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From: [redacted]

Sent: 2026-06-12 Friday 16:14:46

To: tpbpd/PLAND <tpbpd@pland.gov.hk>

Cc: [redacted]

Subject: S. 16 Planning Application No. A/YL-KTS/1135 - Submission of Further Information (1)

Attachment: A_YL-KTS_1135_FI1_Attachment 1_ DIA.pdf

Your Ref.: TPB/A/YL-KTS/1135

Dear Sir/Madam,

Application for Permission under Section 16 of the Town Planning Ordinance (Cap.131)
Proposed Temporary Warehouse (Excluding Dangerous Goods Godown) with Ancillary Facilities and Associated Filling of Land for a Period of 3 Years
in "Agriculture" Zone at Various Lots in D.D. 106 and adjoining Government Land, Kam Tin South, Yuen Long
(Planning Application No. A/YL-KTS/1135)

Submission of Further Information (1)

Reference is made to the captioned planning application and the departmental comments received via phone from the Planning Department on 27.5.2026.

In response to the concerned departmental comments, we are pleased to submit further information including the following document for your consideration:

Attachment 1 – Drainage Impact Assessment

Since the application site is larger than 1 hectare, a drainage impact assessment (DIA) is prepared to demonstrate that with the implementation of necessary mitigation measures, no adverse drainage impact will be generated by the proposed development.

Should you have any queries or require further clarification, please do not hesitate to contact the undersigned at [redacted]. Thank you.

Best regards,
Tiffany HUI
Town Planner
Tensor Planning and Surveying Limited

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

DRAINAGE IMPACT ASSESSMENT
JUN 2026

TABLE OF CONTENTS

1. Introduction & Background

1.1 Introduction

1.1.1 The applicant plans to construct and operate a Proposed Temporary Warehouse (excluding dangerous goods godown) with Ancillary Facilities and Associated Filling of Land for a period of 3 years at various lots in D.D. 106 and adjoining Government Land, Kam Tin, Yuen Long, New Territories

1.1.2 The Site is currently zoned "Agriculture" (AGR) under the Approved Kam Tin South Outline Zoning Plan ("OZP") No. S/YL-KTS/15. In accordance with paragraph 11(b) of the Explanatory Note of the OZP, temporary use or development of any land or building not exceeding a period of three years would require planning permission from the Town Planning Board ('TPB"). Therefore, a Section 16 Planning Application is made. This Drainage Impact Assessment is made for supporting this planning application.

1.2 Site Description

1.2.1 The site is nearly a square shape land with a strip as a road connecting Kam Sheung Road. The Site is currently a vacant land overgrown with weeds. There are two existing watercourses passing through the site running from the south to north direction.

1.2.2 The Site location and its environs are shown on **Fig. 1** which the uses surrounding the Site
include:

- To the north and northwest: vegetation, warehouse temporary structures, village houses and residential temporary structures,
- To the east and northeast: warehouse temporary structures, Kam Shui South Road and Existing Nullah.
- To the south: village houses and Kam Sheung Road.
- To the west: Kam Sheung Road.

1.3 Project Description

1.3.1 The site area is 16,076m^2. The area of the proposed warehouse building is 9,067m^2. Plot ratio is about 0.57.

1.3.2 The two existing watercourses passing through the site from south to north will be replaced by underground concrete pipes.

1.3.3 The surrounding area in the south and northwest is the area to be developed (Catchment A and B).

1.4 Objectives of this Report

1.4.1 The objectives of this DIA Report are to:

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

1.5 Reference Materials

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

- Drainage Services Department ("DSD") publication Stormwater Drainage Manual (with Eurocodes incorporated) Planning, Design and Management (2018 Edition).
- DSD publication – Stormwater Drainage Manual Corrigendum No. 1/2022 and 1/2024 ("SDM 2024").
- DSD Advice Note No.1 – Application of the Drainage Impact Assessment Process to Private Sector Projects.
- GeoInfo Map.

2. Description of Existing Environment and Drainage Conditions

2.1 Site Location and Topography

2.1.1 The site area is 16,076m^2 and is located in Yuen Long District with level vary from +13.5mPD to +14.1mPD.

2.1.2 Kam Sheung Road is to the west of the site, Kam Shui South Road is to the east of the site. A series of village houses and warehouse temporary structures at the north of the site, there is an existing channel in the further north. There is existing trapezoidal nullah (Top width:20m, bottom width:5.3m, Depth:3.85m) beside Kam Shui South Road.

2.1.3 There are two existing watercourses (namely S1 and S2) passing through the site from south to north and converge in the western boundary of the site. Then it finally discharge to the existing channel in the further north of the site (namely S3).

2.1.4 There are existing U-channel along Kam Shui South Road.

2.1.5 According to the previous site inspection dated 4 June 2026, the site is currently a vacant land overgrown with weeds.

3. Drainage Analysis

3.1 Assumptions and Methodology

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

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

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

where Qp = peak runoff in m^3/s

C = runoff coefficient

i = rainfall intensity in mm/hr

A = catchment area in km^2

3.1.3 Rainfall intensity is calculated using the following expression:

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

where i = Rainfall intensity in mm/hr

t = duration in minutes ($t \leq 240$)

a,b,c= storm constants givent in Table 3 of SDM

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

$$V = -\sqrt{(8gDs)}\ \log\left(\frac{ks}{3.7D} + \frac{2.51\nu}{D\sqrt{(2gDs)}}\right) \qquad \text{--- Equation 3}$$

where V = mean velocity (m/s)

g = gravitational acceleration (m/s^2)

D = Pipe diameter (m)

ks = hydraulic pipeline roughness (m)

ν = kinematic viscosity of fluid (m^2/s)

s =hydraulic gradient (energy loss per unit length due to friction)

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

$$V = R^{2/3} S_f^{0.5} / n \qquad \text{--- Equation 5}$$

Where V = mean velocity (m/s)

R = hydraulic radius (m)

n = Manning coefficient ($s/m^{1/3}$)

S_f = hydraulic gradient (energy loss per unit length due to friction)

3.2 Assessment Assumptions

Identification of Catchments

3.2.1 The level of the ground to the north of the site generally lower than that of the site.

3.2.2 The area in the northwest of the site is known with high potential to be developed.

3.2.3 Site inspection was carried out to identify the catchment of the two existing watercourses (Catchment A ~ Catchment D). Also, the runoff from the area bounded by the site, Kam Sheung Road and Kam SHui South apart from Catchment A~ Catchment D is collected by the existing U-channel along Kam Shui South Road, this catchment refers to Catchment E

- Catchment A – The application site and area to be development. Currently a vacant land overgrown with weeds.
- Catchment B – Area to be development. Currently a vacant land overgrown with weeds, temporary residential structure or temporary warehouse.
- Catchment C – Currently a vacant land overgrown with weeds, temporary residential structure or temporary warehouse.
- Catchment D – Area full of small village houses.
- Catchment E – Area full of small village houses, residential buildings, farm lands/warehouse temporary structures.

3.2.4 The surface runoff from Catchment A and C is collected into the watercourse S1. The surface runoff from Catchment B and D is collected into the watercourse S2.

3.2.5 Runoff from Catchment A, B, C, D and E is calculation using Rational Method.

3.2.6 The area of Catchment A, B C, D and E is 24,848m^2, 21,441 m^2, 9,907 m^2, 62,747 m^2 and 148.314 m^2 respectively.

3.2.7 Storm constants a, b and c is taken as 505.5, 3.29 and 0.355 respectively, 50 years return period, Table 3a, Stormwater Drainage Manual Corrigendum No. 1/2024. 1/0.9 factor is adopted to the calculated runoff as the design runoff due the consideration of sediment.

3.2.8 Before development, the runoff coefficient of Catchment A, B C, D and E is 0.25, 0.25, 0.95, 0.656 and 0.6 respectively. After development, the runoff coefficient of Catchment A, B C, D and E is 0.95, 0.95, 0.95, 0.656 and 0.6 respectively

3.2.9 For the design of drains inside the application site, the site is divided into five portions after considering the location of proposed warehouse and configuration of the site. And there are two outside catchment areas from future development as illustrated below:

Catchment ID	Description	Area (m^2)
A1	The Site (Road)	957
A2	The Site (Rest Left Top)	543
A3	The Site (Rest Left Bottom)	2,599
A4	The Site (Warehouse Left)	3,188
A5	The Site (Rest Right Top)	538
A6	The Site (Rest Right Bottom)	2,330
A7	The Site (Warehouse Right)	5,921
A8	Outside Catchment at North	2,407
A9	Outside Catchment at South Right	3,318
A10	Outside Catchment at South Left	1,095

The runoff calculation is presented in **Appendix B**

3.3 Estimated Existing and Future Runoff

3.3.1 The estimated peak runoff generated from Catchment A and B is 0.466m^3/s and 0.391m^3/s respectively (total 0.857m^3/s).

3.3.2 To consider the effect of climate change in the drainage design, the projection of rainfall increase by 11.1% given in SDM 2022 Table 28 is adopted. The design runoff of Catchment A and B after development is 1.968m^3/s and 1.649 m^3/s respectively (total 3.616m^3/s) under 50 years return period. There will be around 222% increase in the estimated peak runoff due to the Proposed Development under 50 years return period. Detailed calculations are provided **Appendix A.**

3.3.3 **Fig. 3** shows the total catchment area of the site. It consist the site and part of the potential future development.

3.3.4 Geoinfo Map is used to identify the total catchment area and corresponding C value of the existing nullah beside Kam Shui South Road, Appendix D refers. The total area is 6.55km2, combined C value is 0.4875. The total peak runoff is 132.582m^3/s. The extra runoff due to the proposed development induce 1% occupation of its capacity.

3.4 Proposed Drainage Layout

The two existing watercourses will be replaced by underground concrete pipe which finally discharge to the existing nullah beside Kam Shui South Road. The converged existing watercourse downstream of the site shall be maintained. The design runoff to the existing nullah beside Kam Shui South Road is 132.582 m^3/s while its capacity is 279.043m^3/s (48% capacity used). The extra runoff due to the proposed development just increase 1% of its capacity.

3.4.1 The existing watercourse S1 will be replaced by a proposed 750mm dia. concrete pipe (1:200) (from MH1 to MH3). Catchment C refers. Its peak runoff 0.698m^3/s while the capacity is 1.066m^3/s (65% capacity used)

3.4.2 The existing watercourse S2 will be replaced by a proposed 1500mm dia. concrete pipe (1:350) (from MH2 to MH3). Catchment D refers. Its peak runoff 2.665m^3/s while the capacity is 4.878 m^3/s (55% capacity used).

3.4.3 From MH3 to MH4, Catchment C+D refers. 1500mm dia. concrete pipe (1:350) is proposed. Its peak runoff 3.363m^3/s while the capacity is 4.878 m^3/s (59% capacity used).

3.4.4 From MH4 to MH6, conservatively take Catchment A+C+D. 1650mm dia. concrete pipe (1:350) is proposed. Its peak runoff 5.331m^3/s while the capacity is 6.254 m^3/s (85% capacity used).

3.4.5 From MH6 to MH7, conservatively take Catchment A+B+C+D. 1800mm dia. concrete pipe (1:375) is proposed. Its peak runoff 6.980m^3/s while the capacity is 7.572 m^3/s (92% capacity used).

3.4.6 From MH7 to Existing Nullah beside Kam Shui Soth Road, Catchment

A+B+C+D+E refers. 2400mm dia. concrete pipe (1:550) is proposed. Its peak runoff 11.662m^3/s while the capacity is 13.145 m^3/s (89% capacity used).

3.4.7 450UC, 525UC and 750UC (all 1:200) is proposed inside the site, then finally discharge to MH4 and MH5 with 750mm dia. concrete pipe (1:200).

3.4.8 Fig. 4 and Fig. 5 shows the proposed drainage layout of the proposed drains as above.

3.4.9 Appendix B and Appendix C shows the details hydraulic calculation.

3.4.10 Appendix D shows the calculation checking the existing nullah beside Kam Shui South Road.

The proposed design drainage facilities helps to improve the discharge ability of rainstorm water from the site and its upstream area without being harmful to the existing nullah beside Kam Shui South Road.

4. Recommendation

4.1 The discharge from Catchment B in future development shall be discharge to MH6.

4.2 Regular maintenance shall be carried out to the drainage system particularly MH1 to MH7 and its final discharge pipe.

4.3 Excavation permit shall be obtained for the construction of the proposed 2.4mm dia concrete pipe from MH7 to the existing nullah beside Kam Shui South Road.

4.4 The proposed drainage works shall be carried out in dry season. Close monitoring to the construction is recommended to avoid the discharge condition from upstream being affected.

Appendix A –Calculation of Runoff

Calculation of Runoff

Before Development

Catchment ID	Area (A) km2	Average Slope (H), m/100	Flow Path (L), m	Inlet time (to), min	Storm constants			Runoff intensity (i), mm/hr	Runoff Coefficient (C)	Q=0.278CiA/0.9, (m^3/s)
					a	b	c			
A	0.024848	1	69.36	4.591	505.5	3.29	0.355	242.905	0.25	0.466
B	0.021441	1	78.5	5.273	505.5	3.29	0.355	235.851	0.25	0.391
C	0.009907	1	66.95	4.858	505.5	3.29	0.355	240.046	0.95	0.698
D	0.062747	3.161	180.35	8.644	505.5	3.29	0.355	209.633	0.656	2.665
E	0.148314	1.588	359	18.119	505.5	3.29	0.355	170.358	0.6	4.683
									Total	8.903

After Development

Catchment ID	Area (A) km2	Average Slope (H), m/100	Flow Path (L), m	Inlet time (to), min	Storm constants			Runoff intensity (i), mm/hr	Runoff Coefficient (C)	Q=0.278CiA/0.9, (m^3/s), extra 11% appliued to
					a	b	c			
A	0.024848	1	69.36	4.591	505.5	3.29	0.355	242.905	0.95	1.968
B	0.021441	1	78.5	5.273	505.5	3.29	0.355	235.851	0.95	1.649
C	0.009907	1	66.95	4.858	505.5	3.29	0.355	240.046	0.95	0.698
D	0.062747	3.161	180.35	8.644	505.5	3.29	0.355	209.633	0.656	2.665
E	0.148314	1.588	359	18.119	505.5	3.29	0.355	170.358	0.6	4.683
									Total	11.662 m^3/s

Sub total (A+B) before development= **0.857** m^3/s

Sub total (A+B) after development= **3.616** m^3/s

Extra runoff due to development= **2.760** m^3/s

The runoff from Catchment A~Catchment D will be converged to Existing Nullah beside Kam Shui South Road, Extra Runoff to Existing Nullah, Sub total (A+B+C+D) after development= **6.980** m^3/s

Appendix B – Calculation of Drainage Capacity of Designed Drains inside The Site

Calculation of Drainage Capacity of Designed Drains inside The Site

Catchment ID	Area (A) km2	Average Slope (H), m/100	Flow Path (L), m	Inlet time (to), min	Storm constants			Runoff intensity (i), mm/hr	Runoff Coefficient (C)	Q=1.111*0.278CiA/0.9, (m3/s)
					a	b	c			
A1	0.000957	1	9.32	0.854	505.5	3.29	0.355	305.157	0.95	0.095
A2	0.000543	1	18.56	1.801	505.5	3.29	0.355	283.673	0.95	0.050
A3	0.002599	1	64.14	5.321	505.5	3.29	0.355	235.387	0.95	0.199
A4	0.003188	1	52.2	4.243	505.5	3.29	0.355	246.834	0.95	0.257
A5	0.000538	1	11.67	1.133	505.5	3.29	0.355	298.184	0.95	0.052
A6	0.00233	1	68.67	5.759	505.5	3.29	0.355	231.274	0.95	0.176
A7	0.005921	1	68.84	5.259	505.5	3.29	0.355	235.987	0.95	0.456
A8	0.002407	1	51.28	4.287	505.5	3.29	0.355	246.324	0.95	0.193
A9	0.003318	1	47.26	3.826	505.5	3.29	0.355	251.873	0.95	0.272
A10	0.001095	1	29.57	2.674	505.5	3.29	0.355	268.160	0.95	0.096
		(1:100 fall)								

For the design of drains from Start Point to CP2 and Start Point to CP18, Consider A1+A8+A10

Design Q = **0.384** m^3/sec

Manning Equation $V = R^{2/3}*S_f^{0.5}/n$

where $R = (\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.2625 m

$= 0.1823$ m A= 0.2461 m^2

$n = 0.014$ $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

$S_f = 0.005$ (1:200)

Therefore, $V = 0.1823^{2/3}*0.05^{0.5}/0.014$

$= 1.624$ m/sec

Maximum Capacity (Q_{max}) = V*A

= **0.400** m^3/sec

> **0.384** m^3/sec

% of capacity utilization = **96%**

Provide 525UC (1:200) is OK (96% capacity utilization)

For the design of drains from Start Point to CP18 via CP16, Consider A3

Design Q = **0.199** m^3/sec

Manning Equation $V = R^{2/3}*S_f^{0.5}/n$

where $R = (\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.225 m

$= 0.156$ m A= 0.1808 m^2

$n = 0.014$ $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

$S_f = 0.005$ (1:200)

Therefore, $V = 0.1563^{2/3}*0.05^{0.5}/0.014$

$= 1.465$ m/sec

Maximum Capacity (Q_{max}) = V*A

= **0.265** m^3/sec

> **0.199** m^3/sec

% of capacity utilization = **75%**

Provide 450UC (1:200) is OK (75% capacity utilization)

For the design of drains from CP18 to CP5 and outfall from CP5, A1+A3+A8+A9+A10

Design Q = **0.856** m^3/sec

Manning Equation V = $R^{2/3}*S_f^{0.5}/n$

where R = $(\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.375 m

= 0.2604 m A= 0.5021 m^2

n = 0.014 $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

S_f = 0.005 (1:200)

Therefore, V = $0.2604^{2/3}*0.05^{0.5}/0.014$

= 2.060 m/sec

Maximum Capacity (Q_{max}) = V*A

= **1.034** m^3/sec

> **0.856** m^3/sec

% of capacity utilization = **83%**

Colebrook-White Equation (For outfall)

$$V = -\sqrt{(8gDs)}\log\left(\frac{ks}{3.7D}+\frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)
g	=	9.81	m/s2	gravitational acceleration (m/s2)
D	=	0.75	m	internal pipe diameter (m)
ks	=	0.00006	m	hydraulic pipeline roughness (m)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)
s	=	0.00500		hydraulic gradient (1: 200)

Therefore, design V of = 2.41 m/s

Q= VA

= **1.066** m3/s

> **0.856** lit/min Ok

% of capacity utilization = **80%**

Provide 750UC (1:200) (83% capacity utilization) or 750mm dia. concrete pipe (1:200) (80% capacity utilization) is OK

For the design of drains from CP15 to CP12, Consider A2+A4

Design Q = **0.307** m^3/sec

Manning Equation V = $R^{2/3}*S_f^{0.5}/n$

where R = $(\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.2625 m

= 0.1823 m A= 0.2461 m^2

n = 0.014 $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

S_f = 0.005 (1:200)

Therefore, V = $0.1823^{2/3}*0.05^{0.5}/0.014$

= 1.624 m/sec

Maximum Capacity (Q_{max}) = V*A

= **0.400** m^3/sec

> **0.307** m^3/sec

% of capacity utilization = **77%**

Provide 525UC (1:200) is OK (77% capacity utilization)

For the design of drains from CP12 to CP10, Consider A2+A4+A5

Design Q = **0.359** m^3/sec

Manning Equation V = $R^{2/3}*S_f^{0.5}/n$

where R = $(\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.2625 m

= 0.1823 m A= 0.2461 m^2

n = 0.014 $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

S_f = 0.005 (1:200)

Therefore, V = $0.1823^{2/3}*0.05^{0.5}/0.014$

= 1.624 m/sec

Maximum Capacity (Q_{max}) = V*A

= **0.400** m^3/sec

> **0.359** m^3/sec

% of capacity utilization = **90%**

Provide 525UC (1:200) is OK (90% capacity utilization)

For the design of drains from Start Point to CP10 via CP6, Consider A6

Design Q = **0.176** m^3/sec

Manning Equation V = $R^{2/3}*S_f^{0.5}/n$

where R = $(\pi r^2/2+2r^2)/(\pi r+2r)$ r= 0.225 m

= 0.1563 m A= 0.1808 m^2

n = 0.014 $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

S_f = 0.005 (1:200)

Therefore, V = $0.1563^{2/3}*0.05^{0.5}/0.014$

= 1.465 m/sec

Maximum Capacity (Q_{max}) = V*A

= **0.265** m^3/sec

> **0.176** m^3/sec

% of capacity utilization = **66%**

Provide 450UC (1:200) is OK (66% capacity utilization)

For the design of drains of outfall from CP10, Consider A2+A4+A5+A6+A7

Design Q = **0.990** m^3/sec

Colebrook-White Equation (For outfall)

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D}+\frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)
g	=	9.81	m/s2	gravitational acceleration (m/s2)
D	=	0.75	m	internal pipe diameter (m)
ks	=	0.00006	m	hydraulic pipeline roughness (m)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)
s	=	0.00500		hydraulic gradient (1: 200)

Therefore, design V of = 2.41 m/s

Q= VA

= **1.066** m3/s

> **0.990** lit/min Ok

% of capacity utilization = **93%**

750mm dia. concrete pipe (1:200) (93% capacity utilization) is OK

Summary

Drains Portion	Design Drain	Design Q (m^3/sec)	Capacity, Qc (m^3/sec)	Q/Qc (%)	Check Qc>Q	Flow Velocity, v (m/sec)	0.7m/s<v<3.0m/s
from Start Point to CP2 and Start Point to CP18	525UC (1:200)	0.384	0.400	96%	OK	1.624	OK
For the design of drains from Start Point to CP18 via CP16	450UC (1:200)	0.199	0.265	75%	OK	1.465	OK
For the design of drains from CP18 to CP5	Provide 750UC (1:200)	0.856	1.034	83%	OK	2.060	OK
For the design of drains of Outfall from CP5	750mm dia. concrete pipe (1:200)	0.856	1.066	80%	OK	2.41	OK
For the design of drains from CP15 to CP12	525UC (1:200)	0.307	0.400	77%	OK	1.624	OK
For the design of drains from CP12 to CP10	525UC (1:200)	0.359	0.400	90%	OK	1.624	OK
For the design of drains from Start Point to CP10 via CP6	450UC (1:200)	0.176	0.265	66%	OK	1.465	OK
For the design of drains of Outfall from CP10	750mm dia. concrete pipe (1:200)	0.990	1.066	93%	OK	2.413	OK

Appendix C – Calculation of Drainage Capacity of Designed Drains replacing the Existing Watercourse S1 and S2

Design of Drains Calculation of Drainage Capacity of Designed Drains replacing the Existing Watercourse S1 and S2

Before Development

Catchment ID	Area (A) km2	Average Slope (H), m/100	Flow Path (L), m	Inlet time (to), min	Storm constants			Runoff intensity (i), mm/hr	Runoff Coefficient (C)	Q=0.278CiA/0.9, (m3/s)
					a	b	c			
A	0.024848	1	69.36	4.591	505.5	3.29	0.355	242.905	0.25	0.466
B	0.021441	1	78.5	5.273	505.5	3.29	0.355	235.851	0.25	0.391
C	0.009907	1	66.95	4.858	505.5	3.29	0.355	240.046	0.95	0.698
D	0.062747	3.161	180.35	8.644	505.5	3.29	0.355	209.633	0.656	2.665
E	0.148314	1.588	359	18.119	505.5	3.29	0.355	170.358	0.6	4.683

After Development

Catchment ID	Area (A) km2	Average Slope (H), m/100	Flow Path (L), m	Inlet time (to), min	Storm constants			Runoff intensity (i), mm/hr	Runoff Coefficient (C)	Q=0.278CiA/0.9, (m3/s), extra 11% appliued to
					a	b	c			
A	0.024848	1	69.36	4.591	505.5	3.29	0.355	242.905	0.95	1.968
B	0.021441	1	78.5	5.273	505.5	3.29	0.355	235.851	0.95	1.649
C	0.009907	1	66.95	4.858	505.5	3.29	0.355	240.046	0.95	0.698
D	0.062747	3.161	180.35	8.644	505.5	3.29	0.355	209.633	0.656	2.665
E	0.148314	1.588	359	18.119	505.5	3.29	0.355	170.358	0.6	4.683

Design Q for replacing existing watercourse S1 (MH1 to MH3), consider Catchment C

Q = **0.698** m3/s **1no. Of 750mm dia. concrete pipes (1:150)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	0.75	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.005		hydraulic gradient	(1: 200)

Therefore, design V = 2.413 m/s
of pipe capacity

Q= VA (0.8 factor for sedimentation)
= **1.066** m3/s
> **0.698** lit/min Ok
% of capacity utilization = **65%**

1 no. of 750mm dia. concrete pipe (1:200) (65% capacity utilization) is OK

Design Q for replacing existing watercourse S2 (MH2 to MH3), consider Catchment D

Q = **2.665** m3/s **1no. Of 1500mm dia. concrete pipes (1:350)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	1.5	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.003		hydraulic gradient	(1: 350)

Therefore, design V = 2.760 m/s
of pipe capacity

Q= VA (0.8 factor for sedimentation)
= **4.878** m3/s
> **2.665** lit/min Ok
% of capacity utilization = **55%**

1no. Of 1500mm dia. concrete pipes (1:350) (55% capacity utilization) is OK

Design Q for replacing existing watercourse S2 (MH3 to MH4), consider Catchment C+D

Q = **3.363** m3/s **1no. Of 1500mm dia. concrete pipes (1:350)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	1.5	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.003		hydraulic gradient	(1: 350)

Therefore, design V = 2.760 m/s
of pipe capacity

Q= VA (0.8 factor for sedimentation)
= **4.878** m3/s
> **3.363** lit/min Ok
% of capacity utilization = **69%**

1no. Of 1500mm dia. concrete pipes (1:350) (69% capacity utilization) is OK

Design Q from MH4 to MH6, consider Catchment A+C+D

Q = **5.331** m3/s **1no. Of 1650mm dia. concrete pipes (1:350)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	1.65	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.003		hydraulic gradient	(1: 350)

Therefore, design V of pipe capacity = 2.925 m/s

Q= VA (0.8 factor for sedimentation)

= **6.254** m3/s

> **5.331** lit/min Ok

% of capacity utilization = **85%**

1no. Of 1650mm dia. concrete pipes (1:350) (85% capacity utilization) is OK

Design Q from MH6 to MH7, consider Catchment A+B+C+D

Q = **6.980** m3/s **1no. Of 1800mm dia. concrete pipes (1:375)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	1.8	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.003		hydraulic gradient	(1: 375)

Therefore, design V of pipe capacity = 2.976 m/s

Q= VA (0.8 factor for sedimentation)

= **7.572** m3/s

> **6.980** lit/min Ok

% of capacity utilization = **92%**

1no. Of 1800mm dia. concrete pipes (1:375) (92% capacity utilization) is OK

Design Q from MH7 to Existing Nullah, consider Catchment A+B+C+D+E

Q = **11.662** m3/s **1no. Of 2400mm dia. concrete pipes (1:550)**

Colebrook-White Equation

$$V = -\sqrt{(8gDs)}\,\log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=			mean velocity (m/s)	
g	=	9.81	m/s2	gravitational acceleration (m/s2)	
D	=	2.4	m	internal pipe diameter (m)	
ks	=	0.00006	m	hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, concrete pipe)
v	=	1.14E-06	m2/s	kinematic viscosity of fluid (m2/s)	
s	=	0.002		hydraulic gradient	(1: 550)

Therefore, design V of pipe capacity = 2.906 m/s

Q= VA (0.8 factor for sedimentation)

= **13.145** m3/s

> **11.662** lit/min Ok

% of capacity utilization = **89%**

1no. Of 2400mm dia. concrete pipes (1:550) (89% capacity utilization) is OK

Summary

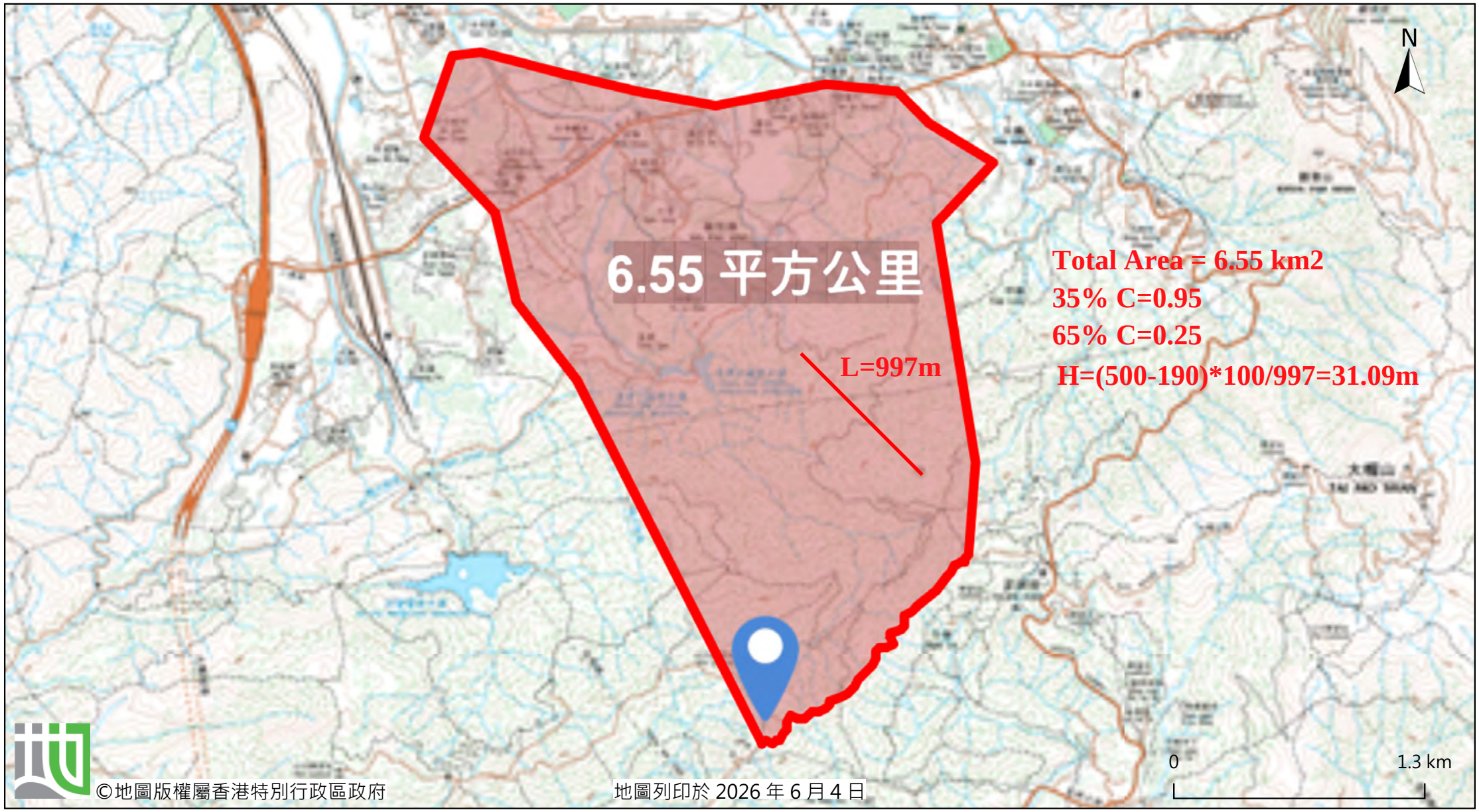
FALL	PIPE	from	to	upstream		downstream		L	Design Q (m^3/sec)	Capacity, Qc (m^3/sec)	Q/Qc (%)	Check Qc>Q	Flow Velocity, v (m/sec)	0.7m/s<v<3.0m/s
				CL	IL	CL	IL							
200	0.75	MH1	MH3	14.200	12.458	14.500	11.696	152.54	0.698	1.066	65%	OK	2.413	OK
350	1.5	MH2	MH3	14.200	11.792	14.500	11.696	33.58	2.665	4.878	55%	OK	2.760	OK
350	1.5	MH3	MH4	14.500	11.696	13.800	11.646	17.48	3.363	4.878	69%	OK	2.760	OK
350	1.65	MH4	MH5	13.800	11.296	13.500	10.968	114.52	5.331	6.254	85%	OK	2.925	OK
350	1.65	MH5	MH6	13.500	10.368	14.500	10.111	90.24	5.331	6.254	85%	OK	2.925	OK
375	1.8	MH6	MH7	14.500	9.511	13.000	9.300	79	6.980	7.572	92%	OK	2.976	OK
550	2.4	MH7	NULLAH	12.500	9.171	13.000	9.150	11.4758	11.662	13.145	89%	OK	2.906	OK

Appendix D – Calculation of Drainage Capacity of Existing Nullah beside Kam Shui South Road.

GEOINFO MAP
地理資訊地圖

前往地圖: https://www.map.gov.hk/gm/geo:22.4124,114.0645?z=72224

Catchment Area Plan for Existing Nullah beside Kam Shui South Road



地圖列印於 2026 年 6 月 4 日

由「地理資訊地圖」網站提供: https://www.map.gov.hk

GEOINFO MAP
地理資訊地圖

前往地圖: https://www.map.gov.hk/gm/geo:22.4124,114.0645?z=72224

Justification of C value (35% developed, C=0.95), (65% undeveloped, C=0.25)

由「地理資訊地圖」網站提供: https://www.map.gov.hk

Calculation of Drainage Capacity of Existing Nullah beside Kam Shui South Road.

Total Catchment = 6550000 m2

Calculation of Design Runoff of the Proposed Development,

$\Sigma Q = \Sigma 0.278\ C\ i\ A$

The Site: C = 0.4875 (35% C=0.95, 65% C=0.25)

A = 6550000 m^2
= 6.55 km^2

t = $0.14465\ L/\ H^{0.2}A^{0.1}$
= $0.14465*997/31.09^{0.2}*6550000^{0.1}$
= 60.099 min

i = $1.111*a/(t+b)^c$ (10 yrs return period, Table 3d, Corrigendum 2024, SDM) and (11.1% increase due to climate change)
= $1.16*505.5/(60.099+3.29)^{0.355}$
= 134.4 mm/hr

Therefore, Q = 0.278*0.4875*134.4*6.55/0.9 (0.9 factor is adopted for sedimentation)
= **132.582** m^3/sec

Calculation Maximum Capacity of Existing Nullah beside Kam Shui South Road

Manning Equation $V = R^{2/3}*S_f^{0.5}/n$

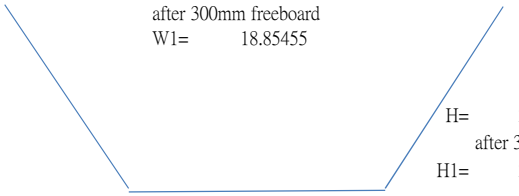
where $R = A/(2E+B)$
= 1.983 m

n = 0.014 $s/m^{1/3}$ (Talbe 13 of Stormwater Drainage Manual)

S_f = 0.00333

Therefore, $V = 1.983^{2/3}*0.00333^{0.5}/0.014$
= 6.508 m/sec

W1= 18.855 m
H1= 3.55 m
B= 5.3 m
E= 8.162 m
A= 42.874 m2



W= 20
after 300mm freeboard
W1= 18.85455

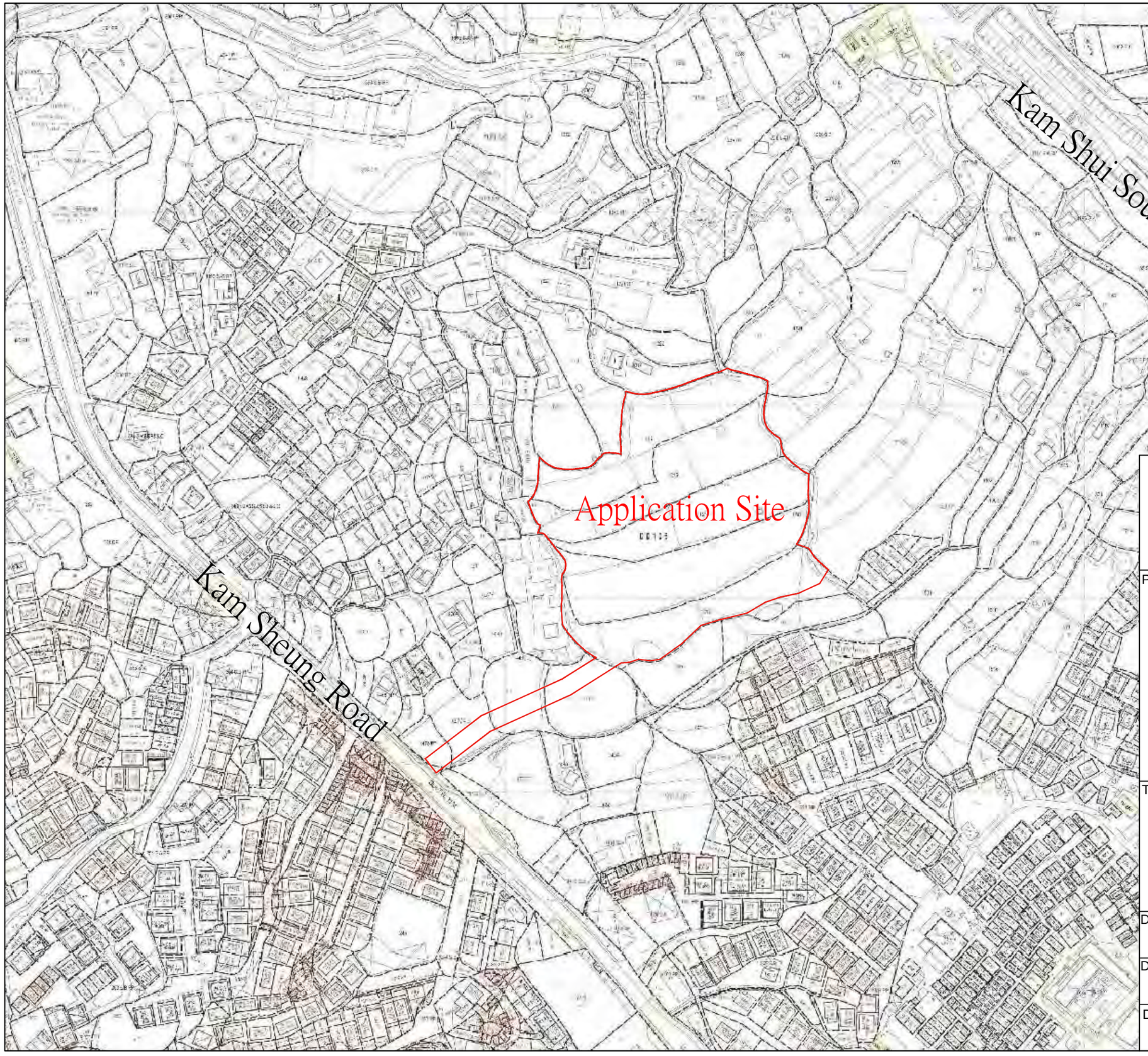
H= 3.85
after 300mm freeboard
H1= 3.55

B= 5.3
inclined edge,after 300mm freeboard, E= 8.162 m

Maximum Capacity (Q_{max}) = V*A
= **279.043** m^3/sec
> **132.582** m^3/sec
% used = **48%**

Extra runoff from proposed development = **2.760** m^3/sec (Appendix A refers)
increase of % = **1%**

Appendix E – Figures and Photos



正宏工程顧問公司

CHING WAN ENGINEERING
CONSULTANT COMPANY

Project:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES
(Application Number:)

Title:

Location Plan

Drawn by:

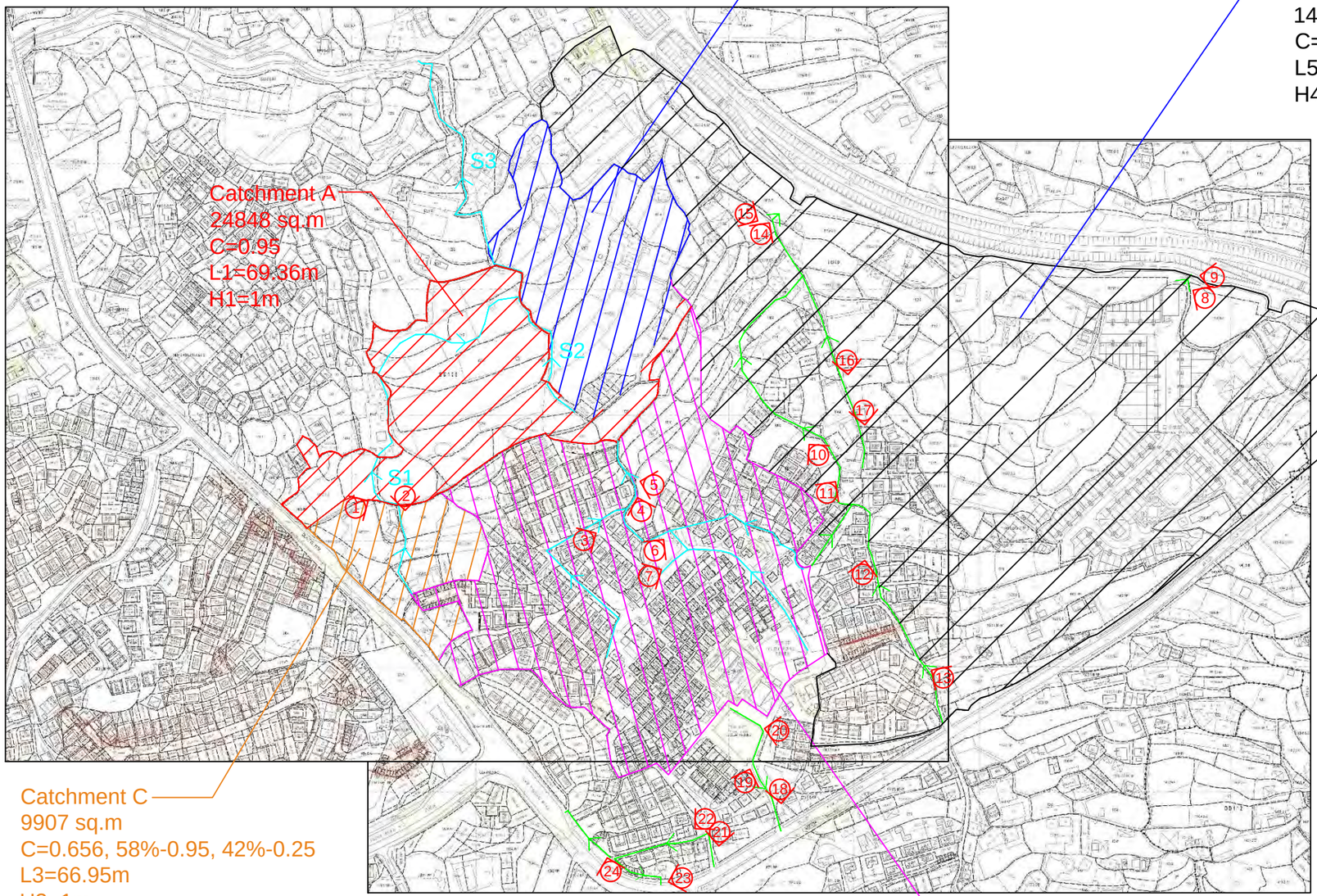
Fig 1

Drawn by:

DM

Date:

11–6–2026



Existing watercourse S1 and S2

Existing drains not contribute to S1 or S2

1 Photo Viewport

正宏工程顧問公司

CHING WAN ENGINEERING CONSULTANT COMPANY

Project:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES (Application Number:)

Title:

Catchment Plan of Existing Watercourse S1 and S2

Drawn by:

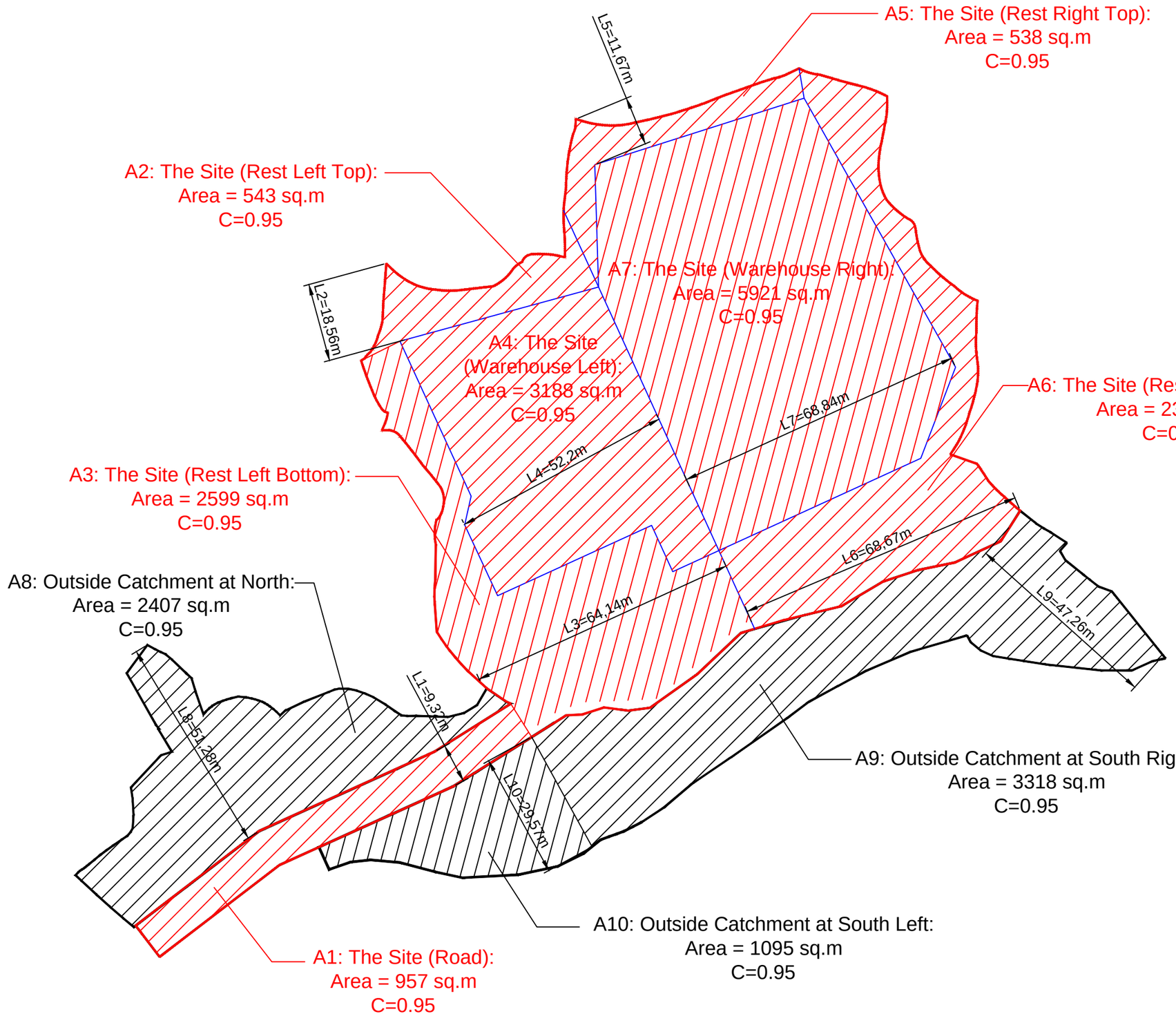
Fig 2

Drawn by:

DM

Date:

11–6–2026



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Project:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES (Application Number:)

Title:

Catchment Plan of The Site

Drawn by:

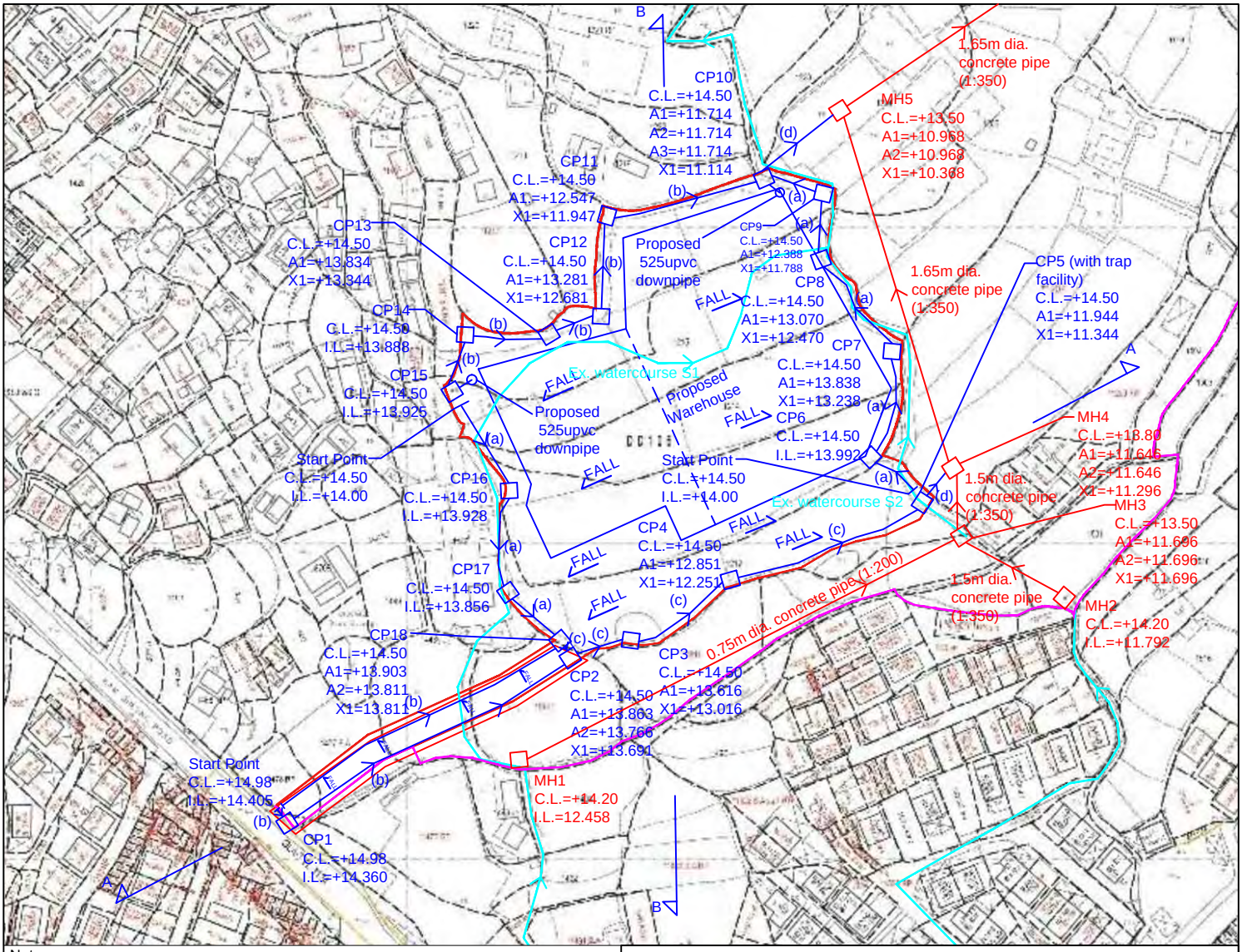
Fig 3

Drawn by:

DM

Date:

11–6–2026



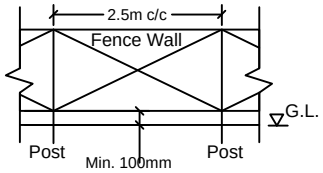
Note:

1. Catchpits (CP5 & CP10) with desilting facility shall follow CEDD standard drawing No. C2406I.

2. Catchpit and UC follows Typical Details of Geotechnical Manual for Slope Fig.8.10 and Fig.8.11 respectively.

3. Fence Wall to be erected (if any) shall be Open-bottom type.

4. Maximum 900mm filling.



TYPICAL DETAIL OF OPEN-BOTTOM TYPE FENCE WALL

LEGEND

CP	Proposed CatchPit
(a)	Proposed 450UC (1:200) with Cast Iron Cover
(b)	Proposed 525UC (1:200) with Cast Iron Cover
(c)	Proposed 750UC (1:200) with Cast Iron Cover
(d)	Proposed 750mm dia. concrete pipe (1:200)
	Existing Stream
	Proposed 525upvc downpipe

***S1and S2 shall be replaced from MH1 and MH2, and to be retained immediate downstream of the site**

正宏工程顧問公司

CHING WAN ENGINEERING CONSULTANT COMPANY

Title: Drainage Proposal - LAYOUT

Fig. 4

Drawn by: DM

Date: 11-6-2026

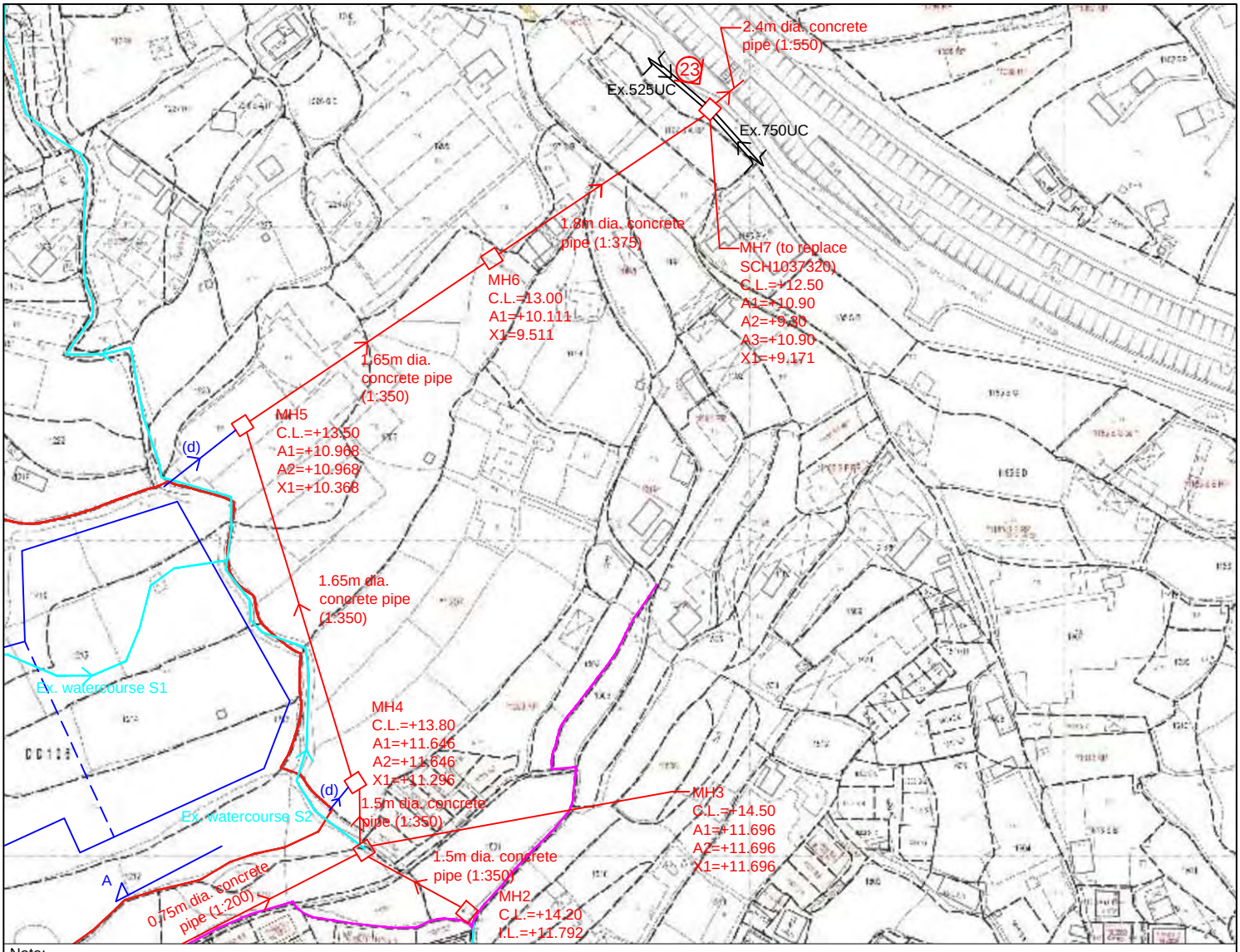
Check by: DM

Scale: ----

Project:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

(Application Number:)



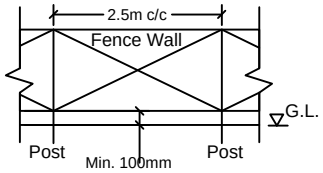
Note:

1. Catchpits (CP5 & CP10) with desilting facility shall follow CEDD standard drawing No. C2406I.

2. Catchpit and UC follows Typical Details of Geotechnical Manual for Slope Fig.8.10 and Fig.8.11 respectively.

3. Fence Wall to be erected (if any) shall be Open-bottom type.

4. Maximum 900mm filling.



TYPICAL DETAIL OF OPEN-BOTTOM TYPE FENCE WALL

LEGEND

- Ex. UC
- CP — Proposed CatchPit
- (a) — Proposed 450UC (1:200) with Cast Iron Cover
- (b) — Proposed 525UC (1:200) with Cast Iron Cover
- (c) — Proposed 750UC (1:200) with Cast Iron Cover
- (d) — Proposed 750mm dia. concrete pipe (1:200)
- Existing Stream
- Proposed 525upvc downpipe
- 1 — Photo Viewport

正宏工程顧問公司

CHING WAN ENGINEERING CONSULTANT COMPANY

Title: Drainage Proposal - LAYOUT

Fig. 5

Drawn by: DM

Date: 11-6-2026

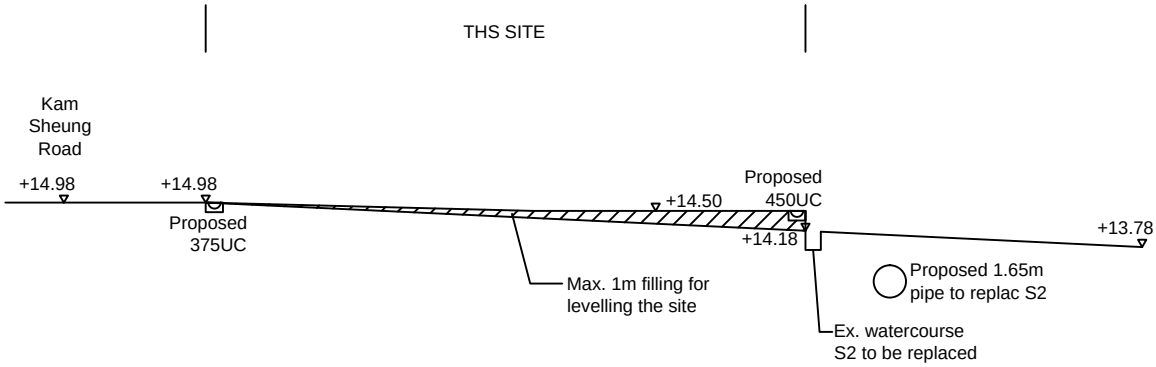
Check by: DM

Scale: ----

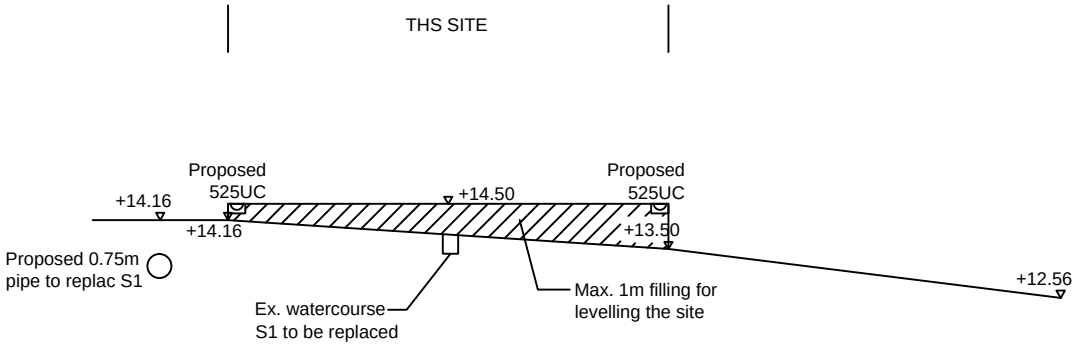
Project:

PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES

(Application Number:)



SECTION A-A



SECTION B-B

正宏工程顧問公司 CHING WAN ENGINEERING CONSULTANT COMPANY	Title: Drainage Proposal - SECTIONS	Fig. 6
	Drawn by: DM	Date: 11−6−2026
Project: **PROPOSED TEMPORARY WAREHOUSE (EXCLUDING DANGEROUS GOODS GODOWN) WITH ANCILLARY FACILITIES AND ASSOCIATED FILLING OF LAND FOR A PERIOD OF 3 YEARS at VARIOUS LOTS IN D.D. 106 AND ADJOINING GOVERNMENT LAND, KAM TIN, YUEN LONG, NEW TERRITORIES** **(Application Number:)**	Check by: DM	Scale: −−−−

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

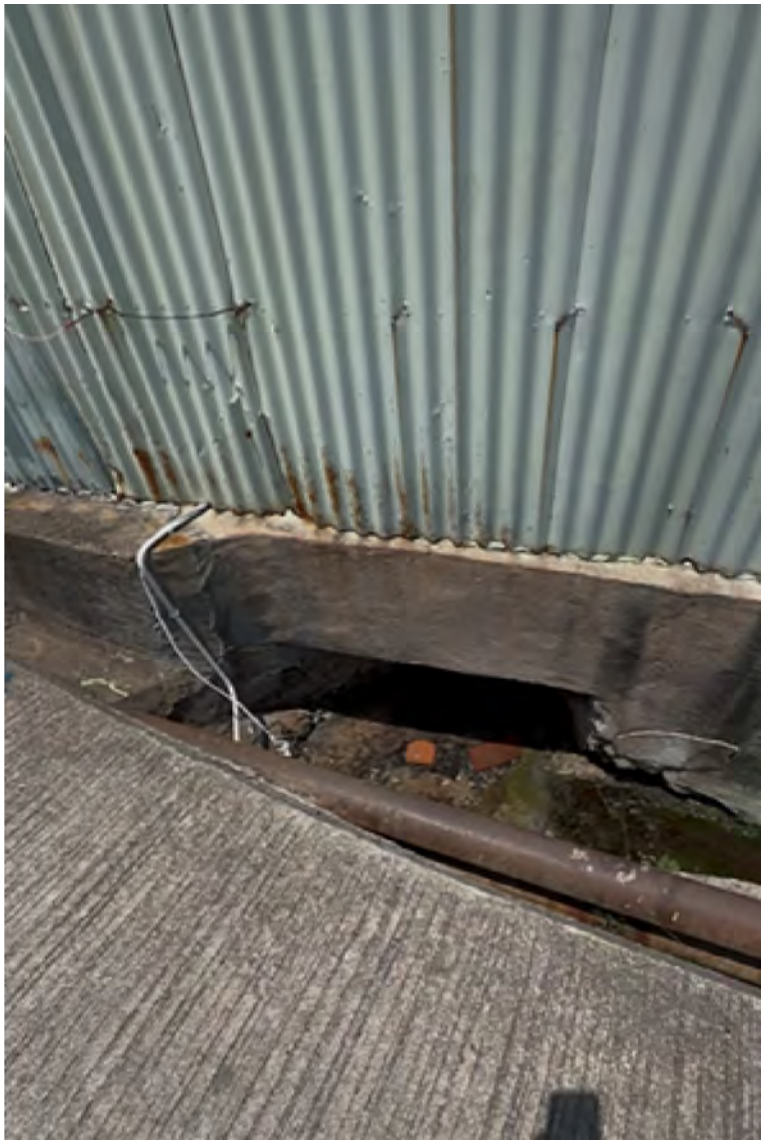


Photo 15

Photo 16

Photo 17

Photo 18

Photo 19

Photo 20

Photo 21

Photo 22

Photo 23 SCH1037320