Appendix 1

Drainage Submission in support of Planning Application No: A/YL-TYST/1293 for a Proposed Warehouse Development at Lots 1198sC (Part) and 1198sF (Part) in DD119, Pak Sha Tsuen, Yuen Long, New Territories

(HT24189)

December 2024

Planning Consultant: Top Bright Consultants Limited

Drainage Consultant:

何田顧問工程師有限公司
HO TIN & ASSOCIATES
CONSULTING ENGINEERS LIMITED
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Prepared & approved by	LEE Kwok Cheung *RPE (Civil)*	

1. Background

1.1 In support of Planning Application No: A/YL-TYST/1293 for a proposed warehouse development at Lots 1198sC (Part) and 1198sF (Part) in DD119, Pak Sha Tsuen, Yuen Long, New Territories, Messrs. Ho Tin & Associates Consulting Engineers Limited was appointed to prepare a Drainage Submission.

1.2 A drainage proposal for the same site was submitted to and subsequently accepted by the Town Planning Board on 6 November 2020 under the Planning Application Nos. A/YL-TYST/960 (a copy of the acceptance letter is enclosed in **Appendix A**).

1.3 The subject site boundary is now slightly adjusted due to the change of the boundary of Lot 1198sF and exclusion of Lots 1195 (Part) and 1197sA (Part), but the total site area remains approximately the same. This Drainage Submission is to review the appropriateness of the previously accepted Drainage Proposal with respect to the latest drainage design requirements.

2. Approach to Prepare this Submission

2.1 This Drainage Submission reviewed the adequacy of the previously accepted proposed drainage works with respect to the latest Stormwater Drainage Manual and its Corrigenda issued by Drainage Services Department and to propose drainage amendment where necessary in order to collect the surface runoff accrued on the subject site and to intercept the overland flow from the adjacent lands not causing any adverse drainage effects on the surroundings.

3. The Subject Site

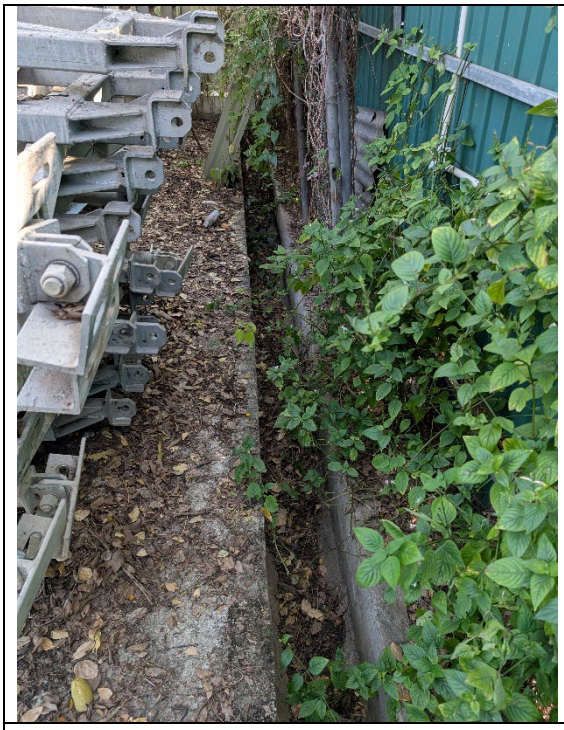
3.1 The subject site comprises of Lots 1198sC (Part) and 1198sF (Part) in DD119, Pak Sha Tsuen, Yuen Long, New Territories with a total site area of about 1,228m^2. It consists of two parcels of land, one larger and one smaller abutting on the western and eastern side of an existing track branching off to the west of Kung Um Road. It is proposed to be developed into warehouse use.

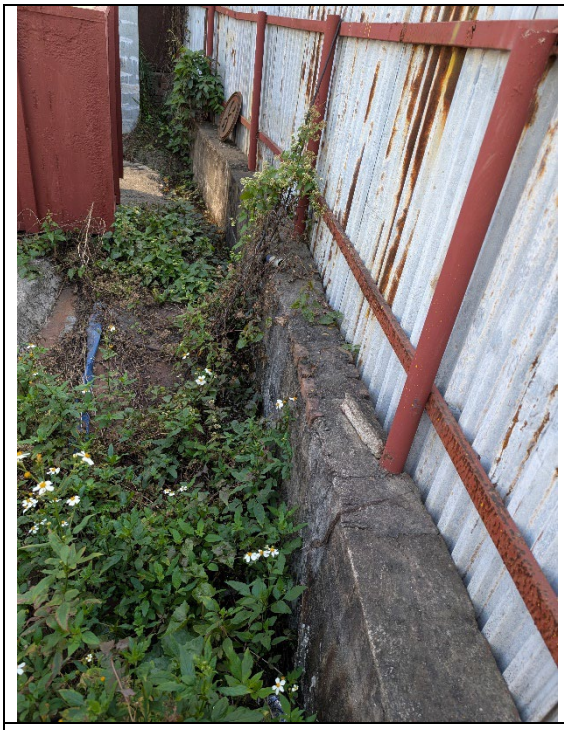
4. Existing Drainage Conditions of the Site

4.1 The subject site as well as the areas in the immediate vicinity are paved with concrete at present. The surface of each of the parcel of land of the subject site is generally gently sloping toward the west. The previously accepted drainage layout is enclosed in **Appendix B**. There is no change in general in the drainage conditions of the subject area.

4.2 Colour photos (location taken shown in **Figure 1**) showing the existing site/drainage conditions are shown in the following:

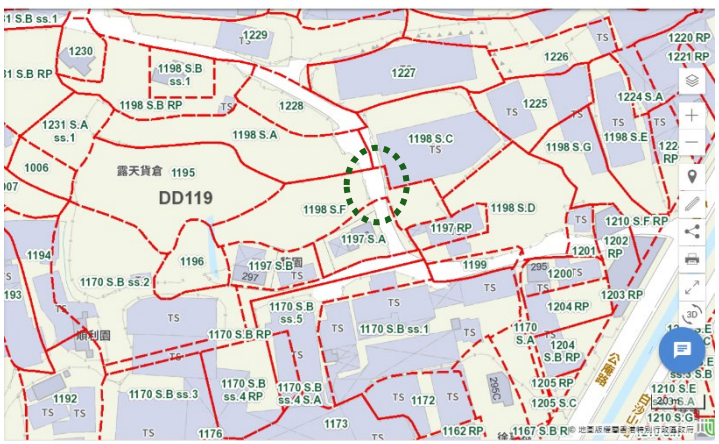
1 – General view of the Eastern Parcel of the Subject Site	2 – General view of the Western Parcel of the Subject Site
3 – Existing 300UC along the southern site boundary of the Western Parcel of the Subject Site (1 of 2)	4 – Existing 300UC along the southern site boundary of the Western Parcel of the Subject Site (2 of 2)

	
5 – Existing 225UC within the northern boundary of the Western Parcel of the Subject Site (1 of 2)	6 – Existing 225UC within the northern boundary of the Western Parcel of the Subject Site (2 of 2)
7 – Viewing east form the centre of the Western Parcel of the Subject Site	8 – Existing 225UC within the northern boundary of the Eastern Parcel of the Subject Site

	
9 – Existing 225UC within the southern boundary of the Eastern Parcel of the Subject Site	7 – Viewing west form the centre of the Eastern Parcel of the Subject Site

5. Necessary Drainage Works

5.1 The subject development will maintain the existing levels of the two parcels of land of the subject site. The existing peripheral channels will be maintained at each parcel of the subject site to intercept all surface runoff running across the subject site boundary. The flows inside the channels of the Eastern Parcel of the subject site is conveyed to the drainage system of the Western Parcel of the subject site. The underground drain across the existing access road runs within the boundary of the subject lot No. 1198 s.F (i.e. part of the existing access road is across Lot No. 1198 s.F, please refer to the extract from 'Geoinfo' shown below) and therefore no consent from others would be required.



5.2 All the discharges from the Western Parcel of the subject site is discharged via a manhole with desilting trap into the existing catchpit outside the western corner of its boundary. The catchpit discharges the flow to the further west into an existing watercourse.

5.3 Since there is only minor changes in subject site boundary and the subject site area remains unchange, only drainage modification works to cope with the actual site boundary within the subject site boundary is necessary.

5.4 The stormwater discharging route of the subject site as well as flow directions of the surface runoff and relevant subcatchment boundaries of the concerned areas are unchanged and shown in **Figure 1**.

6. Hydraulic Calculation

6.1 Assessment criteria is based on the recommendation set out in the Stormwater Drainage Manual (Fifth edition, Jan 2018) (SDM) and its Corrigendum Nos. 1/2022, 1/2024 and 2/2024 issued by DSD. Taking into consideration of the nature of local stormwater drainage system within a village, Design Return Period of 50 years is adopted.

6.2 The corresponding runoffs under rainfall intensity for various return period are worked out with reference to Rational Method. Brandy-Williams method is used in calculation of the time of concentration. A uniformly distributed rainfall with an intensity is determined by the Intensity-Duration-Frequency. With referenced to Table 3a - Storm Constants for different return periods of HKO Headquarters from SDM, the rainfall profiles are derived based on the following equation:

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

where i = mean rainfall intensity (mm/hr)
t = duration time of concentration (min)
a, b and c = storm constants given in Table below

Table : Storm Constants

Return Period (years)	50
a	505.5
b	3.29
c	0.355

6.3 A 16.0% rainfall increase is adopted in the hydraulic calculation to cater for effects due to climate change in accordance with the table 28 with projection to End of 21st Century (it is very conservative, as the subject application is only for 3 years) as stipulated in the item (e) and (k) of the SDM - Corrigendum No. 1/2022. Besides, taking into consideration of design allowance in End of 21st Century, a further 12.1% rainfall increase is incorporated into the hydraulic assessment.

6.4 Hydraulic assessment is enclosed in the **Appendix C**. 10% reduction in flow area has been incorporated to cater for potential deposition of sediment in stormwater channels and pipes as recommended in the SDM. The channels and underground drainage are checked to be capable to cater for the estimated runoff under the designed rainstorms. Therefore, the stormwater drainage system is capable to cater for the surface runoff without causing any adverse drainage impacts on the subject site and its surroundings.

6.5 Since all channels/pipes have sufficient spare capacity, no water backup will occur at the upstream under rainstorms of 50-year (or lower) return periods.

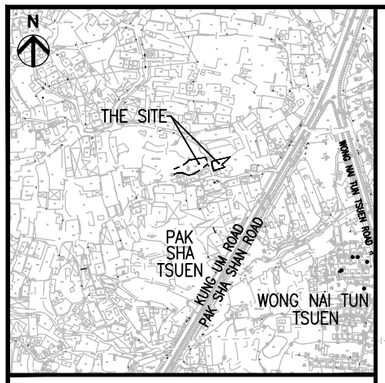
7. Conclusion and Recommendations

7.1 The subject development will be for warehouse use. Peripheral channels and terminal manholes with desilting trap are capable to ensure no surface runoffs running onto the adjacent areas from the subject site. The surface runoff of the subject site is discharged into an existing catchpit outside the western corner of the subject site.

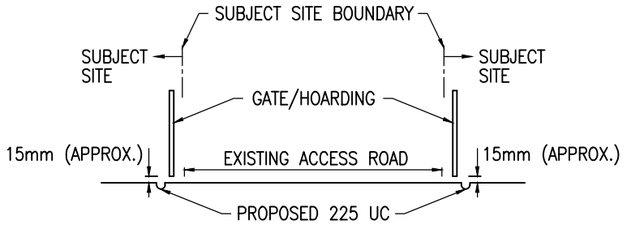
7.2 Due to the two parcels of land of the subject site are sandwiched by adjacent developments of which each has provisions to avoid its surface runoff running to the adjacent developments, there is no overland flows running between different developments. However, there are slots at the bottom of the gates/hoardings of the subject development abutting on the existing access road. Overland flows from the access road can run into the subject development via the slots and be collected by the U channels. Therefore, the drainage conditions of the area would not be altered by the subject development, and the subject development would not obstruct any existing overland flow nor adversely affect existing natural streams, village drains, ditches and the adjacent areas, etc.

7.3 The conditions of the subject site will be maintained similar to those of the existing and matching with the proposed layout in the planning application. Capacities of the previously accepted channels/drainage have been checked being still capable to receive the surface runoff from the subject site under the latest stormwater design requirements.

7.4 In conclusion, the subject development with the drainage works will not cause any adverse drainage impacts onto the area.



KEY PLAN N.T.S.



SECTION 'A' – 'A' N.T.S.

POINT 1.3a
CL 16.00
IL 15.78

225mm DIA. UNDERGROUND DRAIN 1 IN 100

POINT 1.4a
CL 16.00
IL 15.78

POINT 1.2a
CL 16.00
IL 15.78

POINT 1.1a
CL 16.00
IL 15.78

TM1
CL 16.00
IL 15.14

225 UC 1 IN 100

FALL

3 910m²

1 314m²

2 230m²

CP1
CL 16.00
IL 15.34

EXISTING CATCHPIT

EXISTING 300ø UNDERGROUND DRAIN

EXISTING WATERCOURSE

TM2
CL 16.00
IL 14.79

831 100 N

819 900 E

820 000 E

LEGEND:

- SUBJECT SITE BOUNDARY
- SUBCATCHMENT BOUNDARY
- (1) 250m² SUBCATCHMENT NUMBER AND AREA
- EXISTING WATERCOURSE
- U-CHANNEL
- TERMINAL MANHOLE
- (N) LOCATION OF PHOTO TAKEN (No.N)

PROJECT
PROPOSED WAREHOUSE DEVELOPMENT AT LOTS 1198sC(PART) AND 1198sF(PART) IN DD119, PAK SHA TSUEN, YUEN LONG, N.T.

TITLE
STORMWATER DISCHARGING ROUTE OF THE SUBJECT SITE

PLANNING CONSULTANT
Top Bright Consultants Ltd.

DRAINAGE CONSULTANT
何田顧問工程師有限公司
HO TIN & ASSOCIATES CONSULTING ENGINEERS LIMITED

SCALE
1 : 500 – A3

DRAWING No.
FIGURE 1

H:\24189_Pak Sha Tsuen\DRAWING\24189_DIA_FIG1.dwg, 24/12/2024 11:20:44

APPENDIX A -

Copy of TPB's Acceptance Letter of Previous Drainage Proposal of 6 November 2020

規 劃 署

屯門及元朗西規劃處
香港新界沙田上禾輋路一號
沙田政府合署 14 樓

By Fax (2401 0973) & Post
Planning Department

Tuen Mun and Yuen Long West
District Planning Office
14/F., Sha Tin Government Offices,
1 Sheung Wo Che Road, Sha Tin , N.T.
Hong Kong

來函檔號 Your Reference

本署檔號 Our Reference ( ) in TPB/A/YL-TYST/960

電話號碼 Tel. No. : 2158 6296

傳真機號碼 Fax No. : 2489 9711

6 November 2020

Top Bright Consultants Ltd.
Room 1003,
300 Kung Um Road
Yuen Long, N.T.
(Attn.: Mr. Wisely LIU/ Mr. Raymond LEUNG)

Dear Sir,

Compliance with Approval Condition (g)
Planning Application No. A/YL-TYST/960

I refer to your submission dated 22.9.2020 for compliance with the captioned approval condition on the submission of a revised drainage proposal. The Drainage Services Department (DSD) has been consulted on your submission. Your submission is considered:

☑ Acceptable. The captioned condition **has been complied** with. Please find detailed departmental comments at **APPENDIX**.

☐ Acceptable. Since the captioned condition requires both the submission and implementation of the proposal, it **has not been fully complied with**. Please proceed to implement the accepted proposal for full compliance with the approval condition.

☐ Not acceptable. The captioned condition has **not** been complied with.

Should you have any queries on the departmental comments, please contact Mr. Bill C H CHAN (Tel: 2781 4107) of DSD.

Yours faithfully,

(K. K. NG)
for District Planning Officer/
Tuen Mun and Yuen Long West
Planning Department

c.c.
CE/MN, DSD (Attn.: Mr. Bill C H CHAN)
Internal
CTP/TPB (2)
KKN/am

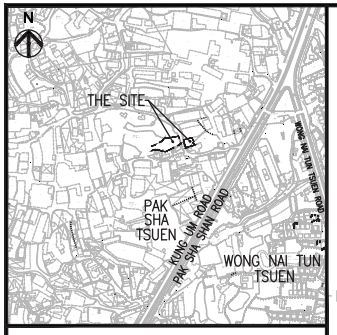
APPENDIX

Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD)

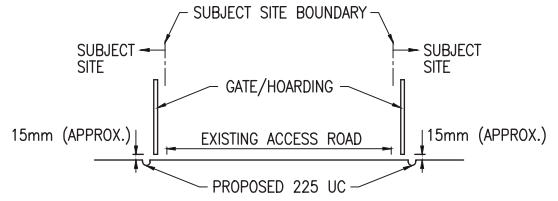
You are reminded to implement the drainage facilities on site in accordance with the agreed drainage proposal. You are required to rectify the drainage system at your own expense to the satisfaction of the government parties concerned if they are found to be inadequate or ineffective during operation. You will also be liable for and shall indemnify claims and demands arising out of damage or nuisance caused by a failure of the drainage system. You are reminded that the proposed development would neither obstruct overland flow nor adversely affected any existing natural streams, village drains, ditches and the adjacent areas. You should consult DLO/YL and seek consent from relevant lot owners for any works to be carried out outside the lot boundary before commencement of the drainage works.

APPENDIX B -

Copy of Previously Accepted Drainage Layout



KEY PLAN N.T.S.



SECTION 'A' – 'A' N.T.S.

LEGEND:

- SUBJECT SITE BOUNDARY
- SUBCATCHMENT BOUNDARY
- (1) 250m² SUBCATCHMENT NUMBER AND AREA
- EXISTING WATERCOURSE
- PROPOSED U-CHANNEL
- NEW TERMINAL MANHOLE WITH DESILTING TRAP (DETAILS REFER TO DSD STANDARD DRAWING NO. DS1053C)
- (N) LOCATION OF PHOTO TAKEN (No.N)

PROJECT
PROPOSED WAREHOUSE DEVELOPMENT AT LOTS 1195(PART), 1197sA(PART), 1198sC(PART) AND 1198sF(PART) IN DD119, KUNG UM ROAD, YUEN LONG, N.T.

TITLE
STORMWATER DISCHARGING ROUTE OF THE SUBJECT SITE

SCALE
1 : 500

DRAWING No.
SKETCH 1

PLANNING CONSULTANT
Top Bright Consultants Ltd.

DRAINAGE CONSULTANT
何田建商工程師有限公司
HO TIN & ASSOCIATES
CONSULTING ENGINEERS LIMITED

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APPENDIX C -

Hydraulic Assessment

Assessment of Hydraulic Capacities of the Proposed Drainage System for 1 in 50 year design return period

Using Rational Method

Design Flow = 0.278CiA m^3/s for grassland (heavy soil) - steep, C 0.35
for concrete surface, C = 0.95

Using Manning Equation

Design Mean Velocity = $R^{1/6}/n(RS_f)^{1/2}$ where n = 0.016 for concrete-lined open channel with fair surface
(ref. Table13 in SDM) 0.045 for natural-stream channels - winding some pools and shoals with some weeds and stones under fair condition

Using Gumbel Solution in frequency analysis

Rainfall intensity = $a / (t_d+b)^c$ where a = 505.5 , b= 3.29 and c= 0.355 in 50 year design return period
referenced from Table 3a in SDM - Storm Constants for Different Return Periods of HKO Headquarters

Using Bransby William's Equation (for channel flow)

Inlet time t_0 = $0.14465L/ (H^{0.2}A^{0.1})$ or 2 when the distance is too short

Using Colebrook's White Equation (for pipe flow)

V = - Sqt (8gDs) x log [(k_s / 3.7D) + (2.51v / D x Sqt (2gDs))]

For precast concrete pipes with 'O' ring joints with poor condition,

k_s (mm) = 0.6 k_s (m) = 0.0006

v (m^2/s) = 1.00E-06

g (m^2/s) = 9.81

* - conservative, as the subject proposed development is for temporary use for 3 years only

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	
USCP/USMH	**DSCP/DSMH**	**Collected Runoff from Catchment (refer to Figure 1)**	**USGL (mPD)**	**DSGL (mPD)**	**USIL (mPD)**	**DSIL (mPD)**	**INVERT DIFF. (m)**	**LENGTH OF CHANNEL/ DRAIN l (m)**	**SLOPE s**	**SLOPE 1 IN**	**LENGTH FOR CALCULATING OF INLET TIME L (m)**	**INLET TIME t_0 (min)**	**TIME OF FLOW INSIDE CHANNEL/ DRAIN = I/V (i.e. Column (9)/Column (26)/60) = t_f (min)**	**TIME OF CONCENTRATION t_c (min)**	**RAINFALL INTENSITY i (mm/hr)**	**RAINFALL INTENSITY INCLUDING EFFECT OF CLIMATE CHANGE (+16.0%*) (mm/hr) [refer to item (e) and (k) in SDM Corrigendum No. 1/2022]**	**ADOPTED RAINFALL INTENSITY INCLUDING EFFECT OF CLIMATE CHANGE (+16.0%) & DESIGN ALLOWANCE (12.1%) (mm/hr) [refer to item (e), (k) and (n) in SDM Corrigendum No. 1/2022]**	**RUNOFF COEF. C**	**SUB-CATCHMENT AREA (m^2)**	**EFF. AREA (m^2)**	**CUM. EFF. AREA (m^2)**	**DESIGN FLOW (m^3/s)**	**SIZE (mm)**	**CHANNEL TYPE**	**VELOCITY (m/s)**	**FLOW CAPACITY (m^3/s)**	**90% FLOW CAPACITY (m^3/s) (to cater for potential deposition of sediment)**	**SPARE CAPACITY (m^3/s)**	**Occupancy of the Proposed Pipe / Channel**	
1.1a	TM1	0.25 x 1	16.00	16.00	15.78	15.41	0.37	36.50	0.010	100	-	2.00	0.53	2.53	270.46	313.74	351.70	0.95	63	59	59	0.006	225	UC	1.14	0.05	0.05	0.046	11.2%	OK!
1.2a	TM1	0.75 x 1	16.00	16.00	15.78	15.67	0.11	10.60	0.010	100	-	2.00	0.15	2.15	276.98	321.30	360.18	0.95	188	178	178	0.018	225	UC	1.14	0.05	0.05	0.034	34.6%	OK!
TM1	CP1	1	16.00	16.00	15.41	15.34	0.07	7.30	0.010	100	-	2.53	0.09	2.63	268.94	311.97	349.72	0.95	0	0	238	0.023	225	precast concrete pipe	1.31	0.10	0.09	0.070	24.7%	OK!
1.3a	CP1	2	16.00	16.00	15.78	15.66	0.11	11.30	0.010	100	-	2.00	0.16	2.16	276.80	321.09	359.94	0.95	230	219	219	0.022	225	UC	1.14	0.05	0.05	0.030	42.4%	OK!
CP1	TM2	2 + 0.5 x 3	16.00	16.00	15.34	14.79	0.55	55.10	0.010	100	-	2.63	0.66	3.29	258.98	300.42	336.77	0.95	465	442	660	0.062	300	UC	1.38	0.11	0.10	0.049	55.6%	OK!
1.4a	TM2	0.5 x 3	16.00	16.00	15.78	15.19	0.59	58.50	0.010	100	-	2.00	0.85	2.85	265.36	307.81	345.06	0.95	465	442	442	0.042	225	UC	1.14	0.05	0.05	0.009	82.1%	OK!
TM2	Adjacent Catchpit	1 + 2 + 3	16.00	16.00	14.79	14.75	0.03	1.70	0.020	50	-	3.29	0.01	3.30	258.78	300.18	336.51	0.95	0	0	1,340	0.125	300	UC	1.96	0.16	0.14	0.032	79.7%	OK!
Adjacent Catchpit	Adjacent Underground Drain	1 + 2 + 3	16.00	15.90	14.75	14.05	0.70	56.20	0.013	80	-	3.30	0.53	3.84	251.74	292.02	327.36	0.95	0	0	1,340	0.122	300	precast concrete pipe	1.76	0.25	0.22	0.102	54.5%	OK!

subcatchment 1,410

1	250
2	230
3	930
total =	1,410