AS 5146.3:2015

Australian STANDARD

Reinforced Autoclaved Aerated Concrete

Part 3: Construction

STANDARDS Australia

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- Association of Consulting Structural Engineers of NSW
- Australian Building Codes Board
- Australian Institute of Building
- Building Designers Association of Australia
- Consult Australia
- CSIRO
- Engineers Australia
- Housing Industry Association
- Master Builders Australia
- National Precast Concrete Association Australia

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Australian Standard®

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Part 3: Construction

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-106, Autoclaved Aerated Concrete (AAC).

The objective of this Standard is to provide construction details and specifications that comply with the requirements of AS 5146.1, *Reinforced autoclaved aerated concrete*, Part 1: *Structures* and AS 5146.2, *Reinforced autoclaved aerated concrete*, Part 2: *Design*.

Statements expressed in mandatory terms in Notes to Figures and Tables are deemed to be requirements of this Standard.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements for construction using Reinforced Autoclaved Aerated Concrete (Reinforced AAC) members complying with AS 5146.1 and AS 5146.2, including associated fixings, flashings and control joints. This Standard does not cover the construction of structures consisting of unreinforced autoclaved aerated concrete blocks.

NOTES:

1 The term 'Reinforced AAC structures' refers to buildings that incorporate 'Reinforced AAC members', such as walls, floors, roofs, beams and the like made of Reinforced AAC. In this Standard, the term 'components' refers to items made from other materials, such as bolts, fixings, flashings and the like.

2 The forms of construction and detailing prescribed in Sections 2 and 3, together with Sections 4, 5, 6, 7 or 8 for the applications described therein, satisfy the requirements of AS 5146.1. However, they are not the only forms of construction or details capable of doing so. Other construction and details may be assessed separately for compliance with AS 5146.1.

3 This Standard should not be interpreted in a way that prevents the design and construction of structures that use alternative materials or methods of design or construction not specifically referred to herein. However, the design and construction of such structures are outside the scope of this Standard.

4 This Standard is based on the assumption that the design information is conveyed to the builders via comprehensive documentation such as drawings, details and specifications.

1.2 APPLICATION

For the applications stated herein, construction in accordance with this Standard satisfies the durability, fire resistance, serviceability, strength, stability and resistance to water penetration requirements of AS 5146.1 and AS 5146.2, and the Standards referenced therein.

Sections 4, 5, 6, 7 and 8 of this Standard provide details specific to durability, fire resistance, serviceability, strength, stability and resistance to water penetration requirements of Reinforced AAC members, and associated fixings, flashings and control joints, in all classes of building defined in the National Construction Code Volumes One and Two, except Class 10b and 10c structures.

The wind resistance of external walls provided in Section 3 are applicable only to buildings that incorporate a lining capable of resisting wind pressure exerted from inside the building, where the cavity between the lining and the cladding is sealed and where windows and doors in the external walls incorporate seals.

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 in AS 5146.1.

AS

1397 Continuous hot-dip metallic coated steel sheet and strip—Coatings of zinc and zinc alloyed with aluminium and magnesium

1530 Methods for fire tests on building materials, components and structures
1530.4 Part 4: Fire-resistance tests for elements of construction

1684 National timber framing code—Timber framing span tables

2601 The demolition of structures

2870 Residential slabs and footings

3566 Self-drilling screws for the building and construction industries
3566.1 Part 1: General requirements and mechanical properties
3566.2 Part 2: Corrosion resistance requirements

3600 Concrete structures

3623 Domestic metal framing

3660 Termite management
3660.1 Part 1: New building work

3959 Construction of buildings in bushfire-prone areas

4055 Wind loads for housing

4654 Waterproofing membranes for external above-ground use
4654.1 Part 1: Materials
4654.2 Part 2: Design and installation

5146 Reinforced autoclaved aerated concrete
5146.1 Part 1: Structures
5146.2 Part 2: Design

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1170 Structural design actions
1170.0 Part 0: General principles
1170.1 Part 1: Permanent, imposed and other actions
1170.2 Part 2: Wind actions

2699 Built in components for masonry construction
2699.2 Part 2: Connectors and accessories
2699.3 Part 3: Lintels and shelf angles (durability requirements)

2904 Damp-proof courses and flashings

4671 Steel reinforcing materials

4600 Cold-formed steel structures

NCC National Construction Code

1.4 DEFINITIONS

For the purposes of this Standard, the definitions below apply:

1.4.1 Autoclaved Aerated Concrete (AAC)

Material manufactured from binders such as cement and/or lime combined with fine siliceous based material, cell generating material and water.

NOTE: The raw materials are mixed together and cast into moulds where the mix is allowed to rise and set into cakes. After this part of the process, the cake is cut into the required sizes of members and cured with high-pressure steam in autoclaves.

1.4.2 Built-in components for Reinforced AAC construction

Metal items used for connecting Reinforced AAC to its supporting structure including, but not limited to the following:

(a) Anchors.

(b) Connectors.

(c) Shelf angles.

(d) Lintel bars.

(e) Bolts and fixings.

1.4.3 Characteristic value

1 For strength properties, the value of the material property that is exceeded by 95% of the material.

2 For coefficients of expansion and contraction, the value that is exceeded by 5% of the material.

1.4.4 Declared value

The value of a particular property of Reinforced AAC, determined in accordance with one of the methods in AS 5146.2.

1.4.5 Exposure environments

1.4.5.1 *Severe marine*

Areas up to 100 m from a non-surf coast and up to 1 km from breaking surf.

NOTE: The distances specified are from the mean high-water mark.

1.4.5.2 *Marine*

Areas from 100 m up to 1 km from a non-surf coast and from 1 km up to 10 km from breaking surf.

NOTE: The distances specified are from the mean high-water mark. Sheltered bays such as Port Phillip Bay and Sydney Harbour are considered to be non-surf coast.

1.4.5.3 *Industrial*

Environments within 1 km of major industrial complexes producing significant acidic pollution.

NOTE: There are only a few such regions in Australia; for example, around Port Pirie.

1.4.5.4 *Moderate*

Areas with light industrial pollution or very light marine influence, or both.

NOTE: Moderate areas include built-up areas within 50 km of the coast and more than 1 km from a non-surf coast and more than 10 km from breaking surf, including suburban areas of cities such as Melbourne, Adelaide and Hobart, many areas of Sydney, Perth and Brisbane, and many inland cities.

1.4.5.5 *Mild*

Environments more than 50 km from the coast, and not classed as industrial, which are divided as follows:

(a) *Mild-tropical* Environments more than 50 km from the coast and falling within the tropical climatic zone shown in Figure 1.4.5(A).

(b) *Mild-temperate* Environments more than 50 km from the coast and falling within the temperate climatic zone shown in Figure 1.4.5(A).

(c) *Mild-arid* Environments more than 50 km from the coast and falling within the arid climatic zone shown in Figure 1.4.5(A).

1.4.5.6 *Special*

Environments that are not defined in Clauses 1.4.5.1 to 1.4.5.5, which have durability requirements different to those set out in Table 2.5(A).

NOTE: Special environments are often more aggressive than severe marine environments, thus requiring greater protection of some or all of the components than would be afforded by compliance with the requirements of Table 2.5(A) for a severe marine environment.