 Created with	
<b>Company Name</b>	<b>Tata Consulting Engineers Ltd.</b>	<b>Project Title</b>	<b>End Plate Problem</b>
<b>Group/Team Name</b>	<b>Team 1</b>	<b>Subtitle</b>	
<b>Designer</b>	<b>Mazhar</b>	<b>Job Number</b>	<b>2</b>
<b>Date</b>	<b>04 /06 /2016</b>	<b>Method</b>	<b>Limit State Design (No Earthquake Load)</b>

<b>Design Conclusion</b>	
<b>Endplate</b>	<b>Pass</b>
<b>Endplate</b>	
<b>Connection Properties</b>	
<b>Connection</b>	
Connection Title	Flexible Endplate
Connection Type	Shear Connection
<b>Connection Category</b>	
Connectivity	Column flange-Beam web
Beam Connection	Welded
Column Connection	Bolted
<b>Loading (Factored Load)</b>	
Shear Force (kN)	160
<b>Components</b>	
<b>Column Section</b>	ISSC 250
Material	Fe 410
<b>Beam Section</b>	ISMB 400
Material	Fe 410
Hole	STD
<b>Plate Section</b>	240X174X10
Thickness (mm)	10
Width (mm)	174
Depth (mm)	240
Hole	STD
<b>Weld</b>	
Type	Double Fillet

Size (mm)	8
<b>Bolts</b>	
Type	HSFG
Grade	8.8
Diameter (mm)	20
Bolt Numbers	6
Columns (Vertical Lines)	2
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	50
End Distance (mm)	70
Edge Distance (mm)	37
<b>Assembly</b>	
Column-Beam Clearance (mm)	10

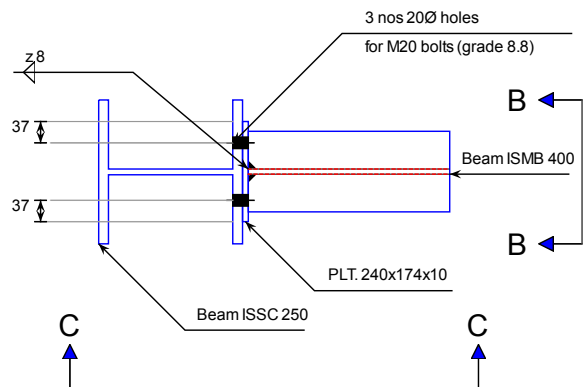
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<b>Design Check</b>			
<b>Check</b>	<b>Required</b>	<b>Provided</b>	<b>Remark</b>
<b>Bolt shear capacity (kN)</b>		$V_{dsb} = ((800.0 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000)) = 52.694$ [cl. 10.3.3]	
<b>Bolt bearing capacity (kN)</b>		$V_{dpb} = (2.5 \times 0.508 \times 20 \times 10.0 \times 410) / (1.25 \times 1000) = 83.312$ [cl. 10.3.4]	
<b>Bolt capacity (kN)</b>		Min (52.694, 83.312) = 52.694	<b>Pass</b>
<b>Critical bolt shear (kN)</b>	$\leq 52.694$	48.074	<b>Pass</b>
<b>No. of bolts</b>		6	
<b>No. of column(s)</b>	$\leq 2$	2	
<b>No. of bolts per column per side of end plate</b>		3	
<b>Bolt pitch (mm)</b>	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	50	<b>Pass</b>
<b>Bolt gauge (mm)</b>	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.9, 300) = 285$ [cl. 10.2.2]	0	
<b>End distance (mm)</b>	$\geq 1.7 \times 22.0 = 37.4, \leq 12 \times 8.9 = 106.8$ [cl. 10.2.4]	70	<b>Pass</b>
<b>Edge distance</b>	$\geq 1.7 \times 22.0 = 37.4, \leq$		

(mm)	$12 \times 8.9 = 106.8$ [cl. 10.2.4]	37	Pass
Block shear capacity (kN)	$\geq 160$	$V_{db} = 203$ [cl. 6.4.1]	
Plate thickness (mm)	$\geq 8$	10	Pass
Plate height (mm)	$\geq 0.6 \times 400.0 = 240.0, \leq 400.0 - 16.0 - 14.0 - 16.0 - 14.0 - 10 = 330.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	240	Pass
Plate Width (mm)	$\geq 174, \leq 250.0$	174	Pass
Effective weld length (mm)		$240 - 2 \times 8 = 224$	
Weld strength (kN/mm)	0.357	$f_v = (0.7 \times 8 \times 410) / (\sqrt{3} \times 1.25 \times 1000)$ $= 1.06$ [cl. 10.5.7]	Pass

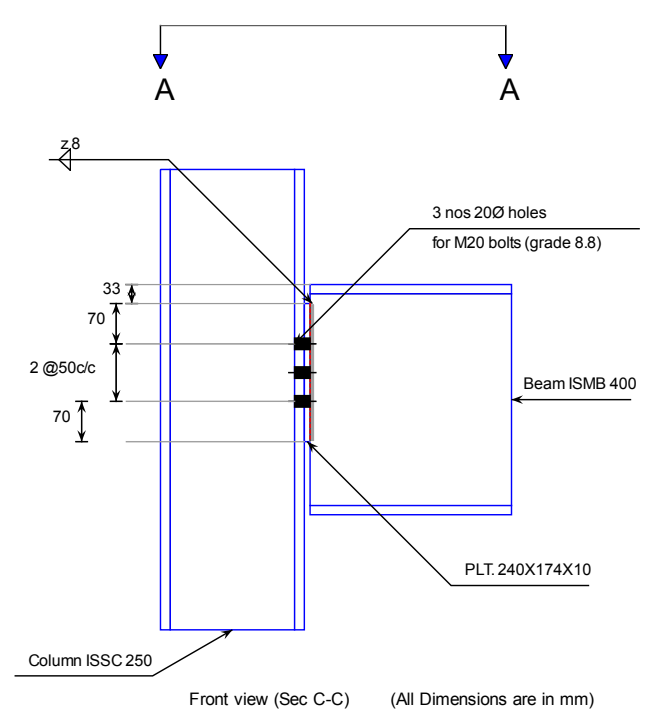
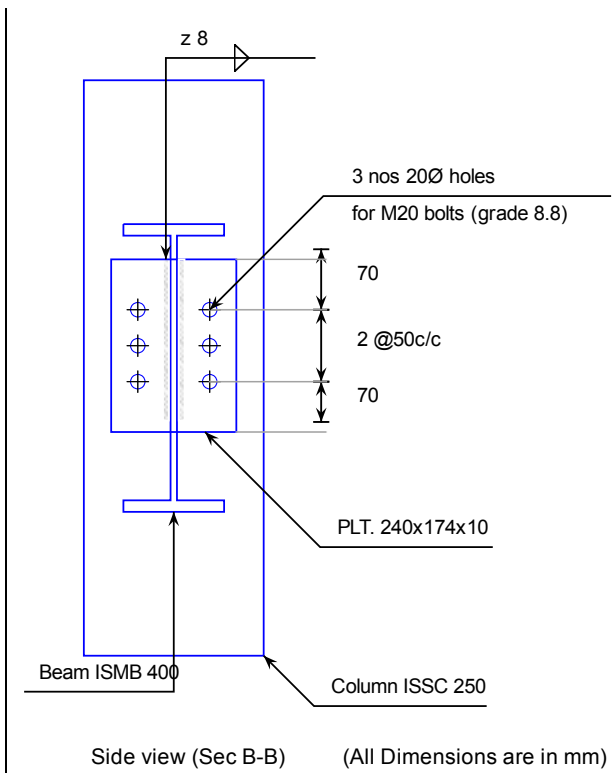
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<b>Group/Team Name</b>	<b>Team 1</b>	<b>Subtitle</b>	
<b>Designer</b>	<b>Mazhar</b>	<b>Job Number</b>	<b>2</b>
<b>Date</b>	<b>04 /06 /2016</b>	<b>Method</b>	<b>Limit State Design (No Earthquake Load)</b>


## Views



Top view (Sec A-A)

(All Dimensions are in mm)



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<b>Designer</b>	<b>Mazhar</b>	<b>Job Number</b>	<b>2</b>
<b>Date</b>	<b>04 /06 /2016</b>	<b>Metdod</b>	<b>Limit State Design (No Earthquake Load)</b>

<b>Additional Comments</b>	Comment for End plate problem
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