

Drainage Proposal

Project : Proposed Temporary Logistic Centre and Warehouse
with Ancillary Open Storage for Machinery,
Solar Panels and Facilities for a Period of 3 Years

1. Site particulars

1.1 The application site is located at Lot.751 S.B RP, 751 S.B ss.1 in D.D. 82 . The site area is approximately 6454 m². The site location is shown in Plan 1.

1.2 The existing site area of Lot.751 S.B RP is partly hard-paved with approximate levels of +9.10 mPD. For the Lot. 751 S.B ss.1,the land area will be filled to the same hard-paved level of Lot.751 S.B RP upon approval of application .

1.3 At the proposed discharge point, the existing watercourse is approximately 2 m wide.

1.4 The site can access from Ping Che Road. The surrounding area is predominantly rural, comprising temporary structures Village House and government facilities.

1.5 The 270 m² non-building area will not be filled at any time.

1.6 Part of the 108 m² non-building area will be filled. The existing streamcourse and a culvert will not be affected by the proposed land-filling works. Please refer to the Land filling Plan.

1.7 The applicant will ensure all the proposed structures would be placed at least 3m away from the top of the bank of the streamcourse.

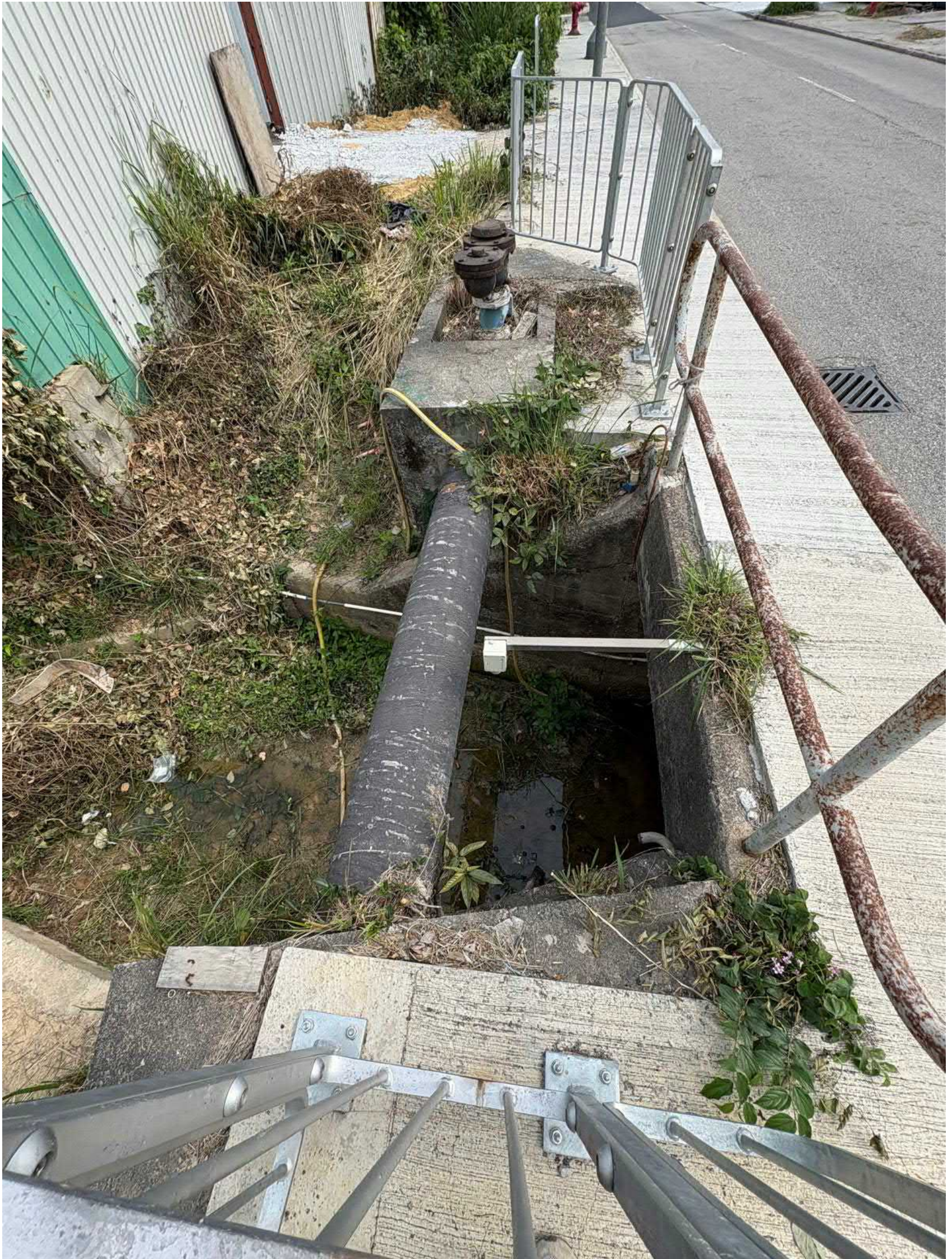




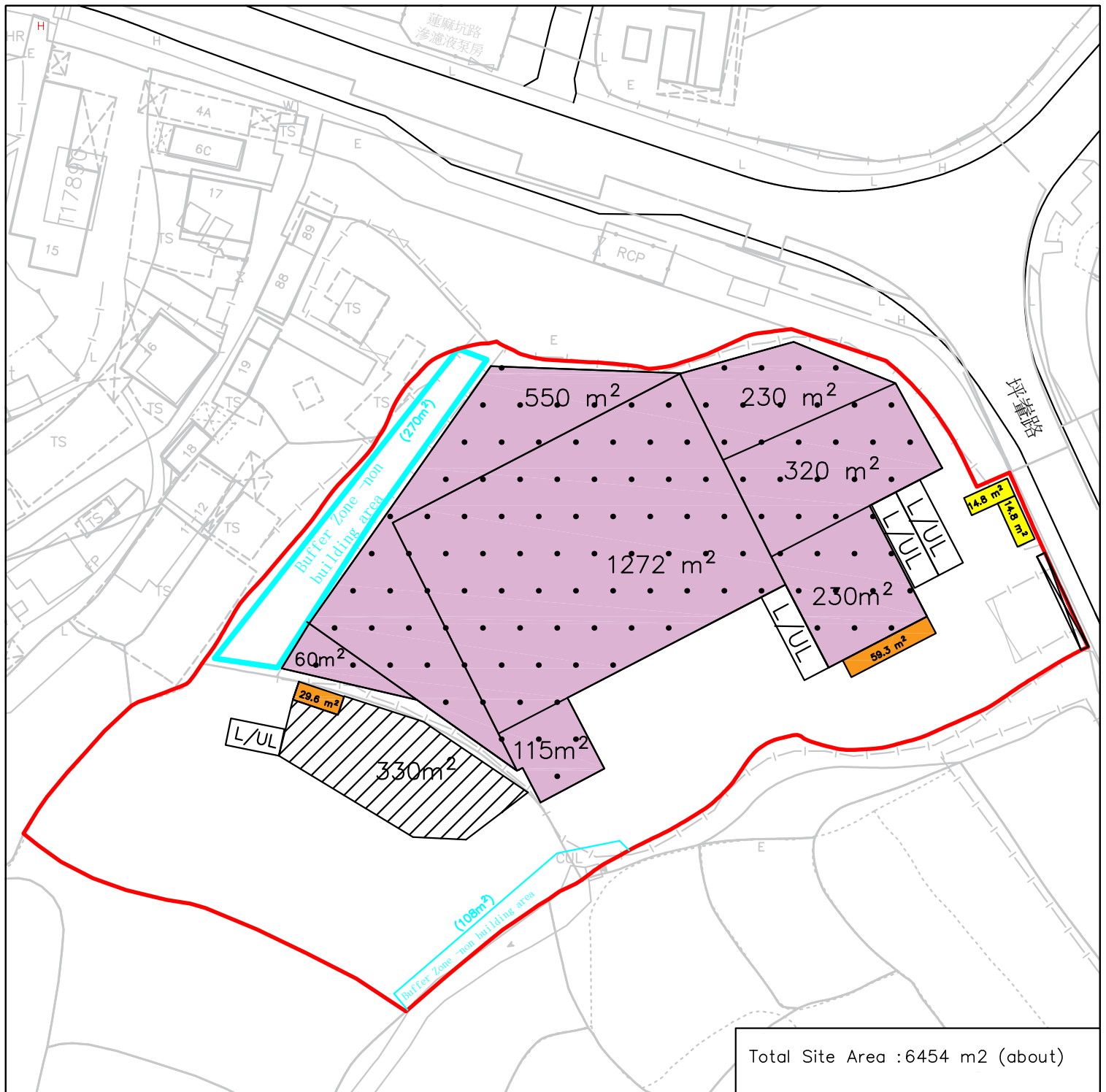


PHOTO 4





GROSS NEED TO BE REMOVED



Legend

- Office (88.90 m²)
- Toilet (29.6 m²)
- Enclosed Warehouse (2,777 m² ≈ 30000 sf)
- Site Boundary
- Buffer Zone Boundary
- Ingress/Egress (11 m wide)
- L/UL 16 tons trucks Loading /Unloading space 3.5m(w) x 12 m(L)
- L/UL Light Goods Vehicle Loading /Unloading space 3.5m(w) x 7 m(L)
- Open Storage Area (about 330 m²)
- Proposed Solar Panel Area

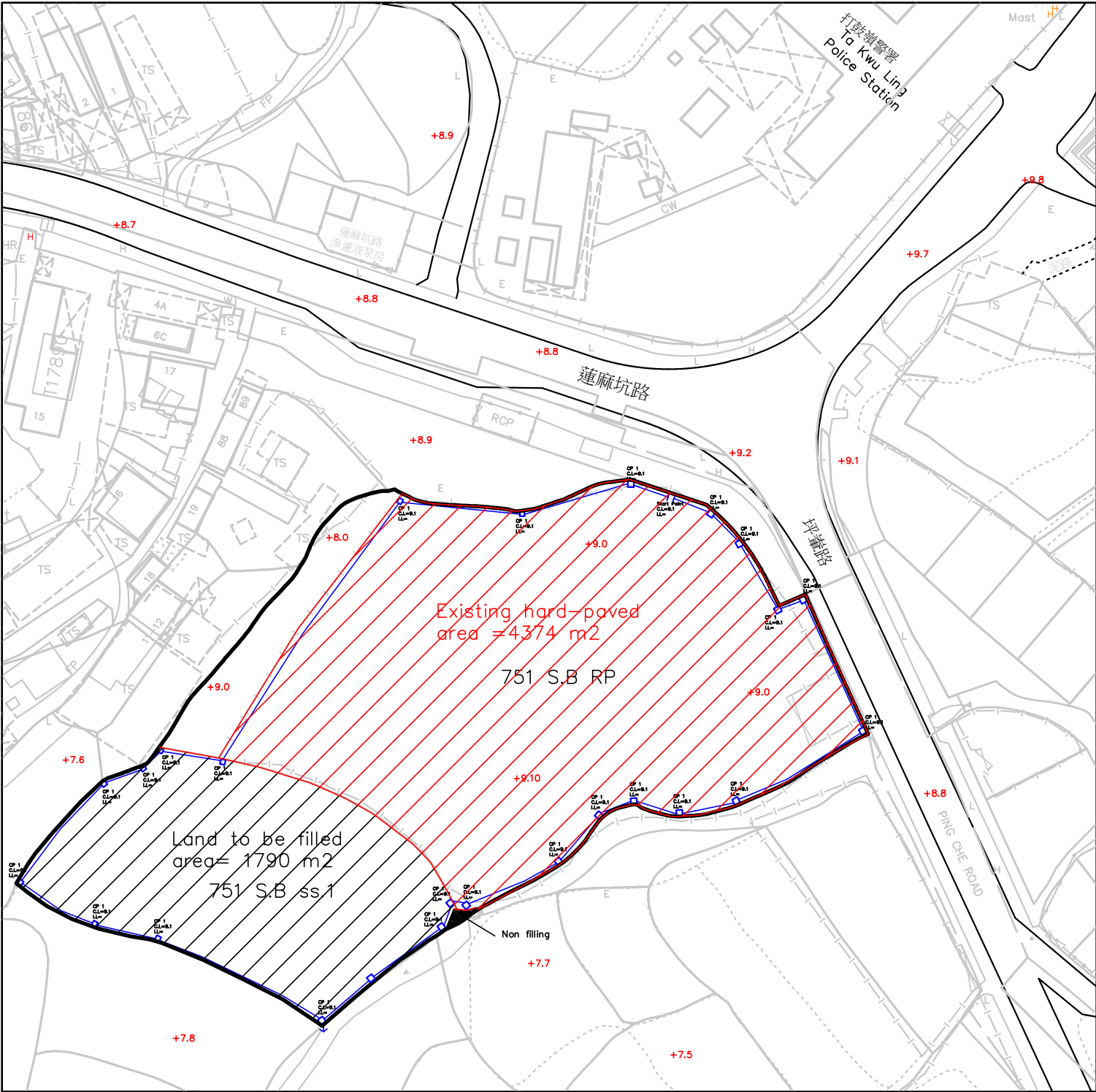
Scale

Not to Scale

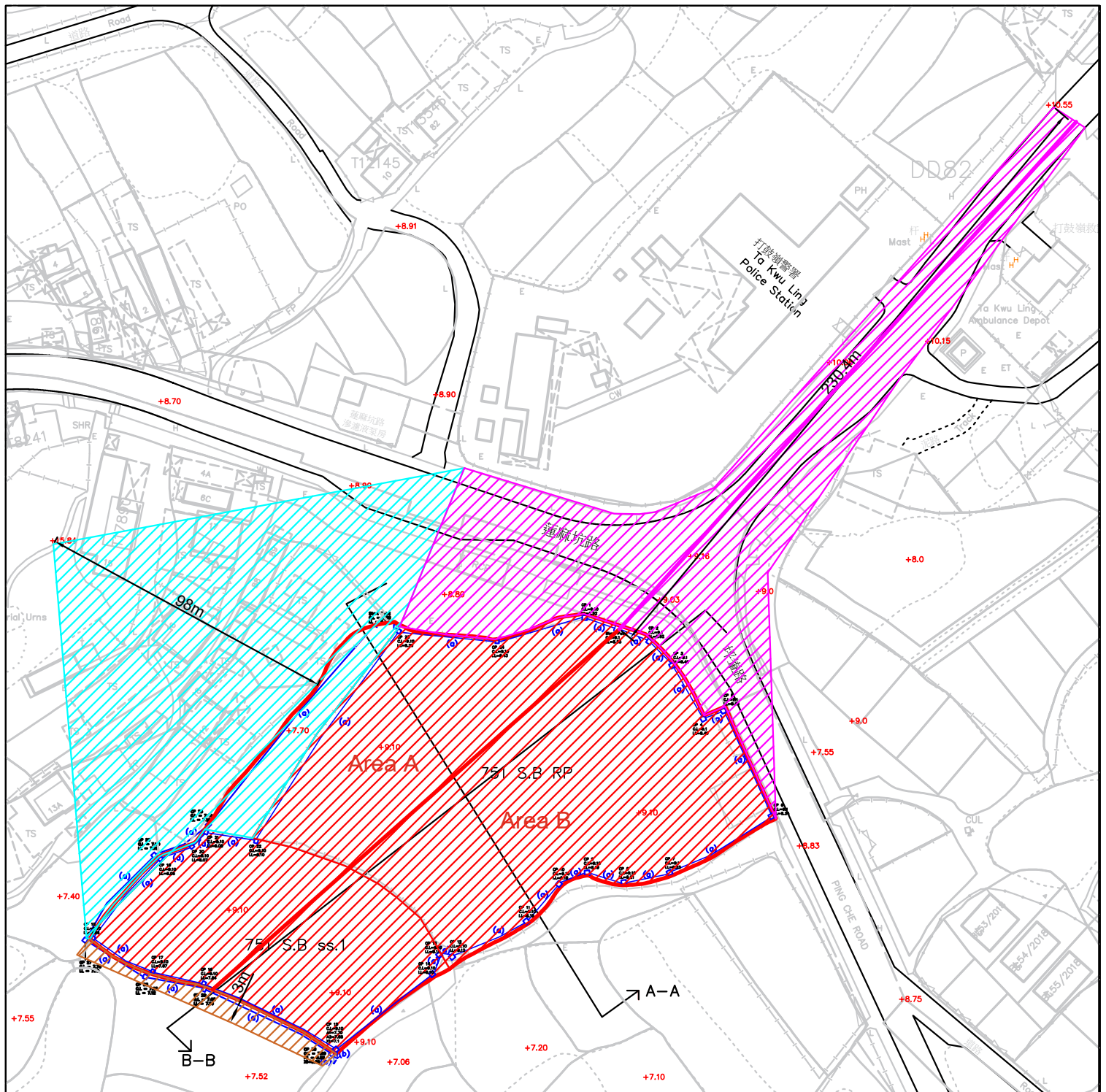
Layout Plan

Lot.751 S.B RP,.751 S.B ss.1
in D.D.82 Ta Kwu Ling

Plan 2



Legend		
Scale	Land Filling Plan	
Not to Scale		



Legend

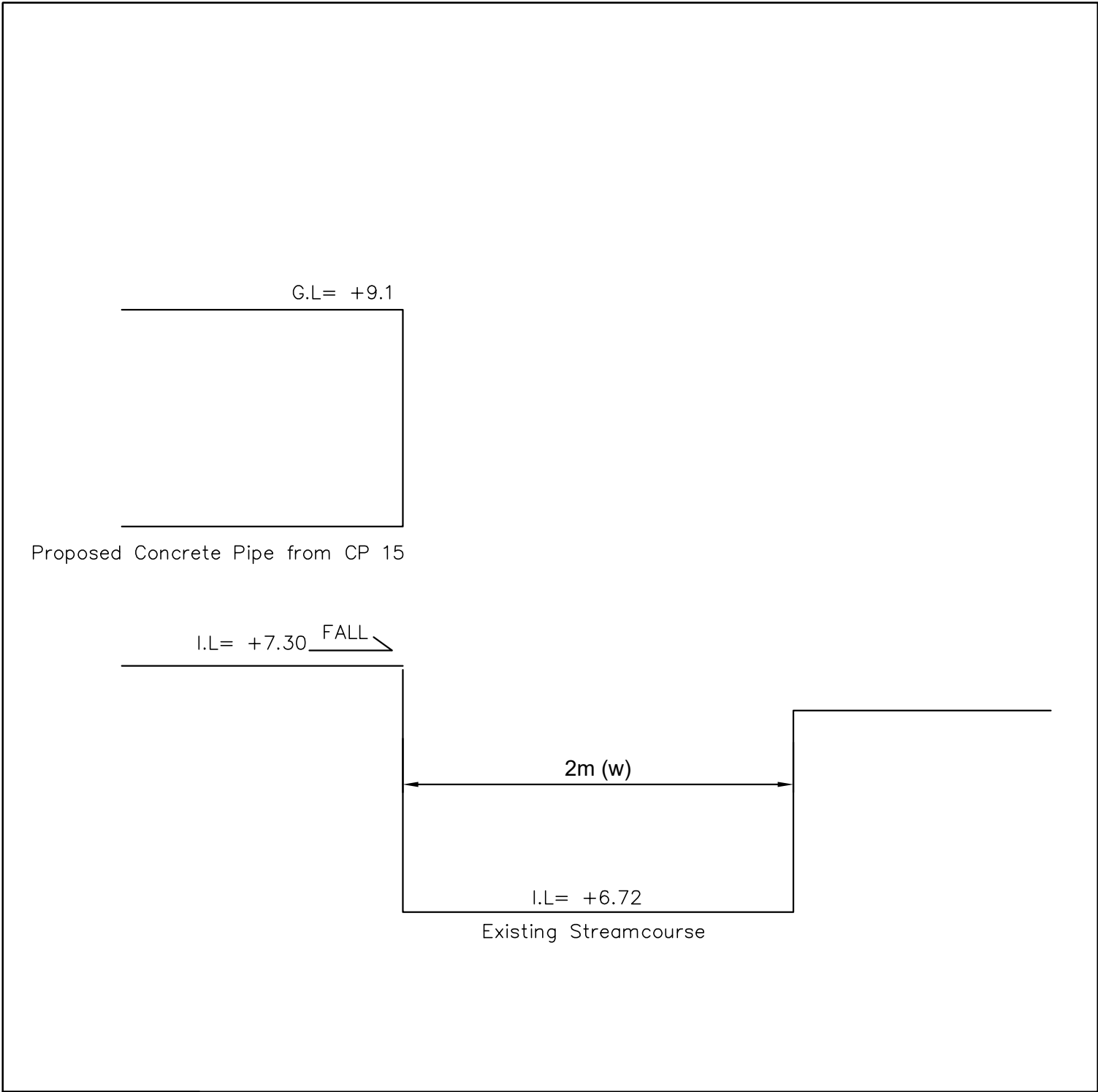
- Catchment Area A = 2574 m² (about)
- Catchment Area B = 3237 m² (about)
- Catchment Area 2 = 5034 m²(about)
- Catchment Area 3 = 3997 m² (about)
- Catchment Area 4 = 441 m² (about)

Scale

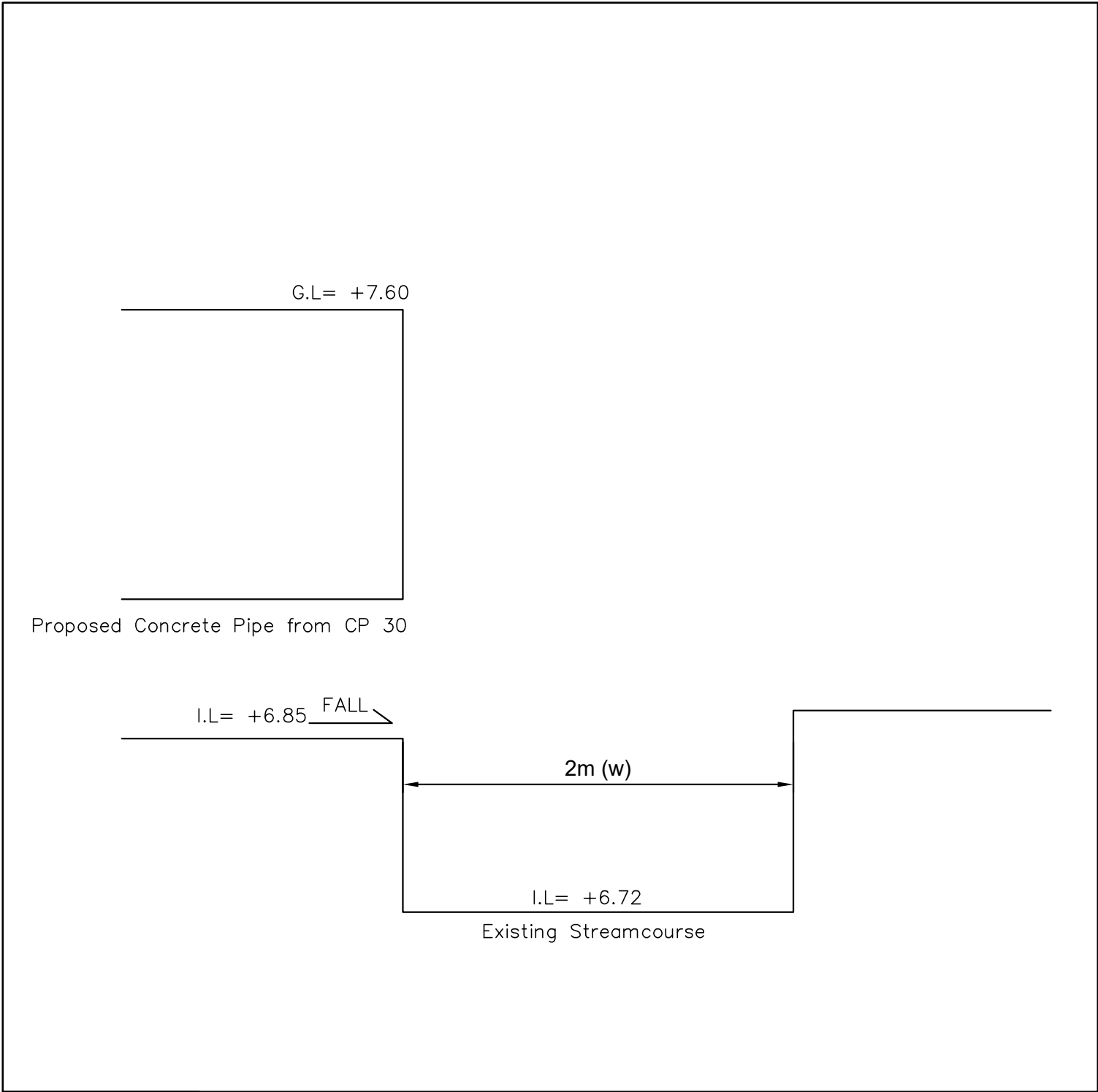
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Catchment Area Plan

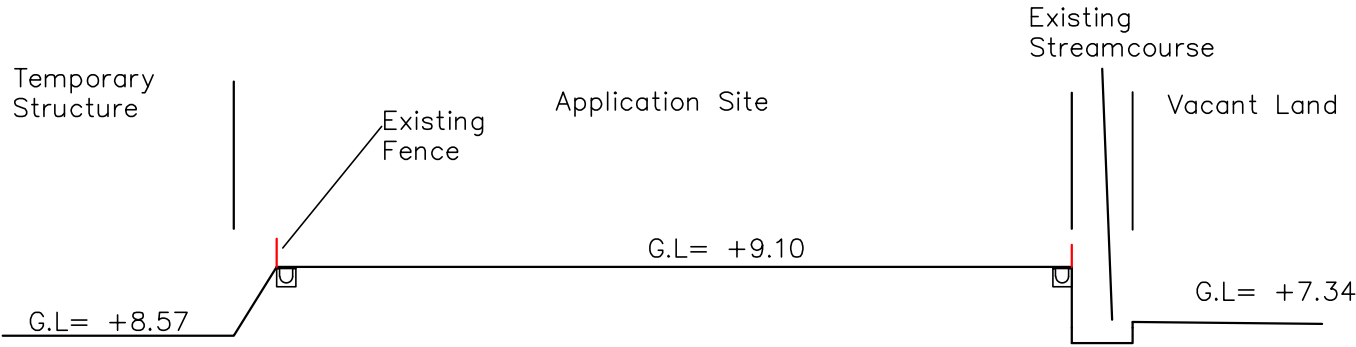
Lot.751 S.B RP, 751 S.B ss.1 in D.D.82
Ta Kwu Ling



Legend			
Scale Not to Scale	Connection Detail (CP 15 to Existing Streamcourse)		



Legend		
Scale	Connection Detail (CP 30 to Existing Streamcourse)	
Not to Scale		

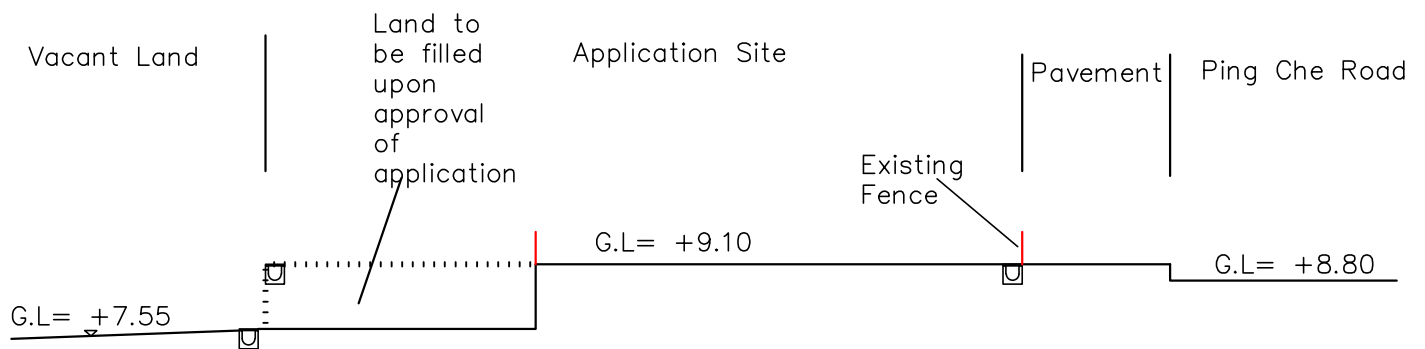


Legend

Scale

Not to Scale

Section Plan (A-A)



Legend

Scale

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Section Plan (B-B)

Catchment Area = 1,998.5 m² (C = 0.950)

The Site Area — RED A = 2,574.0 m² (C = 0.950)

U-channel design for Site catchment area A & half catchment area 2

$$\Sigma Q = \Sigma 0.278 C_i A_i$$

$$A = 1,998.5 + 2,574.0 = 4,572.5 \text{ m}^2 \\ = 0.0045725 \text{ km}^2$$

$$t_o = 0.14465 \times L / (H^{0.2} \times A^{0.1})$$

Adopted rainfall duration = 1.000 min

$$i = \text{multiplier} \times a / (t + b)^c$$

$$= 1.111 \times 474.600 / (1.000 + 2.900)^{0.371} \\ = 318.242 \text{ mm/hr}$$

(50 years return period, North District, Table 3d, Corrigendum 2024, SDM; multiplier = 1.111)

$$\text{Therefore, } Q = 0.278 \times 0.950 \times 318.242 \times 0.0019985 + 0.278 \times 0.950 \times 318.242 \times 0.0025740 \\ = 0.3843 \text{ m}^3/\text{s} \\ = 23,058.5 \text{ L/min}$$

U-channel allowable capacity = 36,860.4 L/min; velocity = 1.912 m/s

n = 0.013; freeboard = 0 mm; capacity factor = 1.000; utilization = 62.6%

Provide 600 mm U-channel (1:200) is OK.

$$V = (1/n) \times R^{(2/3)} \times S^{(1/2)}; R = A/P$$

where:

V	=	1.912 m/s	mean channel velocity
n	=	0.013	Manning roughness coefficient
H	=	0.600 m	channel size H
A	=	0.321372 m ²	wetted flow area
P	=	1.542478 m	wetted perimeter
S	=	0.005000	hydraulic gradient
R	=	0.208348 m	hydraulic radius

Therefore, mean channel velocity = 1.912 m/s

$$Q_{allow} = 1.000 \times V \times A$$

$$y = 0.600 \text{ m; freeboard} = 0 \text{ mm}$$

Allowable U-channel capacity	=	0.614339 m ³ /s
Allowable U-channel capacity	=	36,860.4 L/min
Design runoff	=	23,058.5 L/min
Capacity utilization	=	62.6% —

Provide 600 mm U-channel (1:200) is OK.

Catchment Area = 1,998.5 m² (C = 0.950)

The Site Area — RED B = 3,237.0 m² (C = 0.950)

U-channel design for Site catchment area B & half catchment area 2

$$\Sigma Q = \Sigma 0.278 C_i A_i$$

$$\begin{aligned} A &= 1,998.5 + 3,237.0 = 5,235.5 \text{ m}^2 \\ &= 0.0052355 \text{ km}^2 \end{aligned}$$

$$t_o = 0.14465 \times L / (H^{0.2} \times A^{0.1})$$

Adopted rainfall duration = 1.000 min

$$i = \text{multiplier} \times a / (t + b)^c$$

$$\begin{aligned} &= 1.111 \times 474.600 / (1.000 + 2.900)^{0.371} \\ &= 318.242 \text{ mm/hr} \end{aligned}$$

(50 years return period, North District, Table 3d, Corrigendum 2024, SDM; multiplier = 1.111)

$$\begin{aligned} \text{Therefore, } Q &= 0.278 \times 0.950 \times 318.242 \times 0.0019985 + 0.278 \times 0.950 \times 318.242 \times 0.0032370 \\ &= 0.4400 \text{ m}^3/\text{s} \\ &= \mathbf{26,401.9 \text{ L/min}} \end{aligned}$$

U-channel allowable capacity = 36,860.4 L/min; velocity = 1.912 m/s

n = 0.013; freeboard = 0 mm; capacity factor = 1.000; utilization = 71.6%

Provide 600 mm U-channel (1:200) is OK.

$$V = (1/n) \times R^{(2/3)} \times S^{(1/2)}; R = A/P$$

where:

V	=	1.912 m/s	mean channel velocity
n	=	0.013	— Manning roughness coefficient
H	=	0.600 m	channel size H
A	=	0.321372 m ²	wetted flow area
P	=	1.542478 m	wetted perimeter
S	=	0.005000	— hydraulic gradient
R	=	0.208348 m	hydraulic radius

Therefore, mean channel velocity = 1.912 m/s

$$Q_{\text{allow}} = 1.000 \times V \times A$$

$$y = 0.600 \text{ m, freeboard} = 0 \text{ mm}$$

Allowable U-channel capacity	=	0.614339 m ³ /s
Allowable U-channel capacity	=	36,860.4 L/min
Design runoff	=	26,401.9 L/min
Capacity utilization	=	71.6% —

Provide 600 mm U-channel (1:200) is OK.

$$V = \sqrt{(8gDS) \log_{10} [ks/(3.7D) + 2.51\nu/(D\sqrt{2gDS})]}$$

where:

V	=	1.970 m/s	mean full-pipe velocity
g	=	9.810 m/s ²	gravitational acceleration
D	=	0.600 m	internal pipe diameter
ks	=	0.000150 m	hydraulic pipeline roughness
ν	=	1.14E-06 m ² /s	kinematic viscosity of water
S	=	0.005000 —	hydraulic gradient
Re	=	1,036,679 —	Reynolds number

Therefore, full-pipe mean velocity = 1.970 m/s

$$Q_{\text{allow}} = 0.800 \times V \times \pi D^2/4$$

Allowable pipe capacity	=	0.445533 m ³ /s
Allowable pipe capacity	=	26,732.0 L/min
Design runoff	=	23,058.5 L/min
Capacity utilization	=	86.3% —

Provide 600 mm dia. pipe (1:200) is OK.

$$V = -\sqrt{(8gDS) \log_{10}[k_s/(3.7D) + 2.51\nu/(D\sqrt{2gDS})]}$$

where:

V	=	1.970 m/s	mean full-pipe velocity
g	=	9.810 m/s ²	gravitational acceleration
D	=	0.600 m	internal pipe diameter
k _s	=	0.000150 m	hydraulic pipeline roughness
ν	=	1.14E-06 m ² /s	kinematic viscosity of water
S	=	0.005000 —	hydraulic gradient
Re	=	1,036,679 —	Reynolds number

Therefore, full-pipe mean velocity = 1.970 m/s

$$Q_{allow} = 0.800 \times V \times \pi D^2/4$$

Allowable pipe capacity	=	0.445533 m ³ /s
Allowable pipe capacity	=	26,732.0 L/min
Design runoff	=	26,401.9 L/min
Capacity utilization	=	98.8% —

Provide 600 mm dia. pipe (1:200) is OK.

Catchment Area — BLUE = 5,034.0 m² (C = 0.950)

The Site Area — BROWN = 441.0 m² (C = 0.250)

U-channel design for catchment area 2 & 4

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

$$\begin{aligned} A &= 5,034.0 + 441.0 = 5,475.0 \text{ m}^2 \\ &= 0.0054750 \text{ km}^2 \end{aligned}$$

$$t_o = 0.14465 \times L / (H^{0.2} \times A^{0.1})$$

Adopted rainfall duration = 1.000 min

$$\begin{aligned} i &= \text{multiplier} \times a / (t + b)^c \\ &= 1.111 \times 474.600 / (1.000 + 2.900)^{0.371} \\ &= 318.242 \text{ mm/hr} \end{aligned}$$

(50 years return period, North District, Table 3d, Corrigendum 2024, SDM; multiplier = 1.111)

$$\begin{aligned} \text{Therefore, } Q &= 0.278 \times 0.950 \times 318.242 \times 0.0050340 + 0.278 \times 0.250 \times 318.242 \times 0.0004410 \\ &= 0.4328 \text{ m}^3/\text{s} \\ &= 25,971.0 \text{ L/min} \end{aligned}$$

U-channel allowable capacity = 36,860.4 L/min; velocity = 1.912 m/s

n = 0.013; freeboard = 0 mm; capacity factor = 1.000; utilization = 70.5%

Provide 600 mm U-channel (1:200) is OK

$$V = (1/n) \times R^{(2/3)} \times S^{(1/2)}; R = A/P$$

where:

V	=	1.912 m/s	mean channel velocity
n	=	0.013	— Manning roughness coefficient
H	=	0.600 m	channel size H
A	=	0.321372 m ²	wetted flow area
P	=	1.542478 m	wetted perimeter
S	=	0.005000	— hydraulic gradient
R	=	0.208348 m	hydraulic radius

Therefore, mean channel velocity = 1.912 m/s

$$Q_{\text{allow}} = 1.000 \times V \times A$$

$$y = 0.600 \text{ m; freeboard} = 0 \text{ mm}$$

Allowable U-channel capacity	=	0.614339 m ³ /s
Allowable U-channel capacity	=	36,860.4 L/min
Design runoff	=	25,971.0 L/min
Capacity utilization	=	70.5% —

Provide 600 mm U-channel (1:200) is OK.

$$V = -\sqrt{(8gDS) \log_{10}[ks/(3.7D) + 2.51\nu/(D\sqrt{(2gDS))}]}$$

where:

V	=	1.970 m/s	mean full-pipe velocity
g	=	9.810 m/s ²	gravitational acceleration
D	=	0.600 m	internal pipe diameter
ks	=	0.000150 m	hydraulic pipeline roughness
ν	=	1.14E-06 m ² /s	kinematic viscosity of water
S	=	0.005000 —	hydraulic gradient
Re	=	1,036,679 —	Reynolds number

Therefore, full-pipe mean velocity = 1.970 m/s

$$Q_{allow} = 0.800 \times V \times \pi D^2/4$$

Allowable pipe capacity	=	0.445533 m ³ /s
Allowable pipe capacity	=	26,732.0 L/min
Design runoff	=	25,971.0 L/min
Capacity utilization	=	97.2% —

Provide 600 mm dia. pipe (1:200) is OK.

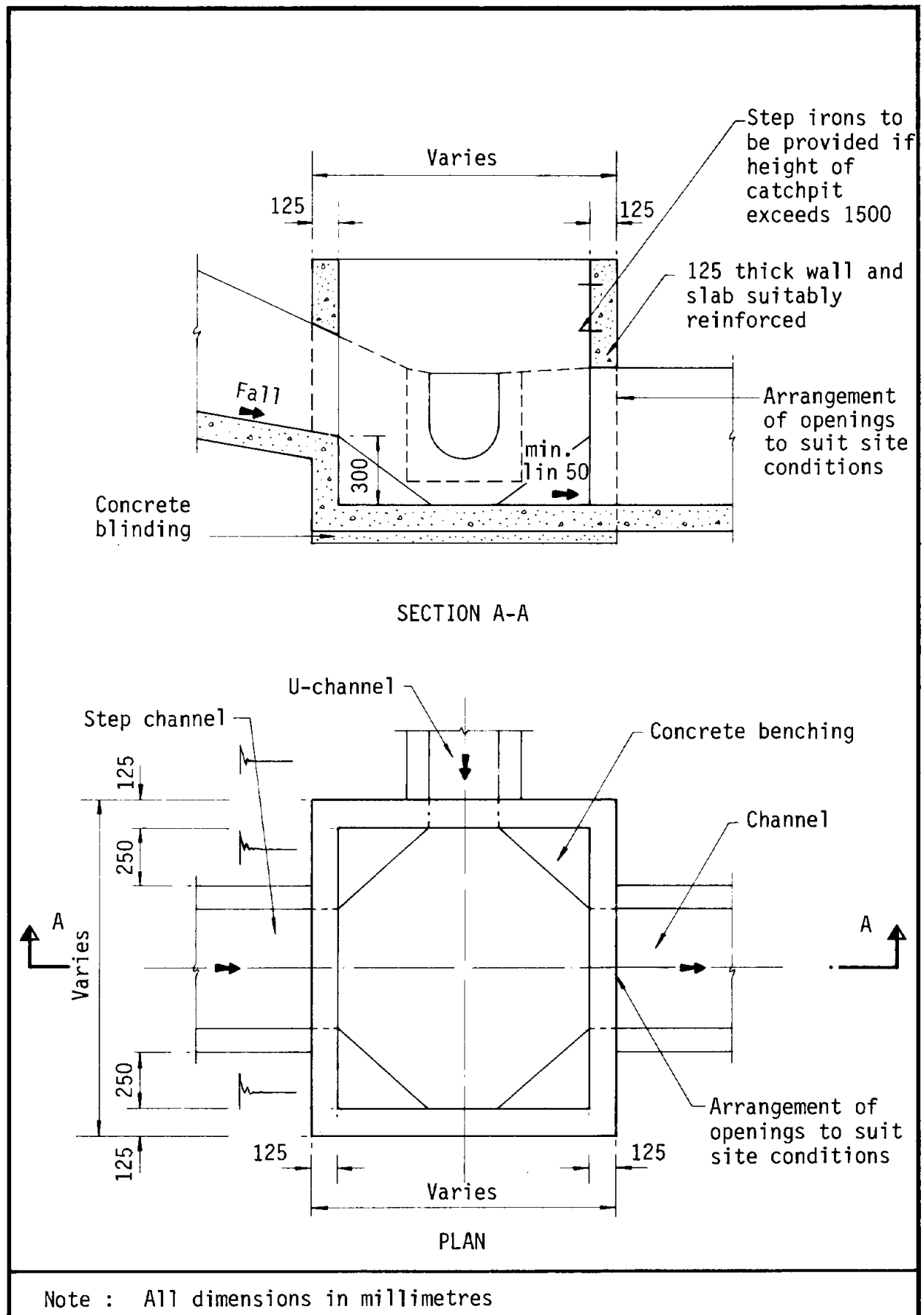
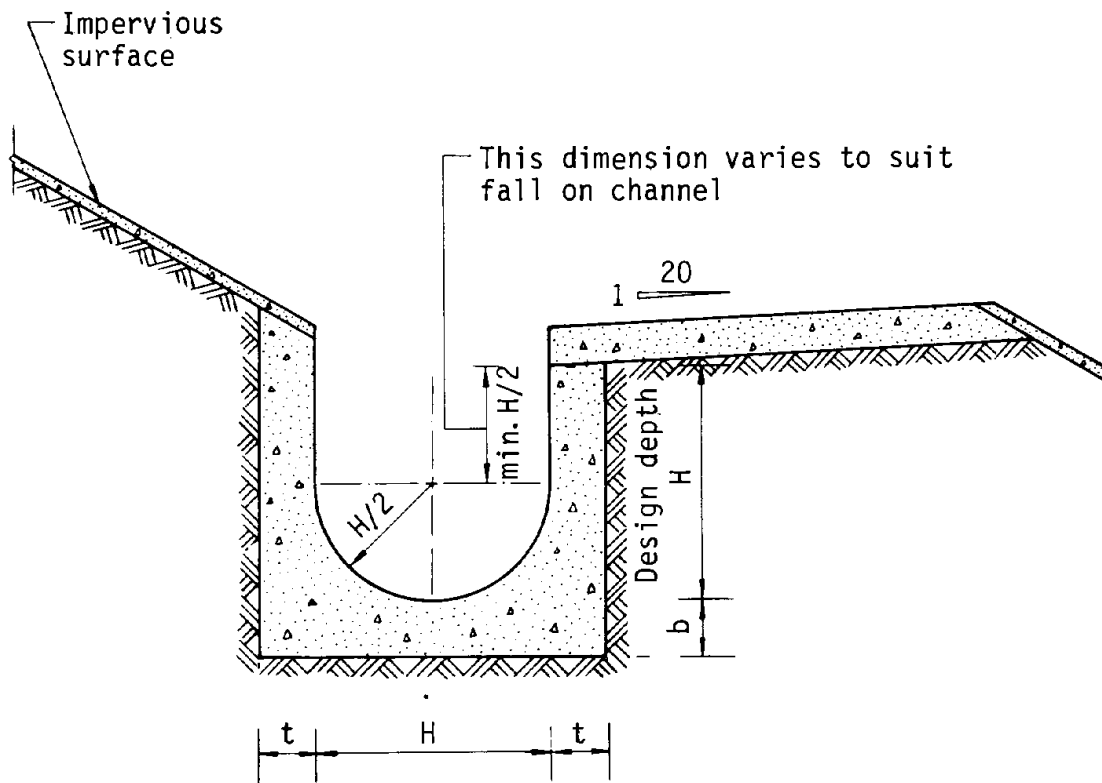


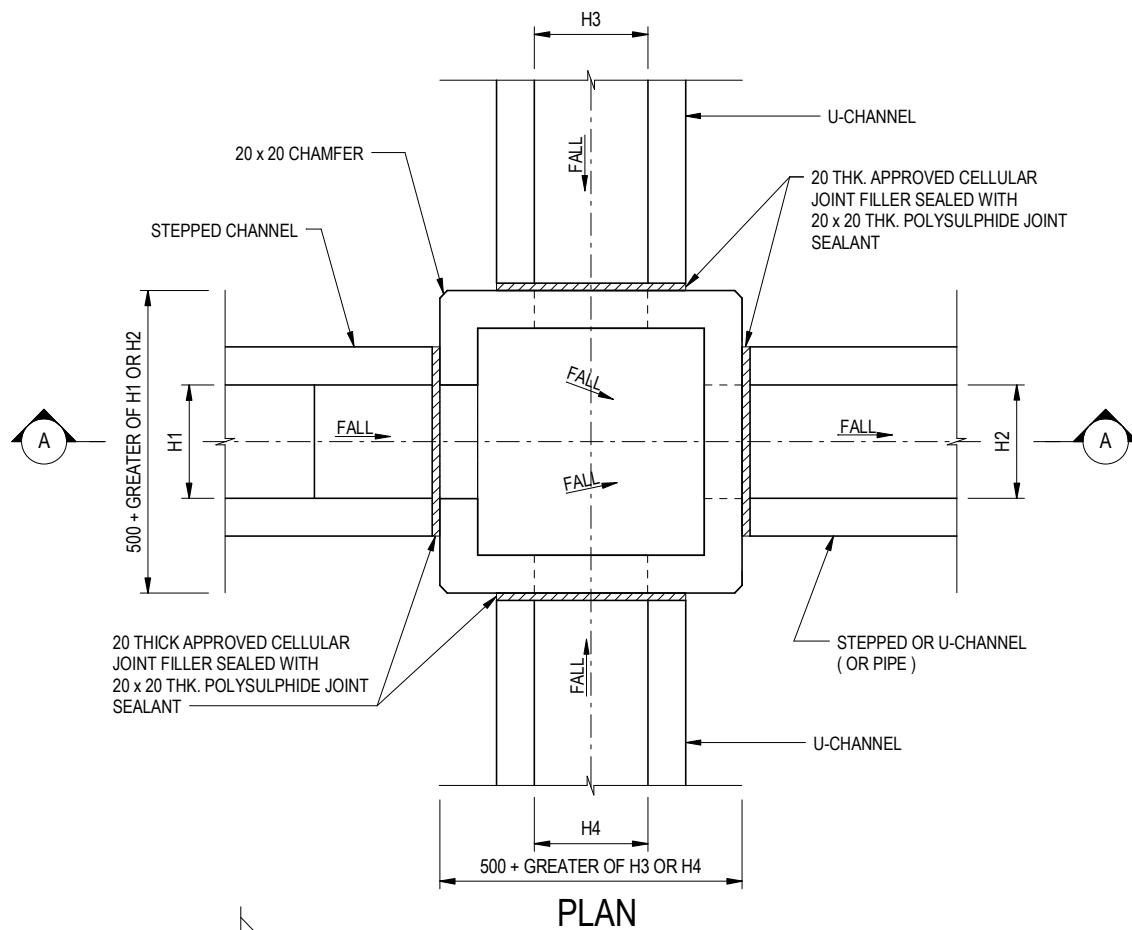
Figure 8.10 - Typical Details of Catchpits



Dimensions of U - channel

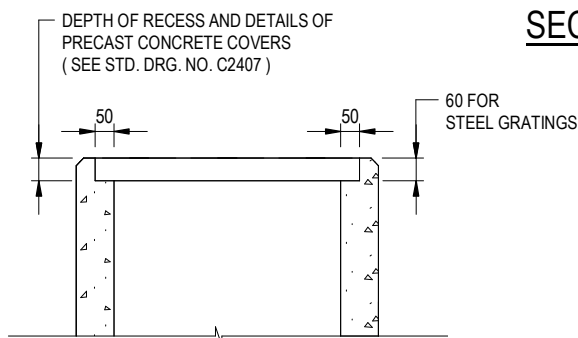
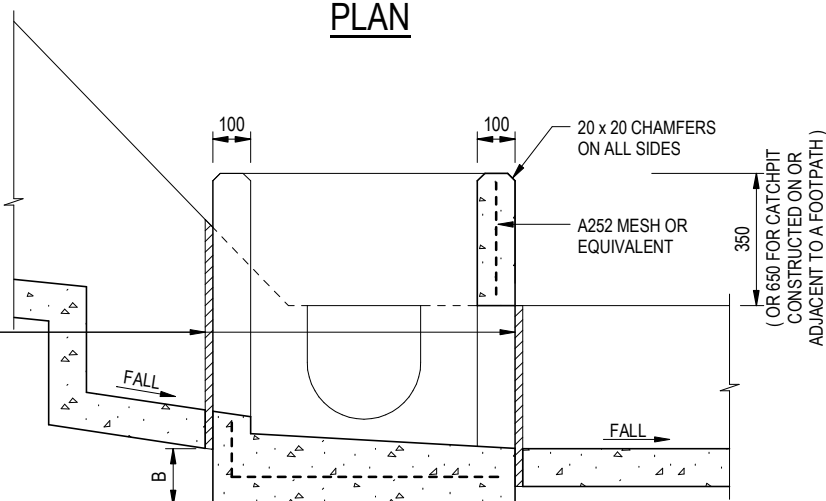
Nominal size of channel H (mm)	Thickness t (mm)	Thickness b (mm)
225 to 600	150	150
675 to 1200	175	225

Figure 8.11 - Typical U-channel Details



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

20 THICK APPROVED CELLULAR
JOINT FILLER SEALED WITH
20 x 20 THK. POLYSULPHIDE JOINT
SEALANT



NOTES:

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

ALTERNATIVE TOP SECTION FOR PRECAST CONCRETE COVERS / GRATINGS

STANDARD CATCHPIT DETAILS (SHEET 1 OF 5)

A	BIM OBJECT REVISION.	Original Signed	12.2025
—	FORMER DRG. NO. C2405J.	Original Signed	03.2015
REF.	REVISION	SIGNATURE	DATE



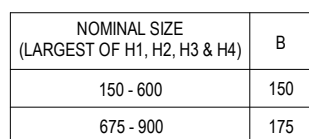
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2405 /1A



- SECTION A - A

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



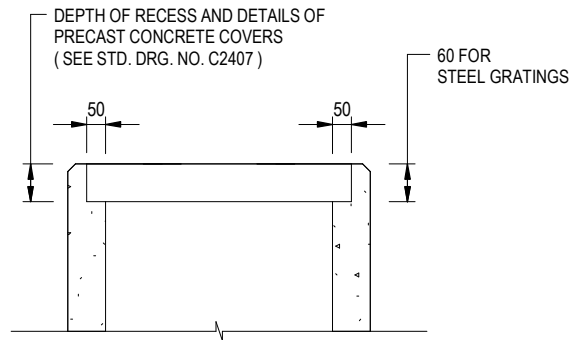
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE	JAN 1991
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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)**



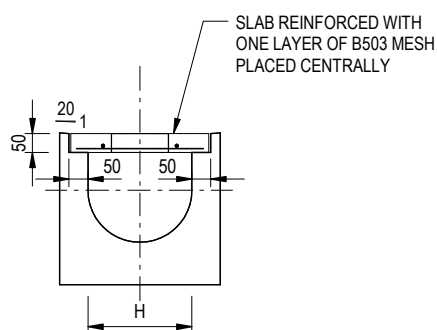
**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

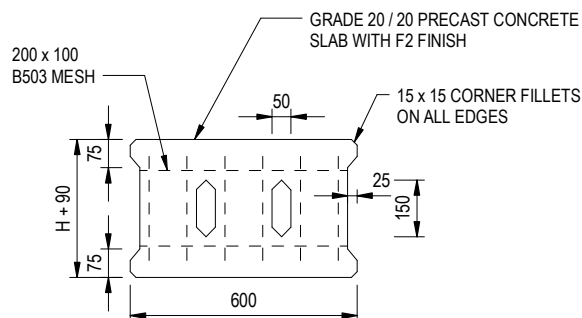
DATE JAN 1991

DRAWING NO.

C2406 /2B



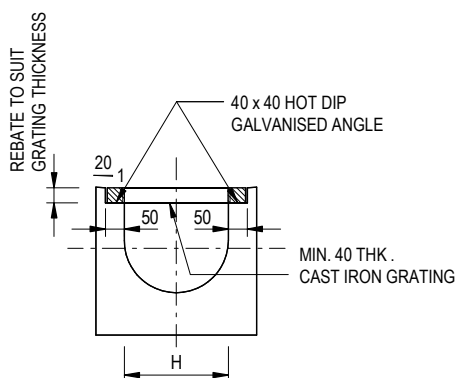
TYPICAL SECTION



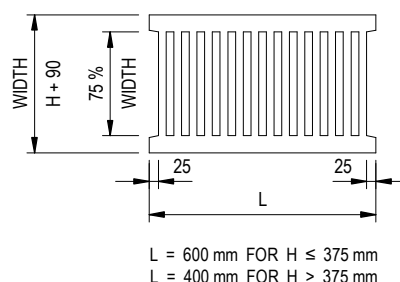
PLAN OF SLAB

U-CHANNELS WITH PRECAST CONCRETE SLABS

(UP TO H OF 525)



TYPICAL SECTION



CAST IRON GRATING

(DIMENSIONS ARE FOR GUIDANCE ONLY, CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)

U-CHANNEL WITH CAST IRON GRATING

(UP TO H OF 525)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. H = NOMINAL CHANNEL SIZE.
3. ALL CAST IRON FOR GRATINGS SHALL BE GRADE EN-GJL-150 COMPLYING WITH BS EN 1561.
4. FOR COVERED CHANNELS TO BE HANDED OVER TO HIGHWAYS DEPARTMENT FOR MAINTENANCE, THE GRATING DETAILS SHALL FOLLOW THOSE AS SHOWN ON HyD STD. DRG. NO. H3156.

F	BIM OBJECT REVISION.	Original Signed	12.2025
E	NOTES 3 & 4 AMENDED.	Original Signed	12.2014
D	NOTE 4 ADDED.	Original Signed	06.2008
C	MINOR AMENDMENT. NOTE 3 ADDED.	Original Signed	12.2005
B	NAME OF DEPARTMENT AMENDED.	Original Signed	01.2005
A	CAST IRON GRATING AMENDED.	Original Signed	12.2002
REF.	REVISION	SIGNATURE	DATE

**COVER SLAB AND CAST IRON
GRATING FOR CHANNELS**



**CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT**

SCALE 1 : 20

DATE JAN 1991

DRAWING NO.

C2412F