

Design capacity tables for structural steel
Volume 4: Rigid connections—Open sections

by

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contributing author

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Design capacity tables for structural steel
Volume 4: Rigid connections—Open sections

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Design Guide 2: Welding in structural steel connections

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PREFACE

This new series of connection publications by the Australian Institute of Steel (ASI) covering capacity tables, theory and design of individual rigid connections will be known as the Structural Steel Connections Series, Part 2: 1st ed. 2009 (*‘Connection Series, Part 2’*). This Connection Series, Part 2 details the method of design and provides capacity tables and detailing parameters for a range of rigid connections commonly used for structural steel in Australia. Connections have a major engineering and economic importance in steel structures influencing design, detailing, fabrication and erection costs. Standardisation of design approach integrated with industry detailing is the key to minimum costs at each stage. This Connections Series, Part 2 in conjunction with the Connection Series, Part 1 for simple connections (collectively the Structural Steel Connections Series or *‘Connection Series’*) replaces and enhances an ASI flagship publication first released in 1978 at which time connection design theories were developed for the purpose of generating and releasing connection capacity tables. The first three editions were released in permissible stress format. The fourth edition *Design of Structural Connections* (often referred to as the Green Book) was released in 1994 in limit state format but there was no subsequent release of a limit state companion document containing connection design capacity tables.

This new Connections Series, Part 2 in limit state format to the Australian Standard for Steel Structures AS 4100—1998 (Ref. 1) separates the Design Capacity Tables from the Connection Theory Handbook 1 and Design Guides for connection parts and has a separate Design Guide for each individual rigid connection type. Connection model elemental theory is referenced back to Handbook 1 in each type of connection formulated. Revision of the ASI connection theory and models included surveys of best practice in the Australian steel industry.

The new Connections Series format with separate design guides for individual connection types is intended to facilitate addition to or revision of connection model theory using any relevant new local or international research as deemed appropriate by the ASI. Connection models developed using the Handbook 1 theory follow a stylised page format with a numbered DESIGN CHECK procedure to simplify connection capacity assessment. This Connection Series, Part 2 contains both design capacity tables and design guides for individual rigid connections. *Design Capacity Tables V4: Rigid Connections—Open sections* consolidates design capacity tables contained in the individual design guides, (specifically Design Guide 10: *Bolted moment end plate to beam splice connections*; Design Guide 11: *Welded beam to column moment connections*; Design Guide 12: *Bolted end plate to column moment connection*; Design Guide 13: *Splice connections*) and is collectively known as the *Rigid connection design capacity tables V4* (*‘Rigid connection DCT’s V4’*).

Engineering Systems has worked closely with the Australian Steel Institute to further develop Limcon as the companion program for this new Connection Series. The latest version of Limcon fully implements the new connection design models and was employed in checking the design capacity tables. The Limcon output for one or more of the worked examples is included in an appendix to each design guide for each connection design type. The program is an efficient tool covering the full range of structural connections, including those beyond the scope of the design capacity tables provided in the Connection Series.

An appendix to each publication in the series also contains an ASI comment form. Users of this Connections Series are encouraged to photocopy this one page form and forward any suggested improvements which may be incorporated into future editions.

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ABOUT THE AUTHOR

Tim Hogan is Consultant to and retired Director of SCP Consulting Pty Ltd. His academic achievements include a Bachelor of Engineering from the University of NSW with 1st Class Honours and the University Medal. Post graduate qualifications include a Master of Engineering Science and a Master of Business Administration. Tim is a Member of the Institution of Engineers Australia with CPEng and FIE Aust. status.

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- All facets of the ASI membership including design engineers, steelwork detailers and fabricators in contributing industry best practice and standards through ASI surveys and direct consultation to establish the theory and geometry in this new ASI Connection Manual.

