Company Name	LERA	Project Title	
Group/Team Name		Subtitle	
Designer	Renuka	Job Number	
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)	200

Components

Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	250X90X16
Thickness (mm)	16
Width (mm)	90
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

Design Check

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = (800*0.6126*12*12)/($\sqrt{3}$*1.25*1000) = 31.223 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dpb} = (2.5*0.519*12*8.9*410)/(1.25*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)	≥ 2.5* 12 = 30, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	31	Pass
Bolt gauge (mm)	≥ 2.5*12 = 30, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*13 = 22.1, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	30	Pass
Edge distance (mm)	≥ 1.7*13 = 22.1, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 200	V_{db} = 467	Pass
Plate thickness (mm)	(5*200*1000)/(250*250) = 16.0 [Owens and Cheal, 1989]	16	Pass
Plate height (mm)	≥ 0.6*400=240.0, ≤ 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*31.223*31^2)/(31*1000) = 12.0	M_d = (1.2*250*Z)/(1000*1.1) = 45.45 [cl. 8.2.1.2]	Pass
Effective weld length (mm)		250-2*16 = 218	
Weld strength (kN/mm)	$\sqrt{[(12000*6)/(2*218^2)]^2 + [200/(2*218)]^2}$ = 0.886	f_v= (0.7*13*410)/($\sqrt{3}$*1.25) = 2.121 [cl. 10.5.7]	Pass
Weld thickness (mm)	Max((0.886*1000*$\sqrt{3}$* 1.25)/(0.7 * 410),16* 0.8) = 12.8 [cl. 10.5.7, Insdag Detailing Manual,	13	Pass

2002]

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Views

Top view (Sec A-A)

- 7 nos 12Ø holes for M12 bolts (grade 8.8)
- 30 mm
- 20 mm
- Beam ISMB 400
- Column ISSC 200
- PLT. 250x90x16
- z 13 mm
- B
- C C

Side view (Sec B-B)

- Beam ISMB 400
- 7 nos 12Ø holes for M 12 bolts (grade 8.8)
- 30 mm
- 6 @31mm c/c
- 30 mm
- z 13 mm
- PLT. 250x90x16
- Column ISSC 200

Front view (Sec C-C)

- A A
- Column ISSC 200
- z 13 mm
- 30 mm
- 33 mm
- 30 mm
- 6 @31 mm c/c
- 30 mm
- 7 nos 12Ø holes for M12 bolts (grade8.8)
- Beam ISMB 400
- PLT. 250X90X16
- 20 mm
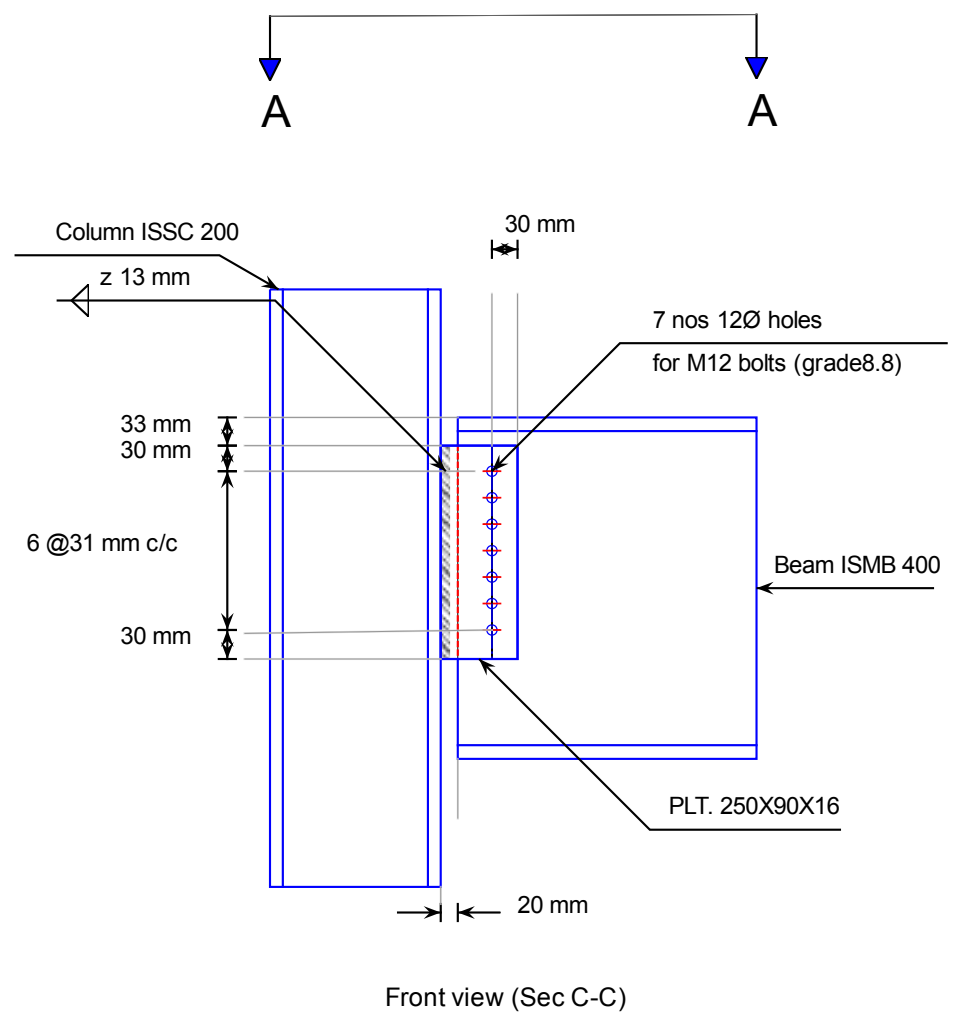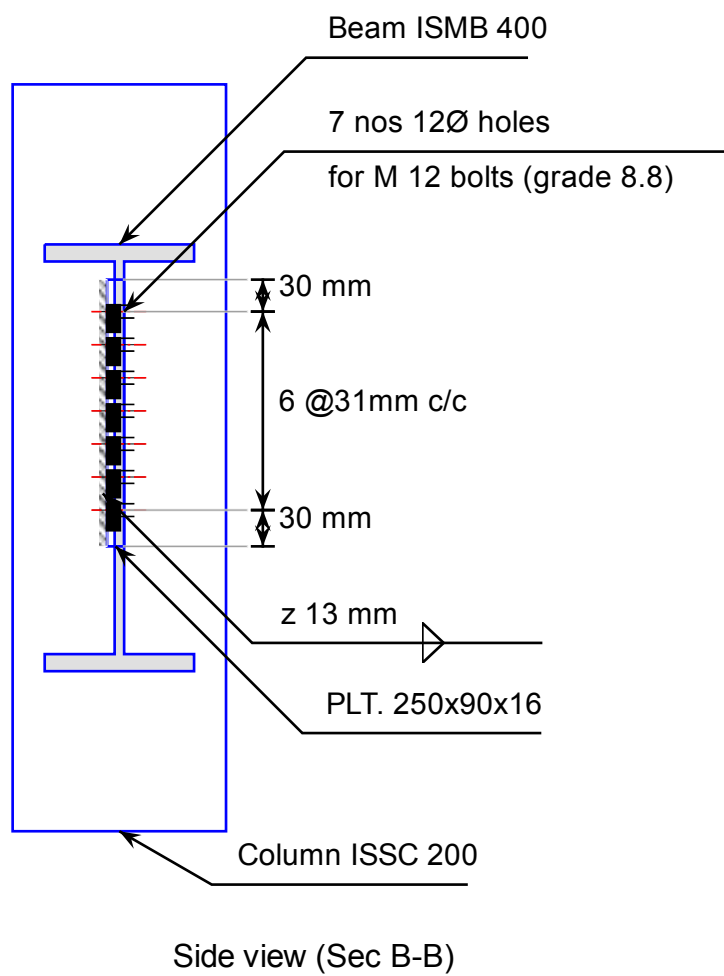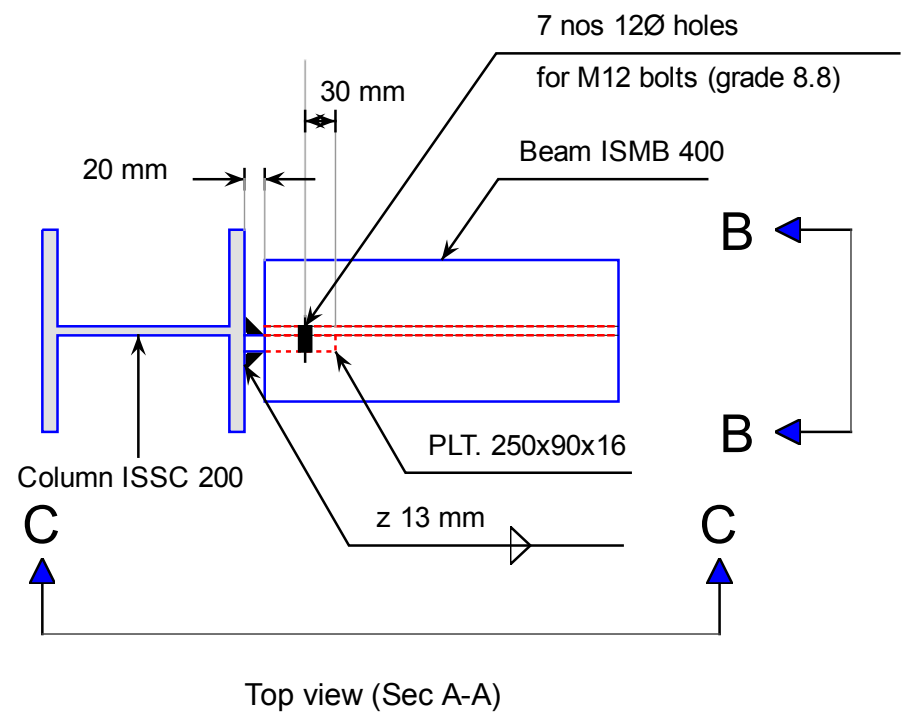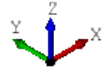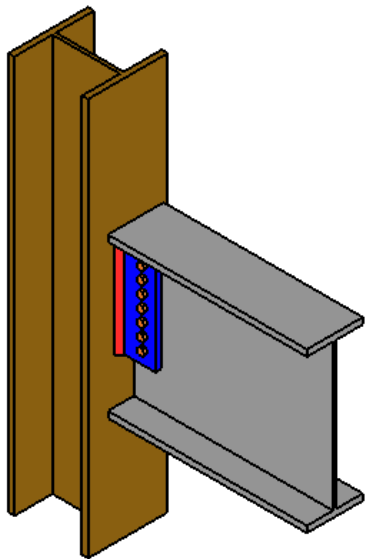
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Additional Comments	