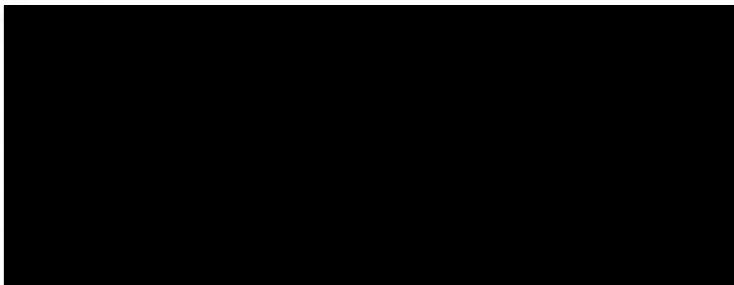
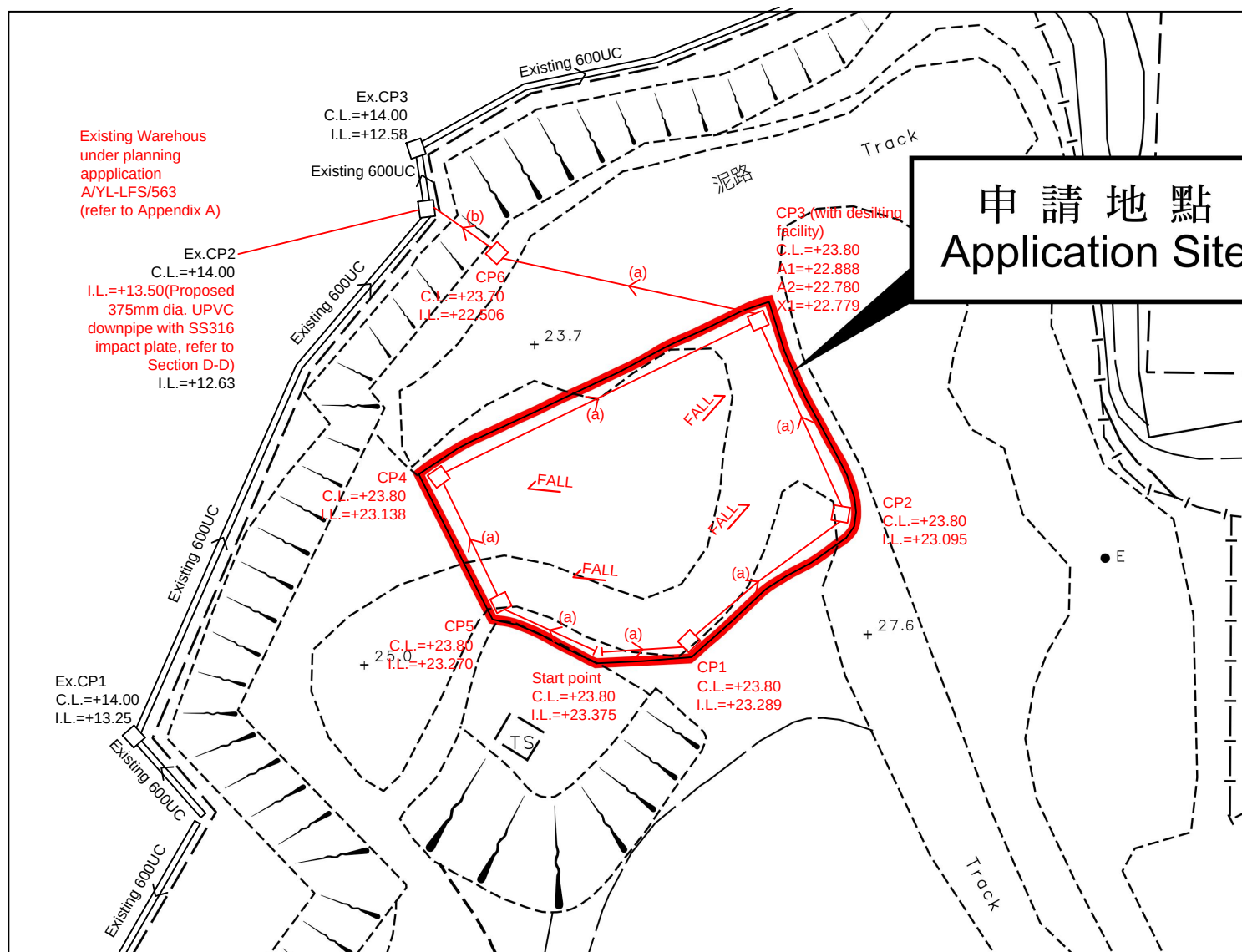


**Proposed Temporary Shop and Services for a Period of 3 Years
(Automated Home Showroom with Ancillary Facilities and Retail Shop
of Accessories) at Lot 2282 (Part) in D.D. 129, Lau Fau Shan, Yuen Long,
New Territories**

Drainage Proposal



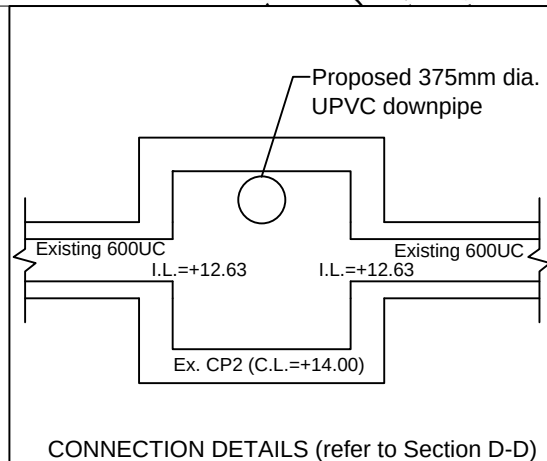
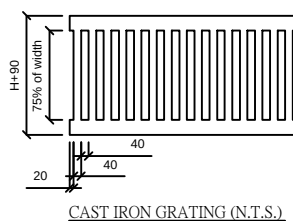
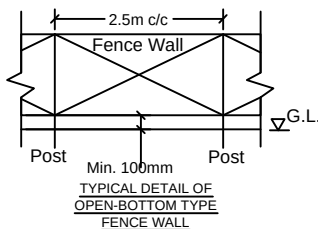


Note:

1. Catchpits (CP3) with desilting facility shall follow CEDD standard drawing No. C24061.
2. Catchpit and UC follows Typical Details of Geotechnical Manual for Slope Fig.8.10 and Fig.8.11 respectively.
3. Fence Wall to be erected (if any) shall be Open-bottom type.
4. No Site Formation/Filling works to be carried out.

LEGEND

- CP Proposed CatchPit
- (a) Proposed 375UC (1:100) with cast iron cover
- (b) Proposed 375mm dia. UPVC downpipe
- Ex.CP Existing CatchPit
- Existing 600UC



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Project:
Proposed Temporary Shop and Services for a Period of 3 Years (Automated Home Showroom with Ancillary Facilities and Retail Shop of Accessories) at Lot 2282 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories

Title:

Drainage Proposal

D01

Drawn by:

DM

Date:

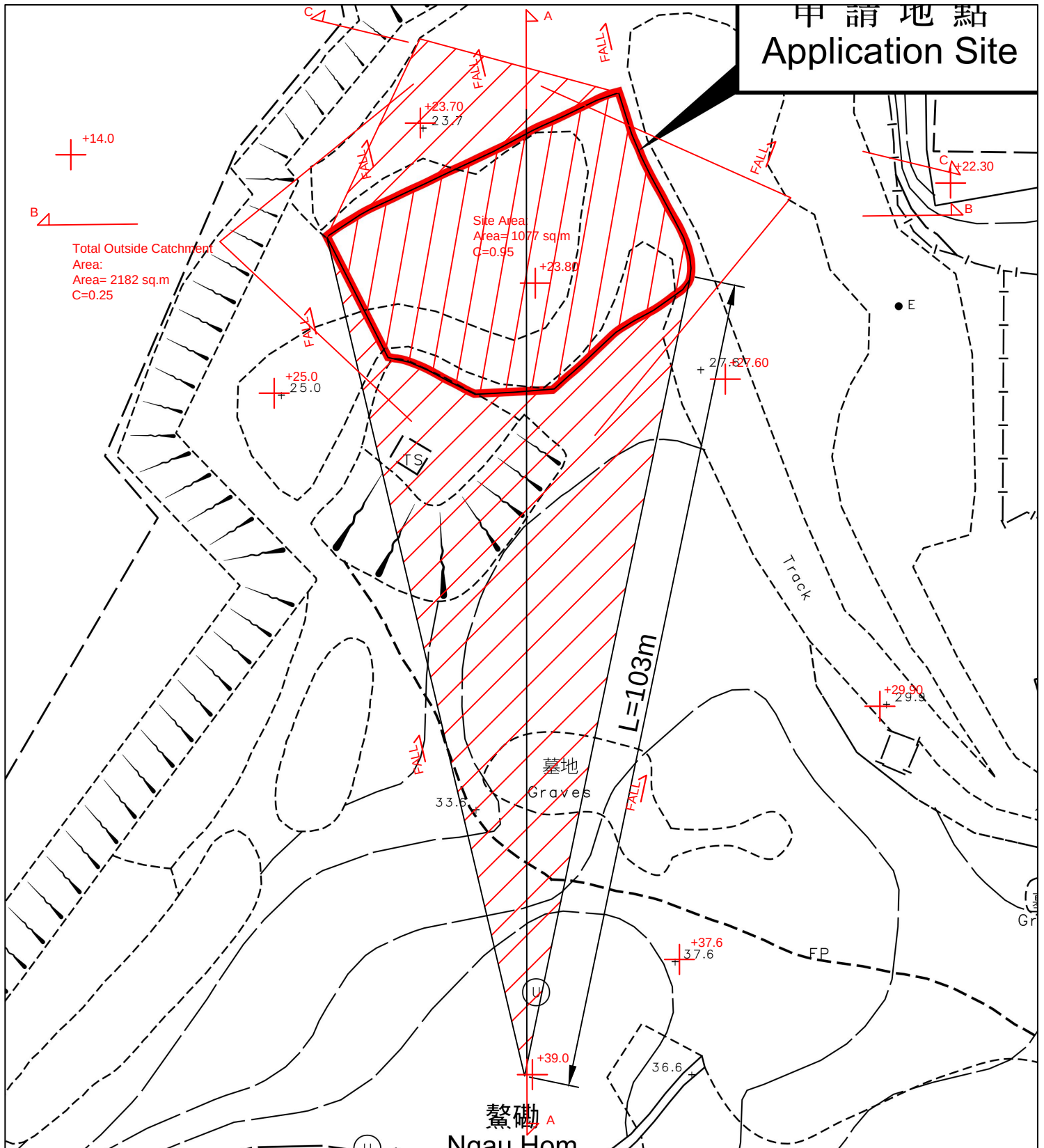
8-9-2026

Check by:

DM

Scale:

申請地點 Application Site



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Project:

Proposed Temporary Shop and Services for a Period of 3 Years (Automated Home Showroom with Ancillary Facilities and Retail Shop of Accessories) at Lot 2282 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories

Title:

Drainage Proposal
Catchment Area Plan

D02

Drawn by:

DM

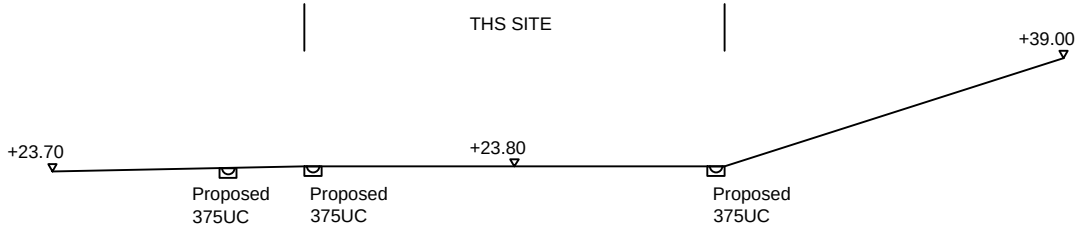
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8-9-2026

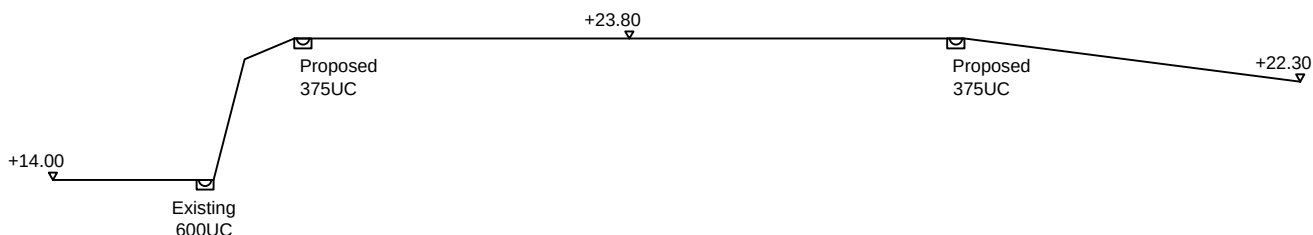
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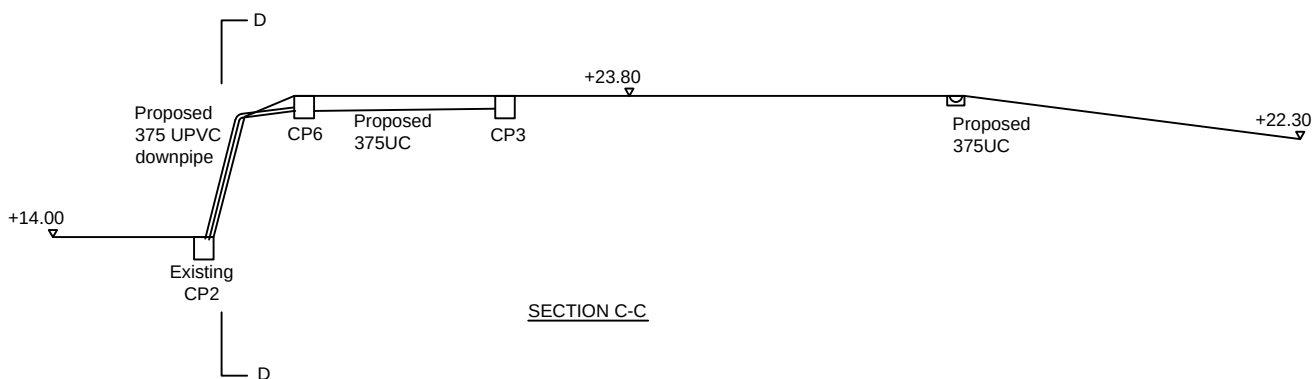
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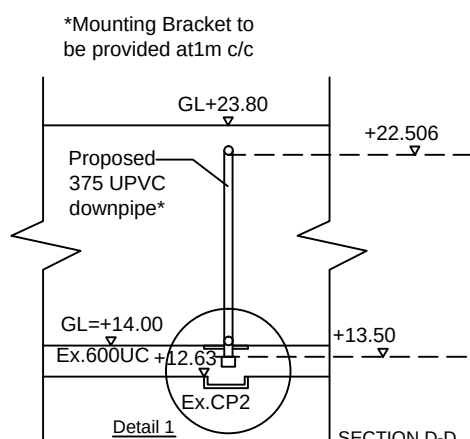
SECTION A-A



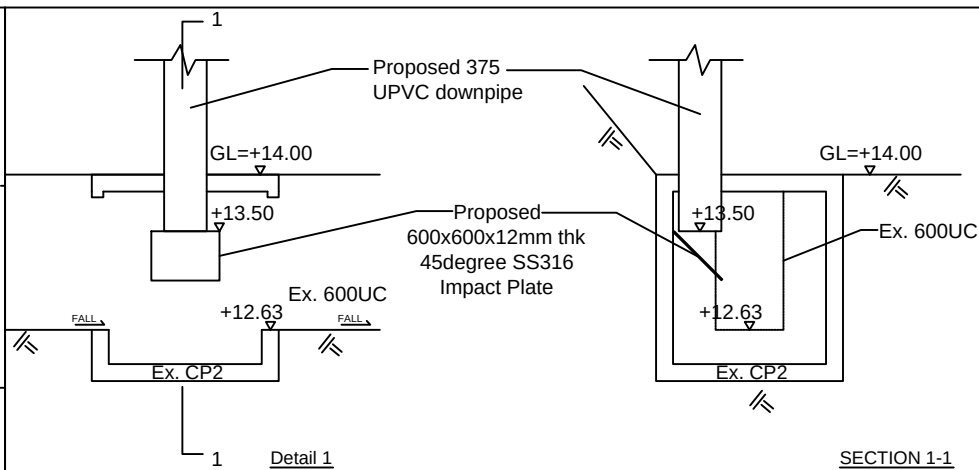
SECTION B-B



SECTION C-C



SECTION D-D



SECTION 1-1

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Project:
Proposed Temporary Shop and Services for a Period of 3 Years (Automated Home Showroom with Ancillary Facilities and Retail Shop of Accessories) at Lot 2282 (Part) in D.D. 129, Lau Fau Shan, Yuen Long, New Territories

Title:

SECTIONS

D03

Drawn by:

DM

Date:

7-9-2026

Check by:

DM

Scale:

Outside Catchment Area, Area = 2182 m² (C= 0.25) L = 103m
 The Site, Area = 1077 m² (C= 0.95)

Calculation of Design Runoff of the Proposed Development,
For checking existing 375UC

$$\Sigma Q = \Sigma 0.278 C i A$$

$$\begin{aligned} A &= 1845+1077 \text{ m}^2 \\ &= 1845+1077 \\ &= 3259 \text{ km}^2 \end{aligned}$$

$$\begin{aligned} t &= 0.14465 L/ H^{0.2} A^{0.1} \\ &= 0.14465*103/14.76^{0.2}*3529^{0.1} \quad (H=(39-23.8)*100/103)=14.76\text{m} \\ &= 3.873 \text{ min} \end{aligned}$$

$$\begin{aligned} i &= 1.16*a/(t+b)^c \quad (50 \text{ yrs return period, Table 3a, Corrigendum 2024,} \\ &= 1.16*505.5/(3.873+3.29)^{0.355} \quad \text{SDM) and (16\% increase due to climate change)} \\ &= 291.5 \text{ mm/hr} \end{aligned}$$

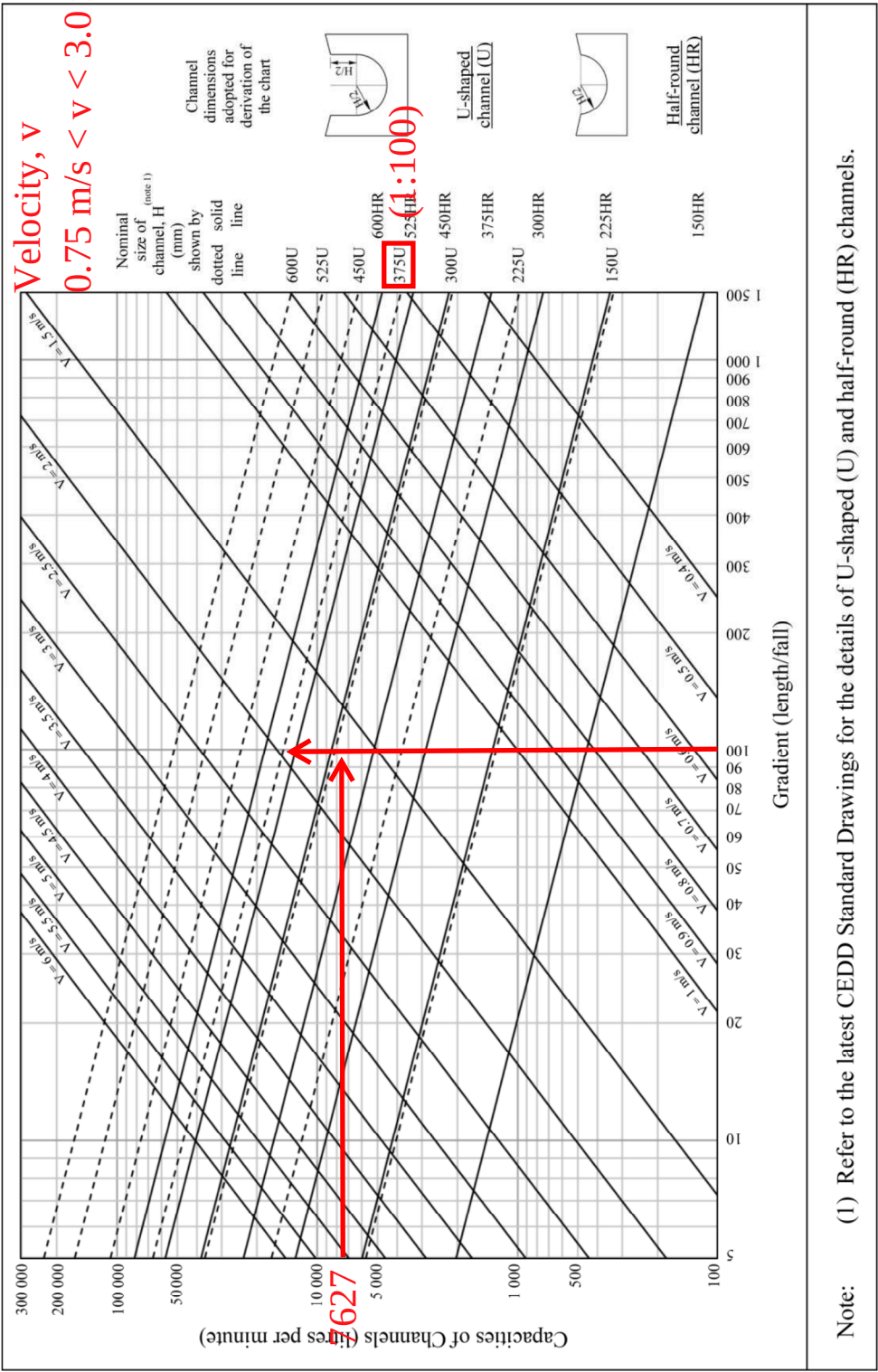
$$\begin{aligned} \text{Therefore, } Q &= 0.278*0.25*291.5*0.002182+0.278*0.95*291.5*0.001077 \\ &= 0.1271 \text{ m}^3/\text{sec} \\ &= \underline{7627} \text{ lit/min} \end{aligned}$$

Existing 375UC (1:100) is OK

GEO Technical Guidance Note No. 43 (TGN 43)
Guidelines on Hydraulic Design of U-shaped and Half-round Channels on Slopes

Issue No.: 1	Revision: -	Date: 05.06.2014	Page: 3 of 3
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Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600 mm



Check 375mm dia. UPVC downpipe by Colebrook-White Equation

$$V = -\sqrt{(8gDs)} \log\left(\frac{ks}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where :

V	=		mean velocity (m/s)	
g	=	9.81	m/s ² gravitational acceleration (m/s ²)	
D	=	0.375	m internal pipe diameter (m)	
ks	=	0.000006	m hydraulic pipeline roughness (m)	(Table14, from DSD SDM 2018, upvc pipe)
v	=	1.14E-06	m ² /s kinematic viscosity of fluid (m ² /s)	
s	=	0.01	hydraulic gradient	

Therefore, design V of pipe capacity = 2.4351 m/s

Q= 0.8VA (0.8 factor for sedimentation)
 = 0.215 m³/s
 = 12910 lit/min
 > 7627 lit/min Ok

Calculation of Energy Dissipation of adopting the

45° SS316 Impact Plate

With the downpipe outlet set at +13.50 mPD inside the chamber, the total vertical acceleration drop occurs between GL +23.80 mPD and +13.50 mPD.

1. Input Parameters

- Design Discharge (Q): 0.1271m³/s
- Downpipe Diameter (D): 375mm = 0.375m
- Upper Level: +23.80 mPD
- Downpipe Discharge Level: +13.50 mPD (500mm below top slab)
- Cover Level (GL): +14.00 mPD
- Outfall Invert to Ex.600UC: +12.63 mPD
- Sump Floor Elevation: +12.33 mPD (300mm depth)
- Chamber Internal Plan Area: 600mmx 600mm

2. Downpipe Exit Velocity & Force Calculation

- Effective Fall Height (H):

$$H = 23.80 - 13.50 = 10.30\text{m}$$

- Jet Terminal Velocity (V₁):

$$V_1 = \sqrt{2gH} = \sqrt{2 \times 9.81 \times 10.30} = 14.22\text{m/s}$$

- Mass Flow Rate (m):

$$m = 1000 \text{ kg/m}^3 \times 0.1271\text{m}^3/\text{s} = 127.1 \text{ kg/s}$$

- Normal Impact Force on 45° Deflector Plate (F_n):

$$F_n = m \cdot V_1 \cdot \sin(45^\circ) = 127.1 \times 14.22 \times 0.7071 = 1.28 \text{ kN}$$

- Design Hydrodynamic Peak Force (F_{design} with Safety Factor 2.0):

$$F_{\text{design}} = 1.28 \times 2.0 = 2.56 \text{ kN}$$

3. Energy Loss & Outfall Velocity Calculations

- Incoming Total Energy Head (E1)

At the downpipe exit elevation of +13.50mPD, the total energy head relative to the sump floor (+12.33mPD) consists of both velocity head and potential head:

- Elevation Head (z_1): $13.50\text{mPD} - 12.33\text{mPD} = 1.17 \text{ m}$
- Velocity Head (h_{v1}):

$$h_{v1} = V_1^2 / 2g = 14.22^2 / 2 \times 9.81 = 10.30\text{m}$$

- Total Incoming Energy Head (E1):

$$E1 = z_1 + h_{v1} = 1.17 + 10.30 = 11.47 \text{ m}$$

- Energy Head Dissipation Across 45° SS316 Impact Plate (ΔE_{impact})

When the high-velocity jet (14.22m/s) strikes the inclined Grade 316 Stainless Steel plate, mechanical impact converts approximately 85% of the kinetic velocity head into dynamic spray, turbulence, and heat:

- Energy Loss Factor (π): 0.85
- Head Loss (ΔE_{impact}):

$$\Delta E_{\text{impact}} = 0.85 \times h_{v1} = 0.85 \times 10.30\text{m} = 8.76\text{m}$$

- Residual Energy Head After Plate Impact (E2):

$$E2 = E1 - \Delta E_{\text{impact}} = 11.47 - 8.76 = 2.71 \text{ m}$$

- Energy Dissipation in the 300 mm Plunge Water Cushion ($\Delta E_{\text{cushion}}$)

The turbulent air-entrained spray curtain drops into the 300mm plunge cushion (between +12.33mPD and +12.63mPD). Submerged vertical jet diffusion and fluid mixing further reduce the remaining energy head by approximately 60%:

- Head Loss in Cushion ($\Delta E_{\text{cushion}}$):

$$\Delta E_{\text{cushion}} = 0.60 \times 2.71 = 1.63 \text{ m}$$

- Final Residual Head at Chamber Outfall (E_{out}):

$$E_{\text{out}} = E_2 - \Delta E_{\text{cushion}} = 2.71 - 1.63 = 1.08 \text{ m}$$

4. Determines the Velocity in Ex.600UC

When water exits the chamber into Ex.600UC, the energy converts between depth (y) and velocity (V). The exact flow regime depends on whether the outfall operates under Free Outfall (Critical Depth) or Submerged/Backwater Control from the downstream channel slope.

Case A: Free Discharge / Critical Depth Control (Maximum Outfall Velocity)

If the downstream Ex.600UC drops away freely or operates at critical slope, the outfall automatically adjusts to critical depth (y_c) to maximize discharge efficiency:

- Critical Depth (y_c) for Rectangular Channel ($B = 0.60 \text{ m}$):

$$y_c = (q^2/g)^{1/3} = ((Q/B)^2/g)^{1/3} = ((0.1271/0.60)^2/9.81)^{1/3} = 0.166 \text{ m}$$

- Critical Velocity (V_c):

$$V_c = Q/(B \cdot y_c) = 0.1271/(0.6 \cdot 0.166) = 1.28 \text{ m/s}$$

- Required Energy Head for Critical Flow (E_c):

$$E_c = 1.5 \cdot y_c = 1.5 \times 0.166 = 0.249 \text{ m}$$

- Energy Check: Since available $E_{\text{out}} = 1.08 \text{ m} > E_c = 0.249 \text{ m}$, the chamber has more than enough energy to discharge $Q = 0.1271 \text{ m}^3/\text{s}$ without causing upstream backwater flooding inside Ex.CP2.

Case B: Submerged Outfall / Backwater Control (Design Depth $y_{\text{out}} = 0.20 \text{ m}$)

If downstream backwater in Ex.600UC maintains a flow depth of $y_{out} = 0.20\text{m}$ at invert level +12.63mPD:

- Actual Velocity Head Available ($h_{v,actual}$):

$$h_{v,actual} = V_{out}^2 / 2g = 1.06^2 / 2 * 9.81 = 0.057\text{m}, \quad (\text{where})$$
$$V_{out}^2 = Q / A = 0.1271 / (0.6 * 0.2)$$

- Actual Dynamic Energy Head Needed (E_{actual}):

$$E_{actual} = y_{out} + h_{v,actual} = 0.20\text{m} + 0.057\text{m} = 0.257\text{m}$$

- Excess Energy Dissipation ($\Delta E_{residual}$):

$$\Delta E_{residual} = E_{out} - E_{actual} = 1.08\text{m} - 0.257\text{m} = 0.823\text{m}$$

This remaining 0.823m of excess head is completely dissipated as secondary turbulence (boiling/eddy action) within the 300mm water cushion before entering Ex.600UC.

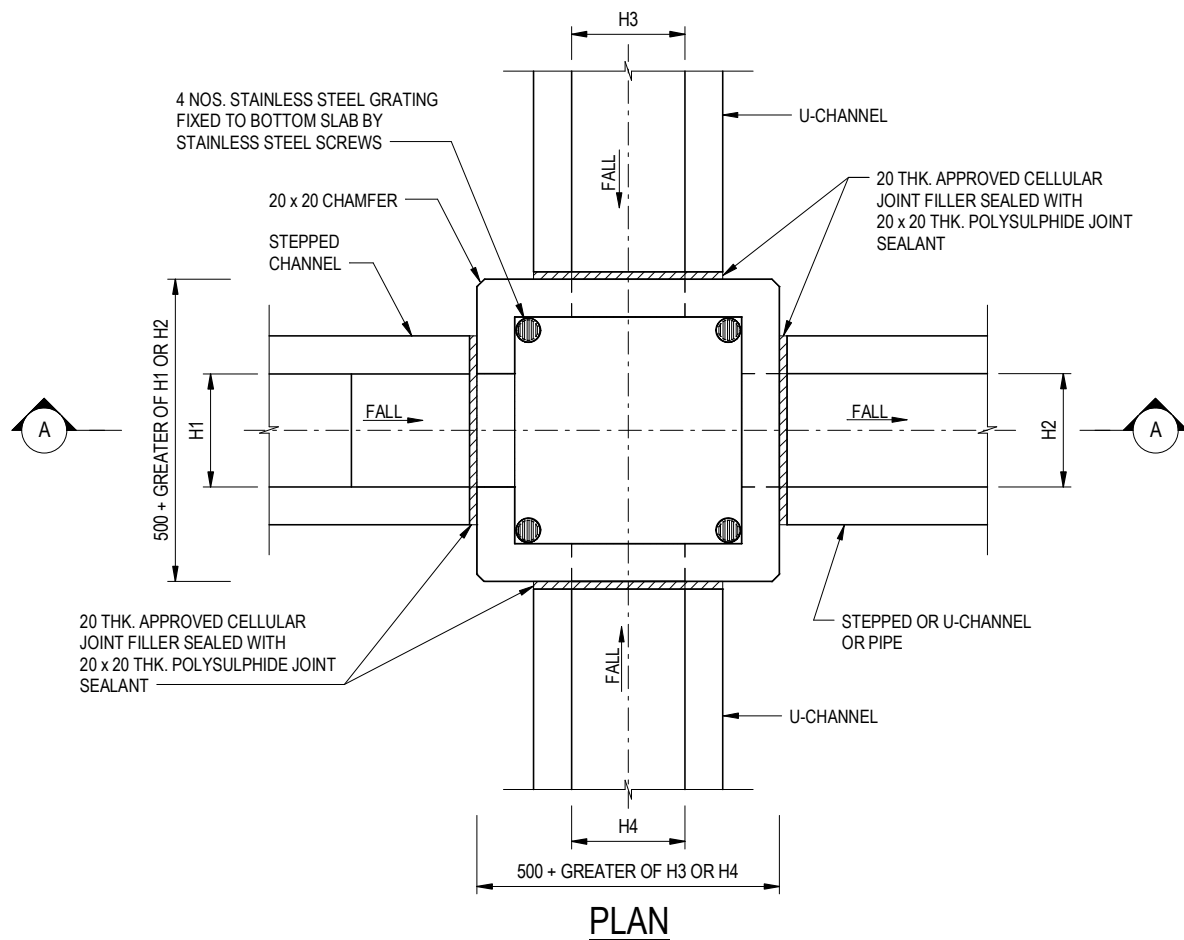
Case A (Free Outfall): $Fr = V_c / \sqrt{g * y_c} = 1.28 / \sqrt{9.81 * 0.166} = 1.00$ (Critical Flow)

Case B (Submerged Outfall): $Fr = V_{out} / \sqrt{g * y_{out}} = 1.06 / \sqrt{9.81 * 0.2} = 0.76$
(Subcritical Flow)

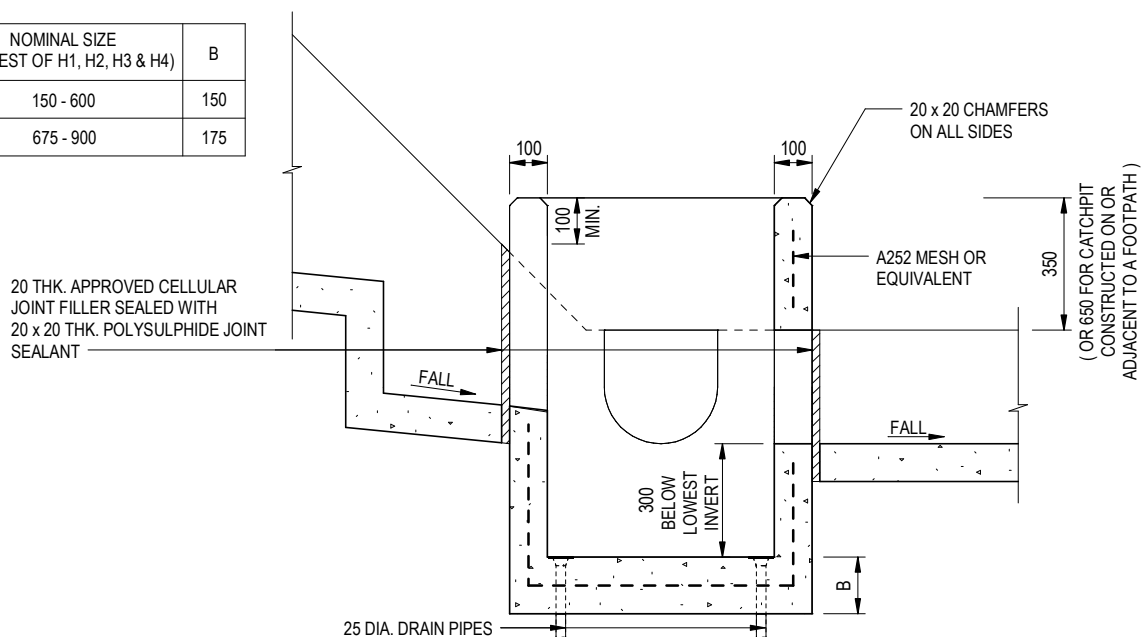
5. Conculsion

Parameter / Check	Calculated Value	DSD Limit / Allowable	Statutory / Design Status
Design Discharge (Q)	0.1271 m ³ /s	—	Design Basis
Downpipe Exit Velocity (V₁)	14.22 m/s	>3.0 m/s (Requires Dissipation)	Intercepted at SS316 Plate
Dynamic Impact Force (F_{design}, SF=2.0)	2.56 kN	—	Structural Check Passed (12mm Grade 316 SS)
Total Head Dissipated (ΔE_{total})	≈90.6%	—	Energy Dissipated via Impact & Sump
Outfall Velocity — Case A (Critical Outfall)	1.28 m/s	≤3.0 m/s	PASSED (Non-scouring)
Outfall Velocity — Case B (Submerged Depth 0.2m)	1.06 m/s	≤3.0 m/s	PASSED (Non-scouring)
Minimum Channel Velocity Check	1.06 m/s–1.28 m/s	≥0.75 m/s	PASSED (Self-cleansing)
Upstream Surcharging Risk	E _{out} (1.08 m)>E _c (0.249 m)	Free Outfall Clearance	PASSED (No Backwater Surcharging)

Providing the 45° SS316 Impact Plate significantly dissipate 90.6% energy. The flow velocity entering Ex. CP2 within the range from 0.75m/s to 3.0m/s, it is considered the hydraulic satisfactory.



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



NOTES:

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

**CATCHPIT WITH TRAP
(SHEET 1 OF 2)**

A	BIM OBJECT REVISION.	Original Signed	12.2025
—	FORMER DRG. NO. C2406J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE



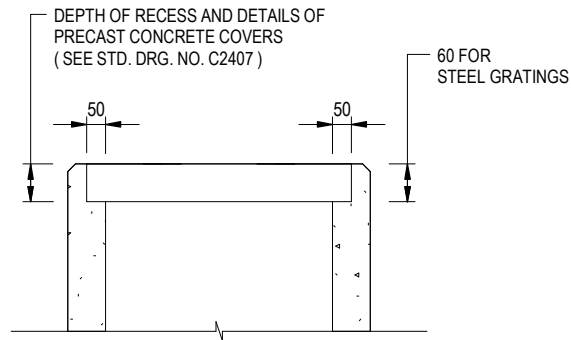
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2406 /1A



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 1000 mm MIN. MEASURED FROM THE ADJACENT GROUND LEVEL.
10. MINIMUM INTERNAL CATCHPIT WIDTH SHALL BE 1000 mm FOR CATCHPITS WITH A HEIGHT EXCEEDING 1000 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.

B	BIM OBJECT REVISION.	Original Signed	12.2025
A	MINOR AMENDMENT.	Original Signed	04.2016
—	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

DATE JAN 1991

DRAWING NO.

C2406 /2B

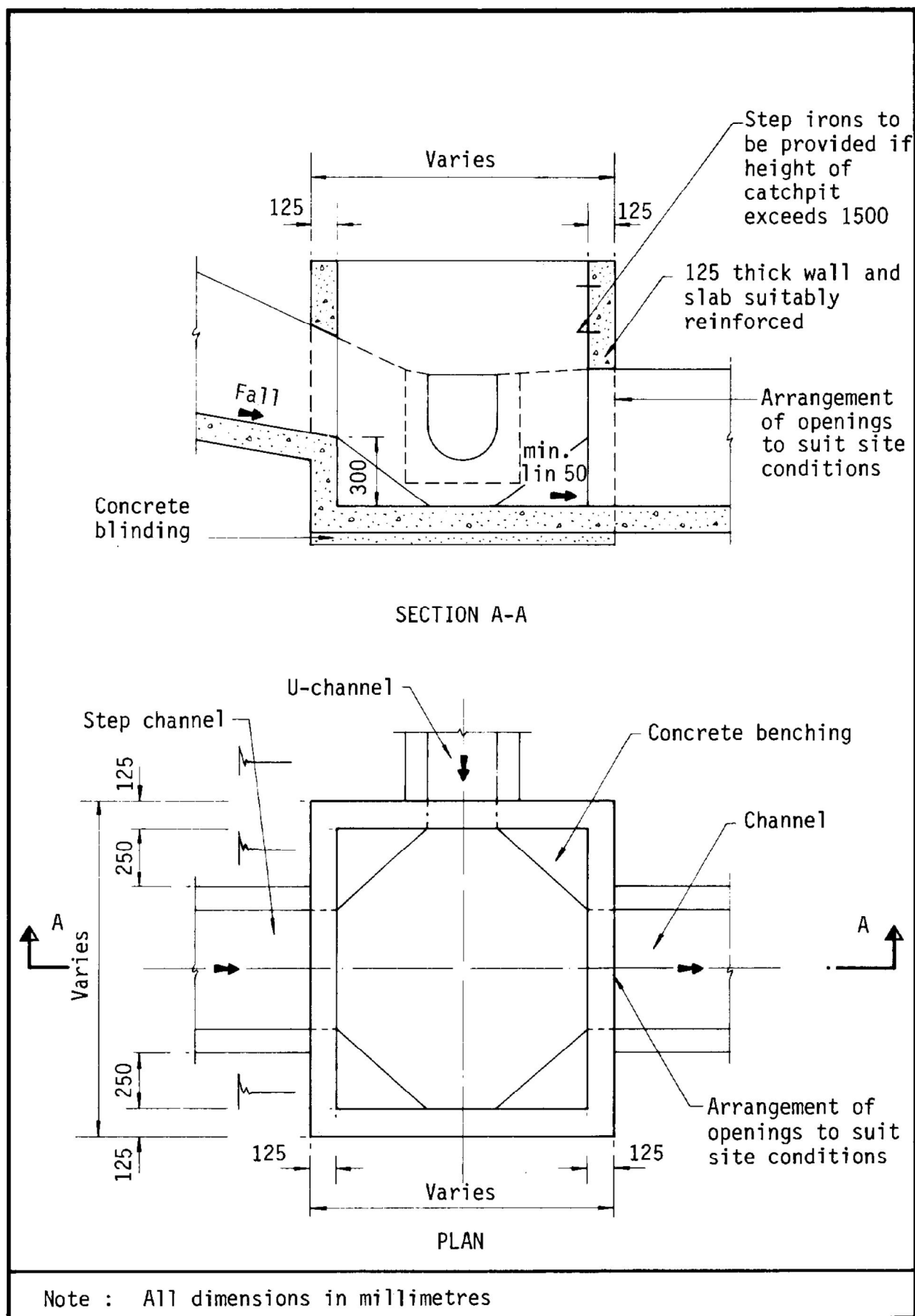
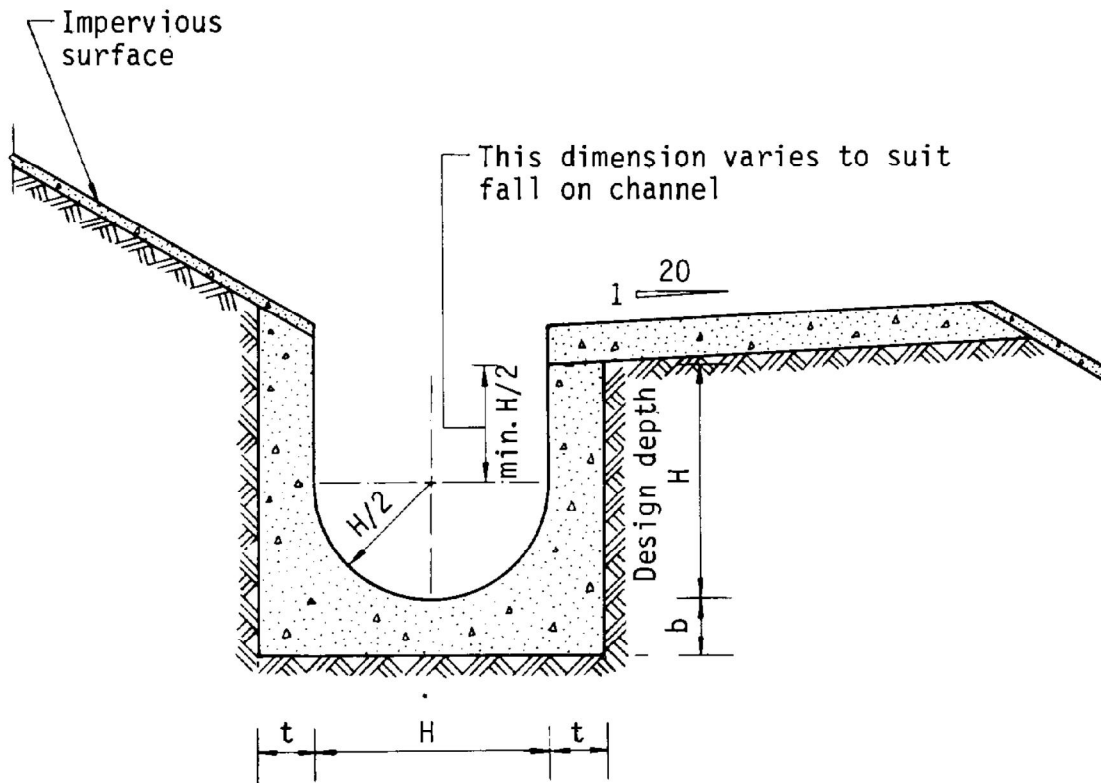


Figure 8.10 - Typical Details of Catchpits



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

Appendix A

As-built Drainage Plan of A/YL-LFS/563

Appendix I
As-built drainage plan

Project 項目名稱:

Proposed Temporary Logistics Centre with Ancillary Office & Parking of Vehicle for a Period of 3 Years at Lots 1709(Part), 1710(Part), 1711(Part), 1712(Part), 1713, 1714(Part), 1715(Part), 1719(Part), 2276S.A, 2276S.B ss.2 (Part), 2276 S.A RP (Part), 2277S.A, 2277S.B (Part), 2278, 2279S.A, 2279S.B (Part), 2280(Part), 2285(Part), 2286, 2287, 2288, 2289, 2291, 2292, 2294, 2295, 2296(Part), 2302(Part), 2305(Part), 2306, 2310, 2311, 2312, 2313, 2314S.A, 2314RP(Part), 2317(Part), 2318(Part), 2320(Part), 2321, 2322, 2323, 2324, 2325S.A, 2325S.B, 2325RP, 2326(Part), 2327(Part), 2328, 2329, 2344S.A(Part), 2344S.B (Part), 2348, 2349(Part), 2351(Part), 2352(Part), 2353(Part) in D.D.129 & Adjoining Government Land, Lau Fau Shan, Yuen Long, N.T.

Drawing No. 圖號:

Figure 5

Drawing Title 圖目:

As-built Drainage Plan

Remarks 備註:

□ Existing catchpit

Scale 比例:

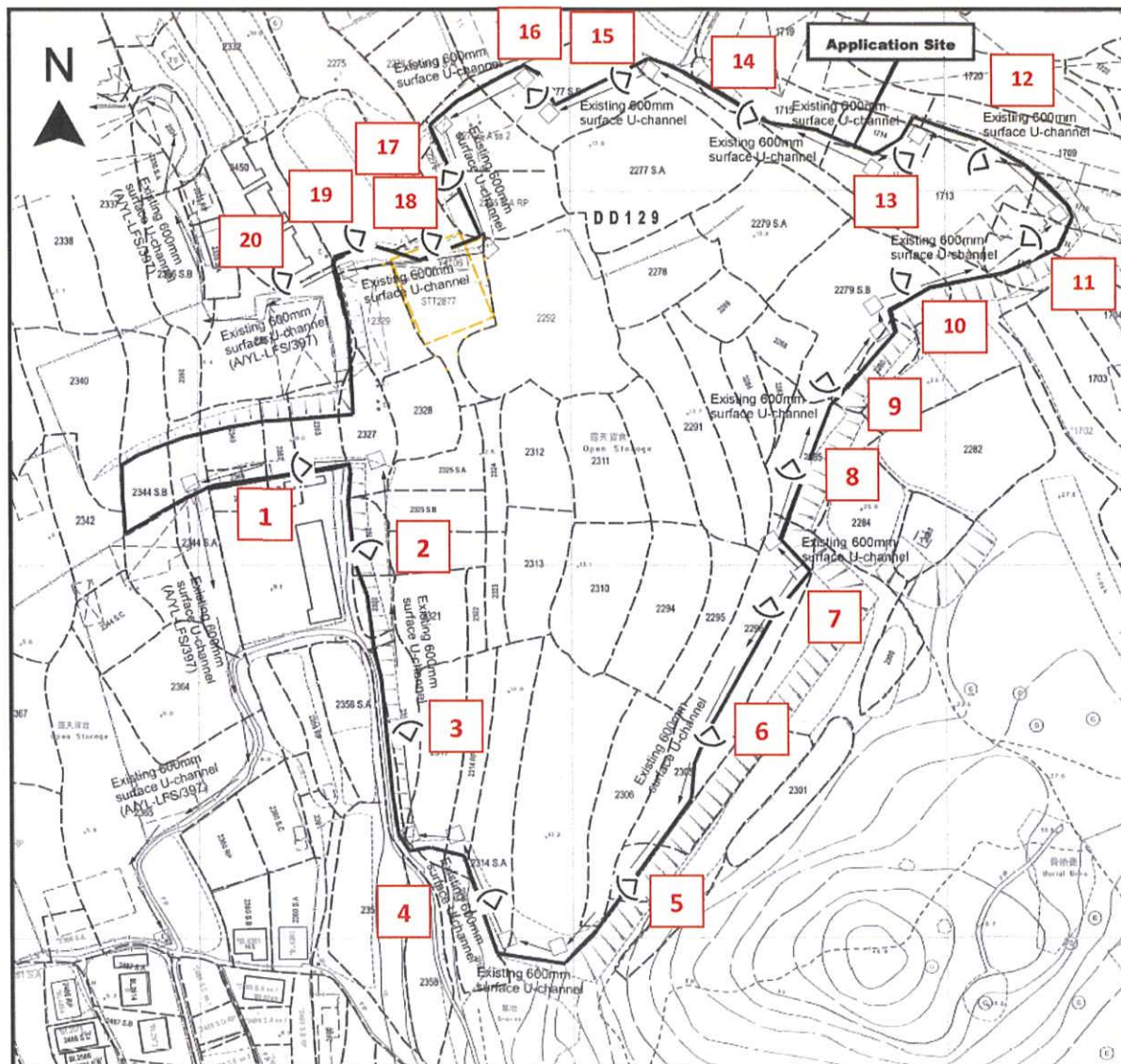
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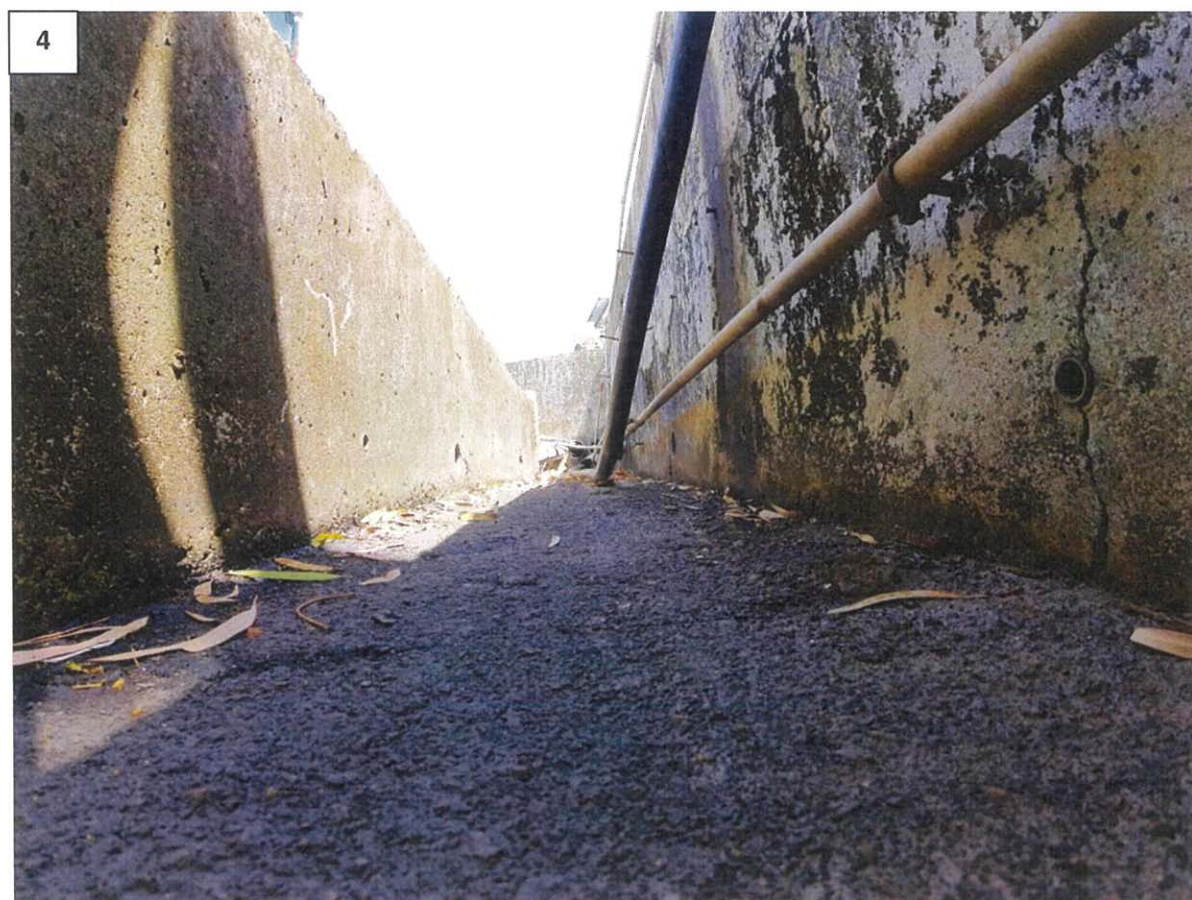
Appendix II

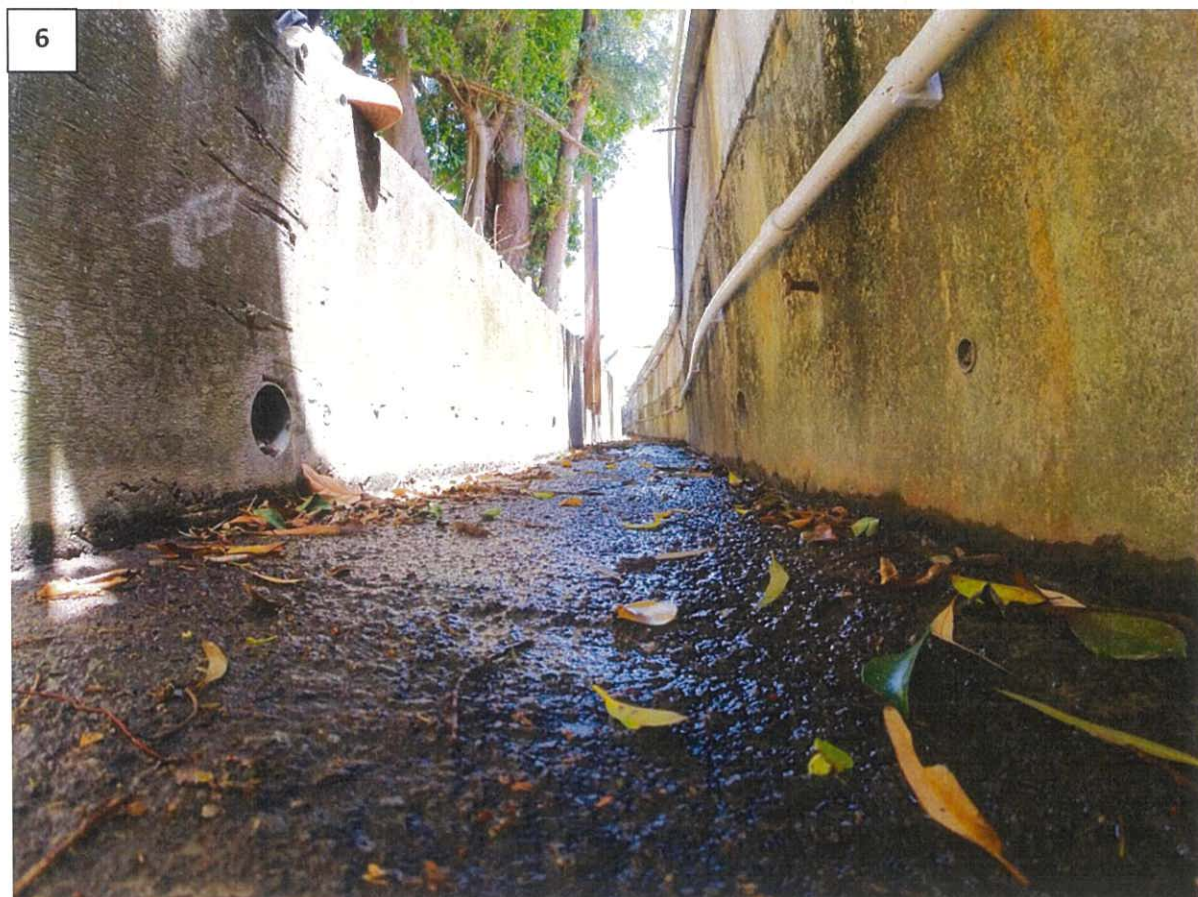
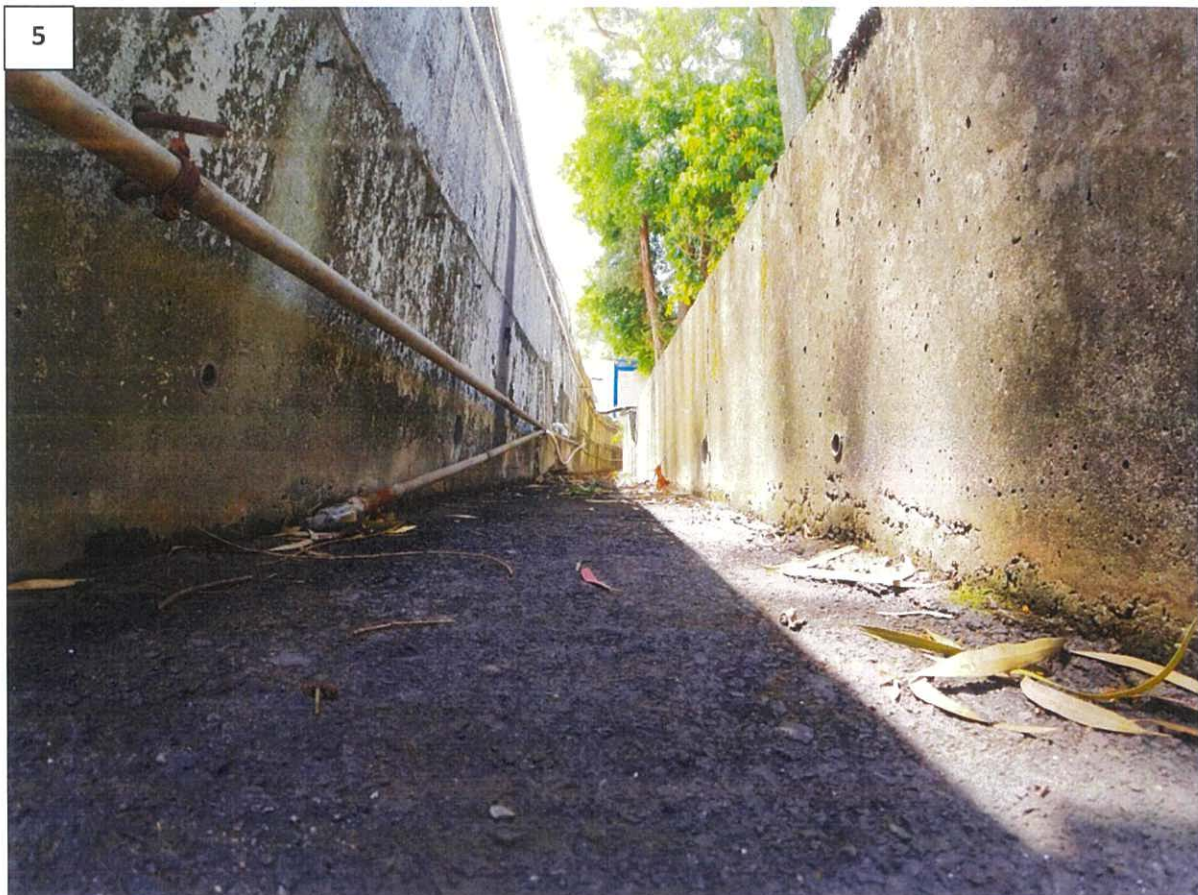
Photographic records of the existing drainage facilities

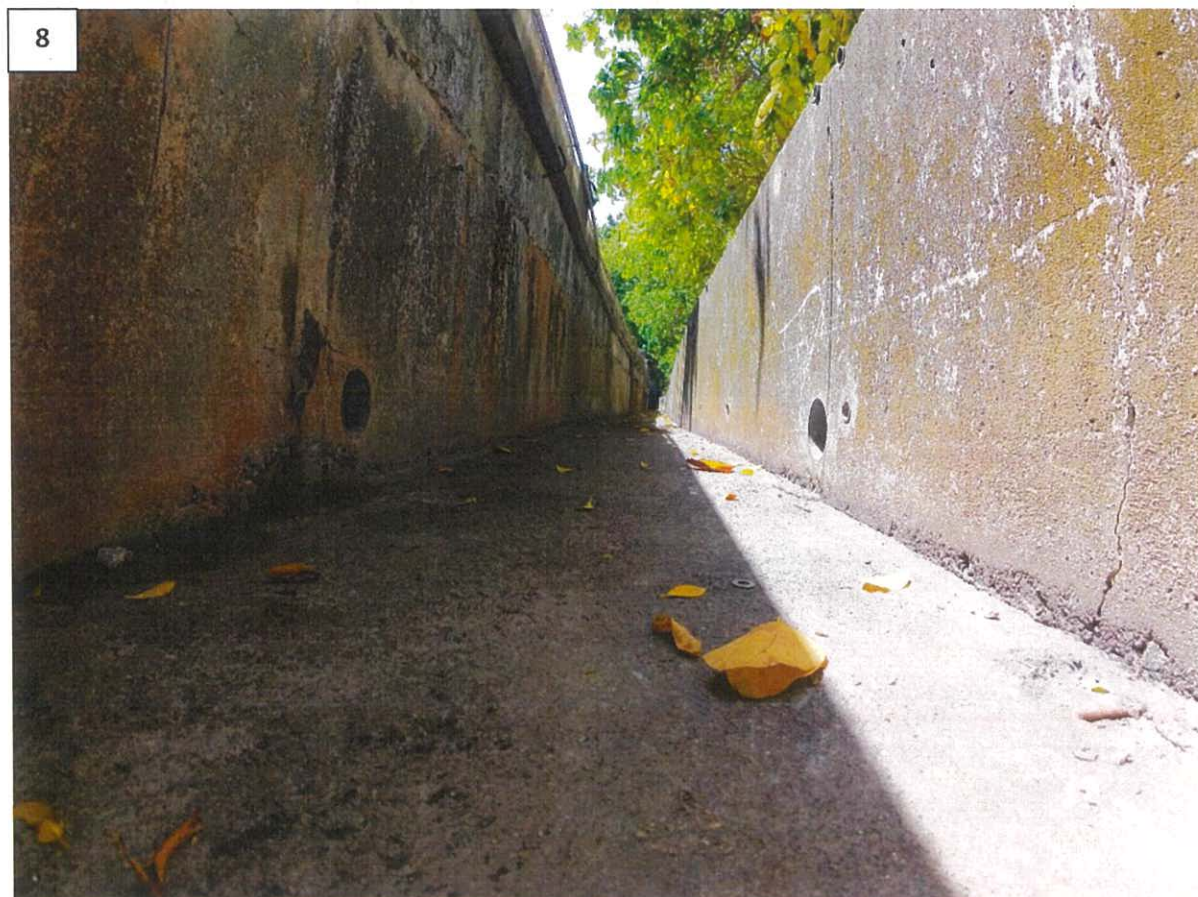
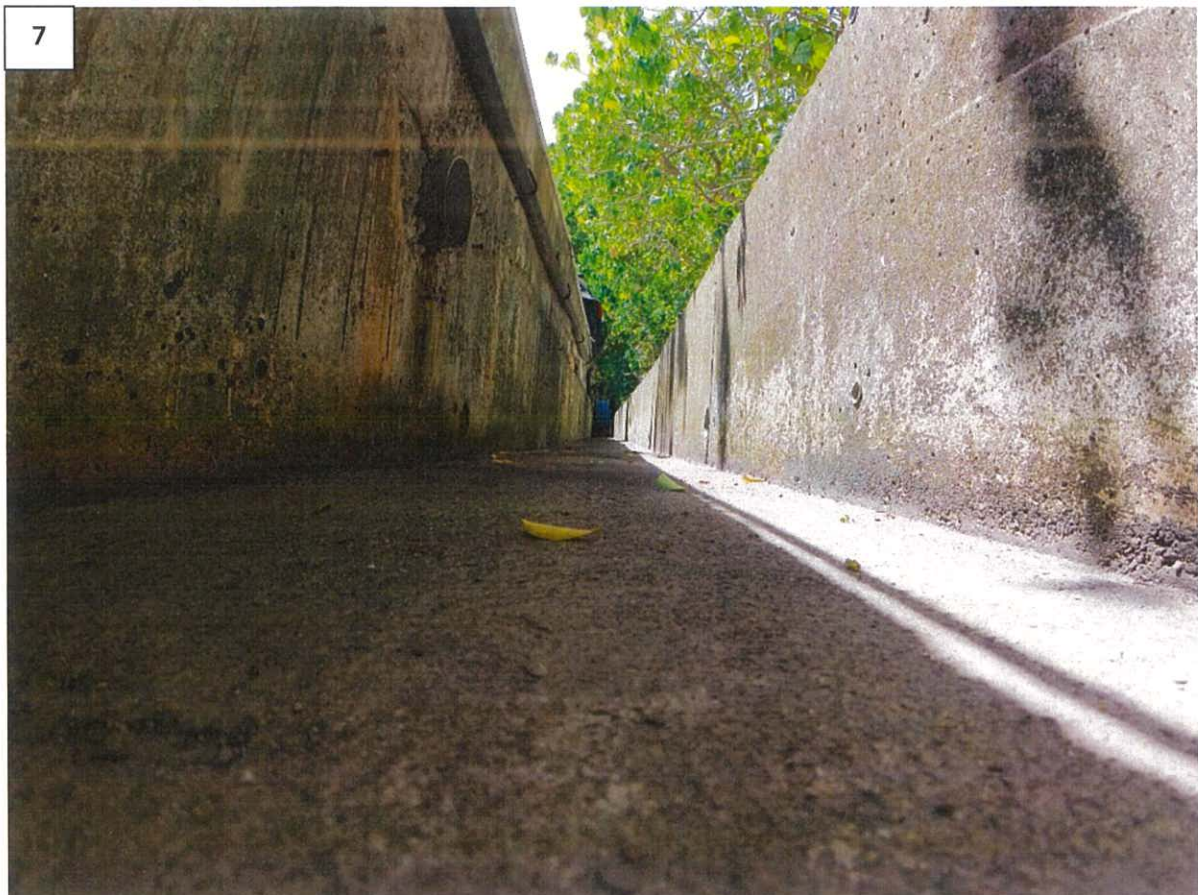
Appendix II - Photographic records of the existing drainage facilities







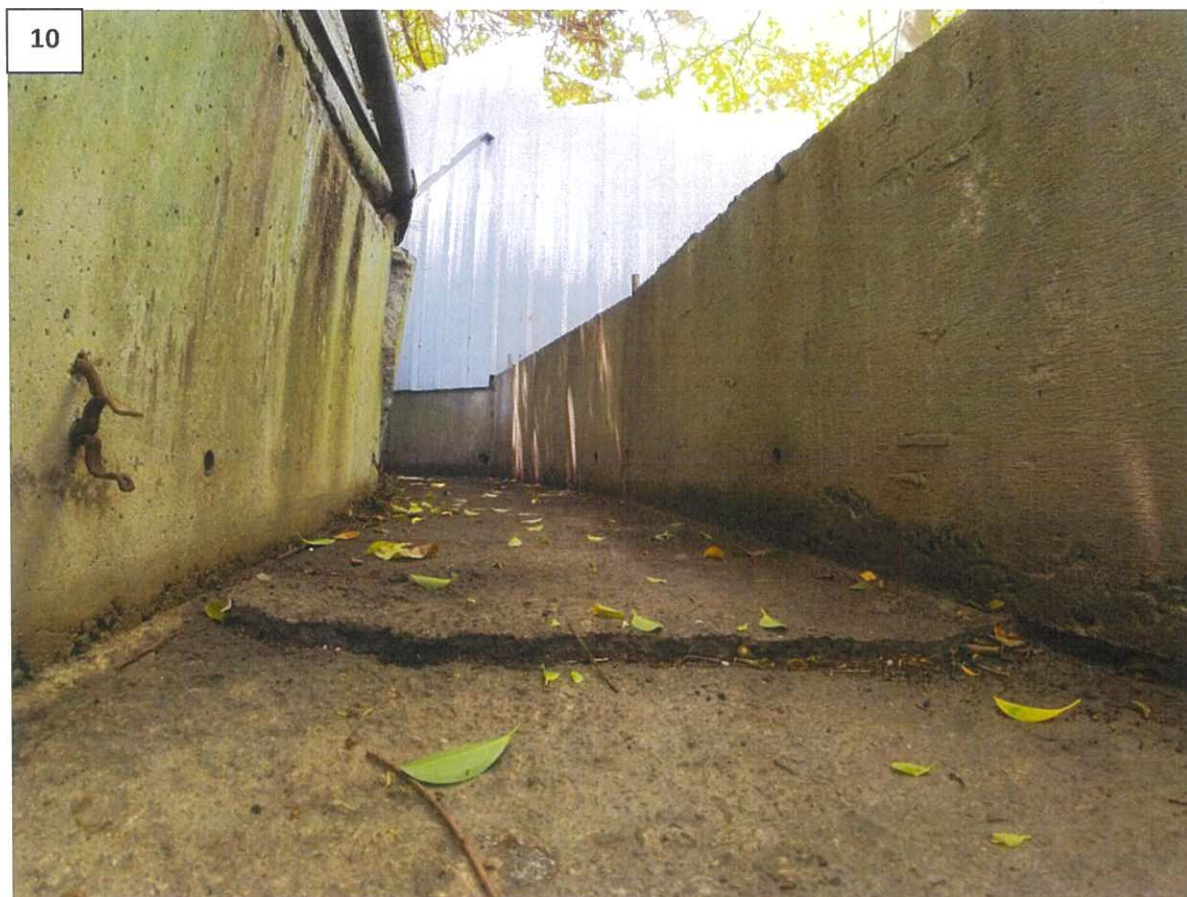




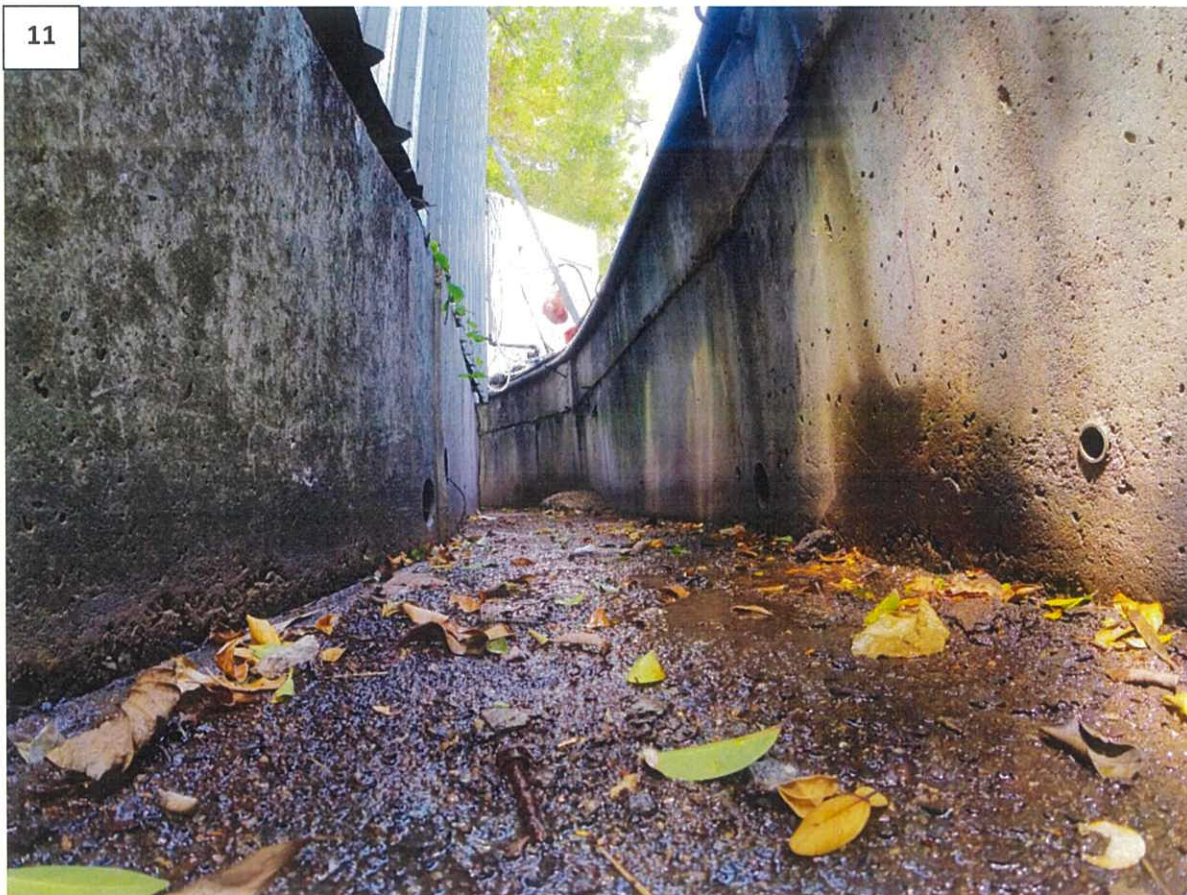
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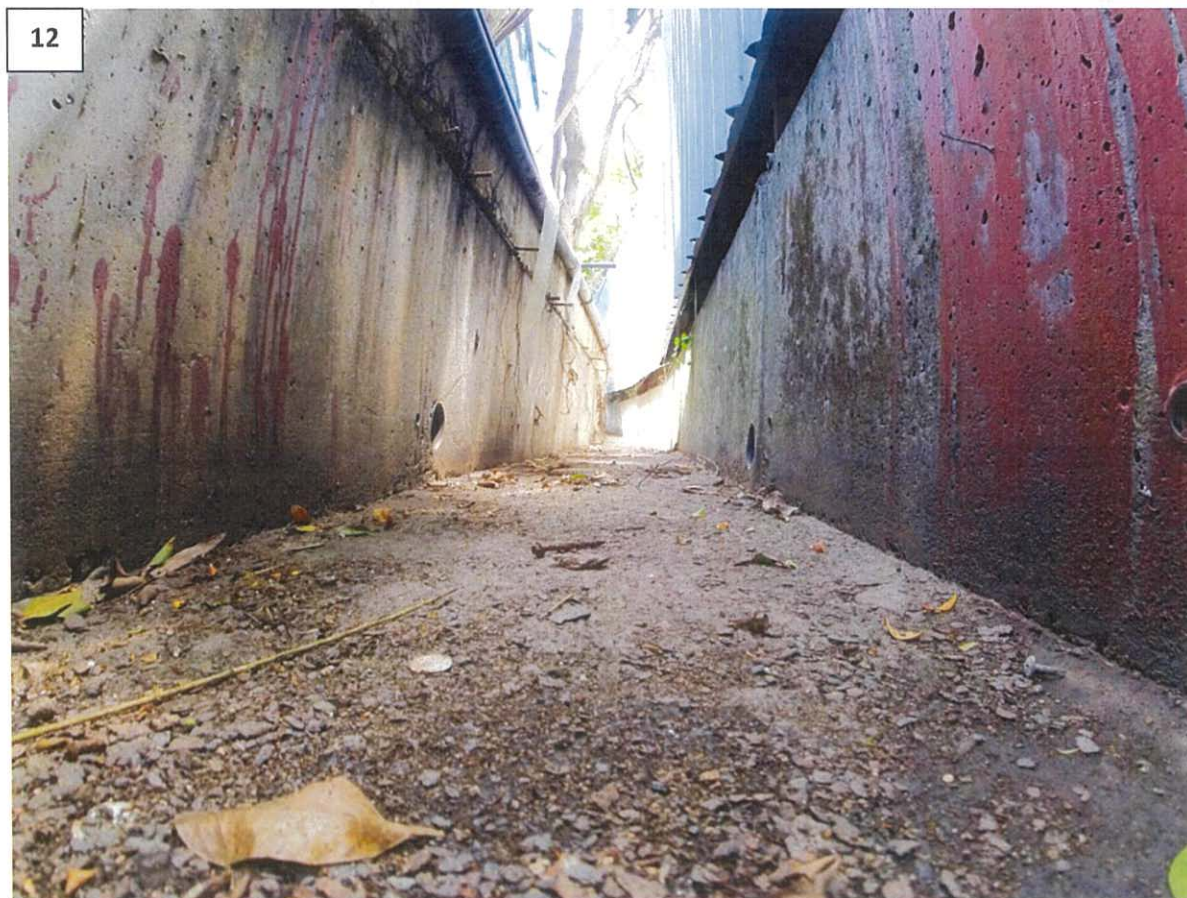
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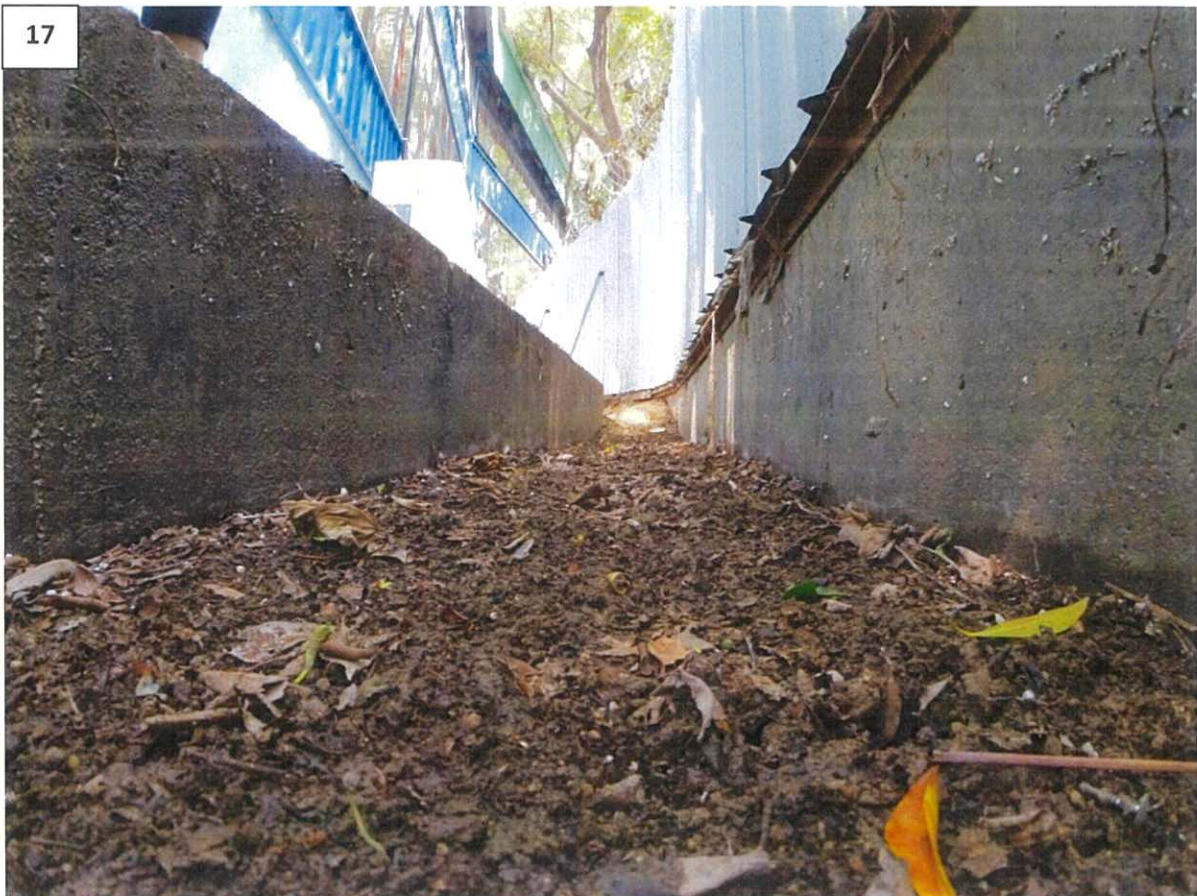
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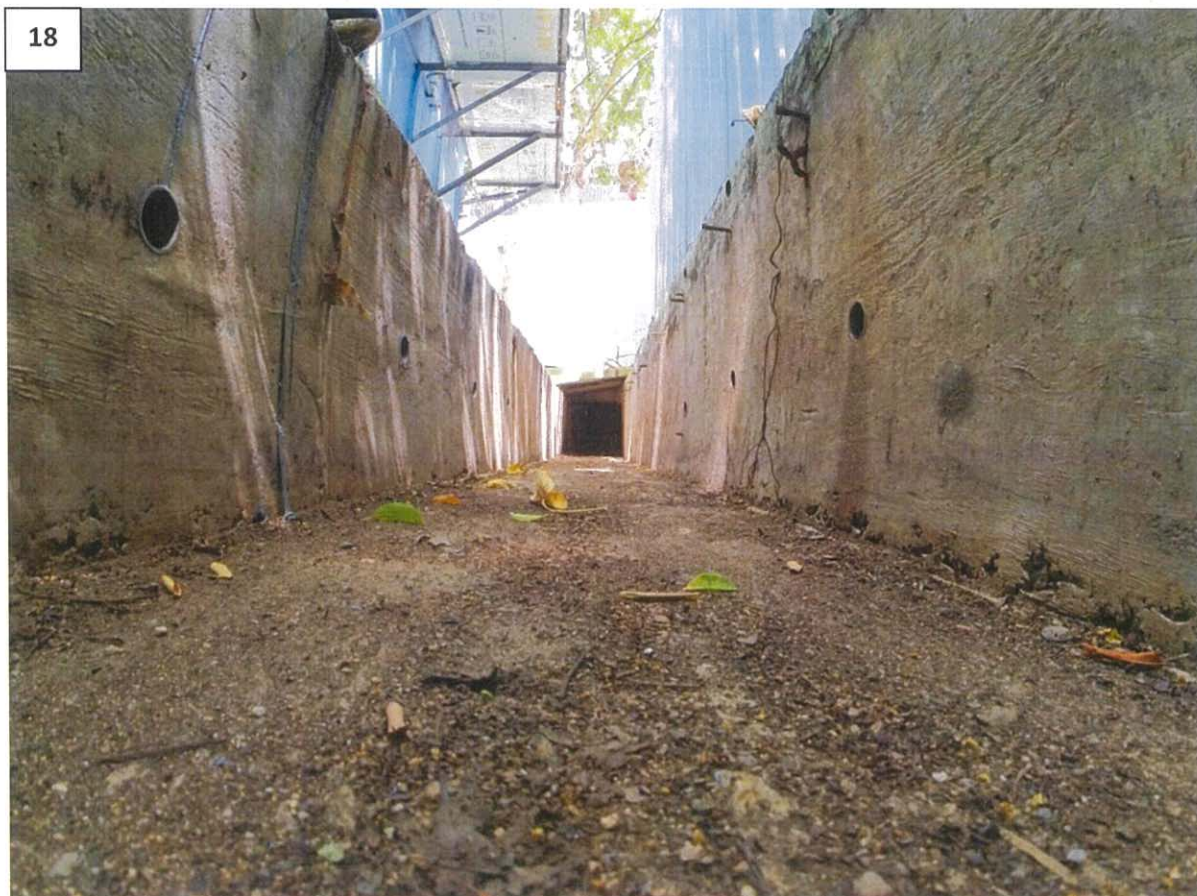
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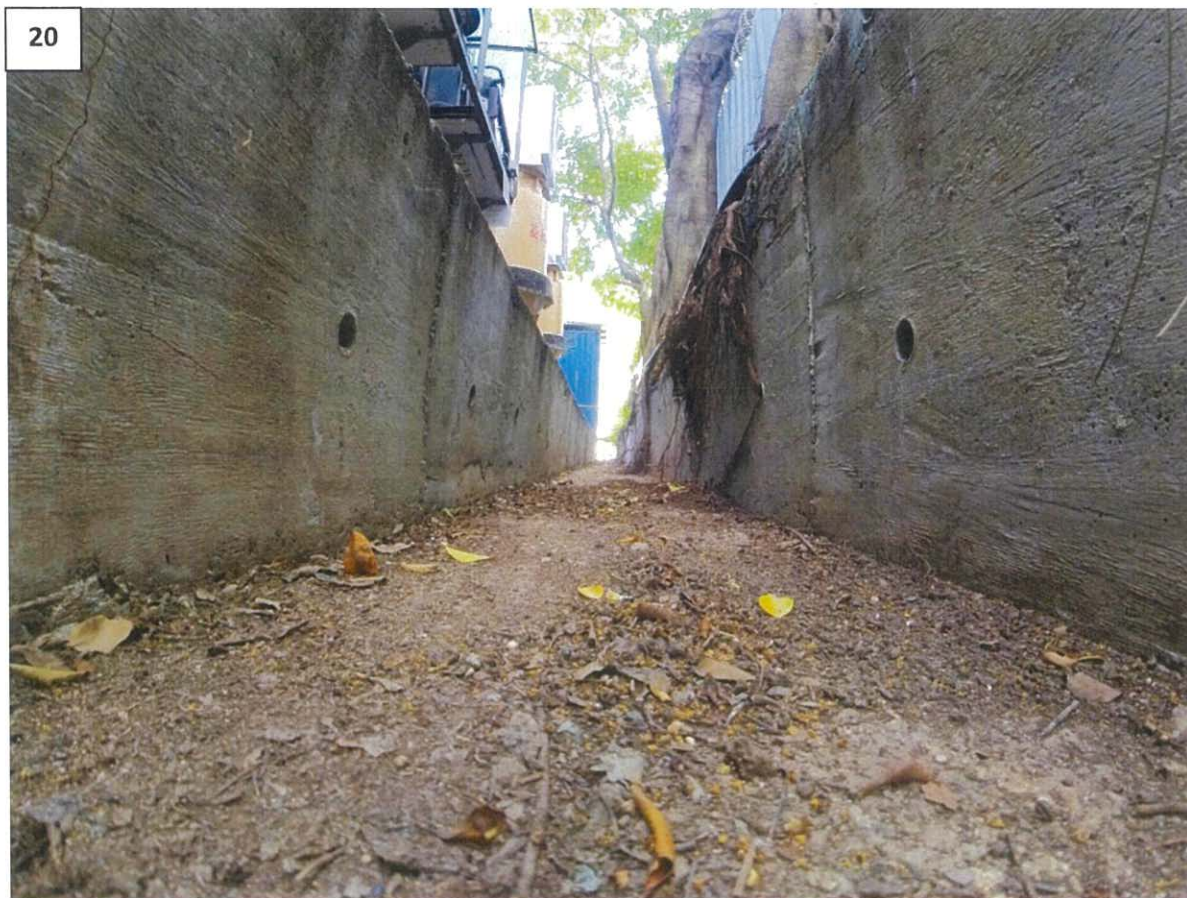
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Ultimate Discharge Path

