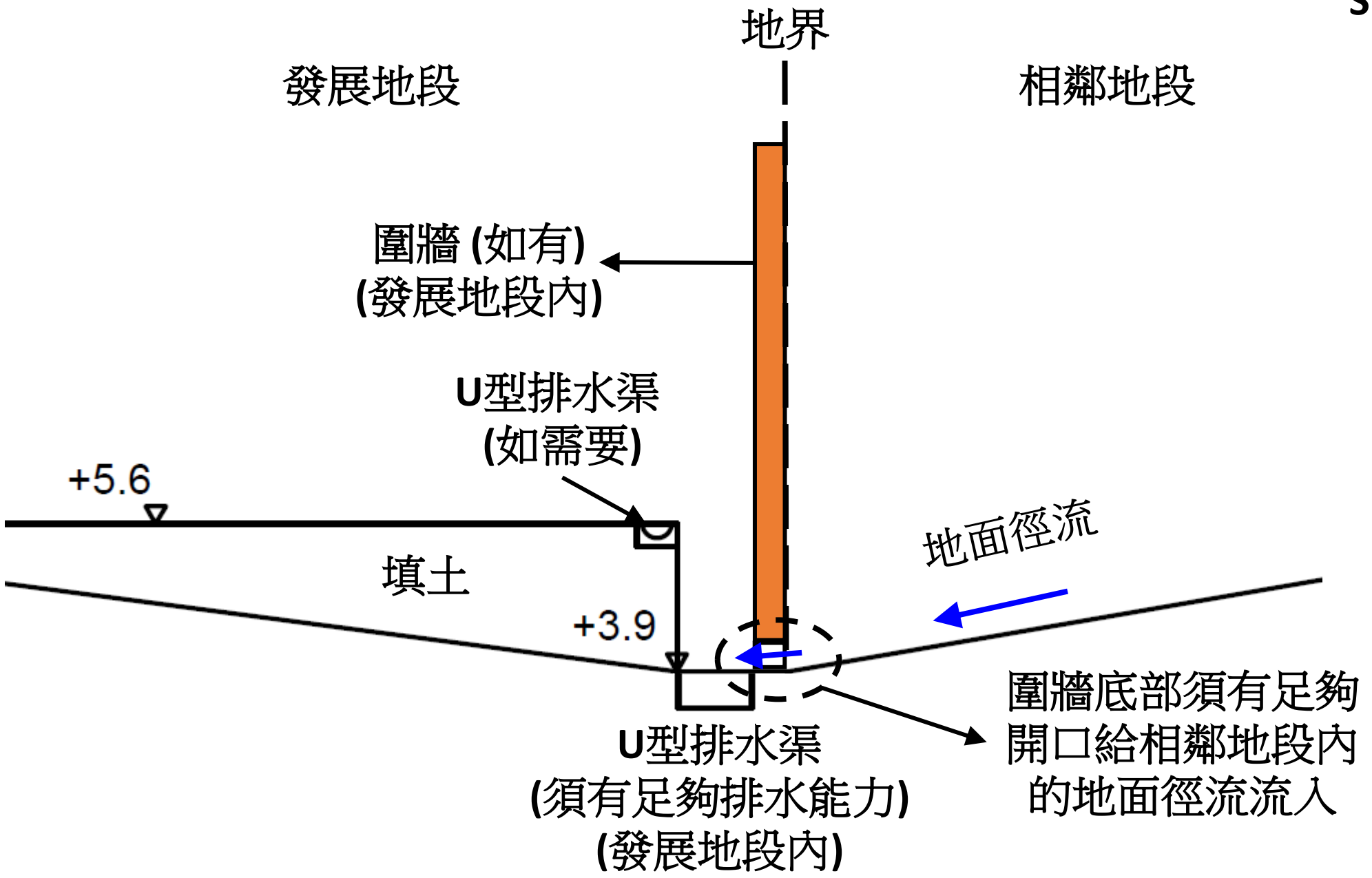
Water (or sewage) at 15°C;
full bore conditions.

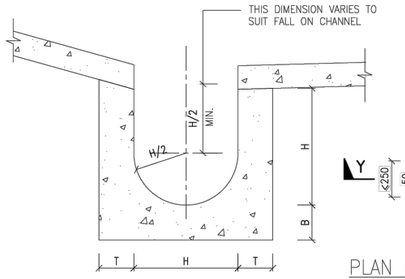
velocities in $ms^{-1}$
discharges in litres/sec

| Gradient | (Equivalent) Pipe diameters in mm | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 150 | 200 | 225 | 250 | 275 | 300 | 350 | 375 | 400 | 450 | 500 | 525 | 600 | 630 |
| 0·02000 | 1·809 | 2·173 | 2·341 | 2·502 | 2·656 | 2·804 | 3·087 | 3·222 | 3·353 | 3·606 | 3·848 | 3·965 | 4·302 | 4·433 |
| 1/ 50 | 31·971 | 68·274 | 93·090 | 122·81 | 157·75 | 198·23 | 297·00 | 355·86 | 421·39 | 573·55 | 755·50 | 858·26 | 1216·5 | 1381·7 |
| 0·02200 | 1·902 | 2·284 | 2·460 | 2·629 | 2·790 | 2·946 | 3·243 | 3·384 | 3·522 | 3·788 | 4·041 | 4·164 | 4·518 | 4·654 |
| 1/ 45·5 | 33·609 | 71·753 | 97·822 | 129·04 | 165·74 | 208·26 | 311·99 | 373·80 | 442·62 | 602·39 | 793·44 | 901·33 | 1277·4 | 1450·9 |
| 0·02400 | 1·991 | 2·390 | 2·574 | 2·750 | 2·919 | 3·082 | 3·392 | 3·540 | 3·684 | 3·961 | 4·226 | 4·354 | 4·724 | 4·867 |
| 1/ 41·7 | 35·176 | 75·078 | 102·35 | 135·00 | 173·38 | 217·85 | 326·32 | 390·95 | 462·91 | 629·95 | 829·70 | 942·50 | 1335·7 | 1517·0 |
| 0·02600 | 2·076 | 2·491 | 2·683 | 2·867 | 3·043 | 3·212 | 3·535 | 3·689 | 3·839 | 4·127 | 4·403 | 4·536 | 4·922 | 5·070 |
| 1/ 38·5 | 36·679 | 78·270 | 106·69 | 140·71 | 180·72 | 227·05 | 340·07 | 407·40 | 482·37 | 656·40 | 864·48 | 981·99 | 1391·5 | 1580·5 |
| 0·02800 | 2·158 | 2·589 | 2·788 | 2·979 | 3·161 | 3·337 | 3·672 | 3·832 | 3·988 | 4·287 | 4·573 | 4·712 | 5·112 | 5·266 |
| 1/ 35·7 | 38·127 | 81·343 | 110·87 | 146·22 | 187·77 | 235·90 | 353·30 | 423·24 | 501·11 | 681·86 | 897·97 | 1020·0 | 1445·3 | 1641·5 |
| 0·03000 | 2·237 | 2·684 | 2·890 | 3·087 | 3·276 | 3·458 | 3·805 | 3·970 | 4·132 | 4·442 | 4·738 | 4·881 | 5·295 | 5·455 |
| 1/ 33·3 | 39·524 | 84·309 | 114·90 | 151·53 | 194·58 | 244·45 | 366·07 | 438·53 | 519·19 | 706·43 | 930·28 | 1056·7 | 1497·2 | 1700·4 |
| 0·03200 | 2·313 | 2·775 | 2·988 | 3·192 | 3·387 | 3·575 | 3·933 | 4·104 | 4·271 | 4·591 | 4·897 | 5·045 | 5·473 | 5·638 |
| 1/ 31·3 | 40·877 | 87·179 | 118·81 | 156·67 | 201·18 | 252·72 | 378·43 | 453·32 | 536·68 | 730·19 | 961·54 | 1092·2 | 1547·4 | 1757·4 |
| 0·03400 | 2·387 | 2·864 | 3·083 | 3·293 | 3·495 | 3·689 | 4·058 | 4·234 | 4·406 | 4·736 | 5·051 | 5·204 | 5·645 | 5·815 |
| 1/ 29·4 | 42·188 | 89·962 | 122·59 | 161·65 | 207·56 | 260·74 | 390·41 | 467·65 | 553·64 | 753·23 | 991·84 | 1126·6 | 1596·1 | 1812·6 |
| 0·03600 | 2·459 | 2·950 | 3·176 | 3·392 | 3·599 | 3·799 | 4·179 | 4·360 | 4·537 | 4·877 | 5·201 | 5·358 | 5·812 | 5·987 |
| 1/ 27·8 | 43·462 | 92·665 | 126·27 | 166·49 | 213·77 | 268·52 | 402·04 | 481·57 | 570·11 | 775·61 | 1021·3 | 1160·0 | 1643·4 | 1866·3 |
| 0·03800 | 2·530 | 3·033 | 3·266 | 3·488 | 3·701 | 3·906 | 4·296 | 4·483 | 4·664 | 5·014 | 5·347 | 5·509 | 5·975 | 6·154 |
| 1/ 26·3 | 44·701 | 95·294 | 129·85 | 171·20 | 219·81 | 276·10 | 413·36 | 495·12 | 586·13 | 797·37 | 1049·9 | 1192·5 | 1689·3 | 1918·5 |
| 0·04000 | 2·598 | 3·115 | 3·353 | 3·581 | 3·800 | 4·010 | 4·411 | 4·602 | 4·788 | 5·147 | 5·489 | 5·655 | 6·133 | 6·317 |
| 1/ 25·0 | 45·909 | 97·856 | 133·33 | 175·79 | 225·69 | 283·48 | 424·38 | 508·31 | 601·74 | 818·58 | 1077·8 | 1224·1 | 1734·1 | 1969·3 |
| 0·04200 | 2·665 | 3·194 | 3·439 | 3·672 | 3·896 | 4·112 | 4·523 | 4·719 | 4·910 | 5·277 | 5·628 | 5·797 | 6·288 | 6·477 |
| 1/ 23·8 | 47·087 | 100·36 | 136·73 | 180·26 | 231·43 | 290·67 | 435·14 | 521·18 | 616·96 | 839·26 | 1105·0 | 1255·0 | 1777·8 | 2018·9 |
| 0·04400 | 2·730 | 3·272 | 3·522 | 3·761 | 3·991 | 4·212 | 4·632 | 4·833 | 5·028 | 5·404 | 5·763 | 5·937 | 6·439 | 6·632 |
| 1/ 22·7 | 48·238 | 102·80 | 140·05 | 184·63 | 237·03 | 297·70 | 445·64 | 533·75 | 631·83 | 859·46 | 1131·5 | 1285·1 | 1820·4 | 2067·3 |
| 0·04600 | 2·793 | 3·348 | 3·604 | 3·848 | 4·083 | 4·309 | 4·739 | 4·944 | 5·144 | 5·528 | 5·895 | 6·073 | 6·586 | 6·784 |
| 1/ 21·7 | 49·363 | 105·18 | 143·29 | 188·91 | 242·51 | 304·58 | 455·91 | 546·04 | 646·37 | 879·20 | 1157·5 | 1314·6 | 1862·1 | 2114·6 |
| 0·04800 | 2·856 | 3·422 | 3·684 | 3·934 | 4·173 | 4·404 | 4·843 | 5·053 | 5·257 | 5·650 | 6·025 | 6·206 | 6·730 | 6·932 |
| 1/ 20·8 | 50·464 | 107·52 | 146·47 | 193·09 | 247·87 | 311·30 | 465·96 | 558·06 | 660·59 | 898·52 | 1182·9 | 1343·5 | 1903·0 | 2161·0 |
| 0·05000 | 2·917 | 3·495 | 3·762 | 4·017 | 4·262 | 4·497 | 4·945 | 5·159 | 5·368 | 5·769 | 6·151 | 6·337 | 6·872 | 7·078 |
| 1/ 20·0 | 51·543 | 109·81 | 149·58 | 197·18 | 253·12 | 317·89 | 475·80 | 569·84 | 674·52 | 917·45 | 1207·8 | 1371·7 | 1942·9 | 2206·3 |
| 0·05500 | 3·064 | 3·671 | 3·951 | 4·219 | 4·475 | 4·722 | 5·193 | 5·417 | 5·636 | 6·056 | 6·458 | 6·652 | 7·213 | 7·429 |
| 1/ 18·2 | 54·150 | 115·34 | 157·10 | 207·08 | 265·81 | 333·81 | 499·58 | 598·30 | 708·18 | 963·18 | 1267·9 | 1440·0 | 2039·5 | 2315·9 |
| 0·06000 | 3·205 | 3·839 | 4·132 | 4·411 | 4·679 | 4·938 | 5·429 | 5·663 | 5·892 | 6·331 | 6·750 | 6·953 | 7·540 | 7·765 |
| 1/ 16·7 | 56·643 | 120·62 | 164·29 | 216·54 | 277·94 | 349·02 | 522·31 | 625·50 | 740·35 | 1006·9 | 1325·4 | 1505·2 | 2131·8 | 2420·7 |
| 0·06500 | 3·341 | 4·001 | 4·305 | 4·596 | 4·875 | 5·144 | 5·655 | 5·900 | 6·137 | 6·594 | 7·031 | 7·242 | 7·853 | 8·088 |
| 1/ 15·4 | 59·034 | 125·69 | 171·18 | 225·62 | 289·57 | 363·62 | 544·11 | 651·59 | 771·21 | 1048·8 | 1380·5 | 1567·8 | 2220·3 | 2521·1 |
| 0·07000 | 3·471 | 4·156 | 4·472 | 4·774 | 5·064 | 5·343 | 5·873 | 6·127 | 6·373 | 6·848 | 7·301 | 7·521 | 8·154 | 8·398 |
| 1/ 14·3 | 61·336 | 130·57 | 177·82 | 234·35 | 300·77 | 377·66 | 565·09 | 676·70 | 800·91 | 1089·1 | 1433·6 | 1628·0 | 2305·5 | 2617·8 |
| 0·07500 | 3·597 | 4·306 | 4·633 | 4·946 | 5·246 | 5·535 | 6·084 | 6·346 | 6·602 | 7·093 | 7·562 | 7·789 | 8·445 | 8·697 |
| 1/ 13·3 | 63·558 | 135·28 | 184·23 | 242·78 | 311·58 | 391·22 | 585·34 | 700·93 | 829·57 | 1128·1 | 1484·8 | 1686·1 | 2387·7 | 2711·1 |
| 0·08000 | 3·718 | 4·451 | 4·789 | 5·112 | 5·422 | 5·720 | 6·288 | 6·559 | 6·822 | 7·330 | 7·814 | 8·049 | 8·726 | 8·987 |
| 1/ 12·5 | 65·707 | 139·84 | 190·42 | 250·93 | 322·03 | 404·33 | 604·93 | 724·37 | 857·30 | 1165·7 | 1534·3 | 1742·3 | 2467·2 | 2801·4 |
| 0·08500 | 3·836 | 4·592 | 4·940 | 5·273 | 5·592 | 5·900 | 6·485 | 6·764 | 7·036 | 7·559 | 8·058 | 8·300 | 8·998 | 9·267 |
| 1/ 11·8 | 67·791 | 144·26 | 196·43 | 258·84 | 332·16 | 417·04 | 623·92 | 747·09 | 884·17 | 1202·2 | 1582·3 | 1796·8 | 2544·2 | 2888·8 |
| 0·09000 | 3·951 | 4·728 | 5·087 | 5·429 | 5·758 | 6·075 | 6·676 | 6·964 | 7·244 | 7·782 | 8·296 | 8·545 | 9·263 | 9·540 |
| 1/ 11·1 | 69·815 | 148·55 | 202·26 | 266·51 | 342·00 | 429·38 | 642·35 | 769·15 | 910·26 | 1237·7 | 1628·9 | 1849·7 | 2619·1 | 2973·8 |
| 0·09500 | 4·062 | 4·861 | 5·230 | 5·582 | 5·919 | 6·244 | 6·863 | 7·158 | 7·446 | 7·999 | 8·527 | 8·782 | 9·521 | 9·805 |
| 1/ 10·5 | 71·784 | 152·72 | 207·93 | 273·98 | 351·57 | 441·39 | 660·29 | 790·61 | 935·64 | 1272·1 | 1674·2 | 1901·2 | 2691·9 | 3056·4 |
| 0·10000 | 4·171 | 4·991 | 5·369 | 5·730 | 6·076 | 6·410 | 7·044 | 7·348 | 7·642 | 8·210 | 8·752 | 9·014 | 9·771 | 10·06 |
| 1/ 10·0 | 73·701 | 156·78 | 213·46 | 281·26 | 360·90 | 453·09 | 677·76 | 811·51 | 960·37 | 1305·7 | 1718·4 | 1951·3 | 2762·8 | 3136·9 |
| | 180 | 240 | 270 | 300 | 320 | 350 | 410 | 440 | 470 | 550 | 600 | 600 | 700 | 750 |

$\theta_{medial}$ for part–full circular pipes.

Sketch A


地界
發展地段
相鄰地段
圍牆 (如有)
(發展地段內)
U型排水渠
(如需要)
+5.6
填土
+3.9
地面徑流
圍牆底部須有足夠
開口給相鄰地段內
的地面徑流流入
U型排水渠
(須有足夠排水能力)
(發展地段內)

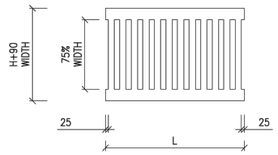


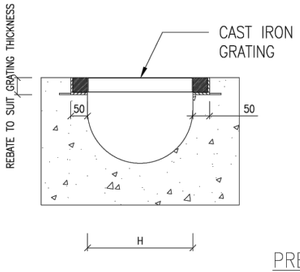

DETAILS OF U-CHANNEL

(REFERENCE : FIG. 8.11 OF GEOTECHNICAL MANUAL FOR SLOPES)
N.T.S.

PLAN OF PRECAST CONCRETE COVERS

(REFERENCE : CEDD DWG. NO. C2407B)
N.T.S.



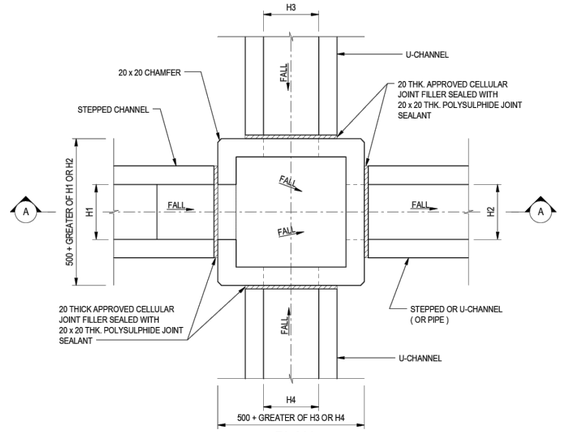

L = 600mm FOR H < 375mm
L = 400mm FOR H > 375mm

CAST IRON GRATING FOR U-CHANNELS

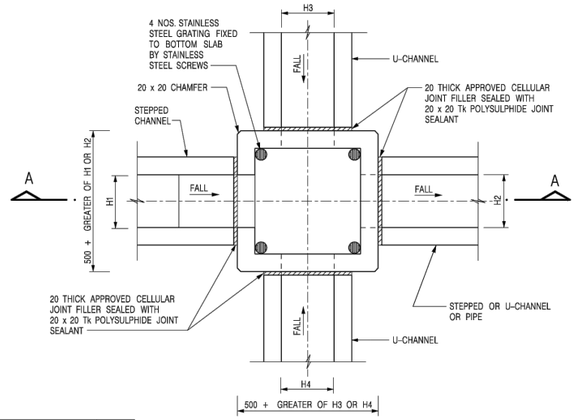
(REFERENCE : CEDD DWG. NO. C2412D)
N.T.S.

SECTION Y-Y
PRECAST CONCRETE COVERS FOR SAND TRAP AND CATCHPIT

(REFERENCE : CEDD DWG. NO. C2407B)
N.T.S.

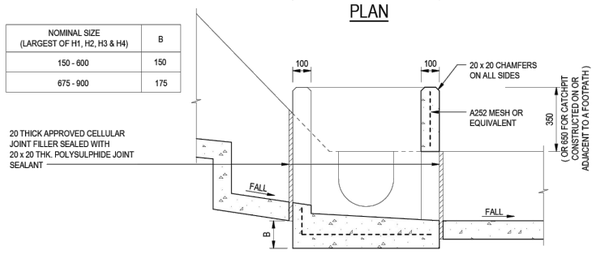



PLAN



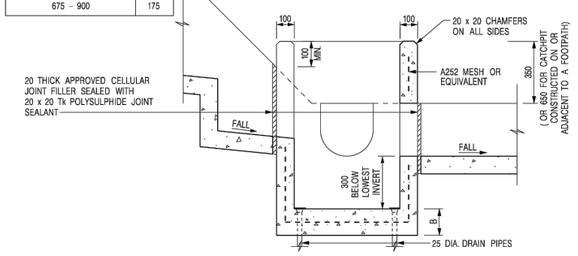

PLAN

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




SECTION A - A

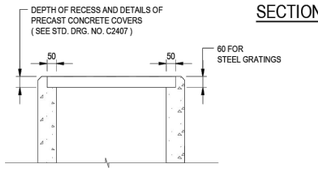
| NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4) | B |
|---|---|
| 300 - 600 | 150 |
| 675 - 900 | 175 |




SECTION A - A

NOTES:

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

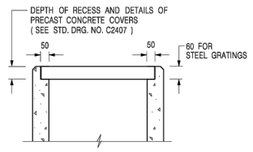



ALTERNATIVE TOP SECTION FOR
PRECAST CONCRETE COVERS / GRATINGS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 5 FOR OTHER NOTES.

STANDARD CATCHPIT DETAILS

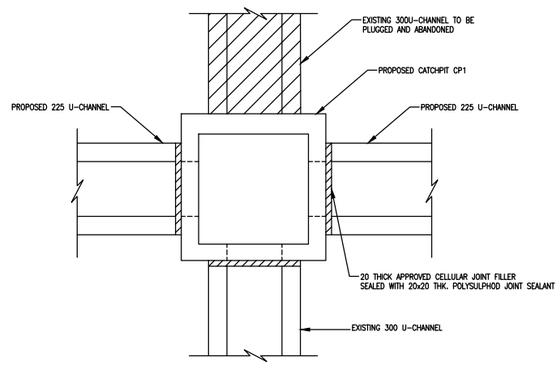



ALTERNATIVE TOP SECTION
FOR PRECAST CONCRETE COVERS / GRATINGS

CATCHPIT WITH TRAP

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE SHALL BE GRADE 20 /20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2 OR F2 AS APPROPRIATE.
4. FOR DETAILS OF JOINT, REFER TO STD. DRG. NO. C2413.
5. CONCRETE TO BE COLOURED AS SPECIFIED.
6. UNLESS REQUESTED BY THE MAINTENANCE PARTY AND AS DIRECTED BY THE ENGINEER, CATCHPIT WITH TRAP IS NORMALLY NOT PREFERRED DUE TO PONDING PROBLEM.
7. UPON THE REQUEST FROM MAINTENANCE PARTY, DRAIN PIPES AT CATCHPIT BASE CAN BE USED BUT THIS IS FOR CATCHPITS LOCATED AT SLOPE TOE ONLY AND AS DIRECTED BY THE ENGINEER.
8. FOR CATCHPITS CONSTRUCTED ON OR ADJACENT TO A FOOTPATH, STEEL GRATINGS ( SEE DETAIL 'A' ON STD. DRG. NO. C2405 /2 ) OR CONCRETE COVERS ( SEE STD. DRG. NO. C2407 ) SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER.
9. IF INSTRUCTED BY THE ENGINEER, HANDRAILING ( SEE DETAIL 'J' ON STD. DRG. NO. C2405 /5; EXCEPT ON THE UPSLOPE SIDE ) IN LIEU OF STEEL GRATINGS OR CONCRETE COVERS CAN BE ACCEPTED AS AN ALTERNATIVE SAFETY MEASURE FOR CATCHPITS NOT ON A FOOTPATH NOR ADJACENT TO IT. TOP OF THE HANDRAILING SHALL BE 1 000 mm MIN. MEASURED FROM THE ADJACENT GROUND LEVEL.
10. MINIMUM INTERNAL CATCHPIT WIDTH SHALL BE 1 000 mm FOR CATCHPITS WITH A HEIGHT EXCEEDING 1 000 mm MEASURED FROM THE INVERT LEVEL TO THE ADJACENT GROUND LEVEL. AND, STEP IRONS ( SEE DSD STD. DRG. NO. DS1043 ) AT 300 c/c STAGGERED SHALL BE PROVIDED. THICKNESS OF CATCHPIT WALL FOR INSTALLATION OF STEP IRONS SHALL BE INCREASED TO 150 mm.
11. FOR RETROFITTING AN EXISTING CATCHPIT WITH STEEL GRATING, SEE DETAIL 'G' ON STD. DRG. NO. C2405 /4.
12. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.




CONNECTION DETAIL FOR EXISTING DRAINAGE
AND PROPOSED DRAINAGE

FIGURE 8