AS 3600:2018
(Incorporating Amendment No. 1)

AS 3600:2018

Concrete structures

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The following are represented on Committee BD-002:

- Australian Building Codes Board
- Bureau of Steel Manufacturers of Australia
- Cement Concrete and Aggregates Australia—Cement
- Cement Concrete and Aggregates Australia—Concrete
- Concrete Institute of Australia
- Consult Australia
- Engineers Australia
- La Trobe University
- Master Builders Australia
- National Precast Concrete Association Australia
- Steel Reinforcement Institute of Australia
- University of Melbourne
- University of New South Wales
- University of Sydney

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

Concrete structures

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PREFACE

This Standard was prepared by Standards Australia Committee BD-002, Concrete Structures, to supersede AS 3600—2009.

This Standard incorporates Amendment No. 1 (November 2018). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The principal objective of this Standard is to provide users with nationally acceptable unified rules for the design and detailing of concrete structures and members, with or without steel reinforcement or prestressing tendons, based on the principles of structural engineering mechanics. The secondary objective is to provide performance criteria against which the finished structure can be assessed for conformance with the relevant design requirements.

The following list indicates the major differences between this edition and the 2009 edition of AS 3600:

(a) Addition of the following new sections:

  (i) Section 14 *Design for Earthquakes Actions* (formerly Appendix C).

  (ii) Section 15 *Diaphragms*.

  (iii) Section 16 *Steel Fibre Reinforced Concrete*.

  (iv) Section 18 *Design for Fatigue*.

  (v) Appendix C *Residual Tensile Strength Test for SFRC*.

(b) Revision of the following requirements:

  (i) Phi factors.

  (ii) Maximum steel strength.

  (iii) Shear in deep slabs.

  (iv) Fire design, including—

    (A) axis distances for fire design;

    (B) continuous top reinforcement; and

    (C) minimum slab thickness.

  (v) Modification of models and calculations of—

    (A) shrinkage;

    (B) creep;

    (C) deflections; and

    (D) development lengths for higher strength steels.

  (vi) Steel shrinkage in areas modelled by strut and tie.

  (vii) Punching shear.

  (viii) Ductility for pre-cast concrete connections.

  (ix) Heating and re-bending bars.

  (x) Crack control.

Statements expressed in mandatory terms in notes to figures and tables are deemed to be requirements of this Standard.

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.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE AND APPLICATION

1.1.1 Scope

This Standard sets out minimum requirements for the design and construction of concrete building structures and members that contain reinforcing steel or tendons, or both. It also sets out minimum requirements for plain concrete pedestals and footings.

NOTES:

1 The general principles of concrete design and construction and the criteria embodied in this Standard may be appropriate for concrete structures other than buildings, members not specifically mentioned herein and to materials outside the limits given in Clause 1.1.2.

2 It is intended that the design of a structure or member to which this Standard applies be carried out by, or under the supervision of, a suitably experienced and competent person.

3 For guidance on the design of maritime structures refer to AS 4997.

4 If alternate materials and methods to those prescribed in this Standard are to be used, they would need to be considered as part of the development of a Performance Solution to demonstrate compliance with the relevant Performance Requirements of the National Construction Code (NCC) and be accepted by the relevant building authority.

This Standard is not intended to apply to the design of mass concrete structures.

1.1.2 Application

This Standard applies to structures and members in which the materials conform to the following:

(a) Concrete with—

(i) characteristic compressive strength at 28 days (f'_c) in the range of 20 MPa to 120 MPa; and

(ii) with a saturated surface-dry density in the range 1800 kg/m^3 to 2800 kg/m^3.

(b) Reinforcing steel of Ductility Class N or E in accordance with AS/NZS 4671.

NOTE: These reinforcing materials may be used, without restriction, in all applications referred to in this Standard. This Standard has been written using Ductility Class N reinforcing steels which are readily available in Australia. Where Ductility Class N is referenced in this Standard, the Earthquake Ductility Class E steels may be substituted but the availability of supply in Australia needs to be checked prior to specification on design drawings.

(c) Reinforcing steel of Ductility Class L in accordance with AS/NZS 4671 may be used as main or secondary reinforcement in the form of welded wire mesh, or as wire, bar and mesh in fitments, provided it is not used in any situation where the reinforcement is required to undergo large plastic deformation under strength limit state conditions.

NOTE: The use of Ductility Class L reinforcement is further limited by other clauses within the Standard.