Created with Osdag			
Company Name	**Python & Co**	**Project Title**	**A simple block of flats**
Group/Team Name	**Flying Circus**	**Subtitle**	**Abattoir**
Designer	**Mr. Wiggin**	**Job Number**	**1.2.1.2.1.2**
Date	**21 /06 /2018**	**Client**	**Mr. Tid**

Design Conclusion	
Extended End Plate	**Fail**
Extended End Plate	
Connection Properties	
Connection	
Connection Title	Extended End Plate
Connection Type	Moment Connection
Connection Category	
Connectivity	Extended both ways
Beam Connection	Bolted and Welded
Loading (Factored Load)	
Bending Moment (kNm)	170.0
Shear Force (kN)	100.0
Axial Force (kN)	40.0
Components	
Beam Section	MB 450
Material	Fe 410.0
Plate Section	742.0 X 175.0 X 12.0
Thickness (mm)	12.0
Width (mm)	175.0
Depth (mm)	742.0
Hole	Standard
Weld	
Type	Double Fillet
Weld at Flange (mm)	6
Weld at Web (mm)	8
Bolts	
Type	Friction Grip Bolt
Grade	8.8
Diameter (mm)	20
Bolt Numbers	20
Columns (Vertical Lines)	2
Bolts Per Column	10
End Distance (mm)	40

Edge Distance (mm)	40
Gauge Distance (mm)	50
Pitch Distance (mm)	50
Assembly	
Beam-Beam Clearance (mm)	N/A

Created with Osdag			
Company Name	**Python & Co**	**Project Title**	**A simple block of flats**
Group/Team Name	**Flying Circus**	**Subtitle**	**Abattoir**
Designer	**Mr. Wiggin**	**Job Number**	**1.2.1.2.1.2**
Date	**21 /06 /2018**	**Client**	**Mr. Tid**

Design Preferences	
Bolt	
Hole Type	Standard
Hole Clearance (mm)	2.0
Material Grade (MPa) (overwrite)	800.0
Slip factor	0.3
Beta (pre-tensioned bolt)	1
Weld	
Type of Weld	Shop weld
Material Grade (MPa) (overwrite)	410.0
Detailing	
Type of Edges	a - Sheared or hand flame cut
Minimum Edge-End Distance	1.7 times the hole diameter
Are members exposed to corrosive influences?	No
Design	
Design Method	Limit State Design

Created with Osdag			
Company Name	**Python & Co**	**Project Title**	**A simple block of flats**
Group/Team Name	**Flying Circus**	**Subtitle**	**Abattoir**
Designer	**Mr. Wiggin**	**Job Number**	**1.2.1.2.1.2**
Date	**21 /06 /2018**	**Client**	**Mr. Tid**

Design Check			
Check	**Required**	**Provided**	**Remark**
Tension in critical bolt (kN)	Tension in bolt due to external factored moment + Prying force = 54.351+40.76 = 95.111 [cl. 10.4.7]		
Tension capacity of critical bolt (kN)	95.111	Tension capacity = (0.9*800*245 / (1.25*1000) = 141.12 [cl. 10.4.5]	**Pass**
Bolt shear capacity (kN)	Factored shear force / Number of bolts = 100.0 / 20 = 5.0	V_{dsf} = (0.3*1*1.0*137.2) / 1.25 = 32.902 [cl. 10.4.3]	**Pass**
Bolt bearing capacity (kN)		N/A	
Bolt capacity (kN)	32.902	32.902	
Combined shear and tension capacity of bolt	≤ 1.0	(V_{sf}/V_{df})^2 + (T_f/T_{df})^2 = (5.0/32.902)^2 + (95.111/141.12)^2 = 0.477 [cl. 10.4.6]	**Pass**
No. of bolts required		20	
No. of column(s)		2	
No. of row(s)		10	
Bolt gauge (mm)	≥ 2.5*20 = 50.0, ≤ Min(32*12.0, 300) = 300.0 [cl. 10.2.2 & cl. 10.2.3]	50	**Pass**
End distance (mm)	≥ 1.7*22 = 40, ≤ 12*12.0 = 145.0 [cl. 10.2.4]	40	**Pass**
Edge distance (mm)	≥ 1.7*22 = 40, ≤ 12*12.0 = 145.0 [cl. 10.2.4]	40	**Pass**
Plate thickness (mm)	((4*1.10*1074.005*1000)/(250.0*75.0)) ^ 0.5 = 15.876 [Design of Steel Structures - N. Subramanian, 2014]	12.0	**Fail**
Plate height	≥ (450.0+ 50.0 + (2*40.0)) = 580.0, ≤ (450.0+ 50.0 + (2*145.0)) = 790.0	742.0	**Pass**

(mm)	[based on detailing requirements]		
Plate width (mm)	≥ max ((90.0+ (2*40.0)), 150.0), ≤ max ((150.0+ 25), 170.0) [based on detailing requirements]	175.0	**Pass**
Plate moment capacity (kNm)	Moment demand M_d = ((15.876^2*250.0*75.0)/(4.4*10^2)) * 10^-6 = 1074.005	Moment capacity M_c = ((12.0^2*250.0*75.0)/(4.4*10 ^ 2)) * 10 ^ -6 = 1090.909 [Design of Steel Structures - N. Subramanian, 2014]	**Pass**
Weld thickness at flange (mm)	≥ (1.323* 10^3)/132.56=9.98 [Design of Steel Structures - N. Subramanian, 2014]	6.0	**Fail**
Weld thickness at web (mm)	≤ minimum(9.4,15.876)	8.0	**Pass**
Effective weld length on flange (each side) (mm)		656.8	
Effective weld length on flange (each side) (mm)		830.4	
Critical stress in weld at flange (N/mm^2)	≤ 410 / (√3 * 1.25) = 189.371 [cl. 10.5.7]	(412.973* 10^3)/(3 * 1313.6) = 104.794	**Pass**
Critical stress in weld at web (N/mm ^ 2)	≤ 410/(√3 * 1.25) = 189.371 [cl. 10.5.7 and cl. 10.5.10]	√((8.028)^2 + (3 * 20.071^2)) =35.678	**Pass**

Company Name	Python & Co	Project Title	A simple block of flats
Group/Team Name	Flying Circus	Subtitle	Abattoir
Designer	Mr. Wiggin	Job Number	1.2.1.2.1.2
Date	21 /06 /2018	Client	Mr. Tid

Views

		Created with Osdag	
Company Name	**Python & Co**	**Project Title**	**A simple block of flats**
Group/Team Name	**Flying Circus**	**Subtitle**	**Abattoir**
Designer	**Mr. Wiggin**	**Job Number**	**1.2.1.2.1.2**
Date	**21 /06 /2018**	**Client**	**Mr. Tid**

Additional Comments	A sample design report.