寄件者: [redacted]
寄件日期: 2025年08月14日星期四 14:07
收件者: tpbpd/PLAND
副本: [redacted]
主旨: Re: S. 16 Planning Application No. A/YL-KTN/1113 - Departmental Comments
附件: AYL-KTN 1113 20250814.pdf

類別: Internet Email

To whom may concern,

Please see the attachment for the further information for TD, LandsD and updated drainage proposal. Please contact Mr. Tang on phone [redacted] or email to [redacted] if you have any question regarding to the proposal.

Your Faithfully,
Mr. Tang

城市規劃委員會:

A/YL-KTN/1113 申請詳細

申請地點設有一個草地狗隻活動區及一個混凝土平整的戶外活動區。草地及混凝土活動區會同時用途狗隻戶外用途，在營運時會用作分隔狗隻用途。此外，申請範圍內會定期進行狗隻領養活動，並會在混凝土平整的戶外活動區上進行，此能防止水土流失及參與者帶走泥土。

保護河道方面，本申請會以保護河道為重點，務求不會影響附近的河道，並不會在東面的河岸頂部至少 3 米內進行任何工程 (包括所有構築物，渠道工程及平整工程)。此外， 本人亦計劃在填土的範圍邊加金屬實心圍邊， 將河道與申請範圍隔開， 以免佔用政府土地及影響河道， 並防止發生水土流失的情況及避免污染附近的自然溪流及影響下游生態。

寄養所運作方面，本申請只會接待狗隻。本申請在營業時間外(即從下午六時至上午八時)會有動物在寄養所內過夜，全日不超過 70 隻寵物。在非營業時間，動物不會到戶外，只留在寄養所內，以免影響周遭。

在非營業時間，動物不會到戶外，所有動物會留在寄養所內。申請範圍內的寄養所計劃安裝 24 小時通風系統及冷風機，例如抽氣扇等，提供良好的寄養空間。並使用隔音及隔熱的鋁板作為的牆身及頂部，鋁板與鋁板之間有聚氨酯，並以組合屋或以預製件組裝合成的方式興建，下圖為物料參考圖:

由於寄養所已用上能夠隔音及隔熱的鋁板，現場會沿用舊有金屬實心物料「鋅鐵皮」，現已將申請地點圍起，進一步降低外來刺激刺激動物，以減少影響環境及附近居民。

本申請禁止使用哨子及任何擴音設備進行廣播，以免為附近環境產生不良影響。

在保護環境方面，首先，當申請獲批後會建設渠道，渠道建議會向渠務署提交。在渠道建議當中會包含建設沙井及其設計，在地面水排出申請地點外之前能以沙井將垃圾過濾，令垃圾及其他廢棄物留在申請地點內，並會定期清理及檢查有關渠道及沙井有否被廢棄物堵塞渠道，確保渠道暢通。雨水渠只會負責收集及引導雨水, 不會連接化糞池及滲水井。

現計劃在申請地點建造二個符合環境保護署所定下的 ProPECC PN 5/93 - Drainage Plans subject to Comment by the Environmental Protection Department 指引的化糞池來收集寄養所內的污水。化糞池及滲水井的距離會遠離河道超過 15 米，由於申請地點附近溪流或河道不是用作飲用用途，此距離亦符合環境保護署所定下的 ProPECC PN 5/93 指引。此外，在興建化糞池前亦會安排認可人士參與、設計及測試化糞池及滲水井的工程，亦會跟隨　貴署所定立的 Professional Persons Environmental Consultative Committee Practice Notes 1/23 - Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations。有關化糞池及滲水井亦不會連接雨水渠，務求對附近的污染降至零污染，確保附近的水源及土地不會被此申請用途污染。

除了以上的措施保護水源外，申請地點內亦不會在戶外使用任何有化學清潔用品。不會影響附近及下遊的生態。定會盡力保護環境。

確定申請地點現時及將來沒有計畫提供符合環境影響評估條例的牲口檢疫站、牲口待宰站或檢疫關禁處等設施。

在營業時間時段內，現計劃安排約 5-6 個員工。動物會到戶外空間，在戶外的動物數量會因應員工人數調整，但同一時間不會超過 20 隻動物到戶

外。到戶外時會使用輔助工具減少來自動物的嘈音，例如狗口罩等。在非營業時間，寵物不會到戶外，只留在寄養所內。

本申請亦會跟隨　　貴署的 Code of Practice on Handling the Environmental Aspects of Temporary Uses and Open Storage Sites，盡量減少對環境的污染。

車輛及道路方面，預計本申請地點的車流為以下:

時段	私家車		輕型貨車		中型貨車		重型貨車		進出總和
	進	出	進	出	進	出	進	出	
早上時段 (7:00-11:59)	**3**	0	**3**	0	0	0	0	0	**6**
下午時段 (12:00-23:59)	0	**3**	0	**3**	0	0	0	0	**6**
凌晨時段 (0:00-06:59)	0	0	0	0	0	0	0	0	0
全日 24 小時	**3**	**3**	**3**	**3**	0	0	0	0	**12**

由於方便上落動物及動物糧食等物品和方便外來使用人士駕車到本申請地點，現申請 **3** 個客貨車上落貨位置及 **3** 個私家車車位。進出本寄養所的人士需透過電話通知寄養所的員工，不接受無提前預約的人士進入（即未有透過電話通知員工的客人），可以控制進入申請範圍人次。因此，**3** 個客貨車上落貨位置及 **3** 個私家車車位已足夠此申請運作。

申請地點有道路連接，前往本申請地點途經尾逢路，再轉到郊區小徑。尾逢路沿途道路約有 3 米闊，沿途設有避車處，客貨車及私家車有足夠的位置通過。申請地點的出入口約 6 米闊。沿途道路相片請參考文件末端，而相片的觀看點請參考 Appendix 3。

在申請地點內有一個直徑超過 14 米的圓形空間，足夠讓車輛進行調遣的動作，不需在公用道路上讓車輛等候進入本申請地點, 停泊在公用道路及以倒後形式進出本申請地點。參考文件末端的 Appendix 2。

地政總署及城市規劃委員會:

有關地政總署對 A/YL-KTN/1113 的疑問

本公司了解及會遵守現有短期豁免書的政策及條款，申請地點的建築物不會用作居住用途。

擬用作 Staff Lounges 的建築物，建築物只會用作提供室內空間予員工進行日常活動，例如進食午餐等及只提供員工在當值時間使用，不會用作居住用途。

本公司亦了解所有有關居住用途的短期豁免書申請， 貴署不會作任何考慮並拒絕相關申請。

如 貴署仍有懷疑相關情況發生，本公司亦會盡力了解事情及進行矯正，以達致 貴署的要求。

希望此附加文件能釋除 貴署的隱憂，並支持本申請。

UMWELT CONSULTING LIMITED
23/F, On Hong Commercial Building, 145 Hennessy Road, Wan Chai, Hong Kong

Application No. A/YL-KTN/1113
Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories

Drainage Proposal
Revision 1
13 August 2025

Content:

Figures:

Appendices:

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1. Introduction

1.1 Project Title

1.1.1 Application for Permission Under Section 16 of the Town Planning Ordinance Application No. A/YL-KTN/1113.

1.2 Project Background

1.2.1 A Planning Application No. A/YL-KTN/1113 was submitted to the Town Planning Board on 15 July 2024 to seek planning permission for a temporary animal boarding establishment with ancillary facilities for a period of 3 years and filling of land at the application site (the Project Site) in Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories.

Statutory Land Use Zoning of the Project Site

1.2.2 The Project Site falls within the 'Agricultural' ("AGR") zone according to the Approved Kam Tin North Outline Zoning Plan No. S/YL-KTN/11 ("the OZP"). According to the Notes of the OZP, 'Animal Boarding Establishment' belongs to Column 2, that the uses may be permitted with or without conditions on application to the Town Planning Board ("TPB"). A Planning Application is therefore submitted for the proposed development at the Project Site.

Location of the Project Site

1.2.3 The location of the Project Site is given in **Figure 1.1**. A panoramic view of the Project Site is given in **Figure 1.2**.

1.2.4 The Project Site has an area of about 5,070m^2 and the proposed development mainly comprises 18 non-domestic buildings with building heights not more than 6m and not with not more than 2 storeys. The buildings are mainly used for shelters for animals.

1.3 Summary of the Project

1.3.1 An outline on the Project is given in **Table 1.1**.

Table 1.1: Outline on the Project

Project title	Application for Permission Under Section 16 of the Town Planning Ordinance
Proponent	
Contact Person (name/telephone)	Mr. TANG Lok San / 6848 3319
Nature and description of the project	Temporary Animal Boarding Establishment with Ancillary Facilities for a Period of 3 Years and Filling of Land
Location (include plans)	Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories
Area of project site and % paved/unpaved (existing and proposed)	About 5,070m^2, partially paved
Level to be filled up	About 0.3m
Whether planning permission application is required	Yes
Whether lease modification application is required	Not Applicable
Statutory land use zoning	Agriculture
Recent and dated photographs to shown a panoramic view of the site	Please refer to **Figure 1.2**.

1.4 Purpose of this Proposal

1.4.1 A Drainage Proposal has been submitted to the TPB on 4 November 2024. Pursuant to the comment received from Drainage Services Department ("DSD"), this drainage proposal is prepared in response to the comments and to supplement the application and the captioned condition to demonstrate no adverse drainage impact will be caused to the adjacent area.

1.5 Relevant Guidelines and Classification of the Project Site

Relevant Guidelines for this Drainage Proposal

1.5.1 This Drainage Proposal has been carried out in accordance with the guidelines given as follows:

a) Technical Note to Prepare a Drainage Submission ("the TN");
b) Stormwater Drainage Manual Planning, Design and Management (Fifth Edition, January 2018) ("the Manual");
c) Drainage Services Department Stormwater Drainage Manual Corrigendum No. 1/2022 and 1/2024;
d) Advice Note No.1 - Application of the Drainage Impact Assessment Process to Private Sector Projects issued by Drainage Services Department, September 2010. Hong Kong Planning Standards and Guidelines, August 2011; and
e) Relevant standard drawings provided by Civil Engineering and Development Department.

Classification of the Project Site

1.5.2 As the Project Site is approximately 5,070m^2, which is smaller than 1 ha, in accordance with the TN, the Project Site is classified as a Simple Site. A Drainage Proposal will be prepared in accordance with the standards set out in the Manual. This Drainage Proposal therefore presented the drainage arrangement within the Project Site only.

2. Existing Environment of the Project Site

2.1 Overview of Local Terrain and Surrounding Environment

Local Terrain within Proximity of the Project Site

2.1.1 The Project Site is located within Fung Kat Heung. To the south of the Project Site located a number of farmlands. The local uncharted drainage system within the farmlands serve as the main discharge channels for the surrounding area.

2.1.2 The area to the north, east and west of the Project Site are generally used as open storage. Within the area to the east, construction works is currently in progress and to the south are farmlands and residential areas.

2.1.3 The local terrain is higher at the north and lower at the south. Stormwater falls at the north of the Project Site will flow towards the site, which will be collected by the U-channel within the Project Site and ultimately discharged southwards, either through the stream located at the central of the Project Site or other minor channels located within the farmlands. The natural stream that runs through the Project Site serves as the main discharge channel for the area and will direct the collected stormwater southwards into local drainage networks, and discharge into the channel feature SUP1019960, and ultimately into the feature SCP1009640.

Terrain of the Project Site

2.1.4 The Project Site is an area of about 5,070m^2. Majority of the Project Site is paved with concrete, and a section of the site is covered with vegetation which is permeable. Multiple temporary structures were erected within the Project Site. Some trees are growing along the eastern, northwestern, and southwestern side of the site. The surrounding areas are predominant by open space storage to the north, northwest, and east, and farmlands and residential units to the south and to the west. At northern side of the Project Site is an open space storage currently used as storage space for construction vehicle.

2.1.5 The Project Site is generally flat, but slightly higher at the northern side and gradually fall towards the southern end, following the local terrain.

2.1.6 **Figure 2.1** shows the indicative topography of the Project Site. **Figure 2.2** shows the existing drainage identified within the Project Site. **Figure 2.3** shows the full alignment of the discharge path from the application site all the way down to the ultimate discharge point.

2.1.7 A cross-section for the Project Site is given in **Figure 2.4**.

2.2 Existing Drainage Channel

Recorded Public Drainage Channel

2.2.1 No public drainage channel was identified within proximity of the Project Site. The nearest discharge channel, a 600mm wide U-Channel SUP1019960, is located at about 60m from the Project Site to the southwest. A 6500mm wide trapezoidal channel SCP1009640, is further south at about 85m from the Project Site to the southwest. This trapezoidal channel is the main discharge channel for the area. **Figure 2.2** shows the identified channels within the proximity of the Project Site. The full alignment of the

discharge path from the application site all the way down to the ultimate discharge point is given in **Figure 2.3**.

2.2.2 The area is currently not a flooding prone area. Demonstrated the trapezoidal channel SCP1009640 would have enough discharge capacity to handle the rainwater for the area.

Site Visit and Observation

2.2.3 A site visit was conducted on 10 December 2024 to obtain the current condition of the surrounding area and existing drainage system within the Project Site. Photos taken during the site visit showing the features identified in the following sections are given in **Figure 2.5** to **Figure 2.9**.

Current Condition of the Project Site

2.2.4 A hoarding made with sheet metal have been erected surrounding the Project Site. Part of the hoardings have no concrete footing, hence the hoarding of the Project Site does not totally seal the project boundary and stormwater would be able to flow into and out of the Project Site during rainstorm at some of the area. (Photo 1 and 2 in **Figure 2.5**) In addition, some of the hoardings have concrete sealed the lower section of the hoardings, preventing stormwater from flowing towards west, out of the Project Site. (Photo 3 in **Figure 2.5**) The stormwater would be directed by the hoarding and flows towards the east, where existing drainage channels within the Project Site will direct the stormwater towards the centre of the site and enters the natural stream and be discharged. The aerial photos showing the existing stream is given in **Figure 2.6**.

2.2.5 A natural stream was found running through the centre of the Project Site. The stream is trapezoidal in shape with dimension of about 2m wide and 1.5m deep. The stream flows under the access road running through the centre of the Project Site and exit the Project Site. (Photo 1 and 2 in **Figure 2.7**)

2.2.6 Within the Project Site, it is observed that simple network of U-channel is in place to direct stormwater through the site. (Photo 3 in **Figure 2.7**, and Photo 1, 2, and 3 in **Figure 2.8**) The location of the identified U-channel and respective size are given in **Figure 2.2**.

Current Condition of the Surrounding Area

2.2.7 At the immediate north of the Project Site is a number of residential units. These premises will have its own drainage system and discharge the stormwater into the channel that connects to the stream and enters the Project Site. Further north is an open space which is currently used for storage of construction vehicles. The area is paved with concrete.

2.2.8 Concrete walls were erected by other landowners at their premises. Rainfalls within other premise are anticipated to be intercepted by the local drainage networks and overflow into other premise is not anticipated. (Photo 1 to 2 in **Figure 2.9**) A tree protection zone is also allocated at the northwest corner of the Project Site. (Photo 3 in **Figure 2.9**)

2.2.9 At the east of the Project Site is an open space storage area where vehicle parking is also observed. A U-channel was identified at east of the Project Site directing stormwater towards east and be discharged.

2.2.10 At the south and west of the Project Site are farmlands. U-channels network was identified. These networks would direct the collected stormwater southwards. Exact drainage path cannot be identified as the U-channels enters private lands which are not accessible, but the stormwater should ultimately enter existing discharge channels SCP1009640 or other discharge channels.

2.2.11 The locations are shown in the photomap given in **Figure 2.10**.

3. Drainage Flow Evaluation

3.1 Relevant Guidelines and Classification of the Project Site

3.1.1 This Drainage Proposal has been carried out in accordance with the guidelines given as follows:

a) Technical Note to Prepare a Drainage Submission ("the TN");
b) Stormwater Drainage Manual Planning, Design and Management (Fifth Edition, January 2018) ("the Manual");
c) Drainage Services Department Stormwater Drainage Manual Corrigendum No. 1/2022 and 1/2024;
d) Advice Note No.1 - Application of the Drainage Impact Assessment Process to Private Sector Projects issued by Drainage Services Department, September 2010. Hong Kong Planning Standards and Guidelines, August 2011; and
e) Relevant standard drawings provided by Civil Engineering and Development Department.

3.2 Existing Stormwater Flow Path

3.2.1 The local stormwater falling at the north of the Project Site and within the Project Site will be directed into the stream and flows along the stream southwards and exit the Project Site. The stormwater then enters the network of local drainage channel network. U-channel directs the stormwater southwards and exits the Project Site at the southern end, enters the U-channel SUP1001962 and ultimately enters Ng Tung River.

Catchment Area Near the Project Site and Respective Stormwater Flow Pattern

3.2.2 The adjacent area is higher at the northern side of the Project Site and lower at the southern side and at the centre of the Project Site. This allows stormwater falls within the proximity of the Project Site enters the natural stream within the Project Site and being directed southwards the discharge channel SUP1001962 and ultimately enters Ng Tung River.

3.2.3 Stormwater falls outside the Project Site will be directed by the local drainage network which are not charted, and ultimately enters the discharge channel SUP1001962 and ultimately enters Ng Tung River.

3.2.4 There are a number of catchment areas identified and are shown in **Figure 3.1**. The unpaved area indicated in the figure can reference to **Figure 2.6**. They are discussed as follows:

Catchment A

3.2.5 Locates at the northwestern side of the Project Site, the Catchment A is a private area with a number of structures located at the north of the Project Site.

3.2.6 The area was not accessible, but during the site visit a discharge point was identified leading out of the area, and discharge into the natural stream. As Catchment A is bounded by an impermeable perimeter fence, all stormwater falls within the catchment would be discharged through the drain into the natural stream, and be discharged accordingly.

Catchment B

3.2.7 Locates at the northeastern side of the Project Site, the Catchment B refers to the area located at the north of the Project Site currently occupied by structures with some open space.

3.2.8 Similar to Catchment A, a discharge point was identified leading out of the area, which was accessible during the site visit, and discharge into the natural stream, where the stormwater will be discharged accordingly.

Catchment C

3.2.9 Catchment C is the Project Site area at the western side of the natural stream. A section of the area, about 970.3m^2, is unpaved and used for cattle keeping and tree protection zone respectively. The remaining area is paved with structures established.

3.2.10 Stormwater falls within this catchment will flows eastwards towards the centre of the Project Site, and then enters the natural stream, where the stormwater will be discharged accordingly.

Catchment D

3.2.11 Catchment D is the Project Site area at the eastern side of the natural stream. A section of the area is unpaved and covered by vegetation. The remaining area is paved with structures established.

3.2.12 Stormwater falls within this catchment will flows westwards towards the centre of the Project Site, and then enters the natural stream, where the stormwater will be discharged accordingly.

Capacity of Existing Drainage Channel

3.2.13 Stormwater falls within the Project Site will be directed towards the natural stream within the Project Site and ultimately enters Ng Tung River.

3.2.14 The natural stream is 2m wide and 1.5m depth. The capacity of the natural stream is considered sufficient under the current scenario as no flooding was recorded during the previous rainstorms.

3.2.15 The photos of the natural stream are given in **Figure 3.2**.

4. Proposed Drainage Infrastructure

4.1 Impact on Local Stormwater Flow Pattern and Discharge Channel Capacity

4.1.1 As given in **Table 1.1**, the Project Site is proposed to fill up to about +11.0mPD with concrete for levelling. The filling works will follow the existing terrain. This would result in less stormwater be able to be soak away into the unpaved ground during a rainstorm. **Figure 4.1** shows proposed area to be filled.

4.1.2 The water flow path is not affected the filling would follow the existing terrain and no additional impermeable structures, including additional fences, and creation of concrete footings, etc, will be established. As such, the current stormwater flow pattern will be maintained, that stormwater will flows towards south, and stormwater falling within the Project Site will be directed to the natural stream located at the centre of the Project Site and exit the Project Site.

4.1.3 To properly collect the stormwater falls within the project site, a drainage system is proposed to collect the stormwater and discharge into the natural stream within the project site, that ultimately discharged through the local drainage system.

4.2 General Specification and Dimension of the Channel

4.2.1 In accordance with the TN, a site with area of 5,070m^2, a perimeter U-channel of 525mm at 1 in 200 gradient will be required. Where necessary, the size of the U-Channel will be increased to ensure enough capacity to handle the stormwater.

4.2.2 At each change of direction, a catchpit with cover will be provided. Catchpits with sand trap shall be provided at the outlets of the drainage system before entering the nullah. The covers of the proposed channels should be flush with the existing adjoining ground level.

4.2.3 Catchpit will be provided at all corners of the Project Site where the U-channel changes direction, and a sand trap will be provided to intercept the debris carried by the stormwater. The dimensions of the U-channels, covers of the catchpits will make reference to Civil Engineering and Development Department (CEDD) Drawing Nos. C2409I, C2406/1, C2406/2A and Drainage Services Department (DSD) Drawing No. DS 1025B.

4.3 Channel Alignment and Components

<u>Drainage Arrangement for Stormwater Flow within the Project: U-channel, floodwall and catchpit</u>

4.3.1 4 U-channel sections will be established within the Project Site to collect the stormwater falls within the Project Site. The drainage channel at the northern side of the project site will intercept the stormwater flows from the Catchment A and Catchment B, while the drainage channel at the southern side of the Project Site will intercept the stormwater falls within the Project Site.

4.3.2 As shown in Photo 1 of **Figure 2.5**, the stormwater will enter the Project Site through the section where no concrete footing is provided at the hoardings. The overland flow entering the Project Site will be intercepted by the U-channel and discharged accordingly.

4.3.3 All 4 sections will be terminated at the natural stream by a sand trap prior discharge into the natural stream.

4.3.4 The natural stream within the Project Site is filled with vegetation. The existing condition, hence the discharge capacity, cannot be properly determined. However, in view of the necessity to maintain the capacity of the discharge stream, the channel under the access road at the middle of the stream, and the exit of the stream, will be upgraded to a casted rectangular box culvert to ensure enough capacity is available to discharge the stormwater collected from the 4 catchments.

4.3.5 Catchpits will be provided at each sharp turn, and at the junctions of drainage channels.

4.3.6 As the Project Site located within the inland of north New Territories with elevation at 10mPD or higher, rise of mean sea level due to climate change does not have significant influence on the drainage capacity of the local drainage channel. Nonetheless, catchment runoff has been included a 16% increment for worst case scenario.

4.3.7 **Figure 4.2** shows the proposed layout of the drainage channel for the Project Site. Technical details of the proposed drainage channel, including the type, dimensions, invert levels are given in **Table 4.1**. The technical details of the proposed upgrade of the natural stream are given in **Table 4.2**. Detailed calculations are given in **Appendix 4.1** to **Appendix 4.4**. As the Project Site is located within Kam Tin North district. According to Figure 3 Delineation of Rainfall Zones of the Manual, the area is outside the 3 specific areas: Tai Mo Shan Area, West Lantau Area, North District Area. As such Storm Constants for rainfall statistics of HKO Headquarters is used in the calculation. The design drainage system is to handle stormwater of Return Period of 50 years.

Table 4.1: Technical Details of the Proposed Drainage Channels

Segment	Upstream Invert Level	Downstream Invert Level	Dimension		Slope	% of Full Capacity under the Peak Flow
			Length	Diameter		
Unit	**mPD**	**mPD**	**m**	**mm**	**-**	**%**
Catchment A						
Channel A-1	10.75	10.60	28.3	525	1 in 189	51.31%
Channel A-2	10.60	10.58	3.1	525	1 in 155	46.50%
Channel A-3	10.58	10.37	40.9	525	1 in 195	52.13%
Catchment B						
Channel B-1	10.55	10.39	32.5	600	1 in 203	77.65%
Channel B-2	10.39	10.37	3.3	600	1 in 165	69.98%
Channel B-3	10.37	10.30	13.1	600	1 in 187	74.53%
Channel B-4	10.30	10.23	13.6	600	1 in 194	75.94%
Channel B-5	10.23	10.21	4.3	600	1 in 215	79.88%
Channel B-6	10.21	10.16	10.2	600	1 in 204	77.81%
Channel B-7	10.16	10.13	5.7	600	1 in 190	75.10%
Channel B-8	10.13	10.03	19.5	600	1 in 195	76.08%

Segment	Upstream Invert Level	Downstream Invert Level	Dimension		Slope	% of Full Capacity under the Peak Flow
			Length	Diameter		
Unit	mPD	mPD	m	mm	-	%
Catchment C						
Channel C-1	10.75	10.65	28.4	525	1 in 284	47.76%
Channel C-2	10.65	10.50	60.8	525	1 in 405	57.06%
Channel C-3	10.37	10.30	19.5	525	1 in 279	47.30%
Catchment D						
Channel D-1	10.55	10.52	6.1	525	1 in 203	63.81%
Channel D-2	10.52	10.39	26.5	525	1 in 204	63.89%
Channel D-3	10.39	10.28	21.4	525	1 in 195	62.42%
Channel D-4	10.28	9.98	59.4	525	1 in 198	62.97%
e	10.10	9.98	28.3	525	1 in 236	68.76%

Table 4.2: Technical Details of the Proposed Upgrade of the Natural Stream

Segment	Type of Channel	Dimension		Slope	% of Full Capacity under the Peak Flow
		Width	Height		
Unit	--	M	m	-	%
Natural Stream at the Centre of the Project Site – Discharge Point for all Catchment Area					
Stream at the Centre of Project Site - Centre Section under Access Road	Rectangular Concrete Structure	0.8	0.8	1 in 167	23.51%
Stream at the Centre of Project Site - Discharge Point	Rectangular Concrete Structure	0.8	0.8	1 in 167	23.51%

4.4 Construction and Maintenance

4.4.1 During construction stage, the Applicant shall ensure that no works, including any site formation works, shall be carried out adversely interfere with the free flow condition of the existing drains, channels and watercourses on or in the vicinity of the subject site any time during or after the works.

4.4.2 The proposed U-channel will intercept and deliver stormwater into the U-channels at the west and south of the Project Site and ultimately discharged into Ng Tung River. The maintenance of the proposed U-channels and catchpits shall be undertaken by the Applicant.

4.4.3 The Applicant shall rectify the system if it is found to be inadequate or ineffective during operation at his / her own expense, in addition to those within the Project Site.

4.4.4 In addition, the Applicant, and the successive lot owners, shall also:

a) make good all adjacent affected areas upon the completion of the drainage works;
b) allow all time free access for the Government and its agent to conduct site inspection on his completed drainage works; and
c) allow connections from the adjacent lots to be completed drainage works on Government Land when so required.

5. Conclusion

5.1.1 Consider the location is not a flooding black spot, the existing drainage channel, including the natural stream running through the Project Site and the ultimate discharge channel, Ng Tung River, are adequate to handle the stormwater discharge for the area. As the project will not increase the stormwater load to the drainage system within proximity of the Project Site, the drainage system after the implementation of the project will not be adversely affected.

5.1.2 Additional connecting U-channels and catchpits are required to collect the stormwater falls within the Project Site and divert to the public drainage network for discharge. Associated drainage proposal has been presented.

5.1.3 The Applicant will ensure the construction works be conducted in a manner that the works will not adversely interfere with the free flow condition of the existing drains, channels and watercourses on or in the vicinity of the subject site any time during or after the works.

Figures

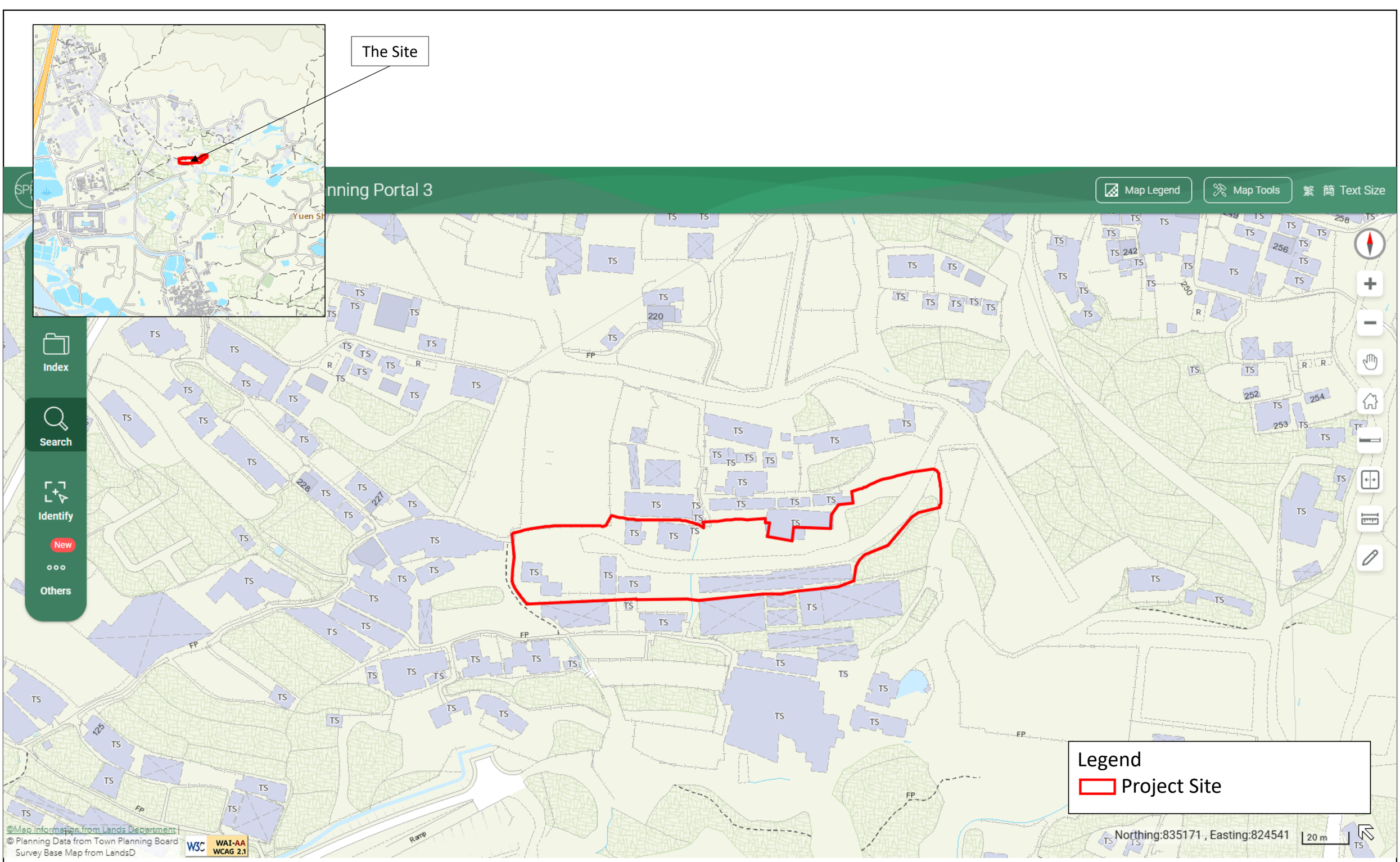

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Figure 1.1 – Location of the Site as in Planning Application

Map Source: Town Planning Board Statutory Planning Portal

Date: 6 May 2025

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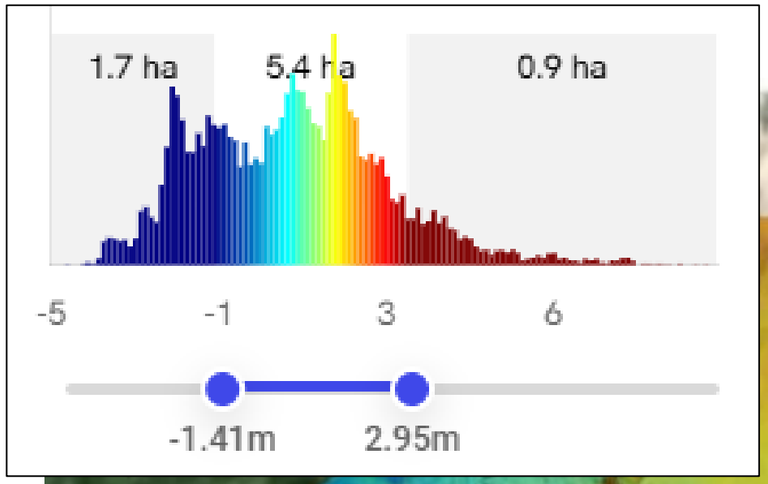
Figure 1.2 – Panoramic View of the Project Site



NOTE:
1. area with higher ground level are indicated in Red colour while area with lower ground level are indicated in Blue colour
2. Elevations are for relative comparison only

Legend
Indicative Project Site Area

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Figure 2.1 – Indicative Terrain of the Project Site

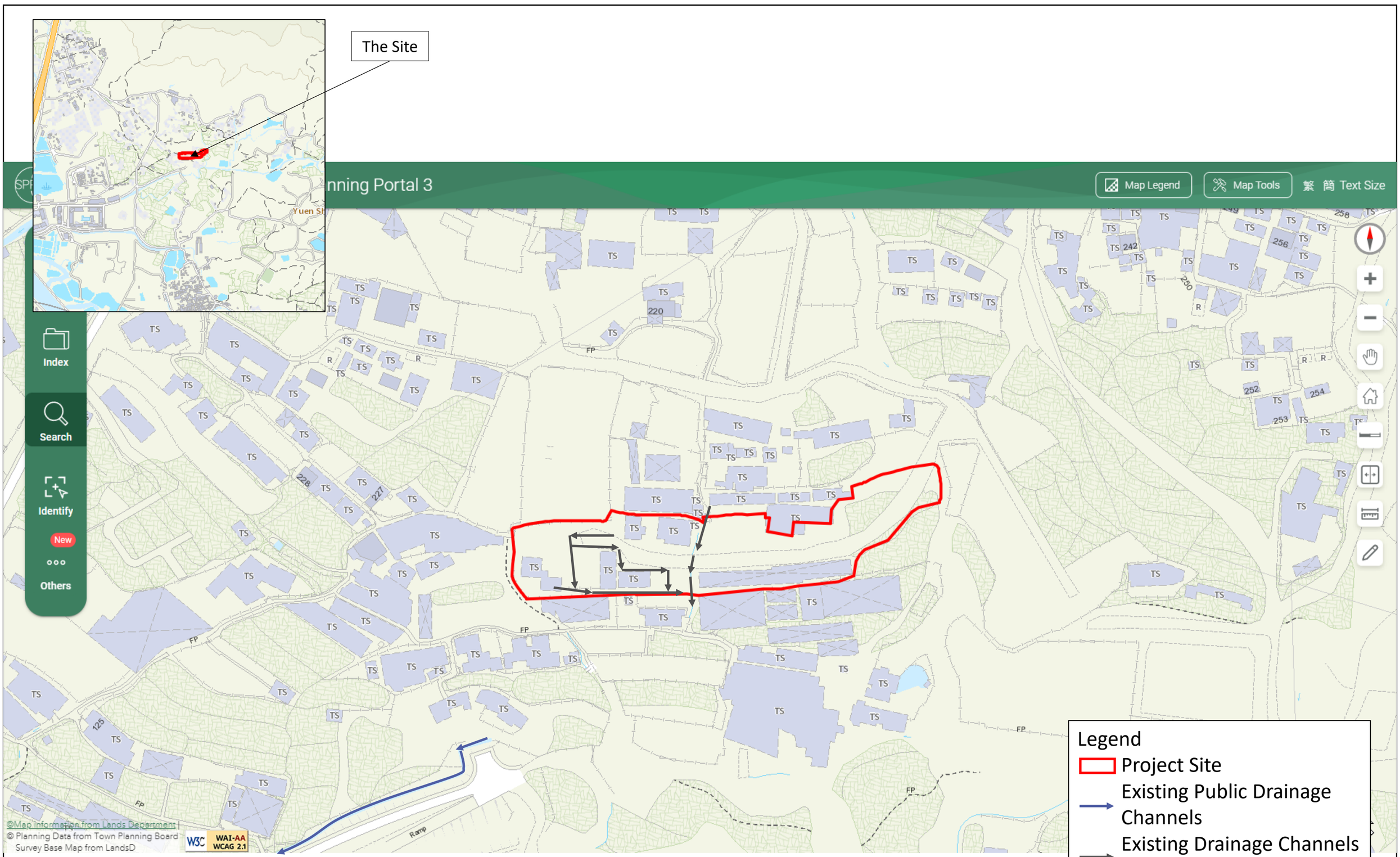

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Figure 2.2 – Identified Existing Drainage Channels

Map Source: GeoInfo Map

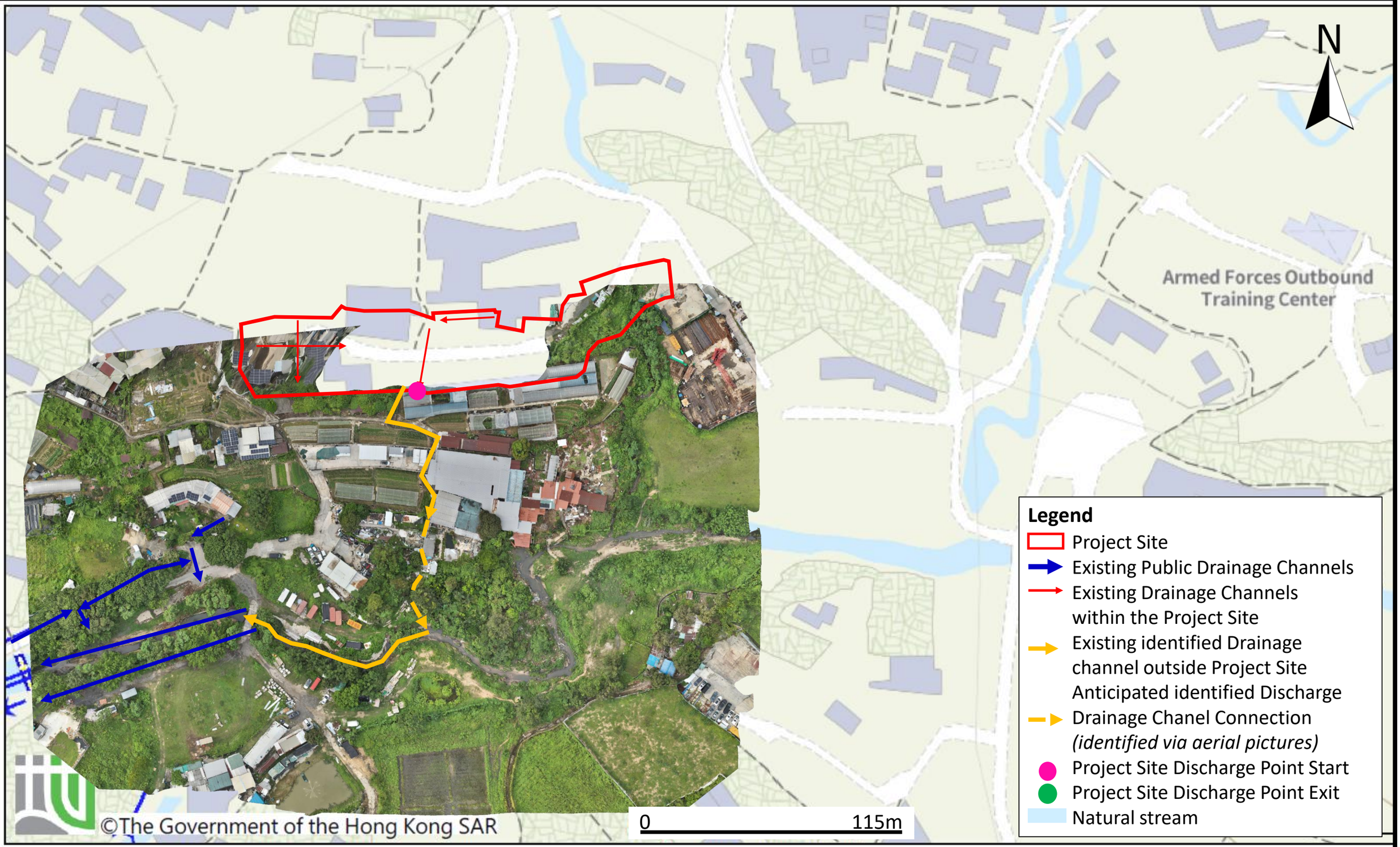

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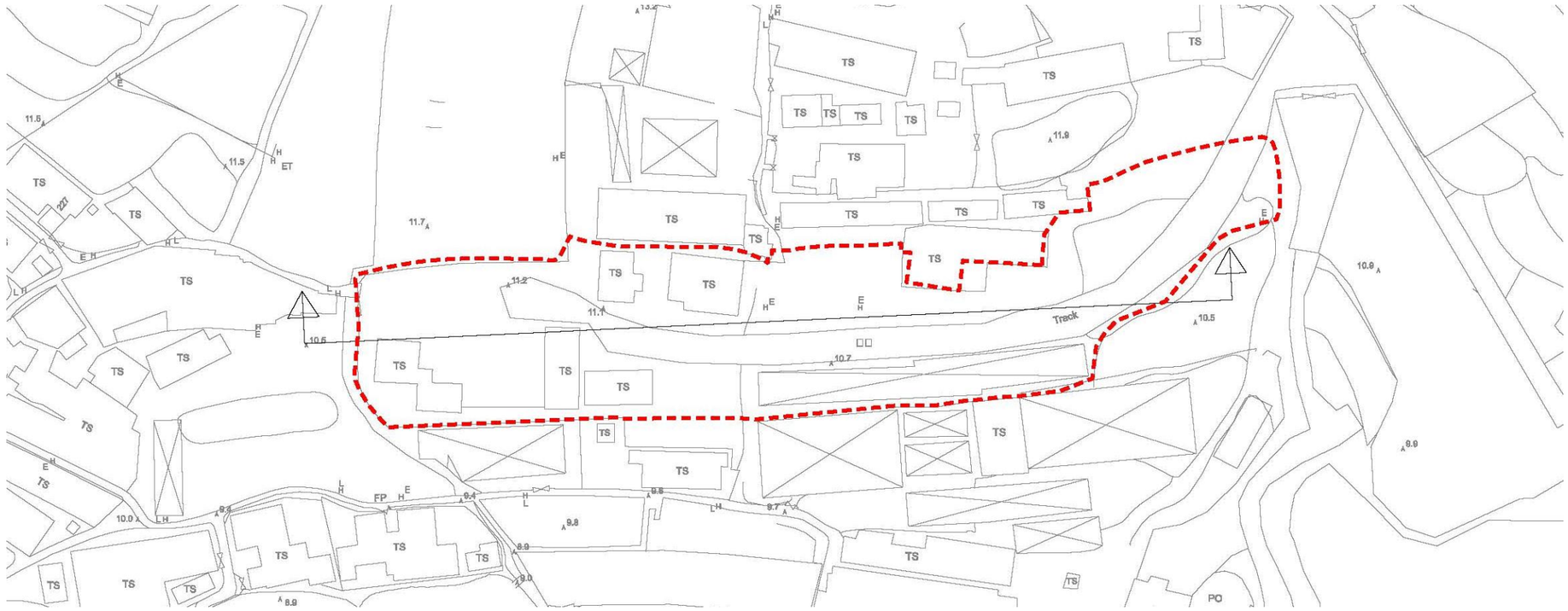
Figure 2.3 – Discharge Path for Stormwater collected within the Project Site

Map Source: GeoInfo Map, Aerial Photo



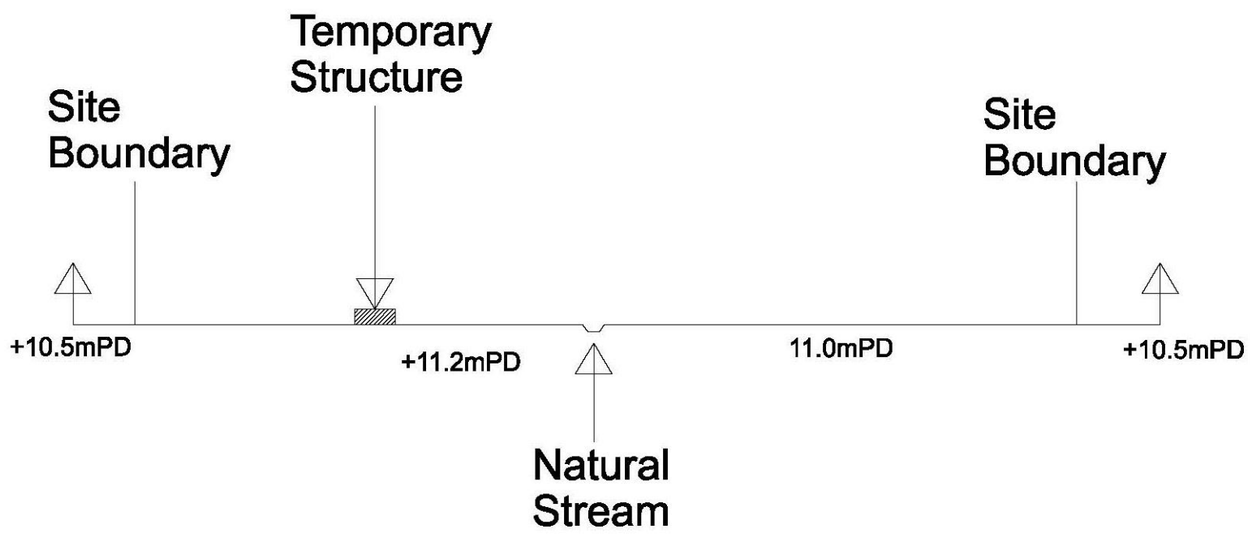


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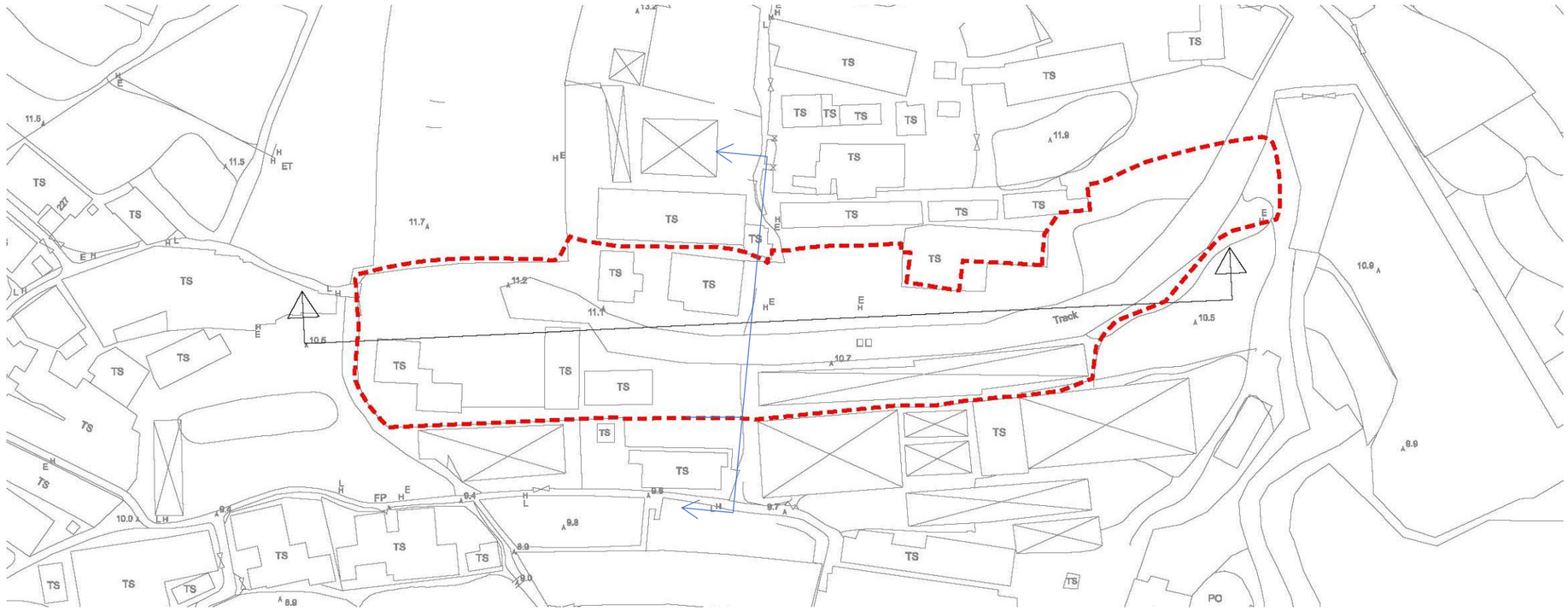
Figure 2.4a – Cross-Section for the Project Site



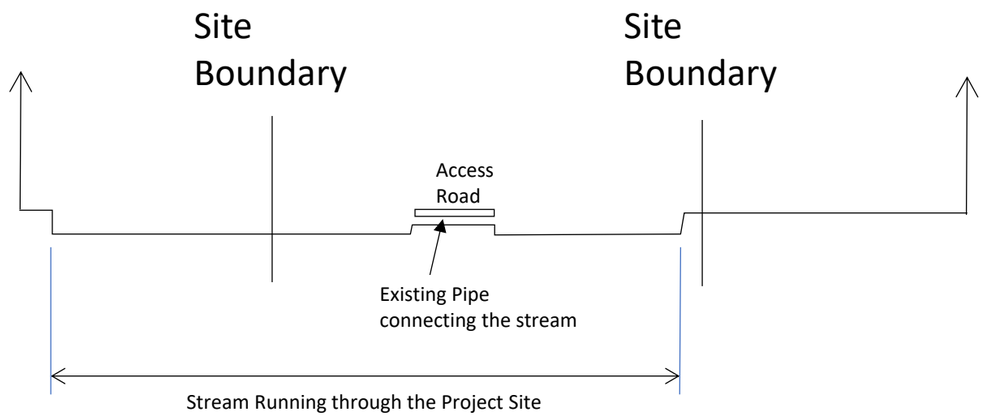


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Figure 2.4b – Cross-Section for the Project Site

Photo 1: Hoarding without concrete footing

View Angle of the Photos

Photo 2: Hoarding without Concrete Footing

Photo 3: Hoarding with Concrete Footing

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Figure 2.5 – Site Photos showing the Existing Scenario of the Project Site

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Figure 2.6 – Aerial Photos showing the Existing Drainage Channel

Photo 1: Natural Stream within Project Site

View Angle of the Photos

Photo 2: Natural Stream within Project Site

Photo 3: Drainage Network within Project Site

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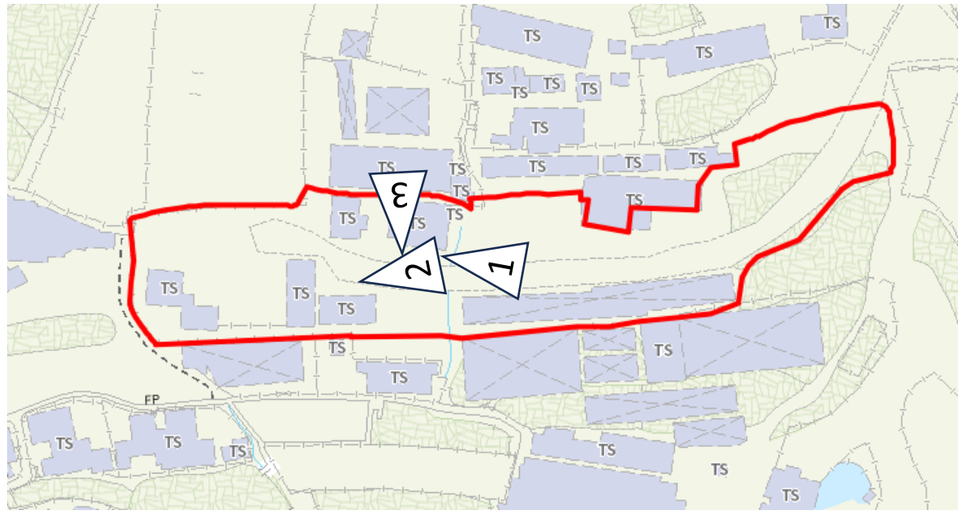
Figure 2.7 – Site Photos showing the Existing Scenario of the Project Site

Photo 1: Drainage Network within Project Site

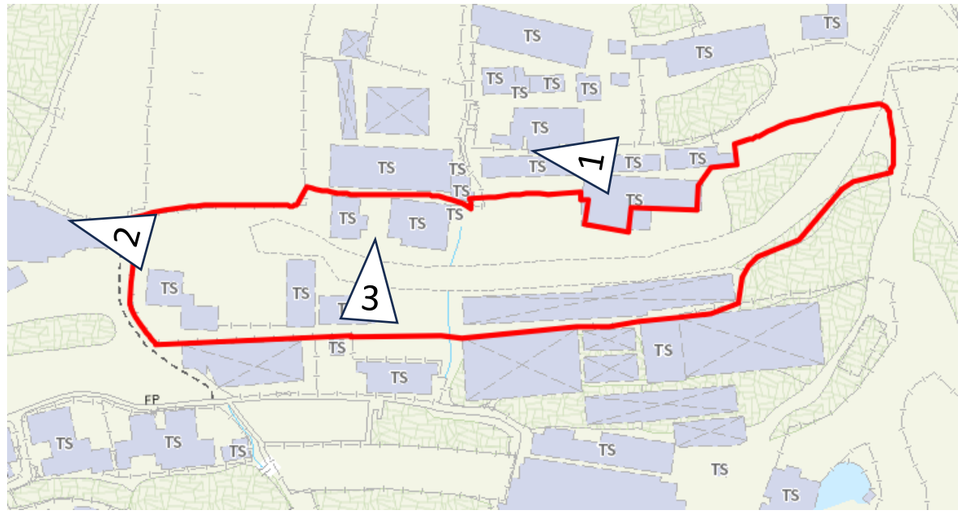


View Angle of the Photos

Photo 2: Drainage Network within Project Site

Photo 3: Drainage Network within Project Site

Photo 1: Concrete Footing at other premises



View Angle of the Photos

Photo 2: Concrete Footing at other premises

Photo 3: Tree Protection Zone

Figure 2.9 – Site Photos showing the Existing Scenario of the Project Site

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Figure 2.10 – Photomap for the Area Surrounding the Project Site

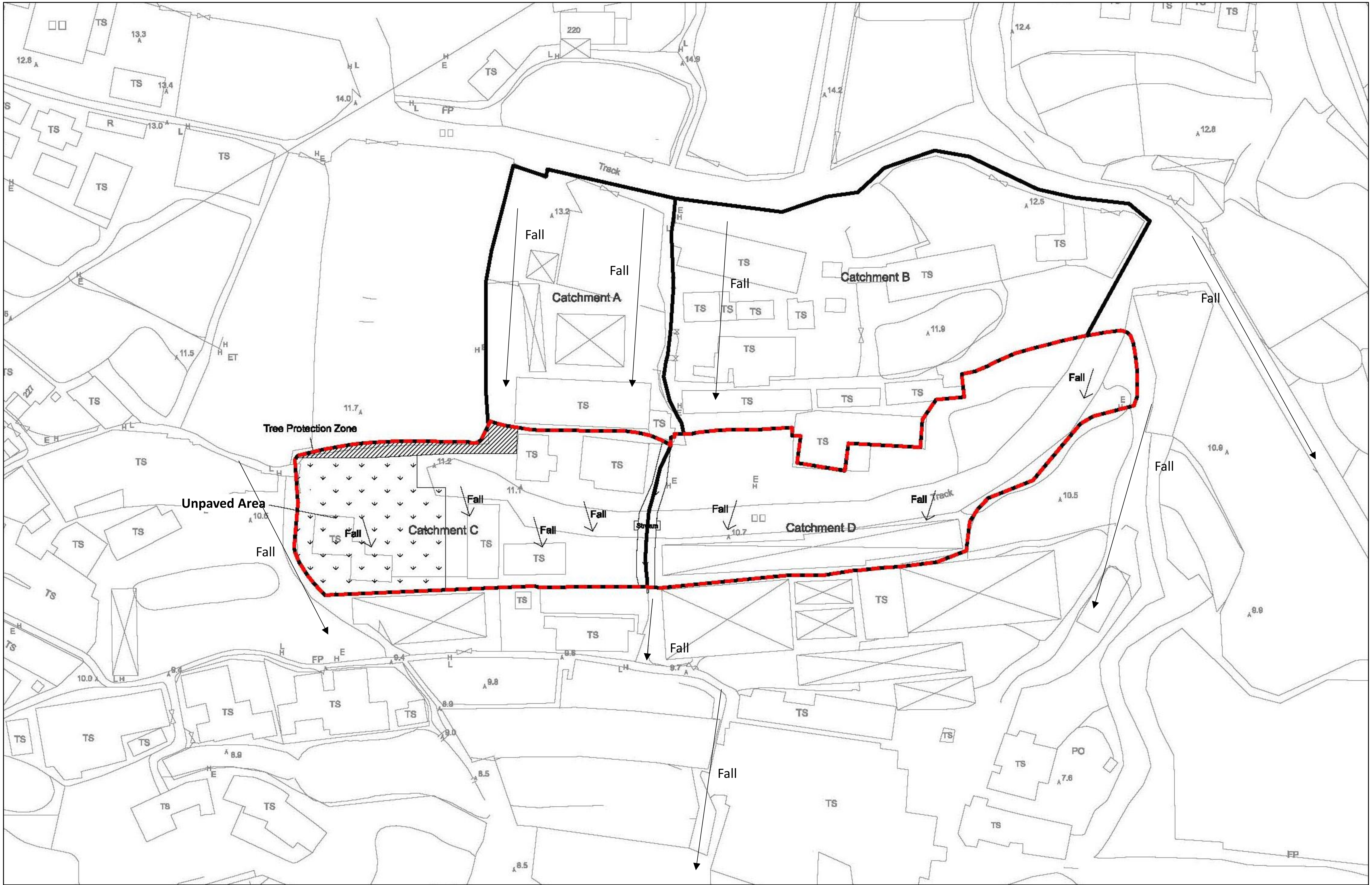

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Figure 3.1 – Identified Catchment Area

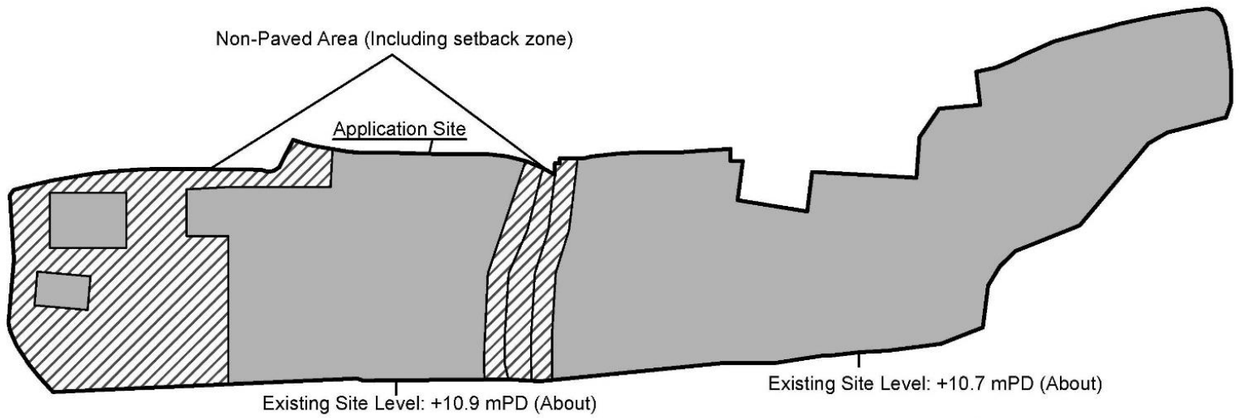
Natural Stream leading out of the Project Site
in January 2025

Concrete pipe under the walkway at the
center of the Project Site

Natural Stream leading out of the Project Site
in May 2025

Figure 3.2 – Condition of the Natural Stream

N



Paved Ratio

Paved Area: 3,938.4 m^2 (About 77.6%)

Non-Paved Area: 1,138 m^2 (About 22.4%)

Legend:

Paved Area 平整範圍

Non-Paved Area 不平整範圍

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Figure 4.1 – Areas to be Filled

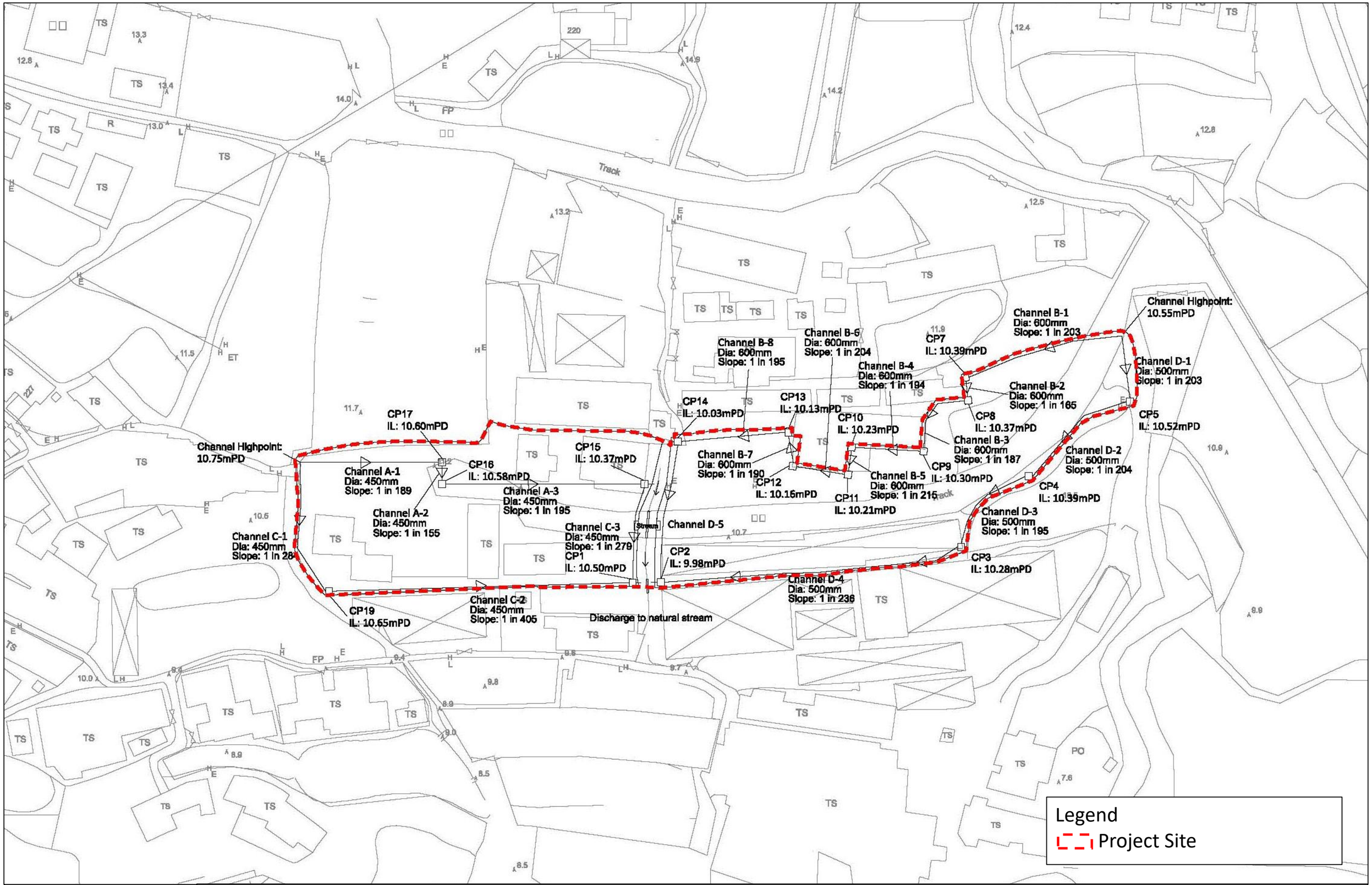

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Figure 4.2 – Proposed Layout of the Drainage Channel for the Project Site

Appendix 4.1:
Time of Concentration

Appendix 4.1:
Time of Concentration

Brandsby William's Equation

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

where:

t_c: time of concentration (min)

A: area of catchment (m^2)

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

L : distance in metre measured on the line of natural flow between the design section and that point of catchment from which water would take the longest time to reach the design section (m)

Catchment Time of Concentration Calculation

	A				H	L	t_c
	Area	High Point	Low Point	Length	Average Fall	Distance of line of natural flow	Time of Concentration
	m^2	m	m	m	m per 100m	m	min
Catchment-Full	11,373.50	28.2	10.7	379	4.617	379.0	15.867
Catchment A	1,989.40	15.8	12.5	95	3.474	95.0	5.012
Catchment B	4,306.90	12.9	11.9	96	1.042	96.0	5.965
Catchment C	2,362.90	11.5	11.1	74	0.541	74.0	5.567
Catchment D	2,714.30	11.3	10.7	116	0.517	116.0	8.683

Appendix 4.2:
Catchment Runoff Estimation for the Project Site

Appendix 4.2:
Catchment Runoff Estimation for the Project Site

Intensity Calculation:

Intensity-Duration-Frequency Relation:

$$i = \frac{a}{(t_d + b)^c} \times 116\%$$

where:
Constants used in the formula refers to Table 2a-d of the Stormwater Drainage Manual, Fifth Edition, January 2018

Location: HKO Headquarters
Return Period T: 50 Years
a: 505.5
b: 3.29
c: 0.355

NOTE:
1. Storm Constants for Return Periods of 50 Years for North District Area is used in the calculation
2. 16% has been added to allow a worse case scenario due to climate change

Intensity of Catchments:

	a	b	c	t_d, min	*i*
Catchment-Full	505.5	3.29	0.355	15.87	177.203
Catchment A	505.5	3.29	0.355	5.01	238.478
Catchment B	505.5	3.29	0.355	5.97	229.390
Catchment C	505.5	3.29	0.355	5.57	233.014
Catchment D	505.5	3.29	0.355	8.68	209.410

NOTE:
Assume: $t_d = t_c$

Runoff Estimation:

Rational Method

$$Q_p = 0.278 i \sum_{j=1}^{m} C_j A_j$$

Catchment	Site Area, m2	Percentage of Paved area	Fixed runoff coefficients		Runoff, m^3/s
			Paved	Unpaved	50 Year
Catchment ID					
Catchment-Full	11,373.5	100%	0.95	0.15	0.5323
Catchment A	1,989.4	100%	0.95	0.15	0.1253
Catchment B	4,306.9	100%	0.95	0.15	0.2609
Catchment C	2,362.9	59%	0.95	0.15	0.0951
Catchment D	2,714.3	100%	0.95	0.15	0.1501

Appendix 4.3:

Calculation of Pipe Capacity for the Proposed Discharge Segment for the Project Site

Appendix 4.3
Calculation of Pipe Capacity for the Proposed Discharge Segment for the Project Site

Manning Equation

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

Segment	Upstream Manhole	Downstream Manhole	Slope		Dimension				R	S_f	n	90% Full Capacity Velocity [2]	90% Full Capacity	Catchment Area	Catchment Flow Rate	% of Full Capacity under the Peak Flow of the Proposed Project
			Upstream Invert Level	Downstream Invert Level	Length	Diameter	Diameter	Area	Hydraulic Radius	Slope	Manning coefficient [1]					
			mPD	mPD	m	mm	m	m^2	m	-	$s/m^{1/3}$	m/s	l/s	-	l/s	%
Catchment A																
Channel A-1	--	CP17	10.75	10.60	28.3	525	0.525	0.216	0.13125	0.005	0.015	1.128	244.218	Catchment A	125.296	51.31%
Channel A-2	CP17	CP16	10.60	10.58	3.1	525	0.525	0.216	0.13125	0.006	0.015	1.245	269.439	Catchment A	125.296	46.50%
Channel A-3	CP16	CP15	10.58	10.37	40.9	525	0.525	0.216	0.13125	0.005	0.015	1.110	240.367	Catchment A	125.296	52.13%
Catchment B																
Channel B-1	CP6	CP7	10.55	10.39	32.5	600	0.600	0.283	0.15000	0.005	0.015	1.188	336.039	Catchment B	260.920	77.65%
Channel B-2	CP7	CP8	10.39	10.37	3.3	600	0.600	0.283	0.15000	0.006	0.015	1.319	372.846	Catchment B	260.920	69.98%
Channel B-3	CP8	CP9	10.37	10.30	13.1	600	0.600	0.283	0.15000	0.005	0.015	1.238	350.094	Catchment B	260.920	74.53%
Channel B-4	CP9	CP10	10.30	10.23	13.6	600	0.600	0.283	0.15000	0.005	0.015	1.215	343.598	Catchment B	260.920	75.94%
Channel B-5	CP10	CP11	10.23	10.21	4.3	600	0.600	0.283	0.15000	0.005	0.015	1.155	326.627	Catchment B	260.920	79.88%
Channel B-6	CP11	CP12	10.21	10.16	10.2	600	0.600	0.283	0.15000	0.005	0.015	1.186	335.317	Catchment B	260.920	77.81%
Channel B-7	CP12	CP13	10.16	10.13	5.7	600	0.600	0.283	0.15000	0.005	0.015	1.229	347.452	Catchment B	260.920	75.10%
Channel B-8	CP13	CP14	10.13	10.03	19.5	600	0.600	0.283	0.15000	0.005	0.015	1.213	342.968	Catchment B	260.920	76.08%
Catchment C																
Channel C-1	--	CP19	10.75	10.65	28.4	525	0.525	0.216	0.13125	0.004	0.015	0.920	199.052	Catchment C	95.070	47.76%
Channel C-2	CP19	CP1	10.65	10.50	60.8	525	0.525	0.216	0.13125	0.002	0.015	0.770	166.617	Catchment C	95.070	57.06%
Channel C-3	CP15	CP1	10.37	10.30	19.5	525	0.525	0.216	0.13125	0.004	0.015	0.928	200.982	Catchment C	95.070	47.30%
Catchment D																
Channel D-1	CP6	CP5	10.55	10.52	6.1	525	0.525	0.216	0.13125	0.005	0.015	1.087	235.246	Catchment D	150.115	63.81%
Channel D-2	CP5	CP4	10.52	10.39	26.5	525	0.525	0.216	0.13125	0.005	0.015	1.085	234.950	Catchment D	150.115	63.89%
Channel D-3	CP4	CP3	10.39	10.28	21.4	525	0.525	0.216	0.13125	0.005	0.015	1.111	240.500	Catchment D	150.115	62.42%
Channel D-4	CP3	CP2	10.28	9.98	59.4	525	0.525	0.216	0.13125	0.005	0.015	1.101	238.393	Catchment D	150.115	62.97%
Channel D-5	CP14	CP2	10.10	9.98	28.3	525	0.525	0.216	0.13125	0.004	0.015	1.008	218.304	Catchment D	150.115	68.76%

NOTE:

[1] For the Manning coefficient use for the proposed channel, the value for Cement mortar surfaces under bad condition is adopted.

[2] Consider the sedimentation, the pipes are considered to be at 90% of its full capcacity for worse case scenario

Appendix 4.4:
Calculation of the Capacity of the Natural Stream

Appendix 4.4
Calculation of the Capacity of the Stream at the Center of Project Site

Manning Equation

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

	Dimension				R	S_f	n						
Segment	Width	Height	Area	Wetted Perimeter	Hydraulic Radius	Slope	Manning coefficient [1]	90% Full Capacity Velocity [2]	90% Full Capacity	90% Full Capacity	Catchment Area	Catchment Flow Rate (l/s)	% of Full Capacity
	m	m	m^2	m	m	-	$s/m^{1/3}$	m/s	m3/s	l/s	-		%
Stream at the Center of Project Site - Centre Section under Access Road	0.8	0.8	1.131	1.500	0.28274	0.0060	0.015	2.002	2.264	2264.336	Catchment-Full	532.272	23.51%
Stream at the Center of Project Site - Discharge Point	0.8	0.8	1.131	1.500	0.28274	0.0060	0.015	2.002	2.264	2264.336	Catchment-Full	532.272	23.51%

NOTE:
[1] For the Manning coefficient use for the proposed channel, the value for Cement mortar surfaces under bad condition is adopted.
[2] Consider the sedimentation, the pipes are considered to be at 90% of its full capcacity for worse case scenario

UMWELT CONSULTING LIMITED
23/F, On Hong Commercial Building, 145 Hennessy Road, Wan Chai, Hong Kong

Application No. A/YL-KTN/1113
Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories

Drainage Proposal
Revision 1
13 August 2025

Content:

Figures:

Appendices:

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1. Introduction

1.1 Project Title

1.1.1 Application for Permission Under Section 16 of the Town Planning Ordinance Application No. A/YL-KTN/1113.

1.2 Project Background

1.2.1 A Planning Application No. A/YL-KTN/1113 was submitted to the Town Planning Board on 15 July 2024 to seek planning permission for a temporary animal boarding establishment with ancillary facilities for a period of 3 years and filling of land at the application site (the Project Site) in Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories.

Statutory Land Use Zoning of the Project Site

1.2.2 The Project Site falls within the 'Agricultural' ("AGR") zone according to the Approved Kam Tin North Outline Zoning Plan No. S/YL-KTN/11 ("the OZP"). According to the Notes of the OZP, 'Animal Boarding Establishment' belongs to Column 2, that the uses may be permitted with or without conditions on application to the Town Planning Board ("TPB"). A Planning Application is therefore submitted for the proposed development at the Project Site.

Location of the Project Site

1.2.3 The location of the Project Site is given in **Figure 1.1**. A panoramic view of the Project Site is given in **Figure 1.2**.

1.2.4 The Project Site has an area of about 5,070m^2 and the proposed development mainly comprises 18 non-domestic buildings with building heights not more than 6m and not with not more than 2 storeys. The buildings are mainly used for shelters for animals.

1.3 Summary of the Project

1.3.1 An outline on the Project is given in **Table 1.1**.

Table 1.1: Outline on the Project

Project title	Application for Permission Under Section 16 of the Town Planning Ordinance
Proponent	
Contact Person (name/telephone)	Mr. TANG Lok San / 6848 3319
Nature and description of the project	Temporary Animal Boarding Establishment with Ancillary Facilities for a Period of 3 Years and Filling of Land
Location (include plans)	Lots 949 (Part) and 1103 (Part) in D.D. 107, Kam Tin North, Yuen Long, New Territories
Area of project site and % paved/unpaved (existing and proposed)	About 5,070m^2, partially paved
Level to be filled up	About 0.3m
Whether planning permission application is required	Yes
Whether lease modification application is required	Not Applicable
Statutory land use zoning	Agriculture
Recent and dated photographs to shown a panoramic view of the site	Please refer to **Figure 1.2**.

1.4 Purpose of this Proposal

1.4.1 A Drainage Proposal has been submitted to the TPB on 4 November 2024. Pursuant to the comment received from Drainage Services Department ("DSD"), this drainage proposal is prepared in response to the comments and to supplement the application and the captioned condition to demonstrate no adverse drainage impact will be caused to the adjacent area.

1.5 Relevant Guidelines and Classification of the Project Site

Relevant Guidelines for this Drainage Proposal

1.5.1 This Drainage Proposal has been carried out in accordance with the guidelines given as follows:

a) Technical Note to Prepare a Drainage Submission ("the TN");
b) Stormwater Drainage Manual Planning, Design and Management (Fifth Edition, January 2018) ("the Manual");
c) Drainage Services Department Stormwater Drainage Manual Corrigendum No. 1/2022 and 1/2024;
d) Advice Note No.1 - Application of the Drainage Impact Assessment Process to Private Sector Projects issued by Drainage Services Department, September 2010. Hong Kong Planning Standards and Guidelines, August 2011; and
e) Relevant standard drawings provided by Civil Engineering and Development Department.

Classification of the Project Site

1.5.2 As the Project Site is approximately 5,070m^2, which is smaller than 1 ha, in accordance with the TN, the Project Site is classified as a Simple Site. A Drainage Proposal will be prepared in accordance with the standards set out in the Manual. This Drainage Proposal therefore presented the drainage arrangement within the Project Site only.

2. Existing Environment of the Project Site

2.1 Overview of Local Terrain and Surrounding Environment

Local Terrain within Proximity of the Project Site

2.1.1 The Project Site is located within Fung Kat Heung. To the south of the Project Site located a number of farmlands. The local uncharted drainage system within the farmlands serve as the main discharge channels for the surrounding area.

2.1.2 The area to the north, east and west of the Project Site are generally used as open storage. Within the area to the east, construction works is currently in progress and to the south are farmlands and residential areas.

2.1.3 The local terrain is higher at the north and lower at the south. Stormwater falls at the north of the Project Site will flow towards the site, which will be collected by the U-channel within the Project Site and ultimately discharged southwards, either through the stream located at the central of the Project Site or other minor channels located within the farmlands. The natural stream that runs through the Project Site serves as the main discharge channel for the area and will direct the collected stormwater southwards into local drainage networks, and discharge into the channel feature SUP1019960, and ultimately into the feature SCP1009640.

Terrain of the Project Site

2.1.4 The Project Site is an area of about 5,070m^2. Majority of the Project Site is paved with concrete, and a section of the site is covered with vegetation which is permeable. Multiple temporary structures were erected within the Project Site. Some trees are growing along the eastern, northwestern, and southwestern side of the site. The surrounding areas are predominant by open space storage to the north, northwest, and east, and farmlands and residential units to the south and to the west. At northern side of the Project Site is an open space storage currently used as storage space for construction vehicle.

2.1.5 The Project Site is generally flat, but slightly higher at the northern side and gradually fall towards the southern end, following the local terrain.

2.1.6 **Figure 2.1** shows the indicative topography of the Project Site. **Figure 2.2** shows the existing drainage identified within the Project Site. **Figure 2.3** shows the full alignment of the discharge path from the application site all the way down to the ultimate discharge point.

2.1.7 A cross-section for the Project Site is given in **Figure 2.4**.

2.2 Existing Drainage Channel

Recorded Public Drainage Channel

2.2.1 No public drainage channel was identified within proximity of the Project Site. The nearest discharge channel, a 600mm wide U-Channel SUP1019960, is located at about 60m from the Project Site to the southwest. A 6500mm wide trapezoidal channel SCP1009640, is further south at about 85m from the Project Site to the southwest. This trapezoidal channel is the main discharge channel for the area. **Figure 2.2** shows the identified channels within the proximity of the Project Site. The full alignment of the

discharge path from the application site all the way down to the ultimate discharge point is given in **Figure 2.3**.

2.2.2 The area is currently not a flooding prone area. Demonstrated the trapezoidal channel SCP1009640 would have enough discharge capacity to handle the rainwater for the area.

Site Visit and Observation

2.2.3 A site visit was conducted on 10 December 2024 to obtain the current condition of the surrounding area and existing drainage system within the Project Site. Photos taken during the site visit showing the features identified in the following sections are given in **Figure 2.5** to **Figure 2.9**.

Current Condition of the Project Site

2.2.4 A hoarding made with sheet metal have been erected surrounding the Project Site. Part of the hoardings have no concrete footing, hence the hoarding of the Project Site does not totally seal the project boundary and stormwater would be able to flow into and out of the Project Site during rainstorm at some of the area. (Photo 1 and 2 in **Figure 2.5**) In addition, some of the hoardings have concrete sealed the lower section of the hoardings, preventing stormwater from flowing towards west, out of the Project Site. (Photo 3 in **Figure 2.5**) The stormwater would be directed by the hoarding and flows towards the east, where existing drainage channels within the Project Site will direct the stormwater towards the centre of the site and enters the natural stream and be discharged. The aerial photos showing the existing stream is given in **Figure 2.6**.

2.2.5 A natural stream was found running through the centre of the Project Site. The stream is trapezoidal in shape with dimension of about 2m wide and 1.5m deep. The stream flows under the access road running through the centre of the Project Site and exit the Project Site. (Photo 1 and 2 in **Figure 2.7**)

2.2.6 Within the Project Site, it is observed that simple network of U-channel is in place to direct stormwater through the site. (Photo 3 in **Figure 2.7**, and Photo 1, 2, and 3 in **Figure 2.8**) The location of the identified U-channel and respective size are given in **Figure 2.2**.

Current Condition of the Surrounding Area

2.2.7 At the immediate north of the Project Site is a number of residential units. These premises will have its own drainage system and discharge the stormwater into the channel that connects to the stream and enters the Project Site. Further north is an open space which is currently used for storage of construction vehicles. The area is paved with concrete.

2.2.8 Concrete walls were erected by other landowners at their premises. Rainfalls within other premise are anticipated to be intercepted by the local drainage networks and overflow into other premise is not anticipated. (Photo 1 to 2 in **Figure 2.9**) A tree protection zone is also allocated at the northwest corner of the Project Site. (Photo 3 in **Figure 2.9**)

2.2.9 At the east of the Project Site is an open space storage area where vehicle parking is also observed. A U-channel was identified at east of the Project Site directing stormwater towards east and be discharged.

2.2.10 At the south and west of the Project Site are farmlands. U-channels network was identified. These networks would direct the collected stormwater southwards. Exact drainage path cannot be identified as the U-channels enters private lands which are not accessible, but the stormwater should ultimately enter existing discharge channels SCP1009640 or other discharge channels.

2.2.11 The locations are shown in the photomap given in **Figure 2.10**.

3. Drainage Flow Evaluation

3.1 Relevant Guidelines and Classification of the Project Site

3.1.1 This Drainage Proposal has been carried out in accordance with the guidelines given as follows:

a) Technical Note to Prepare a Drainage Submission ("the TN");
b) Stormwater Drainage Manual Planning, Design and Management (Fifth Edition, January 2018) ("the Manual");
c) Drainage Services Department Stormwater Drainage Manual Corrigendum No. 1/2022 and 1/2024;
d) Advice Note No.1 - Application of the Drainage Impact Assessment Process to Private Sector Projects issued by Drainage Services Department, September 2010. Hong Kong Planning Standards and Guidelines, August 2011; and
e) Relevant standard drawings provided by Civil Engineering and Development Department.

3.2 Existing Stormwater Flow Path

3.2.1 The local stormwater falling at the north of the Project Site and within the Project Site will be directed into the stream and flows along the stream southwards and exit the Project Site. The stormwater then enters the network of local drainage channel network. U-channel directs the stormwater southwards and exits the Project Site at the southern end, enters the U-channel SUP1001962 and ultimately enters Ng Tung River.

Catchment Area Near the Project Site and Respective Stormwater Flow Pattern

3.2.2 The adjacent area is higher at the northern side of the Project Site and lower at the southern side and at the centre of the Project Site. This allows stormwater falls within the proximity of the Project Site enters the natural stream within the Project Site and being directed southwards the discharge channel SUP1001962 and ultimately enters Ng Tung River.

3.2.3 Stormwater falls outside the Project Site will be directed by the local drainage network which are not charted, and ultimately enters the discharge channel SUP1001962 and ultimately enters Ng Tung River.

3.2.4 There are a number of catchment areas identified and are shown in **Figure 3.1**. The unpaved area indicated in the figure can reference to **Figure 2.6**. They are discussed as follows:

Catchment A

3.2.5 Locates at the northwestern side of the Project Site, the Catchment A is a private area with a number of structures located at the north of the Project Site.

3.2.6 The area was not accessible, but during the site visit a discharge point was identified leading out of the area, and discharge into the natural stream. As Catchment A is bounded by an impermeable perimeter fence, all stormwater falls within the catchment would be discharged through the drain into the natural stream, and be discharged accordingly.

Catchment B

3.2.7 Locates at the northeastern side of the Project Site, the Catchment B refers to the area located at the north of the Project Site currently occupied by structures with some open space.

3.2.8 Similar to Catchment A, a discharge point was identified leading out of the area, which was accessible during the site visit, and discharge into the natural stream, where the stormwater will be discharged accordingly.

Catchment C

3.2.9 Catchment C is the Project Site area at the western side of the natural stream. A section of the area, about 970.3m^2, is unpaved and used for cattle keeping and tree protection zone respectively. The remaining area is paved with structures established.

3.2.10 Stormwater falls within this catchment will flows eastwards towards the centre of the Project Site, and then enters the natural stream, where the stormwater will be discharged accordingly.

Catchment D

3.2.11 Catchment D is the Project Site area at the eastern side of the natural stream. A section of the area is unpaved and covered by vegetation. The remaining area is paved with structures established.

3.2.12 Stormwater falls within this catchment will flows westwards towards the centre of the Project Site, and then enters the natural stream, where the stormwater will be discharged accordingly.

Capacity of Existing Drainage Channel

3.2.13 Stormwater falls within the Project Site will be directed towards the natural stream within the Project Site and ultimately enters Ng Tung River.

3.2.14 The natural stream is 2m wide and 1.5m depth. The capacity of the natural stream is considered sufficient under the current scenario as no flooding was recorded during the previous rainstorms.

3.2.15 The photos of the natural stream are given in **Figure 3.2**.

4. Proposed Drainage Infrastructure

4.1 Impact on Local Stormwater Flow Pattern and Discharge Channel Capacity

4.1.1 As given in **Table 1.1**, the Project Site is proposed to fill up to about +11.0mPD with concrete for levelling. The filling works will follow the existing terrain. This would result in less stormwater be able to be soak away into the unpaved ground during a rainstorm. **Figure 4.1** shows proposed area to be filled.

4.1.2 The water flow path is not affected the filling would follow the existing terrain and no additional impermeable structures, including additional fences, and creation of concrete footings, etc, will be established. As such, the current stormwater flow pattern will be maintained, that stormwater will flows towards south, and stormwater falling within the Project Site will be directed to the natural stream located at the centre of the Project Site and exit the Project Site.

4.1.3 To properly collect the stormwater falls within the project site, a drainage system is proposed to collect the stormwater and discharge into the natural stream within the project site, that ultimately discharged through the local drainage system.

4.2 General Specification and Dimension of the Channel

4.2.1 In accordance with the TN, a site with area of 5,070m^2, a perimeter U-channel of 525mm at 1 in 200 gradient will be required. Where necessary, the size of the U-Channel will be increased to ensure enough capacity to handle the stormwater.

4.2.2 At each change of direction, a catchpit with cover will be provided. Catchpits with sand trap shall be provided at the outlets of the drainage system before entering the nullah. The covers of the proposed channels should be flush with the existing adjoining ground level.

4.2.3 Catchpit will be provided at all corners of the Project Site where the U-channel changes direction, and a sand trap will be provided to intercept the debris carried by the stormwater. The dimensions of the U-channels, covers of the catchpits will make reference to Civil Engineering and Development Department (CEDD) Drawing Nos. C2409I, C2406/1, C2406/2A and Drainage Services Department (DSD) Drawing No. DS 1025B.

4.3 Channel Alignment and Components

Drainage Arrangement for Stormwater Flow within the Project: U-channel, floodwall and catchpit

4.3.1 4 U-channel sections will be established within the Project Site to collect the stormwater falls within the Project Site. The drainage channel at the northern side of the project site will intercept the stormwater flows from the Catchment A and Catchment B, while the drainage channel at the southern side of the Project Site will intercept the stormwater falls within the Project Site.

4.3.2 As shown in Photo 1 of **Figure 2.5**, the stormwater will enter the Project Site through the section where no concrete footing is provided at the hoardings. The overland flow entering the Project Site will be intercepted by the U-channel and discharged accordingly.

4.3.3 All 4 sections will be terminated at the natural stream by a sand trap prior discharge into the natural stream.

4.3.4 The natural stream within the Project Site is filled with vegetation. The existing condition, hence the discharge capacity, cannot be properly determined. However, in view of the necessity to maintain the capacity of the discharge stream, the channel under the access road at the middle of the stream, and the exit of the stream, will be upgraded to a casted rectangular box culvert to ensure enough capacity is available to discharge the stormwater collected from the 4 catchments.

4.3.5 Catchpits will be provided at each sharp turn, and at the junctions of drainage channels.

4.3.6 As the Project Site located within the inland of north New Territories with elevation at 10mPD or higher, rise of mean sea level due to climate change does not have significant influence on the drainage capacity of the local drainage channel. Nonetheless, catchment runoff has been included a 16% increment for worst case scenario.

4.3.7 **Figure 4.2** shows the proposed layout of the drainage channel for the Project Site. Technical details of the proposed drainage channel, including the type, dimensions, invert levels are given in **Table 4.1**. The technical details of the proposed upgrade of the natural stream are given in **Table 4.2**. Detailed calculations are given in **Appendix 4.1** to **Appendix 4.4**. As the Project Site is located within Kam Tin North district. According to Figure 3 Delineation of Rainfall Zones of the Manual, the area is outside the 3 specific areas: Tai Mo Shan Area, West Lantau Area, North District Area. As such Storm Constants for rainfall statistics of HKO Headquarters is used in the calculation. The design drainage system is to handle stormwater of Return Period of 50 years.

Table 4.1: Technical Details of the Proposed Drainage Channels

Segment	Upstream Invert Level	Downstream Invert Level	Dimension		Slope	% of Full Capacity under the Peak Flow
			Length	Diameter		
Unit	mPD	mPD	m	mm	-	%
Catchment A						
Channel A-1	10.75	10.60	28.3	525	1 in 189	51.31%
Channel A-2	10.60	10.58	3.1	525	1 in 155	46.50%
Channel A-3	10.58	10.37	40.9	525	1 in 195	52.13%
Catchment B						
Channel B-1	10.55	10.39	32.5	600	1 in 203	77.65%
Channel B-2	10.39	10.37	3.3	600	1 in 165	69.98%
Channel B-3	10.37	10.30	13.1	600	1 in 187	74.53%
Channel B-4	10.30	10.23	13.6	600	1 in 194	75.94%
Channel B-5	10.23	10.21	4.3	600	1 in 215	79.88%
Channel B-6	10.21	10.16	10.2	600	1 in 204	77.81%
Channel B-7	10.16	10.13	5.7	600	1 in 190	75.10%
Channel B-8	10.13	10.03	19.5	600	1 in 195	76.08%

Segment	Upstream Invert Level	Downstream Invert Level	Dimension		Slope	% of Full Capacity under the Peak Flow
			Length	Diameter		
Unit	mPD	mPD	m	mm	-	%
Catchment C						
Channel C-1	10.75	10.65	28.4	525	1 in 284	47.76%
Channel C-2	10.65	10.50	60.8	525	1 in 405	57.06%
Channel C-3	10.37	10.30	19.5	525	1 in 279	47.30%
Catchment D						
Channel D-1	10.55	10.52	6.1	525	1 in 203	63.81%
Channel D-2	10.52	10.39	26.5	525	1 in 204	63.89%
Channel D-3	10.39	10.28	21.4	525	1 in 195	62.42%
Channel D-4	10.28	9.98	59.4	525	1 in 198	62.97%
e	10.10	9.98	28.3	525	1 in 236	68.76%

Table 4.2: Technical Details of the Proposed Upgrade of the Natural Stream

Segment	Type of Channel	Dimension		Slope	% of Full Capacity under the Peak Flow
		Width	Height		
Unit	--	M	m	-	%
Natural Stream at the Centre of the Project Site – Discharge Point for all Catchment Area					
Stream at the Centre of Project Site - Centre Section under Access Road	Rectangular Concrete Structure	0.8	0.8	1 in 167	23.51%
Stream at the Centre of Project Site - Discharge Point	Rectangular Concrete Structure	0.8	0.8	1 in 167	23.51%

4.4 Construction and Maintenance

4.4.1 During construction stage, the Applicant shall ensure that no works, including any site formation works, shall be carried out adversely interfere with the free flow condition of the existing drains, channels and watercourses on or in the vicinity of the subject site any time during or after the works.

4.4.2 The proposed U-channel will intercept and deliver stormwater into the U-channels at the west and south of the Project Site and ultimately discharged into Ng Tung River. The maintenance of the proposed U-channels and catchpits shall be undertaken by the Applicant.

4.4.3 The Applicant shall rectify the system if it is found to be inadequate or ineffective during operation at his / her own expense, in addition to those within the Project Site.

4.4.4 In addition, the Applicant, and the successive lot owners, shall also:

a) make good all adjacent affected areas upon the completion of the drainage works;
b) allow all time free access for the Government and its agent to conduct site inspection on his completed drainage works; and
c) allow connections from the adjacent lots to be completed drainage works on Government Land when so required.

5. Conclusion

5.1.1 Consider the location is not a flooding black spot, the existing drainage channel, including the natural stream running through the Project Site and the ultimate discharge channel, Ng Tung River, are adequate to handle the stormwater discharge for the area. As the project will not increase the stormwater load to the drainage system within proximity of the Project Site, the drainage system after the implementation of the project will not be adversely affected.

5.1.2 Additional connecting U-channels and catchpits are required to collect the stormwater falls within the Project Site and divert to the public drainage network for discharge. Associated drainage proposal has been presented.

5.1.3 The Applicant will ensure the construction works be conducted in a manner that the works will not adversely interfere with the free flow condition of the existing drains, channels and watercourses on or in the vicinity of the subject site any time during or after the works.

Figures

Appendix 4.1:
Time of Concentration

Appendix 4.1:
Time of Concentration

Brandsby William's Equation

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

where:

t_c: time of concentration (min)

A: area of catchment (m^2)

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

L : distance in metre measured on the line of natural flow between the design section and that point of catchment from which water would take the longest time to reach the design section (m)

Catchment Time of Concentration Calculation

	A				H	L	t_c
	Area	High Point	Low Point	Length	Average Fall	Distance of line of natural flow	Time of Concentration
	m^2	m	m	m	m per 100m	m	min
Catchment-Full	11,373.50	28.2	10.7	379	4.617	379.0	15.867
Catchment A	1,989.40	15.8	12.5	95	3.474	95.0	5.012
Catchment B	4,306.90	12.9	11.9	96	1.042	96.0	5.965
Catchment C	2,362.90	11.5	11.1	74	0.541	74.0	5.567
Catchment D	2,714.30	11.3	10.7	116	0.517	116.0	8.683

Appendix 4.2:
Catchment Runoff Estimation for the Project Site

Appendix 4.2:
Catchment Runoff Estimation for the Project Site

Intensity Calculation:

Intensity-Duration-Frequency Relation:

$$i = \frac{a}{(t_d + b)^c} \times 116\%$$

where:
Constants used in the formula refers to Table 2a-d of the Stormwater Drainage Manual, Fifth Edition, January 2018

Location: HKO Headquarters
Return Period T: 50 Years
a: 505.5
b: 3.29
c: 0.355

NOTE:
1. Storm Constants for Return Periods of 50 Years for North District Area is used in the calculation
2. 16% has been added to allow a worse case scenario due to climate change

Intensity of Catchments:

	a	b	c	t_d, min	*i*
Catchment-Full	505.5	3.29	0.355	15.87	177.203
Catchment A	505.5	3.29	0.355	5.01	238.478
Catchment B	505.5	3.29	0.355	5.97	229.390
Catchment C	505.5	3.29	0.355	5.57	233.014
Catchment D	505.5	3.29	0.355	8.68	209.410

NOTE:
Assume: $t_d = t_c$

Runoff Estimation:

Rational Method

$$Q_p = 0.278 i \sum_{j=1}^{m} C_j A_j$$

Catchment	Site Area, m2	Percentage of Paved area	Fixed runoff coefficients		Runoff, m^3/s
			Paved	Unpaved	50 Year
Catchment ID					
Catchment-Full	11,373.5	100%	0.95	0.15	0.5323
Catchment A	1,989.4	100%	0.95	0.15	0.1253
Catchment B	4,306.9	100%	0.95	0.15	0.2609
Catchment C	2,362.9	59%	0.95	0.15	0.0951
Catchment D	2,714.3	100%	0.95	0.15	0.1501

Appendix 4.3:

Calculation of Pipe Capacity for the Proposed Discharge Segment for the Project Site

Appendix 4.3
Calculation of Pipe Capacity for the Proposed Discharge Segment for the Project Site

Manning Equation

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

Segment	Upstream Manhole	Downstream Manhole	Slope		Dimension				R	S_f	n	90% Full Capacity Velocity [2]	90% Full Capacity	Catchment Area	Catchment Flow Rate	% of Full Capacity under the Peak Flow of the Proposed Project
			Upstream Invert Level	Downstream Invert Level	Length	Diameter	Diameter	Area	Hydraulic Radius	Slope	Manning coefficient [1]					
			mPD	mPD	m	mm	m	m^2	m	-	$s/m^{1/3}$	m/s	l/s	-	l/s	%
Catchment A																
Channel A-1	--	CP17	10.75	10.60	28.3	525	0.525	0.216	0.13125	0.005	0.015	1.128	244.218	Catchment A	125.296	51.31%
Channel A-2	CP17	CP16	10.60	10.58	3.1	525	0.525	0.216	0.13125	0.006	0.015	1.245	269.439	Catchment A	125.296	46.50%
Channel A-3	CP16	CP15	10.58	10.37	40.9	525	0.525	0.216	0.13125	0.005	0.015	1.110	240.367	Catchment A	125.296	52.13%
Catchment B																
Channel B-1	CP6	CP7	10.55	10.39	32.5	600	0.600	0.283	0.15000	0.005	0.015	1.188	336.039	Catchment B	260.920	77.65%
Channel B-2	CP7	CP8	10.39	10.37	3.3	600	0.600	0.283	0.15000	0.006	0.015	1.319	372.846	Catchment B	260.920	69.98%
Channel B-3	CP8	CP9	10.37	10.30	13.1	600	0.600	0.283	0.15000	0.005	0.015	1.238	350.094	Catchment B	260.920	74.53%
Channel B-4	CP9	CP10	10.30	10.23	13.6	600	0.600	0.283	0.15000	0.005	0.015	1.215	343.598	Catchment B	260.920	75.94%
Channel B-5	CP10	CP11	10.23	10.21	4.3	600	0.600	0.283	0.15000	0.005	0.015	1.155	326.627	Catchment B	260.920	79.88%
Channel B-6	CP11	CP12	10.21	10.16	10.2	600	0.600	0.283	0.15000	0.005	0.015	1.186	335.317	Catchment B	260.920	77.81%
Channel B-7	CP12	CP13	10.16	10.13	5.7	600	0.600	0.283	0.15000	0.005	0.015	1.229	347.452	Catchment B	260.920	75.10%
Channel B-8	CP13	CP14	10.13	10.03	19.5	600	0.600	0.283	0.15000	0.005	0.015	1.213	342.968	Catchment B	260.920	76.08%
Catchment C																
Channel C-1	--	CP19	10.75	10.65	28.4	525	0.525	0.216	0.13125	0.004	0.015	0.920	199.052	Catchment C	95.070	47.76%
Channel C-2	CP19	CP1	10.65	10.50	60.8	525	0.525	0.216	0.13125	0.002	0.015	0.770	166.617	Catchment C	95.070	57.06%
Channel C-3	CP15	CP1	10.37	10.30	19.5	525	0.525	0.216	0.13125	0.004	0.015	0.928	200.982	Catchment C	95.070	47.30%
Catchment D																
Channel D-1	CP6	CP5	10.55	10.52	6.1	525	0.525	0.216	0.13125	0.005	0.015	1.087	235.246	Catchment D	150.115	63.81%
Channel D-2	CP5	CP4	10.52	10.39	26.5	525	0.525	0.216	0.13125	0.005	0.015	1.085	234.950	Catchment D	150.115	63.89%
Channel D-3	CP4	CP3	10.39	10.28	21.4	525	0.525	0.216	0.13125	0.005	0.015	1.111	240.500	Catchment D	150.115	62.42%
Channel D-4	CP3	CP2	10.28	9.98	59.4	525	0.525	0.216	0.13125	0.005	0.015	1.101	238.393	Catchment D	150.115	62.97%
Channel D-5	CP14	CP2	10.10	9.98	28.3	525	0.525	0.216	0.13125	0.004	0.015	1.008	218.304	Catchment D	150.115	68.76%

NOTE:

[1] For the Manning coefficient use for the proposed channel, the value for Cement mortar surfaces under bad condition is adopted.

[2] Consider the sedimentation, the pipes are considered to be at 90% of its full capcacity for worse case scenario

Appendix 4.4:
Calculation of the Capacity of the Natural Stream

Appendix 4.4
Calculation of the Capacity of the Stream at the Center of Project Site

Manning Equation

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

Segment	Dimension				R	S_f	n						
	Width	Height	Area	Wetted Perimeter	Hydraulic Radius	Slope	Manning coefficient [1]	90% Full Capacity Velocity [2]	90% Full Capacity	90% Full Capacity	Catchment Area	Catchment Flow Rate (l/s)	% of Full Capacity
	m	m	m^2	m	m	-	$s/m^{1/3}$	m/s	m3/s	l/s	-		%
Stream at the Center of Project Site - Centre Section under Access Road	0.8	0.8	1.131	1.500	0.28274	0.0060	0.015	2.002	2.264	2264.336	Catchment-Full	532.272	23.51%
Stream at the Center of Project Site - Discharge Point	0.8	0.8	1.131	1.500	0.28274	0.0060	0.015	2.002	2.264	2264.336	Catchment-Full	532.272	23.51%

NOTE:
[1] For the Manning coefficient use for the proposed channel, the value for Cement mortar surfaces under bad condition is adopted.
[2] Consider the sedimentation, the pipes are considered to be at 90% of its full capcacity for worse case scenario

Segment	Slope		Dimension		Slope	% of Full Capacity under the Peak Flow of the Proposed Project	
	Upstream Invert Level mPD	Downstream mPD	Length m	Diameter mm		%	
Catchment A							
Channel A-1	10.75	10.60	28.30	525	1 in 189	51.3%	**Dia: 525mmSlope: 1 in 189**
Channel A-2	10.60	10.58	3.10	525	1 in 155	46.5%	**Dia: 525mmSlope: 1 in 155**
Channel A-3	10.58	10.37	40.90	525	1 in 195	52.1%	Dia: 525mmSlope: 1 in 195
Catchment B							Dia: mmSlope:
Channel B-1	10.55	10.39	32.50	600	1 in 203	77.6%	Dia: 600mmSlope: 1 in 203
Channel B-2	10.39	10.37	3.30	600	1 in 165	70.0%	Dia: 600mmSlope: 1 in 165
Channel B-3	10.37	10.30	13.10	600	1 in 187	74.5%	Dia: 600mmSlope: 1 in 187
Channel B-4	10.30	10.23	13.60	600	1 in 194	75.9%	Dia: 600mmSlope: 1 in 194
Channel B-5	10.23	10.21	4.30	600	1 in 215	79.9%	Dia: 600mmSlope: 1 in 215
Channel B-6	10.21	10.16	10.20	600	1 in 204	77.8%	Dia: 600mmSlope: 1 in 204
Channel B-7	10.16	10.13	5.70	600	1 in 190	75.1%	Dia: 600mmSlope: 1 in 190
Channel B-8	10.13	10.03	19.50	600	1 in 195	76.1%	Dia: 600mmSlope: 1 in 195
Catchment C							Dia: mmSlope:
Channel C-1	10.75	10.65	28.40	525	1 in 284	47.8%	Dia: 525mmSlope: 1 in 284
Channel C-2	10.65	10.50	60.80	525	1 in 405	57.1%	Dia: 525mmSlope: 1 in 405
Channel C-3	10.37	10.30	19.50	525	1 in 279	47.3%	Dia: 525mmSlope: 1 in 279
Catchment D							Dia: mmSlope:
Channel D-1	10.55	10.52	6.10	525	1 in 203	63.8%	Dia: 525mmSlope: 1 in 203
Channel D-2	10.52	10.39	26.50	525	1 in 204	63.9%	Dia: 525mmSlope: 1 in 204
Channel D-3	10.39	10.28	21.40	525	1 in 195	62.4%	Dia: 525mmSlope: 1 in 195
Channel D-5	10.10	9.98	28.33	525	1 in 236	68.8%	Dia: 525mmSlope: 1 in 236

970.319

Table 3a – Storm Constants for Different Return Periods of HKO Headquarters

Return Period T (years)	2	5	10	20	50	100	200	500	1000
a	446.1	470.5	485	496	505.5	508.6	508.8	504.6	498.7
b	3.38	3.11	3.11	3.17	3.29	3.38	3.46	3.53	3.55
c	0.463	0.419	0.397	0.377	0.355	0.338	0.322	0.302	0.286

Table 3b – Storm Constants for Different Return Periods of Tai Mo Shan Area

Return Period T (years)	2	5	10	20	50	100	200
a	1743.9	2183.2	2251.3	2159.2	1740.1	1307.3	1005
b	22.12	27.12	27.46	25.79	19.78	12.85	7.01
c	0.694	0.682	0.661	0.633	0.57	0.501	0.434

Table 3c – Storm Constants for Different Return Periods of West Lantau Area

Return Period T (years)	2	5	10	20	50	100	200
a	2047.9	1994.1	1735.2	1445.6	1107.2	909.1	761.8
b	24.27	24.23	21.82	18.36	13.01	8.98	5.4
c	0.733	0.673	0.619	0.561	0.484	0.428	0.377

Table 3d – Storm Constants for Different Return Periods of North District Area

Return Period T (years)	2	5	10	20	50	100	200
a	439.1	448.1	454.9	462.3	474.6	486.6	501.4
b	4.1	3.67	3.44	3.21	2.9	2.67	2.45
c	0.484	0.437	0.412	0.392	0.371	0.358	0.348

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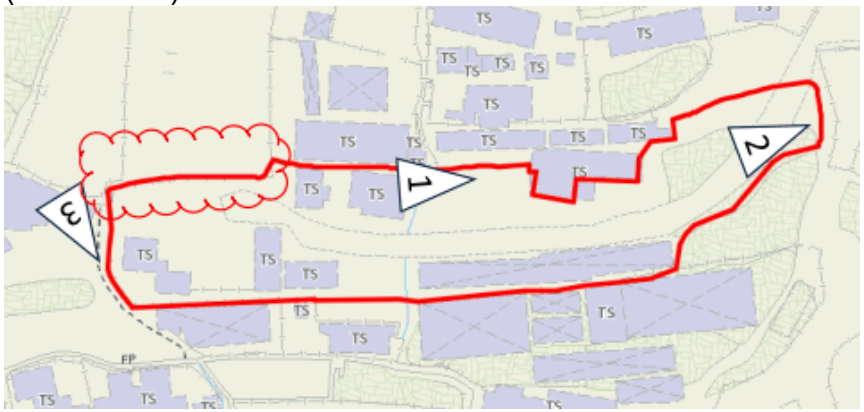
Response to Comment Table

Comments from Drainage Services Department **(Contact Person: Mr. Terence TANG; Tel.: 2300 1257)** I have the following comments on the submitted drainage proposal:		
(a) Inconsistency was observed in Para. 1.5.1 and 3.1.1.		Noted. The quoted guidelines have been aligned accordingly.
(b) Para. 4.2.1 – According to the latest issued Technical Note No. 1 – Technical Note to prepare a Drainage submission, the proposed size of drain appears to be undersized. Please review and upgrade as necessary.		Noted. The minimum size of the U-channel has been upgraded to 525mm. Associated assessments have been updated accordingly.
(c) Para. 4.4.1 – Please advise why form HBP1 is required as there is no direct connection to DSD drains.		Form HBP1 is not required for this drainage proposal. The section has been removed accordingly.
(d) Figure 2.2 - Please indicate clearly 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).		Noted. Site inspection has been conducted to identify the downstream of the discharge path until the ultimate discharge point. However, some of the areas are private area and is not accessible. Aerial pictures were taken and the discharge path is estimated through the aerial photo. **Figure 2.3** has been added to show the anticipated discharge to the ultimate discharge point channel SUP1001962. **Section 2.1.6** and **Section 2.2.1** have been updated accordingly.

(e) Figure 2.3 – More cross sections should be provided. The proposed/ existing drains should also be shown on sections. The sections should extend further to show the flow direction of the adjacent sites.		Noted. Additional cross sections have been added to **Figure 2.3**.
(f) Figure 2.4 – For photo 1, please provide and indicate in the report that adequate opening should be provided to intercept the existing overland flow passing through the site.		Noted. **Section 4.3.2** has been added to discuss the provision of U-Channel to intercept the overland flow entering the Project Site.
(g) Figure 2.4 – For photo 3, please clarify how the overland flow could pass through the site as there is concrete footing along the hoarding.		Noted. **Section 2.2.4** has been updated to discuss how the stormwater being directed into the centre of the project Site. **Figure 2.6** has been added accordingly.
(h) Figure 2.5 – Photo 2, please advise the size of underground pipe. Please provide evidence (such as CCTV record) to show the internal condition of existing pipe is acceptable. The alignment and details of the pipe should show on drainage layout plan as well.		Please note the pipe will be removed and upgraded in the proposed drainage arrangement. **Section 4.3.4** has been revised to discussed the upgrade accordingly.
(i) Figure 2.6 – All existing drainage network and details should be indicated on drainage plan.		The existing drainage network has been given in **Figure 2.2**.
(j) Figure 2.6 – Photo 3, please provide more details of the concerned drains as there is no drainage related item shown in the photo.		As the existing drainage system will not be retained after the works, no details of the existing drainage channels is available. The existing drainage network is given in **Figure 2.2** for reference.

(k) Figure 3.1 – Please provide photo record to show the grassland area, as it cannot be identified in the aerial photo in Figure 2.8.		Noted. The "Grassland" is the unpaved area used for cattle keeping. **Photo 2.4+** has been added to show the grassland area. **Section 3.2.4** has been updated accordingly.
(l) Figure 3.1 – Flow direction of the catchment areas and adjacent sites should be indicated.		Additional fall directions have been added to **Figure 3.1**.
(m) Figure 4.2 – Size and gradient of all proposed and existing drains should be shown on drainage plan for easy reference.		Noted. **Figure 4.2** has been updated accordingly.
(n) Figure 4.2 – All proposed discharge points should be clearly indicated on drainage plan.		Noted. **Figure 4.2** has been updated accordingly.
(o) Appendix 4.2 – Runoff coefficient of unpaved area is considered underestimated. Please justify the land characteristic as appropriate.		The area is considered sandy soil as shown in **Figure 2.6**. For more conservative assessment, 0.15 was used for the runoff coefficient of the unpaved area. **Appendix 4.2** has been updated accordingly.
(p) Appendix 4.4 – Please clarify which natural stream refers to. Please clarify what is mid-point and discharge point refer to. You are suggested to elaborate with showing more details in the drainage plan. Again, the most conservative section of the path should be adopted for assessment.		Noted. The natural stream refers to the stream at the centre of the Project Site. The wordings have been updated accordingly.
(q) R-to-C table – Please review the comment received date which should not be in 2017.		Noted. The typo has been updated accordingly.

(r) R-to-C (vii) – Please justify the size and dimension of existing natural stream.		The size and dimension of the existing stream is measured and assume the shape is trapezoid.
(s) R-to-C (viii) – The photo record along the proposed alignment of existing natural stream to the ultimate discharge point has not been provided.		Noted. **Figure 2.3** has been added to show the flow path from the natural stream towards the ultimate discharge point. As some of the area is private area, aerial photos is provided.
(t) R-to-C (x) – Please provide photo record for the general view of northwest area outside application site for reference (as clouded). 		Noted. Aerial photos are given in **Figure 2.6**. Please note the area is not accessible on ground.
(u) R-to-C No. 5 and para. 4.3.3 – As per your response, the existing pipe will be removed. Thus, please further elaborate in detail what measures/ structure would be proposed at the location of access road.		The section will be upgraded into a casted rectangular box culvert. The discussion has been given in **Section 4.3.4**.

(v) R-to-C No. 8 and Appendix 4.2 – Please review the location adopted for rainfall intensity calculations. Please refer to SDM for correct location adoption.		Noted. Reviewing the map in the SDM, rainfall density of HKO Observatory has been used. Associated calculations have been updated accordingly. **Section 4.3.7** has been updated accordingly.

Previous Comments

Comments received on 7 November 2024 via email (Contact Person: Mr. Terence TANG; Tel.: 2300 1257) I have the following comments on the submitted drainage proposal:		
(i) Please provide a R-to-C table addressing our comment below item to item.		Noted. This Response to Comment Table summarizes all responses to the comments received.
(ii) SDM Corrigendum No. 1/2022 should be considered.		Noted. the SDM Corrigendum No 1/2022 has been referenced. Assessment has been allowed additional rainfall allowance to accommodate the increment of rainfall due to climate change.
(iii) Appendix – Calculation – Please show detailed steps of runoff intensity estimation. Please advise the value with steps of to and tf. Please critically review the value of runoff intensity for application site runoff and existing natural stream.		Noted. Detailed calculations have been provided in **Appendix 4.1** to **Appendix 4.4**.

(iv) Please advise whether any site formation/land filling works to be carried out under this application. The development should neither obstruct overland flow nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc.		No site formation is required for the planning application.
(v) For Catchment B to D, please review the extent of each catchment area and check the hydraulic capacity of the proposed drainage facilities accordingly.		Noted. The catchments have been reviewed and calculations have been updated.
(vi) The existing drainage facilities, to which the stormwater of the development from the subject site would discharge, are not maintained by this office. DSD noticed that the proposed drainage connection(s) to the surrounding/downstream area(s) will run through other private lot(s). The applicant shall demonstrate that the proposed drainage construction / improvement / modification works and the operation of the drainage can be practicably implemented. The applicant(s) shall resolve any conflict/disagreement with relevant lot owner(s) and seek LandsD's permission for laying new drains/channels and/or modifying/upgrading existing ones in other private lots or on Government land (where required) outside the application site(s).		Noted. The local discharge channels have in place and discharge into the networks has been discussed with the local residents. The applicant will be responsible to ensure the drainage discharge can be practicably implemented, and resolve any conflict/disagreement with relevant lot owner(s).
(vii) Please provide photo(s) to justify the size and dimension of existing natural stream.		Noted. Photos have been provided in **Figure 2.4**.

(viii) Please clarify and indicate what the ultimate discharge points/facilities are and provide photo record along the alignment of existing natural stream to the ultimate discharge point for review.		All stormwater will ultimately discharge into SCP1009640 and Ng Tung River. The discussion has been included in **Section 2.2.2**.
(ix) U-channels should be provided from CP14 to CP2 and CP15 to CP1 to collect and intercept the runoff from the application site.		Noted. The U-Channel, namely Channel C-3 and Channel D-5, have been added accordingly.
(x) Please also provide photo record showing i) the tree protection zone, ii) the concrete wall erected by other land owner and iii) general view of northwest area outside application site. Please advise how the overland flow from adjacent area could be intercepted and collected by the proposed drainage facilities effectively.		Noted. Photos have been provided in **Figure 2.6** and **Figure 2.7**.
(xi) Sand trap or provision alike should be provided before the collected runoff is discharged to the public drainage facilities. Please clearly indicate on layout plan.		Noted. Provision of sand trap has been stated in **Section 4.2.2**.
Comments received on 24 March 2025 via email **Comments from Drainage Services Department** **(Contact Person: Mr. Terence TANG; Tel.: 2300 1257)**		
I have the following comment –		

1. Previous comment (i) has not been addressed. Please provide a R-to-C table addressing our comment below item to item in order to have a better tracking record.		Noted. The RtC Table has been prepared accordingly.
2. Para 3.1.1 - SDM Corrigendum No. 1/2024 should also be considered.		Noted. The SDM Corrigendum No. 1/2024 has been included in the referenced document.
3. Figure 4.1 - Channel size and gradient should be shown on drawing.		Noted. The information has been included in **Figure 4.2**.
4. Figure 4.1 - All proposed discharge points (with size and gradient) should be clearly indicated on drawing.		Noted. The information has been included in **Figure 4.2**.
5. Figure 4.1 - The dimension of existing stream/ pipes within the site should be well justified (with providing evidence) and indicated.		Existing pipes will be removed and the photo showing the condition of the stream has been included in **Figure 3.2**. Consider the condition of the stream, improvement works has been proposed and are discussed in **Section 4.3.3**.
6. Please make reference to the latest Technical Note No. 1 - Technical Note to prepare a Drainage Submission issued by DSD for more details in preparing the drainage proposal.		Noted. This drainage proposal has been updated with the necessary information included in **Table 1.1**.
7. Cross sections showing the existing and proposed ground levels of the captioned site with respect to the adjacent areas should be given.		Noted. The cross section has been given in **Figure 2.3**.

8. Appendix 4.2 - The title is incorrect. Besides, please advise why North District is adopted for assessment.		Noted. The appendix number has been updated. Consider the Project Site is located within the area of Kam Tin North, use of North District would be appropriate. **Section 4.2.5** has been updated accordingly.
9. Appendix 4.4 - Please justify with evidence the natural stream. The existing pipe inside the natural stream should be considered. The most conservative section of the path should be adopted for assessment. Please advise how to maintain and ensure no blockage of the pipe and natural stream. The condition of the said existing stream shown in the photos is considered not desirable. Please review if necessary upgrading works of the existing stream and pipe within the application site is required.		Existing natural stream is blocked by vegetation and the condition would be affected. The proposal will include the stream exit to ensure the exit would be sufficient to handle the discharge of the stormwater collected within the identified catchments. **Section 4.3.3** has been updated accordingly.
10. Figure 3.1 - Flow direction should be shown.		Noted. **Figure 3.1** has been updated accordingly.
11. All previous comments are still valid as there is no response table provided.		This RtC Table has included all previous comments.
12. The proposal should indicate how the runoff (the flow direction) within the site would be discharged to the proposed u-channel.		Noted. **Figure 3.1** has been updated to demonstrate the flow within the site.