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SAA CRANE CODE
Part 1—GENERAL REQUIREMENTS

STANDARDS ASSOCIATION OF AUSTRALIA
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This Australian standard was prepared by Committee ME/5, Cranes. It was approved on behalf of the Council of the Standards Association of Australia on 6 March 1986 and published on 7 April 1986.

The following interests are represented on Committee ME/5:

Aluminium Development Council
Association of Consulting Engineers, Australia
Australian Crane Marketers Association Inc.
Australian Institute of Building
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Construction Equipment Importers and Manufacturers of Australia
Crane Industry Council of Australia
Department of Defence
Department of Employment and Industrial Affairs, Qld
Department of Employment and Industrial Affairs, Vic.
Department of Housing and Construction
Department of Industrial Relations, N.S.W.
Department of Labour, S.A.
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Metal Trades Industry Association of Australia
Metropolitan Water, Sewerage and Drainage Board, N.S.W.
Port of Melbourne Authority
Public Works Department, N.S.W.
Railways of Australia Committee
Telecom Australia

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AMENDMENT No 1
to
AS 1418.1—1986
SAA CRANE CODE
Part 1—GENERAL REQUIREMENTS

REVISED TEXT

The 1986 edition of AS 1418.1 is amended as follows; the amendments should be inserted in the appropriate place.

SUMMARY: This amendment applies to Clauses 1.1, 4.9.1, 7.3.8, 7.14.3.2, 7.14.6.2, 7.14.6.4, and 7.14.6.5, Tables 4.8.4.4(B), 4.9.2, and 7.14.9, Figures 4.8.4.4(A), 4.8.4.4(B), 4.9.3, 4.9.4, and N1, and Appendices A, B, J, L, M, and N.

Published on 2 November 1987.

AUSTRALIAN STANDARD

CRANES (INCLUDING HOISTS AND WINCHES)

Known as the SAA CRANE CODE

Part 1 GENERAL REQUIREMENTS

AS 1418.1—1986

First published (as AS CB2).....1938
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AS 1418, Part 1 first published.....1977
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PREFACE

This edition of this standard was prepared by the Association's Committee on Cranes, to supersede AS 1418, SAA Crane Code, Part 1—1977, General Requirements.

As indicated in AS 1418, Part 1—1977, a number of contentious matters needed some resolution. The use of that edition highlighted the significant matters requiring resolution; these were evidenced as classification, crane loads and mechanical equipment. The other matters needing revision were the addition of requirements for hydraulics and pneumatics and materials.

The changed structure of this standard reflects the planning to establish it as a basic design standard. This has caused the introduction of two new standards, viz AS 2549, Cranes—Glossary of Terms, and AS 2550, Cranes—Mobile, Tower and Derrick—Selection and Operation. Both are intended to be complementary to the SAA Crane Code from a practical and educational viewpoint.

This edition includes consequential changes in various sections. Of consequence, the other Parts of the SAA Crane Code will require revision so as to align with this edition. This work is now under way. With respect to AS 1418, Part 5—1980, Mobile Cranes, in conjunction with this edition, the scope is being extended to cover vehicle loading cranes. Other Parts of the SAA Crane Code will be extended to cover more recently developed equipment which should be encompassed in any future editions.

Cranes play a part in the handling of materials by raising and moving loads whose mass is within their nominal capacity. There may, however, be wide variations in duty for a single crane type, e.g. overhead travelling cranes, and between different crane types, e.g. between a builder's tower crane and a heavy-lift dockside crane. The design of the crane has to take account of conditions of service in order to reach an appropriate level of safety and useful life which is in line with the purchaser's requirements. Classification is the system used to provide a means of establishing rational bases for the design of structures and machinery. It also serves as a framework of reference between the purchasers and the manufacturers, by the use of which a particular crane may be matched to the service for which it is required.

Classification, as defined in this standard, considers only the conditions of operation which are independent of the type of crane and the way it is driven. Other Parts of the SAA Crane Code will define which parts of the classification range are applicable to the various types of cranes, i.e. overhead cranes, mobile cranes, tower cranes, hoists, and the like.

This standard establishes a classification of cranes based on the number of operating cycles to be carried out during the expected life of the crane and a load spectrum factor which represents a nominal state of loading.

The two factors to be taken into consideration for the purposes of determining the group to which a crane belongs are the class of utilization and the state of loading.

This standard is technically equivalent to AS 1418, Part 1—1977 with the exception of the following:

(a) In Clause 3.4, chopped-strand mat is accepted as a reinforcing material. The prior edition excluded it. Consequential amendments were necessary in Clauses 5.2.2 and 5.2.3. Additionally Appendices G and H have been prepared for guidance on glass fibre reinforced plastics.

Acknowledgement is made of the organizations responsible for providing the detail incorporated in these Appendices as follows:

(i) Graph in Fig. G1 was derived from research and development carried out by the Electricity Trust of South Australia.

(ii) Fig. G2 is an extract from BS 4994, Vessels and Tanks in Reinforced Plastics.

This amendment was issued for public review as DR 79138.

(b) The addition of Sections 15 and 16 respectively on Hydraulic Equipment and Controls and Pneumatic Equipment and Controls. AS 1418, Part 1—1977 indicated that these Sections were 'in course of preparation'.

This amendment was issued for public review as DR 79109.

(c) Significant revision of the following Sections taking cognizance of recently published ISO standards related to cranes:

(i) Section 2—Classification of Cranes.

(ii) Section 4—Crane Loads.

(iii) Section 7—Crane Mechanisms.

(d) Detail in the Foreword on the structure of the standard has been amended to reflect the planning to establish this edition as a basic design standard. The number of Parts has been rationalized and the Part relating to the application of cranes has been removed and made a separate standard AS 2550.

(e) The corrigenda issued in January 1979 have been incorporated.

(f) The Amendment No 1 issued in July 1982 has been incorporated.

Other adjustments that have been made include the updating of standard numbers in accordance with the current SAA Catalogue and the substitution of the term 'clause' for 'rule' throughout the text.

During the preparation of the draft, the committee considered the work of International Organization for Standardization (ISO) Technical Committee TC 96—Cranes, Lifting Appliances and Related Equipment*; cognizance was also taken of current American, British, European, German and other national standards and assistance is hereby acknowledged.

The notation used throughout the standard is, as far as is practicable, consistent with that used in other Australian standards. A complete listing of notation is provided in Appendix A.

A significant number of other appendices have been added to this edition, as an aid to the designer and in particular a comprehensive worked example and commentary in Appendix M.

An index is included on this Part of the Code.

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* SAA holds the Secretariat of ISO/TC 96.

CONTENTS

FOREWORD

The SAA Crane Code is intended to provide uniform requirements within Australia and Australian Territories for the design, and construction of cranes and like lifting appliances. It is an authoritative source of fundamental principles for application by responsible and competent persons or organizations. It has no legal authority in its own right but it may acquire legal standing in one or more of the following ways:

(a) Adoption by a Statutory Authority (see Appendix F).

(b) Reference to compliance with the standard as a contract requirement.

(c) Claim, by a manufacturer and/or manufacturer's agent, of compliance with the standard.

The standard covers requirements for design, construction, testing, and inspection. It has been prepared in Parts, but only Parts 1, 2, 3, 5 and 7 have been initially published to enable use to be made of them while the other Parts are in course of preparation.

The structure of the SAA Crane Code is as follows:

General Requirements	Part 1	
Serial Hoists and Winches	Part 2	Basic crane types
Bridge and Gantry Cranes	Part 3	
Derrick, Jib, Portal and Tower Cranes	Part 4	
Mobile and Vehicle Loading Cranes.....	Part 5	
Guided Storing and Retrieving Appliances .	Part 6	Application types
Builders Hoists and Equipment	Part 7	
Special Purpose Appliances	Part 8	
Vehicle Hoists	Part 9	
Elevating Work Platforms	Part 10	

Part 1 covers requirements which apply generally to cranes and like lifting appliances. Specific requirements for particular types of crane are covered by subsequent Parts; therefore, for a particular type of crane, Part 1 applies together with the Part relevant to the crane type.

It is not intended that this standard impose unnecessary restrictions on design, construction, testing, and inspection of cranes, or on the development and use of new, improved or unusual methods and materials (see Clause 1.2).

The basic philosophy of the classification method now incorporated is outlined in the Preface. Classification can now be established for the structure, the mechanism, and the crane as a whole. The classification of the structure considers the maximum number of operating cycles and the load spectrum. The mechanism, running time and load spectrum and the crane as a whole uses a classification based on the same premises as for the structure.

A simplified method of oblique travel analysis is provided in Clause 4.9 and a more detailed analysis is outlined in Appendix N.

The simplification of the combination of crane loads has been extended to establish a tabulation on loads applicable to mechanisms. These combination tables make allowances for reduction factors relating to frequency of operation and load application. These have been introduced rather than encourage the use of increased permissible stresses for lower loading frequencies.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
CRANES (INCLUDING HOISTS AND WINCHES)

PART 1—GENERAL REQUIREMENTS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard sets out requirements for design, construction and testing which apply generally to cranes, as defined in AS 2549 and to appliances intended to carry out similar functions.

NOTES:

1. Specific requirements for particular types of crane are specified in other Parts of AS 1418; these requirements take precedence over corresponding requirements in this standard where any difference exists.
2. Requirements for the selection and operation of some types of crane are given in AS 2550.
3. Guidance on derivations and some worked examples are provided in Appendix B.
4. Statutory Authorities concerned with cranes and like lifting appliances are listed in Appendix F.
5. To aid the understanding of the sections on classification and crane loads, a simple worked example and commentary thereon is provided in Appendix M.

1.2 NEW DESIGNS AND INNOVATIONS. Any novel materials, designs, methods of assembly, procedures, and the like, which do not comply with a specific requirement of this standard, or are not mentioned in it, but which give equivalent results to those specified, are not necessarily prohibited. The SAA Committee on Cranes can act in an advisory capacity concerning equivalent suitability, but specific approval remains the prerogative of the Authority.

1.3 INTERPRETATIONS. Questions concerning the meaning, the application, or effect on any part of this standard, may be referred to the SAA Committee on Cranes for explanation. The authority of the committee is limited to matters of interpretations and it will not adjudicate in disputes.

1.4 REFERENCED DOCUMENTS. A list with titles of the documents referred to in this standard is given in the Annex.

1.5 DEFINITIONS. For the purpose of this standard, the definitions given in AS 2549 apply.

1.6 NOTATION. For the purpose of this standard, the notation listed in Appendix A applies.