AS 4997:2026

Australian STANDARD®

STANDARDS Australia

Maritime structures



AS 4997:2026

This Australian Standard® was prepared by CE-030, Maritime Structures. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 13 May 2026.

This Standard was published on 29 May 2026.

The following are represented on Committee CE-030:

- Boating Industry Association
- Consult Australia
- Department of Transport (WA)
- Engineers Australia
- Engineers Australia – National Committee on Coastal and Ocean Engineering
- Fire Protection Association Australia
- Marina Industries Association
- Ports Australia
- Queensland Transport
- The Australasian Corrosion Association
- Transport NSW Maritime

This Standard was issued for comment as DR AS 4997:2024

Status of this document

Standards Australia publications are periodically reviewed to ensure their ongoing relevance and accuracy. This document may be withdrawn, revised, or superseded at any time. To verify this document's current status, visit:

www.standards.org.au

ISBN: 978 1 76175 772 3

Australian Standard®

Maritime structures

First published as AS 4997–2005.
This document AS 4997:2026.

© Standards Australia Limited 2026

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Users must not use the content in this publication in combination with artificial intelligence (AI) tools for any purpose, unless they have the express prior written consent from Standards Australia.

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by Standards Australia Committee CE-030, Maritime Structures, to supersede AS 4997—2005, *Guidelines for the design of maritime structures*.

The objective of this document is to provide the minimum design requirements for designers, operators and regulatory authorities of structures located in the marine environment.

These structures may include fixed moorings for the berthing of vessels, piles and other parts of a substructure, wharf and jetty decks, building substructures over waters, and floating structures.

This edition has been comprehensively revised, with the most significant change being its transition from an informative to a normative document.

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 as “informative” appendix is only for information and guidance.

© Standards Australia Limited 2026

Contents

Page

Preface ..... **v**

Section 1 Scope and general **1**
1.1 Scope 1
1.2 Application 2
1.3 Normative references 2
1.4 Terms and definitions 3
1.5 Notation 8
1.5.1 Abbreviations 8
1.5.2 Symbols 10
1.6 New designs and innovations 11

Section 2 Site investigation and planning **12**
2.1 General 12
2.2 Survey 12
2.2.1 Survey grid 12
2.2.2 Vertical datum 12
2.2.3 Hydrographic survey 12
2.2.4 Terrestrial surveys 13
2.3 Geotechnical 13
2.4 Wind, hydrodynamic and sediment movement assessment 13
2.4.1 General 13
2.4.2 Sources of data 13
2.4.3 Data required and collection methods 14

Section 3 Design requirements **17**
3.1 Aim 17
3.2 General 17
3.3 Design vessels 17
3.4 Dimensional criteria 17
3.4.1 Structure heights 17
3.4.2 Layout of berth structures 17
3.4.3 Fender configuration 18
3.5 Effects of scour and siltation 19
3.6 Fixed structures 19
3.6.1 General 19
3.6.2 Stability 19
3.6.3 Strength 19
3.6.4 Serviceability 19
3.6.5 Jetties, wharves, dolphins, and fixed mooring structures 20
3.6.6 Breakwaters and seawalls 21
3.6.7 Fixed aids to navigation 21
3.6.8 Geotechnical properties of the founding material 21
3.7 Floating structures 22
3.7.1 General 22
3.7.2 Stability 22
3.7.3 Strength 22
3.7.4 Serviceability 22
3.7.5 Single point moorings including swing moorings 24
3.7.6 Floating aids to navigation 24
3.8 Access and safety 24
3.8.1 Application 24
3.8.2 Restricted access for operational, inspection, maintenance, and servicing personnel 24
3.8.3 Public access to structures and facilities 25
3.8.4 Mooring line snap-back 25
3.8.5 Vehicle barriers 26
3.8.6 Ladders 26

© Standards Australia Limited 2026

3.8.7 Pedestrian surfaces ... 26
3.8.8 Separation of intended uses ... 26
3.9 Climate change ... 26
3.9.1 Sea level rise ... 26
3.9.2 Storm frequency and intensity changes ... 28
3.10 Services and non-structural components ... 29
3.11 Maintenance and operation ... 30

Section 4 Design actions ... 31
4.1 General ... 31
4.2 Design events ... 31
4.3 Permanent actions (dead loads) ... 32
4.4 Imposed actions (live loads) ... 32
4.4.1 Surface loads ... 32
4.4.2 Cargo storage ... 33
4.4.3 Cargo handling systems ... 34
4.5 Vessel berthing actions ... 34
4.5.1 General ... 34
4.5.2 Energy absorbed through deflection of a berthing structure ... 34
4.5.3 Energy absorbing fender systems ... 35
4.5.4 Determination of berthing energy and loads ... 35
4.6 Mooring actions ... 38
4.7 Wind actions ... 39
4.7.1 General ... 39
4.7.2 Wind actions on vessels and floating structures ... 39
4.7.3 Operational wind actions ... 40
4.8 Current actions ... 40
4.8.1 Design current ... 40
4.8.2 Current actions on structures ... 40
4.8.3 Current actions on vessels and floating structures ... 41
4.8.4 Negative lift due to currents ... 42
4.9 Hydrostatic actions ... 42
4.9.1 General ... 42
4.9.2 Uplift stability ... 43
4.9.3 Tidal lag ... 43
4.9.4 Ground water ... 43
4.9.5 Wave backpressure ... 43
4.10 Wave actions ... 44
4.10.1 General ... 44
4.10.2 Design wave heights ... 44
4.10.3 Water levels with design wave heights ... 45
4.10.4 Design horizontal wave loads ... 46
4.10.5 Wave uplift loads ... 47
4.11 Debris actions ... 48
4.12 Floating object impact ... 49
4.13 Cyclic actions ... 49
4.14 Lateral earth actions ... 49
4.15 Propeller wash ... 50
4.16 Thermal, shrinkage, creep, and other movement induced actions ... 50
4.17 Earthquake actions ... 50
4.17.1 General ... 50
4.17.2 Maritime structures ... 50
4.18 Tsunami ... 51
4.19 Construction and maintenance actions ... 51
4.19.1 General ... 51
4.19.2 Temporary structures ... 52
4.20 Combinations of actions ... 52
4.20.1 Classification of loads and load effects ... 52
4.20.2 Load factors for serviceability and fatigue limit states ... 55

© Standards Australia Limited 2026

Section 5 Durability **56**
5.1 General 56
5.2 Design life 57
5.2.1 General 57
5.2.2 Replaceable elements 57
5.2.3 Time to first maintenance 58
5.2.4 Material 59
5.3 Durability plan 59
5.3.1 General 59
5.3.2 Construction and quality 60
5.3.3 Inspection and maintenance 60
5.3.4 Durability monitoring 61
5.4 Reinforced concrete 61
5.4.1 General 61
5.4.2 Structural design 62
5.4.3 Exposure classifications 62
5.4.4 Structural concrete 63
5.4.5 Restrictions on chemical content 68
5.4.6 Cover to reinforcement 68
5.4.7 Concrete mixes 69
5.4.8 Durability enhancement measures 71
5.4.9 Embedded items 72
5.4.10 Construction 72
5.4.11 Cathodic protection of concrete 72
5.5 Mass concrete and masonry 73
5.6 Carbon steel 73
5.6.1 General 73
5.6.2 Material requirements 73
5.6.3 Steel corrosion protection systems 73
5.6.4 Member sizes 76
5.6.5 Cathodic protection of steel 76
5.7 Stainless steel 77
5.8 Aluminium 77
5.9 Cast iron 78
5.10 Timber 78
5.10.1 General 78
5.10.2 Immersed timber 79
5.10.3 Timbers above water level 79
5.10.4 Decking 80
5.10.5 Inspection and maintenance 80
5.10.6 Finishes 80
5.11 Engineered timbers 80
5.12 Plastic lumber 81
5.13 Fibre reinforced polymers 81
5.14 Polyethylene 81
5.15 Expanded polystyrene 82
5.15.1 General 82
5.15.2 Environmental protection 82
5.16 Cathodic protection 82
5.16.1 General 82
5.16.2 Cathodic protection of immersed and buried steel 83
5.16.3 Cathodic protection of reinforcement in concrete 84

Appendix A (informative) **Container wharf deck loadings** **86**

Appendix B (informative) **Mooring loads** **90**

Appendix C (informative) **Combination of actions** **91**

Appendix D (informative) **FRP maritime structures** **93**

© Standards Australia Limited 2026

Appendix E (informative) **Geopolymer and alkali activated binder concrete** **94**
Appendix F (informative) **Stainless steel** **95**
Bibliography **97**

© Standards Australia Limited 2026

Australian Standard®

Maritime structures

Section 1 Scope and general

1.1 Scope

This document sets out requirements for the design of structures in a marine environment.

This document applies to the design and maintenance of near-shore coastal and estuarine structures, such as —

(a) jetties;

(b) wharves;

(c) dolphins;

(e) coastal engineering structures such as armoured walls, groynes, breakwaters, seawalls;

(f) mooring structures;

(g) structures for aids to navigation;

(h) laterally restrained floating structures (excluding wave attenuating structures); and

(i) building substructures over water.

For buildings constructed over water, this document applies to the structure up to and including the main deck level.

NOTE 1 The superstructure above main deck level is designed in accordance with the relevant Australian Standards and relevant building regulations.

NOTE 2 For public access structures, refer to AS 1428.1 and the NCC for any relevant requirements.

This document does not apply to the design of —

(i) pipelines;

(ii) marinas (see AS 3962);

(iii) boat ramps (see AS 3962);

(iv) offshore oil and gas structures;

(v) dredging and reclamation;

(vi) bridges (see the AS 5100 series);

(vii) geometrical design of port and harbour infrastructure; and

(viii) floating structures not permanently restrained, e.g. vessels, construction pontoons, barges.

The requirements of this document do not apply to maritime structures designed before the publication of this Standard.

© Standards Australia Limited 2026