

ACS720 Manhole structures

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ACS720.1 Scope

This Specification covers the construction and materials for all manholes and inspection chambers on stormwater pipelines.

This Specification shall be read in conjunction with Standard Specifications *ACS510 Earthworks*, *ACS710 Pipeline Construction*, *ACS610 Concrete Construction*, and the Particular Specifications.

ACS720.2 Materials

ACS720.2.1 Manholes

Manhole bases, risers and lids shall be manufactured from precast concrete, unless otherwise specified. Manholes shall comply with the requirements of the Auckland Code of Practice, Section 4 Stormwater, Drawings SW05 to SW11.

ACS720.2.2 Precast concrete bases, risers and covers

Precast manhole risers, bases and lids shall comply with NZS 4058 and supplied by a certified precast manufacturer.

The minimum riser height shall be 300 mm.

No manhole risers shall be cut to height.

ACS720.2.3 Manhole lids

All lids shall be heavy duty and meet the requirements of the Transit Bridge Manual loading HN-HO-72 and have a minimum clear opening of 600 mm diameter. Access holes and other entry points shall be cast into the slab, not cut.

ACS720.2.4 Manhole covers

Manhole covers and frames shall be heavy duty and meet the requirements of the Transit Bridge Manual loading HN-HO-72.

Manhole covers shall be hinged and have a minimum clear opening of 600 mm diameter, except for non-access chambers which shall have a minimum clear opening of 500 mm.

ACS720.2.5 Storage of materials

Precast elements shall be unloaded and handled in accordance with the manufacturer's recommendations.

Precast elements shall be stored on level ground.

ACS720.2.6 In-situ mass concrete

Unless otherwise specified, all concrete used in stormwater drainage work shall comply with the requirements of NZS 3109 and shall have a minimum compressive strength of 25 MPa at 28 days.

In-situ reinforced concrete shall comply with Auckland Council Standard Specification ACS610 Concrete Construction.

ACS720.2.7 Rungs

Rungs shall comply with the requirements of the Auckland Code of Practice for Land Development and Subdivision, Chapter 4, Stormwater, Drawing SW09.

Rungs shall be galvanised steel or plastic encapsulated and supplied by the manhole manufacturer to suit the manhole system proposed, unless otherwise specified.

Rungs shall be of a type that provides an upstand at the end of each rung to prevent users slipping sideways off the rung.

ACS720.3 Construction

Manholes shall be constructed in accordance with the Auckland Code of Practice for Development and Subdivision: Chapter 4 – Stormwater, unless otherwise specified.

ACS720.4 Tolerances

The position tolerance for manholes structures shall be within ± 30 mm from the specified design.

Pipe levels shall be within the tolerances given in Standard Specification ACS710: Pipeline Construction.

ACS720.5 Excavation

Excavations shall be to the minimum dimensions required to allow safe construction of the manhole and will otherwise be in accordance with Standard Specification *ACS510 Earthworks*.

ACS720.6 Foundations

Manholes shall be founded on a minimum of 75 mm thick, compacted GAP20 and will otherwise be in accordance with Standard Specification *ACS510 Earthworks*.

ACS720.7 Risers

Risers shall be constructed from the minimum number of precast units as is practicable.

ACS720.8 Jointing

Joints between precast units shall be of the interlocking, self-centring type and shall be sealed with epoxy to form a watertight joint. Butyl mastic, or similar, may be used if approved by the Engineer.

ACS720.9 Concrete work

Concrete work shall generally be in accordance with Auckland Council Standard Specification *ACS610 Concrete Construction*.

The concrete shall be thoroughly consolidated by hand tamping or vibration and after hardening shall be kept continuously damp for at least 7 days.

Formwork shall be free from surface blemishes and shall be designed and constructed to have sufficient strength to resist the pressure of wet concrete and superimposed loads without deformation. All joints shall be tight so as to prevent the leakage of cement paste from the concreting. No formwork shall be stripped from concrete until at least 48 hours after the concrete is poured.

All materials used in concrete work including formwork, reinforcement, cement, aggregates, etc., shall be subject to the approval of the Engineer who may reject any materials which they consider will lead to an unsatisfactory finished structure.

ACS720.10 Rungs

The top rung shall be a maximum of 600 mm below the cover measured from cover level to the top part of the step.

Steps shall be at 300 mm intervals within the riser sections.

Steps shall be fitted in accordance with Auckland Code of Practice for Land Development and Subdivision, Chapter 4, Stormwater, Drawing SW09.

ACS720.11 Penetrations

The primary inlet and outlet pipe end shall be finished flush with the benching concrete and provided with a smooth finish.

All inlet and outlet pipes shall be finished with the spring line of the pipe flush with the inside face of the manhole. Where the pipe is not on the centreline of the manhole, the spring line on shortest length shall be flush with the inside face of the manhole.

All manhole openings shall be cored, where applicable, otherwise shall be cut with a concrete saw. Any exposed reinforcement shall be sealed with an appropriate epoxy resin mortar approved by the Engineer.

ACS720.12 Flexible connections

Flexible joints shall be provided in all pipes connecting to the manhole in accordance with Auckland Council Standard Specification *ACS710 Pipeline Construction*.

ACS720.13 Manhole lids

Where there is a requirement to fix down lids, they shall be fixed down using clamps. The use of epoxy or butyl mastic is not permitted on lids.

ACS720.14 Manhole covers

Manhole covers on roads shall be aligned such that a vehicle striking the hinged cover in a partially open position shall push the cover towards a closed position.

The manhole lid shall be set at a level sufficiently low to allow the cover to be set flush with the road surface. Covers (frames) shall be bolted to the lid with stainless steel dynabolts and sealed with epoxy mortar.

ACS720.15 Manhole throats

The maximum depth of the throat shall be 450 mm measured from cover level to the underside of the lid. Deeper throats may be permitted if the clear opening of the manhole cover is increased to 800 mm minimum. The throat shall be painted blue.