DIVISION: 03 00 00—CONCRETE
SECTION: 03 16 00—CONCRETE ANCHORS
DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

SIMPSON STRONG-TIE® CAST-IN-PLACE FOUNDATION ANCHOR STRAPS

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”
DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23—Wood, Plastic, and Composite Fastenings

REPORT HOLDER:
SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:
SIMPSON STRONG-TIE® CAST-IN-PLACE FOUNDATION ANCHOR STRAPS

1.0 EVALUATION SCOPE

Compliance with the following codes:

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see ESR-2555 LABC and LARC Supplement

Property evaluated:
Structural

2.0 USES

The Simpson Strong-Tie® MASA and MASAP foundation anchor straps described in this report are used to connect light-frame construction wood foundation plates (sill plates), having a 2-inch or 3-inch nominal thickness, or cold-formed steel (CFS) track, to concrete foundations or foundation walls. The anchor straps are structural connectors cast-in-place into normalweight concrete, and resist uplift and sliding forces that result from the application of code-prescribed loads for light-frame construction in accordance with Sections 1604.8.1 and 2308.3.1 of the 2018 and 2015 IBC, and Section E2 of AISI S230-15 for the 2018 IBC and 2018 IRC or (referenced in the IBC), Sections 1604.8.1, 2308.3.3, 2308.6, 2308.11.3.1, 2308.12.8, and 2308.12.9 of the 2012 and 2009 IBC, and Sections 1604.8, 1805.6, 2305.3.11, 2308.11.3.3, 2308.6, and 2308.11.3.1 of the 2006 IBC. These foundation anchor straps may also be used under the IRC in accordance with IRC Sections R301.1.3, R403.1.6, R602.11.1 and R603.3.1. For applications with CFS, the MASA and MASAP resist uplift and sliding forces in accordance with Section 2211.1.2 of the 2018 IBC, Section 2211.7 of the 2015 and 2012 IBC, Section 2210.7 for the 2009 IBC, Section 2210.6 of the 2006 IBC, and Section R603.3.1 of the IRC.

3.0 DESCRIPTION

3.1 MASA and MASAP Foundation Anchor Straps:
The MASA and MASAP foundation anchor straps are manufactured from No. 16 gage [0.0555-inch base-metal thickness (1.4 mm)], cold-formed, galvanized sheet steel. Each anchor strap has one end that embeds into a concrete foundation. This end of the anchor strap has two standoff legs that facilitate placement onto the concrete formwork in accordance with the installation instructions prior to placement of concrete. The other end of the foundation anchor strap extends above the concrete foundation or foundation wall and is field-bent over nominally 2-inch or 3-inch wood foundation sill plates (sole plates) or over built-up CFS bottom tracks and is fastened to the foundation sill plate or bottom track, or fastened to both the foundation sill plate or bottom track and an adjacent stud, as shown in Figure 3 and Figure 6.

The MASA anchor strap is die-formed into a shape that facilitates installation at the top of concrete forms as shown in Figure 1, and the MASAP anchor strap is die-formed into a shape that facilitates installation for panelized formwork as shown in Figure 2.

3.2 Materials:

3.2.1 Connector Steel:
The foundation anchor straps described in this report are manufactured from galvanized steel complying with ASTM A653, SS designation, Grade 33, with minimum yield strength, $F_y$, of 33,000 psi (227 MPa), a minimum tensile strength, $F_u$, of 45,000 psi (310 MPa), and a tensile elongation greater than 14 percent. The foundation anchor straps have a minimum G90 zinc coating specification in accordance with ASTM A653. The anchors are also available with a G185 zinc coating, denoted by model numbers ending with Z. Model numbers in this report do not list the Z ending, but the information shown applies. The lumber treaters’ recommendations or recommendations of Simpson Strong-Tie Company, Inc., on minimum corrosion resistance and connection capacities of connectors used with the specific proprietary preservative-treated or fire-retardant treated lumber, must be followed.
3.2.2 Cold-formed Steel (CFS) Structural Members: The allowable loads for connectors described in this evaluation report for anchorage of CFS tracks are based on CFS members (see applicable portions of Table 1 and Figure 6) evaluated using No. 18 gage [43-mil (1.09 mm) base-metal thickness] steel complying with ASTM A653, Grade 33, Fy = 33 ksi, Fu = 45 ksi. Connectors used with CFS members must not be installed over sheathing.

3.2.3 Wood: Wood members with which the connectors are used must be either sawn dimension lumber or, when approved by the code official, engineered lumber complying with an ICC-ES evaluation report. The maximum moisture content is 19 percent for sawn dimension lumber and 16 percent for engineered lumber except as noted in Section 4.1 of this report, and the dimension lumber and 16 percent for engineered lumber maximum moisture content is 19 percent for sawn dimension lumber and 16 percent for engineered lumber except as noted in Section 4.1 of this report, and the dimension lumber and 16 percent for engineered lumber maximum moisture content is 19 percent for sawn dimension lumber and 16 percent for engineered lumber maximum moisture content is 19 percent.

3.2.4 Fasteners: Nails for foundation anchor straps in this report for use in wood installations must be bright or hot-dipped galvanized carbon steel nails complying with ASTM F1667 with the minimum dimensions and bending yield strength (Fy) shown in the following table. Alternatively, nails of other materials or finishes may be used when they are recognized in an ICC-ES evaluation report as having bending yield strength and withdrawal capacity equal to or better than those of a bright carbon steel nail of the same nominal diameter. Self-tapping screw fasteners for steel-to-steel connections must comply with ASTM C1513 and must extend through the steel connection a minimum of three exposed threads in accordance with American Iron and Steel Institute (AISI) S200 General Provisions (AISI General and NAS for the 2006 IBC and IRC). See Table A below for further fastener information:

### TABLE A

<table>
<thead>
<tr>
<th>NAIL TYPE</th>
<th>SHANK DIAMETER (in.)</th>
<th>LENGTH (in.)</th>
<th>Fy (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10d×1½ common</td>
<td>0.148</td>
<td>1½</td>
<td>90,000</td>
</tr>
<tr>
<td>#10 Screw</td>
<td>0.190 (nominal diameter)</td>
<td>3½</td>
<td>See Section 3.2.4 above</td>
</tr>
</tbody>
</table>

For S1: 1 in. = 25.4 mm, 1 psi = 6.89 kPa. Nails used in contact with preservative-treated or fire-retardant-treated lumber must be hot-dipped galvanized carbon steel nails. Nails of other materials or finishes may be used when they are recognized in an ICC-ES evaluation report for use in the applicable treated lumber.

3.2.5 Concrete: Concrete must be normalweight concrete complying with the provisions of IBC Chapter 19 or IRC Section R402.2, as applicable. Design values in this report are based on a minimum specified concrete compressive strength, f'c, of 2,500 psi (17.2 MPa) at 28 days.

4.0 DESIGN AND INSTALLATION

4.1 Design Strength:

The allowable loads shown in the product tables of this report are based on Allowable Stress Design (ASD) and include the load duration factor, C0, corresponding with the applicable loads in accordance with the National Design Specification (NDS) for Wood Construction (NDS), where applicable. The allowable loads are shown for different conditions, including installation configuration (2x- and 3x-wood members, CFS track size, standard, one leg up, two legs up, etc.), load direction (Uplift, F1, F2), load type (seismic or wind) and whether the concrete is cracked or uncracked. The allowable load values based on uncracked concrete are for use where analysis indicates no concrete cracking (f < f) at service (unfactored) load levels. Footnote 6 of Table 1 describes the required procedure for converting the tabulated allowable stress (ASD) loads to strength (LRFD) load values.

Tabulated allowable loads apply to foundation anchor straps connected to wood used under dry conditions and where sustained temperatures are 100°F (37.8°C) or less. When foundation anchor straps are nailed to wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C), the allowable loads based on wood connection strength shown in Table 1 must be adjusted by the temperature factor, C_t, specified in the NDS. When foundation anchor straps are nailed to sawn lumber having a moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable loads must be adjusted by the wet service factor, C_m, specified in the NDS.

IBC Section 1613.1 contains an exception that permits detached one- and two-family dwellings assigned to Seismic Design Category (SDC) A, B, or C to be exempt from the seismic design provisions of IBC Section 1613. When this is the case, as determined by the code official, the allowable wind (or SDC A and B) loads assigned to the anchor straps in Table 1 may be used.

4.2 Installation:

The foundation anchor straps must be installed in accordance with this evaluation report and the manufacturer’s published installation instructions. In the event of a conflict between this report and the manufacturer’s published installation instructions, the most restrictive requirements govern. For buildings regulated under the IRC and for buildings of conventional light-frame construction regulated under IBC Section 2308, the MASA and MASAP foundation anchor straps may be used to attach foundation plates (sole/sill plates) to concrete foundations or foundation walls, provided a satisfactory design is submitted to the code official showing that the specified spacing of the anchor straps provides equivalent anchorage to what is prescribed in the code.

4.3 Special Inspection:

4.3.1 For the purpose of determining special inspection requirements, connectors may be considered to be special cases in accordance with Section 1705.1.1 of the IBC (Section 1704.15 of the 2009 IBC and Section 1704.13 of the 2006 IBC). Periodic special inspection shall be provided except where otherwise required or excepted by specific provisions of the IBC.

4.3.2 For installations under the IRC, special inspections are not required.

5.0 CONDITIONS OF USE

The Simpson Strong-Tie foundation anchor straps 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. In the event of a conflict between this report and the manufacturer’s published installation instructions, the more restrictive requirements shall govern.

5.2 Calculations and details 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 The supporting concrete member must be designed by others to resist the applied uplift and shear forces transferred by the connectors.

5.5 Connected wood members and fasteners must comply with Sections 3.2.3 and 3.2.4, respectively. Connected cold-formed steel members and fasteners must comply with Sections 3.2.2 and 3.2.4, respectively.

5.6 Use of connectors with preservative- or fire-retardant-treated lumber shall be in accordance with Section 3.2.1. Use of fasteners with preservative- or fire-retardant-treated lumber shall be in accordance with Section 3.2.4 of this report.

5.7 Special inspection must be provided in accordance with Section 4.3 of this report.

5.8 The 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 Cast-in-place Cold-formed Steel Connectors in Concrete for Light-frame Construction (AC398), dated May 2018.

7.0 IDENTIFICATION

7.1 The Simpson Strong-Tie foundation anchor straps 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 an index evaluation report (ESR-2523) that is used as an identifier for the products recognized in this report.

7.2 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—ALLOWABLE STRESS DESIGN (ASD) LOADS FOR MASA AND MASAP FOUNDATION ANCHOR STRAPS

<table>
<thead>
<tr>
<th>Sill/Track Size</th>
<th>Fasteners</th>
<th>Uncracked Concrete</th>
<th>Cracked Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sides</td>
<td>Top</td>
<td>Uplift</td>
</tr>
<tr>
<td>STANDARD INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x4, 2x6</td>
<td>3-10dx1.5</td>
<td>6-10dx1.5</td>
<td>920</td>
</tr>
<tr>
<td>3x4, 3x6</td>
<td>5-10dx1.5</td>
<td>4-10dx1.5</td>
<td>630</td>
</tr>
<tr>
<td>ONE LEG UP INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x4, 2x6</td>
<td>6-10dx1.5</td>
<td>3-10dx1.5</td>
<td>755</td>
</tr>
<tr>
<td>3x4, 3x6</td>
<td>7-10dx1.5</td>
<td>2-10dx1.5</td>
<td>-</td>
</tr>
<tr>
<td>TWO LEGS UP INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x4, 2x6</td>
<td>9-10dx1.5</td>
<td>-</td>
<td>810</td>
</tr>
<tr>
<td>DOUBLE 2x SILL INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; CFS Sill</td>
<td>3- #10 Screws</td>
<td>9- #10 Screws</td>
<td>645</td>
</tr>
<tr>
<td>STANDARD INSTALLATION ON 2&quot; CFS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; CFS Sill and Stud</td>
<td>6- #10 Screws</td>
<td>3- #10 Screws</td>
<td>-</td>
</tr>
<tr>
<td>SDC C-F - Allowable Loads (lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sill Size</td>
<td>Fasteners</td>
<td>Uncracked Concrete</td>
<td>Cracked Concrete</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>Sides</td>
<td>Top</td>
<td>Uplift</td>
</tr>
<tr>
<td>STANDARD INSTALLATION</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2x4, 2x6</td>
<td>3-10dx1.5</td>
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<td>745</td>
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<td>3x4, 3x6</td>
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<tr>
<td>ONE LEG UP INSTALLATION</td>
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<td>2x4, 2x6</td>
<td>6-10dx1.5</td>
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<td>660</td>
</tr>
<tr>
<td>3x4, 3x6</td>
<td>7-10dx1.6</td>
<td>2-10dx1.6</td>
<td>-</td>
</tr>
<tr>
<td>TWO LEGS UP INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x4, 2x6</td>
<td>9-10dx1.5</td>
<td>-</td>
<td>740</td>
</tr>
<tr>
<td>DOUBLE 2x SILL INSTALLATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; CFS Sill and Stud</td>
<td>3- #10 Screws</td>
<td>9- #10 Screws</td>
<td>565</td>
</tr>
<tr>
<td>STANDARD INSTALLATION ON 2&quot; CFS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; CFS Sill and Stud</td>
<td>6- #10 Screws</td>
<td>3- #10 Screws</td>
<td>-</td>
</tr>
</tbody>
</table>

For SI: 1 in. = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 6.895 kPa, 1 plf = 14.59 N/m.

1Refer to Figures 3 - 6 for illustrations of anchor straps installed to wood plates or CFS tracks and wood plate/stud or CFS track/stud. Allowable loads are applicable to anchors fastened directly to the sill plate, stud, or both. For wood installations, the plate and stud members must have S.G. ≥ 0.50 (S.G. = Assigned Specific Gravity; refer to Table 12.3.3A of the 2018 and 2015 NDS for the 2018 and 2015 IBC, Table 11.3.3A of the 2012 NDS for the 2012 IBC, and Table 11.3.2A of the 2005 NDS for the 2009 and 2006 IBC). CFS track and studs must comply with the minimum requirements of Section 3.2.2, as applicable.

2Nails and screws must comply with Section 3.2.4 of this report.

3Load direction F1 is parallel to the foundation plate wood member or the CFS track, and load direction F2 is perpendicular to the foundation plate wood member or CFS track. For simultaneous loads in more than one direction, the connector must be evaluated using the straight-line interaction equation.

4Minimum specified concrete compressive strength, f′c, must be 2,500 psi.

5The minimum anchor end distance is 4 inches, the minimum anchor spacing is 8 inches, and the minimum concrete stem wall width is 6 inches.

6Multiply tabulated SDC D-F ASD load values and Wind and SDC A and B ASD load values by 1.43 and 1.67, respectively, to obtain LRFD capacities.

7The allowable load values based on uncracked concrete are for use where analysis indicates no concrete cracking at service (unfactored) load levels.

8The allowable load values based on cracked concrete are for use where analysis indicates concrete cracking at service (unfactored) load levels.

9IBC Section 1613.1 contains an exception that permits detached one- and two-family dwellings assigned to Seismic Design Category (SDC) A, B, or C to be exempt from the seismic design provisions of IBC Section 1613. When this is the case, the allowable Wind and SDC A and B loads assigned to the anchor straps should be used.

10The allowable loads for anchors fastened to wood members are based on allowable stress design (ASD) and include the load duration factor (C_D) corresponding with wind and earthquake loading in accordance with the NDS (C_D = 1.6). No further increase is allowed.

11Deflection at allowable load based on wood connection strength is less than or equal to 1\(\frac{1}{8}\) inch.
FIGURE 1—MASA FOUNDATION ANCHOR STRAP

FIGURE 2—MASAP FOUNDATION ANCHOR STRAP

FIGURE 3—TYPICAL INSTALLATION OF MASA AND MASAP FOUNDATION ANCHOR STRAPS ON SILL PLATE
FIGURE 4—MASA/P INSTALLATION ON DOUBLE 2x MUDSILL

FIGURE 5—MASA/P INSTALLATION FOR TWO LEGS UP

FIGURE 6—MASA/P INSTALLATION ON CFS TRACK
1.0 REPORT PURPOSE AND SCOPE

Purpose:
The purpose of this evaluation report supplement is to indicate that the Simpson Strong-Tie® Cast-In-Place Foundation Anchor Straps, described in ICC-ES master evaluation report ESR-2555, 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 Cast-In-Place Foundation Anchor Straps, described in Sections 2.0 through 7.0 of the master evaluation report ESR-2555, comply with LABC Chapters 19, 22 and 23, and the LARC, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Simpson Strong-Tie Cast-In-Place Foundation Anchor Straps described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the master evaluation report ESR-2555.
- The design, installation, conditions of use and identification of the Simpson Strong-Tie Cast-In-Place Foundation Anchor Straps are in accordance with the 2015 International Building Code® (2015 IBC) provisions noted in the master evaluation report ESR-2555.
- 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 November 2018, revised February 2019.