

Company Name	KLE Institute of Technology Hubballi	Project Title	Assignment_04
Group/Team Name	Civil Dept.	Subtitle	
Designer	ISPatil	Job Number	04
Date	06 /06 /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 flange-Beam web
Beam Connection	Bolted
Column Connection	Welded
Loading (Factored Load)	
Shear Force (kN)	160
Components	
Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	250X120X12
Thickness (mm)	12
Width (mm)	120
Depth (mm)	250
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	10
Bolts	
Type	HSFG
Grade	8.8
Diameter (mm)	12
Bolt Numbers	6
Columns (Vertical Lines)	1
Bolts Per Column	6

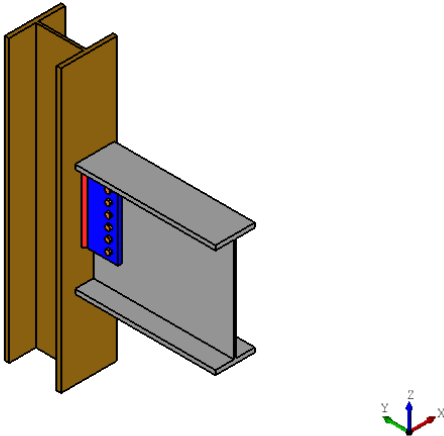
Gauge (mm)	0
Pitch (mm)	38
End Distance (mm)	30
Edge Distance (mm)	30
Assembly	
Column-Beam Clearance (mm)	20

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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (800 \times 0.6126 \times 12 \times 12) / (\sqrt{3} \times 1.25 \times 1000)$ = 31.223 [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.519 \times 12 \times 8.9 \times 410) / (1.25 \times 1000)$ = 45.452 [cl. 10.3.4]	
Bolt capacity (kN)		Min (31.223, 45.452) = 31.223	
No. of bolts	$160 / 31.223 = 5.1$	6	Pass
No. of column(s)	≤ 2	1	
No. of bolts per column		6	
Bolt pitch (mm)	$\geq 2.5 \times 12 = 30, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	38	Pass
Bolt gauge (mm)	$\geq 2.5 \times 12 = 30, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7 \times 13 = 22.1, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Edge distance (mm)	$\geq 1.7 \times 13 = 22.1, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 160	$V_{db} = 385$	Pass
Plate thickness (mm)	$(5 \times 160 \times 1000) / (250 \times 250) = 12.8$ [Owens and Cheal, 1989]	12	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]	250	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2 \times 31.223 \times 38^2) / (38 \times 1000) = 14.4$	$M_d = (1.2 \times 250 \times Z) / (1000 \times 1.1) = 34.09$ [cl. 8.2.1.2]	Pass
Effective weld		$250 - 2 \times 10 = 230$	

length (mm)			
Weld strength (kN/mm)	$\sqrt{[(14400 \cdot 6)/(2 \cdot 230^2)]^2 + [160/(2 \cdot 230)]^2}$ $= 0.888$	$f_v = (0.7 \cdot 10 \cdot 410)/(\sqrt{3} \cdot 1.25)$ $= 1.326$ [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.888 \cdot 1000 \cdot \sqrt{3} \cdot 1.25)/(0.7 \cdot 410), 12 \cdot 0.8) = 9.6$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	10	Pass

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Views	
	

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Additional Comments	
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