The purpose of this Standard Drawing is to provide typical standard details that shall be used within the limitations specified in the drawing and in accordance with the following:

1. The use of the standard details shall be assessed by the project designer in respect of specific project geometric, appropriate foundation and scour conditions.

2. If the field investigation undertaken by the Project Engineer determines that the foundation bearing capacity is not adequate, the Project Engineer shall engage a Geotechnical engineer to develop a specific project solution to ensure the adequate bearing capacity. These design solutions shall be reviewed and accepted by E&T Structures and Geotechnical sections.

3. When there is uncertainty regarding the application of the standard details on this drawing for a specific project, advice should be sought from E&T Structures.

4. The details specific to the project shall be shown on the project specific drawings.

**NOTES:**

1. **PIPE CULVERTS (END STRUCTURES) shall be constructed in accordance with MRTS503.** The purpose of this drawing is to detail headwalls and aprons for culverts with pipe diameters 375 to 675.

2. The minimum foundation bearing capacity is 100 kPa (8 kips/ft²) as per AS 3746.93.

3. CONCRETE shall be in accordance with MRTS70.

4. Reinforced Concrete Headwall shall be in accordance with AS 3600.2.3.

5. The minimum exposed reinforcement shall be 0.02 in (0.50mm) diameter for concrete structures.

6. The maximum exposure classification shall be in accordance with MRTS71.

7. Linked Headwalls shall be in accordance with MRTS70.

8. For the full details of the structural design for pipe culverts with pipe diameter 750 to 2400 refer to Standard Drawing 1304A.


10. The minimum foundation bearing capacity is 100 kPa (8 kips/ft²) as per AS 3746.93.

11. CONCRETE shall be in accordance with MRTS70.

12. Reinforced Concrete Headwall shall be in accordance with AS 3600.2.3.

13. The minimum exposed reinforcement shall be 0.02 in (0.50mm) diameter for concrete structures.

14. The maximum exposure classification shall be in accordance with MRTS71.

15. Linked Headwalls shall be in accordance with MRTS70.

16. Footings shall be designed to support the pipe culverts.


**ASSOCIATED DEPARTMENTAL DOCUMENTS:**

- Design Criteria for Bridges and other Structures
- NORMA Design Guidelines

**REFERENCE DOCUMENTS:**

- Departmental Standard Drawings: 1304A Reinforcing Steel - Splice Lengths
- 3704 Pipe Culverts - Reinforcing Headwall and Apron for Pipe Diameter 750 to 2400
- 3705 Culverts - Grading, Draining and Filling/Excavation, Splices/Arrows Culverts
- Departmental Specifications: MRTS163 Canyon Culverts - Retaining Structures and Protective Treatments
- MRTS70 Concrete
- MRTS71 Reinforcing Steel

**DEPARTMENT OF TRANSPORT AND INFRASTRUCTURE**

**PIPE CULVERTS**

**HEADWALL AND APRON**

**FOR PIPE DIAMETER 375 to 675**

**Table of Dimensions**

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Nominal Internal Diameter (mm)</th>
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<tr>
<td>675</td>
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</tbody>
</table>

**Section A**

**Section B**

**Section C**

**Notes:**

- For all other pipe details refer to MRTS503.
- For construction details of end structures for pipe culverts with diameter 750 to 2400 refer to Standard Drawing 1304A.
- Refer Standard Drawing 1309 for details of culvert installations and earthworks.

**Plan - Skewed Single Culvert**

**Plan - Maximum Two Pipes Skewed Culvert**

**For Maximum Two Pipes**

**For Maximum Two Pipes**

**Elevation at Headwall**

**More Than Two Pipes**

**Section A**

**Typical Details - All Arrangements**

**Section B**

**Elevation at Headwall**

**More Than Two Pipes**

**Section C**

**Reinforcement Details**

**For Maximum Two Pipes**

**Notes:**

- For all other pipe details refer to MRTS503.
- For construction details of end structures for pipe culverts with diameter 750 to 2400 refer to Standard Drawing 1304A.
- Refer Standard Drawing 1309 for details of culvert installations and earthworks.

**Notes:**

- For all other pipe details refer to MRTS503.
- For construction details of end structures for pipe culverts with diameter 750 to 2400 refer to Standard Drawing 1304A.
- Refer Standard Drawing 1309 for details of culvert installations and earthworks.