

1 CONCEPT OF DESIGN GUIDES 1.1 Background

The ASI was formed in 2002 through the merger of Australian Institute of Steel Construction (AISC) and Steel Institute of Australia (SIA). The former AISC published a design manual giving guidance on the design of structural connections in steelwork (Ref. 2).

ASI is updating Reference 2 by way of the Connection Series including design guides dealing with connection parts and individual connection types. The overall series of Connections publications will be known as the Connections Series.

The former AISC also published a manual containing standardised detailing for simple connections, accompanied by load tables (Ref. 3).

Wherever possible each design guide for individual connection types contains standardised detailing and design capacity tables for the connection type covered by that design guide derived using the design models in that design guide.

The Connection Series is a specialist series devoted to the design of connections in structural steel in accordance with current Australian Standard AS 4100 (Ref. 1), reflecting the current state of knowledge of connection behaviour from test results. In some instances, the test evidence is sparse and in other instances the evidence is contradictory or clouded. Each design guide in the Connection Series has been written by weighing the evidence to provide recommended design procedures based in part on the design procedures used in equivalent publications and/or published papers.

Each design guide is intended to provide a design model which gives a reasonable estimate of connection design capacity and effort has been expended in researching and developing design models which can be justified on the basis of the available research and current design practice. It is to be emphasised that for the connections model presented, the design model is not the only possible model. **It is therefore not intended to suggest that other models may not result in adequate connection capacity and further reference is made to the Disclaimer on page ii of this publication as to the required investigation and verification by a competent professional person or persons in regards to the accuracy, suitability and applicability of the materials provided in this Connections Series.**

The connections dealt with are those presently in common use in Australia and reflect the types of connections covered within the earlier AISC Standardized Structural Connections (Ref. 3).

The Rigid Connection DCTs V4 is intended as a replacement for Reference 3. It contains no information on the design model used for an individual connection—leaving that to the individual design guide for that connection—but contains extracts of the typical details and design capacity tables from Design Guides 10 to 13 inclusive consolidated in one publication. Hence, it serves as a ready source of typical details and load capacity tables for those users not interested in the detailed treatment contained in Handbook 1 or in each design guide.



1 CONCEPT OF DESIGN GUIDES 1.3 Included connections

The following connection types have been included in this Rigid Connections DCTs, V4:

- (a) Bolted moment end plate beam splice connection, see Figure 1 (all information extracted from Design Guide 10, Reference 4).
- (b) Welded beam to column moment connection, see Figure 2 (all information extracted from Design Guide 11, Reference 5).
- (c) Bolted end plate to column moment connection, see Figure 3 (all information extracted from Design Guide 12, Reference 6).
- (d) Bolted cover plate splice connection, see Figure 4 (all information extracted from Design Guide 13, Reference 7).
- (e) Bolted/welded cover plate splice connection, see Figure 5 (all information extracted from Design Guide 13, Reference 7).
- (f) Fully welded splice, see Figure 6 (all information extracted from Design Guide 13, Reference 7).

All these connections fall into the RIGID CONSTRUCTION form of construction permitted by AS 4100 (Ref. 1). Rigid construction has the following qualities (see Handbook 1, Reference 8).

Rigid construction—For rigid construction the connections are assumed to have sufficient rigidity to hold the original angles between the members unchanged. The joint deformations must be such that they have no significant influence on the distribution of the action effects nor on the overall deformation of the frame.

AS 4100 allows for three forms of construction which relate to the behaviour of the connections. It then requires that the design of the connections be such that the structure is capable of resisting all design actions, calculated by assuming that the connections are appropriate to the form of construction of the structure or structural part. The design of the connections required is to be consistent with the form of construction assumed.



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

by

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Also in this series:

Design Capacity Tables for Structural Steel Volume 3: Simple connections—Open sections

Handbook 1: Design of structural steel connections

Design Guide 1: Bolting in structural steel connections

Design Guide 2: Welding in structural steel connections

Design Guide 3: Web side plate connections

Design Guide 4: Flexible end plate connections

Design Guide 5: Angle cleat connections

Design Guide 6: Seated connections

Design Guide 10: Bolted end plate beam splice connections

Design Guide 11: Welded beam to column moment connections

Design Guide 12: Bolted end plate to column moment connections

Design Guide 13: Splice connections

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CONTENTS

	<i>Page</i>		<i>Page</i>
List of figures	iv	5.5 Design capacity tables	50
List of tables	v	5.6 Four bolt unstiffened end plate— Design capacity tables	51
Preface	vii	5.7 Four bolt stiffened end plate— Design capacity tables	53
About the author	viii	5.8 Six bolt unstiffened end plate— Design capacity tables	55
About the contributing author	viii	5.9 Eight bolt stiffened end plate— Design capacity tables	57
Acknowledgements	ix		
1 CONCEPT OF DESIGN GUIDES.....	1	6 BOLTED END PLATE TO COLUMN MOMENT CONNECTION	58
1.1 Background	1	6.1 Description of connection	58
1.2 Preliminary considerations	2	6.2 Typical detailing of connection	61
1.3 Included connections	3	6.3 Calculation of design actions	66
2 GEOMETRICAL DETAILS.....	9	6.4 Recommended design model— Summary of design checks	67
2.1 Standard parameters	9	6.5 Design capacity tables	68
2.2 Connection components— Bolted moment end plate	10	6.6 Four bolt unstiffened end plate	69
2.3 Connection components— Column stiffeners	12	6.7 Four bolt stiffened end plate	73
2.4 Bolt gauges to columns for bolted moment end plate connection	15	6.8 Six bolt unstiffened end plate	75
2.5 Flange cover plates for splices	16	6.9 Eight bolt stiffened end plate	77
2.6 Bolting layout to webs for bolted web splices	20		
2.7 Web cover plate components for bolted splices	22	7 BOLTED COVER PLATE SPLICE	78
3 DESIGN BASIS	23	7.1 Description of connection	78
3.1 Design models	23	7.2 Typical detailing of connection	79
3.2 Minimum design actions on connections	24	7.3 Calculation of design actions	82
4 WELDED BEAM TO COLUMN MOMENT CONNECTION	28	7.4 Recommended design model— Summary of design checks	83
4.1 Description of connection	28	7.5 Design capacity tables	84
4.2 Typical detailing of connection	31		
4.3 Calculation of design actions	33	8 BOLTED/WELDED COVER PLATE SPLICE	90
4.4 Recommended Design Model— Summary of design checks	34	8.1 Description of connection	90
4.5 Design capacity tables	35	8.2 Typical detailing of connection	91
4.6 Configuration A—Full penetration butt welds to flanges and webs	36	8.3 Calculation of design actions	94
4.7 Configuration B—Fillet welds required to develop section moment capacity	38	8.4 Recommended design model— Summary of design checks	95
4.8 Configuration C—Fillet welds to flanges and web	40	8.5 Design capacity tables	96
5 BOLTED MOMENT END PLATE BEAM SPLICE CONNECTION.....	42	9 FULLY WELDED SPLICE	102
5.1 Description of connection	42	9.1 Description of connection	102
5.2 Typical detailing of connection	44	9.2 Typical detailing of connection	103
5.3 Calculation of design actions	48	9.3 Calculation of design actions	105
5.4 Recommended design model— Summary of design checks	49	9.4 Recommended design model— Summary of design checks	106
		9.5 Design capacity tables	107
		10 REFERENCES.....	110
		APPENDIX	
		A Rigid connections DCTs, V4 comment form	111



LIST OF FIGURES

	<i>Page</i>		<i>Page</i>		
Figure 1	Typical detailing for unstiffened variations of extended bolted moment end plate.....	4	Figure 25	Shims used between end plates....	46
Figure 2	Typical welded beam to column moment connection	4	Figure 26	Clearance required for tensioning bolts	47
Figure 3	Typical detailing for 4 bolt unstiffened bolted end plate to column connection.....	5	Figure 27	Design actions at connection.....	48
Figure 4	Typical detailing of bolted cover plate splice.....	6	Figure 28	Bolted end plate to column moment connections	58
Figure 5	Typical detailing of bolted/welded cover plate splice.....	7	Figure 29	Forms of extended end plate connection.....	59
Figure 6	Typical detailing of welded splice ...	8	Figure 30	Possible configurations of the bolted moment end plate beam to column connection.....	60
Figure 7	Bolting layouts for M24 bolts in bolted moment endplate	11	Figure 31	Typical detailing for 4 bolt unstiffened bolted end plate to column connection	61
Figure 8	Bolting layouts for M20 bolts in bolted moment endplate	11	Figure 32	Typical detailing for haunched rafter to column bolted end plate connection	62
Figure 9	Transverse stiffener arrangement	12	Figure 33	Removal of column flange with thicker plate inserted	62
Figure 10	Geometry of flange splice plates ..	16	Figure 34	Column doubler plate types.....	63
Figure 11	Web splice bolting layout M20 bolts.....	20	Figure 35	Shims used between end plate and column flange	64
Figure 12	Web splice bolting layout M24 bolts.....	21	Figure 36	Clearance required for tensioning bolts	65
Figure 13	Web cover plate components	22	Figure 37	Design actions on beam at column.....	66
Figure 14	Typical welded beam to column moment connection	28	Figure 38	Bolted cover plate splice	78
Figure 15	Alternative arrangements for welded beam to column connections	29	Figure 39	Typical detailing in flexural member	79
Figure 16	Arrangement with shop welded beams and column splices	29	Figure 40	Typical detailing in column/beam-column.....	80
Figure 17	Possible configurations of the welded moment beam to column connection.....	30	Figure 41	Typical detailing in tension member	80
Figure 18	Stub girder connection, fully shop welded beam stub, beam spliced on site.....	31	Figure 42	Design actions at splice.....	82
Figure 19	Field welded moment connection—including erection cleat.....	31	Figure 43	Bolted/welded cover plate splice	90
Figure 20	Design actions on beam at column.....	33	Figure 44	Typical detailing in flexural member	91
Figure 21	Bolted moment end plate beam splice connection	42	Figure 45	Typical detailing in column/beam column.....	92
Figure 22	Forms of extended bolted end plate connection	43	Figure 46	Typical detailing in tension member	92
Figure 23	Typical detailing for unstiffened variations of extended bolted moment end plate.....	44	Figure 47	Design actions at splice.....	94
Figure 24	Typical detailing for stiffened variations of extended bolted moment end plate.....	45	Figure 48	Fully welded splice	102
			Figure 49	Typical detailing of welded splice	103
			Figure 50	Use of backing strips	104
			Figure 51	Preferred splice location in column.....	104
			Figure 52	Design actions at splice.....	105



LIST OF TABLES

		<i>Page</i>			<i>Page</i>
Table 1	Connection components bolted moment end plate	10	Table 20	Universal beams grade 300 design moment capacity of welded connection with flange welds and web welds.....	41
Table 2	Stiffener material design strengths.....	12	Table 21	Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M24 bolts welded beam/universal beam sections > 300 mm deep	51
Table 3	Flat bar components as stiffeners.....	13	Table 22	Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M20 bolts universal beam sections > 200 mm deep	52
Table 4	Flat bar width/column combinations suited to stiffening...	14	Table 23	Design moment capacity of connection ϕM_{conn} four bolt stiffened end plate M24 bolts welded beam/universal beam sections > 300 mm deep	53
Table 5	Plate width/column combinations suited to stiffening	14	Table 24	Design moment capacity of connection ϕM_{conn} four bolt stiffened end plate M20 bolts universal beam sections > 200 mm deep	54
Table 6	Suitable bolt gauges for column section flanges	15	Table 25	Design moment capacity of connection ϕM_{conn} six bolt unstiffened end plate M24 bolts welded beam/universal beam sections > 450 mm deep	55
Table 7	Flange cover plate width/thickness combinations for one plate bolted cover plate splice	17	Table 26	Design moment capacity of connection ϕM_{conn} six bolt unstiffened end plate M20 bolts universal beam sections > 350 mm deep	56
Table 8	Flange cover plate width/thickness combinations for one plate bolted/welded cover plate splice.....	17	Table 27	Design moment capacity of connection ϕM_{conn} eight bolt stiffened end plate M24 bolts 8.8/TB category threads excluded from shear plane welded beam and universal beam sections > 520 mm deep	57
Table 9	Flange cover plate width/thickness combinations for three plate bolted cover plate splice	18	Table 28	Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M24 bolts unhaunched welded beam/universal beam sections > 300 mm deep	69
Table 10	Flange cover plate width/thickness combinations for three plate bolted/welded cover plate splice.....	19	Table 29	Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M20 bolts unhaunched universal beam sections > 200 mm deep	70
Table 11	Values of n_{max} in web splice	20			
Table 12	Values of n_{max} in web splice.....	21			
Table 13	Universal beams, Grade 300 design section moment and web capacities	26			
Table 14	Welded beams, Grade 300 design section moment and web capacities	27			
Table 15	Universal beams Grade 300 design section moment and web capacities	36			
Table 16	Welded beams Grade 300 design section moment and web capacities	37			
Table 17	Universal beams Grade 300 weld configurations to achieve design section moment capacity ϕM_s	38			
Table 18	Welded beams Grade 300 weld configurations to achieve design section moment capacity ϕM_s	39			
Table 19	Universal beams Grade 300 design moment capacity of welded connection with flange welds and web welds.....	40			



	<i>Page</i>		<i>Page</i>
Table 30		Table 40	
Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M24 bolts haunched universal beam sections > 300 mm deep	71	Design moment capacity of bolted three cover plate splice 700WB/800WB welded beam sections M24 bolts.....	88
Table 31		Table 41	
Design moment capacity of connection ϕM_{conn} four bolt unstiffened end plate M20 bolts haunched universal beam sections > 200 mm deep	72	Design moment capacity of bolted three cover plate splice 900WB/1000WB welded beam sections M24 bolts.....	89
Table 32		Table 42	
Design moment capacity of connection ϕM_{conn} four bolt stiffened end plate M24 bolts unhaunched welded beam/universal beam sections > 300 mm deep.....	73	Design moment capacity of bolted/welded single cover plate splice universal beam sections < 400 deep M20 bolts, 6 fillets to flange plates, 5 fillets to web plates.....	97
Table 33		Table 43	
Design moment capacity of connection ϕM_{conn} four bolt stiffened end plate M20 bolts unhaunched universal beam sections > 200 mm deep	74	Design moment capacity of bolted/welded single cover plate splice universal beam sections > 400 deep M24 bolts, 8 or 6 fillets to flange plates, 5 fillets to web plates	98
Table 34		Table 44	
Design moment capacity of connection ϕM_{conn} six bolt unstiffened end plate M24 bolts unhaunched welded beam/universal beam sections > 450 mm deep	75	Design moment capacity of bolted/welded three cover plate splice universal column sections M24 bolts, 6/8 fillets to flange plates and web plates and 6 fillets to web plates	99
Table 35		Table 45	
Design moment capacity of connection ϕM_{conn} six bolt unstiffened end plate M20 bolts unhaunched universal beam sections > 350 mm deep	76	Design moment capacity of bolted three cover plate splice 700WB/800WB welded beam sections M24 bolts, 6/8 fillets to flange plates and 5 fillets to web plates	100
Table 36		Table 46	
Design moment capacity of connection ϕM_{conn} eight bolt stiffened end plate M24 bolts unhaunched welded beam and universal beam sections > 520 mm deep	77	Design moment capacity of bolted/welded three cover plate splice 900WB/1000WB welded beam sections M24 bolts, 8 or 6 fillets to flange plates and 6 fillets to web plates..	101
Table 37		Table 47	
Design moment capacity of bolted single cover plate splice universal beam sections < 400 deep M20 bolts	85	Universal beams Grade 300 design section moment and shear capacities	107
Table 38		Table 48	
Design moment capacity of bolted single cover plate splice universal beam sections > 400 deep M24 bolts	86	Welded beams Grade 300 design section moment and shear capacities	108
Table 39		Table 49	
Design moment capacity of bolted three cover plate splice universal column sections > 240 deep M24 bolts	87	Universal columns/welded columns grade 300 design section moment and shear capacities	109

