

Current Date: 2/3/2023 1:10 PM

Units system: English

File name: S:\ArchiOffice Jobs\Storage\Project Docs\P2022-0129\Calcs\Connections\HSS Brace Connection.rcnx

Steel Connections Results

Connection: 1 - CBB_SP

Family: Column - Beams - Braces (CBB)
 Type: Gusset

Design code: AISC 360-16 LRFD, AISC 341-16 LRFD

Demands

Description	Right beam			Left beam			Column		Load type
	Pu [kip]	Vu [kip]	Mu33 [kip*ft]	Pu [kip]	Vu [kip]	Mu33 [kip*ft]	Pu [kip]	Vu [kip]	
DL	0.00	3.68	0.00	0.00	1.15	0.00	-2.57	0.00	Design
LL	0.00	4.51	0.00	0.00	1.73	0.00	0.00	0.00	Design
SL	0.00	0.00	0.00	0.00	0.00	0.00	6.17	0.00	Design
Wx	-10.02	0.00	0.00	-0.03	-0.01	0.00	0.00	0.01	Design
EQx	-21.75	0.00	0.00	-0.08	-0.02	0.00	0.00	0.03	Design
D1	0.00	5.15	0.00	0.00	1.61	0.00	-3.60	0.00	Design
D2	0.00	11.63	0.00	0.00	4.14	0.00	-3.09	0.00	Design
D3	0.00	4.41	0.00	0.00	1.38	0.00	0.00	0.00	Design
D4	0.00	11.63	0.00	0.00	4.15	0.00	0.00	0.00	Design
D5	0.00	4.41	0.00	0.00	1.39	0.00	6.78	0.00	Design
D6	-5.01	4.41	0.00	-0.02	1.38	0.00	-3.09	0.01	Design
D7	0.00	8.92	0.00	0.00	3.11	0.00	6.78	0.00	Design
D8	-5.01	4.41	0.00	-0.02	1.38	0.00	6.78	0.01	Design
D9	-10.02	4.41	0.00	-0.03	1.37	0.00	-3.09	0.01	Design
D10	-10.02	4.41	0.00	-0.03	1.37	0.00	0.00	0.01	Design
D11	-10.02	8.92	0.00	-0.03	3.10	0.00	-3.09	0.01	Design
D12	-10.02	8.92	0.00	-0.03	3.10	0.00	0.00	0.01	Design
D13	-10.02	3.31	0.00	-0.03	1.02	0.00	-2.32	0.01	Design
D14	0.00	4.41	0.00	0.00	1.38	0.00	-1.86	0.00	Design
D15	-21.75	4.41	0.00	-0.08	1.36	0.00	-3.09	0.03	Seismic
D16	0.00	8.92	0.00	0.00	3.11	0.00	-1.86	0.00	Design
D17	-21.75	4.41	0.00	-0.08	1.36	0.00	-1.86	0.03	Seismic
D18	-21.75	8.92	0.00	-0.08	3.08	0.00	-3.09	0.03	Seismic
D19	-21.75	8.92	0.00	-0.08	3.08	0.00	-1.86	0.03	Seismic
D20	-21.75	3.31	0.00	-0.08	1.01	0.00	-2.32	0.03	Seismic

Description	Pu				Load type
	Brace1 [kip]	Brace2 [kip]	Brace3 [kip]	Brace4 [kip]	
DL	0.00	-0.16	0.00	0.00	Design
LL	0.00	-0.05	0.00	0.00	Design
SL	0.00	0.00	0.00	0.00	Design
Wx	0.00	-14.01	0.00	0.00	Design
EQx	0.00	-30.39	0.00	0.00	Design
D1	0.00	-0.22	0.00	0.00	Design

D2	0.00	-0.26	0.00	0.00	Design
D3	0.00	-0.19	0.00	0.00	Design
D4	0.00	-0.26	0.00	0.00	Design
D5	0.00	-0.19	0.00	0.00	Design
D6	0.00	-7.19	0.00	0.00	Design
D7	0.00	-0.24	0.00	0.00	Design
D8	0.00	-7.19	0.00	0.00	Design
D9	0.00	-14.20	0.00	0.00	Design
D10	0.00	-14.20	0.00	0.00	Design
D11	0.00	-14.24	0.00	0.00	Design
D12	0.00	-14.24	0.00	0.00	Design
D13	0.00	-14.15	0.00	0.00	Design
D14	0.00	-0.19	0.00	0.00	Design
D15	0.00	-30.58	0.00	0.00	Seismic
D16	0.00	-0.24	0.00	0.00	Design
D17	0.00	-30.58	0.00	0.00	Seismic
D18	0.00	-30.63	0.00	0.00	Seismic
D19	0.00	-30.63	0.00	0.00	Seismic
D20	0.00	-30.53	0.00	0.00	Seismic

Design calculations

Interface between Gusset - Top left brace
Connection: *Directly bolted*

Demands

Pu [kip]	Description	Load type
-0.16	DL	Design
-0.05	LL	Design
0.00	SL	Design
-14.01	Wx	Design
-30.39	EQx	Design
-0.22	D1	Design
-0.26	D2	Design
-0.19	D3	Design
-0.26	D4	Design
-0.19	D5	Design
-7.19	D6	Design
-0.24	D7	Design
-7.19	D8	Design
-14.20	D9	Design
-14.20	D10	Design
-14.24	D11	Design
-14.24	D12	Design
-14.15	D13	Design
-0.19	D14	Design
-30.58	D15	Seismic
-0.24	D16	Design
-30.58	D17	Seismic
-30.63	D18	Seismic
-30.63	D19	Seismic
-30.53	D20	Seismic

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Directly bolted						
Transverse edge distance	[in]	2.00	1.00	--	✓	Tables J3.4, J3.5
Longitudinal edge distance	[in]	2.00	1.00	--	✓	Tables J3.4, J3.5
Transverse center-to-center spacing (gage)	[in]	4.00	2.00	12.00	✓	Sec. J3.5
Longitudinal center-to-center spacing (pitch)	[in]	4.00	2.00	12.00	✓	Sec. J3.5
Gusset						
Transverse edge distance	[in]	3.37	1.00	--	✓	Tables J3.4, J3.5
Longitudinal edge distance	[in]	2.00	1.00	--	✓	Tables J3.4, J3.5
Welds						
Connector to member weld size	[1/16in]	4	3	7	✓	Sec. J2.2b
Stem to cap plate weld size	[1/16in]	4	3	7	✓	Sec. J2.2b

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Directly bolted						
Bolts shear	[Kip]	143.21	30.63	D18	0.21	Tables (7-1..14)
Bolt bearing under shear load	[Kip]	313.20	30.63	D18	0.10	Eq. J3-6
Axial-flexure interaction of tab and gusset plates		1.00	0.37	D18	0.37	Eq. H1-1a
Tee flange						
Tee flange shear yielding	[Kip]	172.80	30.63	D18	0.18	Eq. J4-3
Tee flange shear rupture	[Kip]	208.80	30.63	D18	0.15	Eq. J4-4
Gusset						
Bolt bearing on gusset	[Kip]	156.60	30.63	D18	0.20	Eq. J3-6
Member						
Side wall local yielding	[Kip]	139.60	0.00	DL	0.00	Eq. J10-2
Side wall local crippling	[Kip]	505.50	30.63	D18	0.06	Eq. J10-4
Ratio						
		0.37				

Checks for gusset and brace

Required Resistance of Braced Connections

Requirement	Value [kip]
Required tensile strength	401.70
Required compressive strength	156.96

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Slenderness		93.69	--	200.00	✓	Sec. E2
Local buckling		11.33	0.00	16.05	✓	Seismic Manual Table D1.1

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Member						
Compression	[Kip]	146.38	30.39	EQx	0.21	Eq. E3-1
Gusset						
Buckling on the Whitmore section	[Kip]	133.24	30.63	D18	0.23	Eq. E3-1
⚠ WARNINGS						
- Connector length less than allowable Table D3.1						

Interface Upper left gusset - beam
Connection: Directly welded

Demands

Description	Beam			Column			Load type
	Ru [kip]	Pu [kip]	Mu [kip*ft]	Pu [kip]	Mu22 [kip*ft]	Mu33 [kip*ft]	
DL	-0.09	-0.07	0.00	0.00	0.00	0.00	Design
LL	-0.03	-0.02	0.00	0.00	0.00	0.00	Design
SL	0.00	0.00	0.00	0.00	0.00	0.00	Design
Wx	-7.74	-6.10	0.00	0.00	0.00	0.00	Design
EQx	-16.80	-13.23	0.00	0.00	0.00	0.00	Design
D1	-0.12	-0.10	0.00	0.00	0.00	0.00	Design
D2	-0.15	-0.11	0.00	0.00	0.00	0.00	Design
D3	-0.10	-0.08	0.00	0.00	0.00	0.00	Design
D4	-0.15	-0.11	0.00	0.00	0.00	0.00	Design
D5	-0.10	-0.08	0.00	0.00	0.00	0.00	Design
D6	-3.98	-3.13	0.00	0.00	0.00	0.00	Design
D7	-0.13	-0.10	0.00	0.00	0.00	0.00	Design
D8	-3.98	-3.13	0.00	0.00	0.00	0.00	Design
D9	-7.85	-6.18	0.00	0.00	0.00	0.00	Design
D10	-7.85	-6.18	0.00	0.00	0.00	0.00	Design
D11	-7.87	-6.20	0.00	0.00	0.00	0.00	Design
D12	-7.87	-6.20	0.00	0.00	0.00	0.00	Design
D13	-7.82	-6.16	0.00	0.00	0.00	0.00	Design
D14	-0.10	-0.08	0.00	0.00	0.00	0.00	Design
D15	-16.90	-13.31	0.00	0.00	0.00	0.00	Seismic
D16	-0.13	-0.10	0.00	0.00	0.00	0.00	Design
D17	-16.90	-13.31	0.00	0.00	0.00	0.00	Seismic
D18	-16.93	-13.33	0.00	0.00	0.00	0.00	Seismic
D19	-16.93	-13.33	0.00	0.00	0.00	0.00	Seismic
D20	-16.88	-13.29	0.00	0.00	0.00	0.00	Seismic

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Gusset						
Weld size	[1/16in]	4	3	6	✓	Sec. J2.2b

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Gusset						
Beam yielding (normal stress)	[Kip]	269.83	13.33	D18	0.05	Eq. B-1, Appendix B, DG29
Shear yielding	[Kip]	179.89	16.93	D18	0.09	Eq. J4-3
Gusset edge tension stress	[Kip/in2]	32.40	1.60	D18	0.05	Eq. B-1, Appendix B, DG29
Gusset edge shear stress	[Kip/in2]	21.60	2.03	D18	0.09	J4-1
Weld capacity	[Kip]	230.62	26.93	D18	0.12	Tables 8-4 .. 8-11
Chord						
Weld block shear	[Kip]	206.81	16.93	D18	0.08	Eq. J4-5
Web crippling	[Kip]	162.83	13.33	D18	0.08	Eq. B-1, Appendix B, DG29
Local web yielding	[Kip]	238.51	13.33	D18	0.06	Eq. B-1, Appendix B, DG29
Transverse section web yielding	[Kip]	106.33	13.33	D18	0.13	Eq. G2-1
Ratio		0.13				

Interface Upper left gusset - column Connection: Single plate

Demands

Description	Beam		Column			Load type
	Ru [kip]	Pu [kip]	Pu [kip]	Mu22 [kip*ft]	Mu33 [kip*ft]	
DL	-0.04	-0.02	-2.57	0.00	0.00	Design
LL	-0.01	-0.01	0.00	0.00	0.00	Design
SL	0.00	0.00	6.17	0.00	0.00	Design
Wx	-3.78	-2.19	0.00	0.00	0.00	Design
EQx	-8.20	-4.76	0.00	0.00	0.00	Design
D1	-0.06	-0.03	-3.60	0.00	0.00	Design
D2	-0.07	-0.04	-3.09	0.00	0.00	Design
D3	-0.05	-0.03	0.00	0.00	0.00	Design
D4	-0.07	-0.04	0.00	0.00	0.00	Design
D5	-0.05	-0.03	6.78	0.00	0.00	Design
D6	-1.94	-1.13	-3.09	0.00	0.00	Design
D7	-0.06	-0.04	6.78	0.00	0.00	Design
D8	-1.94	-1.13	6.78	0.00	0.00	Design
D9	-3.83	-2.22	-3.09	0.00	0.00	Design
D10	-3.83	-2.22	0.00	0.00	0.00	Design
D11	-3.84	-2.23	-3.09	0.00	0.00	Design
D12	-3.84	-2.23	0.00	0.00	0.00	Design
D13	-3.82	-2.21	-2.32	0.00	0.00	Design
D14	-0.05	-0.03	-1.86	0.00	0.00	Design
D15	-8.25	-4.79	-3.09	0.00	0.00	Seismic
D16	-0.06	-0.04	-1.86	0.00	0.00	Design
D17	-8.25	-4.79	-1.86	0.00	0.00	Seismic
D18	-8.26	-4.79	-3.09	0.00	0.00	Seismic
D19	-8.26	-4.79	-1.86	0.00	0.00	Seismic
D20	-8.23	-4.78	-2.32	0.00	0.00	Seismic

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Shear plate						
Thickness	[in]	0.31	--	0.44	✓	p. 10-102
Number of bolts		3	2	12	✓	p. 10-102
Distance from the bolt line to the weld line	[in]	2.50	--	3.50	✓	p. 10-102
Minimum plate or beam web thickness	[in]	0.31	--	0.44	✓	Table 10-9
Length	[in]	9.00	4.31	9.00	✓	p. 10-104
Thickness, precludes a punching failure of the HSS...	[in]	0.31	--	--	✓	
Vertical edge distance	[in]	1.50	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✓	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	7.50	✓	Sec. J3.5
Beam						
Vertical edge distance	[in]	1.31	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.50	--	✓	p. 10-103
Support						
Maximum value of the specified yield stress	[Kip/in ²]	50.00	--	--	✓	
Yield stress to tensile stress ratio		0.81	--	--	✓	Table K2.1A
Weld size	[1/16in]	5	4	--	✓	p. 10-87
Weld length	[in]	9.00	1.25	--	✓	Sec. J2.2b
⚠ WARNINGS						
- Connector does not fit on beam						

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Shear plate						
Bolts shear	[Kip]	45.63	9.55	D18	0.21	Tables (7-1..14)
Bolt bearing under shear load	[Kip]	45.48	8.26	D18	0.18	p. 7-18
Shear yielding	[Kip]	60.75	8.26	D18	0.14	Eq. J4-3
Shear rupture	[Kip]	52.00	8.26	D18	0.16	Eq. J4-4
Block shear	[Kip]	52.41	8.26	D18	0.16	Eq. J4-5
Plate (support side)						
Weld capacity	[Kip]	147.57	9.55	D18	0.06	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load	[Kip]	59.94	8.26	D18	0.14	p. 7-18
Shear yielding	[Kip]	93.04	8.26	D18	0.09	Eq. J4-3
Bolt bearing under axial load	[Kip]	117.45	0.00	D15	0.00	Eq. J3-6
Support						
Welds rupture	[Kip/ft]	155.79	7.21	D18	0.05	p. 9-5
Punching shear (shear rupture)	[Kip]	105.16	8.26	D18	0.08	p. 10-153
HSS wall strength due out-of-plane transverse load	[Kip]	48.54	4.79	D18	0.10	p.9-16
Ratio						
		0.21				

Interface Right beam - column
Connection: Single plate

Demands

Description	Beam		Column			Load type
	Ru [kip]	Pu [kip]	Pu [kip]	Mu22 [kip*ft]	Mu33 [kip*ft]	
DL	3.68	0.00	-2.57	0.00	0.00	Design
LL	4.51	0.00	0.00	0.00	0.00	Design
SL	0.00	0.00	6.17	0.00	0.00	Design
Wx	0.00	-10.02	0.00	0.00	0.00	Design
EQx	0.00	-21.75	0.00	0.00	0.00	Design
D1	5.15	0.00	-3.60	0.00	0.00	Design
D2	11.63	0.00	-3.09	0.00	0.00	Design
D3	4.41	0.00	0.00	0.00	0.00	Design
D4	11.63	0.00	0.00	0.00	0.00	Design
D5	4.41	0.00	6.78	0.00	0.00	Design
D6	4.41	-5.01	-3.09	0.00	0.00	Design
D7	8.92	0.00	6.78	0.00	0.00	Design
D8	4.41	-5.01	6.78	0.00	0.00	Design
D9	4.41	-10.02	-3.09	0.00	0.00	Design
D10	4.41	-10.02	0.00	0.00	0.00	Design
D11	8.92	-10.02	-3.09	0.00	0.00	Design
D12	8.92	-10.02	0.00	0.00	0.00	Design
D13	3.31	-10.02	-2.32	0.00	0.00	Design
D14	4.41	0.00	-1.86	0.00	0.00	Design
D15	4.41	-21.75	-3.09	0.00	0.00	Seismic
D16	8.92	0.00	-1.86	0.00	0.00	Design
D17	4.41	-21.75	-1.86	0.00	0.00	Seismic
D18	8.92	-21.75	-3.09	0.00	0.00	Seismic
D19	8.92	-21.75	-1.86	0.00	0.00	Seismic
D20	3.31	-21.75	-2.32	0.00	0.00	Seismic

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Shear plate						
Number of bolts		3	2	12	✓	p 10-102
Distance from the bolt line to the weld line	[in]	2.50	--	3.50	✓	p 10-102
Minimum plate or beam web thickness	[in]	0.26	--	0.44	✓	Table 10-9
Length	[in]	8.50	6.13	12.26	✓	p. 10-104
Thickness, precludes a punching failure of the HSS...	[in]	0.31	--	--	✓	
Vertical edge distance	[in]	1.25	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✓	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	6.12	✓	Sec. J3.5
Beam						
Vertical edge distance	[in]	3.95	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.50	--	✓	p. 10-103
Support						
Maximum value of the specified yield stress	[Kip/in ²]	50.00	--	--	✓	
Yield stress to tensile stress ratio		0.81	--	--	✓	Table K2.1A
Weld size	[1/16in]	4	4	--	✓	p. 10-87
Weld length	[in]	8.50	1.00	--	✓	Sec. J2.2b

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Shear plate						
Bolts shear	[Kip]	46.53	23.51	D18	0.51	Tables (7-1..14)
Bolt bearing under shear load	[Kip]	35.77	8.92	D18	0.25	p. 7-18
Shear yielding	[Kip]	57.38	8.92	D18	0.16	Eq. J4-3
Shear rupture	[Kip]	47.92	8.92	D18	0.19	Eq. J4-4
Block shear	[Kip]	51.15	8.92	D18	0.17	Eq. J4-5
Plate (support side)						
Weld capacity	[Kip]	136.78	23.51	D18	0.17	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load	[Kip]	58.16	8.92	D18	0.15	p. 7-18
Shear yielding	[Kip]	106.33	8.92	D18	0.08	Eq. J4-3
Bolt bearing under axial load	[Kip]	67.13	0.00	D15	0.00	Eq. J3-6
Support						
Welds rupture	[Kip/ft]	155.79	15.31	D18	0.10	p. 9-5
Punching shear (shear rupture)	[Kip]	93.80	8.92	D18	0.10	p. 10-153
HSS wall strength due out-of-plane transverse load	[Kip]	47.24	21.75	D15	0.46	p.9-16

Ratio 0.51

Interface Left beam - column Connection: Single plate

Demands

Description	Beam		Column			Load type
	Ru [kip]	Pu [kip]	Pu [kip]	Mu22 [kip*ft]	Mu33 [kip*ft]	
DL	1.22	-0.09	-2.57	0.00	0.00	Design
LL	1.75	-0.03	0.00	0.00	0.00	Design
SL	0.00	0.00	6.17	0.00	0.00	Design
Wx	6.08	-7.77	0.00	0.00	0.00	Design
EQx	13.20	-16.88	0.00	0.00	0.00	Design
D1	1.71	-0.12	-3.60	0.00	0.00	Design
D2	4.26	-0.15	-3.09	0.00	0.00	Design
D3	1.46	-0.10	0.00	0.00	0.00	Design
D4	4.26	-0.15	0.00	0.00	0.00	Design
D5	1.47	-0.10	6.78	0.00	0.00	Design
D6	4.51	-3.99	-3.09	0.00	0.00	Design
D7	3.22	-0.13	6.78	0.00	0.00	Design
D8	4.51	-3.99	6.78	0.00	0.00	Design
D9	7.55	-7.88	-3.09	0.00	0.00	Design
D10	7.55	-7.88	0.00	0.00	0.00	Design
D11	9.30	-7.90	-3.09	0.00	0.00	Design
D12	9.30	-7.90	0.00	0.00	0.00	Design
D13	7.18	-7.85	-2.32	0.00	0.00	Design
D14	1.46	-0.10	-1.86	0.00	0.00	Design
D15	14.66	-16.99	-3.09	0.00	0.00	Seismic
D16	3.21	-0.13	-1.86	0.00	0.00	Design
D17	14.66	-16.99	-1.86	0.00	0.00	Seismic
D18	16.41	-17.01	-3.09	0.00	0.00	Seismic
D19	16.41	-17.01	-1.86	0.00	0.00	Seismic
D20	14.30	-16.96	-2.32	0.00	0.00	Seismic

Geometric Considerations

Dimensions	Unit	Value	Min.	Max.	Sta.	References
Shear plate						
Number of bolts		3	2	12	✓	p 10-102
Distance from the bolt line to the weld line	[in]	2.50	--	3.50	✓	p 10-102
Minimum plate or beam web thickness	[in]	0.26	--	0.44	✓	Table 10-9
Length	[in]	8.50	6.13	12.26	✓	p. 10-104
Thickness, precludes a punching failure of the HSS...	[in]	0.31	--	--	✓	
Vertical edge distance	[in]	1.25	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✓	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	6.12	✓	Sec. J3.5
Beam						
Vertical edge distance	[in]	3.95	1.00	--	✓	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.50	--	✓	p. 10-103
Support						
Maximum value of the specified yield stress	[Kip/in ²]	50.00	--	--	✓	
Yield stress to tensile stress ratio		0.81	--	--	✓	Table K2.1A
Weld size	[1/16in]	4	4	--	✓	p. 10-87
Weld length	[in]	8.50	1.00	--	✓	Sec. J2.2b

Design Check

Verification	Unit	Capacity	Demand	Ctrl EQ	Ratio	References
Shear plate						
Bolts shear	[Kip]	45.42	23.64	D19	0.52	Tables (7-1..14)
Bolt bearing under shear load	[Kip]	34.92	16.41	D19	0.47	p. 7-18
Shear yielding	[Kip]	57.38	16.41	D19	0.29	Eq. J4-3
Shear rupture	[Kip]	47.92	16.41	D19	0.34	Eq. J4-4
Block shear	[Kip]	51.15	16.41	D19	0.32	Eq. J4-5
Plate (support side)						
Weld capacity	[Kip]	123.56	23.64	D19	0.19	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load	[Kip]	56.77	16.41	D19	0.29	p. 7-18
Shear yielding	[Kip]	106.33	16.41	D19	0.15	Eq. J4-3
Bolt bearing under axial load	[Kip]	67.13	0.00	D15	0.00	Eq. J3-6
Support						
Welds rupture	[Kip/ft]	155.79	17.04	D19	0.11	p. 9-5
Punching shear (shear rupture)	[Kip]	93.80	16.41	D19	0.17	p. 10-153
HSS wall strength due out-of-plane transverse load	[Kip]	47.24	17.01	D18	0.36	p.9-16
Ratio						
0.52						
Global critical strength ratio						
0.52						

Notes

The plate is designed with the conventional configuration criteria.

References

[9] AISC 2005, Design Examples Version 13.0, pp. IIC-26 - IIC-27

[8] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC. Chapter 13, p. 14