Response to Comments

PROPOSED TEMPORARY OPEN STORAGE AND WAREHOUSE OF CONSTRUCTION MACHINERIES FOR A PERIOD OF THREE YEARS IN "AGRICULTURE" ZONE

LOT 369 OF D.D. 87, HUNG LUNG HANG, NEW TERRITORIES

Departmental Comments	Applicant's Response
Comments from Drainage Services Department a) The application site is in the vicinity of an existing streamcourse to the "west" of the application site. The applicant shall be required to place all the proposed works at least 3m away from the top of the bank of the streamcourse. All the proposed works in the vicinity of the streamcourse should not create any adverse drainage impacts, both during and after construction. Proposed flooding mitigation measures if necessary shall be provided at the resources of the applicant to my satisfaction.	We will ensure that all the proposed works in the vicinity of the streamcourse will not create any adverse drainage impacts, both during and after construction. During the construction of the proposed work, proper shoring and sandbags will be installed to ensure the streamcourse will not be adversely affected. All debris from the excavation and construction will be stockpiled away from the streamcourse. We will ensure that all proposed works will be placed at least 3m away from the top of the bank of the streamcourse.
b) Photos should be submitted clearly showing the current condition of the area around the site, the existing drainage/flowpaths around the site, the proposed drainage from the site to the downstream existing watercourse and the existing watercourse at about 20m intervals. The locations of the camera and the direction of each photo should also be indicated on a plan.	Attached in Appendix 1 are the photos and a plan of the location of the camera and the direction of the photos.
c) Section 1.3 of drainage proposal refers. With land to the south being at higher ground level, please review the potential overland flow to the site and the related external catchment area to be considered under the drainage design.	Please find revised drainage plan with proposed peripheral channels outside of the site boundaries to intercept and discharge runoff from the external catchments.
d) Surface channel with grating covers should be provided along the site boundary.	Noted, surface channel with grating covers will be provided along the site boundary as shown in the revised drainage plan.

e) The cover levels of proposed channels should be flush with the existing adjoining ground level.	Noted
f) A catchpit with covers should be provided where there is a change of direction of channel/drain. The details of the catchpit with covers shall be provided.	Noted, Locations of proposed catchpits are detailed on the drainage, and details of a standard catchpit with covers proposed are attached in Appendix II
g) Catchpits with sand trap shall be provided at the outlets of the proposed drainage system. The details of the catchpit with sand trap should be provided.	Noted. Details of the catchpit with sand trap are attached in Appendix II
h) The applicant should check and ensure that the existing drainage downstream to which the proposed connection will be made have adequate capacity and satisfactory condition to cater for the additional discharge from the captioned site. He should also ensure that the flow from this site will not overload the existing drainage system. Please provide further substantiation on the assumptions made on the checking of capacity of the natural stream.	The proposed drainage system will discharge into an existing external catchpit, which, using two 0.7m diameter pipes, discharges into a 1.9m wide x 1.6m deep drain before discharging into a 2.5m wide x 1.6m deep watercourse. The capacity of downstream drainage and watercourse is calculated in the attached drainage proposal, the capacity of the natural stream is calculated based on the watercourse is a canal with rough stony beds, weeds on earth beds in bad condition, with n= 0.04. Conditions of the watercourse is shown in photos 016 and 017.
i) Where walls are erected or kerbs are laid along the boundary of the same, peripheral channels should be provided at the walls/ kerbs to allow existing overland flow passing through the site to be intercepted by the drainage system of the site with details to be agreed by DSD, unless justified not necessary.	Please find revised drainage plan with peripheral channels at the walls and kerbs to intercept and discharge existing overland flow passing through the site
j) All existing flow paths as well as the run-off falling onto and passing through the site should be intercepted and disposed of via proper discharge points. The applicant shall also ensure that no works, including any site formation works, shall be carried out as may adversely interfere with the free flow condition of existing drains, channels and watercourses on or in the vicinity of the subject site any time during or after the works.	Noted, All run-off falling onto and passing through the site will be intercepted and discharged via the proposed drainage system in the proposed drainage plan. We will employ proper mitigation measures, as mentioned above, to ensure that all proposed works will not adversely affect the free flow condition of existing drains, channels, and watercourses on or in the vicinity of the subject site at any time during or after the works.
k) For works to be undertaken outside the lot boundary, the applicant should obtain prior consent and agreement from DLO/N and/or relevant private lot owners.	Noted.

l) The applicant should make good all the adjacent affected areas upon the completion of the drainage works.	Noted
m) The applicant shall allow all time free access for the Government and its agent to conduct site inspection on his completed drainage works	Noted
n) The applicant and the successive lot owners shall allow connections from the adjacent lots to the completed drainage works on Government Land when so required.	Noted
2. The site is in an area where no public sewerage connection is available. EPD should be consulted regarding the sewage treatment/disposal facilities for the proposed development.	Noted
<u>Comments from Transport Department</u> i) The applicant should advise the width of the vehicular access leading to the site;	The width of the vehicular access leading to the site is about 8.6m wide
ii) The applicant shall demonstrate the satisfactory maneuvering of the goods vehicles entering and exiting the subject site, maneuvering within the subject site and into/out of the parking and loading/unloading spaces, preferably using the swept path analysis;	Please find attached in Appendix III swept path analysis.
iii) The applicant shall advise the provision and management of pedestrian facilities to ensure pedestrian safety; and	The applicant will install “TS460” and “5KM/H” signs at the site access to alert drivers to slow down and be aware of pedestrians.
iv) The proposed vehicular access between Man Kam To Road and the application site is not managed by TD. The applicant should seek comments from the responsible party.	Noted

1. Drainage Proposal

1.1 Site Particulars

1.1.1 The application site is abutting a local vehicular access leading to Kong Nga Po Road. possesses an area of approximately 2,118m^2.

1.1.2 There is an existing channel directly to the northwest of the application site leading to an open stream, and an underground drainage to the east of the application site which leads to an open watercourse to the northeast.

1.2 Level and gradient of the subject site & proposed surface channel

1.2.1 The application site is mostly paved, an area of approximately 2,118m^2. The paved area will have a gradient sloping from southeast to northwest from about +29.7mPD to +29.5mPD.

1.2.2 In order to follow the topography of the application site, the proposed surface channel will be constructed following the gradient of the site. As demonstrated in the calculations in Paragraph 3 and 4 hereunder, a 300mm surface U-channel will be capable to drain the surface runoff accrued at the subject site and a 375mm surface U-channel will be capable to drain the surface runoff from the external catchment that may potentially flow overland to the site.

1.3 Catchment area of the proposed drainage provision at the subject site.

1.3.1 For the internal catchment, with an area of approximately 2,118m^2, a 300mm surface U-Channel along the site peripheral is proposed to intercept the run-off of the site.

1.3.2 The intercepted stormwater from the site will then be discharged to the existing open streamcourse to the Northwest of the Site via a proposed 300mm surface U-channel.

1.3.3 It is noted that the land to the East and South of the application site commands a higher level whereas the land to the north and west command a lower level. The external catchment area is estimated to be approximately 2,425m^2

1.3.4 A proposed peripheral 375mm surface U-channel outside of the boundary of the application site is proposed to intercept the external catchment run-off from the East and South of the site, and to be discharged into an existing catchpit as indicated in the drainage plan.

2 Runoff Estimation and Proposed Drainage Facilities

2.1 Proposed Drainage Facilities

2.1.1 Subject to the below calculations, it is determined that 300mm surface U-channel which is made of concrete along the site periphery is adequate to intercept storm water generated at the application site, and a 375mm surface U-channel which is made of concreate along the outer peripheral site boundary is adequate to intercept potential overland flow to the site from the external catchment.

2.1.2 The intercepted stormwater from the site will then be discharged to the existing drainage to the northwest of the application site as shown in Figure 1, and eventually discharges into an natural watercourse to the north. The intercepted stormwater from the external catchment will be discharged into an existing catchpit to the Southwest of the site.

2.1.3 The flow capacities of the proposed U-channel are calculated using the Chart for the Rapid Design of Channels. Runoff from corresponding Site Catchments (calculated based on a return period of 50 years), the capacity estimation are included below.

2.1.4 The first set of calculations below shows that the proposed 300mm U-channel has adequate capacity to cater for the surface runoff generated at the application site.

2.1.5 The second set of calculations below shows that the proposed 375mm U-channel has adequate capacity to cater for the surface runoff generated at the external catchments of the application site.

2.1.6 A final set of calculations checks and confirms that the downstream drainage and subsequent watercourse has the capacity for the surface runoff generated at the application site and external catchment.

2.1.7 All the proposed drainage facilities, including the section of surface channel proposed in between the subject site to the streamcourse will be provided and maintained at the applicant's own expense. Also, surface U-channel will be cleaned at regular interval to avoid the accumulation of rubbish/debris which would affect the dissipation of storm water.

2.1.8 Prior to the commencement of drainage works, the applicant will seek the consent of the District Lands Office/North District and the registered land owner for any drainage works outside the application site or outside the jurisdiction of the applicant.

2.1.9 The provision of the proposed surface U-channel will follow the gradient of the application site. All the proposed drainage facilities will be constructed and maintained at the expense of the applicant.

3 Calculation 1: Drainage Calculation for the proposed Provision of Drainage Facilities at the Application Site

3.1 Runoff Estimation

3.1.1 Rational method is adopted for estimating the designed run-off

$$Q=0.278\ C \times I \times A$$

Table 1: Runoff Coefficients

Surface Characteristics	Runoff Coefficient
Asphalt	0.70-0.95
Concrete	0.80-0.95
Brick	0.70-0.85
Grassland (Heavy Soil)	
Flat	0.13-0.25
Steep	0.25-0.35
Grassland (Sandy Soil)	
Flat	0.05-0.15
Steep	0.15-0.2

Assuming that:

I. The total catchment area from the application site is about 2,118 m^2;

II. Approximately 2,118 m^2 is hard paved, and therefore the value of run-off co-efficient (k) is taken as 0.95.

Difference in Land Datum	=	29.7m –29.5m = 0.2m
L	=	71.6m
Average fall	=	0.28m in 100m

According to the Brandsby-Williams Equation adopted from the "Stormwater Drainage Manual – Planning, Design and management" published by the Drainage Services Department (DSD),

Time of Concentration (t_c) = $0.14465[L/(H^{0.2}\times A^{0.1})]$

t_c = $0.14465[71.6/(0.28^{0.2}\times 2{,}118^{0.1})]$

t_c = 6.22 minutes

The rainfall intensity *i* is determined by using the Gumbel Solution:

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

Where *I* = Extreme mean intensity in mm/hr

td = Duration in minutes (td≤240)

a, b, c = Storm constants given in the table below

Table 2: Storm Constants for Different Return Periods of North District Area

Return Period T(years)	2	5	10	20	50
a	1004.5	1112.2	1157.7	1178.6	1167.6
b	17.24	18.86	19.04	18.49	16.76
c	0.644	0.614	0.597	0.582	0.561

i = $1167.6/[6.22+16.76]^{0.561}$

i = 201.2mm/hr

By Rational Method, Q = 0.95× 201.2mm/hr × 2,118/3600

Q = 112l/s = $0.112m^3/s$ = 6,747 l/min

In accordance with the Chart of the Rapid Design of Channels in "Geotechnical Manual for Slopes", 300mm surface U-channel in 1:100 gradient is considered adequate to dissipate all the stormwater accrued by the application site. The intercepted stormwater will then be discharged to the existing natural stream to the north of the application site as shown in Figure 2.

4 Calculation 2: Drainage Calculation for the Proposed Peripheral Channel for the External Catchment to the South

4.1 Runoff Estimation

4.1.1 Rational method is adopted for estimating the designed run-off

$$Q=0.278\ C \times I \times A$$

Table 1: Runoff Coefficients

Surface Characteristics	Runoff Coefficient
Asphalt	0.70-0.95
Concrete	0.80-0.95
Brick	0.70-0.85
Grassland (Heavy Soil)	
Flat	0.13-0.25
Steep	0.25-0.35
Grassland (Sandy Soil)	
Flat	0.05-0.15
Steep	0.15-0.2

Assuming that:

I. The total external catchment area is about 2,425 m^2;
II. Approximately 2,261 m^2 is hard paved, and therefore the value of run-off co-efficient (k) is taken as 0.95, and approximately 164m^2 is steep grassland, and therefore the value of run-off co-efficient (k) is take as 0.25.

Difference in Land Datum	=	40m –29.5m = 10.5m
L	=	107.8m
Average fall	=	9.74m in 100m

According to the Brandsby-Williams Equation adopted from the "Stormwater Drainage Manual – Planning, Design and management" published by the Drainage Services Department (DSD),

Time of Concentration (t_c)	=	$0.14465[L/(H^{0.2}\times A^{0.1})]$
t_c	=	$0.14465[107.8/(9.74^{0.2}\times 2{,}425^{0.1})]$
t_c	=	4.54 minutes

The rainfall intensity *i* is determined by using the Gumbel Solution:

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

Where *I* = Extreme mean intensity in mm/hr
td = Duration in minutes (td≤240)
a, b, c = Storm constants given in the table below

Table 2: Storm Constants for Different Return Periods of North District Area

Return Period T(years)	2	5	10	20	50
a	1004.5	1112.2	1157.7	1178.6	1167.6
b	17.24	18.86	19.04	18.49	16.76
c	0.644	0.614	0.597	0.582	0.561

i	=	$1167.6/[4.54+16.76]^{0.561}$
i	=	209.9mm/hr

By Rational Method, Q	=	0.95× 209.9mm/hr × 2,261/3600
		+0.2× 209.9mm/hr × 164/3600
Q	=	127l/s = 0.127m^3/s = 7,631 l/min

In accordance with the Chart of the Rapid Design of Channels in "Geotechnical Manual for Slopes", 375mm surface U-channel in 1:100 gradient is considered adequate to dissipate all the stormwater accrued by the external catchment. The intercepted stormwater will then be discharged to the existing catchpit to the West of the external catchment area as shown in Figure 1.

5 Checking the Capacity of the 2 Existing Drainage Pipes

Manning Equation

$$V = \frac{HMD^{\frac{2}{3}} \times S_f^{0.5}}{n}$$

Hydraulic Mean Depth (HMD) = 0.291 × D
HMD = 0.291 × 0.7
HMD = 0.204
n = 0.013 s/m$^{1/3}$
for good uncoated cast iron pipe
(Table 13 of Stormwater Drainage Manual)
V = [$0.204^{2/3}$]×[$0.01^{0.5}$]/0.013
V = 2.67m/sec

Maximum Capacity Q_{Max} = V × A

A = $2 \times \pi R^2$
A = $2 \times \pi 0.35^2$
A = 0.769m^2
Q_{Max} = 2.67m/sec × 0.769m^2
Q_{Max} = 2.05m^3/sec
2.05m^3/sec > (0.114+0.093)m^3/sec
2.05m^3/sec > 0.207m^3/sec
Q_{Max} > Q

The runoff estimation is only a small fraction of the existing drainage channel's capacity

6 Checking the Capacity of the 2 Existing Drainage Channel

Manning Equation

$$V = \frac{R^{\frac{2}{3}} \times S_f^{0.5}}{n}$$

$$R = \frac{L \times D}{2D + L}$$

L = 1.9m
D = 1.6m
R = [1.9×1.6]/[2×1.6+1.9]
R = 0.596m
n = 0.014 s/m$^{1/3}$ for concrete lined channels
(Table 13 of Stormwater Drainage Manual)
V = [$0.596^{2/3}$]×[$0.01^{0.5}$]/0.014
V = 5.06m/sec

Maximum Capacity Q_{Max} = V × A

A = L × D
A = 1.9 × 1.6
A = 3.04m^2
Q_{Max} = 5.06m/sec × 3.04m^2
Q_{Max} = 15.4m^3/sec
15.4m^3/sec > (0.112+0.127)m^3/sec

$15.4m^3/sec$ > $0.239m^3/sec$

Q_{Max} > Q

The runoff estimation is only a small fraction of the existing drainage channel's capacity

7 Checking the Capacity of the Natural Watercourse

Manning Equation

$$V = \frac{R^{\frac{2}{3}} \times S_f^{0.5}}{n}$$

$$R = \frac{L \times D}{2D + L}$$

L = 2.5m

D = 1.6m

R = [2.5×1.6]/[2×1.6+2.5]

R = 0.702m

n = 0.04 $s/m^{1/3}$ for canal with rough stony beds, weed on earth banks in bad condition (Table 13 of Stormwater Drainage Manual)

V = $[0.702^{2/3}]\times[0.01^{0.5}]/0.04$

V = 1.97m/sec

Maximum Capacity $Q_{Max} = V \times A$

A = L × D

A = 2.5 × 1.6

A = $4m^2$

Q_{Max} = $1.97m/sec \times 4m^2$

Q_{Max} = $7.90m^3/sec$

$7.90m^3/sec$ > $(0.112+0.127)m^3/sec$

$7.90m^3/sec$ > $0.239m^3/sec$

Q_{Max} > Q

The runoff estimation is only a small fraction of the existing natural watercourse's capacity

8 Conclusion

8.1 The applicant will be responsible for the construction and ongoing maintenance of the drainage facilities.

8.2 Potential drainage impacts that may arise from the Site after construction of the Proposed Development have been assessed. Thus, existing stormwater system will have sufficient capacity to receive stormwater runoff from the Proposed Development and surrounding catchments.

8.3 Adequate measures are provided at the resources of the applicant to prevent the site from being eroded and flooded

8.4 External catchment is taken into account such that flooding susceptibility of the adjoining areas would not be adversely affected by the proposed development.

Figure 1 Catchment Areas and Flowpath

Figure 2 Drainage Plan

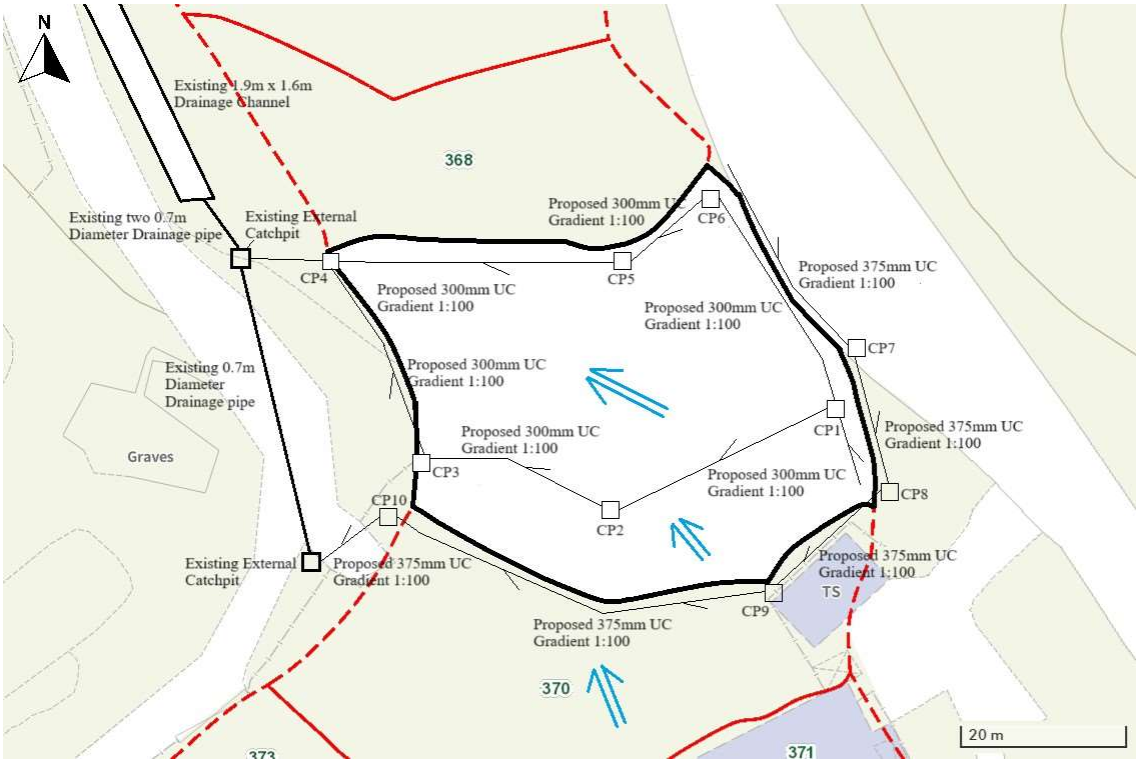


Figure 3 Chart for the Rapid Designs of Channels (Application Site)

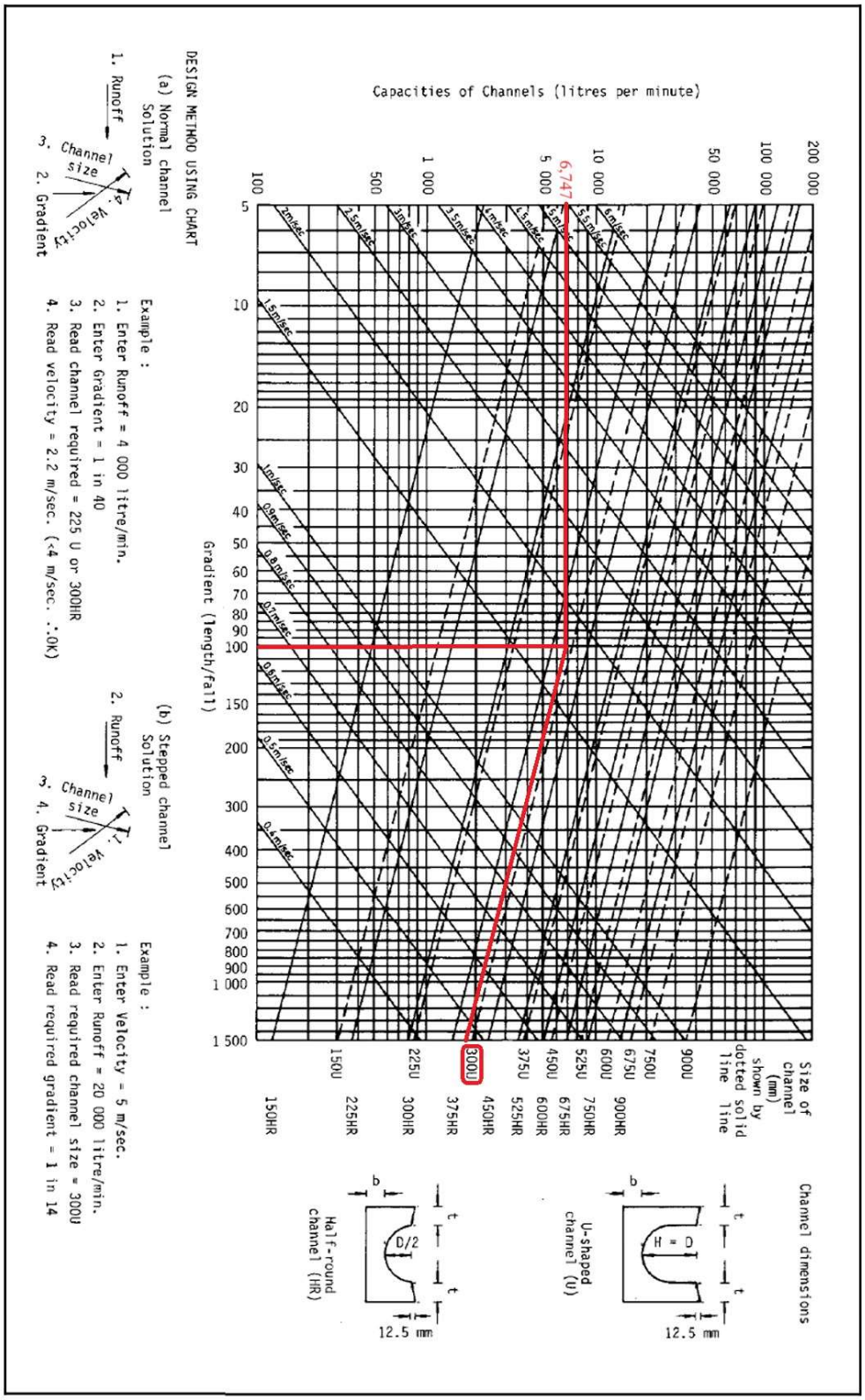


Chart for the Rapid Design of Channels in the Geotechnical Manual for Slopes (Second Edition) (GCO, 1984)

Figure 4 Chart for the Rapid Designs of Channels (External Catchment)

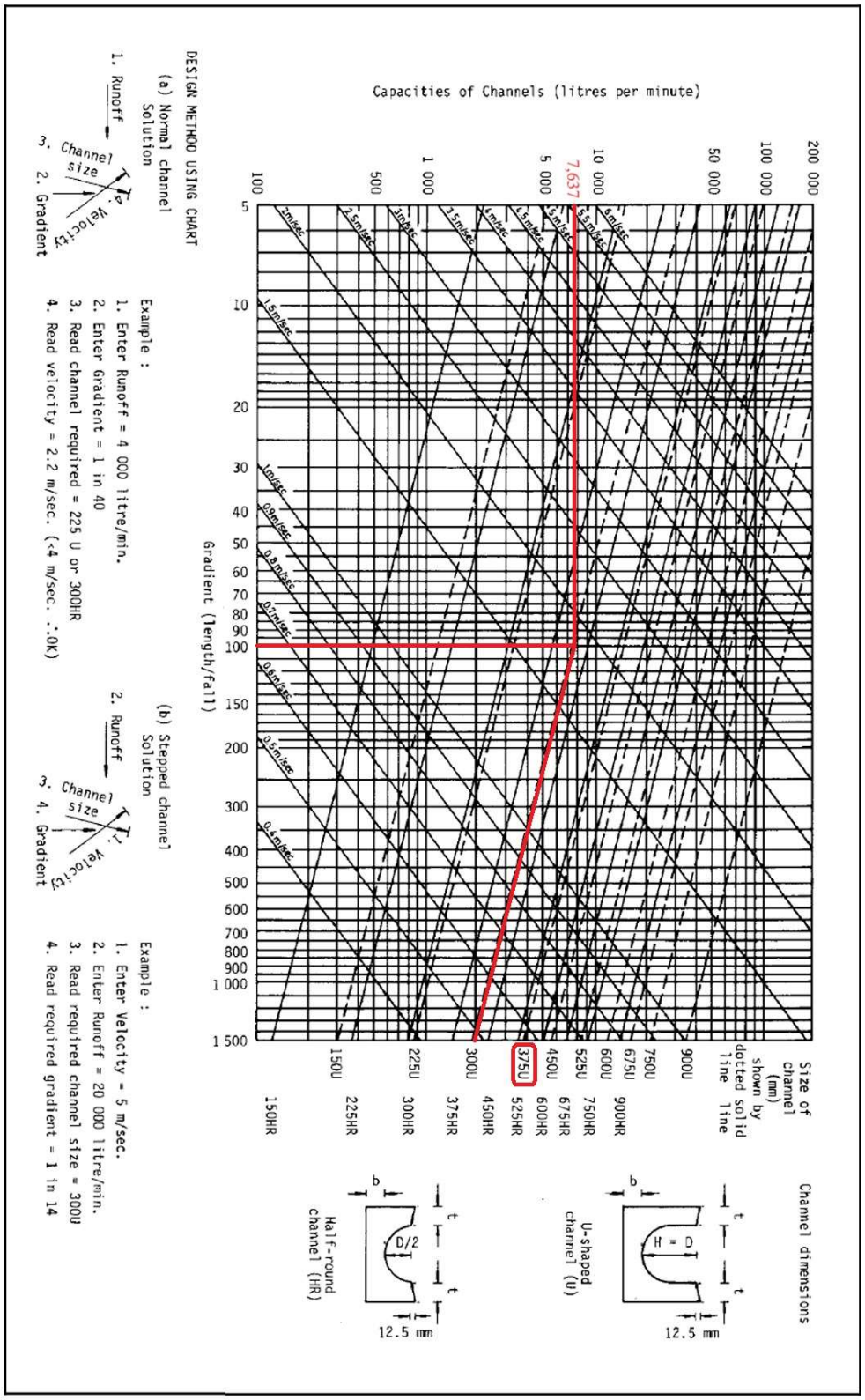


Chart for the Rapid Design of Channels in the Geotechnical Manual for Slopes (Second Edition) (GCO, 1984)

Appendix I: Photos of the Surrounding area

Plan indicating the location of the camera and the angle of the photo:

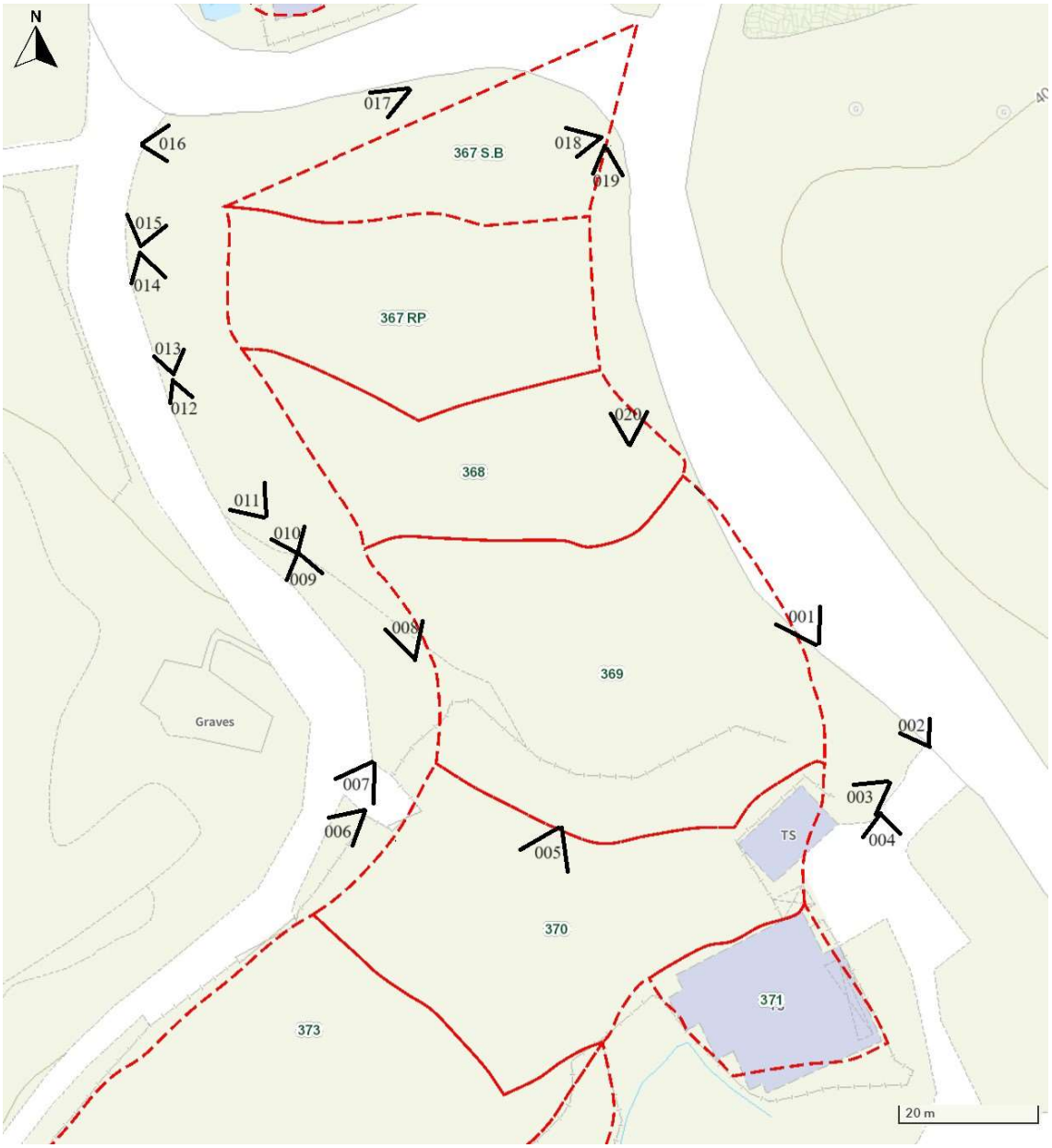


Photo 001

Photo 002

Photo 003

Photo 004

Photo 005

Photo 006

Photo 007

Photo 008

Photo 009

Photo 010

Photo 011

Photo 012-1

Photo 012-2

Photo 013-1

Photo 013-2

Photo 014-1

Photo 014-2

Photo 015

Photo 016

Photo 017

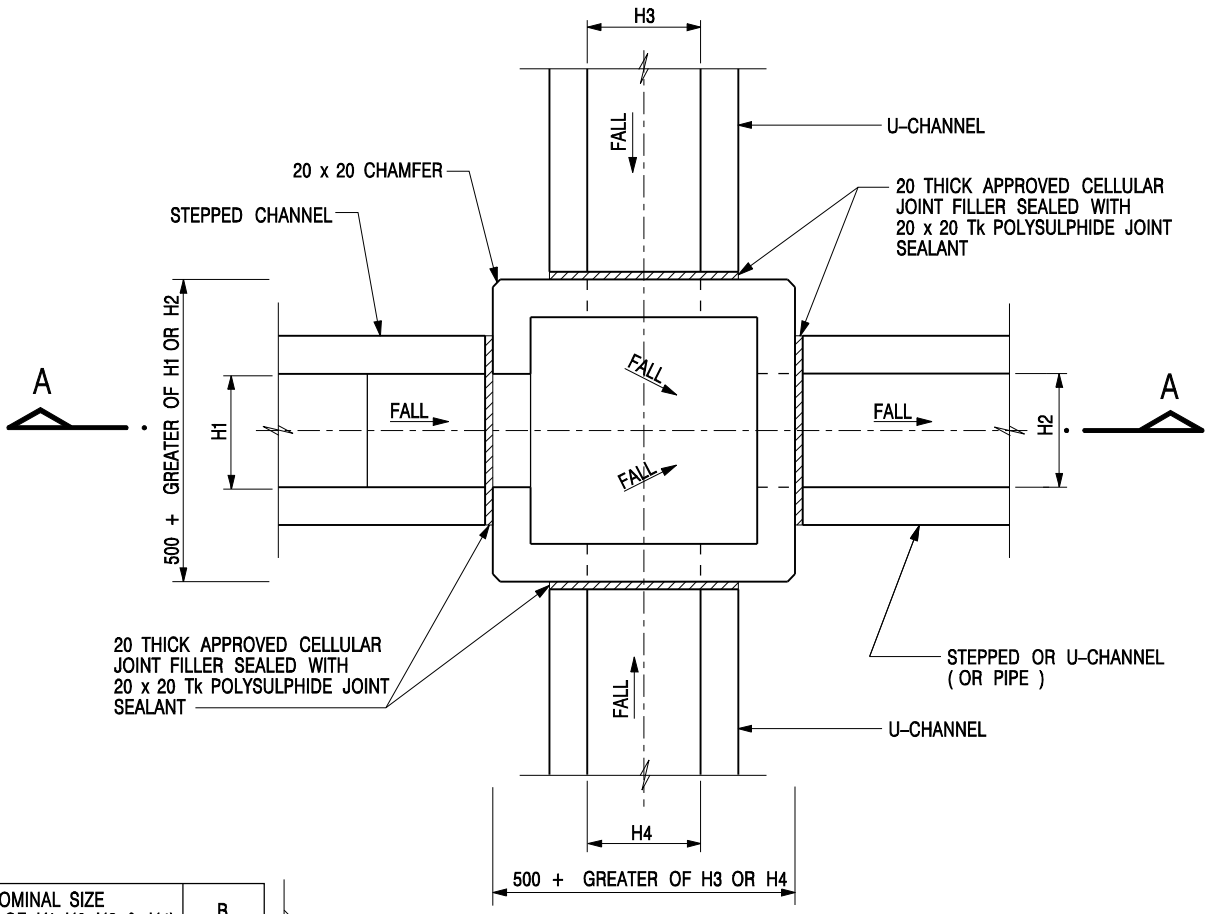
Photo 018

Photo 019

Photo 020

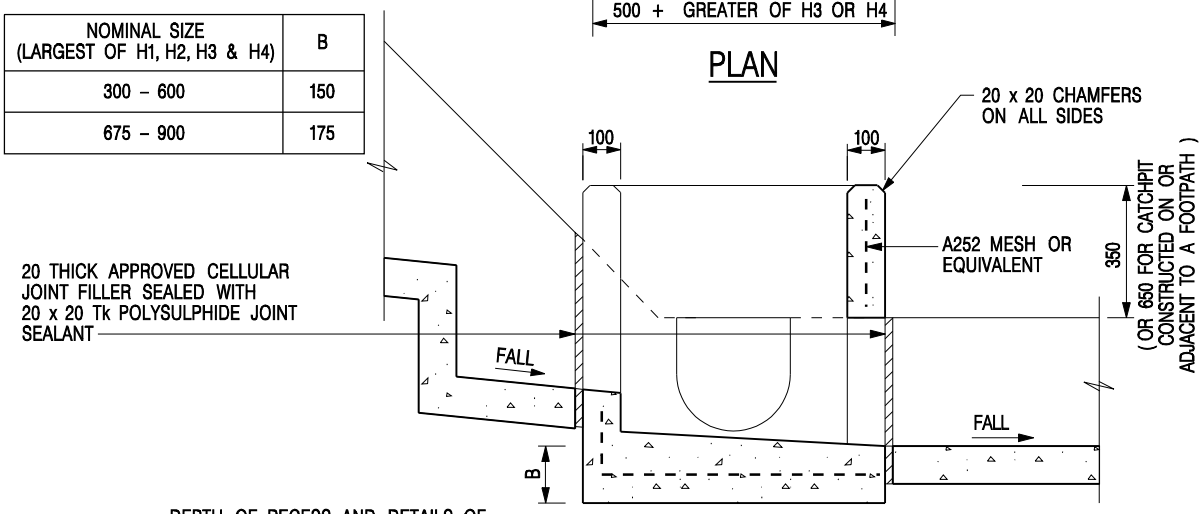
Appendix II: Typical Standard Drawings of Catchpit with Cover and Catchpit with Sand Trap

(Extracted from CEDD, for reference only)

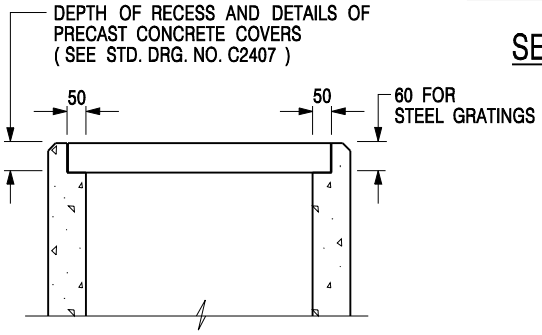


PLAN

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 5 FOR OTHER NOTES.

ALTERNATIVE TOP SECTION FOR PRECAST CONCRETE COVERS / GRATINGS

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

STANDARD CATCHPIT DETAILS

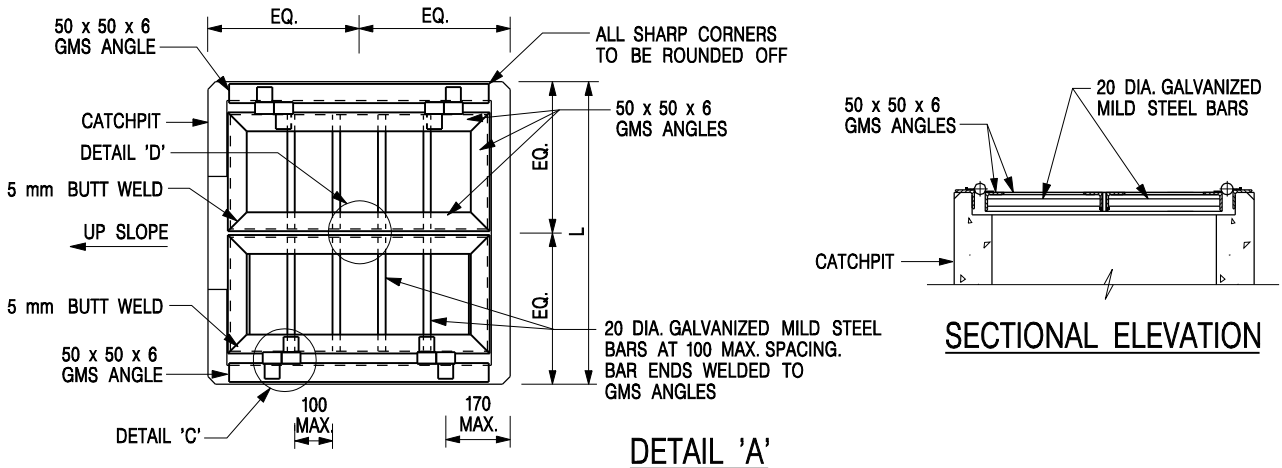
(SHEET 1 OF 5)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE	1 : 20	DRAWING NO.
DATE	JAN 1991	C2405 /1

卓越工程 建設香港

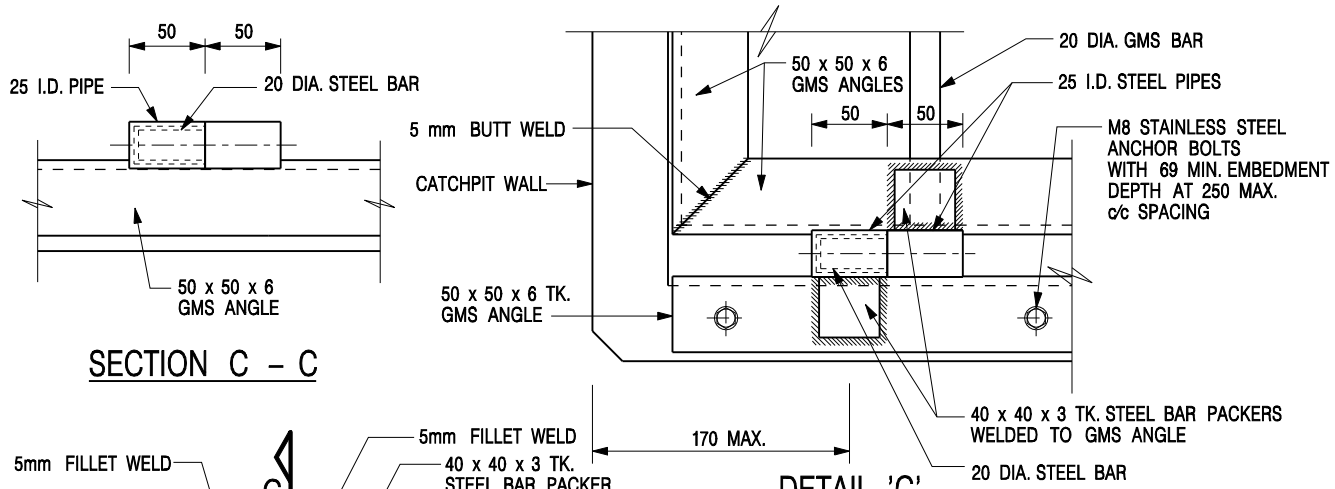
We Engineer Hong Kong's Development



DETAIL 'A'

(DETAILS OF DOUBLE SIDE OPENING STEEL GRATING FOR L>900mm)

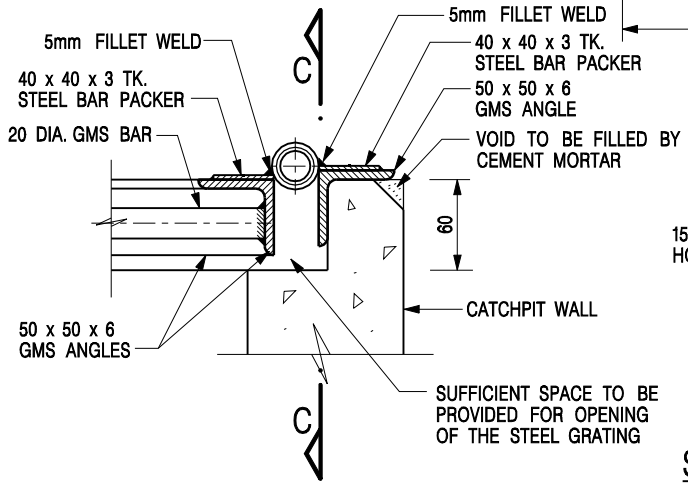
SCALE 1 : 20



DETAIL 'C'

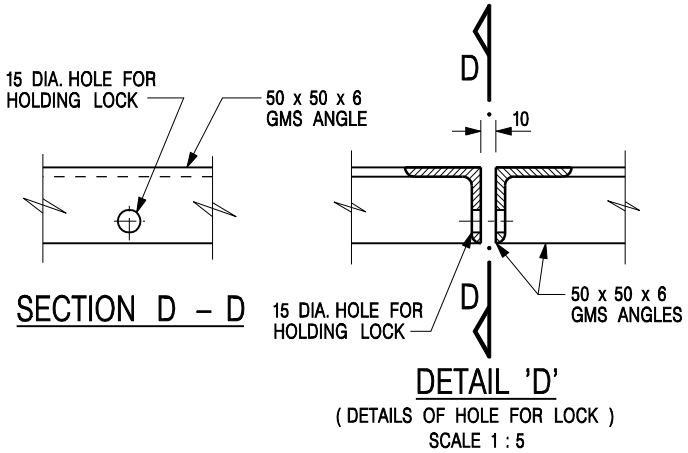
(DETAILS OF HINGE)

SCALE 1 : 5



SECTIONAL ELEVATION

(DETAIL 'C')



DETAIL 'D'

(DETAILS OF HOLE FOR LOCK)

SCALE 1 : 5

NOTES:

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

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

STANDARD CATCHPIT DETAILS

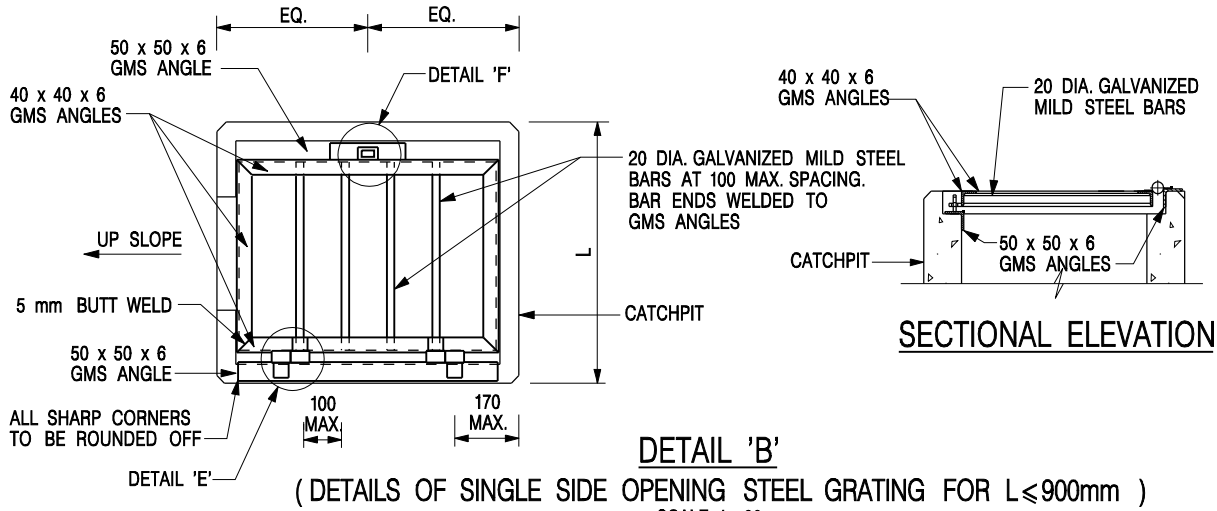
(SHEET 2 OF 5)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE AS SHOWN

DATE JAN 1991

DRAWING NO. C2405 /2

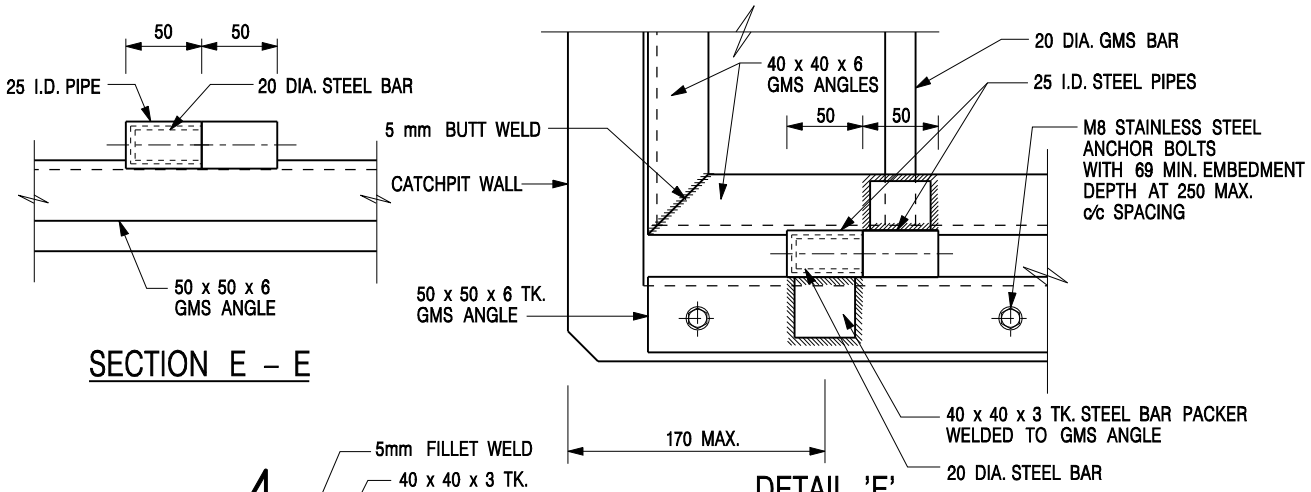


SECTIONAL ELEVATION

DETAIL 'B'

(DETAILS OF SINGLE SIDE OPENING STEEL GRATING FOR L≤900mm)

SCALE 1 : 20



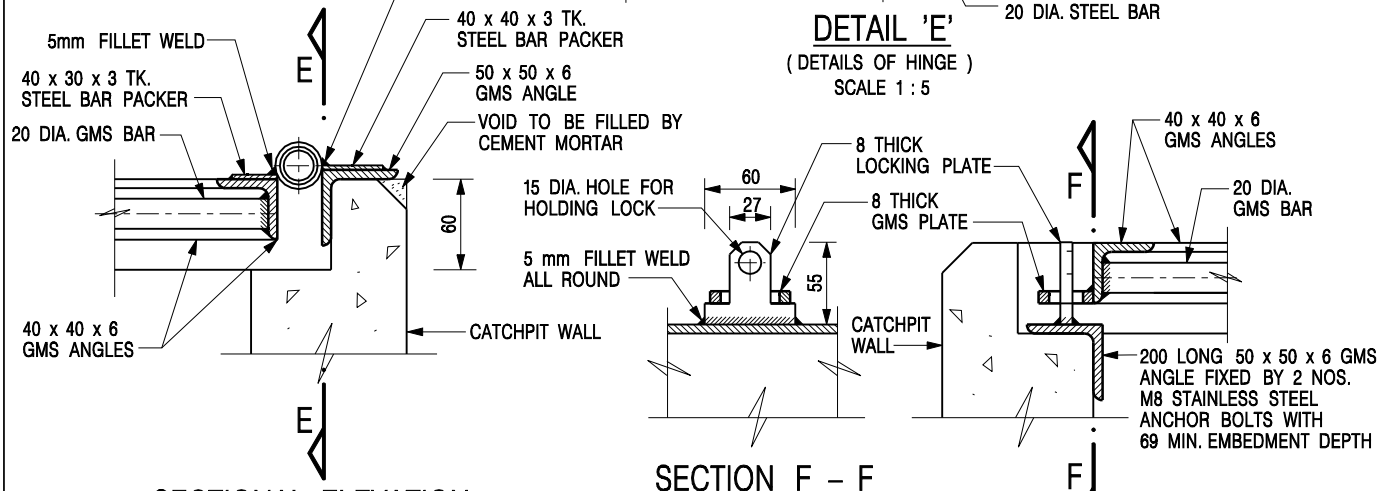
SECTION E – E

170 MAX.

DETAIL 'E'

(DETAILS OF HINGE)

SCALE 1 : 5



SECTIONAL ELEVATION

(DETAIL 'E')

SECTION F – F

DETAIL 'F'

(DETAILS OF LOCKING PLATE)

SCALE 1 : 5

NOTES:

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

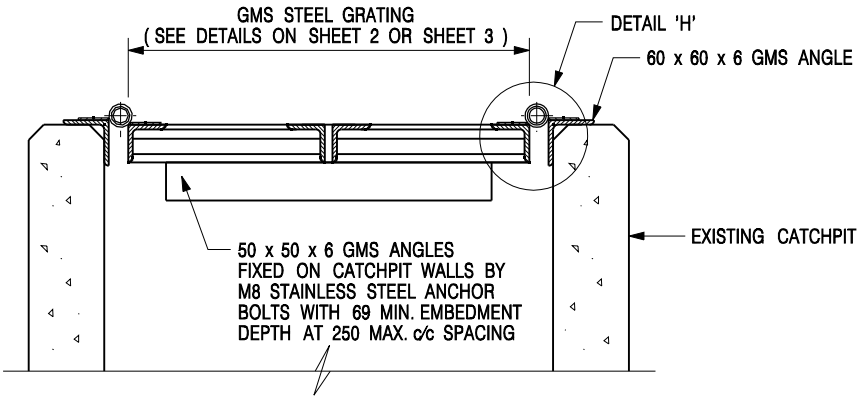
REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

STANDARD CATCHPIT DETAILS

(SHEET 3 OF 5)

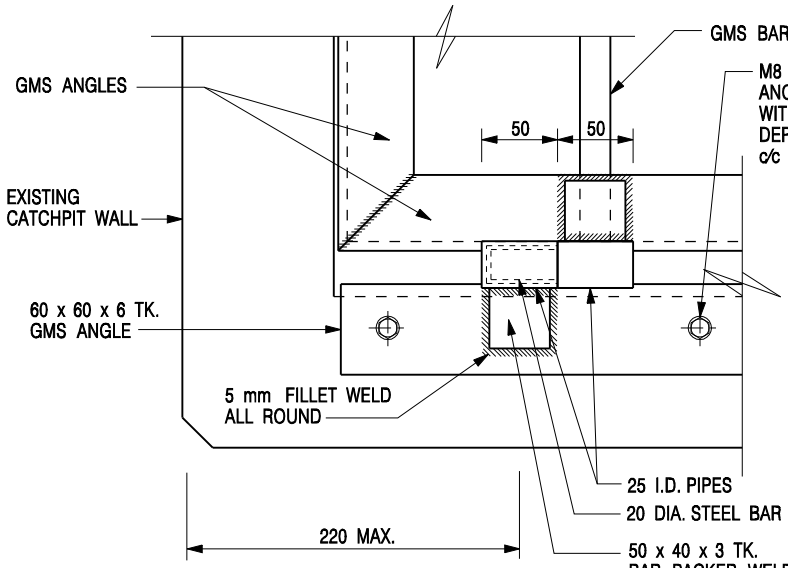
CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE	AS SHOWN	DRAWING NO.
DATE	JAN 1991	C2405 /3



DETAIL 'G' – DETAILS OF STEEL GRATING CONSTRUCTED ON EXISTING CATCHPIT

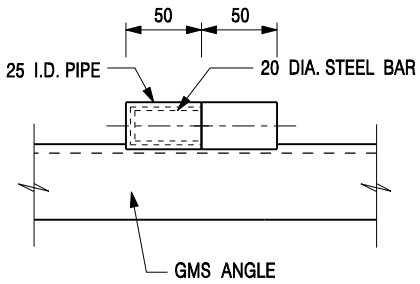
SCALE 1 : 10



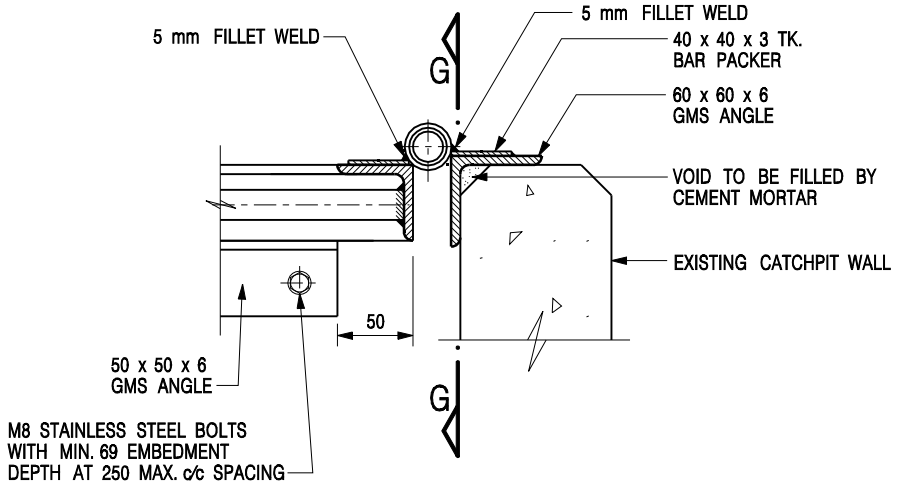
DETAIL 'H'

(DETAILS OF HINGE)

SCALE 1 : 5



SECTION G – G



SECTIONAL ELEVATION

(DETAIL 'H')

NOTES:

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

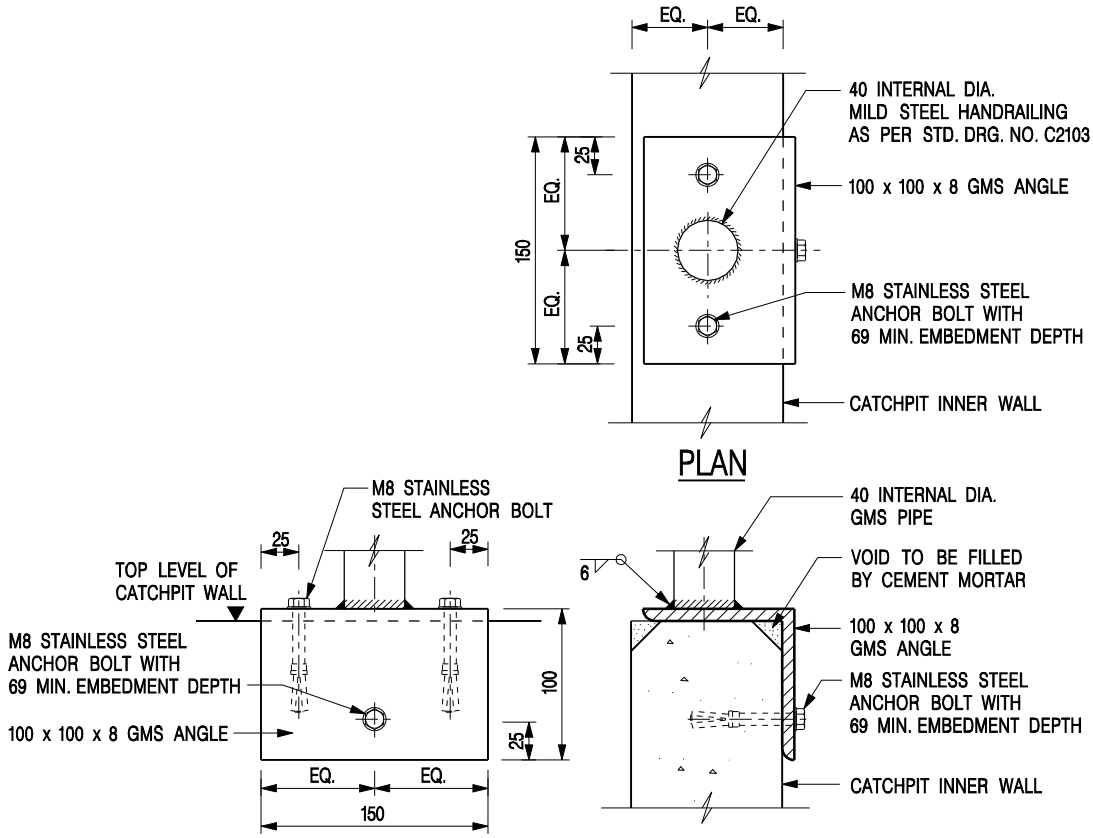
REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

STANDARD CATCHPIT DETAILS

(SHEET 4 OF 5)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE	AS SHOWN	DRAWING NO.
DATE	JAN 1991	C2405 /4



DETAIL 'J' – FIXING DETAILS FOR HANDRAILING ON TOP OF CATCHPIT WALL

SCALE 1 : 5

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. FOR CATCHPITS CONSTRUCTED ON OR ADJACENT TO A FOOTPATH, STEEL GRATINGS (SEE DETAILS ON SHEET 2 OR SHEET 3) OR CONCRETE COVERS (SEE STD. DRG. NO. C2407) SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER.
7. IF INSTRUCTED BY THE ENGINEER, HANDRAILING (SEE DETAIL 'J' ON SHEET 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.
8. 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 mm c/c STAGGERED SHALL BE PROVIDED. THICKNESS OF CATCHPIT WALL FOR INSTALLATION OF STEP IRONS SHALL BE INCREASED TO 150 mm.
9. FOR RETROFITTING AN EXISTING CATCHPIT WITH STEEL GRATING, SEE DETAIL 'G' ON SHEET 4.
10. ALL STEEL ANGLES SHALL COMPLY WITH BS EN 10025 AND BS EN 10056.
11. UNLESS OTHERWISE SPECIFIED, ALL WELDS SHALL BE 5 mm CONTINUOUS FILLET WELDS.
12. ALL WELDS SHALL BE CHIPPED, GROUND SMOOTH, BRUSHED TO REMOVE SLAG PRIOR TO HOT-DIP GALVANIZATION.
13. ALL STEELWORK SHALL BE HOT-DIP GALVANIZED TO BS EN ISO 1461. ALL EXPOSED STEELWORK SURFACES SHALL BE TREATED AND PAINTED IN ACCORDANCE WITH THE GENERAL SPECIFICATION.
14. SUBJECT TO THE APPROVAL OF THE ENGINEER, OTHER MATERIALS CAN ALSO BE USED AS COVERS / GRATINGS.

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2405J.	Original Signed	03.2015

STANDARD CATCHPIT DETAILS

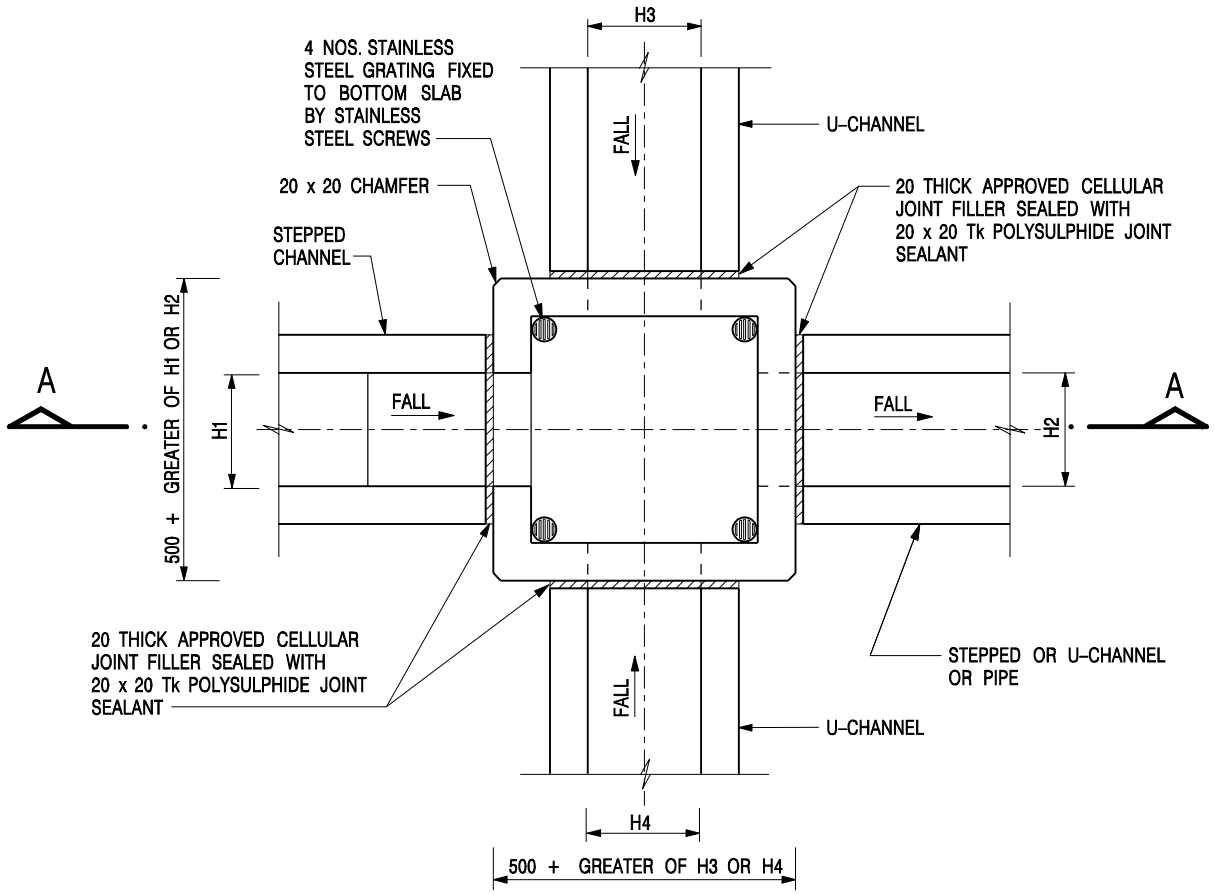
(SHEET 5 OF 5)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE AS SHOWN

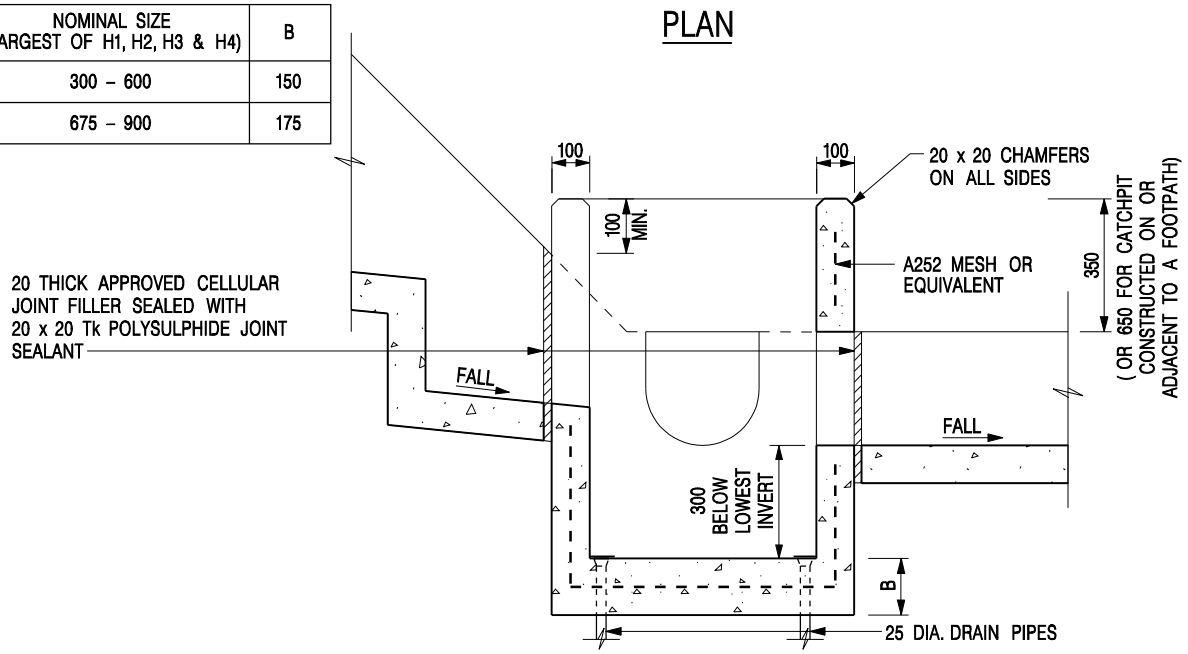
DATE JAN 1991

DRAWING NO. C2405 /5



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

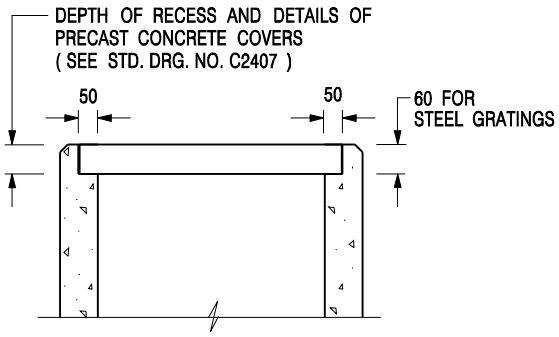
(SHEET 1 OF 2)

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)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

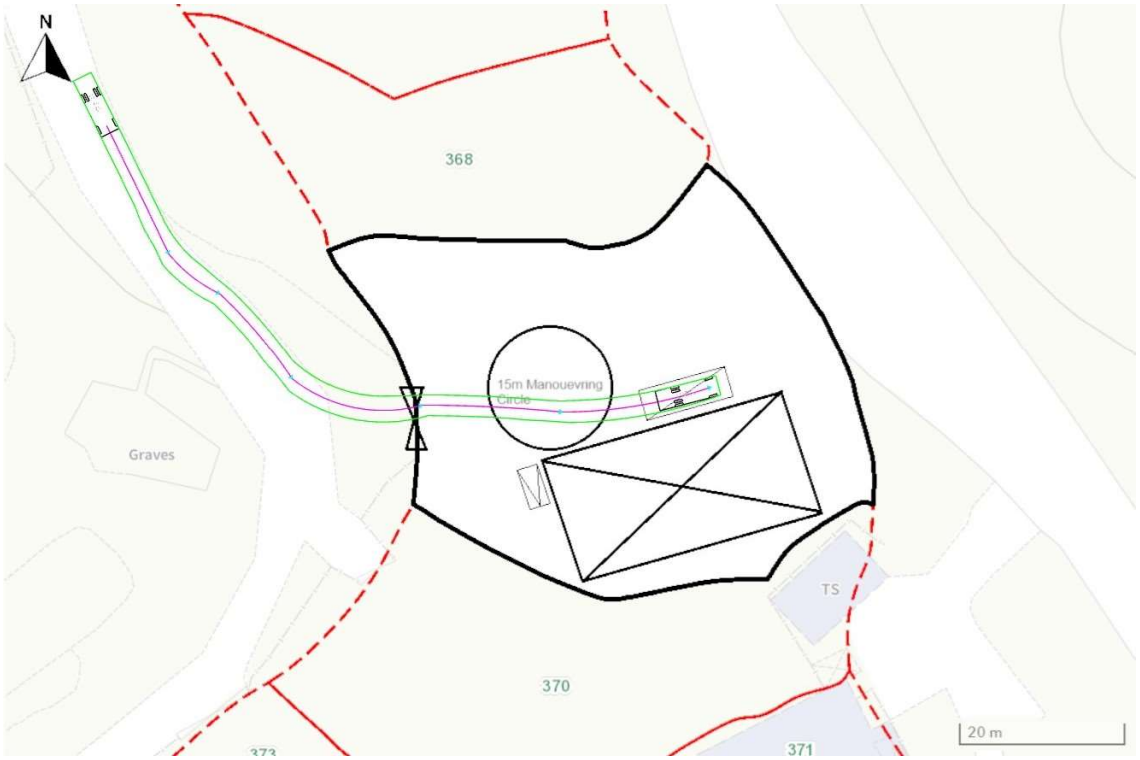
SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /2A

Appendix III: Swept Path Analysis

Swept Path: In



Swept Path: Out