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類別: Internet Email

城規會/規劃處：

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Ms Chong
([redacted])

Drainage Proposal - A/HSK/604

1. Introduction

This proposal aims to provide a drainage submission for the proposed Temporary Recyclable Collection Centre (Electronic Parts) at Lot 47 (Part) in D.D. 128 and adjoining Government Land, Ha Tsuen, Yuen Long, New Territories (Project No. A/HSK/604), in accordance with the requirements of the Drainage Services Department (DSD) of Hong Kong. The proposed operation period for the recycling centre is three years.

1.1 Project Background

The proposed project is a temporary recyclable collection centre for electronic parts, with a total Gross Floor Area (GFA) of approximately 900 square meters, one storey high, and a height not exceeding 9 meters. The site includes a 7m x 3.5m loading/unloading space for light goods vehicles and a manoeuvring circle. This proposal will outline the drainage measures to be implemented to ensure that the temporary facility does not cause adverse drainage impacts on the surrounding areas.

1.2 Objectives of the Proposal

The objectives of this proposal are to:

- Assess the potential drainage impact of the proposed project on the existing drainage system.
- Propose appropriate drainage designs and measures to collect, convey, and discharge stormwater within the site.
- Ensure that the proposed drainage scheme complies with the relevant technical requirements and guidelines of the Drainage Services Department.

2. Existing Site Conditions

Based on the provided Layout Plan (A_HSK_489), the proposed project is located at Lot 47 (Part) in D.D. 128 and adjoining Government Land, Ha Tsuen, Yuen Long, New Territories. The site is currently vacant land, and the surrounding environment is primarily rural. It is assumed that the existing ground surface is partially hardened or impermeable, lacking formal drainage facilities.

2.1 Existing Drainage System

Upon preliminary assessment, no major existing stormwater drains or watercourses were identified within or in the immediate vicinity of the site. It is assumed that existing rainwater primarily discharges as surface runoff to the surrounding land. To prevent adverse impacts on adjacent areas, the proposed project will incorporate an independent drainage system.

3. Proposed Drainage Works

To effectively manage stormwater runoff within the site and comply with DSD's drainage requirements, the following drainage works are proposed:

3.1 Drainage Strategy

The proposed drainage strategy aims to intercept, collect, and orderly discharge stormwater runoff from the site to appropriate discharge points, while minimizing impacts on the existing environment. Key measures include:

- Installation of peripheral drains along the site boundary to intercept stormwater from both within and outside the site.
- Provision of catchpits and sand traps to collect stormwater and filter out sediments.
- Discharge of collected stormwater to an approved public drainage system or suitable discharge point, as approved by DSD.
- Maximizing the use of permeable paving materials to reduce surface runoff.

3.2 Details of Proposed Drainage Facilities

1. **Peripheral U-channels**
    - It is proposed to install concrete U-channels along the perimeter of the recycling centre structure and the loading/unloading area, with a suggested size of 300mm (width) x 300mm (depth).
    - The U-channels will be designed with adequate gradients to ensure efficient stormwater flow and will connect to catchpits.
2. **Catchpits**
    - Catchpits with sand traps will be installed at appropriate locations along the U-channels to intercept sand and debris, preventing blockages in the downstream drainage system.
    - The spacing of catchpits will be determined based on site gradients and runoff calculations, complying with DSD's standard designs.

3. **Discharge Point**
    - All collected stormwater will be conveyed through underground drainage pipes and discharged to a nearby public stormwater drain or a designated discharge point approved by DSD. The specific discharge point will require further consultation and confirmation with DSD.

4. **Permeable Paving**
    - It is recommended to use permeable paving materials, such as crushed aggregate or permeable pavers, in non-heavy vehicle areas and selected parking areas to enhance infiltration and reduce surface runoff loads.

4. Design Calculations (Simplified)

Given the temporary nature and relatively small scale of the project (900 square meters), a simplified runoff calculation method will be adopted. According to DSD guidelines, for simple sites less than 1 hectare in size, the Rational Method can be used for runoff estimation.

- **Catchment Area (A)**: Approximately 900 m² (0.0009 km²)
- **Runoff Coefficient ©**: Considering partially hardened surfaces and the recycling centre structure, a provisional value of 0.8 is adopted (the specific value will be adjusted based on actual paving conditions and DSD requirements).
- **Rainfall Intensity (i)**: Based on the Hong Kong DSD Stormwater Drainage Manual and related guidelines, and considering a 50-year return period rainfall event for temporary projects, reference can be made to rainfall intensity data for the relevant area. A provisional value of 150 mm/hr is adopted (this is an example value and needs to be determined based on detailed hydrological analysis).

Peak Runoff (Qp) = 0.278 * C * i * A

Qp = 0.278 * 0.8 * 150 mm/hr * 0.0009 km² ≈ 0.030 ms/s

This calculation result will be used for preliminary sizing of drainage channels and pipes to ensure sufficient capacity to handle the anticipated peak runoff. The final design will be based on detailed hydrological analysis and DSD’s approval requirements.

5. Construction and Maintenance

5.1 Construction Considerations

- All drainage works must comply with relevant Hong Kong regulations and DSD's technical standards.
- Temporary drainage measures should be implemented during construction to prevent sediment runoff into the existing drainage system.
- Ensure that U-channels and catchpits have correct gradients, tight connections, and no leakage.

5.2 Maintenance Plan

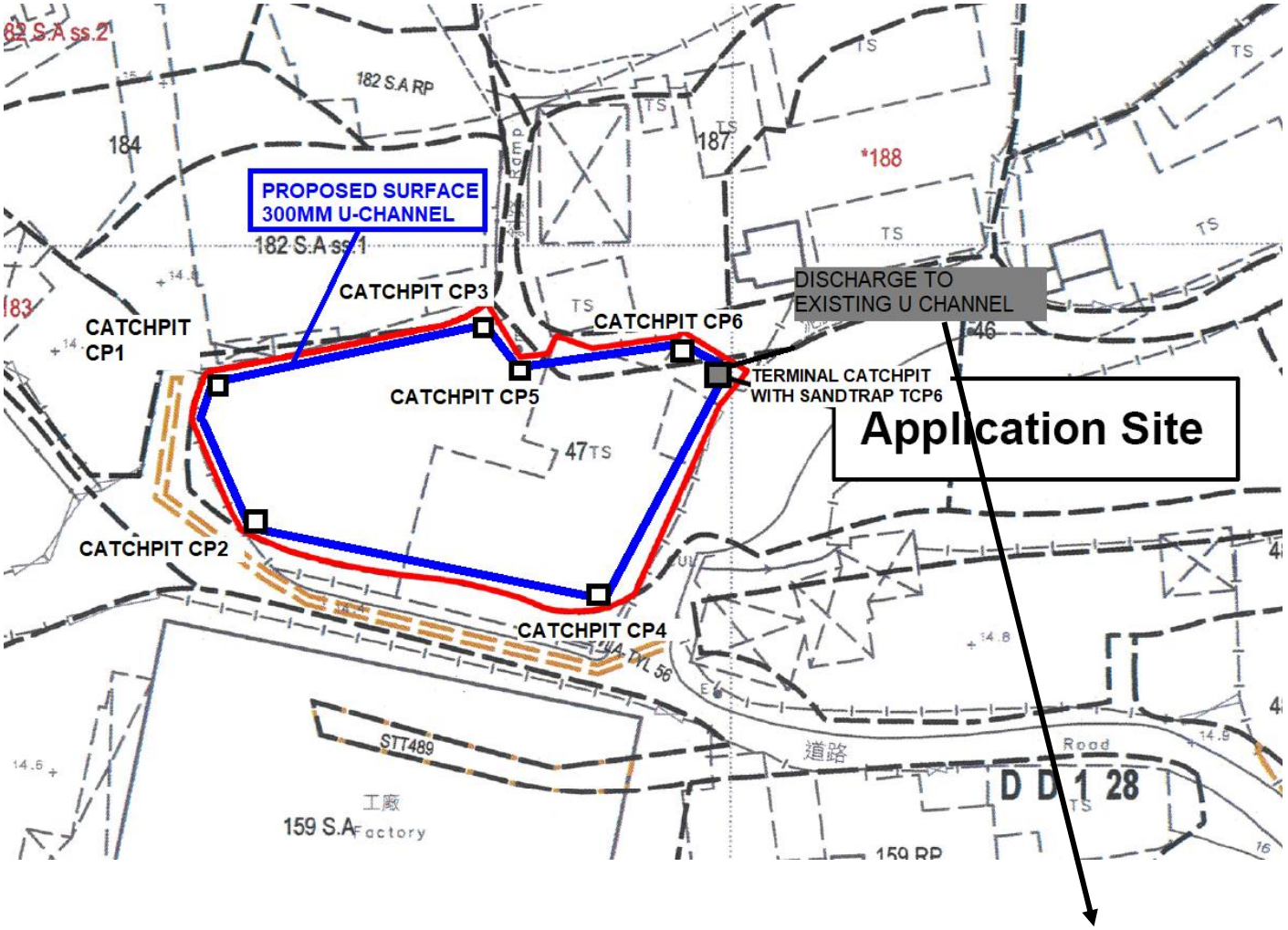
To ensure the long-term effective operation of the drainage system, the following maintenance plan will be implemented:

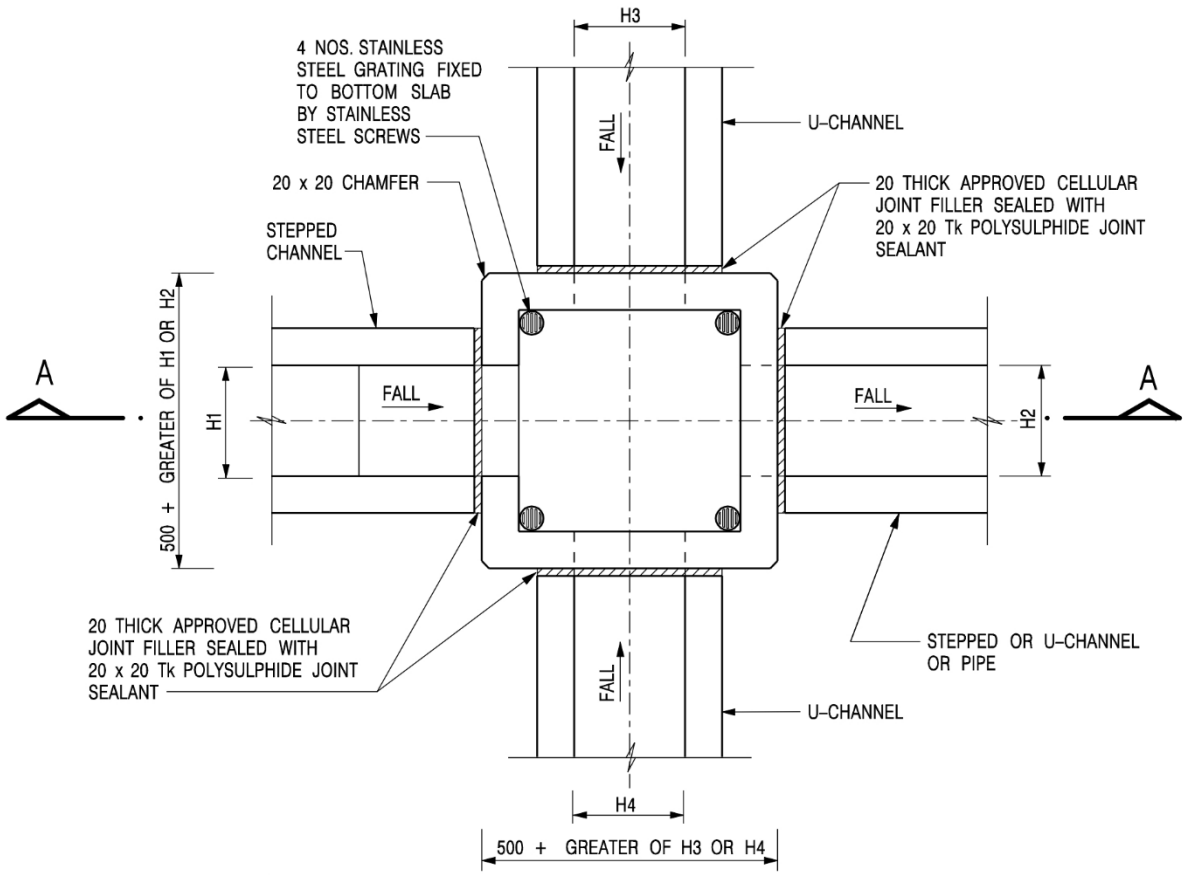
- **Regular Inspection**: Inspect all drainage channels, catchpits, and discharge points at least once a month, especially before and after heavy rainfall.
- **Desilting**: Regularly clean sand traps in catchpits and remove silt, debris, and rubbish from U-channels to ensure unobstructed flow.
- **Structural Inspection**: Annually inspect the structural integrity of drainage facilities and promptly repair any damage.
- **Vegetation Management**: Regularly trim vegetation around drainage channels to prevent root intrusion or leaf blockages.

6. Conclusion

This proposal presents a drainage scheme designed to provide an effective and DSD-compliant drainage system for the proposed Temporary Recyclable Collection Centre. By implementing peripheral U-channels, catchpits, and appropriate discharge measures, combined with permeable paving, stormwater runoff within the site can be effectively managed, minimizing adverse drainage impacts on the surrounding environment. We will fully cooperate with DSD's approval requirements and provide further detailed designs and information as needed.

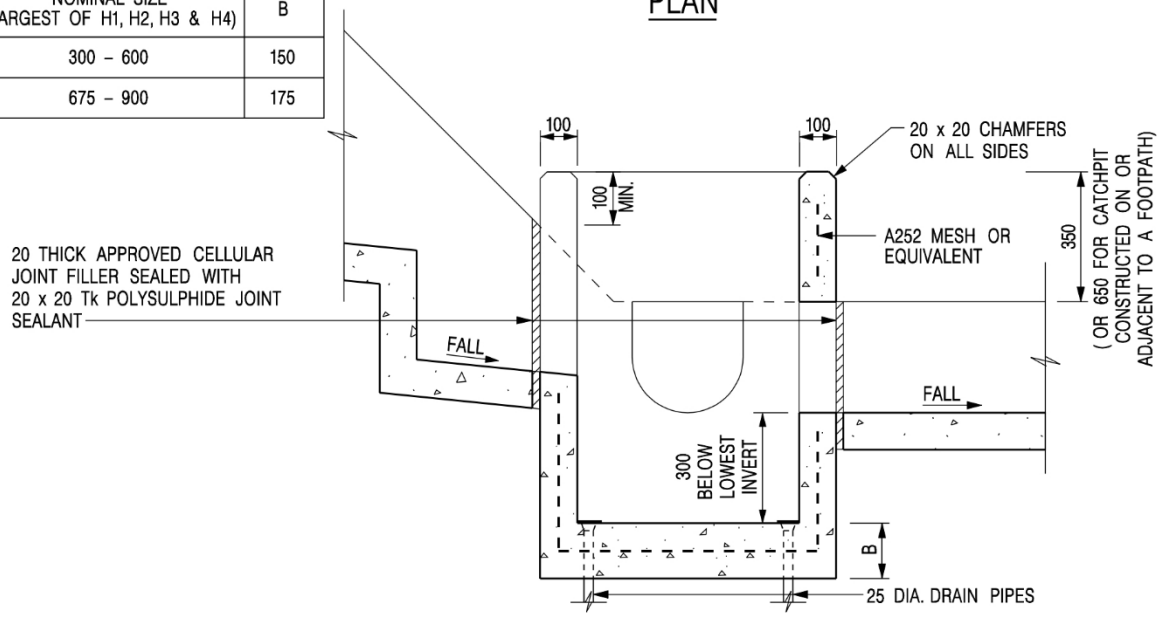
Proposed Drainage Plan





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 2 FOR OTHER NOTES.

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP

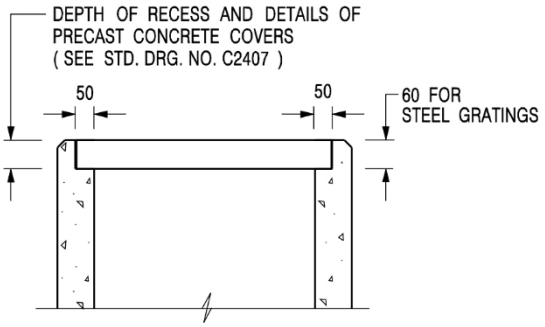
(SHEET 1 OF 2)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /1



ALTERNATIVE TOP SECTION
FOR PRECAST CONCRETE COVERS / GRATINGS

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE SHALL BE GRADE 20 /20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2 OR F2 AS APPROPRIATE.
4. FOR DETAILS OF JOINT, REFER TO STD. DRG. NO. C2413.
5. CONCRETE TO BE COLOURED AS SPECIFIED.
6. UNLESS REQUESTED BY THE MAINTENANCE PARTY AND AS DIRECTED BY THE ENGINEER, CATCHPIT WITH TRAP IS NORMALLY NOT PREFERRED DUE TO PONDING PROBLEM.
7. UPON THE REQUEST FROM MAINTENANCE PARTY, DRAIN PIPES AT CATCHPIT BASE CAN BE USED BUT THIS IS FOR CATCHPITS LOCATED AT SLOPE TOE ONLY AND AS DIRECTED BY THE ENGINEER.
8. FOR CATCHPITS CONSTRUCTED ON OR ADJACENT TO A FOOTPATH, STEEL GRATINGS (SEE DETAIL 'A' ON STD. DRG. NO. C2405 /2) OR CONCRETE COVERS (SEE STD. DRG. NO. C2407) SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER.
9. IF INSTRUCTED BY THE ENGINEER, HANDRAILING (SEE DETAIL 'J' ON STD. DRG. NO. C2405 /5; EXCEPT ON THE UPSLOPE SIDE) IN LIEU OF STEEL GRATINGS OR CONCRETE COVERS CAN BE ACCEPTED AS AN ALTERNATIVE SAFETY MEASURE FOR CATCHPITS NOT ON A FOOTPATH NOR ADJACENT TO IT. TOP OF THE HANDRAILING SHALL BE 1 000 mm MIN. MEASURED FROM THE ADJACENT GROUND LEVEL.
10. MINIMUM INTERNAL CATCHPIT WIDTH SHALL BE 1 000 mm FOR CATCHPITS WITH A HEIGHT EXCEEDING 1 000 mm MEASURED FROM THE INVERT LEVEL TO THE ADJACENT GROUND LEVEL. AND, STEP IRONS (SEE DSD STD. DRG. NO. DS1043) AT 300 c/c STAGGERED SHALL BE PROVIDED. THICKNESS OF CATCHPIT WALL FOR INSTALLATION OF STEP IRONS SHALL BE INCREASED TO 150 mm.
11. FOR RETROFITTING AN EXISTING CATCHPIT WITH STEEL GRATING, SEE DETAIL 'G' ON STD. DRG. NO. C2405 /4.
12. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.

REF.	REVISION	SIGNATURE	DATE
A	MINOR AMENDMENT.	Original Signed	04.2016
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP
(SHEET 2 OF 2)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /2A

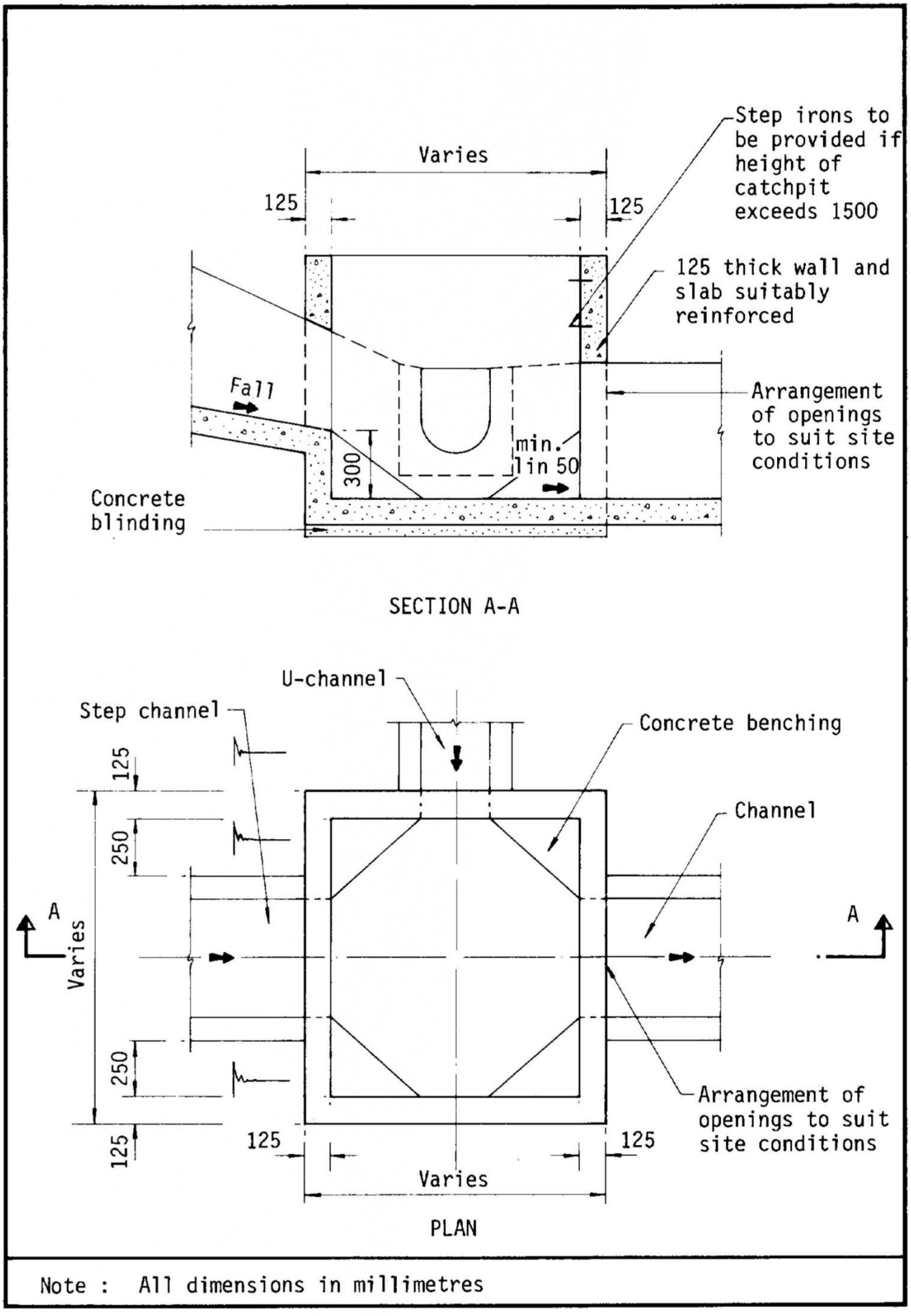
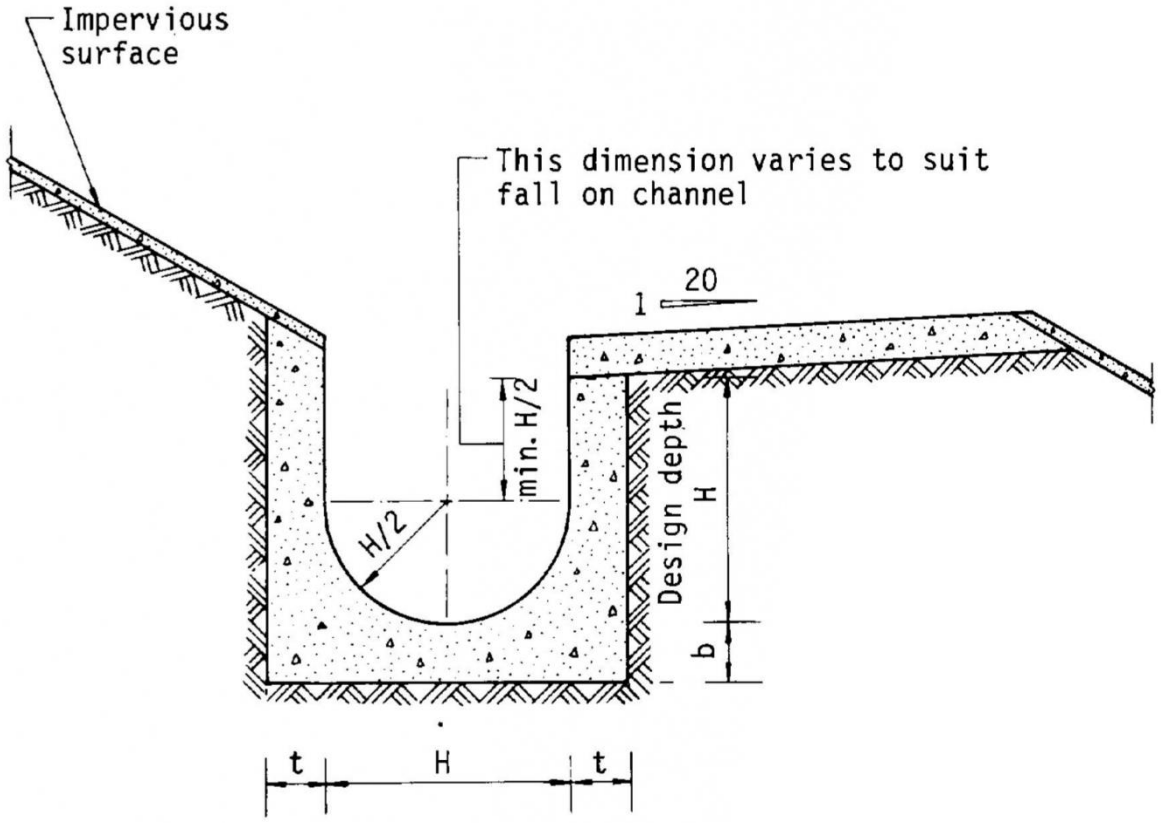


Figure 8.10 - Typical Details of Catchpits



Dimensions of U - channel		
Nominal size of channel H (mm)	Thickness t (mm)	Thickness b (mm)
225 to 600	150	150
675 to 1200	175	225

Figure 8.11 - Typical U-channel Details