# Annex 1 Drainage Assessment

A. Site particulars

1.1.1 The site possesses an area of about 705m$^2$. The surface of the site has been hard paved.

1.1.2 The application site will be occupied by a public vehicle park for private car

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

1.1.3 The subject site has been hard paved and occupied an area of approximately 705m$^2$. It has a gradient sloping from northeast to southwest from about +16.1mPD to +15.6mPD.

1.1.4 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, 375mm 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

1.1.5 With regard to the location of the existing drain and the topography surrounding the application site, the land to the south, west and east of the site is found lower than the application site or about the same as the level of the application site (**Figure 3**). The land to the immediate north of the site is progressively higher than the application site so that it is treated as the external catchment in the drainage calculation.

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

1.1.6 There is an existing river to the south of the application site and public manhole SCH1001029 is found.

## 1.2 Runoff Estimation & Proposed Drainage Facilities

A. Proposed drainage facilities

1.2.1 Subject to the above calculations, it is determined that 375mm 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 3**).

1.2.2 The collected surface runoff will be conveyed to existing river to the south of the site via public manhole SCH1001029. (**Figure 3**)

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

1.2.4 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.

1.2.5 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) 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.

(b) 100mm gap will be provided at the toe of hoarding so as to allow unobstructed flow of surface runoff from adjacent area.

1.2.6 The applicant is conscientious in preparing this drainage proposal. Also, he is willing to provide necessary drainage facilities to minimize the drainage impact accrued by the proposed development. The acceptance of this drainage proposal will give positive recognition to the applicant's efforts.

## Annex 1.3 Drainage Calculation for the Proposed Provision of Drainage Facilities at 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 1,080m$^2$ including the external catchment which is 375m$^2$ in size; (**Figure 3**)
ii. The catchment is predominant paved, it is assumed that the value of run-off co-efficient (k) is taken as 1.

Difference in Land Datum = 16.5m – 15.6m = 0.9m

L = 86m

∴ Average fall = 0.9m in 86m or 1m in 95.56m

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

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

$$t_c = 0.14465 \left[ 86/ (1.05^{0.2} \times 1{,}080^{0.1}) \right]$$

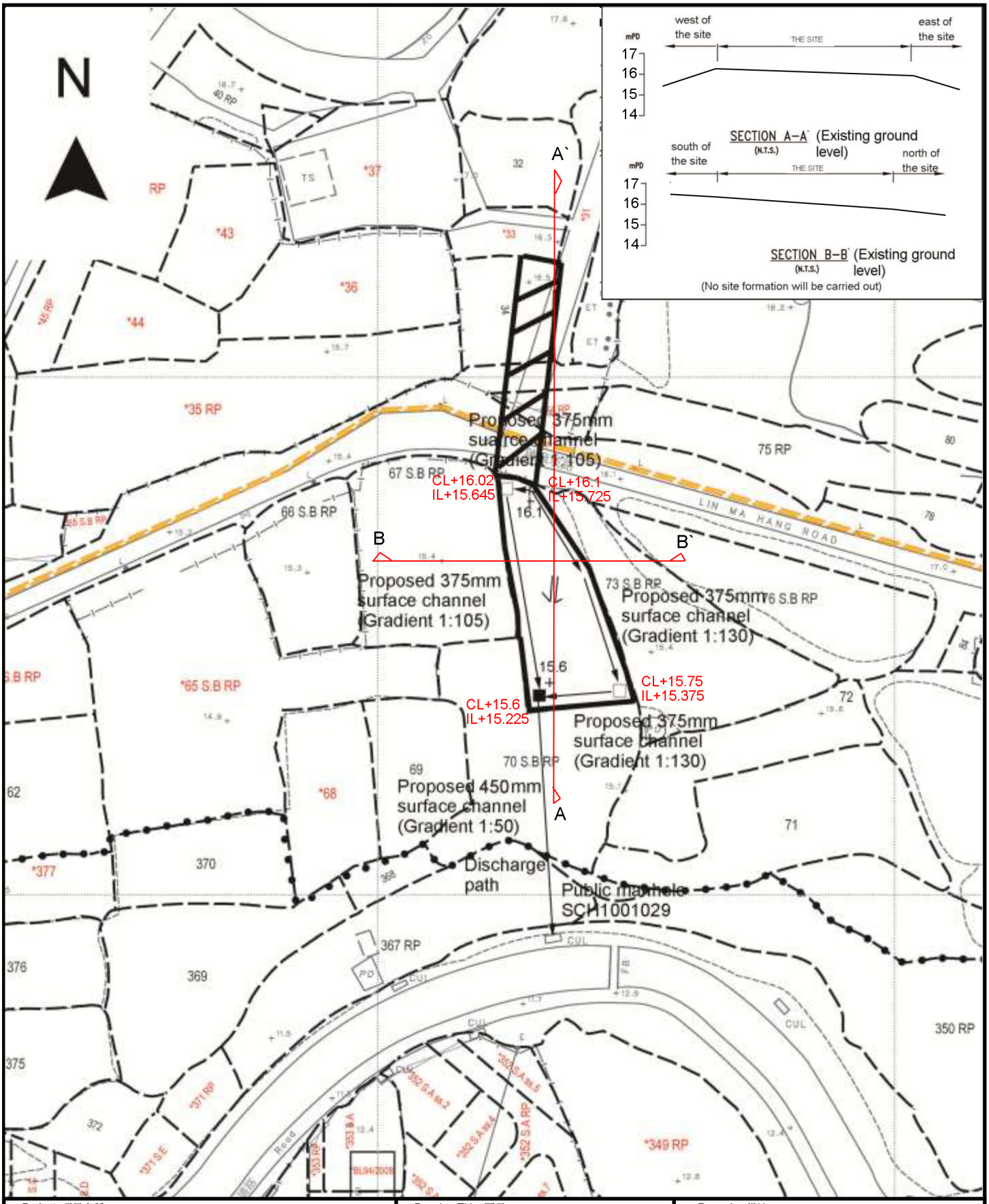
$$t_c = 6.13 \text{ minutes}$$

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

***By Rational Method***, $Q = 1 \times 260 \times 1{,}080 / 3{,}600$

$$\therefore Q = 78 \text{ l/s} = 4{,}680 \text{ l/min}$$

In accordance with the Chart or the Rapid Design of Channels in "Geotechnical Manual for Slopes", for an approximate gradient of about 1:105 and 1:130 along the site periphery of the site, 375mm surface U-channel is considered adequate to dissipate all the stormwater accrued by the application site and the adjacent land.




Project 項目名稱:

Proposed Temporary Public Vehicle Park for Private Car for a Period of 3 Years at Lot 70 S.B ss.1 in D.D. 80 & Adjoining Government Land, Lin Ma Hang Road, North, N.T.

Drawing Title 圖目:

Proposed Drainage Plan

Drawing No. 圖號:

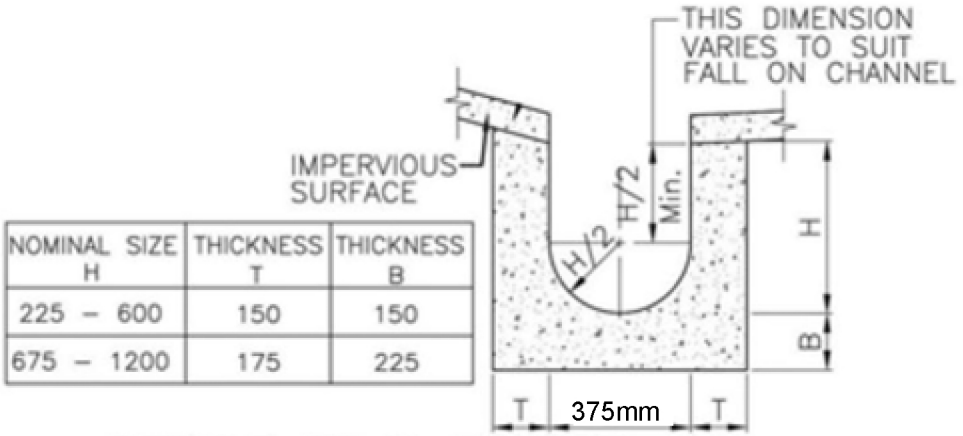
Figure 3

Remarks 備註:

- □ Proposed catchpit
- ■ Catchpit with sand trap
- +16.5 Level (in mPD)
- ⟸ Flow of surface runoff
- External catchment

Scale 比例:

1:1000

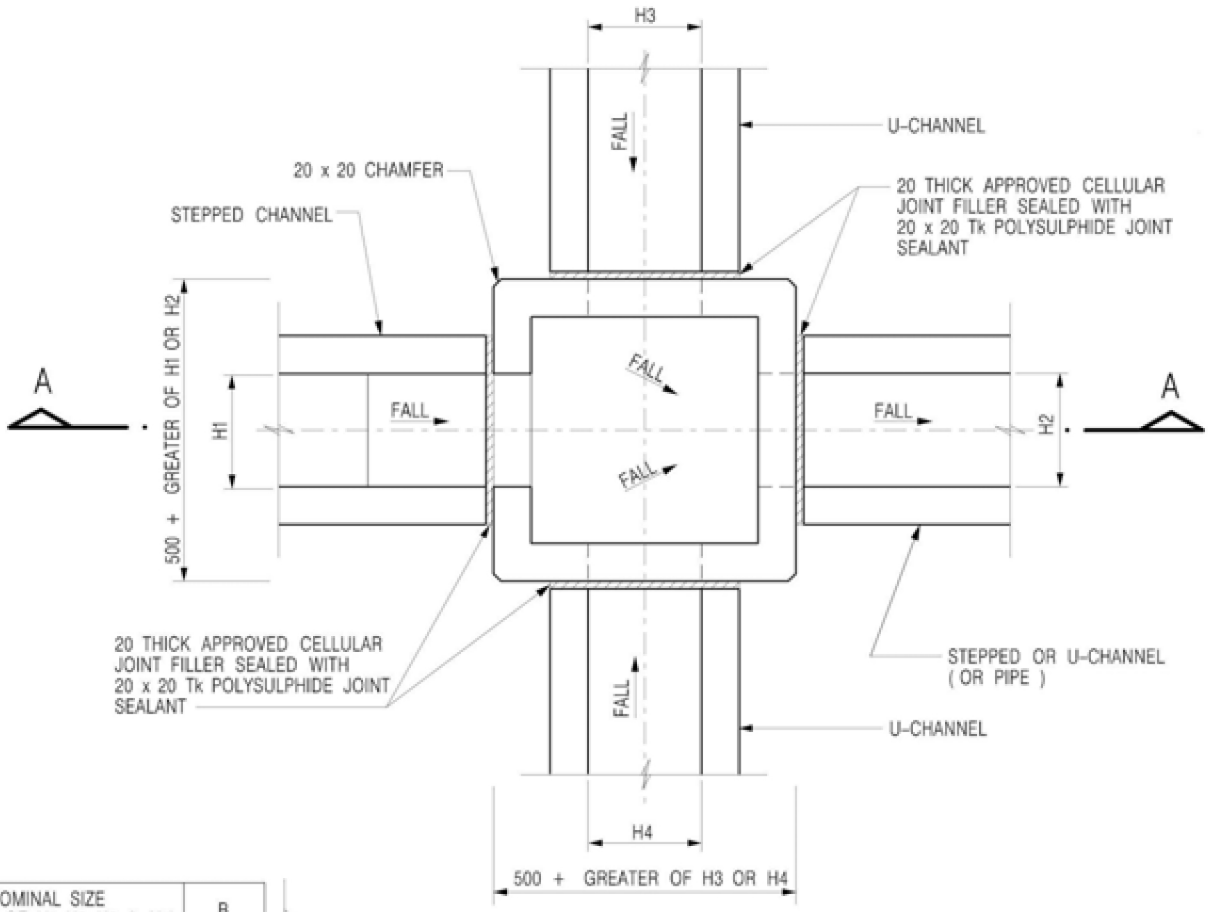



| NOMINAL SIZE H | THICKNESS T | THICKNESS B |
|---|---|---|
| 225 – 600 | 150 | 150 |
| 675 – 1200 | 175 | 225 |

## DETAILS OF U–CHANNEL

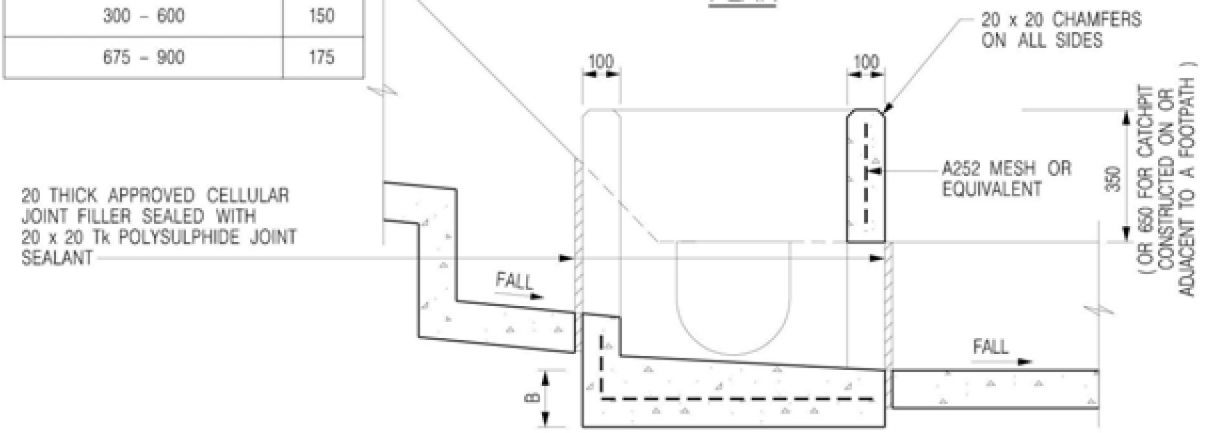
(REFERENCE : FIG. 8.11 OF GEOTECHNICAL MANUAL FOR SLOPES)
(N.T.S.)

| | | |
|---|---|---|
| Project 項目名稱:<br>Proposed Temporary Public Vehicle Park for Private Car for a Period of 3 Years at Lot 70 S.B ss.1 in D.D. 80 & Adjoining Government Land, Lin Ma Hang Road, North, N.T. | Drawing Title 圖目:<br>Details of Proposed Surface U-channel | Remarks 備註: |
| | Drawing No. 圖號:<br>Figure 4 | Scale 比例:<br>Not to scale |




PLAN

| NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4) | B |
|---|---|
| 300 – 600 | 150 |
| 675 – 900 | 175 |

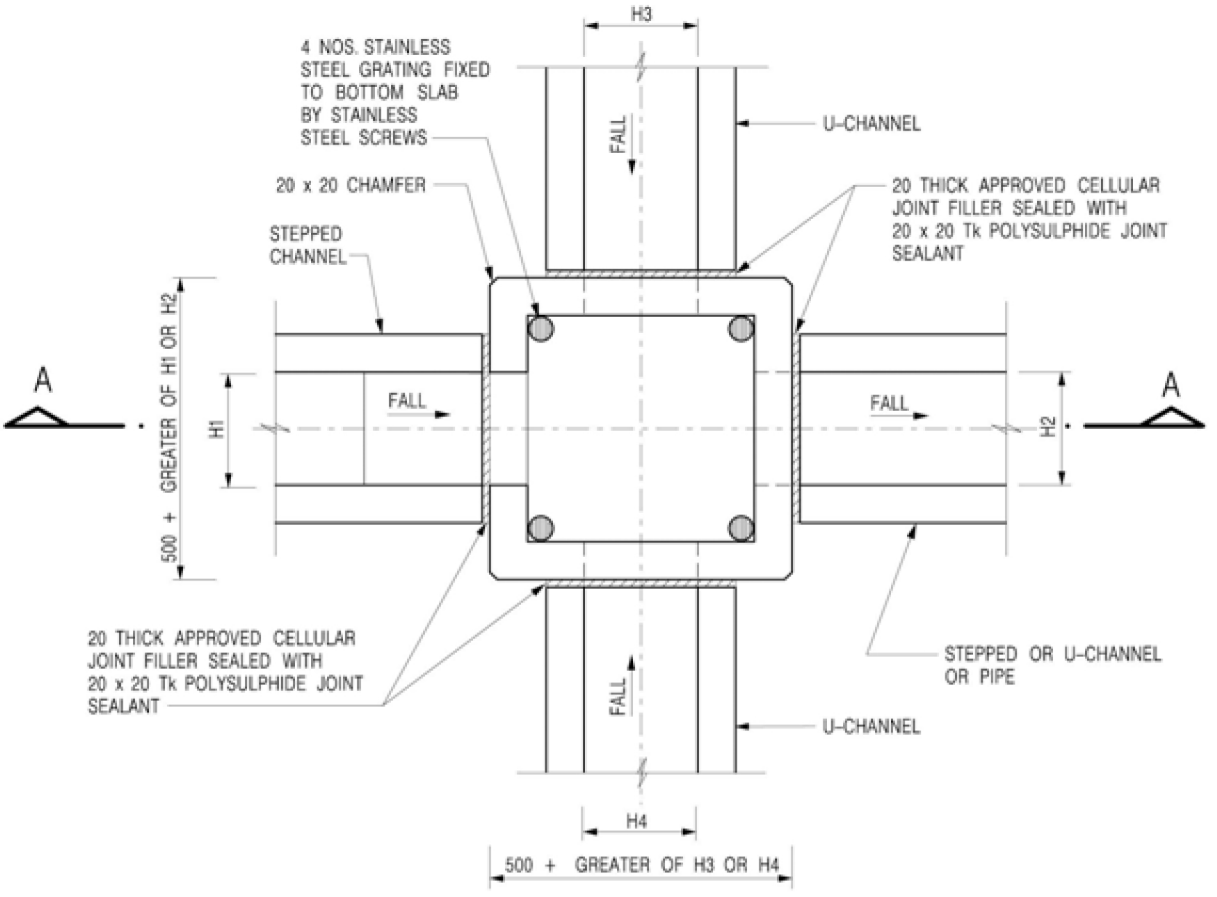



SECTION A – A

NOTES:

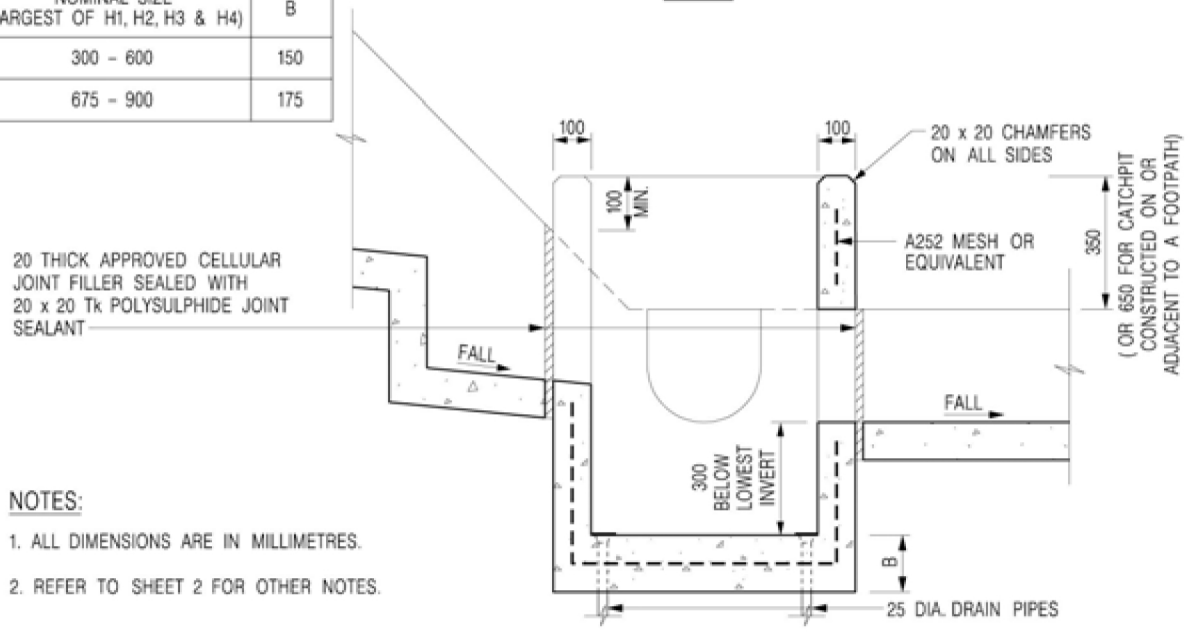
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 5 FOR OTHER NOTES.

| Project 項目名稱: | Drawing Title 圖目: | Remarks 備註: |
|---|---|---|
| Proposed Temporary Public Vehicle Park for Private Car for a Period of 3 Years at Lot 70 S.B ss.1 in D.D. 80 & Adjoining Government Land, Lin Ma Hang Road, North, N.T. | The Details of the Proposed Catchpit | |
| | Drawing No. 圖號: Figure 5 | Scale 比例: Not to scale |




PLAN

| NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4) | B |
|---|---|
| 300 - 600 | 150 |
| 675 - 900 | 175 |




NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 2 FOR OTHER NOTES.

SECTION A - A

| Project 項目名稱: | Drawing Title 圖則: | Remarks 備註: |
|---|---|---|
| Proposed Temporary Public Vehicle Park for Private Car for a Period of 3 Years at Lot 70 S.B ss.1 in D.D. 80 & Adjoining Government Land, Lin Ma Hang Road, North, N.T. | The Details of Catchpit with Desilting Function | |
| | Drawing No. 圖號: Figure 6 | Scale 比例: Not to scale |