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ESR-2556

Reissued 11/2017
This report is subject to renewal 11/2019.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 23—WOOD, PLASTIC, AND COMPOSITE FASTENINGS

REPORT HOLDER:

JENWEST ENTERPRISES LLC dba ADVANCED CONNECTOR SYSTEMS

321 SOUTH 1250 WEST #15
LINDON, UTAH 84042

EVALUATION SUBJECT:

TIE STRAPS, FACE MOUNT JOIST HANGERS, FRAMING ANCHORS AND HURRICANE TIES

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

REPORT HOLDER:

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EVALUATION SUBJECT:

TIE STRAPS, FACE MOUNT JOIST HANGERS, FRAMING ANCHORS AND HURRICANE TIES

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Property evaluated:

Structural

2.0 USES

The Advanced Connector Systems ALSTA, AMSTA, ALSTI AST, AMSTI, AMST, and AMSTC Series Straight Tie Straps; and ACS, ACMST and ACMSTC16 Coiled Tie Strap, described in this report, are used as wood framing connectors to transfer between wood members wind or seismic loads resulting from the critical load combination in accordance with Section 1605.3 of the IBC where allowable stress equations are used. The straps may also be used in structures regulated by the IRC where an engineered design is submitted in accordance with IRC Section R301.1.3.

The Advanced Connector Systems ALUS, AHUS, AHHUS, AHGUS, AU, AHU, ASUR/L and AHSUR/L face-mount hangers; AH, ARSP4 hurricane ties; and AA, ALTP framing anchors described in this report are used as wood framing connectors in accordance with Section 2304.9.3 of the IBC. The products 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 Straight Tie Straps:

The Advances Connector Systems ALSTA, AMSTA, ALSTI, AST, AMSTI, AMST, and AMSTC Series straight tie straps are supplied in the manufacturer-designated lengths with prepunched holes for nails.

3.1.1 ALSTA and AMSTA Series: The ALSTA and AMSTA Series tie straps are $11^{1}/_{4}$ to $49^{3}/_{4}$ inches (286 to 1264 mm) long and $1^{1}/_{4}$ inches (31.8 mm) wide. Each strap has two rows of staggered 0.156-inch-diameter (3.96 mm) prepunched nail holes. Longitudinal spacing (pitch) of consecutive holes alternates $2^{1}/_{4}$ inches (57.2 mm) and $^{1}/_{2}$ inches (12.7 mm), and the transverse distance (gage) between staggered holes is $^{1}/_{2}$ inch (12.7 mm). See Figure 1 for a drawing of the ALSTA and AMSTA Series tie straps. See Table 1 for strap dimensions, fastener schedules, and allowable tension loads.

3.1.2 ALSTI Series: The ALSTI Series tie straps are either 48 or 72 inches (1219 or 1829 mm) long and $3^{3}/_{4}$ inches (95.3 mm) wide. Each strap has two rows of staggered 0.156-inch-diameter (3.96 mm) prepunched nail holes. Longitudinal spacing (pitch) of consecutive holes in a row is 3 inches (76.2 mm), and the transverse distance (gage) between staggered holes in a row is $^{3}/_{8}$ inch (9.5 mm) and 2 inches (50.8 mm) between the holes in two rows. See Figure 1 for a drawing of the ALSTI Series tie straps. See Table 1 for strap dimensions, fastener schedules, and allowable tension loads.

3.1.3 AST Series: The AST9, AST12, AST18, and AST 22 straps are $9^{3}/_{8}$ to $21^{5}/_{8}$ inches (267 to 549 mm) long and $1^{1}/_{4}$ inches (31.8 mm) wide. Each strap has unevenly staggered 0.156-inch-diameter (3.96 mm) prepunched nail holes spaced 1.228 inches (31 mm) on center. See Figure 1 for a drawing of the AST9, AST12, AST18, and AST 22 tie straps.

The AST292, AST2122, AST2215, AST6215, AST6224, and AST6236 straps are $10^{1}/_{2}$ to $34^{3}/_{4}$ inches (267 to 883 mm) long, and have a constant width of 2 inches (50.8 mm). Each AST strap has two rows of staggered 0.188-inch-diameter (4.8 mm) prepunched nail holes spaced at $^{7}/_{8}$ inch (22.2 mm) on center. The longitudinal spacing of consecutive holes in the same row is $1^{3}/_{4}$ inches (44.5 mm) on center and transverse distance between staggered holes is $1^{1}/_{4}$ inches (31.8 mm). See Figure 1 for a drawing of the AST292, AST2122, AST2215, AST6215, AST6224, and AST6236 tie straps.

The AST2115 tie strap is $16^5/_8$ inches (422 mm) long and ¾ inch (19.1 mm) wide, and has one row of 0.188-inch diameter (4.8 mm) prepunched nail holes, spaced at $1^5/_8$ inches (41.3 mm) on center. See Figure 1 for a drawing of the AST2115 tie strap.

See Table 1 for AST Series tie strap dimensions, fastener schedules, and allowable tension loads.

3.1.4 AMSTI Series: The AMSTI Series tie straps are $2^1/_{16}$ inches (52.4 mm) wide and from 26 to 72 inches (660 to 1829 mm) long. Each strap has three rows of 0.156-inch-diameter (3.96 mm) prepunched nail holes. The longitudinal spacing of consecutive holes in a row is 3 inches (76.2 mm) on center. The holes in adjacent rows are offset by 1 inch (25.4 mm), resulting in one nail hole per inch of strap. The transverse spacing between two holes is 0.813 inch (20.7 mm) and 0.5 inch (12.7 mm), respectively. See Figure 1 for a drawing of the AMSTI Series tie straps. See Table 1 for strap dimensions, fastener schedules, and allowable tension loads.

3.1.5 AMST Series: The AMST Series tie straps are 27 to 72 inches (786 to 1829 mm) long and 2 inches (50.8 mm) wide. Each strap has two rows of staggered 0.188-inch-diameter (4.8 mm) prepunched nail holes. The longitudinal spacing of consecutive holes is a row ranges from 1.68 inches (42.7 mm) to 1.77 inches (44.9 mm) on center. The transverse spacing between the staggered holes is $1^1/_4$ inches (31.8 mm) on center. See Figure 1 for a drawing of the AMST series ties straps. See Table 1 for strap dimensions, fastener schedules, and allowable loads.

3.1.6 AMSTC Series: The AMSTC Series tie straps are 32 to 78 inches (813 to 1981 mm) long and 3 inches (76.2 mm) wide. Each strap has two rows of staggered 0.188-inch-diameter (4.8 mm) prepunched holes. The longitudinal spacing of consecutive holes in a row is $1^1/_2$ inches (38.1 mm) on center and the transverse spacing of the staggered holes is 1.5 inches (38.1 mm) on center. See Figure 1 for a drawing of the AMSTC Series tie straps. See Table 1 for strap dimensions, fastener schedules, and allowable tension loads.

3.2 Coiled Tie Straps:

The ACS Series, ACMST Series, and ACMSTC16 tie straps are supplied in coils and are cut to a specified length at the jobsite for engineered applications where the connected wood members are not abutting each other.

3.2.1 ACS Series: The ACS14, ACS16, ACS18, ACS20, and ACS22 straps are supplied as 100-, 150-, 200-, 250-, and 300-foot-long (30.5, 45.7, 61.0, 76.2, and 91.4 m) coils, respectively. The coiled strap is $1^1/_4$ inches (31.8 mm) wide and has two rows of staggered 0.156-inch-diameter (3.96 mm) prepunched holes. The longitudinal spacing of the consecutive holes in each row is 2 inches (50.8 mm) on center. See Figure 2 for a drawing of the ACS Series tie straps and Figure 5 for a typical installation. See Table 2 for strap dimensions, fastener schedules, and allowable tension loads.

3.2.2 ACMST Series: The ACMST12 strap is supplied as a 40-foot-long (12.19 m) coil, and the ACMST14 strap is supplied as a $52^1/_2$-foot-long (16.0 m) coil. The coiled strap is 3 inches (76.2 mm) wide and has two rows of alternating prepunched round holes with 0.188-inch-diameter (4.8 mm). The longitudinal spacing of the alternating holes in each row is $1^3/_4$ inches (44.5 mm) on center. See Figure 4 for a drawing of the ACMST14 and ACMST12 tie strap, and Figure 5 for a typical installation. See Table 2 for strap dimensions, fastener schedules, and allowable tension loads.

3.2.3 ACMSTC16: The ACMSTC16 strap is supplied as a 54-foot-long (16.46 m) coil. The coiled strap is 3 inches (76.2 mm) wide and has two rows of prepunched alternating round holes with 0.188-inch-diameter (4.8 mm). The longitudinal spacing of the alternating adjacent holes is $1^1/_2$ inches (38.1 mm) and the transverse spacing between the adjacent alternating holes is $1^1/_2$-inch (38.1 mm). See Figure 3 for a drawing of the ACMSTC16 tie strap and Figure 5 for a typical installation. See Table 2 for strap dimensions, fastener schedules, and allowable tension loads.

3.3 Face-mount Hangers:

3.3.1 ALUS Series Hangers: The ALUS series hangers are formed from No. 18 gage galvanized steel. The hangers have prepunched holes for the installation of nails that are driven at a 45-degree to 50-degree angle through the joist and into the header, which is described as double shear nailing in the installation instructions. See Table 3 for the hanger dimensions, required fasteners, and allowable loads; and Figure 6 for a drawing of a typical ALUS series hanger.

3.3.2 AHUS and AHUSC Series Hangers: The AHUS and AHUSC series hangers are formed from No. 14 gage galvanized steel with the exception of the AHUS26, AHUS28, AHUS210, and AHUS1.81/10 hangers, which are formed from No. 16 gage galvanized steel. The AHUS models having a seat width (W) equal to $3^9/_{16}$ inches (90.5 mm) are available with concealed flanges and are specified with the model designation AHUSC. The hangers have prepunched holes for the installation of joist nails that are driven at a 45-degree to 50-degree angle through the joist and into the header, which is described as double shear nailing in the installation instructions. See Table 3 for the hanger dimensions, required fasteners, and allowable loads; and Figure 7 for a drawing of a typical AHUS series hanger.

3.3.3 AHHUS Series Hangers: The AHHUS series hangers are formed from No. 14 gage galvanized steel. The hangers have prepunched holes for the installation of joist nails that are driven at a 45-degree to 50-degree angle through the joist and into the header, which is described as double shear nailing in the installation instructions. See Table 3 for the hanger dimensions, required fasteners, and allowable loads; Figure 8 for a drawing of a typical AHHUS series hanger.

3.3.4 AHGUS Series Hangers: The AHGUS series hangers are formed from No. 12 or 11 gage galvanized steel. Refer to Table 4 for steel gage used in producing AHGUS series hangers. The hangers have prepunched holes for the installation of nails that are driven at a 45-degree to 50-degree angle through the joist and into the header, which is described as double shear nailing in the installation instructions. See Table 4 for the AHGUS series hanger model numbers, hanger dimensions, required fasteners, and allowable loads; and Figure 9 for a drawing of a typical AHGUS hanger.

3.3.5 AU Series Hangers: The AU series hangers are formed from No. 16 gage galvanized steel. The hangers have prepunched holes for the installation of nails. See Table 5 for the hanger dimensions, required fasteners, and allowable loads; and Figures 10 and 11 for drawings of a typical AU series hanger.

3.3.6 AHU and AHUC Series Hangers: The AHU and AHUC series hangers are formed from No. 14 gage

galvanized steel. AHU hangers having a width equal to or greater than $2^{9}/_{16}$ inches (65 mm) are available with concealed flanges and are specified with the model designation AHUC. The hangers have prepunched holes for the installation of nails. See Table 6 for the hanger width and height dimensions of specific model numbers and for the reference number to Table 6A. See Table 6A for the seat width range, the seat depth and the minimum height of the AHU series hangers, the required fasteners, and allowable loads. Refer to Figures 12 and 13 for a drawing of a typical AHU series hanger.

3.3.7 ASUR/L and ASUR/LC Series Hangers: The ASUR/L series hangers are formed from No. 16 gage galvanized steel. ASUR and ASUL are mirror-image identical hangers, skewed at 45 degrees right and left, respectively. The hangers have prepunched holes for the installation of nails. The 2-2x and 4x ASUR/L models are available with the A2 flanges concealed and are identified with the model designation ASUR/LC. See Table 7 for the hanger dimensions, required fasteners, and allowable loads; and Figure 14 for a drawing of typical ASUR/L series hangers.

3.3.8 AHSUR/L and AHSUR/LC Series Hangers: The AHSUR/L series hangers are formed from No. 14 gage galvanized steel. AHSUR and AHSUL are mirror-image identical hangers, skewed at 45 degrees right and left, respectively. The hangers have prepunched holes for the installation of nails. The 2-2x and 4x AHSUR/L models are available with the A2 flanges concealed and are identified with the model designation AHSUR/LC. See Table 7 for the hanger dimensions, required fasteners, and allowable loads; and Figure 14 for a drawing of typical ASUR/L series hangers.

3.4 Hurricane Ties:

The Advanced Connector Systems hurricane and seismic ties recognized in this report are installed to resist design forces on wood-frame construction resulting from the application of the most critical effects of the load combinations prescribed by code that include wind or seismic loads.

3.4.1 Hurricane Ties: Hurricane ties are used to anchor wood rafters or joists to wood wall plates or studs or to anchor wood studs to wood sill plates. The H1, H2, H2.5, and H3 hurricane ties are formed from No. 18 gage galvanized steel; and the ARSP4 hurricane tie is formed from No. 20 gage galvanized steel. The ties have prepunched holes for the installation of nails. See Table 8 for tie model numbers, tie dimensions, fastener schedules, and allowable loads. See Figures 15, 16, 17, 18, and 19 for drawings of the hurricane ties recognized in this report and Figure 20 for drawings of installation configurations with designated allowable load directions.

3.5 Framing Anchors:

3.5.1 The AA34 and AA35 framing anchors are used to tie two wood framing members together that are oriented perpendicular to each other. The anchors have prepunched holes for the installation of nails. See Figures 21 and 22. The AA35F and ALTP4 framing anchors are used to tie two wood members together parallel and in the same plane to each other. See figure 26. See Table 9 for model numbers, dimensions, fastener schedules, and allowable loads. See Figures 21, 22, 23, and 24, for drawings of the framing anchors recognized in this report and Figures 25 and 26 for drawings of installation configurations with designated allowable load directions.

3.6 Materials:

3.6.1 Tie Strap Steel: The tie straps described in this report are manufactured from galvanized steel complying with ASTM A653, SS designation, and minimum G90 zinc coating specifications. Refer to Tables 1 and 2 in this report for the minimum specified yield and tensile strengths, F_y and F_u, respectively, of the steel for each strap described in this report. The lumber treater or the holder of this evaluation report (JenWest Enterprises) 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.

3.6.2 Hanger, Hurricane Ties, and Framing Anchor Steel: All hangers, hurricane ties and framing anchors described in this report, with the exception of the HGUS series hangers, are manufactured from galvanized steel complying with ASTM A653 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). The HGUS series hangers are manufactured from galvanized steel complying with ASTM A653 designation, Grade 40 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). All hangers, hurricane ties and framing anchors have a minimum G90 zinc coating specification in accordance with ASTM A653. The lumber treater or the holder of this evaluation report (JenWest Enterprises) 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.

Minimum base-steel thicknesses for the hangers in this report are as follows:

Nominal Thickness (gage)	Base Steel Thickness (inches)
No. 10	0.1275
No. 11	0.1196
No. 12	0.0975
No. 14	0.0685
No. 16	0.0555
No. 18	0.0445
No. 20	0.0334
No. 22	0.0274

3.6.3 Wood: Wood members with which the tie straps, hangers, hurricane ties, and framing anchors are used must be either sawn lumber having a minimum specific gravity of 0.50 or engineered lumber having a minimum equivalent specific gravity of 0.50, and having a maximum moisture content of 19 percent (16 percent for engineered lumber), except as noted in Section 4.1. The hangers, hurricane ties, and framing anchors may also be used with structural glued laminated timbers with the same properties of sawn lumber. The thickness (depth) of the wood main member (header, beam, or ledger) must 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 (NDS) for Wood

Construction and its Supplement is taken into account, or as required by wood member design, whichever is greater.

3.6.4 Fasteners: Nails used for hangers described in this report must comply with ASTM F1667 and have the following minimum fastener dimensions and bending yield strengths (F_{yb}):

COMMON NAIL SIZE	SHANK DIAMETER (inches)	NAIL LENGTH (inches)	F_{yb} (psi)
8d x $1^1/_2$	0.131	$1^1/_2$	100,000
8d	0.131	$2^1/_2$	100,000
10d x $1^1/_2$	0.148	$1^1/_2$	90,000
10d	0.148	3	90,000
16d x $2^1/_2$	0.162	$2^1/_2$	90,000
16d	0.162	$3^1/_2$	90,000

Fasteners used in contact with preservative treated or fire retardant treated lumber must, as a minimum, comply with IBC Sections 2304.9.5, 2012 and 2009 IRC Section R317.3 or 2006 IRC Section R319.3, as applicable. The lumber treater must 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.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The tabulated allowable loads shown in this evaluation report are based on allowable stress design (ASD). These values include the load duration factor, C_D, corresponding to the applicable loads in accordance with the NDS, for cases in which the allowable load is governed by the calculated lateral or withdrawal load of the fasteners. Tabulated allowable loads are for applications in which the connectors are fastened to wood members used under continuous dry interior conditions, and where sustained temperatures are 100°F (37.8°C) or less. When the connectors are fastened 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 evaluation 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 tie strap 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.

5.0 CONDITIONS OF USE

The Advanced Connector Systems connectors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The connectors must be manufactured, identified, and installed in accordance with this report and the manufacturer's published installation instructions. A copy of the instructions must be at the jobsite at all time during construction.

5.2 Calculations showing compliance with this report must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statues of the jurisdiction in which the project is to be constructed.

5.3 Adjustment factors noted in Section 4.1 of this report and the applicable codes must be considered, where applicable.

5.4 Connected wood members and fasteners must comply, respectively, with Sections 3.6.3 and 3.6.4 of this report.

5.5 Use of connectors with preservative-treated and fire-retardant-treated lumber must be in accordance with Section 3.6.1 and Section 3.6.2 of this report. Use of fasteners with treated lumber must comply with Section 3.6.4 of this report.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Joist Hangers and Similar Devices (AC13), dated October 2010 (editorially revised December 2011).

6.2 Structural Calculations.

6.3 Quality documentation.

7.0 IDENTIFICATION

Each connector described in this report is identified with a die-stamped label indicating the name of the manufacturer (Advanced Connector Systems, or ACS), the model number, and the evaluation report number (ESR-2556).

TABLE 1—ALLOWABLE TENSION LOADS FOR ALSTA, AMSTA, ALSTI, AST, AFHA, AMSTI, AMST, AND AMSTC TIE STRAPS

MODEL SERIES	MODEL NUMBER	TIE STRAP PROPERTIES					NAILS[1] Total-Qty	ALLOWABLE TENSION LOADS[2,3,4,5](lbs.)
		Thickness (Gage No.)	Width (inches)	Length (inches)	Min. F_y (ksi)	Min. F_u (ksi)		C_D=1.6
ALSTA	ALSTA9	18	1 1/4	11 1/4	50	65	8-10d	750
	ALSTA12	18	1 1/4	14	50	65	10-10d	940
	ALSTA15	18	1 1/4	16 3/4	50	65	12-10d	1,130
	ALSTA18	18	1 1/4	19 1/2	50	65	14-10d	1,315
	ALSTA21	18	1 1/4	22 1/4	50	65	16-10d	1,505
	ALSTA24	18	1 1/4	25	50	65	18-10d	1,620[(5)]
	ALSTA30	16	1 1/4	30 1/2	50	65	22-10d	2,015[(5)]
	ALSTA36	16	1 1/4	36	50	65	26-10d	2,015[(5)]
AMSTA	AMSTA9	18	1 1/4	11 1/4	50	65	8-10d	750
	AMSTA12	18	1 1/4	14	50	65	10-10d	940
	AMSTA15	18	1 1/4	16 3/4	50	65	12-10d	1,130
	AMSTA18	18	1 1/4	19 1/2	50	65	14-10d	1,315
	AMSTA21	18	1 1/4	22 1/4	50	65	16-10d	1,505
	AMSTA24	16	1 1/4	25	50	65	18-10d	1,730
	AMSTA30	14	1 1/4	30 1/2	50	65	22-10d	2,190
	AMSTA36	14	1 1/4	36	50	65	26-10d	2,490[(5)]
	AMSTA49	14	1 1/4	49 3/4	50	55	26-10d	2,490[(5)]
ALSTI	ALSTI49	18	3 3/4	48	40	55	32-10d x 1 1/2	2,970
	ALSTI73	18	3 3/4	72	40	55	48-10d x 1 1/2	4,205[(5)]
AST	AST292	20	2	10 1/2	33	45	12-16d x 2 1/2	1,305
	AST2122	20	2	14	40	55	16-16d x 2 1/2	1,685[(5)]
	AST2115	18	3/4	16 5/8	40	55	10-16d x 2 1/2	725[(5)]
	AST2215	20	2	17 1/2	50	65	20-16d x 2 1/2	2,030[(5)]
	AST6215	16	2	17 1/2	33	45	20-16d x 2 1/2	2,210[)]
	AST6224	16	2	24 1/2	40	55	28-16d x 2 1/2	2,800[(5)]
	AST6236	14	2	34 3/4	50	65	40-16d x 2 1/2	4,165[(5)]
	AST9	16	1 1/4	9 3/8	40	55	8-16d x 2 1/2	900
	AST12	16	1 1/4	11 7/8	40	55	10-16d x 2 1/2	1,125
	AST18	16	1 1/4	17 3/4	40	55	14-16d x 2 1/2	1,570
	AST22	16	1 1/4	21 5/8	40	55	18-16d x 2 1/2	1,605[(5)]
AMSTI	AMSTI26	12	2 1/16	26	40	55	26-10d x 1 1/2	2,745
	AMSTI36	12	2 1/16	36	40	55	36-10d x 1 1/2	3,805
	AMSTI48	12	2 1/16	48	40	55	48-10d x 1 1/2	5,070
	AMSTI60	11	2 1/16	60	40	55	60-10d x 1 1/2	6,220[(5)]
	AMSTI72	11	2 1/16	72	40	55	72-10d x 1 1/2	6,220[(5)]
AMST	AMST27	12	2	27	40	55	32-16d x 2 1/2	3,700
	AMST37	12	2	37	50	65	42-16d x 2 1/2	5,360
	AMST48	12	2	48	50	65	50-16d x 2 1/2	5,855[(5)]
	AMST60	10	2	60	50	65	68-16d x 2 1/2	7,655[(5)]
	AMST72	10	2	72	50	65	68-16d x 2 1/2	7,655[(5)]
AMSTC	AMSTC28	16	3	32	50	65	36-16d sinker	3,465
	AMSTC40	16	3	42	50	65	52-16d sinker	4,985[(5)]
	AMSTC52	16	3	54	50	65	62-16d sinker	4,985[(5)]
	AMSTC66	14	3	66	50	65	76-16d sinker	6,150[(5)]
	AMSTC78	14	3	78	50	65	76-16d sinker	6,150[(5)]

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

(Continued)

TABLE 1 Notes (Continued):

[1] Total Fasteners are the minimum number of nails to achieve the tabulated allowable loads. One half of the total load must be installed in each wood member forming the connection. Fasteners must comply with Section3.6.4 of this report.

[2] Allowable tension loads are based on the steel straps connected to wood members having an assigned or equivalent minimum specific gravity of 0.50.

[3] Allowable tension loads are the lesser of the tie strap steel strength or the connection strength.

[4] Tabulated allowable tension loads are governed by connection strength, unless noted otherwise. Connection strength has been derived by multiplying the number of nails by the minimum value from the yield mode equations in Section 11.3.1 from the NDS, where the side member (i.e. the steel tie strap) dowel bearing strength, F_{es}, is equal to $2.2F_U/C_D$, where the load duration factor, C_D, equals 1.6 as shown in the table, and where the minimum specified tensile strength, F_u, of the steel strap is as shown in the table. The tabulated allowable tension loads governed by connection strength have been multiplied by the load duration factor, C_D, noted in the table.

[5] The tabulated allowable tension load is governed by steel strength, and does not include a one-third stress increase or the load duration factor, C_D. The steel strength is the lesser of the yielding at the gross section of the strap, the fracture in the net section away from the connection, or the fracture at the connection in accordance with Section C2 of AISI S100-07/S2-10 (2012 IBC), Secton C2 of AISI S100-07 (2009 IBC) or AISI-NAS-01 (North American Specification for the Design of Cold-formed Steel Structural Members, including the 2004 Supplement) (2006 IBC).

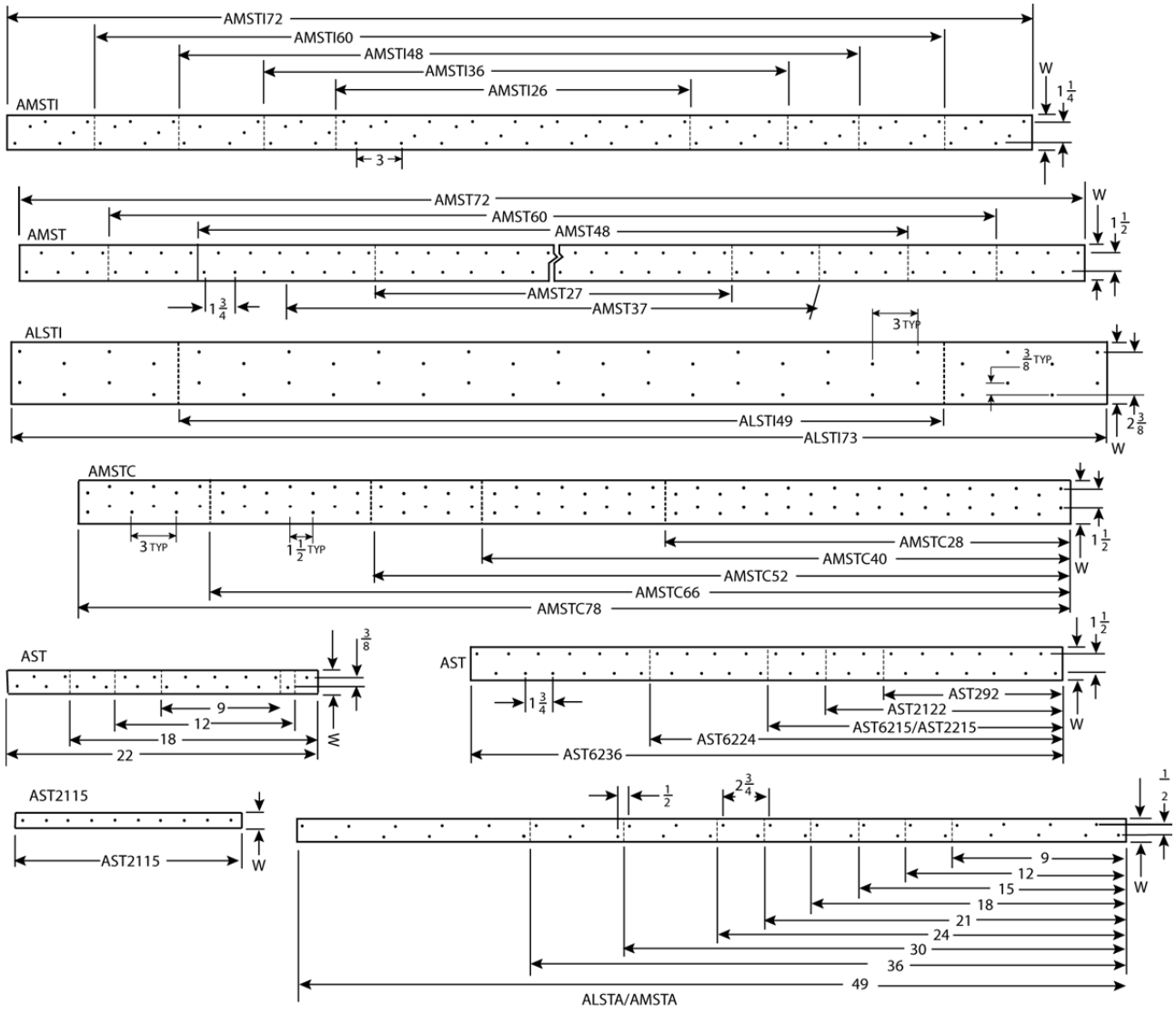

FIGURE 1—STRAP TIES

TABLE 2—ALLOWABLE TENSION LOADS FOR ACS, ACMST AND ACMST TIE STRAPS

MODEL SERIES	MODEL NUMBER	TIE STRAP PROPERTIES					NAILS[1] (Qty-Size)	ALLOWABLE TENSION LOADS[2,3] (inches)	
		Thickness (Gage-No.)	Width (inches)	Length (inches)	Min. F_y (ksi)	Min. F_u (ksi)		Based on Connection Strength C_D=1.60	Based on Steel Strength
ACS	ACS14	14	$1^1/_4$	Cut to Length	50	65	30-10d common	2,990	2,490
							36-8d common	3,005	2,490
	ACS16	16	$1^1/_4$	Cut to Length	50	65	22-10d common	2,115	2,015
							26-8d common	2,085	2,015
	ACS18	18	$1^1/_4$	Cut to Length	50	65	18-10d common	1,690	1,620
							22-8d common	1,720	1,620
	ACS20	20	$1^1/_4$	Cut to Length	40	55	14-10d common	1,295	1,215
							18-8d common	1,380	1,215
	ACS22	22	$1^1/_4$	Cut to Length	40	55	12-10d common	1,105	995
							14-8d common	1,065	995
ACMST	ACMST12	12	3	Cut to Length	50	65	84-16d common	10,720	9,215
							96-10d common	10,980	9,215
	ACMST14	14	3	Cut to Length	50	65	66-16d common	7,745	6,475
							78-10d common	7,770	6,475
ACMSTC	ACMSTC16	16	3	Cut to Length	50	65	56-16d sinker	5,390	4,980

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

[1] Total Fasteners are the minimum number of nails to achieve the tabulated allowable loads. One half of the total load must be installed in each wood member forming the connection.

[2] Allowable tension loads are based on the steel straps connected to wood members having an assigned or equivalent minimum specific gravity of 0.50.

[3] Allowable tension loads are the lesser of the tie strap steel strength or the connection strength.

[4] Allowable tension loads based on connection strength have been derived by multiplying the number of nails by the minimum value from the yield mode equations in Section 11.3.1from the NDS, where the side member (i.e. the steel tie strap) dowel bearing strength, F_{es}, is equal to $2.2F_u/C_D$, where the load duration factor, C_D, equals to 1.6 as shown in the table, and where the minimum specified tensile strength, F_u, of the steel strap is as shown in the table. The tabulated allowable tension loads governed by connection strength have been multiplied by the load duration factor, C_D, noted in the table.

[5] The tabulated allowable tension load is governed by steel strength, and does not include a one-third stress increase or the load duration factor, C_D. The steel strength is the lesser of the yielding at the gross section of the strap, the fracture in the net section away from the connection, or the fracture at the connection in accordance with Section C2 of AISI S100-07/S2 (2012 IBC), Section C2 of AISI S100-07 (2009 IBC), or AISI-NAS-01 (North American Specification for the Design of Cold-formed Steel Structural Members, including the 2004 Supplement) (2006 IBC).

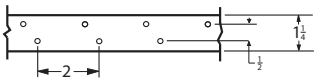

Figure 2—ACS SERIES STRAP TIE

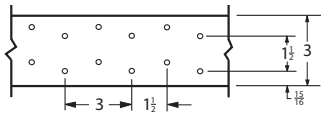

Figure 3—ACMSTC16 TIE STRAP SERIES STRAP TIE

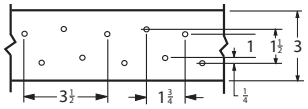

FIGURE 4—ACMST12 & ACMST14 SERIES STRAP TIE

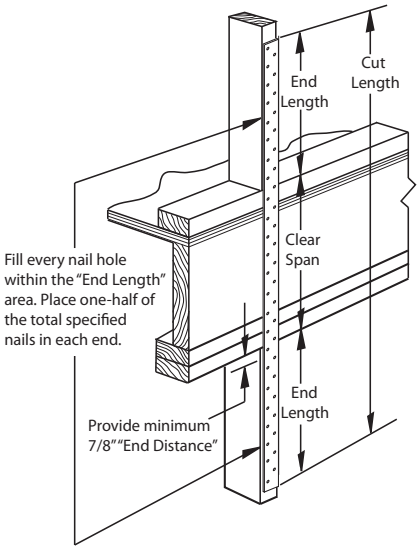

FIGURE 5—TYPICAL INSTALLATION OF ACS, ACMST, AND ACMSTC TIE STRAPS

TABLE 3—ALLOWABLE LOADS FOR THE ALUS/AHUS/AHHUS SERIES JOIST HANGERS

MODEL NUMBER	DIMENSIONS[1] (inches)			COMMON NAILS[2] (Quantity-Type)		ALLOWABLE LOADS[3,4] (lbs)			
						Uplift[6]	Download		
	W	H	B	Header	Joist[5]	C_D=1.6	C_D =1.0	C_D =1.15	C_D =1.25
ALUS24	1 9/16	3 1/8	1 1/2	4-10d	2-10d	620	710	810	875
ALUS26	1 9/16	4 3/4	1 1/2	6-10d	4-10d	1,145	1,180	1,350	1,460
ALUS28	1 9/16	6 5/8	1 1/2	8-10d	6-10d	1,830	1,655	1,765	1,765
ALUS210	1 9/16	8 1/16	1 1/2	10-10d	6-10d	1,830	1,815	1,815	1,815
ALUS24-2	3 1/8	3 5/16	2	4-16d	2-16d	670	845	965	1,045
ALUS26-2	3 1/8	5 3/16	2	4-16d	4-16d	1,190	1,410	1,610	1,745
ALUS28-2	3 1/8	7 3/16	2	6-16d	4-16d	1,190	1,410	1,610	1,745
ALUS210-2	3 1/8	9 3/16	2	8-16d	6-16d	2,965	1,975	2,255	2,445
ALUS214-2	3 1/8	10 11/16	2	10-16d	6-16d	2,965	2,255	2,545	2,545
ALUS26-3	4 5/8	5 3/16	2	4-16d	4-16d	1,190	1,410	1,610	1,745
ALUS28-3	4 5/8	7 3/16	2	6-16d	4-16d	1,190	1,410	1,610	1,745
ALUS210-3	4 5/8	9 3/16	2	8-16d	6-16d	2,965	1,975	2,255	2,445
ALUS36	2 9/16	5 3/16	2	4-16d	4-16d	1,190	1,410	1,610	1,745
ALUS310	2 9/16	7 3/16	2	6-16d	4-16d	1,190	1,975	2,255	2,395
ALUS44	3 9/16	3 5/16	2	4-16d	2-16d	670	845	965	1,045
ALUS46	3 9/16	5 3/16	2	6-16d	4-16d	1,190	1,410	1,610	1,745
ALUS48	3 9/16	7 3/16	2	4-16d	4-16d	1,190	1,410	1,610	1,745
ALUS410	3 9/16	9 3/16	2	8-16d	6-16d	2,965	1,975	2,255	2,445
ALUS414	3 9/16	10 11/16	2	10-16d	6-16d	2,965	2,255	2,575	2,790
AHUS26	1 9/16	5 3/16	3	14-16d	6-16d	1,785	3,150	3,260	3,260
AHUS28	1 9/16	7 1/8	3	22-16d	8-16d	2,115	3,685	3,685	3,685
AHUS210	1 9/16	9 1/8	3	30-16d	10-16d	3,025	3,685	3,685	3,685
AHUS46/AHUSC46	3 9/16	4 31/32	2	4-16d	4-16d	1,600	1,685	1,685	1,685
AHUS48/AHUSC48	3 9/16	6 31/32	2	6-16d	6-16d	1,600	2,585	2,775	2,775
AHUS410/AHUSC410	3 9/16	8 31/32	2	8-16d	8-16d	3,190	3,445	3,935	4,005
AHUS412/AHUSC412	3 9/16	10 15/32	2	10-16d	10-16d	4,155	4,005	4,005	4,005
AHUS26-2	3 1/8	5 3/16	2	4-16d	4-16d	1,600	1,685	1,685	1,685
AHUS28-2	3 1/8	7 3/16	2	6-16d	6-16d	1,600	2,585	2,775	2,775
AHUS210-2	3 1/8	9 3/16	2	8-16d	8-16d	3,190	3,445	3,935	4,005
AHUS212-2	3 1/8	10 11/16	2	10-16d	10-16d	4,155	4,005	4,005	4,005
AHUS1.81/10	1 13/16	9 1/8	3	30-16d	10-16d	3,025	4,680	4,680	4,680
AHHUS26-2	3 5/16	5 3/16	3 1/4	14-16d	6-16d	2,300	2,930	3,325	3,335
AHHUS28-2	3 5/16	7	3 1/4	22-16d	8-16d	2,300	4,400	4,990	4,990
AHHUS210-2	3 5/16	9	3 1/4	30-16d	10-16d	3,780	5,875	6,655	6,710
AHHUS46	3 5/8	5 3/16	3 1/4	14-16d	6-16d	2,300	2,930	3,325	3,335
AHHUS48	3 5/8	7	3 1/4	22-16d	8-16d	2,300	4,400	4,990	4,990
AHHUS410	3 5/8	9	3 1/4	30-16d	10-16d	3,780	5,875	6,655	6,710

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

[1] Refer to Figure 7 on this page for definitions of hanger nomenclature (W, H, B).
[2] Refer to Section 3.6.4 of this report for nail sizes and required minimum physical properties.
[3] Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
[4] When ALUS, AHUS and AHHUS Series hangers support joists, they provide torsional resistance, which is defined as a moment not less than 75 pounds (334N) times the depth of the joist at which the lateral movement of the top or bottom of the joist with respect to the vertical position of the joist is 0.125 inch (3.2mm).
[5] Joist nails must be driven at a 45- to 50-degree angle through the joist into the header/beam (double shear nailing) to achieve the tabulated loads.
[6] Allowable uplift loads have been increased for wind or earthquake loading with no further increase allowed. The allowable uplift loads must be reduced when other load durations govern.

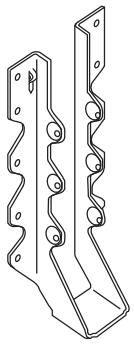

FIGURE 6—ALUS HANGER

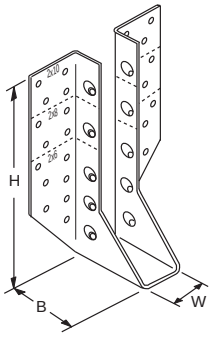

FIGURE 7—AHUS HANGER

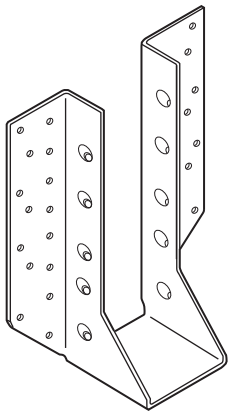

FIGURE 8—AHHUS HANGER

TABLE 4—ALLOWABLE LOADS FOR THE AHGUS SERIES JOIST HANGERS

MODEL NUMBER	GAGE	DIMENSIONS[1] (inches)			COMMON NAILS[2] (Quantity-Type)		ALLOWABLE LOADS[3,4] (lbs)			
							Uplift[5]	Download		
		W	H	B	Header	Joist	C_D=1.6	C_D=1.0	C_D=1.15	C_D=1.25
AHGUS26	12	1 5/8	5	4	20-16d	8-16d	2,300	4,090	4,090	4,090
AHGUS26-2	12	3 5/16	5	4	20-16d	8-16d	2,300	4,555	4,870	4,870
AHGUS26-3	12	4 15/16	5	4	20-16d	8-16d	2,300	4,555	4,870	4,870
AHGUS26-4	12	6 9/16	5	4	20-16d	8-16d	2,300	4,555	4,870	4,870
AHGUS28	12	1 5/8	7	4	34-16d	12-16d	3,265	5,365	5,365	5,365
AHGUS28-2	12	3 5/16	7	4	34-16d	12-16d	3,265	7,515	8,230	8,230
AHGUS28-3	12	4 15/16	7	4	34-16d	12-16d	3,265	7,515	8,230	8,230
AHGUS28-4	12	6 9/16	7	4	34-16d	12-16d	3,265	7,515	8,230	8,230
AHGUS210-2	11	3 5/16	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS210-3	11	4 15/16	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS210-4	11	6 9/16	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS212-3	11	4 15/16	11	4	54-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS212-4	11	6 9/16	11	4	54-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS214-3	11	4 15/16	13	4	64-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS214-4	11	6 11/16	13	4	64-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS46	12	3 5/8	5	4	20-16d	8-16d	2,300	4,555	4,870	4,870
AHGUS48	12	3 5/8	7	4	34-16d	12-16d	3,265	7,515	8,230	8,230
AHGUS410	11	3 5/8	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS412	11	3 5/8	11	4	54-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS414	11	3 5/8	13	4	64-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS2.75/10	11	2 3/4	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS2.75/12	11	2 3/4	11	4	54-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS2.75/14	11	2 3/4	13	4	64-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS3.25/10	11	3 1/4	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS3.25/12	11	3 1/4	11	4	54-16d	18-16d	5,480	10,295	10,295	10,295
AHGUS3.25/14	11	3 1/4	13	4	64-16d	18-16d	5,480	10,295	10295	10,295
AHGUS5.25/10	11	5 1/4	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS5.25/12	11	5 1/4	11	4	54-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS5.25/14	11	5 1/4	13	4	64-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS5.50/10	11	5 1/2	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS5.50/12	11	5 1/2	11	4	54-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS5.50/14	11	5 1/2	13	4	64-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS7.25/10	11	7 1/4	9	4	44-16d	14-16d	5,480	10,015	10,015	10,015
AHGUS7.25/12	11	7 1/4	11	4	54-16d	18-16d	5,480	11,455	11,455	11,455
AHGUS7.25/14	11	7 1/4	13	4	64-16d	18-16d	5,480	11,455	11,455	11,455

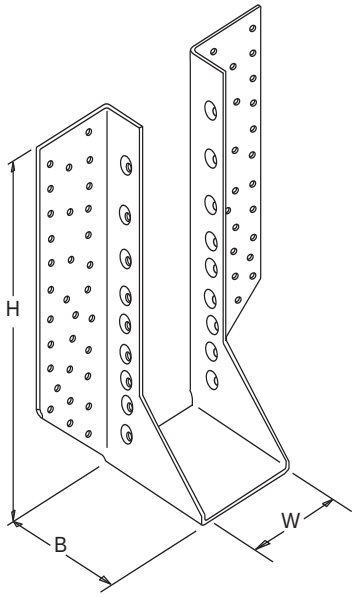

FIGURE 9—AHGUS HANGERS

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

[1] Refer to Figure 9 (this page) for definitions of hanger nomenclature (W, H, B).

[2] Refer to Section 3.6.4 of this report for nail sizes and required minimum physical properties. Joist nails must be driven at a 45- to 50-degree angle through the joist into the header/beam (double shear nailing) to achieve the tabulated loads.

[3] Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.

[4] When AHGUS Series hangers support joists, they provide torsional resistance, which is defined as a moment not less than 75 pounds (334N) times the depth of the joist at which the lateral movement of the top or bottom of the joist with respect to the vertical position of the joist is 0.125 inch (3.2 mm).

[5] Allowable uplift loads have been increased for wind or earthquake loading with no further increase allowed. The allowable uplift loads must be reduced when other load durations govern.

TABLE 5—ALLOWABLE LOADS FOR THE AU SERIES JOIST HANGERS

MODEL NUMBER	DIMENSIONS[1] (inches)			COMMON NAILS[2] (Quantity-Type)		ALLOWABLE LOADS[3,4,5] (lbs)						
						Uplift[6]	Download					
	W	H	B	Header[5]	Joist	C_D=1.6	C_D=1.0		C_D=1.15		C_D=1.25	
							10d	16d	10d	16d	10d	16d
AU24	$1^{9}/_{16}$	3	2	4	2-10d x $1^{1}/_{2}$	295	485	575	550	655	595	705
AU26	$1^{9}/_{16}$	$4^{5}/_{8}$	2	6	4-10d x $1^{1}/_{2}$	585	730	865	825	980	890	1,055
AU210	$1^{9}/_{16}$	$7^{3}/_{4}$	2	10	6-10d x $1^{1}/_{2}$	1,005	1,215	1,440	1,375	1,635	1,485	1,760
AU214	$1^{9}/_{16}$	$10^{1}/_{8}$	2	12	8-10d x $1^{1}/_{2}$	1,005	1,460	1,730	1,655	1,960	1,780	2,030
AU34	$2^{9}/_{16}$	$2^{2}/_{32}$	2	4	2-10d x $1^{1}/_{2}$	295	485	575	550	655	595	705
AU36	$2^{9}/_{16}$	$4^{23}/_{32}$	2	8	4-10d x $1^{1}/_{2}$	585	975	1,150	1,100	1,305	1,185	1,410
AU310	$2^{9}/_{16}$	$8^{7}/_{32}$	2	14	6-10d x $1^{1}/_{2}$	1,110	1,705	2,015	1,930	2,285	2,075	2,465
AU314	$2^{9}/_{16}$	$10^{7}/_{32}$	2	16	6-10d x $1^{1}/_{2}$	1,110	1,945	2,305	2,205	2,615	2,375	2,820
AU24-2	$3^{1}/_{8}$	$3^{3}/_{16}$	2	4	2-10d	370	485	575	550	655	595	705
AU26-2	$3^{1}/_{8}$	$5^{3}/_{16}$	2	8	4-10d	740	975	1,150	1,100	1,305	1,185	1,410
AU210-2	$3^{1}/_{8}$	$8^{11}/_{16}$	2	14	6-10d	1,110	1,705	2,015	1,930	2,285	2,075	2,465
AU44	$3^{9}/_{16}$	$2^{23}/_{32}$	2	4	2-10d	370	485	575	550	655	595	705
AU46	$3^{9}/_{16}$	$4^{31}/_{32}$	2	8	4-10d	740	975	1,150	1,100	1,305	1,185	1,410
AU410	$3^{9}/_{16}$	$8^{15}/_{32}$	2	14	6-10d	1,110	1,705	2015	1,930	2,285	2,075	2,465
AU414	$3^{9}/_{16}$	$10^{15}/_{32}$	2	16	6-10d	1,110	1,945	2,305	2,205	2,615	2,375	2,820
AU26-3	$4^{11}/_{16}$	$5^{3}/_{32}$	2	8	4-10d	740	975	1,150	1,100	1,305	1,185	1,410
AU66	$5^{1}/_{2}$	$4^{3}/_{4}$	2	8	4-10d	740	975	1,150	1,100	1,305	1,185	1,410
AU610	$5^{1}/_{2}$	$8^{1}/_{4}$	2	14	6-10d	1,110	1,705	2,015	1,930	2,285	2,075	2,465
AU210-3	$4^{11}/_{16}$	$8^{21}/_{32}$	2	14	6-10d	1,110	1,705	2,015	1,930	2,285	2,075	2,465
AU24R	2	3	2	4	2-10d x $1^{1}/_{2}$	295	485	575	550	655	595	705
AU26R	2	5	2	8	4-10d x $1^{1}/_{2}$	585	975	1,150	1,100	1,305	1,185	1,410
AU210R	2	$8^{1}/_{2}$	2	14	6-10d x $1^{1}/_{2}$	1,005	1,705	2,015	1,930	2,030	2,030	2,030
AU44R	4	$2^{3}/_{4}$	2	4	2-16d	415	485	575	550	655	595	705
AU46R	4	$4^{3}/_{4}$	2	8	4-16d	875	975	1,150	1,100	1,305	1,185	1,410
AU410R	4	$8^{1}/_{4}$	2	14	6-16d	1,325	1,705	2,015	1,930	2,285	2,075	2,465
AU66R	6	5	2	8	4-16d	875	975	1,150	1,100	1,305	1,185	1,410
AU610R	6	$8^{1}/_{2}$	2	14	6-16d	1,325	1,705	2,015	1,930	2,285	2,075	2,465

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

[1] Refer to Figures 10 and 11 (this page) for definitions of hanger nomenclature (W,H,B).
[2] Refer to Section 3.6.4 of this report for nail sizes and required minimum physical properties.
[3] Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
[4] When AU Series hangers support joists, they provide torsional resistance, which is defined as a moment not less than 75 pounds (334N) times the depth of the joist at which the lateral movement of the top or bottom of the joist with respect to the vertical position of the joist is 0.125 inch (3.2mm).
[5] The quantity of 10d or 16d common nails specified in the "Header" column under "Fasteners" is required to achieve the tabulated allowable loads shown in the Allowable Download "10d" or "16d" columns.
[6] Allowable uplift loads are for hangers installed with either 10d or 16d common nails into the supporting header/beam, and have been increased for wind or earthquake loading with no further increase allowed. The allowable uplift loads must be reduced when other load durations govern.

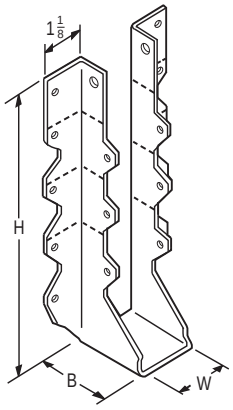

FIGURE 10—AU HANGER 2x SIZES

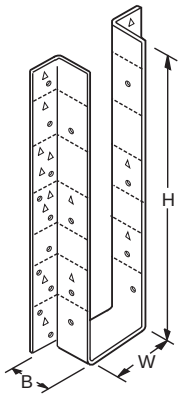

FIGURE 11—AU HANGER ALL OTHER SIZES

TABLE 6—APPLICABLE MODEL NUMBERS FOR THE AHU SERIES JOIST HANGERS

MODEL NUMBER	TABLE 6A[2] REF. NO.	DIMENSIONS[1] (inches)		MODEL NUMBER	TABLE 6A[2] REF. No.	DIMENSIONS[1] (inches)		MODLE NUMBER	TABLE 6A[2] REF. NO.	DIMENSIONS[1] (inches)	
		W	H			W	H			W	H
AHU24-2	12	$3^{1}/_{8}$	$3^{3}/_{16}$	AHU34	1	$2^{9}/_{16}$	$2^{23}/_{32}$	AHU810 Min	27B	$7^{1}/_{2}$	$8^{1}/_{4}$
AHU26	1	$1^{9}/_{16}$	3	AHU36	3	$2^{9}/_{16}$	$4^{23}/_{32}$	AHU810 Max	30	$7^{1}/_{2}$	$8^{1}/_{4}$
AHU26-2 Min	13	$3^{1}/_{8}$	$5^{3}/_{16}$	AHU38	5	$2^{9}/_{16}$	$6^{7}/_{32}$	AHU812 Min	28	$7^{1}/_{2}$	$10^{1}/_{4}$
AHU26-2 Max	15	$3^{1}/_{8}$	$5^{3}/_{16}$	AHU310	8	$2^{9}/_{16}$	$8^{7}/_{32}$	AHU812 Max	33	$7^{1}/_{2}$	$10^{1}/_{4}$
AHU26-3 Min	13	$4^{11}/_{16}$	$5^{3}/_{32}$	AHU312	9	$2^{9}/_{16}$	$10^{7}/_{32}$	AHU814 Mi	29	$7^{1}/_{2}$	$12^{1}/_{4}$
AHU26-3 Max	15	$4^{11}/_{16}$	$5^{3}/_{32}$	AHU314	10	$2^{9}/_{16}$	$12^{7}/_{32}$	AHU814 Max	34	$7^{1}/_{2}$	$12^{1}/_{4}$
AHU28	2	$1^{9}/_{16}$	$4^{5}/_{8}$	AHU316	11	$2^{9}/_{16}$	$13^{7}/_{32}$	AHU816 Min	31	$7^{1}/_{2}$	$13^{1}/_{4}$
AHU28-2 Min	14	$3^{1}/_{8}$	$6^{11}/_{16}$	AHU44	12	$3^{9}/_{16}$	$2^{31}/_{32}$	AHU816 Max	35	$7^{1}/_{2}$	$13^{1}/_{4}$
AHU28-2 Max	16A	$3^{1}/_{8}$	$6^{11}/_{16}$	AHU46 Min	13	$3^{9}/_{16}$	$4^{31}/_{32}$	AHU3.25/10.5	21	$3^{1}/_{4}$	$10^{1}/_{4}$
AHU28-3 Min	14	$4^{11}/_{16}$	$6^{21}/_{32}$	AHU46 Max	15	$3^{9}/_{16}$	$4^{31}/_{32}$	AHU3.25/12	22	$3^{1}/_{4}$	$11^{3}/_{4}$
AHU28-3 Max	16A	$4^{11}/_{16}$	$6^{21}/_{32}$	AHU48 Min	14	$3^{9}/_{16}$	$6^{15}/_{32}$	AHU5.125/12	32	$5^{1}/_{4}$	$10^{1}/_{4}$
AHU28-4 Min	25	$6^{1}/_{8}$	$6^{7}/_{8}$	AHU48 Max	16A	$3^{9}/_{16}$	$6^{15}/_{32}$	AHU5.125/13.5	35	$5^{1}/_{4}$	$13^{1}/_{4}$
AHU28-4 Max	27A	$6^{1}/_{8}$	$6^{7}/_{8}$	AHU410 Min	16B	$3^{9}/_{16}$	$8^{15}/_{32}$	AHU5.125/16	35	$5^{1}/_{4}$	$13^{7}/_{8}$
AHU210	4	$1^{9}/_{16}$	$6^{3}/_{8}$	AHU410 Max	19	$3^{9}/_{16}$	$8^{15}/_{32}$				
AHU210-2 Min	16B	$3^{1}/_{8}$	$8^{11}/_{16}$	AHU412 Min	17	$3^{9}/_{16}$	$10^{15}/_{32}$				
AHU210-2 Max	19	$3^{1}/_{8}$	$8^{11}/_{16}$	AHU412 Max	21	$3^{9}/_{16}$	$10^{15}/_{32}$				
AHU210-3 Min	16B	$4^{11}/_{16}$	$8^{21}/_{32}$	AHU414 Min	18	$3^{9}/_{16}$	$12^{15}/_{32}$				
AHU210-3 Max	19	$4^{11}/_{16}$	$8^{21}/_{32}$	AHU414 Max	22	$3^{9}/_{16}$	$12^{15}/_{32}$				
AHU210-4 Min	27B	$6^{1}/_{8}$	$8^{7}/_{16}$	AHU416 Min	20	$3^{9}/_{16}$	$13^{15}/_{32}$				
AHU210-4 Max	30	$6^{1}/_{8}$	$8^{7}/_{16}$	AHU416 Max	23	$3^{9}/_{16}$	$13^{15}/_{22}$				
AHU212	6	$1^{9}/_{16}$	$7^{3}/_{4}$	AHU66 Min	24	$5^{1}/_{2}$	$4^{3}/_{4}$				
AHU212-2 Min	17	$3^{1}/_{8}$	$10^{11}/_{16}$	AHU66 Max	26	$5^{1}/_{2}$	$4^{3}/_{4}$				
AHU212-2 Max	21	$3^{1}/_{8}$	$10^{11}/_{16}$	AHU68 Min	25	$5^{1}/_{2}$	$6^{1}/_{4}$				
AHU212-3 Min	17	$4^{11}/_{16}$	$10^{21}/_{32}$	AHU68 Max	27A	$5^{1}/_{2}$	$6^{1}/_{4}$				
AHU212-3 Max	21	$4^{11}/_{16}$	$10^{21}/_{32}$	AHU610 Min	27A	$5^{1}/_{2}$	$8^{1}/_{4}$				
AHU214	7	$1^{9}/_{16}$	$10^{1}/_{8}$	AHU610 Max	30	$5^{1}/_{2}$	$8^{1}/_{4}$				
AHU214-2 Min	18	$3^{1}/_{8}$	$12^{11}/_{16}$	AHU612 Min	28	$5^{1}/_{2}$	$10^{1}/_{4}$				
AHU214-2 Max	22	$3^{1}/_{8}$	$12^{11}/_{16}$	AHU612 Max	33	$5^{1}/_{2}$	$10^{1}/_{4}$				
AHU214-3 Min	18	$4^{11}/_{16}$	$12^{21}/_{32}$	AHU614 Min	29	$5^{1}/_{2}$	$12^{1}/_{4}$				
AHU214-3 Max	22	$4^{11}/_{16}$	$12^{21}/_{32}$	AHU614 Max	34	$5^{1}/_{2}$	$12^{1}/_{4}$				
AHU216-2 Min	20	$3^{1}/_{8}$	$13^{11}/_{16}$	AHU616 Min	31	$5^{1}/_{2}$	$13^{1}/_{4}$				
AHU216-2 Max	23	$3^{1}/_{8}$	$13^{11}/_{16}$	AHU616 Max	35	$5^{1}/_{2}$	$13^{1}/_{4}$				
AHU216-3 Min	20	$4^{11}/_{16}$	$13^{21}/_{32}$	AHU88 Min	25	$7^{1}/_{2}$	$6^{1}/_{4}$				
AHU216-3 Max	23	$4^{11}/_{16}$	$13^{21}/_{32}$	AHU88 Max	27A	$7^{1}/_{2}$	$6^{1}/_{4}$				

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

[1] Refer to Figures 12 and 13 (Next page) for definitions of hanger nomenclature (W, H).

[2] For allowable loads of each specific model number shown in the chart above refer to Table 6A on the next page. Match the “Reference Number” shown in Table 6 to the corresponding “Reference Number” shown in table 6A.

TABLE 6A—ALLOWABLE LOADS FOR THE AHU AND AHUC SERIES JOIST HANGERS

MODEL[3]	DIMENSIONS[1] (inches)			TABLE 6[7] REF. NO.	FASTENERS[2] (Quantity-Type)		ALLOWABLE LOADS[4,5,6] (lbs)			
	W	H (min)	B				Uplift	Download		
					Header	Joist	C_D=1.6	C_D=1.0	C_D=1.15	C_D=1.25
AHU AHUC	1 1/2 to 3	2 23/32	2	1	4-16d	2-10d x 1 1/2	295	595	670	725
		4 5/8	2	2	6-16d	4-10d x 1 1/2	585	895	1,010	1,085
		4 23/32	2	3	8-16d	4-10d x 1 1/2	585	1,190	1,345	1,445
		6 3/8	2	4	8-16d	6-10d x 1 1/2	1,005	1,190	1,345	1,445
		6 7/32	2	5	10-16d	4-10d x 1 1/2	585	1,490	1,510	1,510
		7 3/4	2	6	10-16d	6-10d x 1 1/2	1,005	1,490	1,680	1,805
		10 1/8	2	7	12-16d	6-10d x 1 1/2	1,005	1,785	2,015	2,030
		8 7/32	2	8	14-16d	6-10d x 1 1/2	1,135	2,085	2,350	2,530
		10 7/32	2	9	16-16d	6-10d x 1 1/2	1,135	2,380	2,685	2,790
		12 7/32	2	10	18-16d	8-10d x 1 1/2	1,515	2,680	3,015	3,100
		13 7/32	2	11	20-16d	8-10d x 1 1/2	1,515	2,885	3,015	3,100
	3 to 4 1/2	2 31/32	2	12	4-16d	2-10d	380	595	670	725
		4 31/32	2	13	8-16d	4-10d	760	1,190	1,345	1,445
		6 15/32	2	14	10-16d	4-10d	760	1,490	1,680	1,680
		4 31/32	2	15	12-16d	6-10d	1,135	1,790	2,015	2,165
		6 15/32	2	16A	14-16d	6-10d	1,135	2,085	2,350	2,530
		8 15/32	2	16B	14-16d	6-10d	1,135	2,085	2,350	2,530
		10 15/32	2	17	16-16d	6-10d	1,135	2,380	2,685	2,890
		15 15/32	2	18	18-16d	8-10d	1,515	2,680	3,020	3,250
		8 15/32	2	19	18-16d	10-10d	1,770	2680	3,020	3,250
		13 15/32	2	20	20-16d	8-10d	1,515	2,975	3,360	3,610
		10 1/4	2	21	22-16d	10-10d	1,895	3,275	3,695	3,970
		11 3/4	2	22	24-16d	12-10d	2,275	3,570	4,030	4,335
		13 15/32	2	23	26-16d	12-10d	2,275	3,870	4,365	4,465
	5 1/8 to 5 1/2	4 3/4	2	24	8-16d	4-16d	875	1,190	1,345	1,445
		6 1/4	2	25	10-16d	4-16d	875	1,490	1,680	1,680
		4 3/4	2	26	12-16d	6-16d	1,345	1,785	2,015	2,165
		6 1/4	2	27A	14-16d	6-16d	1,345	2,085	2,350	2,530
		8 1/4	2	27B	14-16d	6-16d	1,345	2,085	2,350	2,530
		10 1/4	2	28	16-16d	6-16d	1,345	2,380	2,685	2,890
		12 1/4	2	29	18-16d	8-16d	1,770	2,680	3,020	3,250
		8 1/8	2	30	18-16d	10-16d	1,770	2,680	3,020	3,250
		13 1/4	2	31	20-16d	8-16d	1,770	2,975	3,360	3,610
		10 1/4	2	32	22-16d	8-16d	1,770	3,275	3,695	3,970
		12 1/4	2	33	22-16d	10-16d	1,770	3,275	3,695	3,970
		10 1/4	2	34	24-16d	12-16d	2,695	3,570	4,030	4,335
		10 1/4	2	35	26-16d	12-16d	2,695	3870	4,365	4,465

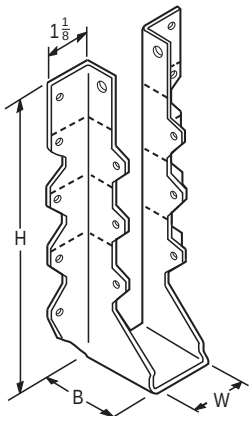

FIGURE 12—AU HANGER 2x SIZES

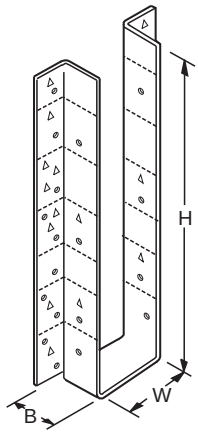

FIGURE 13—AU HANGER ALL OTHER SIZES

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

[1] Refer to Figures 12 and 13 (this page) for definitions of hanger nomenclature (W, H, B). H is the minimum height of the hangers.
[2] Refer to Section 3.6.4 of this report for nail sizes and required minimum physical properties.
[3] AHU series hangers with widths (W) equal to or greater than 2 9/16 inches (65 mm) are available with header flanges turned in (concealed) and are identified with the model designation AHUC#.
[4] Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
[5] AHU Series hangers provide torsional resistance, which is defined as a moment not less than 75 pounds (334N) times the depth of the joist at which the lateral movement of the top or bottom of the joist with respect to the vertical position of the joist is 0.125 inch (3.2 mm).
[6] Allowable uplift loads have been increased for wind or earthquake loading with no further increase allowed. The allowable uplift loads must be reduced when other load durations govern.
[7] Refer to Table 6 on the previous page for specific model numbers assigned to the reference number shown in the column titled "Table 6 Reference Number" above.

TABLE 7—ALLOWABLE LOADS FOR THE ASUR/L AND AHSUR/L SERIES JOIST HANGERS

MODEL NUMBER	DIMENSIONS[1] (inches)					COMMON NAILS[2] (Quantity-Type)		ALLOWABLE LOADS[3,4] (lbs)			
								Uplift[5]	Download		
	W	H	B	A1	A2	Header	Joist	C_D=1.6	C_D=1.0	C_D=1.15	C_D=1.25
ASUR/L24	$1^9/_{16}$	$3^1/_8$	$1^{15}/_{16}$	$1^1/_8$	$1^7/_{16}$	4-16d	4-10d x $1^1/_2$	465	575	655	705
ASUR/L26	$1^9/_{16}$	5	$1^{15}/_{16}$	$1^1/_8$	$1^7/_{16}$	6-16d	6-10d x $1^1/_2$	805	865	980	1,060
ASUR/L210	$1^9/_{16}$	$8^1/_8$	$1^{15}/_{16}$	$1^1/_8$	$1^7/_{16}$	10-16d	10-10d x $1^1/_2$	1,435	1,440	1,635	1,765
ASUR/L214	$1^9/_{16}$	10	$1^{15}/_{16}$	$1^1/_8$	$1^7/_{16}$	12-16d	12-10d x $1^1/_2$	1,655	1,730	1,960	2,115
ASUR/L26-2	$3^1/_8$	$4^{15}/_{16}$	$2^5/_8$	$1^1/_4$	$2^1/_8$	8-16d	4-10d x $1^1/_2$	860	1,150	1,305	1,405
ASUR/L210-2	$3^1/_8$	$8^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	14-16d	6-16d x $2^1/_2$	1,325	2,015	2,285	2,470
ASUR/L214-2	$3^1/_8$	$12^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	18-16d	8-16d x $2^1/_2$	1,765	2,590	2,765	2,765
ASUR/L46	$3^9/_{16}$	$4^{15}/_{16}$	$2^5/_8$	$1^1/_4$	$2^1/_8$	8-16d	4-10d x $1^1/_2$	860	1,150	1,305	1,405
ASUR/L410	$3^9/_{16}$	$8^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	14-16d	6-16d x $2^1/_2$	1,325	2,015	2,285	2,470
ASUR/L414	$3^9/_{16}$	$12^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	18-16d	8-16d x $2^1/_2$	1,765	2,590	2,765	2,765
AHSUR/L26-2	$3^1/_8$	$4^{15}/_{16}$	$2^5/_8$	$1^1/_4$	$2^1/_8$	12-16d	4-16d x $2^1/_2$	860	1,790	2,015	2,030
AHSUR/L210-2	$3^1/_8$	$8^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	20-16d	6-16d x $2^1/_2$	1,345	2,980	3,360	3,625
AHSUR/L214-2	$3^1/_8$	$12^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	26-16d	8-16d x $2^1/_2$	1,790	3,875	4,365	4,675
AHSUR/L46	$3^9/_{16}$	$4^{15}/_{16}$	$2^5/_8$	$1^1/_4$	$2^1/_8$	12-16d	4-16d	860	1,790	2,015	2,030
AHSUR/L410	$3^9/_{16}$	$8^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	20-16d	6-16d	1,345	2,980	3,360	3,625
AHSUR/L414	$3^9/_{16}$	$12^5/_8$	$2^5/_8$	$1^1/_4$	$2^1/_8$	26-16d	8-16d	1,790	3,875	4,365	4,675

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

[1] Refer to Figure 14 (this page) for definitions of hanger nomenclature (W, H, B, A1, A2).
[2] Refer to Section 3.6.4 of this report for nail sizes and required minimum physical properties.
[3] Tabulated allowable loads must be selected based on duration of load as permitted by the applicable building code.
[4] When ASUR/L series hangers support joists, they provide torsional resistance, which is defined as a moment not less than 75 pounds (334N) times the depth of the joist at which the lateral movement of the top or bottom of the joist with respect to the vertical position of the joist is 0.125 inch (3.2 mm). The height "H" must be at least 60% of the total joist height unless additional lateral resistance is provided as designed by others.
[5] Allowable uplift loads have been increased for wind or earthquake loading with no further increase allowed. The allowable uplift loads must be reduced when other load durations govern.

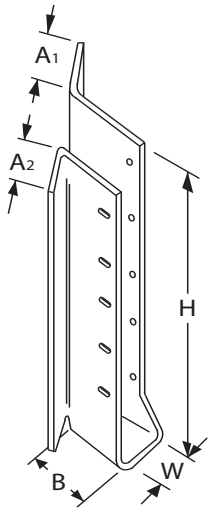

FIGURE 14—ASUR/L HANGERS

TABLE 8—AH AND ARSP4 SERIES HURRICANE TIES

MODEL NUMBER	GAGE	FASTENERS			ALLOWABLE LPADS[1,7] (lbs)		
		To Rafters or Truss	To Plates	To Studs	Uplift[3,4] C_D=1.6	Lateral[5,6] C_D=1.6	
						F_1[2]	F_2[2]
AH1	18	6-8d x $1^1/_2$	4-8d x $1^1/_2$	-----	570	435	225
AH2	18	5-8d x $1^1/_2$	-----	5-8d x $1^1/_2$	475	-----	-----
AH2.5	18	5-8d x $1^1/_2$	5-8d x $1^1/_2$	-----	475	220	220
AH3	18	4-8d x $1^1/_2$	4-8d x $1^1/_2$	-----	470	220	220
ARSP4 Single Plate	18	-----	4-8d x $1^1/_2$	4-8d x $1^1/_2$	320	-----	-----
ARSP4 Double Plate	18	-----	4-8d x $1^1/_2$	4-8d x $1^1/_2$	380	-----	-----

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

[1] Allowable loads are for one anchor installed to a minimum nominal 2x supporting wood member. A rafter minimum actual thickness of $2^1/_2$ inches must be used when framing anchors are installed on each side of the rafter on the same side of the plate.

[2] See Figure 20 for directions of F_1 and F_2, where F_1 = Parallel to the top plate and F_2 = Perpendicular to the top plate.

[3] Connections in the same area (i.e. truss to plate connector and plate to stud connector) must be installed on the same side of the wall to achieve the tabulated allowable uplift loads and ensure a continuous load path.

[4] Allowable uplift loads have been increased for wind or earthquake loading, and no further increase is allowed. Allowable loads must be reduced when other load durations govern.

[5] Allowable lateral loads in the F_1 direction must not be used to replace diaphragm boundary members or nailing or replace solid blocking required by code to laterally support the ends of joist/rafters.

[6] Additional shear transfer elements must be considered if the connector installation induces cross grain bending or tension of the truss or rafter members.

[7] Allowable simultaneous loads in more than one direction on a single connector must be evaluated as follows:

$$\frac{Design\ Uplift}{Alloable\ Uplift} + \frac{Design\ lateral\ Parallel\ to\ Plate}{Allowable\ Lateral\ Parallel\ to\ Plate} + \frac{Design\ lateral\ Perpendicular\ to\ Plate}{Alloable\ lateral\ Perpendicular\ to\ Plate} \leq 1.0$$

The three terms in the unity equation consider all possible forces that a hurricane tie may be designed and installed to resist. The number of terms that must be considered for simultaneous loading is determined by the registered design professional and is dependent on the method of calculating wind forces and the assumed load path that the connector is designed to resist.

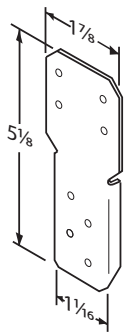

FIGURE 15—ARSP4

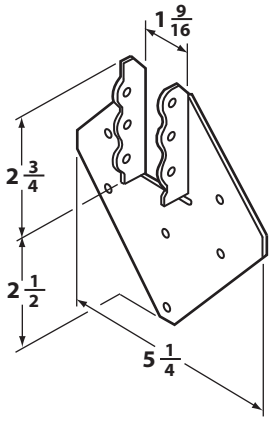

FIGURE 16—AH1

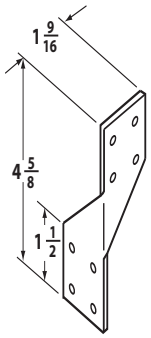

FIGURE 17—AH3

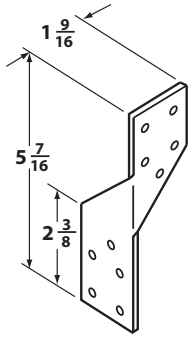

FIGURE 18—AH2.5

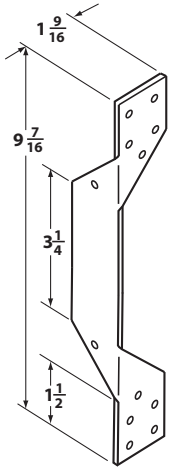

FIGURE 19—AH2

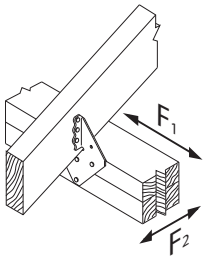

FIGURE 20—LOAD DIRRECTION FOR F_1 AND F_2

TABLE 9—AA SERIES FRAMING ANCHORS

MODEL NUMBER	FASTENERS (Quantity-Type)		DIRECTION OF LOAD[1,2]	ALLOWABLE LOADS[3,4,5]			
	Joist, Rim Joist or Blocking	Header or Plate(s)		C_D=1.0	C_D=1.15	C_D=1.25	C_D=1.6
AA34	6-8d x $1^1/_2$	6-8d x $1^1/_2$	F_1	395	430	430	430
AA35	6-8d x $1^1/_2$	6-8d x $1^1/_2$	F_1	595	650	650	650
AA35F	6-8d x $1^1/_2$	6-8d x $1^1/_2$	G or H	595	670	670	670
ALPT4	6-8d x $1^1/_2$	6-8d x $1^1/_2$	G or H	595	670	730	910

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

[1] 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.

[2] Refer to illustrations in Figures 25 and 26 for definitions of load directions (F_1, G, or H).

[3] 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 member the minimum joist thickness is 3 inches.

[4] Allowable loads under C_D = 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.

[5] The ALPT4 and AA35F may be installed over wood based structural sheathing (as shown in Figure 26 having a maximum thickness of $^1/_2$ inch without adversely affecting the tabulated allowable loads.

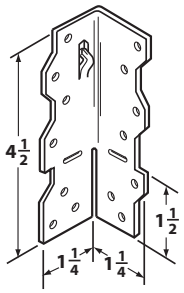

FIGURE 21—AA35

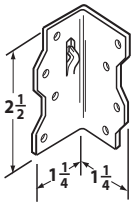

FIGURE 22—AA34

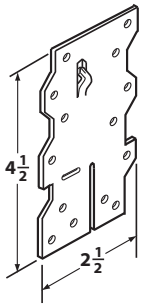

FIGURE 23—AA35F

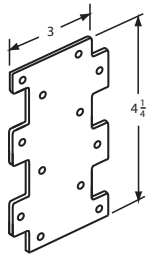

FIGURE 24—ALTP4

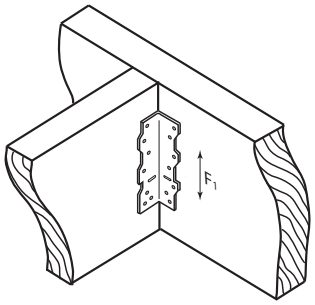

FIGURE 25—TYPICAL INSTALLATION FOR AA34 AND AA35

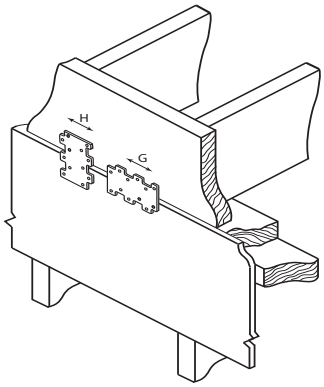

FIGURE 26—TYPICAL INSTALLATION FOR ALTP4 AND AA35F