

Australian Standard™

**Guidelines for the design of maritime
structures**

STANDARDS
Australia



This Australian Standard was prepared by Committee CE-030, Maritime Structures. It was approved on behalf of the Council of Standards Australia on 29 March 2005. This Standard was published on 28 September 2005.

The following are represented on Committee CE-030:

Association of Australian Ports and Marine Authorities
Association of Consulting Engineers Australia
Australian Stainless Steel Development Association
Boating Industry Association of Australia
Cement Concrete & Aggregates Australia – Cement
Civil Contractors Federation
Engineers Australia
Institute of Public Works Engineering Australia
Marina Association of Australia
Monash University
Queensland Transport
University of Wollongong

Keeping Standards up-to-date

Standards are living documents which 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 Standards may also be withdrawn.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 which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Web Shop at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

Australian Standards™ and other products and services developed by Standards Australia are published and distributed under contract by SAI Global, which operates the Standards Web Shop.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.org.au, or write to the Chief Executive, Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard™

**Guidelines for the design of maritime
structures**

First published as AS 4997—2005.

COPYRIGHT

© Standards Australia

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.

Published by Standards Australia, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 6858 X

PREFACE

This Standard was prepared by Standards Australia Committee CE-030, *Maritime Structures*.

The objective of this Standard is to provide designers and regulatory authorities of structures located in the marine environment with a set of guidelines and recommendations for the design, preservation and practical applications of such structures. These structures can include fixed moorings for the berthing of vessels, piles and other parts of a substructure, wharf and jetty decks, building substructures over waters, etc.

This Standard has been prepared as a guideline only, to provide advice and recommendations for maritime structures. Clauses in this document are written using informative terminology and should not be interpreted otherwise. The requirements of a maritime structure and its associated facilities should be determined for the individual application. This Standard should be used in conjunction with the relevant materials and design Standards.

CONTENTS

| | <i>Page</i> |
|---|-------------|
| SECTION 1 SCOPE AND GENERAL | |
| 1.1 SCOPE | 5 |
| 1.2 REFERENCED AND RELATED DOCUMENTS | 6 |
| 1.3 NOTATION | 7 |
| 1.4 DEFINITIONS | 8 |
| SECTION 2 SITE INVESTIGATION AND PLANNING | |
| 2.1 GENERAL | 10 |
| 2.2 SURVEY | 10 |
| 2.3 GEOTECHNICAL..... | 11 |
| 2.4 ASSESSMENT OF LOADS..... | 11 |
| SECTION 3 DIMENSIONAL CRITERIA | |
| 3.1 STRUCTURE HEIGHTS | 12 |
| 3.2 FENDER HEIGHTS..... | 12 |
| 3.3 LAYOUT OF BERTH STRUCTURES | 12 |
| 3.4 ACCESS AND SAFETY..... | 13 |
| SECTION 4 DESIGN REQUIREMENTS | |
| 4.1 AIM..... | 14 |
| 4.2 DESIGN REQUIREMENTS | 14 |
| 4.3 FLOATING STRUCTURES | 15 |
| 4.4 BREAKWATERS | 15 |
| 4.5 EFFECTS OF SCOUR AND SILTATION..... | 16 |
| 4.6 SEA LEVEL RISE (global warming)..... | 16 |
| SECTION 5 DESIGN ACTIONS | |
| 5.1 GENERAL | 17 |
| 5.2 PERMANENT ACTIONS (DEAD LOADS)..... | 17 |
| 5.3 IMPOSED ACTIONS (LIVE LOADS) | 17 |
| 5.4 WIND ACTIONS..... | 21 |
| 5.5 CURRENT ACTIONS..... | 22 |
| 5.6 DEBRIS ACTIONS..... | 23 |
| 5.7 NEGATIVE LIFT DUE TO CURRENTS | 23 |
| 5.8 HYDROSTATIC ACTIONS | 23 |
| 5.9 WAVE ACTIONS | 24 |
| 5.10 CONSTRUCTION AND MAINTENANCE ACTIONS | 26 |
| 5.11 LATERAL EARTH ACTIONS | 26 |
| 5.12 COMBINATIONS OF ACTIONS | 26 |
| 5.13 PROPELLER WASH | 28 |
| 5.14 EARTHQUAKE ACTIONS | 28 |
| SECTION 6 DURABILITY | |
| 6.1 GENERAL | 30 |
| 6.2 DESIGN LIFE | 30 |
| 6.3 CONCRETE..... | 33 |
| 6.4 STEEL..... | 38 |
| 6.5 TIMBER..... | 41 |

APPENDICES

| | | |
|---|------------------------------------|----|
| A | CONTAINER WHARF DECK LOADINGS..... | 43 |
| B | BERTHING ENERGIES AND LOADS..... | 46 |
| C | MOORING LOADS..... | 50 |

Currently in preview, click buy full version

STANDARDS AUSTRALIA

Australian Standard Guidelines for the design of maritime structures

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out guidelines for the design of structures in a marine environment. It is to be used in conjunction with the relevant Standards and provides recommendations additional to the requirements of these Standards.

This Standard is intended to cover the design of near-shore coastal and estuarine structures, such as—

- (a) jetties;
- (b) wharves;
- (c) berthing dolphins;
- (d) floating berths;
- (e) seawalls;
- (f) breakwater structures, excluding rubble mound and floating types;
- (g) boat ramps;
- (h) laterally restrained floating structures, and
- (i) building substructures over water.

This Standard is not intended to cover the design of—

- (A) pipelines;
- (B) marinas (see AS 3902),
- (C) offshore oil and gas structures;
- (D) dredging and reclamation;
- (E) coastal engineering structures such as rock armoured walls, groynes, etc;
- (F) geotechnical design of port and harbour infrastructure;
- (G) floating structures not permanently restrained, e.g., vessels, construction pontoons, barges.

For buildings constructed over water, these guidelines apply to the structure up to and including the main deck level. The superstructure above main deck level should be designed in accordance with the relevant Australian Standards and relevant building regulations.