

Proposed Temporary Place of Recreation, Sports or Culture (Hobby Farm) for a Period of 3 Years & Excavation of Land at Lot 1393 RP in D.D.375, So Kwun Wat, Tuen Mun, N.T.

Annex 1 Drainage Proposal

1.1 Existing Situation

A. Site particulars

- 1.1.1 The application site occupied an area of about 500m².
- 1.1.2 The area adjacent to the proposed development is mainly rural in nature. It is surrounded by vacant land except that a residential dwelling is found to the west of the application site.

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

- 1.1.3 It has a very gentle gradient sloping from northwest to southeast from about +11.2mPD to +10.8mPD.

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

- 1.1.4 According to **Figure 4**, it is noted that the level of the application site is comparatively higher than the adjoining land except the land to the south. As such, an external catchment has been identified.

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

- 1.1.5 As shown in **Figure 4**, an existing open 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 catchment 1 and 2 are approximately 535m² and 500m² respectively;
- ii. For conservative reason, it is assumed that the value of run-off co-efficient (k) is taken as 0.7 for conservative reason.

Catchment 1

$$\text{Difference in Land Datum} = 31.3\text{m} - 10.8\text{m} = 20.5\text{m}$$

$$L = 52\text{m}$$

$$\therefore \text{Average fall} = 20.5\text{m in } 52\text{m} \text{ or } 1\text{m in } 2.54\text{m}$$

Catchment 2

$$\text{Difference in Land Datum} = 11.2\text{m} - 10.8\text{m} = 0.4\text{m}$$

$$L = 30\text{m}$$

$$\therefore \text{Average fall} = 0.4\text{m in } 30\text{m} \text{ or } 1\text{m in } 75\text{m}$$

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

Catchment 1

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

$$t_c = 0.14465 [52 / (39.42^{0.2} \times 535^{0.1})]$$

$$t_c = 1.92 \text{ minutes}$$

Catchment 2

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

$$t_c = 0.14465 [30 / (1.33^{0.2} \times 500^{0.1})]$$

$$t_c = 2.2 \text{ minutes}$$

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 330 mm/hr and 325 mm/hr for catchment 1 and 2 respectively:

Catchment 1

$$\text{By Rational Method, } Q_1 = 0.7 \times 330 \times 535 / 3,600$$

$$\therefore Q_1 = 34.33 \text{ l/s} = 2059.75 \text{ l/min} = 0.034\text{m}^3/\text{s}$$

Catchment 2

$$\begin{aligned} \text{By Rational Method, } Q_1 &= 0.7 \times 325 \times 500 / 3,600 \\ \therefore Q_1 &= 31.6 \text{ l/s} = 1,895.83 \text{ l/min} = 0.032 \text{ m}^3/\text{s} \end{aligned}$$

For conservative reason, the estimated peak runoff equals to the sum of the peak runoff of 2 catchments = 2,059.75 l/min + 1,859.83 l/min = 3,955.58 l/min

In accordance with the Chart or the Rapid Design of Channels in “Geotechnical Manual for Slopes”, for an approximate gradient of about 1:105 in order to follow the gradient of the application site, 300mm surface U-channel is considered adequate to dissipate all the stormwater accrued by the application site.

1.3 Proposed Drainage Facilities

- 1.3.1 Subject to the calculations in 1.2 above, it is determined that proposed 300mm surface U-channel along the site periphery is adequate to intercept storm water passing through and generated at the application site (**Figure 4**). An existing 375mm surface channel is available to connect to the proposed terminal catchpit at the subject site in order to connect to public drain to the east.
- 1.3.2 Catchpit will be provided at the turning point of the surface U-channel. Sand trap will be provided at the terminal catchpit.
- 1.3.3 The collected stormwater will then be dissipate to the existing 375mm open drain to the south of the application site.
- 1.3.4 All the proposed drainage facilities will be provided and maintained at the applicant’s own expense.
- 1.3.5 The provision of the proposed surface channel will follow the gradient of the application site.
- 1.3.6 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 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 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 gap will be provided at the toe of the site hoarding to allow unobstructed flow of surface runoff.