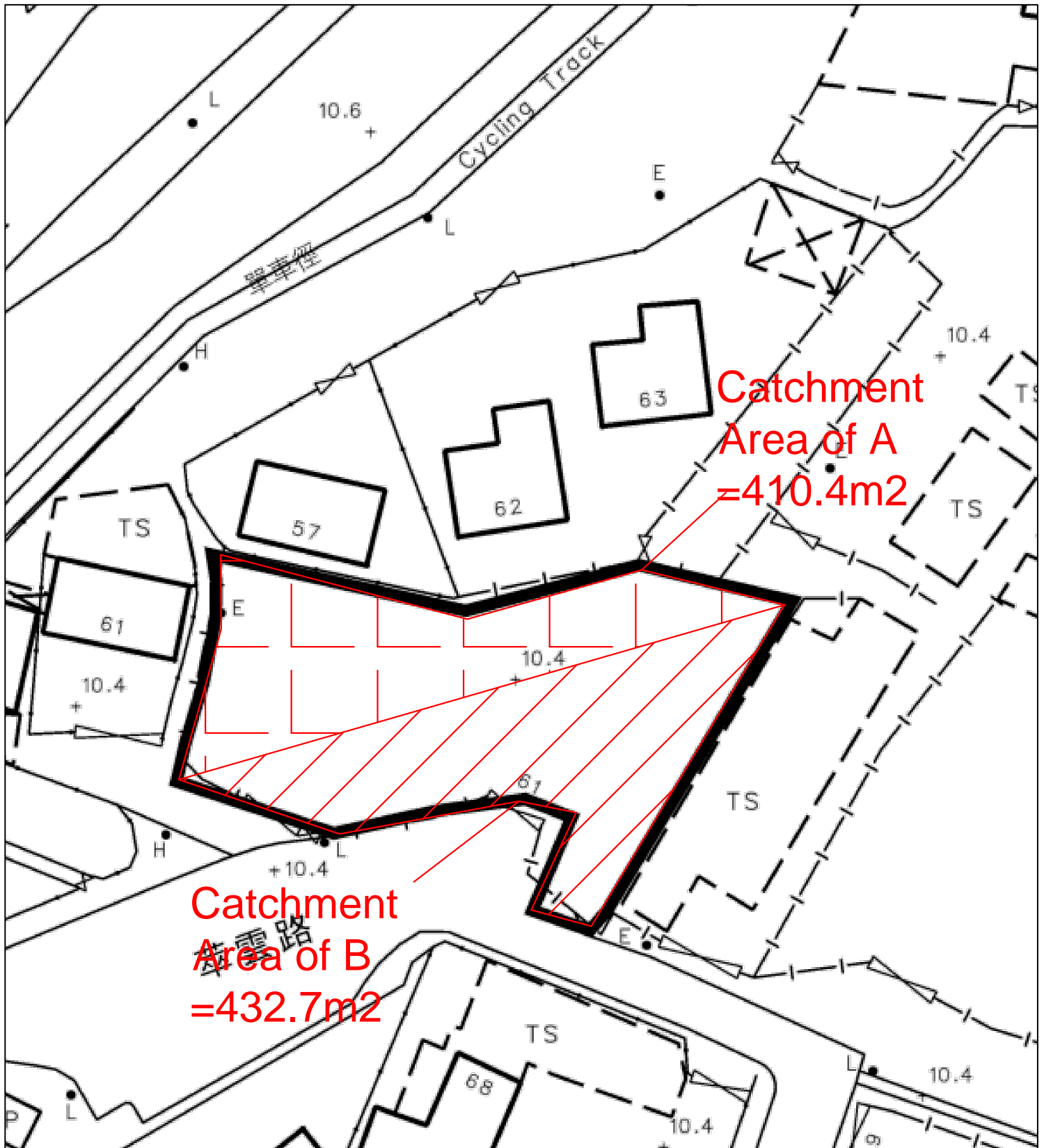


<p>光輝工程顧問公司 GLISTER ENGINEERING CONSULTANTS CO.</p>	<p>Title: Drainage Proposal</p>		<p>DD83(1058)-D01</p>
	<p>Project: Proposed Public Vehicle Park (Private Car) at Lot 1508 S.ARP in D.D.83</p>	<p>Drawn by: DM</p>	<p>Date: 28-6-2023</p>
	<p>Check by: DM</p>	<p>Scale: ----</p>	



Catchment Area of A = 410.4m²

Catchment Area of B = 432.7m²

光輝工程顧問公司

GLISTER ENGINEERING CONSULTANTS CO.

Project:

Proposed Public Vehicle Park (Private Car) at Lot 1508 S.ARP in D.D.83

Title:

Drainage Proposal:
Catchment Area

DD83(1058)-D02

Drawn by:

DM

Date:

28-6-2023

Check by:

DM

Scale:



Company: 光輝工程顧問公司 GLISTER ENGINEERING CONSULTANTS CO.
Project : Proposed Temporary Public Vehicle Park (Private Car)
 Lot 1508 S.ARP in D.D.83 (A/NE-LYT/706)
Date: 28/6/2023

Calculation for channels:

Catchment Zone A

$$\begin{aligned}
 \text{Area} &= 410.4 \text{ m}^2 \\
 &= 0.00041 \text{ km}^2 \\
 \text{Peak runoff in m}^3/\text{s} &= 0.278 \times 0.95 \times 250 \text{ mm/hr} \times 0.00041 \text{ km}^2 \\
 &= 0.027097 \text{ m}^3/\text{s} \\
 &= 1626 \text{ liter/min}
 \end{aligned}$$

According to (Figure 8.7 - Chart for the Rapid Design of Channels),
 For gradient 1:100, 225UC will be suitable for zone A

Catchment Zone B

$$\begin{aligned}
 \text{Area} &= 432.7 \text{ m}^2 \\
 &= 0.000433 \text{ km}^2 \\
 \text{Peak runoff in m}^3/\text{s} &= 0.278 \times 0.95 \times 250 \text{ mm/hr} \times 0.000433 \text{ km}^2 \\
 &= 0.028569 \text{ m}^3/\text{s} \\
 &= 1714 \text{ liter/min}
 \end{aligned}$$

According to (Figure 8.7 - Chart for the Rapid Design of Channels),
 For gradient 1:100, 225UC will be suitable for zone B

Check Existing 300mm dia pipe
 Peak runoff of whole site in m³/s
 = 0.055666 m³/s
 = 3340 liter/min

Road catchment area
 = 622.21
 = 0.000622 km²

Peak runoff in m³/s
 = 0.278 x 0.95 x 250 mm/hr x 0.000622 km²
 = 0.041081 m³/s
 = 2465 liter/min

Total Q
 = 1626 + 1714 + 2465
 = 5805 liter/min

Manning Equation V = R^{2/3} * S_f^{0.5} / n

where R = $\frac{\pi r^2}{2 \pi r}$ dia = 300 mm
 = r/2 r = 0.15 m
 = 0.075 m

n = 0.012 s/m^{1/3} (Talbe 13 of Stormwater Drainage Manual)

1/ 100 S_f = 0.01

Therefore, V = 0.075^{2/3} * 0.01^{0.5} / 0.012
 = 1.48 m/sec

Provide 300mm dia underground pipe (1:100)
 Maximum Capacity (Q_{max})

= V * A
 = 1.48 * π r²
 = 0.1048 m³/sec

1 nos of pipe
 = 0.1048 m³/sec
 = 6286 lit/min > 5805 OK

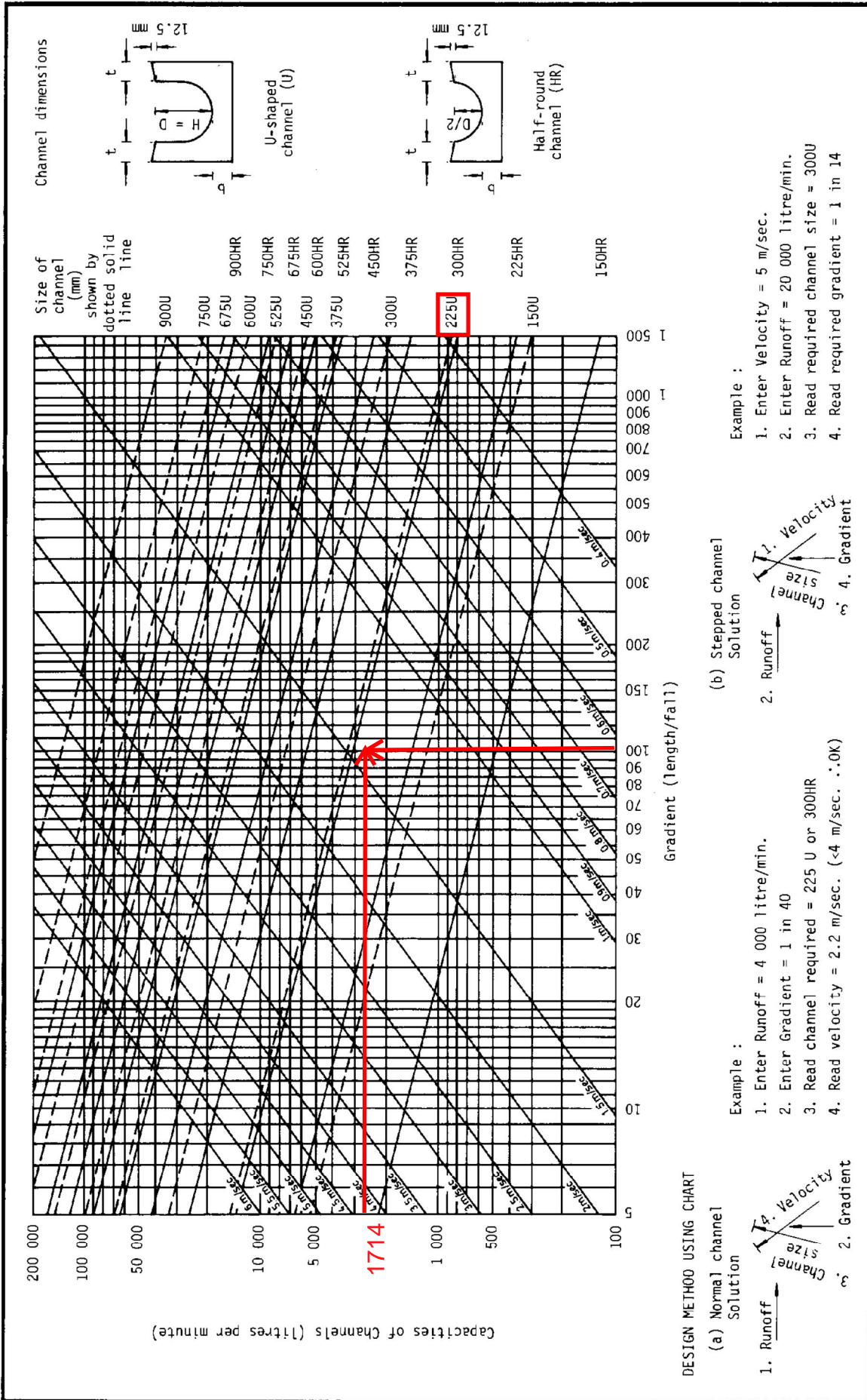
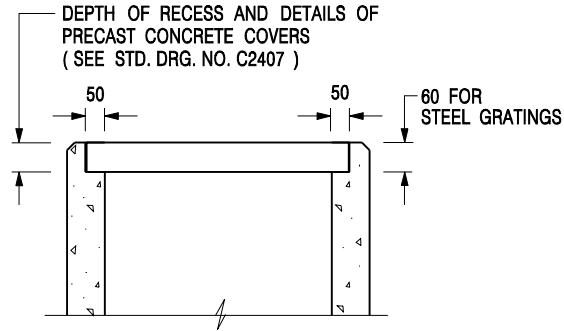


Figure 8.7 - Chart for the Rapid Design of Channels




**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) 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 'G' ON STD. DRG. NO. C2405; 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 'F' ON STD. DRG. NO. C2405.
12. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.

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

**CATCHPIT WITH TRAP
(SHEET 2 OF 2)**

 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	
SCALE 1 : 20	DRAWING NO.
DATE JAN 1991	C2406 /2

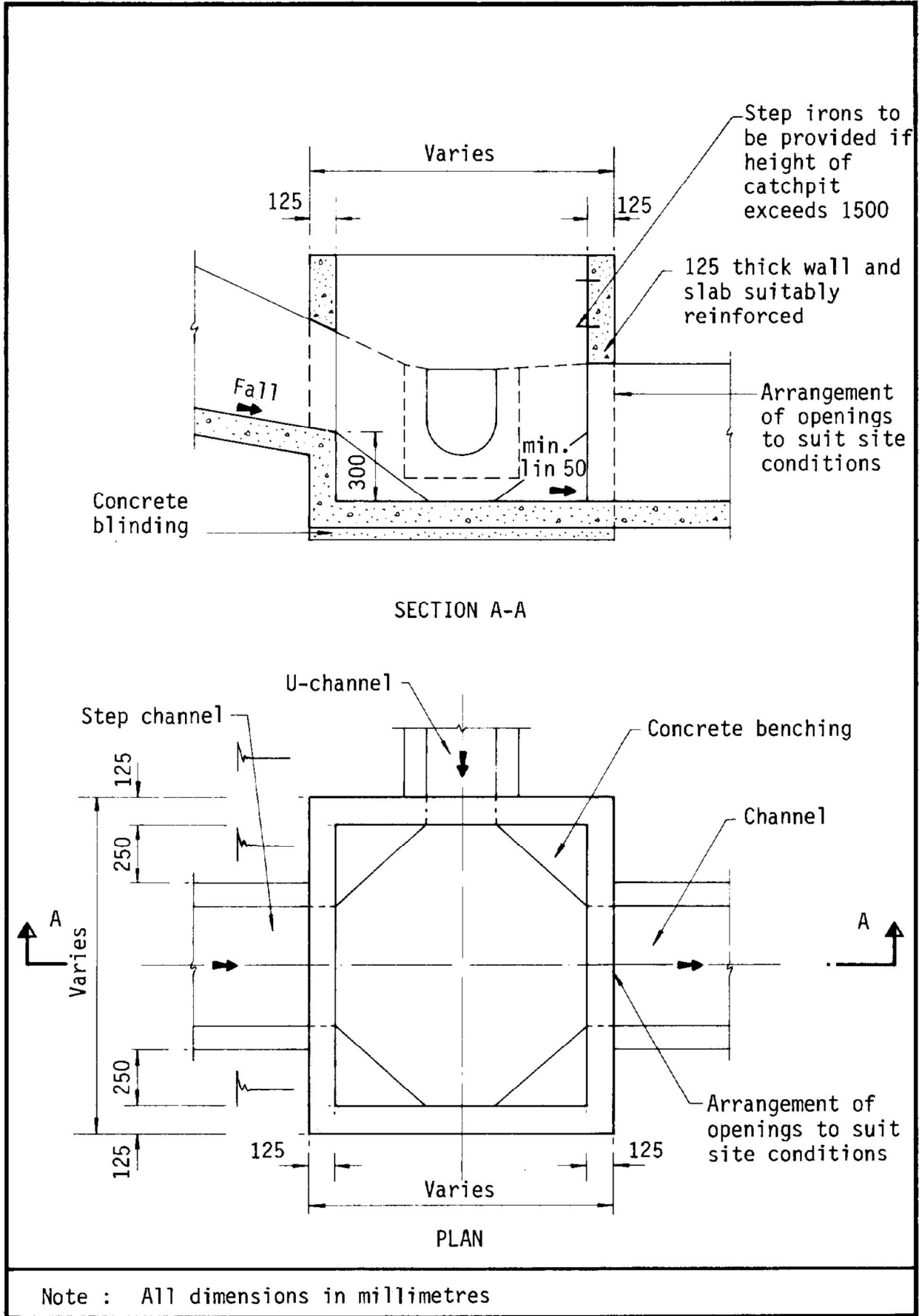
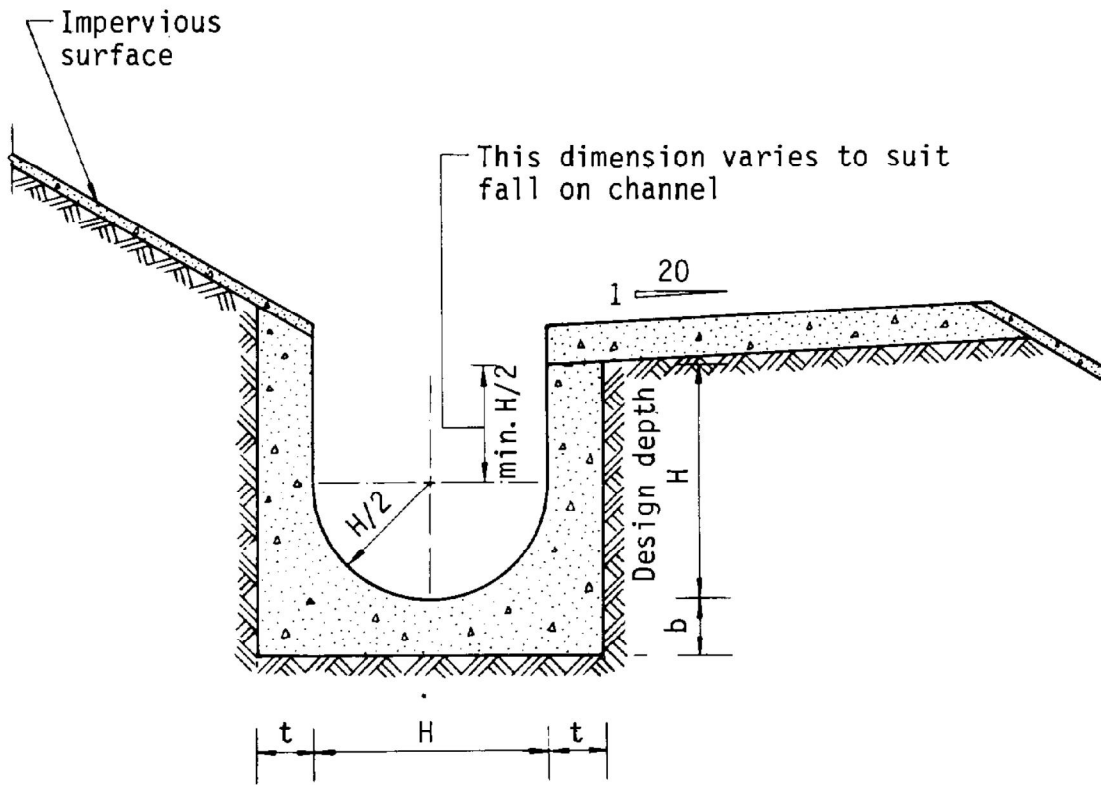


Figure 8.10 - Typical Details of Catchpits



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

**METHOD STATEMENT for the proposed 300mm dia.
underground concrete pipe**

1. Underground utility detection shall be carried out before excavation. Besides, excavation plan and temporary traffic diversion scheme shall be applied and executed.
2. Excavating to the required level and expose the external wall of the connection manhole.
3. Opening the cover of the connection manhole and place pump down to its base.
4. Coring 500mm dia. opening at the connection proposed connection point of the connection manhole.
5. Installing the proposed 300mm dia. pipe.
6. Sealing up the gap at connection point.
7. Carrying out leak test and arranging joint inspection with DSD.
8. Backfilling upon acceptance of the leak test.

Remarks:

1. Excavation permit shall be applied from Highways Department and the application procedures to deal with traffic aspects without causing any unacceptable traffic impact shall be followed.
2. Temporary Traffic Arrangement shall be applied.
3. All Confined Space operation must obey Code of Practice: Safety and Health at Work in Confined Spaces.
4. The works shall be monitored by Registered Professional Engineer.



Photo showing the internal of existing manhole to be connected