

# ESR-2606

Used for Florida State Wide Product Approval #

# FL10446

Products on this Report which are approved:

<u>Product</u>	<u>FL#</u>
A21	10446.1
A23	10446.2
A34	10446.3
A35	10446.4
FC4	10446.5
FC6	10446.6
GA1	10446.7
GA2	10446.8
HH4	10446.9
HH6	10446.10
L30	10446.11
L50	10446.12
L70	10446.13
L90	10446.14
LS30	10446.15
LS50	10446.16
LS70	10446.17
LS90	10446.18
LTP4	10446.19
Z4	10446.20
Z44	10446.21
Z6	10446.22



®

SIMPSON STRONG-TIE COMPANY, INC

**ICC Evaluation Service, Inc.**  
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**DIVISION: 06—WOOD AND PLASTICS**  
**Section: 06090—Wood and Plastics Fastenings**

**REPORT HOLDER:**

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**EVALUATION SUBJECT:**

**SIMPSON STRONG-TIE STRUCTURAL ANGLES, CLIPS,  
AND PLATES FOR WOOD FRAMING**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- # 2006 *International Building Code*® (IBC)
- # 2006 *International Residential Code*® (IRC)
- # Other Codes (see Section 8.0)

**Properties evaluated:**

Structural

**2.0 USES**

The Simpson Strong-Tie structural angles, clips, and plates described in this report are used as wood-to-wood connectors in accordance with Section 2304.9.3 of the IBC. The angles, clips, and plates may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

**3.0 DESCRIPTION**

**3.1 General:**

The angles, clips, and plates described in this report are used as wood-to-wood connections in structural systems that have been designed to transfer loads from their point of origin to load-resisting elements.

**3.1.1 A Series Angles:**

The A series angles are formed from No. 18 gage galvanized steel. See Table 1 for angle model numbers, angle dimensions, fastener schedules, and allowable loads. See Figure 1 for a drawing of A series angles connecting a wood post to a wood sill plate.

**3.1.2 A34 and A35 Framing Angles:**

The A34 and A35 framing angles are formed from No. 18 gage galvanized steel. The A35 angle has slots and bend lines to permit field adjustments of the legs for two- and three-way tied connections. The A34 is an equal leg angle without

slots or bend lines. See Table 2 for angle dimensions, fastener schedules, and allowable loads. See Figure 2 for illustrations of framing configurations with the A34 and A35 angles.

**3.1.3 LTP4 Lateral Tie Plate:**

The LTP4 lateral tie plate is formed from No. 20 gage galvanized steel. See Table 3 for fastener schedules and allowable loads. See Figure 3 for dimensions of the LTP4 connector and a drawing of the LTP4 used as a top plate-to-rim joist connections.

**3.1.4 FC Series Framing Clips:**

The FC series framing clips are formed from No. 16 gage galvanized steel. See Table 4 for clip model numbers, clip dimensions, fastener schedules, and allowable loads. See Figure 4 for clip dimensions and a drawing of FC framing clips used as an alternative to cripple studs for headers and used to connect a wood post to a wood sill plate.

**3.1.5 HH Series Header Hangers:**

The HH series header hangers are formed from No. 16 gage galvanized steel. See Table 5 for hanger model numbers, hanger dimensions, fastener schedules, and allowable loads. See Figure 5 for hanger dimensions and a drawing of an HH hanger connecting a wood door header to jambs.

**3.1.6 GA Series Gusset Angles:**

The GA series gusset angles are formed from No. 18 gage galvanized steel. See Table 6 for gusset angle model numbers, angle length, fastener schedules, and allowable loads. See Figure 6 for a drawing of a GA angle connecting a joist to a header.

**3.1.7 L Series Reinforcing Angles:**

The L series reinforcing angles are formed from No. 16 gage galvanized steel. See Table 7 for angle model numbers, angle length, fastener schedules, and allowable loads. See Figure 7 for angle dimensions and a drawing of an L angle connecting a joist to a header.

**3.1.8 LS Series Skewable Angles:**

The LS series skewable angles are formed from No. 18 gage galvanized steel. The angle is fabricated to assist field adjustment from zero degrees up to a 135-degree bend. See Table 8 for angle model numbers, angle length, fastener schedules, and allowable loads. See Figure 8 for angle dimensions and a drawing of an LS angle connecting a skewed joist to a header.

**3.1.9 Z Series Panel Stiffener Clips:**

The Z series stiffener clips are formed from No. 12 gage galvanized steel. The Z clips are used to support nominally 2-by-4 or 2-by-6 wood blocking between joists or trusses that provide solid backing for ceiling panel material. See Table 9

for Z clip model numbers, clip dimensions, fastener schedules, and allowable loads. See Figure 9 for Z clip dimensions and an illustration of Z clips supporting wood blocking for ceiling panels.

### 3.2 Materials:

**3.2.1 Steel:** The angles, clips, and plates described in this report are manufactured from galvanized steel in accordance with ASTM A 653, SS designation, Grade 33, with 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). Base-metal thicknesses for the connectors in this report are as follows:

NOMINAL THICKNESS (inches <sup>0</sup> )	MINIMUM BASE-METAL THICKNESS (inch)
No. 12	0.0975
No. 16	0.0555
No. 18	0.0445
No. 20	0.0335

For SI: 1 inch = 25.4 mm.

The connectors have a minimum G90 zinc coating specification in accordance with ASTM A 653. Some models (designated with a model number ending with Z) are available with a G185 zinc coating specification in accordance with ASTM A 653. Some models (designated with a model number ending with HDG) are available with a hot-dip galvanization, also known as "batch" galvanization, in accordance with ASTM A 123, with a minimum specified coating weight of 2.0 ounces of zinc per square foot of surface area (600 g/m<sup>2</sup>), total for both sides. Model numbers in this report do not include the Z or HDG ending, but the information shown applies. The lumber treater or holder of this report (Simpson Strong-Tie Company) should be contacted for recommendations on minimum corrosion resistance of steel connectors in contact with the specific proprietary preservative treated or fire retardant treated lumber.

**3.2.2 Wood:** Wood members which the connectors 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), and having a maximum moisture content of 19 percent (16 percent for engineered lumber) except as noted in Section 4.1. The thickness of the wood main member must be equal to or greater than the length of the fasteners specified in the tables in this report, or as required by wood member design, whichever is greater.

**3.2.3 Fasteners:** Nails used for connectors described in this report must comply with ASTM F 1667 and have the following minimum fastener dimensions and bending yield strengths ( $F_{yb}$ ):

COMMON NAIL	SHANK DIAMETER (inch)	NAIL LENGTH (inches)	$F_{yb}$ (psi)
8d × 1½	0.131	1½	100,000
10d × 1½	0.148	1½	90,000
10d	0.148	3	90,000
16d	0.162	3½	90,000

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

Fasteners used in contact with preservative treated or fire retardant treated lumber must comply with IBC Section 2304.9.5 or IRC Section R319.3, as applicable. The lumber treater or this report holder (Simpson Strong-Tie Company) should be contacted for recommendations on minimum corrosion resistance of fasteners and connection capacities of fasteners used with the specific proprietary preservative treated or fire retardant treated lumber.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The tabulated allowable loads shown in this report are based on allowable stress design (ASD) and include the load duration factor,  $C_D$ , corresponding with the applicable loads in accordance with the NDS.

Tabulated allowable loads apply to products connected to wood used under dry conditions and where sustained temperatures are 100°F (37.8°C) or less. When products are installed to wood having a moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, the allowable loads must be adjusted by the wet service factor,  $C_M$ , specified in the NDS. When connectors are installed in wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C), the allowable loads in this report must be adjusted by the temperature factor,  $C_t$ , specified in the NDS.

Connected wood members must be analyzed for load-carrying capacity at the connection in accordance with the NDS.

### 4.2 Installation:

Installation of the 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:** Periodic special inspection is required for installation of connectors described in this report that are designated as components of a seismic-force-resisting system for a structure in Seismic Design Category C, D, E or F in accordance with Section 1707.3 or 1707.4, with the exception of those structures that qualify under Section 1704.1.

**4.3.2 IRC:** Special inspections are not required.

## 5.0 CONDITIONS OF USE

The Simpson Strong-Tie structural angles, clips, and plates 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:

- 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.
- 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.
- Adjustment factors noted in Section 4.1 and the applicable codes must be considered, where applicable.
- Connected wood members and fasteners must comply, respectively, with Sections 3.2.2 and 3.2.3 of this report.
- Use of connectors with preservative treated or fire retardant treated lumber must be in accordance with Section 3.2.1 of this report. Use of fasteners with preservative treated or fire retardant treated lumber must be in accordance with Section 3.2.3 of this report.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Joist Hangers and Similar Devices (AC13), dated October 2006 (corrected March 2007).

## 7.0 IDENTIFICATION

The products described in this report are identified with a die-stamped label indicating the name of the manufacturer (Simpson Strong-Tie), the model number, and the number of an index evaluation report ([ESR-2523](#)) that is used as an identifier for the products recognized in this report.

## 8.0 OTHER CODES

### 8.1 Evaluation Scope:

In addition to the codes referenced in Section 1.0, the products in this report were evaluated for compliance with the requirements of the following codes:

- # 2003 *International Building Code*® (2003 IBC)
- # 2003 *International Residential Code*® (2003 IRC)
- # 2000 *International Building Code*® (2000 IBC)
- # 2000 *International Residential Code*® (2000 IRC)
- # 1997 *Uniform Building Code*™ (UBC)

The products described in this report comply with, or are suitable alternatives to what is specified in, the codes listed above, subject to the provisions of Sections 8.2 through 8.7.

### 8.2 Uses:

**8.2.1 2003 IBC, 2003 IRC, 2000 IBC, and 2000 IRC:** See Section 2.0 of this report.

**8.2.2 UBC:** Replace the information in Section 2.0 with the following: Simpson Strong-Tie structural angles, clips, and plates are used as wood framing connectors in accordance with Section 2318.4.8 of the UBC.

### 8.3 Description:

**8.3.1 2003 IBC and 2003 IRC:** See Section 3.0 of this report.

**8.3.2 2000 IBC and 2000 IRC:** See Section 3.0 of this report, except modify Section 3.2.3 of this report to reference Section R323.3 of the IRC.

**8.3.3 UBC:** See Section 3.0 of this report, except modify the first sentence in the last paragraph of Section 3.2.3 as follows: Fasteners used in contact with preservative treated or fire retardant treated lumber must, as a minimum, comply with UBC Section 2304.3.

### 8.4 Design and Installation:

**8.4.1 2003 IBC, 2003 IRC, 2000 IBC, 2000 IRC:** See Section 4.0 of this report.

**8.4.2 UBC:** The same as Section 4.0 of this report, except delete Section 4.3 since special inspection is not required.

### 8.5 Conditions of Use:

**8.5.1 2003 IBC, 2003 IRC 2000 IBC, and 2000 IRC:** The Simpson Strong-Tie products described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 8.0, subject to the same conditions of use indicated in Section 5.0 of this report.

**8.5.2 UBC:** The Simpson Strong-Tie products described in this report comply with, or are suitable alternatives to what is specified in, the UBC, subject to the same conditions of use indicated in Section 5.0 of this report, except the last sentence of Section 5.5 is replaced with the following: Fasteners used in contact with preservative treated or fire retardant treated lumber must, as a minimum, comply with UBC Section 2304.3.

### 8.6 Evidence Submitted: 2003 IBC, 2003 IRC 2000 IBC, 2000 IRC, and UBC:

See Section 6.0 of this report.

### 8.7 Identification: 2003 IBC, 2003 IRC 2000 IBC, 2000 IRC, and UBC:

See Section 7.0 of this report.

TABLE 1—ALLOWABLE LOADS FOR THE A ANGLES

MODEL NO.	ANGLE DIMENSIONS <sup>1</sup> (in)			FASTENERS (Quantity-Type)		ALLOWABLE LOADS <sup>2,3,4,5,6</sup> (lbs)							
	L	W <sub>1</sub>	W <sub>2</sub>	Supporting Member (Base)	Supported Member (Post)	F <sub>1</sub> where C <sub>D</sub> =				F <sub>2</sub> where C <sub>D</sub> =			
						1.0	1.15	1.25	1.33 or 1.6	1.0	1.15	1.25	1.33 or 1.6
A21	1 <sup>3</sup> / <sub>8</sub>	2	1 <sup>1</sup> / <sub>2</sub>	2-10dx1 <sup>1</sup> / <sub>2</sub>	2-10dx1 <sup>1</sup> / <sub>2</sub>	180	210	230	245	175	175	175	175
A23	2 <sup>3</sup> / <sub>4</sub>	2	1 <sup>1</sup> / <sub>2</sub>	4-10dx1 <sup>1</sup> / <sub>2</sub>	4-10dx1 <sup>1</sup> / <sub>2</sub>	365	420	455	485	365	420	455	485

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

1. Refer to Figure 1 for definitions of angle dimension nomenclature (L, W<sub>1</sub>, W<sub>2</sub>) and allowable load directions (F<sub>1</sub> and F<sub>2</sub>).
2. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
3. F<sub>1</sub> and F<sub>2</sub> loads cannot be combined.
4. The F<sub>1</sub> allowable loads are for one connector. When angles are installed on each side of wood member, the minimum member thickness must be 3 inches.
5. The F<sub>2</sub> allowable loads apply only when the connectors are used in pairs.
6. Allowable loads under C<sub>D</sub> = 1.33 or 1.6 columns have been increased for wind or earthquake loading. No further increase is allowed.

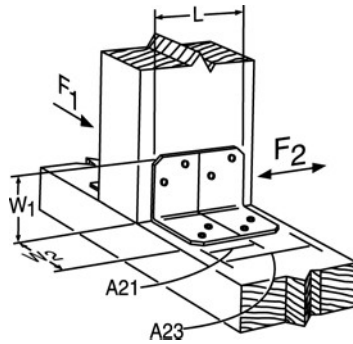


FIGURE 1—A21 AND A23 ANGLE INSTALLATION DETAIL

TABLE 2—ALLOWABLE LOADS FOR A34 AND A35 FRAMING CONNECTORS

MODEL NO.	FASTENERS (Quantity-Type)		CONNECTION CONFIGURATION <sup>1</sup>	LOAD DIRECTION <sup>2</sup>	ALLOWABLE LOADS <sup>3,4,5</sup> (lbs)		
	Joist	Header/Plate			C <sub>D</sub> = 1.0	C <sub>D</sub> = 1.15	C <sub>D</sub> = 1.25 C <sub>D</sub> = 1.33 C <sub>D</sub> = 1.6
A34	4-8dx1½	4-8dx1½	See A34 Framing Illustration	F <sub>1</sub>	345	365	365
				F <sub>2</sub> <sup>(6)</sup>	280	280	280
A35	3-8dx1½	6-8dx1½	2	A <sub>1</sub>	260	295	320
				E	260	295	320
				C <sub>1</sub>	170	170	170
	6-8dx1½	6-8dx1½	3	A <sub>2</sub>	260	295	320
				C <sub>2</sub>	260	295	315
				D	150	150	150
6-8dx1½	6-8dx1½	4	F <sub>1</sub>	450	450	450	
			F <sub>2</sub> <sup>(6)</sup>	515	595	645	

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

- Some illustrations show connections that could cause cross-grain tension or bending of the wood during loading if not reinforced sufficiently. In this case, mechanical reinforcement should be considered.
- Refer to the illustrations in Figure 2 for definitions of load directions (A<sub>1</sub>, A<sub>2</sub>, C<sub>1</sub>, C<sub>2</sub>, D, E, F<sub>1</sub>, F<sub>2</sub>).
- Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
- Allowable loads are for one anchor. When anchors are installed on each side of the joist, the minimum joist thickness is 3 inches.
- Allowable loads under C<sub>D</sub> = 1.33 or 1.6 column have been increased for wind or earthquake loading. No further increase is allowed. Allowable loads must be reduced when other load durations govern.
- Connectors are required on both sides of joist to achieve F<sub>2</sub> loads in both directions.

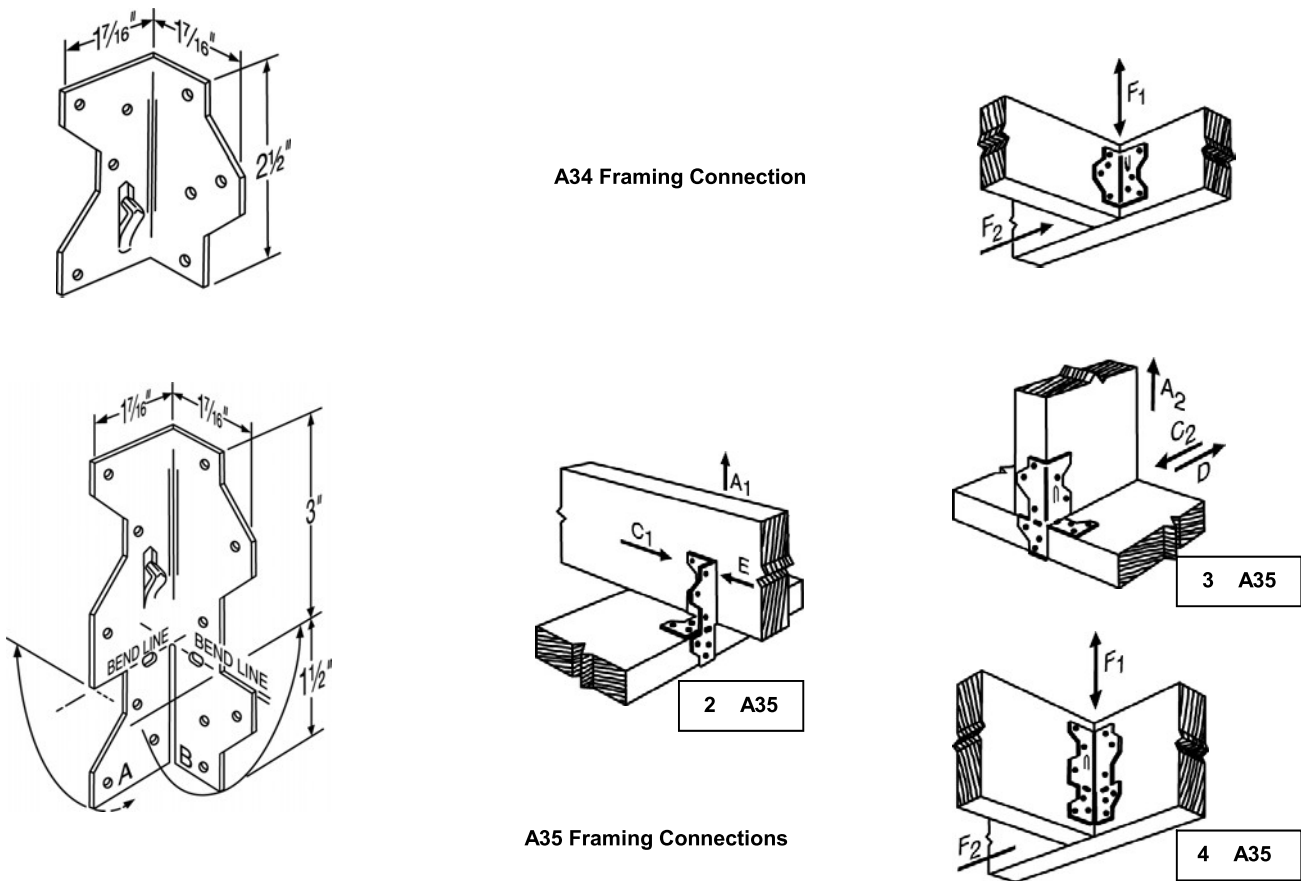


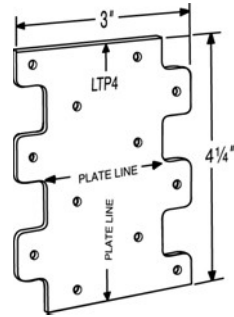
FIGURE 2—A34 AND A35 FRAMING CONNECTORS

TABLE 3—ALLOWABLE LOADS FOR THE LTP4 FRAMING CONNECTOR

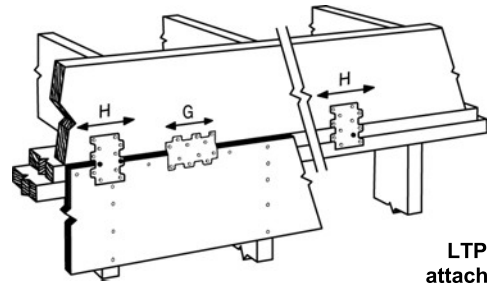
MODEL NO.	FASTENERS (Quantity-Type)		DIRECTION OF LOAD	ALLOWABLE LOADS <sup>1,2</sup> (lbs)			
	Plates	Rim Joist or Blocking		C <sub>D</sub> = 1.0	C <sub>D</sub> = 1.15	C <sub>D</sub> = 1.25	C <sub>D</sub> = 1.33 C <sub>D</sub> = 1.6
LTP4	6-8dx1 <sup>1</sup> / <sub>2</sub>	6-8dx1 <sup>1</sup> / <sub>2</sub>	G	515	590	645	685
	6-8dx1 <sup>1</sup> / <sub>2</sub>	6-8dx1 <sup>1</sup> / <sub>2</sub>	H	515	590	645	685

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

1. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
2. The LTP4 may be installed over wood-based structural sheathing (as shown in Figure 3) having a maximum thickness of 1/2 inch without adversely affecting the tabulated allowable loads.



LTP4 Dimensions



LTP4 Installed over Sheathing

LTP4 attaching Top Plates to Rim Joist

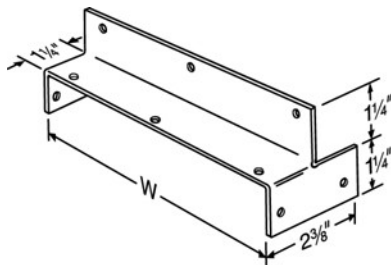
FIGURE 3—LTP4 FRAMING CONNECTOR

TABLE 4—ALLOWABLE LOADS FOR THE FC FRAMING CONNECTORS<sup>1,2,3</sup>

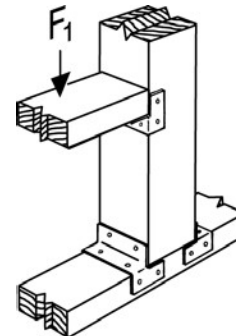
MODEL NO.	CONNECTOR WIDTH (W) (in)	FASTENERS (Quantity-Type)	ALLOWABLE DOWNLOAD, F <sub>1</sub> Where C <sub>D</sub> =1.0 C <sub>D</sub> =1.15 C <sub>D</sub> =1.25 (lbs.)
FC4	3 <sup>9</sup> / <sub>16</sub>	8-16d	800
FC6	5 <sup>1</sup> / <sub>2</sub>	10-16d	920

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

1. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
2. Minimum thickness of the supporting member (post) must be 2 1/2 inches to achieve the table load value (similar to Figure 5).
3. Loads may not be increased for short-term loading.



FC Connector Dimensions



Typical FC Connector Installation

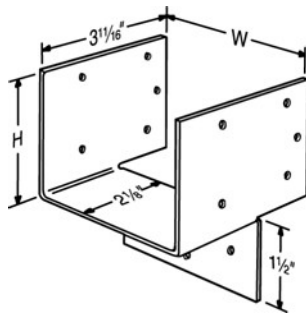
FIGURE 4—FC CLIPS

TABLE 5—ALLOWABLE LOADS FOR THE HH HEADER HANGERS

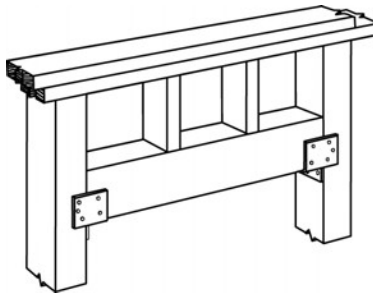
MODEL NO.	HANGER DIMENSIONS <sup>1</sup> (in)		FASTENERS (Quantity-Type)		ALLOWABLE LOADS <sup>2,3,4,5</sup> (lbs)					
	W	H	Stud	Header	F <sub>1</sub> where C <sub>D</sub> =		F <sub>2</sub> where C <sub>D</sub> =		F <sub>3</sub> where C <sub>D</sub> =	
					1.0	1.25	1.0	1.33 or 1.6	1.0	1.33 or 1.6
HH4	3 <sup>9</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>8</sub>	9-16d	4-16d	1,195	1,495	530	710	530	710
HH6	5 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>4</sub>	12-16d	6-16d	1,595	1,995	800	1,065	800	1,065

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

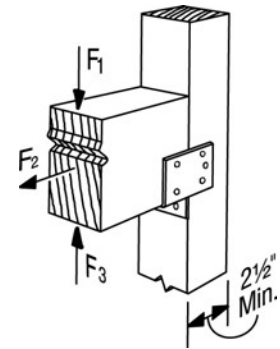
1. Refer to Figure 5 for definitions of angle dimension nomenclature (W and H).
2. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
3. Allowable F<sub>2</sub> and F<sub>3</sub> loads under C<sub>D</sub> = 1.33 or 1.6 column have been increased for wind or earthquake loading. No further increase is allowed. Allowable loads must be reduced when other load durations govern.
4. Duration of load increase for F<sub>1</sub> direction may not exceed 25 percent.
5. Minimum lumber thickness must be 2½ inches to achieve tabulated allowable load values.



HH4 Hanger Dimensions



Typical HH Installation



Allowable Load Directions

FIGURE 5—HH HEADER HANGERS

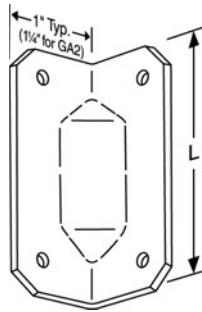


TABLE 6—ALLOWABLE LOADS FOR THE GA ANGLES

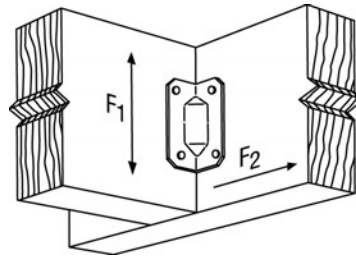
MODEL NO.	ANGLE LENGTH (L) (inches)	FASTENERS (Quantity-Type)	ALLOWABLE LOADS <sup>1,2,3</sup> (lbs)							
			F <sub>1</sub> where C <sub>D</sub> =				F <sub>2</sub> where C <sub>D</sub> =			
			1.0	1.15	1.25	1.33 or 1.6	1.0	1.15	1.25	1.33 or 1.6
GA1	2 <sup>3</sup> / <sub>4</sub>	4-10d	185	185	185	185	220 <sup>(4)</sup>	260 <sup>(4)</sup>	280 <sup>(4)</sup>	300 <sup>(4)</sup>
GA2	3 <sup>1</sup> / <sub>4</sub>	6-10d	335 <sup>(4)</sup>	385 <sup>(4)</sup>	415 <sup>(4)</sup>	450 <sup>(4)</sup>	335 <sup>(4)</sup>	385 <sup>(4)</sup>	420 <sup>(4)</sup>	450 <sup>(4)</sup>

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

1. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
2. Allowable F<sub>1</sub> and F<sub>2</sub> loads under C<sub>D</sub> = 1.33 or 1.6 column have been increased for wind or earthquake loading. No further increase is allowed. Allowable loads must be reduced when other load durations govern.
3. Connectors are required on both sides to achieve F<sub>2</sub> loads in both directions.
4. 10d x 1<sup>1</sup>/<sub>2</sub>-inch-long nails may be used provided the tabulated allowable loads are multiplied by 0.81, except for the GA1 angles in the F<sub>1</sub> direction, which must be limited to 185 lbs for all load durations.



GA1



Typical GA Installation

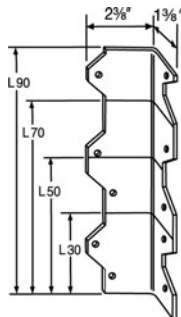
FIGURE 6—GA ANGLES

TABLE 7—ALLOWABLE LOADS FOR THE L REINFORCING ANGLES

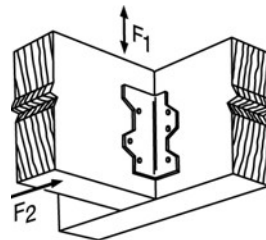
MODEL NO.	ANGLE LENGTH (L) (inches)	FASTENERS (Quantity-Type)	ALLOWABLE LOADS <sup>1,2,3,4</sup> (lbs)							
			F <sub>1</sub> where C <sub>D</sub> =				F <sub>2</sub> where C <sub>D</sub> =			
			1.0	1.15	1.25	1.33 or 1.6	1.0	1.15	1.25	1.33 or 1.6
L30	3	4-10d	220	240	240	240	220	255	280	295
L50	5	6-10d	335	385	415	445	335	385	415	445
L70	7	8-10d	445	510	555	565	445	510	555	565
L90	9	10-10d	555	640	695	740	555	640	695	740

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

1. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
2. Allowable F<sub>1</sub> and F<sub>2</sub> loads under C<sub>D</sub> = 1.33 or 1.6 column have been increased for wind or earthquake loading. No further increase is allowed. Allowable loads must be reduced when other load durations govern.
3. Minimum lumber thickness must be 2<sup>1</sup>/<sub>2</sub> inches to achieve the tabulated allowable load values.
4. 10d x 1<sup>1</sup>/<sub>2</sub> nails may be used provided the tabulated allowable loads are multiplied by 0.81.
5. Connectors are required on both sides to achieve F<sub>2</sub> loads in both directions.



L Angle



Typical L50 Installation and Allowable Load Directions

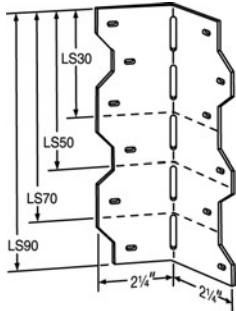
FIGURE 7—L REINFORCING ANGLES

TABLE 8—ALLOWABLE LOADS FOR THE LS REINFORCING ANGLES

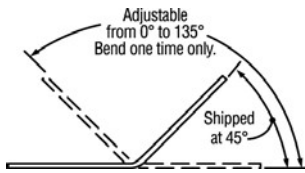
MODEL NO.	ANGLE LENGTH (in)	FASTENERS (Quantity-Size)	ALLOWABLE LOAD PARALLEL TO LENGTH OF ANGLE <sup>1,2</sup> (lbs)			
			C <sub>D</sub> =1.0	C <sub>D</sub> =1.15	C <sub>D</sub> =1.25	C <sub>D</sub> = 1.33 C <sub>D</sub> = 1.6
LS30	3 <sup>3</sup> / <sub>8</sub>	6-10d	335	385	395	395
LS50	4 <sup>7</sup> / <sub>8</sub>	8-10d	450	520	560	600
LS70	6 <sup>7</sup> / <sub>8</sub>	10-10d	560	645	665	665
LS90	7 <sup>7</sup> / <sub>8</sub>	12-10d	670	770	840	890

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

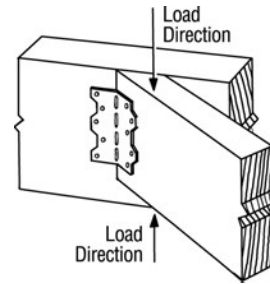
1. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
2. The tabulated allowable loads are for a single connector.



LS Angle Dimensions



Allowable Bend Angles



LS Angle Installed

FIGURE 8—LS REINFORCING ANGLE

TABLE 9 —ALLOWABLE LOADS FOR THE Z CLIPS

MODEL NO.	CLIP DIMENSIONS <sup>1</sup> (in)				FASTENERS		ALLOWABLE DOWNLOAD Where C <sub>D</sub> =1.0 C <sub>D</sub> =1.15 C <sub>D</sub> =1.25 (lbs.)
	W	H	B	TF	Top	Seat	
Z4	1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	1 - 16d	1 - 16d	465
Z6	1 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>8</sub>	2	1 <sup>3</sup> / <sub>8</sub>	1 - 16d	1 - 16d	485
Z44	2 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	2	1 <sup>3</sup> / <sub>8</sub>	2 - 16d	2 - 16d	865

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

1. Refer to Figure 9 for definitions of clip dimension nomenclature (W, H, B, TF).
2. Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
3. Compression perpendicular-to-grain capacity for the joists bearing on the clips must be verified and must not exceed the allowable loads noted in the table.

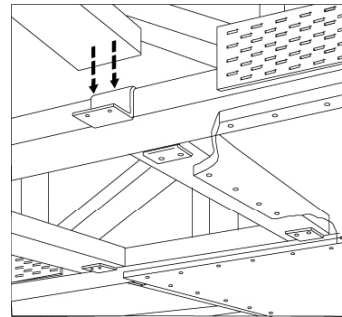
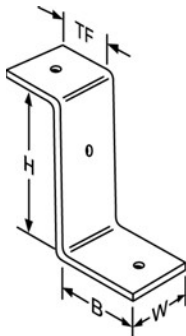


FIGURE 9—Z CLIPS