



Company Name	DYPCOE	Project Title	Problem 4
Group/Team Name		Subtitle	
Designer	Paresh	Job Number	4
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
Connection Type	Shear Connection

Connection Category

Connectivity	Column flange-Beam web
Beam Connection	Bolted
Column Connection	Welded

Loading (Factored Load)

Shear Force (kN)	200
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Components

Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	250X80X16
Thickness (mm)	16
Width (mm)	80
Depth (mm)	250
Hole	STD

Weld

Type	Double Fillet
Size (mm)	13

Bolts

Type	HSFG
Grade	8.8
Diameter (mm)	12
Bolt Numbers	7
Columns (Vertical Lines)	1
Bolts Per Column	7
Gauge (mm)	0
Pitch (mm)	31
End Distance (mm)	30
Edge Distance (mm)	30

Assembly

Column-Beam Clearance (mm)	20
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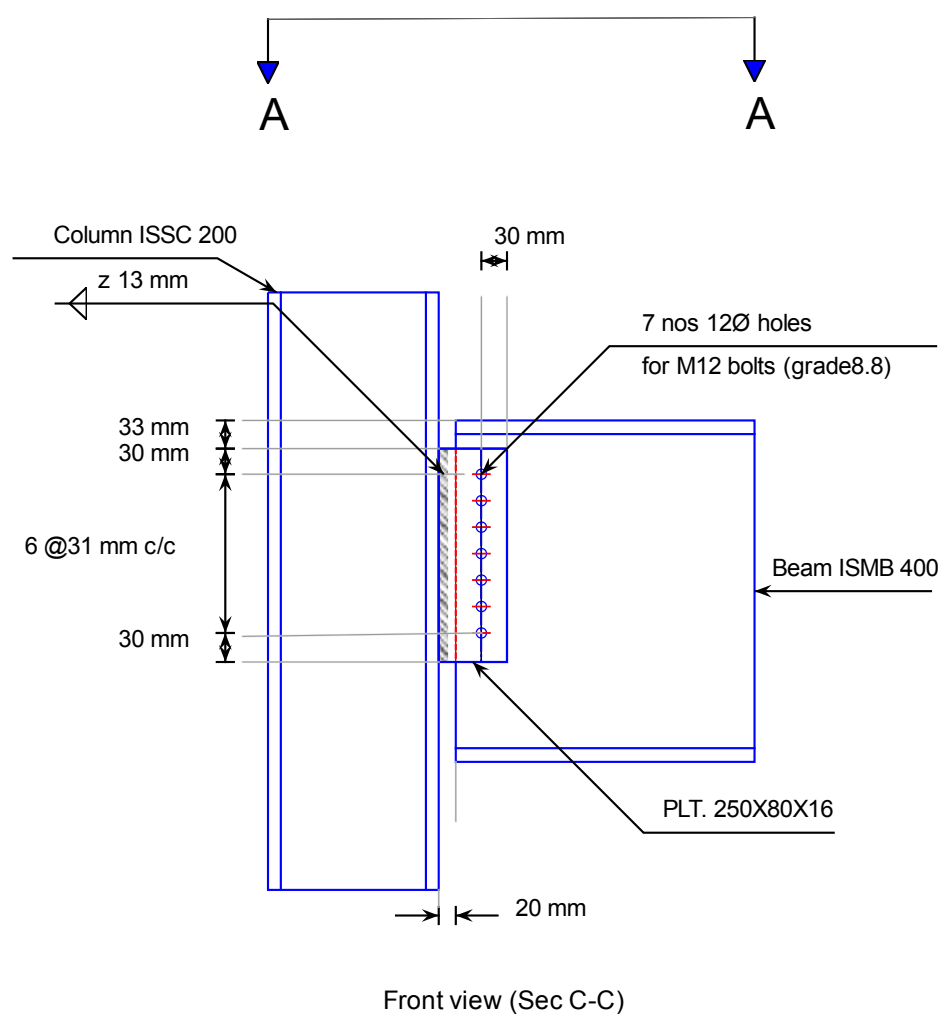
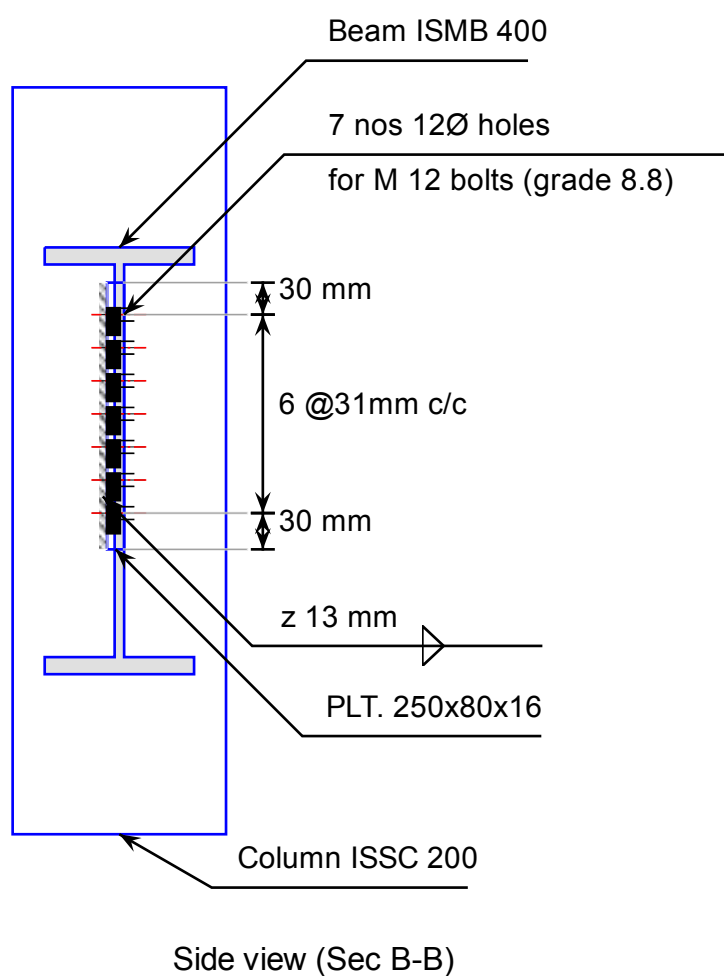
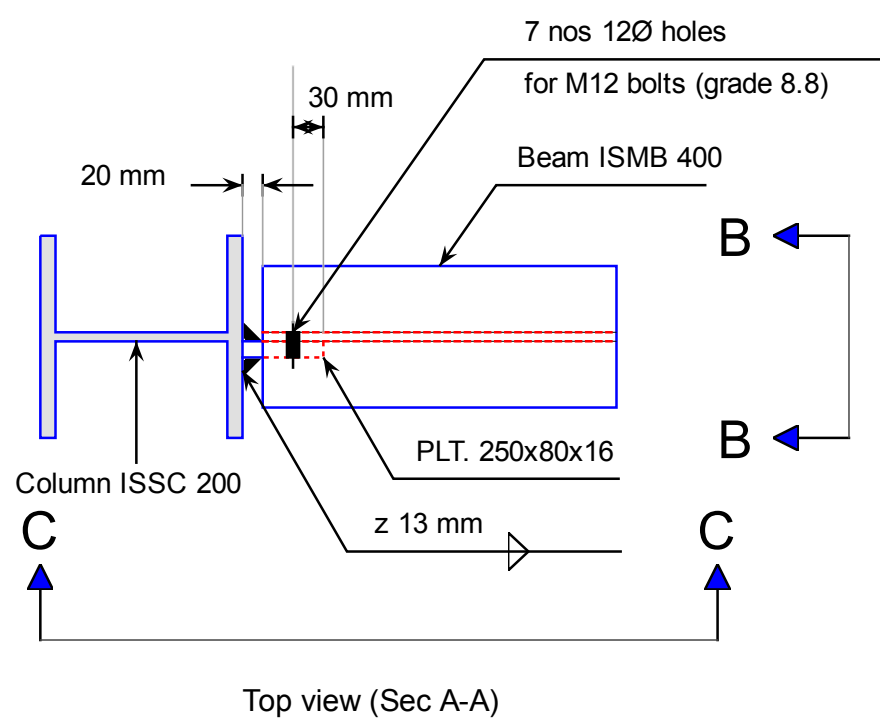
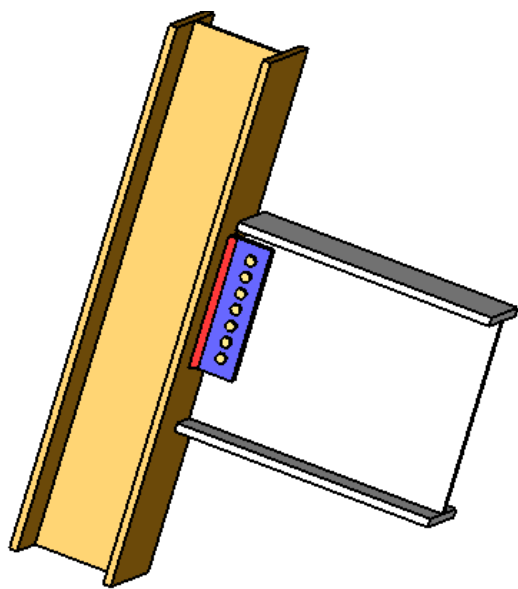
Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (800 \cdot 0.6126 \cdot 12 \cdot 12) / (\sqrt{3} \cdot 1.25 \cdot 1000) = 31.223$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \cdot 0.519 \cdot 12 \cdot 8.9 \cdot 410) / (1.25 \cdot 1000) = 45.452$ [cl. 10.3.4]	
Bolt capacity (kN)		Min (31.223, 45.452) = 31.223	
No. of bolts	$200 / 31.223 = 6.4$	7	Pass
No. of column(s)	≤ 2	1	
No. of bolts per column		7	
Bolt pitch (mm)	$\geq 2.5 \cdot 12 = 30, \leq \text{Min}(32 \cdot 8.9, 300) = 285$ [cl. 10.2.2]	31	Pass
Bolt gauge (mm)	$\geq 2.5 \cdot 12 = 30, \leq \text{Min}(32 \cdot 8.9, 300) = 285$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7 \cdot 13 = 22.1, \leq 12 \cdot 8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Edge distance (mm)	$\geq 1.7 \cdot 13 = 22.1, \leq 12 \cdot 8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 200	$V_{db} = 467$	Pass
Plate thickness (mm)	$(5 \cdot 200 \cdot 1000) / (250 \cdot 250) = 16.0$ [Owens and Cheal, 1989]	16	Pass
Plate height (mm)	$\geq 0.6 \cdot 400 = 240.0, \leq 400 - 16 - 14 - 10 = 330.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	250	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2 \cdot 31.223 \cdot 31^2) / (31 \cdot 1000) = 11.99$	$M_d = (1.2 \cdot 250 \cdot Z) / (1000 \cdot 1.1) = 45.45$ [cl. 8.2.1.2]	Pass
Effective weld length (mm)		$250 - 2 \cdot 16 = 218$	
Weld strength (kN/mm)	$\sqrt{[(11990 \cdot 6) / (2 \cdot 218^2)]^2 + [200 / (2 \cdot 218)]^2} = 0.885$	$f_v = (0.7 \cdot 13 \cdot 410) / (\sqrt{3} \cdot 1.25) = 2.121$ [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.885 \cdot 1000 \cdot \sqrt{3} \cdot 1.25) / (0.7 \cdot 410), 16 \cdot 0.8) = 12.8$ [cl. 10.5.7, Insdag Detailing Manual,	13	Pass

	2002]		
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Additional Comments	
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