

AS 4100 Supplement 1—1999

Steel structures—Commentary
(Supplement to AS 4100—1998)

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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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CONTENTS

SECTION C1 SCOPE AND GENERAL	
C1.1	SCOPE.....7
C1.2	REFERENCED DOCUMENTS8
C1.3	DEFINITIONS.....8
C1.4	NOTATION.....8
C1.5	USE OF ALTERNATIVE MATERIALS OR METHODS.....8
C1.6	DESIGN.....8
C1.7	CONSTRUCTION.....8
SECTION C2 MATERIALS	
C2.1	YIELD STRESS AND TENSILE STRENGTH USED IN DESIGN9
C2.2	STRUCTURAL STEEL9
C2.3	FASTENERS9
C2.4	STEEL CASTINGS9
SECTION C3 GENERAL DESIGN REQUIREMENTS	
C3.1	DESIGN.....11
C3.2	LOADS AND OTHER ACTIONS11
C3.3	STABILITY LIMIT STATE12
C3.4	STRENGTH LIMIT STATE.....12
C3.5	SERVICEABILITY LIMIT STATE13
SECTION C4 METHODS OF STRUCTURAL ANALYSIS	
C4.1	METHODS OF DETERMINING ACTION EFFECTS.....17
C4.2	FORMS OF CONSTRUCTION ASSUMED FOR STRUCTURAL ANALYSIS ...18
C4.3	ASSUMPTIONS FOR ANALYSIS19
C4.4	ELASTIC ANALYSIS20
C4.5	PLASTIC ANALYSIS23
C4.6	MEMBER BUCKLING ANALYSIS23
C4.7	FRAME BUCKLING ANALYSIS25
SECTION C5 MEMBERS SUBJECT TO BENDING	
C5.1	DESIGN FOR BENDING MOMENT.....28
C5.2	SECTION MOMENT CAPACITY FOR BENDING ABOUT A PRINCIPAL AXIS29
C5.3	MEMBER CAPACITY OF SEGMENTS WITH FULL LATERAL RESTRAINT32
C5.4	RESTRAINTS34
C5.5	CRITICAL FLANGE.....36
C5.6	MEMBER CAPACITY OF SEGMENTS WITHOUT FULL LATERAL RESTRAINT.....36
C5.7	BENDING IN A NON-PRINCIPAL PLANE.....41
C5.8	SEPARATORS AND DIAPHRAGMS41
C5.9	DESIGN OF WEBS41
C5.10	ARRANGEMENT OF WEBS.....42

C5.11	SHEAR CAPACITY OF WEBS	43
C5.12	INTERACTION OF SHEAR AND BENDING.....	48
C5.13	COMPRESSIVE BEARING ACTION ON THE EDGE OF A WEB.....	49
C5.14	DESIGN OF LOAD BEARING STIFFENERS	50
C5.15	DESIGN OF INTERMEDIATE TRANSVERSE WEB STIFFENERS	51
C5.16	DESIGNING OF LONGITUDINAL WEB STIFFENERS.....	52
SECTION C6 MEMBERS SUBJECT TO AXIAL COMPRESSION		
C6.1	DESIGN FOR AXIAL COMPRESSION	56
C6.2	NOMINAL SECTION CAPACITY	56
C6.3	NOMINAL MEMBER CAPACITY.....	57
C6.4	LACED AND BATTENED COMPRESSION MEMBERS	59
C6.5	COMPRESSION MEMBERS BACK TO BACK	61
C6.6	RESTRAINTS	62
SECTION C7 MEMBERS SUBJECT TO AXIAL TENSION		
C7.1	DESIGN FOR AXIAL TENSION.....	65
C7.2	NOMINAL SECTION CAPACITY	65
C7.3	DISTRIBUTION OF FORCES	66
C7.4	TENSION MEMBERS WITH TWO OR MORE MAIN COMPONENTS	67
C7.5	MEMBERS WITH PIN CONNECTIONS	67
SECTION C8 MEMBERS SUBJECT TO COMBINED ACTIONS		
C8.1	GENERAL.....	69
C8.2	DESIGN ACTIONS.....	69
C8.3	SECTION CAPACITY	70
C8.4	MEMBER CAPACITY.....	70
C8.5	TORSION	73
SECTION C9 CONNECTIONS		
C9.1	GENERAL.....	82
C9.2	DEFINITIONS.....	85
C9.3	DESIGN OF BOLTS	85
C9.4	ASSESSMENT OF THE STRENGTH OF A BOLT GROUP.....	93
C9.5	DESIGN OF A PIN CONNECTION.....	95
C9.6	DESIGN DETAILS FOR BOLTS AND PINS	95
C9.7	DESIGN OF WELDS	96
C9.8	ASSESSMENT OF THE STRENGTH OF A WELD GROUP.....	104
C9.9	PACKING IN CONSTRUCTION.....	107
SECTION C10 BRITTLE FRACTURE		
C10.2	METHODS	110
C10.3	NOTCH-DUCTILE RANGE METHOD.....	110
C10.4	DESIGN SERVICE TEMPERATURE	111
C10.5	MATERIAL SELECTION.....	111
C10.6	FRACTURE ASSESSMENT	112

SECTION C11 FATIGUE	117
C11.1 GENERAL.....	119
C11.2 FATIGUE LOADING.....	120
C11.3 DESIGN SPECTRUM	121
C11.4 EXEMPTION FROM FURTHER ASSESSMENT	122
C11.5 DETAIL CATEGORY	122
C11.6 FATIGUE STRENGTH	123
C11.7 EXEMPTION FROM FURTHER ASSESSMENT	123
C11.8 FATIGUE ASSESSMENT.....	123
C11.9 PUNCHING LIMITATION	124
 SECTION C12 FIRE	
C12.1 REQUIREMENTS	125
C12.2 DEFINITIONS.....	125
C12.3 DETERMINATION OF PERIOD OF STRUCTURAL ADEQUACY	125
C12.4 VARIATION OF MECHANICAL PROPERTIES OF STEEL WITH TEMPERATURE.....	126
C12.5 DETERMINATION OF LIMITING STEEL TEMPERATURE.....	126
C12.6 DETERMINATION OF TIME AT WHICH LIMITING TEMPERATURE IS ATTAINED FOR PROTECTED MEMBERS	126
C12.7 DETERMINATION OF TIME AT WHICH LIMITING TEMPERATURE IS ATTAINED FOR UNPROTECTED MEMBERS	126
C12.8 DETERMINATION OF PSA FROM A SINGLE TEST	126
C12.9 THREE-SIDED FIRE EXPOSURE CONDITION.....	127
C12.10 SPECIAL CONSIDERATIONS.....	127
 SECTION C13 EARTHQUAKE	
C13.1 GENERAL.....	129
C13.2 DEFINITIONS.....	129
C13.3 DESIGN AND DETAILING REQUIREMENTS.....	129
C13.4 DESIGN REQUIREMENTS FOR NON-BUILDING STRUCTURES.....	132
ADDITIONAL COMMENTARY—SECOND ORDER EFFECTS	132
 SECTION C14 FABRICATION	
C14.1 GENERAL.....	134
C14.2 MATERIAL.....	134
C14.3 FABRICATION PROCEDURES.....	135
C14.4 TOLERANCES.....	140
C14.5 INSPECTION	142
C14.6 FABRICATION MATTERS AND CONTRACT DOCUMENTS.....	143
 SECTION C15 ERECTION	
C15.1 GENERAL.....	145
C15.2 ERECTION PROCEDURES.....	146
C15.3 TOLERANCES.....	149
C15.4 INSPECTION OF BOLTED CONNECTIONS.....	151
C15.5 GROUTING AT SUPPORTS	152
C15.6 INSPECTION	152
C15.7 ERECTION MATTERS AND CONTRACT DOCUMENTS	152

SECTION C16 MODIFICATION OF EXISTING STRUCTURES

C16.1 GENERAL.....	153
C16.2 MATERIALS.....	154
C16.3 CLEANING.....	154
C16.4 SPECIAL PROVISIONS	154

SECTION C17 TESTING OF STRUCTURES OR ELEMENTS

C17.1 GENERAL.....	156
C17.2 DEFINITIONS.....	156
C17.3 TEST REQUIREMENTS.....	157
C17.4 PROOF TESTING	157
C17.5 PROTOTYPE TESTING	158
C17.6 REPORT OF TESTS.....	158

APPENDICES

CA DOCUMENTS REFERENCED.....	160
CB SUGGESTED DEFLECTION LIMITS	161
CC CORROSION PROTECTION	162
CD ADVANCED STRUCTURAL ANALYSIS	163
CE SECOND-ORDER ELASTIC ANALYSIS.....	164
CF MOMENT AMPLIFICATION FOR A SWAY MEMBER.....	165
CG BRACED MEMBER BUCKLING IN FRAMES.....	166
CH ELASTIC RESISTANCE TO LATERAL BUCKLING	167
CI STRENGTH OF STIFFENED WEB PANELS UNDER COMBINED ACTIONS	169
CJ STANDARD TEST FOR EVALUATION OF SLIP FACTOR	170
CK INSPECTION OF BOLT TENSION USING A TORQUE WRENCH	171
CL LIMIT STATES DATA SHEETS.....	172

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.)