# ICC-ES Evaluation Report

**ESR-2330**

*Reissued May 2026*

*This report also contains:*

- City of LA Supplement
- FL Supplement w/ HVHZ

*This report remains under an active continuous compliance program through the end of May 2027*

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| DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES<br><br>Section: 06 05 23.30—Connectors - General | REPORT HOLDER:<br><br>SIMPSON STRONG-TIE COMPANY INC. | EVALUATION SUBJECT:<br><br>SIMPSON STRONG-TIE® SCREW HOLD-DOWN CONNECTORS | |
|---|---|---|---|

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2024, 2021, 2018, 2015 and 2012 *International Building Code®* (IBC)
- 2024, 2021, 2018, 2015 and 2012 *International Residential Code®* (IRC)

**Property evaluated:**

Structural

## 2.0 USES

Simpson Strong-Tie® screw hold-down connectors are used as wood framing anchorage, such as to connect wood posts to concrete foundations or to connect an upper-story wood post to a lower-story supporting wood post, in accordance with 2024 IBC Sections 2304.10.4, 2305.1, 2305.3, 2308.10.5.1 and 2308.10.5.2; 2021 IBC Sections 2304.10.4, 2305.1, 2305.3, 2308.6.5.1 and 2308.6.5.2, 2018 and 2015 IBC Sections 2304.10.3, 2305.1, 2305.3, 2308.6.5.1 and 2308.6.5.2; 2012 IBC Sections 2304.9.3, 2305.1, 2305.3, 2308.9.3.1, and 2308.9.3.2; and 2021 AWC Special Design Provisions for Wind and Seismic (SDPWS) Section 4.3.6.4.2, 2015 AWC SDPWS Section 4.3.6.4.2; and 2008 AF&PA SDPWS Sections 4.3.6.4.2 and 4.3.6.1.2; and are used as anchorage of concrete and masonry walls to structural wood elements to provide lateral support for the walls as required by IBC Section 1604.8. The hold-down connectors may also be used in structures regulated under the IRC, when an engineered design is submitted in accordance with IRC Section R301.1.3 ; or when used in accordance with the prescriptive provisions of 2024, 2021 and 2018 IRC Section R507.9.2; 2015 IRC Section R507.2.4; 2012 IRC Section R507.2.3; 2024, 2021, 2018, 2015 and 2012 IRC Sections R602.10.2.2.1, R602.10.6.1, R602.10.6.2, R602.10.6.5 and R602.10.7.

## 3.0 DESCRIPTION

### 3.1 General:

**3.1.1 HDU Hold-downs:** HDU hold-downs consist of a main structural steel component with prepunched holes for installation of SDS wood screws used to connect the hold-down to the wood member, and a base plate component that provides a seat for an anchor rod/bolt nut, as shown in Figure 1. The body of the HDU2, HDU4 and HDU5 hold-downs is formed from No. 14 gage galvanized steel; the HDU8 and HDU11 bodies are

formed from No. 10 gage galvanized steel; and the HDU14 body is formed from No. 7 gage galvanized steel. The base plate component for all HDU hold-downs is formed from No. 3 gage galvanized steel. See Table 1A for HDU hold-down dimensions and fastener requirements.

**3.1.2 HDUE Hold-down:** HDUE hold-downs consist of a main structural steel component with prepunched holes for installation of SDS wood screws used to connect the hold-down to the wood member, and a base plate component that provides a seat for an anchor rod/bolt nut, as shown in Figure 2. The body of the HDUE3, HDUE5, and HDUE7 hold-downs are formed from No.14 gage galvanized steel; the HDUE9 and HDUE13 bodies are formed from No.12 gage galvanized steel; and the HDUE17 body is formed from No.10 gage galvanized steel. The base plate steel component for HDUE3, HDUE5, HDUE7, HDUE9, and HDUE13 hold-downs is formed from No. 3 gage galvanized steel, while the base plate steel component for HDUE17 is a solid aluminum washer. See Table 2A for HDUE hold-down dimensions and fastener requirements.

**3.1.3 HDQ8 and HHDQ Hold-downs:** The HDQ8 hold-down consists of a main structural steel component with prepunched holes for installation of SDS wood screws used to connect the HDQ8 hold-down to the wood member, and steel crossbars and a washer for an anchor rod/bolt nut, as shown in Figure 3A. The HHDQ11 and HHDQ14 hold-downs also have a main structural steel component with pre-drilled holes for SDS wood screws used to connect HHDQ hold-downs to the wood member, and have a factory-welded load transfer plate at its base for an anchor rod or bolt. The HDQ8 body is formed from No. 7 gage galvanized steel, and its crossbars are formed from $^{3}/_{8}$-inch-thick-by-1-inch-deep (9.5 mm by 25.4 mm) steel bar stock, and the washers are formed from $^{3}/_{8}$-inch-thick (9.5 mm) steel plate. The HHDQ bodies are formed from No. 7 gage steel, and the load transfer plates are $^{1}/_{2}$-inch-thick (12.7 mm) steel plate. See Table 3A for HDQ8 and HHDQ hold-down dimensions and fastener requirements. See Figure 3B for typical installations of the HDQ8 and HHDQ hold-downs.

**3.1.4 DTT2 Hold-down:** The DTT2 hold-down consists of a single-piece formed structural steel component with prepunched holes for installation of SDS wood screws used to connect the hold-down to the wood member as shown in Figure 4. The DTT2 is formed from No. 14 gage galvanized steel. One steel, plain (flat), standard plate (W) washer conforming to ASTM F844 and ASME B18.22.1, Type A, with a $1^{3}/_{8}$-inch (35 mm) outer diameter, is provided with the DTT2 hold-down, and must be installed between the nut and the seat of the hold-down. See Table 4 for product dimensions, required fasteners and allowable loads.

**3.2 Materials:**

**3.2.1 Steel:** The bodies of the HDU, HDUE3, HDUE5, HDUE7, HDUE9 and HDQ8 hold-downs are fabricated from ASTM A653, SS, Grade 33, galvanized steel, having a minimum yield strength, $F_y$, of 33,000 psi (227 MPa) and a minimum tensile strength, $F_u$, of 45,000 psi (310 MPa). The bodies of the HDUE13 and HDUE17 hold-downs are fabricated from ASTM A653, SS, Grade 40, galvanized steel, having a minimum yield strength, $F_y$, of 40,000 psi (276 MPa) and a minimum tensile strength, $F_u$, of 55,000 psi (379 MPa). The load transfer base plates of the HDU series hold-downs is fabricated from ASTM A1011, SS, Grade 33 steel, having a minimum yield strength, $F_y$, of 33,000 psi (227 MPa) and a minimum ultimate strength, $F_u$, of 52,000 psi (359 MPa). The load transfer base plates of the HDUE3, HDUE5, HDUE7, HDUE9, HDUE13 hold-downs are fabricated from ASTM A101, SS, Grade 50 steel, having a minimum yield strength, $F_y$, of 50,000 psi (345 MPa) and a minimum ultimate strength, $F_u$, of 65,000 psi (448 MPa). The support base of the HDUE17 hold-downs is machined solid aluminum. The crossbars and the load transfer washer for the HDQ8 hold-down are fabricated from No. 1018 carbon steel complying with SAE J403, and having a minimum yield strength, $F_y$, of 54,000 psi (371 MPa) and a minimum tensile strength, $F_u$, of 64,000 psi (440 MPa).

The bodies of the HHDQ hold-downs are fabricated from ASTM A1011, SS, Grade 33 steel, having a minimum yield strength, $F_y$, of 33,000 psi (227 MPa) and a minimum ultimate strength, $F_u$, of 52,000 psi (359 MPa). The load transfer plates for the HHDQ hold-downs are formed from ASTM A36 steel, having a minimum yield strength, $F_y$, of 36,000 psi (248 MPa) and a minimum tensile strength, $F_u$, of 58,000 psi (399 MPa). The DTT2 hold-down is formed from ASTM A653, SS designation, Grade 33 steel.

The galvanized bodies of the HDU, HDUE, HDQ8 and DTT2 hold-downs have a minimum G90 zinc coating in accordance with ASTM A653. Some models may also be available with either a G185 zinc coating (denoted by model numbers ending in the letter Z) or with a batch hot-dipped galvanized coating (denoted by model numbers ending with the letters HDG) with a minimum specified coating weight of 2.0 ounces of zinc per square foot of surface area (600 g/m$^2$), total for both sides in accordance with ASTM A123. Model numbers shown in this report do not list the -Z or -HDG suffix, but the information shown applies. The HHDQ hold-downs have a painted finish. HDU and HDUE base plates, and HDQ8 washers and crossbars have a minimum ASTM B633, SC 1, Type I electro galvanized coating.

The lumber treater or the report holder (Simpson Strong-Tie Company) should be contacted for recommendations on minimum corrosion resistance protection of steel hold-down connectors in contact with the specific proprietary preservative-treated or fire-retardant-treated lumber. The use of hold-downs in contact

with preservative-treated or fire-retardant-treated lumber is outside the scope of this report, and is subject to the approval of the code official.

The steel components of the hold-downs described in this report have the following minimum base-metal thicknesses:

| NOMINAL THICKNESS | MINIMUM BASE-METAL THICKNESS (in.) |
|---|---|
| 1/2 inch | 0.4845 |
| 3/8 inch | 0.3600 |
| No. 3 gage | 0.2285 |
| No. 7 gage (ASTM A653) | 0.1715 |
| No. 7 gage (ASTM A1011) | 0.1705 |
| No. 10 gage | 0.1275 |
| No. 12 gage | 0.0975 |
| No. 14 gage | 0.0685 |

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

**3.2.2 Wood:** Wood members with which the hold-downs are used, must be either sawn lumber or engineered lumber having a minimum specific gravity of 0.50 (minimum equivalent specific gravity of 0.50 for engineered lumber). The required thickness (depth) of the wood members in the direction of the fastener penetration is specified in Table 1B for HDU hold-down assemblies, Table 2B for HDUE hold-down assemblies, Tables 3B and 3D for HDQ8/HHDQ hold-down assemblies, and Table 4 for DTT2 hold-down assemblies. Unless noted otherwise, the minimum width of the wood members listed in Tables 1B, 2B, 3B, 3D, and 4 is 3 1/2 inches (88.9 mm).

**3.2.3 SDS Wood Screws:** Fasteners used with the hold-down assemblies described in Tables 1B, 2B, 2D, 3, and 4 must be Simpson Strong-Tie SDS wood screws recognized in ESR-2236. Model numbers shown in this report do not include the SDS model number after the hold-down model number (e.g., HDU4-SDS2.5), but the information shown applies. SDS screws used in contact with preservative-treated or fire-retardant-treated lumber must, as a minimum, comply with ESR-2236. The lumber treater or Simpson Strong-Tie Company should be contacted for recommendations on minimum corrosion resistance and connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.

**3.2.4 Threaded Rods:** As a minimum, threaded steel rods must comply with ASTM A307 A36 or F1554.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

**4.1.1 Hold-down Assembly:** The allowable loads shown in Tables 1B, 2B, 3B, 3D and 4 of this report are for hold-down assemblies consisting of the following components: (1) hold-down device; (2) an anchor bolt/rod attached to the seat of the device; (3) a wood member, having minimum specified dimensions and properties; (4) quantity and size of SDS wood screws used to attach the hold-down device to the wood member; and, in some cases as noted, (5) bearing plates or washers. The allowable loads for these assemblies are based on allowable stress design (ASD) and include the load duration factor, $C_D$, corresponding with the applicable loads in accordance with the National Design Specification (NDS) for Wood Construction. The assembly must have an allowable strength equal to or exceeding the required strength of the assembly under the action of the ASD (Allowable Stress Design) load combinations referenced in the applicable code.

Where design load combinations include earthquake loads or effects, story drifts of the structure must be determined in accordance with Section 12.8.6 of ASCE 7 by using strength-level seismic forces without reduction for ASD. The deflection of a shear wall restrained from overturning by hold-downs installed in accordance with this report is calculated using Equation 23-2 shown in Section 2305.3 of the IBC, or Equation 4.3-1 shown in Section 4.3.4 of AWC SDPWS-2021 (Special Design Provisions for Wind and Seismic), Equation 4.3-1 shown in Section 4.3.2 of AWC SDPWS-2015 or ANSI AF&PA SDPWS-2008, as applicable. The total deflection values, $\Delta_{all}$ and $\Delta_s$, at ASD-level and strength-level forces, respectively, for hold-down assemblies shown in Tables 1B, 2B, 3B, 3C, 3D and 4 of this report, include all sources of hold-down assembly elongation, such as fastener slip, hold-down device extension and rotation, and anchor rod elongation where the unbraced length of the rod is a maximum of 6 inches (152 mm) for assemblies using HDU, HDUE, HDQ, and HHDQ hold-downs; and a maximum of 4.5 inches (114 mm) for assemblies using DTT2 hold-downs. The

contribution of the hold-down anchor rod elongation to the total elongation (deflection) of the hold-down assembly needs to be considered when the actual diameter, length, or ASTM steel specification of the anchor rod differs from that described in this report.

Please note: When seismic governs, the symbol $\Delta_s$ as used in this report for hold-down *assemblies* refers to the symbol $d_a$ in IBC Section 2305.3 and to the symbol $\Delta_a$ in Section 4.3.4 of AWC SDPWS-2021, Section 4.3.2 of AWC SDPWS-2015 or ANSI/AF&PA SDPWS-2008, as applicable.

Tabulated allowable loads are for hold-downs connected to wood used under continuously dry interior conditions, and where sustained temperatures are 100ºF (37.8ºC) or less.

When hold-downs are fastened to wood having a moisture content greater than 19 percent (16 percent for engineered lumber), or where wet service is expected, the allowable loads shown in Tables 1B, 2B, 3B, 3D and 4 of this report must be adjusted by the wet service factor, $C_M$, specified in the NDS.

When hold-downs are fastened to wood that will experience sustained exposure to temperatures exceeding 100ºF (37.8ºC), the allowable loads shown in Tables 1B, 2B, 3B, 3D and 4 in this report must be adjusted by the temperature factor, $C_t$, specified in the NDS.

The design of wood members fastened to the hold-down devices must consider combined stresses due to axial tension or compression, and flexural bending induced by eccentricities in the connection about either or both axes, relative to the centroid of the wood member. Stresses must be evaluated at the critical net section for total combined stress in accordance with the NDS.

The design of hold-downs used in series must account for the cumulative deformation of all hold-downs within that series.

**4.1.2 Hold-down Devices Used as Anchorage of Structural Walls:** Allowable tensile strengths and strength-level displacements are specified in Table 1C for HDU hold-down devices and Table 2C for HDUE hold-down devices. Allowable tensile and compressive strengths and corresponding displacements are specified in Table 3C for HDQ8/HHDQ hold-down devices. These values are for the steel anchorage device independent of the SDS screws and anchor rod, and are used when designing structural wall anchorage in accordance with Section 12.11.2.2.2 of ASCE 7. Allowable compression loads of a structural wall anchorage system consisting of HDQ8/HHDQ hold-down devices, wood members, SDS wood screws, and threaded anchor rod, are shown in Table 3D. Axial compression of the anchor rod must be calculated when the actual diameter, length, or ASTM steel specification of the anchor rod differs from that described in the footnotes to Table 3D. The effective length and slenderness ratio of anchor rods subject to axial compression loads must be determined using accepted engineering principles.

**4.1.3 Anchorage to Concrete or Masonry:** Adequate embedment length and anchorage details, including edge and end distances, must be determined by a registered design professional in accordance with Chapters 19 or 21 of the IBC, as applicable, for design of anchorage to concrete and masonry structural members.

Where design load combinations include earthquake loads or effects, the design strength of anchorage to concrete must be determined in accordance with 2024, 2021, 2018 or 2015 IBC Sections 1901.3 and 1905, 2012 IBC Section 1909, except for detached one- and two-family dwellings assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, $S_s$, is less than 0.4g.

### 4.2 Installation:

Installation of the Simpson Strong-Tie hold-down connectors must be 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, this report governs.

### 4.3 Special Inspection:

**4.3.1 IBC:** For compliance with the 2024, 2018, 2015 and 2012 IBC, a statement of special inspection must be prepared by the registered design professional in responsible charge, and submitted to the code official for approval, where required by 2024, 2021, 2018, 2015 and 2012 IBC Section 1704.3. Special inspections for seismic resistance must be conducted as required, and in accordance with the appropriate sections of Chapter 17 of the IBC. Special inspections for anchor bolts in concrete or masonry must be conducted in accordance with 2024, 2021, 2018, 2015, and 2012 IBC Sections 1705.3 or 1705.4.

**4.3.2 IRC**: 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 in Section 4.3.1, as applicable for installations under the IRC.

## 5.0 CONDITIONS OF USE:

The Simpson Strong-Tie hold-down connectors 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 steel hold-down connectors with preservative- or fire-retardant-treated lumber must be in accordance with Section 3.2.1 of this report. Use of fasteners with preservative- or fire-retardant-treated lumber must be in accordance with Section 3.2.3 of this report.

**5.6** Anchorage to concrete or masonry structural members must be designed in accordance with Section 4.1.3 of this report.

**5.7** No further duration of load increase for wind or earthquake loading is allowed.

**5.8** Hold-downs 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 Hold-downs (Tie-downs) Attached to Wood Members (AC155), dated May 2015 (editorially revised June 2024).

## 7.0 IDENTIFICATION

**7.1** The hold-down devices 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) which contains a summary of all the product model numbers in the ICC-ES evaluation reports listed in that report for this manufacturer. The SDS wood screws are identified as described in evaluation report ESR-2236.

**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) 925-5099**
**www.strongtie.com**

**TABLE 1A—DIMENSIONS AND FASTENER REQUIREMENTS FOR HDU SERIES HOLD-DOWN CONNECTORS**

| HOLD-DOWN MODEL NO. | DIMENSIONS (in) | | | | | ANCHOR BOLT DIA. (in) | SDS SCREW QUANTITY |
|---|---|---|---|---|---|---|---|
| | H | W | B | CL | SO | | |
| HDU2 | $8^{11}/_{16}$ | 3 | $3^{1}/_{4}$ | $1^{1}/_{4}$ | $1^{3}/_{8}$ | $^{5}/_{8}$ | 6 |
| HDU4 | $10^{15}/_{16}$ | 3 | $3^{1}/_{4}$ | $1^{1}/_{4}$ | $1^{3}/_{8}$ | $^{5}/_{8}$ | 10 |
| HDU5 | $13^{3}/_{16}$ | 3 | $3^{1}/_{4}$ | $1^{1}/_{4}$ | $1^{3}/_{8}$ | $^{5}/_{8}$ | 14 |
| HDU8 | $16^{5}/_{8}$ | 3 | $3^{1}/_{2}$ | $1^{1}/_{4}$ | $1^{1}/_{2}$ | $^{7}/_{8}$ | 20 |
| HDU11 | $22^{1}/_{4}$ | 3 | $3^{1}/_{2}$ | $1^{1}/_{4}$ | $1^{1}/_{2}$ | 1 | 30 |
| HDU14 | $25^{21}/_{32}$ | 3 | $3^{1}/_{2}$ | $1^{9}/_{16}$ | $1^{9}/_{16}$ | 1 | 36 |

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

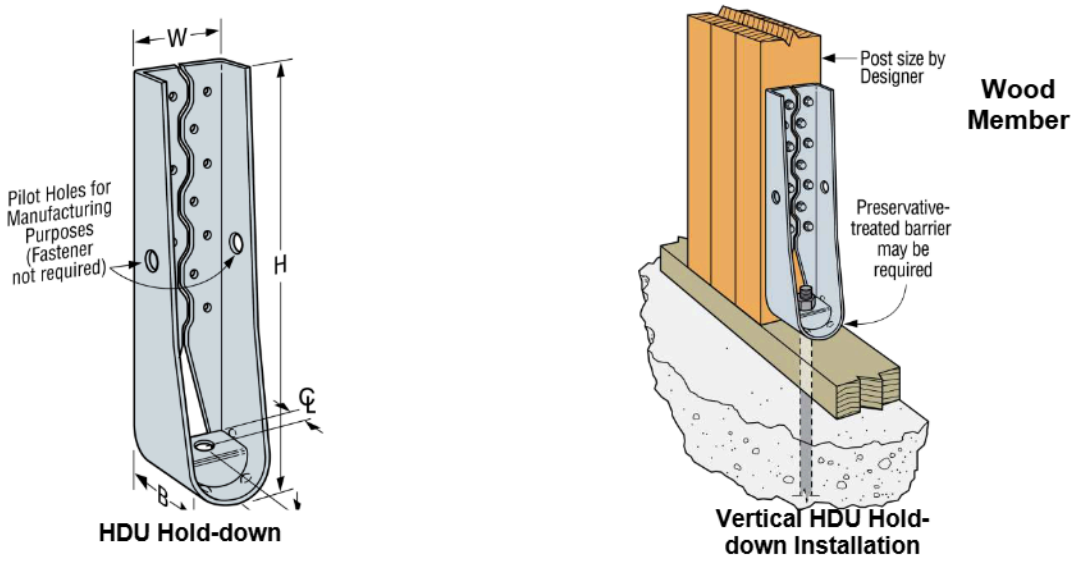



**FIGURE 1—HDU SERIES HOLD-DOWNS**

**TABLE 1B—ALLOWABLE TENSION LOADS AND DISPLACEMENTS FOR HDU SERIES HOLD-DOWN ASSEMBLIES[1,2,3,4]**

| HOLD-DOWN MODEL NO. | SDS SCREW SIZE (in) | ALLOWABLE TENSION LOADS[5], $P_{all}$ (lbs) $C_D$ = 1.33 or $C_D$ = 1.6 Wood Member Thickness[6] (in.) | | | | | | DISPLACEMENT Δ AT MAXIMUM LOAD[8,9] (in.) | |
|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[(7)] | $\Delta_{all}$ | $\Delta_s$ |
| HDU2 | 1/4 x 1.5 | 1,810 | 1,810 | 1,810 | 1,810 | 1,810 | 1,810 | 0.069 | 0.090 |
| | 1/4 x 2.5 | 3,075 | 3,075 | 3,075 | 3,075 | 3,075 | 3,075 | 0.088 | 0.118 |
| HDU4 | 1/4 x 1.5 | 3,105 | 3,105 | 3,105 | 3,105 | 3,105 | 3,105 | 0.083 | 0.108 |
| | 1/4 x 2.5 | 4,565 | 4,565 | 4,565 | 4,565 | 4,565 | 4,565 | 0.114 | 0.154 |
| HDU5 | 1/4 x 1.5 | 3,960 | 3,960 | 3,960 | 3,960 | 3,960 | 3,960 | 0.109 | 0.142 |
| | 1/4 x 2.5 | 5,645 | 5,670 | 5,670 | 5,670 | 5,670 | 5,670 | 0.115 | 0.158 |
| HDU8 | 1/4 x 1.5 | 5,980 | 5,980 | 5,980 | 5,980 | 5,980 | 5,980 | 0.087 | 0.115 |
| | 1/4 x 2.5 | 6,765 | 6,970 | 7,870 | 7,870 | 7,870 | 7,870 | 0.113 | 0.161 |
| HDU11 | 1/4 x 2.5 | — | — | — | 9,535 | 11,175[(10)] | 11,175 | 0.137 | 0.182 |
| HDU14 | 1/4 x 2.5 | — | — | — | — | 14,390[(10)] | 14,445 | 0.172 | 0.239 |

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

[1]Tabulated allowable loads are for a hold-down assembly consisting of the hold-down device attached to a wood structural member with the size of SDS wood screws noted in the table. The quantity of SDS wood screws must comply with Table 1A.
[2]The allowable loads for the hold-down assemblies are based on allowable stress design (ASD) and include the load duration factor, $C_D$, corresponding with wind/earthquake loading in accordance with the NDS. No further increase is allowed.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down assembly must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024, 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down assembly must not be increased by 33 1/3 percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]Anchorage to concrete or masonry must be determined in accordance with Section 4.1.3 of this report.
[5]The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level resistance loads associated with the tabulated $\Delta_s$ deformations.
[6]The minimum thickness of the wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3 1/2 inches, except as noted.
[7]The minimum width of the wood members must be 5 1/2 inches (6x6 nominal).
[8]Tabulated displacement values, $\Delta_{all}$ and $\Delta_s$, for hold-down assemblies include all sources of hold-down assembly elongation, such as fastener slip, hold-down device extension and rotation, and anchor rod elongation, at ASD-level and strength-level forces, respectively.
[9]Elongation of the hold-down anchor rod must be calculated when the ASTM steel specification of the anchor rod differs from that described in the Section 3.2.4 of this report, or the actual unbraced length is greater than 6 inches. In lieu of calculating the elongation of the hold-down anchor rod for hold-downs raised 6 inches to 18 inches above the concrete, an additional 0.010 inch may be added to the tabulated hold-down displacement at allowable load, $\Delta_{all}$, and an additional 0.014 inch may be added to the tabulated hold-down displacement at strength-level load, $\Delta_s$, to account for anchor rod elongation.
[10]Requires a heavy hex anchor nut to achieve tabulated tension loads.

**TABLE 1C—ALLOWABLE TENSION LOADS AND DISPLACEMENTS OF HDU SERIES HOLD-DOWN CONNECTORS[1,2,3]**

| HOLD-DOWN MODEL NO. | ALLOWABLE TENSION LOAD, $P_{all}$ (lbs) | DISPLACEMENT Δ AT MAX LOAD[4] (in) | |
|---|---|---|---|
| | | $\Delta_{all}$ | $\Delta_s$ |
| HDU2 | 3,505 | 0.081 | 0.110 |
| HDU4 | 4,990 | 0.089 | 0.117 |
| HDU5 | 5,670 | 0.078 | 0.107 |
| HDU8 | 9,950 | 0.131 | 0.164 |
| HDU11 | 11,905 | 0.121 | 0.157 |
| HDU14 | 15,905[(5)] | 0.124 | 0.172 |

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

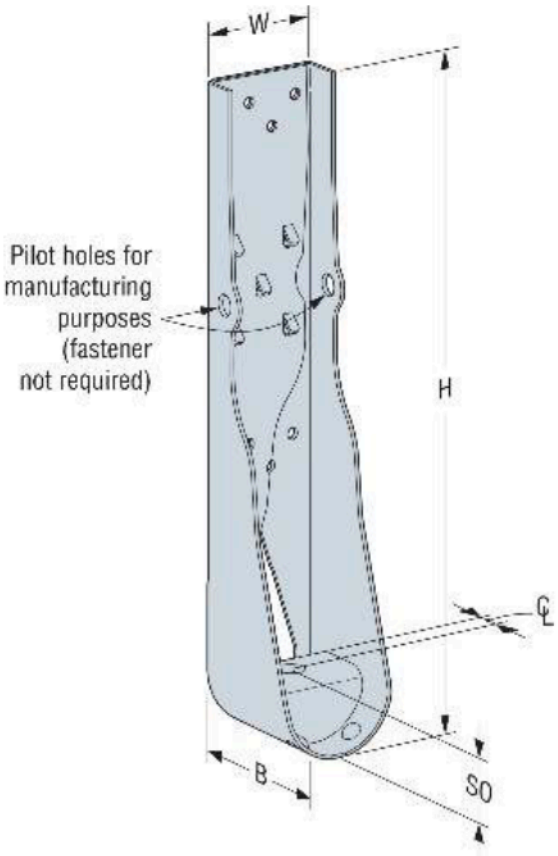
[1]This table lists the allowable tensile strength of the steel hold-down connectors exclusive of fasteners and anchor rods when tested on a steel jig.
[2]Allowable tension loads are applicable for designs complying with Section 12.11.2.2.2 of ASCE 7.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down must not be increased by 33 1/3 percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]$\Delta_{all}$ is the displacement at the tabulated ASD load and $\Delta_S$ is displacement at the strength-level load. Tabulated displacement values in Table 1C consist only of deformation of the hold-down (tie-down) device when tested on a steel jig. Other variables contributing to total displacement, $d_a$, such as fastener slip, wood shrinkage, and anchor bolt/rod elongation, must be checked by the registered design professional. The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level loads associated with the tabulated strength-level deformations, $\Delta_S$.
[5]Requires a heavy hex anchor nut to achieve tabulated tension loads.

**TABLE 2A— DIMENSIONS AND FASTENER REQUIREMENTS FOR HDUE SERIES HOLD-DOWN CONNECTORS[1]**

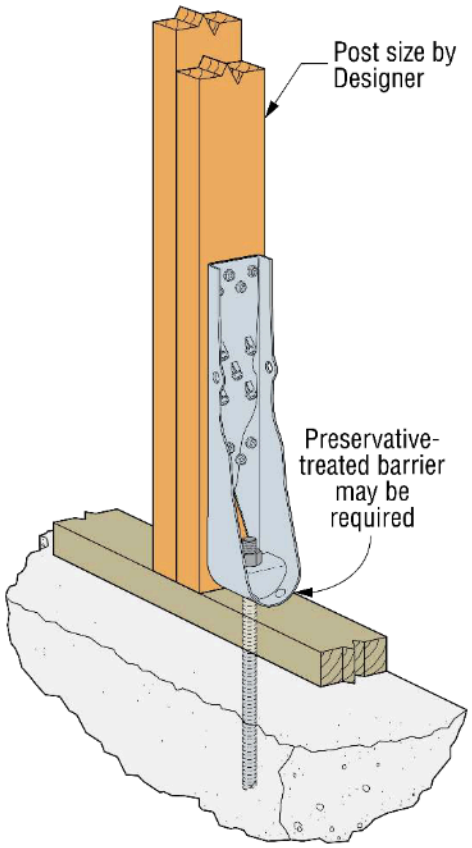
| HOLD-DOWN MODEL NO. | DIMENSIONS (in) | | | | | ANCHOR BOLT DIA. (in) | SDS SCREW QUANTITY |
|---|---|---|---|---|---|---|---|
| | H | W | B | CL | SO | | |
| HDUE3 | $8^{11}/_{16}$ | $2^{7}/_{8}$ | $3^{3}/_{8}$ | $1^{3}/_{8}$ | $1^{1}/_{2}$ | $^{5}/_{8}$ | 7 |
| HDUE5 | $11^{5}/_{16}$ | $2^{7}/_{8}$ | $3^{3}/_{8}$ | $1^{3}/_{8}$ | $1^{1}/_{2}$ | $^{5}/_{8}$ | 10 |
| HDUE7 | $14^{11}/_{16}$ | $2^{7}/_{8}$ | $3^{3}/_{8}$ | $1^{3}/_{8}$ | $1^{1}/_{2}$ | $^{5}/_{8}$ | 13 |
| HDUE9 | $17^{3}/_{8}$ | 3 | $4^{5}/_{16}$ | $1^{7}/_{16}$ | $1^{1}/_{2}$ | $^{7}/_{8}$ | 16 |
| HDUE13 | $23^{1}/_{16}$ | 3 | $4^{5}/_{16}$ | $1^{7}/_{16}$ | $1^{1}/_{2}$ | 1 | 23 |
| HDUE17 | $27^{7}/_{8}$ | 3 | $5^{3}/_{16}$ | $1^{15}/_{16}$ | $1^{1}/_{2}$ | 1 | 28 |

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

[1]High strength anchor bolt may be required.




HDUE Hold-Down




HDUE Installation

**FIGURE 2—HDUE HOLD-DOWN**

**TABLE 2B—ALLOWABLE TENSION LOADS AND DISPLACEMENTS FOR HDUE SERIES HOLD-DOWN ASSEMBLES[1,2,3,4]**

| HOLD-DOWN MODEL NO. | SDS SCREW SIZE (in) | ALLOWABLE TENSION LOADS[5], $P_{all}$ (lbs) $C_D$ = 1.33 or $C_D$ = 1.6 | | | | | | DISPLACEMENT Δ AT MAXIMUM LOAD[8,9] (in.) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Wood Member Thickness[6] (in.) | | | | | | | |
| | | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[7] | $\Delta_{all}$ | $\Delta_s$ |
| HDUE3 | ¼ x 3 | 3,790 | 3,790 | 3,790 | 3,790 | 3,790 | 3,790 | 0.127 | 0.167 |
| HDUE5 | ¼ x 3 | 5,375 | 5,375 | 5,375 | 5,375 | 5,375 | 5,375 | 0.146 | 0.195 |
| HDUE7 | ¼ x 3 | 7,015[11] | 7,015[11] | 7,015[11] | 7,015[11] | 7,015[11] | 7,015[11] | 0.154 | 0.214 |
| HDUE9 | ¼ x 3.5 | — | 8,425 | 9,390 | 9,390 | 9,390 | 9,390 | 0.159 | 0.195 |
| HDUE13 | ¼ x 3.5 | — | — | — | 11,900[10] | 12,950[10] | 13,110[10] | 0.164 | 0.206 |
| HDUE17 | ¼ x 4.5 | — | — | — | 16,040 | 16,040 | 17,685[11] | 0.111 | 0.145 |

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

[1]Tabulated allowable loads are for a hold-down assembly consisting of the hold-down device attached to a wood structural member with the size of SDS wood screws noted in the table. The quantity of SDS wood screws must comply with Table 2A.
[2]The allowable loads for the hold-down assemblies are based on allowable stress design (ASD) and include the load duration factor, $C_D$, corresponding with wind/earthquake loading in accordance with the NDS. No further increase is allowed.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down assembly must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down assembly must not be increased by 33$^1/_3$ percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]Anchorage to concrete or masonry must be determined in accordance with Section 4.1.3 of this report.
[5]The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level resistance loads associated with the tabulated $\Delta_s$ deformations.
[6]The minimum thickness of the wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3$^1/_2$ inches, except as noted.
[7]The minimum width of the wood members must be 5$^1/_2$ inches (6x6 nominal).
[8]Tabulated displacement values, $\Delta_{all}$ and $\Delta_s$, for hold-down assemblies include all sources of hold-down assembly elongation, such as fastener slip, hold-down device extension and rotation, and anchor rod elongation, at ASD-level and strength-level forces, respectively.
[9]Elongation of the hold-down anchor rod must be calculated when the ASTM steel specification of the anchor rod differs from that described in the Section 3.2.4 of this report, or the actual unbraced length is greater than 6 inches. In lieu of calculating the elongation of the hold-down anchor rod for hold-downs raised 6 inches to 18 inches above the concrete, an additional 0.010 inch may be added to the tabulated hold-down displacement at allowable load, $\Delta_{all}$, and an additional 0.014 inch may be added to the tabulated hold-down displacement at strength-level load, $\Delta_s$, to account for anchor rod elongation.
[10]Requires a heavy hex anchor nut to achieve tabulated tension loads.
[11]Requires a high strength anchor bolt to achieve tabulated tension loads.

**TABLE 2C— ALLOWABLE TENSION LOADS AND DISPLACEMENTS OF HDUE SERIES HOLD-DOWN CONNECTORS[1,2,3]**

| HOLD-DOWN MODEL NO. | ALLOWABLE TENSION LOAD, $P_{all}$ (lbs) | DISPLACEMENT Δ AT MAX LOAD[4] (in) | |
|---|---|---|---|
| | | $\Delta_{all}$ | $\Delta_s$ |
| HDUE3 | 4,380 | 0.124 | 0.164 |
| HDUE5 | 7,085 | 0.121 | 0.170 |
| HDUE7 | 7,470 | 0.105 | 0.154 |
| HDUE9 | 9,845 | 0.117 | 0.152 |
| HDUE13 | 13,645[5] | 0.126 | 0.185 |
| HDUE17 | 24,260 | 0.070 | 0.100 |

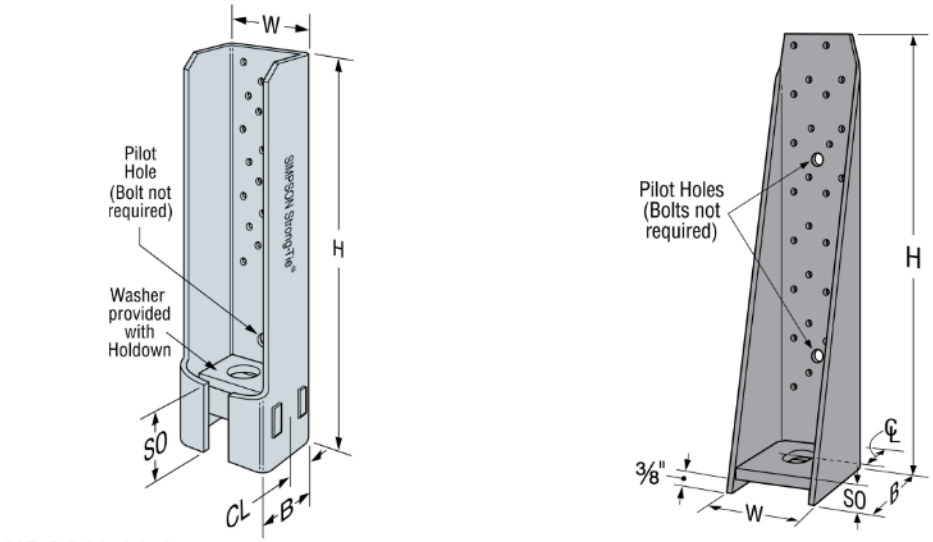
For **SI:** 1 inch = 25.4 mm, 1 lbs = 4.45 N.

[1]This table lists the allowable tensile strength of the steel hold-down connectors exclusive of fasteners and anchor rods when tested on a steel jig.
[2]Allowable tension loads are applicable for designs complying with Section 12.11.2.2.2 of ASCE 7.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down must not be increased by 33 1/3 percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]$\Delta_{all}$ is the displacement at the tabulated ASD load and $\Delta_S$ is displacement at the strength-level load. Tabulated displacement values in Table 2C consist only of deformation of the hold-down (tie-down) device when tested on a steel jig. Other variables contributing to total displacement, $d_a$, such as fastener slip, wood shrinkage, and anchor bolt/rod elongation, must be checked by the registered design professional. The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level loads associated with the tabulated strength-level deformations, $\Delta_S$.
[5]Requires a heavy hex anchor nut to achieve tabulated tension loads.

**TABLE 3A—DIMENSIONS AND FASTENER REQUIREMENTS FOR HDQ8/HHDQ HOLD-DOWN CONNECTORS**

| HOLD-DOWN MODEL NO. | DIMENSIONS (in) | | | | | ANCHOR BOLT DIA. (in) | SDS SCREW QUANTITY |
|---|---|---|---|---|---|---|---|
| | H | W | B | CL | SO | | |
| HDQ8 | 14 | $2^{7}/_{8}$ | $2^{1}/_{2}$ | $1^{1}/_{4}$ | $2^{3}/_{8}$ | $^{7}/_{8}$ | 20 |
| HHDQ11 | $15^{1}/_{8}$ | 3 | $3^{1}/_{2}$ | $1^{1}/_{2}$ | $^{7}/_{8}$ | 1 | 24 |
| HHDQ14 | $18^{3}/_{4}$ | 3 | $3^{1}/_{2}$ | $1^{1}/_{2}$ | $^{7}/_{8}$ | 1 | 30 |

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




**HDQ8 Hold-down** **HHDQ Hold-down**

**FIGURE 3A—HDQ8/HHDQ SERIES HOLD-DOWNS**

**TABLE 3B—ALLOWABLE TENSION LOADS AND DISPLACEMENTS FOR HDQ8/HHDQ SERIES HOLD-DOWN ASSEMBLIES[1,2,3,4]**

| HOLD-DOWN MODEL NO. | SDS SCREW SIZE (in) | ALLOWABLE TENSION LOADS[5], $P_{all}$ (lbs) $C_D$ = 1.33 or $C_D$ = 1.6 Wood Member Thickness[6] (in.) | | | | | | DISPLACEMENT[8,9] Δ AT MAX LOAD (in) | |
|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[(7)] | $\Delta_{all}$ | $\Delta_s$ |
| HDQ8 | ¼x 1.5 | 5,715 | 5,715 | 5,715 | 5,715 | 5,715 | 5,715 | 0.073 | 0.093 |
| | ¼x 2.5 | 5,715 | 5,715 | 7,280 | 7,280 | 7,280 | 7,280 | 0.091 | 0.121 |
| | ¼x 3 | 5,715 | 7,630 | 9,230 | 9,230 | 9,230 | 9,230 | 0.095 | 0.130 |
| HHDQ11 | ¼x 2.5 | — | — | — | 11,810 | 11,810 | 11,810[(10)] | 0.131 | 0.168 |
| HHDQ14 | ¼x 2.5 | — | — | — | — | 13,015 | 13,710[(10)] | 0.107 | 0.144 |

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

[1]Tabulated allowable loads are for a hold-down assembly consisting of the hold-down device attached to a wood structural member with the size of SDS wood screws noted in the table above. The quantity of SDS wood screws must comply with Table 3A.
[2]The allowable loads for the hold-down assemblies are based on allowable stress design (ASD) and include the load duration factor, $C_D$, corresponding with wind/earthquake loading in accordance with the NDS. No further increase is allowed.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down assembly must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads, that tabulated allowable loads for the hold-down assembly must not be increased by $33^{1}/_{3}$ percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]Anchorage to concrete or masonry must be determined in accordance with Section 4.1.3 of this report.
[5]The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level resistance loads associated with the tabulated $\Delta_S$ deformations.
[6]The minimum thickness of the wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be $3^{1}/_{2}$ inches, except as noted.
[7]The minimum width of the wood members must be $5^{1}/_{2}$ inches (6x6 nominal).
[8]Tabulated displacement values, $\Delta_{all}$ and $\Delta_S$, for hold-down assemblies include all sources of hold-down assembly elongation, such as fastener slip, hold-down device extension and rotation, and anchor rod elongation, at ASD-level and strength-level forces, respectively.
[9]Elongation of the hold-down anchor rod must be calculated when the ASTM steel specification of the anchor rod differs from that described in the Section 3.2.4 of this report, or the actual unbraced length is greater than 6 inches. In lieu of calculating the elongation of the hold-down anchor rod for hold-downs raised 6 inches to 18 inches above the concrete, an additional 0.010 inch may be added to the tabulated hold-down displacement at allowable load, $\Delta_{all}$, and an additional 0.014 inch may be added to the tabulated hold-down displacement at strength-level load, $\Delta_s$, to account for anchor rod elongation.
[10]Requires a heavy hex anchor nut to achieve tabulated tension loads.

**TABLE 3C—ALLOWABLE TENSION AND COMPRESSION LOADS AND DISPLACEMENTS FOR HDQ AND HHDQ SERIES HOLD-DOWN CONNECTORS[1,2,3]**

| MODEL NO. | ALLOWABLE LOAD[4], $P_{all}$ (lbs) | | DISPLACEMENT[5] Δ AT MAXIMUM LOAD (in.) | | | |
|---|---|---|---|---|---|---|
| | | | Tension | | Compression | |
| | Tension | Compression | $\Delta_{all}$ | $\Delta_s$ | $\Delta_{all}$ | $\Delta_s$ |
| HDQ8 | 12,200 | 7,725 | 0.080 | 0.101 | 0.052 | 0.067 |
| HHDQ11 | 12,290 | 9,745 | 0.053 | 0.068 | 0.086 | 0.120 |
| HHDQ14 | 14,605[6] | 11,010[6] | 0.036 | 0.052 | 0.070 | 0.097 |

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

[1]This table lists the allowable tensile and compressive strengths of the steel hold-down connectors exclusive of fasteners and anchor rods when tested on a steel jig.
[2]Allowable tension and compression loads are applicable for designs complying with Section 12.11.2.2.2 of ASCE 7.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down must not be increased by $33^1/_3$ percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]The designer must verify that the hold-down anchor bolt is adequate to resist compression forces based on the unbraced length of the anchor bolt.
[5]$\Delta_{all}$ is the displacement at the tabulated ASD loads and $\Delta_S$ is displacement at strength-level loads. Tabulated displacement values in Table 3C consist only of deformation of the hold-down (tie-down) device when tested on a steel jig. Other variables contributing to total displacement, $d_a$, such as fastener slip, wood shrinkage, and anchor bolt/rod elongation, must be checked by the registered design professional. The tabulated allowable tension and compression (ASD) loads must be multiplied by 1.4 to obtain the strength-level loads associated with the tabulated strength-level deformations, $\Delta_S$.
[6]A heavy hex anchor nut is required to achieve tabulated loads.

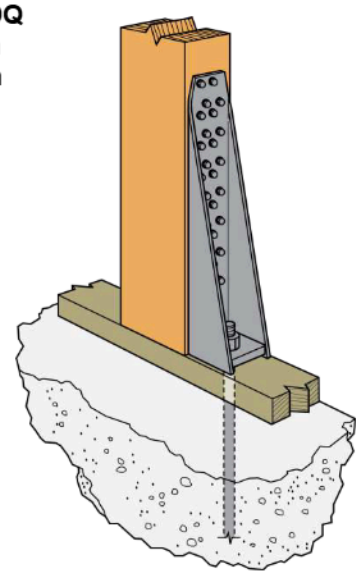
**TABLE 3D—ALLOWABLE COMPRESSION LOADS AND DISPLACEMENTS FOR HDQ8/HHDQ SERIES HOLD-DOWN ASSEMBLIES[1,2,3]**

| MODEL NO. | SDS SCREW SIZE (in) | ALLOWABLE COMPRESSION LOADS[4], $P_{all}$ (lbs) $C_D$ = 1.33 or $C_D$ = 1.6 | | | | | | DISPLACEMENT[5,6] Δ AT MAX LOAD (in) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Wood Member Thickness[7] (in.) | | | | | | | |
| | | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[8] | $\Delta_{all}$ | $\Delta_s$ |
| HDQ8 | ¼ x 1.5 | 5,570 | 5,570 | 5,570 | 5,570 | 5,570 | 5,570 | 0.038 | 0.045 |
| | ¼ x 2.5 | 5,570 | 5,570 | 7,825 | 7,825 | 7,825 | 7,825 | 0.049 | 0.075 |
| | ¼ x 3 | 5,570 | 5,570 | 8,995 | 8,995 | 8,995 | 8,995 | 0.053 | 0.076 |
| HHDQ11 | ¼ x 2.5 | — | — | — | 10,860 | 10,860 | 10,860[9] | 0.109 | 0.143 |
| HHDQ14 | ¼ x 2.5 | — | — | — | — | 12,035 | 12,035[9] | 0.081 | 0.110 |

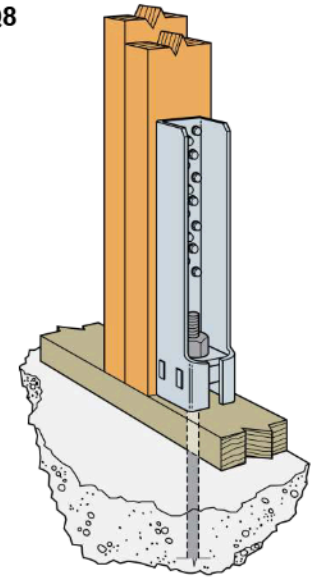
For **SI:** 1 inch = 25.4 mm, 1 lbs = 4.45 N.

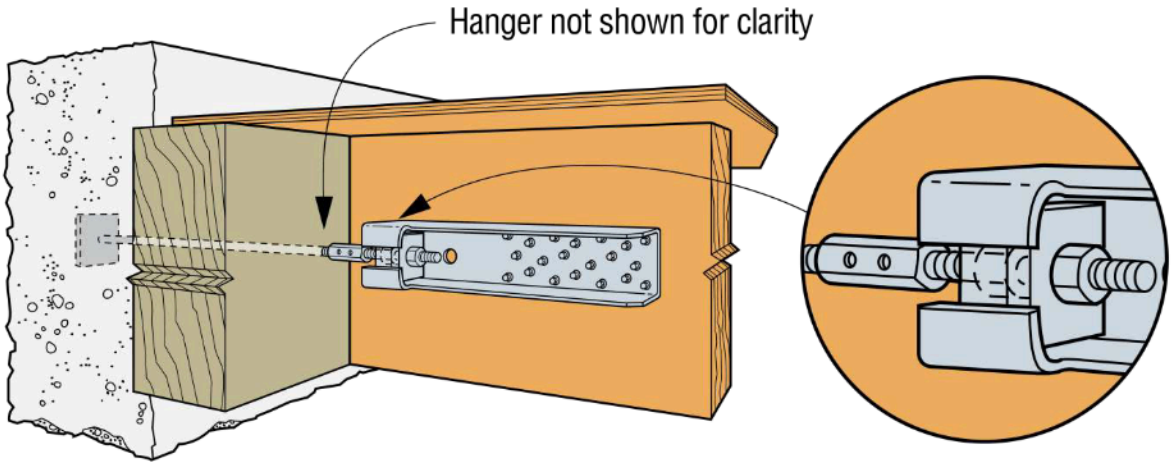
[1]Tabulated allowable compression loads are for a HDQ8 AND HHDQ Series hold-down assemblies consisting of the hold-down device attached to a wood structural member with the size of SDS wood screws noted in the table. The quantity of SDS wood screws must comply with Table 3A.
[2]Allowable compression loads are applicable for design of anchorage assemblies for structural walls in accordance with Section 12.11 of ASCE 7.
[3]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down assembly must not be increased for wind of earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads that tabulated allowable loads for the hold-down assemblies must not be increased by $33^1/_3$ percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[4]The tabulated allowable compression load does not consider the end bearing capacity of the connected wood member.
[5]$\Delta_{all}$ is the displacement at the tabulated ASD loads and $\Delta_S$ is displacement at strength-level loads. The tabulated allowable tension and compression (ASD) loads must be multiplied by 1.4 to obtain the strength-level loads associated with the tabulated strength-level deformations, $\Delta_S$.
[6]The registered design professional must verify that the hold-down anchor bolt is adequate to resist design compression forces based on the unbraced length of the anchor bolt.
[7]The minimum thickness of the wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be $3^1/_2$ inches, except as noted.
[8]The minimum width of the wood members must be $5^1/_2$ inches (6x6 nominal).
[9]A heavy hex anchor nut is required to achieve tabulated loads.

Vertical HHDQ Hold-down Installation



Vertical HDQ8 Hold-down Installation






Horizontal HDQ8 Hold-down Installation

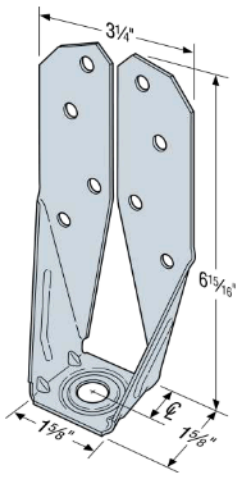
FIGURE 3B—TYPICAL INSTALLATIONS OF HDQ8/HHDQ SERIES HOLD-DOWNS

**TABLE 4—DIMENSIONS, FASTENER REQUIREMENTS, ALLOWABLE TENSION LOADS AND DISPLACEMENTS FOR DTT2 SERIES HOLD-DOWN ASSEMBLIES[1,2,3,4,5]**

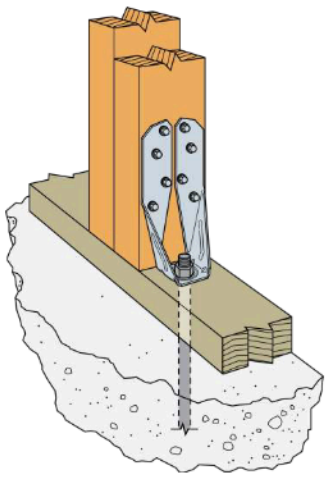
| MODEL NO. | DIMENSIONS (inches) | | | | REQUIRED FASTENERS | | | WOOD MEMBER THICKNESS[6] (inches) | ALLOWABLE TENSION LOADS[7], $P_{all}$ (lbs) | | DISPLACEMENT Δ AT MAXIMUM LOAD[8,9] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Anchor Bolt Dia. | SDS Screws | | | | | | |
| | L | W | CL | B | | Qty. | Size | | $C_D$=1.0 | $C_D$=1.6 | $\Delta_{all}$ | $\Delta_s$ |
| DTT2 | 6 15/16 | 3 1/4 | 13/16 | 1 5/8 | 1/2 | 8 | SDS 1/4 x 1 1/2 | 1.5 | 1,825 | 1,825 | 0.105 | 0.189 |
| | | | | | | | | 3.0 | 2,000 | 2,145 | 0.128 | 0.241 |

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

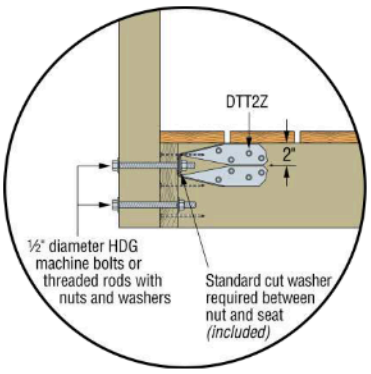
[1]One steel, plain (flat), standard plate (W) washer, as provided with the DTT2 hold-down, must be installed between the nut and the seat of the hold-down.
[2]Tabulated allowable loads are for a hold-down assembly consisting of the hold-down device attached to a wood structural member with the fasteners noted in Table 4.
[3]The allowable loads for the hold-down assemblies are based on allowable stress design (ASD) and include the load duration factors, $C_D$, corresponding with a normal duration of load ($C_D$=1.0) and wind/earthquake loading ($C_D$=1.6) in accordance with the NDS. No further increase is allowed. Reduce where other load durations govern.
[4]When using the basic load combinations in accordance with 2024 and 2021 IBC Section 1605.1 (ASCE 7 Section 2.4.1) or 2018, 2015 and 2012 IBC Section 1605.3.1, as applicable, the tabulated allowable loads for the hold-down assembly must not be increased for wind or earthquake loading. When using the alternative basic load combinations in 2024 and 2021 IBC Section 1605.2 [2018, 2015 and 2012 IBC Section 1605.3.2] that include wind or earthquake loads, the tabulated allowable loads for the hold-down assembly must not be increased by 33 1/3 percent, nor can the alternative basic load combinations be reduced by a factor of 0.75.
[5]Anchorage to concrete or masonry must be determined in accordance with Section 4.1.3 of this report.
[6]The minimum thickness of the wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3 1/2 inches.
[7]The tabulated allowable (ASD) tension loads must be multiplied by 1.4 to obtain the strength-level resistance loads associated with the tabulated $\Delta_s$ deformations.
[8]Tabulated displacement values, $\Delta_{all}$ and $\Delta_s$, for hold-down assemblies include all sources of hold-down assembly elongation, such as fastener slip, hold-down device extension and rotation, and anchor rod elongation, at ASD-level and strength-level forces, respectively.
[9]Elongation of the hold-down anchor rod must be calculated when the ASTM steel specification of the anchor rod differs from that described in the Section 3.2.4 of this report, or the actual unbraced length is greater than 4.5 inches. In lieu of calculating the elongation of the hold-down anchor rod for hold-downs raised 4.5 inches to 18 inches above the concrete, an additional 0.010 inch may be added to the tabulated hold-down displacement at allowable load, $\Delta_{all}$, and an additional 0.014 inch may be added to the tabulated hold-down displacement at strength-level load, $\Delta_s$, to account for anchor rod elongation.



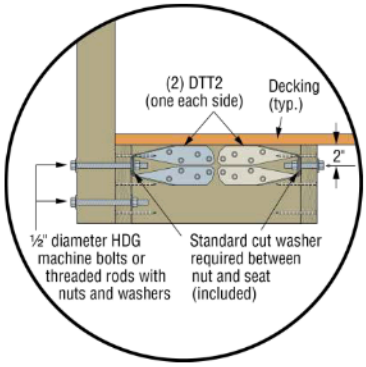

DTT2 Hold-Down



DTT2 Vertical Installation




DTT2 Horizontal Installation




DTT2 Horizontal Installation

**FIGURE 4—DTT2 HOLD-DOWN**

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**
**Section: 06 05 23.30—Connectors-General**

**REPORT HOLDER:**

**SIMPSON STRONG-TIE COMPANY, INC.**

**EVALUATION SUBJECT:**

**SIMPSON STRONG-TIE® SCREW HOLD-DOWN CONNECTORS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Simpson Strong-Tie® Screw Hold-Down Connectors, described in ICC-ES evaluation report ESR-2330, 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:**

- 2026* *City of Los Angeles Building Code* (LABC)
- 2026* *City of Los Angeles Residential Code* (LARC)

*For evaluation for compliance with the anticipated requirements of the 2026 LABC and LARC.

## 2.0 CONCLUSIONS

The Simpson Strong-Tie® Screw Hold-Down Connectors, described in Sections 2.0 through 7.0 of the evaluation report ESR-2330, 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® Screw Hold-Down Connectors described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-2330.
- The design, installation, conditions of use and identification of the screw hold-down connectors are in accordance with the 2024 *International Building Code®* (IBC) and 2024 *International Residential Code®* (IRC) provisions, as applicable, noted in the evaluation report ESR-2330.
- The design, installation and inspection are in accordance with additional requirements of the LABC Chapters 16 and 17, Sections 2305 and 2306, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- In accordance with LABC Section 2305.5, allowable seismic load values of Simpson Strong-tie® Screw Hold-Down Connectors used as hold-down connectors must be 75 percent of those in the evaluation report ESR-2330.
- The seismic design provisions for hillside buildings referenced in LABC Section 2301.1 have not been considered and are outside of the scope of this supplement.
- For use in wall anchorage assemblies to flexible diaphragms, allowable loads for screw hold-down connectors shall be in accordance with Tables 1 through 6 of this supplement, calculated in accordance with City of Los Angeles Information Bulletin P/BC 2026-071.

This supplement expires concurrently with the evaluation report, reissued May 2026.

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**TABLE 1—ALLOWABLE LOADS FOR HDU SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1,2,3,4] IN THE CITY OF LOS ANGELES PER 2026 LABC CHAPTER 16**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 16 (lbs.) $C_d$ = 1.6 and Governing Load Case (a, b, c) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in.) | Wood MBR Fastener | | Minimum Wood Member Thickness (in.)[5] | | | | | | |
| | | QTY | SDS Screw Size (in) | 1.5 | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| DTT2 | 1/2 | 8 | 1/4x1.5 | 1560 a | 1560 a | 1560 a | 1560 a | 1560 a | 1560 a | 1560 a |
| HDU2 | 5/8 | 6 | 1/4x1.5 | - | 1810 c | 1810 c | 1810 c | 1810 c | 1810 c | 1810 c |
| | | | 1/4x2.5 | - | 2445 a | 2445 a | 2445 a | 2445 a | 2445 a | 2445 a |
| HDU4 | 5/8 | 10 | 1/4x1.5 | - | 3105 a | 3105 a | 3105 a | 3105 a | 3105 a | 3105 a |
| | | | 1/4x2.5 | - | 3485 a | 3485 a | 3485 a | 3485 a | 3485 a | 3485 a |
| HDU5 | 5/8 | 14 | 1/4x1.5 | - | 3960 a | 3960 a | 3960 a | 3960 a | 3960 a | 3960 a |
| | | | 1/4x2.5 | - | 3960 a | 3960 a | 3960 a | 3960 a | 3960 a | 3960 a |
| HDU8 | 7/8 | 20 | 1/4x1.5 | - | 5980 a | 5980 a | 5980 a | 5980 a | 5980 a | 5980 a |
| | | | 1/4x2.5 | - | 6945 a | 6945 a | 6945 a | 6945 a | 6945 a | 6945 a |
| HDU11[7] | 1 | 30 | 1/4x2.5 | - | - | - | - | 8315 a | 8315 a | 8315 a |
| HDU14[7] | 1 | 36 | 1/4x2.5 | - | - | - | - | - | 9850 b | 9960 b |

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

[1]For hold-down dimensions, refer to ESR-2330 Table 1A for HDU or Table 4 for DTT2.
[2]The wood member must be sized for the load carrying capacity.
[3]Loads shall not be increased for short-term duration.
[4]Anchor bolt type, length, and embedment to be specified by the registered design professional.
[5]The minimum thickness of wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3 $^1/_2$ inches, except as noted.
[6]The minimum width of the wood members must be 5 $^1/_2$ inches (6x6 nominal).
[7]Requires heavy hex anchor nut for 4x8 nominal values.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / (3 x 1.4).
b = average deflection on wood assembly at $^3/_8$" / 3.
c = the fastener value in accordance with 2026 LABC.

**TABLE 2—ALLOWABLE LOADS FOR HDU SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1] IN CITY OF LOS ANGELES PER 2026 LABC CHAPTERS 91 AND 96**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 91 & 96 (lbs.) $C_d$ = 1.0 and Governing Load Case (a, b, c) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in.) | Wood MBR Fastener | | Minimum Wood Member Thickness (in.)[5] | | | | | | |
| | | QTY | SDS Screw Size (in) | 1.5 | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| DTT2 | 1/2 | 8 | 1/4x1.5 | 1310 a | 1310 a | 1310 a | 1310 a | 1310 a | 1310 a | 1310 a |
| HDU2 | 5/8 | 6 | 1/4x1.5 | - | 1500 c | 1500 c | 1500 c | 1500 c | 1500 c | 1500 c |
| | | | 1/4x2.5 | - | 2055 a | 2055 a | 2055 a | 2055 a | 2055 a | 2055 a |
| HDU4 | 5/8 | 10 | 1/4x1.5 | - | 2500 c | 2500 c | 2500 c | 2500 c | 2500 c | 2500 c |
| | | | 1/4x2.5 | - | 2630 b | 2630 b | 2630 b | 2630 b | 2630 b | 2630 b |
| HDU5 | 5/8 | 14 | 1/4x1.5 | - | 2440 b | 2440 b | 2440 b | 2440 b | 2440 b | 2440 b |
| | | | 1/4x2.5 | - | 3325 a | 3325 a | 3325 a | 3325 a | 3325 a | 3325 a |
| HDU8 | 7/8 | 20 | 1/4x1.5 | - | 5000 b | 5000 b | 5000 b | 5000 b | 5000 b | 5000 b |
| | | | 1/4x2.5 | - | 5000 b | 4215 b | 5345 b | 5345 b | 5345 b | 5345 b |
| HDU11[7] | 1 | 30 | 1/4x2.5 | - | - | - | - | 4540 b | 5500 b | 5500 b |
| HDU14[7] | 1 | 36 | 1/4x2.5 | - | - | - | - | - | 5550 b | 5575 b |

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

[1]See footnotes to Table 1.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / 5.
b = average deflection on wood assembly at $^3/_8$" / 5.
c = the fastener value in accordance with 2026 LABC.

**TABLE 3—ALLOWABLE LOADS FOR HDQ AND HHDQ SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1,2,3,4] IN CITY OF LOS ANGELES PER 2026 LABC CHAPTER 16**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 16 (lbs.) $C_d$ = 1.6 and Governing Load Case (a, b, c) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in.) | Wood MBR Fastener | | Minimum Wood Member Thickness (in.)[5] | | | | | |
| | | QTY | SDS Screw Size (in) | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| HDQ8 | 7/8 | 20 | 1/4x1.5 | 5715 a | 5715 a | 5715 a | 5715 a | 5715 a | 5715 a |
| | | | 1/4x2.5 | 5715 a | 5715 a | 7280 a | 7280 a | 7280 a | 7280 a |
| | | | 1/4x3.0 | 5715 a | 7280 a | 9060 a | 9060 a | 9060 a | 9060 a |
| HHDQ11[7] | 1 | 24 | 1/4x2.5 | - | - | - | 8550 a | 8550 a | 8550 a |
| HHDQ14[7] | 1 | 30 | 1/4x1.5 | - | - | - | - | 10160 a | 10160 a |

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

[1]For hold-down dimensions, refer to ESR-2330 Table 3A.
[2]The wood member must be sized for the load carrying capacity.
[3]Loads shall not be increased for short-term duration.
[4]Anchor bolt type, length, and embedment to be specified by the registered design professional.
[5]The minimum thickness of wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3 $^1/_2$ inches, except as noted.
[6]The minimum width of the wood members must be 5 $^1/_2$ inches (6x6 nominal).
[7]Requires heavy hex anchor nut for 6x6 nominal values.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / (3 x 1.4).
b = average deflection on wood assembly at $^3/_8$" / 3.
c = the fastener value in accordance with 2026 LABC.

**TABLE 4—ALLOWABLE LOADS FOR HDQ AND HHDQ SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1] IN CITY OF LOS ANGELES PER 2026 LABC CHAPTERS 91 AND 96**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 91 & 96 (lbs.) $C_d$ = 1.0 and Governing Load Case (a, b, c) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in.) | Wood MBR Fastener | | Minimum Wood Member Thickness (in.)[5] | | | | | |
| | | QTY | SDS Screw Size (in) | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| HDQ8 | 7/8 | 20 | 1/4x1.5 | 5000 c | 5000 c | 5000 c | 5000 c | 5000 c | 5000 c |
| | | | 1/4x2.5 | 5000 c | 5000 c | 5665 b | 5665 b | 5665 b | 5665 b |
| | | | 1/4x3.0 | 5000 c | 5665 b | 6965 b | 6965 b | 6965 b | 6965 b |
| HHDQ11[7] | 1 | 24 | 1/4x2.5 | - | - | - | 5770 b | 5770 b | 5770 b |
| HHDQ14[7] | 1 | 30 | 1/4x1.5 | - | - | - | - | 8535 a | 8535 a |

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

[1]See footnotes to Table 3.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / 5.
b = average deflection on wood assembly at $^3/_8$" / 5.
c = the fastener value in accordance with 2026 LABC.

**TABLE 5—ALLOWABLE LOADS FOR HDUE SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1,2,3,4] IN THE CITY OF LOS ANGELES PER 2026 LABC CHAPTER 16**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 16 (lbs) $C_d$ = 1.6 and Governing Load Case Criteria (a, b, c) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in) | Wood MBR Fastener | | Minimum Wood Member Thickness (in)[5] | | | | | |
| | | QTY | SDS Screw Size (in) | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| HDUE3 | 5/8 | 7 | 1/4x3 | 3475 a | 3475 a | 3475 a | 3475 a | 3475 a | 3475 a |
| HDUE5 | 5/8 | 10 | 1/4x3 | 4145 b | 4145 b | 4145 b | 4145 b | 4145 b | 4145 b |
| HDUE7 | 5/8 | 13 | 1/4x3 | 5210 a | 5210 a | 5210 a | 5210 a | 5210 a | 5210 a |
| HDUE9 | 7/8 | 16 | 1/4x3.5 | - | 5445 b | 7080 a | 7080 a | 7080 a | 7080 a |
| HDUE13[7] | 1 | 23 | 1/4x3.5 | - | - | - | 7760 b | 9505 a | 9505 a |
| HDUE17 | 1 | 28 | 1/4x4.5 | - | - | - | 15470 b | 15470 b | 15470 b |

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

[1]For hold-down dimensions, refer to ESR-2330 Table 2A for HDUE.
[2]The wood member must be sized for the load carrying capacity.
[3]Loads shall not be increased for short-term duration.
[4]Anchor bolt type, length, and embedment to be specified by the registered design professional.
[5]The minimum thickness of wood members (i.e., the dimension parallel to the long axis of the SDS wood screws) must be as indicated in the table above. The minimum width of the wood members must be 3 $^1/_2$ inches, except as noted.
[6]The minimum width of the wood members must be 5 $^1/_2$ inches (6x6 nominal).
[7]Requires heavy hex anchor nut.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / (3 x 1.4).
b = average deflection on wood assembly at $^3/_8$" / 3.
c = the fastener value in accordance with 2026 LABC.

**TABLE 6— ALLOWABLE LOADS FOR HDUE SERIES HOLD-DOWNS USED FOR WALL ANCHORAGE[1] IN THE CITY OF LOS ANGELES PER 2026 LABC CHAPTERS 91 AND 96**

| Hold-down Model No. | Fasteners | | | Allowable Tension Loads per Chapter 91 & 96 (lbs.) $C_d$ = 1.0 and Governing Load Case Criteria (a, b, c) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Anchor Bolt Dia. (in) | Wood MBR Fastener | | Minimum Wood Member Thickness (in)[5] | | | | | |
| | | QTY | SDS Screw Size (in) | 3 | 3.5 | 4.5 | 5.5 | 7.25 | 5.5[6] |
| HDUE3 | 5/8 | 7 | 1/4x3 | 1780 b | 1780 b | 1780 b | 1780 b | 1780 b | 1780 b |
| HDUE5 | 5/8 | 10 | 1/4x3 | 1990 b | 1990 b | 1990 b | 1990 b | 1990 b | 1990 b |
| HDUE7 | 5/8 | 13 | 1/4x3 | 2470 b | 2470 b | 2470 b | 2470 b | 2470 b | 2470 b |
| HDUE9 | 7/8 | 16 | 1/4x3.5 | - | 1840 b | 4255 b | 4255 b | 4255 b | 4255 b |
| HDUE13[7] | 1 | 23 | 1/4x3.5 | - | - | - | 3040 b | 5085 b | 5840 b |
| HDUE17 | 1 | 28 | 1/4x4.5 | - | - | - | 7955 b | 7955 b | 7955 b |

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

[1]See footnotes to Table 5.

**Legend of Governing Criteria:**

a = average ultimate load value on steel jig / 5.
b = average deflection on wood assembly at $^3/_8$" / 5.
c = the fastener value in accordance with 2026 LABC.

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**
**Section: 06 05 23.30—Connectors-General**

**REPORT HOLDER:**

**SIMPSON STRONG-TIE COMPANY, INC**

**EVALUATION SUBJECT:**

**SIMPSON STRONG-TIE® SCREW HOLD-DOWN CONNECTORS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Simpson Strong-Tie® Screw Hold-Down Connectors, described in ICC-ES evaluation report ESR-2330, 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® Screw Hold-Down Connectors, described in Sections 2.0 through 7.0 of the evaluation report ESR-2330, comply with the *Florida Building Code—Building*, and the *Florida Building Code—Residential*. The design requirements must be determined 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-2330 for the 2021 *International Building Code®* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable.

Use of the Simpson Strong-Tie® Screw Hold-Down Connectors 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 condition:

a. For connections subject to uplift, the connection must be designed for no less than 700 pounds (3,114 N) in accordance with item 3 of Section 2321.7 of the *Florida Building Code—Building*.

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). Florida Rule 61G20-3 is applicable to products and/or systems which comprise the building envelope and structural frame for compliance with the structural requirements of the Florida Building Code.

This supplement expires concurrently with the evaluation report ESR-2330, reissued May 2026.

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