

Australian Standard[®]

SAA Steel Structures Code

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Association of Consulting Engineers Australia
Australian Institute of Building
Australian Institute of Steel Construction
Australian Road Research Board
Australian Welding Research Association
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Department of Housing and Construction
Department of Public Works, N.S.W.
Department of Public Works, W.A.
Experimental Building Station
National Association of Australian State Road Authorities
University of Sydney

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SAA Steel Structures Code

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PREFACE

This edition of this standard was prepared by the Association's Committee on Steel Structures to supersede the 1975 edition. This edition is being issued prior to the preparation of the standard in 'limit state' format in order to simplify the use of the standard and to improve clarity. The opportunity has been taken to present the standard in A4, size, thus bringing it into line with the other major structural codes. There have not been any changes of major technical significance in this edition, but some editorial updating has been carried out.

The following have been amended (other than editorially):

- Clause 1.5.3 Technical Definitions
 - Clause 1.6 Notation
 - Clause 2.1.4 Unidentified Steel
 - Clause 2.2.2 Rivets
 - Clause 3.1 Loads
 - Clause 4.3 Plate Thickness
 - Clause 4.5 Sectional Areas of Bolts, Screwed Tension Rods and Rivets
 - Clause 4.5.1 Bolts and Screwed Tension Rods
 - Clause 5.4.1 Equal-flange I-beams of Channels
 - Clause 5.5 Elastic Critical Stress
 - Clause 5.10.2 Average Shear Stress in Rolled I-beams and Channels, Plate Girders, Box-sections, Rectangular and Circular Hollow Sections
 - Clause 5.11.1 Maximum Permissible Stress
 - Clause 5.13.1 Minimal Thickness
 - Clause 5.13.3.1 Vertical Stiffeners
 - Clause 6.9 Bearing Stresses
 - Clause 7.5.3 Pin Connections
 - Section 8 Combined Stresses
 - Section 9 Design of Connections
 - Clause 10.1 Plastic Design—General
 - Clause 11.2.3 Length
 - Clause 11.3.2 Cutting
 - Clause 11.4.2 Setting Out Tolerances
 - Appendix B Fatigue
 - Appendix C Minimum Yield Stresses for Steel to AS 1163, AS 1204 and AS 1205
 - Appendix D List of References on the Elastic Flexural Torsional buckling of Steel Beams
 - Paragraph E.15 Application
 - Paragraph E2 Effective Length of Struts in Triangulated Frames
- Attention is drawn to the following Australian and British standards and other documents which may be required for use in connection with this standard:
- AS 1111 ISO Metric Hexagon Commercial Bolts and Screws

- AS 1112 ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and Castle Nuts
- AS 1131 Dimensions of Hot-rolled Structural Steel Sections
- AS 1163 Welded and Seamless Steel Hollow Sections for General Structural Purposes (Metric Units)
- AS 1170 SAA Loading Code
 - Part 1—Dead and Live Loads
 - Part 2—Wind forces
- AS 1204 Structural Steels—Ordinary Weldable Grades
- AS 1205 Structural Steels—Weather-resistant Weldable Grades
- AS 1227 General Requirements for the Supply of Hot-rolled Steel Plates, Sections, Piling and Bars for Structural Purposes
- AS 1252 General Grade High-strength Steel Bolts with Associated Nuts and Washers for Structural Engineering (ISO Metric Series)
- AS 1275 Metric Screw Threads for Fasteners (Based on ISO Recommendations)
- AS 1302 Steel Reinforcing Bars for Concrete
- AS 1303 Hard-drawn Steel Reinforcing Wire for Concrete (Metric Units)
- AS 1391 Methods for Tensile Testing of Metals
- AS 1418 SAA Crane Code
- AS 1480 SAA Concrete Structures Code
- AS 1511 SAA High-strength Structural Bolting Code
- AS 1538 SAA Cold-formed Steel Structures code
- AS 1554 SAA Structural Welding Code
- AS 1735 SAA Lift Code
- AS 2074 Steel Castings for General Engineering Purposes
- AS 2121 SAA Earthquake Code
- AS 2214 SAA Structural Welding Supervisors' Certification Code
- AS 2312 Guide to the Protection of Iron and Steel Against Exterior Atmospheric Corrosion
- AS Z5 Glossary of metal Welding Terms and Definitions
- SAA MA1—Manual on Steel Structures
- SAA MA1.5—Protection of Steel from Corrosion
- SAA MA1.8—Fabrication
- SAA MA1.9—Erection
- BS 5135 Metal-arc Welding of Carbon and Carbon Manganese Steels
- Supplement 1 (PD 3343) to BS 449, Part 1 Recommendations for Design

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
THE USE OF STEEL IN STRUCTURES

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard applies to the design, fabrication, erection, repair and alteration of steel-work in structures, including foot and service bridges.

The standard does not apply to the following structures and materials:

- (a) Road and railway bridges.
- (b) Material less than 3 mm thick.
- (c) Steel for which the value F_Y used in design exceeds 450 MPa.
- (d) Cold-formed members other than those com-plying with AS 1163.

NOTES:

1. The use of cold-formed steel sections in structures is covered by AS 1538. Reference should also be made to Addendum No 1 to BS 449 (PD 4064), and the AISI* Cold-formed Steel Design Manual.
2. Packings may be of any thickness.

1.2 STANDARDS. Unless otherwise noted, a standard referred to in this standard is the current edition thereof.

1.3 NEW MATERIALS OR METHODS. This standard shall not be interpreted to prevent the use of materials or of methods of design or construction not specifically referred to herein. If it is desired to seek the opinion of the SAA Committee on Steel Structures as to whether materials other than those specified, or methods of design or construction not covered herein, are deemed to comply with the intention of this standard, details of such materials or methods, including relevant test results, shall be submitted to the Committee.

NOTE: It will be necessary to seek approval from the Building Authority for the use of new materials or methods.

1.4 DESIGN AND SUPERVISION.

1.4.1 Design. The design of a structure or the part of a structure to which this standard is applied shall be the responsibility of an engineer experienced in the design of such structures.

For the purposes of this standard the term 'Design Engineer' shall mean the engineer responsible for design and shall include his representative.

1.4.2 Supervision. All stages of construction of a structure or the part of a structure to which this standard is applied shall be adequately supervised to ensure that all the requirements of the design are satisfied in the completed structure. Supervision shall be the responsibility of either—

- (a) the Design Engineer, or
- (b) an engineer experienced in such supervision.

For the purposes of this standard, the term 'Supervising Engineer' shall mean the engineer responsible for supervision of construction and shall include his representative.

NOTES:

1. Although the execution of design and supervision may be delegated to other acceptable persons who need not necessarily be qualified, Clause 1.4 requires that design and supervision be the responsibility of qualified and experienced persons.
2. The Clause does not require the Design Engineer to be responsible for supervision also unless he has been assigned this responsibility specifically. The Design Engineer and the Supervising Engineer need not be the same person.
3. Welding inspectors should be qualified to the requirements of AS 2214.

1.5 DEFINITIONS.

1.5.1 General. For the purposes of this standard, the definitions in Clauses 1.5.2 to 1.5.4 shall apply.

NOTE: Other terms having special meanings are defined in the Clause in which they occur.

1.5.2 Administrative Definitions.

1.5.2.1 Approved—according to the context, approved either by the Engineer or the Building Authority.

1.5.2.2 Building Authority—a body having statutory powers to control the design and erection of buildings or structures in the area in which the building or structure concerned is to be erected.

1.5.2.3 Contractor—the person, persons or organization agreeing under a contract to execute the work.

1.5.2.4 Engineer—a person qualified for Corporate Membership of the Institution of Engineers, Australia. (See Clause 1.4.)

NOTE: The definition of engineer does not require that an engineer be a Corporate Member of the Institution of Engineers, Australia.

1.5.3 Technical Definitions.

1.5.3.1 Beam or girder—a structural member, other than a triangulated frame, which supports load primarily by its internal resistance to bending.

1.5.3.2 Dead load—the actual weight of all permanent construction and all permanently installed plant, equipment, and services required for functional purposes.

* American Iron and Steel Institute.