利安設計工程有限公司
LEON Design Engineering Limited

PROJECT

Proposed Temporary Open Storage of Second-hand Private Cars for Sale and Associated Filling of Land (for a Period of 3 Years) at Lots 1047A & 1049BRP (part) in DD109, Kam Tin North, Yuen Long, N.T.

TITLE

消防滅火筒放置地點圖

DRAWN BY	CHECKED BY	DATE
PT	PT	June 2026
SCALE: 1 : 400	JOB NO.: LD/ -	
CAD / FILE: LD-L1047A-APP01	DWG NO.: LD/L1047A/APP01	

利安設計工程有限公司
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Stormwater Drainage Design

For

Temporary Open Storage (private car prior to sale)

at Lots 1047A & 1049BRP (part) for a Period of Three Years

in DD109, Kam Tin North, Yuen Long, N.T.

Report No.: **LD/L1047A/DS01**
Date: **22/6/2026**

1. Equations and Assumptions

1.1 Surface drainage design is in accordance with Geotechnical Manual for Slopes (2nd Edition, 1984).

1.2 Slope drainage is designed to a frequency of 1 in 50 rainfall return period.

1.3 Time of Concentration = time of entry + time of flow

i.e. $t_c = t_e + t_f$

1.4 Time of entry is calculated based on the modified form of Bransby-Williams Equation:

$$t_e = 0.14465 \times L / (H^{0.2} \times A^{0.1})$$ Eqn. 8.2 Geotechnical Manual for Slopes

where t_e = time of entry (min) ,

A = area of catchment (m^2) ,

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

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

1.5 Time of flow is calculated from the measured water flow length in channel divided by the assumed flow velocity.

i.e. $t_f = w / v$

where t_f = time of flow (min) ,

w = measured water flow length in channel (m) ,

v = assumed water flow velocity (m/s)

1.6 Runoff coefficient for the slope is assumed to be 1.0 for paved ground surface. Geotechnical Manual for Slopes (p. 96)

1.7 Peak stormwater is determined by the "Rational Method" using the following formula:

$$Q = KiA/60$$ Eqn. 8.7 Geotechnical Manual for Slopes

where Q = maximum runoff (litres/min) ,

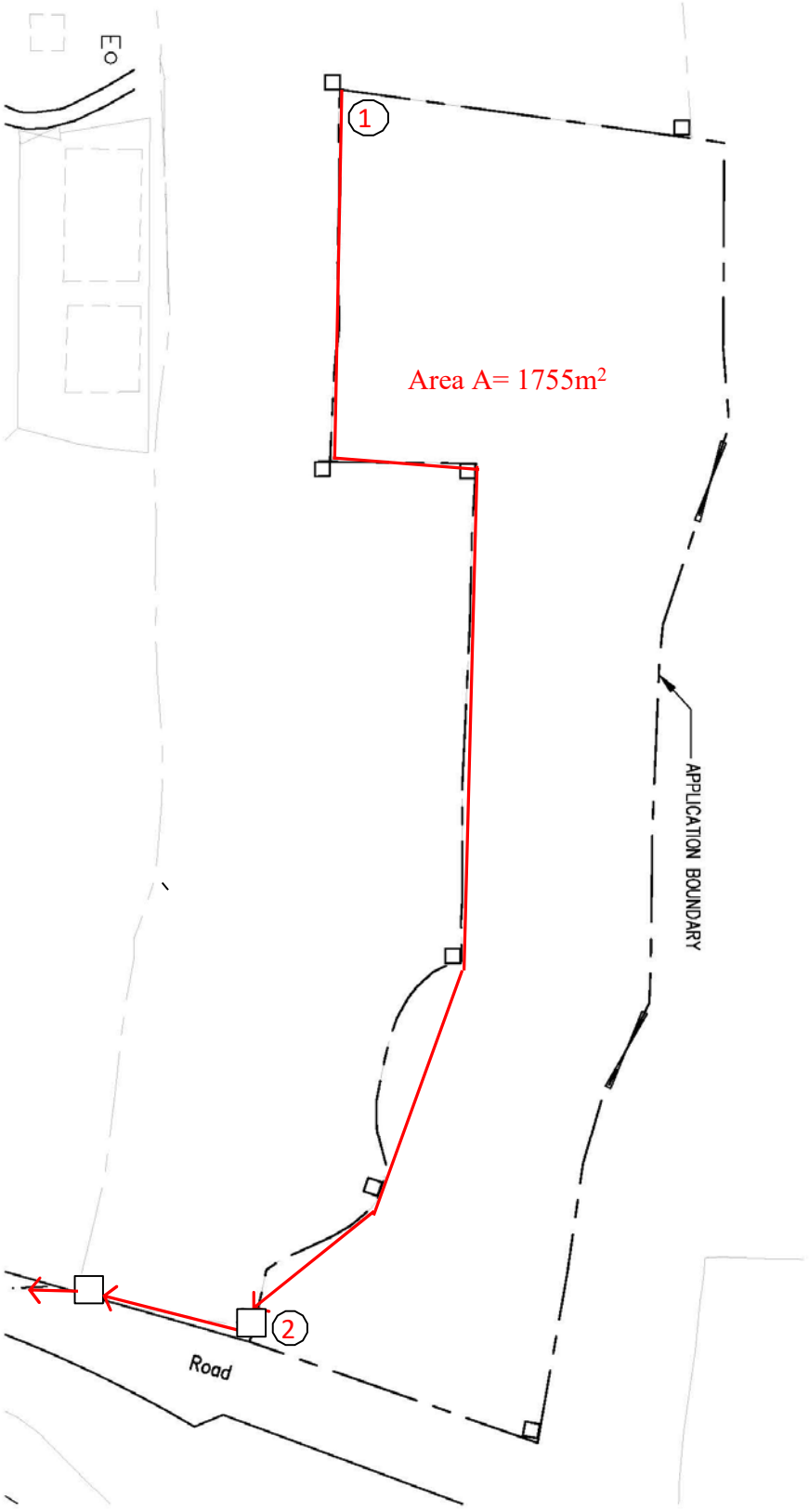
K = runoff coefficient (K = 1.0) ,

i = design mean intensity of rainfall (mm/hr) ,

A = area of catchment (m^2) .

2. Catchment Area

The catchment area for the design of surface channels is shown below :



Plan of Catchment Areas

NTS

3. Checking requirement width by rainwater through between 1 and 2

a. Catchment Area A to Proposed Drainage (375 UC)

Area A = 1755 m^2
L = 127 m

δh = 13 - 12.5 = 0.5 m

H = 0.5 * 100/ 127 = 0.39 m (average fall per 100m run)

t_c = 0.14465 x 127/(0.39 $^{0.2}$ x 1755 $^{0.1}$) = 10.507 min

For t_f, w = 102 m, v = 3 m/s (assumed)

t_{f1} = 102 / (3 x 60) = 0.567 min

t_1 = 10.507 + 0.567 = 11.074 min

From rainfall curve, use t = 11.1 min

i_{50} = 240 mm/hr — Fig. 1, TGN 30
K = 1

Flow for 50 years return periods,

Q_{50} = 1*240 x 1755 / 60 = 7020 litres/min

Drop of channel = 12.670 - 12.190 = 0.48 m

Gradient = 0.48 / 102 = 1 in 213

Proposed channel size = 375 UC — Fig. 8.7 Geotechnical Manual for Slopes

Capacity = 10000 > Q50 OK

Read v_{max} = 1.4 m/s < 4 m/s OK

Therefore, Proposed 375mm UC is adequate for catchment Area of A.

Geotechnical Engineering Office, Civil Engineering and Development Department
The Government of the Hong Kong Special Administrative Region

GEO Technical Guidance Note No. 30 (TGN 30)
New Intensity-Duration-Frequency Curves for Slope Drainage Design

Issue No.: 1	Revision: -	Date: 21.3.2011	Page: 3 of 4

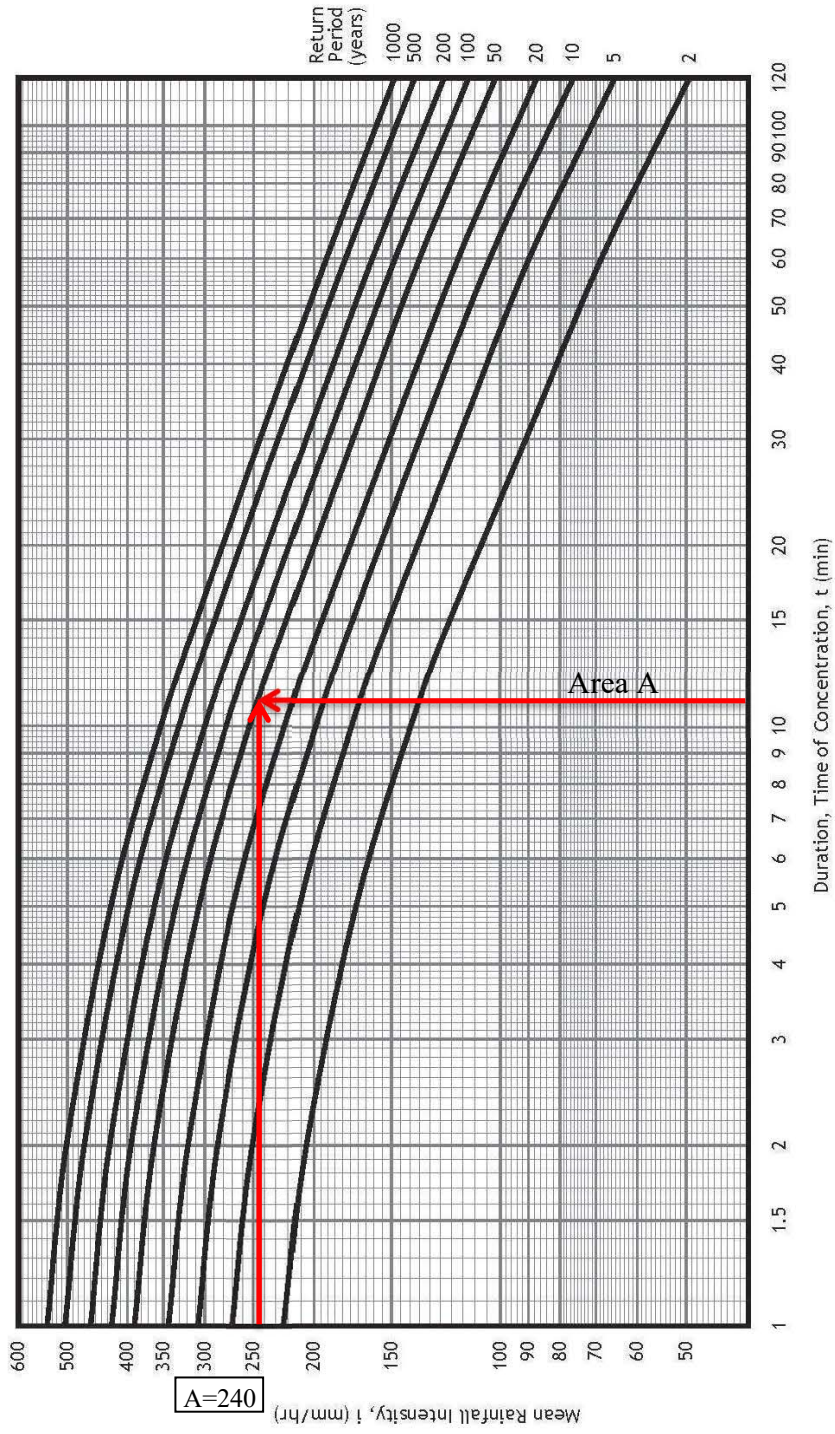


Figure 1 – New Intensity-Duration-Frequency (IDF) Curves (Tang & Cheung, 2011)

Note: These IDF curves are to supersede those given in Figure 8.2 of the Geotechnical Manual for Slopes (GCO, 1984).

ANNEX TGN 30 A1 (1/2)

Geotechnical Engineering Office, Civil Engineering and Development Department
The Government of the Hong Kong Special Administrative Region

GEO Technical Guidance Note No. 43 (TGN 43)
Guidelines on Hydraulic Design of U-shaped and Half-round Channels on Slopes

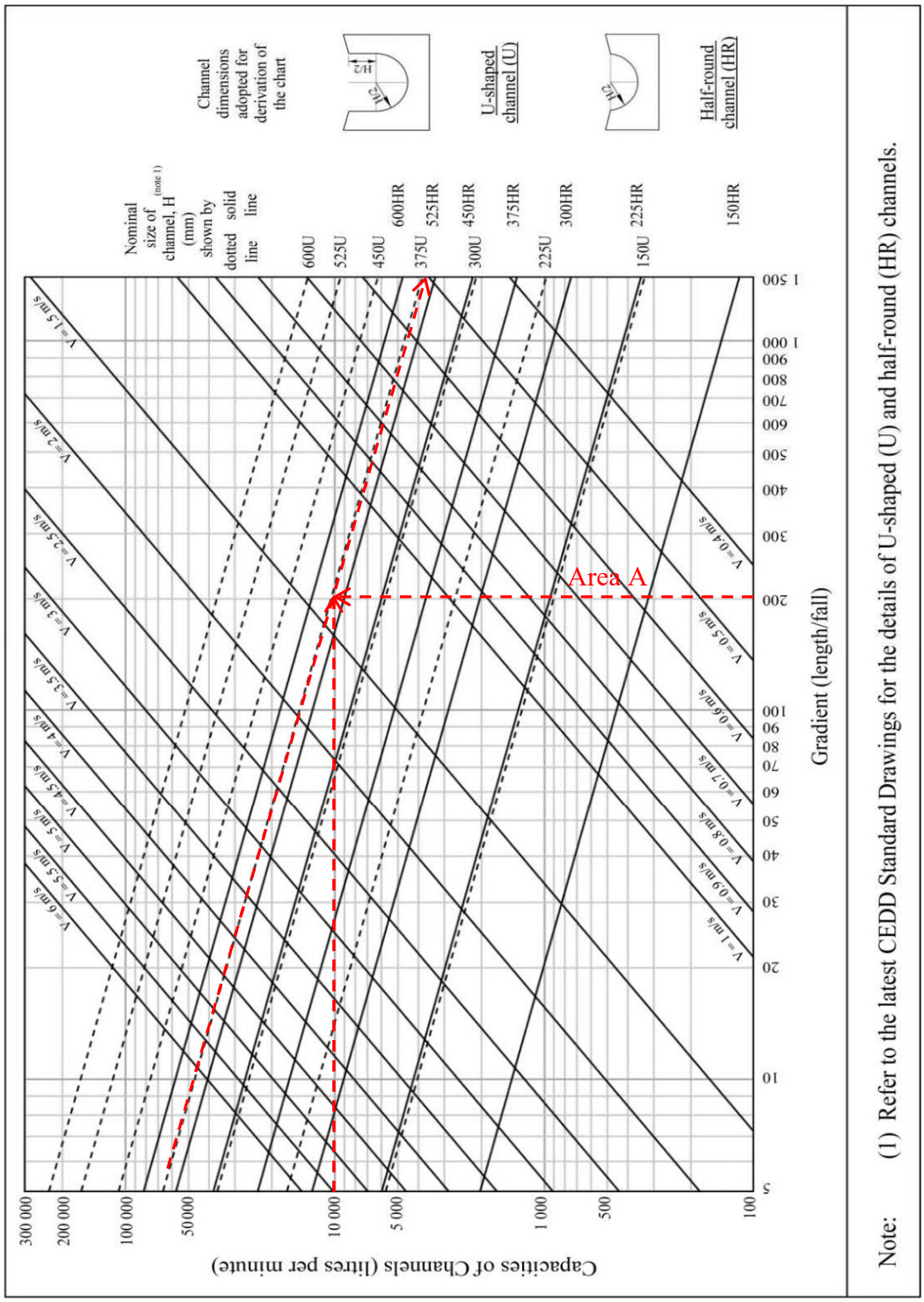
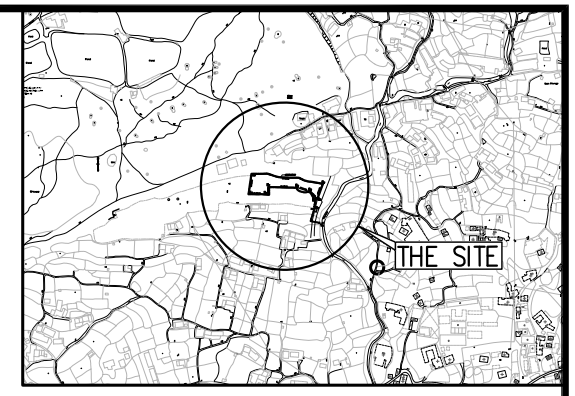


Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600 mm

Note: (1) Refer to the latest CEDD Standard Drawings for the details of U-shaped (U) and half-round (HR) channels.

ANNEX TGN 43 A1



KEY PLAN
1 : 10000

N

APPLICATION BOUNDARY

CL:13.00
IL:12.80

300 UC(1:200)

CP8
CL:12.70
IL:12.32

CP5
CL:13.00
IL:12.51

CP4
CL:13.00
IL:12.33

CP3
CL:12.50
IL:12.25

CP7
CL:13.00
IL:12.67

CP6
CL:13.00
IL:12.55

375 UC(1:200)

CP2
CL:12.30
IL:12.19

CP1
CL:12.10
IL:11.52

ST3
CL:12.00
IL:11.16

450 UC(1:200)

OUTLET

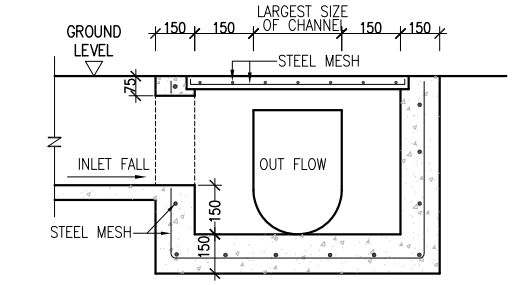
Road

Existing Drainage

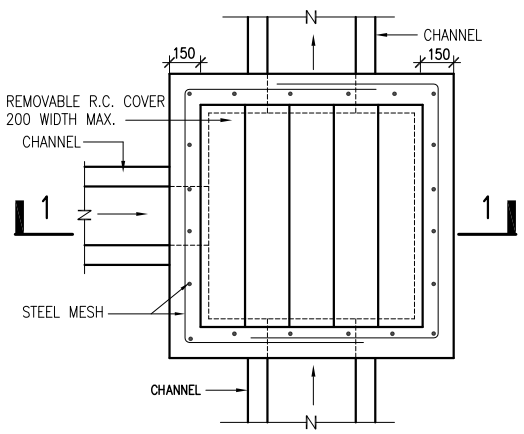
排水口
Outfall

FP

E

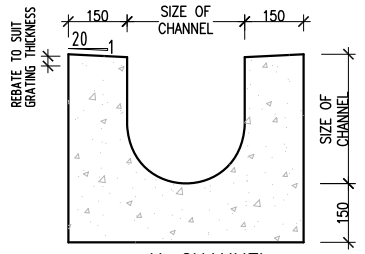


SECTION 1 – 1



PLAN OF CATCH-PIT

DETAILS OF CATCH-PIT
N.T.S



U-CHANNEL
N.T.S

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PROPOSED DRAINAGE LAYOUT PLAN

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