AS 3850.1:2015

Australian STANDARD

Prefabricated concrete elements

Part 1: General requirements

STANDARDS Australia

This Australian Standard® was prepared by Committee BD-066, Tilt-up Construction. It was approved on behalf of the Council of Standards Australia on 8 July 2015.
This Standard was published on 3 September 2015.

The following are represented on Committee BD-066:

- Australasian Fire and Emergency Service Authorities Council
- Australian Council of Trade Unions
- Australian Engineered Fasteners and Anchors Council
- Australian Institute of Building Surveyors
- Australian Steel Institute
- Building Designers Association of NSW
- Cement Concrete and Aggregates Australia
- Concrete Institute of Australia
- Concrete Pipe Association of Australasia
- Crane Industry Council of Australia
- Curtin University of Technology
- Engineers Australia
- Master Builders Australia
- National Association of Testing Authorities Australia
- National Precast Concrete Association Australia
- Steel Reinforcement Institute of Australia
- Sydney University
- WorkCover New South Wales
- WorkSafe Victoria

This Standard was issued in draft form for comment as DR2 AS 3850.1.

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.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard®

Prefabricated concrete elements

Part 1: General requirements

Originated as AS 3850.1—1990, AS 3850.2—1990 and AS 3850.3—1992.
AS 3850.1—1990, AS 3850.2—1990 and AS 3850.3—1992 revised, amalgamated and redesignated as AS 3850—2003.
AS 3850—2003 revised and redesignated (in part) as AS 3850.1:2015.
Reissued incorporating Amendment No. 1 (January 2019).

Published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 978 1 76035 242 4

PREFACE

This Standard was prepared by the Standards Australia Committee BD-066, Tilt up Construction, to supersede, in part, AS 3850—2003, *Tilt-up concrete construction*.

This Standard incorporates Amendment No. 1 (January 2019). 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 AS 3850 series comprises the following parts:

AS	
3850	Prefabricated concrete elements
3850.1	Part 1: General requirements
3850.2	Part 2: Building construction

The objective of this part of the Standard is to provide requirements for the materials, components and equipment used in the manufacture of prefabricated concrete elements.

In this Standard where the word ‘shall’ is used, a mandatory requirement is implied; where the word ‘should’ is used, a recommendation is implied.

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

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

This document includes commentary on some of the clauses of the Standard. The commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

CONTENTS

Page

STANDARDS AUSTRALIA

Australian Standard
Prefabricated concrete elements

Part 1: General requirements

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard provides general requirements for the materials, components and equipment used in the manufacture of prefabricated concrete elements.

1.2 APPLICATION

This Standard shall be read in conjunction with AS 3850.2 and AS 3600.

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard.

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

AS	
1012	Methods of testing concrete (series)
1110	ISO metric precision hexagon bolts and screws (series)
1111	ISO metric hexagon bolts and screws
1111.1	Part 1: Product grade C—Bolts
1199	Sampling procedures for inspection by attributes
1199.1	Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
1171	Non-destructive testing—Magnetic particle testing of ferromagnetic products, components and structures
1379	Specification and supply of concrete
1391	Metallic materials—Tensile testing at ambient temperature
1733	Methods for the determination of grain size in metals
2193	Calibration and classification of force-measuring systems
2550	Cranes, hoists and winches—Safe use (series)
3600	Concrete structures
3799	Liquid membrane-forming curing compounds for concrete
3850	Prefabricated concrete elements
3850.2	Part 2: Building construction
4100	Steel structures

	AS/NZS	
A1	1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series) (ISO 10684:2004, MOD)
	1554	Structural steel welding (series)
	4671	Steel reinforcing materials
A1	4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
	ABCB	
	NCC	National Construction Code
	ASTM	
	D618	Standard Practice for Conditioning Plastics for Testing
	D695	Standard Test Method for Compressive Properties of Rigid Plastics
	CEN/TR	
	15728:2008	Design And Use Of Inserts For Lifting And Handling Of Precast Concrete—Elements
	CEN/TS	
	1992	Design of fastenings for use in concrete
	1992-4-2:2009	Part 4-2: Headed fasteners
	ETAG	
	001	Metal anchors for use in concrete (series)

1.4 DEFINITIONS

For the purposes of this Standard, the definitions in AS 3600 and those below apply.

1.4.1 Axial insert loading

Load applied along the longitudinal axis of the insert.

1.4.2 Bending insert loading

Bending effect induced by a shear load applied with an eccentricity with respect to the centroid of resistance.

1.4.3 Blow-out failure

Spalling of the concrete on the side face of the anchorage component at the level of the embedded head, with no major breakout at the top concrete surface.

A1 NOTE: This is usually associated with inserts with small side cover and deep embedment [see Figure A4(e), Appendix A].

1.4.4 Bondbreaker

A chemical product used to prevent bonding of freshly poured concrete to a concrete substrate.

1.4.5 Brace

A temporary support (which is usually inclined but may be horizontal in certain circumstances) that provide stability for vertical prefabricated concrete elements to prevent overturning, with both ends of the brace fitted with a pinned foot, allowing a degree of freedom for variable fixing angles.

NOTE: Unless otherwise specified, a reference in this Standard to a brace means a primary brace.

1.4.6 Brace insert

A component or system cast or post-installed into the prefabricated concrete element, or into a supporting member, for later attachment of a brace.

1.4.7 Bracing feet or shoes

The elements that connect braces onto a prefabricated concrete element or onto the bracing support by way of pinned connections and inserts.

1.4.8 Characteristic spacing

Spacing required to ensure the characteristic resistance of a single insert.

1.4.9 Characteristic value

The 5% fractile (value with a 95% probability of being exceeded, with a confidence of 90%).

1.4.10 Compatible

The coordinated use of two (or more) separate components without compromise to the working load limit (WLL) or utility of either component.

1.4.11 Competent person

A person who has acquired through training, qualification or experience, or a combination of these, the knowledge and skills to enable that person to perform the required task.

1.4.12 Component reinforcement

Reinforcement placed in conjunction with lifting, brace and fixing inserts and required to achieve the nominated capacities of the inserts.

1.4.13 Concrete cone failure

Failure that corresponds to a wedge or cone of concrete surrounding the insert separating from the base material.

NOTES:

A1

1 See Figure A4, illustrations (a), (b) and (c), Appendix A.

2 Concrete cone failure occurs when a load is applied to an insert embedded in concrete until tensile failure of the concrete occurs and a ‘cone’ or ‘wedge’ of concrete is pulled from the main body of the element, together with the insert See Figure A4(a) , Appendix A.

1.4.14 Concrete pry-out failure

Failure that corresponds to the formation of a concrete spall opposite to the loading direction under shear loading.

NOTE: See Figure A5(b), Appendix A.

1.4.15 Drop zone

A designated restricted area in and around a building construction site where items may potentially fall through or onto.

NOTE: The drop zone of each building site is determined by and detailed in the builders Safe Work Method Statement.

1.4.16 Ductile material

A material that demonstrates plastic elongation after yielding.

1.4.17 Edge distance

Distance from the edge of the concrete element to the centre of the insert.