AS 4100—1990

Australian Standard®

Steel structures

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Australian Construction Services

Australian Institute of Steel Construction

AUSTROADS

Building Management Authority, WA

Bureau of Steel Manufacturers of Australia

CSIRO, Division of Building, Construction and Engineering

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PREFACE

This Standard was prepared by the Standards Australia Committee on Steel Structures to supersede AS 1250–1981, *SAA Steel Structures Code*, and AS 1511–1984, *SAA High–Strength Structural Bolting Code*, which are to be withdrawn 12 months after publication of this Standard.

AS 4100 for Steel Structures was first published in part as AS CA1 of 1933. The second edition of AS CA1 was published in 1939. In 1952, this Standard was revised and issued as Interim Standard SAA Int. 351. This Interim Standard was revised in 1968 and redesignated as AS CA1. The last edition of AS CA1, which was in imperial units, was published in 1972 and withdrawn in 1976. It was published as a parallel code to the metric version which was designated AS 1250 of 1972. These two Standards were amalgamated and published in a new edition of AS 1250 in 1975 with a second edition in 1981.

Also incorporated in the new AS 4100 is AS 1511 of 1984. This was originally published in 1966 as AS CA45, the *SAA Code for High Strength Bolting*. The second edition of AS CA45 was published in 1970 and withdrawn in 1976. It was superseded by and ran concurrently with the metric version, AS 1511 of 1973. The second edition of AS 1511 was published in 1984.

AS 1250 of 1981 (to run concurrently for 12 months after publication of the new Standard) and AS 1511 of 1984 were revised, amalgamated and redesignated AS 4100 in 1990.

During the preparation of this Standard, the limit state steel structures Standards of other countries, notably Canada, the United States, and the United Kingdom, and Eurocode No.3 produced by countries of the European Economic Community were considered. Of those countries, Canada has had a limit state steel structures code since 1974, while those in the UK and USA are of more recent origin (1985 and 1986 respectively).

Other technical documents considered or referred to in the preparation of individual Clauses or Sections of this Standard are cited in the Commentary to this Standard.

This Standard differs from the previous Standard in both the design approach and the content. The following brief outline gives some indication of the nature and extent of the differences to be found.

Limit–states format In keeping with current Standards Australia and ISO policy on structural design Standards, the appropriate functional states and the corresponding performance limits are presented generally in the format of design actions and corresponding design capacities, expressed generally in force units. This represents a major step towards a probabilistic approach to structural design Standards.

General application Where necessary, the requirements of the Standard have been broadened and modified to cover not only building structures but cranes and bridges. This Standard does not apply to steel for which the yield stress used in design is greater than 450 MPa.

The relevant provisions of the Standard have been widened so that it is now suitable for bridge design in conjunction with the AUSTROADS Bridge Design Code or the ANZRC Railway Bridge Design Manual. However, additional or more stringent provisions for some aspects of steel bridge design may still be required by the relevant Authority.

New inclusions The new Sections that have been included in the Standard are:

Methods of analysis

Brittle fracture

Fatigue

Fire

Earthquake

Modification of existing structures

Testing of structures or elements

Some of these are entirely new Sections, while others are expansions of earlier notes or appendices, or are transferred from other codes.

Major technical revisions. Major technical revisions have been made in the design of members subject to bending, compression, tension, or combined actions. These changes reflect recent advances in research into structural behaviour and computational methods for analysis. The basis for each technical provision is discussed in the Commentary together with selected references from the published technical literature.

Tiered approach A tiered approach to design has been introduced to allow the designer more flexibility in the choice of a design method to suit a particular project. Simplified rules are generally presented first, with more complex but economical rules following.

Editorial changes Advantage has been taken of the current revision to rearrange the material contained in the Standard so that it is more readily usable by the practising design engineer.

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