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Company Name	Aker Solutions Pvt. Ltd.	Project Title	Connection Design
Group/Team Name		Subtitle	Fin Plate - MB400
Designer	Amol Taralkar	Job Number	2016
Date	04 /06 /2016	Method	Limit State Design (No Earthquake Load)

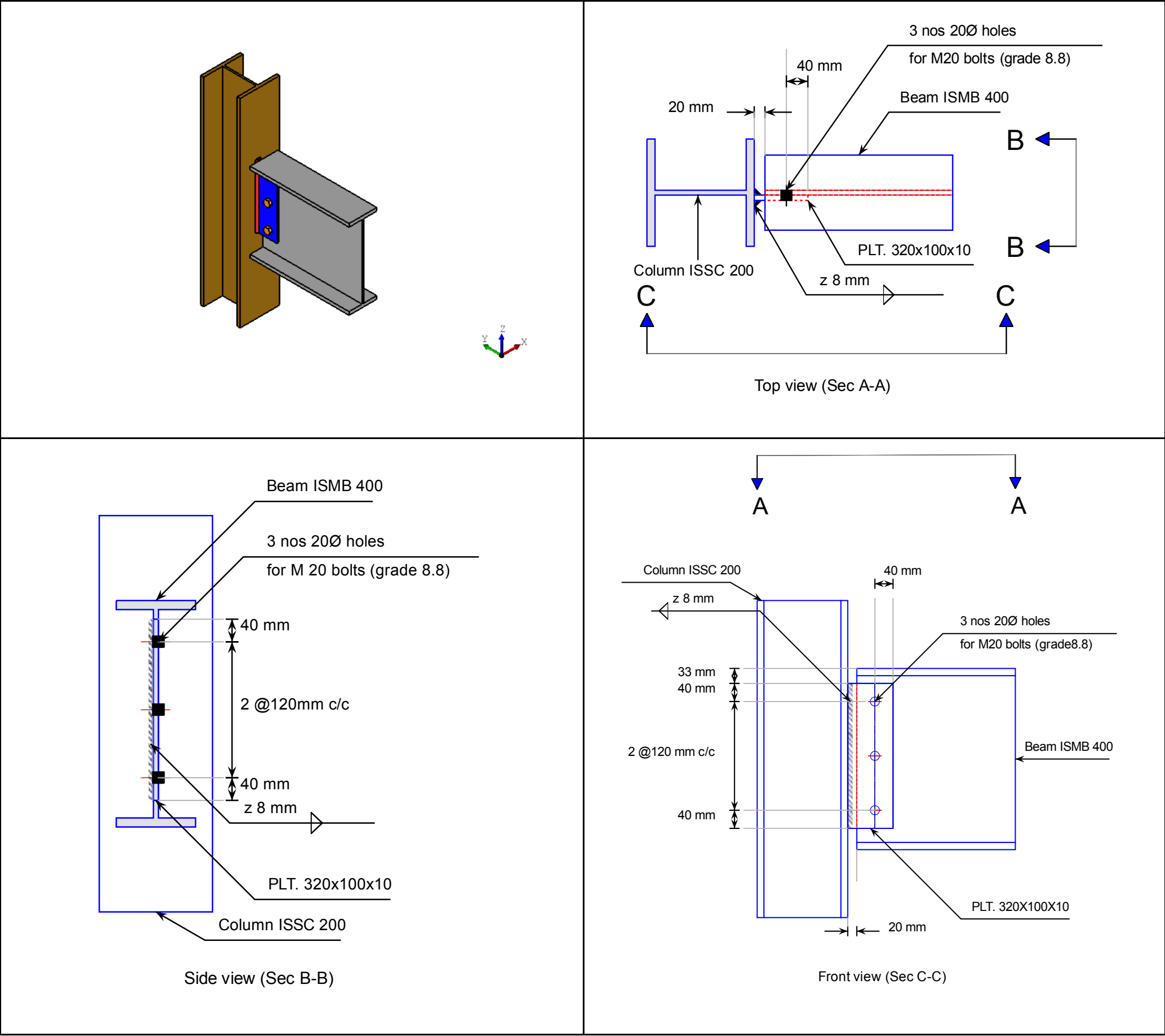
Design Conclusion	
Finplate	Pass
Finplate	
Connection Properties	
Connection	
Connection Title	Single Finplate
Connection Type	Shear Connection
Connection Category	
Connectivity	Column flange-Beam web
Beam Connection	Bolted
Column Connection	Welded
Loading (Factored Load)	
Shear Force (kN)	160
Components	
Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	320X100X10
Thickness (mm)	10
Width (mm)	100
Depth (mm)	320
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	8
Bolts	
Type	HSFG
Grade	8.8
Diameter (mm)	20
Bolt Numbers	3
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	120
End Distance (mm)	40
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	20


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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (800 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000) = 90.529$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.508 \times 20 \times 8.9 \times 410) / (1.25 \times 1000) = 74.148$ [cl. 10.3.4]	
Bolt capacity (kN)		Min (90.529, 74.148) = 74.148	
No. of bolts	160/74.148 = 2.2	3	Pass
No.of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	120	Pass
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*22 = 37.4, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	40	Pass
Edge distance (mm)	≥ 1.7*22 = 37.4, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	40	Pass
Block shear capacity (kN)	≥ 160	$V_{db} = 453$	Pass
Plate thickness (mm)	(5*160*1000)/(320*250) = 10.0 [Owens and Cheal, 1989]	10	Pass
Plate height (mm)	≥ 0.6*400=240.0, ≤ 400-16-14-10=330.0 [cl. 10.2.4, Insdag Detailing Manual, 2002]	320	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	(2*90.529*120 <sup>2</sup> )/(120*1000) = 14.485	$M_d = (1.2 \times 250 \times Z) / (1000 \times 1.1) = 46.55$ [cl. 8.2.1.2]	Pass
Effective weld length (mm)		320-2*10 = 300	
Weld strength (kN/mm)	$\sqrt{[(14485 \times 6) / (2 \times 300^2)]^2 + [160 / (2 \times 300)]^2} = 0.552$	$f_v = (0.7 \times 8 \times 410) / (\sqrt{3} \times 1.25) = 1.326$ [cl. 10.5.7]	Pass
Weld thickness (mm)	Max((0.552*1000*√3* 1.25)/(0.7 * 410),10* 0.8) = 8.0 [cl. 10.5.7, Insdag Detailing Manual, 2002]	8	Pass

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Views



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Additional Comments			