

- 11.8 DESIGN CHECK NO. 8 - Beam rotation check
- 11.9 DESIGN CHECK NO. 9 - Local stability of coped supported member
- 11.10 DESIGN CHECK NO. 10 - Local capacity of supporting member
  - 11.10.1 Single-sided connection
  - 11.10.2 Double-sided connection
- 12 OTHER DESIGN CONSIDERATIONS
- 13 REFERENCES
- 14 DESIGN EXAMPLES
  - 14.1 Design example No. 1 - Connection capacity with single-sided double AC connection to supporting column
  - 14.2 Design example No. 2 - Connection capacity with single-sided single AC connection to supporting beam
- 15 DESIGN CAPACITY TABLES
  - 15.1 Configuration A - Double angle cleat single line of bolts to supported member
  - 15.2 Configuration B - Double angle cleat, double line of bolts to supported member
  - 15.3 Configuration C - Single angle cleat single line of bolts to supported member
  - 15.4 Configuration D - Single angle cleat double line of bolts to supported member
- APPENDICES
  - A Limcon software
  - B ASI Design Guide 5 comment form

## 12. DESIGN GUIDE 6: SEATED CONNECTIONS

Design Guide 6 covers seated connections and references back to Handbook 1, Design of Structural Steel Connections. These important connections are often detailed as part of new or existing structural steelwork.

The most significant upgrades in reviewing and consolidating the previous seated connections are the isolation of each type of seated connection theory into stand-alone models. Despite making this Design Guide larger, this separation eliminates confusion and differentiation in detailing and design parameters. Part A contains the stiff seat connection theory, Part B the unstiffened angle seat connection, Part C the stiffened angle seat connection and Part D the bearing pad connection. The primary theoretical refinements lie in the detailing limitations, inclusion of some unstiffened RHS and SHS beams in Part A and local capacity checks of the supported member now with RHS and

SHS sections in Part C. The almost pure pinned and high shear capacity bearing pad connection has been retained in Part D. Design Guide 6 includes standardised detailing, but due to the limitless configurations and relatively simple checks there are no DCTs. The Design Guide contains many design examples for each Part which have been rigorously checked by hand calculation and using the Limcon software for consistency and validity. Special surveys of the Australian steel industry provided Best Practice for component and dimensional standardisation. The models are only applicable for the dimensional and geometrical limitations specified. Any additional loads, load combinations or geometry arrangement beyond the limits specified must be undertaken by a competent professional person and supported by engineering research, theory or principles.

### Contents of Design Guide 6 include:

- CONCEPT OF DESIGN GUIDES
- 1.1 Background
- PART A STIFF SEAT CONNECTION
  - A1 Typical details
  - A2 Compliance with AS 4100 requirements
  - A3 Recommended design model - Unstiffened I and [ section beams
  - A4 Recommended design model - Unstiffened RHS and SHS section beams
  - A5 Recommended design model—Stiffened I section beams
  - A6 Design examples
    - A6.1 Design example No. 1 - Un-stiffened end supported beam
    - A6.2 Design example No. 2 - Un-stiffened internal supported beam
    - A6.3 Design example No. 3 - Stiffened end supported beam
  - A7 References
- PART B UNSTIFFENED ANGLE SEAT
  - B1 Description of connection
  - B2 Typical detailing of connection
  - B3 Detailing considerations
  - B4 Compliance with AS 4100 requirements
  - B5 Background information
  - B6 Basis of design model
  - B7 Connection geometry
  - B8 Recommended design model - Welded angle seat
  - B9 Recommended design model - Bolted angle seat
  - B10 Other design considerations

B11	References
B12	Design examples
B12.1	Design example No. 1 - Welded seat
B12.2	Design example No. 2 - Bolted seat
PART C STIFFENED ANGLE SEAT	
C1	Description of connection
C2	Typical detailing of connection
C3	Detailing considerations
C4	Compliance with AS 4100 requirements
C5	Background information
C6	Basis of design model
C7	Connection geometry
C8	Recommended design model - Bolted angle seat
C9	Recommended design model - Welded angle seat
C10	Recommended design model - Welded tee seat
C11	Other design considerations
C12	References
C13	Design example
C13.1	Design example No. 1 - Welded tee seat to I-section web from one side
PART D BEARING PAD	
D1	Description of connection
D2	Typical detailing of connection (Alternatives A, B & C)
D3	Detailing considerations
D4	Compliance with AS 4100 requirements
D5	Basis of design model
D6	Connection geometry
D7	Recommended design model
D8	Other design considerations
D9	References
D10	Design example
D10.1	Design example No. 1 - Bearing pad to I-section flange
APPENDICES	
A	Limcon software
B	ASI Design Guide 6 comment form

### 13. CONCLUSIONS

The object of this Connection Series is to provide a rationalised approach to the design, detailing and fabrication of selected structural steel connections. The benefits of this approach include:

- provision to the competent professional person as designer - a range of reliable and economic connections accompanied by design capacity tables (wherever possible for each connection type);
- elimination of the need for repetitive computation by structural engineers;
- scope for the fabricator to produce connection components by production engineering methods, developing standard jigs, fixtures and using NC methods for ready connection fabrication and assembly;
- advantages that can be expected to flow from industry rationalisation, such as better communication, better availability of materials and suitable components; and
- provide a considerable impetus towards improving the economy, and therefore the competitive position of structural steel, in the Australian building industry.

There is no valid reason for diversity in detailing the selected connections contained in this Connection Series, and one of the prime objectives of this Connection Series is to minimise variety by providing only selected connection configurations containing all essential components, for each connection type. The selected connection configurations provided should prove compatible with the requirements of designers, fabricators and erectors.

### 14. REFERENCES

- 1 STANDARDS AUSTRALIA, AS 4100—1998 'Steel structures'.
- 2 AUSTRALIAN INSTITUTE OF STEEL CONSTRUCTION, 'Design of structural connections', 4th edition, Authors Hogan, T.J. and Thomas, I.R., Editor Syam, A.A., 1994.
- 3 AUSTRALIAN INSTITUTE OF STEEL CONSTRUCTION, 'Standardized structural connections', 3rd edition, 1985.
- 4 AUSTRALIAN STEEL INSTITUTE, 'Design capacity tables for structural steel. Volume 3: Simple connections - open sections', Author Hogan, T.J., Contributing author and editor, Munter, S.A., 2007.
- 5 AUSTRALIAN STEEL INSTITUTE, 'Handbook 1: Design of structural steel connections', Author Hogan, T.J., Contributing author and editor, Munter, S.A., 2007
- 6 AUSTRALIAN STEEL INSTITUTE, 'Design Guide 1: Bolting in structural steel connections', Author Hogan, T.J., Contributing author and editor, Munter, S.A., 2007.
- 7 AUSTRALIAN STEEL INSTITUTE, 'Design Guide