Company Name	IIT Bombay	Project Title	Connection Design Examples
Group/Team Name	Osdag	Subtitle	Seated angle shear connection
Designer	Engineer #1	Job Number	1.1.4.1.1
Date	20 /06 /2018	Client	Somnath Mukherjee

Design Conclusion	
Seated Angle	**Pass**
Seated Angle	
Connection Properties	
Connection	
Connection Title	Seated Angle
Connection Type	Shear Connection
Connection Category	
Connectivity	Column flange-Beam flange
Beam Connection	Bolted
Column Connection	Bolted
Loading (Factored Load)	
Shear Force (kN)	100.0
Components	
Column Section	UC 203 x 203 x 86
Material	Fe 410
Hole	Standard
Beam Section	MB 300
Material	Fe 410
Hole	Standard
Seated Angle Section	150 150 X 15
Material	Fe 410
Hole	Standard
Top Angle Section	150 150 X 10
Material	Fe 410
Hole	Standard
Bolts	
Type	Friction Grip Bolt
Grade	10.9
Diameter (mm)	20
Bolts - Required	2
Bolts - Provided	2
Rows	1
Columns	2
Gauge (mm)	60.0
Pitch (mm)	0.0

End Distance (mm)	85
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	10.0

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Design Preferences	
Bolt	
Hole Type	Standard Hole
Material Grade Fu (MPa) (overwrite)	940
Slip Factor	0.55
Detailing	
Type of Edge	Sheared or hand flame cut
Minimum Edge Distance check multiplier	1.7 * bolt_hole_diameter
Are members exposed to corrosive influences?	No
Gap between Beam and Column (mm)	10.0
Design	
Design Method	Limit State Design

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Design Check			
Check	**Required**	**Provided**	**Remark**
Bolt Checks			
Bolt shear capacity (kN)	Friction Grip Bolt bolt shear capacity: [cl. 10.3.3]	V_{dsf} = (0.55)*(1)*(1.0)*(0.6126*20^2) *(0.70*1000)/1.25/1000 = 75.46	
Bolt bearing capacity (kN)	V_{dpb}: [Cl. 10.3.4]	N/A	
Bolt capacity (kN)	min (bolt_shear_capacity, bolt_bearing_capacity)	min (75.46, 0.0) = 75.46	
No. of bolts	100.0/75.46 = 2.0	2	**Pass**
No. of columns		2	
No. of row(s)	≤ 2	1	
Bolt pitch (mm)	N/A	N/A	
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ min(32*15.0, 300) = 300.0 [cl. 10.2.2]	60.0	**Pass**
End distance (mm)	≥1.7*22 = 38	85	**Pass**
Edge distance (mm)	≥1.7*22 = 38 [cl. 10.2.4.2] ≤ 12*15.0sqrt(250/250) = 180.0[Cl 10.2.4.3]	40	**Pass**
Seated Angle 150 150 X 15			
Length (mm)	= min(140.0, 209.1)	140	
Outstanding leg length (mm)	[Cl. 8.7.4] = (100.0*1000*1.1/(250*7.7)) + 10.0	150	**Pass**
Shear capacity of outstanding leg (kN)	$V_{dp} \geq V$ $V_{dp} \geq$ 100.0kN [Cl. 8.4.1]	= (140*15.0)*250/ (√ 3 *1.1) = 333.4	**Pass**

Moment capacity of outstanding leg (kN-mm)	As V ≤ 0.6 V_d, [Cl 8.2.1.2] is applicable M_d ≥ Moment at root of angle M_d ≥ 136.1	M_d = min(beta$_b$$Z_e$$f_y$/gamma$_{m0}$, 1.5$Z_e$$f_y$/gamma$_{m0}$) = min(1.0* 140*(15.0^2/6)*250/1.1, 1.5*140*(15.0^2/6)*250/1.1) = 1193.2	**Pass**
Top Angle			
Section	Recommended size (based on stability only): 80 80 X 8	User selected size: 150 150 X 10	
End distance (mm)	≥1.7*bolt_hole_diameter [cl. 10.2.4.2] ≥1.7*22 = 38	on leg connected to Beam: 70 on leg connected to Column: 70	**Pass**

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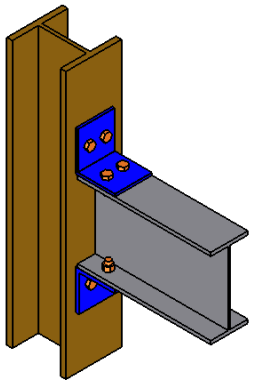
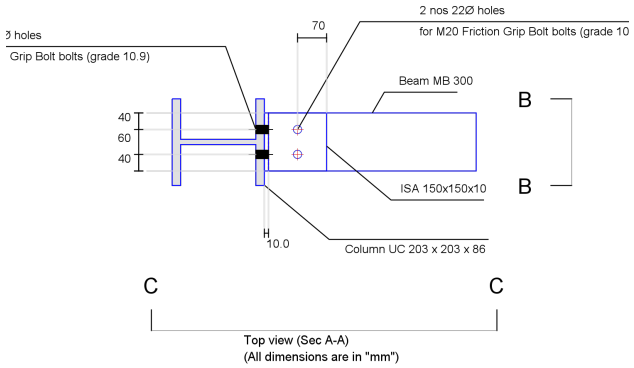
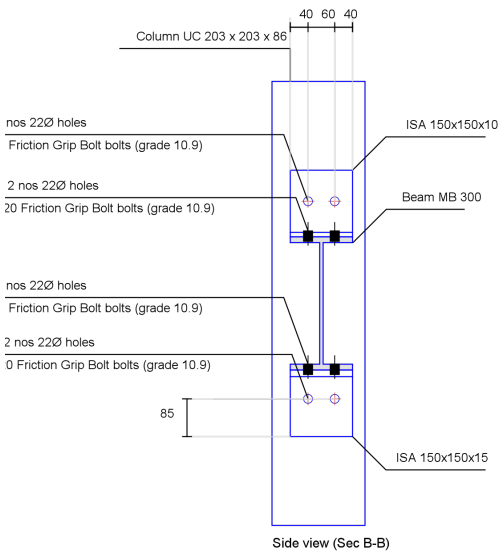
Views

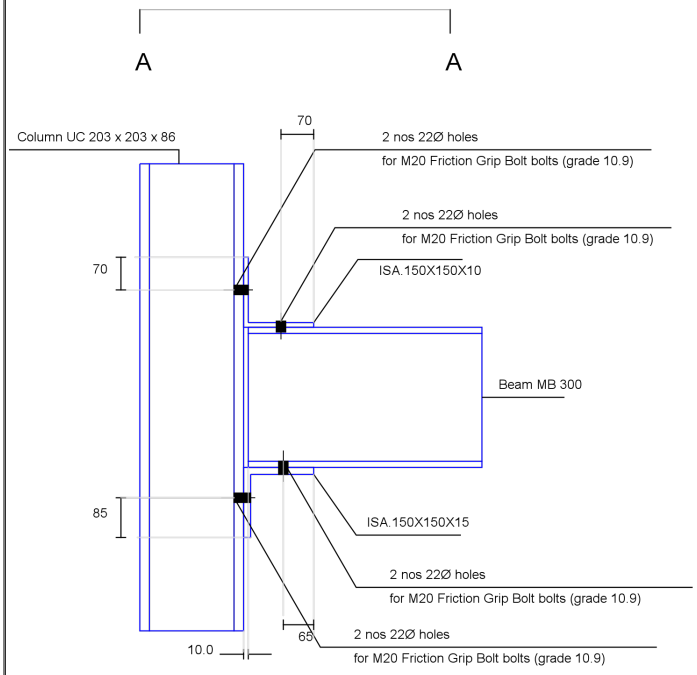




Top view (Sec A-A)
(All dimensions are in "mm")



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



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

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