Jax Apex Technology, Inc.
4745 Sutton Park Court, Suite 402
Jacksonville, FL 32224

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, P.E., a licensed Florida professional engineer and employee of Jax Apex Technology, Inc. (Apex Technology) has reviewed the data submitted for compliance with the Florida Building Code. Neither Jeffrey P. Arneson, nor Apex Technology, are responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests, or summaries prepared and submitted by the design professional or preparer of record who are listed in the Substantiating Data section of this report.

REPORT NO: SIM201701

CATEGORY: Structural Components

SUBCATEGORY: 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 61G20-3.

2. PRODUCT NAMES:

Truss to Wall Connectors
MTSM16, MTSM20, HTSM16, HTSM20, HM9, HGAM10

Embedded Truss Anchors
META12, META16, META18, META20, META22, META24, META40, HETA12, HETA16, HETA20, HETA24, HETA40, HHETA16, HHETA20, HHETA24, HHETA40, HETAL12, HETAL16, HETAL20, LTA2, DETAL20

Wood to Masonry Straps
MSTAM24, MSTAM36, MSTCM40, MSTCM60

Girder Tiedowns

LGT2, LGT3, LGT4, MGT, VGT, VGTL, VGTR, FGTR, FGTRHL, FGTRHR

3. SCOPE OF EVALUATION:

Load evaluation as a structural component using the requirements of the *6th Edition (2017) Florida Building Code, Building* and *6th Edition (2017) Florida Building Code, Residential*.

4. DESCRIPTION:

4.1 MTSM and HTSM Twist Straps. The MSTM and HTSM twist straps are used to anchor wood trusses, rafters, or beams to masonry or concrete walls. They fasten to the wood member with 10d common or 10d×1½" nails, and fasten to masonry with ¼"×2¼" Titen® or Titen® 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. MTSM twist straps are manufactured from 16 gauge steel meeting ASTM A653 SS Grade 33 with a G90 galvanized finish. HTSM twist straps are manufactured from 14 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. Twist strap fastener schedules, dimensions, and allowable loads are shown in Table 1. See Figures 1 and 2 for additional details.

4.2 HM9 Hurricane Tie. The HM9 is used to anchor wood trusses, rafters, or joists to masonry or concrete. The HM9 fastens to the wood member with ¼"×1½" long Strong-Drive® SDS Heavy-Duty Connector screws and fastens to masonry with ¼"×2¼" Titen® or Titen® 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. The HM9 is manufactured from 18 gauge steel meeting ASTM A653 SS Grade 33 with a G90 galvanized finish. Hurricane tie fastener schedule, dimensions, and allowable loads are shown in Table 1. See Figures 1 and 2 for additional details.

4.3 HGAM10 Hurricane Gusset Angle. The HGAM10 is used to anchor wood trusses, rafters, joists, or beams to masonry or concrete. The HGAM10 fastens to the wood member with ¼"×1½" long Strong-Drive® SDS Heavy-Duty Connector screws and fastens to masonry with ¼"×2¾" Titen® or Titen® 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. The HGAM10 is manufactured from 14 gauge steel meeting ASTM A653 SS Grade 33 with a G90 galvanized finish. Angle fastener schedule, dimensions, and allowable loads are shown in Table 1. See Figures 1 and 2 for additional details.

4.4 LTA2 Lateral Truss Anchor. The LTA2 is used to anchor wood trusses, rafters, or beams to masonry or concrete. The LTA2 fastens to the wood member with 10d×1½" nails and has legs which are embedded into the wall system. The LTA2 is manufactured from 18 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. Lateral truss anchor fastener schedule, dimensions, and allowable loads are shown in Table 1. See Figures 1 and 2 for additional details.

4.5 META, HETA, HHETA, and HETAL Embedded Truss Anchors. Embedded truss anchors are used to anchor a wood member (usually a truss) to masonry or concrete. Embedded truss anchors fasten to a single-ply wood truss with 10d×1½" nails or to a multi-ply truss with 16d common nails. META, HETA, and HHETA models can be installed in a single application or doubled to achieve additional capacity. They are embedded in the masonry or concrete to a depth indicated on the side of the anchor (4" for META, HETA, and HHETA, and $5^{1}/_{16}$" for HETAL). The strap portion of the anchor is 1⅛" wide. The anchors are manufactured from steel meeting ASTM A653 SS Grade 50, Class 1, with a G90 galvanized finish, with the exception of the HETAL truss seat which is manufactured from steel meeting ASTM A653 SS Grade 33 with

a G90 galvanized finish. Steel thickness is as specified in Table 2. Embedded truss anchor fastener schedule, dimensions, and allowable loads are shown in Table 2 for single installations and Table 3 for double installations. See Figures 3 and 4 for additional details of single and double embedded truss anchors.

4.6 DETAL20 Double Embedded Truss Anchor. The DETAL20 is a high capacity connector used to anchor single-ply wood trusses or rafters to masonry or concrete. The DETAL fastens to the wood member with 10d×1½" nails. It is embedded in the masonry or concrete to a depth of 4½". The strap portion of the anchor is 1⅛" wide and is manufactured from 16 gauge steel meeting ASTM A653 SS Grade 50, Class 1, with a G90 galvanized finish. The truss seat is manufactured from 18 gauge steel meeting ASTM A653 SS Grade 33 with a G90 galvanized finish. Embedded truss anchor fastener schedule, dimensions, and allowable loads are shown in Table 3. See Figure 4 for additional details.

4.7 MSTAM and MSTCM Strap Ties. The MSTAM and MSTCM strap ties are used to provide a tension connection between wood members and a masonry or concrete structure. The MSTAM straps are 1¼" wide for use on single 2× and thicker members. They fasten to the wood member with 10d common nails and fasten to masonry with ¼"×2¼" Titen® or Titen® 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. The MSTCM straps are 3" wide for use on double 2× or single 4× and larger members. They fasten to the wood member with 16d sinker nails and fasten to masonry with ¼"×2¼" Titen or Titen 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. The MSTCM straps have countersunk nail slots for a lower nailing profile and coined edges for safer handling. MSTAM and MSTCM straps are manufactured from steel meeting ASTM A653 SS Grade 50, Class 1, with a G90 galvanized finish. Steel thickness is as specified in Table 4. Masonry strap fastener schedule, dimensions, and allowable loads are shown in Table 4. See Figure 5 for additional details.

4.8 FGTR, FGTRHL, and FGTRHR Face Mount Girder Tiedowns. The FGTR is a non-pitch specific girder tie down that can be used in new construction or retrofit applications to tie down a girder truss or beam to a concrete or masonry. The FGTR can be installed in a single application or doubled to achieve additional uplift capacity. The FGTR plate fastens to the wood member with Strong-Drive® SDS Heavy-Duty Connector screws and the strap fastens to masonry or concrete with ½"×5" Titen HD® Heavy-Duty Screw Anchors. The FGTRHL and FGTRHR are designed with the strap at a 45 degree angle for corner hip applications. The FGTR straps are manufactured from 7 gauge ASTM A1011 Grade 33 steel and the plates are made from 3 gauge ASTM A1011 Grade 33 steel. Both components have a powder coat painted finish. Girder tie down fastener schedule, dimensions, and allowable loads are shown in Table 5. See Figure 6 for additional details.

4.9 LGT2 Light Truss/Girder Tiedown. The LGT2 is used to anchor a 2-ply wood truss or beam (maximum 3" wide) to wood, concrete, or masonry. The LGT2 fastens to the wood truss or beam with 16d sinker nails. For wood wall applications, it is fastened with 16d sinker nails. For masonry or concrete applications, it fastens to masonry with ¼"×2¼" Titen® or Titen® 2 screws, or to concrete with ¼"×1¾" Titen or Titen 2 screws. The LGT2 is manufactured from 14 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. Allowable loads and fastener schedule are shown in Table 6. See Figure 7 for additional details.

4.10 LGT3-SDS2.5 Light Truss/Girder Tiedown. The LGT3-SDS2.5 is used to anchor a 3-ply wood truss or beam (maximum 5" wide) to wood, concrete, or masonry. The

LGT3-SDS2.5 fastens to the wood truss or beam with ¼"×2½" long Strong-Drive® SDS Heavy-Duty Connector screws. For wood wall applications, it is fastened to wood studs and plates with 16d sinker nails. For masonry or concrete applications, it is fastened with ⅜"×5" Titen HD® Heavy-Duty Screw Anchors. The LGT3-SDS2.5 is manufactured from 12 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. Allowable loads and fastener schedule are shown in Table 6. See Figure 8 for additional details.

4.11 LGT4-SDS3 Light Truss/Girder Tiedown. The LGT4-SDS3 is used to anchor a 4-ply wood truss or beam (maximum 6½" wide) to wood, concrete, or masonry. The LGT4-SDS3 fastens to the wood truss or beam with ¼"×3" long Strong-Drive® SDS Heavy-Duty Connector screws. For wood wall applications, it is fastened to wood studs and plates with 16d sinker nails. For masonry or concrete applications, it is fastened with ⅜"×5" Titen HD® Heavy-Duty Screw Anchors. The LGT4-SDS3 is manufactured from 12 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. Allowable loads and fastener schedule are shown in Table 6. See Figure 8 for additional details.

4.12 MGT Medium Girder Tiedown. The MGT is used to anchor a multi-ply wood truss or beam (minimum 3" wide) to wood, concrete, or masonry. The MGT fastens to the wood truss or beam with 10d common nails. A minimum of six nails must be into the face of the truss or beam adjacent to the MGT. A minimum of four nails must be into the top of the truss. The base of the MGT is designed for a single ⅝" diameter anchor bolt or rod. For masonry or concrete applications, this ⅝" anchor must be designed by the building designer to provide at least as much capacity as is required of the MGT. For wood wall applications, this ⅝" anchor may be a length of all thread rod that is attached to an anchor fastened to the studs beneath the truss or beam. This anchor must provide at least as much capacity as is required of the MGT. The MGT is manufactured from 12 gauge steel meeting ASTM A653 SS Grade 40 with a G90 galvanized finish. The washer in the seat is ⅜" plate steel meeting ASTM A36. Allowable loads and fastener schedule are shown in Table 6. See Figure 9 for additional details.

4.13 VGT, VGTL, and VGTR Variable Girder Tiedowns. The VGT girder tiedown is used to anchor a multi-ply wood truss or beam (minimum 3" wide) to wood, concrete, or masonry. The VGT fastens to the wood truss or beam with ¼"×3" long Strong-Drive® SDS Heavy-Duty Connector screws. The base of the VGT is designed for a single ⅝" diameter anchor bolt or rod. The rod can be fastened to a connector mounted to framing below the girder or extend to and be anchored into the foundation. The anchor bolt can be anchored to a concrete or masonry wall that is designed by the building designer to resist the high concentrated uplift load at that location. The VGT can be installed a single application or doubled to achieve additional uplift capacity. The included crescent washer allows the VGT to be installed at an angle from 3:12 to 8:12. If the VGT is installed on a member sloped less than or greater than that amount, the VGT must be rotated so that it is sloped between 3:12 and 8:12. The VGTR and VGTL have one of the side flanges concealed so they can be placed at the end of a truss or beam. The VGT is manufactured from 7 gauge steel meeting ASTM A653 SS Grade 33 with a G90 galvanized finish. Allowable loads and fastener schedule are shown in Table 6. See Figure 10 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. In addition to the standard G90 coating, some models (designated with a model number ending with Z) are available with a G185 zinc coating specification in accordance with ASTM A653. Some models (designated with a model number ending with HDG) are available with a hot-dip galvanization, also known as "batch" galvanization, in accordance with ASTM A123, with a minimum specified coating weight of 2.0 ounces of zinc per square foot of surface area, total for both sides. Some models (designated with a model number ending with SS) are available in Type 316L stainless material manufactured in accordance with ASTM A240 sheet, strip or plate and ASTM A480 (General Requirements) in the following designation: UNS designation S31603, AISI Type 316L. Model numbers in this report may not include the Z, HDG, or SS ending, but the information shown applies.

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 6. Unless otherwise noted, lumber shall be Southern Pine (SP) or Douglas Fir-Larch (DF) having a minimum specific gravity of 0.55 or 0.50, respectively. Where indicated by SPF, lumber shall be Spruce-Pine-Fir having a minimum specific gravity of 0.42.

5.3 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	-	2,500 psi
Masonry, f'_m	ASTM E447	1,500 psi
Masonry Unit	ASTM C90	1,900 psi
Mortar	ASTM C270 Type S	1,800 psi (or by proportions)
Grout	ASTM C476	2,000 psi (or by proportions)

5.4 Nails. Unless noted otherwise, nails shall be common nails. Nails shall comply with ASTM F1667 and shall have the minimum bending yield strengths F_{yb}:

Nail Pennyweight	Nail Shank Diameter (inch)	Nail Length (inch)	F_{yb} (psi)
10d×1½	0.148	1.50	90,000
10d Common	0.148	3.00	90,000
16d sinker	0.148	3.25	90,000
16d Common	0.162	3.50	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 or steel mechanically galvanized in accordance with ASTM B695, Class 55. Fasteners for stainless steel connectors shall be stainless steel except where otherwise permitted by the treatment manufacturer.

The allowable loads of stainless-steel connectors match those of carbon-steel connectors when installed with Simpson Strong-Tie stainless-steel, SCNR ring-shank nails, unless noted otherwise.

5.5 Strong-Drive® SDS Heavy-Duty Connector Screws. Fasteners used with the connectors described in Tables 1, 5, and 6, and shown in Figures 2, 6, 8, and 10 of the report must be Simpson Strong-Tie® Strong-Drive SDS Heavy-Duty Connector wood screws recognized in FL9589. Model numbers shown in this report may not include the full SDS model number after the connector model number (e.g., LGT3-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.

5.6 Titen® 2 and Titen® Concrete and Masonry Screws. Titen® 2 screws shown in Tables 1, 4 and 6 and Figures 2, 5, and 7 shall be Simpson Strong-Tie Titen 2 Concrete and Masonry screws as recognized in FL16230. Installation shall be as specified in FL16230. Alternately, Titen® screws of the same diameter and length may be substituted for Titen 2 screw models shown. Titen screws are recognized in FL2355. Installation shall be as specified in FL2355.

5.7 Titen HD® Heavy-Duty Screw Anchors. Anchors shown in Tables 5 and 6 and Figure 6 shall be Simpson Strong-Tie® Titen HD Heavy-Duty Screw Anchors for masonry or concrete as recognized in FL15730. Installation shall be as specified in FL15730.

6. INSTALLATION:

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

7. SUBSTANTIATING DATA:

Test data submitted by Testing Engineers Inc. and Product Testing, Inc., and signed and sealed calculations performed by Bryan Wert, P.E., performed in accordance with the *6th Edition (2017) Florida Building Code, Building* and *Residential* codes.

Product	Test Lab	Test Number
MTSM, HTSM	Testing Engineers, Inc.	H756, I841, O555, O564
HM9	Product Testing, Inc.	02-3793
HGAM10	Product Testing, Inc.	L007, L018
	Testing Engineers, Inc.	H046, H141
META, HETA, HHETA, HETAL	Product Testing, Inc.	K966, K997, L008, L011, L012, L013, L014, L015, L019, L020, L021, L022, L023, P670, Q219, Q220, Q221
	Testing Engineers, Inc.	D792, D793, D844, N218
DETAL	Testing Engineers, Inc.	O795, O796, O797, O798, O799
LTA2	Testing Engineers, Inc.	P966, P967, P968, Q018, Q019, Q020, Q856
MSTCM	Testing Engineers, Inc.	N471
FGTR	Product Testing, Inc.	K930, K931, K987
FGTRHL/R	Product Testing, Inc.	K932
LGT2	Testing Engineers, Inc.	H429, I839, L921, L922
LGT3	Testing Engineers, Inc.	L233, L234, L431, L918
LGT4	Testing Engineers, Inc.	O113, O393, O394, O587
MGT	Testing Engineers, Inc.	I134
VGT	Testing Engineers, Inc.	M950, M985, N074, N075, N142, N149
VGTL/R	Testing Engineers, Inc.	M988, M989, M990, M991

8. FINDINGS:

The connectors listed in this evaluation report comply with the *6th Edition (2017) Florida Building Code, Building*, and *6th Edition (2017) Florida Building Code, Residential* when installed in accordance with 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. Connectors in this report having a galvanized coating thickness less than G185 shall not be installed in contact with preservative-treated wood products that are exposed to rainfall or ground moisture.
4. 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 Perpendicular to Plate / Allowable Lateral Perpendicular to Plate) < 1.0

   As an alternate, the embedded truss anchors in Tables 2 and 3 can be evaluated using the following: The design load in each direction shall not exceed the published allowable load in that direction multiplied by 0.75.

10. ALLOWABLE LOADS:

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

TABLE 1: MTSM, HTSM, HM9, HGAM10, and LTA2 Dimensions, Fasteners, and Allowable Loads												
Model No.	Ga.	Length (in.)	Fasteners			Allowable Loads (lb.)					
						DF/SP (160)			SPF/HF (160)		
			Truss/Rafter	GFCMU (Titen® 2)[6]	Concrete (Titen® 2)[6]	Uplift	F_1	F_2	Uplift	F_1	F_2
MTSM16	16	16	(7) 10d×1½"	(4) ¼"×2¼"	(4) ¼"×1¾"	830	120[3]	90[3]	715	120[3]	90[3]
MTSM20	16	20	(7) 10d×1½"	(4) ¼"×2¼"	(4) ¼"×1¾"	830			715		
HTSM16	14	16	(8) 10d×1½"	(4) ¼"×2¼"	(4) ¼"×1¾"	1,110			955		
HTSM20	14	20	(10) 10d×1½"	(4) ¼"×2¼"	(4) ¼"×1¾"	1,110			955		
HM9[9]	18	–	(4) ¼"×1½" SDS	(5) ¼"×2¼"	(5) ¼"×1¾"	760	670	190	760	670	190
HGAM10[9]	14	–	(4) ¼"×1½" SDS	(4) ¼"×2¾"	(4) ¼"×1¾"	810	875	1,105[5]	585	630	795[5]
LTA2 Perp.-to-Wall Installation	18	–	(10) 10d×1½"	Embed	Embed	1,180[7]	415	875	990	415	735
LTA2 Parallel-to-Wall Installation	18	–	(10) 10d×1½"	Embed	Embed	1,180[7]	950	220	990	800	220

Notes:

1. Loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. MTSM and HTSM do not have to be wrapped over the truss/rafter to achieve tabulated loads.
3. Lateral loads apply for the MTSM and HTSM twist straps when the first seven nail holes near the bend line are filled on the truss/rafter side. Any other fasteners required can be installed in any open hole.
4. Allowable loads for the HGAM10 are for one connector. A minimum truss/rafter thickness of 2½" must be used when framing anchors are installed on each side of the joist or truss.
5. HGAM10 F_2 loads are for forces into the connector. F_2 loads away from the connector are 640 lb. (DF/SP) and 460 lb. (SPF/HF).
6. Minimum edge distance for Titen 2 screw is 1½". Titen screws of the same diameter and length may be substituted for the tabulated Titen 2 screw size with no change in allowable load.
7. LTA2 allowable uplift on SP is 1,350 lb. for perpendicular-to-wall installation and parallel-to-wall installation.
8. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.
9. The HM9KT and HGAM10KTA are kits with (20) HM9 and (10) HGAM10 connectors packaged with Simpson Strong-Tie® Strong-Drive® SDS Heavy-Duty Connector screws and 2¼" and 2¾" Titen® 2 screws, respectively. (1¾" Titen 2 screws for concrete installations sold separately)

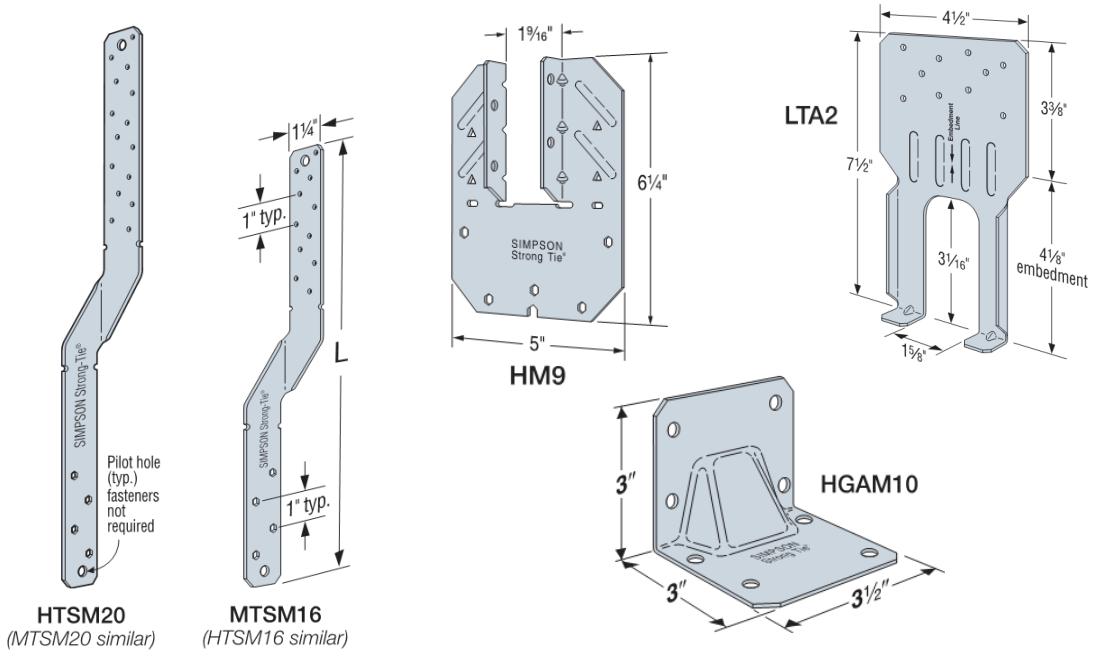


FIGURE 1: MTSM / HTSM / HM9 / HGAM10 / LTA2 Dimensions

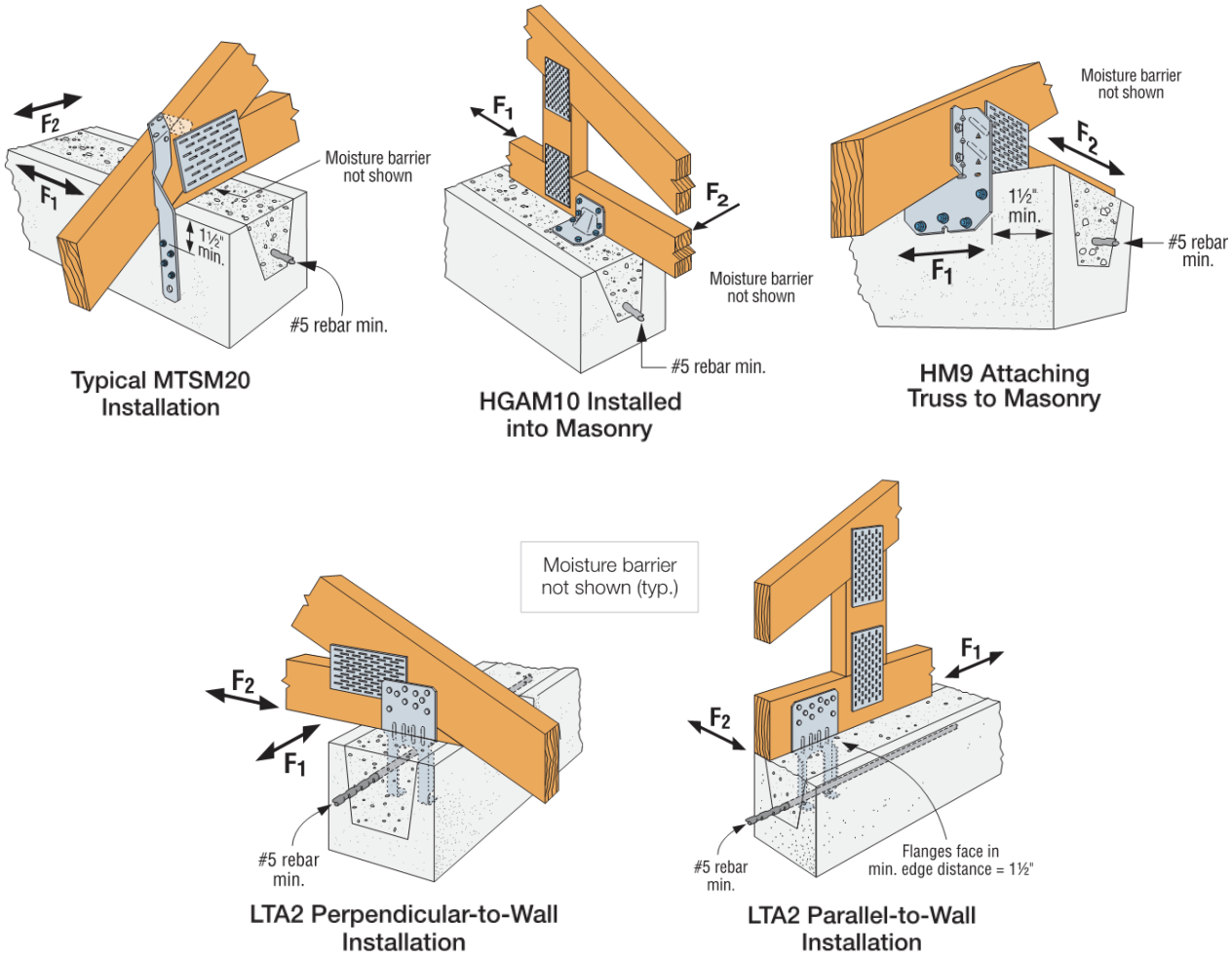


FIGURE 2: MTSM / HTSM / HM9 / HGAM10 / LTA2 Installation Details

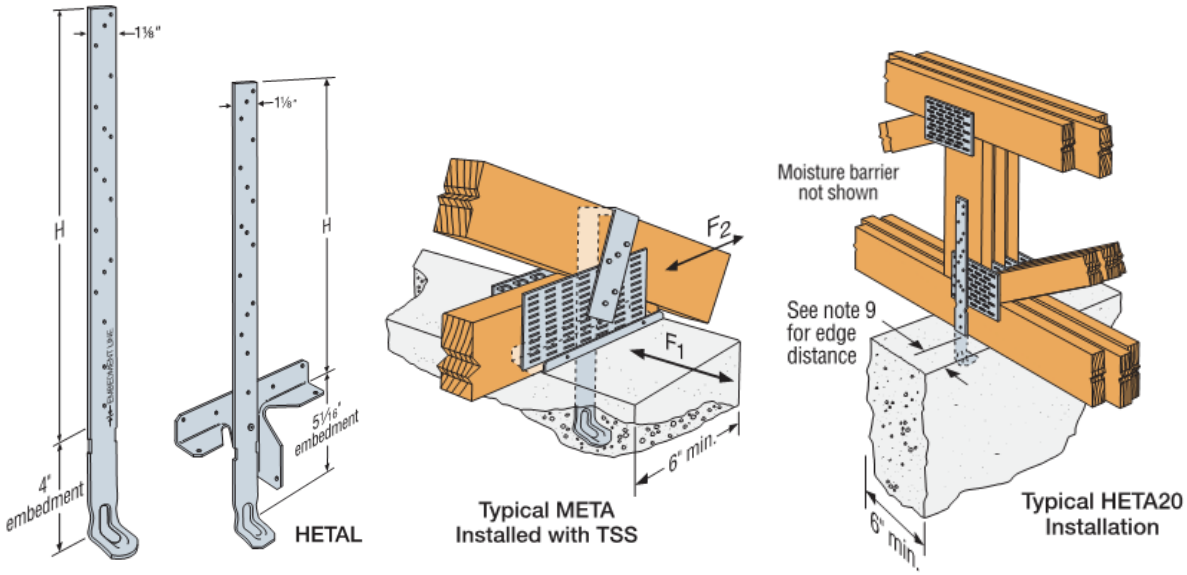


FIGURE 3: META / HETA / HHETA / HETAL Dimensions and Installation Details

TABLE 2: META, HETA, HHETA, and HETAL Dimensions, Fasteners, and Allowable Loads

Model No.	Ga.	H (in.)	SP Allowable Loads (lb.)					
			10d×1½" Nails (1-ply Truss)		16d Nails (2- or 3-ply Truss)		F_1 (160)	F_2 (160)
			Qty.[2]	Uplift (160)	Qty.[2]	Uplift (160)		
META12	18	8	7	1,420	6	1,450	340	770
META16		12	8	1,450	6	1,450		
META18		14	8	1,450	6	1,450		
META20		16	7	1,420	5	1,210		
			8	1,450	6	1,450		
META22		18	8	1,450	6	1,450		
META24		20	8	1,450	6	1,450		
META40		36	8	1,450	6	1,450		
HETA12	16	8	7	1,455	7	1,730	340	770
HETA16		12	9	1,810	8	1,810		
HETA20		16	8	1,655	7	1,730		
			9	1,810	8	1,810		
HETA24		20	9	1,810	8	1,810		
HETA40		36	9	1,810	8	1,810		
HHETA16	14	12	10	2,120	9	2,120	340[7]	770
HHETA20		16	9	1,935	8	2,030		
			10	2,120	9	2,120		
HHETA24		20	10	2,120	9	2,120		
HHETA40		36	10	2,120	9	2,120		
HETAL12	16	7	10[3]	1,040	10[3]	1,235	390[4]	1,040
HETAL16		11	14[3]	1,810	13[3]	1,810		
HETAL20		15	14[3]	1,810	13[3]	1,810		

Notes:

1. Loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. The META, HETA, and HHETA, require the lowest four nail holes be filled.
3. Five nails must be installed into the truss seat of the HETAL.
4. F_1 load towards face of HETAL is 1,870 lb.
5. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.
6. It is acceptable to use a reduced number of fasteners in any model listed provided that there is a reduction in uplift load capacity. The load per nail can be approximated by dividing the allowable load by the number of nails. There should be a minimum of 4 nails installed in the strap. Lateral loads do not apply when fewer than 7 fasteners are used with the HETA and HHETA anchors or less than (6) 16d or (7) 10d×1½" fasteners are used with the META anchor.
7. The HHETA allowable F_1 load can be increased to 435 lb. if the strap is wrapped over the truss and a minimum of 12 nails are installed.
8. Straps do not have to be wrapped over the truss/rafter to achieve tabulated loads unless specifically noted otherwise.
9. Minimum edge distance for META, HETA, and HHETA is 1½" for concrete and 2" for masonry.

TABLE 3: DETAL20 and Double META, HETA, and HHETA Fasteners and Allowable Loads										
Model No.	Qty.	Application	SP Allowable Loads (lb.)							
			1-ply Truss/Rafter				2- or 3-ply Truss/Rafter			
			10d×1½" Nail Qty.[4]	Uplift	F_1	F_2	16d Nail Qty.[4]	Uplift	F_1	F_2
DETAL20	1	GFCMU	18	2,480	2,000[5]	1,370	–	–	–	–
		Concrete	18	2,480	2,000	1,465	–	–	–	–
META	2	GFCMU	10	1,875	Refer to Table 2[6]		14	1,795	1,285[7]	1,080
		Concrete	10	1,875			14	2,435	1,285[7]	1,080
HETA	2	GFCMU	10	1,920			12	2,365	1,350[7]	1,430
		Concrete	10	1,920			12	2,560	1,350[7]	1,430
HHETA	2	GFCMU	10	1,920			12	2,365	1,350[7]	1,430
		Concrete	10	1,920			14	3,180	1,350[7]	1,430

Notes:
1. Loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.
3. Install with spoons facing outward and spaced no more than ⅛" wider than the truss width.
4. The DETAL20 requires (6) 10d×1½" nails in the truss seat and (6) 10d×1½" nails into each strap. For all other models, install half of the required number of fasteners in each strap.
5. F_1 loads for the DETAL20 in GFCMU may cause an additional $^1/_{32}$" deflection beyond the standard ⅛" limit.
6. Lateral loads for double META, HETA, and HHETA apply only to 2- or 3-ply applications with anchors spaced a minimum of 3" apart. For 1-ply applications, use lateral loads in Table 2. DETAL lateral loads apply to 1-ply application.
7. F_1 loads for double META, HETA, and HHETA may cause an additional $^1/_{16}$" deflection beyond the standard ⅛" limit when the straps are installed not wrapped over the heel as shown.

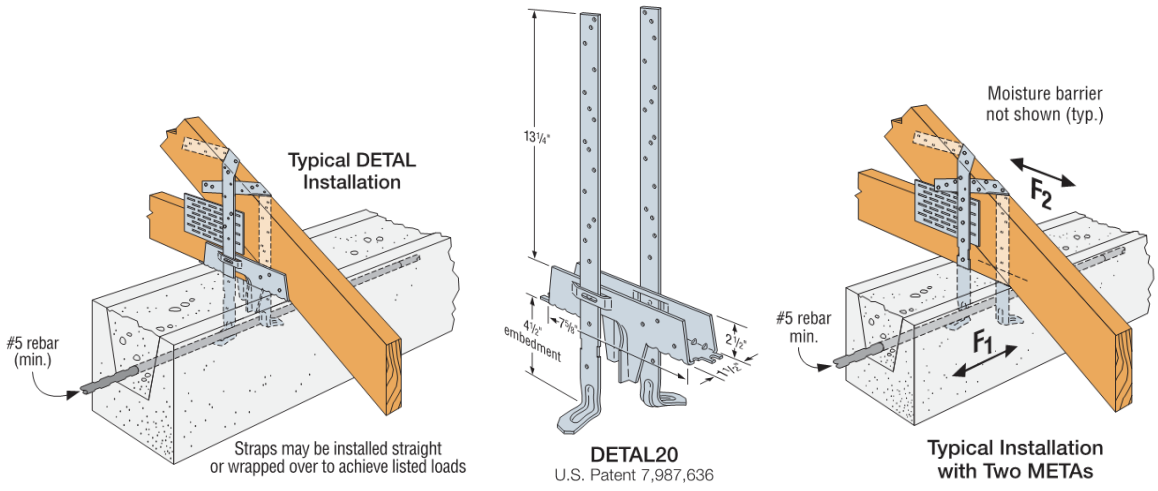


FIGURE 4: DETAL20 Dimensions and Double META / HETA / HHETA Installation Detail

TABLE 4: MSTAM and MSTCM Dimensions, Fasteners, and Allowable Loads								
Model No.	Ga.	W (in.)	L (in.)	Fasteners			Allowable Tension Load (lb.)	
				Nails	GFCMU (Titen® 2)[3]	Concrete (Titen® 2)[3]	DF/SP/SPF/HF (160)	
							GFCMU	Concrete
MSTAM24	18	1¼	24	(9) 10d	(5) ¼"×2¼"	(5) ¼"×1¾"	1,375[4]	1,460
MSTAM36	16	1¼	36	(13) 10d	(8) ¼"×2¼"	(8) ¼"×1¾"	1,870	1,870
MSTCM40	16	3	40¼	(26) 16d Sinker	(14) ¼"×2¼"	(14) ¼"×1¾"	4,220	4,220
MSTCM60	16	3	59½	(26) 16d Sinker	(14) ¼"×2¼"	(14) ¼"×1¾"	4,220	4,220

Notes:
1. Tension loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.
3. Minimum edge distance for Titen 2 screw is 1½". Titen screws of the same diameter and length may be substituted for the tabulated Titen 2 screw size with no change in allowable load, except where specifically noted otherwise.
4. MSTAM24 allowable tension load in GFCMU shall be limited to 1,250 lb. if installed with original Titen screws.

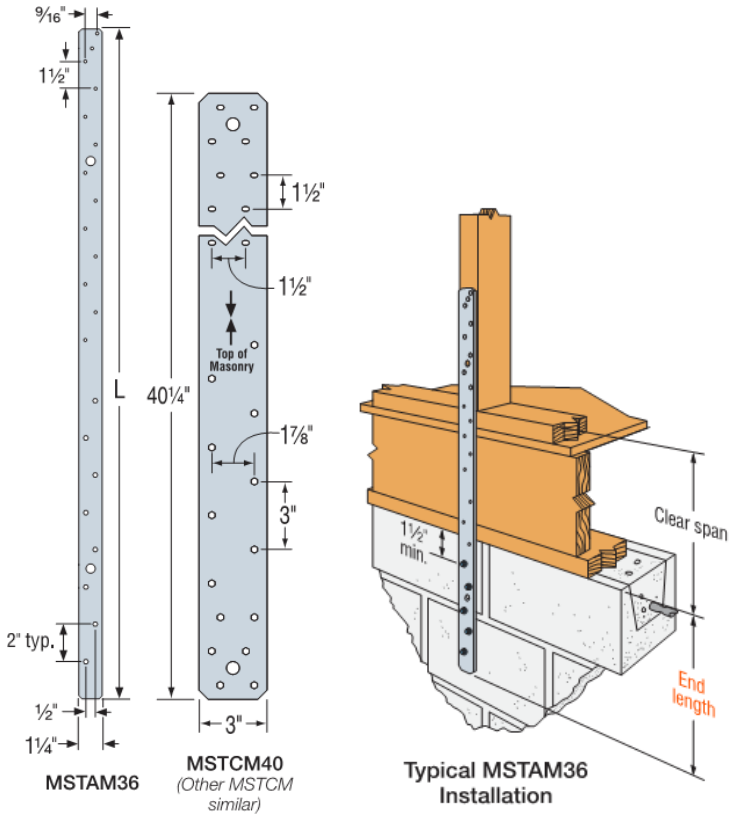


FIGURE 5: MSTAM / MSTCM Dimensions and Installation Details

TABLE 5: FGTR, FGTRHL, and FGTRHR Fasteners and Allowable Loads					
Model No.	Qty.	Fasteners		Allowable Uplift Load (lb.)	
		Truss / Rafter (Strong-Drive® SDS)	GFCMU / Concrete (Titen HD®)	DF/SP (160)	SPF/HF (160)
FGTR	1	(18) ¼"×3"	(2) ½"×5"	4,725[6]	3,400
	2	(36) ¼"×3"	(4) ½"×5"	8,885	6,395
FGTRHL/R	1	(18) ¼"×3"	(2) ½"×5"	3,635	2,615

Notes:

1. Uplift loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. Products shall be attached to grouted and reinforced CMU walls or reinforced concrete walls that are designed to transfer the uplift loads to the foundation.
3. Minimum edge distance for the Titen HD anchor is 4".
4. Titen HD anchors should be spaced in every other hole on the part.
5. Attached members must be designed to resist the applied loads.
6. Uplift for FGTR corner installations shall be limited to 4,425 lb.
7. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.

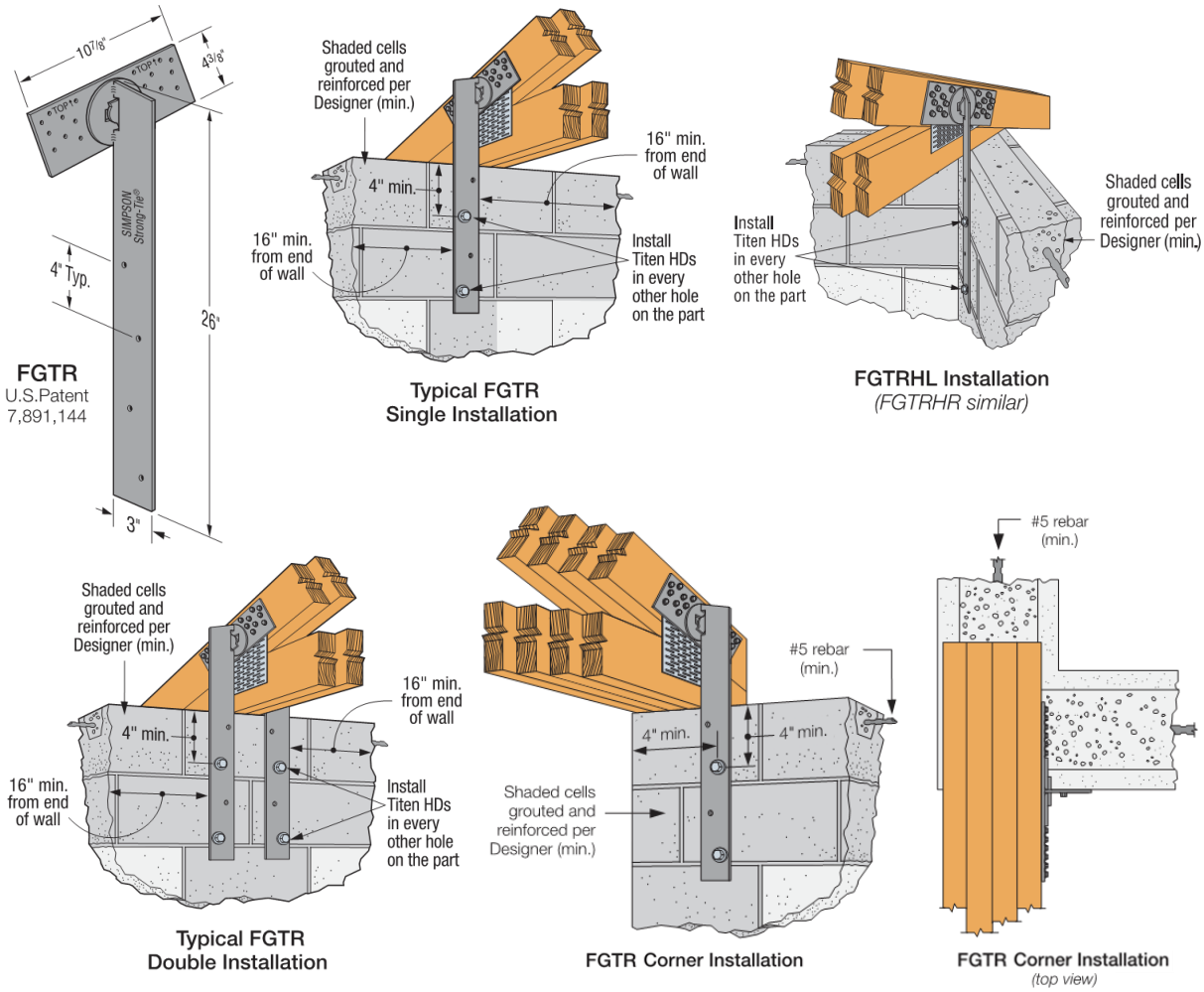


FIGURE 6: FGTR / FGTRHL / FGTRHR Dimensions and Installation Details

TABLE 6: LGT, MGT, VGT, VGTL, and VGTR Fasteners and Allowable Loads										
Model No.	Qty.	No. of Plies	Applica-tion	Fasteners			Allowable Loads (lb.)			
							Uplift (160)		Lateral (160)	
				Truss / Rafter	Wood Studs / Framing	GFCMU / Concrete	DF/SP	SPF/HF	DF/SP/SPF/HF	
									F_1	F_2
LGT2	1	2	Wood	(16) 16d Sinker	(14) 16d Sinker	—	1,885	1,620	700[4]	170[4]
			GFCMU or Conc.	(16) 16d Sinker	—	(7) ¼"×2¼" Titen 2 [2,7]	2,030	1,750		
LGT3-SDS2.5	1	3	Wood	(12) ¼"×2½" SDS	(21) 16d Sinker	—	3,480	2,505	795	385
			GFCMU or Conc.	(12) ¼"×2½" SDS	—	(4) ⅜"×5" Titen HD	3,285	2,365		
LGT4-SDS3	1	4	Wood	(16) ¼"×3" SDS	(30) 16d Sinker	—	4,060	2,920	2,000[5]	675[5]
			GFCMU or Conc.	(16) ¼"×3" SDS	—	(4) ⅜"×5" Titen HD	3,285	2,365		
MGT	1	2 (min)	Both	(22) 10d	(1) ⅝" anchor		3,965	3,330	—	—
VGT	1	2 (min)	Both	(16) ¼"×3" SDS	(1) ⅝" anchor		4,940	3,555	—	—
	2	2 (min)	Both	(32) ¼"×3" SDS	(2) ⅝" anchors		7,185	5,170	—	—
		3 (min)	Both	(32) ¼"×3" SDS	(2) ⅝" anchors		8,890	6,400	—	—
VGTL/R	1	2 (min)	Both	(16) ¼"×3" SDS	(1) ⅝" anchor		2,225	1,600	—	—
	2	2 (min)	Both	(32) ¼"×3" SDS	(2) ⅝" anchors		5,545	3,990	—	—

Notes:
1. Loads have been increased 60% for wind loading as permitted by the code. No further increase permitted. Reduce where other loads govern.
2. For concrete applications, use ¼"×1¾" Titen 2.
3. For MGT and VGT application to wood, provide equivalent anchorage to wood framing to provide resistance to applied load on the MGT or VGT. Provide continuous load path to the foundation. For MGT or VGT application to masonry/concrete, provide ⅝" anchor designed by building designer to provide resistance to applied load on the MGT or VGT. Provide continuous load path to foundation.
4. LGT2 lateral loads require installation of optional (4) 16d sinkers in triangle fastener holes into top plates.
5. LGT4 lateral loads require installation of optional (7) 16d sinkers in triangle fastener holes into top plates.
6. Minimum f'_c = 2,500 psi. Minimum f'_m = 1,500 psi.
7. Minimum edge distance for Titen 2 screw is 1½". Titen screws of the same diameter and length may be substituted for the tabulated Titen 2 screw size with no change in allowable load.

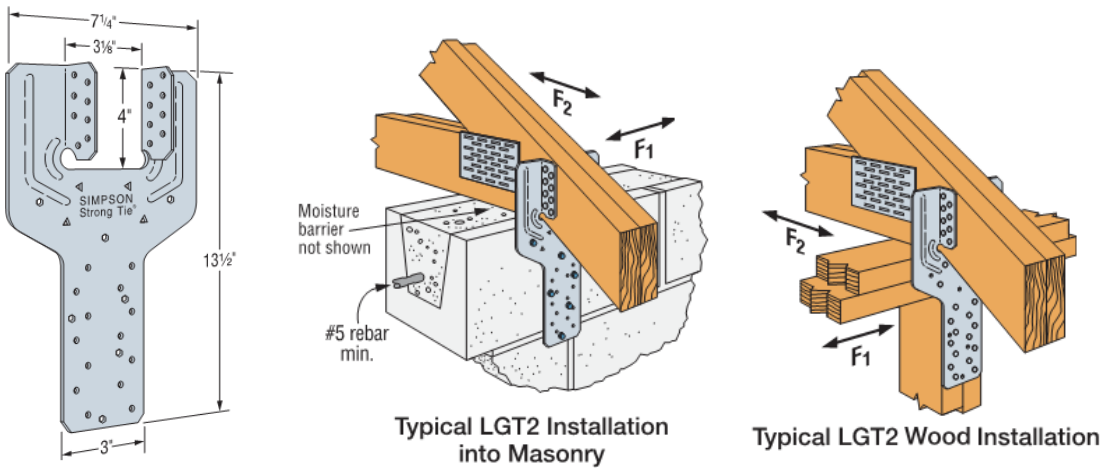


FIGURE 7: LGT2 Dimensions and Installation Details

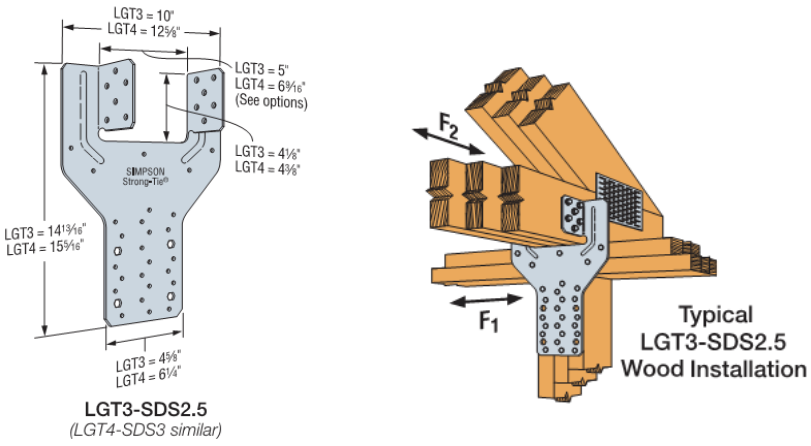


FIGURE 8: LGT3 / LGT4 Dimensions and Installation Detail

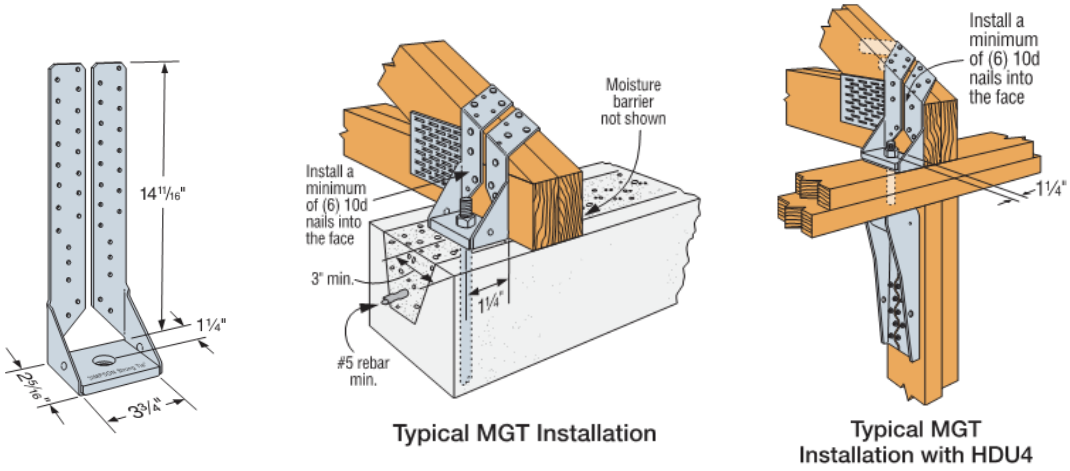


FIGURE 9: MGT Dimensions and Installation Details

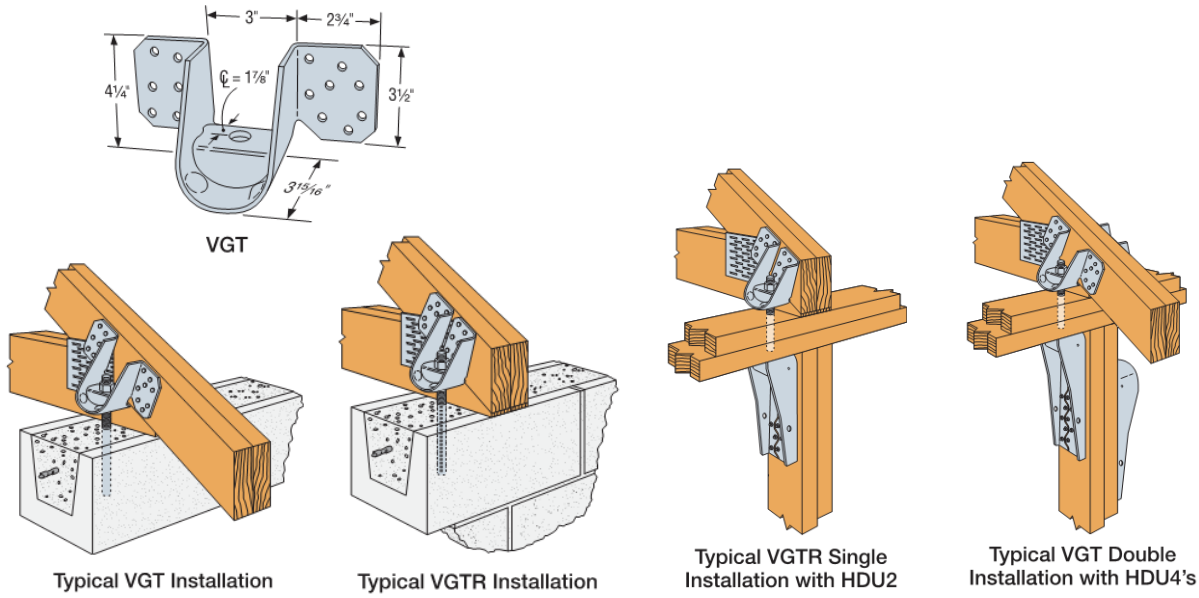


FIGURE 10: VGT / VGTR / VGTL Dimensions and Installation Details

11. REFERENCES:

Florida Building Code, Building 6th Edition (2017)

Section 104.11	Alternative materials, design, and methods of construction and equipment
Chapter 19	Concrete
Chapter 21	Masonry
Chapter 22	Steel
Chapter 23	Wood

Florida Building Code, Residential 6th Edition (2017)

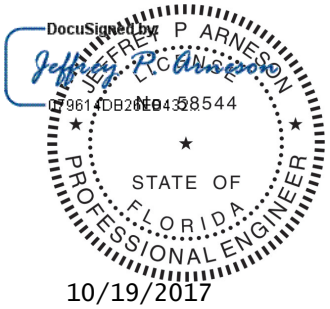
R101.2.1	Scope
R4405	HVHZ Concrete
R4407	HVHZ Masonry
R4408	HVHZ Steel
R4409	HVHZ Wood

Standards

AISI S100	2012
ANSI/AWC NDS	2015
ASTM D7147	2005

12. IDENTIFICATION:

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



10/19/2017

Jax Apex Technology, Inc.
Jeffrey P. Arneson, P.E.
P.E. No. 58544
October 19, 2017