

Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		Job Number	
Date	31 /05 /2016	Method	Limit State Design (No Earthquake Load)

Design Conclusion	
Finplate	Pass
Finplate	
Connection Properties	
Connection	
Connection Title	Single Finplate
Connection Type	Shear Connection
Connection Category	
Connectivity	Column web-Beam web
Beam Connection	Bolted
Column Connection	Welded
Loading (Factored Load)	
Shear Force (kN)	100
Components	
Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	240X100X10
Thickness (mm)	10
Width (mm)	100
Depth (mm)	240
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	8
Bolts	
Type	Black Bolt
Grade	3.6
Diameter (mm)	20
Bolt Numbers	3
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	80
End Distance (mm)	40

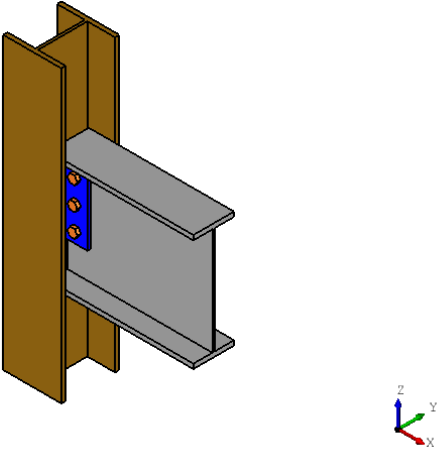
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	20

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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (300 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000)$ = 33.948 [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.508 \times 20 \times 8.9 \times 410) / (1.25 \times 1000)$ = 74.148 [cl. 10.3.4]	
Bolt capacity (kN)		Min (33.948, 74.148) = 33.948	
No. of bolts	100/33.948 = 2.9	3	Pass
No. of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	80	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)	$\geq 1.7 \times 22 = 37.4, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	40	Pass
Edge distance (mm)	$\geq 1.7 \times 22 = 37.4, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	40	Pass
Block shear capacity (kN)	≥ 100	$V_{db} = 338$	Pass
Plate thickness (mm)	$(5 \times 100 \times 1000) / (240 \times 250) = 8.33$ [Owens and Cheal, 1989]	10	Pass
Plate height (mm)	$\geq 0.6 \times 400 = 240.0, \leq 400 - 16 - 14 - 10 = 330.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	240	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2 \times 33.948 \times 80^2) / (80 \times 1000) = 6.0$	$M_d = (1.2 \times 250 \times Z) / (1000 \times 1.1) = 26.18$ [cl. 8.2.1.2]	Pass
Effective weld length (mm)		$240 - 2 \times 8 = 224$	
Weld strength (kN/mm)	$\sqrt{[(6000 \times 6) / (2 \times 224^2)]^2 + [100 / (2 \times 224)]^2}$ = 0.423	$f_w = (0.7 \times 8 \times 410) / (\sqrt{3} \times 1.25)$ = 1.06 [cl. 10.5.7]	Pass

Weld thickness (mm)	$\text{Max}((0.423 \cdot 1000 \cdot \sqrt{3} \cdot 1.25) / (0.7 \cdot 410), 10 \cdot 0.8) = 8.0$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	8	Pass
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Additional Comments	
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