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By Email and Post

Date : 1 June 2026
Your Ref : TPB/A/NE-TKLN/124
Our Ref. : LDS/PLAN/7252

Secretary
Town Planning Board
15/F, North Point Government Offices
333 Java Road
North Point, Hong Kong

Dear Sir/Madam,


Application for Planning Permission for Proposed Temporary Green Fuel Station for Electric Private Vehicles with Ancillary Facilities for a Period of 3 Years at Lots 1343RP(Part), 1356RP in D.D. 78 and Adjoining Government Land, Lin Chuk Road, Ta Kwu Ling North, N.T.

(Application No. A/NE-TKLN/124)

We refer to the captioned application and herewith submit our responses to departmental comments in **Table 1** and a Drainage Proposal for your consideration.

Should there be any queries, please contact our Ms. Cannis Lee or Ms. Yancy Fung at [REDACTED]

Yours faithfully,
For and on behalf of
Lawson David & Sung Surveyors Limited

Encl.

c.c. DPO/STN (Attn: Timothy WU) – By Email
Client

Table 1: Responses to Comments from Government Departments on Planning Application No. A/NE-TKLN/124 (1 June, 2026)

| COMMENTS | | RESPONSES |
|-----------|---|--|
| 1. | Lands Department | |
| (1) | <p>My comments/observations based on the applicant's information are as follow:</p> <p>The application site comprises Government Land (GL) and Old Schedule Agricultural Lots held under the Block Government Lease which contain the restriction that no structures are allowed to be erected without the prior approval of the Government. The proposed ingress/egress of the application site is required to pass through GL but no right of access via GL is granted to the application site.</p> | Noted. |
| (2) | No consent is given for inclusion of GL (about 85m ²) as mentioned in the application form in the application site. | The Applicant will apply for a Short Term Tenancy for the proposed occupation of GL upon approval of this application. |
| (3) | <p>I must point out that the following irregularities covered by the subject planning application have been detected by this office:</p> <p><u>Unauthorized structures within Lot No. 1356RP in D.D. 78 covered by the planning application.</u></p> <p>LandsD has reservation on the planning application since there are unauthorized structures on Lot No. 1356RP in D.D.78 which are already subject to lease enforcement actions</p> | The unauthorized structures within Lot No. 1356 RP in D.D.78 will be demolished by the Applicant. |

| COMMENTS | | RESPONSES |
|----------|---|--|
| | <p>according to case priority. The lot owner(s) should rectify/regularize the lease breaches as demanded by LandsD.</p> | |
| | <p><u>Unlawful occupation of Government land adjoining Lot Nos. 1343S.B and S.C in D.D. 78 covered by the planning application</u></p> <p>Part of the Government land within the application site has been fenced off and illegally occupied with unauthorized structure without any permission. Any occupation of GL without Government's prior approval is an offence under Cap. 28. This office reserves the rights to take necessary land control action against the illegal occupation of Government land without further notice. Besides, part of a footpath on GL is included in the application site which is not acceptable.</p> | <p>The Applicant will apply for a Short Term Tenancy for the proposed occupation of GL upon approval of this application. The existing footpath on GL leads from the private lot (Lot 1343RP in DD78). As the footpath on private land will no longer be used, the footpath on GL is also redundant.</p> |
| 4. | <p>If the planning application is approved, the lot owners shall apply to this office for a Short Term Waiver (STW) and Short Term Tenancy (STT) to permit the structures erected within the said private lots and the occupation of the Government land. The application(s) for STW and STT will be considered by the Government in its capacity as a landlord and there is no guarantee that they will be approved. The STW, if approved, will be on whole lot basis and the STW/STT, if approved, will be subject to such terms and conditions</p> | <p>Noted.</p> |

| COMMENTS | | RESPONSES |
|--|---|---|
| | including the payment of back-dated waiver fee/rent from the date when the GL was first enclosed/the unauthorized structure on private lots were first detected and administrative fee as considered appropriate by LandsD. Besides, given the proposed use is temporary in nature, only erection of temporary structure(s) will be considered. | |
| 2. Drainage Services Department | | |
| (1) | It appears that a pond and a drainage channel situated within the site would be filled/adversely affected by the proposed use. Unless the applicant can submit a satisfactory drainage proposal to mitigate the possible drainage impacts arising from the proposed use to my satisfaction, I do not support the application. | The Applicant's consultant has prepared a Drainage Proposal (see Annex 1) for consideration by DSD. |
| 3. Environment and Ecology Bureau (EEB) | | |
| (1) | APD/EEB has no adverse comment from EV charging policy perspective on the application provided that relevant statutory requirements and procedures (such as land lease, traffic and safety requirements) are fulfilled; | Noted. |
| (2) | the Government announced the Green Transformation Roadmap of Public Buses and Taxis in December 2024, including measures to realise the target of introducing about 3,000 electric taxis by end-2027. A comprehensive fast | Fast chargers with an output power of 100kW will be installed at the Application Site to serve electric private vehicles (including electric taxis). The Application Site will not serve electric light goods vehicles. |

| COMMENTS | | RESPONSES |
|----------|---|---|
| | <p>charging network is needed to effectively support the operations of electric taxis and achieve the aforesaid target. In addition, the Government announced the Updated Version of the Hong Kong Roadmap on Popularisation of Electric Vehicles in February 2026, which states that the Government will leverage market forces in the future to build a public charging network with fast chargers as the backbone. In this connection, EEB recommends that the applicant consider installing some fast chargers with a rated output power of 100kW or higher at the subject site and open up a certain number of charging spaces for electric commercial vehicles for use, e.g. electric taxis, electric light goods vehicles;</p> | |
| (3) | <p>the applicant is also suggested to consider arranging some of the chargers to also be compatible with Guobiao charging standard to support southbound vehicles; and</p> | <p>The Applicant will consider this suggestion.</p> |
| (4) | <p>it is recommended that the applicant provides charger information, including the real-time availability data of each charger, through government-designated mobile applications such as “HKeMobility” of the Transport Department. For any queries, please contact the Environmental Protection Department’s EV Hotline at 3757 6222 or email to ev@epd.gov.hk.</p> | <p>Noted.</p> |

| COMMENTS | | RESPONSES |
|-----------|---|---|
| 4. | Transport Department (TD) | |
| (1) | The applicant should advise and substantiate the traffic flow generation from and attraction to the subject site and the traffic impact to the nearby road links and junctions; | <p><u>Traffic Count Survey</u></p> <p>Traffic count surveys are conducted at Lin Ma Hang Road on 28 May 2026 (Thursday) during 08:00 – 10:00 and 17:00 – 19:00. The identified weekday AM and PM peak hours are 09:00 – 10:00 and 17:30 – 18:30, respectively.</p> <p>The survey results are summarized in Table A.</p> <p><u>Traffic Generation and Attraction</u></p> <p>The estimated traffic generation and attraction for proposed development during the peak operation hour will be a two-way traffic of 22 vehicles (22 Nos. of vehicles = 22 EV charging stations because of 45-60 minutes charging/servicing time for each vehicle).</p> <p><u>Traffic Assessment</u></p> <p>Based on the above, the road link capacity assessment is carried out and the results are shown in the attached Table A.</p> <p>The results show that the concerned road links are operating with spare capacities during peak hours after accommodating the traffic induced by the proposed development.</p> |
| (2) | The applicant shall advise the provision of pedestrian facilities and management measures to ensure pedestrian safety; | Revolving lanterns will be provided at both sides of the vehicular access to warn the pedestrians when there is a vehicle exiting from the proposed development. |
| (3) | The applicant shall advise the management/control measures to be implemented to ensure no queuing of vehicles outside the subject site; | Waiting spaces are provided and a management staff will be stationed at the entrance to advise the drivers not to queue up outside the subject site when the EV charging facilities are full. |
| (4) | The applicant shall advise the measures for preventing illegal | All visitors must call to reserve a space in advance. If a particular timeslot |

| COMMENTS | | RESPONSES |
|----------|---|--|
| | parking of visitors' vehicles outside the subject site; and | of the car parking spaces is full, they will be informed to reserve other timeslots. |
| (5) | The proposed vehicular access road between Lin Chuk Road and the subject site is not managed by TD. The applicant should seek comments/approvals from the responsible parties to validate the feasibility to form the proposed vehicular access road. | Noted. The Applicant would seek comments from the responsible party. |

Table A Road Link Capacity Assessment

| Junction | | Capacity (veh/hr) ⁽¹⁾ | Peak Hour Traffic Flow (veh/hr) [volume/capacity ratio] | | | |
|--|------------|----------------------------------|--|------------|--------------------------------------|------------|
| | | | <u>Without</u> the proposed development | | <u>With</u> the proposed development | |
| | | | AM Peak | PM Peak | AM Peak | PM Peak |
| Lin Ma Hang Road (north of Lin Chuk Road) | northbound | 400 | 95 [0.24] | 96 [0.24] | 106 [0.27] | 107 [0.27] |
| | southbound | 400 | 180 [0.45] | 181 [0.45] | 191 [0.48] | 192 [0.48] |
| Lin Ma Hang Road (south of Lin Chuk Road) | northbound | 400 | 102 [0.26] | 103 [0.26] | 113 [0.28] | 114 [0.29] |
| | southbound | 400 | 183 [0.46] | 184 [0.46] | 194 [0.49] | 195 [0.49] |

Note: (1) According to the TPDM Vol 2, Section 2.4, the capacity for 2-lane single carriageway is 800 veh/hr, 2-way.

| COMMENTS | | RESPONSES |
|-----------|--|---|
| 5. | Planning Department | |
| (1) | It is noted that a total of 25 parking spaces are proposed, in which 22 of them will be fee-paying parking spaces with EV charging devices equipped. Please advise the nature of the land use, including whether the main use of the Site is for public vehicle park with ancillary EV charging service. | The proposed use is temporary green fuel station for charging of electric private vehicles. |
| (2) | If the proposed use is for temporary green fuel station, please also advise the operation details including whether non-EV vehicles (except the one for staff) will be allowed to be entered the Site, measures on handling overtime parking/charging. | Only EVs (except for staff use) are permitted to enter the Application Site for charging purposes. On-site staff will ask drivers to leave promptly after charging. Additional charges apply for overtime parking/charging. |

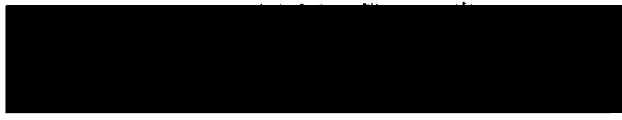
Drainage Proposal in support of
Planning Application No. A/NE-TKLN/124
for Temporary Green Fuel Station for Electric Private Vehicles with
Ancillary Facilities for a Period of 3 Years
at Lots 1343 RP (Part), 1356 RP in D.D. 78
and Adjoining Government Land, Lin Chuk Road, Ta Kwu Ling North,
New Territories

(HT26049)

May 2026

Drainage Consultant:

何田顧問工程師有限公司
HO TIN & ASSOCIATES
CONSULTING ENGINEERS LIMITED



| | | |
|------------------------|--|--|
| Prepared & approved by | LEE Kwok Cheung <i>RPE(Civil)</i> (Registration No. RP0159301) | |
|------------------------|--|--|

1. Background

With respect to Planning Application No. A/NE-TKLN/124 for a Temporary Green Fuel Station for Electric Private Vehicles with Ancillary Facilities for a Period of 3 Years at Lots 1343 RP (Part), 1356 RP in D.D. 78 and Adjoining Government Land, Lin Chuk Road, Ta Kwu Ling North, New Territories, Ho Tin & Associates Consulting Engineers Limited was appointed to prepare a drainage proposal.

2. The Subject Site and Proposed Development

- 2.1 The subject site with a total site area of about 2,582m² comprises of Lots 1343 RP (Part), 1356 RP in D.D. 78 and adjoining Government land, Lin Chuk Road, Ta Kwu Ling North, New Territories. It is located at the east side of Heung Yuen Wai Highway, south side of Lin Chuk Road, and at about 100 meters to the south of the junction of Lin Ma Hang Road and Lin Chuk Road. A Site Location Plan is shown in **Figure D1**.
- 2.2 The subject proposed development consists of a Transformer Room and Switch Room, a Site Office, a Washroom, 2 waiting spaces for private vehicles, 1 parking space for staff, and 22 charging spaces with an open-sided shelter for private vehicles. A Layout Plan is shown in **Figure D2**.

3. Existing Drainage Conditions of the Subject Site

- 3.1 At present, the subject site is a piece of flat grassland with ground levels ranging between +9.9mPD and +10.83mPD. It generally slopes from its eastern to its western boundary (refer to **Photo Nos. 1 and 2**). There is an existing gully running across the northern portion of the subject site from the eastern to the western boundary. The gully receives flow from the drainage ditch of the adjacent farmland to its east (refer to **Photo Nos. 3 and 4**), and discharges its flow into an existing stormwater inlet under the elevated Heung Yuen Wai Highway from which the flow will pass through twin 900mm diameter drains and go to the west (refer to **Photo Nos. 5 and 6**).
- 3.2 Besides, there is an existing streamcourse running from the east to the west close to the southern boundary of the subject site (i.e. without crossing the subject site). The existing streamcourse conveys significant portion of the surface runoff of the concerned area to the east of the subject site to an existing stormwater inlet under the elevated

Heung Yuen Wai Highway and from which via twin 900mm diameter drains to the further west of the area (refer to **Photo Nos. 7 and 8**).

3.3 Current conditions of the subject site and its surrounding areas are shown in the following photos (photo taking locations are shown in **Figure D3**):



Photo No. 1 – The northern part of the subject site



Photo No. 2 – The southern part of the subject site



Photo No. 3 – Existing gully receives flow from the drainage ditch of the adjacent farmland and runs across the northern portion of the subject site from the eastern to the western boundary (bird's eye view)



Photo No. 4 – Existing gully receives flow from the drainage ditch of the adjacent farmland and runs across the northern portion of the subject site from the eastern to the western boundary (close-up of the intersection between the drainage ditch of the adjacent farmland and the existing gully)



Photo No. 5 – Existing stormwater inlet under the elevated Heung Yuen Wai Highway from which the flow will pass through twin 900mm diameter drains and go to the west



Photo No. 6 – View toward the downstream of the existing stormwater inlet under the elevated Heung Yuen Wai Highway



Photo No. 7 – Existing streamcourse running from the east to the west close to the southern boundary of the subject site



Photo No. 8 – Existing streamcourse and stormwater inlet close to the southern boundary of the subject site under the elevated Heung Yuen Wai Highway from which the flow will pass through twin 900mm diameter drains and go to the west

4. Potential Drainage Impact and proposed drainage works

- 4.1 No significant site formation works is proposed. Filling of land of not exceeding 0.2m with concrete for forming hard surface is proposed. There is no change in the flowing directions nor obstruction of the existing flows of the concerned area.
- 4.2 Peripheral channels are proposed at the subject site to intercept overland flows across the subject site boundary. Besides, in order to ensure no surface runoff from the surroundings flowing towards the subject site, if occurs, being obstructed, 100mm high gap will be formed at the bottom of solid security hoarding/fence, when erected, along the subject site boundary. A Proposed Stormwater Drainage Layout Plan is shown in **Figure D4**.
- 4.4 The Applicant is committed to obtain consents from relevant Government departments and/or owners of adjacent relevant land/lots prior to commencement of the proposed drainage works outside the subject site and to maintain regularly whether within or outside the subject site at his own expense to avoid blockage of the drainage system to the satisfaction of relevant Government departments.
- 4.5 Details of proposed drainage provisions shall follow relevant details shown in Government departments' Standard Drawings as follows:

| <i>Proposed Drainage Provisions</i> | <i>Standard Drawings</i> | <i>Drawing No. & Title</i> |
|-------------------------------------|--------------------------|--|
| Catchpit | CEDD Standard Drawings | C 2405/1 to /5 – Standard Catchpit Details |
| Catchpit with trap | | C 2406/1 to /2A – Catchpit with Trap |
| Catchpit precast concrete cover | | C 2407B – Precast Concrete Covers for Catchpit and Sand Trap |
| U-channel | | C 2409J – Details of Half-round and U-channels |
| Channel cover | | C 2412E – Cover Slab and Cast Iron Grating for Channels |

5. Hydraulic Calculation

- 5.1 Assessment criteria is based on the recommendation set out in the Stormwater Drainage Manual (Fifth edition, Jan 2018) (SDM) and its Corrigendum No. 1/2022, 1/2024 and 2/2024 issued by DSD. Design Return Period of 50 years (recommended for ‘Main Rural Catchment Drainage Channel’ in SDM) is adopted.
- 5.2 The corresponding runoffs under rainfall intensity for various return period are worked out with reference to Rational Method. Brandy-Williams method is used in calculation of the time of concentration. A uniformly distributed rainfall with an intensity is determined by the Intensity-Duration-Frequency. With reference to Table 3d - Storm Constants for different return periods of North District Area from SDM (Corrigendum No. 1/2024 (26 March 2024)), the rainfall profiles are derived based on the following equation:

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

- where i = mean rainfall intensity (mm/hr)
t = duration time of concentration (min)
a, b and c = storm constants given in Table below

Table : Storm Constants

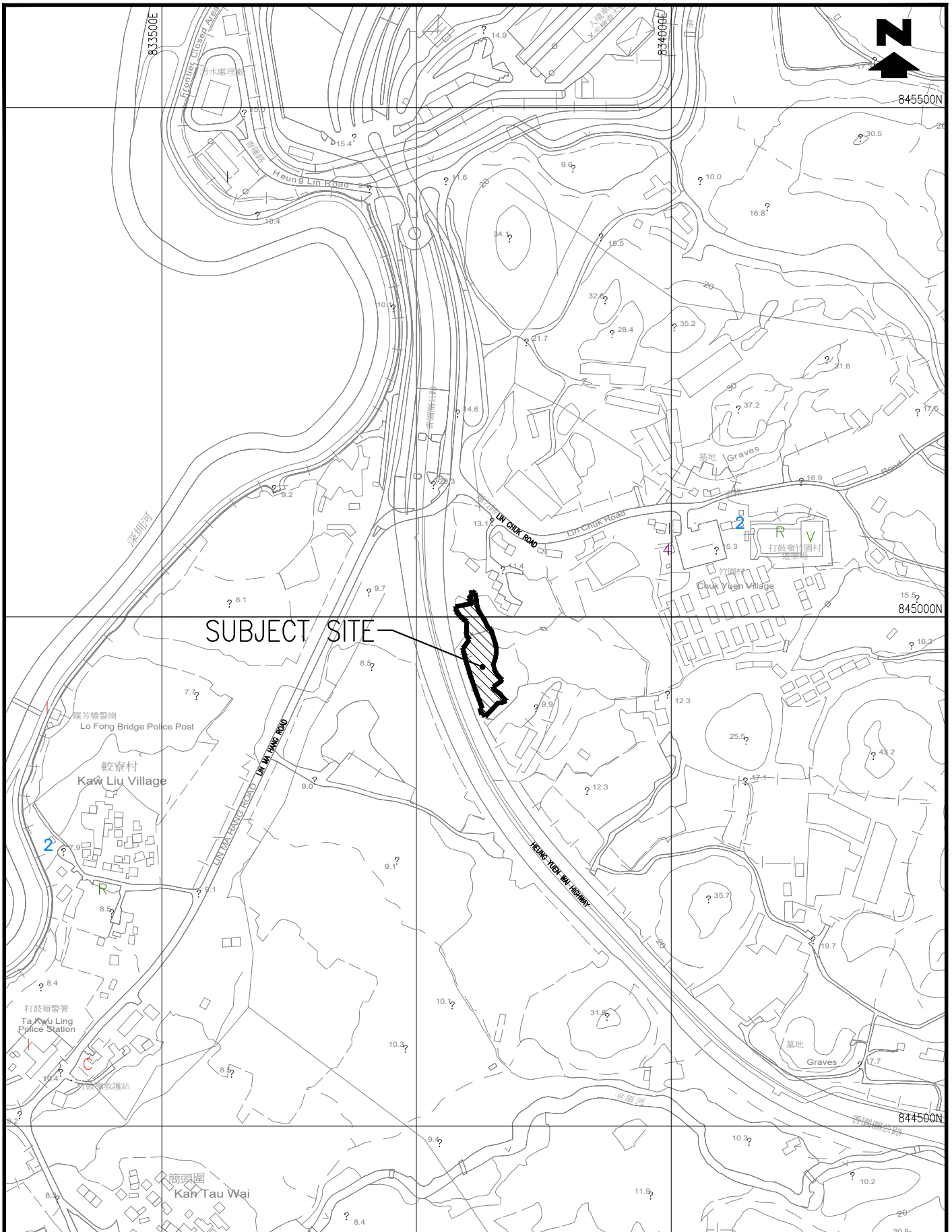
| Return Period (years) | 50 |
|-----------------------|-------|
| a | 474.6 |
| b | 2.90 |
| c | 0.371 |

A 16.0% rainfall increase is adopted in the hydraulic calculation to cater for effects due to climate change in accordance with the table 28 with projection to End of 21st Century as stipulated in the item (e) and (k) of the SDM - Corrigendum No. 1/2022. Besides, taking into consideration of design allowance in End of 21st Century, a further 12.1% rainfall increase is incorporated into the hydraulic assessment.

- 5.3 Hydraulic assessment is enclosed in the **Appendix**. 10% reduction in flow area has been incorporated to cater for potential deposition of sediment in stormwater channels and pipes as recommended in the SDM. The proposed channels and underground drainage are designed to cater for the estimated runoff under the designed rainstorms. With respect to the calculation, the proposed stormwater drainage system is capable to cater for the surface runoff without causing any adverse drainage impacts on the Application Site and its surroundings.
- 5.4 Since all drainage would have sufficient spare capacity, no water backup will occur at the upstream under rainstorms of 50-year (or lower) return periods.

6. Conclusion and Recommendations

- 6.1 The subject proposed development is for a Temporary Green Fuel Station for Electric Vehicles with Ancillary Facilities for a Period of 3 Years at Various Lots 1343 RP (Part), 1356 RP in D.D 78 and adjoining Government land, Lin Chuk Road, Ta Kwu Ling North, New Territories. The existing site levels would only be slightly altered, i.e. filling of land of not exceeding 0.2m with concrete for forming a paving area is proposed.
- 6.2 The subject proposed development would not alter the existing drainage conditions and pattern of the area and the proposed drainage system would be maintained with appropriate drainage clearance and repair works, i.e. debris clearance and damage repair. The proposed internal drainage system will have only one discharge point (in the form of a catchpit with trap) discharging the flow into the existing stormwater inlet to its west. The subject proposed development is committed to obtain all necessary permits/consents from relevant public and/or private parties whenever necessary for carrying out the proposed drainage works outside the subject site boundary. Therefore, in conclusion, the subject proposed development would not cause any adverse drainage impact onto the area.



SUBJECT SITE

TITLE

SITE LOCATION PLAN

何田顧問工程師有限公司
HO TIN & ASSOCIATES
 CONSULTING ENGINEERS LIMITED

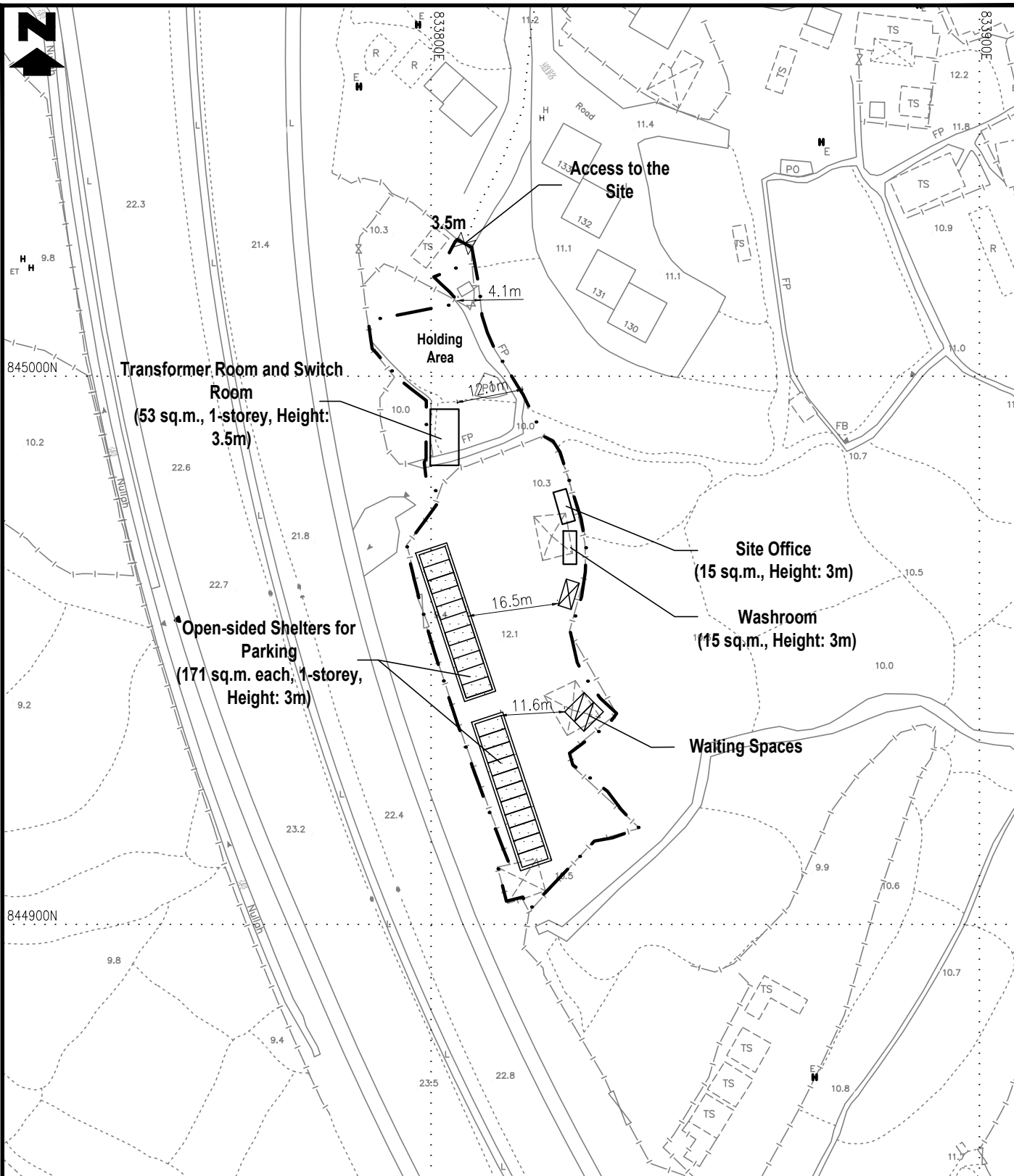
SCALE

1 : 5000 - A4

DRAWING No.

FIGURE D1

H:\26049_LinChukRoad\DRAWING\26049_FIGD1_00.dwg, 8/5/2026 11:49:35



Legend:

- Application Site (Area: about 2,582m²)
- Open-sided Shelters for Charging Spaces
- Charging Spaces for Private Vehicles (22 nos.) (2.5m x 5m)
- Waiting Spaces for Private Vehicles (2 nos.) (2.5m x 5m)
- Parking Space for Staff (1 no.) (2.5m x 5m)

TITLE

LAYOUT PLAN

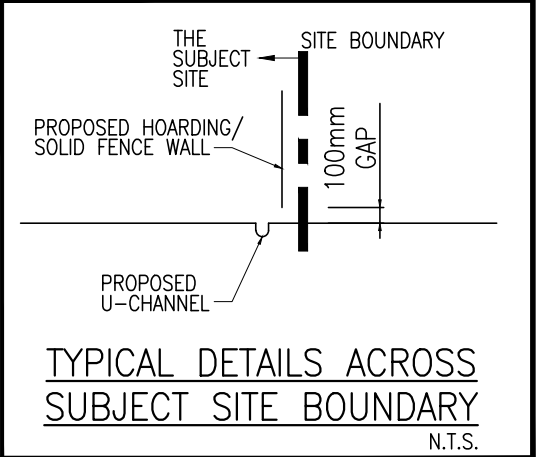
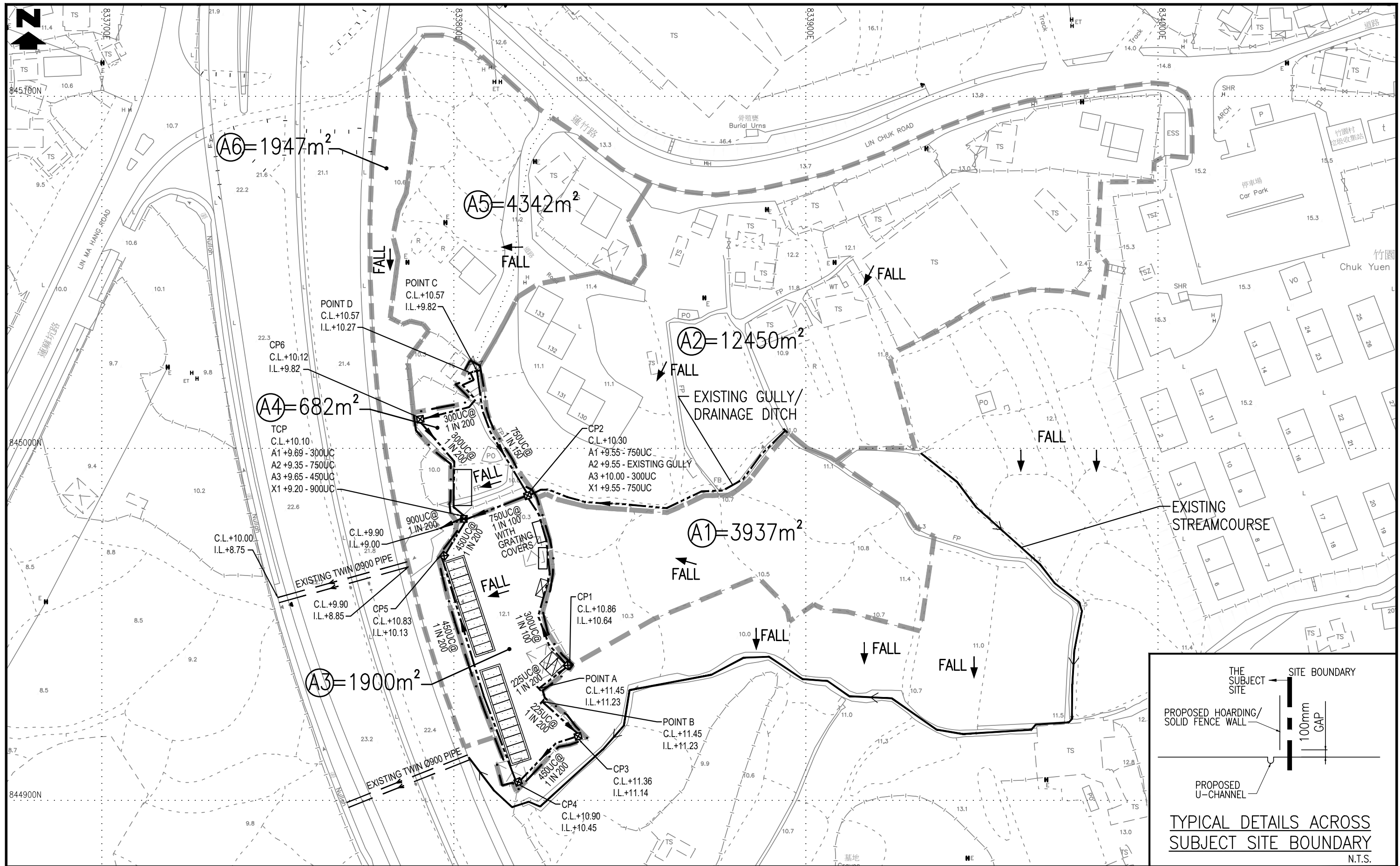
何田顧問工程師有限公司
HO TIN & ASSOCIATES
 CONSULTING ENGINEERS LIMITED

SCALE

1 : 1000 - A4

DRAWING No.

FIGURE D2

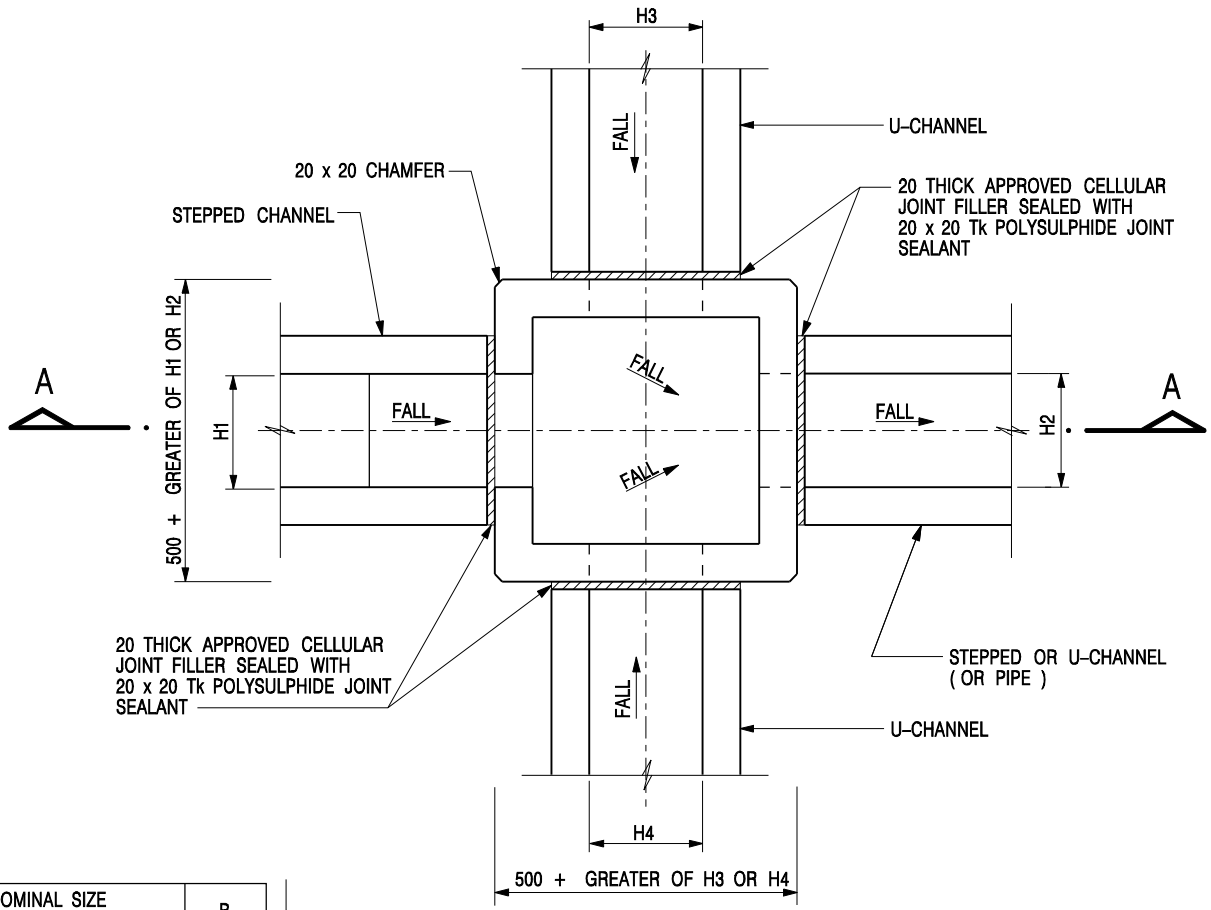


| | |
|---------------|--|
| LEGEND | |
| | SUBJECT SITE BOUNDARY |
| | PROPOSED U-CHANNEL |
| | PROPOSED CATCHPIT (CEDD STANDARD DRAWING NOS.C2405/1 TO /5) |
| | PROPOSED TERMINAL CATCHPIT WITH TRAP (CEDD STANDARD DRAWING NOS.C2406/1 TO /2A) |
| | CATCHMENT BOUNDARY |

| | |
|---------|--|
| PROJECT | |
| TITLE | PROPOSED STORMWATER DRAINAGE LAYOUT PLAN |

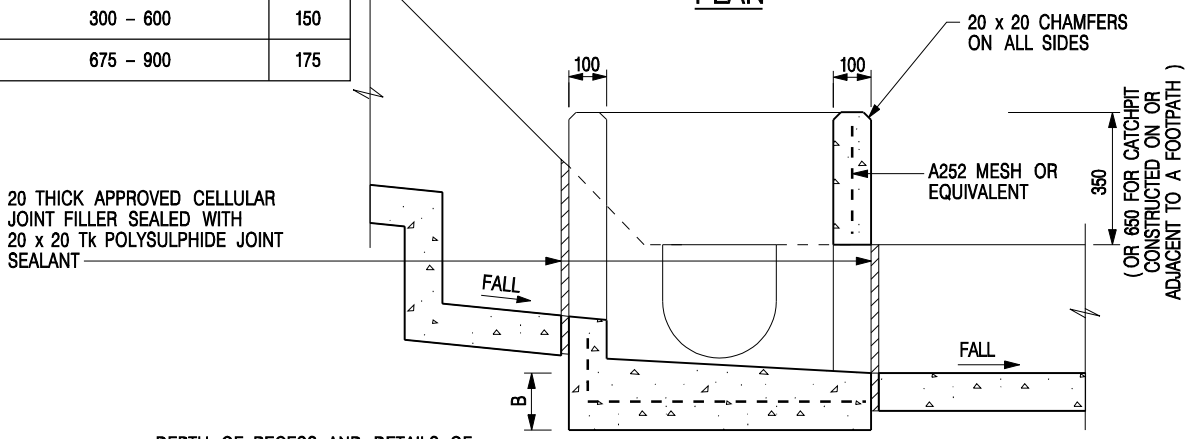
| | |
|---|-------------|
| 何田顧問工程師有限公司 HO TIN & ASSOCIATES CONSULTING ENGINEERS LIMITED | |
| SCALE | DRAWING No. |
| 1: 1000 - A3 | FIGURE D4 |

H:\26049_LinChukRoad\DRAWING\26049_FIGD2_00 FIGD3_00 FIGD4_00 & FIGD5_00.dwg, 19/15/2026 9:20:06

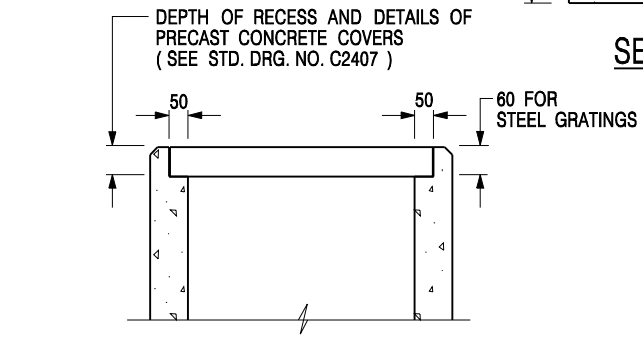


| | |
|--|-----|
| NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4) | B |
| 300 - 600 | 150 |
| 675 - 900 | 175 |

PLAN



SECTION A - A

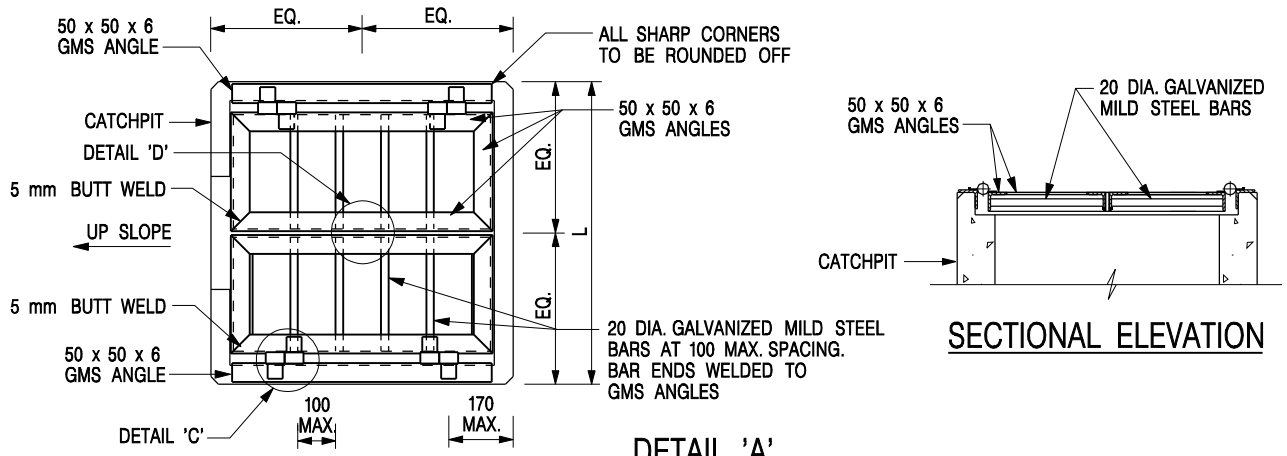


ALTERNATIVE TOP SECTION FOR
PRECAST CONCRETE COVERS / GRATINGS

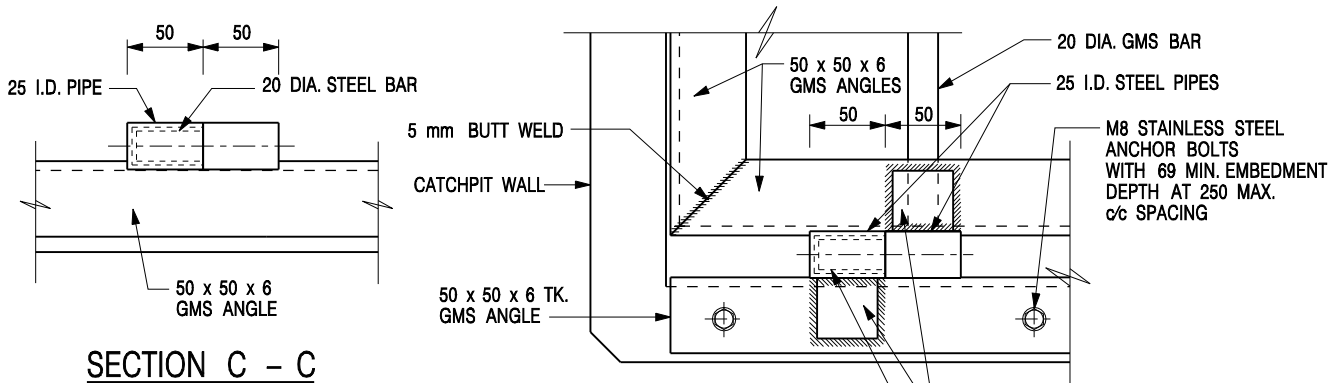
- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. REFER TO SHEET 5 FOR OTHER NOTES.

STANDARD CATCHPIT DETAILS
(SHEET 1 OF 5)

| | | | |
|---|-------------------------|------------------------------|---------|
| - | 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 / 1 | |

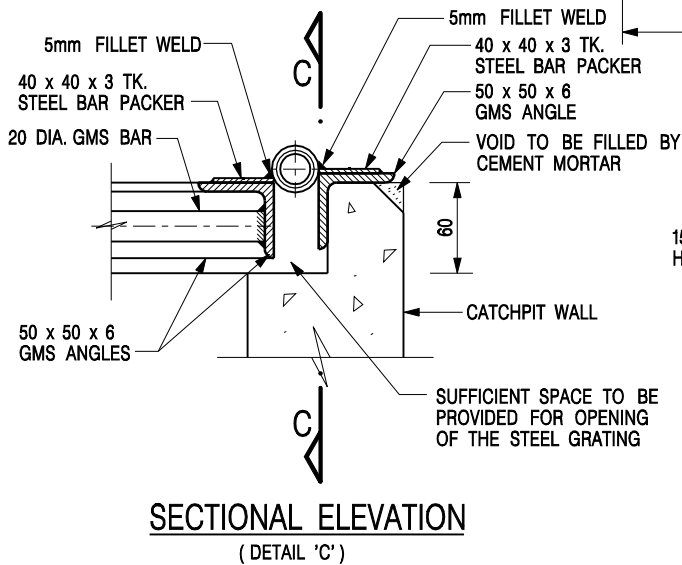


DETAIL 'A'
 (DETAILS OF DOUBLE SIDE OPENING STEEL GRATING FOR L > 900mm)
 SCALE 1 : 20

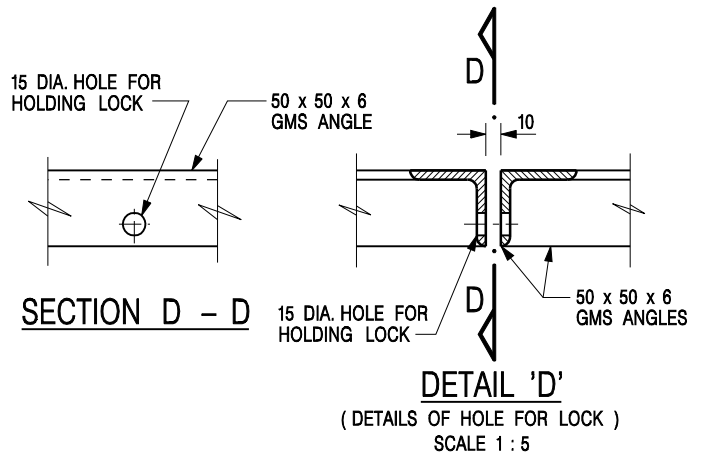


SECTION C - C

DETAIL 'C'
 (DETAILS OF HINGE)
 SCALE 1 : 5



SECTIONAL ELEVATION
 (DETAIL 'C')



SECTION D - D

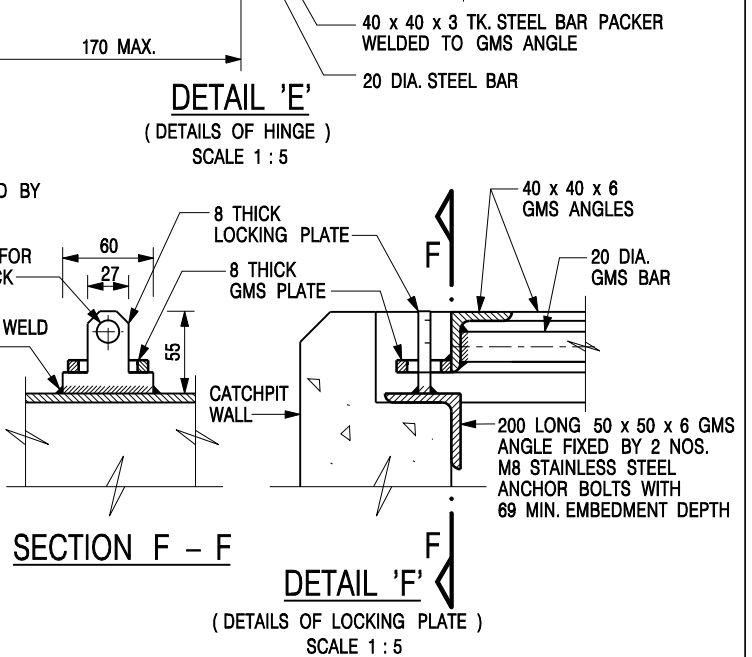
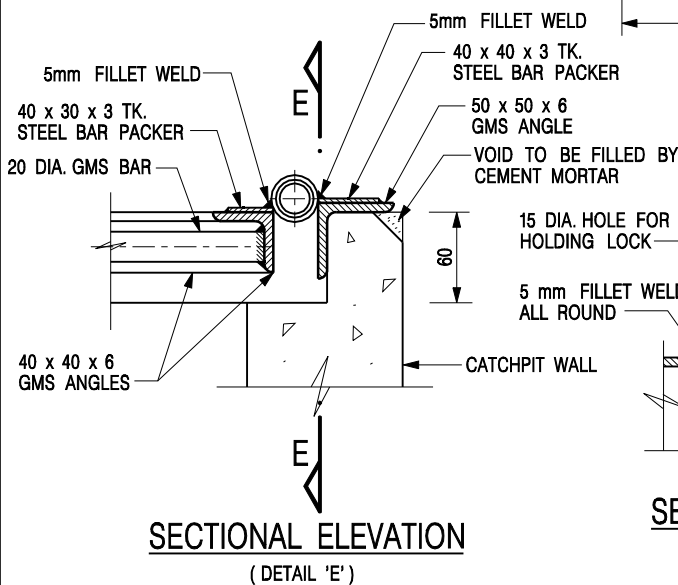
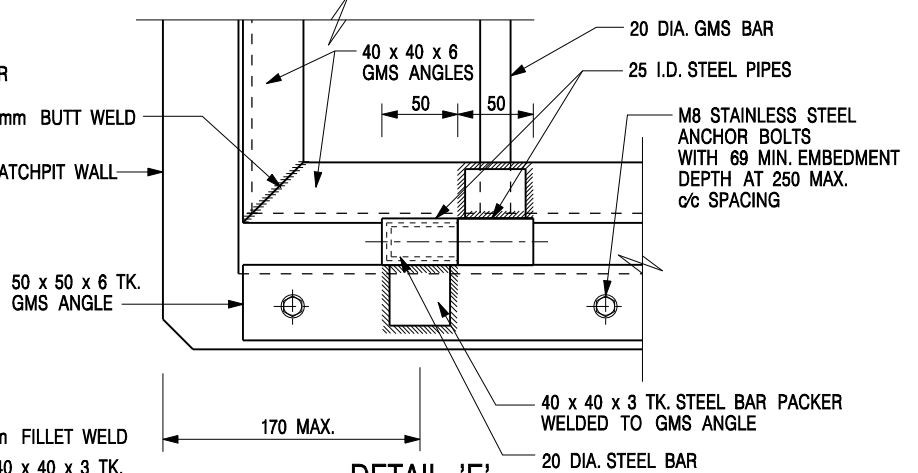
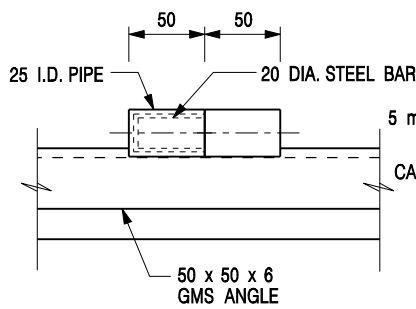
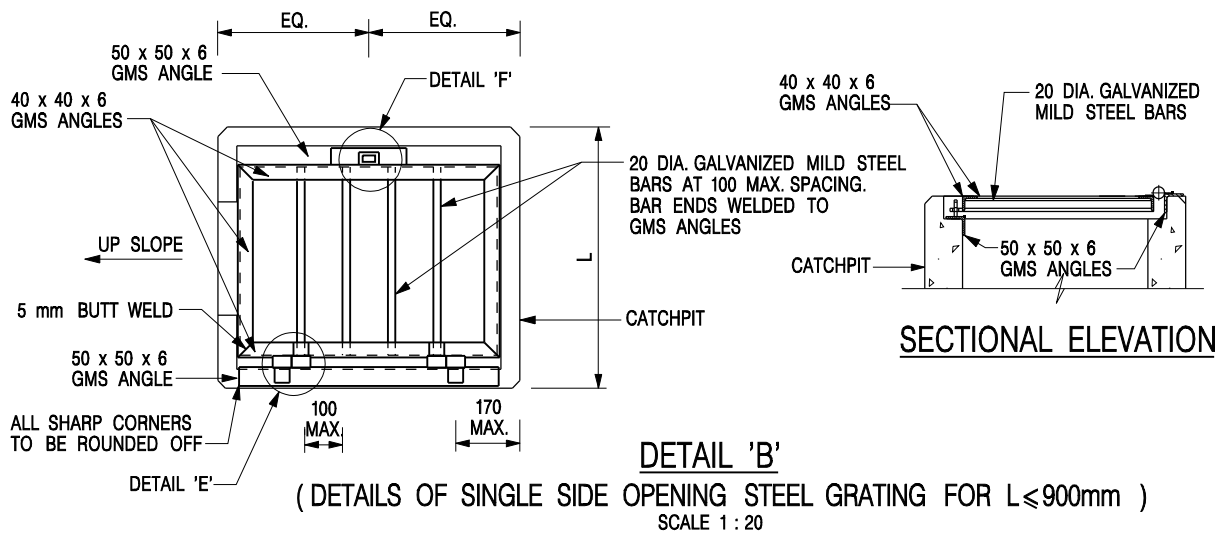
DETAIL 'D'
 (DETAILS OF HOLE FOR LOCK)
 SCALE 1 : 5

NOTES:

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

STANDARD CATCHPIT DETAILS
 (SHEET 2 OF 5)

| | | | |
|----------------------|-------------------------|------------------------------|-------------|
| - | FORMER DRG. NO. C2405J. | Original Signed | 03.2015 |
| REF. | REVISION | SIGNATURE | DATE |
| | | SCALE AS SHOWN | |
| | | DRAWING NO. C2405 / 2 | |
| DATE JAN 1991 | | | |




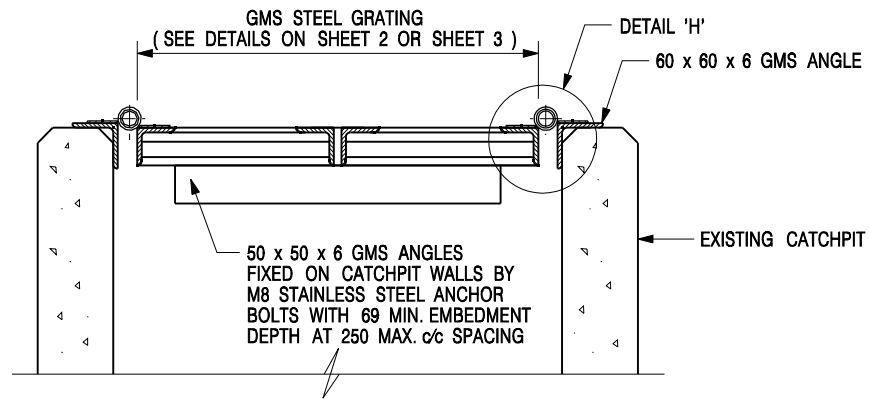
NOTES:

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

STANDARD CATCHPIT DETAILS
(SHEET 3 OF 5)

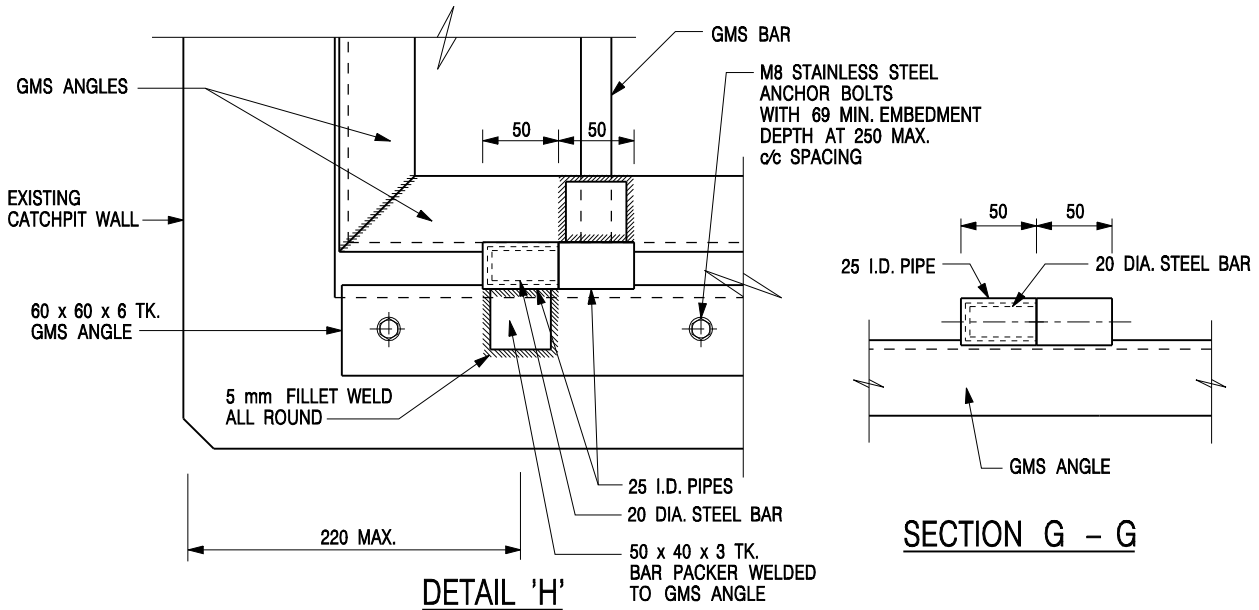
| | | | |
|------|-------------------------|-----------------|---------|
| - | FORMER DRG. NO. C2405J. | Original Signed | 03.2015 |
| REF. | REVISION | SIGNATURE | DATE |

| | |
|---|--------------------|
|  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT | |
| SCALE AS SHOWN | DRAWING NO. |
| DATE JAN 1991 | C2405 / 3 |



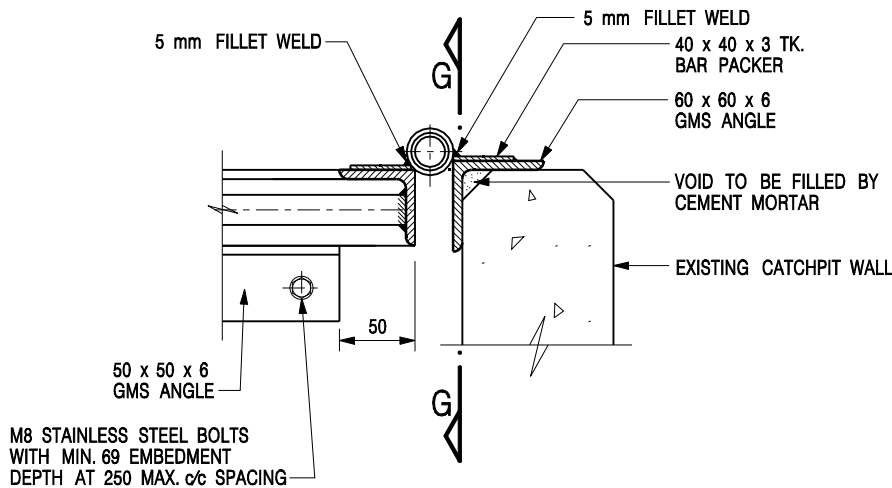
**DETAIL 'G' - DETAILS OF STEEL GRATING
CONSTRUCTED ON EXISTING CATCHPIT**

SCALE 1 : 10



DETAIL 'H'
(DETAILS OF HINGE)
SCALE 1 : 5

SECTION G - G




SECTIONAL ELEVATION
(DETAIL 'H')

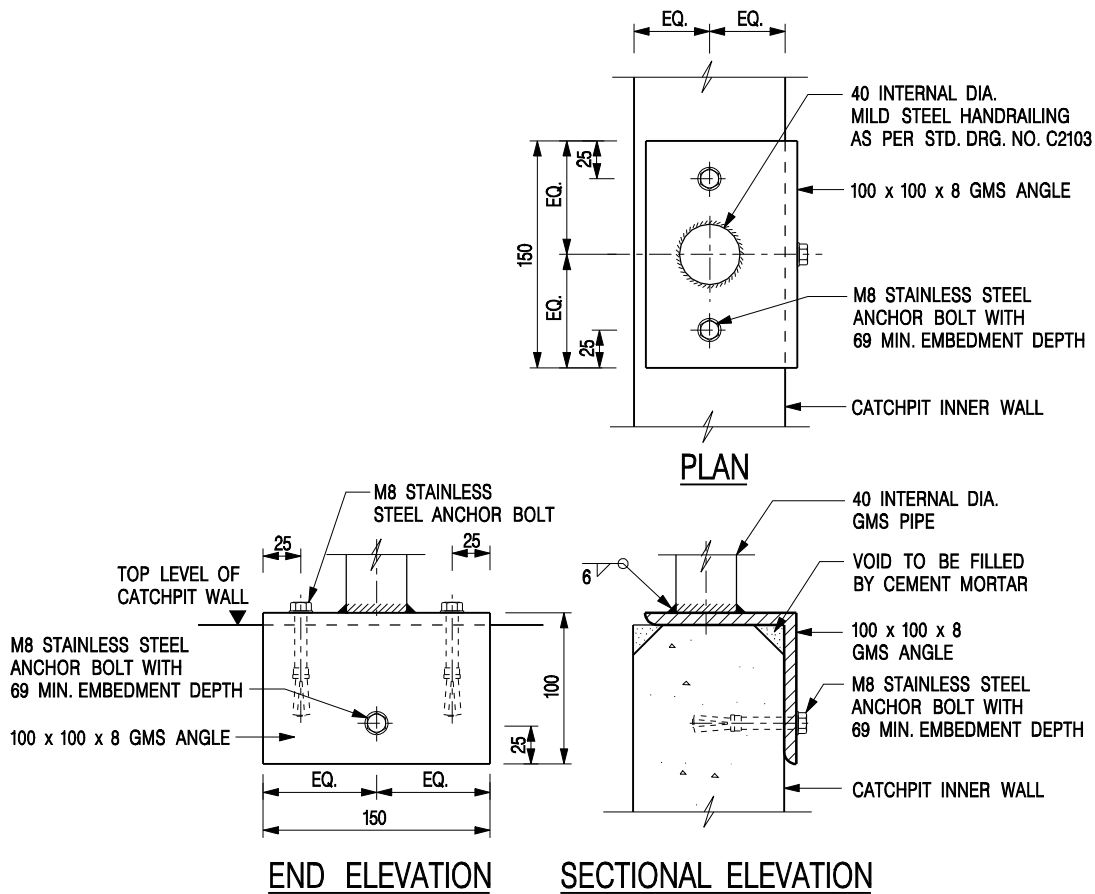
NOTES:

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

STANDARD CATCHPIT DETAILS
(SHEET 4 OF 5)

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

| | | | |
|---|--|------------------------------|--|
|  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT | | SCALE AS SHOWN | |
| | | DATE JAN 1991 | |
| | | DRAWING NO. C2405 / 4 | |




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

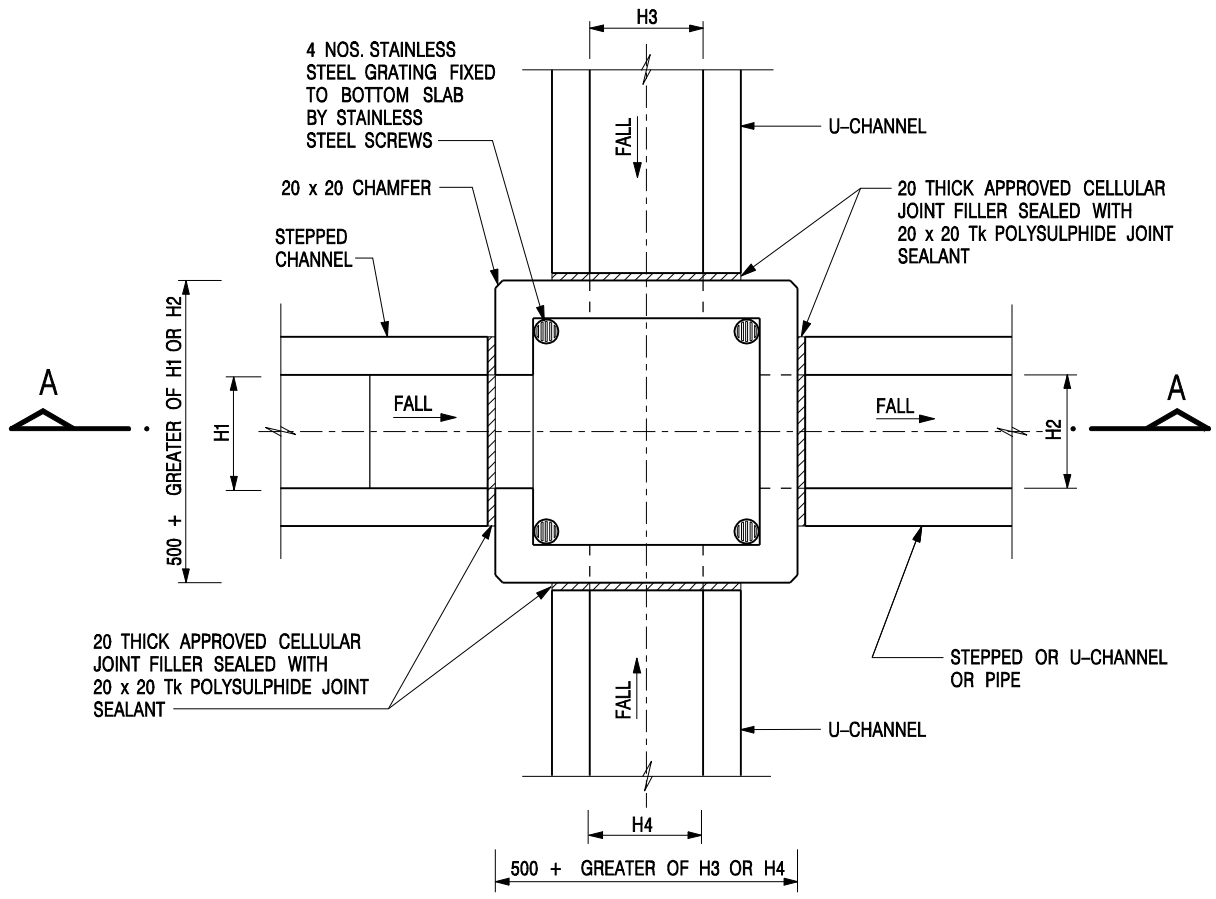
SCALE 1 : 5

NOTES:

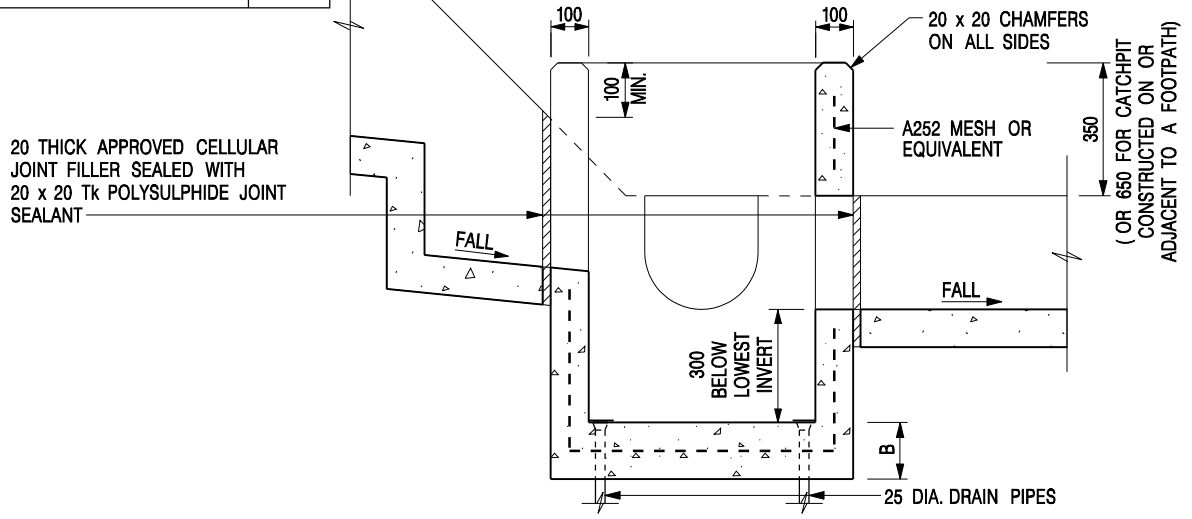
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE SHALL BE GRADE 20 /20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2 OR F2 AS APPROPRIATE.
4. FOR DETAILS OF JOINT, REFER TO STD. DRG. NO. C2413.
5. CONCRETE TO BE COLOURED AS SPECIFIED.
6. FOR CATCHPITS CONSTRUCTED ON OR ADJACENT TO A FOOTPATH, STEEL 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 ϕ 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.

**STANDARD CATCHPIT DETAILS
(SHEET 5 OF 5)**

| | | | |
|---|-------------------------|---------------------------------------|-------------|
| - | FORMER DRG. NO. C2405J. | Original Signed | 03.2015 |
| REF. | REVISION | SIGNATURE | DATE |
|  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT | | | |
| SCALE AS SHOWN DATE JAN 1991 | | DRAWING NO. C2405 /5 | |



| NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4) | B |
|--|-----|
| 300 - 600 | 150 |
| 675 - 900 | 175 |



SECTION A - A

NOTES:

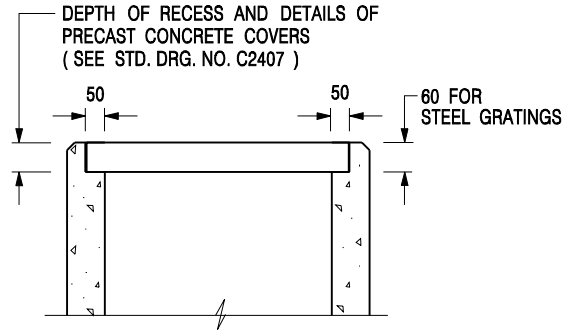
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 2 FOR OTHER NOTES.

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

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



| | |
|----------------------|--------------------|
| SCALE 1 : 20 | DRAWING NO. |
| DATE JAN 1991 | C2406 /1 |




**ALTERNATIVE TOP SECTION
FOR PRECAST CONCRETE COVERS / GRATINGS**

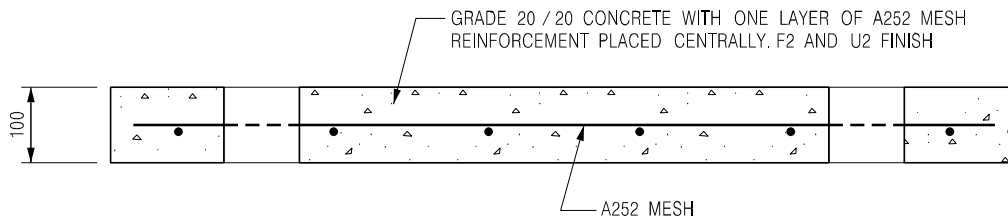
NOTES:

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.

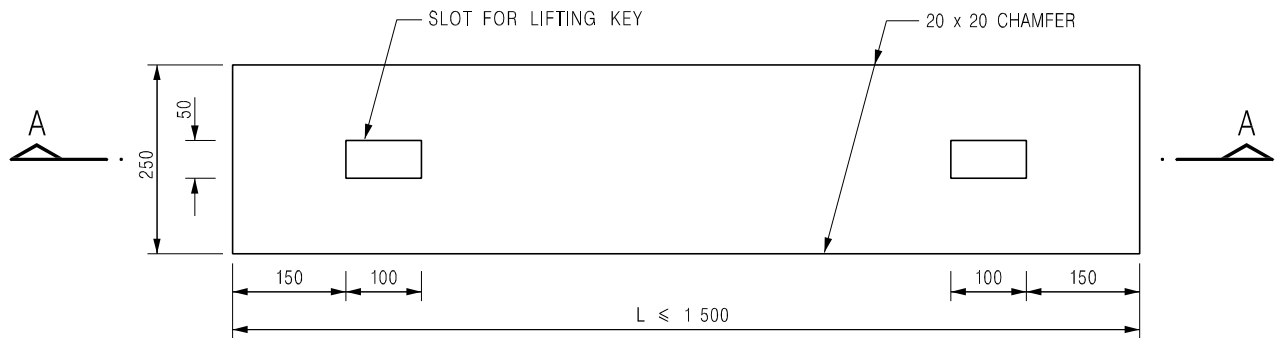
| | | | |
|-------------|-------------------------|------------------|-------------|
| A | MINOR AMENDMENT. | Original Signed | 04.2016 |
| - | FORMER DRG. NO. C2406J. | Original Signed | 03.2015 |
| REF. | REVISION | SIGNATURE | DATE |

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

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

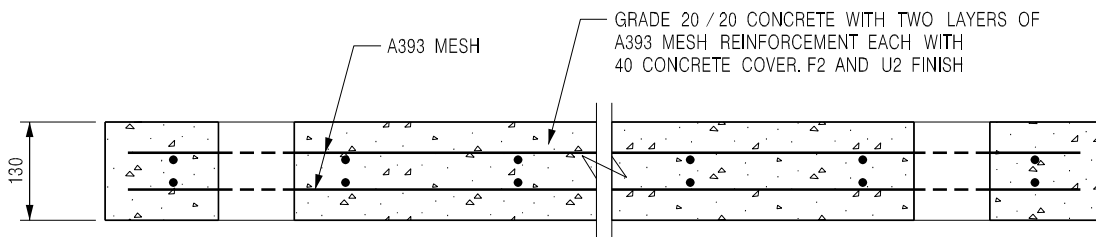


SECTION A - A

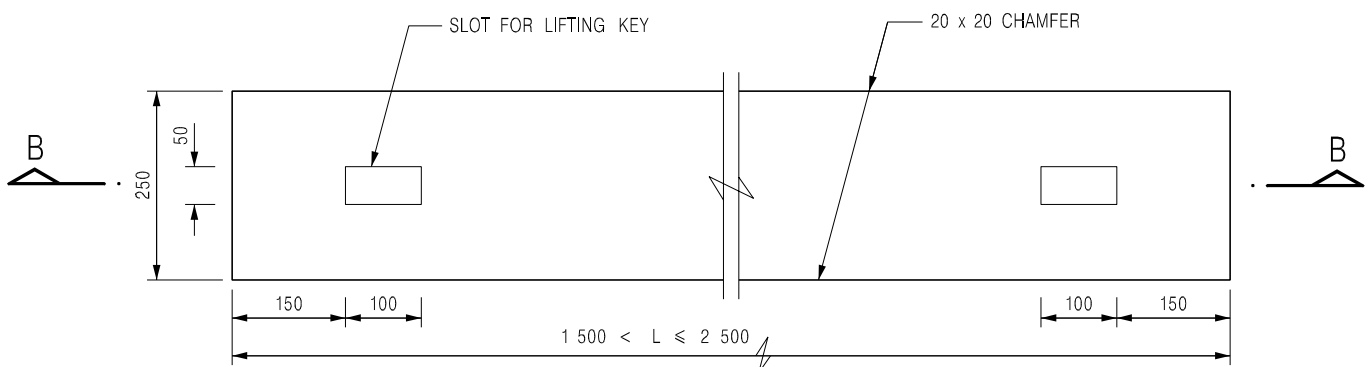


PLAN

TYPE 1 - FOR SPAN UP TO 1.5 m



SECTION B - B



PLAN

TYPE 2 - FOR SPANS 1.5 m TO 2.5 m

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL EXTERNAL EDGES OF THE COVERS SHALL BE 20mm CHAMFERED.

| | | | |
|------|-----------------------------|-----------------|---------|
| B | NAME OF DEPARTMENT AMENDED. | Original Signed | 01.2005 |
| A | GENERAL REVISION | Original Signed | 12.2002 |
| REF. | REVISION | SIGNATURE | DATE |

PRECAST CONCRETE COVERS
FOR CATCHPIT AND SAND TRAP

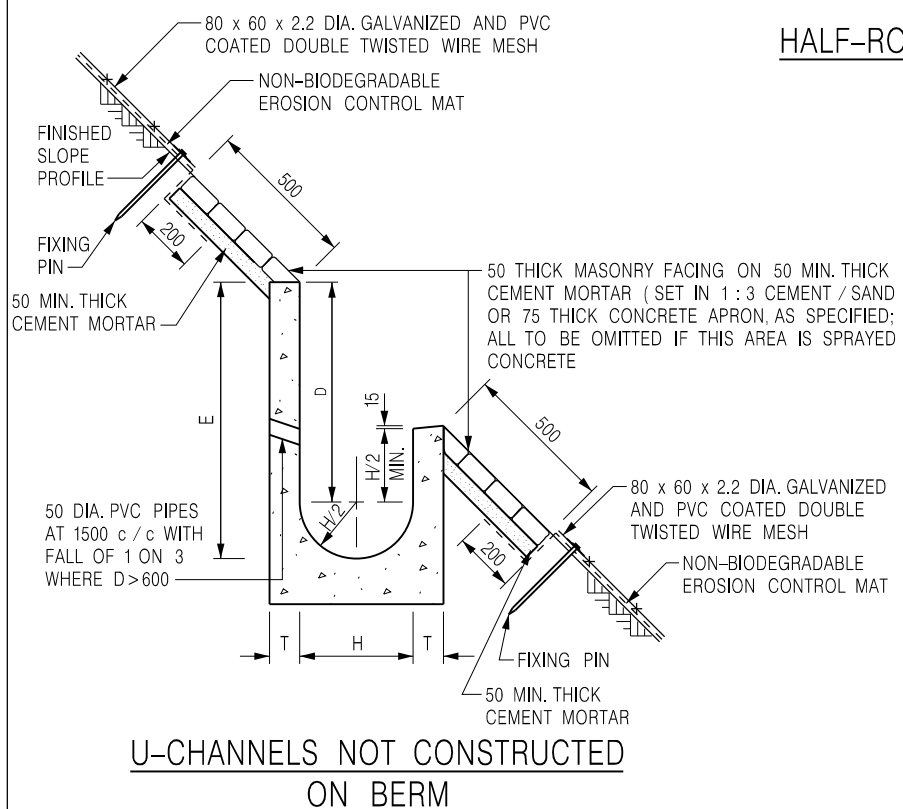
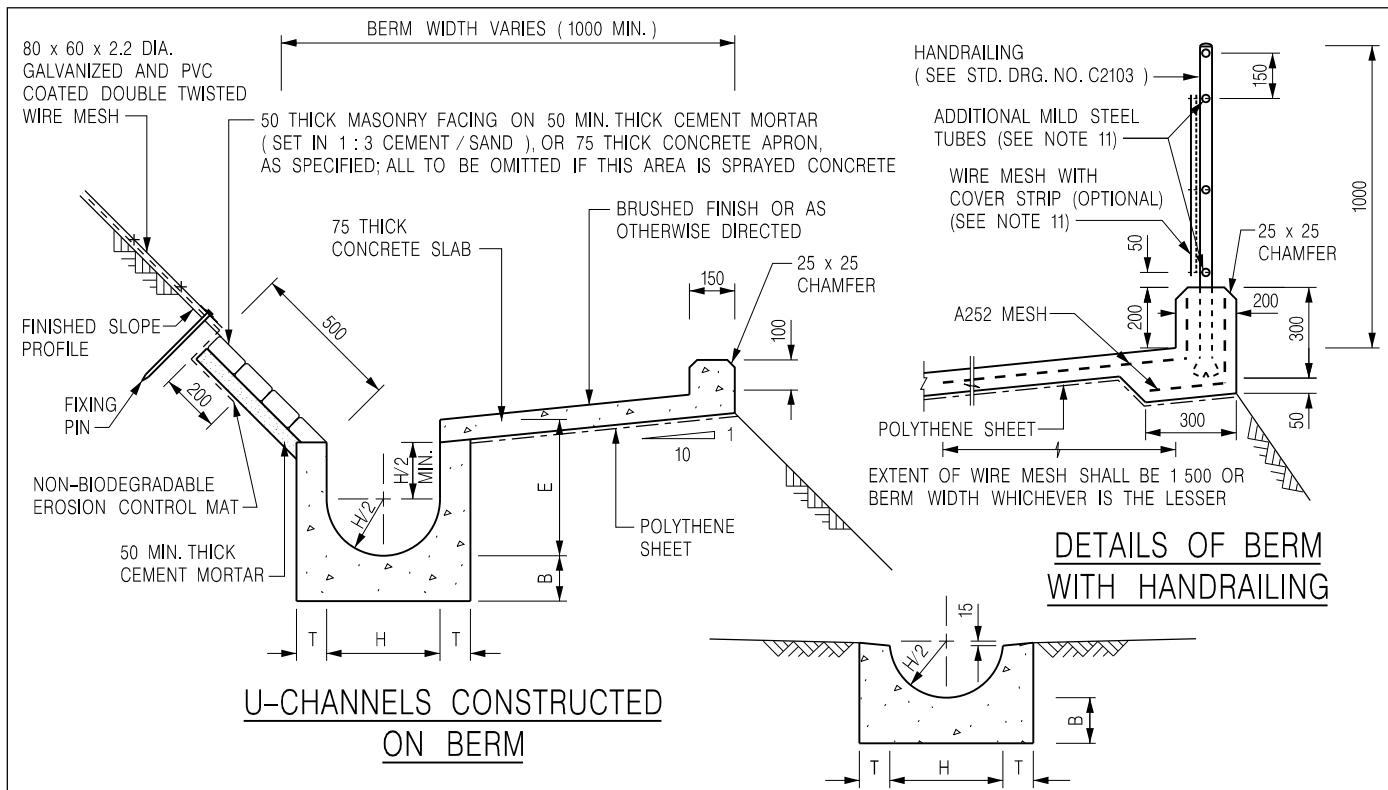


CIVIL ENGINEERING AND
DEVELOPMENT DEPARTMENT

SCALE 1 : 10

DATE JAN 1991

DRAWING NO.
C2407B



HALF-ROUND CHANNEL


NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL CONCRETE TO BE GRADE 20 / 20.
3. CONCRETE SURFACE FINISH SHALL BE CLASS U2, F2 OR BRUSHED FINISH AS DIRECTED.
4. SPACING OF EXPANSION JOINT IN CHANNELS, BERM SLABS AND APRONS TO BE 10 METRES MAXIMUM, SEE STD. DRG. NO. C2413 FOR DETAILS.
5. JOINTS FOR CHANNELS, BERM SLABS, APRONS AND WALLS, ETC. TO BE ON THE SAME ALIGNMENT.
6. FOR DIMENSIONS T, H, & B, SEE TABLE BELOW.
7. BIODEGRADABLE EROSION CONTROL MAT IF REQUIRED, SEE STD. DRG. NO. C2511/E.
8. CONCRETE TO BE COLOURED AS SPECIFIED.
9. CONCRETE U-CHANNEL CAN BE CAST IN-SITU OR PRECAST CONCRETE SUBJECT TO THE ENGINEER'S AGREEMENT ON THE DETAILS.
10. DETAILS OF EROSION CONTROL MAT AND WESH MESH ON BERM. (SEE STD. DRG. NO. C2511/E)
11. THE WIRE MESH ON HANDRAILING IS OPTIONAL. THE COVER STRIP AND ADDITIONAL MILD STEEL TUBES ARE NEEDED ONLY IF WIRE MESH IS PROVIDED. (SEE STD. DRG. NO. C2103)

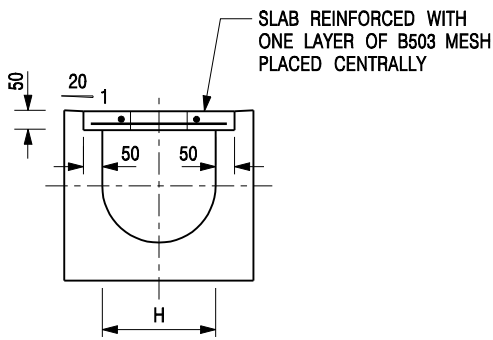
| NOMINAL SIZE H | T | B | REINFORCEMENT |
|----------------|-----|-----|---|
| 300 | 80 | 100 | A252 MESH PLACED CENTRALLY AND T=100 WHEN E>650 |
| 375 - 600 | 100 | 150 | |
| 675 - 900 | 125 | 175 | A252 MESH PLACED CENTRALLY |

| | | | |
|-------------|--------------------------------------|------------------|-------------|
| J | DETAILS OF HANDRAILING AMENDED. | Original Signed | 08.2024 |
| I | MINOR AMENDMENT. | Original Signed | 07.2018 |
| H | THICKNESS OF MASONRY FACING AMENDED. | Original Signed | 01.2005 |
| G | MINOR AMENDMENT. | Original Signed | 01.2004 |
| F | GENERAL REVISION. | Original Signed | 12.2002 |
| REF. | REVISION | SIGNATURE | DATE |

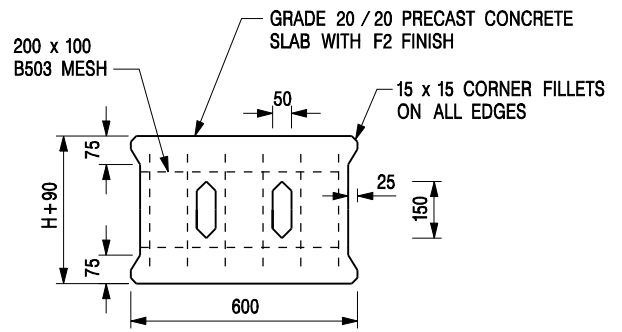
DETAILS OF HALF-ROUND AND U-CHANNELS (TYPE A - WITH MASONRY APRON)


CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

| | |
|----------------------|--------------------|
| SCALE 1 : 25 | DRAWING NO. |
| DATE JAN 1991 | C2409J |



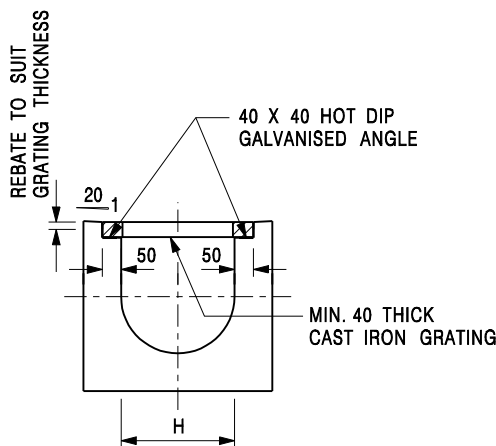
TYPICAL SECTION



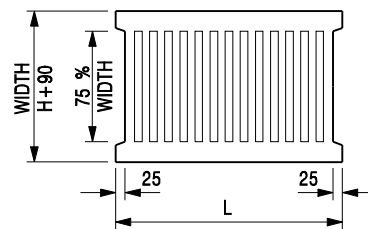
PLAN OF SLAB

U-CHANNELS WITH PRECAST CONCRETE SLABS

(UP TO H OF 525)



TYPICAL SECTION



L = 600mm FOR H ≤ 375mm
L = 400mm FOR H > 375mm

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.

| | | | |
|-------------|--------------------------------|------------------|-------------|
| 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

DRAWING NO.

DATE JAN 1991

C2412E

Assessment of Hydraulic Capacities of the Proposed Drainage System for 1 in 50 year design return period

Using Rational Method
 Design Flow = $0.278CIA \text{ m}^3/\text{s}$ for grassland (heavy soil) - steep, C = 0.35 for grassland (heavy soil) - flat, C = 0.25
 for concrete surface, C = 0.95

Using Manning Equation (for channel flow)
 Design Mean Velocity = $R^{1/6}/n(RS)^{1/2}$ where n = 0.016 for concrete-lined open channel with fair surface (ref. Table13 in SDM) or 0.045 for natural stream channels, winding some pools and shoals with some weeds and stones with fair surface

Using GEV distribution model in frequency analysis
 Rainfall intensity = $a / (L_0 + b)^c$ where a = 474.6, b = 2.90 and c = 0.371 in 50 year design return period (for 'Main Rural Catchment Drainage Channel' in SDM is adopted)
 referenced from Table 3a in SDM Corrigendum No. 1/2022 - Storm Constants for Different Return Periods of North District Area

Using Bransby William's Equation
 Inlet time $t_0 = 0.14465L / (H^{0.2} A^{0.1})$ or 2 when the distance is too short

Using Colebrook's White Equation (for pipe flow)
 $V = \text{sqrt}(8gDs) \times \log[(k_s / 3.7D) + (2.51v / D \times \text{sqrt}(2gDs))]^{-1}$
 For precast concrete pipes with 'O' ring joints with poor condition,
 $k_s \text{ (mm)} = 0.6$ $k_s \text{ (m)} = 0.0006$
 $v \text{ (m}^2/\text{s)} = 1.00E-06$
 $g \text{ (m}^2/\text{s)} = 9.81$

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) | (27) | (28) | (29) | (30) | (31) | | | | | | |
|------------------------|----------------------------|---|------------|------------|------------|------------|------------------|---------------------------------|---------|------------|--|--|--|---|---|------------------------------|--|--|----------------|--|--|--|---------------------------------|-----------|--------------|----------------|-----------------------------------|---|------------------------------------|--|-----|--|--|--|--|--|
| USCP/USMH | DSCP/DSMH | Collected Runoff from Catchment (refer to Figure 3 and 4) | USGL (mPD) | DSGL (mPD) | USIL (mPD) | DSIL (mPD) | INVERT DIFF. (m) | LENGTH OF CHANNEL / DRAIN l (m) | SLOPE s | SLOPE 1 IN | LENGTH FOR CALCULATION OF INLET TIME L (m) | AVERAGE SLOPE OF GROUND FOR CALCULATION OF INLET TIME H (m per 100m) | INLET TIME t_0 (min) = $0.14465 \times [L / (H^{0.2} \times A^{0.1})]$ | TIME OF FLOW INSIDE CHANNEL/ DRAIN t_c (min) = L/V (i.e. Column (9) + Column (26) + 60) | TIME OF CONCENTRATION t_c (min) = $t_0 + t_c$ | RAINFALL INTENSITY i (mm/hr) | RAINFALL INTENSITY INCLUDING EFFECT OF CLIMATE CHANGE (+16.0%) (mm/hr) | ADOPTED RAINFALL INTENSITY INCLUDING EFFECT OF CLIMATE CHANGE (+16.0%) & DESIGN ALLOWANCE (12.1%) (mm/hr) [refer to item (e), (k) and (n) in SDM Corrigendum No. 1/2022] | RUNOFF COEF. C | SUB-CATCHMENT AREA A (m ²) | EFFECTIVE CATCHMENT AREA (m ²) | EFFECTIVE CATCHMENT AREA (m ²) | DESIGN FLOW (m ³ /s) | SIZE (mm) | CHANNEL TYPE | VELOCITY (m/s) | FLOW CAPACITY (m ³ /s) | 90% FLOW CAPACITY (m ³ /s) (to cater for potential deposition of sediment) | SPARE CAPACITY (m ³ /s) | Occupancy of the Proposed Pipe / Channel | | | | | | |
| Point C | CP2 | A2 | 10.57 | 10.30 | 9.82 | 9.55 | 0.27 | 40.00 | 0.007 | 150 | 220.00 | 2.05 | 10.75 | 0.32 | 11.07 | 178.42 | 206.96 | 232.01 | 0.95 | 12,278 | 11,664 | 11,664 | 0.752 | 750 | UC | 2.08 | 1.05 | 0.94 | 0.188 | 80.0% | OK! | | | | | |
| Point A | CP1 | nominal | 11.45 | 10.86 | 11.23 | 10.64 | 0.05 | 10.00 | 0.005 | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | 225 | UC | - | - | - | - | - | OK! | | | | | |
| CP1 | CP2 | A1 | 10.86 | 10.30 | 10.56 | 10.00 | 0.45 | 45.00 | 0.010 | 100 | 107.00 | 1.02 | 6.71 | 0.54 | 7.25 | 200.87 | 233.01 | 261.21 | 0.25 | 4,108 | 1,027 | 1,027 | 0.075 | 300 | UC | 1.38 | 0.11 | 0.10 | 0.025 | 74.5% | OK! | | | | | |
| CP2 | TCP | A1+A2 | 10.30 | 10.10 | 9.55 | 9.35 | 0.20 | 20.00 | 0.010 | 100 | - | - | 7.25 | 0.13 | 7.38 | 199.92 | 231.91 | 259.97 | 0.95 | 0 | 0 | 12,691 | 0.917 | 750 | UC | 2.55 | 1.28 | 1.15 | 0.235 | 79.6% | OK! | | | | | |
| Point B | CP3 | nominal | 11.45 | 11.36 | 11.23 | 11.14 | 0.08 | 16.00 | 0.005 | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | 225 | UC | - | - | - | - | - | OK! | | | | | |
| CP3 | CP4 | A3 | 11.36 | 10.90 | 10.91 | 10.45 | 0.10 | 19.00 | 0.005 | 200 | - | - | 2.00 | 0.25 | 2.25 | 258.43 | 299.78 | 336.05 | 0.95 | 1,900 | 1,805 | 1,805 | 0.169 | 450 | UC | 1.28 | 0.23 | 0.21 | 0.040 | 80.8% | OK! | | | | | |
| CP4 | CP5 | ditto | 10.90 | 10.83 | 10.45 | 10.13 | 0.33 | 65.00 | 0.005 | 200 | - | - | 2.25 | 0.84 | 3.09 | 244.26 | 283.34 | 317.62 | 0.95 | 0 | 0 | 1,805 | 0.159 | 450 | UC | 1.28 | 0.23 | 0.21 | 0.049 | 76.4% | OK! | | | | | |
| CP5 | TCP | ditto | 10.83 | 10.10 | 10.13 | 9.65 | 0.06 | 12.00 | 0.005 | 200 | - | - | 3.09 | 0.16 | 3.25 | 241.94 | 280.65 | 314.61 | 0.95 | 0 | 0 | 1,805 | 0.158 | 450 | UC | 1.28 | 0.23 | 0.21 | 0.051 | 75.7% | OK! | | | | | |
| Point D | CP6 | A4 | 10.57 | 10.12 | 10.27 | 9.82 | 0.10 | 20.00 | 0.005 | 200 | - | - | 2.00 | 0.34 | 2.34 | 256.71 | 297.78 | 333.81 | 0.95 | 682 | 648 | 648 | 0.060 | 300 | UC | 0.98 | 0.08 | 0.07 | 0.011 | 85.0% | OK! | | | | | |
| CP6 | TCP | ditto | 10.12 | 10.10 | 9.82 | 9.69 | 0.13 | 26.00 | 0.005 | 200 | - | - | 2.34 | 0.44 | 2.78 | 249.09 | 288.95 | 323.91 | 0.95 | 0 | 0 | 648 | 0.058 | 300 | UC | 0.98 | 0.08 | 0.07 | 0.012 | 82.5% | OK! | | | | | |
| Discharge Point | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TCP | outfall | A1+A2+A3+A4 | 10.10 | 9.90 | 9.20 | 9.00 | 0.03 | 6.00 | 0.005 | 200.00 | - | - | 7.38 | 0.05 | 7.43 | 199.57 | 231.50 | 259.51 | 0.95 | 0 | 0 | 15144 | 0.975 | 900 | UC | 2.04 | 1.47 | 1.32 | 0.350 | 73.6% | OK! | | | | | |
| outfall | twin 900 dia. pipe culvert | A1+A2+A3+A4+A5+A6 | 9.90 | 11.00 | 8.85 | 8.77 | 0.08 | 38.00 | 0.002 | 200.00 | - | - | 7.43 | 0.29 | 7.72 | 197.55 | 229.16 | 256.89 | 0.73 | 6289 | 4612 | 19756 | 1.259 | 900 | Twin Pipe | 2.21 | 2.81 | 2.53 | 1.274 | 49.7% | OK! | | | | | |

| | | |
|-----------|----------------|------------------|
| catchment | m ² | |
| A1 | 4,108 | Grassland (flat) |
| A2 | 12,278 | hardpaved |
| A3 | 1,900 | hardpaved |
| A4 | 682 | hardpaved |
| A5 | 4,342 | hardpaved |
| A6 | 1,947 | Grassland (flat) |
| total = | 25,257 | |