# AS 4100 Supplement 1—1999

## Steel structures—Commentary

## (Supplement to AS 4100—1998)

This Australian Standard was prepared by Committee BD/1, Steel Structures. It was approved on behalf of the Council of Standards Australia on 23 October 1998 and published on 5 March 1999.

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## Steel structures

## (Supplement to AS 4100— 1998)

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# PREFACE

This Commentary is intended to be read in conjunction with AS 4100—1998, *Steel structures.*

The objective of this edition of the Commentary is to align it with the revised edition of AS 4100 which was published in 1998, and to provide users with—

(a) background reference material to AS 4100—1998;

(b) the origins of particular requirements;

(c) explanation to the application of certain clauses; and

(d) guidance in the use of AS 4100—1998.

In this Commentary, AS 4100—1998 is referred to as 'the Standard'.

The clause numbers and titles used in this Commentary are the same as those in AS 4100—1998 except that the clause numbers are prefixed by the letter 'C', e.g. C7.2. To avoid possible confusion between Commentary and Standard clauses, a Commentary Clause is referred to as 'Clause C . . .' in accordance with Standards Australia policy.

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STANDARDS AUSTRALIA

# Australian Standard
# (Supplement to AS 4100—1998)

## SECTION C1 SCOPE AND GENERAL

by T. J. Hogan

### C1.1 SCOPE

The Standard sets out the minimum requirements for the limit states design, fabrication, erection, and modification of safe, serviceable and durable steel structures. There may be additional requirements not specifically covered in the Standard which may also have to be considered by design engineers.

Road and railway bridges are covered by the Australian Bridge Design Code HB 77 (written in limit states format). HB 77 uses the Standard as the basis of its steel bridge design provisions.

Steel elements less than 3 mm thick are excluded for reasons of practicality and concern about corrosion, because members from thinner material are usually cold-formed and then they fall within the scope of AS/NZS 4600. In addition, the connections in elements less than 3 mm thick are better handled by the provisions of AS/NZS 4600 than by the Standard. The exceptions to this exclusion are hollow section members to AS 1163.

Hollow section members to AS 1163 are most commonly cold-formed, but have traditionally been designed using the previous editions of the Standard since they were for many years hot-formed. Tests carried out on members manufactured to AS 1163 confirm the applicability of the provisions of the Standard for such members including members with a wall thickness less than 3 mm. (Refs 1, 2 and 3). All other cold-formed members should be designed in accordance with AS/NZS 4600.

The limit of 450 MPa for the yield stress used in design stems from a lack of research data on steel grades above this value, and the applicability of all of the member design provisions for a higher design yield stress cannot be confirmed. Australian steel Standards generally contain no steel grades with a specified yield stress above 450 MPa, with the exception of one grade (XF500) in AS/NZS 1594. Additional provisions to those in the standards may be required for steels of higher yield stress.

Clause 1.1 does not preclude the use of steels having a specified yield stress greater than 450 MPa provided that the yield stress used in design ($f_y$) is limited to 450 MPa. Note, however, that the use of a steel having a specified yield stress greater than 450 MPa is specifically excluded from plastic design by Clause 4.5.2.

Composite steel-concrete members should be designed using the provisions of AS 2327, Composite structures.

The Standard is not intended to be used for thin-walled shell or plate structures since such structures are subject to failure modes not addressed in the Standard. It is, however, considered reasonable to design floor plates using the Standard. (See Introduction to Commentary on Section 5.)