

**Temporary Public Vehicle Park for Private Cars & Light Goods Vehicles  
and Filling of Land and Excavation of Land for a Period of 3 Years  
at  
Lots 2794, 2795, 2796, 2798, 2799, 2800, 2831 (Part) & 2832 in D.D.129,  
Sha Kong Wai, Yuen Long, N.T.**

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**Annex 1 Drainage Assessment**

**1.1 Introduction**

**A. Site particulars**

- 1.1.1 The application site is situated at Sha Kong Wai. (**Figure 1**) It possesses an area of approximately 8,000m<sup>2</sup>.
- 1.1.2 Significant of the application site has been hard paved and previously occupied for recreation use. It is intended for public parking of private cars.
- 1.1.3 Sha Kong Wai is an indigenous village. It is noted that village houses were found to the north, east and west of the application site.

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

- 1.1.4 Significant part of the application site has been hard paved and occupied an area of approximately 8,000m<sup>2</sup>. It is sloping from northeast to southwest from about +6.4mPD to +4.8mPD.
- 1.1.5 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**

- 1.1.6 The level of the land to the west is progressively higher. However, the land to the north is occupied by rows of village house (NTEHs) so that they block the surface runoff from the north. The level of the land to the south and east is lower than the application site. A public culvert is found to the south of the site. The land to the north of the site is found lower and then progressively higher so that the stormwater from the north is actually flowing to the eastern side and it would not via the subject site.
- 1.1.7 As such, an external catchment to the west has been identified.

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

1.1.8 According to recent site inspection, there is a public culvert to the south of the application site (**Figure 4**).

## **1.2 Runoff Estimation & Proposed Drainage Facilities**

A. Proposed drainage facilities

1.2.1 Subject to the calculations below, it is determined that 675mm surface U-channel is required along the site periphery to intercept storm water generated at the application site. (**Figure 4**)

1.2.2 The collected surface runoff will be conveyed to public culvert to the south of the application site via the proposed 675mm surface U-channel outside the application site. (**Figure 4**)

1.2.3 The calculations in **Annex 1.3** shows that the proposed 675mm surface U-channel has adequate capacity to cater for the surface runoff generated at the subject site.

1.2.4 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, surface U-channel will be cleaned at regular interval to avoid the accumulation of rubbish/debris which would affect the dissipation of storm water.

1.2.5 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.

1.2.6 All proposed works at the site periphery would not obstruct the flow of surface runoff from the adjacent areas, the provision of trees and 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 and landscaping. 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) 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.
- (c) Openings will be provided at the toe of hoarding so as to allow unobstructed flow of surface runoff from adjacent area.

## Annex 1.3 Drainage Calculation for the Proposed Provision of Drainage Facilities at Application 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 9,600m<sup>2</sup> including the external catchment;
- ii. The value of run-off co-efficient (k) is taken as 1 for conservative reason.

$$\text{Difference in Land Datum} = 8.2\text{m} - 4.8\text{m} = 3.4\text{m}$$

$$L = 164\text{m}$$

$$\therefore \text{Average fall} = 3.4\text{m in } 164\text{m} \text{ or } 1\text{m in } 48.24\text{m}$$

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

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

$$t_c = 0.14465 [ 164 / (2.07^{0.2} \times 9,600^{0.1}) ]$$

$$t_c = 8.2 \text{ minutes}$$

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 240 mm/hr

$$\text{By Rational Method, } Q = 1 \times 240 \times 9,600 / 3,600$$

$$\therefore Q = 640 \text{ l/s} = 38,400 \text{ l/min}$$

In accordance with the Chart or the Rapid Design of Channels in “Geotechnical Manual for Slopes”, 675mm surface U-channel at gradient 1:100 and 1:165 is considered adequate to dissipate all the stormwater accrued by the application site. The intercepted stormwater will then be discharged to the public drain to the east of the application site.