Created with

Company Name	aaravind	Project Title	
Group/Team Name	jggjh	Subtitle	
Designer	dshfj	Job Number	
Date	03 /04 /2016	Method	Limit State Design

Design Conclusion	
Cleat Angle	Pass
Cleat Angle	
Connection Properties	
Connection	
Connection Title	Double Angle Cleat Angle
Connection Type	Shear Connection
Connection Category	
Connectivity	Beam-Beam
Beam Connection	Bolted
Column Connection	Bolted
Loading (Factored Load)	
Shear Force (kN)	200.0
Components	
Column Section	ISMB 550
Material	Fe 410
Beam Section	ISMB 500
Material	Fe 410
Hole	STD
Cleat Section	ISA 100X100X10
Thickness (mm)	10
Cleat Leg Size B (mm)	100
Cleat Leg Size A (mm)	100
Hole	STD
Bolts on Beam	
Type	Black Bolt
Grade	12.9
Diameter (mm)	16
Bolt Numbers	6
Columns (Vertical Lines)	1
Bolts Per Column	6
Gauge (mm)	0
Pitch (mm)	40
End Distance (mm)	50
Edge Distance (mm)	30
Bolts on Column	
Type	Black Bolt
Grade	12.9
Diameter (mm)	16
Bolt Numbers	8
Columns (Vertical Lines)	1
Bolts Per Column	4
Gauge (mm)	0
Pitch (mm)	40
End Distance (mm)	90.0

Edge Distance (mm) 35.1

Assembly

Column-Beam Clearance (mm) 20

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Design Check: Beam Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = ((2*1200*0.6126*16*16)/(√3*1.25*1000) = 173.846 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dsb} = (2.5*0.5*16*10.0*1200)/(1.25*1000) = 195.84 [cl. 10.3.4]	
Bearing capacity of beam web (kN)		V_{dsb} = (2.5*0.5*18.0*10.2*410)/(1.25*1000) = 66.912 [cl. 10.3.4]	
Bearing capacity of cleat (kN)		V_{dsb} = (2.5*0.5*18.0*10*410)/(1.25*1000) = 66.912 [cl. 10.3.4]	
Bearing capacity (kN)		Min (195.84, 66.912, 131.2) = 66.912	**Pass**
Bolt capacity (kN)		Min (173.846, 66.912) = 66.912	**Pass**
Critical Bolt Shear (kN)	≤66.912	58.149	**Pass**
No. of bolts	200.0/66.912 = 3.0	6	**Pass**
No.of column(s)	≤2	1	
No. of bolts per column		6	
Bolt pitch (mm)	≥2.5* 16 = 40, ≤Min(32*10.2, 300) = 300 [cl. 10.2.2]	40	
Bolt gauge (mm)	≥2.5*16 = 40, ≤Min(32*10.2, 300) = 300 [cl. 10.2.2]	0	
End distance (mm)	≥1.7*18.0 = 30.6, ≤12*10.2 = 122.4 [cl. 10.2.4]	50	
Edge distance (mm)	≥1.7*18.0 = 30.6, ≤12*10.2 = 122.4 [cl. 10.2.4]	30	**Pass**
Block shear capacity (kN)	200.0	V_{db} = 325.537 [cl. 6.4.1]	
Cleat height (mm)	≥0.6*500.0=300.0, ≤500.0-17.2-17.0-19.3-18.0- 5=423.5 [cl. 10.2.4, Insdag Detailing Manual, 2002]	0.0	**Pass**
Cleat moment capacity (kNm)	$(2*173.846*40^2)/(40*1000)$ = 7.0	M_d = (1.2*250*Z)/(1000*1.1) = 270.0 [cl. 8.2.1.2]	**Pass**

Design Check: Column Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = ((1200*0.6126*16*16)/(√3*1.25*1000) = 86.923 [cl. 10.3.3]	

Bolt bearing capacity (kN)		V_{dsb} = (2.5*0.5*16*10.0*1200)/(1.25*1000) = 192.0 [cl. 10.3.4]	
Bearing capacity of Primary beam web (kN)		V_{dsb} = (2.5*0.5*18.0*11.2*410)/(1.25*1000) = 142.434 [cl. 10.3.4]	
Bearing capacity of cleat leg (kN)		V_{dsb} = (2.5*0.5*18.0*10*410)/(1.25*1000) = 73.8 [cl. 10.3.4]	
Bearing capacity (kN)		Min (192.0, 142.434, 73.8) = 142.434	**Pass**
Bolt capacity (kN)		Min (86.923, 142.434) = 86.923	**Pass**
No. of bolts	200.0/66.912 = 8692.3	8	**Pass**
No.of column(s)	≤2	1	
No. of bolts per column		4	
Bolt pitch (mm)	≥2.5* 16 = 40, ≤Min(32*10.0, 300) = 300 [cl. 10.2.2]	40	
Bolt gauge (mm)	≥2.5*16 = 40, ≤Min(32*10.0, 300) = 300 [cl. 10.2.2]	0	
End distance (mm)	≥1.7*18.0 = 30.6, ≤12*10.0 = 120.0 [cl. 10.2.4]	90.0	
Edge distance (mm)	≥1.7*18.0 = 30.6, ≤12*10.0 = 120.0 [cl. 10.2.4]	35.1	**Pass**
Block shear capacity (kN)	200.0	V_{db} = 330.31 [cl.]	
Cleat height (mm)	≥0.6*500.0=300.0, ≤500.0-17.2-17.0-19.3-18.0- 5=423.5 [cl. 10.2.4, Insdag Detailing Manual, 2002]	35.1	**Pass**
Moment capacity of cleat leg (kNm)	(2*86.923*40^2)/(40*1000) = 7.0	M_d = (1.2*250*Z)/(1000*1.1) = 270.0 [cl. 8.2.1.2]	**Pass**

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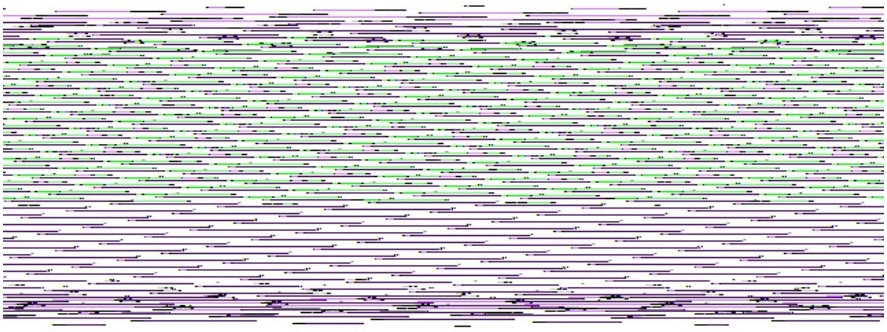
Views



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Additional Comments