Temporary Open Storage and Warehouse for Storage of Construction Materials and Metal for a Period of 3 Years
at
Lots 175 (Part), 176 (Part), 177 (Part), 178 S.A, 178 S.B, 179 & 181 in D.D. 128 & Adjoining Government Land, Ha Tsuen, Yuen Long, N.T.

Annex 1 Drainage Assessment

1.1 Introduction

A. Site particulars

1.1.1 The application site possesses an area of about 8,200m^2. The surface of the site has been paved with sand and gravel.

1.1.2 The application site is accessible via a vehicular track leading from Fung Kong Tsuen Road.

1.1.3 There are some open storage yards and port back-up use such as construction machinery and material storage yard to the south of the site. Some vacant land which is a knoll was found to the north of the application site.

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

1.1.4 The application site will be hard paved and occupied an area of approximately 8,200m^2. It has a deep gradient sloping from north to south from about +28.6mPD to +18.8mPD.

1.1.5 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, 600mm 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

1.1.6 It is found that the level of the application site is generally higher than the adjoining land except to the north. Hence, an external catchment is found in **Figure 4**.

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

1.1.7 According to recent site inspection, there is a natural drain to the southeast 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 600mm 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 the natural drain to the southeast of the site through the proposed 600mm surface U-channel outside the application site boundary. (**Figure 4**)

1.2.3 Prior to the commencement of the drainage works, the applicant will seek the consent of the District Lands Office/Yuen Long and the registered land owner for drainage works outside the application site or outside the jurisdiction of the applicant.

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

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 channel at site boundary is detailed hereunder:

(a) Soil excavation at site periphery, although at minimal scale, is inevitably for the provision of surface 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) 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 gap will be provided at the toe of site hoarding so as to allow unobstructed flow of surface runoff to and from adjacent area.

Annex 1.3 Drainage Calculation for the 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 12,600m^2;
ii. It is assumed that the value of run-off co-efficient (k) is taken as 1 for conservative reason.

Difference in Land Datum = 36.5m – 18.8m = 17.7m

L = 136m

∴ Average fall = 17.7m in 136m or 1m in 7.68

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

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

$t_c = 0.14465 [136/ (13.01^{0.2} \times 12,600^{0.1})]$

$t_c = 4.58$ 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 285 mm/hr

By Rational Method, $Q = 1 \times 285 \times 12,600 / 3,600$

∴ $Q = 997.5$ l/s = 59,850 l/min = 1 m^3/s

In accordance with the Chart or the Rapid Design of Channels in "Geotechnical Manual for Slopes", for an approximate gradient of 1:20 and 1:23, 600mm surface U-channel is considered adequate to dissipate all the storm water generated at the application site.