

Design of Cold-Formed Steel Structures
(To Australian/New Zealand Standard
AS/NZS 4600:2005)

by

Gregory J. Hancock BSc BE PhD DEng

Bluescope Steel Professor of Steel Structures

Dean

Faculty of Engineering & Information Technologies

University of Sydney

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Design of cold-formed steel structures

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PREFACE TO THE 4th EDITION

The Australian/New Zealand Cold-Formed Steel Structures Standard AS/NZS 4600 originally published in 1996 was based on the limit states design method. The third edition of this book applied to AS/NZS 4600:1996 and was completely converted from permissible stress design in the earlier 1st and 2nd editions to limit states design. AS/NZS 4600 was updated and revised in 2005 in line with the latest revisions of the North American Specification (formerly the American Iron and Steel Institute Specification), and the most recent Australian research. The fourth edition of this book applies to AS/NZS 4600:2005.

A large number of changes have been made in AS/NZS 4600:2005 from the 1996 edition and are summarised in Section 1.1.3 of this book. Some of the more significant changes and additions include:

- (a) Alignment with terminology for structural design actions and testing provisions of AS/NZS 1170:2002
- (b) Acceptance of welding of G450 steel
- (c) Increase in design stress in G550 steel to $0.90f_y$
- (d) Rules for webs with holes
- (e) Rules for unstiffened elements under stress gradient
- (f) Liberalisation of the lateral buckling rules
- (g) A unified bearing equation for webs
- (h) Modification of the bearing coefficients for bolted and screwed connections in thin sheets
- (i) Inclusion of Fatigue provisions
- (j) Addition of the Direct Strength Method (DSM) as an alternative to the Effective Width Method (EWM) of design.

The new rules are explained in this 4th Edition. Where appropriate, the design examples from earlier editions have been modified to include the new design rules and changes to existing rules. Chapter 10 on Frames has been deleted and replaced by a completely new chapter on the Direct Strength Method of design including two new design examples. Chapter 11 on Steel Storage Racking has been converted to limit states format although the Australian Steel Storage Racking Standard AS 4084 has not yet been converted. The basis of Chapter 11 is the 1997 Edition of the American Rack Manufacturers Institute Specification which includes limit states design rules.

The worked examples in Chapters 4, 5, 7, 8, 10 and 11 have all been programmed as MATHCAD spreadsheets to ensure their accuracy. Hence the numerical values quoted in these chapters are taken directly from the MATHCAD and have been rounded to the appropriate number of significant figures at each output point. Rounding is not therefore included in the computation as it would be if the values passing within the calculation were rounded progressively during the calculation. The final values quoted in the book at the end of examples can therefore be compared directly with other computer software.

The 2nd and 3rd editions of this book were typed in WordPerfect by Gwenda McJannet. I am particularly grateful to Gwenda, who died in 2005, for this earlier work. The 3rd edition was converted to Word™ by Colleen Moore before the 4th edition could be prepared and I am thankful to Colleen for this tedious task and typing of the changes in the new edition. There are now 31 new figures as well as 5 which have had substantial modifications from the 3rd Edition. I am grateful to Mr Ron Brew for the careful preparation of these new and revised figures. The book has been checked very carefully by Mr Ross Dempsey at Australian Tube Mills and I appreciate his thoroughness. The book has been edited by Mr Tony Pollard of the Australian Steel Institute into its new electronic format and I thank Tony for this.

As always, I am indebted to Professor Teoman Pekoz at Cornell University and Emeritus Professor Wei-Wen Yu at the University of Missouri-Rolla for their continued support of my research activities in cold-formed steel. I am also appreciative of the American Iron and Steel Institute for allowing me to be a member of its Specification committee which has kept me in touch with developments in the USA. Finally, I would like to thank my wife Susan for her continued patience and support during the preparation of this 4th Edition.

Gregory Hancock

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