

**Proposed Temporary Warehouse for Storage of Construction Machinery and Construction Materials for a Period of 3 Years
at
Lots 189 S.A (Part) & 189 S.B (Part) in D.D.128 & Adjoining Government Land, Ha Tsuen, Yuen Long, N.T.**

Annex 1 DRAINAGE PROPOSAL

1.1 Existing Situation

A. Site particulars

1.1.1 The application site had been paved with sand and gravel. The application site occupies an area of about 4,000m².

1.1.2 The area adjacent to the proposed development is mainly rural in nature. It is surrounded by an open storage yard to the south and north. Some open storage yards were also found to the southeast and northeast of the site.

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

1.1.3 It has a gradient sloping from northwest to east from about +12.5mPD to +11.4mPD. (**Figure 4**)

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

1.1.4 According to **Figure 5**, it is noted that the land to the north is progressively higher than the application site and it reaches +38.6mPD at the peak of the knoll. The land to the south and east of the site is comparatively lower than the application site. The level of the land to the west of the site is about the same as the application site.

1.1.5 As such, an external catchment has been identified to the north of the application site.

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

1.1.6 As shown in **Figure 5**, a public drain is found to the east of the application site.

1.2 Runoff Estimation

1.2.1 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 (including the external catchment) is approximately 10,500m²; (**Figure 5**)
- ii. The knoll to the north is untouched and unpaved. It is assumed that the value of run-off co-efficient (k) of the entire catchment is taken as 0.8.

$$\text{Difference in Land Datum} = 38.6\text{m} - 11.4\text{m} = 27.2\text{m}$$

$$L = 188\text{m}$$

$$\therefore \text{Average fall} = 27.2\text{m in } 188\text{m} \text{ or } 1\text{m in } 6.91\text{m}$$

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

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

$$t_c = 0.14465 [188 / (14.47^{0.2} \times 10,500^{0.1})]$$

$$t_c = 6.31 \text{ minutes}$$

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 260 mm/hr

$$\text{By Rational Method, } Q_1 = 0.8 \times 260 \times 10,500 / 3,600$$

$$\therefore Q_1 = 606.67 \text{ l/s} = 36,400 \text{ l/min} = 0.61\text{m}^3/\text{s}$$

In accordance with the Chart or the Rapid Design of Channels in “Geotechnical Manual for Slopes”, for an approximate gradient of about 1:95 & 1:140 in order to follow the gradient of the application site, 600mm surface U-channel along the site periphery is considered adequate to dissipate all the stormwater accrued by the application site and adjacent land.

1.3 Proposed Drainage Facilities

- 1.3.1 Subject to the calculations in 1.2 above, it is determined that proposed 600mm concrete surface U-channel along the site periphery is adequate to intercept storm water passing through and generated at the application site (**Figure 4**).
- 1.3.2 The collected stormwater will then be discharged to the public drain to the east of the application site via 600mm surface channel outside the site.
- 1.3.3 All the proposed drainage facilities will be provided and maintained at the applicant's own expense. Also, sand trap and surface U-channel will be cleaned at regular interval to avoid the accumulation of rubbish/debris which would affect the dissipation of storm water.
- 1.3.4 The provision of the proposed surface 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.
- 1.3.5 Prior to the commencement of the drainage works, the applicant will seek consent from District Lands Office/Yuen Long and relevant land owners for the provision of drainage facilities outside the application site.
- 1.3.6 The proposed development would not affect the existing ditches, drains and obstruct the flow of the flow of surface runoff.
- 1.3.7 The provision of surface channel at site boundary is detailed hereunder:
- (a) Soil excavation at site periphery, is inevitably for the provision of surface channel. The accumulation of excavated soil at the site periphery would obstruct the free flow of the surface runoff from the surroundings. Hence, 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 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. The works at the site periphery would not either alter the flow of surface runoff from adjacent areas.
 - (d) 100mm gap will be provided at the toe of the site hoarding to allow unobstructed flow of surface runoff from adjacent areas.
 - (e) For any drainage works outside the site boundary, the applicant would obtain consent of DLO/YL, LandsD or other lot owners on the proposed works before commencement of works.