Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		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 110X110X12
Thickness (mm)	12
Cleat Leg Size B (mm)	110
Cleat Leg Size A (mm)	110
Hole	STD
Bolts on Beam	
Type	Black Bolt
Grade	4.8
Diameter (mm)	20
Bolt Numbers	3
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	73
End Distance (mm)	37

Edge Distance (mm)	37
Bolts on Column	
Type	Black Bolt
Grade	4.8
Diameter (mm)	20
Bolt Numbers	6
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	73
End Distance (mm)	37
Edge Distance (mm)	43.85
Assembly	
Column-Beam Clearance (mm)	20

Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Design Check: Secondary Beam Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = ((2*400*0.6126*20*20)/(√3*1.25*1000)) = 90.529 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dpb} = (2.5*0.508*20*7.7*400)/(1.25*1000) = 62.586 [cl. 10.3.4]	
Bearing capacity of beam web (kN)		V_{dpb} = (2.5*0.508*20*7.7*410)/(1.25*1000) = 64.15 [cl. 10.3.4]	
Bearing capacity of cleat (kN)		V_{dpb} = (2.5*0.508*20*12*410)/(1.25*1000) = 99.974 [cl. 10.3.4]	
Bearing capacity (kN)		Min (62.586, 64.15, 99.974) = 62.586	
Bolt capacity (kN)		Min (90.529, 62.586) = 62.586	
Critical bolt shear (kN)	≤ 62.586	30.046	**Pass**
No. of bolts		3	
No.of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*7.7, 300) = 247 [cl. 10.2.2]	73	**Pass**
Bolt gauge (mm)	≥ ;2.5*20 = 50, ≤ Min(32*7.7, 300) = 247 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*22.0 = 37.4, ≤ 12*7.7 = 92.4 [cl. 10.2.4]	37	**Pass**
Edge distance	≥ 1.7*22.0 = 37.4, ≤ 12*7.7 = 92.4	37	**Pass**
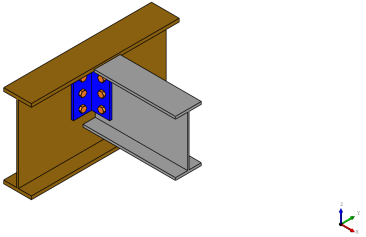
(mm)	[cl. 10.2.4]		
Block shear capacity (kN)	≥ 100.0	V_{db} = 362.695 [cl. 6.4.1]	**Pass**
Cleat height (mm)	≥ 0.6*300.0=180.0, ≤ 300.0-13.1-14.0-17.4-15.0- 5=235.5 [cl. 10.2.4, Insdag Detailing Manual, 2002]	220	**Pass**
Cleat moment capacity (kNm)	(2*90.529*73^2)/(73*1000) = 3.65	M_d = (1.2*250*Z)/(1000*1.1) = 174.24 [cl. 8.2.1.2]	**Pass**

Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Design Check: Primary Beam Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} =$ ((400*0.6126*20*20)/($\sqrt{3}$*1.25*1000)) = 45.264 [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} =$ (2.5*0.508*20*9.4*400)/(1.25*1000) = 76.403 [cl. 10.3.4]	
Bearing capacity of beam web (kN)		$V_{dpb} =$ (2.5*0.508*20*9.4*410)/(1.25*1000) = 78.313 [cl. 10.3.4]	
Bearing capacity of cleat (kN)		$V_{dpb} =$ (2.5*0.508*20*12*410)/(1.25*1000) = 99.974 [cl. 10.3.4]	
Bearing capacity (kN)		Min (76.403, 78.313, 99.974) = 99.974	
Bolt capacity (kN)		Min (45.264, 99.974) = 45.264	
Critical bolt shear (kN)	≤ 45.264	29.197	**Pass**
No. of bolts		6	
No.of column(s) per angle	≤ 2	1	
No. of bolts per column per angle		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*9.4, 300) = 300 [cl. 10.2.2]	73	**Pass**
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*9.4, 300) = 300 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*22.0 = 37.4, ≤ 12*9.4 = 112.8 [cl. 10.2.4]	37	**Pass**
	≥1.7*22.0 = 37.4, ≤12*9.4 =		

Edge distance (mm)	112.8 [cl. 10.2.4]	43.85	**Pass**
Block shear capacity (kN)	≥100.0	V_{db} = 381.377 [cl. 6.4.1]	**Pass**
Cleat height (mm)	≥ 0.6*300.0=180.0, ≤ 300.0-13.1-14.0-17.4-15.0- 5=235.5 [cl. 10.2.4, Insdag Detailing Manual, 2002]	220	**Pass**
Cleat moment capacity (kNm)	(2*45.264*73^2)/(73*1000) = 3.5	M_d = (1.2*250*Z)/(1000*1.1) = 174.24 [cl. 8.2.1.2]	**Pass**

Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Views

Company Name		Project Title	
Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Additional Comments	