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Design Conclusion	
Cleat Angle	**Pass**
Cleat Angle	
Connection Properties	
Connection	
Connection Title	Double Angle Web Cleat
Connection Type	Shear Connection
Connection Category	
Connectivity	Beam-Beam
Beam Connection	Bolted
Column Connection	Bolted
Loading (Factored Load)	
Shear Force (kN)	250.0
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	HSFG
Grade	10.8
Diameter (mm)	16
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
Bolts on Column	
Type	HSFG
Grade	10.8
Diameter (mm)	16
Bolt Numbers	12
Columns (Vertical Lines)	1
Bolts Per Column	6
Gauge (mm)	0
Pitch (mm)	40
End Distance (mm)	50.0
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*1000*0.6126*16*16)/(√3*1.25*1000) = 84.311 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dsb} = (2.5*0.5*16*10.0*1000)/(1.25*1000) = 163.2 [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 (163.2, 66.912, 131.2) = 66.912	**Pass**
Bolt capacity (kN)		Min (84.311, 66.912) = 66.912	**Pass**
Critical Bolt Shear (kN)	≤66.912	37.558	**Pass**
No. of bolts	250.0/66.912 = 3.7	7	**Pass**
No.of column(s)	≤2	1	
No. of bolts per column		7	
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]	30	
Edge distance (mm)	≥1.7*18.0 = 30.6, ≤12*10.2 = 122.4 [cl. 10.2.4]	30	**Pass**
Block shear capacity (kN)	250.0	V_{db} = 328.946 [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)	$(2*84.311*40^2)/(40*1000)$ = 8.75	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} = ((1000*0.6126*16*16)/(√3*1.25*1000) = 42.156 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dsb} = (2.5*0.5*16*10.0*1000)/(1.25*1000) = 160.0 [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 (160.0, 142.434, 73.8) = 142.434	**Pass**
Bolt capacity (kN)		Min (42.156, 142.434) = 42.156	**Pass**
No. of bolts	250.0/66.912 = 5269.5	12	**Pass**
No.of column(s)	≤2	1	
No. of bolts per column		6	
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]	50.0	
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)	250.0	V_{db} = 337.128 [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*42.156*40^2)/(40*1000) = 8.75	M_d = (1.2*250*Z)/(1000*1.1) = 270.0 [cl. 8.2.1.2]	**Pass**

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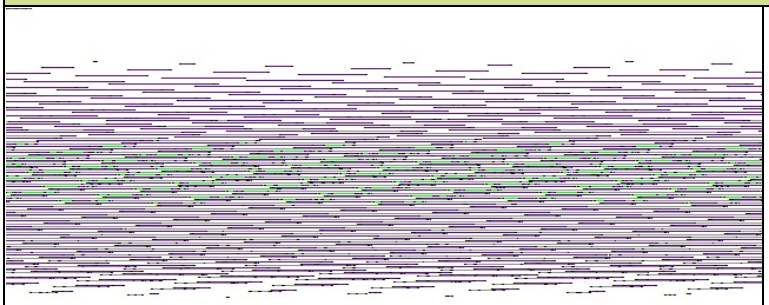
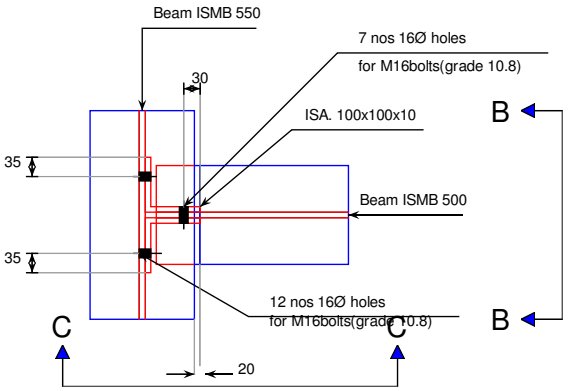
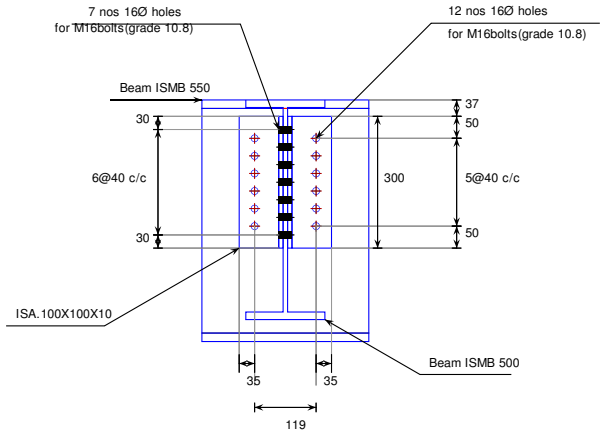
Views

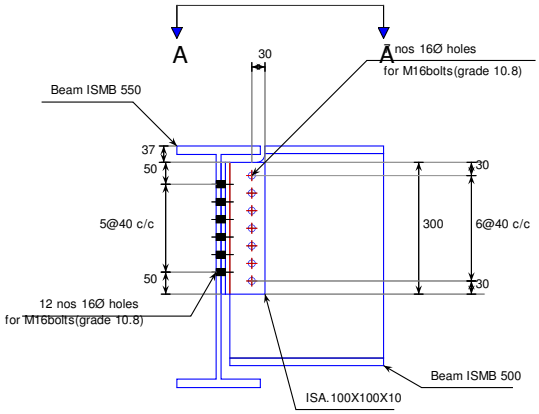




Top view (Sec A-A) (All distances are in "mm")



Side View (Sec B-B) (All distances are in "mm")



Front view (Sec C-C) (All distances are in "mm")

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Additional Comments	