<table>
<thead>
<tr>
<th>DWG. No.</th>
<th>DESCRIPTIONS</th>
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<tr>
<td>RCC D-0001</td>
<td><strong>DRAINAGE</strong></td>
</tr>
<tr>
<td>IPWEAQ D-0010</td>
<td>Access Chamber — Details #1050 to #2100</td>
</tr>
<tr>
<td>IPWEAQ D-0011</td>
<td>Access Chamber — Roof Slabs #1050 to #2100</td>
</tr>
<tr>
<td>IPWEAQ D-0012</td>
<td>Access Chamber — Roof Slabs #1500 Extended 500 &amp; 900</td>
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<tr>
<td>IPWEAQ D-0013</td>
<td>Access Chamber — Rectangular, Standard Reinforcement</td>
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<tr>
<td>IPWEAQ D-0014</td>
<td>Access Chamber — Cast Iron Cover and Frame, C/I Conc. Filled Cover</td>
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<tr>
<td>IPWEAQ D-0015</td>
<td>Cast Iron Cover and Frame, Bolt Down</td>
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<tr>
<td>IPWEAQ D-0017</td>
<td>Roof Slab, Rectangular, Fabric Reinforcement</td>
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<td><strong>BEDDING AND BACKFILLING</strong></td>
<td></td>
</tr>
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<td>IPWEAQ D-0030</td>
<td>Excavation, Bedding &amp; Backfill of Concrete/Fibre Reinforced Pipes</td>
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<tr>
<td>IPWEAQ D-0031</td>
<td>Excavation, Bedding &amp; Backfill of Precast Box Culverts</td>
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<td><strong>SEDIMENT AND EROSION</strong></td>
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<td>IPWEAQ D-0040</td>
<td>Sediment Fence, Entry/Exit Sediment Trap</td>
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<tr>
<td>IPWEAQ D-0041</td>
<td>Kerb and Field Inlets, Check Dams &amp; Straw Bale Bank</td>
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<td><strong>FIELD INLET</strong></td>
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<td>IPWEAQ D-0050</td>
<td>Field Inlet and Overflow Gully, Type 1 and Type 2</td>
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<td><strong>GULLEY</strong></td>
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<tr>
<td>IPWEAQ D-0060</td>
<td>Gully, Road Type — General Arrangement</td>
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<tr>
<td>IPWEAQ D-0061</td>
<td>Precast Unit Details</td>
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<tr>
<td>IPWEAQ D-0062</td>
<td>Grate and Frame Details</td>
</tr>
<tr>
<td>IPWEAQ D-0063</td>
<td>General Arrangement — Channel Lip in Line</td>
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<tr>
<td>IPWEAQ D-0066</td>
<td>Anti-Flooding Depression 77mm</td>
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<tr>
<td>IPWEAQ D-0069</td>
<td>Precast Units on Grade — Lip in Line Only</td>
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<tr>
<td>IPWEAQ D-0070</td>
<td>Precast Units Sag &amp; Anti-Flooding — Lip in Line Only</td>
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<tr>
<td>RCC D-0085</td>
<td>Scour Protection Bulkhead</td>
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<tr>
<td>RCC D-0086</td>
<td>Stormwater Outlet</td>
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<tr>
<td>IPWEAQ D-0110</td>
<td>Rockwater Inspection Chamber</td>
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<th>DESCRIPTIONS</th>
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<td><strong>CULVERTS</strong></td>
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<tr>
<td>MR 1179</td>
<td>Construction of Base, Aprons, Walls and Wings</td>
</tr>
<tr>
<td>MR 1303</td>
<td>Construction of RC Wingwalls and Headwalls</td>
</tr>
<tr>
<td>MR 1304</td>
<td>Pipe Culverts — Construction of RC Wingwalls &amp; Aprons for pipes &lt;2400</td>
</tr>
<tr>
<td>MR 1305</td>
<td>General Arrangement and Installation of Wingwalls, Headwalls and Aprons</td>
</tr>
<tr>
<td>MR 1306</td>
<td>Construction of Unreinforced Wingwalls, Headwalls and Aprons</td>
</tr>
<tr>
<td>MR 1316</td>
<td>General Arrangement and Installation of Precast Units</td>
</tr>
<tr>
<td>MR 1317</td>
<td>Construction of Bases with Nibs and Aprons</td>
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<td>MR 1318</td>
<td>Construction of Bases with Recesses and Aprons</td>
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<tr>
<td>MR 1319</td>
<td>Construction of Unreinforced Wingwalls and RC Headwalls H=750 — 2400</td>
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<tr>
<td>MR 1320</td>
<td>Crown Unit Holding Down Anchors</td>
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<tr>
<td>MR 1359</td>
<td>Culverts — Installation, Bedding and Filling/Backfilling against/over Culverts</td>
</tr>
</tbody>
</table>
SECTION ALTERNATIVE 1

Invert grade dimension "t" (mm)

<table>
<thead>
<tr>
<th>Access chamber DIA &quot;D&quot;</th>
<th>Floor thickness &quot;t&quot;</th>
<th>Wall thickness &quot;W&quot;</th>
<th>Roof slab DIA</th>
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<tr>
<td>1050</td>
<td>175</td>
<td>150</td>
<td>1350</td>
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<td>1200</td>
<td>250</td>
<td>225</td>
<td>1650</td>
</tr>
<tr>
<td>1500</td>
<td>250</td>
<td>225</td>
<td>1950</td>
</tr>
<tr>
<td>1800</td>
<td>250</td>
<td>225</td>
<td>2400</td>
</tr>
<tr>
<td>2100</td>
<td>275</td>
<td>275</td>
<td>2730</td>
</tr>
</tbody>
</table>

2-6% bars Grade 400 to AS 1392, placed centrally in ring with 40s side cover, lap 250.

Overall diameter NOM 1050* Concrete thickness 35 or 50mm.

PLAN ROOF RING

For use in raising covers and frames of existing access chambers *Size to suit existing access chamber

LIFTING ANCHOR LOCATIONS

(Refer Note 5)

=112° for Ø1350
=120° for Ø1850-2650

NOTES
3. Alternatives: --- for access hole opening refer Service Authority,
for parent type refer Service Authority.
4. Refer Project Drawings for size and level of culverts, and chamber cover level.
5. Lifting anchors to be "swiftlift" or equivalent 1.8 tonnes, galvanized to AS 1650 and

STORMWATER ACCESS CHAMBER DETAILS

DIA 1050 TO 2100

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C Step irons removed, opening dia. 3/4/00
Wall thickness and Note 5 amended 3/2/97
B Ø1800 and Ø2100 chambers added 3/2/97
A ORIGINAL ISSUE 8/12/95

REVISIONS DATE

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DRAINAGE STANDARD Drawing D-0010

WP - ORENDA 113337-0-2010
1500 DIA ACCESS CHAMBER
EXTENDED 600

Space upper and lower layers of fabric as shown.

NOTES:
1. Roof design based on Austroads Bridge code, W7 wheel load, dynamic factor 0.4.
2. Concrete N40 in accordance with AS 1379 and AS 3600.
3. Reinforcement cover 30 mm (bottom face).
4. Reinforcement: FRP fabric to AS 1304 Bars Y12 and Y16, Grade 400 to AS 1302.
6. Lifting anchors to be "twisted" or equivalent, 1.8 tonnes, galvanized to AS 1650 and fitted to manufacturer's specification at points shown "X".
7. Lifting capacity of mechanical devices to be no less than 4 tonnes.
8. All dimensions in millimetres.

LEGEND
- Offset to access hole varies:
  a) Hole in line with chamber wall, or
  b) Hole offset from wall 460mm (Refer Alternative 2 on Standard Drawing D-0010).

Steel Mass
Concrete Volume: 0.90 m³
Total Mass: 2200 Kg

1500 DIA ACCESS CHAMBER
EXTENDED 900

Steel Mass
Concrete Volume: 1.03 m³
Total Mass: 2572 Kg

DRAINAGE Standard Drawing D-0012

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B Opening Diameter 600
A ORIGINAL ISSUE
REVISIONS
DATE

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### TABLE A: S Bars

<table>
<thead>
<tr>
<th>Long Span</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2000</th>
<th>2200</th>
<th>2400</th>
<th>2600</th>
<th>2800</th>
<th>3000</th>
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<tbody>
<tr>
<td>3200</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
</tr>
<tr>
<td>S Bar</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
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### TABLE B: L Bars

<table>
<thead>
<tr>
<th>Short Span</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2000</th>
<th>2200</th>
<th>2400</th>
<th>2600</th>
<th>2800</th>
<th>3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>3200</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
<td>Y12 @ 150</td>
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<tr>
<td>L Bar</td>
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<td>1000</td>
<td>1000</td>
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<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Typical Slab Reinforcement Around Chamber Access**

**Notes:**
1. Concrete N32/20 in accordance with AS 1379 and AS 3600.
2. Reinforcement: FB1 Fabric to AS 1334.
3. All bars in reinforcement shall be Y12 - 300, Y16 - 400.
4. Formwork in accordance with AS 3610.
5. Designed to Austroads Bridge Code, M7 wheel load, dynamic factor 0.8.
6. Maximum fill over roof slab shall be 3000mm.
7. Reinforcement cover 45mm.
8. Refer Service Authority for access hole diameter to be adopted.
9. Refer project drawings for details of chamber walls and floors.
10. For sections at chamber access refer Standard Drawing D-0010.
11. All dimensions in millimetres.
SECTION A–A

SECTION B–B

DETAIL AT LIFTING SLOTS

4 slots as shown

DETAIL A

PLAN

COVER AND FRAME

DETAIL OF HOLDING DOWN BOLTS

Legend:
△ Denotes machined surface.

Notes:
1. This drawing is intended to provide the performance specification only for the type of access chamber shown. The structure as shown is schematic as sizes and shapes may vary.
2. Access chambers which are proprietary items are required to be designed and certified to AS 3996–1992.
3. Cover and frame, grey cast iron, Grade 2 T220 to AS 1830.
4. Cover design to be Class D to AS 3996 – 1992, where Minimum Ultimate Limit State Design Load = 210kN
5. All welds to AS 1554.
6. Bitumen point cover and frame to AS/NZS 3750.4.
7. All dimensions in millimetres.
TYPICAL SLAB REINFORCEMENT

FABRIC REINFORCED SLAB

<table>
<thead>
<tr>
<th>SHORT SPAN</th>
<th>SLAB THICKNESS</th>
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</thead>
<tbody>
<tr>
<td>1200-1600</td>
<td>225</td>
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<tr>
<td>1800-2400</td>
<td>250</td>
</tr>
<tr>
<td>2600-3000</td>
<td>275</td>
</tr>
</tbody>
</table>

NOTES:
1. Concrete N32/20 in accordance with AS 1379 and AS 3600.
2. Reinforcement: F81 Fabric to AS 1304
   Bars Y16, Grade 400 to AS 1302.
3. All bars in reinforcement shall be ≤
   Y12 = 500, Y16 = 400, Fabric = 290
4. Formwork in accordance with AS 3610.
5. Designed to Austroads Bridge Code, W7 wheel load, dynamic factor 0.4.
6. Maximum fill over roof slab shall be 3000mm.
7. Reinforcement cover 45 MM.
8. Refer Service Authority for access hole diameter to be adopted.
9. Refer project drawings for details of chamber walls and floors.
10. For sections at chamber access refer Standard Drawing D-0010.
11. All dimensions in millimetres.

ACCESS CHAMBER
ROOF SLAB – RECTANGULAR
FABRIC REINFORCEMENT

DRAINAGE
Standard Drawing
D-0017
PLAN
INLET ON GRADE

Gully grate with frame, refer Standard Drawing D-0082.
Outlet culvert
Gully lip to match road crossfall

SECTION A - A

Text "DUMP NO WASTE — FLOWS TO CREEK"
(40mm high letters, imprinted 5mm into concrete)

SECTION B - B

Gully grate frame cast into concrete
Typically 117

SECTION C - C
(Through lintel & extended kerb inlet)

NOTES
1. Insti concrete N25 in accordance with AS 1379 and AS 3600.
2. Grate and frame Class D to AS 3995.
3. An alternative precast concrete gully, kerb inlet, apron and pit surround
   may be provided subject to the approval of the Superintendent.
   Refer Std. Dwg. D-0089 and D-0070 for basic dimensions.
4. All dimensions in millimetres.

LEGEND
- N0M kerb line
- Setting out dimensions

GULLY — ROADWAY TYPE
GENERAL ARRANGEMENT
KERB IN LINE

DRAINAGE
Standard Drawing
D-0060

B Note 3 Precast gully added 16/1/87
A ORIGINAL ISSUE 8/12/95

REVISIONS DATE

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and assessment by an appropriately qualified professional.
### Notes:
1. Concrete N32 in accordance with AS 1379 and AS 3600.
2. Each lifting anchor to be "Swish" or equivalent 1.3 tonnes, galvanized to AS 1650 and fitted to manufacturer's specification.
3. Reinforcing steel Grade 400 to AS 1392. Place centrally, 40 mm end cover.
4. All steel flats Grade 250 to AS 3678.
5. All welds to AS 1554.
6. R. Dr. wire to AS 1303.
7. Steel plate hot dip galvanized to AS 1650.
8. All dimensions in millimeters.

**Legend:**
- Text 40mm high letters imprinted 5mm into concrete.

### Dimensions:
- **Lintel Type 'S'**
  - B: 215
  - D: 215
  - Details:
    - 5 taper
    - Bent #12 end stud
    - 75 x 10 galv. Plate
    - Provide recess for formwork when specified
  - Plan:
    - Refer Detail A
    - Lifting anchors

- **Lintel Type 'M'**
  - B: 180
  - C: 180
  - Details:
    - 75 x 10 galv. plate with #12 studs, 300 long, welded 150 from the end, then of 300 max C/C, bend end studs to maintain cover.

- **Lintel Type 'L'**
  - B: 450
  - C: 4440
  - Details:
    - Steel plate
    - Manufacturers identification to be shown on this face
    - 3 - Y12 bars

<table>
<thead>
<tr>
<th>Lintel</th>
<th>A (kg)</th>
<th>B (kg)</th>
<th>C (kg)</th>
<th>D (kg)</th>
<th>X (kg)</th>
<th>Mass (kg)</th>
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</thead>
<tbody>
<tr>
<td>S</td>
<td>2400</td>
<td>2040</td>
<td>1800</td>
<td>1970</td>
<td>400</td>
<td>445</td>
</tr>
<tr>
<td>M</td>
<td>3500</td>
<td>3240</td>
<td>3000</td>
<td>3170</td>
<td>690</td>
<td>550</td>
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<tr>
<td>L</td>
<td>4500</td>
<td>4440</td>
<td>4200</td>
<td>4370</td>
<td>1000</td>
<td>725</td>
</tr>
</tbody>
</table>

**Drainage Standard Drawing D-0061**

**Gully - Roadway Type Precast Lintel Details**

**Kerb in Line**
SECTION B-B

SECTION C-C

PLAN OF GRATE

PLAN OF FRAME

NOTES:
1. Mass of grate = 85 kg.
3. All steel flats Grade 250 to AS 3678.
4. All steel bars and angles Grade 250 to AS 3679.
5. Grate and frame to be hot dip galvanized after fabrication to AS 1850.
6. All welds to AS 1554. Welding symbols to AS 1101.3.
9. Grate and frame Class D to AS 3399.
10. Alternative fabricated steel grate and frame, Grade 250 to AS 3679, may be used when approved.

A locking device shall be provided in accordance with clause 3.2.1.4 of AS 3695.
MOUNTABLE KERB AND CHANNEL

PLAN

150
600
150

Bicycle safe gate

SECTION A - A

Concrete benching where specified

Note: Dimensions of grate and frame may be varied subject to approval.

Design load for grate and frame shall be in accordance with AUSTRONAS Bridge Design Specification, W7 wheel load.

All grates bicycle safe to AS 3986.

Grate and frame, grey cast iron Grade ≥ T220 to AS 1830 or alternatively fabricated steel
Grade 250 to AS 3678 / 3679 and hot dip galvanized to AS 1650 may be used when approved.

Concrete: Batching N10, Structural N20 in accordance with AS 1379 and AS 3600.

Examples indicates W1 and B1 Kerb and channel types.

Refer Standard Drawing R-0080, adjust for other alternatives.

Blumen paint C.I. cover and frame to AS/NZS 3750-A.

An alternative precast concrete gully, kerb inlet, apron and pit surround may be provided subject to the approval of the Superintendent. Refer Std. Dwg. 0-0070 for basic dimensions.

Grate hinges and locking device must conform to AS 3998.

All dimensions in millimetres.
### TABLE A
#### LOADING CRITERIA

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>PRECAST GULLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proof Load</td>
<td>50 kN</td>
</tr>
<tr>
<td>Ultimate Load</td>
<td>75 kN</td>
</tr>
</tbody>
</table>

### CHANNEL UP IN LINE
Manufacture opposite hand for flow left to right

### SECTION A – A

### KERB IN LINE
Manufacture opposite hand for flow left to right

### SECTION B–B

### NOTES
1. Concrete N40 in accordance with AS 3902, Castings to AS 1830.
2. Each lifting anchor to be "swivel" or equivalent 1.3 tonnes.
   galvanized to AS 1650 and fitted to manufacturers' specification.
3. Reinforcement to AS 1302 shall be provided by the designer to obtain the
   strength required to pass the test criteria detailed on Std. Dwg. D–0068.
   The load detailed in Table A shall be applied to each location, separate
   tests at each location.
4. All steel flats Grade 250 to AS 3678.
5. All welds to AS 1554.
6. H. Di. wire to AS 1303.
7. Steel plate hot dip galvanised to AS 1650.
8. Grate and frame Class D to AS 3886.
9. Grate frame to be cast into concrete.
10. Refer Std. Dwg. D–0062 for grates and frame for sag location and D–0068
    for anti-pointing location.
11. Refer project drawings for layout of gully inlets.
12. Precast concrete units and grate/frames must be approved by the
    Superintendent prior to use.
13. Provide 10mm mortar (1 cement : 3 fine sand) joint between gully pit
    and precast units.
14. All dimensions in millimeters.
**ISOMETRIC VIEW**

**PLAN**

**PERSPECTIVE VIEW - KERB IN LINE**

**PLAN**

**PERSPECTIVE VIEW - CHANNEL LIP IN LINE**

---

**END ELEVATION**

**BARRIER KERB**

**MOUNTABLE KERB**

**ANTI-PONDING GULLIES**

---

**TABLE A**

**LOADING CRITERIA**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>PRECAST GULLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proof Load</td>
<td>50 kN</td>
</tr>
<tr>
<td>Ultimate Load</td>
<td>75 kN</td>
</tr>
</tbody>
</table>

---

**SAG GULLIES**

**LEGEND**

- Text "DUMP NO WASTE - FLOWS TO CREEK" (40mm high letters, imprinted 5mm into concrete)
- Load test area (200 x 150), refer note 3.
- Width of channel to suit project drawings/specifications
- Manufacturers' identification to be shown on this face

---

**NOTES**

1. Concrete N40 in accordance with AS 3902, Castings to AS 1830.
2. Each lifting anchor to be "flexible" or equivalent 1:3 tonne, galvanized to AS 1650 and fitted to manufacturers' specification.
3. Reinforcement to AS 1302 shall be provided by the designer to obtain the strength required to pass the test criteria detailed on Std. Dwg. D-0066. The test described in Table A shall be applied to each location, separate tests at each location.
4. All steel bars Grade 250 to AS 3578.
5. All welds to AS 1654.
6. H. Dr. win to AS 1303.
7. Steel plate hot dip galvanized to AS 1650.
8. Grib and frame Class D to AS 3966.
9. Grabs frame to be cast into concrete.
11. Refer project drawings for layout of gully inlets.
12. Precast concrete units and grib/frames must be approved by the Superintendent prior to use.
13. Provide 10mm mortar (1 cement : 3 fine sand) joint between gully pit and precast units.
14. All dimensions in millimeters.

---

**GULLY - ROADWAY TYPE**

**PRECAST UNITS**

**DRAINAGE**

**Standard Drawing**

**D-0070**

---

**ORIGINAL ISSUE**

16/7/97

**REVISED DATE**

A

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NOTES:

1. CONCRETE BULKHEADS TO BE LOCATED AT MAXIMUM INTERVALS OF 10m WHERE PIPE GRADES EXCEED 15%.

2. WHERE SPECIFIED SCOUR BULKHEADS TO EXTEND TO THE TOP OF THE TRENCH.

PLACE 200 SQ. X 200 HIGH OF 30mm CRUSHED ROCK WRAPPED IN GEOTEXTILE IMMEDIATELY UPSTREAM OF WEEPHOLES.

FINISHED SURFACE LEVEL

BACKFILL OF TRENCH REFER DWG NO. D-0030

300 Min

CONCRETE GRADE N25

II TRENCH

PROVIDE #50 WEEPHOLES

SECTION A-A
NOTES:

1. PIPE DETAILS ARE AS FOLLOWS:
   (a) Ø75 to 750 DIA. - PVC CLASS 2, SUPERITE JOINTS
   (b) GREATER THAN 750 DIA. - PVC CLASS 2, PVC & SWC
      HDPE MAY BE SUBSTITUTED AS DIRECTED BY THE SUPERINTENDENT
   2. TO MINIMISE VISUAL IMPACT THE PIPE GRADING IS TO FOLLOW THE
      FINAL BEACH PROFILE
   3. MARKER POST TO COMPLY WITH THE FOLLOWING:
      (a) MINIMUM Ø150 UPVC PIPE FILLED WITH CONCRETE
      (b) PAINTED APPROVED YELLOW
      (c) EXTEND 100MM ABOVE MEAN HIGH WATER LEVEL (MHW)
      (d) A BAND OF APPROVED YELLOW REFLECTIVE TAPE TO BE PLACED
          AROUND EXPOSED TOP OF PIPE (MINIMUM 250MM HIGH)
   4. MINIMUM COVER TO REINFORCEMENT TO BE 50
   5. ALL CONCRETE TO BE GRADE 500 FIBRE REINFORCED CONCRETE,
      POLYPROPYLENE FIBRES TO BE ADDED AT NOT LESS THAN 0.90Kg/m².
   6. ALL CONCRETE EDGES TO HAVE MIN 25 RADIUS, NO SQUARE EDGES
      PERMITTED.
   7. PIER/CRADLE TO BE DESIGNED AND APPROVED BY COUNCIL.
   8. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN

PLAN

SECTION A-A

ELEVATION

PIER/CRADLE ELEVATIONS
INDICATIVE ONLY

PIPE DIA |
<table>
<thead>
<tr>
<th>300-450</th>
<th>525-600</th>
<th>675-750</th>
<th>825-900</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>400</td>
<td>500</td>
<td>600</td>
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</tbody>
</table>

PIECE 1 PER PIPE JOIN AS SHOWN

3 x PIPE DIAMETER

500 MIN 1000 MAX

NATURAL GROUND LEVEL

PIECE 1 PER PIPE JOIN AS SHOWN

3 x PIPE DIAMETER

500 MIN 1000 MAX

MARKER POST LOCATION

MARKER POST

PLAN

PIECE 1 PER PIPE JOIN AS SHOWN

3 x PIPE DIAMETER

500 MIN 1000 MAX

PIECE 1 PER PIPE JOIN AS SHOWN

3 x PIPE DIAMETER

500 MIN 1000 MAX

NATURAL GROUND LEVEL
NOTES
1. 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 mm Class SH uPVC pipe or a 100 x 75 galvanized RHS to a kerb adaptor.
   A maximum of two properties can be connected via a 200 x 75 galvanized RHS.
2. The pipe materials and joint types shall be as follows:
   - Material: Aust. Std Joint Type Restrictions
     - Fibre reinforced, Class 2: AS 4139 Rubber ring: N/A
     - Concrete, Class 2: AS 1342 Rubber ring: N/A
     - uPVC, sewer, Class SH: AS 1260 Solvent welded: Not to be used in easements
3. Minimum cover to roofwater pipes to be 450mm except where less cover is necessary to discharge to kerb and channel.
4. The access chamber depths and minimum diameters shall be as follows:
   - Depth < 600: Min. 6300, 600 – 750: Min. 6500, > 750: Min. 6900
5. 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 No. 25) up to 150 above crown of the inlet pipe with all subsequent backfill compacted to 85% NDD (modified compaction to
   AS 1289) to ensure stability and robustness.
6. Alternative covers and frames proposed for approval must be circular, and be designed as Class C to AS 3996.
7. Concrete, base No. 22, cover No. 22 in accordance with AS 1379 and AS 3600.
8. The roofwater drainage system shall be shown on the stormwater drainage plans for the development.
9. The following 'as constructed' information shall be submitted to Superintendent, refer Sewerage Sample as constructed plan S-0010.
   - Offsets of the main line to property boundary
   - The locations of access chambers and Y junctions measured from the property boundary
10. Where individual lots can directly discharge to the kerb and channel, kerb adaptors shall be used. Refer Standard Drawing R-0081.
11. All dimensions in millimetres.

LEGEND
- Refer project drawings for pipe diameter and type
- At Ø900 chambers adopt roof design off Standard Drawing D-0011.
For culverts with a base > 100mm using small depth fill, this design should not be used.

1. Highly reactive or expansive clay soil (linear shrinkage > 8%).
2. Where large differential settlements are expected to occur. Special design advice should be obtained in these circumstances.

### TABLE 1 - SLAB DETAILS

<table>
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<tr>
<th>Dims</th>
<th>Refer Notes</th>
<th>Notes</th>
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<tbody>
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<td>8.2.11.10</td>
<td>(a)</td>
</tr>
<tr>
<td>1800</td>
<td>1800</td>
<td>(b)</td>
</tr>
<tr>
<td>1800</td>
<td>1800</td>
<td>(c)</td>
</tr>
</tbody>
</table>

### FOOTNOTES

1. **CONSTRUCTION JOINTS** are to be formed where (a) the length of the base slab over 
   (b) the width of the base slab over (c) the length of the base slab over (d) the 
   width of the base slab over (e) the length of the base slab over (f) the width of 
   the base slab over (g) the length of the base slab over (h) the width of the 
   base slab over (i) the length of the base slab over (j) the width of the base slab 
   over (k) the length of the base slab over (l) the width of the base slab over 
   (m) the length of the base slab over (n) the width of the base slab over 
   (o) the length of the base slab over (p) the width of the base slab over 
   (q) the length of the base slab over (r) the width of the base slab over 
   (s) the length of the base slab over (t) the width of the base slab over 
   (u) the length of the base slab over (v) the width of the base slab over 
   (w) the length of the base slab over (x) the width of the base slab over 
   (y) the length of the base slab over (z) the width of the base slab over 

2. **Materials** are to be used as per the specification.

3. **Concrete** is to be mixed to the correct mix proportions.

4. **Reinforcement** is to be detailed in accordance with the specification.

5. **Jointing** is to be carried out in accordance with the specification.

6. **Dimensions** are to be checked for accuracy.

7. **Geotechnical** investigations are to be carried out in accordance with the specification.

8. **Quality Control** is to be carried out in accordance with the specification.

9. **Safety** is to be considered during the construction phase.

**Notes:**
- **SPECIFICATIONS:**
  - Reinforcing bars: ASTM A615.
  - Concrete: ASTM C150.
  - Mortar: ASTM C270.
  - Sealant: ASTM C1160.

**For General Information:*
- **References:**
  - Queensland Government Department of Main Roads Standard Specifications.
  - (**Recommended:**) Reinforcement and Protection of Concrete Structures.

**Additional Information:**
- **Contact:** Queensland Government Department of Main Roads.
- **Feedback:** Comments and suggestions are welcome.
HOLDING DOWN ANCHORS (Bases without recesses)

HOLDING DOWN ANCHORS (Bases with recesses)

NOTES:
1. BOLTS - hexagonal bolts and screws M20 grade 4.6 to AS 1111 with M20 nuts and washers grade 5 to AS 1112 and AS 1327, hot dipped galvanised to AS 1214.
2. STEEL BRACKETS shall be Grade 250 to AS 3876.1.
3. BRACKETS to be hot-dipped galvanised after fabrication to AS 1650.
4. APPROVED MILD STEEL FERRULES with cross bar for use in precast base slabs:
   (a) length 65, thread depth 32, for P.C. base slabs 80 thick or greater.
   (b) to take hexagonal screw M20 x 45 to AS 1111.
   (c) cross holes to take 12 x 250 M.S. bar.
   (d) ferrule and cross bar to be hot-dipped galvanised to AS 1214.
   (e) ferrule located 300 from ends to match cored holes in crown units. (If precast base slabs are less than 80 thick, the ferrule length, thread depth and screw length are to be reduced in order to maintain clear cover of 15.)
5. HOLDING DOWN BOLTS to be placed in drilled 30dia holes and grouted with 1:2 cement sand grout after placing crown.
6. DIMENSIONS are to be in millimetres unless shown otherwise.

ASSOCIATED DOCUMENTS:

REFERENCED DOCUMENTS:
Australian Standards:
AS 1111 ISO Metric Hexagon Commercial Bolts and Screws
AS 1112 ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and Castle Nuts
AS 1214 Hot-Dip Galvanised Coatings on Threaded Fasteners (ISO metric coarse thread series)
AS 1327 Flat Metal Washers for General Engineering Purposes (metric series)
AS 1650 Hot-Dipped Galvanised Coatings on Ferrous Articles
AS 3876.1 Hot-Dipped Bars and Sections

R C BOX CULVERTS & SLAB LINK BOX CULVERTS

CROWN UNIT HOLDING DOWN ANCHORS

<table>
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<tr>
<th>R C BOX CULVERTS &amp; SLAB LINK BOX CULVERTS</th>
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<td>Crown Unit Holding Down Anchors</td>
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<table>
<thead>
<tr>
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