SS08531

Used for Florida State Wide Product Approval

FL13904

Products on this Report which are approved:

Product	FL#
CCQM-SDSHDG Series	13904.1
CCTQM-SDSG Series	13904.1
ECCLQMG-KT Series	13904.1
ECCLQ Series	13904.2
CCCQ Series	13904.2
CCTQ Series	13904.2
LTA2	13904.3
MBHU3.56 Series	13904.4
MBHU5.50 Series	13904.4

SIMPSON Strong-Tie®

SIMPSON STRONG-TIE COMPANY, INC.

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FL CA No. 7547

Evaluation reports are the opinion of the engineer who prepared the report, based on the findings, and in no way constitute or imply approval by a local building authority. The engineer, in review of the data submitted, finds that, in his opinion, the product, material, system, or method of construction specifically identified in this report conforms with or is a suitable alternate to that specified in the Florida Building Code, SUBJECT TO THE LIMITATIONS IN THIS REPORT

Jeffrey P. Arneson, an employee of Jax Apex Technology, Inc. (Apex Technology), is the authorized evaluating engineer of this report. Apex Technology is the prime professional, as defined in Florida Rule 61G-30.002, authorized to sell the engineering services performed by Jeffrey P. Arneson, and is in no way acting, nor attempting to act, as an approved evaluation entity. Neither Jeffrey P. Arneson, nor any other employee of Apex Technology, has performed calculations or testing for the products listed in this report. This evaluation is based solely upon the review, under the direct supervision of Jeffrey P. Arneson, of testing and/or calculations submitted by the manufacturer.

The capacities listed in this report are based on the limiting capacities as determined from the substantiating data. We reviewed the substantiating data to a degree that allowed us to determine whether or not the work performed is consistent with the intended use of the product, and that the methods used are in compliance with, or meet the intent of, the Florida Building Code. All test reports were prepared by an approved testing laboratory.

REPORT NO.: SS08531

CATEGORY: Structural Components

SUB CATEGORY: Metal Connectors

SUBMITTED BY:

SIMPSON STRONG-TIE COMPANY, INC.
5956 W. LAS POSITAS BOULEVARD
PLEASANTON, CA 94588

1. CERTIFICATION OF INDEPENDENCE:

Jeffrey P. Arneson, the Florida engineer who prepared this report, and Apex Technology have no financial interest in the manufacturing, sales, or distribution of the products included in this report. Jeffrey P. Arneson and Apex Technology comply with all criteria as stated in Florida Administrative Code Chapter 9B-72.110.

2. PRODUCT NAME

Embedded Truss Anchor:	LTA2
Masonry Beam Hangers:	MBHU3.56, MBHU5.50
Multiple Member Column Caps:	CCCQ, CCTQ, ECCLQ
Column Caps for CMU and Concrete Piers:	CCQM, CCTQM, ECCLQM

3. SCOPE OF EVALUATION

Load Evaluation as a Structural Component using the requirements of the *Florida Building Code, Building.*

4. DESCRIPTION:

4.1 LTA2 Embedded Truss Anchor. The LTA2 is used to anchor wood trusses, rafters, or beams to masonry or concrete walls. The LTA2 fastens to the wood member with ten 10d×1½" nails, and embeds into the bond beam or tie beam of a masonry or concrete wall. These connectors are manufactured from 18 gauge steel meeting ASTM A653 SS Grade 40. The galvanized coating complies with the G90 requirements of ASTM A653. LTA2 fastener schedules, dimensions and allowable loads are shown in Table 1. See Figures 1 and 2 for additional details of the LTA2.

4.2 MBHU3.56, MBHU5.50 Masonry Beam Hangers. The MBHU3.56 and MBHU5.50 are used to anchor wood beams, trusses, or rafters to masonry or concrete walls. The MBHU fastens to the wood member with twelve Simpson Strong-Tie ¼" × 2½" SDS Wood Screws, and fastens to the masonry or concrete wall with two ¾" × 5" Titen HD Masonry Screw Anchors. These connectors are manufactured from 10 gauge steel meeting ASTM A653 SS Grade 50, Class 1. The galvanized coating complies with the G90 requirements of ASTM A653. Hanger fastener schedules, dimensions and allowable loads are shown in Table 2. See Figures 3 and 4 for additional details of masonry beam hangers.

4.3 CCCQ, CCTQ, ECCLQ Multiple Member Column Caps. The CCCQ, CCTQ, and ECCLQ are used to connect multiple beams to the top of wood columns. The beams can be oriented in a "cross" configuration (CCCQ), "T" configuration (CCTQ), or an "L" configuration (ECCLQ). The Column Caps fasten to the side beams with eight Simpson ¼" X 2½" SDS screws and to the main beam with sixteen Simpson Strong-Tie ¼" X 2½" SDS screws (provided with the part). The CCCQ, CCTQ, and ECCLQ are manufactured from 7 gauge steel meeting ASTM A-1011 GRADE 33. The coating is a powder coated gray paint. Column Cap fastener schedule, dimensions and allowable loads are shown in Table 3. See Figure 5 for additional details.

4.4 CCQM, CCTQM, ECCLQM Column Caps for CMU and Concrete Piers. The CCQM, CCTQM, and ECCLQM are used to connect beams to the top of CMU or concrete piers, primarily for raised pier foundations. The beams can be oriented in a "straight" configuration (CCQM), "T" configuration (CCTQ), or an "L" configuration (ECCLQM). The Column Caps fasten to the beams with Simpson Strong-Tie ¼" X 2½" SDS screws, which are included with the connector. Specially shaped anchor bolts are welded to the bottom of the buckets, and are embedded in the top of the pier. The ECCLQM-KT includes two MSTQM straps, which extend up to provide a shearwall overturning holdown for corner framing above. The CCQM, CCTQM, and ECCLQM are manufactured from 7 gauge steel meeting ASTM A-1011 GRADE 33. The coating is a hot-dipped galvanizing in accordance with ASTM A 153. MSTQM strap is manufactured from 12 gauge steel meeting ASTM A-653 SS GRADE 40. The galvanized coating complies with the G90 requirements of ASTM A-653. Column Cap fastener schedule, dimensions and allowable loads are shown in Table 4. MSTQM strap fastener schedule and allowable loads are specified in Note 9 of Table 4. See Figures 6, 7 and 8 for additional details.

5. MATERIALS

5.1 Steel. Steel specifications for each product listed in this evaluation report shall be as indicated in the previous section.

5.2 Wood. Wood members to which these connectors are fastened shall be solid sawn lumber, glued-laminated lumber, or structural composite lumber having dimensions consistent with the connector dimensions shown in Tables 1 through 5. Unless otherwise noted, lumber shall be Southern Pine or Douglas Fir-Larch having a minimum specific gravity of 0.50. Where indicated by SPF, lumber shall be Spruce-Pine-Fir having a minimum specific gravity of 0.42.

5.3 Nails. Unless noted otherwise, nails shall be common nails. Nails shall comply with ASTM F 1667 and shall have the minimum bending yield strengths F_{yb}:

Common Nail Pennyweight	Nail Shank Diameter (inch)	F_{yb} (psi)
10d	0.148	90,000

Fasteners for galvanized connectors in pressure-preservative treated wood shall be hot-dipped zinc coated galvanized steel with coating weights in accordance with ASTM A153.

5.4 SDS Wood Screws: Fasteners used with the connectors described in tables 2, 3 and 4 of the report must be Simpson Strong-Tie SDS wood screws recognized in FL9589. Model numbers shown in this report do not include the full SDS model number after the connector model number (e.g., CCTQ-SDS2.5), but the information shown applies. SDS screws used in contact with preservative-treated or fire-retardant-treated lumber must, as a minimum, comply with FL9589. The lumber treater or Simpson Strong-Tie Company should be contacted for recommendations on minimum corrosion resistance and connection capacities of fasteners used with the specific proprietary preservative-treated or fire retardant-treated lumber.

5.5 Titen HD Anchors: Titen HD anchors shown in Table 2 and Figure 4 shall be Simpson Strong-Tie Titen HD screw anchors for masonry or concrete as recognized in FL11506. Installation shall be as specified in FL11506.

5.6 Concrete/Masonry. Concrete and Masonry design specifications shall be the stricter of the specifications by the engineer of record, the Florida Building Code minimum standards, the following, or as noted in the report:

Material	Specification	Minimum Compressive Strength
Concrete, f'c	-	2500 psi
Masonry, f'm	ASTM E447	1500 psi
Masonry Unit	ASTM C90	1900 psi
Mortar	ASTM C270 Type S	1800 psi (or by proportions)
Grout	ASTM C476	2000 psi (or by proportions)

6. INSTALLATION

Installation shall be in accordance with this report and the most recent edition of the Simpson Strong-Tie *Wood Construction Connectors* catalog. The Information in this report supercedes any conflicting information between information provided in this report and the catalogue.

7. SUBSTANTIATING DATA

Testing performed in accordance with ASTM D1761 standards. Test data submitted by Testing Engineers Inc., and signed and sealed calculations performed by Samuel Hensen, P.E., and Bryan Wert, P.E., performed in accordance with the 2007 Florida Building Code, Building and Residential codes.

Product	Test Number	Date Tested
LTA2	P966	10/29/2009
	P967	10/29/2009
	P968	10/01/2009
	Q018	10/02/2009
	Q019	9/30/2009
	Q020	09/30/2009
	Q856	10/01/2009
MBHU	O356	08/28/2008
	O357	01/23/2009
	O360	08//28/2008
	O361	01/22/2009
	N447	06/26/2007
	N448	06/26/2007
	N449	06/26/2007
	N450	06/26/2007
	P773	09/11/2009
	P774	09/11/2009
	Q848	09/24/2009
	Q849	09/25/2009
CCTQ	N784	09/19/2007
	O139	07/27/2007
CCCQ	N786	09/20/2007
ECCLQ	O125	06/25/2007
	O142	07/26/2007
ECCQM	P002	02/25/2009
	P003	02/27/2009
	P004	05/26/2009
	P005	05/22/2009
	P008	05/26/2009
	Q375	04/16/2009
CCQM	P006	11/09/2009
	P007	04/15/2009
	P009	05/21/2009
CCTQM	P011	04/15/2009

8. FINDINGS

Upon review of the data submitted by Simpson Strong-Tie, it is my opinion that the models as described in this report conform with or are a suitable alternative to the standards and sections in the 2007 Florida Building Code, Building, and the Florida Building Code, Residential code editions listed in Section 10 of this report, subject to the limitations below. Maximum allowable loads shall not exceed the allowable loads listed in this report.

9. LIMITATIONS:

1. Maximum allowable loads shall not exceed the allowable loads listed in this report. Allowable loads listed in this report are based on allowable stress design. The loads in this report are not applicable to Load and Resistance Factor Design.
2. Capacity of wood members is not covered by this report. Capacity of wood members must be checked by the building designer.
3. Allowable loads for more than one direction for a single connection cannot be added together. A design load that can be divided into components in the directions given must be evaluated as follows:

   Design Uplift/Allowable Uplift + Design Lateral Parallel to Plate/Allowable Lateral Parallel to Plate + Design Lateral Perp. to Plate/Allowable Lateral Perp. to Plate < 1.0

10. CODE REFERENCES

Florida Building Code, Building 2007 Edition

Section 104.11	Alternate Materials and Methods
Section 1714.2	Load Test Procedure Specified
Chapter 21	Masonry
Chapter 22	Steel
Chapter 23	Wood

Florida Building Code, Residential 2007 Edition

R101.2.1	Scope
R4407	HVHZ Masonry
R4408	HVHZ Steel
R4409	HVHZ Wood

11. ALLOWABLE LOADS:

The tables that follow reference the allowable loads for the aforementioned products.

TABLE 1 ALLOWABLE LOADS AND FASTENERS FOR LTA2 CONNECTOR								
Model No.	Fasteners to Rafter/Truss	DF/SP Allowable Loads (lbs.)				SPF Allowable Loads (lbs.)		
		SP Uplift (160)	DF Uplift (160)	Lateral (160)		Uplift (160)	Lateral (160)	
				F1	F2		F1	F2
LTA2 Typical Installation	10 – 10d×1½" nails	1425	1210	415	875	1015	415	735
LTA2 Gable Installation		1390	1210	950	220	1015	800	220

Notes:

1. Loads include a 60% load duration increase on the fastener capacity for wind loading where allowed by the Florida Building Code. Loads do not include a stress increase on the strength of the steel. No further increases are permitted. Reduce loads where other loads govern.
2. The gable end wall should be braced to either the roof or ceiling diaphragm. Additional connectors may be required.

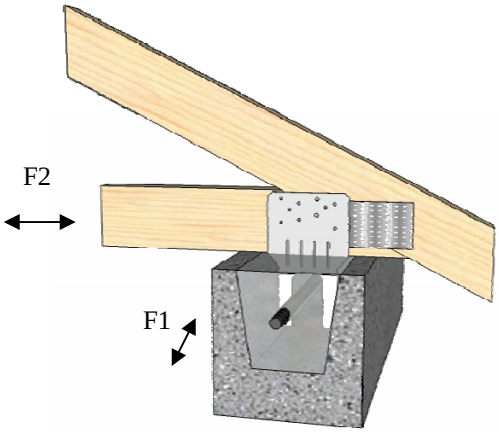


Figure 1
Typical LTA2 Side Wall Installation

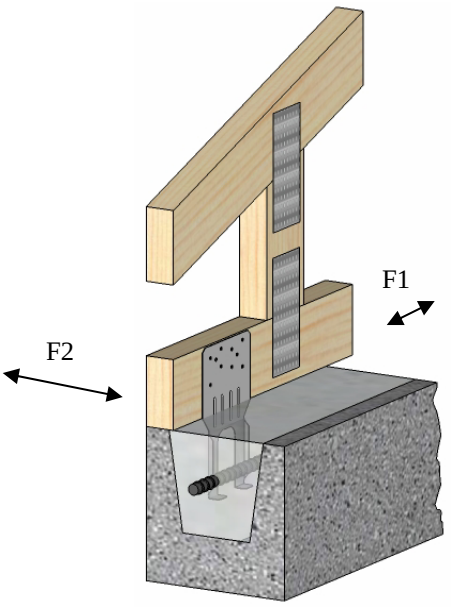


Figure 2
Typical LTA2 Gable End Installation

TABLE 2 ALLOWABLE LOADS AND FASTENERS FOR MBHU CONNECTOR												
Series Model No.	Ga	Dimensions (in.)			Fasteners		Allowable Loads					
					CMU/ Concrete	Joist	End of Wall/Outside Corner DF/SP				Away From Edge DF/SP	
							CMU		Concrete		CMU/Concrete	
		W	H	B	Titen HD® Anchors	SDS Screws	Uplift (160)	Download (100)	Uplift (160)	Download (100)	Uplift (160)	Download (100)
MBHU3.56	10	3 9/16	9¼ to <14	3½	2 - ¾" × 5"	12 - ¼ × 2½	1720	2440	2715	4190	2210	4005
			14 to 18				1720	2440	2715	4190	3345	6065
MBHU5.50	10	5½	9¼ to <14	3½	2 - ¾" × 5"	12 - ¼ × 2½	1720	2440	2715	4190	2210	4005
			14 to 18				2175	3260	3485	6970	3345	6065

Notes:

1. Uplift loads include a 60% load duration increase on the fastener capacity in wood for wind loading where allowed by the Florida Building Code. Loads do not include a stress increase on the strength of the steel. No further increases are permitted. Reduce loads where other loads govern.
2. Concrete applications are based on f'c = 2500 psi.
3. CMU applications are based on fully grouted CMU with an f'm = 1500 psi.

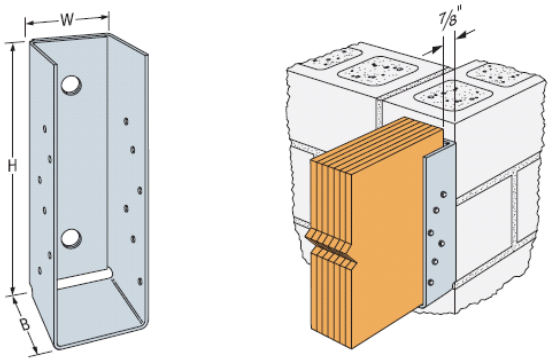


Figure 3
MBHU Typical Installation

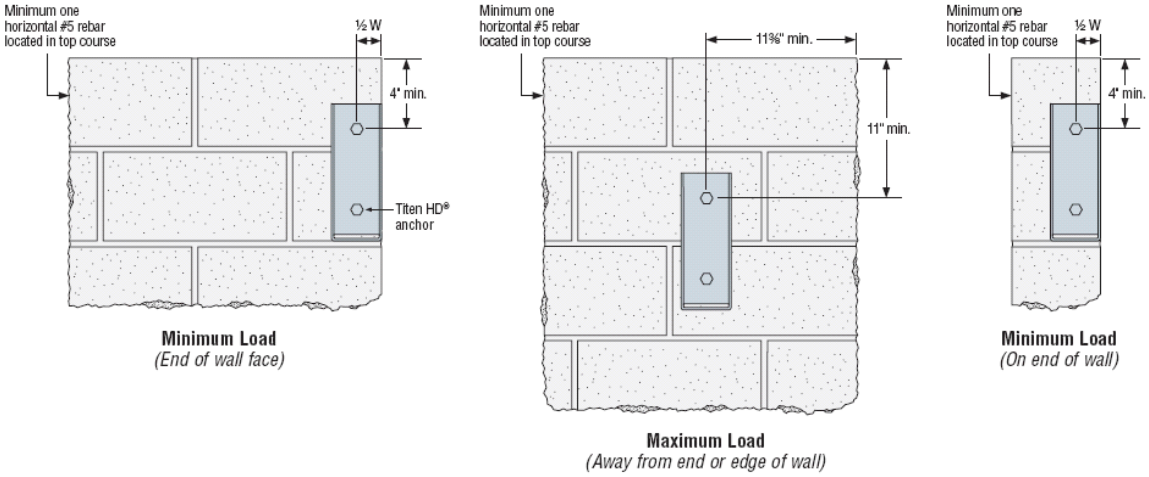


Figure 4
MBHU Installation Location Options

TABLE 3 ALLOWABLE LOADS AND FASTENERS FOR ECCLQ/CCCQ/CCTQ						
Column Cap Series	No. of SDS ¼" × 2½" Screws		Allowable Loads			
	Main Beam	Side Beam	Uplift, lbs. (160)			Download, lbs (100/115/125)
			Main Beam	Side Beam	Total[2]	
ECCLQ-SDS2.5	16	8	2835	2835	3795	Refer to Note #3
CCCQ-SDS2.5	16	8	4780	2390[1]	4780	
CCTQ-SDS2.5	16	8	4910	2350	5315	

Notes:

1. Allowable load is per seat. Side beams must be loaded symmetrically for the CCCQ.
2. The combined uplift loads applied to all beams in the connector must not exceed the total allowable uplift load listed in the table.
3. The combined download for all of the carried beams shall not exceed the allowable download for the unmodified standard CCQ column cap (See FL 10860) *(CCQ load for CCCQ and CCTQ, or ECCQ load for ECCLQ)*. The download for each side beam shall not exceed the lesser of 35% of the allowable download **or 9265 lbs.** for the unmodified product.
4. Uplift loads include a 60% load duration increase on the fastener capacity in wood for wind loading where allowed by the Florida Building Code. Loads do not include a stress increase on the strength of the steel. No further increases are permitted. Reduce loads where other loads govern.

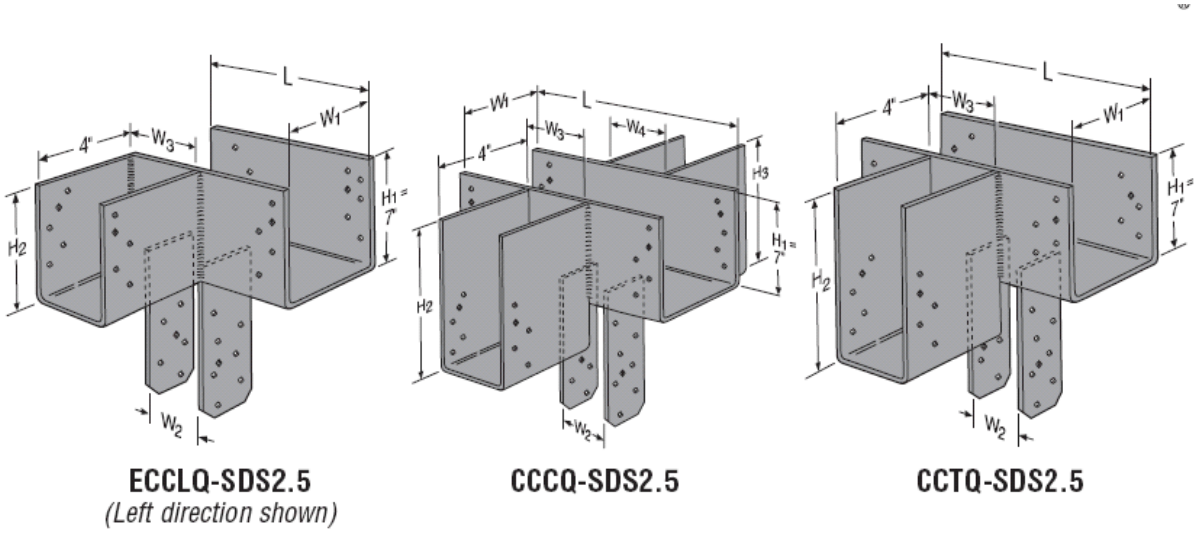


Figure 5
ECCLQ/CCCQ/CCTQ Typical Illustrations

TABLE 4 ALLOWABLE LOADS AND FASTENERS FOR CCCQM/CCTQM/ECCLQM										
Model No.	No. of SDS ¼" × 2½" Screws		16" Square Grout-Filled CMU Pier[5]				16" Square CMU Shell Filled with 3000 psi Concrete			
			Uplift (160)			Lateral (160)	Uplift (160)			Lateral (160)
	Main Beam	Side Beam	Main Beam	Side Beam	Total		Main Beam	Side Beam	Total	
CCQM-SDSHDG	12	-	6750	-	6750	2460	6855	-	6855	2770
CCTQM-SDSG	12	8	6750	5375	6750	2460	6855	6720	6855	2770
ECCLQMG-KT[6]	16	16	6240	6240	7300	2220	6240	6240	8260	2680

Notes:

1. Loads include a 60% load duration increase on the fastener capacity in wood for wind loading where allowed by the Florida Building Code. Loads do not include a stress increase on the strength of the steel. No further increases are permitted. Reduce loads where other loads govern.
2. The allowable loads have been increased for wind or earthquake loading with no further increase allowed.
3. Total uplift load and lateral load is based on tested anchor failure in the pier.
4. Allowable loads are based on either a 16" square grout-filled CMU pier with f'm of 1500 psi or a 16" square CMU shell filled with 3000 psi concrete. A minimum of (4) #7 vertical rebars are required. The Designer shall design and detail the CMU/concrete pier to resist all forces including uplift, shear, and moment.
5. Pier height per Designer.
6. Side beam and main beam uplift loads assume DF or SP members and are not additive.
7. The allowable loads listed for grout-filled CMU apply to solid concrete piers of 2500 psi concrete a minimum of 16" square.
8. The allowable loads listed for CMU shell-filled with 3000 psi concrete apply to solid concrete piers of 3000 psi concrete a minimum of 12" square.
9. The ECCLQM-KT is a kit packaged with (2) MSTQM straps and (32) SDS 1⁄4"x2 1⁄2" screws. One strap may be installed on each face of the ECCLQM (as shown), using the SDS screws into the beams and 26-16dx2 1⁄2" nails (not provided) into the wall framing. The MSTQM strap's allowable tension load is 6240 lbs.

TABLE 5 CCQM/CCTQM/ECCLQM DIMENSIONS				
Model No.	Main Channel Width (W1)	Side Stirrup Width (W3)	Main Channel Length (L1)	Main Channel Length (L2)
CCQM3.62-SDSHDG	3 5/8	-	11	-
CCQM4.62-SDSHDG	4 5/8	-	11	-
CCQM5.50-SDSHDG	5 ½	-	11	-
CCTQM3.62-SDSG	3 5/8	3 5/8	11 ½	4
CCTQM4.62-SDSG	4 5/8	4 5/8	13 ½	4
CCTQM5.50-SDSG	5 ½	5 ½	13 ½	4
ECCLQM3.62G-KT[1]	3 5/8	3 5/8	11 ½	7 ¾
ECCLQM4.62G-KT[1]	4 5/8	4 5/8	11 ½	7 ¾
ECCLQM5.50G-KT[1]	5 ½	5 ½	11 ½	7 ¾

Notes:

1. The MSTQM strap is a component of the ECCLQM kits. It is 12 ga. (0.101"); 3" wide and 48" long.

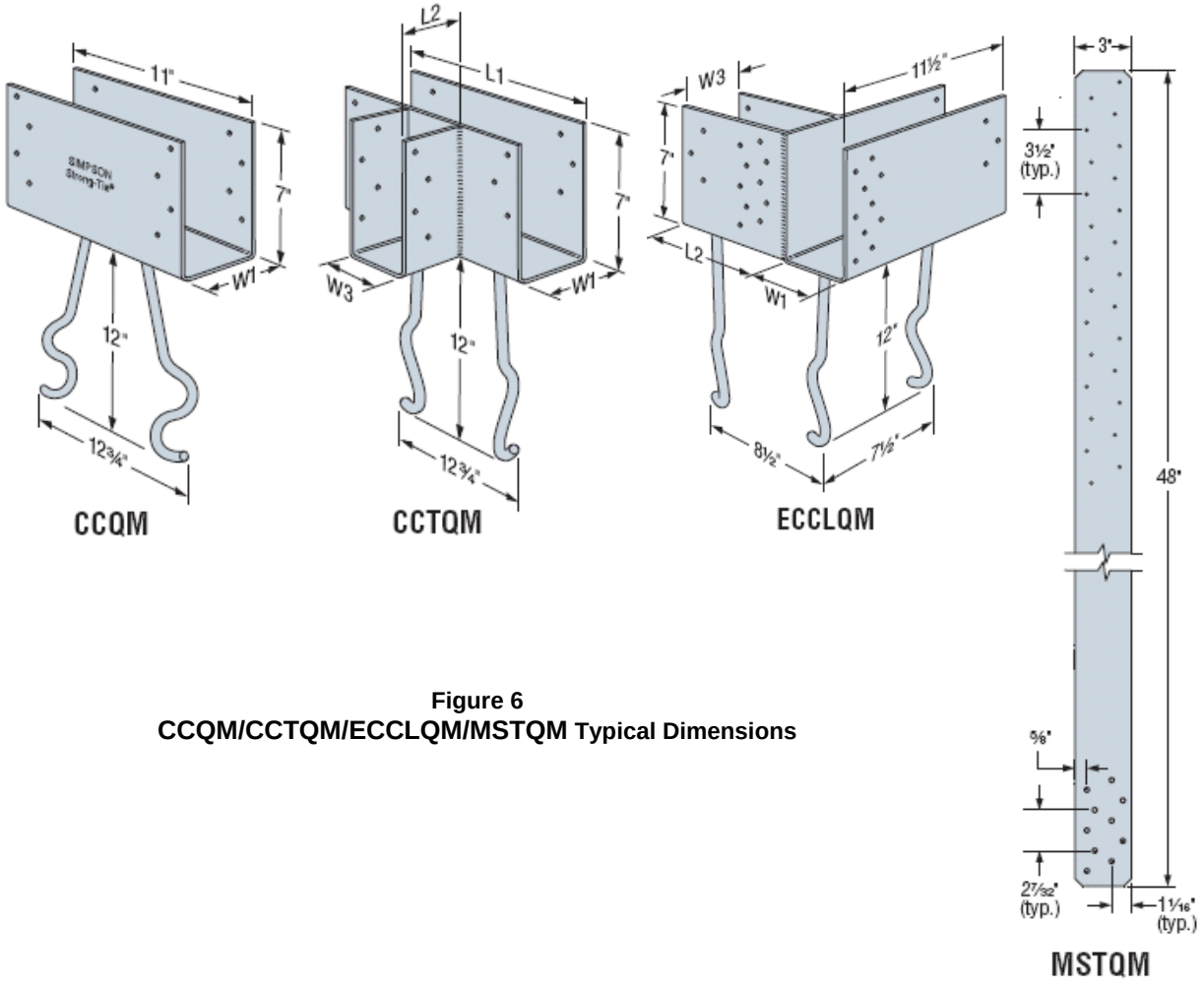


Figure 6
CCQM/CCTQM/ECCLQM/MSTQM Typical Dimensions

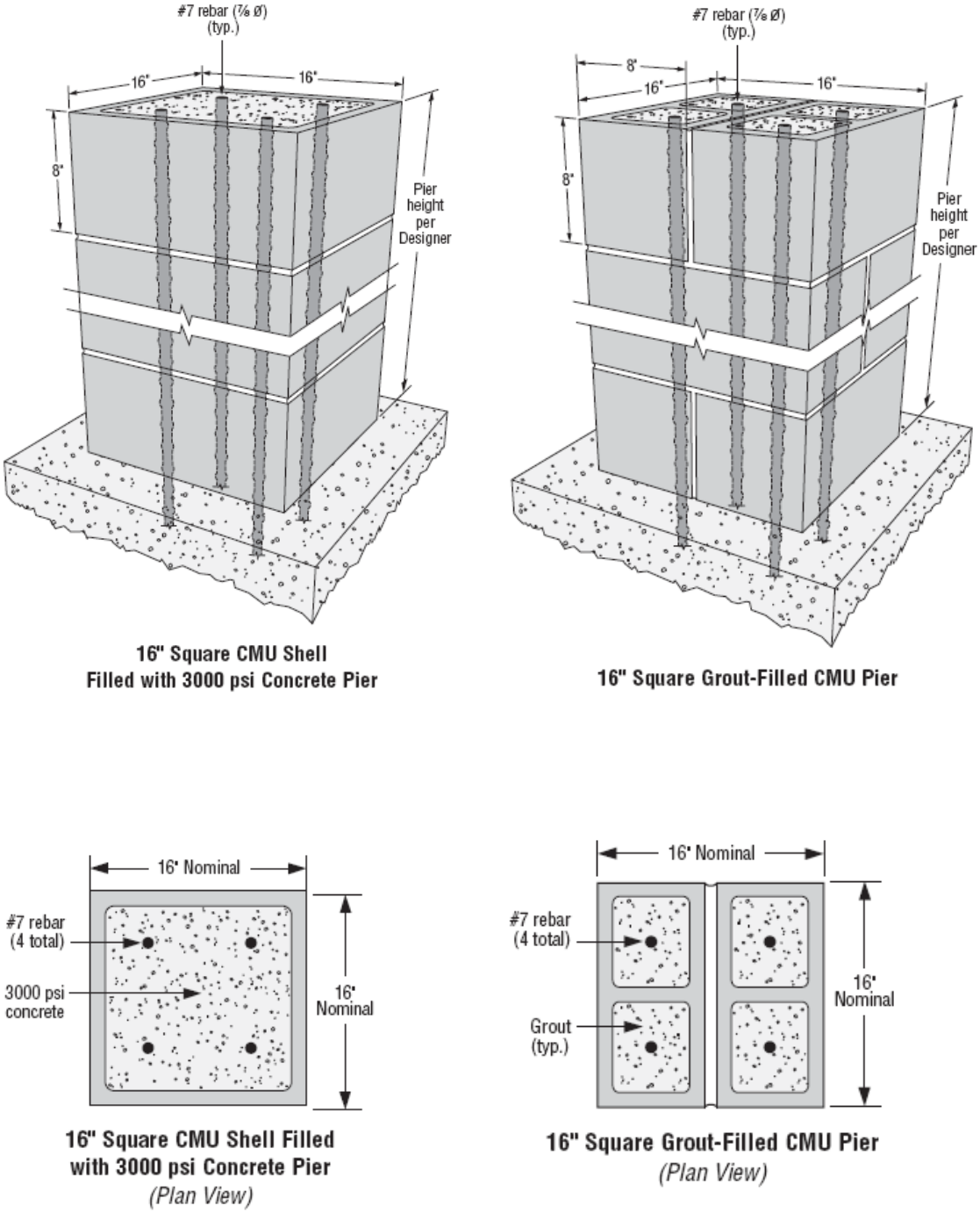
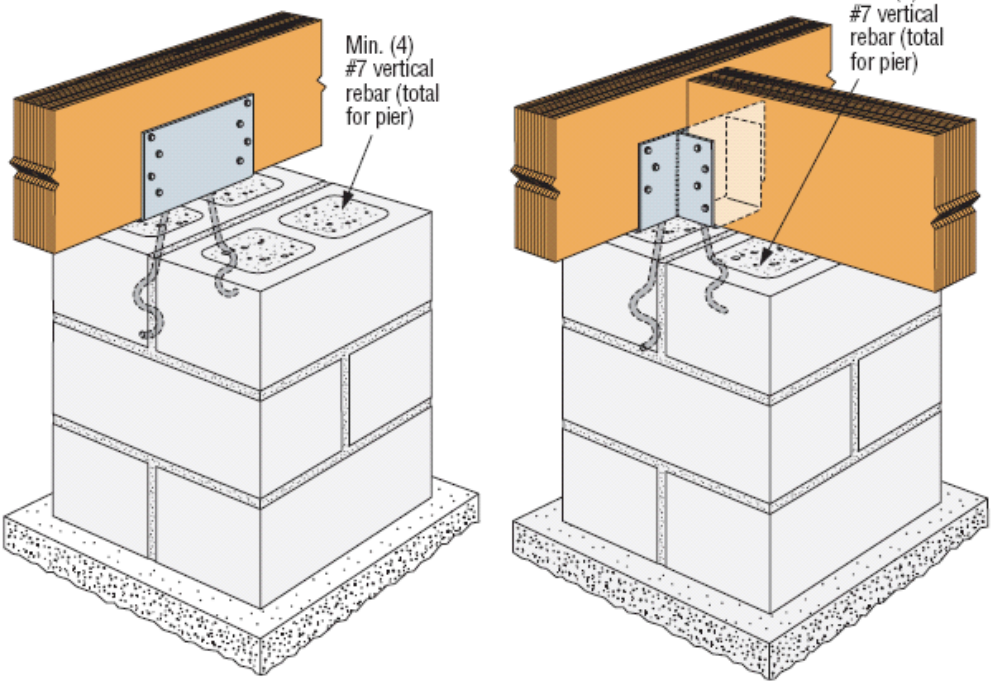
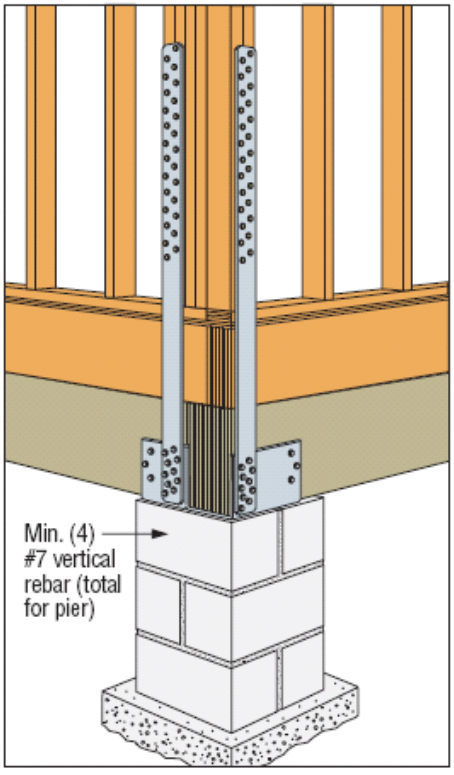


Figure 7
PIER Typical Dimensions and minimum requirements



Typical CCQM Installation

Typical CCTQM Installation

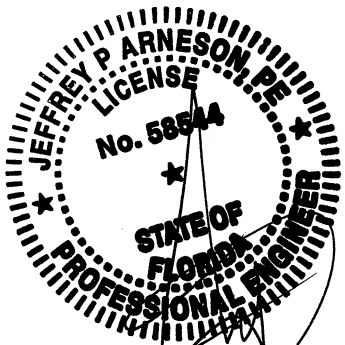


Typical ECCLQM Installation

Figure 8
Typical Installation details

12. IDENTIFICATION

Each connector covered by this report shall be stamped with the manufacturer's name and/or trademark and the product name.



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