Tubular Design Guide 22:

Bolted bracing cleats

by

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first edition - 2014

AUSTRALIAN STEEL INSTITUTE
(ABN)/ACN (94) 000 973 839

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Published by: AUSTRALIAN STEEL INSTITUTE

FIRST EDITION 2014 (LIMIT STATES)

National Library of Australia Cataloguing-in-Publication entry:

Key, Peter W.
Tubular Design Guide 22: Bolted bracing cleats / Peter W. Key, Arun A. Syam.

ISBN 978 1 921476 31 0 (pbk.).
Series: Structural steel tubular connection series.
Includes bibliographical references.
Steel, Structural—Standards - Australia.
Structural engineering.
Syam, Arun A.
Australian Steel Institute.
624.1821021894

Also in this series:
Tubular Design Guide 20: Background and design basis
Tubular Design Guide 21: Bolted bracing connections
Tubular Design Guide 23: Plate fitments
Tubular Design Guide 24: Bolted planar connections
Tubular Design Guide 25: Fully welded – Simple planar connections
Tubular Design Guide 26: Fully welded – Gap planar connections
Tubular Design Guide 27: Fully welded – Overlap planar connections

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PREFACE

This new series of connection publications by the Australian Steel Institute (ASI) covering design capacity tables, theory and design of individual structural steel hollow section ('tubular') member connections will be known as the Structural Steel Tubular Connection Series: 1st edition 2013 ('Tubular Connection Series'). The Tubular Connection Series details the method of design and provides design capacity tables and detailing parameters for a range of tubular connections commonly used 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. The Tubular Connection Series is written in the same format as and extends the range of the existing 'Structural Steel Connection Series Parts 1 and 2' published by ASI commencing 2007. Each book in the new Tubular Connection Series is numbered as a continuation from the existing series and hence this current book is referred to as 'Tubular Design Guide 22' (TDG22). The Tubular Connection Series replaces and enhances an AISC publication released in 1996 and titled 'Design of structural steel hollow section connections' (often referred to as the 'Blue Book'). With significant international research undertaken in the interim period and new and refined design models available, together with improvements in the performance of Australian produced structural steel hollow sections (SSHS), the time was appropriate to revise and update the Blue Book.

Tubular Design Guide 22 brings together a number of design models for the cleats associated with connections to bracing members in frames that are usually subjected to predominantly axial tension and/or compression and are pin-ended. The format and intent of the technical components of TDG22 is to provide sufficient technical basis to allow TDG22 to be a self-standing document, but at the same time, where substantive background technical basis is required, the reader may refer back to both Tubular Design Guide 20 (TDG20) and Handbook 1 of the existing Structural Steel Connection Series.

This has been achieved through extensive local and international literature reviews using ASI's close association with like organisations and searching the wealth of material contained in the ASI Library (the largest steel design library in the Southern Hemisphere). This process consolidated industry best practice, references and research papers. TDG22, in conjunction with TDG20 and Handbook 1, formulates the design models and procedures for the assessment of bolts, bolt groups, welds, weld groups, connection components and supporting members associated with the end connections to SSHS bracing members.

Following on from the existing Structural Steel Connection Series, the new Tubular Connection Series format, with separate design guides for individual connection types or groupings related to similar functions, is intended to facilitate addition to, or revision of, connection model theory using relevant new local or international research. Connection models developed follow a stylised page format with a numbered DESIGN CHECK procedure to simplify connection capacity assessment. Combined with a worked example and accompanying design capacity tables, each connection model provides a self-standing solution for the design engineer.

Engineering Systems has worked closely with the ASI to further develop their existing Limcon software as the companion program for this new Tubular Connection Series. The latest version of Limcon (V3.6) fully implements the new connection design models and was employed in checking the design 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 Tubular Connection Series.

The existing Structural Steel Connection Series included comment/feedback forms. In the current series, these are replaced by a recently developed web based eForum facility. Every publication, seminar and talk that ASI sponsors has or will have a corresponding thread on the ASI eForum. Users are encouraged to log into the eForum and provide feedback on this current series. The eForum is located off our website at http://steel.org.au/forum/

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