FASTBRIDGE™ CLIP FB43 & FB68

BAILEY® METAL PRODUCTS LIMITED

FB43 & FB68 SCREW REQUIREMENTS FOR LATERAL PRESSURE OF STUDS at *16"* o.c. with Bracing Distance from *4' to 8'*

Specified Wind Pressure (psf) and Bracing Distance (ft): 5 psf (5', 6', 7', 8'); 10 psf, 20 psf, 25 psf, 30 psf, 35 psf, 40 psf, 50 psf (4', 5', 6', 7', 8' each)

Stud Section	Stud Thickness (mil)	FastBridge Type	5 psf	10 psf	20 psf	25 psf	30 psf	35 psf	40 psf	50 psf
362S162	33, 43, 54	FB43	1*	1*	1*, 2*	1*, 2*	2*, -	2*, -	2*, -	2*, -
362S162	54, 68, 97	FB68	1*	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*
362S200	33, 43, 54	FB43	1*	1*, 2*	1*, 2*	1*, 2*, -	2*, -	2*, -	2*, -	2*, -
362S200	54, 68, 97	FB68	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -
362S250	33, 43, 54	FB43	1*	1*, 2*	1*, 2*, -	2*, -	2*, -	2*, -	2*, -	2*, -
362S250	54, 68, 97	FB68	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -	2*, -
400S162	33, 43, 54	FB43	1*	1*	1*, 2*	1*, 2*	1*, 2*	2*, -	2*, -	2*, -
400S162	54, 68, 97	FB68	1*	1*	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*
400S200	33, 43, 54	FB43	1*	1*, 2*	1*, 2*	1*, 2*	2*, -	2*, -	2*, -	2*, -
400S200	54, 68, 97	FB68	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -
400S250	33, 43, 54	FB43	1*	1*, 2*	1*, 2*	2*, -	2*, -	2*, -	2*, -	2*, -
400S250	54, 68, 97	FB68	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -	1*, 2*, -
600S162	33, 43, 54	FB43	1*	1*	1*, 2*	1*, 2*	1*, 2*, -	2*, -	2*, -	2*, -
600S162	54, 68, 97	FB68	1*	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*
600S200	33, 43, 54	FB43	1*	1*	1*, 2*	2*, -	2*, -	2*, -	2*, -	2*, -
600S200	54, 68, 97	FB68	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -
600S250	33, 43, 54	FB43	1*	1*, 2*	2*, -	2*, -	2*, -	2*, -	2*, -	2*, -
600S250	54, 68, 97	FB68	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -	2*, -, 1*, 2*
800S162	43, 54	FB43	1*	1*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*	1*, 2*, -
800S162	54, 68, 97	FB68	1*	1*	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*
800S200	43, 54	FB43	1*	1*	2*, 1*	2*, 1*	2*, 1*	2*, 1*	1*, 2*, -	2*, -, 1*
800S200	54, 68, 97	FB68	1*	1*	1*	1*, 2*	1*, 2*	1*, 2*	2*, 1*	2*, 1*
800S250	43, 54	FB43	1*	1*, 2*	2*, 1*	2*, 1*	1*, 2*, -	1*, 2*, -	1*, 2*, -	2*, -
800S250	54, 68, 97	FB68	1*	1*	1*, 2*	1*, 2*	2*, 1*	2*, 1*	2*, 1*	2*, -, 1*

NOTES:

- "1*" indicates that one #10 screw used with either the FB43 or FB68 FastBridge Clip provides adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- "2*" indicates that two #10 screws used with either the FB43 or FB68 FastBridge Clip provides adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- Blank portions of the table indicates that FB43 or FB68 FastBridge Clip do not provide adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- Specified wind pressure to be obtained from NBC 2015.

FASTBRIDGE™ CLIP FB43 & FB68

FB43 & FB68 **SCREW REQUIREMENTS FOR LATERAL PRESSURE OF STUDS at *24"* o.c. with Bracing Distance from *4' to 8'***

Stud Section	Stud Thickness (mil)	FastBridge Type	Specified Wind Pressure (psf) and Bracing Distance (ft)																																							
			5 psf					10 psf					20 psf					25 psf					30 psf					35 psf					40 psf					50 psf				
			4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'	4'	5'	6'	7'	8'
362S162	33	FB43										2*																						2*						2*		
	43				1*				1*						2*				2*			-		2*			-	2*			-					-				-		
	54												1*																									2*				
	54	FB68															2*					2*					2*										-					-
	68				1*					1*				1*					1*					1*				1*			2*					2*			2*			
	97																																1*									
362S200	33	FB43																				-						2*														
	43				1*			1*			2*			2*			-	2*					2*			-					-				-					-		
	54																											2*					2*									
	54	FB68															2*														-						-					
	68				1*					1*				1*				1*			2*		1*		2*			1*		2*				2*				2*			-	
	97																																									
362S250	33	FB43					2*																																			
	43				1*						2*		2*			-					-				-					-					-					-		
	54							1*										2*					2*					2*														
	54	FB68																				-					-					-										
	68				1*					1*			1*			2*				2*				2*					2*				2*			-					-	
	97																	1*																				2*				
400S162	33	FB43										2*				-					-		-			-					-											
	43				1*				1*						2*					2*																-					-	
	54												1*					1*						2*				2*					2*					2*				
	54	FB68																			2*						2*					2*					-					-
	68				1*					1*					1*					1*				1*									1*			2*				2*		
	97																											1*										1*				
400S200	33	FB43										2*																2*					2*									
	43				1*									2*		-		2*			-		2*			-					-				2*	-					-		
	54							1*																				2*					2*									
	54	FB68															2*														-											
	68				1*					1*					1*				1*			2*	1*			2*				2*				2*			-	2*			-	
	97																											1*					1*									
400S250	33	FB43					2*																2*																			
	43				1*						2*			2*			-	2*			-				-					-					-					-		
	54							1*															2*																			
	54	FB68																				-					-															
	68				1*					1*				1*			2*				2*				2*				2*			-	2*			-					-	
	97																	1*					1*					1*										2*				
600S162	33	FB43														-					-		-			-					-					-						
	43				1*					1*			1*			2*																									-	
	54																			2*				2*					2*				2*					2*				
	54	FB68															2*				2*					2*					2*					2*						-
	68				1*					1*					1*					1*				1*															2*			
	97																												1*					1*				1*				2*
600S200	33	FB43															-				-																					
	43				1*				1*		2*			2*					2*							-					-					-					-	
	54																						2*					2*					2*					2*				
	54	FB68															2*				2*					2*					-					-						
	68				1*					1*				1*					1*											2*					2*			2*			-	
	97																							1*				1*					1*					1*			2*	
600S250	33	FB43																																								
	43				1*						2*					-					-					-					-					-				-		
	54							1*					2*					2*					2*					2*					2*									
	54	FB68															2*				2*						-				-		2*					2*				
	68				1*					1*				1*											2*				2*							-					-	
	97																	1*					1*					1*					1*		2*			1*	2*			
800S162	43	FB43			1*					1*				2*		-		2*			-		2*		-					-					-						-	
	54													1*					1*			2*		1*		2*		1*		2*			1*		2*			2*				
	54	FB68																			2*				2*					2*							2*					-
	68				1*					1*					1*					1*				1*										1*					2*		
	97																													1*								1*				
800S200	43	FB43			1*						2*						2*				2*				2*					2*							-	2*				
	54								1*					1*				1*					1*				-	1*				-	2*									-
	54	FB68														2*					2*						2*			2*						2*	-					-
	68				1*					1*				1*					1*					1*																2*		
	97																											1*					1*					1*				
800S250	43	FB43			1*					2*						2*			2*					2*				2*					2*		-					-		
	54							1*					1*					1*				-					-					-										
	54	FB68													2*					2*					2*	-					-					-					-
	68				1*					1*																				2*					2*				2*			
	97														1*					1*				1*				1*					1*					1*				

NOTES:

- "1*" indicates that one #10 screw used with either the FB43 or FB68 FastBridge Clip provides adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- "2*" indicates that two #10 screws used with either the FB43 or FB68 FastBridge Clip provides adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- Blank portions of the table indicates that FB43 or FB68 FastBridge Clip do not provide adequate torsional restraint to the stud for the designated lateral design pressure and brace spacing.
- Specified wind pressure to be obtained from NBC 2015.

FASTBRIDGE™ CLIP FB43 & FB68

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:

$W = (20)(16/12)(4) =$ *107 lbs*

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

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

Specified torsional brace moment (d = 6 in.)

$M = P_{L1}(d) = 17.9(6) =$ *108 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)

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

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

Brace stiffness shall be ≥ Eq. C2.3-2b (ϕ = 0.70)

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

FASTBRIDGE™ CLIP FB43 & FB68

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:

$W = (25)(16/12)(4) =$ *133 lbs*

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

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

Specified torsional brace moment (d = 8 in.)

$M = P_{L1}(d) = 19.9(8) =$ *159 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)

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

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

Brace stiffness shall be ≥ Eq. C2.3-2b (ϕ = 0.70)

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