



Company Name	Wymer & Dibble	Project Title	A simple block of flats
Group/Team Name	Flying Circus	Subtitle	Cantilever floors
Designer	Mr. Wymer	Job Number	1.1.1.2.1
Date	18 /06 /2017	Client	Mr. Tid

Design Conclusion

Fin Plate	Pass
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Fin Plate

Connection Properties

Connection

Connection Title	Single Fin Plate
Connection Type	Shear Connection

Connection Category

Connectivity	Column web-Beam web
Beam Connection	Bolted
Column Connection	Welded

Loading (Factored Load)

Shear Force (kN)	120
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Components

Column Section	PBP 300X180
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Material	Fe 410.0
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Beam Section	UB 356 x 171 x 45
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Material	Fe 410.0
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Hole	STD
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Plate Section	220X115X12
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Thickness (mm)	12
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Width (mm)	115
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Depth (mm)	220
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Hole	STD
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Weld

Type	Double Fillet
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Size (mm)	10
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Bolts

Type	HSFG
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Grade	8.8
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Diameter (mm)	16
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Bolt Numbers	8
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Columns (Vertical Lines)	2
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Bolts Per Column	4
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Gauge (mm)	40
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Pitch (mm)	50
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End Distance (mm)	30
Edge Distance (mm)	30
Assembly	
Column-Beam Clearance (mm)	15.0



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Design Preferences

Bolt

Hole Type	Standard
Hole Clearance (mm)	2.0
Material Grade (MPa) (overwrite)	800.0
Slip factor	0.25

Weld

Type of Weld	Field weld
Material Grade (MPa) (overwrite)	410.0

Detailing

Type of Edges	Sheared or hand flame cut
Minimum Edge-End Distance	1.7 times the hole diameter
Gap between Beam and Column (mm)	15.0
Are members exposed to corrosive influences?	No

Design

Design Method	Limit State Design
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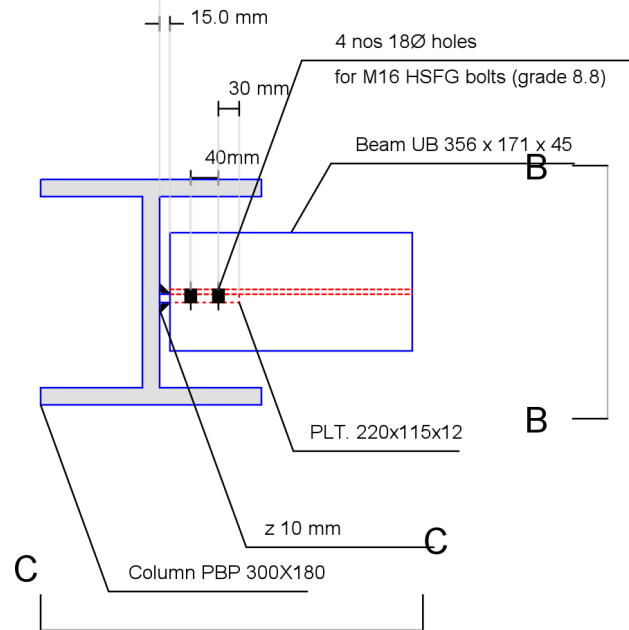
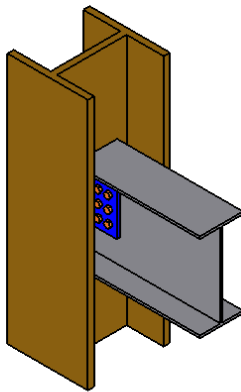
Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsf} = ((0.25 \times 1 \times 1.0 \times 87.92) / (1.25)) = 17.584$ [cl. 10.4.3]	
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)		17.584	Pass
No. of bolts	$120 / 17.584 = 6.8$	8	Pass
No. of column(s)	≤ 2	2	
No. of bolts per column		4	
Bolt pitch (mm)	$\geq 2.5 \times 16 = 40, \leq \text{Min}(32 \times 7.0, 300) = 224$ [cl. 10.2.2]	50	Pass
Bolt gauge (mm)	$\geq 2.5 \times 16 = 40, \leq \text{Min}(32 \times 7.0, 300) = 224$ [cl. 10.2.2]	40	
End distance (mm)	$\geq 1.7 \times 18 = 30, \leq 12 \times 7.0 = 84.0$ [cl. 10.2.4]	30	Pass
Edge distance (mm)	$\geq 1.7 \times 18 = 30, \leq 12 \times 7.0 = 84.0$ [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 120	$V_{db} = 251$	Pass
Plate thickness (mm)	$(5 \times 120 \times 1000) / (220 \times 250.0) = 10$ [Owens and Cheal, 1989]	12	Pass
Plate height (mm)	$\geq 0.6 \times 351 = 210.6, \leq 351 - 9 - 10 - 10 = 303.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	220	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	$(2 \times 17.584 \times 50^2) / (50 \times 1000) = 7.8$	$M_d = (1.2 \times 250.0 \times Z) / (1000 \times 1.1) = 26.4$ [cl. 8.2.1.2]	Pass
Effective weld length on each side (mm)		$220 - 2 \times 10 = 200$	
Weld strength (kN/mm)	$\sqrt{[(7800 \times 6) / (2 \times 200^2)]^2 + [120 / (2 \times 200)]^2} = 0.657$	$f_v = (0.7 \times 10 \times 410) / (\sqrt{3} \times 1.25) = 1.105$ [cl. 10.5.7]	Pass

Weld thickness (mm)	$\text{Max}((0.657 \cdot 1000 \cdot \sqrt{3 \cdot 1.25}) / (0.7 \cdot 410), 12 \cdot 0.8) = 9.6$ [c. 10.5.7, Insdag Detailing Manual, 2002]	10	Pass
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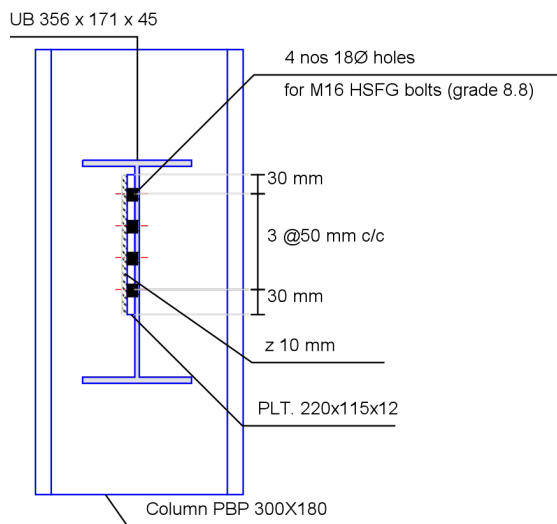


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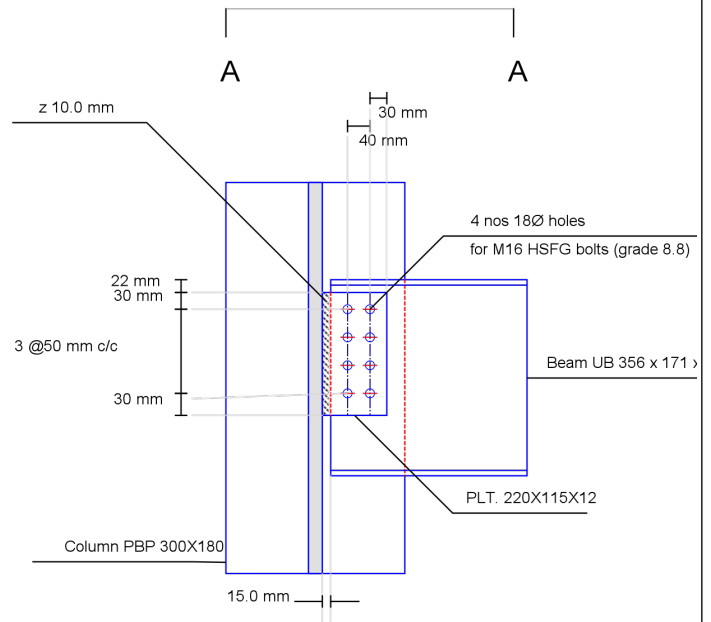
Views



Top view (Sec A-A)



Side view (Sec B-B)



Front view (Sec C-C)



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Additional Comments	
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