Company Name	IIT Bombay	Project Title	Connection Design Examples
Group/Team Name	Osdag	Subtitle	End plate shear connection
Designer	Engineer #1	Job Number	1.1.2.3.1
Date	20 /06 /2018	Client	Pradyumna M

Design Conclusion	
End Plate	**Pass**
End Plate	
Connection Properties	
Connection	
Connection Title	Flexible End Plate
Connection Type	Shear Connection
Connection Category	
Connectivity	Beam-Beam
Beam Connection	Welded
Column Connection	Bolted
Loading (Factored Load)	
Shear Force (kN)	160
Components	
Column Section	MB 500
Material	Fe 410
Beam Section	MB 400
Material	Fe 410
Hole	STD
Plate Section	240X172X16
Thickness (mm)	16
Width (mm)	172
Depth (mm)	240
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	8
Bolts	
Type	Friction Grip Bolt
Grade	8.8
Diameter (mm)	20
Bolt Numbers	10
Columns (Vertical Lines)	1
Bolts Per Column	5
Gauge (mm)	0
Pitch (mm)	42

End Distance (mm)	36
Edge Distance (mm)	36
Assembly	
Column-Beam Clearance (mm)	16

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Design Preferences	
Bolt	
Hole Type	Over-sized
Hole Clearance (mm)	4.0
Material Grade (MPa) (overwrite)	800.0
Slip factor	0.2
Weld	
Type of Weld	Shop weld
Material Grade (MPa) (overwrite)	410.0
Detailing	
Type of Edges	Rolled, machine-flame cut, sawn and planed
Minimum Edge-End Distance	1.5 times the hole diameter
Are members exposed to corrosive influences?	No
Design	
Design Method	Limit State Design

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Design Check			
Check	**Required**	**Provided**	**Remark**
Bolt shear capacity (kN)		V_{dsf} = ((0.2*1*0.85*137.2)/(1.25)) = 18.659 [cl. 10.4.3]	
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)		18.659	**Pass**
Critical bolt shear (kN)	≤ 18.659	16.0	**Pass**
No. of bolts		10	
No.of column(s) per side of end plate	≤ 2	1	
No. of bolts per column per side of end plate		5	
Bolt pitch (mm)	≥ 2.5*20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	42	**Fail**
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.5 * 24.0 = 36, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	36	**Pass**
Edge distance (mm)	≥ 1.5 * 24.0 = 36, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	36	**Pass**
Block shear capacity (kN)	≥ 160	V_{db} = 161 [cl. 6.4.1]	**Pass**
Plate thickness (mm)	≥ 8	16	**Pass**
Plate height (mm)	≥ 0.6*400.0=240.0, ≤ 400.0-16.0-14.0-17.2-17.0- 5=330.8 [cl. 10.2.4, Insdag Detailing Manual, 2002]	240	**Pass**
Plate Width (mm)	≥ 172, ≤ 212	172	**Pass**
Effective weld length on each side(mm)		240-2*8 = 224	
Weld strength (kN/mm)	0.357	f_v = (0.7*8*410)/(√3*1.25*1000) = 1.06 [cl. 10.5.7]	**Pass**

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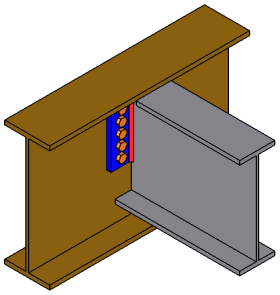
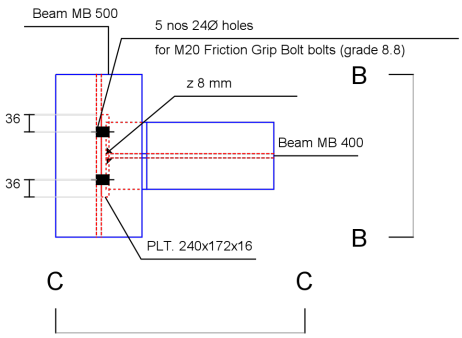
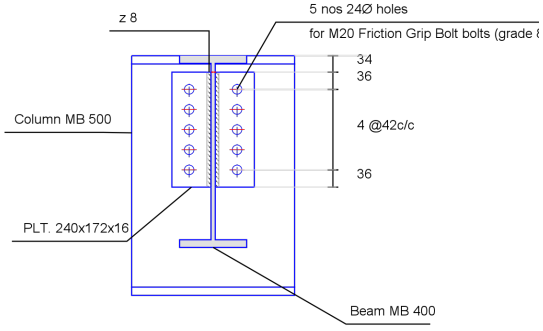
Date	**20 /06 /2018**	**Client**	**Pradyumna M**

Views

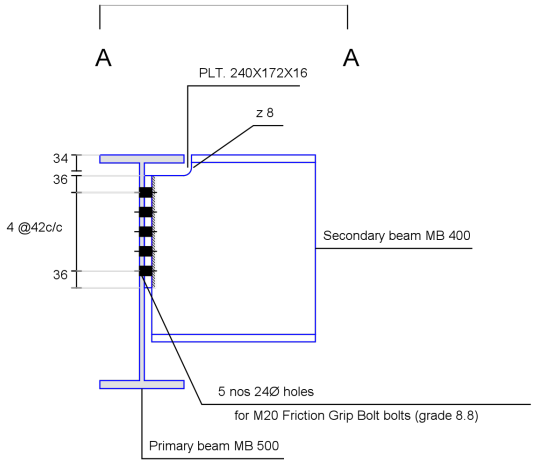




Top view (Sec A-A)
(All Dimensions are in mm)



Side view (Sec B-B)
(All Dimensions are in mm)



Front view (Sec C-C)
(All Dimensions are in mm)

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Date	**20 /06 /2018**	**Client**	**Pradyumna M**

Additional Comments	This is a sample design report generated in Osdag!