

# ACS730 Box culverts and concrete channels

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## ACS730.1 Scope

This Specification covers the installation/construction and materials for all concrete culverts and channels.

This Specification shall be read in conjunction with Standard Specification ACS510: Earthworks and the Particular Specifications.

This Specification does not cover circular culverts. Circular culverts shall comply with Auckland Council Standard Specification ACS710: Pipelaying.

## ACS730.2 Materials

### ACS730.2.1 Precast concrete units

Box culvert and channel sections shall be proprietary precast units. In-situ concrete or site manufactured precast units are not permitted except when specifically required by the Drawings or Particular Specifications. They shall have a 100-year design life.

Precast concrete units shall comply with NZS 3109 and NZS 3101.

Precast concrete box culverts installed beneath roads/motorways shall comply with the ATCOP or the NZ Transport Agency Bridge Manual as appropriate.

Precast concrete box culverts shall be single-barrelled, unless otherwise specified on the Drawings or Particular Specifications.

Cutting of precast units is not permitted.

### ACS730.2.2 Bedding material

Compacted GAP65 shall be used as bedding material. Up to 50mm of compacted sand may be used on top of the GAP 65.

### ACS730.2.3 Storage and handling of materials

Precast units shall be stored, unloaded and handled in accordance with the manufacturer's recommendations.

Any precast unit damaged during handling or storage shall be replaced or repaired, as directed by the Engineer.

## ACS730.3 Tolerances

Box culverts and channels shall be installed to the line and level required on the specific drawings. The position tolerance at any point along the length of the installation shall be within  $\pm 30$  mm from the specified design. Notwithstanding this, no culvert or channel shall be laid at zero or negative grade unless otherwise indicated in the drawings or Particular Specifications.

Connections to any structure shall be to the tolerance required by the structure, typically  $\pm 5$  mm.

## ACS730.4 Excavation

Trench excavation shall be in accordance with Auckland Council Standard Specification ACS510 Earthworks.

Excavation shall not commence until sufficient supplies of all materials are available to ensure speedy and uninterrupted progress of the work.

Trenches shall be of sufficient width and depth as to permit the safe installation of the precast units.

The formation shall be excavated to form a flat, firm base to support bedding material. Over excavation at the base of the trench shall be filled with bedding material and compacted in layers as required for the bedding.

No trenches shall be opened up more than 10 m ahead of culvert or channel installation, unless otherwise approved by the Engineer.

## ACS730.5 Bedding

The bedding material surface shall be smooth and offer continuous support for the precast units.

Bedding depth shall be as per the manufacturer's requirements or 200 mm (whichever is greater), unless otherwise directed in the drawings or particular specifications.

Local soft spots in the trench shall be excavated and the voids filled with well compacted bedding material to provide uniform support under the entire structure. This must provide a bearing capacity of a minimum of 100 kPa or as otherwise required by the design or precast manufacturer's requirements.

## ACS730.6 Installation

Precast units shall be laid strictly in accordance with the manufacturer's requirements, the drawings and particular specifications.

Precast units shall not be laid before the trench and bedding have been inspected and approved by the Engineer. Laying units shall commence at the downstream end, unless otherwise directed by the Engineer.

If any adjustment of level is necessary, the culvert or channel shall be removed and the surface layer of the bedding adjusted before replacing the unit. Local packers shall not be used to adjust the level.

## ACS730.7 Jointing of precast units

Joints shall be watertight, with a design life of at least 100 years, i.e. in-line with the design life of the entire precast box culvert system/structure. The jointing system shall be installed strictly in accordance with the manufacturer's directions.

Each joint shall be individually locked together using a proprietary jointing system. The system shall comply with the precast manufacturer's requirements and have corrosion protection sufficient for the design life of the precast unit.

Jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled.

## ACS730.8 Backfilling

Backfilling shall generally be in accordance with Standard Specification ACS510: Earthworks and the Auckland Council Stormwater Code of Practice drawing SW01.

Backfilling, surround and overlay material shall be placed and compacted in 200 mm layers to ensure that the precast unit is not distorted. Mechanical compaction plant shall only be used in accordance with the design and precast manufacturer's requirements to avoid damaging the units.

Mechanical compaction of the fill material directly above the precast units shall not be commenced until the total depth of cover above the unit is adequate to prevent damage to the unit.

## ACS730.9 Inspections and testing

The precast units shall be inspected by the Engineer internally and externally prior to backfilling to confirm the joints have been correctly made and that there is no damage to the precast concrete.

The internal faces shall be re-inspected following backfilling to confirm the joints are sound and there is no leakage.