Company Name	Pythons & Co	Project Title	A simple block of flats
Group/Team Name	Flying Circus	Subtitle	Abattoir
Designer	Mr. Wiggin	Job Number	1.1.3.3.2
Date	20 /06 /2018	Client	Mr. Tid

Design Conclusion

Cleat Angle	**Fail**

Cleat Angle

Connection Properties

Connection

Connection Title	Double Angle Web Cleat
Connection Type	Shear Connection

Connection Category

Connectivity	Beam-Beam
Beam Connection	Bolted
Column Connection	Bolted

Loading (Factored Load)

Shear Force (kN)	100

Components

Column Section	WPB 280x280x61.2
Material	Fe 410
Beam Section	NPB 220x110x29.4
Material	Fe 410
Hole	STD
Cleat Section	100 100 x 8
Thickness (mm)	8
Cleat Leg Size B (mm)	100
Cleat Leg Size A (mm)	100
Hole	STD
Bolts on Beam	
Type	Friction Grip Bolt
Grade	10.9
Diameter (mm)	20
Bolt Numbers	3
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	50
End Distance (mm)	40

Edge Distance (mm)	40
Bolts on Column	
Type	Friction Grip Bolt
Grade	10.9
Diameter (mm)	20
Bolt Numbers	6
Columns (Vertical Lines)	1
Bolts Per Column	3
Gauge (mm)	0
Pitch (mm)	50
End Distance (mm)	40
Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	15.0

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Design Preferences	
Bolt	
Hole Type	Over-sized
Material Grade (MPa) (overwrite)	800.0
Slip factor	0.52
Detailing	
Type of Edges	Rolled, machine-flame cut, sawn and planed
Minimum Edge-End Distance	1.5 times the hole diamter
Gap between beam & support (mm)	15.0
Are members exposed to corrosive influences?	No
Design	
Design Method	Limit State Design

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Design Check: Secondary Beam Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsf} = ((0.52*2*0.85*137.2)/(1.25)) = 121.285 [cl. 10.4.3]	
Bolt bearing capaciy (kN)		N/A	
Bearing capacity of beam web (kN)		N/A	
Bearing capacity of cleat (kN)		N/A	
Bearing capacity (kN)		N/A	
Bolt capacity (kN)		121.285	
Critical bolt shear (kN)	≤ 121.285	34.319	**Pass**
No. of bolts		3	
No.of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*6.6, 300) = 212 [cl. 10.2.2]	50	**Pass**
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*6.6, 300) = 212 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.5*24.0 = 36, ≤ 12*6.6 = 79.2 [cl. 10.2.4]	40	**Pass**
Edge distance (mm)	≥ 1.5*24.0 = 36, ≤ 12*6.6 = 79.2 [cl. 10.2.4]	40	**Pass**
Block shear capacity (kN)	≥ 100	V_{db} = 108.114 [cl. 6.4.1]	**Pass**
Cleat height (mm)	≥ 0.6*222.0=133.2, ≤ 222.0-10.2-1.2-10.0-2.4- 5=193.2 [cl. 10.2.4, Insdag Detailing Manual, 2002]	180.0	**Pass**
Cleat moment		M_d = (1.2*250*Z)/(1000*1.1)	**Pass**

4

| capacity (kNm) | $(2*121.285*50^2)/(50*1000)$ = 3.0 | = 77.76 [cl. 8.2.1.2] | Pass |

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Design Check: Primary Beam Connectivity

Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsf} =$ ((0.52*1*0.85*137.2)/(1.25)) = 60.642 [cl. 10.4.3]	
Bolt bearing capaciy (kN)		N/A	
Bolt bearing capaciy (kN)		N/A	
Bolt bearing capaciy (kN)		N/A	
Bolt bearing capaciy (kN)		N/A	
Bolt capacity (kN)		60.642	
Critical bolt shear (kN)	≤ 60.642	35.77	**Pass**
No. of bolts		6	
No.of column(s) per angle	≤ 2	1	
No. of bolts per column per angle		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*7.0, 300) = 224 [cl. 10.2.2]	50	**Pass**
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*7.0, 300) = 224 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.5*24.0 = 36, ≤ 12*7.0 = 84.0 [cl. 10.2.4]	40	**Pass**
Edge distance (mm)	≥ 1.5*24.0 = 36, ≤12*7.0 = 84.0 [cl. 10.2.4]	40	**Pass**
Block shear capacity (kN)	≥100	$V_{db} = 108.114$ [cl. 6.4.1]	**Pass**
Cleat height (mm)	≥ 0.6*222.0=133.2, ≤ 222.0-10.2-1.2-10.0-2.4- 5=193.2 [cl. 10.2.4, Insdag Detailing Manual, 2002]	180.0	**Pass**

Cleat moment capacity (kNm)	$(2*60.642*50^2)/(50*1000) = 3.165$	$M_d = (1.2*250*Z)/(1000*1.1)$ $= 77.76$ [cl. 8.2.1.2]	**Pass**

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Views

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Additional Comments	