

Proposed Temporary Cold Store and Shop and Services (Fresh Provision Shop) and Associated Filling of Land for a Period of 3 Years at Lots 510, 511, 512 & 524 S.A ss.1 S.A in D.D.90, Lin Ma Hang Road, Ta Kwu Ling, N.T.

Annex 1 Drainage Proposal

1.1 Existing Situation

A. Site particulars

- 1.1.1 The application site occupied an area of about 1,500m². It is proposed to fill the site with 0.2m concrete for the proposed development.
- 1.1.2 The area adjacent to the proposed development is mainly rural in nature. It is surrounded by temporary structures to the north and west. To the south is Lin Ma Hang Road. Vacant land is found to the east of the site.

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

- 1.1.3 It is sloping from southeast to northwest from about +10.0mPD to +8.0mPD.

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

- 1.1.4 According to **Figure 3**, it is noted that the level of the application site is comparatively higher than the adjoining land except to the east and south. The land to the further east is even higher than the application site but it is the approved site boundary of another planning permission No. A/NE-MKT/37 of which drainage proposal has been submitted for the consideration of the CE/MN, DSD. As such, external catchment has been identified in **Figure 3**. Although the land to the south is progressively higher than the application site, it is separated by Lin Ma Hang Road so that the road side drain and road side kerb will intercept the stormwater from the south.

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

- 1.1.5 As shown in **Figure 3**, an existing natural drain is found to the west of the application site connecting to an existing open drain as shown in **Figure 4**.

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 is approximately 5,200m²;
- ii. For conservative reason, it is assumed that the value of run-off co-efficient (k) is taken as 1.

$$\text{Difference in Land Datum} = 13.5\text{m} - 8.0\text{m} = 5.5\text{m}$$

$$L = 100\text{m}$$

$$\therefore \text{Average fall} = 5.5\text{m in } 100\text{m} \text{ or } 1\text{m in } 18.18\text{m}$$

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

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

$$t_c = 0.14465 [100 / (5.5^{0.2} \times 5,200^{0.1})]$$

$$t_c = 4.37 \text{ minutes}$$

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 280 mm/hr

By Rational Method, $Q_1 = 1 \times 280 \times 5,200 / 3,600$

$$\therefore Q_1 = 404.44 \text{ l/s} = 24,266.67 \text{ l/min} = 0.41\text{m}^3/\text{s}$$

In accordance with the Chart or the Rapid Design of Channels in “Geotechnical Manual for Slopes”, for an approximate gradient of about 1:35 & 1:60 in order to follow the gradient of the application site, 450mm 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 450mm surface U-channel along the site periphery is adequate to intercept storm water passing through and generated at the application site (**Figure 3**).

1.3.2 Catchpits will be provided at the turning point of the surface U-channel.

1.3.3 The collected stormwater will then be dissipate to the existing natural drain to the west of the application site. The existing natural drain is now receiving the stormwater from the application site and it is deemed adequate to receive the stormwater from the application site because the application site has been paved.

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 Prior to the commencement of drainage works, the applicant will seek the consent of the District Lands Office/North and relevant registered land owner for works outside the application site or outside the jurisdiction of the applicant.
- 1.3.7 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 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) 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) 100mm gap will be reserved at the toe of the site hoarding to allow unobstructed flow of surface runoff.