Simpson Strong-Tie
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Riverside, CA 92509

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RESEARCH REPORT: RR 25814
(CSI #06 05 23)

BASED UPON IAPMO EVALUATION SERVICE
REPORT NO. ER-0112

REEVALUATION DUE
DATE: April 1, 2016
Issued Date: April 1, 2014
Code: 2014 LABC

GENERAL APPROVAL – Reevaluation - The Simpson Strong-Tie- A Series, A34, A35, DSP, SSP, FC, FSC, GA, H2A, H2.5T, H8, H10A, H10A-2, H10S, H14, HH, L, LCE4, LS, LP4, LTP5, LS, RBC, RBCP, and TJC37 Angles, Z Clips, and Ties

DETAILS

The above assemblies and/or products are approved when in compliance with the description, use, identification and findings of Evaluation Report No. ER-0112, revised September 24, 2013, of the IAPMO Evaluation Service, Incorporated. The report, in its entirety, is attached and made part of this general approval.

The parts of Evaluation Report No.ER-0112 marked by an asterisk are revised or deleted by the Los Angeles City Building Department from this approval.

The approval is subject to the following conditions:

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 job site at all times during installation.

2. Calculations demonstrating that the applied loads are less than the allowable loads described in this report shall be submitted to the plan check Engineer at the time of permit application. The calculations shall be prepared by a Civil or Structural Engineer registered in the State of California.

3. Where applicable, adjustment factors noted in Section 4.1 of ER-0112 and the applicable codes must be considered.

4. Fasteners and connected wood members must be in compliance, respectively, with Sections 3.2.2 and 3.2.3 of ER-0112.

5. Use of connectors with fire-retardant-treated or preservative- lumber must be in accordance with Section 3.2.2 of ER-0112. Use of fasteners with fire-retardant-treated or preservative-lumber must be in accordance with Section 3.2.3 of ER-0112.

DISCUSSION

The report is in compliance with the 2014 Los Angeles City Building Code.

The approval is based on data in accordance with the IAPMO ES Evaluation Criteria for Testing and Analysis of Joist Hangers and Miscellaneous Connectors (EC 002-2011), inclusive of tests and calculations.

This general approval will remain effective provided the Evaluation Report is maintained valid and unrevised with the issuing organization. Any revisions to the report must be submitted to this Department, with appropriate fee, for review in order to continue the approval of the revised report.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

_____

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RR25814/MSWord.2010
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Attachments: IAPMO-ES Evaluation Report No. ER-0112 (21-Pages)

Report Number: 112
Originally Issued: 08/2008
Revised: 09/24/2013
Valid Through: 08/2014

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

REPORT HOLDER:
SIMPSON STRONG-TIE COMPANY INC.
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EVALUATION SUBJECT:

SIMPSON STRONG-TIE ANGLES, CLIPS, AND TIES

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes

- 2012 International Building Code® (IBC)
- 2012 International Residential Code® (IRC)
- 2009 International Building Code® (IBC)
- 2009 International Residential Code® (IRC)
- 2006 International Building Code® (IBC)
- * ~~2006 International Residential Code® (IRC)~~

1.2 Evaluated in accordance with

IAPMO UES Evaluation Criteria for Joist Hangers and Miscellaneous Connectors (EC 002-2011)

1.3 Property evaluated

- Structural

2.0 USES

Simpson Strong-Tie structural angles, clips and ties are used as wood framing anchors and mechanical fastenings in accordance with Section 2304.9.3 of the IBC. The products may 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 Product Information

3.1.1 A Series Angles: The A series angles transfer shear loads between wood members and are formed from No. 18 gage steel. Table 1 provides model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.2 A34 and A35 Framing Angles: The A34 and A35 framing angles connect wood framing members and are fabricated from No.18 gage steel. The connectors have cutouts on each leg and a prong to aid in installation. The A35 angle has slots and bend lines to permit field adjustments of the legs for two- and three-way tied connections. Table 2 and Figure 2 provides model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.3 DSP and SSP Stud Plate Tie Connectors: The SSP stud plate ties transfer uplift loads from a double top plate to a stud or from a stud to sill plate. The SSP is formed from No. 18 gage steel. The DSP is used to connect a double wood stud to a single or double wood plate, and is formed from No. 18 gage steel. Table 3 and Figure 3 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.4 FC Series Framing Clips: The FC series framing clips transfer shear loads between wood members and are formed from No. 16 gage steel. Table 4 and Figure 4 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.5 FSC Floor Span Connectors: The FSC connector transfer tension loads from member to member and may be used as an alternative to floor-to-floor strap connectors. The connector is formed from No. 12 gage steel. Table 5 and Figure 5 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.6 GA Series Gusset Angles: The GA series gusset angles connect wood framing members and are formed from No. 18 gage steel. Table 6 and Figure 6 contain model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.7 H2A, H2.5T, H8, H10A, H10A-2, H10S, H14 and HGA10 Hurricane Ties: The hurricane ties connect wood rafters or trusses to wood wall plates or studs. The H2A, H2.5T, H8, H10A, H10A-2, H10S, and H14 are formed from No. 18 gage steel, and the HGA10 is formed from No. 14 gage steel. Table 7 and Figure 7 contain model numbers, dimensions, fastener schedules, allowable loads, and installation details.

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3.1.8 HH Series Header Hangers: The HH series header hangers transfer wind uplift and lateral loads between wood roof and wall members and are formed from No. 16 gage steel. Table 8 and Figure 8 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.9 L Series Reinforcing Angles: The L series reinforcing angles connect wood framing members and are formed from No. 16 gage steel. Table 9 and Figure 9 describe model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.10 LCE4 Post Cap: The LCE4 post cap transfers uplift and lateral forces from a wood beam to a wood post and is formed from No. 20 gage steel. Table 10 and Figure 10 describe model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.11 LS Series Skewable Angles: The LS series skewable angles transfer loads between wood framing members and are formed from No. 18 gage steel. The angles are designed to allow field skewing from 0 to 135 degrees. Table 11 and Figure 11 contain model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.12 LTP4 and LTP5 Lateral Tie Plates: The LTP4 and LTP5 lateral tie plates transfer shear loads from the wood top plate to wood rim joist or blocking members and is formed from No. 20 gage steel. Table 12 and Figure 12 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.13 RBC and RBCP Roof Boundary Clips: The RBC/RBCP roof boundary clips transfer loads between the roof diaphragm perimeter blocking and wall top plates and are formed from No. 20 gage steel. Table 13 and Figure 13 contain model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.14 TJC37 Jack Truss Connector: The TJC37 is a field skewable connector that transfers loads from jack trusses, joists, rafters and blocking members to supporting members and is formed from No. 16 gage steel. Table 14 and Figure 14 describe model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.15 Z Series Panel Stiffener Clips: The Z2 and Z4, Z44 panel stiffener clips are formed from No. 20 and No. 12 gage steel, respectively. 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. Table 15 and Figure 15 provide model numbers, dimensions, fastener schedules, allowable loads, and installation details.

3.1.16 FWANZ Foundation Wall Angles: The FWANZ foundation wall angles are used to attach the foundation or basement walls to the floor system to resist out-of-plane loads imposed by soil pressure. Each angle fastens to the wood rimboard and wood mudsill with nails. The FWANZ is formed from No.14 gauge steel. Table 16 and Figure 16 provide model numbers, dimensions, fastener schedule, allowable loads, and installation details.

3.2 Materials

3.2.1 Steel: The DSP, FWANZ, H2A, H2.5T, H8, H14, LCE4, LTP5, RBC, RBCP, SSP and TSP connectors described in this report are manufactured from galvanized steel complying with ASTM A 653, Grade 40, SS designation with a minimum yield strength of 40,000 psi (227 MPa) and a minimum ultimate tensile strength of 55,000 psi (358 MPa). All other connectors described in this report are manufactured from galvanized steel complying with ASTM A 653, Grade 33, SS designation with a minimum yield strength of 33,000 psi (227 MPa) and a minimum ultimate tensile strength of 45,000 psi (310 MPa). Base metal thicknesses for the connectors in this report are as follows:

GAGE	BASE METAL THICKNESS (inches)
No. 12	0.0975
No. 14	0.0720
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 designation complying with ASTM A 653. Some models also are available with a G185 zinc coating designation in accordance with ASTM A 653 (denoted by model numbers ending in the letter Z). Some models are available with a batch hot-dipped galvanized coating 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^2), total for both sides (denoted by model numbers ending with the letters HDG). Model numbers in this

report do not list the Z or HDG ending, but the information shown applies.

The holder of this report (Simpson Strong-Tie) or lumber treater shall be contacted for recommendations on minimum corrosion resistance of steel connectors in contact with specific proprietary preservative-treated or fire-retardant-treated lumber.

3.2.2 Wood: Wood members with which the connectors are used shall 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 (depth) of the wood main member shall be equal to or greater than the length of the fasteners specified in the tables in this report, unless the reduced penetration effect on the load calculation per the applicable National Design Specification for Wood Construction and its Supplement (NDS) is taken into account, or as required by wood member design, whichever is greater.

3.2.3 Fasteners: Common nails shall comply with ASTM F 1667 when used with connectors in this report and have the following minimum fastener dimensions and bending yield strengths (F_{yb}):

FASTENER	SHANK DIAMETER (inches)	FASTENER LENGTH (inches)	F_{yb} (psi)
8d x 1½	0.131	1½	100,000
8d	0.131	2½	100,000
10d x 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 fire-retardant-treated or preservative-treated lumber shall comply with IBC Section 2304.9.5 or the 2012 and 2009 IRC Section R317.3 (2006 IRC Section R319.3), as applicable. The report holder or lumber treater shall 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.

SDS wood screw fasteners described in Table 7 shall be Simpson Strong-Tie SDS wood screws recognized in ** ~~ICC-ES ESR-2236~~. LARR 25711

4.0 DESIGN AND INSTALLATION

4.1 Design

The tabulated connector loads shown in this report are for allowable stress design and include the load duration factor, C_D, corresponding with the applicable loads in accordance with the National Design Specification for Wood Construction and its supplement (NDS). Further load duration increases are not permitted other than those shown.

Tabulated allowable loads apply to products connected to wood used where sustained temperatures are 100°F (37.8°C) or less and under dry conditions. The allowable loads shall be adjusted by the wet service factor, C_M, specified in the NDS for dowel-type fasteners, 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 in this report shall be adjusted by the temperature factor, C_t, specified in the NDS when connectors are installed in wood that will experience sustained exposure to temperatures exceeding 100°F (37.8°C),

4.2 Installation

Installation of the connectors shown in this report shall be in accordance with the manufacturer's published installation instructions and this evaluation report. If there is a conflict between this report and the manufacturer's published installation instructions, the more restrictive prevails.

4.3 Special Inspection

4.3.1: Periodic special inspection shall be conducted in accordance with the 2012 IBC Section 1705.10, 2009 IBC Section 1706 or 2006 IBC Section 1704, as applicable, when the product series are components within the main wind-force-resisting system of structures constructed in areas listed in the 2012 IBC Section 1705.10, 2009 IBC Section 1706.1 and Section 1705.4 for the 2006 IBC. Special inspection requirements do not apply to structures, or portions thereof, that qualify for exception under the 2012 IBC Sections 1704.2, 1705.3, 1705.10.1 or 1705.10.2, 2009 IBC Sections 1704.1, 1704.4, 1706.2 or 1706.3 and 2006 IBC Sections 1704.1 and 1704.4.

4.3.2: Periodic special inspection shall be conducted in accordance with the applicable subsections of Section

** Modified by the City of Los Angeles

1705.11 of the 2012 IBC and Section 1707 of the 2009 and 2006 IBC when the product series are components within the seismic-force-resisting system of structures constructed in Seismic Design Category C, D, E or F. Special inspection requirements do not apply to structures, or portions thereof, that qualify for exception under 2012 IBC Sections 1704.2 or 1705.11, 2009 IBC Sections 1704.1, 1707.3 or 1707.4 or 2006 IBC Sections 1704.1 or 1707.3.

4.3.3: 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 Sections 4.3.1 and 4.3.2 as applicable for installations under the IRC.

5.0 CONDITIONS OF USE

The Simpson Strong-Tie products described in this report are in compliance with, or are acceptable 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 shall be manufactured, identified and installed in accordance with the manufacturer's published installation instructions and this report. A copy of the instructions shall be available at the jobsite continuously during installation.

5.2 Where applicable, adjustment factors noted in Section 4.1 and the applicable codes shall be considered.

5.3 Connected wood members and fasteners shall be in compliance, respectively, with Sections 3.2.2 and 3.2.3 of this report.

5.4 Use of connectors with fire-retardant-treated or preservative-treated lumber shall be in accordance with Section 3.2.1 of this report. Use of fasteners with fire-retardant-treated or preservative-treated lumber shall be in accordance with Section 3.2.3 of this report.

6.0 EVIDENCE SUBMITTED

Data in accordance with IAPMO UES Evaluation Criteria for the Testing and Analysis of Joist Hangers and Miscellaneous Connectors (EC 002-2011), inclusive of tests and calculations.

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 the index evaluation report (ER-102), which identifies products recognized in this report.

IAPMO UES ER-112

Brian Gerber, P.E., S.E.
Technical Director of Uniform Evaluation Service

Richard Beck, PE, CBO, MCP
Director of Uniform Evaluation Service

GP Russ Chaney
CEO, The IAPMO Group

TABLE 1: ALLOWABLE LOADS FOR THE A ANGLES

MODEL NO.	ANGLE DIMENSIONS[1] (in)			FASTENERS (Quantity-Type)		ALLOWABLE LOADS[2,3,4,5] (lbs)							
						F_1 where C_D =				F_2 where C_D =			
	L	W_1	W_2	Supporting Member (Base)	Supported Member (Post)	1.0	1.15	1.25	1.6[6]	1.0	1.15	1.25	1.6[6]
A21	$1^3/_8$	2	$1^1/_2$	2-10d x 1½	2-10d x 1½	235	270	290	365	175	175	175	175
A23	$2^3/_4$	2	$1^1/_2$	4-10d x 1½	4-10d x 1½	475	540	580	715	475	540	565	565
A33	$1^1/_2$	3	3	4-10d	4-10d	565	625	665	800	330	330	330	330
A44	$1^1/_2$	$4^9/_{16}$	$4^3/_8$	4-10d	4-10d	565	625	665	800	295	295	295	295

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

1. Refer to Figure 1 for definitions of angle dimension nomenclature (L, W_1, W_2) and allowable load directions (F_1 and F_2).
2. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable building code.
3. F_1 and F_2 loads cannot be combined.
4. The F_1 allowable loads are for one connector. When angles are installed on each side of wood member, the minimum member thickness shall be 3 inches.
5. The F_2 allowable loads apply only when the connectors are used in pairs.
6. Allowable loads have been increased for wind or earthquake loading. No further increase is allowed.

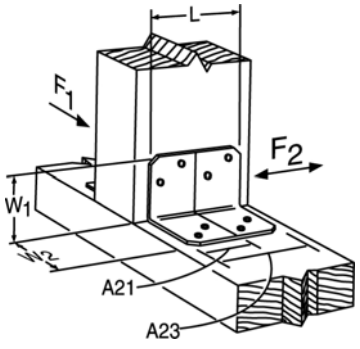


Figure 1 – A21 and A23 Angles

TABLE 2: ALLOWABLE LOADS FOR THE A34 / A35 FRAMING ANGLES

MODEL NO.	FASTENERS (Quantity-Type)		DIRECTION OF LOAD	ALLOWABLE LOADS[1,2] (lbs)			
	Joist	Header/Plate		C_D=1.0	C_D=1.15	C_D=1.25	C_D=1.6
A34	4-8dx1½	4-8dx1½	F_1	395	450	485	515
	4-8dx1½	4-8dx1½	F_2	395	450	455	455
A35	3-8dx1½	6-8dx1½	A_1	295	335	365	395
	3-8dx1½	6-8dx1½	C_1	210	210	210	210
	3-8dx1½	6-8dx1½	E	295	335	365	425
	6-8dx1½	6-8dx1½	A_2	295	335	365	380
	6-8dx1½	6-8dx1½	C_2	295	335	365	370
	6-8dx1½	6-8dx1½	D	230	230	230	230
	6-8dx1½	6-8dx1½	F_1	595	670	695	695
	6-8dx1½	6-8dx1½	F_2	595	670	670	670

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

1. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable NDS edition.
2. Connectors are required on both sides of joist to achieve F_2 loads in both directions.

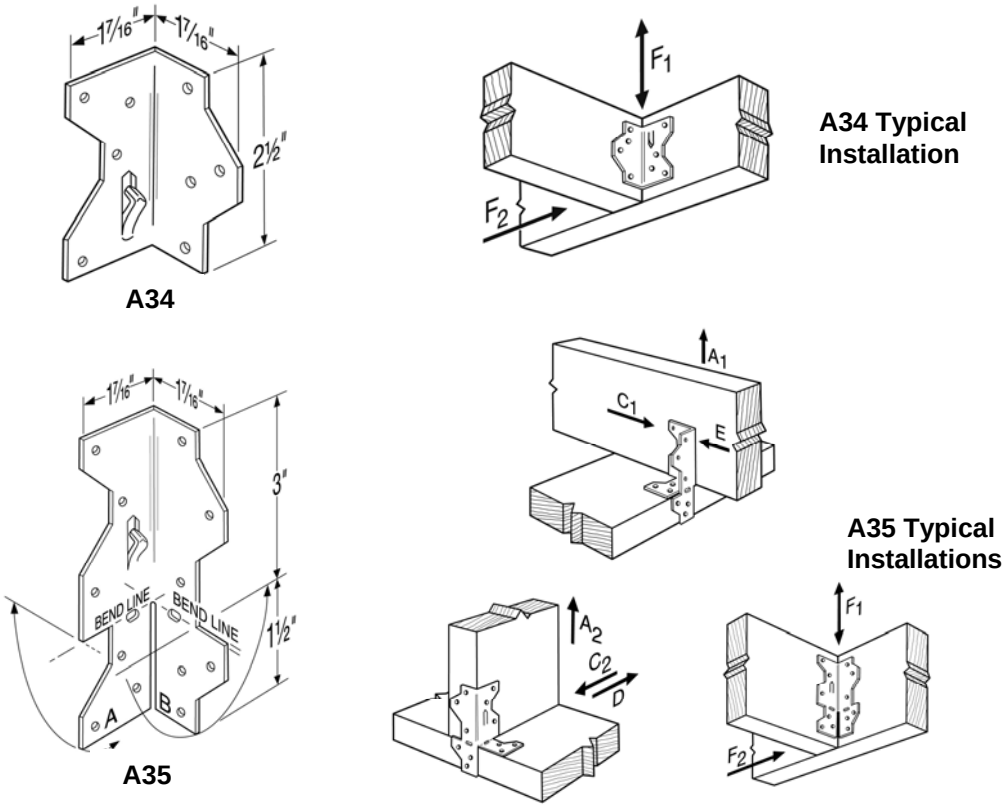


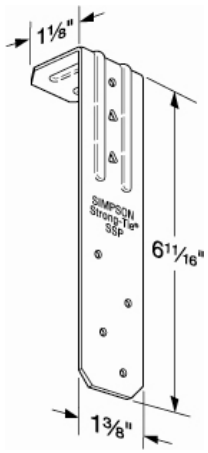
Figure 2 – A34 and A35 Framing Angles

TABLE 3: ALLOWABLE LOADS FOR SSP AND DSP STUD PLATE TIES

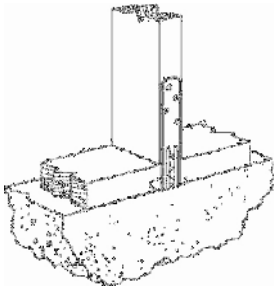
MODEL NO.	FASTENERS (Quantity-Type)			ALLOWABLE UPLIFT LOADS[1](lbs)	
	Studs	Double Top Plate	Sill Plate	Double Top Plate[3]	Sill Plate[4]
				C_D=1.60	C_D=1.60
SSP	4-10dX1½	3-10dX1½	-	350	-
		-	1-10dX1½	-	420
	4-10d	3-10d	-	435	-
		-	1-10d	-	455
DSP	8-10dX1½	6-10dX1½	-	775	-
		-	2-10dX1½	-	660
	8-10d	6-10d	-	825	-
		-	2-10d	-	825

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

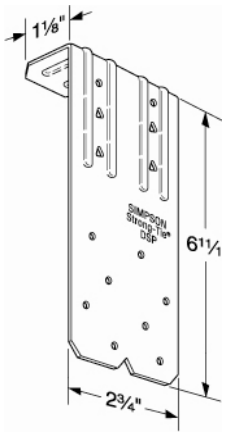
1. The allowable uplift loads have been increased for wind or earthquake loading using the tabulated value of C_D with no further increase allowed. Allowable loads shall be adjusted when other load durations govern.
2. When cross-grain bending or cross-grain tension cannot be avoided, mechanical reinforcement of the wood members to resist such loads shall be considered.
3. For Double Top Plate allowable load, all round and triangle holes shall be filled with the tabulated nails.
4. For Sill Plate allowable load, all round holes shall be filled with the tabulated nails.



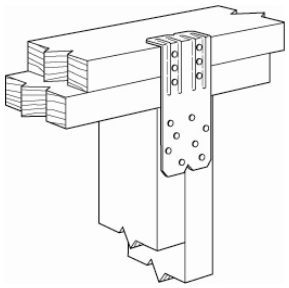
SSP



SSP Sill Plate Installation (DSP Similar)



DSP



DSP Top Plate Installation (SSP Similar)

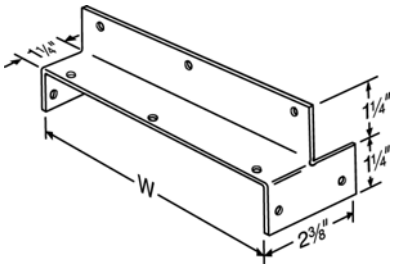
Figure 3 – SSP and DSP Stud Plate Ties

TABLE 4: ALLOWABLE LOADS FOR THE FC FRAMING CLIPS

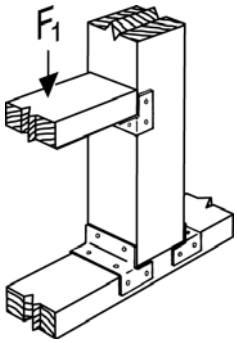
MODEL NO.	CONNECTOR WIDTH (W) (in)	FASTENERS (Quantity-Type)	ALLOWABLE DOWNLOAD, F_1[1,2] (lbs.)		
			C_D=1.0	C_D=1.15	C_D=1.25
FC4	$3^9/_{16}$	8-16d	865	920	920
FC6	$5^1/_2$	10-16d	1,010	1,145	1,235

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

1. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable building code.
2. Minimum thickness of the supporting member (post) shall be $2^1/_2$ inches to achieve the tabulated load value (similar to Figure 8).



FC Connector Dimensions



Typical FC Connector Installation

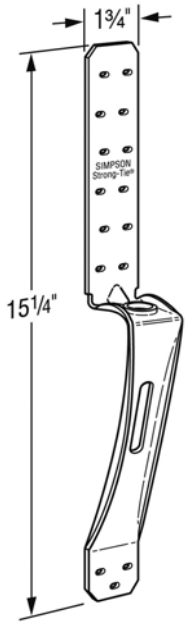
Figure 4- FC Framing Clips

TABLE 5: ALLOWABLE LOADS FOR FSC FLOOR SPAN CONNECTOR

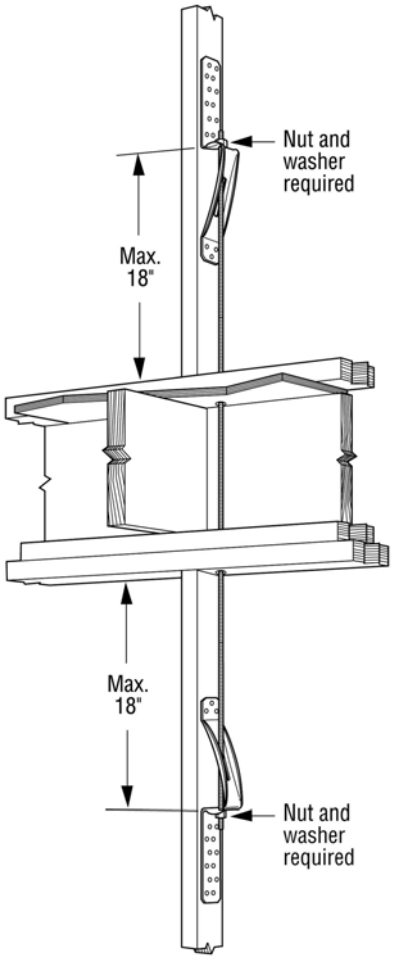
MODEL NO.	FASTENERS (Quantity-Type)		ALLOWABLE UPLIFT LOADS[1,2](lbs) C_D=1.6
	Stud	Anchor[3]	
FSC	15-10dx1 ½	3/8inch diameter ATR	**1,830**

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

1. The uplift loads have been increased using the tabulated value of C_D for wind or earthquake loading with no further increase allowed. Allowable loads shall be adjusted when other load durations govern.
2. Load values are based on a minimum lumber thickness of 1½ inches.
3. Standard cut washer is required with the 3/8inch diameter all-thread rod.
4. The all-thread rod shall comply with minimum requirements of ASTM A307 Grade A.



FSC



FSC Stud to Stud Installation

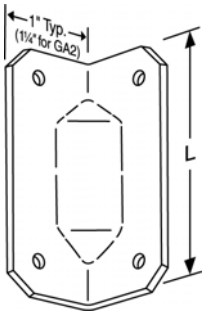
Figure 5 – FSC Floor Span Connector

TABLE 6: ALLOWABLE LOADS FOR GA GUSSET ANGLES

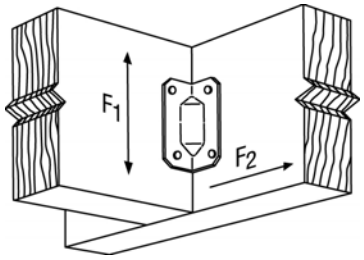
MODEL NO.	ANGLE LENGTH (L) (inches)	FASTENERS (Quantity-Type)	ALLOWABLE LOADS[1] (lbs)							
			F_1 where C_D =				F_2 where C_D = [3]			
			1.0	1.15	1.25	1.6[2]	1.0	1.15	1.25	1.6[2]
GA1	$2^3/_4$	4-10d x 1 ½	235	270	290	330	235	270	290	365
GA2	$3^1/_4$	6-10d x 1 ½	355	405	435	550	355	405	435	550

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

1. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable NDS edition.
2. Allowable loads have been increased using the tabulated value of C_D for wind or earthquake loading. No further increase is allowed.
3. Connectors are required on both sides to achieve F_2 loads in both directions.



GA1



Typical GA Installation

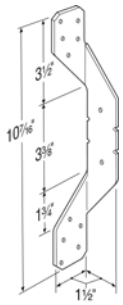
Figure 6 – GA Gusset Angles

TABLE 7: ALLOWABLE LOADS FOR H HURRICANE TIES

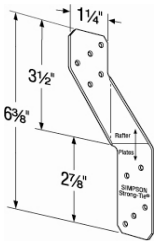
MODEL NO.	FASTENERS (Quantity-Type)			ALLOWABLE LOADS[1,2,3] (lbs)		
				Uplift[3] C_D=1.6	Lateral C_D=1.6	
	To Rafter	To Plates	To Studs		F_1[4]	F_2
H2A	5 - 8d x 1½	2 - 8d x 1½	5 - 8d x 1½	575	130	55
H2.5T	5 - 8d	5 - 8d	-	545[7]	135	145
H8	5 – 10d x 1 ½	5 – 10d x 1 ½	-	795	95	90
H10A	9 - 10d x 1 ½	9 - 10d x 1 ½	-	1,140	590	285
H10A-2	9 – 10d x 3	9 – 10d x 3	-	1,245	815	260
H10S	8 - 8d x 1½	8 - 8d x 1½	8 - 8d	1,010[7,8]	660[8]	215[8]
H14	12 - 8d x 1½	[1] 13 - 8d	-	1,350	725	285
	12 - 8d x 1½	[2] 15 - 8d	-	1,465	670	230
HGA10	4 – SDS 1/4 x 1½	4 – SDS 1/4 x 3	-	695	1,165	940[10]

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

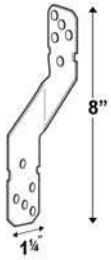
1. Allowable loads are for one anchor. A minimum rafter thickness of 2 ½ inches shall be used when framing anchors are installed on each side of the rafter and on the same side of the plate.
2. Allowable simultaneous loads in more than one direction on a single connector shall be evaluated as follows: Design Uplift/Allowable Uplift + Design Lateral Parallel to Plate/Allowable Lateral Parallel to Plate + Design Lateral Perpendicular to Plate/Allowable Lateral Perpendicular to Plate < 1.0. The number of terms considered in the equation is dependent on the designer's method of calculating wind forces and the utilization of the connector in the structural system.
3. The loads have been increased for wind or earthquake loading using the tabulated value of C_D with no further increase is allowed. Allowable loads shall be adjusted when other load durations govern.
4. Allowable loads in the F_1 direction are not intended to replace diaphragm boundary members or prevent cross-grain bending of the truss or rafter members.
5. When cross-grain bending or cross-grain tension cannot be avoided in the members, mechanical reinforcement of the wood members to resist such loads shall be considered.
6. Hurricane Ties are shown installed on the outside of the wall for clarity. Installation on the inside of the wall is acceptable. For a Continuous Load Path against uplift loads, connections in the same area (i.e. truss to plate connector and plate to stud connector) shall be on same side of the wall.
7. Allowable uplift load for the H2.5T and H10S with 8dX1½ fasteners is 425 lbs and 550 lbs, respectively.
8. H10S nails to plates are optional for uplift loads but required for lateral loads.
9. Stud may be offset 1inch maximum from center of rafter for reduced uplift and F_1 load capacities of 890 lbs and 545 lbs, respectively.
10. HGA10 F_2 value is for load acting toward the connector. For load away from the connector, F_2 = 780 lbs.



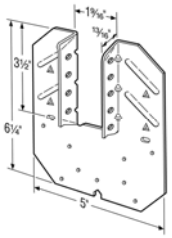
H2A



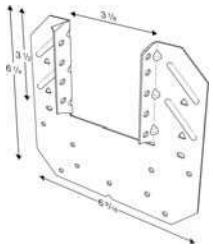
H2.5T



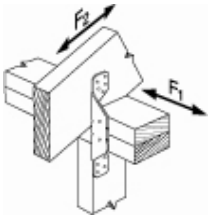
H8



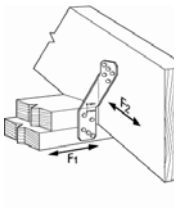
H10A



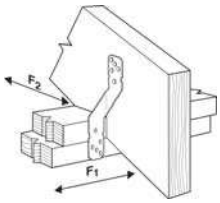
H10A-2



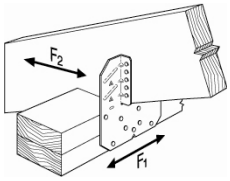
H2A Typical Installation



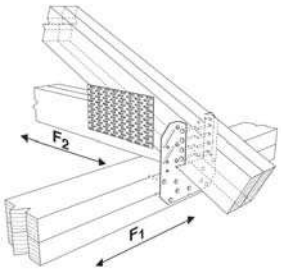
H2T Typical Installation



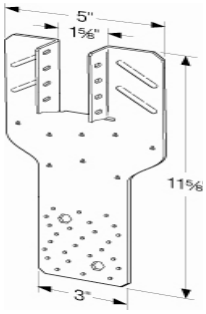
H8 Typical Installation



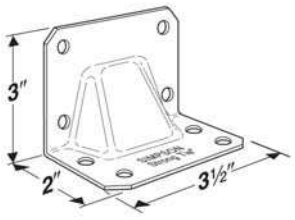
H10A Typical Installation



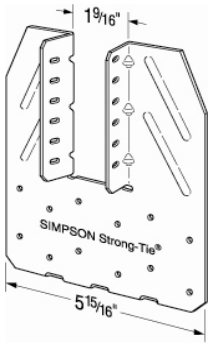
H10A-2 Typical Installation



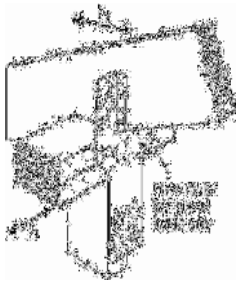
H10S



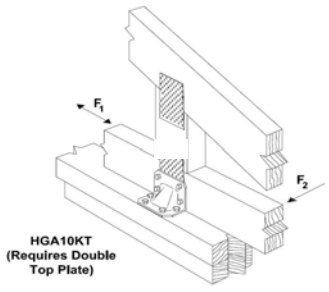
HGA10



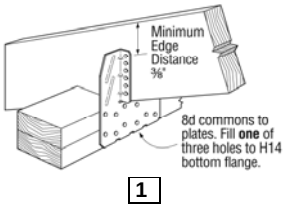
H14



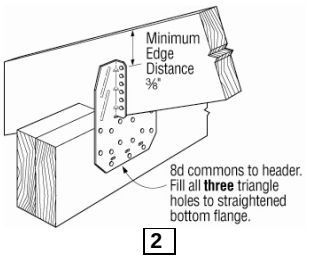
H10S Typical Installation



HGA10 Typical Installation



H14 Typical Top Plate Installation



H14 Typical Beam Installation

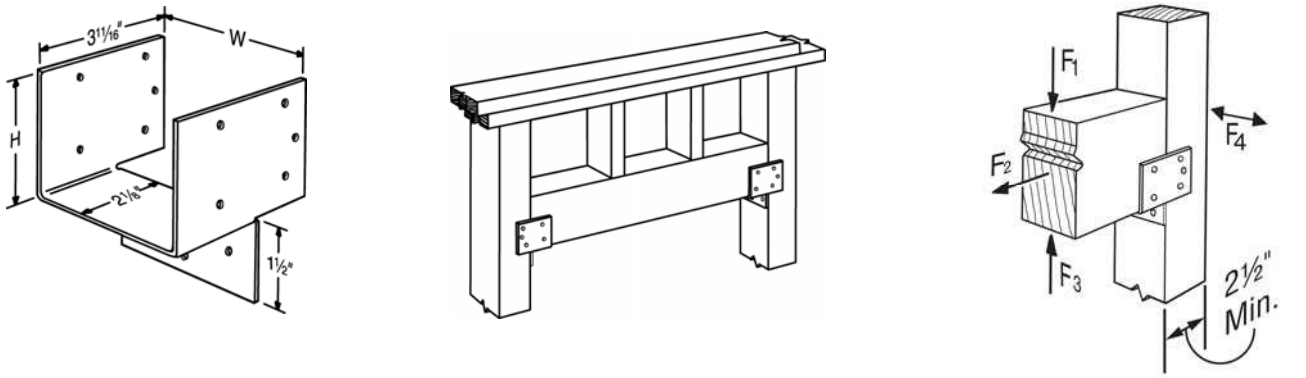
Figure 7 – H Hurricane Ties

TABLE 8: ALLOWABLE LOADS FOR THE HH HEADER HANGERS

MODEL NO.	HANGER DIMENSIONS[1] (in)		FASTENERS (Quantity-Type)		ALLOWABLE LOADS[2,5] (lbs)								
	W	H	Stud	Header	F_1 where C_D = [4]			F_2 where C_D =		F_3 where C_D =		F_4 where C_D =	
					1.0	1.15	1.25	1.0	1.6[3]	1.0	1.6[3]	1.0	1.6[3]
HH4	$3^1/_2$	$2^{13}/_{16}$	9-16d	4-16d	1,295	1,470	1,585	575	780	575	795	1,085	1,085
HH6	$5^1/_2$	$5^1/_8$	12-16d	6-16d	1,730	1,960	2,115	865	1,025	865	1,105	1,700	1,700

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

1. Refer to Figure 8 for definitions of dimension nomenclature (W and H).
2. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable building code.
3. Allowable loads have been increased using the tabulated value of C_D for wind or earthquake loading. No further increase is allowed. Allowable loads shall be reduced when other load durations govern.
4. Duration of load increase may not exceed 25 percent.
5. Minimum lumber thickness shall be $2^1/_2$ inches to achieve tabulated allowable load values.



HH4 Hanger Dimensions | **Typical HH Installation** | **Allowable Load Directions**

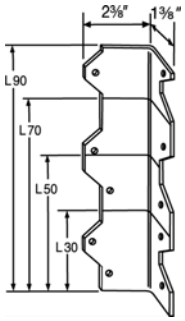
Figure 8 – HH Header Hangers

TABLE 9: ALLOWABLE LOADS FOR THE L REINFORCING ANGLES

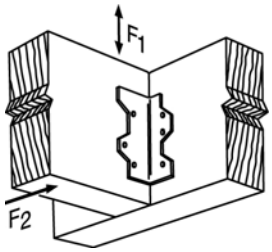
MODEL NO.	ANGLE LENGTH (L) (inches)	FASTENERS (Quantity-Type)	ALLOWABLE LOADS[1,3,4] (lbs)							
			F_1 where C_D =				F_2 where C_D =			
			1.0	1.15	1.25	1.6[2]	1.0	1.15	1.25	1.6[2]
L30	3	4-10d x 1 ½	245	250	250	250	245	275	295	370
L50	5	6-10d x 1 ½	365	415	445	555	365	415	445	555
L70	7	8-10d x 1 ½	485	550	595	740	485	550	595	740
L90	9	10-10d x 1 ½	610	690	740	925	610	690	740	925

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

1. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable building code.
2. Allowable loads have been increased for wind or earthquake loading. No further increase is allowed.
3. Minimum member thickness shall be 1¾ inches to achieve the tabulated allowable load values.
4. Connectors are required on both sides to achieve F_2 loads in both directions.



L Angle



Typical L50 Installation and Allowable Load Directions

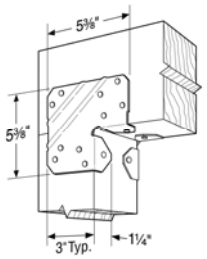
Figure 9 – L Reinforcing Angles

TABLE 10: ALLOWABLE LOADS FOR LCE4 POST CAP

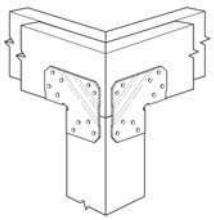
MODEL NO.	FASTENERS (Quantity-Type)		ALLOWABLE LOADS[1,2] (lbs)	
			Uplift[3]	Lateral
	Beam	Post	C_D=1.60	C_D=1.60
LCE4	14-16d	10-16d	1,955	1,425
LCE4 (Mitered Corner)	14-16d	10-16d	985	-

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

1. The loads have been increased using the tabulated value of C_D for wind or earthquake loading, with no further increase allowed. Allowable loads shall be adjusted when other load durations govern.
2. Loads apply only when used in pairs. Loads in table above are for each connector.
3. Uplift loads do not apply to splice conditions.



LCE4



LCE4
(Mitered Corner)

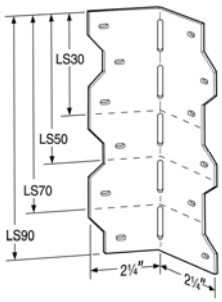
Figure 10 – LCE4 Post Cap

TABLE 11: ALLOWABLE LOADS FOR LS SKEWABLE ANGLES

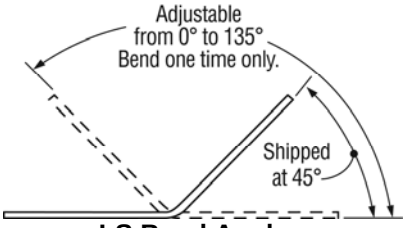
MODEL NO.	L (inches)	FASTENERS (Quantity-Type)		ALLOWABLE LOADS[1,2] (lbs)			
		Carried Member	Carrying Member	C_D=1.0	C_D=1.15	C_D=1.25	C_D=1.6
LS30	3 ⅜	3-10d x 1½	3-10d x 1½	325	325	325	325
		3-10d	3-10d	355	395	395	395
LS50	4 ⅞	4-10d x 1½	4-10d x 1½	475	540	565	565
		4-10d	4-10d	475	540	585	730
LS70	6 ⅜	5-10d x 1½	5-10d x 1½	595	640	640	640
		5-10d	5-10d	595	675	730	915
LS90	7 ⅞	6-10d x 1½	6-10d x 1½	715	810	845	845
		6-10d	6-10d	715	810	875	1,040

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

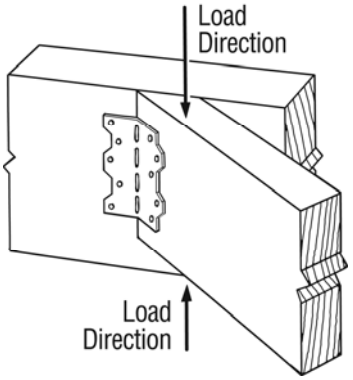
1. Tabulated allowable load capacities shall be selected based on duration of load as permitted by the applicable NDS edition.
2. Figure 11 indicates load directions.



LS



LS Bend Angles



LS Installed

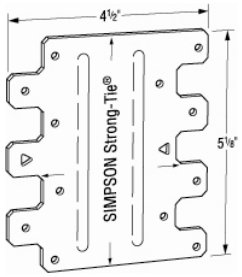
Figure 11 – LS Skewable Angles

TABLE 12: ALLOWABLE LOADS FOR LTP4 AND LTP5 LATERAL TIE PLATES

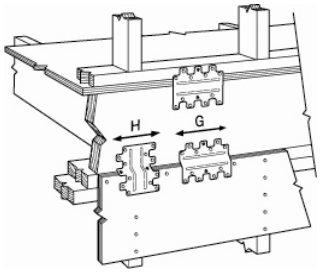
MODEL NO.	CONNECTOR CONFIGURATION	FASTENERS (Quantity-Type)		ALLOWABLE LATERAL LOADS[1] (lbs) C_D=1.6
		Rim Board	Plates	
LTP4	G	6-8d x 1 ½	6-8d x 1 ½	670
	H	6-8d x 1 ½	6-8d x 1 ½	600
LTP5	G	6-8d x 1 ½	6-8d x 1 ½	620
	H	6-8d x 1 ½	6-8d x 1 ½	545

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

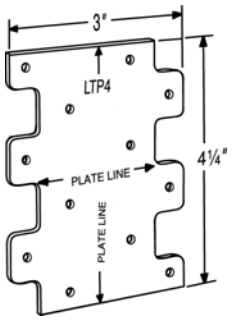
1. The loads have been increased using the tabulated value of C_D for wind or earthquake loading with no further increase allowed. Allowable loads shall be adjusted when other load durations govern
2. The LTP5 may be installed over wood structural panel sheathing no greater than ½" thick.



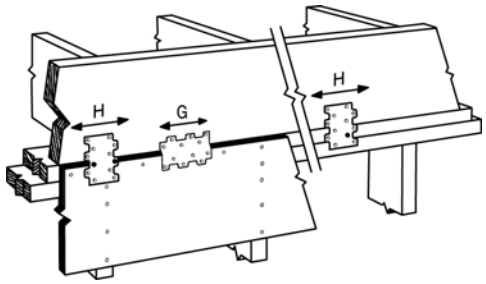
LTP5



LTP5 Typical Installations



LTP4



LTP4 Typical Installations

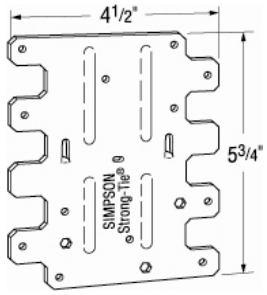
Figure 12 – LTP4 and LTP5 Lateral Tie Plates

TABLE 13: ALLOWABLE LOADS FOR RBC/RBCP ROOF BOUNDARY CLIPS

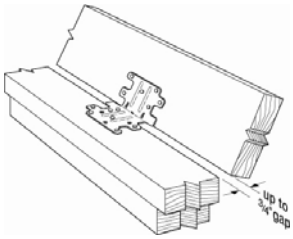
MODEL NO.	CONNECTION TYPE	BEND ANGLE[4]	FASTENERS (Quantity-Type)		ALLOWABLE LATERAL LOADS[1,2,3] (lbs) C_D=1.6
			Plate	Blocking	
RBC	Inside	45 to 90°	6-10dx1 ½	6-10dx1 ½	445
	Outside	0 to 29°			435
		30 to 45°			480

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

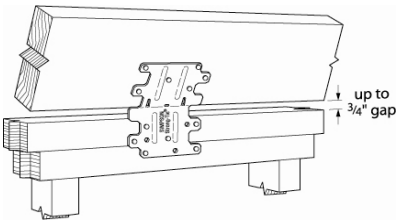
1. The loads have been increased using the tabulated value of C_D for wind or earthquake loading with no further increase allowed. Allowable loads shall be adjusted when other load durations govern.
2. Allowable loads are for one clip attached to blocking minimum 1½" thick.
3. RBCP replaces blocking fasteners with prongs. All load values are identical. Bend holes shall be aligned along lower edge of block as shown in Figure 13 below. All prongs in the RBCP shall be pressed (not hammered) into the block such that there is no more than a 1/32 inch gap between the face of the block and the bottom surface of the RBCP. RBCP prongs shall be installed in clear wood (no knots, etc.).
4. RBC/RBCP is shipped flat. Bending angle is measured from initial flat orientation. For inside installation, the bend angle = 90° - roof slope. For outside installation, the bend angle = roof slope.



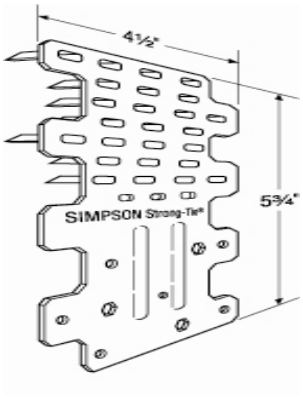
RBC



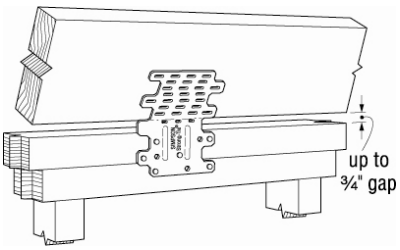
RBC Inside Installation (RBCP Similar)



RBC Outside Installation



RBCP



RBCP Outside Installation

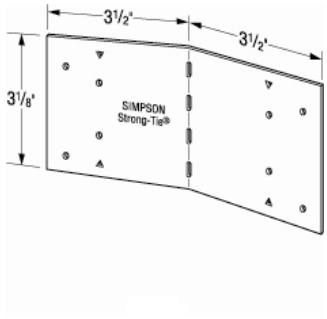
Figure 13 – RBC and RBCP Roof Boundary Clips

TABLE 14: ALLOWABLE LOADS FOR TJC37 TRUSS JACK CONNECTOR

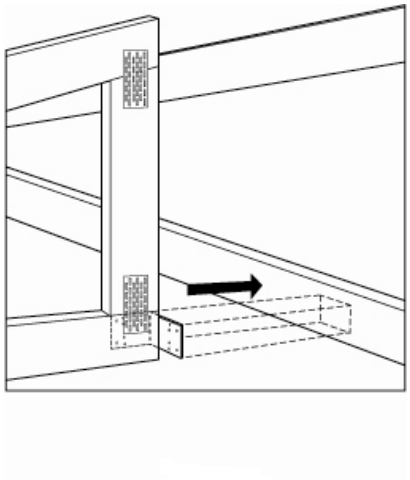
MODEL NO.	FASTENERS (Quantity-Type)		ALLOWABLE LOADS[1,2] Where C_D=1.0 C_D=1.15 C_D=1.25 C_D=1.6 (lbs.)		
	Carrying Member	Carried Member	0° Skew	1 to 60° Skew	61 to 67.5° Skew
TJC37	4-8dx1 ½	4-8dx1 ½	340	300	320
	6-8dx1 ½	6-8dx1 ½	580	485	425

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

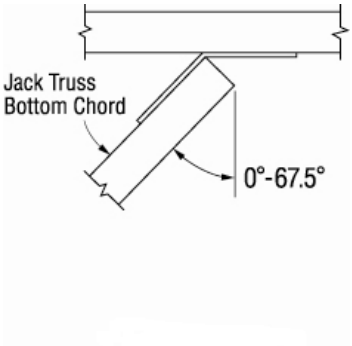
1. No load duration increase allowed.
2. Allowable loads are for vertical direction (uplift or download).



TJC37



TJC37 Typical Installation



TJC37 Bend Angles

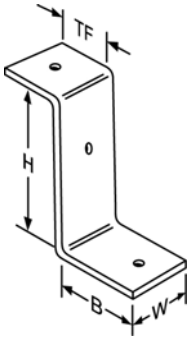
Figure 14 – TJC37 Truss Jack Connector

TABLE 15: ALLOWABLE LOADS FOR Z PANEL STIFFENER CLIPS

MODEL NO.	CLIP DIMENSIONS[1] (in)				FASTENERS (Quantity-Type)		ALLOWABLE DOWNLOAD Where C_D=1.0 C_D=1.15 C_D=1.25 C_D=1.6 (lbs.)
	W	H	B	TF	Top	Seat	
Z2	$2^{5}/_{16}$	$1^{1}/_{2}$	$1^{3}/_{8}$	$1^{3}/_{8}$	2-10d x $1^{1}/_{2}$	2-10d x $1^{1}/_{2}$	465
Z4	$1^{1}/_{2}$	$3^{1}/_{2}$	$2^{1}/_{8}$	$1^{3}/_{4}$	1-16d	1-16d	465
Z44	$2^{1}/_{2}$	$3^{1}/_{2}$	2	$1^{3}/_{8}$	2-16d	2-16d	865

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

1. Figure 15 provides definitions of clip dimension nomenclature (W, H, B, TF).
2. No load duration increase permitted.
3. Compression perpendicular-to-grain capacity for the joists bearing on the clips shall be verified in accordance with the applicable NDS edition and shall not exceed the allowable loads noted in the table.



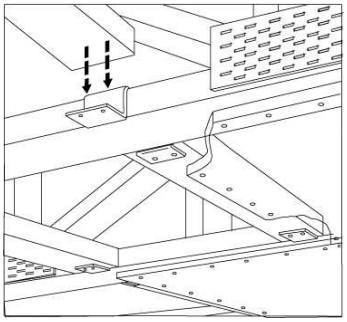


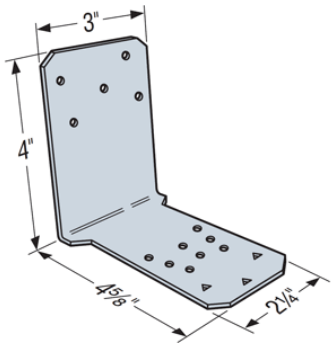
Figure 15 – Z Panel Stiffener Clips

TABLE 16: ALLOWABLE LOADS FOR FWANZ FOUNDATION WALL ANGLES

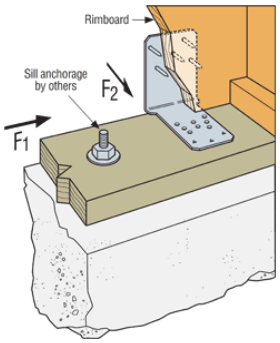
Model No.	Sill Plate	Fastener (Quantity-Type)		Rim Board Material	Allowable Load		
		Sill Plate	Rim Board		C_D = 0.90	C_D = 1.00	C_D = 1.60
FWANZ	2x4, 3x4, 2-2x4, 4x4	(8) 10d x 1½	(5) 10d x 1½	1" OSB	895	895	895
				1⅛" OSB	945	970	970
				1¾" I-Joist	945	1,050	1,275
				1¼" LSL	945	1,050	1,315
				2x DF/SP	945	1,050	1,410
				1¾" LVL	945	1,050	1,485
	2x6, 3x6, 2-2x6, 4x6	(11) 10d x 1½	(5) 10d x 1½	1" OSB	895	895	895
				1⅛" OSB	1,110	1,110	1,110
				1¾" I-Joist	1,135	1,135	1,135
				1¼" LSL	1,220	1,220	1,220
				2x DF/SP	1,300	1,440	1,445
				1¾" LVL	1,300	1,440	1,645

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

1. Tabulated allowable loads shall be selected based on duration of load as permitted by the applicable NDS edition.
2. FWANZ lateral F_1 load is equal to 310 lbs. No further increase in load permitted.
3. For simultaneous F_1 and F_2 loads, the connector shall be evaluated as follows: Design Lateral Parallel to Plate/Allowable Lateral Parallel to Plate + Design Lateral Perpendicular to Plate/Allowable Lateral Perpendicular to Plate ≤ 1.0. The number of terms in the equation is dependent on the utilization of the connector in the structural system.
4. For joist/blocking spacing greater than 16 inches on center. The FWANZ shall be located within 4 inches of the adjacent joist/blocking.
5. Splice joint not permitted on rim board in same bay as FWANZ unless blocking is placed on both sides of the splice joint.
6. When floor joists are parallel to the rimboard, the structural design professional shall ensure proper load transfer from rimboard into the diaphragm.
7. When I-joist rim material is used, backer blocks shall be used and installed according to the I-Joist manufacturer's instructions.



FWANZ



Typical Installation and Allowable Load Direction

Figure 16 – FWANZ Foundation Wall Angles