			Created with OSdag
Company Name		Project Title	Ex-4
Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Finplate Pass Connection Properties Connection Title Single Finplate Connection Type Shear Connection Connectivity Column flange-Beam web Beam Connection Welded Column Connection Welded Loading (Factored Load) Shear Force (kN) 200 Components ISSC 200 All Components Column Section ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 100 100 Depth (mm) 250 10	Design Conclusion	
Connection Single Finplate Connection Type Shear Connection Connection Category Column flange-Beam web Beam Connection Bolted Column Connection Welded Loading (Factored Load) Shear Force (kN) Shear Force (kN) 200 Components Column Section Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250x100x16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Type Double Fillet Size (mm) 13 Bolts Type Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Finplate	Pass
Connection Single Finplate Connection Type Shear Connection Connection Category Column flange-Beam web Beam Connection Bolted Column Connection Welded Loading (Factored Load) Shear Force (kN) Shear Force (kN) 200 Components Stock 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Type Double Fillet Size (mm) 13 Bolts Type Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Botts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Finplate	
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Connection Type	Connection	
Connection Category Column flange-Beam web Beam Connection Bolted Column Connection Welded Loading (Factored Load) 200 Shear Force (kN) 200 Components ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 0 Pitch (mm) 85	Connection Title	Single Finplate
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Beam Connection Bolted Column Connection Welded Loading (Factored Load) Shear Force (kN) 200 Components ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Connection Category	
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Column C	Beam Connection	Bolted
Shear Force (kN) 200 Components ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Column Connection	Welded
Components ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Loading (Factored Load)	
Column Section ISSC 200 Material Fe 410 Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Shear Force (kN)	200
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Beam Section ISMB 400 Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Column Section	ISSC 200
Material Fe 410 Hole STD Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Material	Fe 410
Hole	Beam Section	ISMB 400
Plate Section 250X100X16 Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Size (mm) 13 Bolts Type Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Material	Fe 410
Thickness (mm) 16 Width (mm) 100 Depth (mm) 250 Hole STD Weld Type Size (mm) 13 Bolts Type Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Hole	STD
Width (mm) 100 Depth (mm) 250 Hole STD Weld Size (mm) Type Double Fillet Size (mm) 13 Bolts HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Plate Section	250X100X16
Depth (mm) 250 Hole STD Weld Type Double Fillet Size (mm) 13 Bolts HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Thickness (mm)	16
Hole	Width (mm)	100
Weld Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Depth (mm)	250
Type Double Fillet Size (mm) 13 Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Hole	STD
Size (mm) 13	Weld	
Bolts Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Туре	Double Fillet
Type HSFG Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Size (mm)	13
Grade 8.8 Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Bolts	
Diameter (mm) 20 Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Туре	HSFG
Bolt Numbers 3 Columns (Vertical Lines) 1 Bolts Per Column 3 Gauge (mm) 0 Pitch (mm) 85	Grade	8.8
Columns (Vertical Lines) Bolts Per Column Gauge (mm) Pitch (mm) 1 0 85	Diameter (mm)	20
Bolts Per Column 3	Bolt Numbers	3
Gauge (mm) 0 Pitch (mm) 85	Columns (Vertical Lines)	1
Pitch (mm) 85	Bolts Per Column	3
	Gauge (mm)	0
End Distance (mm) 40	Pitch (mm)	85
	End Distance (mm)	40

Edge Distance (mm)	40
Assembly	
Column-Beam Clearance (mm)	20

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Design Check			
Check	Required	Provided	Remark
Bolt shear capacity (kN)		V_{dsb} = (800*0.6126*20*20)/($\sqrt{3}$ *1.25*1000) = 90.529 [cl. 10.3.3]	
Bolt bearing capacity (kN)		V _{dpb} = (2.5*0.508*20*8.9*410)/(1.25*1000) = 74.148 [cl. 10.3.4]	
Bolt capacity (kN)		Min (90.529, 74.148) = 74.148	
No. of bolts	200/74.148 = 2.7	3	Pass
No.of column(s)	≤ 2	1	
No. of bolts per column		3	
Bolt pitch (mm)	≥ 2.5* 20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	85	Pass
Bolt gauge (mm)	≥ 2.5*20 = 50, ≤ Min(32*8.9, 300) = 285 [cl. 10.2.2]	0	
End distance (mm)	≥ 1.7*22 = 37.4, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	40	Pass
Edge distance (mm)	≥ 1.7*22 = 37.4, ≤ 12*8.9 = 106.8 [cl. 10.2.4]	40	Pass
Block shear capacity (kN)	≥ 200	V _{db} = 568	Pass
Plate thickness (mm)	(5*200*1000)/(250*250) = 16.0 [Owens and Cheal, 1989]	16	Pass
Plate height (mm)	≥ 0.6*400=240.0, ≤ 400-16-14- 10=330.0 [cl. 10.2.4, Insdag Detailing Manual, 2002]	250	Pass
Plate width (mm)		100	
Plate moment capacity (kNm)	(2*90.529*85 ²)/(85*1000) = 14.485	$M_{\rm d}$ = (1.2*250* Z)/(1000*1.1) = 45.45 [cl. 8.2.1.2]	Pass
Effective weld length (mm)		250-2*16 = 218	
Weld strength (kN/mm)	$\sqrt{[(14485*6)/(2*218^2)]^2}$ + $[200/(2*218)]^2$ = 1.023	$f_V = (0.7*13*410)/(\sqrt{3}*1.25)$ = 2.121 [cl. 10.5.7]	Pass

Weld thickness (mm)	Max($(1.023*1000*\sqrt{3}*1.25)/(0.7*410),16*0.8$) = 12.8 [cl. 10.5.7, Insdag Detailing Manual, 2002]	13	Pass
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Group/Team Name		Subtitle	
Designer		Job Number	
Date	05 /06 /2016	Method	Limit State Design (No Earthquake Load)

Views	

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Company Name		Project Title	Ex-4
Group/Team Name		Subtitle	
Designer		Job Number	
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Additional Comments	