



Created with



Company Name	Pythons & Co	Project Title	A simple block of flats
Group/Team Name	Flying Circus	Subtitle	Abattoir
Designer	Mr. Wiggin	Job Number	1.1.1.1.2
Date	18 /06 /2017	Client	Mr. Tid

Design Conclusion

Fin Plate**Fail**

Fin Plate

Connection Properties

Connection

Connection Title

Single Fin Plate

Connection Type

Shear Connection

Connection Category

Connectivity

Column flange-Beam web

Beam Connection

Bolted

Column Connection

Welded

Loading (Factored Load)

Shear Force (kN)

150

Components

Column Section

SC 200

Material

Fe 410.0

Beam Section

MB 350

Material

Fe 410.0

Hole

STD

Plate Section

280X90X12

Thickness (mm)

12

Width (mm)

90

Depth (mm)

280

Hole

STD

Weld

Type

Double Fillet

Size (mm)

8

Bolts

Type

Bearing Bolt

Grade

4.6

Diameter (mm)

20

Bolt Numbers

5

Columns (Vertical Lines)

1

Bolts Per Column

5

Gauge (mm)	0
Pitch (mm)	50
End Distance (mm)	40
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	10.0



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Design Preferences

Bolt

Hole Type	Standard
Hole Clearance (mm)	2.0
Material Grade (MPa) (overwrite)	400.0
Slip factor	N/A

Weld

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

Detailing

Type of Edges	Rolled, machine-flame cut, sawn and planed
Minimum Edge-End Distance	1.5 times the hole diameter
Gap between Beam and Column (mm)	10.0
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)		$V_{dsb} = (400 \times 0.6126 \times 20 \times 20) / (\sqrt{3} \times 1.25 \times 1000)$ = 45.264 [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \times 0.5 \times 20 \times 8.1 \times 410.0) / (1.25 \times 1000)$ = 66.42 [cl. 10.3.4]	
Bolt capacity (kN)		Min (45.264, 66.42) = 45.264	
No. of bolts	150/45.264 = 3.3	5	Pass
No. of column(s)	≤ 2	1	
No. of bolts per column		5	
Bolt pitch (mm)	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.1, 300) = 260$ [cl. 10.2.2]	50	Pass
Bolt gauge (mm)	$\geq 2.5 \times 20 = 50, \leq \text{Min}(32 \times 8.1, 300) = 260$ [cl. 10.2.2]	0	
End distance (mm)	$\geq 1.5 \times 22 = 33, \leq 12 \times 8.1 = 97.2$ [cl. 10.2.4]	40	Pass
Edge distance (mm)	$\geq 1.5 \times 22 = 33, \leq 12 \times 8.1 = 97.2$ [cl. 10.2.4]	40	Pass
Block shear capacity (kN)	≥ 150	$V_{db} = 268$	Pass
Plate thickness (mm)	$(5 \times 150 \times 1000) / (280 \times 250.0) = 10$ [Owens and Cheal, 1989]	12	Pass
Plate height (mm)	$\geq 0.6 \times 350 = 210.0, \leq 350 - 14 - 14 - 10 = 284.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	280	Pass
Plate width (mm)		100	
Plate moment	$(2 \times 45.264 \times 50^2) / (50 \times 1000) =$	$M_d = (1.2 \times 250.0 \times Z) / (1000 \times 1.1) = 42.76$	Pass

capacity (kNm)	13.579	[cl. 8.2.1.2]	
Effective weld length on each side (mm)		$280 - 2 \cdot 8 = 264$	
Weld strength (kN/mm)	$\sqrt{[(13579 \cdot 6) / (2 \cdot 264^2)]^2 + [150 / (2 \cdot 264)]^2} = 0.65$	$f_v = (0.7 \cdot 8 \cdot 410) / (\sqrt{3} \cdot 1.25) = 1.06$ [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.65 \cdot 1000 \cdot \sqrt{3} \cdot 1.25) / (0.7 \cdot 410), 12 \cdot 0.8) = 9.6$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	8	Fail



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Additional Comments	
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