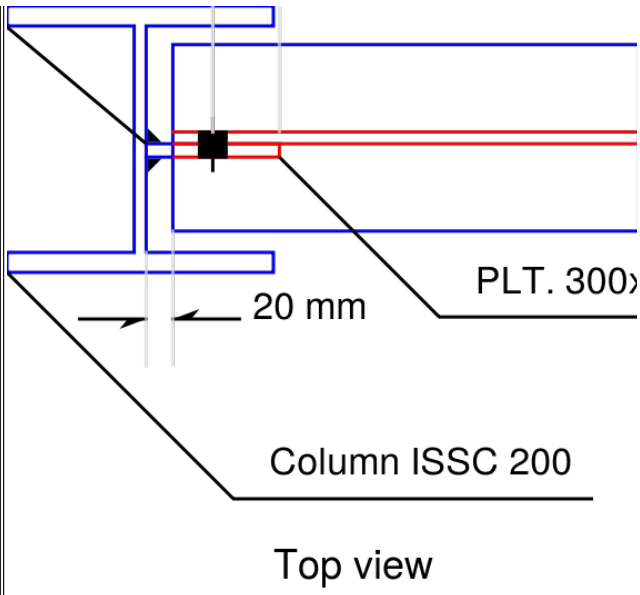
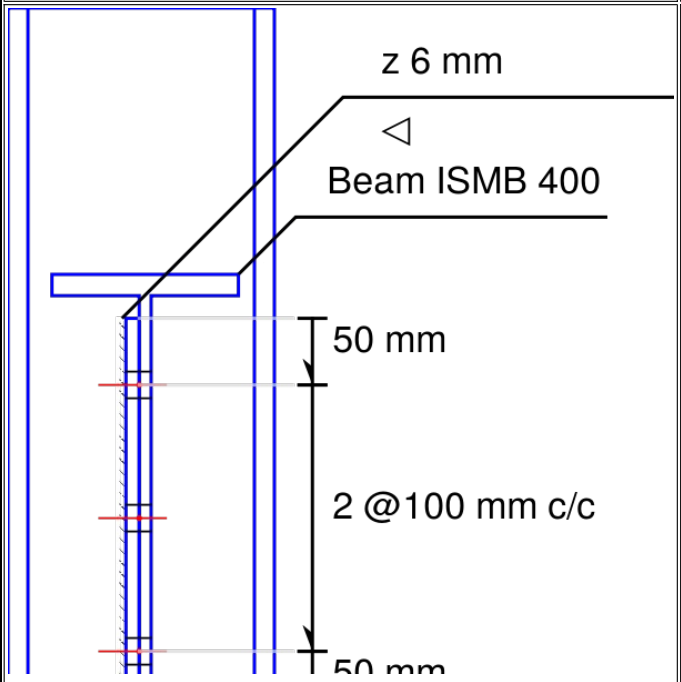
Osdag
Open Steel Design and Graphics

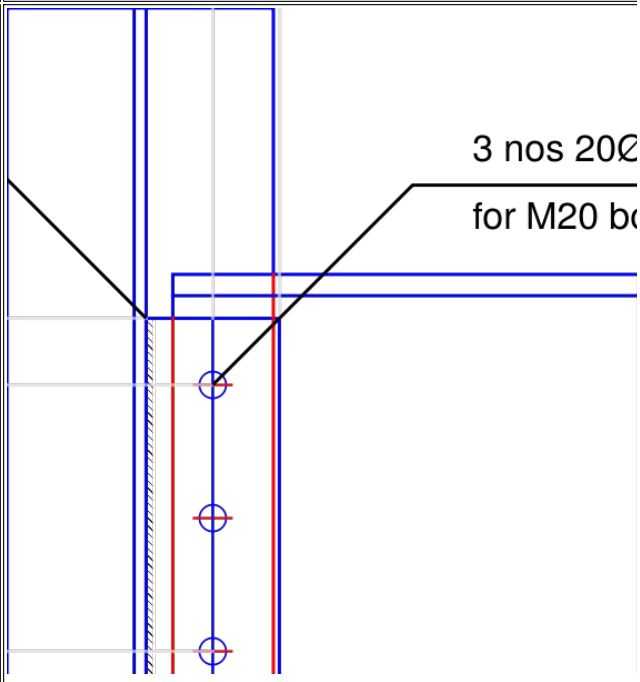
Date:12/01/2016

Project Summary	
Project Title	**Finplate Connection**
Company	**Osdag**
Designer	**Subhrajit Dutta**
Job Number	**test_1**
Design Code	**IS 800:2007**
Method	**Limit state design (LSD)**
Design Conclusion	
Finplate	**Pass**
Finplate	
Connection Properties	
Connection	
Connection Title	Single Finplate
Connection Type	Shear Connection
Connection Category	
Connectivity	Column Web Beam Web
Beam Connection	Bolted
Beam Connection	Bolted
Column Connection	Welded
Loading (Factored Load)	
Shear Force (kN)	140
Components	
Column Section	ISSC 200
Material	Fe 410
Beam Section	ISMB 400
Material	Fe 410
Hole	STD
Plate Section	PLT 300X10X100
Thickness (mm)	10
Width (mm)	10
Depth (mm)	300
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	6
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)	100
End Distance (mm)	50
Edge Distance (mm)	50
Assembly	
Column-Beam Clearance (mm)	20

Views







Design Check

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = ((800*0.6123*20*20)/(√3*1.25*1000) = 90.53 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dsb} = (2.5*0.5*20*8.9*410) = 72.98 [cl. 10.3.4]	
Bolt capacity (kN)		Min (90.53,72.98) = 72.98	**Pass**
No. of bolts	140/72.98 = 1.9	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) = 300 [cl. 10.2.2]	100	
	≥2.5*20 = 50,≤ Min(32*8.9, 300) =		

Bolt gauge (mm)	300 [cl. 10.2.2]	0	
End distance (mm)	≥1.7* 22 = 37.4,≤12*8.9 = 106.9 [cl. 10.2.4]	50	
Edge distance (mm)	≥ 1.7* 22 = 37.4,≤12*8.9 = 106.9 [cl. 10.2.4]	50	**Pass**
Plate thickness (mm)	(5*140*1000)/(300*250)= 9.33	10	
Plate height (mm)		300	
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2*90.5*100^2)/100$ = 18.1	M_d =1.2*250*Z = 40.9 [cl. 8.2.1.2]	**Pass**
Effective weld length (mm)		300 - 2*6 = 288	
Weld strength (kN/mm)	$\sqrt{[(18100*6)/(2*288)^2]^2 + [140/(2*288)]^2}$ =0.699	f_v=(0.7*6*410)/(√3*1.25) = 0.795 [cl. 10.5.7]	**Pass**
Weld thickness (mm)	(0.699*√3*1.25)/(0.7*410)=5.27 [cl. 10.5.7]	6	**Pass**

Design Check

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Bolt bearing capacity (kN)	V_{dsb} = (2.5*0.5*20*8.9*410) = 72.98 [cl. 10.3.4]		
Bolt Capacity (kN)	Min (90.53,72.98) = 72.98		**Pass**
No. of bolts	140/72.98 = 1.9	3	
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Plate thickness (mm)	9.33	10	
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Plate width (mm)		100	
Plate moment capacity (kNm)	18.1	M_d =1.2*250*Z = 40.9 [cl. 8.2.1.2]	**Pass**
Weld thickness (mm)	6	6	
Weld strength (kN/mm)	0.699	f_v=(6*250)/(√3*1.25*1000) = 0.96 [cl. 10.5.7]	**Pass**