

Company Name	LERA	Project Title	Connection design
Group/Team Name	LERA Team	Subtitle	
Designer	Raju	Job Number	P001
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Design Conclusion

Finplate	Pass
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Finplate**Connection Properties****Connection**

Connection Title	Single Finplate
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Connection Type	Shear Connection
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Connection Category

Connectivity	Column flange-Beam web
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Beam Connection	Bolted
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Column Connection	Welded
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Loading (Factored Load)

Shear Force (kN)	160
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Components

Column Section	ISSC 200
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Material	Fe 410
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Beam Section	ISMB 400
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Material	Fe 410
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Hole	STD
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Plate Section	320X100X10
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Thickness (mm)	10
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Width (mm)	100
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Depth (mm)	320
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Hole	STD
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Weld

Type	Double Fillet
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Size (mm)	8
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Bolts

Type	HSFG
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Grade	8.8
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Diameter (mm)	20
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Bolt Numbers	3
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Columns (Vertical Lines)	1
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Bolts Per Column	3
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Gauge (mm)	0
Pitch (mm)	120
End Distance (mm)	40
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	20

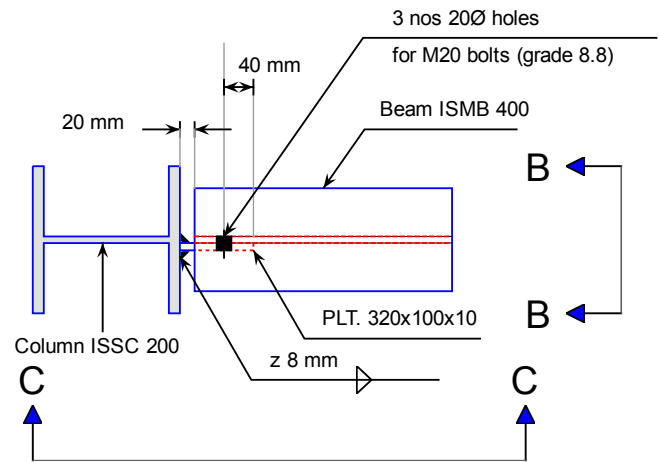
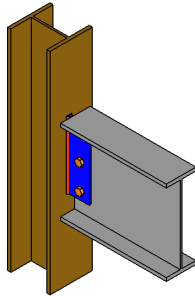
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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (800 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000)$ = 90.529 [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.508 \times 20 \times 8.9 \times 410) / (1.25 \times 1000)$ = 74.148 [cl. 10.3.4]	
Bolt capacity (kN)		Min (90.529, 74.148) = 74.148	
No. of bolts	160/74.148 = 2.2	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]	120	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)	≥ 160	$V_{db} = 453$	Pass
Plate thickness (mm)	$(5 \times 160 \times 1000) / (320 \times 250) = 10.0$ [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]	320	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2 \times 90.529 \times 120^2) / (120 \times 1000) = 14.485$	$M_d = (1.2 \times 250 \times Z) / (1000 \times 1.1) = 46.55$ [cl. 8.2.1.2]	Pass
Effective weld length (mm)		320 - 2 × 8 = 304	

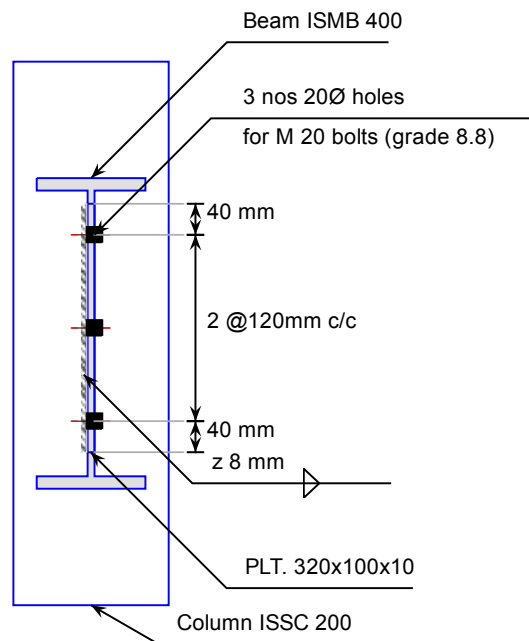
Weld strength (kN/mm)	$\sqrt{[(14485 \cdot 6)/(2 \cdot 304^2)]^2 + [160/(2 \cdot 304)]^2}$ = 0.539	$f_v = (0.7 \cdot 8 \cdot 410)/(\sqrt{3} \cdot 1.25)$ = 1.06 [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.539 \cdot 1000 \cdot \sqrt{3} \cdot 1.25)/(0.7 \cdot 410), 10 \cdot 0.8) = 8.0$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	8	Pass

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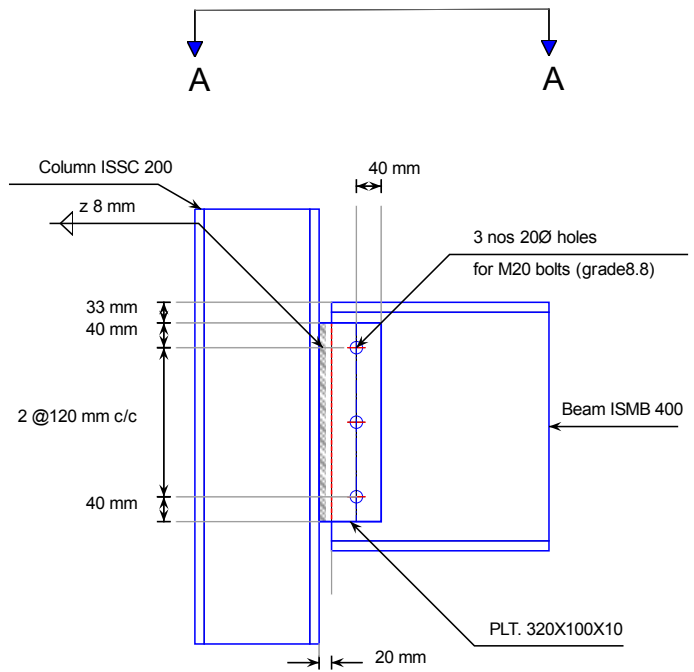
Views




Top view (Sec A-A)



Side view (Sec B-B)



Front view (Sec C-C)

		Created with 	
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Additional Comments			