

## Australian Standard™

A1

### **Cranes, hoists and winches**

### **Part 18: Crane runways and monorails**

This Australian Standard was prepared by Committee ME-005, Cranes. It was approved on behalf of the Council of Standards Australia on 8 December 2000 and published on 16 February 2001.

---

The following are represented on Committee ME-005:

Association of Consulting Engineers, Australia  
Australian Chamber of Commerce and Industry  
Australian Elevator Association  
Australian Institute of Building  
Australian Institute for Non-destructive Testing  
Bureau of Steel Manufacturers of Australia  
Construction and Mining Equipment Association of Australia  
Crane Industry Council of Australia  
Department of Defence (Commonwealth)  
Department of Training and Industrial Relations, Qld  
Department for Industrial Affairs, S.A.  
Institution of Engineers, Australia  
Metal Trades Industry Association of Australia  
University of New South Wales  
Victorian WorkCover Authority, Health and Safety Division  
WorkCover, N.S.W.  
Work Health Authority, N.T.  
Workplace Standards Authority, Tas.  
WorkSafe, W.A.

---

#### **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 Standards may also be withdrawn.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 Australia web site at [www.standards.com.au](http://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 Australian Standard*, has a full listing of revisions and amendments published each month.

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.com.au](mailto:mail@standards.com.au), or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

---

*This Standard was issued in draft form for comment as DR 97405.*

# Australian Standard™

A1

## Cranes, hoists and winches

### Part 18: Crane runways and monorails

First published as AS 1418.18—2001.  
Reissued incorporating Amendment No. 1 (March 2003).  
Reissued incorporating Amendment No. 2 (November 2003).

#### **COPYRIGHT**

© Standards Australia International

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 International Ltd  
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 3725 0

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-005, Cranes.

*This Standard incorporates Amendment No. 1 (March 2003) and Amendment No. 2 (November 2003). 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.*

This Standard is a result of a consensus among representatives on the Joint Committee to produce it as an Australian Standard.

Runway girders are the subject of much debate relating to their method of design, as some people regard them as a part of the building structure that houses and supports the crane and others regard them as an integral part of the crane. This Standard allows for the design of runway girders by either limit states or permissible stress methods to allow their design by those engineers who favour either method. However, in choosing to design the runway girders by one method, the designer must use that exclusively throughout the design.

This Standard has been introduced in recognition that there is currently little guidance given to aid designers in designing runway girders. It is intended that the Standard will give direction on the correct implementation of the appropriate structural design Standards with a view to producing a uniform design method for crane runways and monorails.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

## CONTENTS

	<i>Page</i>
<b>SECTION 1 SCOPE AND GENERAL</b>	
1.1 SCOPE AND APPLICATION.....	5
1.2 NEW DESIGNS AND INNOVATIONS .....	5
1.3 INTERPRETATIONS.....	5
1.4 REFERENCED DOCUMENTS.....	5
1.5 DEFINITIONS.....	6
<b>SECTION 2 MATERIALS</b>	
2.1 YIELD STRESS AND TENSILE STRENGTH.....	8
2.2 ACCEPTANCE OF STEEL.....	8
2.3 UNIDENTIFIED STEEL.....	8
2.4 WELDS AND WELD CATEGORIES.....	8
2.5 LAMELLAR INCLUSIONS.....	8
<b>SECTION 3 CLASSIFICATION OF RUNWAY GIRDERS</b>	
3.1 SCOPE OF SECTION .....	9
3.2 CLASSIFICATION OF CRANE RUNWAYS.....	9
3.3 UTILIZATION CLASS .....	9
3.4 LOCAL UTILIZATION CLASS .....	9
<b>SECTION 4 LOADS AND LOAD COMBINATIONS</b>	
4.1 SCOPE OF SECTION .....	10
4.2 CATEGORIZATION OF CRANE LOADS.....	10
4.3 DETERMINATION OF LOADS.....	10
4.4 LOAD COMBINATIONS .....	11
<b>SECTION 5 DESIGN OF RUNWAY GIRDERS</b>	
5.1 GENERAL.....	13
5.2 FORMS OF CONSTRUCTION.....	13
5.3 APPLICATION OF CRANE LOADS .....	14
5.4 METHODS OF ANALYSIS.....	15
5.5 VERIFICATION OF STRENGTH ADEQUACY.....	15
5.6 METHOD OF DESIGN .....	16
5.7 DETAIL DESIGN OF GIRDER WEBS AND FLANGES.....	17
5.8 GIRDER SUPPORT .....	24
5.9 BOX GIRDERS AND COMPOUND GIRDERS.....	24
5.10 LATTICED RUNWAY GIRDERS.....	25
5.11 END BUFFER STOPS .....	25
5.12 MONORAIL BEAMS.....	26
5.13 SERVICEABILITY .....	29
<b>SECTION 6 VERIFICATION OF FATIGUE LIFE</b>	
6.1 GENERAL.....	31
6.2 FATIGUE STRENGTH.....	32
6.3 METHOD OF VERIFICATION .....	33
6.4 LATTICED STRUCTURES .....	33
6.5 LOCAL AREAS .....	33
<b>SECTION 7 CRANE RAIL AND RAIL ACCESSORIES .....</b>	<b>34</b>

## SECTION 8 FABRICATION AND ERECTION

8.1	GENERAL.....	35
8.2	TOLERANCES.....	35
8.3	CAMBERING .....	35

## SECTION 9 INSPECTION AND MAINTENANCE

9.1	GENERAL.....	36
9.2	SCOPE OF INSPECTION .....	36
9.3	FREQUENCY OF INSPECTIONS.....	36
9.4	REPAIRS.....	36

## APPENDICES

A	DESIGN INFORMATION REQUIRED.....	38
B	INTERIM CRITERIA IN ABSENCE OF CRANE DATA .....	40
C	DETERMINATION OF TORSION .....	42
D	HORIZONTAL LOADINGS APPLIED TO LIGHT DUTY RUNWAYS.....	44

STANDARDS AUSTRALIA

---

**Australian Standard**

**Cranes, hoists and winches**

---

Part 18: Crane runways and monorails

---

SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE AND APPLICATION**

**1.1.1 Scope**

This Standard specifies the general requirements for runway girders and monorails constructed of structural steel.

Deflection limits and construction tolerances for structures supporting the runway girders are also covered by this Standard.

A distinction is made between light duty and heavy duty runways.

NOTE: See Clause 1.5.4 for a definition of heavy duty runways and Clause 1.5.7 for a definition of light duty runways.

**1.1.2 Application**

Loads and load combinations shall be determined in accordance with the requirements of AS 1418.1 with the additions specified herein.

Where this Standard indicates that specific requirements apply to heavy duty runways, such requirements may be omitted from the design considerations of light duty runways. Where no distinction is specified, the requirement applies to both heavy and light duty runways.

Requirements specified for application to light duty runways shall not be used in the design of heavy duty runways.

**1.2 NEW DESIGNS AND INNOVATIONS**

Any novel materials, designs and procedures that do not comply with the specific requirement of this Standard, or are not mentioned in it, are not necessarily prohibited provided the designer can demonstrate that generally accepted methods and procedures or well-documented research results have been employed.

**1.3 INTERPRETATIONS**

Questions concerning the meaning, the application, or the effect of any part of this Standard may be referred to the Standards Australia Crane Committee. The authority of the Committee is limited to matters of interpretations and precludes the dispute adjudication.

**1.4 REFERENCED DOCUMENTS**

The following documents are referenced in this Standard:

AS	
1085	Railway permanent way material
1085.1	Part 1: Steel rails



SAI GLOBAL

This is a free 7 page sample. Access the full version online.

The remainder of this document  
is available for purchase online at

**[www.saiglobal.com/shop](http://www.saiglobal.com/shop)**

SAI Global also carries a wide range of publications from a wide variety of Standards Publishers:



SAI GLOBAL



Click on the logos to search the database online.