

FOOTPATHS/PRIVATE PROPERTY/ROADS

ROADS

ROADS

ROADS

FOOTPATHS/PRIVATE PROPERTY/ROADS

TYPE 1

TYPE 2

TYPE 3 – SAND SURROUND

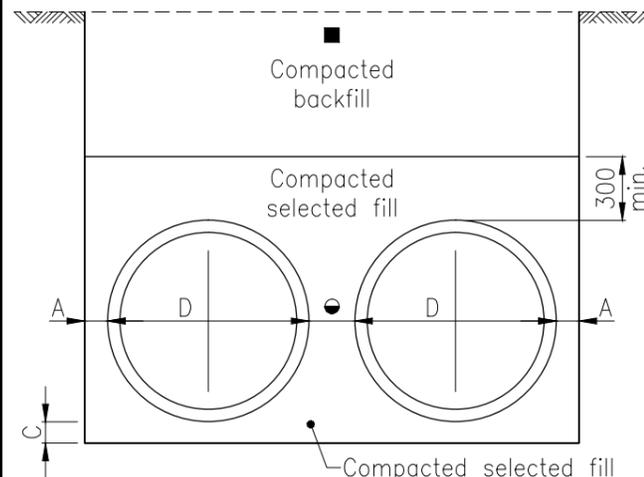
TYPE 4 – CONCRETE OR GRAVEL SURROUND

TYPE 5 – CONCRETE OR GRAVEL ENCASEMENT

TYPE 6 – BEDDING IN POOR GROUND

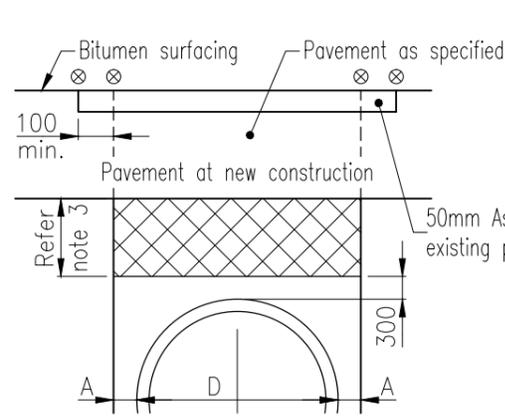
Conforms to Support Type U AS 3725

Conforms to Support Type H1 AS 3725



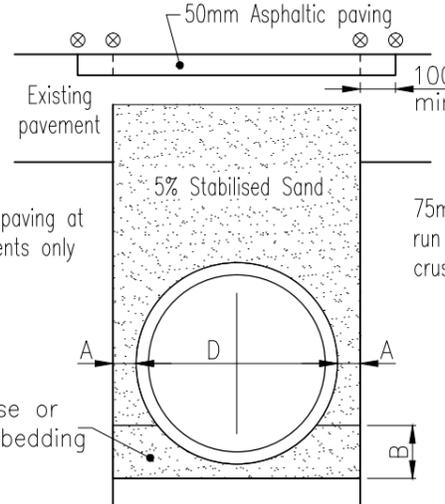
TYPE 7 – BEDDING OF MULTIPLE PIPES

Conforms to Support Type H1



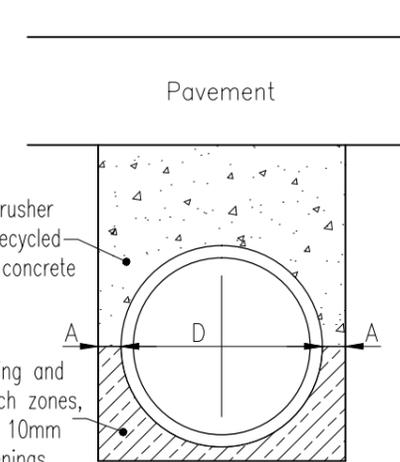
ALTERNATIVE A

(At new pavements on residential streets and rural roads and existing sealed roads)



ALTERNATIVE B

(At existing surfaced pavements on industrial, trunk collector, sub-arterial and arterial streets/roads)



ALTERNATIVE C

| NOMINAL ϕ culvert D (mm) | MINIMUM width A (mm) | HAUNCH depth B (mm) | BEDDING depth C (mm) | Allowable width, E(m) | |
|-------------------------------|----------------------|---------------------|----------------------|-----------------------|-----|
| | | | | DES | MAX |
| 300 | 300 | 36 | 100 | 1.0 | 1.1 |
| 375 | 300 | 45 | 100 | 1.1 | 1.2 |
| 450 | 300 | 53 | 100 | 1.1 | 1.3 |
| 525 | 300 | 61 | 100 | 1.2 | 1.5 |
| 600 | 300 | 69 | 100 | 1.3 | 1.6 |
| 750 | 300 | 85 | 100 | 1.5 | 1.8 |
| 900 | 300 | 103 | 100 | 1.6 | 1.9 |
| 1050 | 300 | 120 | 100 | 1.8 | 2.1 |
| 1200 | 300 | 135 | 100 | 2.0 | 2.2 |
| 1350 | 300 | 150 | 100 | 2.1 | 2.4 |
| 1500 | 300 | 169 | 100 | 2.3 | 2.7 |
| 1650 | 330 | 184 | 150 | 2.6 | 2.9 |
| 1800 | 360 | 200 | 150 | 2.8 | 3.1 |
| 1950 | 390 | 222 | 150 | 3.1 | 3.3 |
| 2100 | 420 | 239 | 150 | 3.4 | 3.5 |
| 2400 | 480 | 270 | 150 | 3.9 | 4.2 |
| 2700 | 540 | 303 | 150 | 4.3 | 4.6 |
| 3000 | 600 | 335 | 150 | 4.9 | 5.0 |

NOTES:

- Selected backfill in all cases shall be carried through to the wings and continued 300 thick for the length and height of the wings.
- Bedding compaction (Compacted selected fill/sand bedding):
 - Cohesive material – 95% standard compaction.
 - Non-cohesive material – density index of 70MIN, refer AS1289.5.5.1.
 - Sand – compact by flooding and use of vibrators.
- Backfill compaction:
 - Compacted gravel (300mm) layer under road pavement 95% standard compaction.
 - Compacted selected fill/CBR 15 Gravel 90% standard compaction – below 300mm zone.
 - Compacted backfill – at footpaths/private property 90% standard compaction.
 - MAX. densities determined by standard compaction tests to AS 1289.5.1.1.

- Refer project drawings for types and/or alternatives to be adopted.
- Type U & Type H1 to conform to AS 3725.
- Dimension A can be reduced to 150 MIN for non mechanical compaction of backfill.
- Pipes are to be designed to their correct strength class under all construction loads, dead loads and in-service loads.
- All dimensions in millimetres.
- Where groundwater is encountered the superintendent must be notified and an appropriate trench drainage solution provided.

LEGEND

- ⊗ Saw cut at existing pavement.
- Pipes: 600 when NOMINAL D < 1800
900 when NOMINAL D > 1800
- Dimensions can be reduced to 100 MIN for 5% stabilised sand backfill.
- Refer Alternative A, B and C for backfill requirements at existing and new pavements.
- Depth to be approved by the superintendent.
- ⊠ Gravel (Min CBR 15).

BEDDING AND HAUNCH MATERIAL GRADING

(Gravel, loam, sand, or mixture)

| AS Sieve Size | % Passing by mass | |
|---------------|----------------------------|---------------------------------|
| | Type 1 Pipes < 1200 ϕ | Type 2 Pipes \geq 1350 ϕ |
| 19.0 | 100 | 98-100 |
| 9.5 | - | 35-50 |
| 4.75 | - | 5-10 |
| 2.36 | 40-100 | 0-2 |
| 0.425 | 15-70 | 0-1 |
| 0.075 | 3-30 | 0-1 |

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

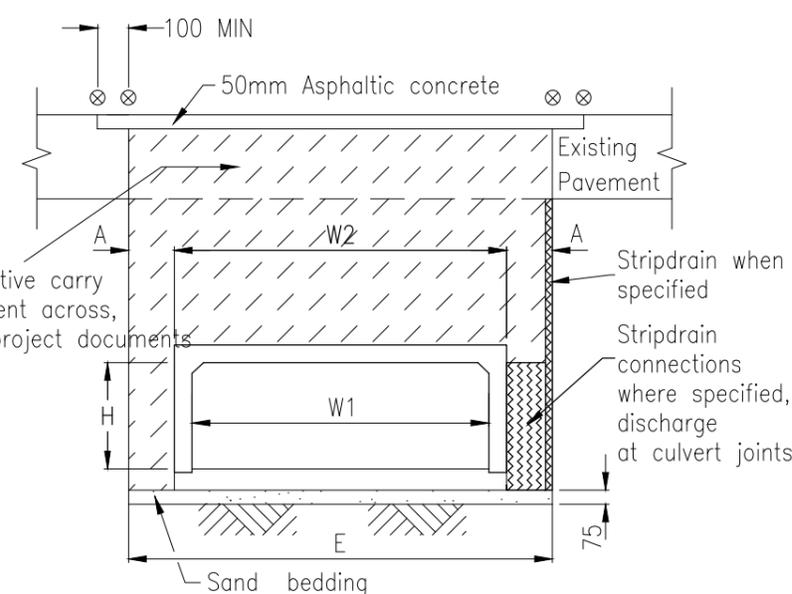
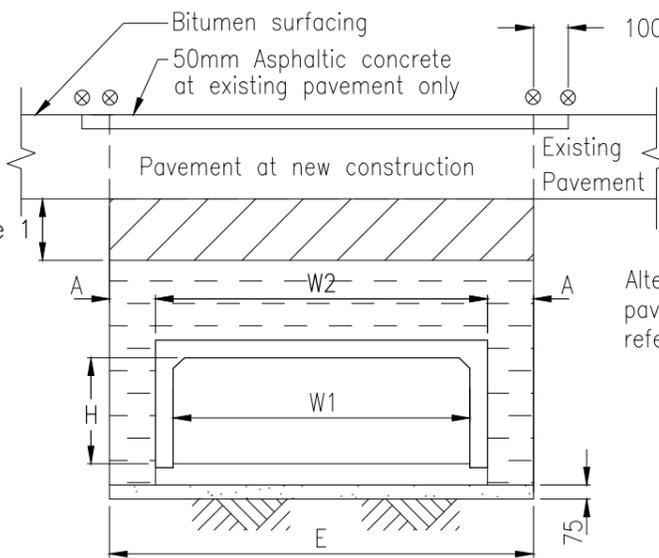
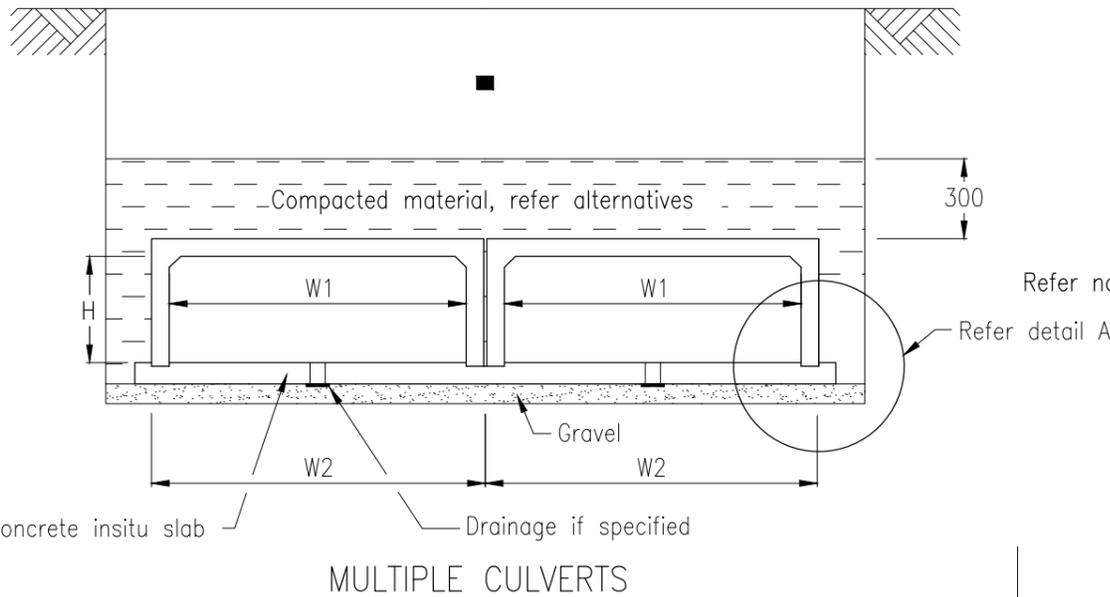
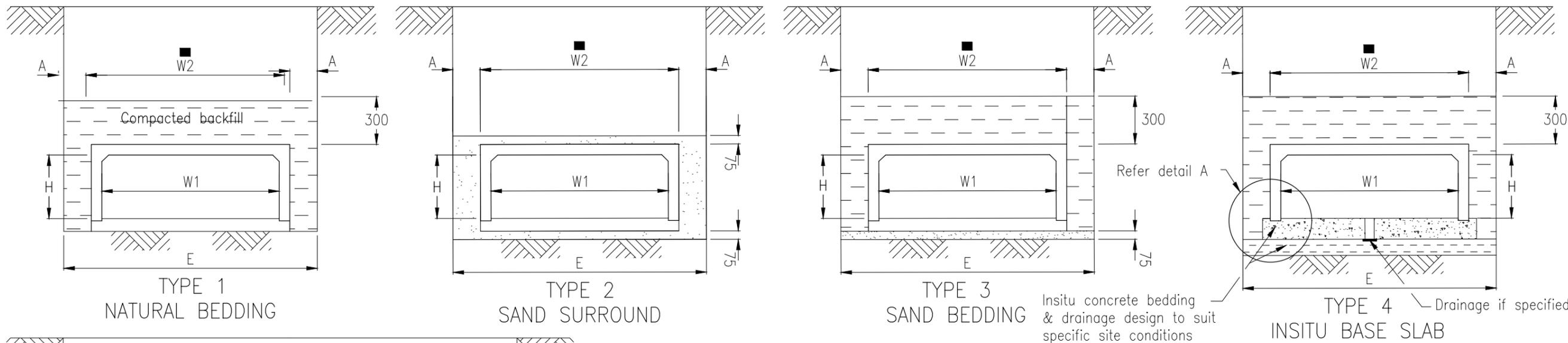
| REVISIONS | DATE | |
|-----------|--------------------------------------|---------|
| F | IRC ADDED | 12/2016 |
| E | GRC AND LSC ADDED | 09/2014 |
| D | NOTE 9 ADDED RE: GROUNDWATER | 03/2012 |
| C | MRC ADDED | 04/2011 |
| B | REFERENCE TO 'ORDINARY' FILL REMOVED | 07/2010 |
| A | POST AMALGAMATION REVIEW | 10/2003 |

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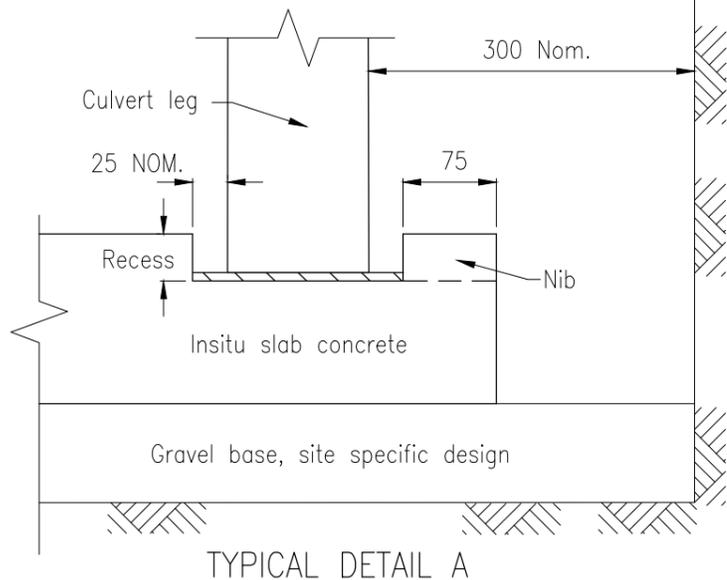
EXCAVATION, BEDDING AND BACKFILLING OF CONCRETE/REINFORCED FIBRE DRAINAGE PIPES

DRAINAGE
STANDARD DRAWING
CMDG-D-010
REV. | B | C | D | E | F | G



| W1 | W2 | E NOM. |
|------|------|--------|
| 300 | 420 | 1000 |
| 375 | 500 | 1100 |
| 450 | 570 | 1200 |
| 600 | 730 | 1300 |
| 750 | 890 | 1500 |
| 900 | 1050 | 1700 |
| 1200 | 1360 | 2000 |
| 1520 | 1700 | 2300 |
| 1820 | 2010 | 2600 |
| 2130 | 2340 | 3000 |
| 2440 | 2670 | 3300 |

EXCAVATION WIDTH



TYPICAL DETAIL A

ALTERNATIVE A
AT EXISTING SURFACED PAVEMENTS OR
AT NEW PAVEMENTS ON RESIDENTIAL
STREETS & RURAL ROADS

NOTES:

- Backfill compaction:
Approved fill/approved bedding/compacted backfill/CBR15 Gravel 90% Compacted gravel (300mm layer) under road pavement 95% Compacted fill - at footpaths/private property 90% MAX. densities determined by standard compaction tests to AS 1289.5.5.1.
- Tape all joints with 75mm wide Denso (600) Tape or equivalent.
- All dimensions in millimetres.

LEGEND:

- A 300mm NOMINAL
- Refer Alternative A for backfill requirements at new pavements
- ⊗ Saw cut at existing pavement
- ▨ Gravel (MIN CBR15) or 75mm crusher run backfill
- ▧ Lean mix concrete backfill (1:15 mix)
- ▬ 10mm cement mortar bed, 1:3 mix

ALTERNATIVE B
AT EXISTING SURFACED PAVEMENTS
ON INDUSTRIAL, TRUNK COLLECTOR,
SUB-ARTERIALS & ARTERIAL STREETS/ROADS

APPLICABILITY TABLE

| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
|------------|-----|------|-----|-----|-----|-----|-----|
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| REVISIONS | DATE |
|----------------------------|---------|
| D IRC ADDED | 12/2016 |
| C GRC AND LSC ADDED | 09/2014 |
| B MRC ADDED | 04/2011 |
| A POST AMALGAMATION REVIEW | 01/2010 |

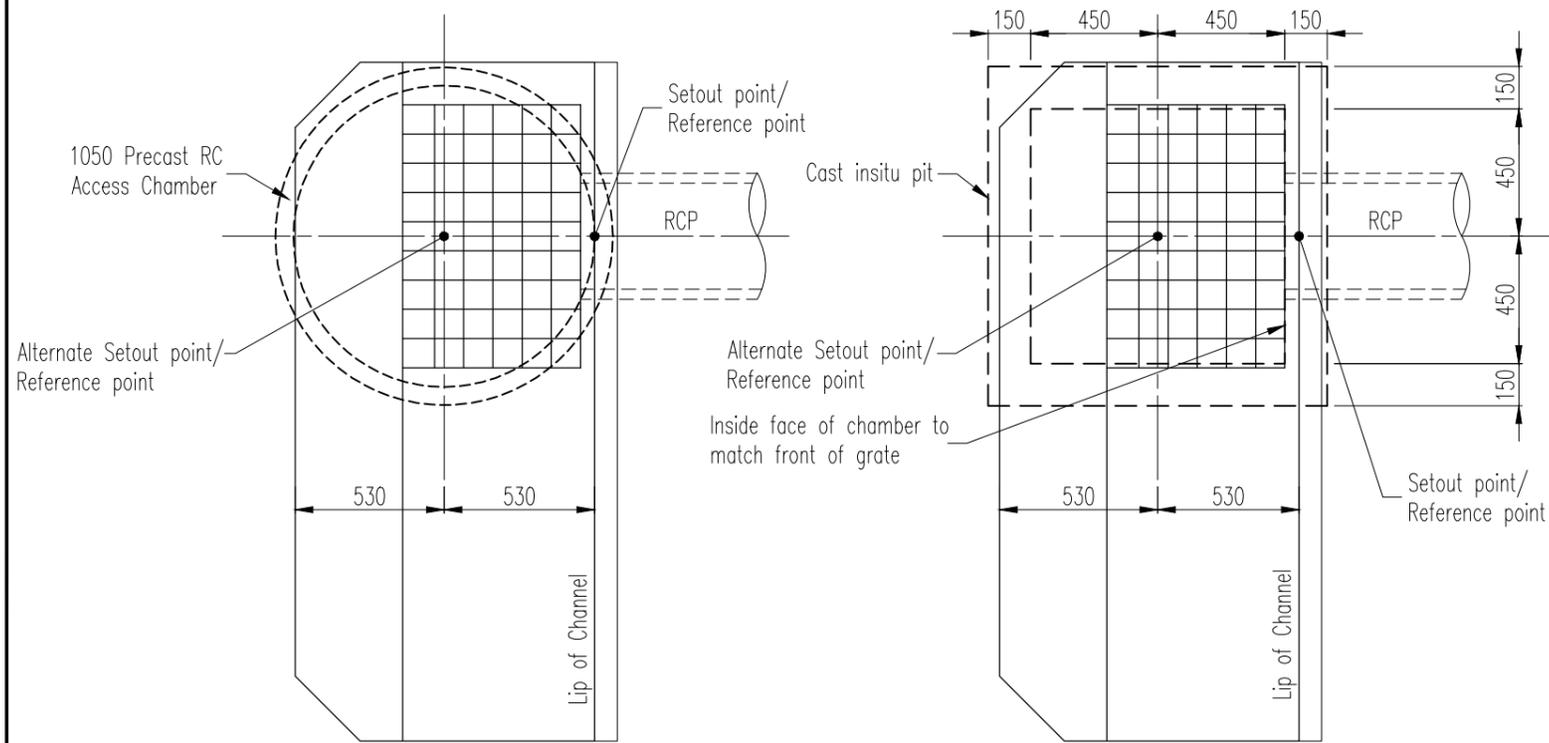
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EXCAVATION, BEDDING AND BACKFILLING
OF PRECAST BOX CULVERTS

| DRAINAGE |
|------------------|
| STANDARD DRAWING |
| CMDG-D-011 |
| REV. A B C D |

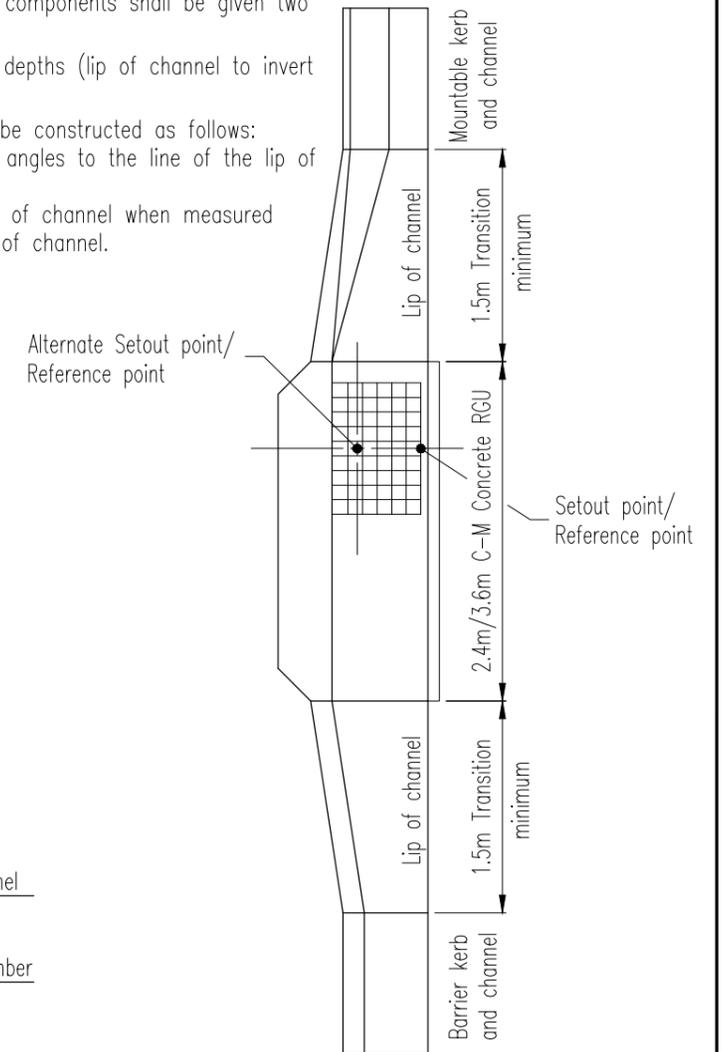


PLAN
C-M CONCRETE RGU
(with 1050 RCP shaft)

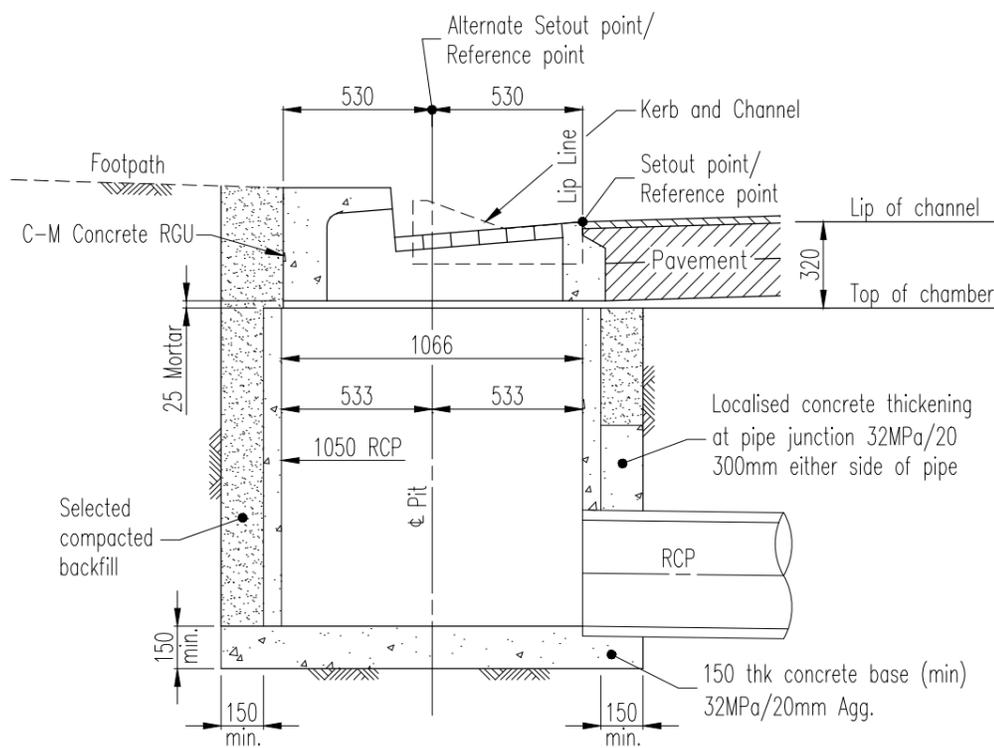
PLAN
C-M CONCRETE RGU
(with 900x900 insitu pit)

NOTES:

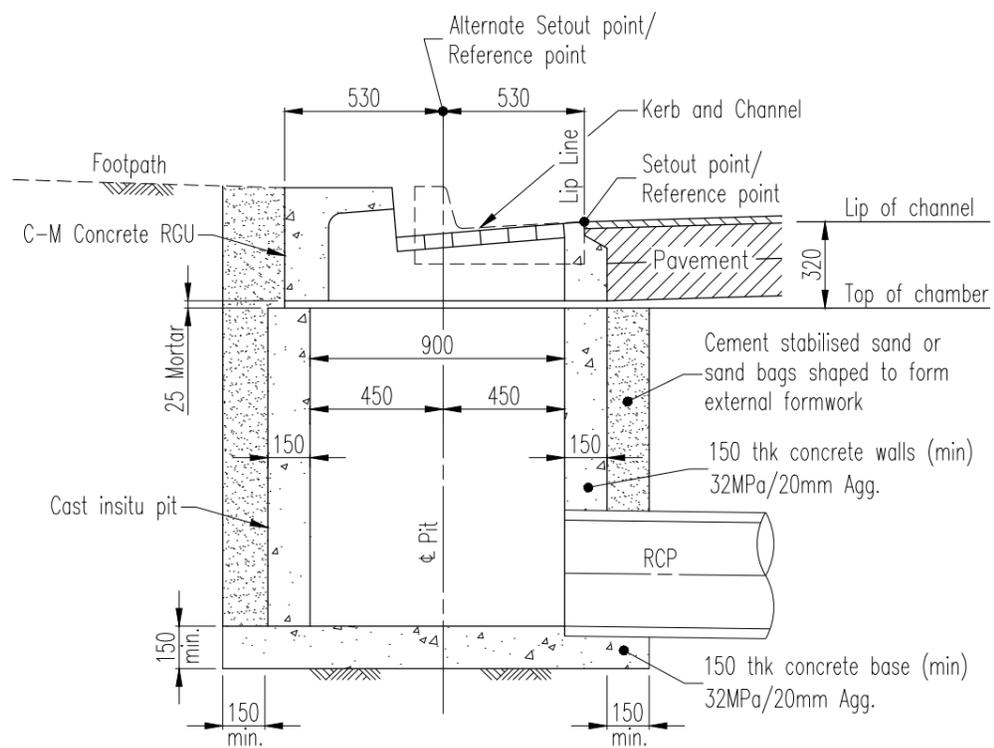
1. Precast road gully units to be 2.4m or 3.6m C-M Concrete Products (recessed type) or similar approved.
2. Reference point/setout point is on line of lip of kerb and channel at centre of grate. alternate reference point/setout point is geometric centre of chamber.
3. Pipe ends to be trimmed flush with internal wall and repaired so as to provide required concrete cover to pipe reinforcing.
4. Cut surfaces of concrete drainage components shall be given two coats of a tar epoxy paint.
5. Precast RC shafts to be used for depths (lip of channel to invert of pit) greater than 0.9m.
6. The plane of the top of pit is to be constructed as follows:
 - (a) Level when measured at right angles to the line of the lip of channel.
 - (b) To the same grade as the lip of channel when measured parallel to the line of the lip of channel.



C-M CONCRETE RGU CONFIGURATION



SECTIONAL ELEVATION



SECTIONAL ELEVATION

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

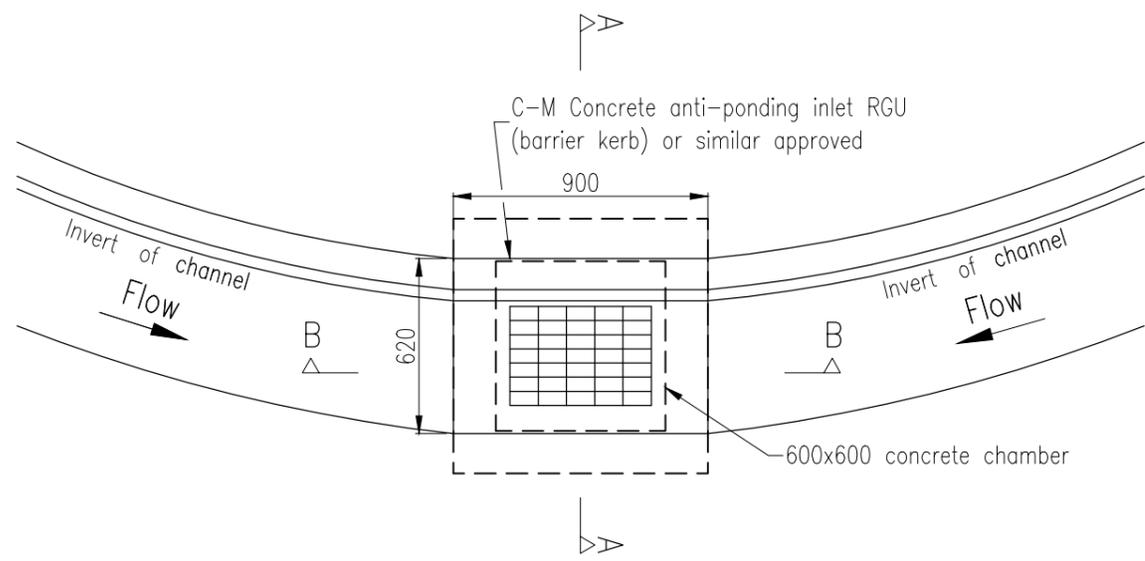
| REVISIONS | DATE |
|----------------------------|---------|
| F IRC ADDED | 12/2016 |
| E GRC AND LSC ADDED | 09/2014 |
| D MRC ADDED | 04/2011 |
| C REFERENCE TO LSC REMOVED | 01/2011 |
| B TRANSITION 1.5 MINIMUM | 07/2010 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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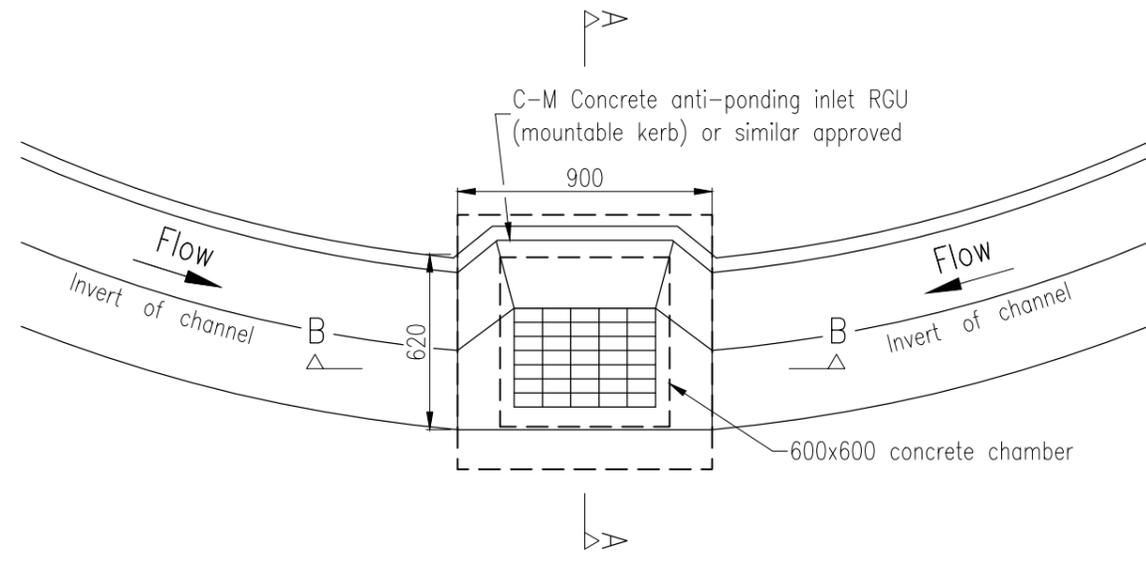
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Isaac Regional Council (IRC)

**PRECAST STORMWATER INLET
INSTALLATION DETAILS**

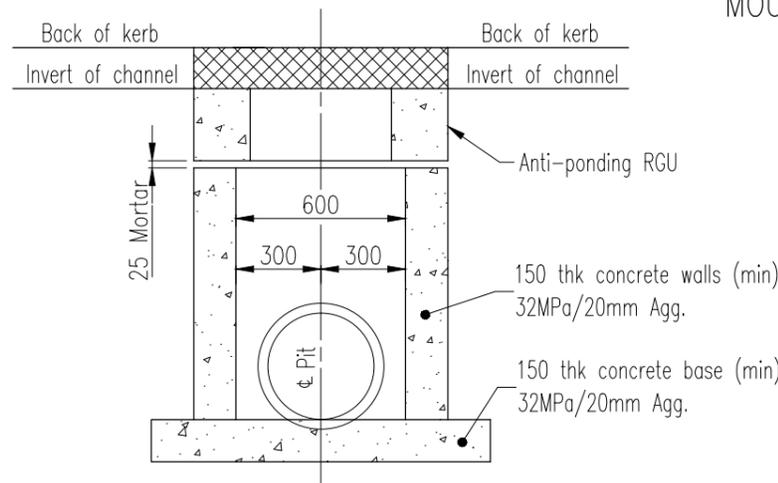
| DRAINAGE | |
|------------------|-------------|
| STANDARD DRAWING | |
| CMDG-D-020 | |
| REV. | A B C D E F |



PLAN
BARRIER KERB AND CHANNEL



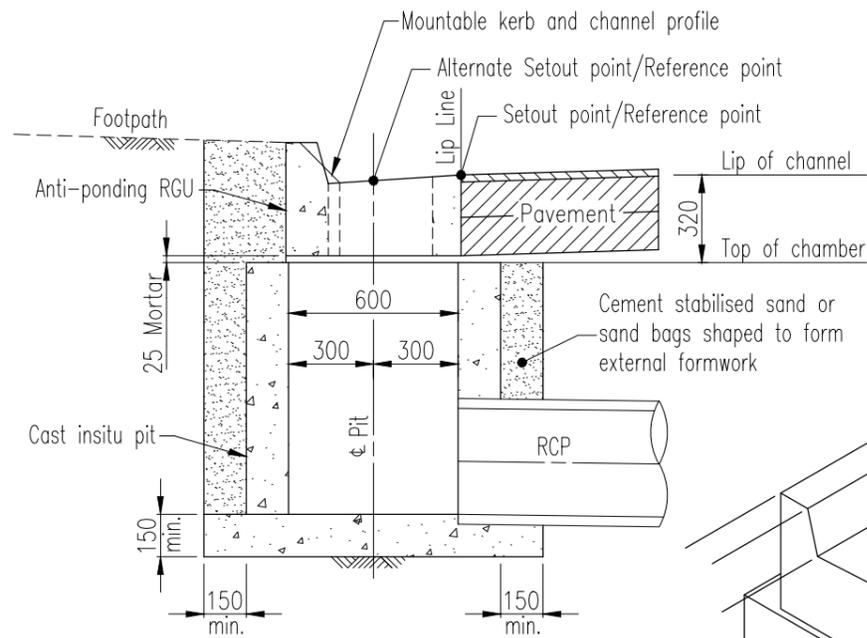
PLAN
MOUNTABLE KERB AND CHANNEL



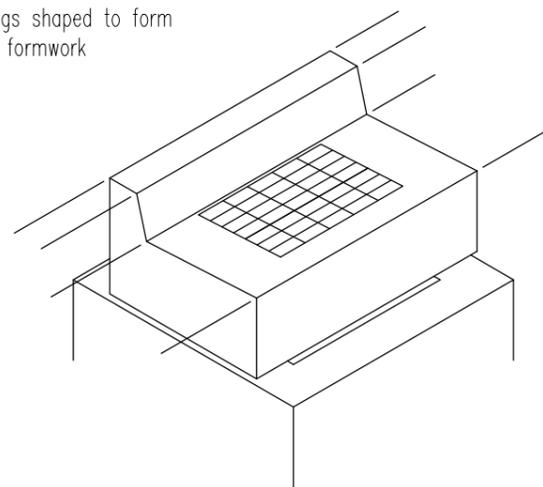
SECTION B-B

NOTES:

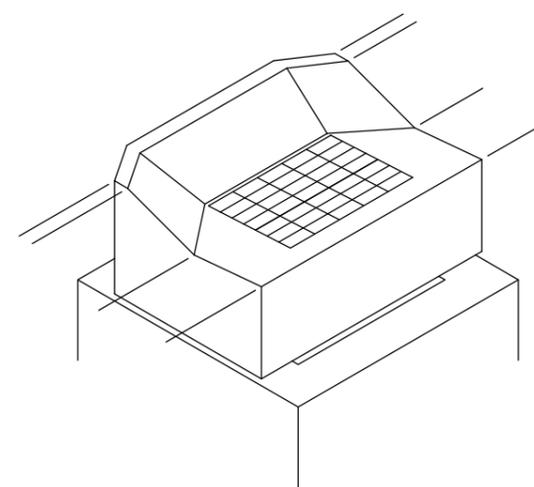
1. Precast anti-ponding road gully units to be 0.9m wide C-M Concrete Products or similar approved.
2. Reference point/setout point is on line of lip of kerb and channel at centre of grate. alternate reference point/setout point is geometric centre of chamber.
3. Pipe ends to be trimmed flush with internal wall and repaired so as to provide required concrete cover to pipe reinforcing.
4. Cut surfaces of concrete drainage components shall be given two coats of a tar epoxy paint.
5. The plane of the top of pit is to be constructed level when measured at right angles and parallel to the line of the lip of channel.



SECTION A-A



PERSPECTIVE
BARRIER KERB AND CHANNEL



PERSPECTIVE
MOUNTABLE KERB AND CHANNEL

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

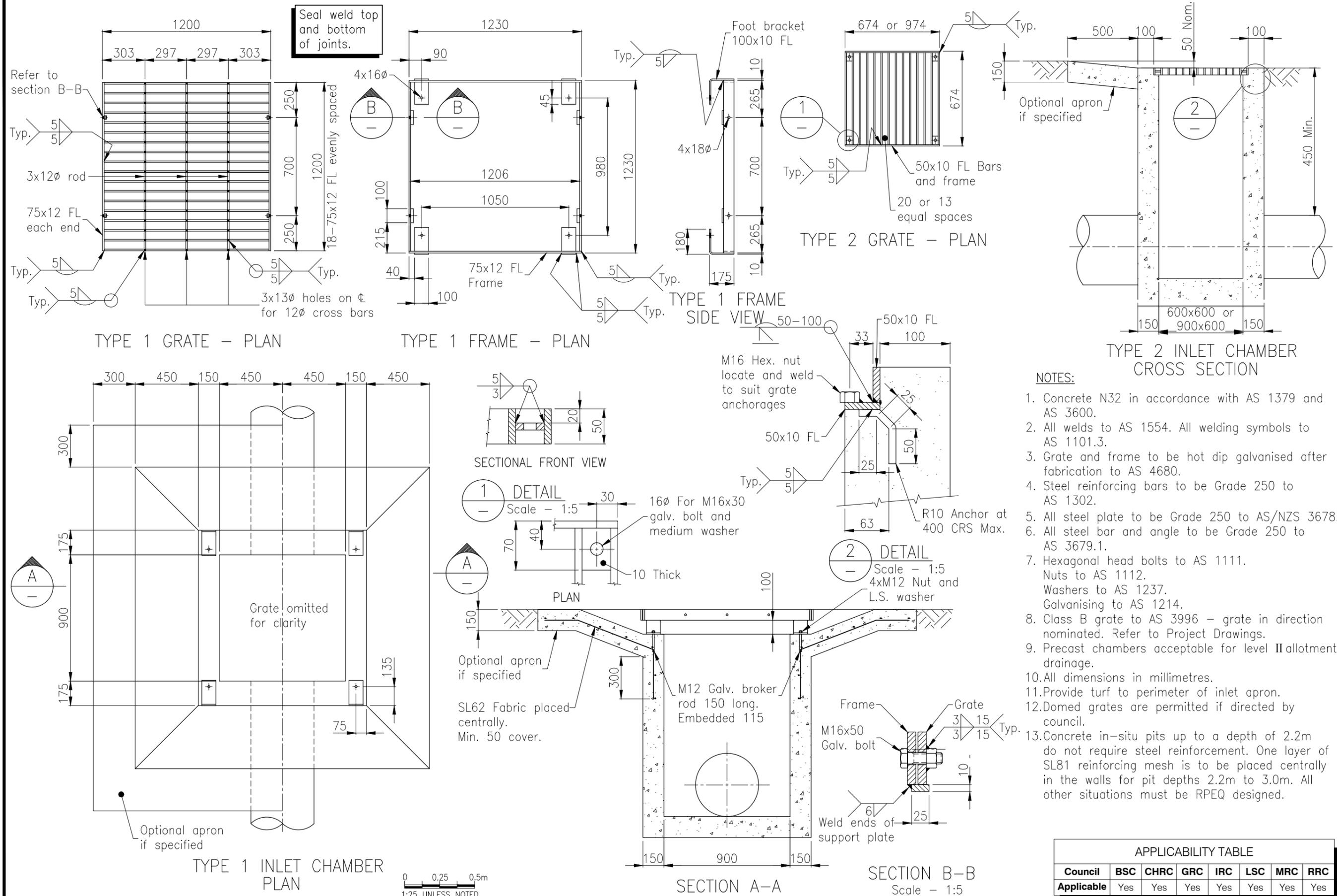
| REVISIONS | DATE |
|----------------------------|---------|
| E IRC ADDED | 12/2016 |
| D GRC AND LSC ADDED | 09/2014 |
| C MRC ADDED | 04/2011 |
| B REFERENCE TO LSC REMOVED | 01/2011 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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PRECAST ANTI-PONDING INLET
INSTALLATION DETAILS

| DRAINAGE | | | | |
|------------------|---|---|---|---|
| STANDARD DRAWING | | | | |
| CMDG-D-021 | | | | |
| REV. | A | B | C | D |



- NOTES:**
- Concrete N32 in accordance with AS 1379 and AS 3600.
 - All welds to AS 1554. All welding symbols to AS 1101.3.
 - Grate and frame to be hot dip galvanized after fabrication to AS 4680.
 - Steel reinforcing bars to be Grade 250 to AS 1302.
 - All steel plate to be Grade 250 to AS/NZS 3678.
 - All steel bar and angle to be Grade 250 to AS 3679.1.
 - Hexagonal head bolts to AS 1111. Nuts to AS 1112. Washers to AS 1237. Galvanising to AS 1214.
 - Class B grate to AS 3996 - grate in direction nominated. Refer to Project Drawings.
 - Precast chambers acceptable for level II allotment drainage.
 - All dimensions in millimetres.
 - Provide turf to perimeter of inlet apron.
 - Domed grates are permitted if directed by council.
 - Concrete in-situ pits up to a depth of 2.2m do not require steel reinforcement. One layer of SL81 reinforcing mesh is to be placed centrally in the walls for pit depths 2.2m to 3.0m. All other situations must be RPEQ designed.

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

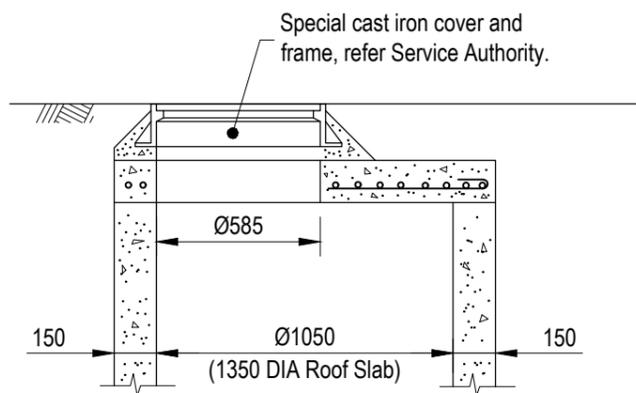
| REVISIONS | DATE |
|----------------------------------|---------|
| F NOTE 13 ADDED. | 03/2017 |
| E IRC ADDED | 12/2016 |
| D GRC AND LSC ADDED | 09/2014 |
| C MRC ADDED | 04/2011 |
| B NOTE 12 ADDED RE. DOMED GRATES | 07/2010 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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FIELD INLET DETAILS

| DRAINAGE | |
|------------------|-------------|
| STANDARD DRAWING | |
| CMDG-D-022 | |
| REV. | A B C D E F |
| | |

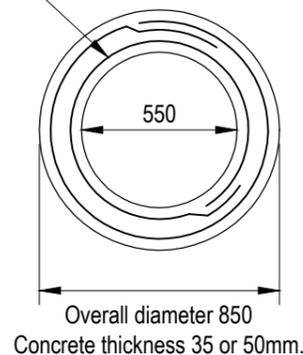


SECTION
ALTERNATIVE 1
1050 DIA MH.

INVERT GRADE DIMENSION 't' (MIN)

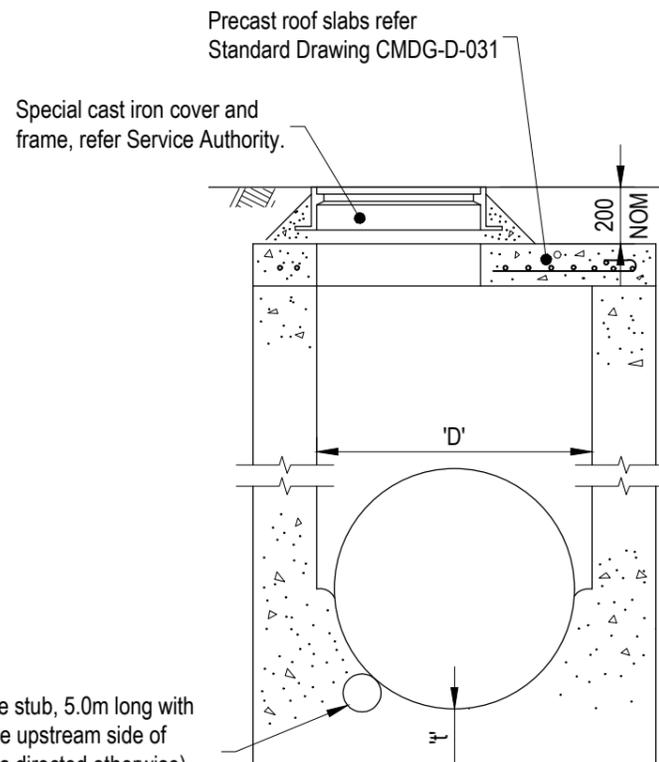
| Access Chamber DIA | FLOOR THICKNESS 't' | |
|--------------------|---------------------|--------|
| | INLET | OUTLET |
| 1050 | 175 | 150 |
| 1200 | 250 | 225 |
| 1350 | 250 | 225 |
| 1500 | 250 | 225 |

2 R6 bars, Grade 400 to AS ISO 1302, placed centrally in ring with 40 side cover. Lap 250.



PLAN
ROOF RING

For use in raising covers and frames of existing access chambers.

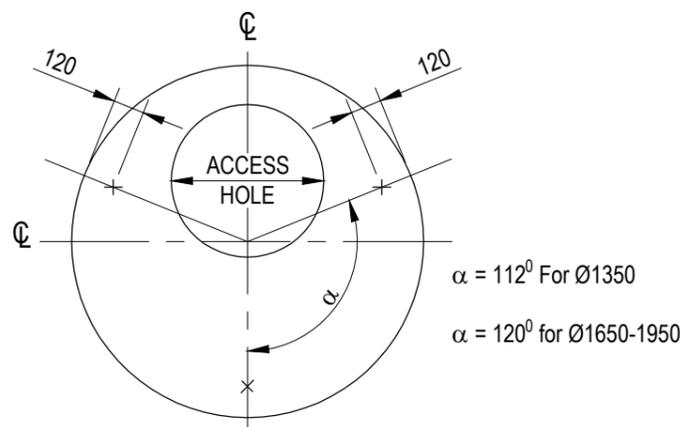


Ø100 uPVC slotted pipe stub, 5.0m long with end cap, installed on the upstream side of access chamber (unless directed otherwise). The stub is required to dewater the pipe trench.

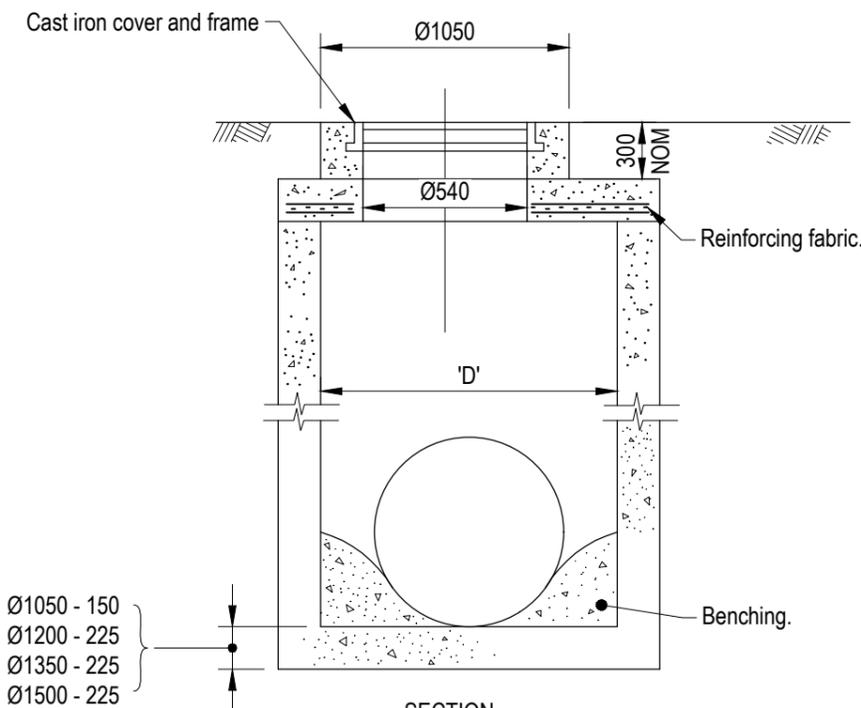
'D' {
1200 (1650 DIA roof slab)
1350 (1800 DIA roof slab)
1500 (1950 DIA roof slab)

TYPICAL SECTION

ACCESS CHAMBER DETAILS



LIFTING ANCHOR LOCATIONS
(Refer Note 4)



SECTION
ALTERNATIVE 2

NOTES:

- Structural concrete N32, benching N20 in accordance with AS 1379 and AS 3600.
- Alternatives: For access hole location refer Service Authority, For turret type refer Service Authority.
- Refer Project Drawings for size and level of culverts, and chamber cover level.
- Lifting anchors to be SWIFTLIFT or equivalent, 1.8 tonne, galvanized to AS 4680 and fitted to manufacturer's specifications.
- All dimensions in millimetres.
- Concrete in-situ pits up to a depth of 2.2m do not require steel reinforcement. One layer of SL81 reinforcing mesh is to be placed centrally in the walls for pit depths 2.2m to 3.0m. All other situations must be RPEQ designed.

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

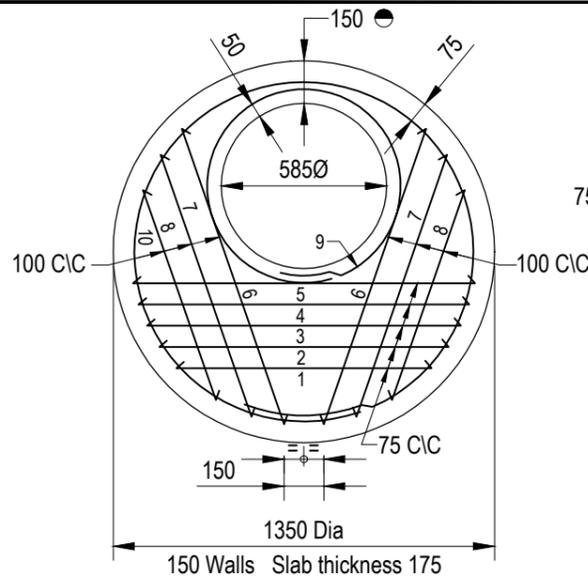
| REVISIONS | DATE |
|--------------------------------------|---------|
| F NOTE 1 REINFORCING DETAILS AMENDED | 12/2017 |
| E NOTE 6 ADDED | 03/2017 |
| D IRC ADDED | 12/2016 |
| C GRC AND LSC ADDED | 09/2014 |
| B MRC ADDED | 04/2011 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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ACCESS CHAMBER DETAILS
DIA 1050 TO 1500

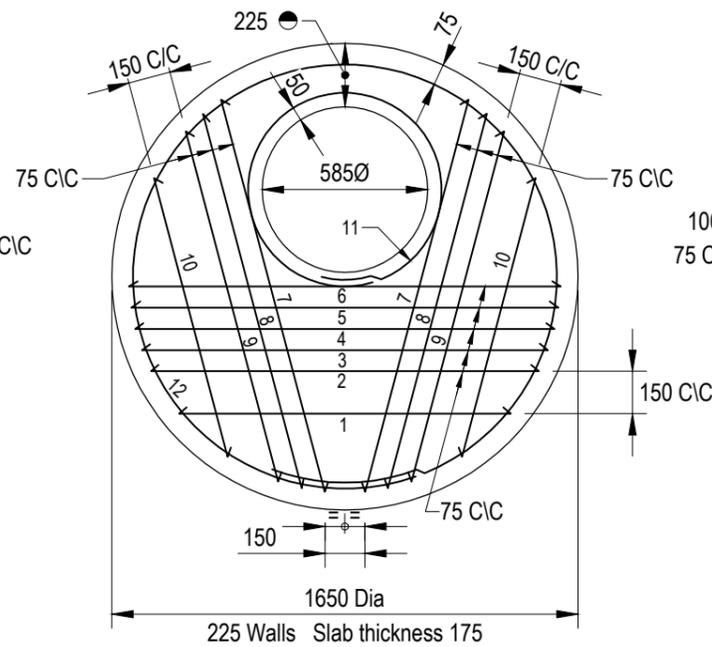
DRAINAGE
STANDARD
DRAWING
CMDG-D-030
REV. A B C D E F



| BAR No. | SHAPE | a/b | OVERALL LENGTH | No. OFF | TOTAL LENGTH |
|---------|-------|------|----------------|---------|--------------|
| 1 | | 937 | 1175 | 1 | 1175 |
| 2 | | 1030 | 1255 | 1 | 1255 |
| 3 | | 1125 | 1350 | 1 | 1350 |
| 4 | a | 1175 | 1400 | 1 | 1400 |
| 5 | | 1225 | 1450 | 1 | 1450 |
| 6 | | 1125 | 1350 | 2 | 2700 |
| 7 | | 1000 | 1225 | 2 | 2450 |
| 8 | | 812 | 1050 | 2 | 2100 |
| 9 | b | 685 | 2550 | 1 | 2550 |
| 10 | | 1200 | 4200 | 1 | 4200 |
| TOTAL | | | | | 20630 |

Steel Mass: 19kg
Concrete: 0.20m³
Total Mass: 508kg

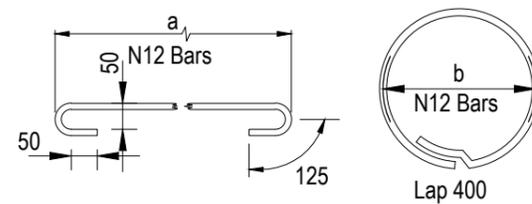
1050 DIA ACCESS CHAMBER



| BAR No. | SHAPE | a/b | OVERALL LENGTH | No. OFF | TOTAL LENGTH |
|---------|-------|------|----------------|---------|--------------|
| 1 | | 1200 | 1425 | 1 | 1425 |
| 2 | | 1400 | 1625 | 1 | 1625 |
| 3 | | 1450 | 1675 | 1 | 1675 |
| 4 | | 1500 | 1725 | 1 | 1725 |
| 5 | a | 1520 | 1745 | 1 | 1745 |
| 6 | | 1537 | 1775 | 1 | 1775 |
| 7 | | 1450 | 1675 | 2 | 3350 |
| 8 | | 1375 | 1600 | 2 | 3200 |
| 9 | | 1300 | 1525 | 2 | 3050 |
| 10 | | 1050 | 1275 | 2 | 2550 |
| 11 | b | 685 | 2550 | 1 | 2550 |
| 12 | | 1500 | 5150 | 1 | 5150 |
| TOTAL | | | | | 23200 |

Steel Mass: 27kg
Concrete: 0.33m³
Total Mass: 818kg

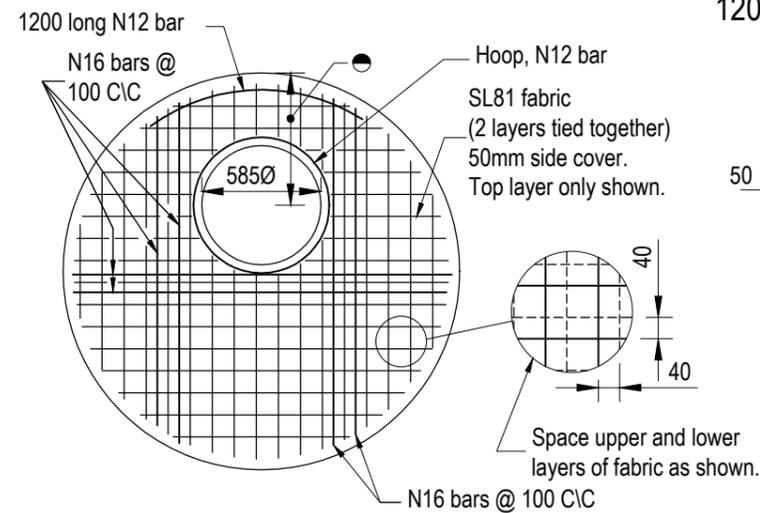
1200 DIA ACCESS CHAMBER



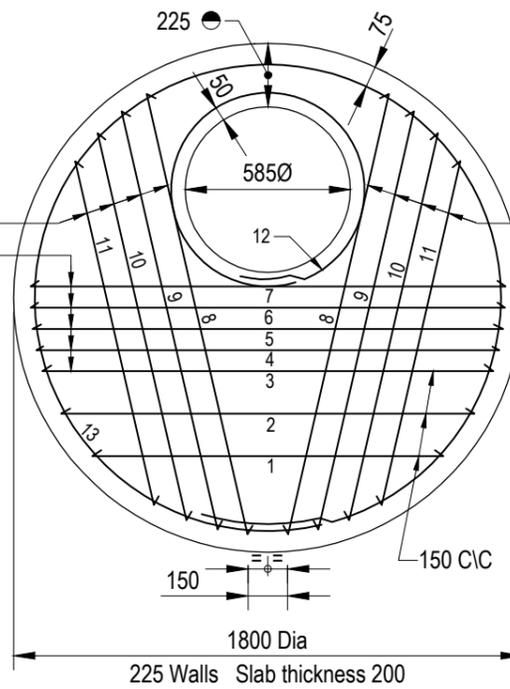
REINFORCEMENT DIMENSIONS

FABRIC REINFORCED SLAB

| NOM DIA | ROOF THICKNESS |
|---------|----------------|
| 1050 | 175 |
| 1200 | 175 |
| 1350 | 200 |
| 1500 | 250 |



FABRIC REINFORCEMENT ALTERNATIVE



| BAR No. | SHAPE | a/b | OVERALL LENGTH | No. OFF | TOTAL LENGTH |
|---------|-------|------|----------------|---------|--------------|
| 1 | | 1275 | 1500 | 1 | 1500 |
| 2 | | 1488 | 1725 | 1 | 1725 |
| 3 | | 1612 | 1850 | 1 | 1850 |
| 4 | | 1645 | 1870 | 1 | 1870 |
| 5 | a | 1675 | 1900 | 1 | 1900 |
| 6 | | 1675 | 1900 | 1 | 1900 |
| 7 | | 1675 | 1900 | 1 | 1900 |
| 8 | | 1600 | 1825 | 2 | 3650 |
| 9 | | 1525 | 1750 | 2 | 3500 |
| 10 | | 1412 | 1650 | 2 | 3300 |
| 11 | | 1262 | 1500 | 2 | 3000 |
| 12 | b | 685 | 2550 | 1 | 2550 |
| 13 | | 1650 | 5625 | 1 | 5625 |
| TOTAL | | | | | 34270 |

Steel Mass: 31kg
Concrete: 0.45m³
Total Mass: 1138kg

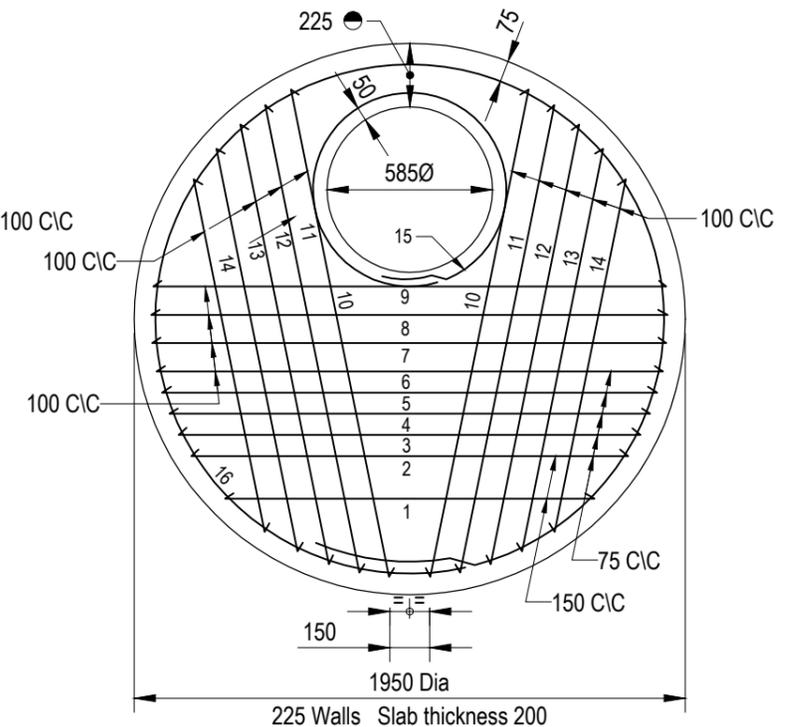
1350 DIA ACCESS CHAMBER

LEGEND:

- Offset to access hole varies:
 - Hole in line with chamber wall, or
 - Hole offset from wall 460mm

NOTES:

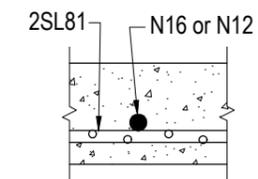
- Concrete N40 in accordance with AS 1379 and AS 3600.
- Reinforcement cover 30 MIN (bottom cover).
- Reinforcement: SL81 Fabric to AS/NZS 4671.
Bars N12 and N16, Grade 400 to AS ISO 1302.
- Refer Std Dwg No. CMDG-D-030 (Access Chamber Details - Dia 1050 to 1500) for lifting anchor locations and details.
- Roof design based on Austroads bridge code, W7 wheel load, dynamic factor 0.4.
- All dimensions in millimetres.



| BAR No. | SHAPE | a/b | OVERALL LENGTH | No. OFF | TOTAL LENGTH |
|---------|-------|------|----------------|---------|--------------|
| 1 | | 1337 | 1575 | 1 | 1575 |
| 2 | | 1575 | 1800 | 1 | 1800 |
| 3 | | 1645 | 1870 | 1 | 1870 |
| 4 | | 1712 | 1950 | 1 | 1950 |
| 5 | | 1756 | 1980 | 1 | 1980 |
| 6 | a | 1800 | 2025 | 1 | 2025 |
| 7 | | 1825 | 2050 | 1 | 2050 |
| 8 | | 1837 | 2075 | 1 | 2075 |
| 9 | | 1825 | 2050 | 1 | 2050 |
| 10 | | 1762 | 2000 | 2 | 4000 |
| 11 | | 1700 | 1925 | 2 | 3850 |
| 12 | | 1600 | 1825 | 2 | 3650 |
| 13 | | 1462 | 1700 | 2 | 3400 |
| 14 | | 1275 | 1500 | 2 | 3000 |
| 15 | b | 685 | 2550 | 1 | 2550 |
| 16 | | 1800 | 6100 | 1 | 6100 |
| TOTAL | | | | | 43925 |

Steel Mass: 39kg
Concrete: 0.55m³
Total Mass: 1360kg

1500 DIA ACCESS CHAMBER



ROOF SECTION

APPLICABILITY TABLE

| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
|------------|-----|------|-----|-----|-----|-----|-----|
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| REVISIONS | DATE | |
|-----------|-----------------------------|---------|
| E | REINFORCING DETAILS AMENDED | 12/2017 |
| D | IRC ADDED | 12/2016 |
| C | GRC AND LSC ADDED | 09/2014 |
| B | MRC ADDED | 04/2011 |
| A | POST AMALGAMATION REVIEW | 01/2010 |

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Isaac Regional Council (IRC)

ACCESS CHAMBER ROOF SLAB DIA 1050 TO 1500

| REV. | A | B | C | D | E |
|------|---|---|---|---|---|
| | | | | | |

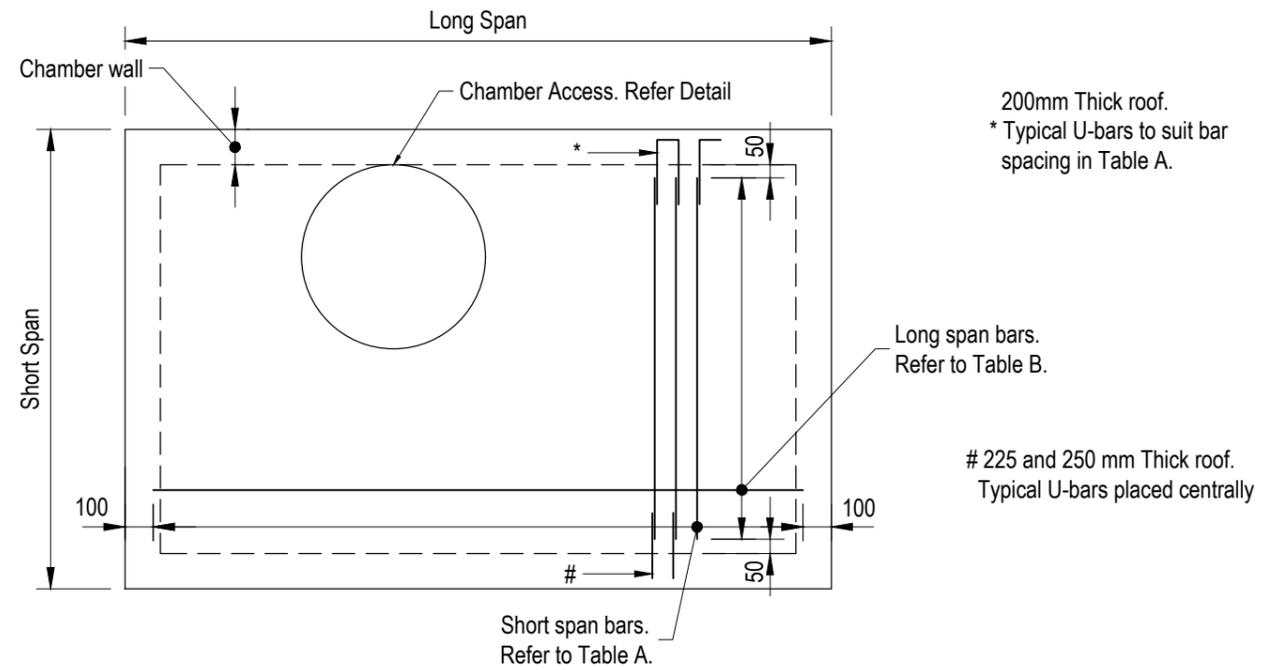
DRAINAGE
STANDARD
DRAWING
CMDG-D-031

| SHORT SPAN | LONG SPAN | | | | | | | | | | SLAB DEPTH |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | |
| 1200 | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 175 | N16 AT 175 | N16 AT 150 | N12 AT 150 | N16 AT 150 | 200 |
| 1400 | | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 175 | N16 AT 150 | N16 AT 150 | N16 AT 150 | N16 AT 150 | 200 |
| 1600 | | | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 150 | N16 AT 150 | N16 AT 150 | N16 AT 150 | 200 |
| 1800 | | | | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 175 | N16 AT 175 | N16 AT 175 | 225 |
| 2000 | | | | | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 175 | 225 |
| 2200 | | | | | | N12 AT 150 | N16 AT 200 | N16 AT 200 | N16 AT 175 | N16 AT 175 | 225 |
| 2400 | | | | | | | N16 AT 200 | N16 AT 200 | N16 AT 200 | N16 AT 175 | 225 |
| 2600 | | | | | | | | N16 AT 200 | N16 AT 200 | N16 AT 175 | 250 |
| 2800 | | | | | | | | | N16 AT 200 | N16 AT 175 | 250 |
| 3000 | | | | | | | | | | N16 AT 175 | 250 |

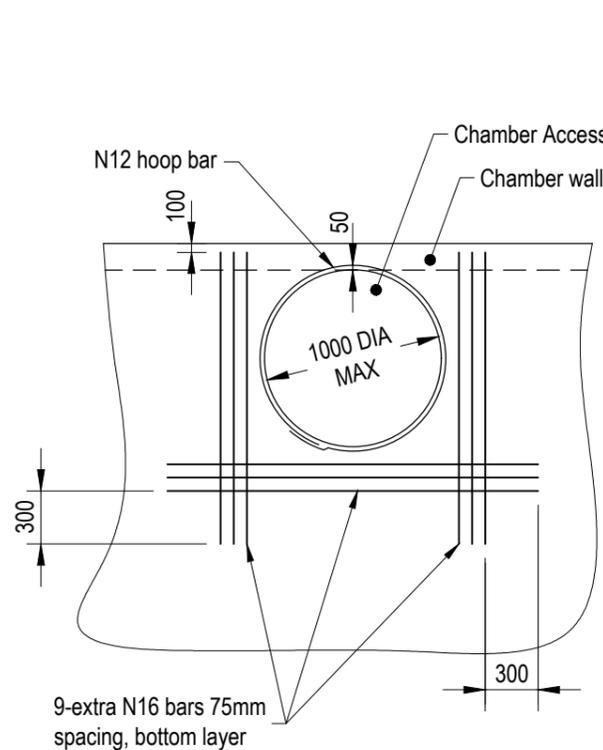
TABLE A: SHORT SPAN BARS

| SHORT SPAN | LONG SPAN | | | | | | | | | | SLAB DEPTH |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | |
| 1200 | N12 AT 150 | N12 AT 200 | 200 |
| 1400 | | N12 AT 150 | N12 AT 200 | 200 |
| 1600 | | | N12 AT 150 | N12 AT 150 | N12 AT 200 | 200 |
| 1800 | | | | N12 AT 150 | N12 AT 150 | N12 AT 200 | 225 |
| 2000 | | | | | N12 AT 150 | N12 AT 200 | 225 |
| 2200 | | | | | | N12 AT 150 | N12 AT 150 | N12 AT 150 | N12 AT 200 | N12 AT 200 | 225 |
| 2400 | | | | | | | N16 AT 200 | N12 AT 150 | N12 AT 150 | N16 AT 150 | 225 |
| 2600 | | | | | | | | N16 AT 200 | N16 AT 200 | N16 AT 200 | 250 |
| 2800 | | | | | | | | | N16 AT 200 | N16 AT 200 | 250 |
| 3000 | | | | | | | | | | N16 AT 175 | 250 |

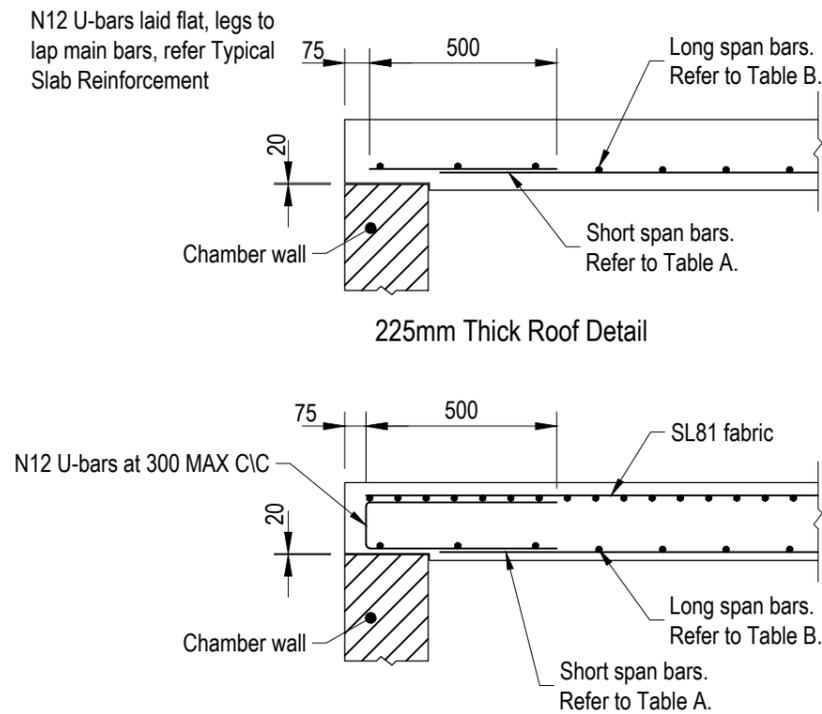
TABLE B: LONG SPAN BARS



TYPICAL SLAB REINFORCEMENT



SLAB REINFORCEMENT AROUND CHAMBER ACCESS



TYPICAL SECTIONS

NOTES:

- Concrete N32/20 in accordance with AS 1379 and AS 3600.
- Reinforcement :- SL81 fabric to AS/NZS 4671
Bars N12 and N16 Grade 400 to AS ISO 1302.
- All laps in reinforcement shall be :- N12 - 300, N16 - 400.
- Form work in accordance with AS 3610.
- Designed to AustRoads Bridge Code, W7 wheel load, dynamic factor 0.4.
- Maximum fill over roof slab shall be 3000mm.
- Reinforcement cover 45 min.
- Refer Service Authority for access hole diameter to be adopted.
- Refer project drawings for details of chamber walls and floors.
- All dimensions in millimetres.

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

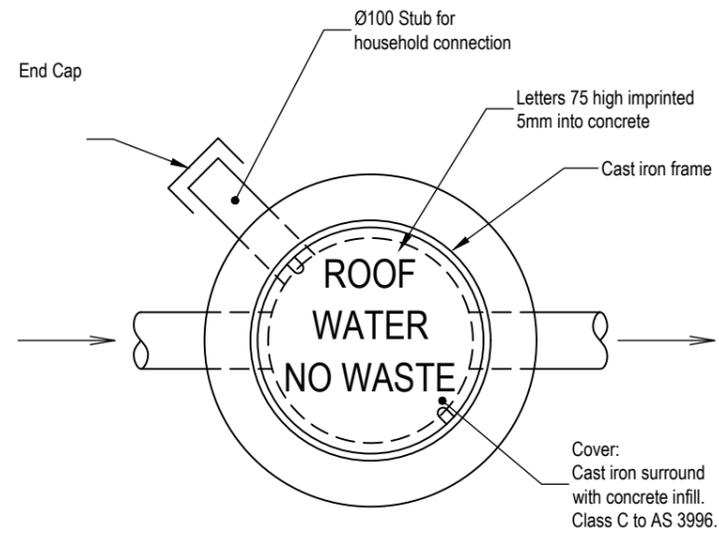
| REVISIONS | DATE | |
|-----------|-----------------------------|---------|
| E | REINFORCING DETAILS AMENDED | 12/2017 |
| D | IRC ADDED | 12/2016 |
| C | GRC AND LSC ADDED | 09/2014 |
| B | MRC ADDED | 04/2011 |
| A | POST AMALGAMATION REVIEW | 01/2010 |

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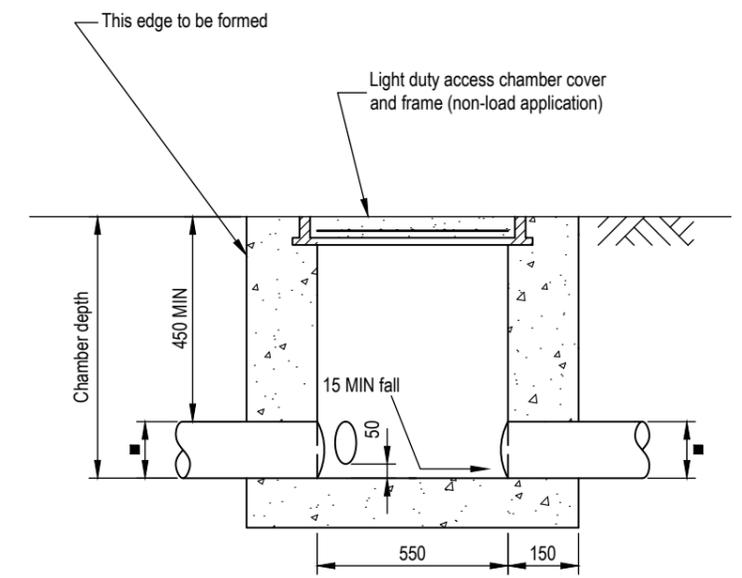
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Isaac Regional Council (IRC)

ACCESS CHAMBER ROOF SLAB RECTANGULAR

| DRAINAGE | | | | |
|------------------|---|---|---|---|
| STANDARD DRAWING | | | | |
| CMDG-D-032 | | | | |
| REV. | A | B | C | D |
| | | | | |

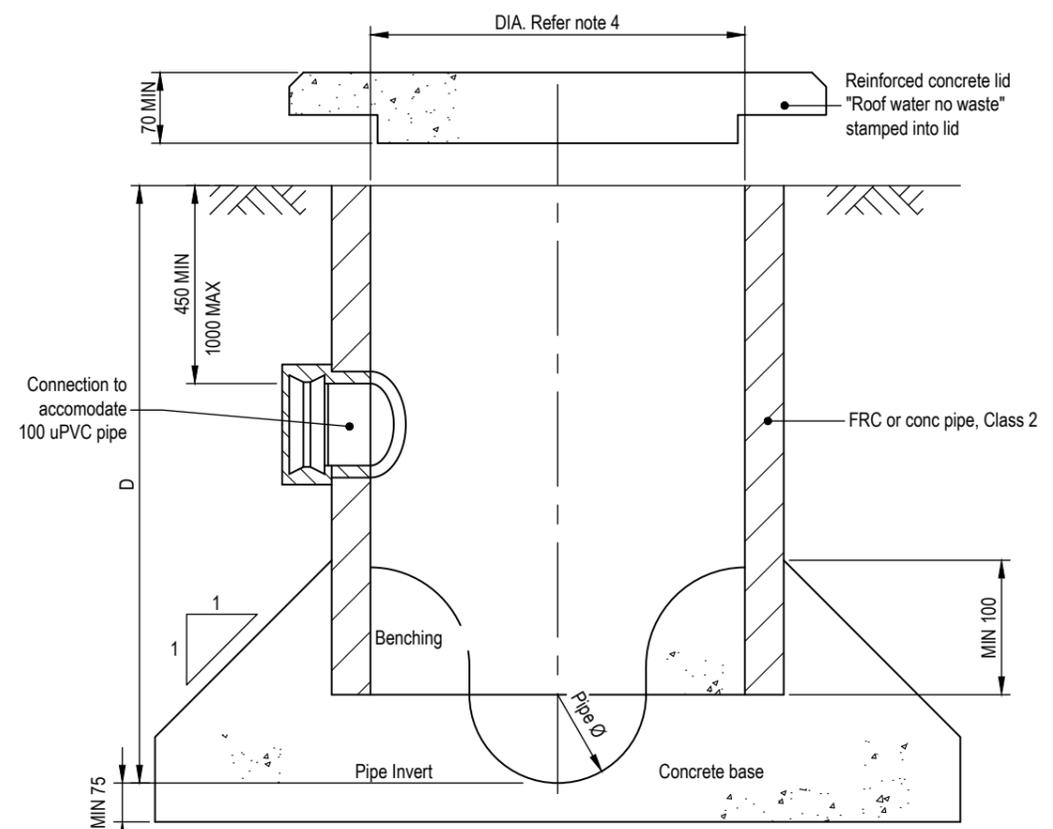


PLAN



SECTION

TYPE1
CAST INSITU



SECTIONAL ELEVATION

TYPE 2
PRECAST/INSITU

NOTES:

- Roofwater systems are to be connected to stormwater gullies or access chambers. Where the system is to be connected to kerb and channel one property can be connected via a 100 Class 12 uPVC pipe or a 100x75 galvanized R.H.S. to a kerb adaptor. A maximum of two properties can be connected via a 200x75 galvanized R.H.S.
- The pipe materials and joint types shall be as follows:

| MATERIAL | AUST STD | JOINT | RESTRICTIONS |
|---------------------------|--------------|----------------|-----------------------------|
| Fibre reinforced, Class 2 | AS 4139-2003 | Rubber ring | N/A |
| Concrete, Class 2 | AS 1342 | Rubber ring | N/A |
| uPVC, sewer Class 12 | AS/NZS 1260 | Solvent welded | Not to be used in easements |
- Minimum cover to roofwater pipes to be 450mm except where less cover is necessary to discharge to kerb and channel.
- Access chamber depths and minimum diameters shall be as follows:

| DEPTH | DIAMETER (MIN) |
|--------|----------------|
| ≤750mm | 600Ø |
| >750mm | 900Ø |
- Alternative designs, materials and methods of construction will be considered for approval including precast roofwater chambers available from various manufacturers. Alternative precast units will require to be bedded and encased in 150 thick concrete (Grade N32) up to 150 above crown of the inlet pipe with all subsequent backfill compacted to 95% MDD (modified compaction to AS 1289) to ensure stability and robustness.
- Alternative covers and frames proposed for approval, and be designed as Class C to AS 3996.
- Concrete, base N32, cover infill N32, in accordance with AS 1379 and AS 3600.
- The roofwater drainage system shall be shown on the stormwater drainage plans for the development.
- The following AS CONSTRUCTED information shall be submitted to Superintendent:
 - Offsets of the main line to property boundary.
 - The locations of access chambers and Y junctions measured from the property boundary.
- Where individual lots can be directly discharged to the kerb and channel, kerb adaptors shall be used.
- All dimensions in millimetres.

LEGEND:

- Refer project drawings for pipe diameter and type
- Refer Std Dwg No. SD-D-031 (Access Chamber Roof Slabs - Dia 1050 to 1500) for roof design at 900Ø chambers.

| APPLICABILITY TABLE | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes |

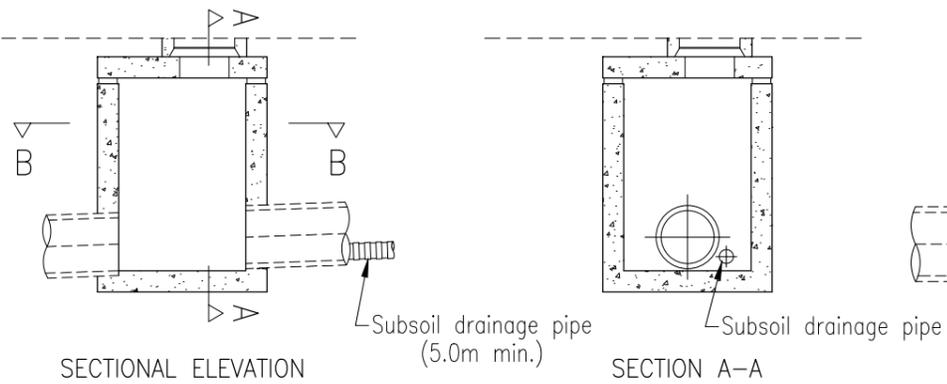
| REVISIONS | DATE |
|-----------|--|
| E | NOTE 5 AMENDED TO PERMIT NON CIRCULAR CHAMBERS 08/2022 |
| D | IRC ADDED 12/2016 |
| C | GRC AND LSC ADDED 09/2014 |
| B | MRC ADDED 04/2011 |
| A | POST AMALGAMATION REVIEW 01/2010 |

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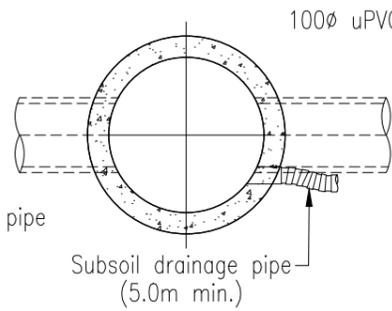
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Gladstone Regional Council (GRC) Isaac Regional Council (IRC)
Livingstone Shire Council (LSC)

ROOFWATER INSPECTION CHAMBER

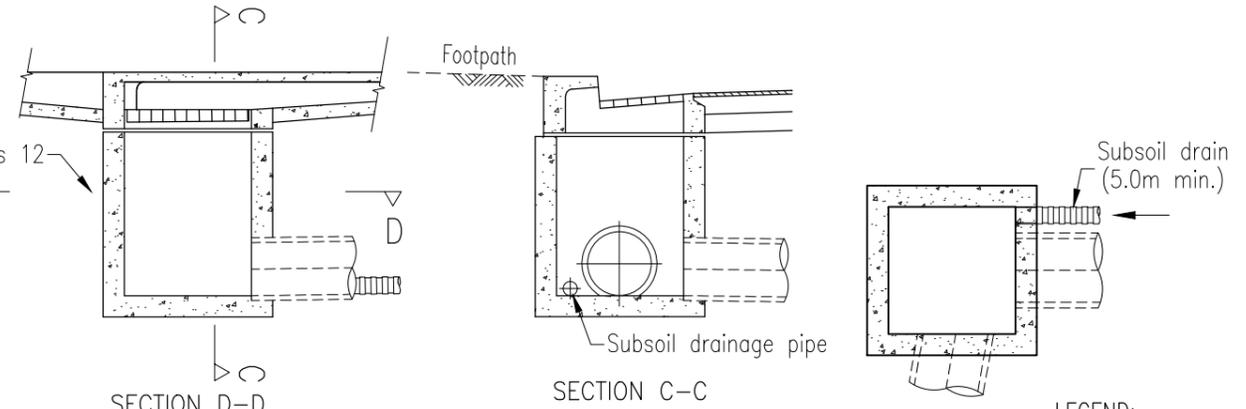
| DRAINAGE | |
|------------------|-----------|
| STANDARD DRAWING | A3 |
| CMDG-D-033 | |
| REV. | A B C D E |



TYPICAL ACCESS CHAMBER DETAILS



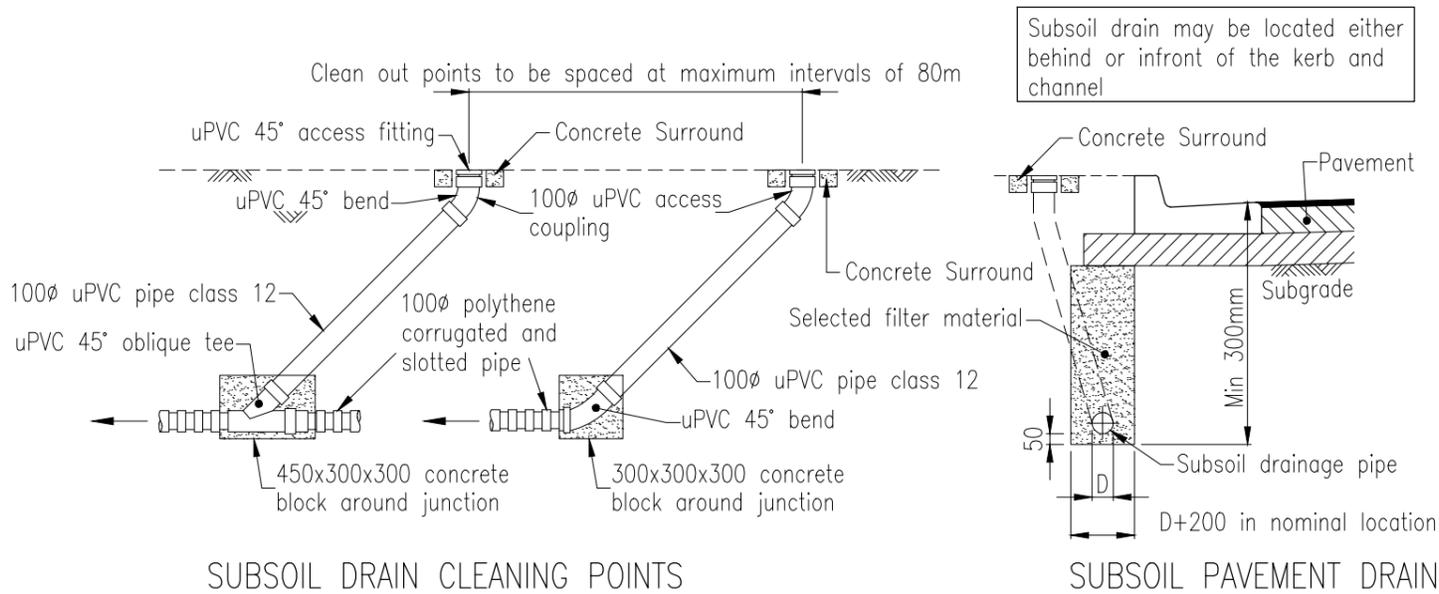
TYPICAL GULLY DETAILS



LEGEND:
⊗ Refer note 9

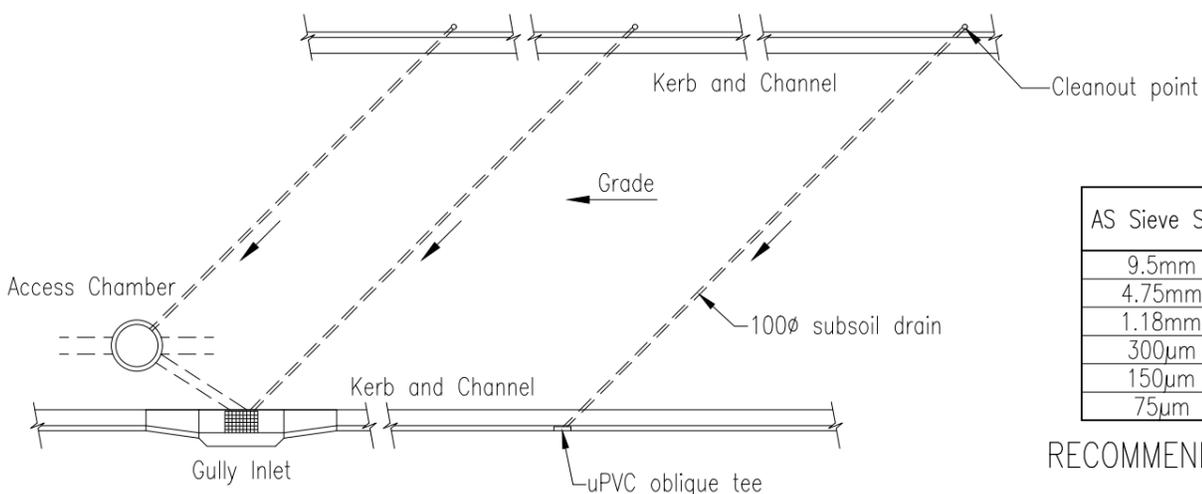
NOTES:

1. Minimum 5.0m length of subsoil drainage pipe to be located upstream of all manholes to drain trench.
2. All Subsoil pipe drains to be polyethylene corrugated slotted pipe to AS 2439.1.
3. Subsoil drains to outlet at invert level of inlet pipe, unless noted otherwise.
4. Minimum grade of Type 1 subsoil drain to be 0.5%. Desirable minimum grade of Type 2 Subsoil drain 0.5%. Absolute minimum grade 0.1% subject to council approval.
5. Filter materials not complying with the specified grading requirements may be used if approved by the Superintendent. A geofabric may be used to line trenches where approved by the Superintendent.
6. Concrete anchors N32 in accordance with AS1379 and AS 3600.
7. At an oblique tee on subsoil drain cleaning points, the contractor may install Vinidex vertical fittings or similar if approved by the Superintendent.
8. Minimum cover over subsoil drain for various compactors unless approved otherwise: Hand held units - 100, Units < 15 tonnes - 200, Units > 15 tonnes - 300
9. Subsoil drain dia.(D)=100 nom. unless specified otherwise.
10. Impervious material to be provided where subsoil drainage is not under pavement. When impervious material is omitted the backfill/selected filter material shall extend to underside of pavement.
11. All dimensions in millimetres.



SUBSOIL DRAIN CLEANING POINTS

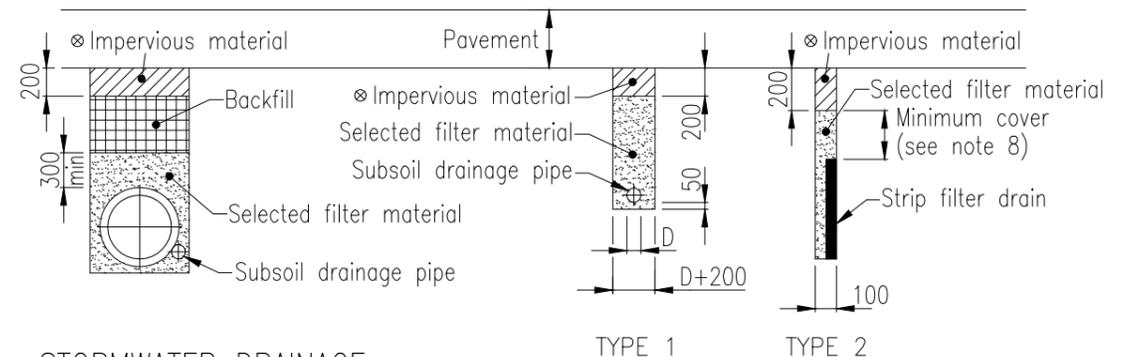
SUBSOIL PAVEMENT DRAIN



TYPICAL MITRE DRAIN LOCATIONS

| AS Sieve Size | % Passing by mass |
|---------------|-------------------|
| 9.5mm | 100 |
| 4.75mm | 90-100 |
| 1.18mm | 45-80 |
| 300µm | 10-30 |
| 150µm | 0-10 |
| 75µm | 0-1 |

RECOMMENDED FILTER MATERIAL GRADING



STORMWATER DRAINAGE TRENCHES WITH SUBSOIL DRAINAGE

STANDARD SUBSOIL DRAIN

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

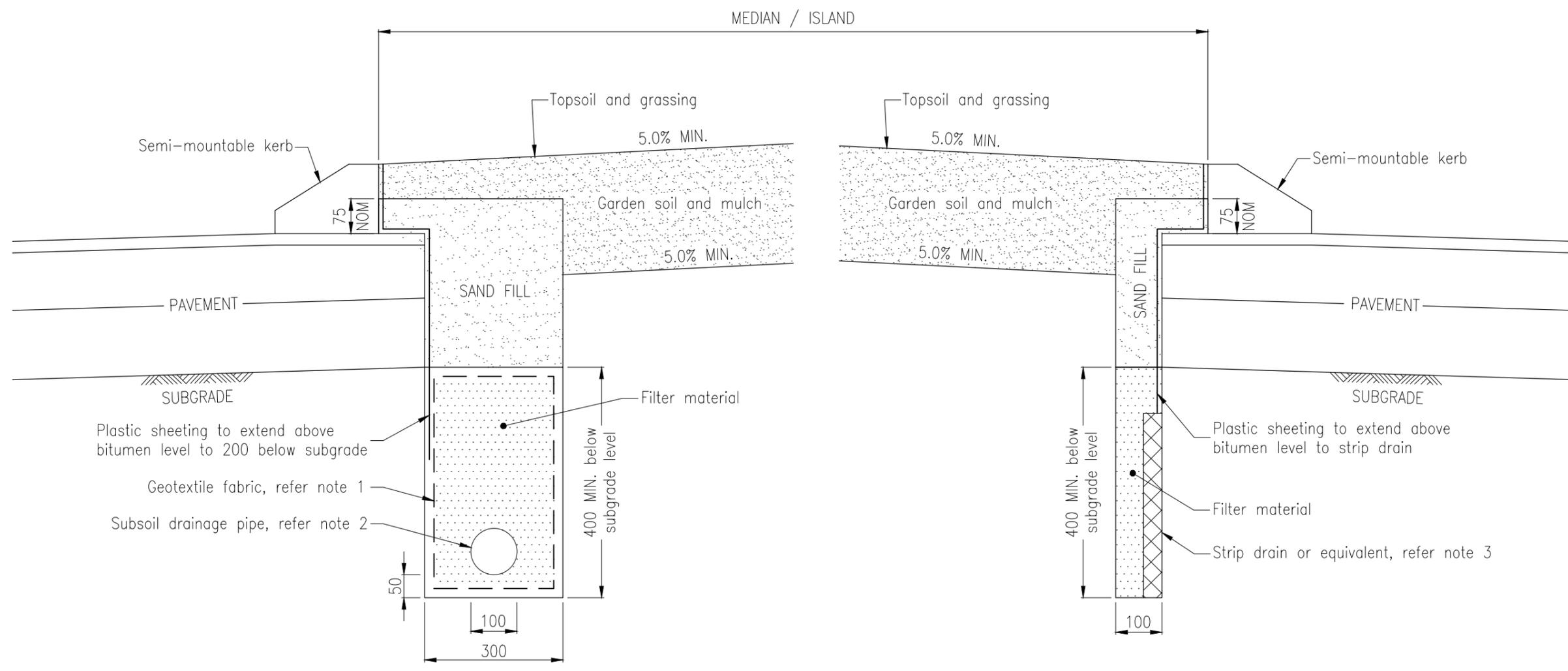
| REVISIONS | DATE |
|--|---------|
| F IRC ADDED | 12/2016 |
| E GRC AND LSC ADDED | 09/2014 |
| D MRC ADDED | 04/2011 |
| C NOTE 4 AMENDED | 01/2011 |
| B CLEAN OUT POINTS SHOWN AT SURFACE WITH CONCRETE SURROUND | 07/2010 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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Isaac Regional Council (IRC)

SUBSOIL DRAINAGE

DRAINAGE
STANDARD
DRAWING
CMDG-D-040
REV. A B C D E F



| AS Sieve Size | % Passing by mass |
|---------------|-------------------|
| 9.5mm | 100 |
| 4.75mm | 90-100 |
| 1.18mm | 45-80 |
| 300µm | 10-30 |
| 150µm | 0-10 |
| 75µm | 0-1 |

RECOMMENDED FILTER MATERIAL GRADING

NOTES:

1. Geotextile surround proprietary product, U.V. stabilised, non-woven, type flow rate > 50 l/m/sec, G >1300 and E.O.S. < 200µm.
2. 100Ø Subsoil drainage pipe – corrugated slotted polyethylene, connect to drainage system at 0.5% minimum grade.
3. Strip drain – proprietary product, deep-fin plastic core, 120 Kpa minimum crush strength, 40mm minimum thickness, fully enclosed by a non woven geotextile, connect to drainage system at 0.5% desirable minimum grade, 0.1% absolute minimum grade subject to Council approval.
4. All dimesions in millimetres.
5. Plastic sheeting to be 200µm minimum

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| REVISIONS | DATE |
|---|---------|
| F IRC ADDED | 12/2016 |
| E GRC AND LSC ADDED | 09/2014 |
| D MRC ADDED | 04/2011 |
| C NOTE 3 AMENDED | 01/2011 |
| B NOTE 5 ADDED. SHEETING EXTENDED UP KERB | 07/2010 |
| A POST AMALGAMATION REVIEW | 01/2010 |

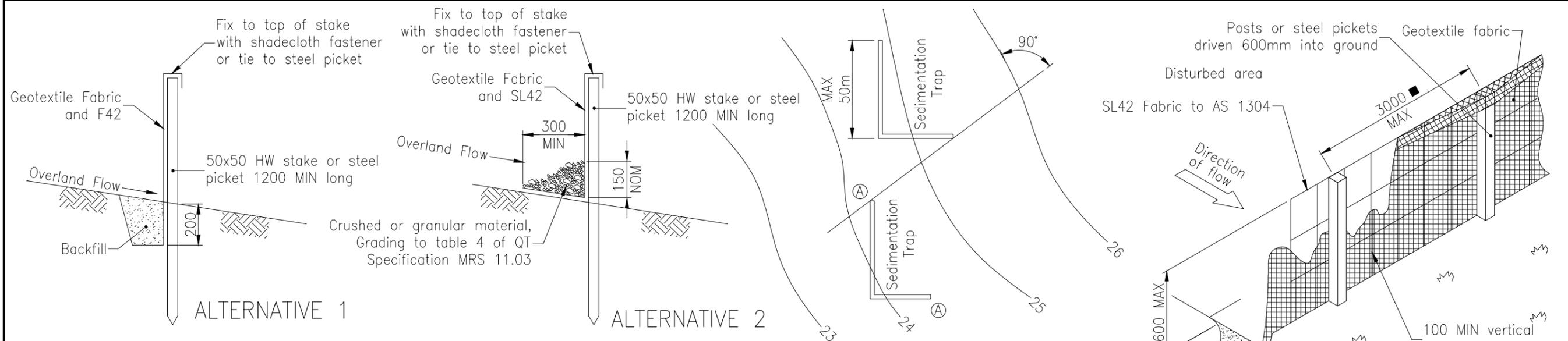
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Capricorn Municipal Development Guidelines

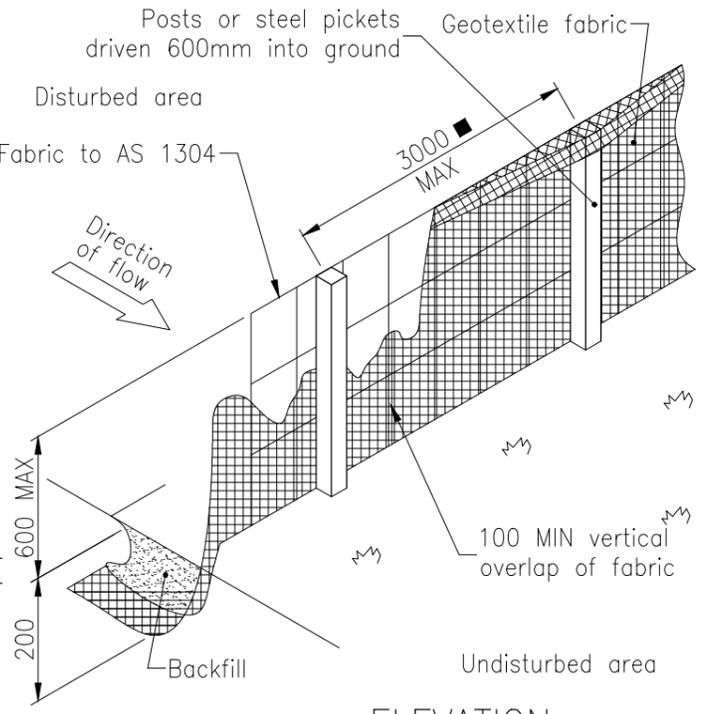
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Isaac Regional Council (IRC)

SUBSOIL DRAINAGE DETAILS AT MEDIANS/ISLANDS

| DRAINAGE | | | | | |
|------------------|---|---|---|---|---|
| STANDARD DRAWING | | | | | |
| CMDG-D-041 | | | | | |
| REV. | A | B | C | D | E |
| | | | | | |



TYPICAL LAYOUT ACROSS GRADE
Points A at same elevation



ELEVATION

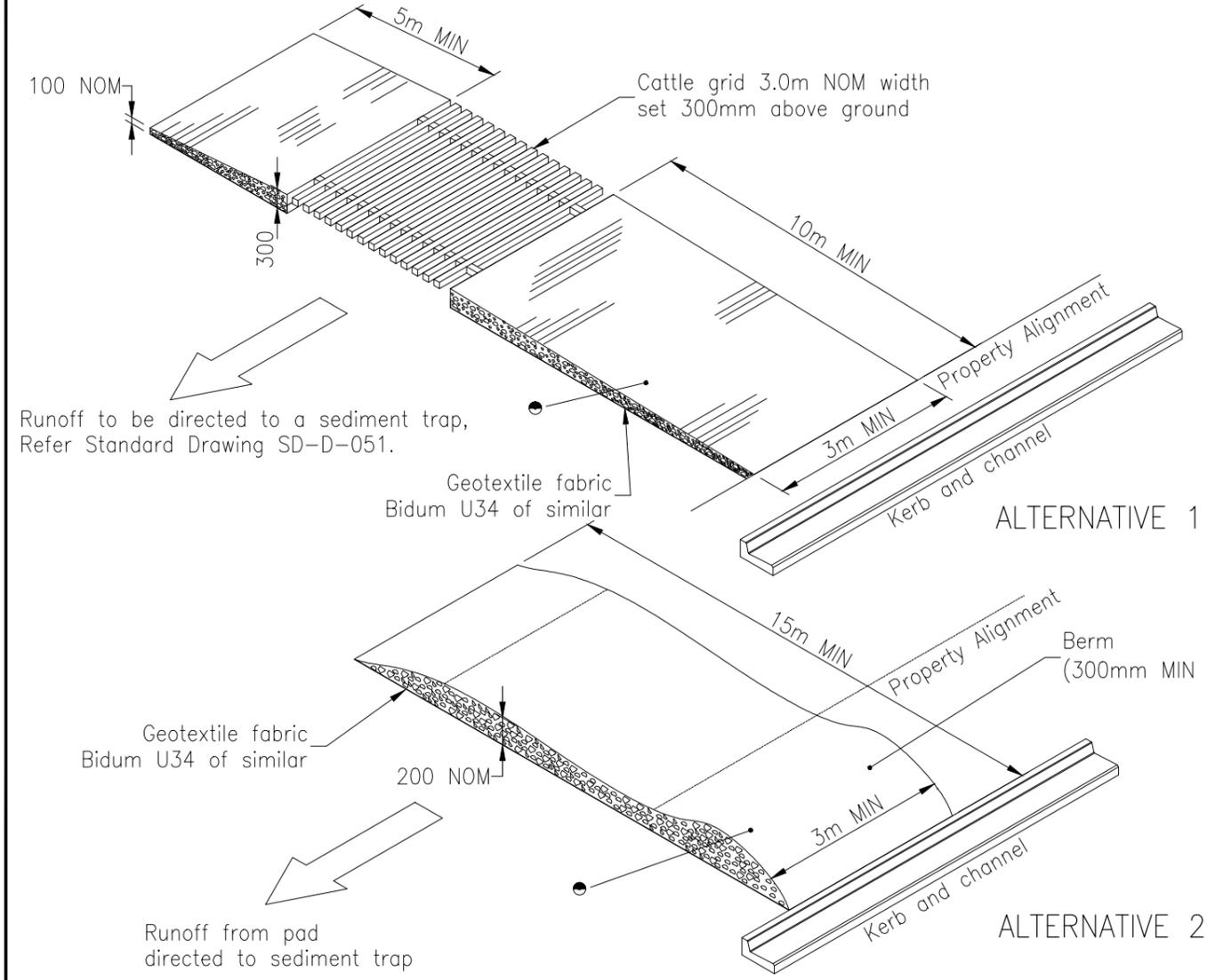
LEGEND:

- Unbound pavement material (gravel) to Grading B, Table 9 of QT Specification MRS11.05, exclude material finer than AS sieve 2.36mm
- Without SL42 fabric, 2000 MAX. C/C

NOTES:

1. General
 - a. (Temporary drainage control. Flow should be diverted around the work site where possible.
 - b. All drainage, erosion and sediment controls to be installed and be operational before commencing up-slope earthworks.
 - c. All control measures to be inspected at least weekly and after significant runoff producing storms.
 - d. Control measures may be removed when on-site erosion is controlled and 70% permanent soil coverage is obtained over all upstream disturbed land.
 - e. In areas where runoff turbidity is to be controlled, exposed surfaces to be either mulched, covered with erosion control blankets or turfed if earthworks are expected to be delayed for more than 14 days.
 - f. Straw bale sediment traps are a secondary option which generally should not be used if other options are available.
2. Sediment Fence
 - a. Not to be located in areas of concentrated flow.
 - b. Normally located along the contour with a maximum catchment area 0.6ha per 100m length of fence.
 - c. Woven fabrics are preferred, non-woven fabrics may be used on small work sites. i.e. operational period less than 6 months or on sites where significant sediment runoff is not expected.
 - d. Where fences need to be located across the contour the layout shall conform to 'Typical Layout Across Grade'.
 - e. Fences are required 2m MIN from toe of cut or fill batters, where not practical one fence can be at the toe with a second fence 1m MIN away. Fence should not be located parallel with toe if concentration of flow will occur behind the fence.
3. Temp Construction Entry/Exit Sediment Trap.
 - a. Adjacent stormwater runoff to be diverted away from entry/exit.
 - b. Wheel-wash or spray unit may be required during wet weather.
4. Safety issues must be considered at all times, incorporate traffic control devices to the satisfaction of the Superintendent.
5. All dimensions in millimetres unless indicated otherwise.

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |



TEMPORARY CONSTRUCTION ENTRY/EXIT
SEDIMENT TRAP

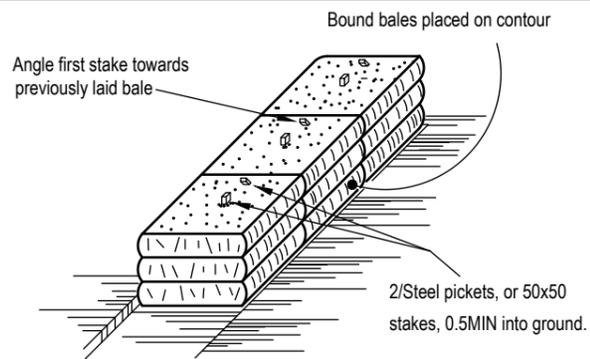
| REVISIONS | DATE |
|----------------------------|---------|
| D IRC ADDED | 12/2016 |
| C GRC AND LSC ADDED | 09/2014 |
| B MRC ADDED | 04/2011 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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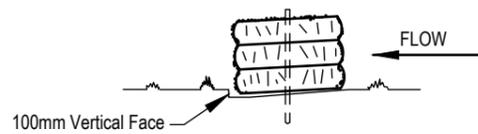
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Isaac Regional Council (IRC)

SEDIMENT CONTROL DEVICES
SEDIMENT FENCE
ENTRY/EXIT SEDIMENT TRAP

| DRAINAGE | | | | |
|------------------|---|---|---|---|
| STANDARD DRAWING | | | | |
| CMDG-D-050 | | | | |
| REV. | A | B | C | D |
| | | | | |

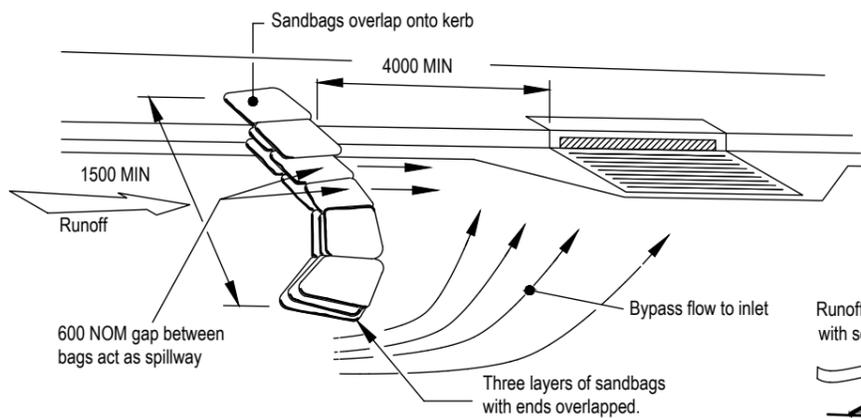


ANCHORING DETAIL

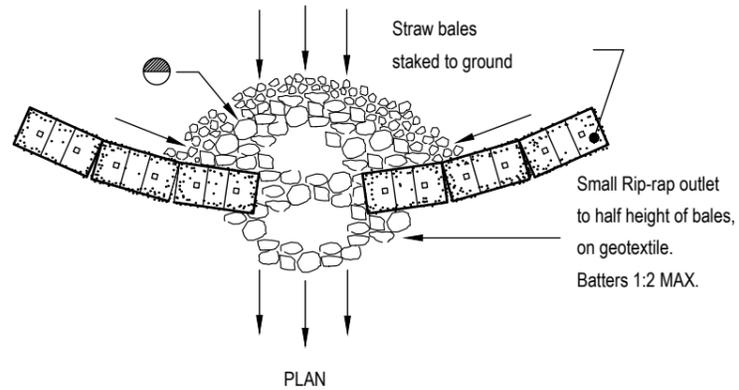


BEDDING DETAIL

STRAW BALE BANK SEDIMENT CONTROL

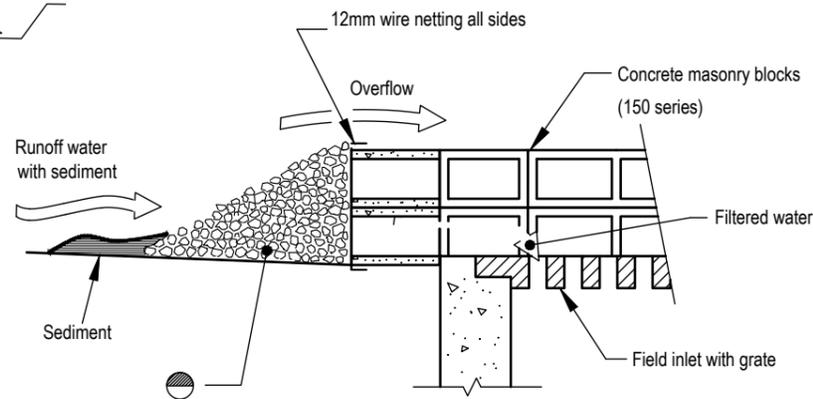
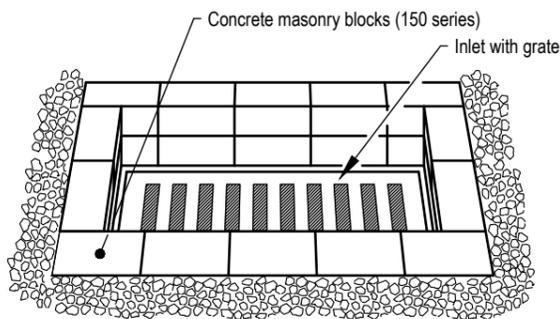


ON GRADE KERB INLET SEDIMENT TRAP



PLAN

STRAW BALE AND STONE TRAP SEDIMENT CONTROL - CONCENTRATED FLOW



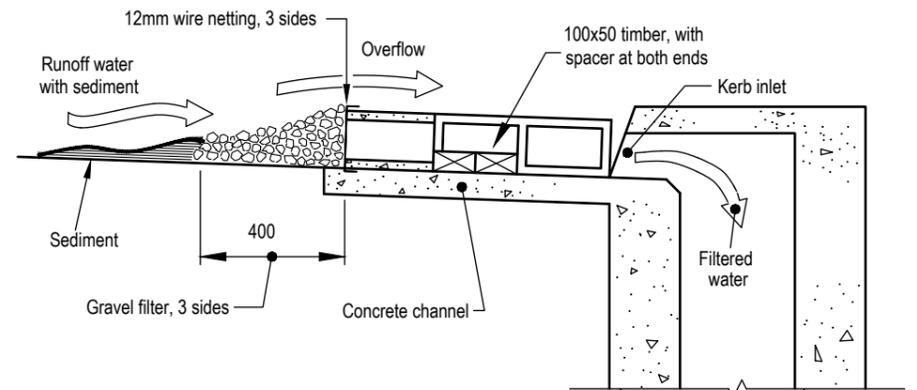
FIELD INLET SEDIMENT TRAP

LEGEND:

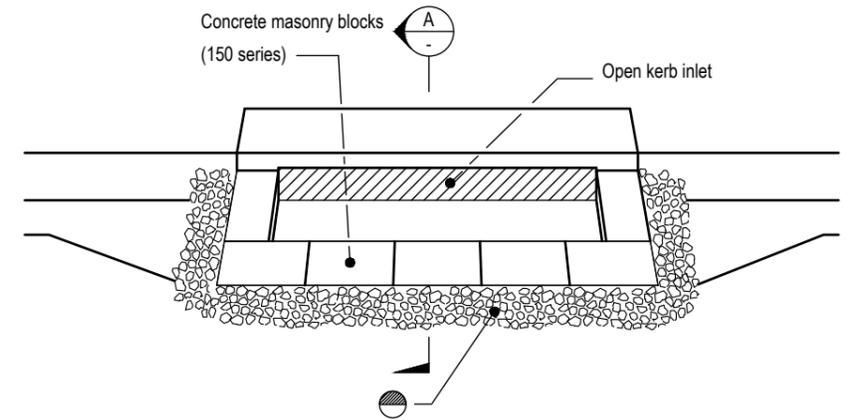
- Gravel filter, refer MRTS 05 Table 7.2.4(a) - Grading Envelopes - Type 2 - Grading B, exclude material finer than AS sieve 2.36mm.

NOTES:

- Field Inlet
 - A stabilised bypass overland flow path should exist adjacent to the field inlet.
 - Water level control perimeter banks may be required.
 - Blocks to be restrained by a horizontal timber rail at block joint height fixed to timber stakes at corners.
- Check Dams
 - Catchment area limited to 4 ha.
 - Use in minor open drains only, (velocity control), sediment collection is a secondary purpose.
- Straw Bale Banks
 - Bales shall be placed at the toe of a slope or on the contour, in a row with ends tightly abutting the adjacent bales.
 - Each bale shall be embedded in the soil a minimum of 100mm on the downstream side and placed so the bindings are horizontal.
 - Bales shall be securely anchored in place with either two stakes or steel pickets driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together.
 - Inspections shall be frequent and repair or replacement shall be made promptly as needed. Replace at least 3 monthly.
- Safety issues must be considered at all times, incorporate traffic control devices to the satisfaction of the Superintendent.
- All dimensions in millimeters.

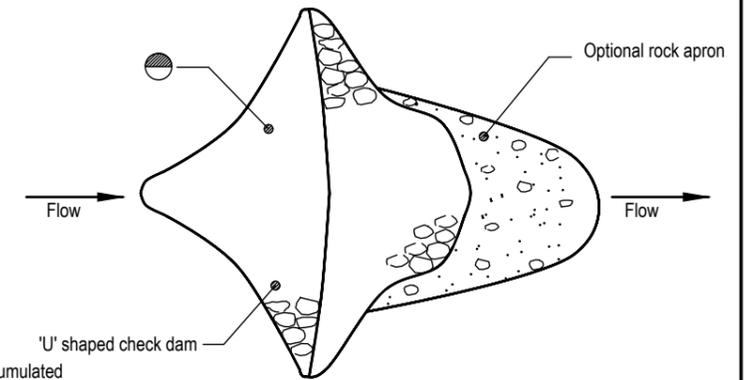


SECTION A-A



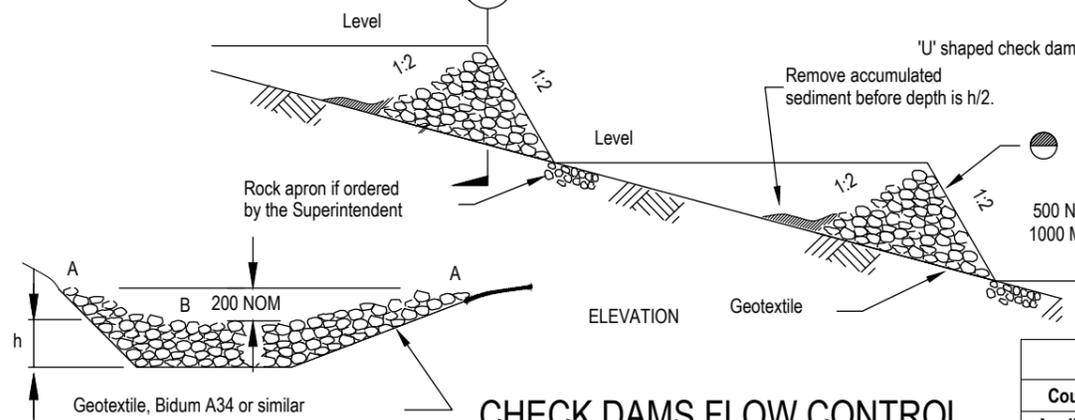
SAG INLET SEDIMENT TRAP

A stabilised bypass 'overland flow path' should exist adjacent to inlet in genuine sags.



PLAN

'A' to be higher than 'B' to prevent sediment bypass



SECTION B-B

CHECK DAMS FLOW CONTROL

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| REVISIONS | DATE | |
|-----------|---------------------------|---------|
| E | NOTE ADDED, STYLE UPDATED | 04/2023 |
| D | IRC ADDED | 12/2016 |
| C | GRC AND LSC ADDED | 09/2014 |
| B | MRC ADDED | 04/2011 |
| A | POST AMALGAMATION REVIEW | 01/2010 |

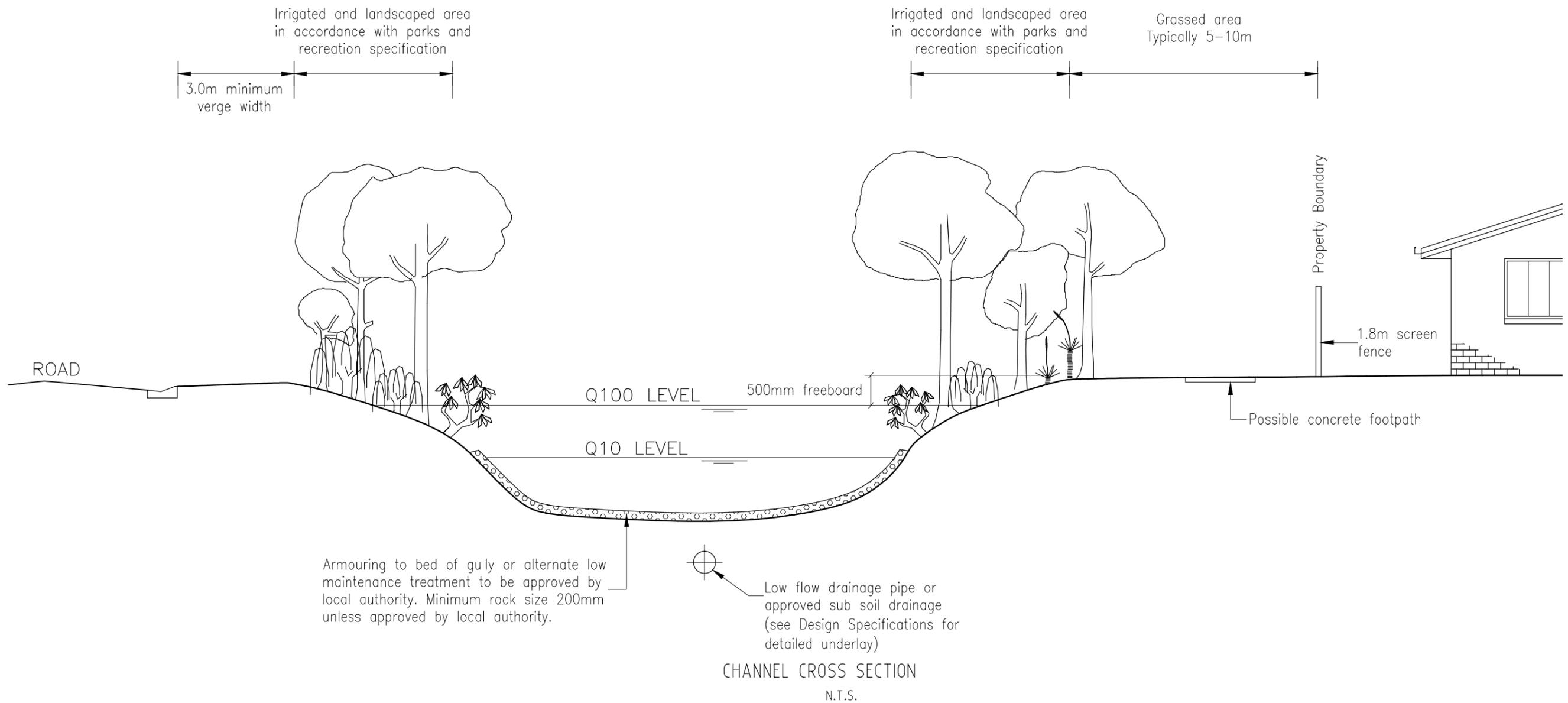
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Livingstone Shire Council (LSC)

SEDIMENT CONTROL DEVICES KERB AND FIELD INLET, CHECK DAMS & STRAW BALE BANK

| DRAINAGE | |
|------------------|-------------------|
| STANDARD DRAWING | A3 |
| CMDG-D-051 | |
| REV. | A B C D E |



NOTES:

1. The desired treatment is for the road to be provided along the bank of the gully.
2. The above solutions are indicative of councils requirements but alternate proposals will be considered on the basis of merit and sound engineering practice.

| APPLICABILITY TABLE | | | | | | | |
|---------------------|-----|------|-----|-----|-----|-----|-----|
| Council | BSC | CHRC | GRC | IRC | LSC | MRC | RRC |
| Applicable | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| REVISIONS | DATE |
|---|---------|
| E IRC ADDED | 12/2016 |
| D GRC AND LSC ADDED | 09/2014 |
| C MRC ADDED | 04/2011 |
| B ARI REFERENCE TO LOW FLOW DRAINAGE PIPE REMOVED | 01/2011 |
| A POST AMALGAMATION REVIEW | 01/2010 |

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REQUIRED TREATMENTS TO OPEN CHANNELS

| DRAINAGE | | | | |
|------------------|---|---|---|---|
| STANDARD DRAWING | | | | |
| CMDG-D-060 | | | | |
| REV. | A | B | C | D |