

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

**REPORT HOLDER:**

PERMA-COLUMN, LLC

**EVALUATION SUBJECT:**

**STURDI-WALL® (SW) SERIES AND STURDI-WALL® PLUS (SWP) SERIES ANCHOR BRACKETS**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

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

**Property evaluated:**

Structural

**2.0 USES**

The Perma-Column’s SW Series and SWP Series anchor brackets described in this evaluation report are used as wood framing anchors in accordance with IBC Section 2304.10.3, and are used to resist lateral and net induced uplift forces at the bottom end of wood posts or columns in accordance with IBC Section 2304.9.7, and to prevent lateral displacement at the bottom end of wood posts or columns in accordance with IRC Section R407.3. The anchor brackets may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

**3.0 DESCRIPTION**

**3.1 General:**

The Perma-Column’s SW Series and WP Series anchor brackets described in this evaluation report are either cold-formed or welded anchor brackets that are used to install wood posts or glued-laminated (glulam) timber columns to concrete foundations or footings complying with the IBC or IRC, as applicable, by using anchor bolts installed during the concrete pour or after the concrete hardens. The design of anchor bolts into the concrete foundations or footings, and the design of concrete foundations or footings are not within the scope of this evaluation report. A concrete foundation or footing larger than the maximum required by IBC Section 1809, or IRC Section R403 may be necessary to meet anchorage to concrete requirements.

**3.1.1 SW Series:** The Perma-Column’s SW6C, SW60 and SW80 anchor brackets are L-shaped, cold-formed angle brackets. The SW4X/5X/6X and SW8X anchor brackets consist of two vertical steel plates that are factory-welded to a steel base plate. The anchor brackets are designed for post-installation into concrete foundations or footings; and for installation above the grade. The vertical plates and base plate of anchor brackets are pre-drilled with holes for installations of wood screws and through-bolts into the wood posts and columns, and anchor bolts into concrete foundations or footings. The anchor brackets are powder coated with a proprietary corrosion resistant epoxy coating. Table 1 lists the anchor bracket dimensions, fastener type, size and numbers, post/column sizes, and allowable lateral and uplift loads. Figure 1 depicts an illustration of SW Series anchor brackets and loading directions.

**3.1.2 SWP Series:** The Perma-Column’s SWP Series anchor brackets consist of a U-shaped steel bracket and four (4) straight, deformed steel rebars that are factory-welded onto a steel plate that is welded to the bottom surface of U-shaped brackets. The SWP anchor brackets are designed for cast-in-place installations into concrete foundations or footings, and for installation above the grade. The vertical plates of anchor brackets are pre-drilled with holes for installations of screws and through-bolts into the wood posts and columns. The anchor brackets are powder coated with a proprietary corrosion resistant epoxy coating. Table 2 list the anchor bracket dimensions, fastener type, size and numbers, post/column sizes, and allowable lateral and uplift loads. Figure 2 depicts an illustration of SWP Series anchor bracket and loading directions.

**3.2 Materials:**

**3.2.1 Steel:** The Perma-Column’s SW Series and SWP Series anchor brackets are manufactured from nominally 1/4-inch-thick (6.35 mm) hot-rolled steel plate, complying with ASTM A1018, SS designation, Grade 40 steel, with 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).

**3.2.2 Steel Rebars:** Steel rebars used with Perma-Column’s SWP Series anchor brackets are minimum No. 4 for SWP4 and SWP6 brackets and No. 5 for SWP8 brackets, respectively. Steel rebars are ASTM A706, Grade 60, deformed steel bars and are 18 inches (457 mm) in length.

**3.2.3 Wood:** Wood posts or columns with which the anchor brackets are used must be made of either dimension lumber or glued-laminated (glulam) timber, having a minimum specific gravity of 0.55 as defined in the NDS and a maximum in-service moisture content of 19 percent, except as noted in Section 4.1. The minimum allowable

fastener spacing, and end and edge distances set forth in NDS must be met.

### 3.2.4 Fasteners:

**3.2.4.1 Screws:** The screws used to install wood posts and columns to anchor brackets are partially threaded carbon or stainless steel screws, having a minimum specified bending yield strength,  $F_{yb}$ , of 164,000 psi (1130 MPa), provided with the brackets, or evaluated in a current ICC-ES evaluation report. The unthreaded portion of the screws must have an actual shank diameter of 0.242 inch (6.15 mm) and a length between 1 inch (25.4 mm) and 1½ inches (38.1 mm). The screws must be minimum 3 inches (76.2 mm) in length.

**3.2.4.2 Through-bolts:** The through-bolts used to install wood posts or columns to anchor brackets must comply with SAE J429 Grade 5, having a minimum tensile yield strength,  $F_y$ , of 92,000 psi (635 MPa) and a minimum tensile strength,  $F_u$ , of 120,000 psi (830 MPa). The bolts and finish must comply with the coating requirement in ASTM F1470. The minimum diameter of the bolts is ½ inches (12.7 mm).

**3.2.5 Fasteners and anchor brackets used in contact with preservative-treated or fire-retardant-treated lumber must comply with IBC Section 2304.10.5 and IRC Section R317.3, as applicable. The lumber treater or this evaluation report holder (Perma-Column, LLC), or both, must be contacted for recommendations on the appropriate coating or material to specify for the fasteners as well as the connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.**

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The reference design values provided in Tables 1 and 2 of this evaluation report are for Allowable Stress Design (ASD) method and Load and Resistance Factor Design (LRFD) method. The load duration factor,  $C_D$ , (ASD) and the Time Effect Factor,  $\lambda$ , (LRFD), have been applied to the corresponding loads in accordance with the *National Design Specification for Wood Construction* (NDS) and its supplement. The SW Series anchor brackets are not designed to resist moments.

The allowable and LRFD strength values apply to anchor brackets connected to wood posts or columns that are used under dry conditions and where sustained temperatures are 100°F (37.8°C) or less. When anchor brackets are installed in wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C), the allowable loads in this report must be adjusted by the applicable temperature factor,  $C_t$ , specified in the NDS. When anchor brackets are installed in wood having a moisture content greater than 19 percent, or where wet service is expected, the allowable loads must be adjusted by the wet service factor,  $C_M$ , specified in the NDS for dowel-type fasteners. Wood posts or columns must be analyzed for load-carrying capacity at the connection in accordance with this evaluation report and the NDS.

### 4.2 Installation:

The Perma-Column's SW Series and SWP Series anchor brackets must be installed in accordance with Perma-Column's published installation instructions, the applicable code, and this evaluation report. In the event of a conflict between the published installation instructions and this evaluation report, this evaluation report governs.

## 5.0 CONDITIONS OF USE

The Perma-Column's SW Series and SWP Series anchor brackets described in this evaluation 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 anchor brackets must be manufactured, identified and installed in accordance with this evaluation report, the manufacturer's published installation instructions, and applicable codes. A copy of the instructions must be available at the jobsite at all times during installation.
- 5.2 Complete plans and calculations demonstrating compliance with this evaluation report must be submitted to the code official for approval when required. The calculations and details 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 Wood posts and columns, and fasteners must comply, respectively, with Sections 3.2.3 and 3.2.4 of this evaluation report.
- 5.5 Use of Perma-Column's SW Series and SWP Series anchor brackets and fasteners with preservative treated or fire retardant treated lumber must be in accordance with Section 3.2.5 of this evaluation report.
- 5.6 The anchorage of anchor brackets to concrete foundations or footings has not been evaluated and must be designed by a registered design professional in accordance with applicable code requirements.
- 5.7 The concrete foundation or footing must be designed by a registered design professional in accordance with applicable code requirements to the satisfaction of the code official.
- 5.8 The Perma-Column's SW Series and SWP Series anchor brackets must not be field modified (e.g. cut, drilled, torched, etc.) in any way.
- 5.9 The Perma-Column's SW Series and SWP Series anchor brackets are manufactured at the Perma-Column LLC's facility located in Ossian, Indiana, under an approved quality control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with ICC-ES Acceptance Criteria for Joist Hangers and Similar Devices (AC13), dated October 2018.
- 6.2 Engineering calculations in accordance with ACI 318 and AISC 360.

## 7.0 IDENTIFICATION

- 7.1 Each Perma-Column Sturdi-Wall® SW and SWP Series anchor bracket must bear the name of the report holder (Perma-Column, LLC), the model number, and the evaluation report number (ESR-4239).
- 7.2 The report holder's contact information is the following:

**PERMA-COLUMN, LLC**  
**400 CAROL ANN LANE**  
**OSSIAN, INDIANA 46777**  
**(260) 622-7190**  
[www.permacolumn.com](http://www.permacolumn.com)  
[info@permacolumn.com](mailto:info@permacolumn.com)

TABLE 1—REFERENCE DESIGN VALUES FOR STURDI-WALL® SW SERIES ANCHOR BRACKETS<sup>1,2,3</sup>

MODEL NO.	BRACKET DIMENSIONS				POST SIZE	FASTENERS <sup>4</sup> (Quantity-Type)		ASD (C <sub>D</sub> = 1.6)		LRFD (λ = 1.0)	
	W (in.)	D (in.)	H (in.)	B (in.)		Screws	Bolts	F <sub>1</sub> <sup>5</sup> (lbf)	F <sub>uplift</sub> (lbf)	F <sub>1</sub> <sup>5</sup> (lbf)	F <sub>uplift</sub> (lbf)
SW6C <sup>6</sup>	-	5	13	3 1/2	4x6	6	0	1,120	1,300	1,510	1,950
SW60 <sup>7</sup>	-	5	15	3 1/2	6x6 <sup>8</sup>	4	2	2,100	3,400	2,830	5,110
SW80 <sup>7</sup>	-	7	18	3 1/2	8x8 <sup>8</sup>	8	2	3,030	4,500	4,080	6,760
SW46	3 5/8	5	13	12 1/8	4x6	4	2	2,100	2,970	2,830	4,460
SW55	4 5/8	5	13	12 1/8	5x5	4	2	2,100	3,330	2,830	5,010
SW63	4 5/8	5	13	12 1/8	3-ply 2x6	4	2	2,100	3,680	2,830	5,530
SW64	6 1/8	5	13	13 5/8	4-ply 2x6	4	2	2,100	3,620	2,830	5,450
SW65	7 5/8	5	13	15 1/8	5-ply 2x6	4	2	2,100	3,440	2,830	5,170
SW66	5 5/8	5	13	13 5/8	6x6	4	2	2,100	3,640	2,830	5,470
SW83	4 5/8	7	18	12 1/8	3-ply 2x8	8	2	3,030	4,980	4,080	7,480
SW84	6 1/8	7	18	13 5/8	4-ply 2x8	8	2	3,030	4,880	4,080	7,330
SW85	8 1/8	7	18	15 1/8	5-ply 2x8	8	2	3,030	4,800	4,080	7,240
SW88	8 1/8	7	18	15 1/8	8x8	8	2	3,030	4,800	4,080	7,210

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

<sup>1</sup>The reference design values are for Allowable Strength Design (ASD) method and the Load and Resistance Factor Design (LRFD) method and have been increased for wind or earthquake loading with no further increase allowed. The ASD values must be reduced when other load durations govern.

<sup>2</sup>The reference design values do not apply to the anchorage to concrete or masonry. Anchorage to concrete or masonry must be designed, by a registered design professional, to resist all loads and forces transferred from the post or column to the anchor brackets.

<sup>3</sup>Download shall be checked and limited by the design capacity of the post or column.

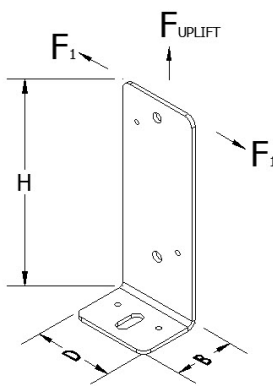
<sup>4</sup>Screws and bolts must comply with Section 3.2.4 of this evaluation report and used together in order to achieve the tabulated allowable loads.

<sup>5</sup>Lateral load, F<sub>1</sub>, is perpendicular to the axis of the fasteners.

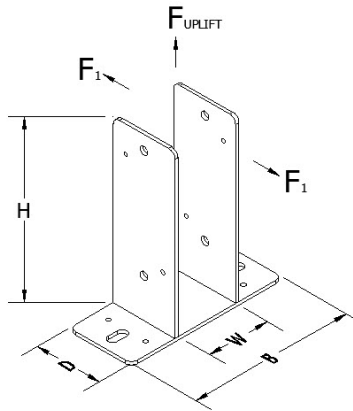
<sup>6</sup>SW6C anchor bracket is for a wall corner installation and must be installed in pairs on the adjacent faces of a column or a post in order to achieve the tabulated reference design values.

<sup>7</sup>SW60 and SW80 anchor brackets must be installed in pairs on the opposite faces of the column or post in order to achieve the tabulated reference design values.

<sup>8</sup>Posts can be made from minimum 3 plies of 2x6 and 2x8 sawn lumber, complying with Section 3.2.3 of this evaluation report, for SW60 and SW80 anchor brackets, respectively.



SW6C/SW60/SW80 and Series Installation



SW6X/SW8X SERIES Loading Directions



SW6X/SW8X Series Installation

FIGURE 1—STURDI-WALL® (SW) SERIES ANCHOR BRACKET AND TYPICAL INSTALLATION

TABLE 2—REFERENCE DESIGN VALUES STURDI-WALL® PLUS SWP SERIES ANCHOR BRACKETS<sup>1,2,3</sup>

MODEL NO.	BRACKET DIMENSIONS			POST SIZE	FASTENERS <sup>4</sup> (Quantity-Type)		ASD (C <sub>D</sub> = 1.6)		LRFD (λ = 1.0)	
	W (in.)	D (in.)	H (in.)		Screw	Bolt	F <sub>1</sub> <sup>5</sup> (lbf)	F <sub>uplift</sub> (lbf)	F <sub>1</sub> <sup>5</sup> (lbf)	F <sub>uplift</sub> (lbf)
SWP46	3 <sup>5</sup> / <sub>8</sub>	5	13	4x6	4	2	2,100	6,050	2,830	8,160
SWP63	4 <sup>5</sup> / <sub>8</sub>	5	13	3-ply 2x6	4	2	2,100	6,050	2,830	8,160
SWP64	6 <sup>1</sup> / <sub>8</sub>	5	18	4-ply 2x6	4	2	2,380	6,030	3,200	8,160
SWP66	5 <sup>5</sup> / <sub>8</sub>	5	13	6x6	4	2	2,100	6,050	2,830	8,160
SWP83	4 <sup>5</sup> / <sub>8</sub>	7	18	3-ply 2x8	8	2	3,030	8,490	4,080	11,450
SWP84	6 <sup>1</sup> / <sub>8</sub>	7	18	4-ply 2x8	8	2	3,030	8,490	4,080	11,450
SWP85	7 <sup>5</sup> / <sub>8</sub>	7	18	5-ply 2x8	8	2	3,030	8,210	4,080	11,450
SWP88	7 <sup>5</sup> / <sub>8</sub>	7	18	8x8	8	2	3,030	8,010	4,080	11,450

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

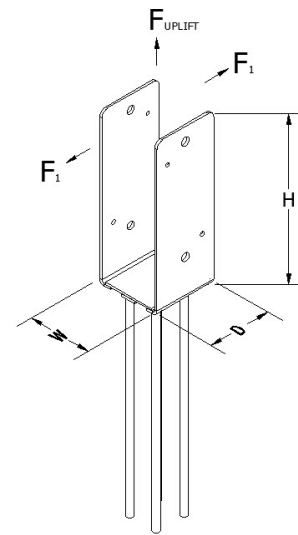
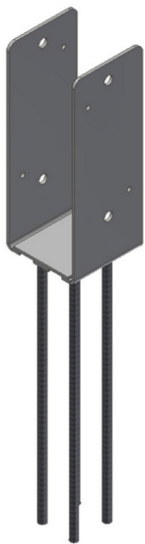
<sup>1</sup>The reference design values are for Allowable Strength Design (ASD) method and the Load and Resistance Factor Design (LRFD) method and have been increased for wind or earthquake loading with no further increase allowed. The ASD values must be reduced when other load durations govern.

<sup>2</sup>The reference design values do not apply to the anchorage to concrete or masonry. Anchorage to concrete or masonry must be designed, by a registered design professional, resist all loads and forces transferred from the post or column anchor brackets.

<sup>3</sup>Download shall be checked and limited by the design capacity of the post or column.

<sup>4</sup>Screws and bolts must comply with Section 3.2.4 of this evaluation report and used together in order to achieve the tabulated allowable loads.

<sup>5</sup>Lateral load, F<sub>1</sub>, is parallel to the axis of the fasteners.



SWP6X/WSP8X Series and Installation

Loading Directions

FIGURE 2—STURDI-WALL® PLUS (SWP) SERIES POST/COLUMN ANCHOR BRACKET AND TYPICAL INSTALLATION

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

**REPORT HOLDER:**

PERMA-COLUMN, LLC

**EVALUATION SUBJECT:**

**STURDI-WALL® (SW) SERIES AND STURDI-WALL® PLUS (SWP) SERIES ANCHOR BRACKETS**

**1.0 REPORT PURPOSE AND SCOPE**

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Perma-Column Sturdi-Wall® (SW) Series and Sturdi-Wall® Plus (SWP) Series anchor brackets evaluated in the ICC-ES evaluation report ESR-4239, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 and 2016 *California Building Code (CBC)*

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1 and 2.2 below.

- 2019 and 2016 *California Residential Code (CRC)*

**2.0 CONCLUSIONS**

The Perma-Column SW Series and SWP Series anchor brackets, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-4239, comply with CBC Chapter 23 and CRC Section R301.1.3 provided the design and installation are in accordance with the 2018 and 2015 *International Building Code® (IBC)* provisions noted in the ICC-ES evaluation report ESR-4239 and the additional requirements of the CBC Chapters 16, 17, 18 and 19, as applicable.

**2.1 OSHPD:**

The applicable OSHPD Sections of the CBC are beyond the scope of this evaluation report supplement.

**2.2 DSA:**

The applicable DSA Sections of the CBC are beyond the scope of this evaluation report supplement.

**3.0 CONDITIONS OF USE**

The Perma-Column Sturdi-Wall® SW Series and Sturdi-Wall® Plus SWP Series anchor brackets, described in this evaluation report supplement must comply with the following condition:

- The ASD capacities described in the ICC-ES evaluation report ESR-4239 must not be increased for seismic or wind load combinations.

This supplement expires concurrently with the evaluation report issued April 2020.

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**Section: 06 05 23—Wood, Plastic and Composite Fastenings**

**REPORT HOLDER:**

PERMA-COLUMN, LLC

**EVALUATION SUBJECT:**

STURDI-WALL® (SW) SERIES AND STURDI-WALL® PLUS (SWP) SERIES ANCHOR BRACKETS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Perma-Column Sturdi-Wall® SW Series and Sturdi-Wall® Plus SWP Series anchor brackets, evaluated in the ICC-ES evaluation report ESR-4239, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2017 *Florida Building Code—Building*
- 2017 *Florida Building Code—Residential*

**2.0 CONCLUSIONS**

The Perma-Column SW Series and SWP Series anchor brackets, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-4239, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2015 *International Building Code*® provisions noted in the master report.

Use of the Perma-Column SW Series and SWP Series anchor brackets has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report issued April 2020.