



Company Name	El Mystico & Janet	Project Title	Twenty-five story blocks
Group/Team Name	Design by Hypnosis	Subtitle	Something completely different
Designer	El Mystico	Job Number	1.1.1.2.2
Date	18 /06 /2017	Client	Mr. Clement Onan

Design Conclusion	
Fin Plate	Fail
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)	135
Components	
Column Section	SC 250
Material	Fe 410.0
Beam Section	LB(P) 300
Material	Fe 410.0
Hole	STD
Plate Section	270X100X10
Thickness (mm)	10
Width (mm)	100
Depth (mm)	270
Hole	STD
Weld	
Type	Double Fillet
Size (mm)	8
Bolts	
Type	Bearing Bolt
Grade	4.8
Diameter (mm)	12
Bolt Numbers	10
Columns (Vertical Lines)	2
Bolts Per Column	5

Gauge (mm)	30
Pitch (mm)	52
End Distance (mm)	30
Edge Distance (mm)	30
Assembly	
Column-Beam Clearance (mm)	10.0



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Design Preferences

Bolt

Hole Type	Standard
Hole Clearance (mm)	1.0
Material Grade (MPa) (overwrite)	420.0
Slip factor	N/A

Weld

Type of Weld	Shop 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)	10.0
Are members exposed to corrosive influences?	Yes

Design

Design Method	Limit State Design
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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		$V_{dsb} = (400 \cdot 0.6126 \cdot 12 \cdot 12) / (\sqrt{3} \cdot 1.25 \cdot 1000) = 15.612$ [cl. 10.3.3]	
Bolt bearing capacity (kN)		$V_{dpb} = (2.5 \cdot 0.519 \cdot 12 \cdot 7.0 \cdot 410.0) / (1.25 \cdot 1000) = 35.749$ [cl. 10.3.4]	
Bolt capacity (kN)		Min (15.612, 35.749) = 15.612	
No. of bolts	135/15.612 = 8.6	10	Pass
No. of column(s)	≤ 2	2	
No. of bolts per column		5	
Bolt pitch (mm)	$\geq 2.5 \cdot 12 = 30, \leq \text{Min}(32 \cdot 7.0, 300) = 224$ [cl. 10.2.2]	52	Pass
Bolt gauge (mm)	$\geq 2.5 \cdot 12 = 30, \leq \text{Min}(32 \cdot 7.0, 300) = 224$ [cl. 10.2.2]	30	
End distance (mm)	$\geq 1.7 \cdot 13 = 22, \leq 12 \cdot 7.0 = 84.0$ [cl. 10.2.4]	30	Pass
Edge distance (mm)	$\geq 1.7 \cdot 13 = 22, \leq 12 \cdot 7.0 = 84.0$ [cl. 10.2.4]	30	Pass
Block shear capacity (kN)	≥ 135	$V_{db} = 312$	Pass
Plate thickness (mm)	$(5 \cdot 135 \cdot 1000) / (270 \cdot 250.0) = 10$ [Owens and Cheal, 1989]	10	Pass
Plate height (mm)	$\geq 0.6 \cdot 300 = 180.0, \leq 300 - 11 - 15 - 10 = 238.0$ [cl. 10.2.4, Insdag Detailing Manual, 2002]	270	Fail
Plate width (mm)		100	
Plate moment	$(2 \cdot 15.612 \cdot 52^2) / (52 \cdot 1000) =$	$M_d = (1.2 \cdot 250.0 \cdot Z) / (1000 \cdot 1.1) = 33.14$	Pass

capacity (kNm)	7.425	[cl. 8.2.1.2]	
Effective weld length on each side (mm)		$270 - 2 \cdot 8 = 254$	
Weld strength (kN/mm)	$\sqrt{[(7425 \cdot 6) / (2 \cdot 254^2)]^2 + [135 / (2 \cdot 254)]^2} = 0.436$	$f_v = (0.7 \cdot 8 \cdot 410) / (\sqrt{3} \cdot 1.25) = 1.06$ [cl. 10.5.7]	Pass
Weld thickness (mm)	$\text{Max}((0.436 \cdot 1000 \cdot \sqrt{3} \cdot 1.25) / (0.7 \cdot 410), 10 \cdot 0.8) = 8.0$ [cl. 10.5.7, Insdag Detailing Manual, 2002]	8	Pass



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Views



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Additional Comments	
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