Comments and Responses for Drainage Department (Lot 764RP DD 120)

I refer to DSD referenced memo dated 3 January 2025 regarding the captioned submission and reply comments:	
Section A-A; please advise the clearance provided between a) the proposed catchpit with sand trap and the existing 1800mm underground pipe and b) the proposed 200mm pipe and the existing 1800mm underground pipe for review. Please also review the alignment of the proposed 300mm u-channel to minimize the conflict with the said existing 1800mm pipe	Please refer to the attached drawing
I. Please clearly indicate the existing and proposed ground levels of the captioned site with respect to the adjacent areas in cross section for review.	Noted and no any ground levels to be proposed
II. Please justify the size of the 200mm underground pipe with hydraulic assessment while it conveys the flow of two 300 UC upstream.	Please refer to the attached hydraulic calculation
III. Precast concrete is generally used for stormwater pipe, please review.	Noted and see attached drawing
IV. Please confirm if any walls or hoarding are / to be erected or laid along the site boundary. If affirmative, adequate opening should be provided to intercept the existing overland flow passing through the site and please provide its details for comments.	There are no walls or hoarding to be erected along the site boundary. At the same time, there is no water source passing through the site boundary, and no need to provide an opening for water to pass through.
V. The development should neither obstruct overland flow nor adversely affected existing natural streams, village drains, ditches and the adjacent areas, etc.	Noted and based on the actual site conditions, this development will not affect the existing channels or adjacent areas.
VI. The applicant should resolve any conflict / disagreement with relevant lot owner(s) and seek permission from DLO/YL for laying new drains / channels and/or modifying/upgrading existing ones in other private lots or on Government Land, where required, outside the application site(s)	Noted
VII. The applicant should submit form HBP1 to this Division of DSD for application of technical audit for any proposed connection to DSD's drainage facilities.	Noted

利安設計工程有限公司
LEON Design Engineering Limited

Stormwater Drainage Design

For

Temporary Shop and Services with Ancillary Office

at Lot No. 764 RP in D.D. 120

in Ma Tin Road in Yuen Long, N.T.

Report No.: **LD/L764 RP/DS02**
Date: **19/1/2025**

Project :	Temporary Shop and Services with Ancillary Office at Lot 764RP	Date	File No: DS02
	in DD120 in Ma Tin Road in Yuen Long, N.T.	19/1/2025	Sheet No.
Title:	**Stormwater Drainage Proposal**		1 of 3

Background

Due to the proposed development at Lot 764 RP DD 120, surface runoff will be connected to the drainage system at the site by U-channels and catchpits. The runoff will be finally discharged to an existing drainage system.
This report is to briefly assess the impact to the existing drainage system arising from the development.

Scope of Work

Determine the existing drainage condition & impact arising from the development and verify the adequacy of the downstream drainage to cater for the additional runoff in the proposed condition.

Assessment Cristeria and Methodology

1. Determine the catchment area of the existing drainage channel adjacent to Lot 764 RP DD 120 to be affected.
2. Determine the runoff directions and land uses to assign suitable runoff coefficients to the catchments.
3. Determine the rainfall intensity for the catchments.
4. Determine the runoff by Rational Method as advised in the Stormwater Drainage Manual (SDM).
5. Determine the capacity of the affected channel.

1. Determine the Catchment for the Downstream Drainage

Refer to Appendix-A for the proposed catchment plan.
As shown, the catchment area of the development to be affected is 206 meter square.

2. Determine the Rainfall Intensity for the Catchment

2.1. Determine the Rainfall lntensity for the Catchment of the affected channel.
SDM
Catchment Area and Run-off (1 in 50-year)

Site Area, m^2 : **206**

Proposed Application Site is concrete paved, C = **0.95**
No Upstream Catchment
Proposed Development will be paved Area, C = **0.95**
Catchment is small, so Rational Method is appropriate.

Catchment	Area, A	t_c [1]	Intensity, i [2]	Runoff	Peak Runoff, Q_p [4]	
				Coefficient, C [3]	Base Case	Mid 21st Century [5]
	(m^2)	(min)	(mm/h)		(m^3/s)	
Paved 100%	206	5	239	0.95	0.01	0.01

Remarks:

[1] The Application Site is flat. Time of concentration (t_d) is assumed to be 5 min.

[2] $$i = \frac{a}{(t_d + b)^c}$$ where i = extreme mean intensity in mm/hr
t_d = duration in minutes ($t_d \leq 240$)
a, b and c = storm constants

According to Table 3a - Storm Constants for Different Return Periods of **HKO Headquarters** of SDM:

Corrigendum No. 1/2022	Return Period	50 Years
	a	451.3
	b	2.46
	c	0.337

Corrigendum No. 1/2024	Return Period	50 Years
	a	505.5
	b	3.29
	c	0.355

[3] Value of C is made reference to Section 7.5.2 of DSD's SDM.

[4] $Q_p = 0.278C\ i\ A$ where Q_p = peak runoff in m^3/s
C = runoff coeficient (dimensionless)
i = rainfall intensity in mm/hr
A = catchment area in km^2

[5] The rainfall increase due to climate change for mid 21st century of 11.1% is adopted based on (k) of SDM - Corrigendum No. 1/2022 and 1/2024.

time of concentration (t_d) = natural flow time (t_0) + channel flow time (t_f)

SDM
Cl.7.5.2

$$t_0 = 0.14465 \frac{L}{H^{0.2} A^{0.1}}$$

For the affected channel section:
distance (L) = 3.6 m
average slope (H) = (change in height)/L
H = (5.22 - 5.15) / 3.6
H = 1.94%
area of catchment(A)= 206 m^2
t_0 = 0.6 min
t_f=time of flow (which is assumed to be zero for conservative checking
t_f = 0 min
t_d = 0.6 min

SDM
Cl. 4.3.2

$$i = \frac{a}{(t_d + b)^c}$$

where i is the rainfall intensity

Corrigendum No. 1/2022

Return period T (years)	2	5	10	20	50	100	200	500	1000	
i =	229	266	283	296	310	315	321	328	332	mm/hr

Corrigendum No. 1/2024

Return period	2	5	10	20	50	100	200	500	1000	
i =	235	292	288	301	312	319	324	329	332	mm/hr

3. Determine Existing Flow to the affected channel

SDM
Cl. 7.5.2

$$Q = 0.278i \sum_{j=1}^{m} CjAj$$

where m is the number of subcatchments
refer to LD/L764RP/D01(B) for the existing catchment plan

Assumptions

SDM
Cl. 7.5.2

The whole catchment can be described by three types of catchment characteristics:
1. Grassland & paved.
2. Grassland catchment shall take a runoff coefficient of 0.35 as taken from the higher end of 0.35 "Steep Grassland"· C=0.25.
3. Paved catchement shall take a runoff coefficient of 0.95 as taken from the higher end of "Concrete".

3.1. Summary of existing flow in the affected section of the channel in different return period

For the section of the channel to be affected

Return Period	Existing Flow (m^3/s)
2	0.01
10	0.02
50	0.02
200	0.02

4. Proposed Diversion for the affected section of channel

$$Q = A\frac{R^{1/6}}{n}\sqrt{RS}f$$

Use the Manning Equation to Determine the Drainage Capacity

Refer to Drawing No. LD/L764RP/D01(B), the alignment of proposed channel is indicated to suit for the proposed development. The proposed diversion comprise of 200mm precast concrete pipe. The pipe size and the capacity check are as follows.

Assumptions:

4.1 Roughless coefficient of proposed precast concrete pipe, n is 0.014 (Concrete-lined channels)
4.2 End of the proposed precast concrete pipe will connect with existing manhole gradient would be 1 in 100

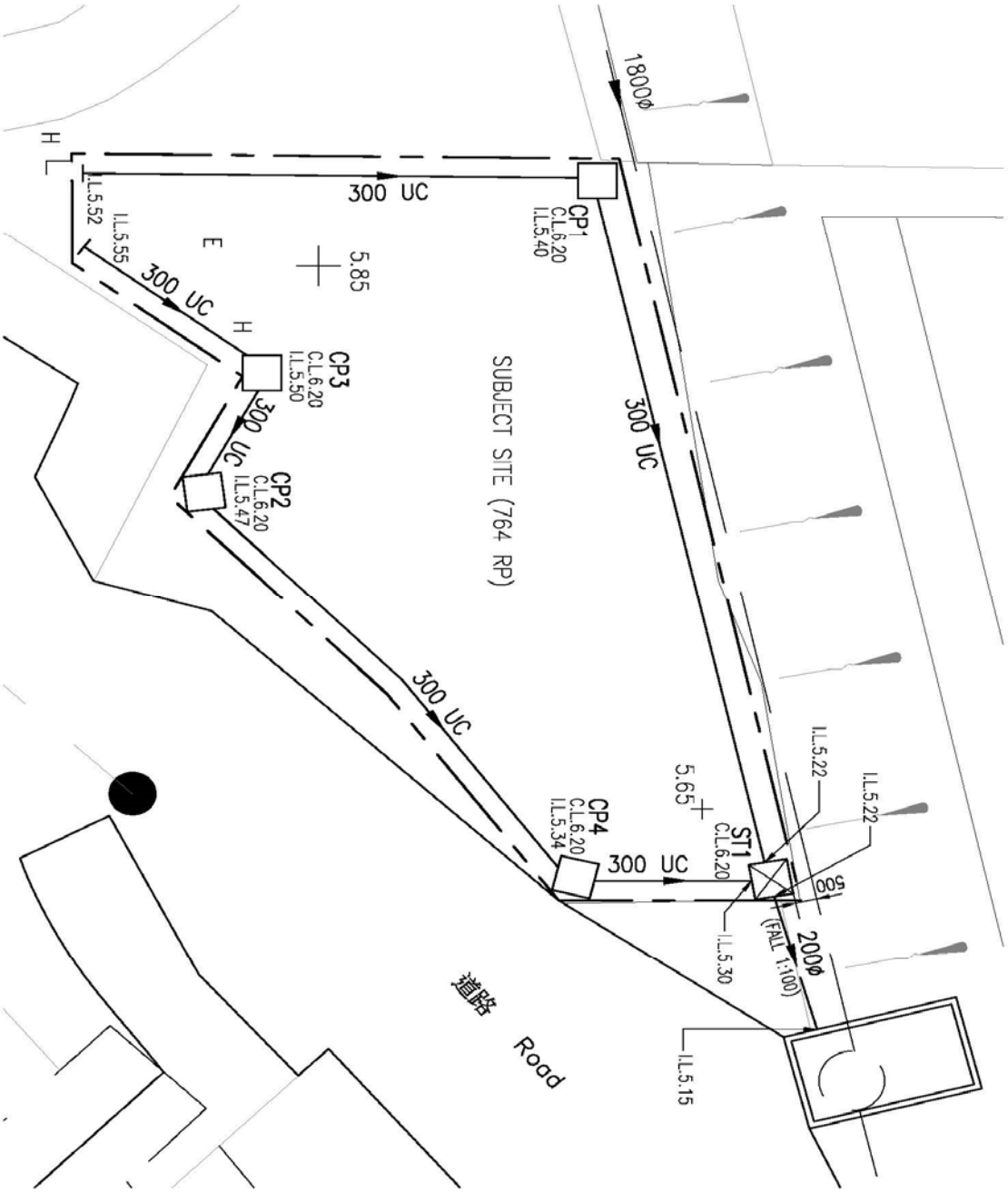
Full-bore capacity of the proposed precast concrete pipe section

Pipe Width	=	200	mm	=	0.2 m
Pipe Depth	=	200	mm	=	0.2 m
Hydraulic Gradient, S_f	=	0.01			
Gradient 1 in	=	100			
A	=	0.04	m^2		
P	=	0.6	m		
R	=	0.0667	m		
Full bore capacity	=	0.047	m^3/s		

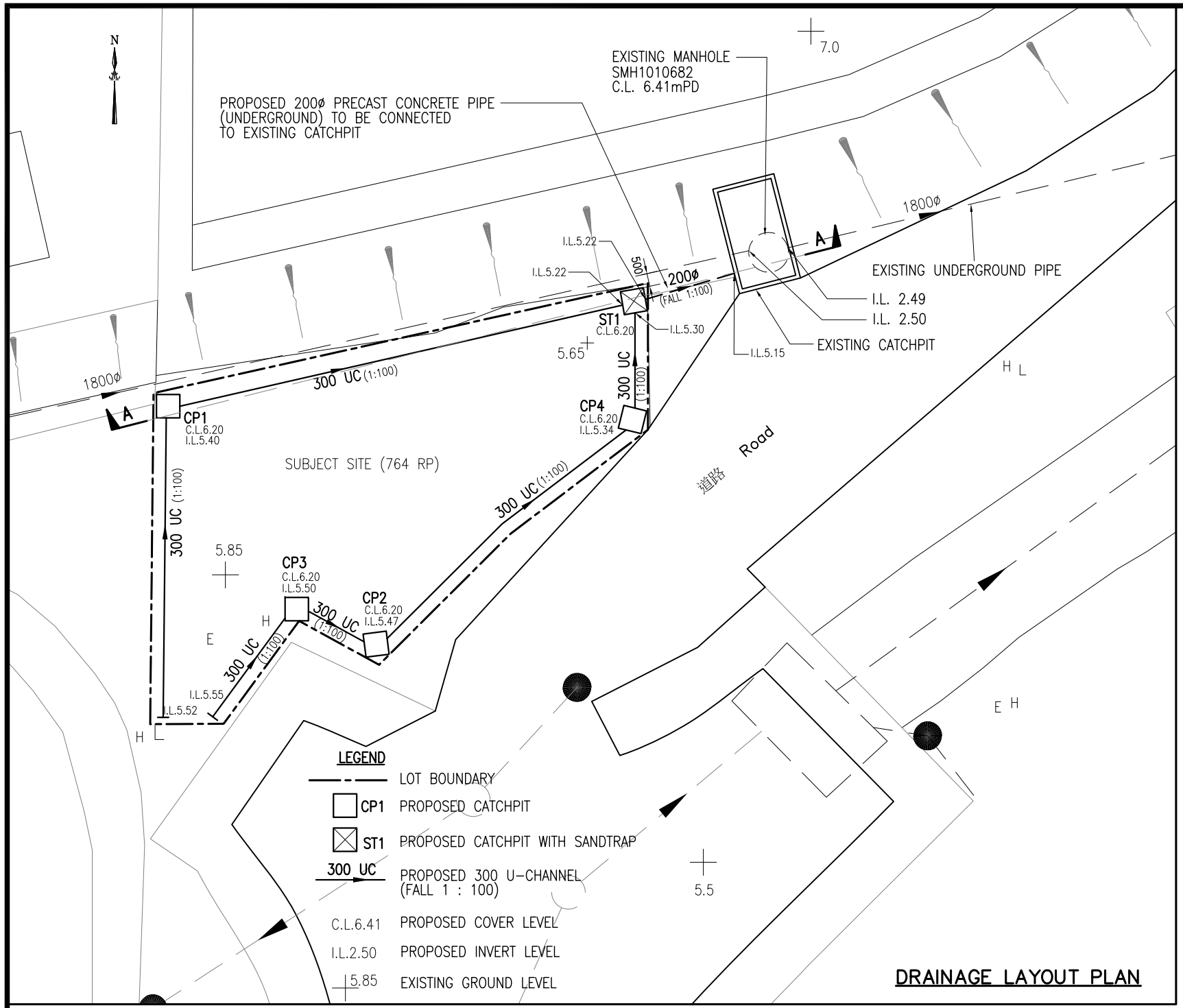
The capacity (0.047 m^3/s) of the proposed pipe is larger than the highest capacity of Return Period 1 in 50 (0.03 m^3/s). Therefore, used 200mm precast concrete pipe is adequate for catchment Area of A.

5. CONCLUSION

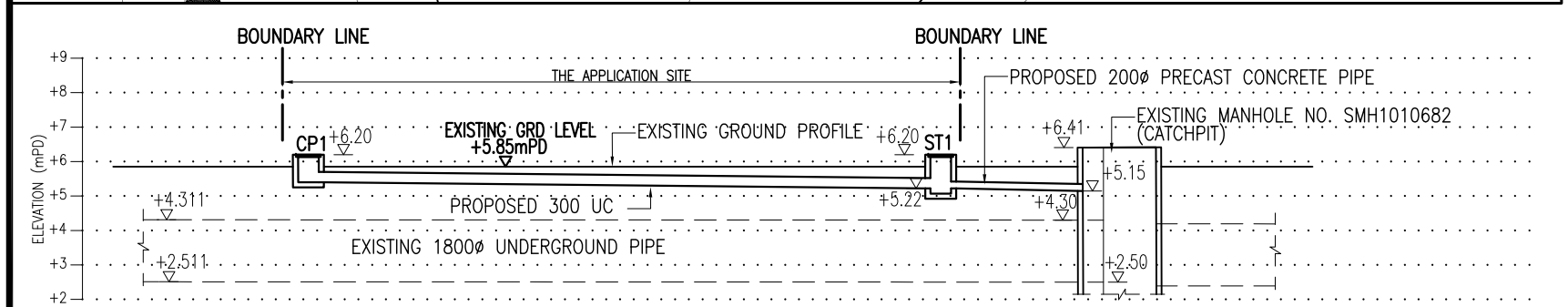
5.1 A Drainage Impact Assessment has been conducted to evaluate the potential drainage impact due to the proposed drainage system.
5.2 The Drainage Impact Assessment has demonstrated that subject to the implementation of the proposed drainage system would not cause adverse drainage impact or an increase in the flooding susceptibility of the adjacent areas.
5.3 It is concluded that the Proposed Development will not result in any adverse drainage impact to the existing drainage system.



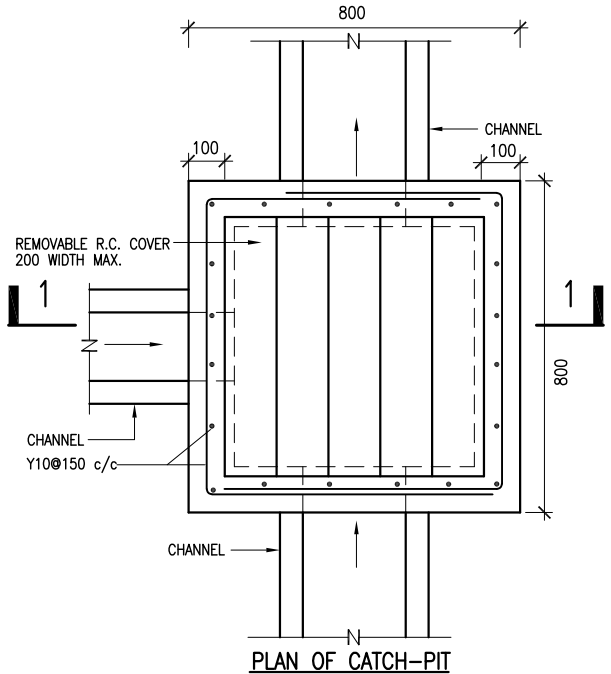
Plan of Catchment Areas
NTS



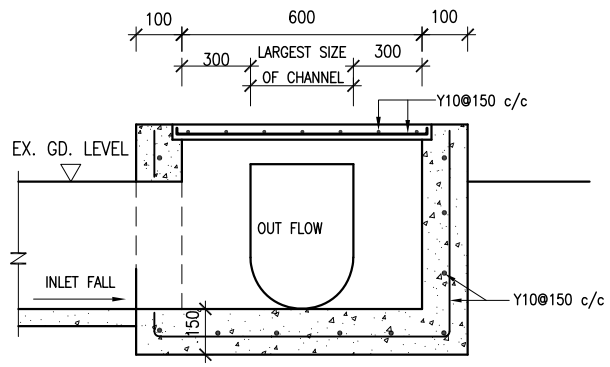
DRAINAGE LAYOUT PLAN



SECTION A – A
(1:200)



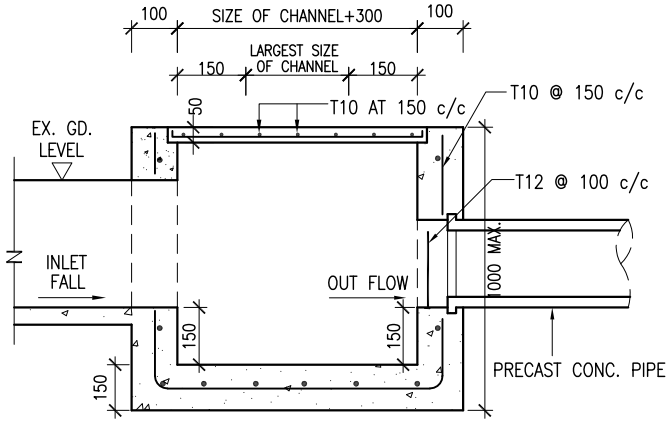
PLAN OF CATCH-PIT



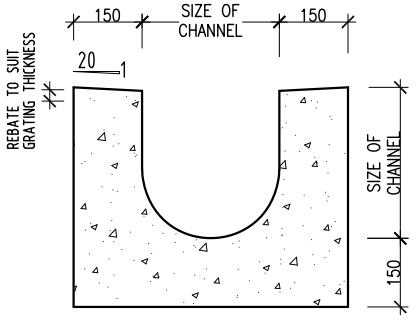
SECTION 1 – 1

DETAILS OF CATCH-PIT

N. T. S.

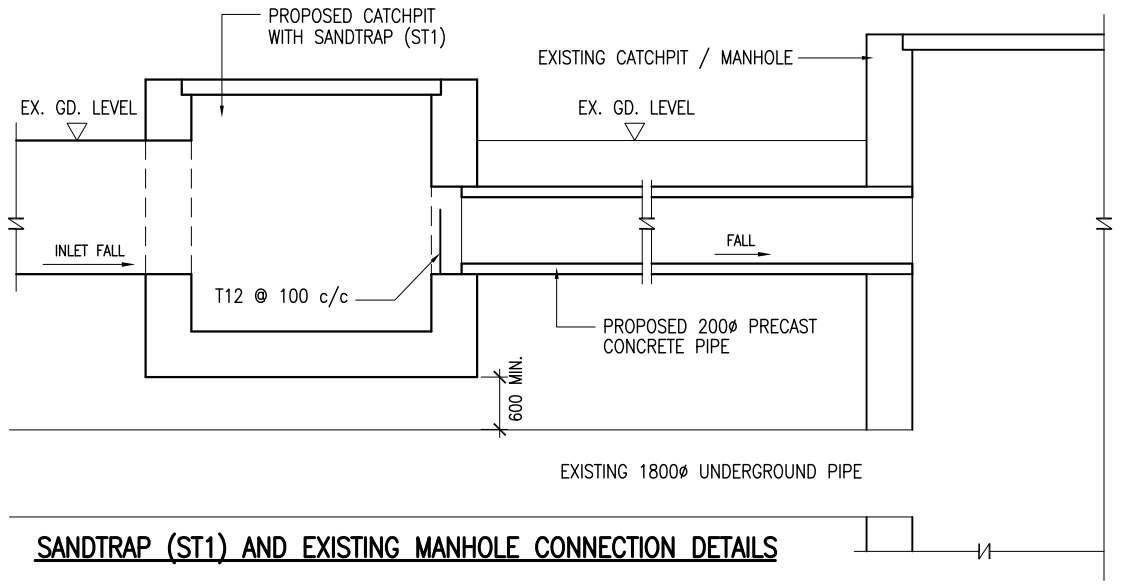


CATCHPIT WITH SANDTRAP (ST1)



U-CHANNEL

N. T. S.



SANDTRAP (ST1) AND EXISTING MANHOLE CONNECTION DETAILS

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PROJECT

LOT 764RP IN D.D. 120
MA TIN ROAD,YUEN LONG, N.T.

TITLE

PROPOSED DRAINAGE LAYOUT PLAN

DRAWN BY	CHECKED BY	DATE
PT	PT	January 2025
SCALE: 1 : 200(A3)	JOB NO.: LD/ –	
CAD / FILE: LD–L764RP–D01(B)	DWG NO.: LD/L764RP/D01(B)	