



PARIC CORPORATION
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St. Louis, MO 63146
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REQUEST FOR INFORMATION **DATE:** January 25, 2017 **NO.:** RFI-423

To: Cannon Design

Attn: Kelvin Patel

From: Paric Corporation

Requested By: Devin Gates

Project Name: 15051-Webster University Interdisciplinary Science Building Project No.: 15051

Subject: Clerestory curtainwall anchorage points

Response Required By: February 01, 2017

Drawing / Spec Reference:

Information Requested:

There is not a bent plate or edge of slab to attach the curtainwall to at clerestory area where it diminishes to the end. See attached loadings at these curtainwall members. Paric has reviewed with the cold formed metal framing engineer and were hopeful that some sort of backing could be added to the studs for a connection point, and they have advised that the parapet cannot be reinforced to support these curtainwall loads (even retrofitting existing studs). The cold formed framed engineer has suggested a red angle attachment. See attached photo of the condition for reference. Please advise of what structure should be provided to connect to and please design so that it can be installed from the roof side of aluminum framing area.

Response:

SEE ATTACHED COMMENTS AND DETAILS

ARCHITECT'S RESPONSE:

This information is provided as an interpretation of the Contract Documents for implementation. It is not an authorization for change to the Contract Sum or Contract Time. If this information results in a claim for a change to the Contract, the Contractor shall notify the [Construction Manager][Architect] of a change through the change process.

Answered By: JILL WALKER / DMA

Date: 02.16.2017

MULLION CONN FOR
WIND AT TOP -
PROVIDE DETAIL #1

MULLION WILL
BEAR AT SILL - JEI
TO MODIFY BASE
CONNECTION -
PROVIDE DETAIL #2

MULLIONS TO DEAD
HANG FROM BENT
PLATE AND CONN
FOR WIND AT TOP -
PROVIDE DETAIL #1



DAVID MASON & ASSOCIATES

CHICAGO, IL • ST. LOUIS, MO

COMPUTATION SHEETS

2/16/2017 JYW

PROJECT #: _____

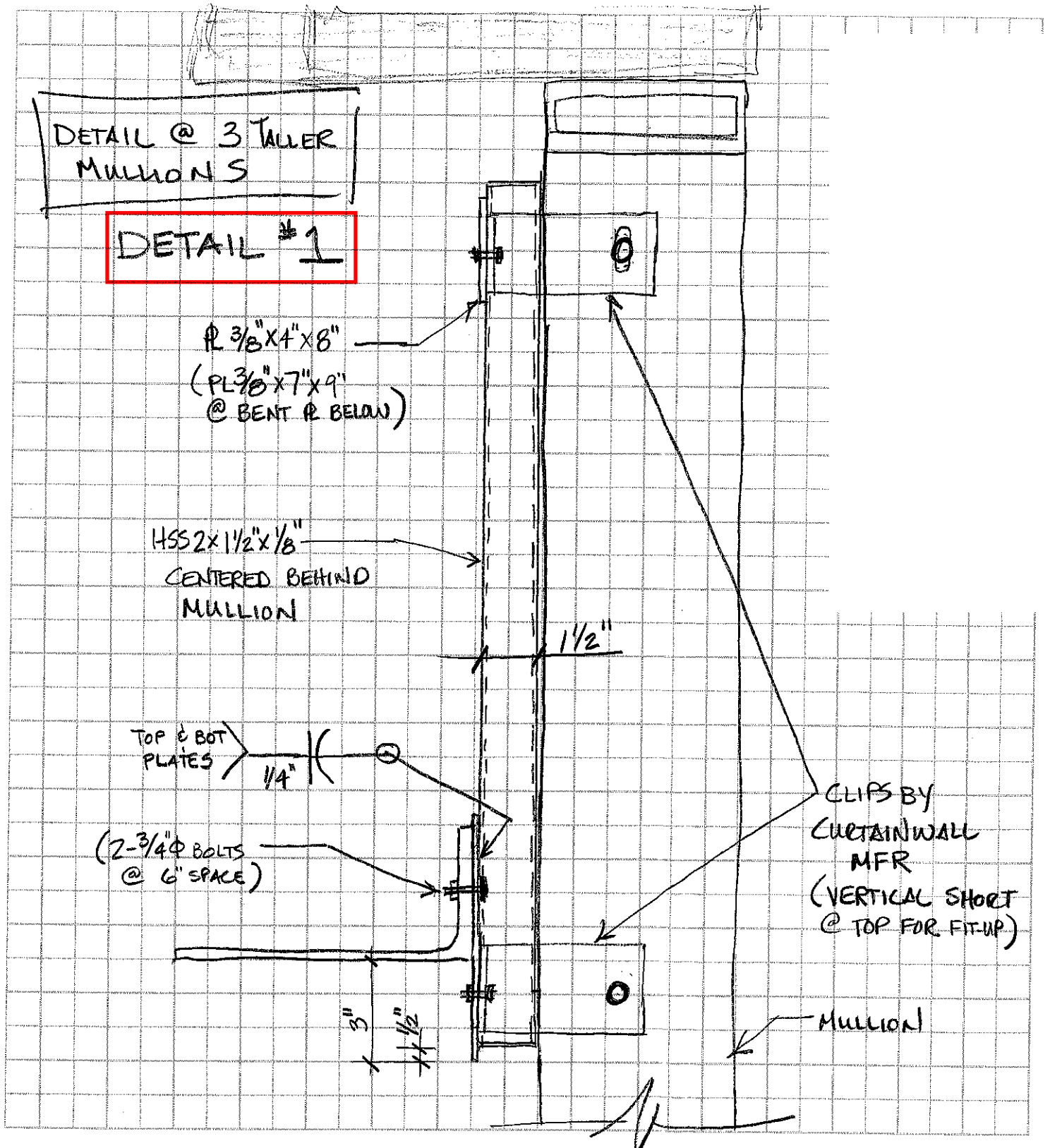
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COMPUTATION SHEETS

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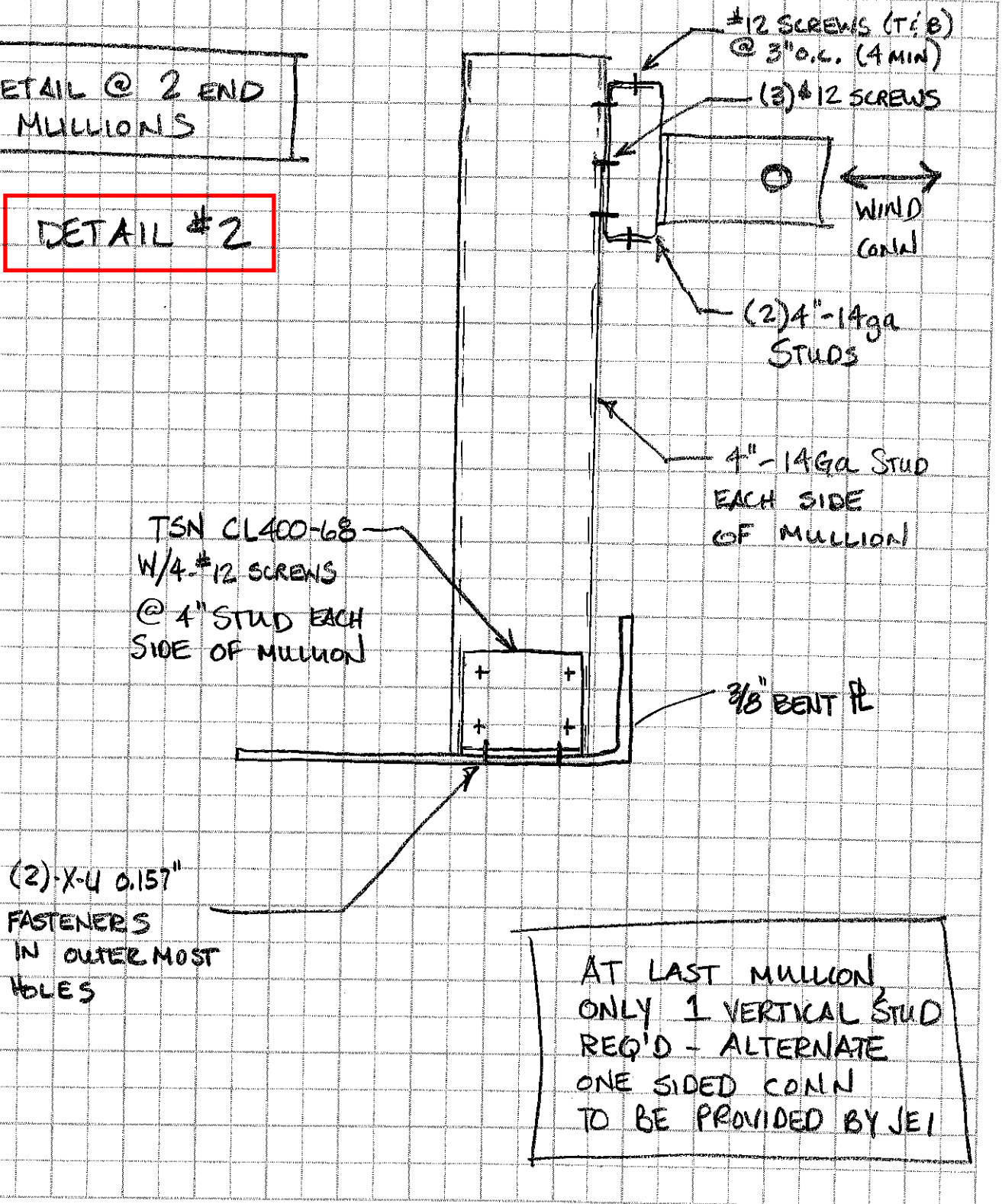
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DATE: _____

DETAIL @ 2 END
MULLIONS

DETAIL #2



StiffClip® CL

Floor Tie

The Steel Network, Inc.

www.steelnetwork.com

1-888-474-4876



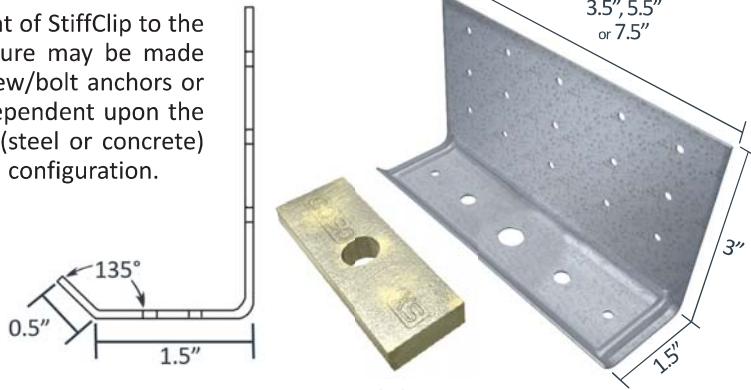
Material Composition

68mil Clip: ASTM A1003/A1003M Structural Grade 50 (340) Type H, ST50H (ST340H): 50ksi (340MPa) minimum yield strength, 65ksi (450MPa) minimum tensile strength, 68mil minimum thickness (14 gauge, 0.0713" design thickness) with ASTM A653/A653M G90 (Z275) hot dipped galvanized coating.

118mil Clip: ASTM A1003/A1003M Structural Grade 50 (340) Type H, ST50H (ST340H): 50ksi (340MPa) minimum yield strength, 65ksi (450MPa) minimum tensile strength, 118mil minimum thickness (10 gauge, 0.1242" design thickness) with ASTM A653/A653M G90 (Z275) hot dipped galvanized coating.

"H" Plate: ½" steel, ASTM A36, 36ksi min yield, 58-80ksi min tensile, with ASTM B633 Type II Yellow Zinc Coating, or Paint, or Equivalent.

The attachment of StiffClip to the primary structure may be made with PAFs, screw/bolt anchors or weld and is dependent upon the base material (steel or concrete) and the design configuration.



CL (H) Plate



US Patent #7,533,508

StiffClip CL Allowable Loads

		StiffClip® CL362/400, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness														
Stud		CL362/400-68					CL362/400-118					CL362/400-118 (H)				
		4 #12 Screws, Pattern 1					4 #12 Screws, Pattern 1					9 #12 Screws, Pattern 2				
Thickness Mils (ga)	Yield Strength (ksi)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)
33 (20)	33	191	535	754	1,108	85,340	191	535	754	1,108	109,279	286	980	1,696	1,653	169,064
33 (20)	50	275	773	1,089	1,601		275	773	1,089	1,601		413	1,415	2,450	2,388	
43 (18)	33	248	796	1,122	1,649		248	796	1,122	1,649		373	1,458	2,524	2,460	
43 (18)	50	359	1,150	1,151	1,804		359	1,150	1,620	2,383		538	2,107	3,646	3,554	
54 (16)	33	312	1,120	1,151	1,804		312	1,120	1,577	2,319		468	2,050	3,549	3,459	
54 (16)	50	450	1,617	1,151	1,804		450	1,617	2,225	3,350		676	2,961	5,126	4,996	
68 (14)	50	567	1,917	1,151	1,804		567	2,287	2,225	3,936		851	4,187	5,713	6,716	
97 (12)	50	809	1,917	1,151	1,804		809	2,411	2,225	3,936		1,214	4,415	5,713	6,716	
118 (10)	50	856	1,917	1,151	1,804		856	2,411	2,225	3,936		1,284	4,415	5,713	6,716	
Max Allowable Clip Load		1,416	1,917	1,151	1,804		2,423	4,107	2,225	3,936		2,598	4,978	5,713	6,716	

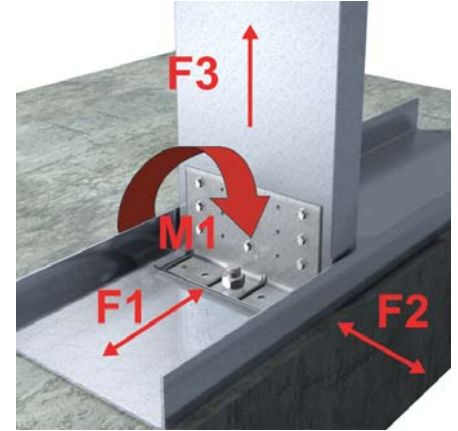
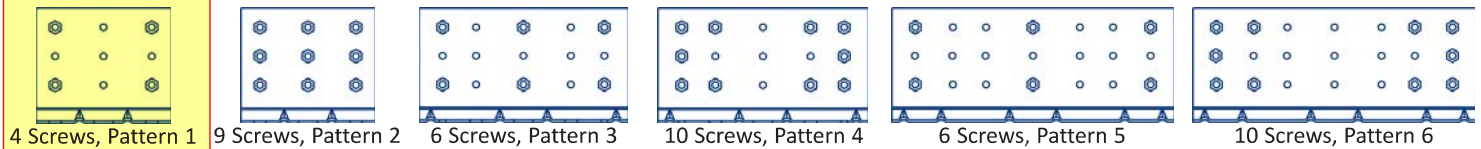
		StiffClip® CL600, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness														
Stud		CL600-68					CL600-118					CL600-118 (H)				
		6 #12 Screws, Pattern 3					6 #12 Screws, Pattern 3					10 #12 Screws, Pattern 4				
Thickness Mils (ga)	Yield Strength (ksi)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)
33 (20)	33	286	874	1,067	1,713	171,480	286	874	1,130	1,713	283,521	381	1,481	1,884	3,140	344,193
33 (20)	50	413	1,263	1,067	2,435		413	1,263	1,633	2,475		550	2,139	2,722	4,537	
43 (18)	33	373	1,301	1,067	2,435		373	1,301	1,682	2,549		497	2,204	2,804	4,673	
43 (18)	50	538	1,880	1,067	2,435		538	1,880	2,225	3,683		718	3,184	4,051	6,755	
54 (16)	33	468	1,830	1,067	2,435		468	1,830	2,225	3,585		624	3,099	3,943	6,571	
54 (16)	50	676	2,510	1,067	2,435		676	2,642	2,225	5,177		901	4,476	5,695	7,306	
68 (14)	50	851	2,510	1,067	2,435		851	3,736	2,225	5,702		1,134	6,329	6,007	7,306	
97 (12)	50	1,214	2,510	1,067	2,435		1,214	3,939	2,225	5,702		1,618	6,455	6,007	7,306	
118 (10)	50	1,284	2,510	1,067	2,435		1,284	3,939	2,225	5,702		1,712	6,455	6,007	7,306	
Max Allowable Clip Load		1,421	2,510	1,067	2,435		2,580	4,107	2,225	5,702		4,158	6,455	6,007	7,306	

****StiffClip CL Allowable Load tables and important notes continued on next page.**

StiffClip® CL800, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness																
Stud		CL800-68					CL800-118					CL800-118 (H)				
Thickness Mils (ga)	Yield Strength (ksi)	6 #12 Screws, Pattern 5					6 #12 Screws, Pattern 5					10 #12 Screws, Pattern 6				
		F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)	F1 (lbs)	F2 (lbs)	F3 (lbs)	M1 (in-lbs)	Stiffness (in-lbs/rad)
33 (20)	33	286	976	1,077	2,479	150,779	286	976	1,130	2,479	469,941	381	1,664	1,884	4,710	581,080
33 (20)	50	413	1,410	1,077	2,860		413	1,410	1,633	3,582		550	2,404	2,722	6,805	
43 (18)	33	373	1,452	1,077	2,860		373	1,452	1,682	3,689		497	2,476	2,804	7,010	
43 (18)	50	538	2,098	1,077	2,860		538	2,098	2,431	5,330		718	3,577	4,051	10,128	
54 (16)	33	468	2,042	1,077	2,860		468	2,042	2,366	5,188		624	3,482	3,943	9,858	
54 (16)	50	676	2,662	1,077	2,860		676	2,950	2,666	7,493		901	5,029	5,695	11,143	
68 (14)	50	851	2,662	1,077	2,860		851	4,171	2,666	8,229		1,134	7,110	7,446	11,143	
97 (12)	50	1,214	2,662	1,077	2,860		1,214	4,398	2,666	8,229		1,618	7,497	7,446	11,143	
118 (10)	50	1,284	2,662	1,077	2,860		1,284	4,398	2,666	8,229		1,712	7,497	7,446	11,143	
Max Allowable Clip Load		1,435	2,662	1,077	2,860		3,356	6,410	2,666	8,229		4,816	8,274	7,446	11,143	

Notes:

- StiffClip CL resists vertical, horizontal, and torsional loads.
- Allowable load tables incorporate eccentric loading of fasteners. Values with welded connection may increase.
- Fasten within ¾" from the angle heel (centerline of the 1½" leg), using pre-drilled holes.
- Center hole is 0.563" in diameter for ½" anchor. Middle guide holes are 0.313" in diameter. Outer guide holes and guide holes in 3" leg are 0.141" in diameter.
- Guide holes are in place for fastener installation efficiency. All guide holes may not require fasteners. Fastener amount determined by the designer. Screw fasteners should be symmetrically placed in guide holes. Refer to screw pattern diagrams below for placement.
- Loads listed reflect force in a single direction. When multiple loads react on the connection, it is the responsibility of the designer to check the interaction of forces.
- Allowable loads have not been increased for wind, seismic, or other factors.
- Torsional effects are considered on screw group for F2 & F3 allowable loads. It is assumed that half of the torsional moment is taken by the connection to the structure and half is taken by the connection to the stud.
- M1 loads are reported as Max. Load divided by a Factor of Safety. M1 loads maybe limited by the Serviceability Load calculated as Clip Stiffness times the Serviceability Limit in radians.
- Stiffness is the Max Allowable Clip Moment divided by the clip rotation measured at the Max Allowable Clip Moment.

Load Direction**Screw Patterns****Nomenclature**

To specify StiffClip CL on drawings, multiply stud depth by 100, followed by the appropriate material thickness, based on strength required (see load tables). The StiffClip CL118(H) utilizes a plate in the 1½" leg (shown on page 1).

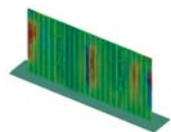
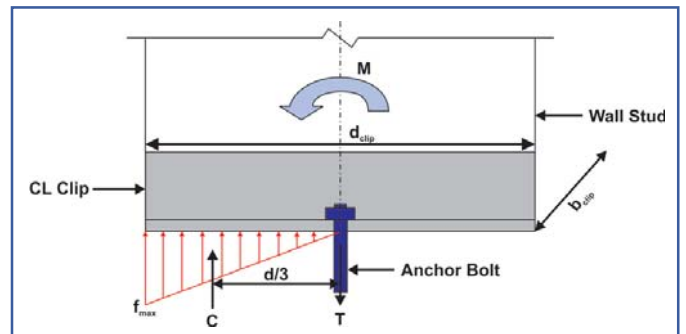
Example: 6" stud, uplift load of 650lbs

Designate: StiffClip® CL600-68

Anchor Bolt Design

The following equation for tension force in the anchor is derived using the assumed bearing stress distribution shown in the figure to the right. This assumed stress distribution provides a conservative anchor force approximation.

$$T = \frac{M}{\left(\frac{2}{3}\right)(d_{clip}/2)} = \frac{3M}{d_{clip}}$$



StiffClip CL Series
Blast and Seismic Design data
www.steelnetwork.com

** For more information or to review a copy of this report, please visit our website at <http://www.steelnetwork.com/Site/TechnicalData>

3.2.2 General Application Fasteners

Allowable Loads in Minimum ASTM A36 ($F_y \geq 36$ ksi, $F_u \geq 58$ ksi) Steel^{1,2,4,5}

Fastener Description	Fastener	Shank Diameter in. (mm)	Steel Thickness (in.)											
			1/8		3/16		1/4		3/8		1/2		≥3/4	
			Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
Universal Knurled Shank*	X-U ⁶	0.157 (4.0)	-	-	535 (2.38)	720 (3.20)	775 (3.45)	720 (3.20)	935 (4.16)	720 (3.20)	900 (4.00)	720 (3.20)	350 (1.56)	375 (1.67)
Stepped-Shank Knurling-Lengthwise	X-U 15 ⁷	0.145 (3.7)	-	-	155 (0.69)	395 (1.76)	230 (1.02)	395 (1.76)	420 (1.86)	450 (2.00)	365 (1.62)	500 (2.22)	365 (1.62)	400 (1.78)
Standard Smooth Shank	X-S13	0.145 (3.7)	140 (0.62)	300 (1.33)	300 (1.33)	450 (2.00)	300 (1.33)	450 (2.00)	300 (1.33)	450 (2.00)	-	-	-	-
Drywall Smooth Shank w/Metal Top Hat Washer	X-S16	0.145 (3.7)	-	-	225 (1.00)	420 (1.87)	225 (1.00)	430 (1.91)	225 (1.00)	430 (1.91)	225 (1.00)	430 (1.91)	-	-
Heavy Duty Knurled Shank	EDS ³	0.177 (4.5)	-	-	305 (1.36)	615 (2.67)	625 (2.78)	870 (3.87)	715 (3.18)	870 (3.87)	890 (3.96)	960 (4.27)	400 (1.78)	655 (2.91)
Heavy Duty Smooth Shank	DS	0.177 (4.5)	-	-	365 (1.62)	725 (3.22)	580 (2.58)	725 (3.22)	695 (3.09)	725 (3.22)	735 (3.27)	860 (3.83)	-	-
Stainless Steel Smooth Shank	X-CR	0.145 (3.7)	-	-	460 (2.05)	460 (2.05)	615 (2.74)	500 (2.22)	-	-	-	-	-	-
	X-CR ⁸	0.145 (3.7)	300 (1.33)	190 (0.85)	615 (2.74)	495 (2.20)	760 (3.38)	500 (2.22)	220 (0.98)	325 (1.45)	225 (1.00)	335 (1.49)	-	-
Drywall Track Smooth Shank	X-EGN ⁹	0.118 (3.0)	140 (0.62)	230 (1.02)	220 (0.98)	245 (1.09)	225 (1.00)	290 (1.29)	280 (1.25)	330 (1.47)	280 (1.25)	330 (1.47)	280 (1.25)	330 (1.47)
	X-EGN ^{8,9}	0.118 (3.0)	-	-	220 (0.98)	295 (1.31)	260 (1.16)	355 (1.58)	280 (1.25)	385 (1.71)	280 (1.25)	385 (1.71)	280 (1.25)	385 (1.71)
Premium Gas Fastener	X-GHP	0.118 (3.0)	125 (0.56)	230 (1.02)	170 (0.76)	245 (1.09)	200 (0.89)	230 (1.02)	250 (1.11)	255 (1.13)	-	-	-	-

- The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.
- Low-velocity fasteners shall be driven to where the point of the fastener penetrates the steel base material in accordance with Section 3.2.1.2.3, except as noted in this table.
- EDS fasteners installed into greater than 1/2" thick steel require 1/2" minimum penetration.
- Multiple fasteners are recommended for any attachment.
- Refer to guidelines for fastening to steel, Section 3.2.1.2, for application limits.
- Tabulated allowable load values provided for 3/4" steel are based upon minimum point penetration of 1/2". If 1/2" point penetration is not achieved, but a point penetration of at least 3/8" is obtained, the tabulated tension value should be reduced by 20 percent and the tabulated shear load should be reduced by 8 percent.
- X-U 15 fasteners installed into greater than 3/8" thick steel require 15/32" minimum penetration.
- Based on testing with $F_y = 50$ ksi base material.
- X-EGN fasteners installed into 3/8" or thicker base steel require 0.320" minimum penetration depth.

Allowable Tensile Pullover and Shear Bearing Load Capacities for Steel Framing with Power Driven Fasteners^{1,2,3,4}

Fastener Description	Fastener	Head Dia. in. (mm)	Sheet Steel Thickness													
			14 ga.		16 ga.		18 ga.		20 ga.		22 ga.		24 ga.		25/26 ga.	
			Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
0.157" shank with or w/o plastic washers or MX collation	X-U*	0.322 (8.2)	825 (3.67)	1,085 (4.83)	685 (3.05)	720 (3.20)	490 (2.18)	525 (2.34)	360 (1.60)	445 (1.98)	300 (1.33)	330 (1.47)	205 (0.91)	255 (1.13)	120 (0.53)	145 (0.64)
0.145" shank with or w/o plastic washers or MX collation	X-C ⁵ , X-CR	0.322 (8.2)	-	985 (4.38)	685 (3.05)	720 (3.20)	490 (2.18)	515 (2.29)	360 (1.60)	440 (1.96)	300 (1.33)	310 (1.38)	205 (0.91)	235 (1.05)	120 (0.53)	145 (0.64)
0.177" shank without washer	DS, EDS	0.322 (8.2)	965 (4.29)	1,085 (4.83)	810 (3.60)	815 (3.63)	625 (2.78)	535 (2.38)	460 (2.05)	465 (2.07)	360 (1.60)	350 (1.56)	300 (1.33)	260 (1.16)	240 (1.07)	180 (0.80)
0.145" shank with plastic top hat washers	X-S13 THP X-S16 TH	0.322 (8.2)	-	985 (4.38)	685 (3.05)	720 (3.20)	490 (2.18)	515 (2.29)	360 (1.60)	440 (1.96)	300 (1.33)	310 (1.38)	205 (0.91)	235 (1.05)	120 (0.53)	145 (0.64)
0.118" shank with MX collation	X-EGN, X-GN, X-GHP	0.276 (7.0)	-	-	-	-	325 (1.45)	390 (1.73)	265 (1.18)	335 (1.49)	250 (1.11)	235 (1.05)	170 (0.76)	185 (0.82)	100 (0.44)	125 (0.56)

- Allowable load values are based on a safety factor of 3.0 in accordance with the AISI S100.
- Allowable pullover capacities of sheet steel should be compared to the allowable fastener tensile load capacities in concrete, steel, and masonry to determine controlling resistance load.
- Allowable shear bearing capacities of sheet steel should be compared to allowable fastener shear capacities in concrete, steel and masonry to determine controlling resistance load.
- Data is based on the following minimum sheet steel properties, $F_y = 33$ ksi, $F_u = 45$ ksi (ASTM A653 material).
- Allowable load values apply to X-C fasteners with black or white collated strip or guidance washer.

* More details about the innovative X-U fastener can be found in Section 3.2.3.