





FB43: FastBridge Connector - Maximum Specified Design Values						
FastBridge Model	Stud Depth (in.)	Maximum Specified Design Values	No. of Screws	Stud Thickness (mil)		
				33	43	54
FB43	3.625	Axial Brace Stiffness (lbs/in)	1	1140	1330	2270
			2	1220	1480	2270
		Axial Brace Force (lbs)	1	168	198	258
			2	259	300	400
		Torsional Brace Moment (lbs-in)	1	140	172	196
			2	312	406	524
FB43	4.00	Axial Brace Stiffness (lbs/in)	1	1030	1460	2170
			2	1190	1520	3030
		Axial Brace Force (lbs)	1	180	201	248
			2	267	303	402
		Torsional Brace Moment (lbs-in)	1	129	172	221
			2	380	380	470
FB43	6.00	Axial Brace Stiffness (lbs/in)	1	790	990	1730
			2	990	1160	1930
		Axial Brace Force (lbs)	1	101	201	273
			2	248	306	424
		Torsional Brace Moment (lbs-in)	1	157	160	162
			2	279	383	535
FB43	8.00	Axial Brace Stiffness (lbs/in)	1	-	750	1910
			2	-	750	1960
		Axial Brace Force (lbs)	1	-	200	256
			2	-	284	413
		Torsional Brace Moment (lbs-in)	1	-	143	323
			2	-	435	496

**NOTES:**

- Maximum specified loads are based on studs with a minimum yield stress,  $F_y = 33$  ksi and tensile strength,  $F_u = 45$  ksi for 43 mil or thinner and a minimum yield stress,  $F_y = 50$  ksi and tensile strength,  $F_u = 65$  ksi for 54 mil or thicker.
- Maximum specified loads are based on 54 mil bridging U-channel with a minimum yield stress,  $F_y = 33$  ksi and tensile strength,  $F_u = 45$  ksi.
- Maximum specified loads are based only on the bridging connection. It is the responsibility of the designer to verify the strength and serviceability of the framing members.
- Maximum specified loads are based on #10 self-drilling screws with a nominal diameter of 0.190 in. and a washer diameter of 0.375 in. Fasteners must have a minimum nominal shear resistance,  $P_{nvs} = 1718$  lbs and a minimum nominal tensile resistance,  $P_{ts} = 2654$  lbs.
- Maximum specified loads may not be increased for wind or seismic load.
- Serviceability limit state is not considered since brace stiffness requirements are given in Section C2.3 of CSA S136-16.
- Tabulated values are based on physical tests carried out by Clark Dietrich.

## FB43 Design Examples

### Example-1: Exterior Load Bearing Wall

#### Input

- CSA S136-16 w/ S1-18 Supplement
- 600S162-43 ( $F_y = 33$  ksi) studs at 16 in. o.c., 10 ft tall
- Bracing at 4 ft o.c.
- Factored axial stud resistance,  $P_r = 5070$  lbs (CSSBI 58-2018)
- Distance from shear center to mid-plane of web,  $m = 0.670$  in. (CSSBI 58-2018)
- Specified wind pressure = 20 psf

#### Laterally Loaded Studs (Wind load)

Specified tributary load to brace:

$$W = (20)(16/12)(4) = \underline{107 \text{ lbs}}$$

Specified flange force (Eq. C2.2.1-3)

$$P_{L1} = 1.5(m/d)W = 1.5(0.670/6)107 = \underline{17.9 \text{ lbs}}$$

Specified torsional brace moment ( $d = 6$  in.)

$$M = P_{L1}(d) = 17.9(6) = \underline{108 \text{ lbs-in}}$$

From **FB33** Connector Table for 600S162-43 stud,

select clip with **One** #10 fasteners

Maximum specified torsional brace moment = **160 lbs-in > 108 in-lbs OK**

#### Bracing of Axially Loaded Studs (Section C2.3)

Axial brace force due to factored loads (assume  $P_{ra} = P_r = 5070$  lbs)

$$P_{rb} = 0.01(P_{ra}) = 0.01(5070) = \underline{50.7 \text{ lbs}} \text{ (Eq. C2.3-1)}$$

where  $P_{ra}$  is the compressive axial force due to factored loads

Brace stiffness shall be  $\geq$  Eq. C2.3-2b ( $\phi = 0.70$ )

$$\beta_{rb} = 2[4-(2/n)]/L_b(P_{ra}/\phi) = 2[4-(2/1)]/48(5070/0.70) = \underline{604 \text{ lbs/in}}$$

From **FB33** Connector Table for 600S162-43 stud,

select clip with **Two** #10 fasteners

Maximum specified axial brace force = **271 lbs > 50.7 lbs OK**

Maximum specified axial brace stiffness = **860 lbs/in > 604 lbs/in OK**

### Example-2: Installation Requirement

#### Input

- CSA S136-16 w/ S1-18 Supplement
- 362S162-43 (33 ksi) studs at 16" o.c., 10 ft tall
- Bracing at 5 ft o.c.
- Specified wind pressure = 20 psf

From **FB33** Installation Table for 362S162-43 stud with 20 psf specified wind pressure w/ 5 ft bracing distance,

select clip with One #10 fasteners **OK**

#### GENERAL NOTES:

- Bridging connectors may also be designed using Maximum Specified Design Values.
- Only lateral load has been included.
- Design of curtain wall studs should consider load combinations in accordance with the applicable building code.

FB68: FastBridge Connector - Maximum Specified Design Values						
FastBridge Model	Stud Depth (in.)	Maximum Specified Design Values	No. of Screws	Stud Thickness (mil)		
				54	68	97
FB68	3.625	Axial Brace Stiffness (lbs/in)	1	3410	4410	6270
			2	4010	6880	7585
		Axial Brace Force (lbs)	1	438	490	540
			2	627	690	776
		Torsional Brace Moment (lbs-in)	1	313	415	410
			2	693	843	1084
FB68	4.00	Axial Brace Stiffness (lbs/in)	1	3060	3440	6740
			2	3710	4670	8960
		Axial Brace Force (lbs)	1	448	477	477
			2	637	709	828
		Torsional Brace Moment (lbs-in)	1	360	436	532
			2	682	756	885
FB68	6.00	Axial Brace Stiffness (lbs/in)	1	2270	3240	3200
			2	2710	3870	3530
		Axial Brace Force (lbs)	1	442	477	486
			2	643	743	835
		Torsional Brace Moment (lbs-in)	1	277	389	632
			2	647	715	947
FB68	8.00	Axial Brace Stiffness (lbs/in)	1	1940	2500	2530
			2	1960	2810	3015
		Axial Brace Force (lbs)	1	436	481	487
			2	601	705	847
		Torsional Brace Moment (lbs-in)	1	292	483	636
			2	643	743	908

**NOTES:**

- Maximum specified loads are based on studs with a minimum yield stress,  $F_y = 33$  ksi and tensile strength,  $F_u = 45$  ksi for 43 mil or thinner and a minimum yield stress,  $F_y = 50$  ksi and tensile strength,  $F_u = 65$  ksi for 54 mil or thicker.
- Maximum specified loads are based on 54 mil bridging U-channel with a minimum yield stress,  $F_y = 33$  ksi and tensile strength,  $F_u = 45$  ksi.
- Maximum specified loads are based only on the bridging connection. It is the responsibility of the designer to verify the strength and serviceability of the framing members.
- Maximum specified loads are based on #10 self-drilling screws with a nominal diameter of 0.190 in. and a washer diameter of 0.375 in. Fasteners must have a minimum nominal shear resistance,  $P_{nvs} = 1718$  lbs and a minimum nominal tensile resistance,  $P_{ts} = 2654$  lbs.
- Maximum specified loads may not be increased for wind or seismic load.
- Serviceability limit state is not considered since brace stiffness requirements are given in Section C2.3 of CSA S136-16.
- Tabulated values are based on physical tests carried out by Clark Dietrich.

## FB68 Design Examples

### Example-1: Exterior Bearing Wall

#### Input

- CSA S136-16 w/S1-18 Supplement
- 800S200-68 (50 ksi) studs at 16 in. o.c., 10 ft tall
- Bracing at 4 ft o.c.
- Factored axial stud resistance,  $P_r = 14900$  lbs (CSSBI 58-2018)
- Distance from shear center to mid-plane of web,  $m = 0.796$  in. (CSSBI 58-2018)
- Specified wind pressure = 25 psf

#### Laterally Loaded Studs (Wind Load)

Specified tributary load to brace:

$$W = (25)(16/12)(4) = \underline{133 \text{ lbs}}$$

Specified flange force (Eq. C2.2.1-3)

$$P_{L1} = 1.5(m/d)W = 1.5(0.796/8)133 = \underline{19.9 \text{ lbs}}$$

Specified torsional brace moment ( $d = 8$  in.)

$$M = P_{L1}(d) = 19.9(8) = \underline{159 \text{ lbs-in}}$$

From **FB68** Connector Table for 8-in deep 68-mil stud,  
select clip with **One** #10 fasteners

Maximum specified torsional brace moment = **483 lbs-in > 159 in-lbs OK**

#### Bracing of Axially Loaded Studs (Section C2.3)

Axial brace force due to factored loads (assume  $P_{ra} = P_r = 14900$  lbs )

$$P_{rb} = 0.01(P_{ra}) = 0.01(14900) = \underline{149 \text{ lbs}} \text{ (Eq. C2.3-1)}$$

where  $P_{ra}$  is the compressive axial force due to factored loads

Brace stiffness shall be  $\geq$  Eq. C2.3-2b ( $\phi = 0.70$ )

$$\beta = 2[4-(2/n)]/L_b(P_{ra}/\phi) = 2[4-(2/1)]/48(14900/0.70) = \underline{1774 \text{ lbs/in}}$$

From **FB68** Connector Table for 8-in deep 68-mil stud,  
select clip with **One** #10 fasteners

Maximum specified axial brace force = **481 lbs > 149 lbs OK**

Maximum specified axial brace stiffness = **2500 lbs/in > 1774 lbs/in OK**

### Example-2: Curtain-Wall Stud

#### Input

- CSA S136-16 w/ S1-18 Supplement
  - 362S162-43 (33 ksi) studs at 16" o.c., 10 ft tall
  - Bracing at 5 ft o.c.
  - Specified wind design pressure = 20 psf
- From **FB33** Installation Table for 362S162-43 stud with 20 psf specified wind pressure w/ 5 ft bracing distance,  
select clip with One #10 fasteners **OK**

#### GENERAL NOTES:

- Bridging connectors may also be designed using Maximum Specified Design Values.
- Only lateral load has been included.
- Design of curtain wall studs should consider load combinations in accordance with the applicable building code.