Company Name	IIT Bombay	Project Title	Connection Design Examples
Group/Team Name	Osdag	Subtitle	Fin plate shear connection
Designer	Engineer #1	Job Number	1.1.1.1.1
Date	20 /06 /2018	Client	Manas M. Ghosh, INSDAG, Kolkata

Design Conclusion	
Fin Plate	**Pass**
Fin Plate	
Connection Properties	
Connection	
Connection Title	Single Fin Plate
Connection Type	Shear Connection
Connection Category	
Connectivity	Column flange-Beam web
Beam Connection	Bolted
Column Connection	Welded
Loading (Factored Load)	
Shear Force (kN)	140
Components	
Column Section	UC 305 x 305 x 97
Material	Fe 410.0
Beam Section	MB 500
Material	Fe 410.0
Hole	STD
Plate Section	300X110X12
Thickness (mm)	12
Width (mm)	110
Depth (mm)	300
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	12
Bolts	
Type	Friction Grip Bolt
Grade	8.8
Diameter (mm)	24
Bolt Numbers	3
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	100

End Distance (mm)	50
Edge Distance (mm)	50
Assembly	
Column-Beam Clearance (mm)	10.0

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Date	**20 /06 /2018**	**Client**	**Manas M. Ghosh, INSDAG, Kolkata**

Design Preferences	
Bolt	
Hole Type	Standard
Hole Clearance (mm)	2.0
Material Grade (MPa) (overwrite)	800.0
Slip factor	N/A
Weld	
Type of Weld	Shop weld
Material Grade (MPa) (overwrite)	410.0
Detailing	
Type of Edges	Sheared or hand flame cut
Minimum Edge-End Distance	1.7 times the hole diameter
Gap between Beam and Column (mm)	10.0
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} = ((0.3*1*1.0*197.68)/(1.25)) = 47.4432 [cl. 10.4.3]	
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)		47.4432	**Pass**
No. of bolts	140/47.4432 = 3.0	3	**Pass**
No.of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	≥ 2.5* 24 = 60, ≤ Min(32*10.2, 300) = 300 [cl. 10.2.2]	100	**Pass**
Bolt gauge (mm)	≥ 2.5*24 = 60, ≤ Min(32*10.2, 300) = 300 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*26 = 44, ≤ 12*10.2 = 122.4 [cl. 10.2.4]	50	**Pass**
Edge distance (mm)	≥ 1.7*26 = 44, ≤ 12*10.2 = 122.4 [cl. 10.2.4]	50	**Pass**
Block shear capacity (kN)	≥ 140	V_{db} = 437	**Pass**
Plate thickness (mm)	(5*140*1000)/(300*250.0) = 9 [Owens and Cheal, 1989]	12	**Pass**
Plate height (mm)	≥ 0.6*500=300.0, ≤ 500-17-17-10=422.0 [cl. 10.2.4, Insdag Detailing Manual, 2002]	300	**Pass**
Plate width (mm)		100	
Plate moment capacity (kNm)	(2*47.4432*100^2)/(100*1000) = 9.489	M_d = (1.2*250.0*Z)/(1000*1.1) = 49.09 [cl. 8.2.1.2]	**Pass**
Effective weld length on each side (mm)		300-2*12 = 276	
Weld strength (kN/mm)	$\sqrt{[(9489*6)/(2*276^2)]^2}$ + $[140/(2*276)]^2$ = 0.452	f_V= (0.7*12*410)/(√3*1.25) = 1.591 [cl. 10.5.7]	**Pass**

Weld thickness (mm)	Max((0.452*1000*√3* 1.25)/(0.7 * 410),12* 0.8) = 9.6 [cl. 10.5.7, Insdag Detailing Manual, 2002]	12	**Pass**

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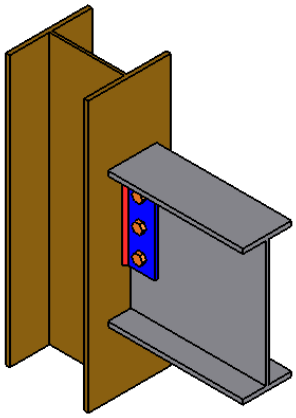
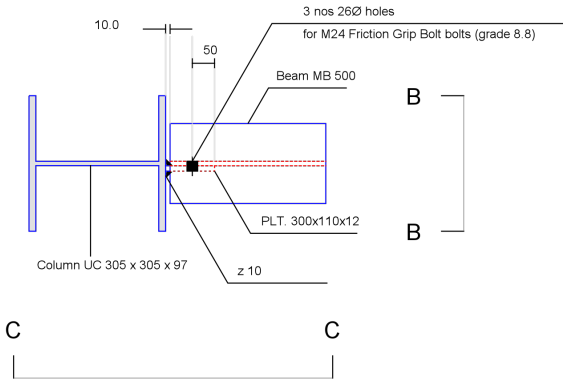
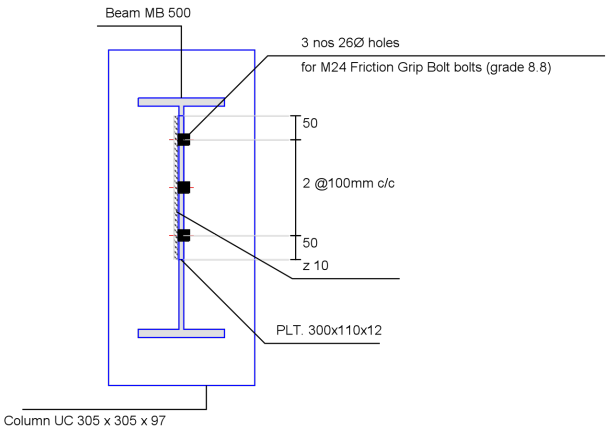
Views

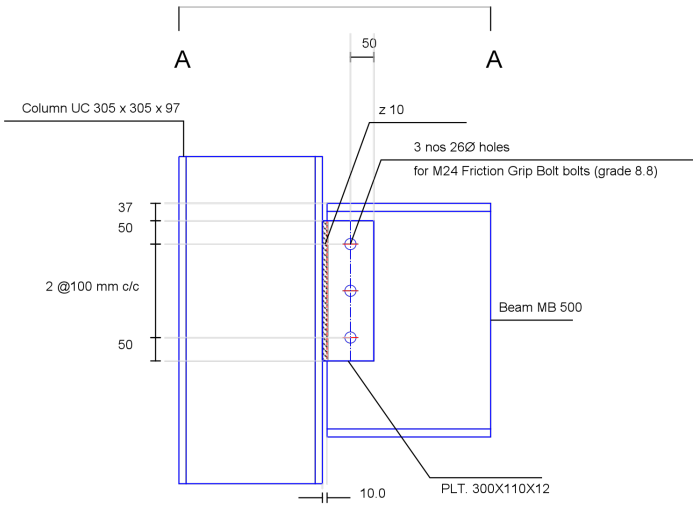




Top view (Sec A-A)
(All dimensions are in "mm")



Side view (Sec B-B)
(All dimensions are in "mm")



Front view (Sec A-A)
(All dimensions are in "mm")

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Date	**20 /06 /2018**	**Client**	**Manas M. Ghosh, INSDAG, Kolkata**

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