

Appendix IV

Accepted Drainage Impact Assessment under Previous Application No. A/NE-FTA/247



規 劃 署

沙田、大埔及北區規劃處
香港新界沙田上禾輦路一號
沙田政府合署
十三樓 1301-1314 室



Planning Department

Sha Tin, Tai Po & North
District Planning Office
Rooms 1301-1314, 13/F,
Shatin Government Offices,
1 Sheung Wo Che Road, Sha Tin,
N.T., Hong Kong

來函檔號 Your Reference DD89 Lot 466 & VL
本署檔號 Our Reference () in TPB/A/NE-FTA/247
電話號碼 Tel. No. : 2158 6220
傳真機號碼 Fax No. : 2691 2806

By Email

R-riches Property Consultants Ltd.
Block D, The Richfield,
236 Kat Hing Wai, Kam Tin,
Yuen Long, New Territories
(Attn.: Louis Tse)

24 July 2025

Dear Sir/Madam,

Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land in “Agriculture” Zone, Various Lots in D. D. 89 and Adjoining Government Land, Man Kam To (Compliance with Approval Condition (c) for Planning Application No. A/NE-FTA/247)

I refer to your submissions received by this Office on 3.7.2025 and 18.7.2025 respectively for compliance with approval condition (c) in relation to the submission of a revised drainage impact assessment to the satisfaction of the Director of Drainage Services or of the Town Planning Board under the captioned planning application.

The Chief Engineer/Mainland North, Drainage Services Department (Contact person: Mr. Samuel WANG; Tel.: 2300 1135) has been consulted and considered that approval condition (c) has been complied with. Her advisory comments are attached at **Appendix I**. Please proceed to implement the flood mitigation measures and drainage facilities for compliance with approval condition (d).

Should you have any queries related to planning matters, please contact Ms. Shirley CHAN of this Office at 2158 6241.

Yours faithfully,

(Rico TSANG)

for Director of Planning



規 劃 署 35 周 年
Planning Department 35th Anniversary

劃 出 更 多 可 能 · 創 造 無 限 機 遇
Planning a Future of Boundless Opportunities

Appendix I

Comments of the Chief Engineer/Mainland North, Drainage Services Department (DSD) (Contact person: Mr. WANG Xing, Samuel; Tel. No.: 2300 1135):

1. No works which may induce drainage impact should be carried out until completion of the proposed drainage facilities including the storage tank. Please also be reminded to provide the emergency contact of the operator for the proposed storage tank in due course.
2. Should there be any construction works to be carried out, the applicant shall provide proper temporary drainage facilities and adequate precautionary measures to prevent contamination to the downstream watercourse and to prevent adverse drainage impacts to the neighborhood, particularly in rainy season. DSD shall carry out site audit on the temporary drainage system on need basis.
3. For works undertaken outside the application boundary, prior consent and agreement from the District Lands Officer/North, Lands Department and/or relevant private lot owners should be sought. The future maintenance issue should also be agreed with relevant private lot owners.
4. The applicant shall take all precautionary measures to prevent any disturbance, damage and pollution from the proposed use to any parts of the existing drainage system, especially the downstream watercourse proposed as discharge point, in the vicinity of the lots. In the event of any damage to the existing drainage facilities, the applicant shall be held responsible for the cost of all necessary repair works, compensation and any other consequences arising there from.
5. The applicant is required to construct and maintain the proposed drainage works properly and rectify the drainage systems if they are found to be inadequate or ineffective during operation. Regular maintenance should be carried out by the applicant to avoid blockage of drain. 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 systems.
6. The applicant is reminded that all existing flow paths as well as the run-off falling onto and passing through the application site (the Site) should be intercepted and disposed of via proper discharge points. The applicant shall also ensure that no works, including any site formation works, shall be carried out as may adversely interfere with the free flow condition of the existing drain, channels and watercourses on or in the vicinity of the Site any time during or after the works.
7. The applicant shall allow all time free access for the Government and its agent to conduct site inspection on his/her completed drainage works.
8. The applicant should also be advised that the limited desk-top checking by the Government on the drainage impact assessment covers only the fundamental aspects of the drainage design which will by no means relieve his/her obligations to ensure that:

- (i) the proposed drainage works will not cause any adverse drainage or environmental impacts in the vicinity; and
- (ii) the proposed drainage works and the downstream drainage systems have the adequate capacity and are in good conditions to receive the flows collected from his/her lots and all upstream catchments.

Our Ref.: DD89 Lot 466 & VL
Your Ref.: TPB/A/NE-FTA/247

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

By Email

18 July 2025

Dear Sir,

Compliance with Approval Condition (c)

**Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities
for a Period of 3 Years and Associated Filling of Land in "Agriculture" Zone,
Various Lots in D. D. 89 and Adjoining Government Land, Man Kam To, New Territories**

(S.16 Planning Application No. A/NE-FTA/247)

We are writing to submit a revised drainage impact assessment (DIA) for compliance with approval condition (c) of the subject application, i.e. *the submission of a revised DIA (Appendix I)*.

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

Yours faithfully,

For and on behalf of
R-riches Property Consultants Limited

Louis TSE
Town Planner

cc DPO/STN, PlanD

(Attn.: Ms. Shirley CHAN
(Attn.: Mr. Brian CHAN

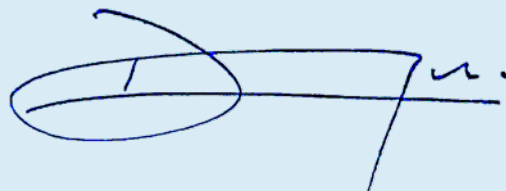
email: skkchan@pland.gov.hk)
email: bchchan@pland.gov.hk)



PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOFD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN “AGRICULTURE” ZONE, VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES

Drainage Impact Assessment

Jul 2025



Prepared by: YU Cheuk Yin Derek (RP0735920)



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1 Introduction

1.1 Background

- 1.1.1 The applicant seeks planning permission from the Town Planning Board (the Board) under Section (S.) 16 of the Town Planning Ordinance (Cap. 131) (the Ordinance) to use Various Lots in D.D. 89 and Adjoining Government Land (GL), Man Kam To, New Territories (the Site) for 'Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities for a Period of 3 Years and Associated Filling of Land'.
- 1.1.2 This report aims to support the development in drainage aspect.

1.2 Application Site

- 1.2.1 The application site is situated beside Man Kam To Road and Law Wo Station Road. It has an area of approx. 16,256 m². The site location is shown in **Figure 1**.
- 1.2.2 The existing site is mainly cover with vegetation with level various from approx. +5.0 to + 6.5mPD. The proposed site intent to fill to +7.5mPD to match with entrance level and for formation of structures, parking, L/UL spaces and circulation.
- 1.2.3 The surrounding site levels are mainly higher along the Man Kam To Road at approx. + 5.5 to + 8.1 mPD at the east. The site levels are generally lower at the north and west at approx. +2.9 to + 4.0 mPD.
- 1.2.4 There are existing watercourse surrounding the proposed site, collecting runoff near Man Kam To Road which has generally higher ground level. The proposed site is minimum 3m away from the existing watercourse. **Figure 2** indicates the existing drainage system of the area.
- 1.2.5 According to the topo information, there is an area with ground level of approximate +4mPD which may provide flood storage during rainfall event. An area is identified as wetland area. The wetland area is proposed to be maintained. The existing levels, proposed levels and wetland area are shown in **Figure 4-1**.

2 Development Proposal

2.1 The Proposed Development

2.1.1 The total site area is approximately 16,256 m². The existing site area is mainly covered by vegetation.

2.1.2 After the development the site will be fully paved. The catchment plan is shown in **Figure 4-2**.

Proposed Development	
Total Site Area (m ²)	16,256
Paved Area after Development (m ²)	16,256

Table 1 – Site Development Area

3 Assessment Criteria

3.1.1 The Recommended Design Return Period based on Flood Level from SDM (Table 10) is adopted for this report. The recommendation is summarized in **Table 2** below.

Description	Design Return Periods
Intensively Used Agricultural Land	2 – 5 Years
Village Drainage Including Internal Drainage System under a polder Scheme	10 Years
Main Rural Catchment Drainage Channels	50 Years
Urban Drainage Trunk System	200 Years
Urban Drainage Branch System	50 Years

Table 2– Design Return Periods under SDM

3.1.2 The proposed drainage system intended to collect runoff from internal site and external catchment. 1 in 10 years return period is adopted for the drainage design.

3.1.3 Stormwater drainage design will be carried out in accordance with the criteria set out in the Stormwater Drainage Manual published by DSD. The proposed design criteria to be adopted for design of this stormwater drainage system and factors which have been considered are summarised below.

1. Intensity-Duration-Frequency Relationship – The Recommended Intensity-Duration-Frequency relationship is used to estimate the intensity of rainfall. It can be expressed by the following algebraic equation.

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

The site is located within the North District Zone. Therefore, for 10 years return period, the following values are adopted.

a	=	454.9
b	=	3.44
c	=	0.412

2. The peak runoff is calculated by the Rational Method
i.e. $Q_p = 0.278CiA$

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

3. The run-off coefficient (C) of surface runoff are taken as follows:

1. Paved Area: C = 0.95
2. Unpaved Area: C = 0.35

4. Manning's Equation is used for calculation of velocity of flow inside the channels:

$$\text{Manning's Equation: } v = \frac{R^{\frac{1}{6}}}{n} R^{\frac{1}{2}} S_f^{\frac{1}{2}}$$

Where,

V = velocity of the pipe flow (m/s)

S_f = hydraulic gradient

n = manning's coefficient

R = hydraulic radius (m)

5. Colebrook-White Equation is used for calculation of velocity of flow inside the pipes:

$$\text{Colebrook-White Equation: } \frac{v}{R} = -\sqrt{32gRS} \log \log \left(\frac{k_s}{14.8R} + \frac{1.255v}{R\sqrt{32gRS}} \right)$$

where,

V = velocity of the pipe flow (m/s)

S_f = hydraulic gradient

k_f = roughness value (m)

v = kinematics viscosity of fluid

D = pipe diameter (m)

R = hydraulic radius (m)

6. Volume of Drainage Detention Tank:

Extreme Rainfall intensity (1 in 10 yr) at North District Area for rainfall duration of 240 mins, I = 44.5 mm/hr

4 hours rainfall duration is adopted

4 Proposed Drainage System

4.1. Proposed Storage Tank

- 4.1.1 Additional runoff is generated due to the change of hard pavement ratio. Storage tank is proposed to collect the additional runoff from the site, such that there is no drainage impact to the nearby area.
- 4.1.2 The storage tank is proposed to collect the additional runoff for a 1 in 10 year rainfall event for 4 hours. The volume of existing suspected flood storage is also considered in the storage tank design (suspected flood storage area refer to **Figure 4-1**). As per the design for volume of storage tank shown in **Appendix A2**, the total storage volume of the storage tank is proposed to be not less than 1,542 m³.
- 4.1.3 At the beginning of rainstorm event, runoff would first be discharged to manhole A by Orifice in CP1.12, and it would discharge to existing stream (the orifice flow to manhole A is designed to not more than existing flow, see **Appendix E**). The excessive flow would be stored in the storage tank. According to the checking in **Appendix E**, the freeboard would be maintained not less than 500mm. The arrangement between manhole A, CP1.12 and storage tank are shown in **Figure 7**.
- 4.1.4 An interconnection pipe is proposed between IL of storage tank and manhole A, and the flow is controlled by a penstock. The operation mechanism are as followings:-
- I. The storage tank to be emptied and the penstock to be closed before rainfall event.
 - II. The penstock to be kept close during rainfall event. The rainwater would be discharged by orifice and excessive water to be overflow to storage tank.
 - III. Withing 8 hours after rainfall event, by opening the penstock, the water in the storage tank to be drained off to Manhole A and eventually discharge to existing watercourse downstream by gravity. The penstock to be closed after drain off.

4.2. Proposed Channels

- 4.2.1 Proposed channels are designed for collection of runoff for internal and external catchment. They are proposed to connect to proposed storage tank and manhole A. The arrangement between manhole A, CP1.12 and storage tank are shown in **Figure 7**. They are then connected to the intersection point of existing northern and southern watercourse.
- 4.2.2 The design calculations of proposed UChannel are shown in **Appendix A1**.
- 4.2.3 The alignment, size, gradient and details of the proposed drains are shown in **Figure 3**. The catchment plan is shown in **Figure 4-2**.
- 4.2.4 Reference Drawings are shown in **Appendix C** for reference.

4.3 Other Improvement Works

- 4.3.1 As discussed with DSD, assessment on existing watercourse and catchments has been conducted. The updated catchment plan is shown in Figure 4-2, the updated calculation is Appendix A1.
- 4.3.2 The existing approx. 2m width watercourse at eastern and southern site is capable to carry the runoff from existing external catchment (B3, C1, C2 and C3). It serves to carry the external runoff as per existing conditions.
- 4.3.3 External upstream catchments were studied (C1, C2, C3) as presented in updated catchment plan Figure 4-2 and Appendix A1. Relevant channels are proposed by the side of existing watercourse (Figure 3). An 525mm dia. pipe is proposed across the site from east to west to provide additional flow path/capacity between eastern catchments to western receiving body. The proposed channels and 525mm dia. pipe could carry the external runoff if there is any overflow from the existing watercourse.
- 4.3.4 Further to the discussion with DSD, assessment for flow and capacity of existing northwestern watercourse has been conducted. The catchment plan and flow estimation are shown in Appendix F and A respectively. Assessment of capacity is also shown in Appendix F. It is proposed to widen the existing watercourse to 3.7m.
- 4.3.5 The Application Site is considered have no adverse impact to the existing northwestern watercourse due to the followings:-
- The existing site levels are generally higher than the watercourse. The levels of the surrounding are generally falling from east to the west.
 - The proposed site would collect the runoff (which originally fall to watercourse) and discharge to the downstream of the existing northwestern watercourse.
 - The proposed wetland area could serve as buffer area.

With the improvement works, the northwestern watercourse drainage conditions would be improved.

5 Temporary Drainage System

- 5.1.1 Temporary drainage system to cater for the proposed site formation works and drainage work. **Figure T-1** showing the temporary drainage system and summarized as followings:-

Stage 1

1. Provision of temporary storage area with volume not less than 1095 m³ at site low point.
2. Provision of temporary channel and/or flow path at local low point to convey runoff to temporary storage area.
3. Run off should be treated to prevent muddy water from being discharged to existing watercourse.
4. If temporary slope sloping outward is unavoidable, slope surface to be covered with plastic sheet or shotcrete to avoid muddy runoff.

Stage 2

1. Construction of proposed drainage system and site formation works.
2. Followed by construction of proposed works, temporary drainage system in stage 1 to be maintained and updated to suit with construction works.

Stage 3

1. After completion of proposed drainage system, site runoff to be conveyed to proposed drainage system.
2. Temporary drainage system to be removed.

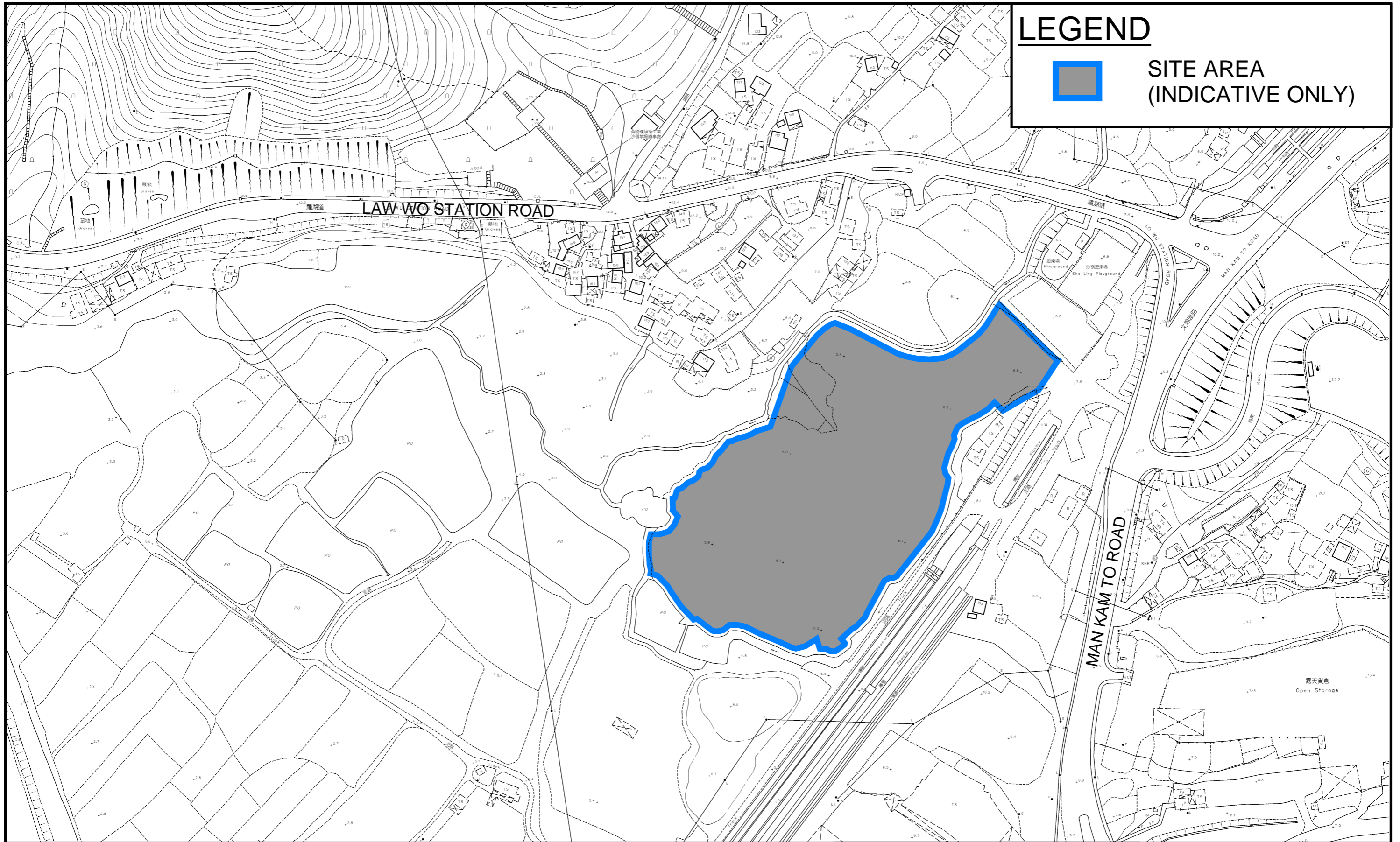
- 5.1.2 In addition, emergency standby pump is proposed such that it could be deployed to carry the flow to downstream if existing watercourse is found to insufficient capacity in the emergency situation.

6 Conclusion

- 5.1.1 Drainage review has been conducted for the Proposed Development. Storage tank, orifice and channels are proposed to mitigate the drainage impact to the nearby area. Temporary drainage system is proposed to minimize the drainage impact during construction stage.
- 5.1.2 With implementation of the above drainage system, no unacceptable drainage impact is anticipated.

- End of Text -

FIGURES



LEGEND



**SITE AREA
(INDICATIVE ONLY)**

PROJECT:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE

SITE LOCATION PLAN

FIGURE NUMBER

FIGURE 1

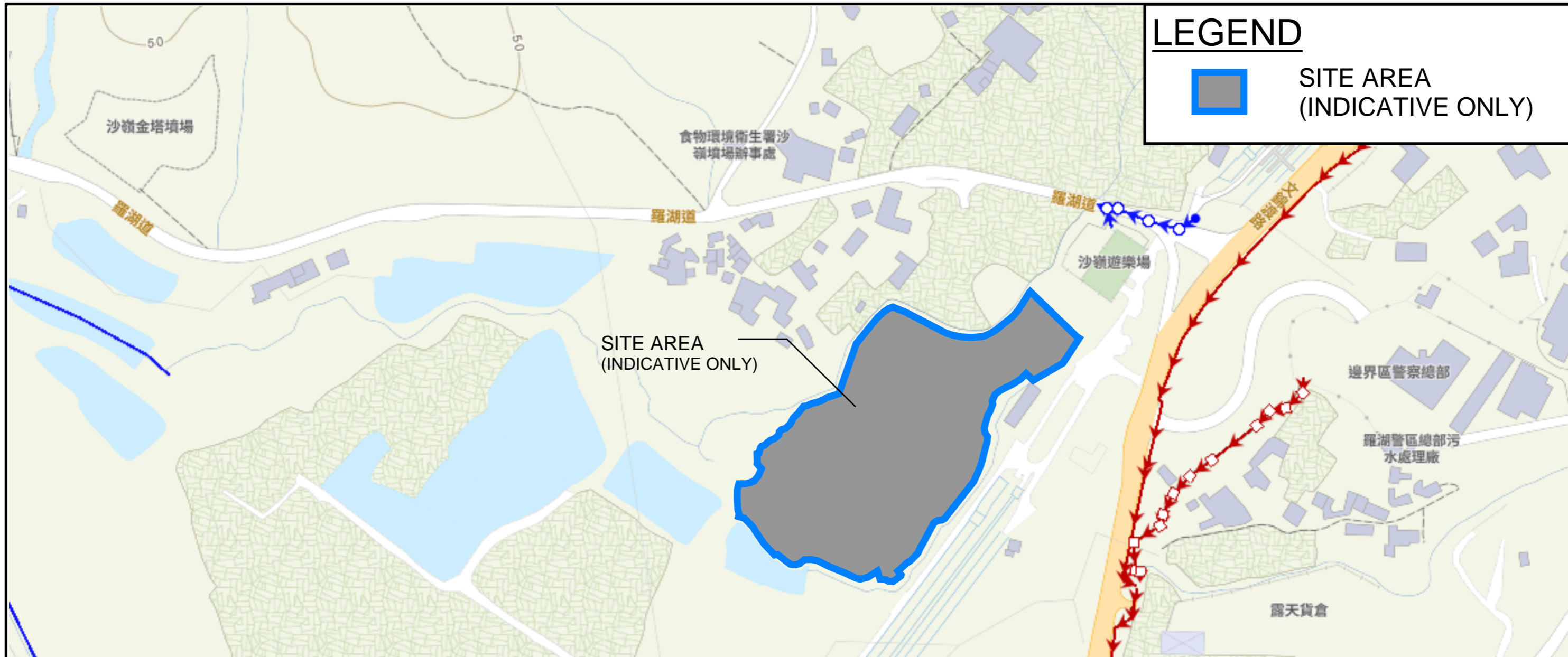
LOCATION:

VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



MARVELLOUS
CONSTRUCTION & DESIGN COMPANY LIMITED























VER	DESCRIPTION	DATE



LEGEND

 SITE AREA (INDICATIVE ONLY)

LEGEND:

 Combined Manhole	 Tapping Point (Sewer)	 Tapping Point (Storm)
 Overflow (Combined)	 Sewer Terminal Manhole	 Storm Water Terminal Manhole
 Pipe (Combined)	 Catchpit	 Tunnel Protection Zone (100m / 200m)
 Interface Valve Chamber	 Inlet	 Tunnel Protection Zone (General Range)
 Sewer Manhole	 Storm Water Manhole	 Tunnel / Box Culvert (Sewer)
 Oil / Petrol Interceptor	 Outlet	 Tunnel / Box Culvert (Storm)
 Overflow (Sewer)	 Pipe (Storm)	
 Pipe (Sewer)	 Sand Trap	

PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE
 EXISTING DRAINAGE PLAN







FIGURE NUMBER
 FIGURE 2

LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



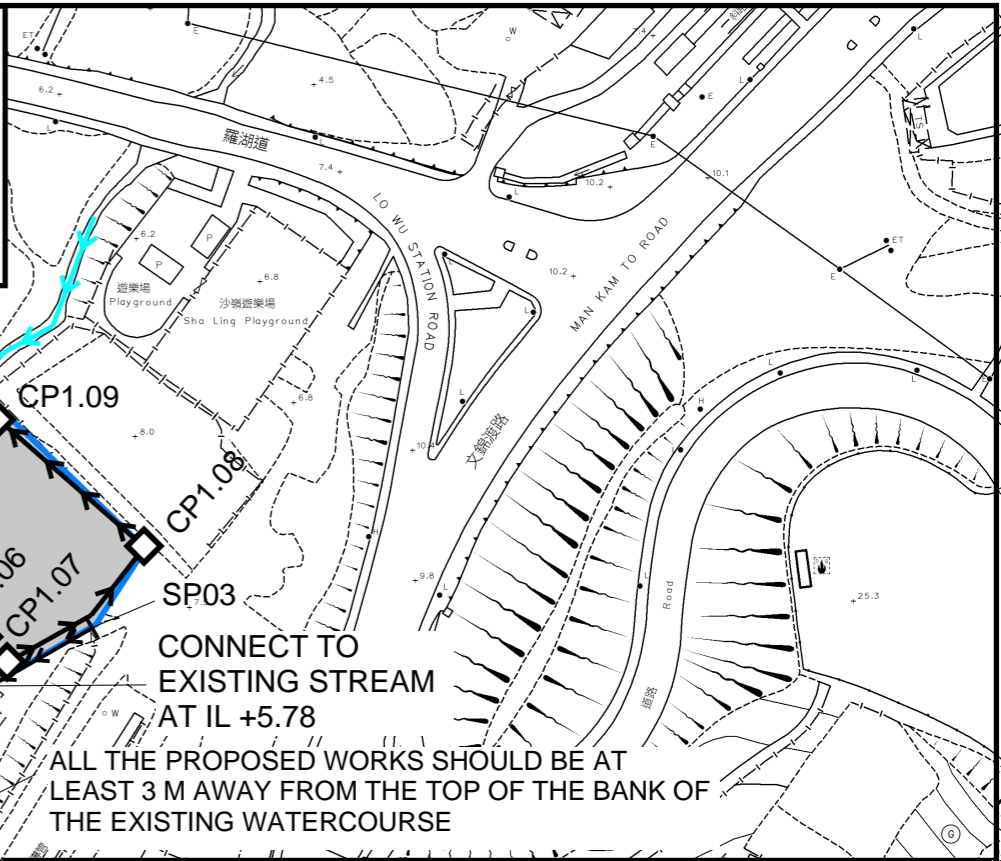
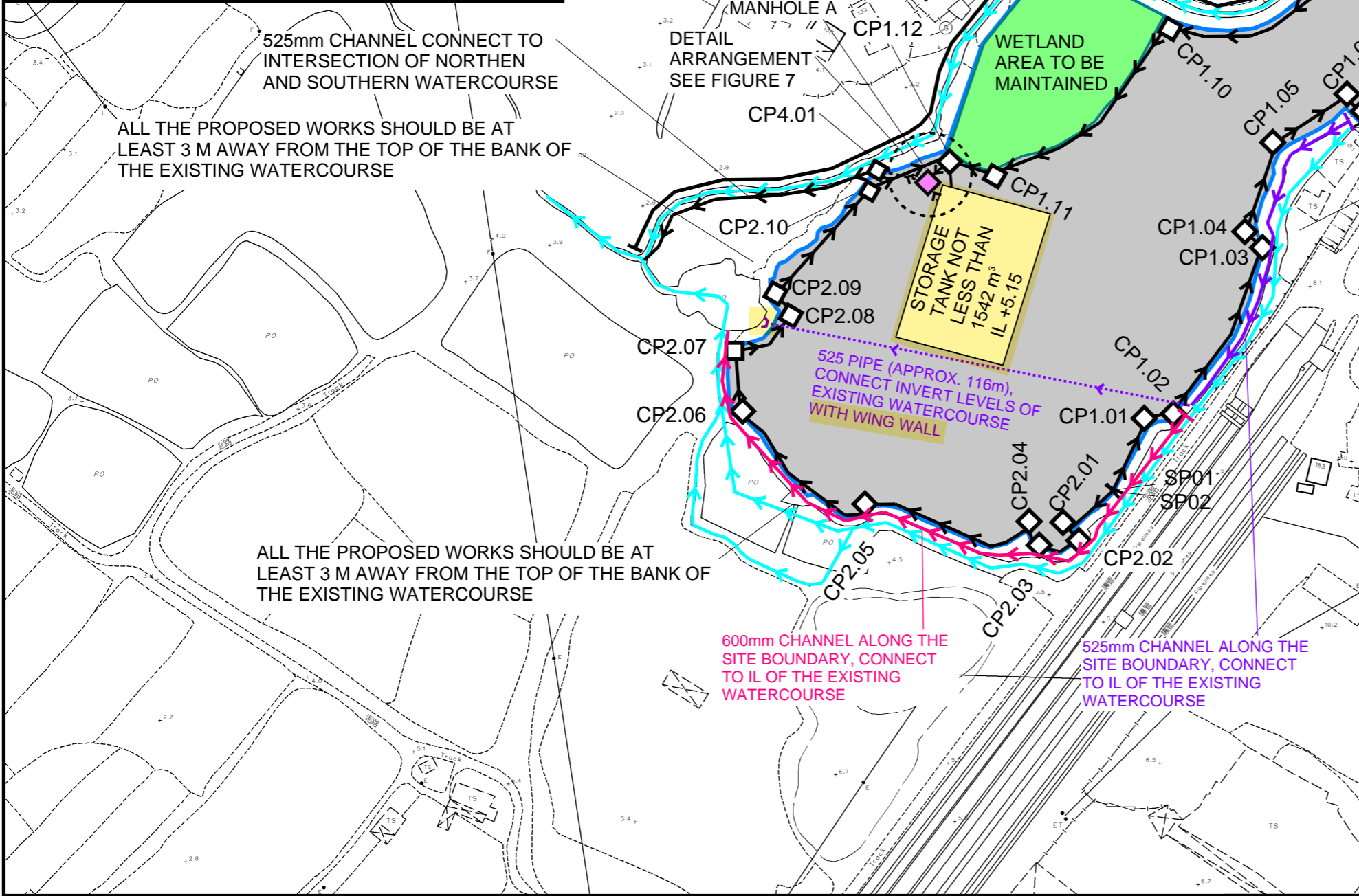
VER	DESCRIPTION	DATE

LEGEND

-  SITE AREA (INDICATIVE ONLY)
-  EXISTING WATERCOURSE
-  PROPOSED CHANNEL
-  PROPOSED PIPE
-  PROPOSED CATCHPIT
-  MANHOLE A (TYPE F1)

NOTES:

- ALL LEVELS ARE IN METRES TO HONG KONG PRINCIPAL DATUM (m.P.D.) UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- LOCATION OF CATCHPITS ARE APPROX. ONLY.
- CONNECTION LEVELS ARE APPROX. ONLY AND SHALL BE VERIFIED ON SITE.



DRINAGE SCHEDULE

US MH/PIT	DS MH/PIT	US GL	DS GL	Size mm	Gradient 1 in	Type	US IL	DS IL	U/S MH/PIT TYPE#	Remark
SP01	CP1.01	7.5	7.5	525	300	UC	6.98	6.90	SP	#SP: Start Point
CP1.01	CP1.02	7.5	7.5	525	300	UC	6.90	6.88	CP	
CP1.02	CP1.03	7.5	7.5	525	300	UC	6.88	6.71	CP	
CP1.03	CP1.04	7.5	7.5	525	300	UC	6.71	6.69	CP	
CP1.04	CP1.05	7.5	7.5	600	300	UC	6.69	6.60	CP	
CP1.05	CP1.06	7.5	7.5	600	300	UC	6.60	6.53	CP	
CP1.06	CP1.07	7.5	7.5	600	300	UC	6.53	6.51	CP	
CP1.07	CP1.08	7.5	7.5	600	300	UC	6.51	6.40	CP	
CP1.08	CP1.09	7.5	7.5	675	300	UC	6.40	6.27	CP	
CP1.09	CP1.10	7.5	7.5	675	300	UC	6.27	6.07	CP	
CP1.10	CP1.11	7.5	7.5	675	300	UC	6.07	5.85	CP	
CP1.11	CP1.12	7.5	7.5	675	300	UC	5.85	5.82	CP	
CP1.12	STORAGE TANK	7.5	7.5	525	100	UC	6.48	6.43	CP	Overflow Channel to Storage Tank
										Arrangement between Manhole A, CP1.12 and Storage Tank refer to Figure 7
SP02	CP2.01	7.5	7.5	450	300	UC	7.05	7.00	SP	
CP2.01	CP2.02	7.5	7.5	450	300	UC	7.00	6.99	CP	
CP2.02	CP2.03	7.5	7.5	450	300	UC	6.99	6.94	CP	
CP2.03	CP2.04	7.5	7.5	450	300	UC	6.94	6.93	CP	
CP2.04	CP2.05	7.5	7.5	450	300	UC	6.93	6.77	CP	
CP2.05	CP2.06	7.5	7.5	450	300	UC	6.77	6.61	CP	
CP2.06	CP2.07	7.5	7.5	600	300	UC	6.61	6.56	CP	
CP2.07	CP2.08	7.5	7.5	600	300	UC	6.56	6.49	CP	
CP2.08	CP2.09	7.5	7.5	600	300	UC	6.49	6.47	CP	
CP2.09	CP2.10	7.5	7.5	600	300	UC	6.47	6.34	CP	
CP2.10	CP1.12	7.5	7.5	600	300	UC	6.34	6.26	CP	
SP03	EXISTING STREAM	7.5	6.0	225	40	UC	7.28	5.78	SP	
MANHOLEA	CP4.01	7.5	7.5	450	76	PIPE	4.57	4.33	F1	

PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE
 PROPOSED DRAINAGE SYSTEM

FIGURE NUMBER
 FIGURE 3

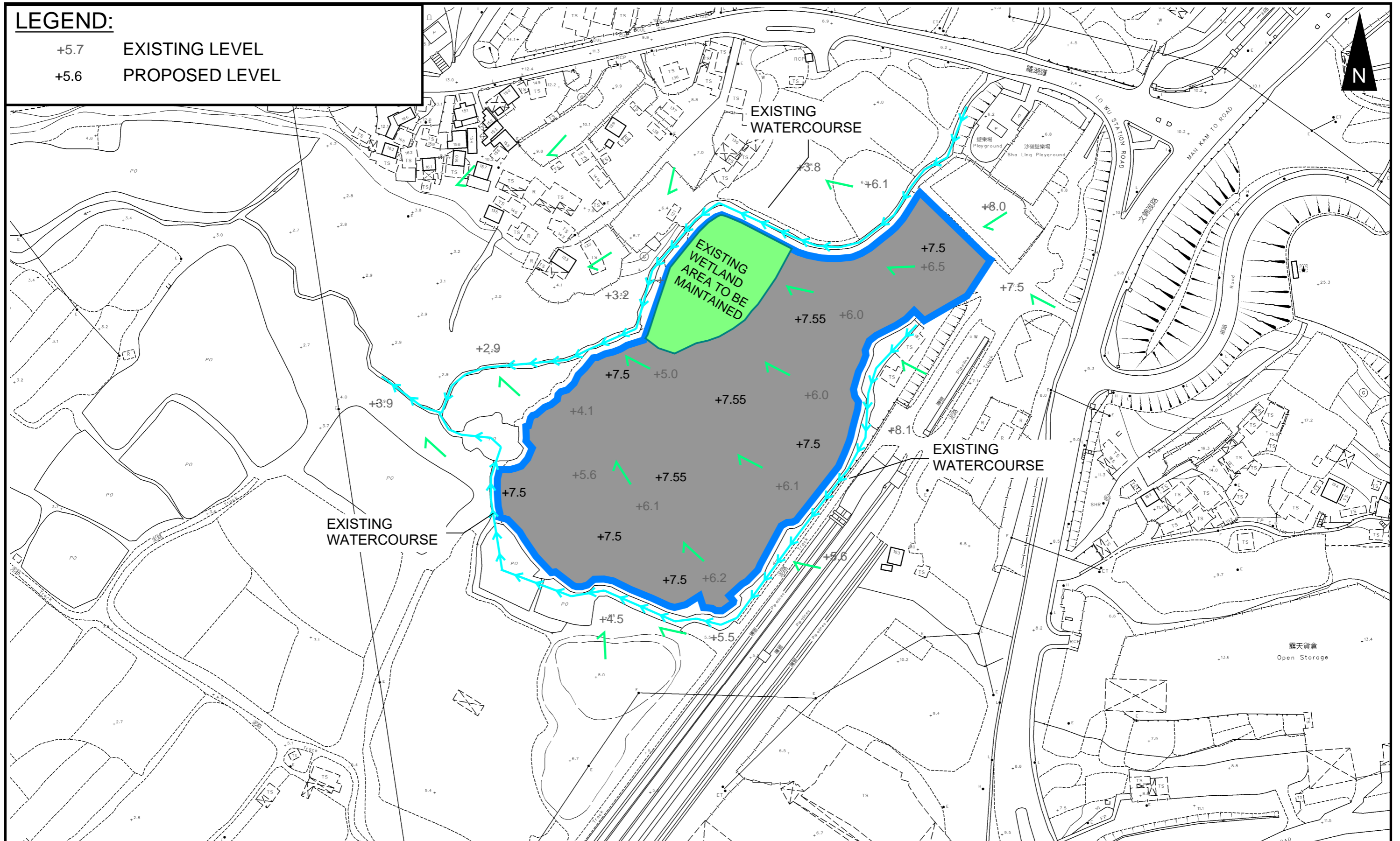
LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE

LEGEND:

- +5.7 EXISTING LEVEL
- +5.6 PROPOSED LEVEL



PROJECT:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE

EXISTING WETLAND AREA

FIGURE NUMBER

FIGURE 4-1

LOCATION:

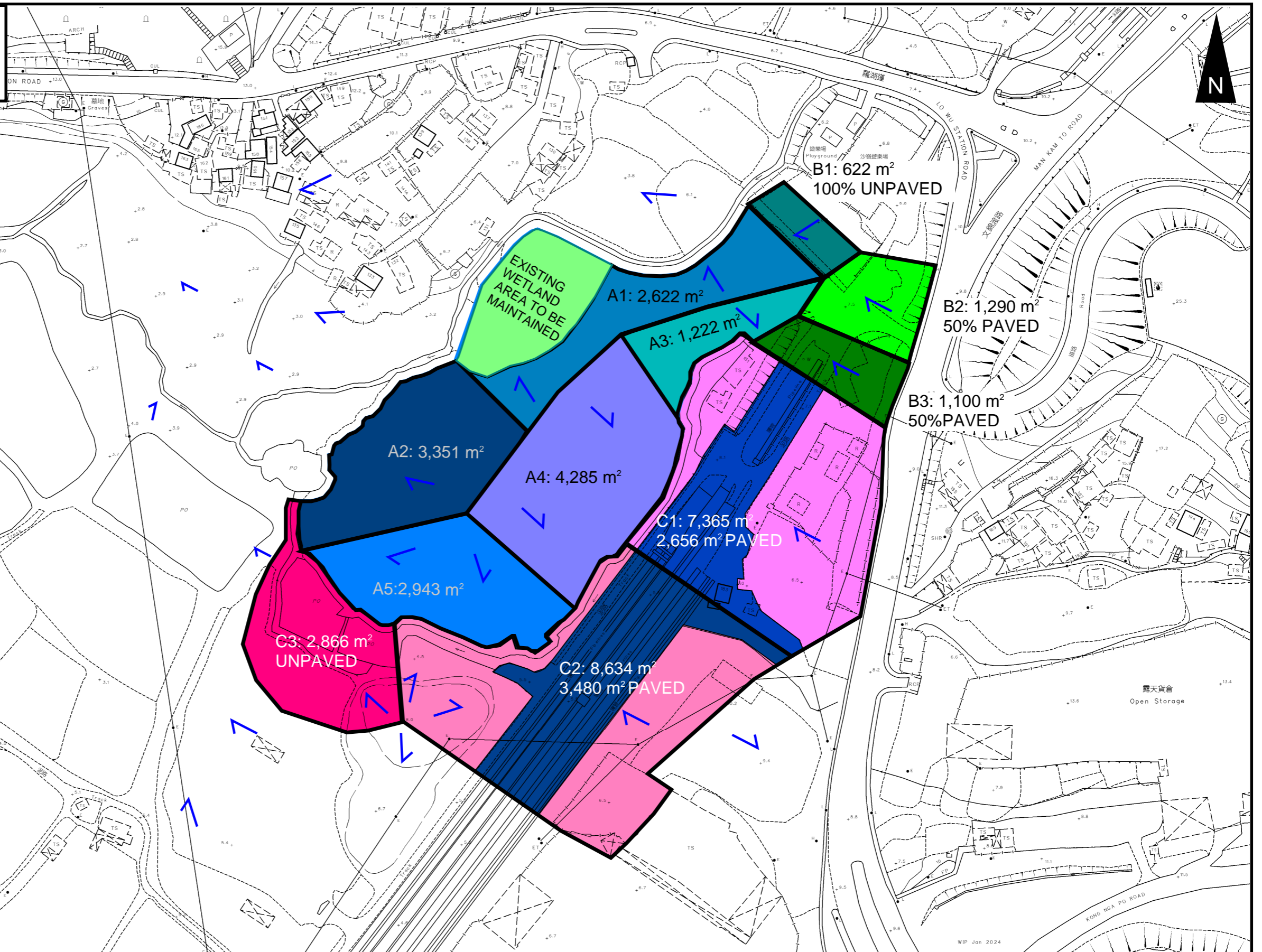
VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE

LEGEND:

→ FALL



PROJECT:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE
CATCHMENT PLAN

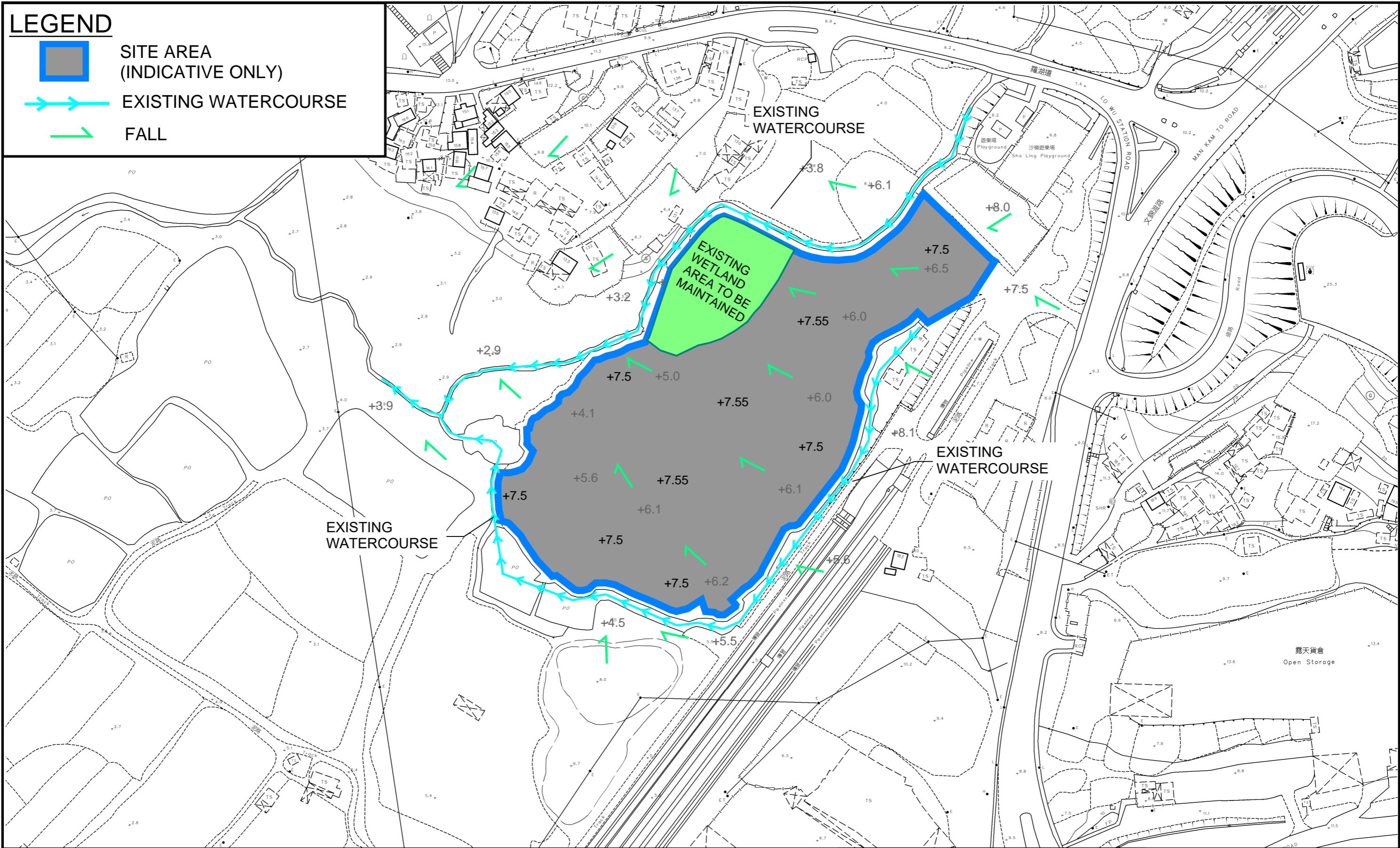
FIGURE NUMBER
FIGURE 4-2

LOCATION:

VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE



PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE
 EXISTING DRAINAGE LAYOUT PLAN

FIGURE NUMBER
 FIGURE 5

LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES

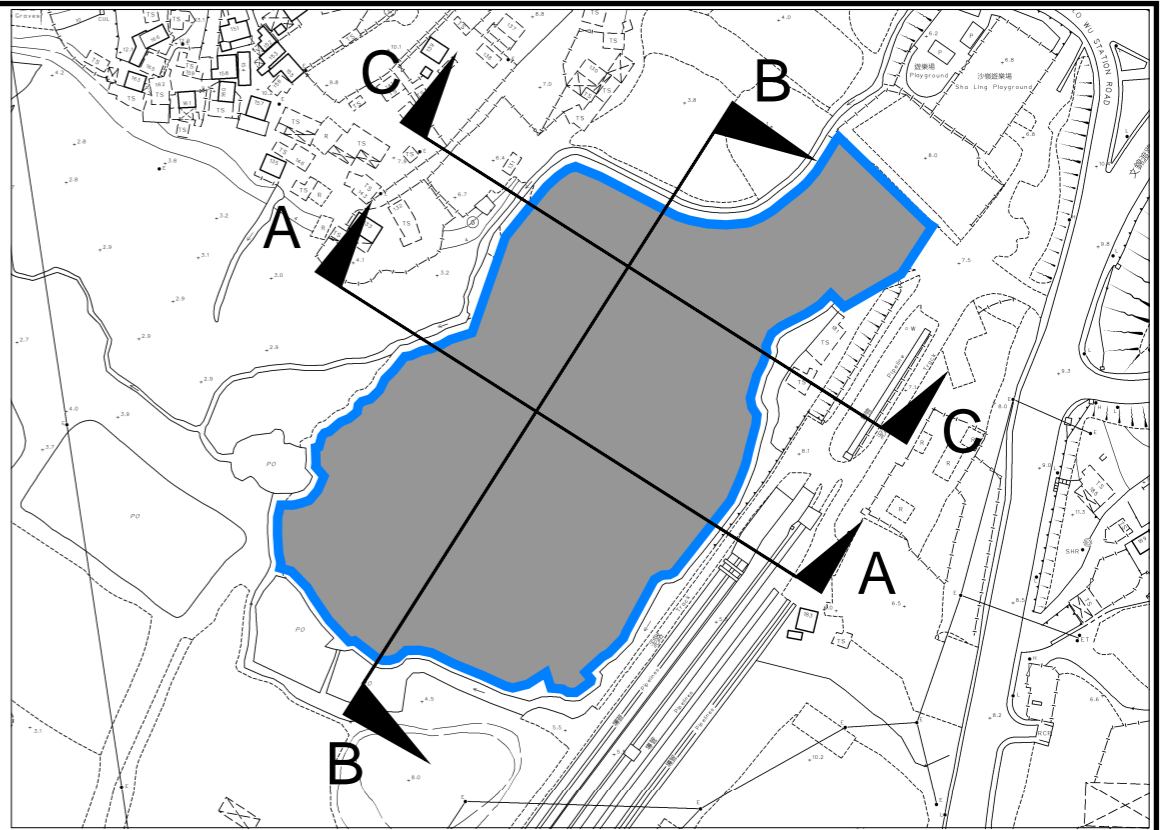
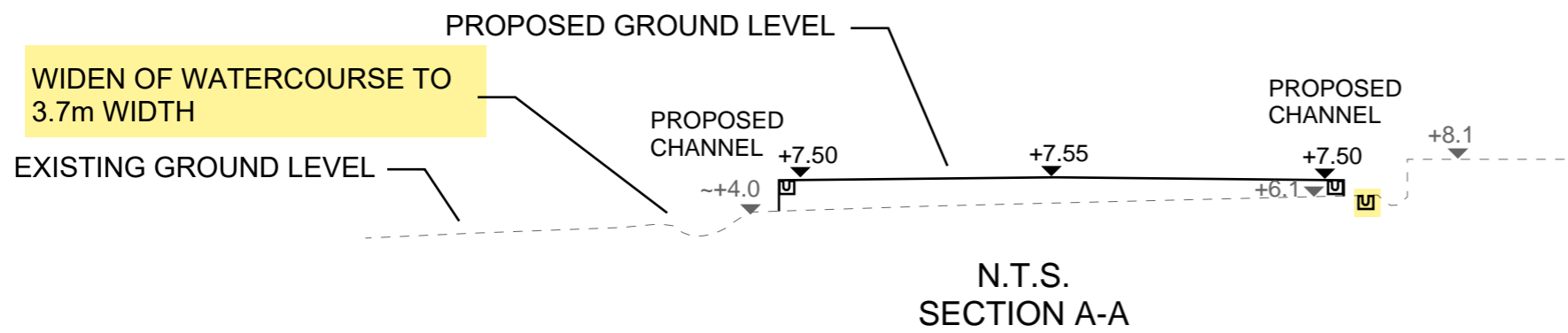


VER	DESCRIPTION	DATE

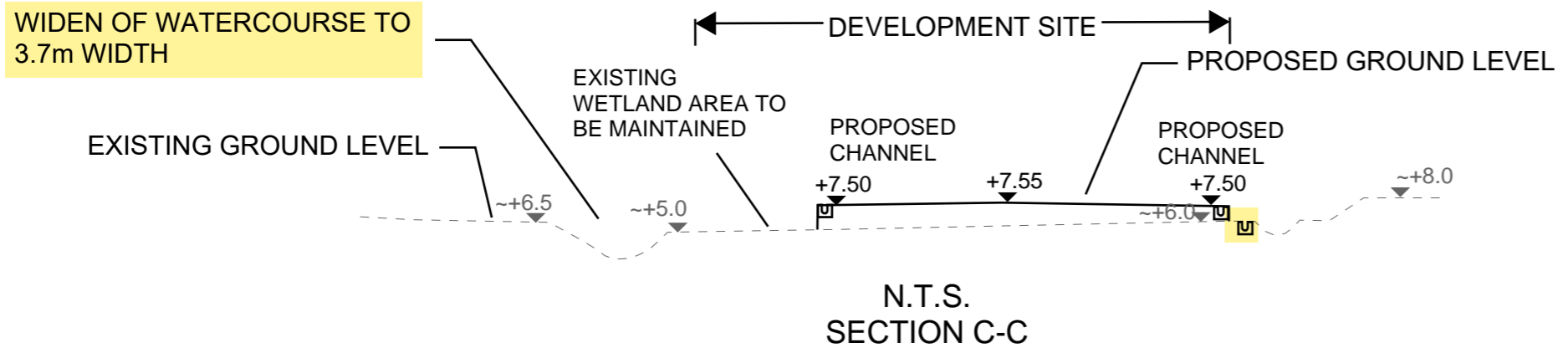
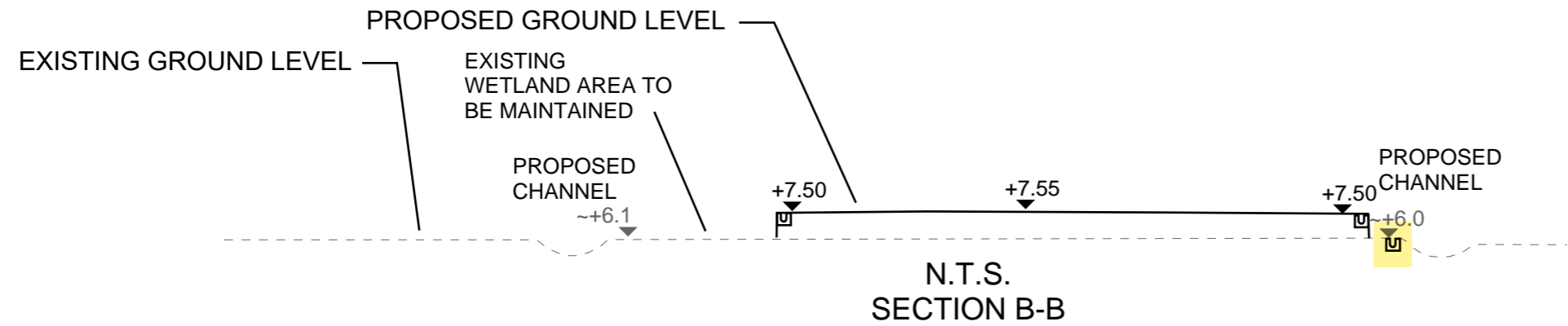
LEGEND

 SITE AREA (INDICATIVE ONLY)

← DEVELOPMENT SITE →



← DEVELOPMENT SITE →



PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

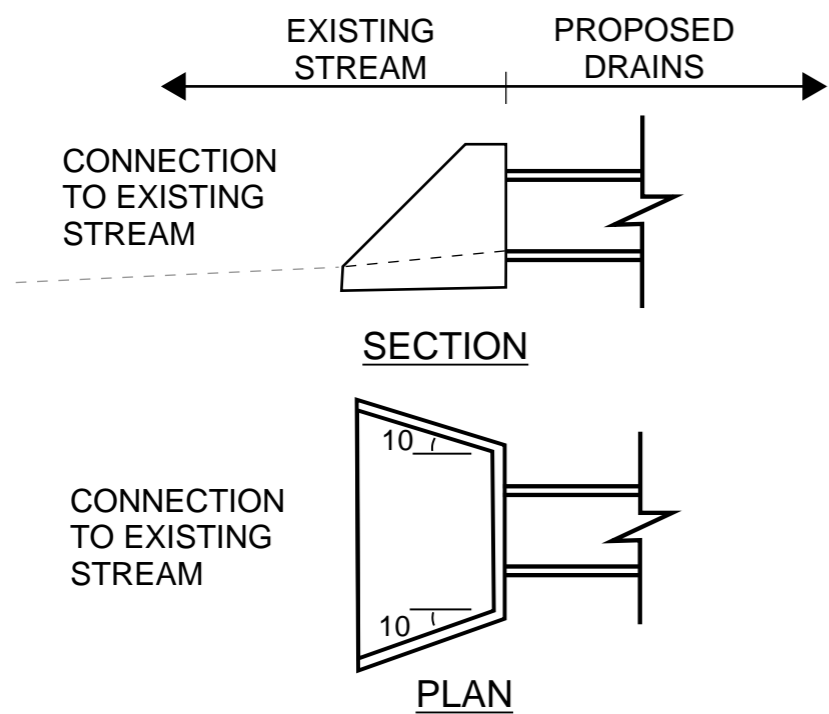
TITLE
 SECTIONS

FIGURE NUMBER
 FIGURE 6

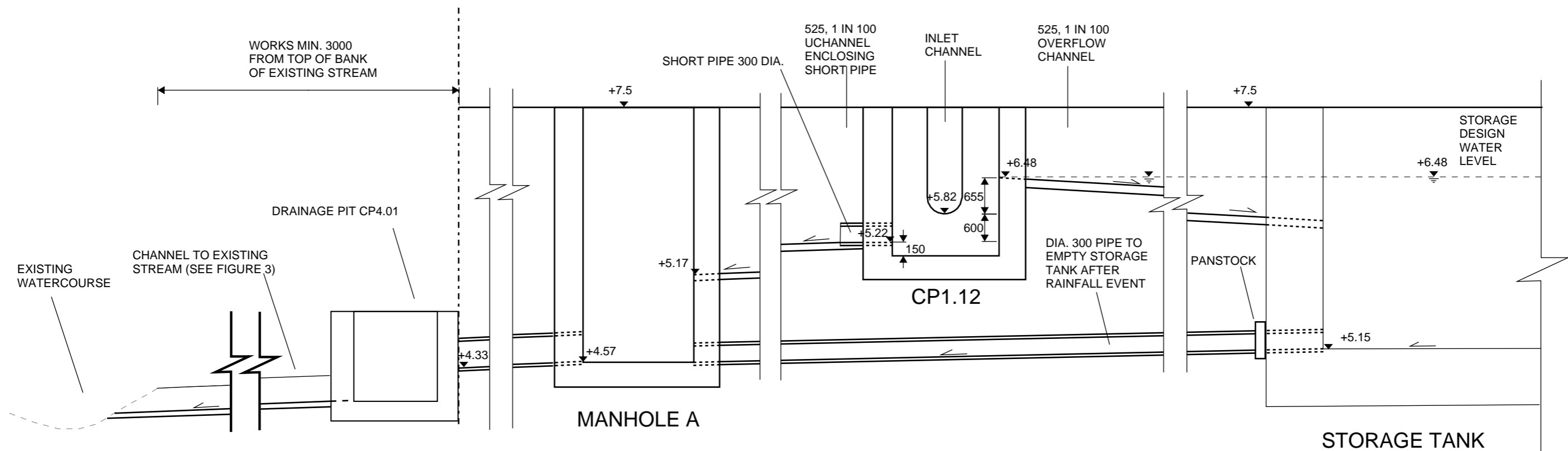
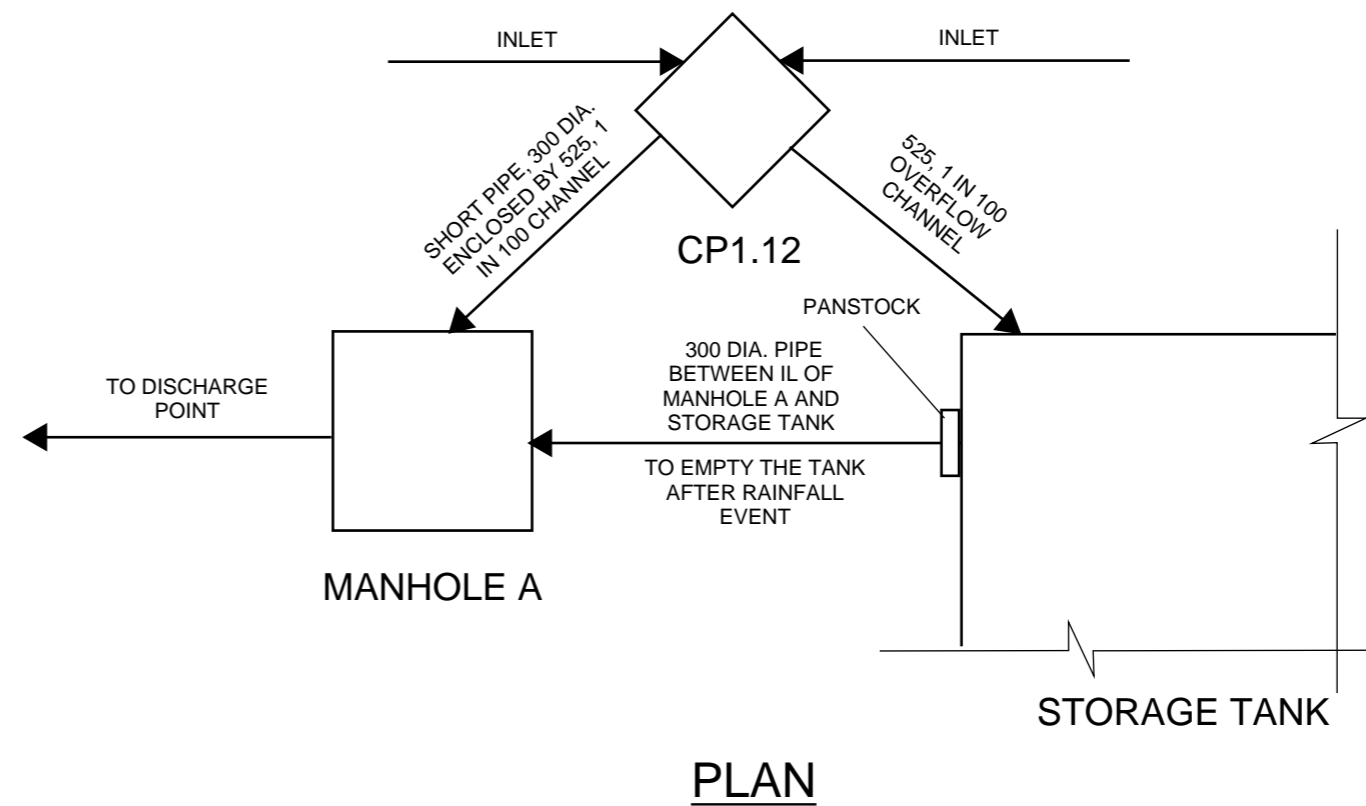
LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE



TYPICAL DETAIL OF WING WALL



DETAIL 1 - PROPOSED ARRANGEMENT BETWEEN CP1.12, MANHOLE A AND STORAGE TANK

PROJECT:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE

PROPOSED ARRANGEMENT OF CP1.12, MANHOLE A AND STORAGE TANK

FIGURE NUMBER

FIGURE 7

LOCATION:

VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE

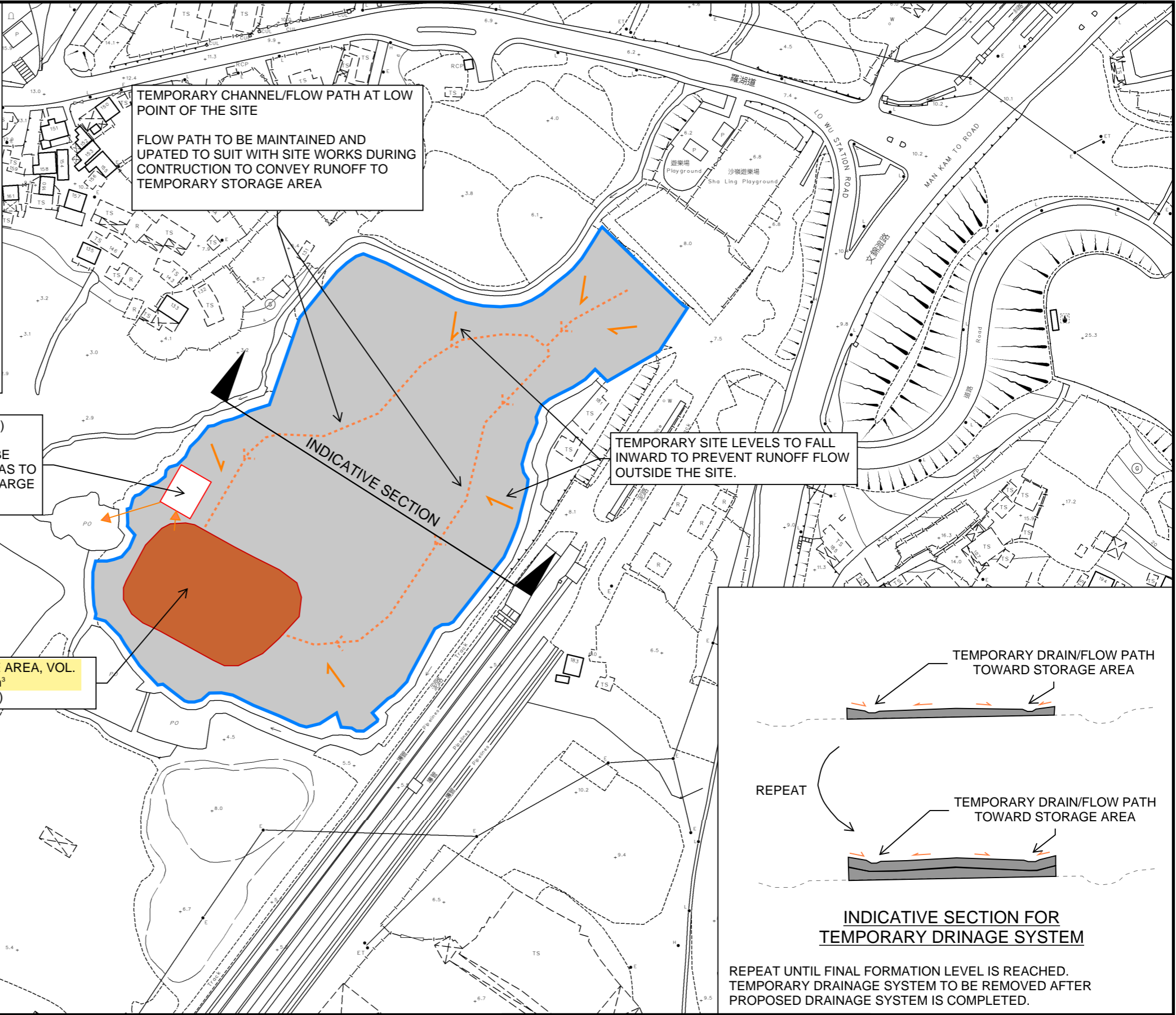
TEMPORARY DRAINAGE SYSTEM DURING CONSTRUCTION STAGE

- STAGE 1**
1. PROVISION OF TEMPORARY STORAGE AREA WITH VOL. NOT LESS THAN 1095 m³ AT SITE LOW POINT.
 2. PROVISION OF TEMPORARY CHANNEL AND/OR FLOW PATH AT LOCAL LOW POINT TO CONVEY RUNOFF TO TEMPORARY STORAGE AREA.
 3. RUN OFF SHOULD BE TREATED TO PREVENT MUDDY WATER FROM BEING DISCHARGE TO EXISTING WATERCOURSE.
 4. IF TEMPORARY SLOPE SLOPING OUTWARD IS UNAVOIDABLE, SLOPE SURFACE TO BE COVERED WITH PLASTIC SHEET OR SHOTCRETE TO AVOID MUDDY RUNOFF.

- STAGE 2**
1. CONSTRUCTION OF PROPOSED DRAINAGE SYSTEM AND SITE FORMATION WORKS.
 2. FOLLOWED BY CONSTRUCTION OF PROPOSED WORKS, TEMPORARY DRAINAGE SYSTEM IN STAGE 1 TO BE MAINTAINED AND UPDATED TO SUIT WITH CONSTRUCTION WORKS.

- STAGE 3**
1. AFTER COMPLETION OF PROPOSED DRAINAGE SYSTEM, SITE RUNOFF TO BE CONVEYED TO PROPOSED DRAINAGE SYSTEM.
 2. TEMPORARY DRAINAGE SYSTEM TO BE REMOVED.

EMERGENCY STANDBY PUMP TO BE PROVIDED FOR EMERGENCY FLOODING SITUATION OF NEARBY WATERCOURSE



PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

TITLE
 TEMPORARY DRAINAGE SYSTEM

FIGURE NUMBER
 FIGURE T-1

LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE

APPENDIX

Appendix A1: Design Calculation

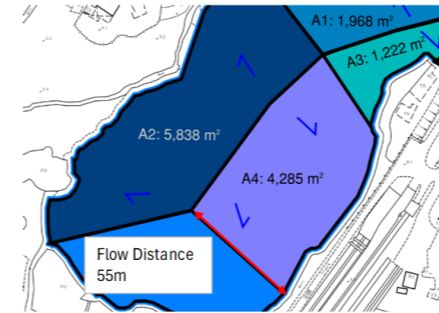
Zone				
North District	Return Period	1 in	10	years

n	0.014
Ks	0.15
Viscosity	0.000001

Storm Constant	North District a	454.9
	North District b	3.44
	North District c	0.412

Time of Concentration Checking

Catchment	Flow Distance	Highest Level	Lowest Level	Gradient (per 100m) = (H1-H2)/L x 100	to (min) = 0.14465L / (H ^{0.2} A ^{0.1})	tc = to + tf
A	L	H1	H2			
(m2)	(m)	(mPD)	(mPD)		(min)	(min)
4285	55	7.6	7.5	0.182	4.848	4.848



Catchment Area Table (Area in m²)

Catchment	A1	A2	A3	A4	A5	B1	B2	B3	Total Site Area	Total Site Area (Before Development)	C1	C2	C3	D1 - D4
Total Area	2622	3351	1222	4285	2943	622	1290	1100	14423	14423	7385	8634	2866	244045
Hard Paved Area	2622	3351	1222	4285	2943	0	645	550	14423	0	2656	3480.00	0.00	72814.00
Unpaved Area	0	0	0	0	0	622	645	550	0	14423	4709	5154.00	2866.00	171231.00
Equivalent Area	2490.9	3183.45	1160.9	4070.75	2795.85	217.7	838.5	715	13701.85	5048.05	4171.35	5109.90	1003.10	129104.15

Pavement Type	Hard Paved	Unpaved
Runoff Coefficient	0.95	0.35

Calculation Table of Drainage System

US MH/PIT	DS MH/PIT	US GL	DS GL	Size mm	Gradient 1 in	Type	US IL	DS IL	U/S MH/PIT TYPE [#]	Length m	V m/s	Capacity m ³ /s	Catchment ID1	Catchment ID2	Catchment ID3	Catchment ID4	Catchment ID5	Total Equivalent Area m ² *	ToC min	Intensity mm/hr	Total Discharge m ³ /s	Utilization	Remark
SP01	CP1.01	7.50	7.50	525	300	UC	6.98	6.90	SP	21.26	1.33	0.33	A4					4070.75	3.00	211	0.24	73.3%	
CP1.01	CP1.02	7.50	7.50	525	300	UC	6.90	6.88	CP	6.86	1.33	0.33	A4					4070.75	3.00	211	0.24	73.3%	
CP1.02	CP1.03	7.50	7.50	525	300	UC	6.88	6.71	CP	51.37	1.33	0.33	A4					4070.75	3.00	211	0.24	73.3%	
CP1.03	CP1.04	7.50	7.50	525	300	UC	6.71	6.69	CP	5.77	1.33	0.33	A4					4070.75	3.00	211	0.24	73.3%	
CP1.04	CP1.05	7.50	7.50	600	300	UC	6.69	6.60	CP	25.93	1.45	0.47	A3	A4				5231.65	3.00	211	0.31	65.9%	
CP1.05	CP1.06	7.50	7.50	600	300	UC	6.60	6.53	CP	21.96	1.45	0.47	A3	A4				5231.65	3.00	211	0.31	65.9%	
CP1.06	CP1.07	7.50	7.50	600	300	UC	6.53	6.51	CP	6.01	1.45	0.47	A3	A4				5231.65	3.00	211	0.31	65.9%	
CP1.07	CP1.08	7.50	7.50	600	300	UC	6.51	6.40	CP	34.41	1.45	0.47	A3	A4	B2			6070.15	3.00	211	0.36	76.5%	
CP1.08	CP1.09	7.50	7.50	675	300	UC	6.40	6.27	CP	37.11	1.57	0.64	A1	A3	A4	B1	B2	8778.75	3.00	211	0.52	80.8%	
CP1.09	CP1.10	7.50	7.50	675	300	UC	6.27	6.07	CP	61.7	1.57	0.64	A1	A3	A4	B1	B2	8778.75	3.00	211	0.52	80.8%	
CP1.10	CP1.11	7.50	7.50	675	300	UC	6.07	5.85	CP	64.15	1.57	0.64	A1	A3	A4	B1	B2	8778.75	3.00	211	0.52	80.8%	
CP1.11	CP1.12	7.50	7.50	675	300	UC	5.85	5.82	CP	10.11	1.57	0.64	A1	A3	A4	B1	B2	8778.75	3.00	211	0.52	80.8%	
CP1.12	STORAGE TANK	7.50	7.50	525	100	UC	6.48	6.43	CP	5	2.30	0.57	Overflow Channel to Storage Tank (See Appendix D)										
SP02	CP2.01	7.50	7.50	450	300	UC	7.05	7.00	SP	15.69	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.01	CP2.02	7.50	7.50	450	300	UC	7.00	6.99	CP	3.36	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.02	CP2.03	7.50	7.50	450	300	UC	6.99	6.94	CP	12.82	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.03	CP2.04	7.50	7.50	450	300	UC	6.94	6.93	CP	5.14	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.04	CP2.05	7.50	7.50	450	300	UC	6.93	6.77	CP	46.26	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.05	CP2.06	7.50	7.50	450	300	UC	6.77	6.61	CP	47.81	1.20	0.22	A5					2795.85	3.00	211	0.16	75.9%	
CP2.06	CP2.07	7.50	7.50	600	300	UC	6.61	6.56	CP	16.8	1.45	0.47	A2	A5				5979.30	3.00	211	0.35	75.4%	
CP2.07	CP2.08	7.50	7.50	600	300	UC	6.56	6.49	CP	20.08	1.45	0.47	A2	A5				5979.30	3.00	211	0.35	75.4%	
CP2.08	CP2.09	7.50	7.50	600	300	UC	6.49	6.47	CP	6.39	1.45	0.47	A2	A5				5979.30	3.00	211	0.35	75.4%	
CP2.09	CP2.10	7.50	7.50	600	300	UC	6.47	6.34	CP	38.62	1.45	0.47	A2	A5				5979.30	3.00	211	0.35	75.4%	
CP2.10	CP1.12	7.50	7.50	600	300	UC	6.34	6.26	CP	23.49	1.45	0.47	A2	A5				5979.30	3.00	211	0.35	75.4%	
SP03	EXISTING STREAM	7.50	6.00	225	40	UC	7.28	5.78	SP	37.11	2.06	0.09	B3					715.00	3.00	211	0.04	45.0%	
Checking Total Flow collected by CP1.12	Manhole A	7.50	7.50	525	100	UC	5.22	5.17	CP	5	2.30	0.57	Total Site Area	B1	B2			14758.05	3.00	211	0.87		
MANHOLE A	CP4.01	7.50	7.50	450	76	PIPE	4.57	4.33	F1	17.9	2.71	0.43						Max. Flow from Orifice see Appendix D		211	0.32	74.3%	From Manhole A to Existing Stream
CP4.01	EXISTING STREAM			525	200	UC			CP	71.6	1.62	0.40						Max. Flow from Orifice see Appendix D		211	0.32	80.0%	From Manhole A to Existing Stream
Checking Total Flow before Development													Total Site Area (Before Development)	B1	B2			6104.25	3.00	211	0.36		
Additional Improvement, pipe across the development				525	200	PIPE					1.82	0.39	C1	B3				4886.35	3.00	211	0.29	72.9%	
Existing Catchment from East (B3, C1)				600	200	UC					1.62	0.40	C1	B3				4886.35	3.00	211	0.29	71.8%	
Existing Catchment (C2 C3)				600	200	UC					1.78	0.57	C2	C3				6113.00	3.00	211	0.36	62.9%	
Existing Approx. 2m width eastern and southern watercourse				2000	200	UC	(n = 0.035)	Natural-stream channels with some weeds			1.58	5.66	B3	C1	C2	C3		10999.35	3.00	211	0.65	11.4%	
Estimation of Flow to northwestern watercourse (Catchments see Appendix F)													D1 - D4	Catchment See Appendix F				129104.15	20.70	123	4.40		

#SP: Start Point
 * Equivalent Area: Sum of Area x runoff coefficient. e.g. equivalent area of A3 and A4 = [1222 x 0.95 + 0 x 0.35] + [4285 x 0.95 + 0 x 0.35] = 1160.9 + 4070.75 = 5231.65. Equivalent Area of each catchment is shown in the Catchment Area Table above.

Appendix A2: Sizing of Storage Tank

North District	Return Period	1 in	10	years	Duration	240	min	Rainfall Intensity, I	44.5	mm/hr
----------------	---------------	------	----	-------	----------	-----	-----	-----------------------	------	-------

Site Area	16256	m ²	Wetland Area	1833	m ²
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	Pre-Development (exclude Wetland Area)			Post-Development (exclude Wetland Area)	
Hard Paved		0 m ²	➤➤➤		14423 m ²
Green		14423 m ²			0 m ²
Total Equivalent Area	= 0 x 0.95 + 14423 x 0.35	5048.05 m ²		= 14423 x 0.95 + 0 x 0.35	13701.85 m ²
Design Flow Rate, Q	= 0.278 x 5048.05 x 44.5 / 1000000	0.062 m ³ /s		= 0.278 x 13701.85 x 44.5 / 1000000	0.170 m ³ /s
Volume of Runoff in 240 min	= 0.062 x 240 x 60	899 m ³			2441 m ³

Runoff Coefficient	0.95
	0.35

Storage Vol. Required = 2441 - 899 = 1542 m³

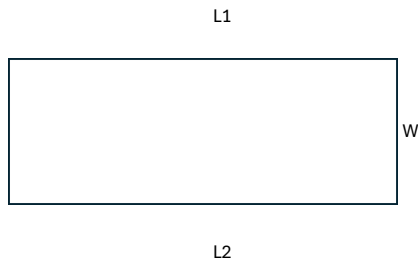
Provide Rectangle Tank

Tank Area	
L1 =	41 m
L2 =	41 m
W =	29 m
A =	1189 m ²

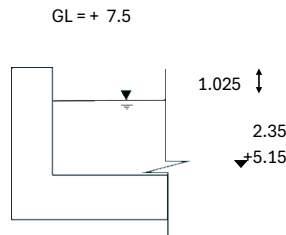
Water Depth

Assume Water Level is 1.025 m below GL and IL is 2.35m below GL.
Water Depth = 1.325 m

Therefore, the Provided Storage Volume is 1575.4 m³
> 1542 m³



PLAN



SECTION

for IL of Overflow Channel to Tank (see Design of Orifice)

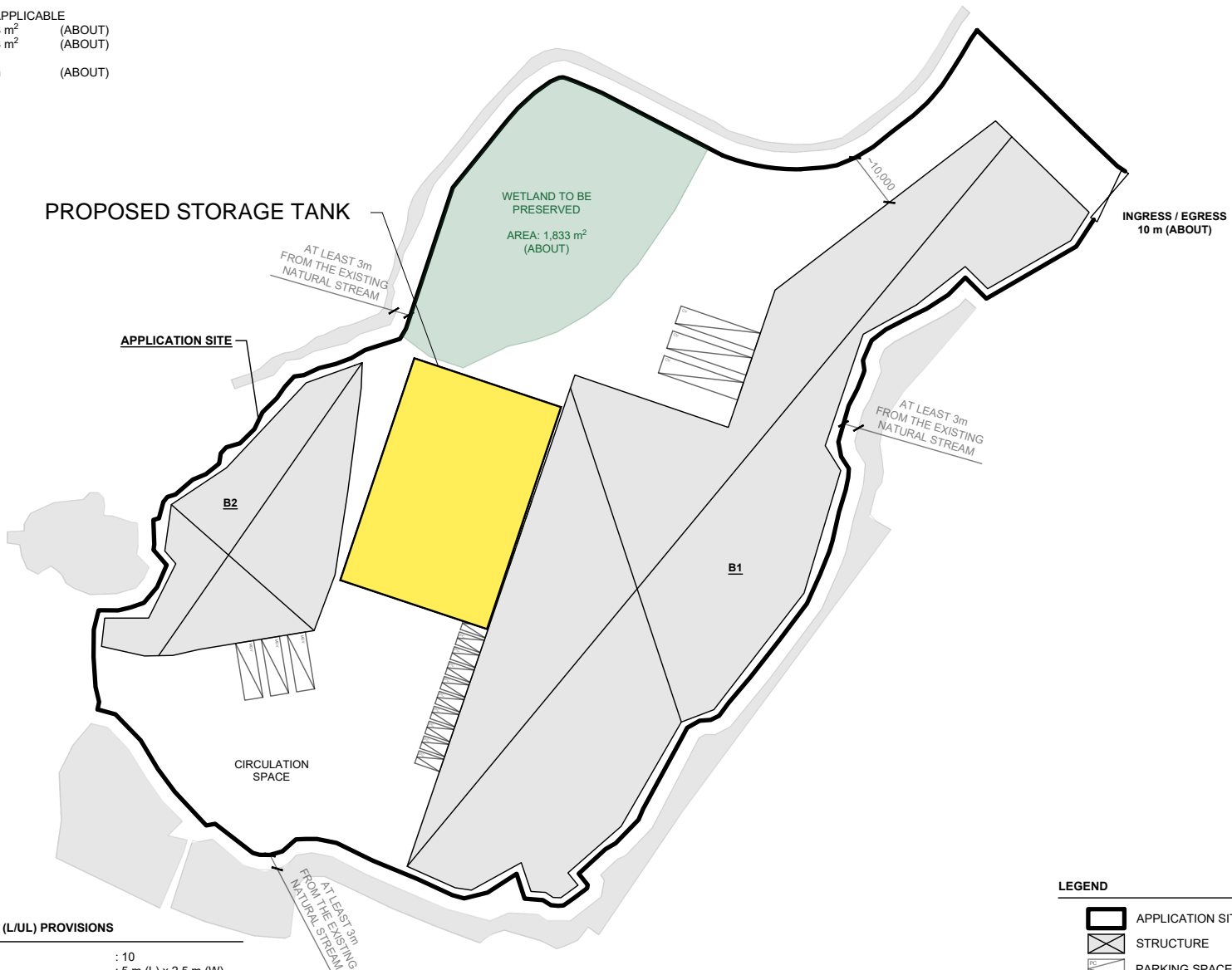
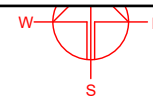
= 7.5 - (+5.15)

APPENDIX B - PROPOSED SITE LAYOUT PLAN

DEVELOPMENT PARAMETERS

APPLICATION SITE AREA	: 16,256 m ²	(ABOUT)
COVERED AREA	: 7,369 m ²	(ABOUT)
UNCOVERED AREA	: 8,887 m ²	(ABOUT)
PLOT RATIO	: 0.91	(ABOUT)
SITE COVERAGE	: 45 %	(ABOUT)
NO. OF STRUCTURE	: 2	
DOMESTIC GFA	: NOT APPLICABLE	
NON-DOMESTIC GFA	: 14,738 m ²	(ABOUT)
TOTAL GFA	: 14,738 m ²	(ABOUT)
BUILDING HEIGHT	: 16.5 m	(ABOUT)
NO. OF STOREY	: 2	

B1	WAREHOUSE (EXCL. D.G.G), OFFICE AND WASHROOM	5,950 m ² (ABOUT)	11,900 m (ABOUT)	16.5 m (ABOUT)(2-STOREY)
B2	WAREHOUSE (EXCL. D.G.G), OFFICE AND WASHROOM	1,419 m ² (ABOUT)	2,838 m (ABOUT)	16.5 m (ABOUT)(2-STOREY)
TOTAL		7,369 m² (ABOUT)	14,738 m (ABOUT)	



PARKING AND LOADING / UNLOADING (L/U/L) PROVISIONS

NO. OF PRIVATE CAR PARKING SPACE	: 10
DIMENSION OF PARKING SPACE	: 5 m (L) x 2.5 m (W)
NO. OF L/U/L SPACE FOR MEDIUM GOODS VEHICLE	: 3
DIMENSION OF L/U/L SPACE	: 11 m (L) x 3.5 m (W)
NO. OF L/U/L SPACE FOR CONTAINER VEHICLE	: 6
DIMENSION OF L/U/L SPACE	: 16 m (L) x 3.5 m (W)

LEGEND

	APPLICATION SITE
	STRUCTURE
	PARKING SPACE (PC)
	L/U/L SPACE (MGV)
	L/U/L SPACE (CV)
	INGRESS / EGRESS
	WETLAND TO BE PRESERVED

PLANNING CONSULTANT



PROJECT

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

SITE LOCATION

VARIOUS LOTS IN D.D.89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES

SCALE

1 : 1200 @ A4

DRAWN BY: MN DATE: 11.12.2024

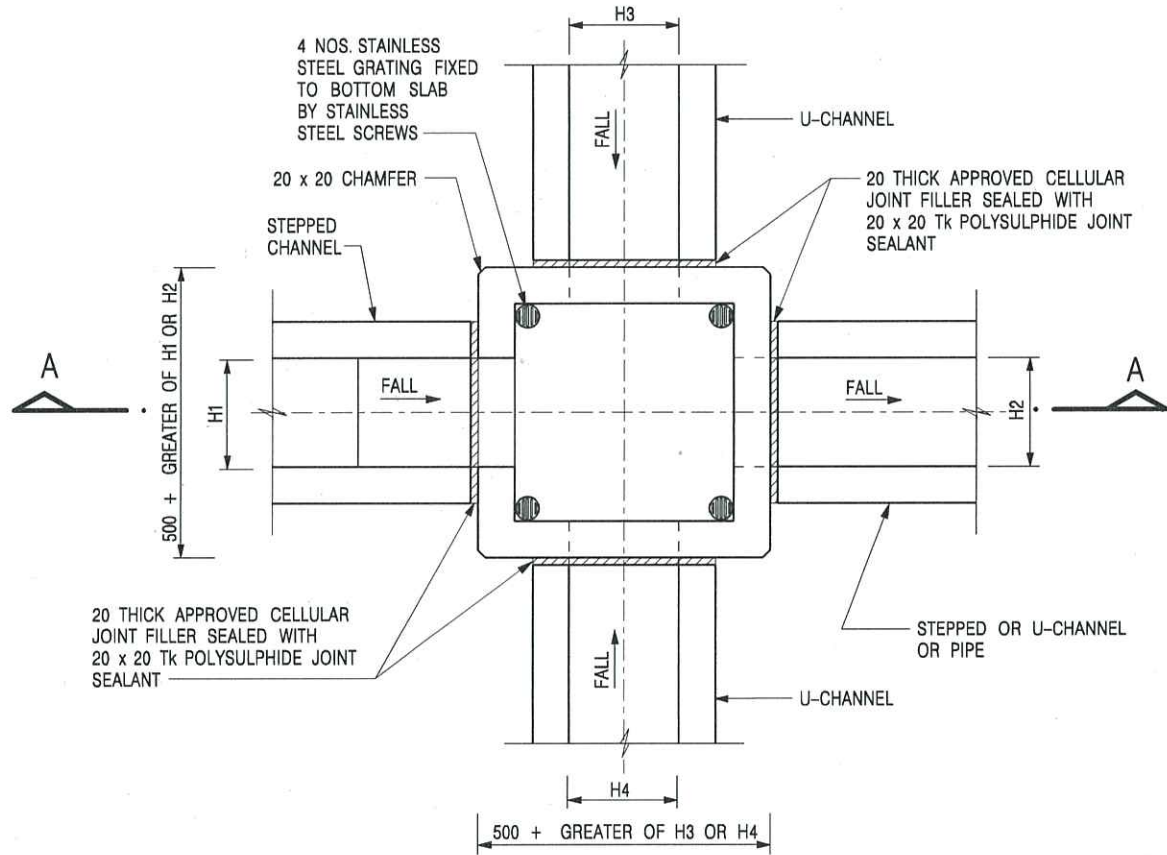
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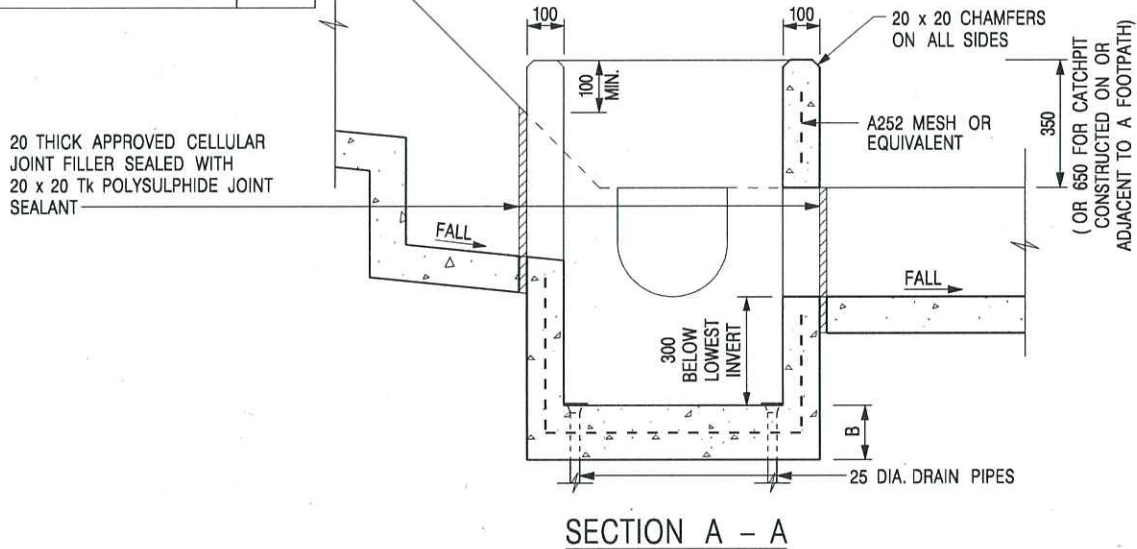
DWG. TITLE
LAYOUT PLAN

DWG NO. PLAN 9 VER. 002

Appendix C - Reference Drawings



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



NOTES:

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

CATCHPIT WITH TRAP
(SHEET 1 OF 2)

-	FORMER DRG. NO. C2406J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE



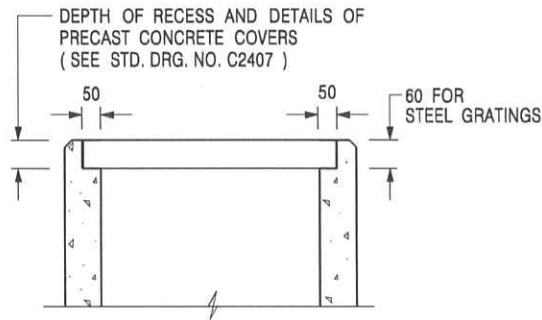
CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DRAWING NO.

DATE JAN 1991

C2406 /1



**ALTERNATIVE TOP SECTION
FOR PRECAST CONCRETE COVERS / GRATINGS**

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.

A	MINOR AMENDMENT.	Original Signed	04.2016
-	FORMER DRG. NO. C2406J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE

**CATCHPIT WITH TRAP
(SHEET 2 OF 2)**



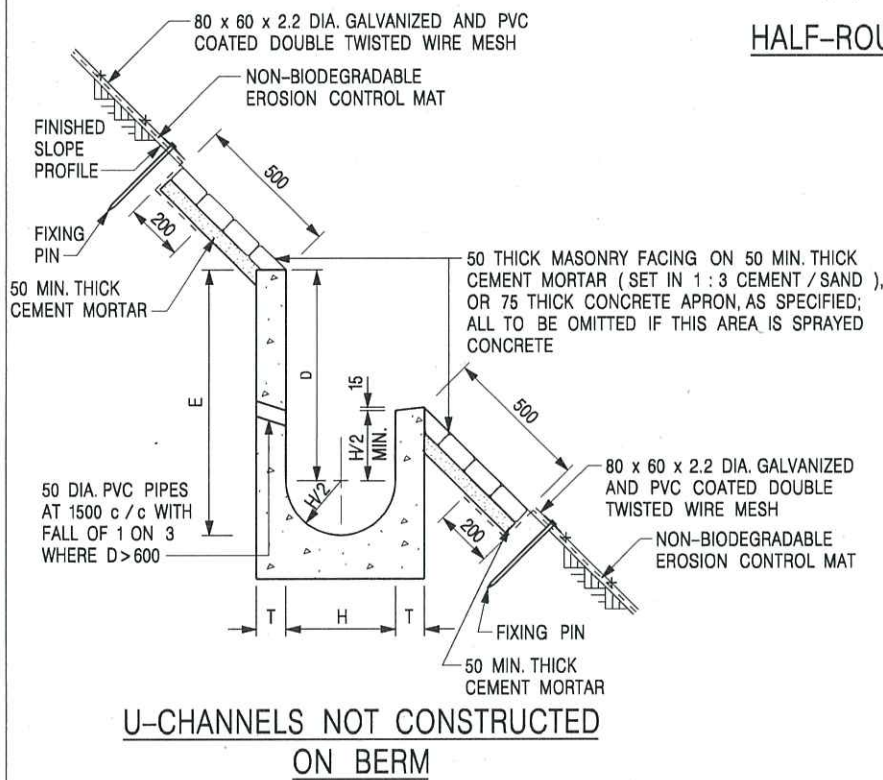
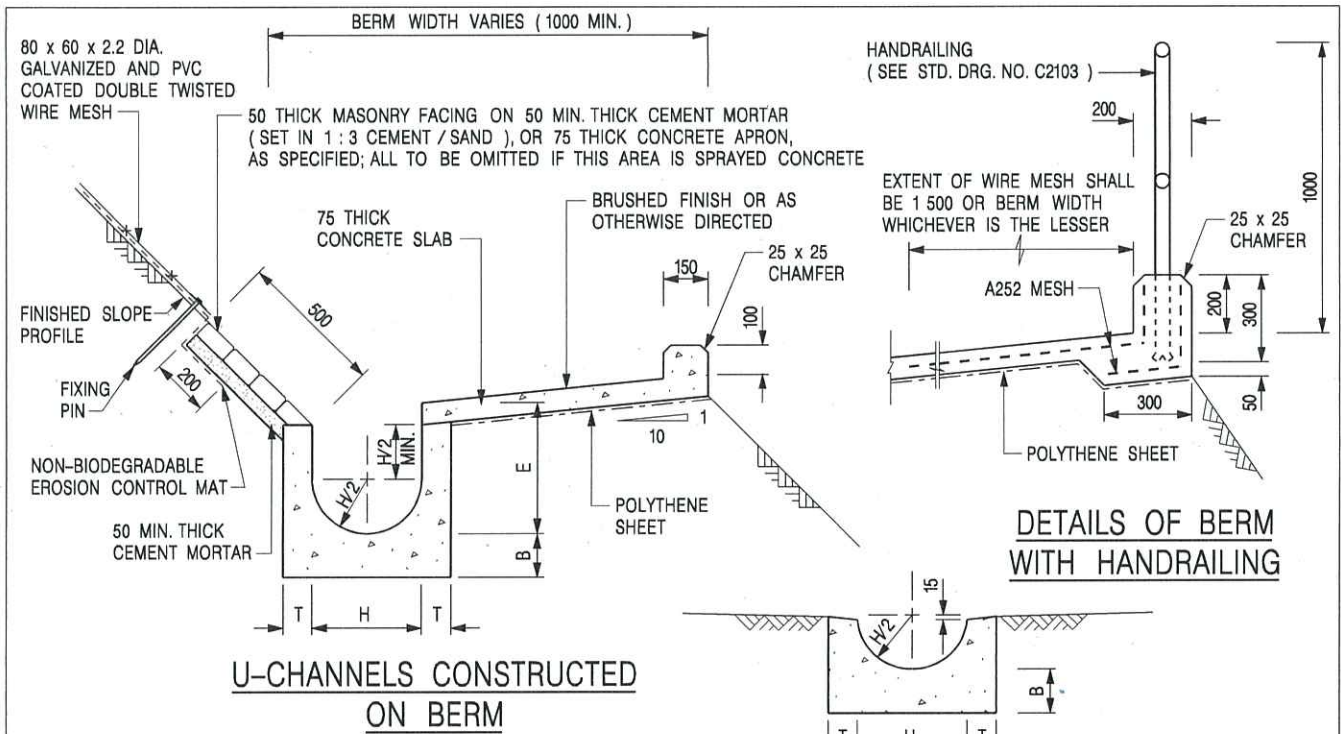
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DRAWING NO.

DATE JAN 1991

C2406 /2A



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE TO BE GRADE 20 / 20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2, F2 OR BRUSHED FINISH AS DIRECTED.
4. SPACING OF EXPANSION JOINT IN CHANNELS, BERM SLABS AND APRONS TO BE 10 METRES MAXIMUM, SEE STD. DRG. NO. C2413 FOR DETAILS.
5. JOINTS FOR CHANNELS, BERM SLABS, APRONS AND WALLS, ETC. TO BE ON THE SAME ALIGNMENT.
6. FOR DIMENSIONS T, H, & B, SEE TABLE BELOW.
7. BIODEGRADABLE EROSION CONTROL MAT IF REQUIRED, SEE STD. DRG. NO. C2511/E.
8. CONCRETE TO BE COLOURED AS SPECIFIED.
9. CONCRETE U-CHANNEL CAN BE CAST IN-SITU OR PRECAST CONCRETE SUBJECT TO THE ENGINEER'S AGREEMENT ON THE DETAILS.
10. DETAILS OF EROSION CONTROL MAT AND WESH MESH ON BERM. (SEE STD DRG. NO. C2511/E)

NOMINAL SIZE H	T	B	REINFORCEMENT
300	80	100	A252 MESH PLACED CENTRALLY AND T=100 WHEN E > 650
375 - 600	100	150	
675 - 900	125	175	A252 MESH PLACED CENTRALLY

REF.	REVISION	SIGNATURE	DATE
I	MINOR AMENDMENT.	Original Signed	07.2018
H	THICKNESS OF MASONRY FACING AMENDED.	Original Signed	01.2005
G	MINOR AMENDMENT.	Original Signed	01.2004
F	GENERAL REVISION.	Original Signed	12.2002
E	DRAWING TITLE AMENDED.	Original Signed	11.2001
D	MINOR AMENDMENT.	Original Signed	08.2001
C	150 x 100 UPSTAND ADDED AT BERM.	Original Signed	6.99
B	MINOR AMENDMENTS.	Original Signed	3.94

DETAILS OF HALF-ROUND AND U-CHANNELS (TYPE A WITH MASONRY APRON)



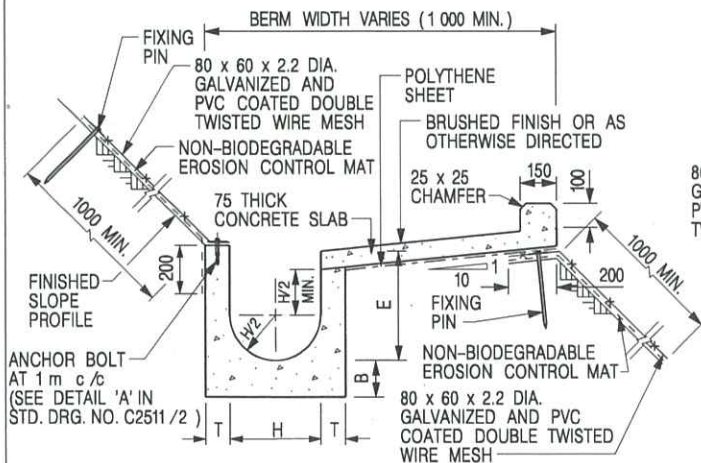
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 25

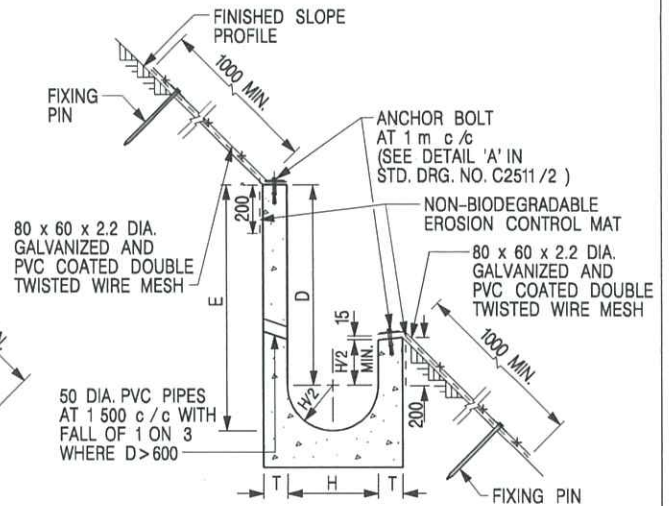
DRAWING NO.

DATE JAN 1991

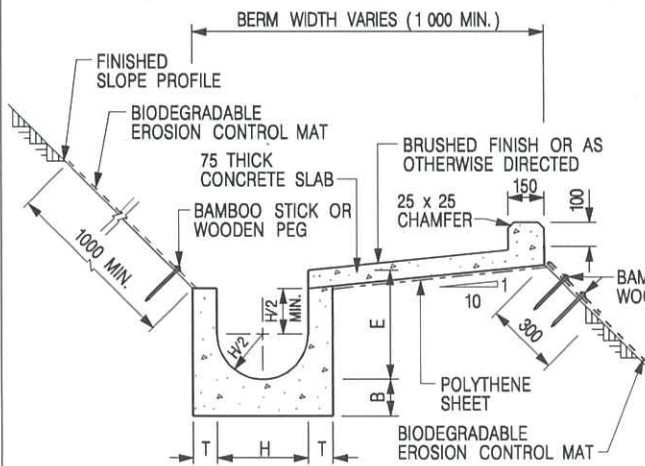
C24091



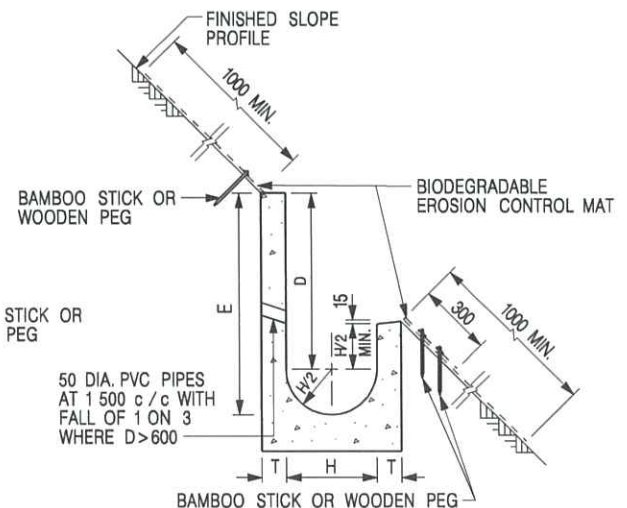
U-CHANNELS CONSTRUCTED ON BERM WITH NON-BIODEGRADABLE EROSION CONTROL MAT



U-CHANNELS NOT CONSTRUCTED ON BERM WITH NON-BIODEGRADABLE EROSION CONTROL MAT



U-CHANNELS CONSTRUCTED ON BERM WITH BIODEGRADABLE EROSION CONTROL MAT



U-CHANNELS NOT CONSTRUCTED ON BERM WITH BIODEGRADABLE EROSION CONTROL MAT

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES.
- ALL CONCRETE TO BE GRADE 20 /20.
- CONCRETE SURFACE FINISH SHALL BE CLASS U2, F2 OR BRUSHED FINISH AS DIRECTED.
- SPACING OF EXPANSION JOINT IN CHANNELS, BERM SLABS AND APRONS TO BE 10 METRES MAXIMUM, SEE STD. DRG. NO. C2413 FOR DETAILS.
- JOINTS FOR CHANNELS, BERM SLABS, APRONS AND WALLS, ETC. TO BE ON THE SAME ALIGNMENT.
- FOR DIMENSIONS T, H, & B, SEE TABLE BELOW.
- FOR TYPICAL FIXING PIN DETAILS, SEE STD. DRG. NO. C2511/2.
- MINIMUM SIZE OF 25 x 50 x 300mm SHALL BE PROVIDED FOR WOODEN PEG.
- MINIMUM SIZE OF 10mm DIAMETER WITH 200mm LONG SHALL BE PROVIDED FOR BAMBOO STICK.
- THE FIXING DETAILS OF NON-BIODEGRADABLE AND BIODEGRADABLE EROSION CONTROL MATS ON EXISTING BERM SHALL REFER TO STD. DRG. NO. C2511/1.

NOMINAL SIZE H	T	B	REINFORCEMENT
300	80	100	A252 MESH PLACED CENTRALLY AND T=100 WHEN E > 650
375 - 600	100	150	
675 - 900	125	175	A252 MESH PLACED CENTRALLY

REF.	REVISION	SIGNATURE	DATE
I	MINOR AMENDMENT.	Original Signed	07.2018
H	FIXING DETAILS OF BIODEGRADABLE EROSION CONTROL MAT ADDED.	Original Signed	12.2017
G	DIMENSION TABLE AMENDED.	Original Signed	01.2005
F	MINOR AMENDMENT.	Original Signed	01.2004
E	GENERAL REVISION.	Original Signed	12.2002
D	MINOR AMENDMENT.	Original Signed	08.2001
C	150 x 100 UPSTAND ADDED AT BERM.	Original Signed	6.99
B	MINOR AMENDMENT.	Original Signed	3.94
A	MINOR AMENDMENT.	Original Signed	10.92

DETAILS OF HALF-ROUND AND U-CHANNELS (TYPE B - WITH EROSION CONTROL MAT APRON)



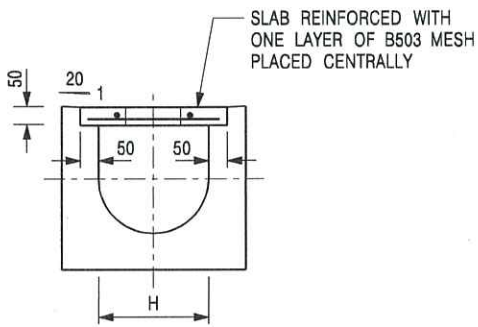
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE DIAGRAMMATIC

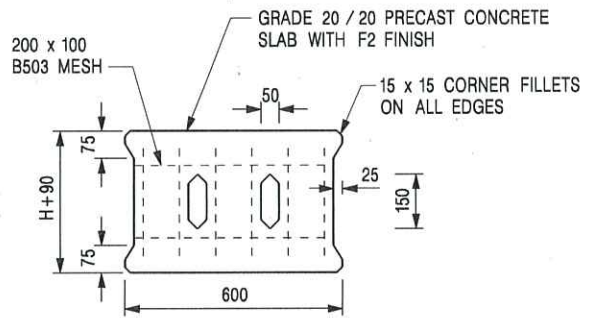
DRAWING NO.

DATE JAN 1991

C24101



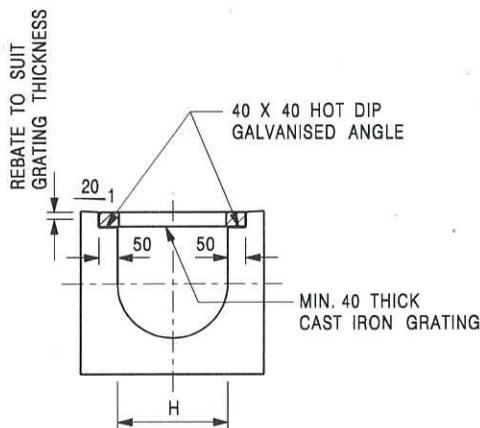
TYPICAL SECTION



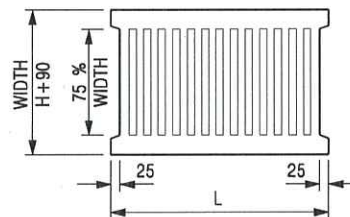
PLAN OF SLAB

U-CHANNELS WITH PRECAST CONCRETE SLABS

(UP TO H OF 525)



TYPICAL SECTION



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

CAST IRON GRATING

(DIMENSIONS ARE FOR GUIDANCE ONLY, CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)

U-CHANNEL WITH CAST IRON GRATING

(UP TO H OF 525)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. H=NOMINAL CHANNEL SIZE.
3. ALL CAST IRON FOR GRATINGS SHALL BE GRADE EN-GJL-150 COMPLYING WITH BS EN 1561.
4. FOR COVERED CHANNELS TO BE HANDED OVER TO HIGHWAYS DEPARTMENT FOR MAINTENANCE, THE GRATING DETAILS SHALL FOLLOW THOSE AS SHOWN ON HyD STD. DRG. NO. H3156.

E	NOTES 3 & 4 AMENDED.	Original Signed	12.2014
D	NOTE 4 ADDED.	Original Signed	06.2008
C	MINOR AMENDMENT. NOTE 3 ADDED.	Original Signed	12.2005
B	NAME OF DEPARTMENT AMENDED.	Original Signed	01.2005
A	CAST IRON GRATING AMENDED.	Original Signed	12.2002
REF.	REVISION	SIGNATURE	DATE

COVER SLAB AND CAST IRON
GRATING FOR CHANNELS



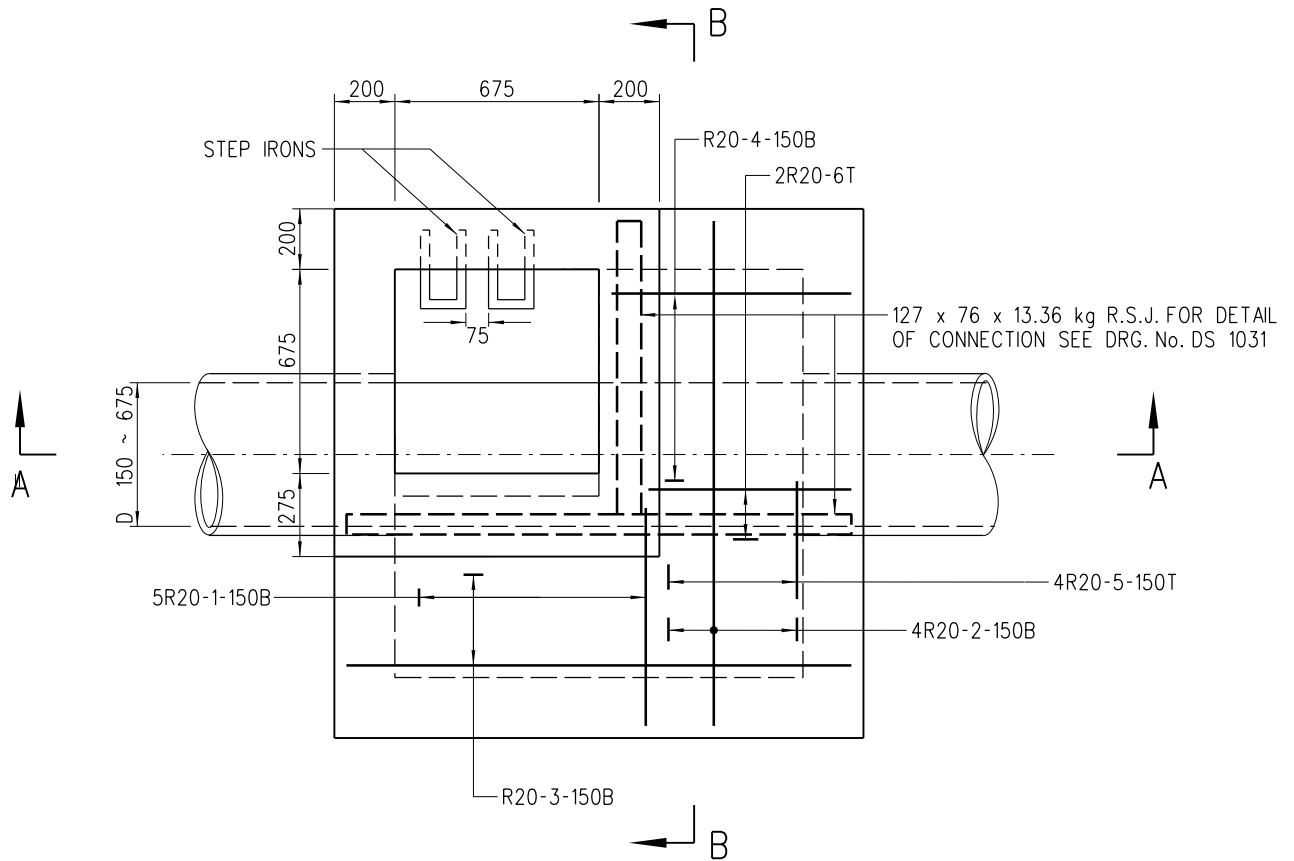
CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DRAWING NO.

DATE JAN 1991

C2412E



NOTES:

PLAN

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. NOTATION OF REINFORCEMENT : THE SEQUENCE OF DESCRIPTION OF IDENTIFICATION MARKS ON DRAWINGS FOR STEEL REINFORCING BARS FOR CONCRETE WORK IS AS FOLLOWS (NUMBER, TYPE, SIZE, MARK, SPACING, LOCATION OR COMMENT)
3. B DENOTES GRADE 500B RIBBED REINFORCEMENT.
4. R DENOTES GRADE 250 PLAIN REINFORCEMENT.
5. PIPE DIAMETER : 150 TO 675 mm
6. NORMAL RANGE OF DEPTH : 2 500 TO 3700 mm (MEASURED FROM ROAD LEVEL TO LOWEST INVERT)
7. USED IN : STORMWATER DRAIN AND SEWER
8. JUNCTION : POSITION OF JUNCTION TO BE DETERMINED IN EACH INDIVIDUAL CASE. CHANNELS IMMEDIATELY UNDER ACCESS TO MANHOLE SHOULD BE AVOIDED.
9. TOP TREATMENT : SEE DRG. No. DS 1032
10. FOUNDATION : FOUNDATION OF MANHOLE VARIES WITH SITE CONDITION. THEREFORE, IT SHOULD BE DETERMINED ON SITE BY THE ENGINEER.
11. CONCRETE : GRADE 30/20
12. ALL BAR MARKS APPEARED HEREON ARE USED FOR REFERENCE IN THIS DRAWING ONLY.
13. MINIMUM COVER AT END OF BARS 40 mm
14. COVER AND FRAME NOT SHOWN ON PLAN FOR CLARITY.
15. RECESS WITH SQUARE STEEL ROD SHALL BE PROVIDED AT TOP OF MANHOLE CHAMBER FOR INSTALLING MONITORING DEVICE(S). DETAILS REFER TO DSD STANDARD DRAWING NO. DS 1099.

REV.	DESCRIPTION	SIGNATURE	DATE
C	NOTE 15 ADDED	ORIGINAL SIGNED	2.8.2022
B	NOTE 11 DELETED NOTES 2, 3 & 4 ADDED	ORIGINAL SIGNED	29.4.2015
A	NOTE 11 REVISED	ORIGINAL SIGNED	24.11.2014
	NEW ISSUE	ORIGINAL SIGNED	15.8.2007

STANDARD MANHOLE
TYPE F1

DRAINAGE SERVICES DEPARTMENT

REFERENCE

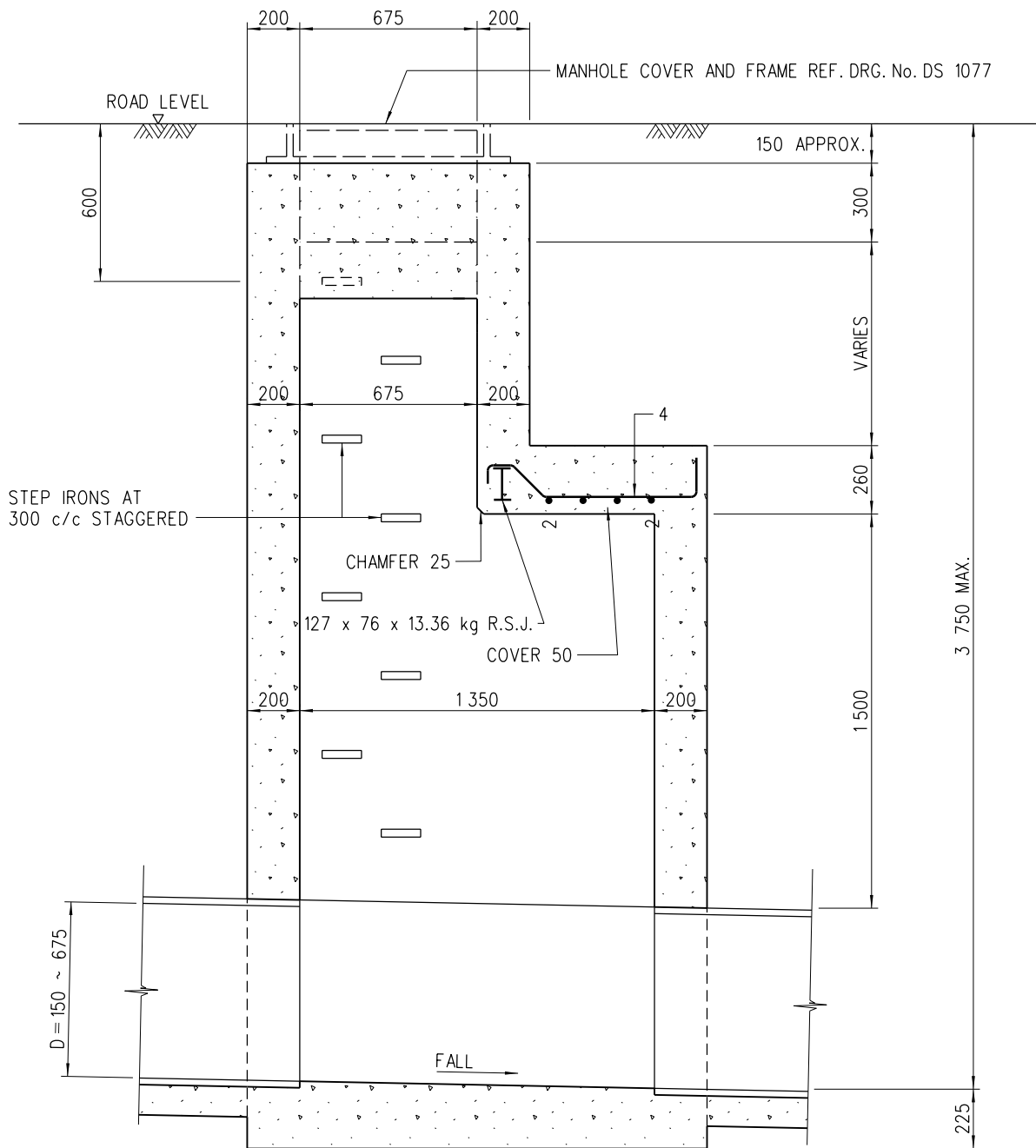
DRAWING No.

SCALE

1 : 25

DS 1081C

(SHEET 1 OF 3)



SECTION A-A

BAR MARKS	SHAPE CODE	○
5 & 6	(20)	○
2 & 3	(35)	○
1 & 4	(99)	○

C	NOTE 15 ADDED	ORIGINAL SIGNED	2.8.2022
B	NOTE 11 DELETED NOTES 2, 3 & 4 ADDED	ORIGINAL SIGNED	29.4.2015
A	NOTE 11 REVISED	ORIGINAL SIGNED	24.11.2014
	NEW ISSUE	ORIGINAL SIGNED	15.8.2007
REV.	DESCRIPTION	SIGNATURE	DATE

STANDARD MANHOLE
TYPE F1

DRAINAGE SERVICES DEPARTMENT

REFERENCE

DRAWING No.

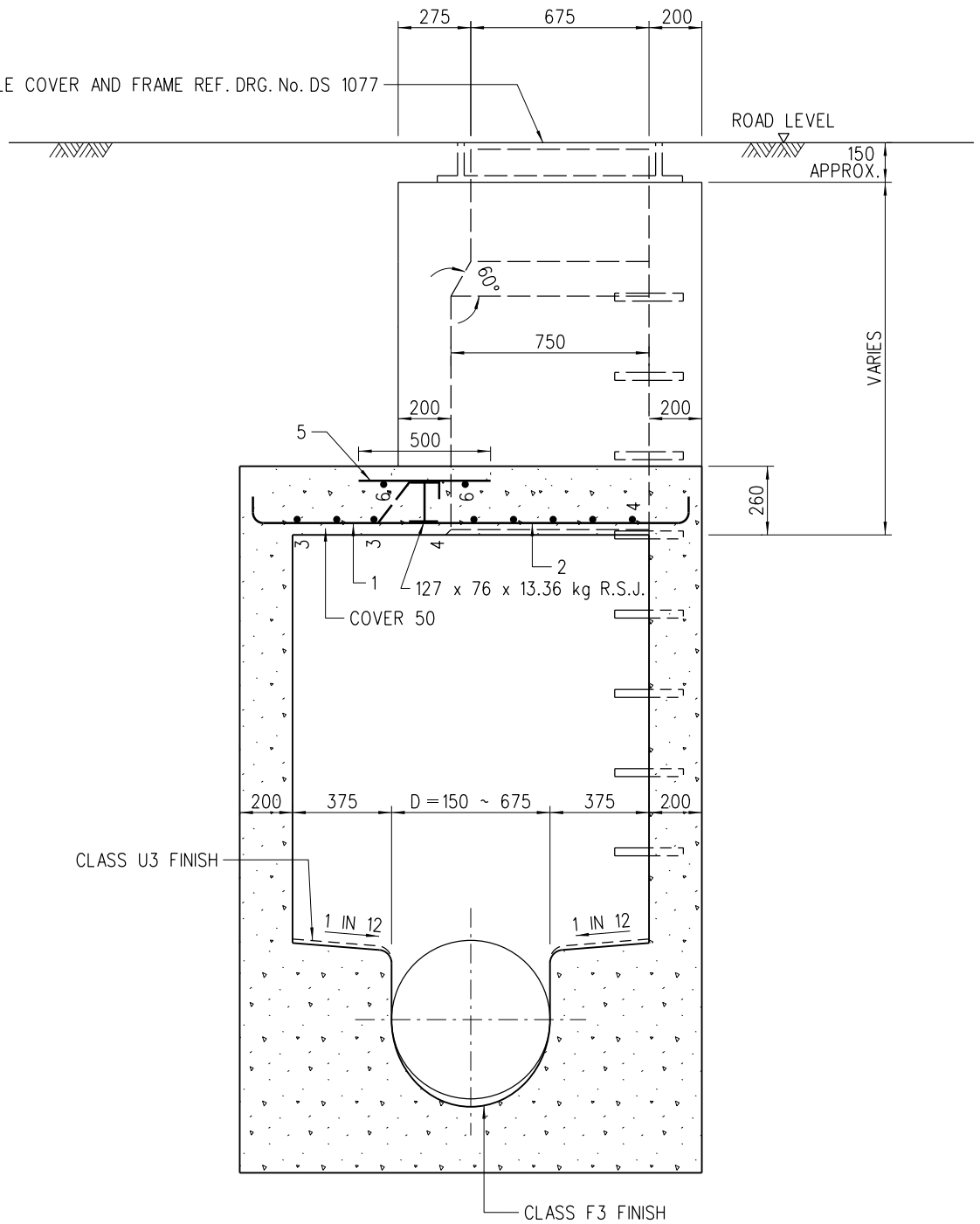
SCALE

1 : 25

DS 1081C

(SHEET 2 OF 3)

MANHOLE COVER AND FRAME REF. DRG. No. DS 1077



SECTION B-B

C	NOTE 15 ADDED	ORIGINAL SIGNED	2.8.2022
B	NOTE 11 DELETED NOTES 2, 3 & 4 ADDED	ORIGINAL SIGNED	29.4.2015
A	NOTE 11 REVISED	ORIGINAL SIGNED	24.11.2014
	NEW ISSUE	ORIGINAL SIGNED	15.8.2007
REV.	DESCRIPTION	SIGNATURE	DATE

STANDARD MANHOLE
TYPE F1

DRAINAGE SERVICES DEPARTMENT

REFERENCE

DRAWING No.

SCALE

1 : 25

DS 1081C

(SHEET 3 OF 3)



PHOTO 1



PHOTO 4

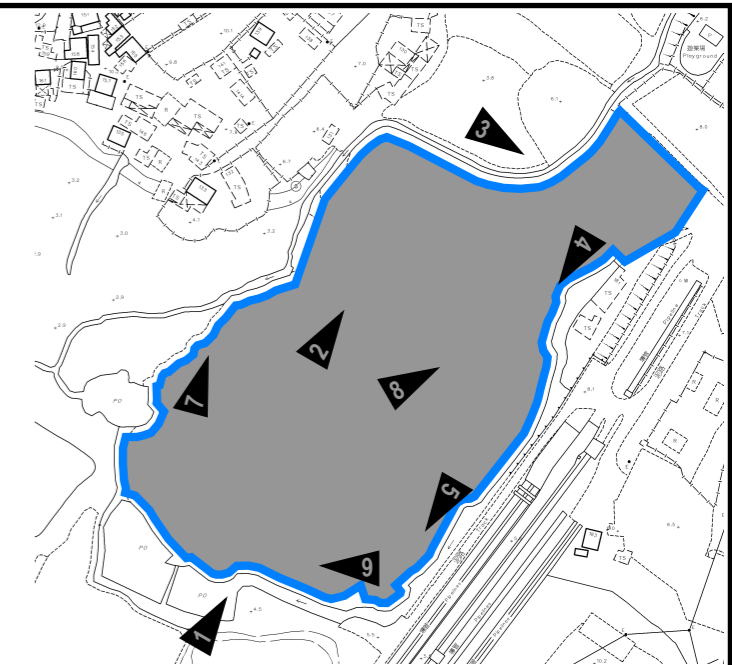


PHOTO 2



PHOTO 5



PHOTO 7



PHOTO 3



PHOTO 6



PHOTO 8

PROJECT:
 PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES FOR A PERIOD OF 3 YEARS AND ASSOCIATED FILLING OF LAND IN "AGRICULTURE" ZONE

SITE PHOTOS

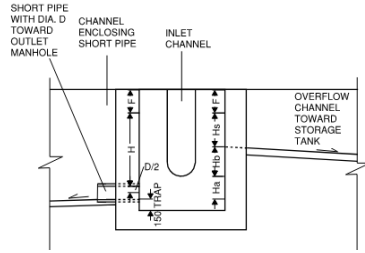
APPENDIX D

LOCATION:
 VARIOUS LOTS IN D.D. 89 AND ADJOINING GOVERNMENT LAND, MAN KAM TO, NEW TERRITORIES



VER	DESCRIPTION	DATE

Appendix E - Design of Orifice



Catch Pit: CP1.12

Total Flow from Inlet Channels (Qi) = Outlet flow by Short Pipe (Qo1) + Flow toward Storage Tank by Overflow Channel (Qo2)

Flow from Inlet Channels,	$Q_i = 0.87 \text{ m}^3/\text{s}$		(Total Flow Collected by CP1.12, See Appendix A)
Outlet flow by Short Pipe,	$Q_{o1} = C_d \times A \times \sqrt{2 \times g \times (H + D/2)}$	Where C_d	Coefficient of Discharge $C_d = 0.8$ for Short Pipe (Dally et al. (1993))
		A	Area of Orifice
		$H + D/2$	Mean Centre Height
Flow toward Storage Tank,	$Q_{o2} = \text{Capacity of Overflow Channel toward Storage Tank}$	When H_s = size of Overflow Channel = 525 mm	
	$= 0.57 \text{ m}^3/\text{s}$		(See Appendix A)

When Freeboard = 0.5, Check if $Q_{o1} + Q_{o2} \geq Q_i$, and

Check if $Q_{o1} \leq \text{Total Flow before Development} = 0.36 \text{ m}^3/\text{s}$ (See Appendix A)

Freeboard, F (m)	Provide H_a (m)
0.5	0.6

C_d	Provide Short Pipe Dia. (m)	Area of Orifice (m^2)	g (m^2/s)	Provide H (m)	$H + D/2$ (m)	Q_{o1}^* (m^3/s)
0.8	0.3	0.071	9.81	1.48	1.63	0.320

≤ 0.36 , OK
(* $Q_{o1} = C_d \times A \times \sqrt{2 \times g \times (H + D/2)}$)
(Outlet flow controlled by orifice \leq existing flow before development)

H_s = Size of Overflow Channel (m)	Q_{o2}^{**} (m^3/s)
0.525	0.57

** $Q_{o2} = \text{Capacity of Overflow Channel toward Storage Tank} = 0.57 \text{ m}^3/\text{s}$
When H_s = size of Overflow Channel

$Q_{o1} + Q_{o2}$ (m^3/s)
0.885

$> Q_i$, OK

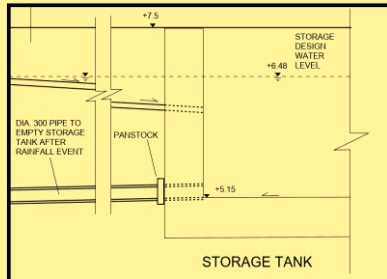
$H_s = 0.525 \text{ m}$
 $F + H_s + H_b = \text{GL - Inlet IL} = 7.50 - 5.82 = 1.68 \text{ m}$ (GL and IL, See Figure 7 and Appendix A)

Therefore
 $H_b = 1.68 - 0.5 - 0.525 = 0.655 \text{ m}$

Provide **300 mm** Short Pipe, and **525 mm** Overflow Channel.

In addition, Provide **525 mm** Channel enclosing the Short Pipe to D/S.

Checking of max flow from storage tank by opening penstock



$dIL = 6.48 - 5.15 = 1.33 \text{ m}$

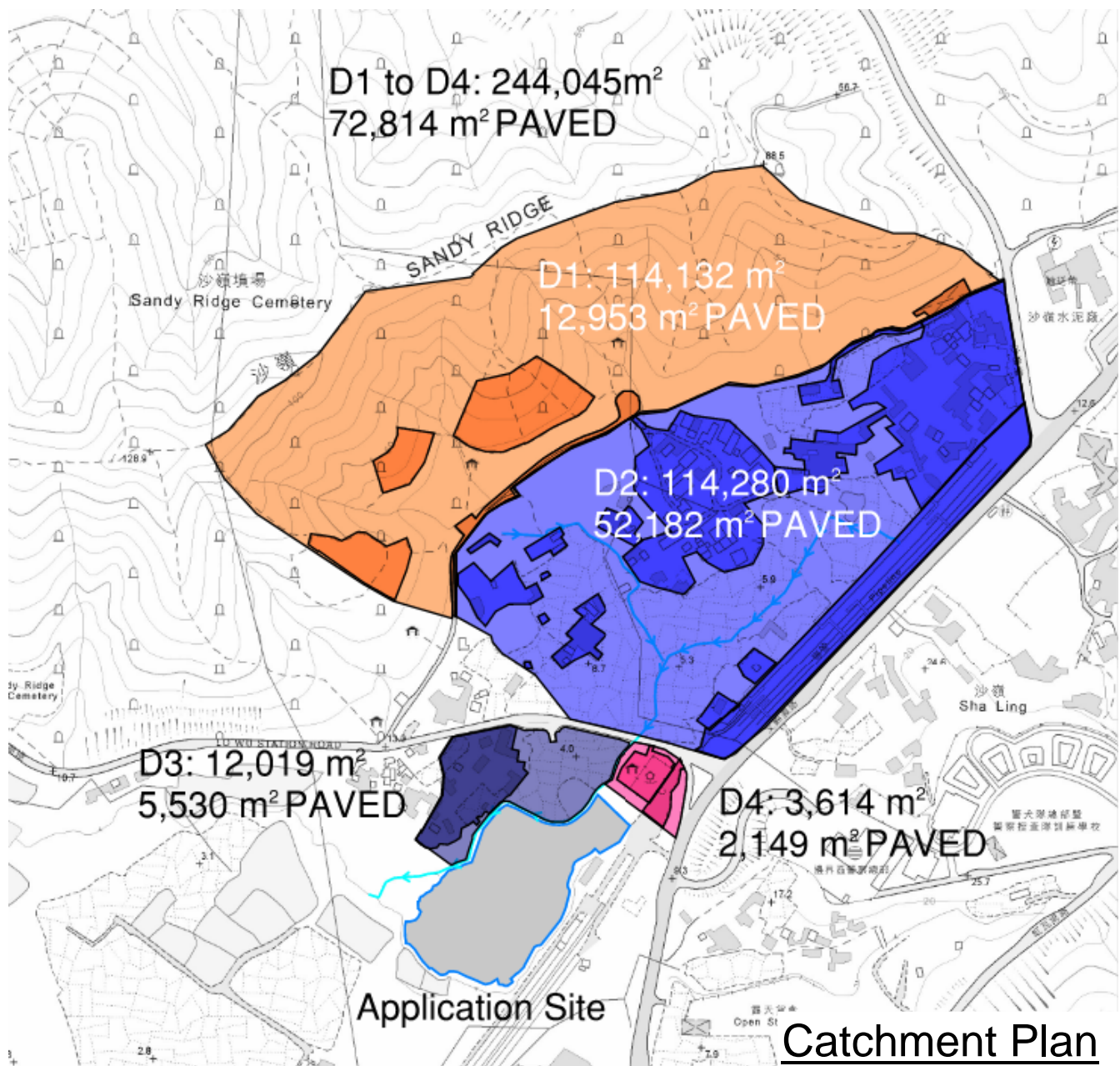
Velocity of discharge by 300mm pipe is less than discharge by 300mm orifice (due to energy loss by friction in 300mm pipe).

Checking of max flow by orifice for conservative purpose.

C_d	Provide Short Pipe Dia. (m)	Area of Orifice (m^2)	g (m^2/s)	Provide dIL (m)	dIL - D/2 (m)	Max. Q (m^3/s)
0.8	0.3	0.071	9.81	1.33	1.18	0.272

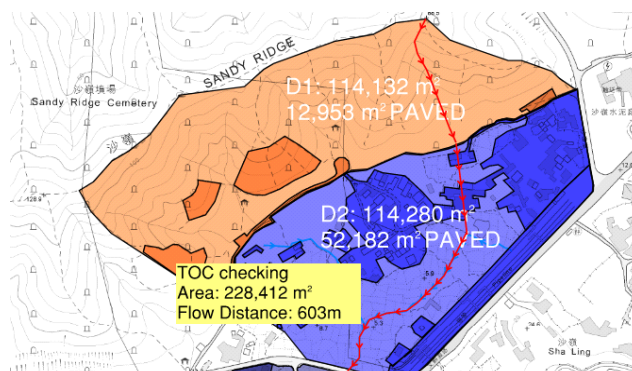
≤ 0.36 , OK
(Outlet flow \leq existing flow before development)

APPENDIX F - Assessment of Northwestern Watercourse



Time of Concentration Checking

Catchment	Flow Distance	Highest Level	Lowest Level	Gradient (per 100m) = (H1-H2)/L x 100	to (min) = 0.14465L / (H ^{0.2} A ^{0.1})	tc = to + tf
(m ²)	(m)	(mPD)	(mPD)		(min)	(min)
228412	603	22.8	6	2.786	20.690	20.690



APPENDIX F - Assessment of Northwestern Watercourse

Catchment Area Table (Area in m²)

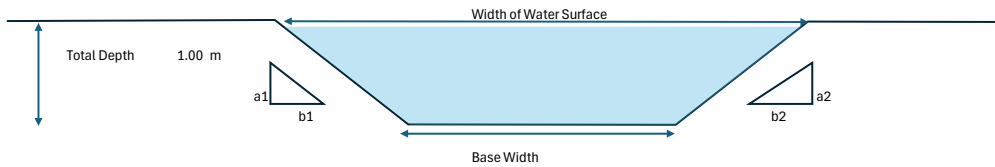
Catchment	D1	D2	D3	D4	D1-D4
Total Area	114132	114280	12019	3614	244045
Hard Paved Area	12953	52182	5530	2149	72814
Unpaved Area	101179	62098	6489	1465	171231
Equival. Area	47718	71307.2	7524.65	2554.3	129104.15

* Equivalent Area: Sum of Area x runoff coefficient. e.g. equivalent area of D3 and D4 = [5530 x 0.95 + 6489 x 0.35] + [2149 x 0.95 + 1465 x 0.35] = 7524.65 + 2554.3 = 10078.95.

Flow Estimation (Extract from Appendix A)

Catchment ID1	Catchment ID2	Catchment ID3	Catchment ID4	Catchment ID5	Total Equivalent Area m ² *	ToC min	Intensity mm/hr	Total Discharge m ³ /s
D1 - D4					129104.15	20.70	123	4.40

Existing Northwestern Watercourse

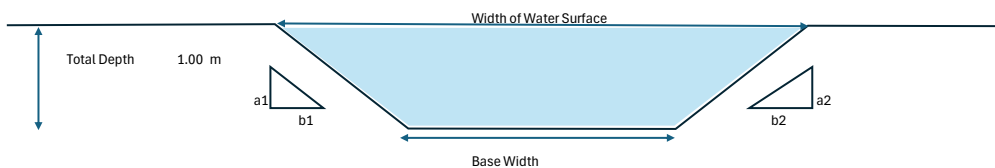


a1	1	
b1	0.3	
a2	1	
b2	0.3	
Total Depth	1.000	m
Base Width	1.150	m

Base Width	Width of Water Surface	Flow Area	Wetted Perimeter	Hydraulic Radius	Manning's Roughness	Gradient	Velocity	Capacity
m	m	m ²	m	m		1 in	m/s	m ³ /s
1.150	1.650	1.40	3.21	0.44	0.035	200	1.16	1.63

Total Flow due to catchment D1 - D4 = 4.40 m³/s See Appendix A
 Utilization Rate = 270.4%

Proposed Improvement of Northwestern Watercourse to 3.7m width



a1	1	
b1	0.3	
a2	1	
b2	0.3	
Total Depth	1.000	m
Base Width	3.200	m

Base Width	Width of Water Surface	Flow Area	Wetted Perimeter	Hydraulic Radius	Manning's Roughness	Gradient	Velocity	Capacity
m	m	m ²	m	m		1 in	m/s	m ³ /s
3.200	3.700	3.45	5.26	0.66	0.035	200	1.52	5.26

Total Flow due to catchment D1 - D4 = 4.40 m³/s See Appendix A
 Utilization Rate = 83.6%

With widening of watercourse to 3.7m, existing northwestern watercourse would have enough capacity