Company Name	IIT Bombay	Project Title	Moment Connection Design Examples
Group/Team Name	Osdag	Subtitle	Cover Plate Moment Connection
Designer	Engineer #1	Job Number	1.2.1.1.1.1
Date	21 /06 /2018	Client	Manas M. Ghosh, INSDAG, Kolkata

Design Conclusion	
Beam to Beam Spliced Cover Plate	**Pass**
Beam to Beam Spliced Cover Plate	
Connection Properties	
Connection	
Connection Title	Beam to Beam Spliced Cover Plate
Connection Type	Moment Connection
Connection Category	
Connectivity	Bolted
Loading (Factored Load)	
Moment (kNm)	140.0
Shear Force (kN)	110.0
Axial Force (kN)	40.0
Components	
Beam Section	MB 450
Material	Fe 410.0
Hole	Standard
Flange Splice Plate	525 X 150 X 20
Thickness (mm)	20
Height (mm)	525
Width (mm)	150
Hole	Standard
Web Splice Plate	240 X 165 X 10
Thickness (mm)	10
Height (mm)	240
Width (mm)	165
Hole	Standard
Bolts	
Type	Friction Grip Bolt
Grade	8.8
Diameter (mm)	20
Flange Splice Plate	
Total no. of Bolts	32
No. of Rows (Parallel to Beam Length; Connecting Each Beam)	4
No. of Columns	2

(Perpendicular to Beam Length; Connecting Each Beam)	
Gauge (mm)	80
Pitch (mm)	60
End Distance (mm)	40
Edge Distance (mm)	40
Web Splice Plate	
Total no. of Bolts	6
No. of Rows (Parallel to Beam Length; Connecting Each Beam)	3
No. of Columns (Perpendicular to Beam Length; Connecting Each Beam)	1
Gauge (mm)	85
Pitch (mm)	80
End Distance (mm)	40
Edge Distance (mm)	40
Assembly	
Beam-Beam Clearance (mm)	5.0

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Date	**21 /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	0.48
Detailing	
Type of Edges	Sheared or hand flame cut
Minimum Edge/End Distance	1.7 times the hole diameter
Gap between Beams (mm)	5.0
Are Members Exposed to Corrosive Influences?	No
Design	
Design Method	Limit State Design

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Design Check: Flange Splice Plate			
Check	**Required**	**Provided**	**Remark**
Bolt shear capacity (kN)		V_{dsf} = ((0.48 * 1 * 1.0 * 137.2) / (1.25)) = 52.68 [cl. 10.4.3]	
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)		52.68	
No. of bolts parallel to beam length; connecting each beam	(1.05 * 343.62) / 52.68 = 6.8	8	**Pass**
No. of rows of bolt (parallel to beam length; connecting each beam)		4	
No. of column(s) of bolt (perpendicular to beam length; connecting each beam)		2	
Total no. of bolts	4 * 8 = 32	32	**Pass**
Bolt pitch (mm)	≥ 2.5 * 20 = 50.0, ≤ min(32 * 17.4, 300) = 300.0 [cl. 10.2.2]	60	**Pass**
Bolt gauge (mm)	≥ 2.5 * 20 = 50, ≤ min(32 * 17.4, 300) = 300.0 [cl. 10.2.2]	80	**Pass**
End distance (mm)	≥ 1.7 * 22 = 37, ≤ 12 * 17.4 = 112.8 [cl. 10.2.4]	40	**Pass**
Edge distance (mm)	≥ 1.7 * 22 = 37, ≤ 12 * 17.4 = 112.8 [cl. 10.2.4]	40	**Pass**
Block shear capacity (kN)	≥ 343.62	V_{db} = 1251.14 [cl. 6.4.1]	**Pass**
Flange plate thickness (mm)	14.3 [Cl. 6.2]	20	**Pass**
Flange plate height (mm)	≥ 2 * min(150.0, 225) + 5.0 = 305.0 [SCI - 6th edition, page-754]	525	**Pass**
Flange plate width (mm)	≥ 130.0, ≤150.0	150	**Pass**

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Design Check: Web Splice Plate			
Check	**Required**	**Provided**	**Remark**
Bolt shear capacity (kN)		V_{dsf} = ((0.48 * 2 * 1.0 * 137.2) / (1.25)) = 105.37 [cl. 10.4.3]	
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)		105.37	
No. of bolts parallel to beam length; connecting each beam	110.0 / 105.37 = 1.04	3.0	**Pass**
No. of rows of bolt (parallel to beam length; connecting each beam)		3	
No. of column(s) of bolt (perpendicular to beam length; connecting each beam)		1	
Total no. of bolts	2 * 3.0 = 6	6	**Pass**
Bolt pitch (mm)	≥ 2.5 * 20 = 50.0, ≤ min(32 * 9.4, 300) = 300.0 [cl. 10.2.2]	80	**Pass**
Bolt gauge (mm)	≥ 2.5 * 20 = 50, ≤ min(32 * 9.4, 300) = 300.0 [cl. 10.2.2]	85	**Pass**
End distance (mm)	≥ 1.7 * 22 = 37, ≤ 12 * 9.4 = 112.8 [cl. 10.2.4]	40	**Pass**
Edge distance (mm)	≥ 1.7 * 22 = 37, ≤ 12 * 9.4 = 112.8 [cl. 10.2.4]	40	**Pass**
Block shear capacity (kN)	≥ 110.0	V_{db} = 327.16 [cl. 6.4.1]	**Pass**
Web plate thickness (mm)	≥ max(9.8, 4.7) = 9.8	10	**Pass**
Web plate height (mm)	≤ 450.0 - 2 * 17.4 - 2 * 15.0 - 2 * 5 = 365.2 [SCI - 6th edition, page 754]	240	**Pass**
Web plate width (mm)		165	

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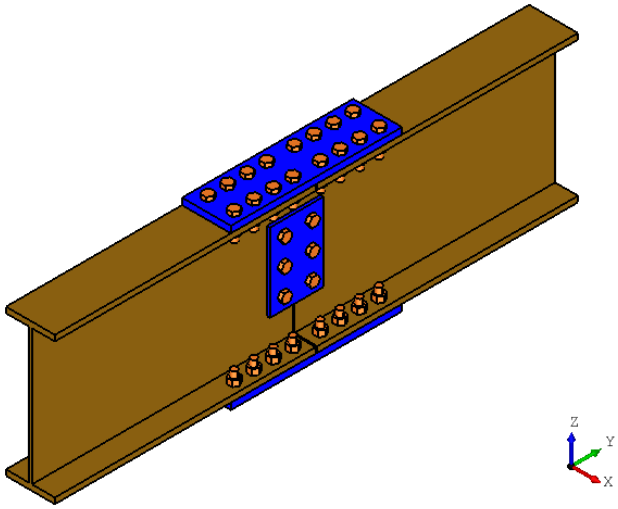
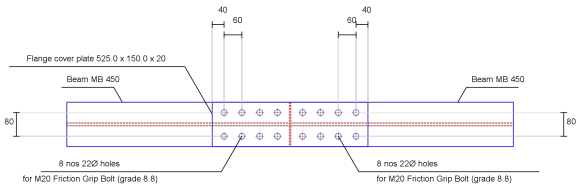
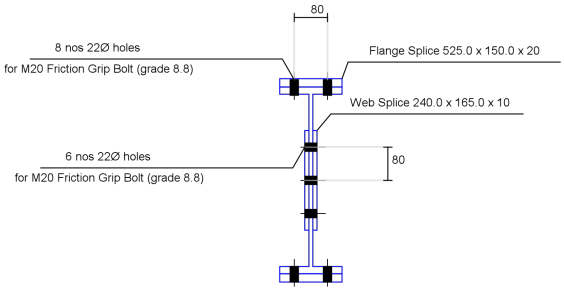
Date	**21 /06 /2018**	**Client**	**Manas M. Ghosh, INSDAG, Kolkata**

Views

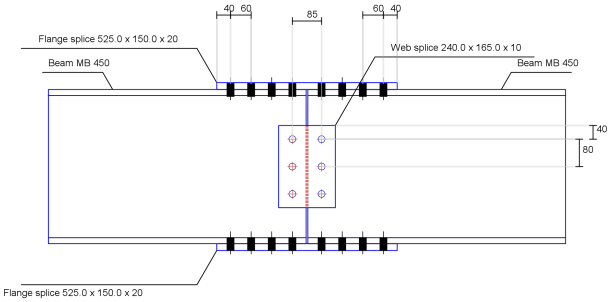




Top view (Sec A-A)
(All dimensions are in "mm")



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	Good Design!