

Company Name	Leslie E. Robertson Associates	Project Title	Design Problem 2
Group/Team Name	Individual	Subtitle	
Designer	Karthik Bandi	Job Number	P786
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Design Conclusion	
Endplate	Pass
Endplate	
Connection Properties	
Connection	
Connection Title	Flexible Endplate
Connection Type	Shear Connection
Connection Category	
Connectivity	Column flange-Beam web
Beam Connection	Welded
Column Connection	Bolted
Loading (Factored Load)	
Shear Force (kN)	160
Components	
Column Section	ISSC 250
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	240X174X16
Thickness (mm)	16
Width (mm)	174
Depth (mm)	240
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	8
Bolts	
Type	HSFG
Grade	8.8
Diameter (mm)	20

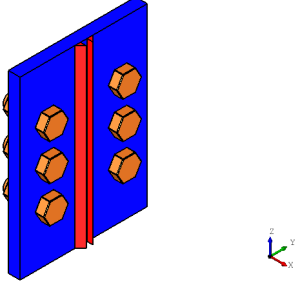
Bolt Numbers	6
Columns (Vertical Lines)	2
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	50
End Distance (mm)	70
Edge Distance (mm)	37
Assembly	
Column-Beam Clearance (mm)	16

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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = ((800.0 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000)) = 52.694$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dps} = (2.5 \times 0.508 \times 20 \times 16.0 \times 410) / (1.25 \times 1000) = 133.299$ [cl. 10.3.4]	
Bolt capacity (kN)		Min (52.694, 133.299) = 52.694	Pass
Critical bolt shear (kN)	≤ 52.694	48.074	Pass
No. of bolts		6	
No. of column(s)	≤ 2	2	
No. of bolts per column per side of end plate		3	
Bolt pitch (mm)	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	50	Pass
Bolt gauge (mm)	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7 \times 22.0 = 37.4, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	70	Pass
Edge distance (mm)	$\geq 1.7 \times 22.0 = 37.4, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	37	Pass
Block shear capacity (kN)	≥ 160	$V_{db} = 325$ [cl. 6.4.1]	
Plate thickness (mm)	≥ 8	16	Pass
	$\geq 0.6 \times 400.0 = 240.0, \leq$		

Plate height (mm)	400.0-16.0-14.0-16.0-14.0-10=330.0 [cl. 10.2.4, Insdag Detailing Manual, 2002]	240	Pass
Plate Width (mm)	$\geq 174, \leq 250.0$	174	Pass
Effective weld length (mm)		$240 - 2 \cdot 8 = 224$	
Weld strength (kN/mm)	0.357	$f_v = (0.7 \cdot 8 \cdot 410) / (\sqrt{3} \cdot 1.25 \cdot 1000)$ = 1.06 [cl. 10.5.7]	Pass

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Views	
	

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Additional Comments	
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