

Created with

Company Name	LERA	Project Title	IIT
Group/Team Name	LERA team	Subtitle	
Designer	Raju	Job Number	P04
Date	06 /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	300X90X14
Thickness (mm)	14
Width (mm)	90
Depth (mm)	300
Hole	STD

Weld

Type	Double Fillet
Size (mm)	12

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) 40

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)		$V_{dsb} = (800*0.6126*12*12)/(\sqrt{3}*1.25*1000)$ $= 31.223$ [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)	$\geq 2.5*12 = 30, \leq \text{Min}(32*8.9, 300) = 285$ [cl. 10.2.2]	40	Pass
Bolt gauge (mm)	$\geq 2.5*12 = 30, \leq \text{Min}(32*8.9, 300) = 285$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7*13 = 22.1, \leq 12*8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Edge distance (mm)	$\geq 1.7*13 = 22.1, \leq 12*8.9 = 106.8$ [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 200	$V_{db} = 538$	Pass
Plate thickness (mm)	$(5*200*1000)/(300*250) = 13.33$ [Owens and Cheal, 1989]	14	Pass
Plate height (mm)	$\geq 0.6*400 = 240.0, \leq 400 - 16 - 14 - 10 = 330.0$ [cl. 10.2.4, Insdag Detailing Manual,	300	Pass

2002]

Plate width (mm)		100	
Plate moment capacity (kNm)	$(2*31.223*40^2)/(40*1000) = 14.987$	$M_d = (1.2*250*Z)/(1000*1.1) = 57.27$ [cl. 8.2.1.2]	Pass
Effective weld length (mm)		$300-2*12 = 276$	
Weld strength (kN/mm)	$\sqrt{[(14987*6)/(2*276^2)]^2 + [200/(2*276)]^2} = 0.693$	$f_v = (0.7*12*410)/(\sqrt{3}*1.25) = 1.591$ [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.693*1000*\sqrt{3}*1.25)/(0.7*410), 14*0.8) = 11.2$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	12	Pass

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Additional Comments