Proposed Temporary Open Storage of Scrap Metal for a Period of 3 Years at
Lots 1973 (Part), 2028 RP (Part), 2029, 2030 (Part), 2031 (Part), 2032 RP (Part), 2033 RP (Part) in D.D. 129 & Adjoining Government Land, Deep Bay Road, Lau Fau Shan, Yuen Long, N.T.

Annex 1   Drainage Assessment

A.   Site particulars

1.1.1   The site possesses an area of about 2,440m^2.   The surface of the site has been hard paved.

1.1.2   The application site will be occupied by an open storage for scrap metal.

B.   Level and gradient of the subject site & proposed surface channel

1.1.3   The subject site has been hard paved and occupied an area of approximately 2,440m^2.   It has a very gradient sloping from southeast to northwest from about +10.3mPD to +9.8mPD.

1.1.4   In order to follow the topography of the application site, the proposed surface channel will be constructed following the gradient of the site.   As demonstrated in the calculation in **Annex 1.3** hereunder, 675mm surface U-channel will be capable to drain surface runoff accrued at the subject site and the same passing through the site from adjacent area.

C.   Catchment area of the proposed drainage provision at the subject site

1.1.5   With regard to the topography surrounding the application site, the land to the southeast of the site is found higher than the application site.   The structures to the further south of the application site blocks the stormwater from the higher ground.   The land to west of the site is found lower than the application site. (**Figure 5**)   Although the land to the north of the site is found higher than the application site, the stormwater flows to the Deep Bay Road which is lower than the application site.

1.1.6   As such, an external catchment is identified has been identified in **Figure 5**.

D.   Particulars of the existing drainage facilities to accept the surface runoff collected at the application site

1.1.7   There is an existing watercourse to the west of the application site (**Figure 4**).

1.2   Runoff Estimation & Proposed Drainage Facilities

A.   Proposed drainage facilities

1.2.1   Subject to the above calculations, it is determined that 675mm surface U-channel which is made of concrete along the site periphery is adequate to intercept storm water passing through and generated at the application site (**Figure 4**).

1.2.2   The collected surface runoff will be conveyed to existing watercourse to the west of the site. (**Figure 4**)

1.2.3   All the proposed drainage facilities, including the section of surface channel proposed in between of the subject site to the open drain, will be provided and maintained at the applicant's own expense.   Also, sand trap and U-channel will be cleaned at regular interval to avoid the accumulation of rubbish/debris which would affect the dissipation of storm water.

1.2.4   The provision of the proposed surface U-channel will follow the gradient of the application site.   All the proposed drainage facilities will be constructed and maintained at the expense of the applicant.

1.2.5   All proposed works at the site periphery would not obstruct the flow of surface runoff from the adjacent areas, the provision of surface U-channel at site boundary is detailed hereunder:

(a)   Soil excavation at site periphery, although at minimal scale, is inevitably for the provision of surface U-channel.   In the reason that the accumulation of excavated soil at the site periphery would obstruct the free flow of the surface runoff from the surroundings, the soil will be cleared at the soonest possible after the completion of the excavation process.

(b)   In view of that soil excavation may be continued for several working days, surface U-channel will be dug in short sections and all soil excavated will be cleared before the excavation of another short section.

(c)   No leveling work will be carried at the site periphery.   The level of the site periphery will be maintained during and after the works.   As such, the works at the site periphery would not either alter or obstructed the flow of surface runoff from adjacent areas.

(d)   100mm openings will be provided at the toe of hoarding so as to allow unobstructed flow of surface runoff from adjacent area.

1.2.6   The applicant is conscientious in preparing this drainage proposal.   Also, he is willing to provide necessary drainage facilities to minimize the drainage impact accrued by the proposed development.   The acceptance of this drainage proposal will give positive recognition to the applicant's efforts.

Annex 1.3 Drainage Calculation for the Proposed Provision of Drainage Facilities at Subject Site

1. Runoff Estimation

1.1 Rational method is adopted for estimating the designed run-off

$$Q = k \times i \times A/3{,}600$$

Assuming that:

i. The area of the entire catchment is approximately 10,400m^2; (**Figure 5**)

ii. The catchment is predominant paved, it is assumed that the value of run-off co-efficient (k) is taken as 1.

Difference in Land Datum	=	19.2m – 9.6m	= 9.6m
L	=	145m	
∴ Average fall	=	9.6m in 145m	or 1m in 15.1m

According to the Brandsby-Williams Equation adopted from the "Stormwater Drainage Manual – Planning, Design and Management" published by the Drainage Services Department (DSD),

$$\text{Time of Concentration } (t_c) = 0.14465 \, [\, L/(H^{0.2} \times A^{0.1}) \,]$$

$$t_c = 0.14465 \, [\, 145/ (6.62^{0.2} \times 10{,}400^{0.1}) \,]$$

$$t_c = 5.7 \text{ minutes}$$

With reference to the Intensity-Duration-Frequency Curves provided in the abovementioned manual, the mean rainfall intensity (i) for 1 in 50 recurrent flooding period is found to be 265 mm/hr

$$\textit{By Rational Method}, Q = 1 \times 265 \times 10{,}400 / 3{,}600$$

$$\therefore Q = 765.56 \text{ l/s} = 45{,}933.33 \text{ l/min}$$

In accordance with the Chart or the Rapid Design of Channels in "Geotechnical Manual for Slopes", for an approximate gradient of about 1:180 along the site periphery of the site, 675mm surface U-channel is considered adequate to dissipate all the stormwater accrued by the application site and the adjacent land.