EVALUATION SUBJECT:
SIMPSON STRONG-TIE STRONG DRIVE®
SDWC WOOD SCREWS

REPORT HOLDER:
SIMPSON STRONG-TIE COMPANY INC.
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Pleasanton, California 94588
(800) 999-5099
www.strongtie.com

CSI Division: 06 00 00 – Wood, Plastics, and Composites
CSI Section: 06 05 23 – Wood, Plastic, and Composite Fastenings

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:
- 2023 City of Los Angeles Building Code (LABC) – attached Supplement
- 2023 City of Los Angeles Residential Code (LARC) – attached Supplement

1.2 Evaluated in accordance with:
- ICC-ES AC233
- ICC-ES AC257

1.3 Properties assessed:
- Structural
- Corrosion Resistance

2.0 PRODUCT USE

The Simpson Strong-Tie Strong-Drive® SDWC fasteners described in this report are dowel-type threaded and self-drilling fasteners used for wood-to-wood connections. These fasteners comply with 2021, 2018, and 2015 IBC Section 2304.10 (2012 and 2009 IBC Section 2304.9). The fasteners are permitted when an engineered design is submitted in accordance with IRC Section R301.1.3.

The Simpson Strong-Tie Strong-Drive® SDWC15450 may be used where fasteners are required to exhibit corrosion resistance when exposed to adverse environmental conditions and/or in chemically treated wood, which are subject to limitations of Section 5.5 of this report, and are alternatives to hot-dipped-zinc-coated galvanized fasteners with a coating weight in compliance with ASTM A153, Class D. Fasteners with these proprietary corrosion-resistant coatings were evaluated for contact with wood chemically treated with waterborne alkaline copper quaternary, Type (D) (ACQ-D), to a maximum retention level of 0.4 pcf (6.4 kg/m³), which was shown to be more corrosive than Chromated Copper Arsenate, Type C (CCA-C), Micronized Copper Azole (MCA), and Dispersed Copper Azole (μCA-C).

3.0 PRODUCT DESCRIPTION

3.1 General: The SDWC screws (Figure 1 of this report) are fully threaded with rolled threads spaced approximately at 7 threads per inch (0.28 threads/mm) and a type 17 point. The head is a cap-style head with a T-30 recess. The SDWC screws are available in two lengths: 4½ inches and 6 inches (114 mm and 152 mm). The SDWC15600 screws have a clear zinc coating and are acceptable for dry-service conditions, and the SDWC15450 screws have a proprietary black electro-coat applied over a clear zinc undercoating. Table 1 of this report describes the screws recognized in this report including the bending yield strength, tensile strength, and shear strength.

3.2 Materials

3.2.1 SDWC Wood Screws: The SDWC screws are manufactured from C1022 carbon steel complying with ASTM A510. The manufacturing process involves cold-forming followed by heat treatment.

3.2.2 Wood Members: The wood side and main members shall consist of solid-sawn lumber with a specific gravity of 0.42 to 0.55 or structural composite lumber (e.g., LVL, PSL, LSL, etc.) shall have a minimum of 0.8E for lateral and withdrawal loading. The structural composite lumber shall be recognized in an evaluation report and shall have an equivalent specific gravity of 0.50 minimum for lateral and 0.42 for withdrawal. The combined thickness of the main and side members shall be equal to or greater than the screw length. The side member thickness shall be at least 1.5 inches (38 mm).

Chemicals used to preservative treat wood are limited to the following:

1. Alkaline Copper Quaternary Type D (ACQ-D), with a maximum retention level of 0.4 pcf (6.4 kg/m³).
2. Wood treatments that have been demonstrated to have lower levels of corrosivity compared to ACQ-D.

4.0 DESIGN AND INSTALLATION

4.1 Design

4.1.1 General: Reference lateral, withdrawal, and pull-through design values in the report are for allowable stress design and shall be multiplied by all applicable adjustment factors specified in the ANSI/AWC NDS to determine adjusted design values, including wet service conditions...
specified in Section 11.3.3 of the ANSI/AWC NDS – 2018 or 2015 (or Section 10.3.3 of the ANSI/AWC NDS – 2012 or ANSI/AF&PA NDS – 2005). The fastener strength taken from Table 1 of this report shall not be multiplied by the ANSI/AWC NDS adjustment factors.

Local stresses in connections using multiple fasteners shall be checked in accordance with Section 11.1.2 of ANSI/AWC NDS – 2018 or 2015 (or Section 10.1.2 of the ANSI/AWC NDS – 2012 or ANSI/AF&PA NDS – 2005). Structural members forming the connection shall be designed in accordance with the IBC.

The following requirements shall be observed when designing with the fasteners:

1. The allowable load for a single-screw connection in which the screw is subject to tension is the lesser of: (a) the reference withdrawal design value given in Table 3 of this report, adjusted by all applicable adjustment factors; (b) the reference head pull-through design value given in Table 3 of this report, adjusted by all applicable adjustment factors; and (c) the allowable screw tension strength given in Table 1 of this report.

2. The allowable lateral load for a single-fastener connection is the lesser of: (a) the reference lateral design value given in Table 2 of this report, adjusted by all applicable adjustment factors, and (b) the allowable screw shear strength given in Table 1 of this report.

3. Connections containing multiple fasteners shall be designed in accordance with Sections 11.2.2 and 12.6 of ANSI/AWC NDS – 2018 or 2015 (or Sections 10.2.2 and 11.6 of ANSI/AWC NDS – 2012 or ANSI/AF&PA NDS – 2005).

4. Where the screws are subjected to combined lateral and withdrawal loads, connections shall be designed in accordance with Section 12.4.1 of ANSI/AWC NDS – 2018 or 2015 (or Section 11.4.1 of ANSI/AWC NDS – 2012 or ANSI/AF&PA NDS – 2005).

5. When designing a connection, the structural members shall be checked for load-carrying capacity in accordance with Section 11.1.2 of ANSI/AWC NDS – 2018 or 2015 (or Section 10.1.2 of the ANSI/AWC NDS – 2012 or ANSI/AF&PA NDS – 2005) and local stresses within the connection shall be checked against Appendix E in the ANSI/AWC NDS to ensure the capacity of the connection and fastener group.

6. When the use is in structural composite lumber products, the minimum fastener end and edge distances and spacings shall be in accordance with Table 4 of this report or in accordance with the recommendations of the structural composite lumber manufacturer, whichever is more restrictive.

The SDWC15450 wood screws have corrosion-resistant coatings that are recognized for use in wood members with chemical treatments as set forth in Section 3.2.2 of this report. These fasteners shall be limited to use in applications and limitations defined in Table 5 of this report.

4.1.2 Lateral Design Values: Reference lateral (Z) design values for SDWC wood screws for single shear wood-to-wood connections loaded perpendicular to grain and parallel to grain are shown in Table 2 of this report.

4.1.3 Reference Withdrawal Design Values: Reference withdrawal (W) design values for SDWC wood screws are shown in Table 3 of this report and are given in pounds per inch of thread penetration into the main member.

4.1.4 Pull-through Design Values: Reference pull-through design values for SDWC wood screws are shown in Table 3 of this report and are given in pounds per inch of thread penetration into the side member.

4.2 Installation: The SDWC wood screws shall be installed in accordance with the manufacturer’s installation instructions, the evaluation report, and the codes listed in Section 1.1 of this report. Installation may be performed without pre-drilling wood members. Edge distances, end distances, and spacing of the screws shall be sufficient to prevent splitting of the wood, or as required by Table 4 of this report, whichever is more restrictive. The top of the screw head shall be installed flush with the surface of the member being connected.

5.0 LIMITATIONS

The Simpson Strong-Tie Strong-Drive® SDWC 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 limitations:

5.1 The fasteners shall be manufactured, identified, and installed in accordance with the manufacturer’s published installation instructions, this report, and the applicable code. A copy of the instructions shall be available at the job site continuously during installation. If there is a conflict between this report and the manufacturer’s published installation instructions, the more restrictive shall govern.

5.2 Calculations and details showing compliance with this report shall be submitted to the building official. The calculations and details shall 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 Design and installation shall conform to Section 4.0 of this report.

5.4 Calculations and details showing compliance with this report shall be submitted to the building official. The calculations and details shall 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 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation report.
5.6 The SDWC wood screws are manufactured under a quality control program with inspections by IAPMO Uniform ES.

6.0 SUBSTANTIATING DATA

6.1 Data and test reports submitted are from laboratories in compliance with ISO/IEC 17025 and in accordance with the ICC-ES Acceptance Criteria for Alternate Dowel-type Threaded Fasteners (AC233 Approved February 2022).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Corrosion-Resistant Fasteners and Evaluation of Corrosion Effects of Wood Treatments (AC 257 approved October 2009, editorially revised October 2022).

7.0 IDENTIFICATION

The packaging for the SDWC wood screws is labeled with the designation “Simpson Strong-Drive® SDWC15450 or SDWC15600”, the Simpson Strong-Tie Co. name and address, the fastener size, and the IAPMO UES evaluation report number (ER-262). Each screw head is marked with the No-Equal symbol (≠) and the numeric number “4.5 or 6” indicating screw length, as shown in Figure 1 of this report. A die-stamp label may also substitute for the label. Either IAPMO UES Mark of Conformity may also be used as follows:

IAPMO UES ER-262

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org
TABLE 1 – SDWC WOOD SCREW SPECIFICATIONS, ALLOWABLE BENDING YIELD STRENGTH, AND FASTENER ALLOWABLE STEEL STRENGTH

<table>
<thead>
<tr>
<th>FASTENER DESIGNATION</th>
<th>HEAD MARKING</th>
<th>FASTENER LENGTH(^1) L (in)</th>
<th>LENGTH OF THREAD(^2) TL (in)</th>
<th>MAJOR THREAD DIAMETER (in)</th>
<th>MINOR THREAD (ROOT) DIAMETER (in)</th>
<th>FASTENER ALLOWABLE PROPERTIES(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.235</td>
<td>0.152</td>
<td>Bending Yield Strength(^3) (F_{yb}) (psi) Tension (lbs) Shear (lbs)</td>
</tr>
<tr>
<td>SDWC15450</td>
<td>≠, 4.5</td>
<td>4.5</td>
<td>4 ¼</td>
<td></td>
<td></td>
<td>195,000</td>
</tr>
<tr>
<td>SDWC15600</td>
<td>≠, 6</td>
<td>6.0</td>
<td>5 ¾</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

\(^1\) For purposes of measuring overall fastener length, screw fasteners are measured from the top of the head to the bottom of the tip.

\(^2\) Length of thread includes tip. Figure 1 of this report shows the location of the dimensions.

\(^3\) Bending yield strength determined in accordance with methods specified in ASTM F1575 and based on the minor thread (root) diameter.

\(^4\) Allowable connection loads include consideration of fastener properties. Tables 3 and 4 of this report provide allowable reference lateral (Z), withdrawal (W), and pull-through design values for the screws in wood-to-wood connections.
TABLE 2 – REFERENCE LATERAL (Z) DESIGN VALUES FOR WOOD-TO-WOOD CONNECTIONS  

<table>
<thead>
<tr>
<th>FASTENER DESIGNATION</th>
<th>FASTENER LENGTH (in)</th>
<th>THREAD LENGTH TL (in)</th>
<th>SIDE MEMBER</th>
<th>MAIN MEMBER</th>
<th>LATERAL DESIGN VALUE (Z) FOR SINGLE SHEAR (TWO-MEMBER) CONNECTIONS (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Z_{para}^6 Z_{perp}^7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SP DF SPF SP DF SPF</td>
</tr>
<tr>
<td>SDWC15450</td>
<td>4¹/₂</td>
<td>4¹/₄</td>
<td>2x (Face)</td>
<td>2x (End Grain)</td>
<td>- - - 225 205 192</td>
</tr>
<tr>
<td>SDWC15600</td>
<td>6</td>
<td>5³/₄</td>
<td>(2)2x (Face)</td>
<td>2x (Edge)</td>
<td>245 240 180 240 240 240</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2x (Face)</td>
<td>2x (End Grain)</td>
<td>- - - 225 205 192</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2)2x (Face)</td>
<td>2x (End Grain)</td>
<td>- - - 225 205 192</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N

1. The connection conditions of this table are for specific intended applications. Reference lateral design values for all other shear connections shall be calculated in accordance with the NDS. Minimum fastener penetration into the main member shall be 1.0 inch.
2. The main and side members shall be wood having a minimum NDS-referenced specific gravity of 0.50 for DF, 0.55 for SP, and 0.42 for SPF and HF. Lateral table values for sawn lumber are also applicable for fasteners installed into structural composite lumber described in Section 3.2.2 of this report.
3. Reference lateral design values (Z) shall be multiplied by all applicable adjustment factors, including the load duration factor, C_{0}, from the NDS as referenced in the IBC or IRC.
4. Screws shall be installed into the side grain of the wood main member with the screw axis at a 90-degree angle to the surface of the member.
5. DF is Douglas Fir-Larch. SP is Southern Pine. SPF is Spruce-Pine-Fir.
6. Parallel to grain loading in the side member and perpendicular to grain loading in the main member.
7. Perpendicular to grain loading in the side member and perpendicular to grain loading in the main member, except for 2x (edge) where the main member is loaded parallel to the grain.
8. Specific gravities for each species combination are based on values in 2018 and 2015 ANSI/AWC NDS Table 11.3.3A.

TABLE 3 – REFERENCE WITHDRAWAL (W) AND PULL-THROUGH DESIGN VALUES FOR WOOD-TO-WOOD CONNECTIONS  

<table>
<thead>
<tr>
<th>FASTENER DESIGNATION</th>
<th>FASTENER LENGTH (in)</th>
<th>THREAD LENGTH (in)</th>
<th>MAIN MEMBER</th>
<th>WITHDRAWAL DESIGN VALUE (W) (lbs./in)</th>
<th>PULL-THROUGH DESIGN VALUE (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SP DF SPF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SP DF SPF</td>
</tr>
<tr>
<td>DWC15450</td>
<td>4¹/₂</td>
<td>4¹/₄</td>
<td>2x (Edge)</td>
<td>250 230 149</td>
<td>- - - 240 225 188</td>
</tr>
<tr>
<td>SDWC15600</td>
<td>6</td>
<td>5³/₄</td>
<td>2x (End Grain)</td>
<td>200 140 103</td>
<td>208 179 175</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2x (Face)</td>
<td>210 177 118</td>
<td>255 195 159</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2) 2x (Face)</td>
<td>220 199 163</td>
<td>240 225 188</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N

1. The reference withdrawal and pull-through values are in pounds per inch of the thread penetration into the main member and a minimum 1½ inch thick side member, respectively.
2. The reference withdrawal and pull-through design values shall be multiplied by all applicable adjustment factors in the ANSI/AWC NDS, including the load duration factor, C_{0}, from the NDS as referenced in the IBC or IRC.
3. Screws shall be installed into the side grain of the wood main member with the screw axis at a 90-degree angle to the surface.
4. Specific gravities for each species combination are based on values in 2018 and 2015 ANSI/AWC NDS Table 12.3.3A (2012 ANSI/AWC NDS Table 11.3.3A).
5. The reference withdrawal values shall be multiplied by the length of thread penetration in the main member. The length includes the threaded tip.
6. The reference pull-through values shall be multiplied by the length of thread penetration in the side member.
7. The main members shall be wood having a minimum NDS-referenced specific gravity of 0.50 for DF, 0.55 for SP, and 0.42 for SPF and HF. Withdrawal table values for sawn lumber are also applicable for fasteners installed into structural composite lumber described in Section 3.2.2 of this report.
8. DF is Douglas Fir-Larch. SP is Southern Pine. SPF is Spruce-Pine-Fir. HF is Hem-Fir.
## TABLE 4 – CONNECTION GEOMETRY REQUIREMENTS\(^1,2,3\)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>MINIMUM DIMENSION (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Distance</td>
<td>Load toward end</td>
</tr>
<tr>
<td></td>
<td>Load away from the end</td>
</tr>
<tr>
<td></td>
<td>Load perpendicular to the grain</td>
</tr>
<tr>
<td>Edge Distance</td>
<td>Load any direction</td>
</tr>
<tr>
<td>Spacing Between Fasteners in a Row</td>
<td>Load parallel to the grain</td>
</tr>
<tr>
<td></td>
<td>Load perpendicular to the grain</td>
</tr>
<tr>
<td>Spacing between rows</td>
<td>In-line rows</td>
</tr>
<tr>
<td></td>
<td>Staggered rows</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

1. For fasteners installed inside the grain.
2. Edge distances, end distances, and spacing of the screws shall be sufficient to prevent splitting of the wood, or as required by this table, or when applicable, as recommended by the structural composite lumber manufacturer, whichever is the more restrictive.
3. Values for spacing between staggered rows apply where fasteners in adjacent rows are offset by half of the spacing between fasteners in a row.

## TABLE 5 – RECOGNIZED EXPOSURE CONDITIONS FOR SIMPSON STRONG-TIE® SDWC15450 FASTENERS

<table>
<thead>
<tr>
<th>EXPOSURE CONDITION</th>
<th>TYPICAL APPLICATIONS</th>
<th>RECOGNITION LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Treated wood in dry-use applications</td>
<td>Limited to use where the equilibrium moisture content of the chemically treated wood meets the dry service condition as described in NDS</td>
</tr>
<tr>
<td>3</td>
<td>General Construction</td>
<td>Limited to freshwater and chemically treated wood exposure, e.g., no saltwater exposure</td>
</tr>
</tbody>
</table>
CITY OF LOS ANGELES
SUPPLEMENT

SIMPSON STRONG-TIE STRONG DRIVE®
SDWC WOOD SCREWS

REPORT HOLDER:
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CSI Division: 06 00 00—Wood, Plastics, and Composites
CSI Section: 06 05 23—Wood, Plastic, and Composite
Fastenings

1.0 RECOGNITION

Simpson Strong-Tie Strong-Drive® SDWC wood screws described in ER-262 and this supplemental report have been evaluated for use as dowel-type threaded and self-drilling fasteners in wood-to-wood connections. Simpson Strong-Tie Strong-Drive® SDWC wood screws have been evaluated for structural and corrosion resistance performance properties, subject to the requirements in ER-262 and this supplemental report. Simpson Strong-Tie Strong-Drive® SDWC wood screws were evaluated for compliance with the following codes and regulations:

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

2.0 LIMITATIONS

Use of the Simpson Strong-Tie Strong-Drive® SDWC wood screws recognized in ER-262 and this report supplement are subject to the following limitations in addition to the limitations shown in the ER-262:

2.1 Simpson Strong-Tie Strong-Drive® SDWC wood screws shall be installed in accordance with the manufacturer’s published installation instructions and ER-262.

2.2 Construction details and specifications verifying compliance with the Simpson Strong-Tie Strong-Drive® SDWC wood screws shall be indicated on the approved plans by the engineer of record. The details shall be approved by the structural plan check engineer at the time of application.

2.3 Reference lateral and withdrawal design values in ER-262 are for allowable stress design and shall be multiplied by all applicable adjustment factors specified in the ANSI/AWC NDS.

2.4 Structural members forming the connection shall be designed in accordance with the 2023 LABC.

2.5 When designing a connection, the structural members shall be checked for load-carrying capacity in accordance with Section 11.1.2 of ANSI/AWC NDS 2018.

2.6 The calculations shall be prepared, stamped, and signed by a California-registered design professional.

2.7 The design, installation, and inspection shall be in accordance with LABC Chapters 16 and 17, as applicable, due to local amendments to these chapters.

2.8 This supplement expires concurrently with ER-262.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org
FLORIDA SUPPLEMENT

SIMPSON STRONG-TIE STRONG DRIVE®
SDWC WOOD SCREWS

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CSI Division: 06 00 00—Wood, Plastics, and Composites
CSI Section: 06 05 23—Wood, Plastic, and Composite Fastenings

1.0 RECOGNITION

Simpson Strong-Tie Strong-Drive® SDWC wood screws have been evaluated for structural performance properties, subject to the requirements in ER-262 and this supplemental report for compliance with the following codes and regulations:


2.0 LIMITATIONS

Use of the Simpson Strong-Tie Strong-Drive® SDWC wood screws recognized in this supplement complies with the FBC–Building and the FBC–Residential subject to the following limitations in addition to the limitations shown in the ER-262:

2.1 The design and installation of Simpson Strong-Tie Strong-Drive® SDWC wood screws recognized in this supplement shall be in accordance with the 2021 International Building Code and the 2021 International Residential Code as noted in ER-262.

2.2 Load combinations shall be in accordance with Sections 1605.1 or 1605.2 of the FBC–Building, as applicable.

2.3 Design wind loads shall be in accordance with Section 1609.1.1 of the FBC–Building or Section R301.2.1.1 of the FBC–Residential, as applicable, and Section 1620 of the FBC–Building where used in High-velocity Hurricane Zones (HVHZ).

2.4 The use of Simpson Strong-Tie Strong-Drive® SDWC wood screws recognized in this supplement complies with the High-velocity Hurricane Zone (HVHZ) provisions set forth in Sections 2324.2 of the FBC–Building.

2.5 Simpson Strong-Tie Strong-Drive® SDWC wood screws shall be manufactured, identified, and installed in accordance with ER-262 and the manufacturer’s published installation instructions. A copy of the installation instructions shall be available at the job site continuously during installation. If there is a conflict between this report and the manufacturer’s published installation instructions, the more restrictive prevails.

2.6 For products falling under Section (5)(d) of Florida Rule 61G20-3.008, verification that the report holder’s quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission (or the building official when the report holder does not possess an approval by the Commission) is required to provide oversight and determine that the products are being manufactured as described in this evaluation report to establish continual product performance.

2.7 This supplement expires concurrently with ER-262.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org