AS 4198:2022

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Precast concrete access and maintenance chambers for sewerage applications

AS 4198:2022

This Australian Standard ® was prepared by WS-006, Concrete Pipes. It was approved on behalf of the Council of Standards Australia on 4 March 2022.

This Standard was published on 18 March 2022.

The following are represented on Committee WS-006:

Australian Chamber of Commerce and Industry
Australian Institute of Building
Austroads
Concrete Institute of Australia
Concrete Pipe Association of Australasia
Engineers Australia
National Precast Concrete Association Australia
University of New South Wales
Water Services Association of Australia

Additional Interests

Auckland Council
Business New Zealand
Concrete New Zealand Precast

This Standard was issued in draft form for comment as DR AS 4198:2020.

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ISBN 978 1 76113 685 6

Precast concrete access and maintenance chambers for sewerage applications

First published as AS 4198—1994.
Second edition 2022.

Preface

This Standard was prepared by the Standards Australia Committee WS-006, Concrete Pipes, to supersede AS 4198:1994, *Precast concrete access chambers for sewerage applications*.

The objective of this Standard is to provide a performance-based document for precast concrete access and maintenance chambers.

The major changes in this edition are as follows:

(a) Durability has been enhanced with additional requirements covering reinforcement and concrete materials, as well as production, placement and curing of concrete. This edition also introduces a new exposure classification for chambers in sewer applications.

(b) Precast concrete maintenance chambers have been incorporated into this Standard.

(c) An increase in the maximum depth of chambers and the maximum nominal diameter of chambers and an increase in the maximum diameter of connecting pipes. Additional testing requirements and test methods have been included that accompany these changes in diameter and depth.

(d) Updates to the load testing requirements to accommodate larger diameter chambers and also changes in road traffic loading from AS 5100.2:2017.

(e) A new informative appendix has been added to provide guidance on the installation of precast access and maintenance chamber systems.

Statements in alphabetical superscript footnotes in tables expressed in mandatory terms are deemed to be requirements of this document. Other notes are only for information and guidance.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Introduction

This Standard was prepared by the Standards Australia Committee WS-006, Concrete Pipes, as a performance-based document for precast concrete access and maintenance chambers.

It was prepared to address advances in current practice, the age of the previous publication of AS 4198 and proposals from industry to move towards greater use of product performance testing. This Standard specifies product performance requirements and excludes normative installation procedures. However, this Standard provides an informative procedure for installation. For further guidelines on recommended installation procedures, reference should be made to the relevant published literature of access and maintenance chamber manufacturers, asset owners, asset owner industry associations and, where appropriate, regulatory authorities.

The in-service life of a precast concrete access or maintenance chamber is dependent on the manufacture, application and installation conditions. This Standard intends that for such installations, service life of 100 years could be expected when components are manufactured in accordance with and installed as recommended by this Standard in the environments defined in this Standard. Components subject to other environments should be assessed for suitability using appropriate engineering judgement. The Standard specifies requirements for concrete access cover assemblies and excludes requirements for metal and polymeric access cover assemblies. The use of some blended cement and chemical admixtures in concrete components is addressed by the Standard.

This document specifically addresses sewerage applications but may also be relevant to drainage, stormwater and other conveyance applications.

Australian Standard®

Precast concrete access and maintenance chambers for sewerage applications

Section 1 Scope and general

1.1 Scope

This Standard describes performance requirements for circular precast concrete access and maintenance chambers systems including chamber materials, component manufacture and quality control. It also describes methods of sampling and testing of precast concrete components manufactured in accordance with the Standard.

This Standard applies to precast concrete access and maintenance chamber components manufactured from steel reinforced, synthetic fibre reinforced or unreinforced concrete that are intended for use in buried sewerage systems. Access chambers conforming to the requirements of this Standard are suitable for a maximum depth to invert of 9 m and to a typical connected pipe diameter not larger than DN750. Similarly, maintenance chambers are suitable for a maximum depth of 6 m and a connecting pipe diameter of not more than DN300.

For other circumstances where depths are greater than 9 m, then specific design matters should be addressed between the designer and the manufacturer.

NOTE 1 Information on means for demonstrating conformity to this Standard is given in Appendix A.

NOTE 2 Guidance on the information to be exchanged by purchaser and manufacturer at the time of an access or maintenance chamber product enquiry or order is given in Appendix B.

NOTE 3 Special design considerations, including high water table, buoyancy uplift resistance, chamber depths greater than 9 m and connected pipes that exceed 750 mm in diameter should be addressed by negotiation between the parties.

NOTE 4 Guidance on the installation of precast access and maintenance chamber systems, including excavation, foundation preparation, placing of units, backfilling, compaction and *in situ* testing is provided in an informative Appendix M.

This Standard does not provide for the following:

(a) Requirements for cast *in situ* concrete components.

(b) Ladders that are supplied and installed *in situ*.

(c) Plastics maintenance shafts.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes the requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1012.1, *Methods of testing concrete, Method 1: Sampling of fresh concrete*

AS 1012.3.5, *Methods of testing concrete, Method 3.5: Determination of properties related to the consistency of concrete — Slump flow, T500 and J-ring test*

AS 1012.8.1, *Methods of testing concrete, Method 8.1: Method for making and curing concrete — Compression and indirect tensile test specimens*

AS 1012.9, *Methods of testing concrete, Method 9: Compressive strength tests — Concrete, mortar and grout specimens*

AS 1012.12.1, *Methods of testing concrete, Method 12.1: Determination of mass per unit volume of hardened concrete — Rapid measuring method*

AS 1012.20.1, *Methods of testing concrete, Method 20.1: Determination of chloride and sulfate in hardened concrete and aggregates — Nitric acid extraction method*

AS 1141.2, *Methods for sampling and testing aggregates, Method 2: Basic testing equipment*

AS 1141.5, *Methods for sampling and testing aggregates, Method 5: Particle density and water absorption of fine aggregate*

AS 1141.6.1, *Methods for sampling and testing aggregates, Method 6.1: Particle density and water absorption of coarse aggregate — Weighing-in-water method*

AS 1141.6.2, *Methods for sampling and testing aggregates, Method 6.2: Particle density and water absorption of coarse aggregate — Pycnometer method*

AS 1141.60.1, *Methods for sampling and testing aggregates, Method 60.1: Potential alkali-silica reactivity — Accelerated mortar bar method*

AS 1141.60.2, *Methods for sampling and testing aggregates, Method 60.2: Potential alkali-silica reactivity — Concrete prism method*

AS 1379, *Specification and supply of concrete*

AS 1478.1, *Chemical admixtures for concrete, mortar and grout, Part 1: Admixtures for concrete*

AS 1646, *Elastomeric seals for waterworks purposes*

AS 1657, *Fixed platforms, walkways, stairways and ladders — Design, construction and installation*

AS 2193, *Calibration and classification of force-measuring systems*

AS 2758.1, *Aggregates and rock for engineering purposes, Part 1: Concrete aggregates*

AS 3500.0, *Plumbing and drainage, Part 0: Glossary of terms*

AS 3582.2, *Supplementary cementitious materials, Part 2: Slag — Ground granulated blast-furnace*

AS 3799, *Liquid membrane-forming curing compounds for concrete*

AS 3850, *Prefabricated concrete elements (series)*

AS 3972, *General purpose and blended cements*

AS 3996, *Access covers and grates*

AS 4586, *Slip resistance classification of new pedestrian surface materials*

AS 4663, *Slip resistance measurement of existing pedestrian surfaces*

AS 5100.2, *Bridge design, Part 2: Design loads*

AS 5100.5, *Bridge design, Part 5: Concrete*

AS/NZS 1554.3, *Structural steel welding, Part 3: Welding of reinforcing steel*

AS/NZS 3582.1, *Supplementary cementitious materials, Part 1: Fly ash*

AS/NZS 3582.3, *Supplementary cementitious materials, Part 3: Amorphous silica*