SECTION 626 - INSTALLATION OF PRECAST CONCRETE CROWN UNIT CULVERTS

626.01 GENERAL

This section specifies requirements for the installation of reinforced precast concrete crown unit culverts and the associated cast-in-place concrete.

626.02 TOLERANCES FOR PLACEMENT OF UNITS

The culvert shall be constructed in the location and to the alignment shown on the drawings with the following tolerances:

Grade	5 mm in 5 m (1 in 1000)
Overall plan position	50 mm
Gap between adjacent units	12 mm maximum
Step at joint between adjacent units	12 mm maximum horizontal or vertical.

626.03 DIVERSION AND DISPOSAL OF WATER

Before obstructing or diverting any waterway, stream or channel for construction purposes, the Contractor shall obtain the written approval of the relevant authority to construct the obstruction or diversion. The Contractor shall observe all requirements imposed by the relevant authority and included in the written approval. A copy of the written approval shall be provided to the Superintendent prior to the commencement of work.

The Contractor shall:

- divert or dispose of water where necessary to enable construction of the culvert;
- devise and install measures to prevent the escape of sediment and/or construction materials into the watercourse;
- implement appropriate measures to prevent damage to other parts of the works or surrounding properties that might result from the temporary modification of flows. The Contractor shall rectify any damage that may occur to the works or to adjacent properties to the satisfaction of the Superintendent.

The Contractor shall produce a written declaration from the relevant authority that the waterway has been left in a satisfactory condition prior to Practical Completion.

626.04 EXCAVATION

Excavation shall be as shown on the drawings and shall comply with Section 204.

The required ground bearing pressure shall be as stated on the drawings.

Excavation for the culvert shall include all excavation necessary to provide the specified depth of bedding to place the units and associated walls, working space and space required for filling, including the removal and replacement of unsuitable material below the level of the underside of the bedding.

The foundation material at the level of the underside of the bedding shall be test rolled in accordance with Section 173. Foundation material that is soft, excessively wet, unstable or that does not comply with the requirements for test rolling or does not achieve the required ground bearing pressure stated on the drawings shall be treated as unsuitable material. Such unsuitable material shall be excavated and replaced with 40 mm Class 3 crushed rock, spread in layers not exceeding 150 mm compacted thickness and compacted to achieve the required ground bearing pressure stated on the drawings.

When the foundation is in rock, all loose rock and pockets of unsound material, mud or water, shall be removed to expose the sound rock and the surface shall be brought to level as necessary with blinding concrete.

The excavation shall be supported in accordance with the requirements of Section 602.

626.05 BEDDING

Bedding material shall comply with the requirements of Section 812.

Bedding for the cast-in-place concrete base slab shall consist of a compacted layer of 20 mm Class 3 crushed rock, of not less than 150 mm compacted thickness. Where shown on the drawings, this material shall be placed on 40 mm Class 3 crushed rock spread in layers not exceeding 150 mm compacted thickness and compacted to achieve the required bearing pressure specified on the drawings.

626.06 CAST-IN-PLACE CONCRETE

Cast-in-place concrete for bedding slabs shall comply with the drawings and the requirements of Section 610.

Steel reinforcement shall comply with the drawings and the requirements of Section 611.

626.07 PLACING CROWN UNITS

The cast-in-place concrete base slab shall be cured in accordance with the requirements of Section 610 and shall achieve the 28 day minimum compressive strength shown on the drawings before any precast concrete units are placed.

Immediately prior to placing crown units, the surfaces of the bearing areas which support the crown units shall be cleaned, wetted and then covered with sufficient stiff mortar to give a finished thickness not less than 5 mm and not more than 10 mm after the crown units have been placed. The mortar shall consist of cement and clean sand at a ratio of 1:3 and mixed to a consistency that can be displaced to provide an even bearing. The crown units shall be placed in position before the mortar has stiffened to ensure that a uniform bearing is achieved.

Lifting loops shall be cut off flush with the top surface of the units and covered with a minimum 15 mm thickness of epoxy mortar.

626.08 STRUCTURAL FILLING

Structural filling shall comply with the drawings and the requirements of Section 204.

626.09 CONSTRUCTION LOADING ON CULVERTS

If construction vehicles or plant are required to cross the culvert at any time before completion of the road construction, the Contractor shall construct a temporary riding surface over the culvert.

Construction vehicles or plant with axle load-effects (including the load due to the actual depth of construction or temporary riding surface) that exceed the design load-effect shall not be permitted to pass over the culvert at any time without the approval of the Superintendent. The Contractor shall submit its proposals (including supporting calculations) to move such vehicles to the Superintendent for review not later than two weeks prior to the proposed movement. Supporting calculations shall be proof-checked in accordance with the requirements stated in Section 613.

The temporary riding surface shall have a smooth profile to produce a surface free from ruts and bumps. The depth of the temporary riding surface shall be determined by the Contractor but shall be not less than 600 mm.

Construction vehicles or plant shall not pass over the culvert:

- until at least 28 days has elapsed following casting of the base slab; or
- until at least 7 days has elapsed following casting, provided that the cylinder strength of the base slab concrete has achieved 20 MPa.

If vibrating rollers are required to work on or move over the temporary riding surface, the axle load for determining the required depth of cover shall be the combined static and dynamic load.

The Contractor shall maintain the temporary riding surface for the period during which construction traffic is required to pass over the culvert and shall remove it prior to construction of the final embankment and pavement. The temporary materials may be left in place at the discretion of the Superintendent subject to the suitability of the material, its density and condition.