Company Name	DIEMS	Project Title Numerical 4
Group/Team Name	DIEMS	Subtitle
Designer	Kavish Patwari	Job Number 4
Date	04 /06 /2016	Method Limit State Design (No Earthquake Load)

Design Conclusion

   Finplate   Pass   **Pass**

Finplate

Connection Properties

Connection

   Connection Title   Single Finplate

   Connection Type   Shear Connection

Connection Category

   Connectivity   Column flange-Beam web

   Beam Connection   Bolted

   Column Connection   Welded

Loading (Factored Load)

   Shear Force (kN)   200

Components

   Column Section   ISSC 250

      Material   Fe 410

   Beam Section   ISMB 400

      Material   Fe 410

      Hole   STD

   Plate Section   240X110X18

      Thickness (mm)   18

      Width (mm)   110

      Depth (mm)   240

      Hole   STD

   Weld

      Type   Double Fillet

      Size (mm)   15

   Bolts

      Type   Black Bolt

      Grade   4.8

      Diameter (mm)   12

      Bolt Numbers   13

      Columns (Vertical Lines)   2

      Bolts Per Column   7

      Gauge (mm)   30

      Pitch (mm)   30

      End Distance (mm)   30

      Edge Distance (mm)   30

Assembly

   Column-Beam Clearance (mm) 20

Design Check

Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = (400*0.6126*12*12)/(√3*1.25*1000) = 15.612 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V_{dpb} = (2.5*0.519*12*8.9*410)/(1.25*1000) = 45.452 [cl. 10.3.4]	
Bolt capacity (kN)		Min (15.612, 45.452) = 15.612	
No. of bolts	200/15.612 = 12.8	13	**Pass**

No.of column(s)	≤ 2	2	
No. of bolts per column		7	
Bolt pitch (mm)	≥ 2.5* 12 = 30, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	30	**Pass**
Bolt gauge (mm)	≥ 2.5*12 = 30, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	30	
End distance (mm)	≥ 1.7*13 = 22.1, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	30	**Pass**
Edge distance (mm)	≥ 1.7*13 = 22.1, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	30	**Pass**
Block shear capacity (kN)	≥ 200	V_{db} = 630	**Pass**
Plate thickness (mm)	(5*200*1000)/(240*250) = 16.67 [Owens and Cheal, 1989]	18	**Pass**
Plate height (mm)	≥ 0.6*400=240.0, ≤ 400-16-14-10=330.0 [cl. 10.2.4, Insdag Detailing Manual, 2002]	240	**Pass**
Plate width (mm)		100	
Plate moment capacity (kNm)	(2*15.612*30^2)/(30*1000) = 13.0	M_d = (1.2*250*Z)/(1000*1.1) = 47.13 [cl. 8.2.1.2]	**Pass**
Effective weld length (mm)		240-2*16 = 208	
Weld strength (kN/mm)	√[(13000*6)/(2*208^2)]^2 + [200/(2*208)]^2 = 1.022	f_v= (0.7*15*410)/(√3*1.25) = 2.121 [cl. 10.5.7]	**Pass**
Weld thickness (mm)	Max((1.022*1000*√3* 1.25)/(0.7 * 410),18* 0.8) = 14.4 [cl. 10.5.7, Insdag Detailing Manual, 2002]	15	**Pass**

Views

Additional Comments