 <small>Created with</small>	
Company Name	abc	Project Title	Cleat angle
Group/Team Name	xyz	Subtitle	
Designer	amit	Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

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)	100.0
Components	
Column Section	ISMB 450
Material	Fe 410
Beam Section	ISMB 300
Material	Fe 410
Hole	STD
Cleat Section	ISA 65X65X8
Thickness (mm)	8
Cleat Leg Size B (mm)	65
Cleat Leg Size A (mm)	65
Hole	STD
Bolts on Beam	
Type	Black Bolt
Grade	4.8
Diameter (mm)	12
Bolt Numbers	6
Columns (Vertical Lines)	1
Bolts Per Column	6
Gauge (mm)	0
Pitch (mm)	30
End Distance (mm)	22

Edge Distance (mm)	22
Bolts on Column	
Type	Black Bolt
Grade	4.8
Diameter (mm)	12
Bolt Numbers	12
Columns (Vertical Lines)	1
Bolts Per Column	6
Gauge (mm)	0
Pitch (mm)	30
End Distance (mm)	22
Edge Distance (mm)	22
Assembly	
Column-Beam Clearance (mm)	20

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Design Check: Secondary Beam Connectivity			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = ((2*400*0.6126*12*12)/(\sqrt{3}*1.25*1000)) = 31.223$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5*0.519*12*7.7*400)/(1.25*1000) = 38.364$ [cl. 10.3.4]	
Bearing capacity of beam web (kN)		$V_{dpb} = (2.5*0.519*12*7.7*410)/(1.25*1000) = 39.324$ [cl. 10.3.4]	
Bearing capacity of cleat (kN)		$V_{dpb} = (2.5*0.519*12*8*410)/(1.25*1000) = 40.856$ [cl. 10.3.4]	
Bearing capacity (kN)		Min (38.364, 39.324, 40.856) = 38.364	
Bolt capacity (kN)		Min (31.223, 38.364) = 31.223	
Critical bolt shear (kN)	≤ 31.223	13.201	Pass
No. of bolts		6	
No.of column(s)	≤ 2	1	
No. of bolts per column		6	
Bolt pitch (mm)	$\geq 2.5*12 = 30, \leq \text{Min}(32*7.7, 300) = 247$ [cl. 10.2.2]	30	Pass
Bolt gauge (mm)	$\geq ;2.5*12 = 30, \leq \text{Min}(32*7.7, 300) = 247$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7*13.0 = 22.1, \leq 12*7.7 = 92.4$ [cl. 10.2.4]	22	Pass
Edge distance	$\geq 1.7*13.0 = 22.1, \leq 12*7.7 = 92.4$	22	Pass

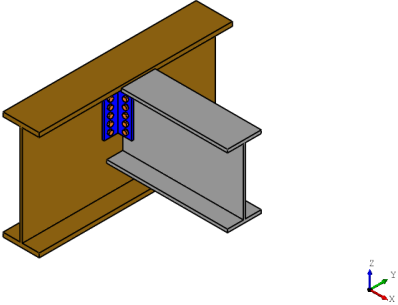
(mm)	[cl. 10.2.4]		
Block shear capacity (kN)	≥ 100.0	$V_{db} = 177.029$ [cl. 6.4.1]	Pass
Cleat height (mm)	$\geq 0.6 \cdot 300.0 = 180.0, \leq 300.0 - 13.1 - 14.0 - 17.4 - 15.0 - 5 = 235.5$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	194	Pass
Cleat moment capacity (kNm)	$(2 \cdot 31.223 \cdot 30^2) / (30 \cdot 1000) = 2.15$	$M_d = (1.2 \cdot 250 \cdot Z) / (1000 \cdot 1.1) = 90.326$ [cl. 8.2.1.2]	Pass


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Design Check: Primary Beam Connectivity			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = ((400 \times 0.6126 \times 12 \times 12) / (\sqrt{3} \times 1.25 \times 1000)) = 15.611$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.519 \times 12 \times 8.0 \times 400) / (1.25 \times 1000) = 39.859$ [cl. 10.3.4]	
Bearing capacity of beam web (kN)		$V_{dpb} = (2.5 \times 0.519 \times 12 \times 9.4 \times 410) / (1.25 \times 1000) = 48.005$ [cl. 10.3.4]	
Bearing capacity of cleat (kN)		$V_{dpb} = (2.5 \times 0.519 \times 12 \times 8 \times 410) / (1.25 \times 1000) = 40.856$ [cl. 10.3.4]	
Bearing capacity (kN)		Min (39.859, 48.005, 40.856) = 40.856	
Bolt capacity (kN)		Min (15.611, 40.856) = 15.611	
Critical bolt shear (kN)	≤ 15.611	13.924	Pass
No. of bolts		12	
No. of column(s) per angle	≤ 2	1	
No. of bolts per column per angle		6	
Bolt pitch (mm)	$\geq 2.5 \times 12 = 30, \leq \text{Min}(32 \times 8.0, 300) = 256$ [cl. 10.2.2]	30	Pass
Bolt gauge (mm)	$\geq 2.5 \times 12 = 30, \leq \text{Min}(32 \times 8.0, 300) = 256$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.7 \times 13.0 = 22.1, \leq 12 \times 8.0 = 96.0$ [cl. 10.2.4]	22	Pass
	$\geq 1.7 \times 13.0 = 22.1, \leq 12 \times 8.0 =$		-

Edge distance (mm)	96.0 [cl. 10.2.4]	22	Pass
Block shear capacity (kN)	≥ 100.0	$V_{db} = 177.029$ [cl. 6.4.1]	Pass
Cleat height (mm)	$\geq 0.6 \cdot 300.0 = 180.0, \leq 300.0 - 13.1 - 14.0 - 17.4 - 15.0 - 5 = 235.5$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	194	Pass
Cleat moment capacity (kNm)	$(2 \cdot 15.611 \cdot 30^2) / (30 \cdot 1000) = 2.342$	$M_d = (1.2 \cdot 250 \cdot Z) / (1000 \cdot 1.1) = 90.326$ [cl. 8.2.1.2]	Pass

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Additional Comments			