ICC-ES Evaluation Report

ESR-2811

Reissued February 2024

Subject to renewal February 2025

This report also contains:

- LABC Supplement

- FBC Supplement

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

DIVISION: 03 00 00—CONCRETE **Section: 03 16 00—Concrete Anchors** **DIVISION: 04 00 00—MASONRY** **Section: 04 05 19.16—Masonry Anchors** **DIVISION: 05 00 00—METALS** **Section: 05 05 23—Metal Fastenings**	**REPORT HOLDER:** **SIMPSON STRONG-TIE COMPANY INC.**	**EVALUATION SUBJECT:** **SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS AND ASSEMBLIES**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015 and 2012 *International Residential Code* (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-2811 LABC and LARC Supplement.

Property evaluated:

Structural

2.0 USES

The Simpson Strong-Tie® Gas-Actuated Fasteners described in this report are used to fasten building components, such as cold-formed steel framing members, to base materials of normalweight concrete, sand-lightweight concrete, steel decks filled with sand-lightweight concrete, concrete masonry units (CMUs) and structural steel. The fasteners are alternatives to the cast-in-place anchors described in IBC Section 1901.3 (2012 IBC Section 1908) for placement in concrete; the embedded anchors described in Section 8.1.3 of TMS 402, referenced in Section 2107 of the IBC, (Section 2.1.4 of TMS 402-11, referenced in Section 2107 of the 2012 IBC) for placement in masonry; and the welds and bolts used to attach materials to steel, described in IBC Sections 2204.1 and 2204.2, respectively.

Simpson Strong-Tie Angle Clip Assemblies are used to attach wire to concrete.

For structures regulated under the IRC, the fasteners and assemblies may be used where an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 Gas-Actuated Fasteners:

3.1.1 Materials: Simpson Strong-Tie® GDP and GDPS Gas-Actuated Fasteners are power-actuated fasteners (PAFs) manufactured from steel complying with ASTM A510, Grade 1060 or 10B60, and austempered to a Rockwell "C" core hardness of 53 to 56.

Simpson Strong-Tie® GW and GTH Gas-Actuated Fasteners are PAFs manufactured from steel complying with ASTM A510 Grades 1060 to 1065 or 10B60 to 10B65, austempered to a Rockwell "C" core hardness of 53 to 56.

See Table 1 for coating information.

3.1.2 Shank Type and Dimensions: The fasteners have straight or stepped smooth shanks. See Table 1 for shank type and fastener dimensions. Maximum point length is the maximum specified length from the tip of the fastener to the location where the diameter of the shank becomes constant. Minimum effective length is the minimum specified length from the underside of the fastener head to the tip of the fastener, except for fasteners with premounted washers, where the minimum effective shank length is the minimum specified length from the underside of the washer, in its installed condition, to the tip of the fastener.

3.2 Gas-Actuated Assemblies:

3.2.1 Angle Clip Assemblies: The Simpson Strong-Tie® GAC Angle Clip Assemblies consist of a GTH smooth shank fastener described in Section 3.1, with a premounted cold-formed steel 90-degree clip angle. The outstanding leg of the clip angle has a 0.315-inch-diameter (8.0 mm) hole for the attachment of ceiling wire. The clips are formed from carbon steel complying with the report holder's specifications. The clips have a minimum base steel thickness of 0.071 inch (1.8 mm). See Table 1 for additional details.

3.3 Substrate Materials:

3.3.1 Concrete: Normalweight and sand-lightweight concrete must comply with IBC Chapter 19 or IRC Section R402.2, as applicable. The minimum concrete compressive strength at the time of fastener installation must be as noted in Tables 2 and 3, as applicable.

3.3.2 Concrete Masonry Units (CMUs): CMUs must be minimum 8-inch-thick (203 mm) lightweight blocks complying with ASTM C90 for the GDP fastener. CMUs must be minimum 8-inch-thick (203 mm) mediumweight blocks complying with ASTM C90 for the GW and GTH fasteners.

3.3.3 Steel: Structural steel must comply with the minimum requirements of ASTM A36, ASTM A572 Grade 50 or ASTM A992, and have the minimum thicknesses as noted in Table 5.

3.3.4 Steel Deck: Steel deck panels must conform to ASTM A653 SS Grade 33 (minimum) with a minimum yield strength of 38,000 psi and a minimum tensile strength of 45,000 psi. Steel deck configurations must be as described in Table 3 and Figures 1A, 1B, 2A and 2B.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Selection of fasteners must take into consideration the applicable base material and the length of the fastener. The minimum fastener length must be determined as follows:

- For installation into concrete, concrete-filled steel deck panels, concrete masonry units and steel base materials, the minimum effective shank length shown in Table 1 must equal or exceed the sum of the thickness of the attached material and the minimum embedment depth (penetration) shown in the applicable tables in this report.
- For installation through steel base materials, the minimum effective shank length shown in Table 1 must equal or exceed the sum of the following: the thickness of the attached material, the thickness of the base material and the required point penetration shown in the applicable tables in this report.

4.1.2 Allowable Loads: The applicable allowable load tables for Simpson Strong-Tie® Gas-Actuated Fasteners and assemblies driven into different base materials may be determined by referencing Table 1.

The most critical applied loads, excluding seismic load effects, resulting from the load combinations in Section 2.4 of ASCE 7-16/S1 (referenced in 2021 IBC Section 1605.1) or 2021 IBC Section 1605.2 (Section 1605.3.1 or 1605.3.2 of the 2018, 2015 and 2012) must not exceed the allowable loads. For fasteners which are subjected to seismic loads, see Section 4.1.5 for additional information. The stress increases and load reductions described in 2021 IBC Section 1605.2 (2018, 2015 and 2012 IBC Section 1605.3) are not allowed.

The allowable tension (pullout) loads, shear loads and oblique loads (applied at a 45-degree angle with respect to the fastener axis), listed in this report apply only to the connection of the fasteners to the base

materials and to the connection of premounted accessories to the fastener. Other limit states applicable to the design of a connection, such as fastener pull-through (pull-over) and lateral bearing on the attached material, which are governed by the properties of attached material, are outside the scope of this report. Design of the connection to the attached material must comply with the applicable requirements of the IBC. When designing the connection of wood members to the base material, the bending yield strength of the PAFs can be assumed to be the same as that of a nail with the same shank diameter as the PAF.

4.1.3 Combined Loading: For fasteners subjected to both tension and shear loads, compliance with the following interaction equation must be verified:

$$(p/P_a) + (v/V_a) \leq 1$$

where:

p = Actual applied tension load on fastener, lbf (N).

P_a = Allowable tension load on fastener, lbf (N).

v = Actual applied shear load on fastener, lbf (N).

V_a = Allowable shear load on fastener, lbf (N).

4.1.4 Steel-to-steel Connections: When the Simpson Strong-Tie® fasteners listed in Table 5 are used in connections of two steel elements in accordance with Section J5 of AISI S100 (Section E5 of AISI S100-12 for the 2015 and 2012 IBC), connection capacity must be determined in accordance with Sections 4.1.4.1 and 4.1.4.2, as applicable.

4.1.4.1 Connection Strength - Tension: To determine tensile connection strength in accordance with Section J5.2 of AISI S100 (Section E5.2 of AISI S100-12), the fastener tension strength, pull-out strength and pull-over strength must be known. These characteristics must be determined as follows:

- **PAF Tensile Strength:** The available tension strengths must be calculated in accordance with Section J5.2.1 of AISI S100 (Section E5.2.1 of AISI S100-12) using a value of 260,000 psi for F_{uh}.
- **Pull-out Strength:** See Table 5 for available pull-out strength.
- **Pull-over Strength:** The available pull-over strengths must be calculated in accordance with Section J5.2.3 of AISI S100 (Section E5.2.3 of AISI S100-12).

4.1.4.2 Connection Strength - Shear: To determine shear connection strength in accordance with Section J5.3 of AISI S100 (Section E5.3 of AISI S100-12), the fastener shear strength, bearing and tilting strength, pull-out strength in shear, net section rupture strength and shear strength limited by edge distance must be known. These characteristics must be determined as follows:

- **PAF Shear Strength:** The available shear strengths must be calculated in accordance with Section J5.3.1 of AISI S100 (Section E5.3.1 of AISI S100-12) using a value of 260,000 psi for F_{uh}.
- **Bearing and Tilting Strength:** The available bearing and tilting strengths must be calculated in accordance with Section J5.3.2 of AISI S100 (Section E5.3.2 of AISI S100-12).
- **Pull-out Strength in Shear:** The available pull-out strength in shear must be the applicable allowable shear strength from Table 5, or must be calculated in accordance with Section J5.3.3 of AISI S100 (Section E5.3.3 of AISI S100-12).
- **Net Section Rupture Strength and Shear Strength Limited by Edge Distance:** These limit states have not been considered in the determination of allowable loads in this report and must be addressed in the calculations submitted to the code official. The net section rupture strength must be determined in accordance with Section J5.3.4 of AISI S100 (Section E5.3.4 of AISI S100-12) and the shear strength limited by edge distance must be determined in accordance with Section J5.3.5 of AISI S100 (Section E5.3.5 of AISI S100-12).

4.1.5 Seismic Considerations: When subjected to seismic loads, the Simpson Strong-Tie fasteners and assemblies may be used as follows:

1. The fasteners and assemblies may be used for attachment of nonstructural components listed in Section 13.1.4 of ASCE 7, which are exempt from the requirements of ASCE 7.
2. Concrete base materials: The fasteners and assemblies installed in concrete may be used to support acoustical tile or lay-in panel suspended ceiling systems, distributed systems and distribution systems where the service load on any individual fastener or assembly does not exceed the lesser of 90 lbf (400 N) or the published allowable load in Tables 2A, 2B and 3, as applicable.
3. Steel base materials: The fasteners installed in steel may be used where the service load on any individual fastener or assembly does not exceed the lesser of 250 lbf (1112 N) or the published allowable load shown in Table 5.

4. For interior, nonstructural walls that are not subject to sustained tension loads and that are not a bracing application, the power-driven fasteners may be used to attach steel track to concrete or steel in all Seismic Design Categories. In Seismic Design Categories D, E, and F, the allowable shear load due to transverse pressure shall be no more than 90 pounds (400 N) when attaching to concrete; or 250 pounds (1,112 N) when attaching to steel. Substantiating calculations must be submitted addressing the fastener-to-base-material capacity and the fastener-to-attached-material capacity. Interior nonstructural walls are limited to locations where bearing walls, shear walls or braced walls are not required by the approved plans. The design load on the fastener must not exceed the allowable load established in this report for the concrete or steel base material.

4.2 Installation:

The fasteners and assemblies must be installed with a power fastening tool in accordance with Simpson Strong-Tie® recommendations. The fastening procedures must comply with the manufacturer's published installation instructions. These instructions must be available on the jobsite at all times during fastener installation.

The fasteners size, minimum embedment or penetration, minimum spacing and edge distances must comply with Tables 2 through 5, as applicable. For fasteners installed into concrete, the fasteners must not be installed into concrete until the concrete has reached the designated compressive strength.

5.0 CONDITIONS OF USE:

The Simpson Strong-Tie® Gas-Actuated Fasteners and Assemblies described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The fasteners and assemblies must be manufactured and identified in accordance with this report.

5.2 Fastener installation complies with this report and the Simpson Strong-Tie® published installation instructions. In the event of conflict between this report and the Simpson Strong-Tie® published installation instructions, the more restrictive requirements govern.

5.3 Calculations demonstrating that the applied loads are less than the allowable loads described in this report must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 For steel-to-steel connections that meet the applicability requirements of Section J5 of AISI S100 (Section E5 of AISI S100-12 for the 2015 and 2012 IBC), calculations demonstrating that the available connection strength has been determined in accordance with Section J5 of AISI S100 (Section E5 of AISI S100-12) and Section 4.1.4 of this report, and equals or exceeds the applied load, must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.5 The minimum concrete thickness must be three times the fastener penetration depth. Face shell thickness of CMUs must be a minimum of $1^1/_4$ inches (32 mm).

5.6 Refer to Section 4.1.5 for seismic considerations.

5.7 The use of fasteners in concrete or masonry is limited to installation in uncracked concrete or masonry. Cracking occurs when $f_t > f_r$ due to service loads or deformations.

5.8 Use of fasteners is limited to dry, interior locations, which include exterior walls which are protected by an exterior wall envelope.

5.9 Use of fasteners in contact with preservative-treated or fire-retardant-treated wood is not permitted.

5.10 The Simpson Strong-Tie products addressed in this report are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements (AC70), dated December 2019 (editorially revised January 2021).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ESR-2811) along with the name, registered trademark, or registered logo of the report holder must be included in the product label. [Electronic labeling is the ICC-ES web address (www.icc-es.org); specific URL related to the report; or the ICC-ES machine-readable code placed on the aforementioned items.]

7.2 In addition, containers of fasteners and assemblies are identified with the product name, the fastener catalog number, the length, the quantity and the manufacturing date. Each fastener is identified by ≠ (the "no equal" sign) stamped on the fastener head.

7.3 The report holder's contact information is the following:

SIMPSON STRONG-TIE COMPANY INC.
5956 WEST LAS POSITAS BOULEVARD
PLEASANTON, CALIFORNIA 94588
(800) 999-5099
www.strongtie.com

TABLE 1—SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS AND ASSEMBLIES

FASTENERS (see Figures 5 and 6)								
FASTENER MODEL NUMBER	**SHANK TYPE**	**SHANK DIAMETER[2] (inch)**	**NOMINAL HEAD DIAMETER (inch)**	**MAXIMUM POINT LENGTH (inch)**	**MINIMUM EFFECTIVE SHANK LENGTH[4] (inch)**	**FASTENER GALVANIZATION**	**APPLICABLE BASE MATERIAL**	**APPLICATION TABLES**
GDP-XX(X)[3]	Smooth, straight	0.106	0.240	0.22	XX(X)/100 - 0.02	ASTM B695, CLASS 5, TYPE I	Concrete Conc.-filled deck Masonry Steel	2A, 3, 4, 5
GDPS-XX(X)[3]	Smooth, stepped	0.118/0.102	0.240	0.22	XX(X)/100 - 0.02	ASTM B633, SC1, TYPE 1	Steel	5

FASTENERS WITH PREMOUNTED WASHERS (see Figures 7 and 8)									
ASSEMBLY MODEL NUMBER	**SHANK TYPE**	**SHANK DIAMETER[2] (inch)**	**NOMINAL HEAD DIAMETER (inch)**	**MAXIMUM POINT LENGTH (inch)**	**MINIMUM EFFECTIVE SHANK LENGTH (inch)**	**WASHER DESCRIPTION**	**WASHER MATERIAL & GALVANIZATION**	**APPLICABLE BASE MATERIAL**	**APPLICATION TABLES**
GW-75	Smooth, straight	0.126	0.283	0.25	0.654	$^5/_8$-inch diameter, dimpled	Carbon steel ASTM B633, SC1, TYPE 1	Concrete Conc.-filled deck Masonry	2A, 3, 4
GW-100					0.905				
GW-50	Smooth, stepped	0.128/0.110	0.283	0.21	0.425	$^5/_8$-inch diameter, dimpled	Carbon steel ASTM B633, SC1, TYPE 1	Steel	5
GTH[1]	Smooth, straight	0.126	0.283	0.25	0.959	Tophat	Aluminum	Concrete Conc.-filled deck Masonry	2A, 3, 4

CEILING CLIP ASSEMBLIES (see Figure 9)					
ASSEMBLY MODEL NUMBER	**FASTENER W/WASHER**	**CLIP DESCRIPTION**	**CLIP MATERIAL & GALVANIZATION**	**APPLICABLE BASE MATERIAL**	**APPLICATION TABLES**
GAC	GTH	0.071 inch thick, 90° clip angle	Carbon steel ASTM B633, SC1, TYPE 1	Concrete Conc.-filled deck	2B, 3

For **SI:** 1 inch = 25.4 mm.

[1]The tophat is manufactured from aluminum complying with the manufacturer's specifications in the approved quality documentation.
[2]For step shank fasteners: (Diameter of shank above the step)/(Diameter of shank below the step).
[3]The XX(X) designation in the model number represents the length of the fastener expressed in inches multiplied by 100.
[4]When multiple lengths of a fastener are addressed, the minimum effective shank length is expressed in terms of the designated length, XX(X), in inches.

TABLE 2A—ALLOWABLE LOADS FOR SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS DRIVEN INTO NORMALWEIGHT CONCRETE[1,3]

FASTENER MODEL NUMBER	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING (inches)	MINIMUM EDGE DISTANCE (inches)	ALLOWABLE LOADS (lbf)							
Concrete Compressive Strength:					2,500 psi		3,000 psi		4,000 psi		5,000 psi	
Load Direction:					Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
GDP-XX(X)	0.106	5/8	4	3	25	25	30	25	45	25	45	25
	0.106	3/4	4	3	30	50	30	55	30	75	30	75
GW-75 GW-100 GTH	0.126	5/8	4	3	65	60	70	65	95	95	-	-
		3/4	4	3	95	135	105	145	190	215	-	-

TABLE 2B—ALLOWABLE LOADS FOR SIMPSON STRONG-TIE® GAS-ACTUATED ASSEMBLIES DRIVEN INTO NORMALWEIGHT CONCRETE[1,2,3]

ASSEMBLY MODEL NUMBER	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING (inches)	MINIMUM EDGE DISTANCE (inches)	ALLOWABLE LOADS (lbf)									
Concrete Compressive Strength:					2,500 psi		3,000 psi		4,000 psi		5,000 psi		6,000 psi	
Load Direction:					Tension	Oblique	Tension	Oblique	Tension	Oblique	Tension	Oblique	Tension	Oblique
GAC	0.126	3/4	4	3	105	130	120	135	150	145	170	155	195	175

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]The fasteners must not be driven until the concrete has reached the designated minimum compressive strength, or the minimum compressive strength specified in the applicable code, whichever is greater.
[2]Oblique load direction is 45° from the concrete member surface.
[3]The fasteners and assemblies listed in the tables above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 2 and 4, as applicable.

TABLE 3—ALLOWABLE LOADS FOR SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS AND ASSEMBLIES DRIVEN INTO SAND-LIGHTWEIGHT CONCRETE AND SAND-LIGHTWEIGHT CONCRETE FILLED STEEL DECK [1,7,8]

FASTENER MODEL NUMBER	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING (inches)	MINIMUM EDGE DISTANCE[3] (inches)	ALLOWABLE LOADS (lbf)							
Fastener Location:					Fasteners Installed Directly into Concrete[2]		Fasteners Installed through Lower Flute of Steel Deck into Concrete [3,4]					
							1.5-inch "B" Deck[5]			3-inch "W" Deck[6]		
Load Direction:					Tension	Shear	Tension	Shear	Oblique	Tension	Shear	Oblique
GDP-XX(X)	0.106	5/8	4	3	75	35	65	195	-	60	180	-
	0.106	3/4	4	3	105	140	130	270	-	60	180	-
GW-75 GW-100 GTH	0.126	5/8	4	3	60	110	-	-	-	35	215	-
		3/4	4	3	115	130	-	-	-	55	235	-
GAC	0.126	3/4	4	-	-	-	90	-	90	105	-	120

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]The fasteners must not be driven until the concrete has reached a minimum compressive strength of 3,000 psi.
[2]For fasteners installed in concrete (not through metal deck), the fastener must be installed with a minimum edge distance of 3 inches from the edge of the concrete.
[3]For fasteners installed through metal deck, the fastener must be installed through the lower flutes of the deck with minimum edge distances as shown in Figures 1A, 1B, 2A and 2B, and a minimum of 3 inches from the end of the deck.
[4]The allowable load values are applicable to fasteners installed through the underside of a steel deck at the ribs and into sand-lightweight concrete with a minimum compressive strength, f'_c, of 3,000 psi. The steel deck must have a minimum base-metal thickness of 20 gage (0.0359 inch).
[5]See Figures 1A and 1B for installation parameters for the GDP fasteners. See Figure 1A for installation parameters for the GAC assemblies.
[6]See Figure 2A for installation parameters for the GDP fasteners and the GAC assemblies. See Figure 2B for installation parameters for GW and GTH fasteners.
[7]Oblique load direction is 45° from the concrete member surface.
[8]The fasteners and assemblies listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 2 and 4, as applicable.

TABLE 4—ALLOWABLE LOADS FOR SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS DRIVEN INTO THE FACE SHELL OF HOLLOW CONCRETE MASONRY UNITS (CMUs)[1,3,4]

FASTENER MODEL NUMBER	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING (inches)	MINIMUM EDGE DISTANCE[2] (inches)	ALLOWABLE LOADS (lbf)	
Load Direction:					Tension	Shear
GDP-XX(X)	0.106	5/8	8	3	35	60
GW-75 GW-100 GTH	0.126	5/8	8	3	75	90

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]The tabulated allowable load values are for fasteners installed in a hollow CMU conforming to ASTM C90. The minimum allowable nominal size of the CMU must be 8 inches high by 8 inches wide by 16 inches long, with a minimum, 1 1/4-inch-thick face shell thickness. See Section 3.3.2 for additional information.
[2]Distance from center of PAF to edge of individual blocks.
[3]The tabulated allowable load values are for fasteners installed in the center of a hollow CMU face shell. See Figure 4 for a depiction of the evaluated placement zone. Only one PAF may be installed at each cell. Allowable loads for fasteners installed in mortar head and bed joints, or into the web of the CMU, are outside the scope of this report.
[4]The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Item 1 of Section 4.1.5.

TABLE 5—ALLOWABLE LOADS FOR SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS DRIVEN INTO STEEL[1,2]

FASTENER MODEL NUMBER	SHANK DIAMETER[3] (inch)	MINIMUM SPACING (inch)	MINIMUM EDGE DISTANCE (inch)	MINIMUM STEEL STRENGTH	ALLOWABLE LOADS (lbf)									
Steel Thickness (inch):					1/8		3/16		1/4		3/8		1/2	
Load Direction:					Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
GDP-XX(X)	0.106	1	1/2	ASTM A36	125[6]	285	210[6]	225	220[6]	205	—	—	—	—
GDP-XX(X)	0.106	1	1/2	ASTM A572, Grade 50 or ASTM A992	—	—	225[6]	250	185[6]	145	—	—	—	—
GDPS-XX(X)	0.118/0.102	1	1/2	ASTM A36	—	—	95[6]	180	170[6]	265	165[4]	225[4]	145[4]	225[4]
GDPS-XX(X)	0.118/0.102	1	1/2	ASTM A572, Grade 50 or ASTM A992	—	—	110[6]	205	170[6]	305	155[4]	205[4]	—	—
GW-50	0.128/0.110	1	1/2	ASTM A36	-	-	225[6]	400	275[6]	345	245[5]	310[5]	-	-
				ASTM A572 Grade 50 or ASTM A992	-	-	240[6]	380	215[5]	325[5]	280[5]	350[5]	-	-

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N, 1 ksi = 6.895 MPa.

[1]The entire pointed portion of the fastener must penetrate through the steel to obtain the tabulated values (see Figure 3), unless otherwise noted.
[2]The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 3 and 4, as applicable.
[3]For stepped shank fasteners: (Diameter of shank above the step)/(Diameter of shank below the step).
[4]Tabulated values are based on minimum penetration of the fastener point into the steel of 0.35 inch (8.9 mm).
[5]Tabulated values are based on minimum penetration of the fastener point into the steel of 0.25 inch (6.4 mm).
[6]For steel-to-steel connections designed in accordance with Section 4.1.4, the tabulated allowable load may be increased by a factor of 1.25, and the design strength may be taken as the tabulated allowable load multiplied by a factor of 2.0.

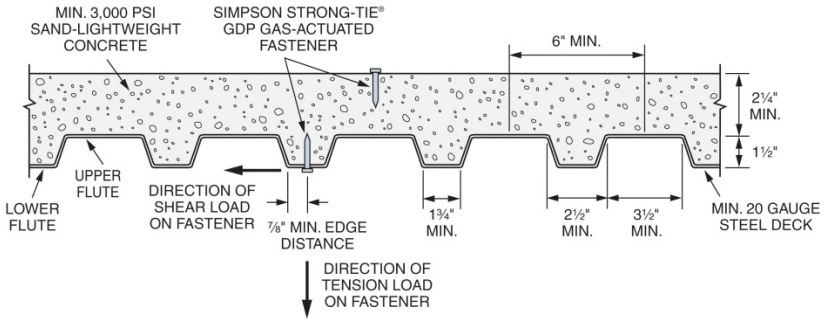

FIGURE 1A—GDP GAS-ACTUATED FASTENER AND GAC ASSEMBLIES INSTALLED INTO CONCRETE FILLED $1^1/_2$-INCH-DEEP COMPOSITE FLOOR "B" DECK

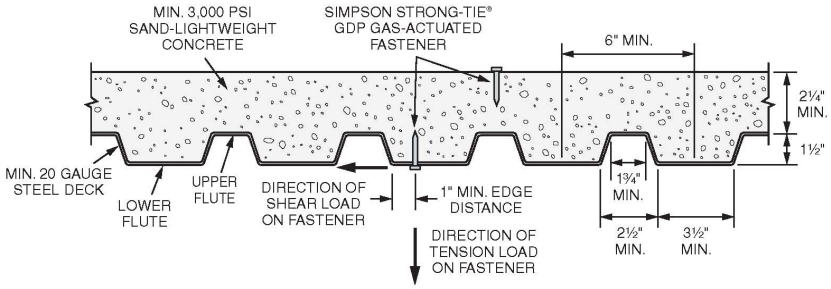

FIGURE 1B—GDP GAS-ACTUATED FASTENER INSTALLED INTO CONCRETE FILLED INVERTED $1^1/_2$-INCH-DEEP COMPOSITE FLOOR "B" DECK

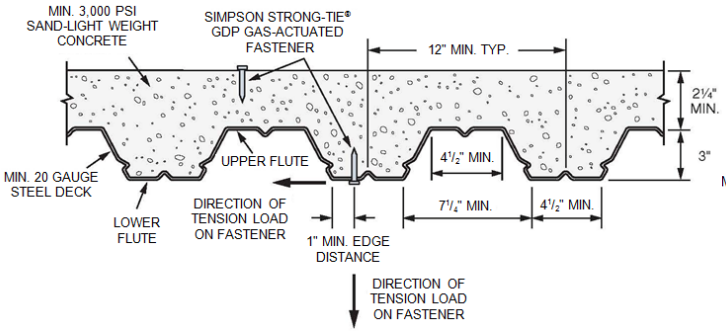

FIGURE 2A—GDP GAS-ACTUATED FASTENER AND GAC ASSEMBLIES INSTALLED IN CONCRETE FILLED 3-INCH-DEEP COMPOSITE FLOOR "W" DECK

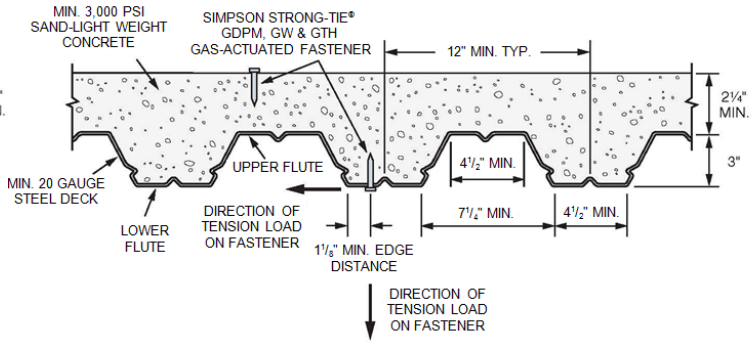

FIGURE 2B—GW AND GTH GAS-ACTUATED FASTENER INSTALLED IN CONCRETE FILLED 3-INCH-DEEP COMPOSITE FLOOR "W" DECK

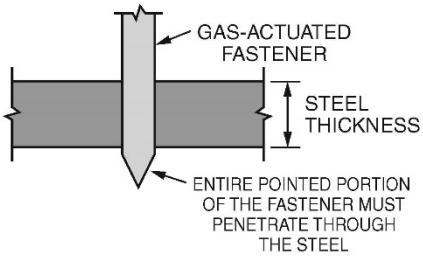

FIGURE 3—FASTENER PENETRATION THROUGH STEEL WHERE REQUIRED

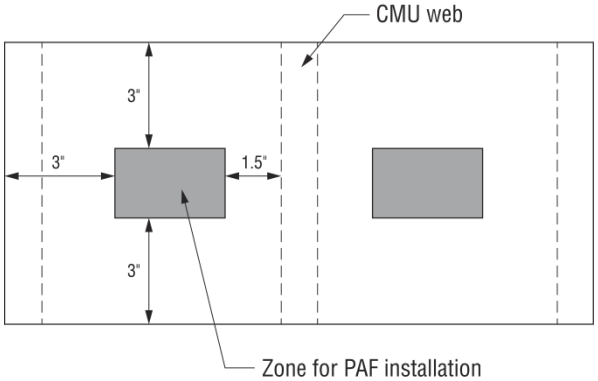

FIGURE 4—ZONE FOR FASTENER INSTALLATION IN FACE SHELL OF CMU

FIGURE 5—COLLATED GDP GAS-ACTUATED SMOOTH SHANK FASTENER

FIGURE 6—COLLATED GDPS GAS-ACTUATED STEP SHANK FASTENER

FIGURE 7—GW GAS-ACTUATED SMOOTH OR STEP SHANK FASTENER

FIGURE 8—GTH GAS-ACTUATED SMOOTH SHANK FASTENER

FIGURE 9—GAC ANGLE CLIP ASSEMBLY

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

SIMPSON STRONG-TIE® GAS-ACTUATED FASTENERS AND ASSEMBLIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Simpson Strong-Tie® Gas-Actuated Fasteners, described in ICC-ES evaluation report ESR-2811, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Simpson Strong-Tie® Gas-Actuated Fasteners, described in Sections 2.0 through 7.0 of the evaluation report ESR-2811, comply with LABC Chapters 19, 21, 22, and the LARC, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Simpson Strong-Tie® Gas-Actuated Fasteners described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2811.
- The design, installation, conditions of use and identification of the fasteners are in accordance with the 2021 *International Building Code®* (IBC) provisions noted in the evaluation report ESR-2811.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- The allowable values listed in the attached evaluation report and tables are for the fasteners only. Connected members shall be checked for their capacity (which may govern).
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued February 2024.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

SIMPSON STRONG-TIE GAS-ACTUATED FASTENERS AND ASSEMBLIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Simpson Strong-Tie Gas-Actuated Fasteners and Assemblies, described in ICC-ES evaluation report ESR-2811, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Simpson Strong-Tie Gas-Actuated Fasteners and Assemblies, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2811, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*.The design requirements must be in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2811 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code—Building* or *Florida Building Code—Residential,* as applicable.

Use of the Simpson Strong-Tie Gas-Actuated Fasteners and Assemblies has also been found to be in compliance with the High Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, with the following conditions:

a) Simpson Strong-Tie Gas-Actuated Fasteners and Assemblies must not be used in wood blocking attachment, in accordance with the *Florida Building Code—Building* Section 2330.1.10.

b) For connections subject to uplift, the connection must be designed for no less than 700 pounds (3114 N).

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued February 2024.