DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES
SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

5956 WEST LAS POSITAS BOULEVARD
PLEASANTON, CALIFORNIA 94588

EVALUATION SUBJECT:

SIMPSON STRONG-TIE® CONNECTORS ATTACHING WOOD MEMBERS TO MASONRY CONSTRUCTION
DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES
Section: 06 05 23—Wood, Plastic, and Composite Fastenings

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

EVALUATION SUBJECT:
SIMPSON STRONG-TIE® CONNECTORS ATTACHING WOOD MEMBERS TO MASONRY CONSTRUCTION

1.0 EVALUATION SCOPE
Compliance with the following codes:


For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-2877 LABC and LARC Supplement.

Property evaluated:
Structural

2.0 USES
Simpson Strong-Tie connectors for wood members supported by masonry construction are used as wood framing connectors in accordance with Section 2304.10.3 of the 2015 IBC and Section 2304.9.3 of the 2012, 2009 and 2006 IBC. The products may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION
3.1 General:
The allowable loads for connectors described in this report are based on the reference and adjusted design values of fasteners in wood, the reference perpendicular-to-grain design values of wood members, the steel strength of the connectors, and testing, as applicable.

3.1.1 GLB/HGLB Beam Seats: The GLB and HGLB beam seats are connectors used to support and connect sawn lumber or engineered wood beams to structural masonry construction. The GLB and HGLB beam seat connectors have two No. 3 gage vertical steel plates, which are factory-welded to the top of the steel bearing plate, with one bolt hole each for the GLB bearing plate connectors and two bolt holes each for the HGLB bearing plate connectors. The GLB connectors have two 12-inch-long (305 mm) No. 6 deformed reinforcing rebars, conforming to ASTM A615, Grade 60, spaced 3 1/2 inches (8.9 mm) on center, factory-welded to the underside of the flat steel bearing plate. The HGLB connectors have three 12-inch-long (305 mm) No. 6 deformed reinforcing rebars, conforming to ASTM A615, Grade 60, spaced 2 1/4 inches (63.5 mm) on center, factory-welded to the underside of the flat steel bearing plate. The bearing plate of the GLB and HGLB connectors is a flat, rectangular structural steel plate. See Table 1 for GLB and HGLB series model numbers, bearing plate dimensions, required fasteners, and allowable loads. Tabulated lateral loads for the HGLB series beam seat connectors are adjusted lateral design values for symmetric double shear connections using the bolts and the widths of the glued-laminated wood beams specified in Table 1. The design of the masonry to transfer these lateral loads is outside the scope of this report. See Figure 1 for drawings of the GLB and HGLB bearing plate connectors.

3.1.2 HGT Heavy Girder Tiedowns: The HGT heavy girder tiedowns connect 2-, 3- and 4-ply metal plate connected wood trusses to bond beams located at the top of masonry wall construction. The HGT tiedowns are fabricated from No. 7 gage steel and factory-welded insert plates. The HGT tiedowns have slotted holes at each end for 3/4-inch-diameter anchor bolts that are used to connect the tiedown to the masonry member. The threaded ends of the anchor bolts are fastened with a standard cut washer and nut. Between anchor bolt nut and washer is a crescent-shaped washer that is supplied with the tiedowns. The curved top of the crescent-shaped washers permit the tiedown to be rotated and field-adjusted to accommodate top chord slopes from 3:12 (14 degrees) minimum to 8:12 (34 degrees) maximum. See Table 2 for the tiedown model numbers, anchor dimensions, required fasteners and allowable loads. See Figure 2 for a drawing of the HGT Heavy Girder Tiedowns and a drawing of a typical installation of HGT Heavy Girder Tiedowns into masonry construction.

3.2 Materials:
3.2.1 Steel: The GLB and HGLB beam seat connectors are manufactured from steel complying with ASTM A36, with a minimum yield strength, $F_y$, of 36,000 psi (248 MPa)
and a minimum tensile strength, $F_t$, of 58,000 psi (400 MPa); and with ASTM A1011 hot rolled steel with a minimum yield strength of 33,000 psi (227 MPa) and a minimum tensile strength of 52,000 psi (359 MPa). The HGT heavy girder tiedowns are fabricated from ASTM A1011 SS designation, Grade 33, hot-rolled steel with a minimum yield strength of 33,000 psi (227 MPa) and a minimum tensile strength of 52,000 psi (359 MPa). The insert plates of the HGT Heavy Girder Tiedowns are made from ASTM A36 hot-rolled steel with a minimum yield strength of 36,000 psi (248 MPa) and a tensile strength of 58,000 psi (400 MPa). Base-metal thicknesses for the connectors in this report are as follows:

<table>
<thead>
<tr>
<th>GAGE</th>
<th>BASE-METAL THICKNESS (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3</td>
<td>0.2285</td>
</tr>
<tr>
<td>No. 7</td>
<td>0.1705</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

The GLB and HGLB beam seat connectors have a painted finish and may also be available with a hot-dipped galvanized (–HDG) finish, as described below. The HGT Heavy Girder Tiedowns have a painted finish. Some models may also be available with either a G185 zinc coating (denoted by model numbers ending with a –Z designation) or with a batch hot-dipped galvanized coating with a minimum specified coating weight of 2.0 ounces of zinc per square foot of surface area (600 g/m²) total for both sides in accordance with ASTM A123 (denoted by model numbers ending with an –HDG designation). Model numbers in this report do not include the –Z or –HDG designation, but the information shown applies. The lumber treater or the report holder (Simpson Strong-Tie Company) should be contacted for recommendations on minimum corrosion resistance of fasteners and connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.

### 3.2.2 Wood:
Wood members with which the connectors are used must be either sawn lumber or engineered wood having a minimum specific gravity of 0.50 (minimum equivalent specific gravity of 0.50 for engineered lumber), and having a maximum moisture content of 19 percent (16 percent for engineered lumber) except as noted in Section 4.1. For the GLB and HGLB beam seat connectors, the thickness of the supporting wood member must be equal to or greater than the dimension W in both sides in accordance with ASTM A123 (denoted by model numbers ending with an –HDG designation). Model numbers in this report do not include the –Z or –HDG designation, but the information shown applies. The lumber treater or the report holder (Simpson Strong-Tie Company) should be contacted for recommendations on minimum corrosion resistance of fasteners and connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.

### 3.2.3 Fasteners:
Nails used with connectors described in this report must comply with the material requirements, physical properties, tolerances, workmanship, protective coating and finishes, certification, and packaging and package marking requirements specified in ASTM F1667. The nails must have the following minimum fastener dimensions and bending yield strengths ($F_{p0}$):

<table>
<thead>
<tr>
<th>NAIL</th>
<th>SHANK DIAMETER (in.)</th>
<th>LENGTH (in.)</th>
<th>BENDING YIELD STRENGTH, $F_{p0}$ (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10d common</td>
<td>0.148</td>
<td>3</td>
<td>90,000</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 psi = 6.895 kPa.

At a minimum, bolts must comply with ASTM A36 or ASTM A307.

Nails and bolts used in contact with preservative-treated or fire-retardant-treated lumber must comply with IBC Section 2304.10.5 of the 2015 IBC or Section 2304.9.5 of the 2012, 2009 and 2006 IBC, or 2012 IRC Section R317, or 2009 and 2006 IRC Section R319.3, as applicable. For use with treated lumber, the lumber treater or the report holder (Simpson Strong-Tie Company), or both, should be contacted for recommendations on the appropriate coating or material to specify for the fasteners as well as the connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated wood.

### 3.2.4 Masonry Construction:
Materials and quality of structural masonry construction must comply with the applicable provisions of Chapter 21 of the IBC, Section R606 of the 2015 IRC, or Sections R606, R607, and R609 of the 2012, 2009, and 2006 IRC, as applicable.

### 4.0 DESIGN AND INSTALLATION

#### 4.1 Design:
The tabulated allowable loads shown in the tables of this report are based on allowable stress design (ASD) and include the load duration factor, $C_d$, corresponding to the applicable loads in accordance with the National Design Specification® for Wood Construction (NDS) and its Supplement – Design Values for Wood Construction.

Tabulated allowable loads apply to products connected to wood used under dry conditions and where sustained temperatures are 100°F (37.8°C) or less. When connectors are installed in wood having a moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable uplift and horizontal loads must be adjusted by the wet service factor, $C_{uw}$ specified in the NDS for dowel-type fasteners, and the allowable download must be multiplied by the applicable wet service factor, $C_{wl}$ specified for $F_{c}$ in the NDS Supplement for the wood member. When connectors are installed in wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C), the allowable loads in this report must be adjusted by the applicable temperature factor, $C_t$ specified in the NDS. Connected wood members must be analyzed for load-carrying capacity at the connection in accordance with the NDS.

The design of masonry construction must comply with TMS 402/ACI 530/ASCE 5, entitled “Building Code Requirements for Masonry Construction”, as referenced in Chapter 21 of the IBC, or with Section R606 of the IRC, as applicable.

#### 4.2 Installation:
Installation of the connectors must be in accordance with this evaluation report and the manufacturer’s published installation instructions. Bolts must be installed in wood or engineered wood members in accordance with the applicable provisions of the NDS. In the event of a conflict between this report and the manufacturer’s published installation instructions, this report governs.

#### 4.3 Special Inspection:
Periodic special inspection must be conducted when the connectors are components within the main wind-force-resisting system of structures constructed in areas listed in Section 1705.11 of the 2015 IBC, Section 1705.10 of the 2012 IBC, Section 1705.1 of the 2009 IBC or Section 1705.4 of the 2006 IBC. Special inspection requirements do not apply to structures, or portions thereof, that qualify for exemption under Sections 1704.2, 1705.4, 1705.11.1 of
the 2015 IBC, Sections 1704.2, 1705.3, 1705.10.1 of the 2012 IBC, Sections 1704.1, 1705.4 and 1706.2 of the 2009 IBC, or Sections 1704.1 and 1705.4 of the 2006 IBC.

Periodic special inspection shall be conducted in accordance with the applicable portions of Section 1707 when the connectors are components within the seismic-force-resisting system of structures constructed in Seismic Design Category C, D, E or F. Special inspection requirements do not apply to structures, or portions thereof, that qualify for exception under Sections 1704.2 and 1705.12.2 of the 2015 IBC, or Sections 1704.2, 1705.4, 1705.11, and 1705.11.2 of the 2012 IBC, Sections 1704.1, 1704.5, 1705.3, or 1707.3 of the 2009 IBC and 2006 IBC, and Section 1705.3.1 the 2009 IBC.

For installations under the IRC, special inspection is not normally required. However, for an engineered design where calculations are required to be signed by a registered design professional, periodic special inspection requirements and exemptions are as stated above, as applicable for installations under the IRC.

5.0 CONDITIONS OF USE

The Simpson Strong-Tie products 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 connectors must be manufactured, identified and installed in accordance with this report and the manufacturer’s published installation instructions. A copy of the instructions must be available at the jobsite at all times during installation.

5.2 Calculations showing compliance with this report 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.

5.3 Adjustment factors noted in Section 4.1 and the applicable codes must be considered, where applicable.

5.4 Connected wood members and fasteners must comply, respectively, with Sections 3.2.2 and 3.2.3 of this report.

5.5 Use of the connectors with preservative-treated or fire-retardant-treated wood must be in accordance with Section 3.2.1 of this report. Use of fasteners with preservative-treated or fire-retardant-treated wood must be in accordance with Section 3.2.3 of this report.

5.6 The design of the anchorage of the connectors specified in this report to masonry construction is outside the scope of this report.

5.7 Welded connectors 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 Joist Hangers and Similar Devices (AC13), dated February 2017.

7.0 IDENTIFICATION

The products described in this report are identified with a die-stamped label or an adhesive label indicating the name of the manufacturer (Simpson Strong-Tie), the model number, and the number of the index evaluation report (ESR-2523) that is used as an identifier for the products recognized in this report. Additionally, the factory-welded connectors are manufactured in the United States and Canada.
<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DIMENSIONS (in.)</th>
<th>ALLOWABLE DOWNLOADS&lt;sup&gt;1,2&lt;/sup&gt; (lbs)</th>
<th>ALLOWABLE HORIZONTAL BOLT LOADS&lt;sup&gt;3&lt;/sup&gt; (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLB5A</td>
<td>5&lt;sup&gt;/16&lt;/sup&gt;</td>
<td>0.2285 1 - 1/2 13,125</td>
<td>10,155</td>
</tr>
<tr>
<td>GLB5B</td>
<td>5&lt;sup&gt;/16&lt;/sup&gt;</td>
<td>0.2285 1 - 1/2 15,750</td>
<td>12,190</td>
</tr>
<tr>
<td>GLB5C</td>
<td>5&lt;sup&gt;/16&lt;/sup&gt;</td>
<td>0.2285 1 - 1/2 18,375</td>
<td>14,220</td>
</tr>
<tr>
<td>GLB5D</td>
<td>5&lt;sup&gt;/16&lt;/sup&gt;</td>
<td>0.2285 1 - 1/2 21,000</td>
<td>16,250</td>
</tr>
<tr>
<td>GLB7A</td>
<td>6&lt;sup&gt;/8&lt;/sup&gt;</td>
<td>0.2285 1 - 3/4 16,875</td>
<td>18,750</td>
</tr>
<tr>
<td>GLB7B</td>
<td>6&lt;sup&gt;/8&lt;/sup&gt;</td>
<td>0.2285 1 - 3/4 20,250</td>
<td>20,250</td>
</tr>
<tr>
<td>GLB7C</td>
<td>6&lt;sup&gt;/8&lt;/sup&gt;</td>
<td>0.2285 1 - 3/4 23,625</td>
<td>23,625</td>
</tr>
<tr>
<td>GLB7D</td>
<td>6&lt;sup&gt;/8&lt;/sup&gt;</td>
<td>0.2285 1 - 3/4 27,000</td>
<td>27,000</td>
</tr>
<tr>
<td>HGLBA</td>
<td>3&lt;sup&gt;/16&lt;/sup&gt; to 9</td>
<td>0.2285 2 - 3/4 10,155 16,655 18,750 18,750 10,305</td>
<td></td>
</tr>
<tr>
<td>HGLBB</td>
<td>3&lt;sup&gt;/16&lt;/sup&gt; to 9</td>
<td>0.2285 2 - 3/4 12,190 19,990 22,500 22,500 10,305</td>
<td></td>
</tr>
<tr>
<td>HGLBC</td>
<td>3&lt;sup&gt;/16&lt;/sup&gt; to 9</td>
<td>0.2285 2 - 3/4 14,220 23,230 26,250 26,250 10,305</td>
<td></td>
</tr>
<tr>
<td>HGLBD</td>
<td>3&lt;sup&gt;/16&lt;/sup&gt; to 9</td>
<td>0.2285 2 - 3/4 16,250 26,650 30,000 30,000 10,305</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 lbs = 4.45 N.

<sup>1</sup>Allowable download is based on the lesser of the following:

a. Allowable bearing stress of masonry, 0.25 f<sub>′m</sub>, under TMS 402/ACI 350/ASCE 5 for the 2012, 2009, and 2006 IBC and 2012, 2009, and 2006 IRC,

b. Allowable bearing stress of masonry, 0.33 f<sub>′m</sub>, under TMS 402/ACI 350/ASCE 5 for the 2015 IBC and 2015 IRC, where f<sub>′m</sub> = 1,500 psi, and where the full area of the plate (depth x width) bears over a running bond or a stack bond of fully grouted masonry wall construction (according to Section 5.1.3 of TMS 402/ACI 350/ASCE 5 under the 2015 IBC and 2015 IRC or Section 21.9 of TMS 402/ACI 350/ASCE 5 under the 2012, 2009, and 2006 IBC and 2012, 2009, and 2006 IRC, and

c. Allowable bearing stress perpendicular to grain of the wood member, F<sub>c┴</sub> = 650 psi, such as for 24F-1.8E DF/DF Structural Glued-laminated Timber, where the supported wood member must bear on the full depth (PD) of the bearing plate.

<sup>2</sup>Design of the structural concrete masonry construction and the anchorage of the HGLB connector to the masonry must be in accordance with applicable provisions of the code, including code requirements for a continuous load path and interconnection resisting horizontal lateral loads acting parallel to the beam when seismic design governs in accordance with Section 12.1.3 of ASCE/SEI 7.

<sup>3</sup>Tabulated allowable horizontal loads parallel to the beam are based on adjusted lateral design values for ¾-inch diameter bolts used in symmetric double shear connections, with applied loading parallel-to-grain of the connected wood member, and include a load duration factor, C<sub>D</sub>, equal to 1.6 for earthquake or wind loading. Loads must be reduced if stresses in masonry are limiting.
TABLE 2—HGT SERIES HEAVY GIRDER TIEDOWN¹

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DIMENSIONS (inches)</th>
<th>FASTENERS</th>
<th>ALLOWABLE UPLIFT LOADS²/³ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W</td>
<td>Anchor Spacing</td>
<td>Anchor Bolts⁴/⁵ (Quantity – Dia.)</td>
</tr>
<tr>
<td>HGT-2</td>
<td>3²/₁₆</td>
<td>5³/₄</td>
<td>2 – ³/₄&quot;</td>
</tr>
<tr>
<td>HGT-3⁶</td>
<td>4¹/₁₆</td>
<td>7³/₈</td>
<td>2 – ³/₄&quot;</td>
</tr>
<tr>
<td>HGT-4</td>
<td>6⁹/₁₆</td>
<td>9</td>
<td>2 – ³/₄&quot;</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 lbs = 4.45 N.

¹The HGT is available in sizes for 2-, 3-, and 4-ply metal plate connected wood trusses.
²The allowable uplift loads have been increased for wind or earthquake loading with no further increase is allowed. Allowable uplift loads must be reduced when other load durations govern.
³Attached members must be designed to resist applied loads.
⁴Design of the ³/₄-inch diameter anchor bolts into masonry construction must be determined in accordance with Section 8.1.3 or 9.1.6 of TMS 402/ACI 530/ASCE 5 for the 2015 IBC and 2015 IRC or Section 2.1.4 or Section 3.1.6 of TMS 402/ACI 530/ASCE 5 for the 2012, 2009 and 2006 IBC and IRC. Alternatively, the anchorage to masonry may be in accordance with a current ICC-ES evaluation report.
⁵The allowable pullout capacity or nominal strength of the anchorage to masonry needs to be greater than the tabulated allowable uplift load of the HGT tiedowns.
⁶When the HGT-3 is used with a 2-ply truss, shimming must be provided. Shimming must be a similar size and grade of lumber as the girder, and the entire assembly must be fastened to act as one unit.
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that Simpson Strong-Tie connectors used for attaching wood members to masonry construction, described in ICC-ES master evaluation report ESR-2877, 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:
- 2017 City of Los Angeles Building Code (LABC)
- 2017 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The Simpson Strong-Tie connectors used for attaching wood members to masonry construction, described in Sections 2.0 through 7.0 of the master evaluation report ESR-2877, comply with the LABC Chapter 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Simpson Strong-Tie connectors used for attaching wood members to masonry construction, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the master evaluation report ESR-2877.
- The design, installation, conditions of use and identification are in accordance with the 2015 International Building Code® (2015 IBC) provisions noted in the master evaluation report ESR-2877.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the master report, reissued February 2018 and revised February 22, 2018.