ICC-ES Evaluation Report

ESR-1822

Reissued July 2025

This report also contains:

- **CA Supplement**

Subject to renewal July 2026

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES **Section: 06 05 23—Wood, Plastic and Composite Fastenings**	**REPORT HOLDER:** **TOBIN STEEL COMPANY, INC.**	**EVALUATION SUBJECT:** **TOBIN STEEL STRUCTURAL WOOD HANGERS AND CONNECTORS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, and 2009 *International Building Code®* (IBC)
- 2021, 2018, 2015, 2012, and 2009 *International Residential Code®* (IRC)

Property evaluated:

- Structural

2.0 USES

The structural wood hangers and connectors described in this report are used for connecting wood framing members in accordance with IBC Section 2304.10.4 (2018 and 2015 IBC Section 2304.10.3, 2012 and 2009 IBC Section 2304.9.3). They may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 TECC and TCC Series Column Caps:

The TECC and TCC series column caps are used to connect a wood beam to a wood post, and provide both uplift load resistance and download support for the wood beam. The TECC column caps are designed for use at beam ends, while the TCC column caps are used for support of continuous beams. These post caps are fabricated from two either No. 7 or No. 3 gage steel straps factory-welded to either a No. 7 or a No. 3 gage steel U-shaped channel. The U-shaped steel channel is $^1/_8$-inch (3.2 mm) wider than the wood beam net width, and the two vertical steel straps have a clear distance $^1/_8$-inch (3.2 mm) wider than the supporting wood post net width. Both the U-channel and vertical steel strap have prepunched holes to receive either $^5/_8$ inch- (15.9 mm) or $^3/_4$-inch-diameter (19.1 mm) bolts. See Table 1 for column cap models, dimensions, required quantity and diameter of bolts, and allowable uplift loads and downloads.

3.2 TF Series Panelized Roof Joist Hangers:

The TF series panelized roof hangers are engineered components for panelized roof construction only. The TF series hangers are fabricated from No. 18 gage galvanized steel. The TF series hangers have a seat width to accommodate sawn-lumber joists. The TF series hangers have vertical flange edges designed to grip the wood joist during installation of the roof panel, without the use of fasteners. The TF series panelized roof joist hangers have prepunched nail holes in the top bearing flange for two 10d common nails used to fasten the hanger to the header. See Table 2 for hanger models, dimensions, fastener schedules, and allowable downloads.

3.3 TVB Series Kneebraces:

The TVB series knee brace connectors are designed to provide lateral support of the bottom of deep beams by attaching to purlins installed on each side of the beam. The knee brace connectors are fabricated from No. 12 gage by $2^{1}/_{16}$-inch-wide (52 mm) galvanized steel straps. The knee brace connectors are used in pairs and are nailed to the bottom portion of the braced beam and nailed to the adjacent purlins that are perpendicular to the beam. See Table 3 for models, brace dimensions, fastener schedules, and allowable tension loads.

3.4 TXC Series Purlin Hangers:

The TXC series purlin hangers are top-flange hangers designed to support sawn-lumber purlins having nominal widths shown in Table 4. The top flange is a No. 7 gage equal-leg angle factory-welded to a 0.125-inch-thick (3.2 mm) (base-metal thickness) U-shaped stirrup. The top flange angle is 7 inches (178 mm) long and $2^{1}/_{2}$ inches (64 mm) deep. See Table 4 for hanger models, hanger dimensions, nominal purlin sizes, fastener schedules, and allowable downloads and uplift loads.

3.5 TXD Series Purlin Hangers:

The TXD series purlin hangers are top-flange hangers that are designed to support sawn-lumber purlins and laminated veneer lumber (LVL) purlins. Each hanger consists of a No. 11 gage hot-rolled steel plate bent into a U-shaped stirrup that is factory-welded to a No. 3 gage unequal-leg, hot-rolled steel angle. The top flange angle is 10 inches (254 mm) long by $2^{3}/_{4}$ inches (70 mm) deep. The hangers have prepunched holes for installing nails into both the supporting and supported wood members. See Table 5 for hanger models, hanger dimensions, purlin sizes, fastener schedules, and allowable downloads and uplift loads.

3.6 TGLT/THGLT Beam Hangers:

The TGLT/THGLT beam hangers are top-flange hangers that are designed to connect sawn-lumber, glued-laminated or engineered wood beams to a supporting member. The hangers consist of a No. 7 gage , hot-rolled steel plate bent into a U-shaped stirrup that is factory-welded to a No. 3 gage unequal-leg, hot-rolled steel angle. The hangers have prepunched holes for installing N54A nails into the wood members. See Table 6 for hanger models, hangers dimensions, fastener schedules, and allowable downloads and uplift loads.

3.7 TLEG/TMEG/TEG Series Beam Hangers:

The TLEG/TMEG/TEG series beam hangers are designed to connect glued-laminated or engineered wood beams to a supporting member. The TLEG and TMEG series hangers consist of a No. 7 gage, 6-inch-wide (152 mm) steel sheet bent into a U-shaped stirrup that is factory-welded to a No. 3 gage, unequal-leg, steel header angle. The TEG series hangers consist of a No. 3 gage by 6-inch-wide (152 mm) steel sheet bent into a U-shaped stirrup that is factory-welded to a No. 3 gage, unequal-leg, steel header angle. The depth of the top flange of the header angle is $2^{1}/_{2}$ inches (64 mm) for all hangers. The steel U-shaped stirrup is factory-welded to the vertical leg of the steel header angle. The header angle and the U-shaped stirrup have prepunched bolt holes that are $^{1}/_{16}$-inch (1.6 mm) larger in diameter than the bolts used to attach the supported beam and the supporting header. See Table 7 for hanger models, hanger dimensions, fastener schedules, and allowable downloads and uplift loads.

3.8 TGLS/THGLS and TGLST/THGLST Series Beam Saddle Hangers:

The TGLS/THGLS series beam saddle hangers are designed to support two horizontally aligned glued-laminated or sawn-lumber beams on one wood girder. The TGLST and THGLST series beam saddle hangers are designed to connect glued-laminated beams to a girder, and to transfer wind and seismic forces through the girder in drag strut applications. The TGLS series hangers consist of two No. 7 gage by 5-inch-wide (127 mm) hot-rolled steel plates bent into U-shaped stirrups that are factory-welded to a No. 3 gage inverted steel channel with 4-inch-long (102 mm) vertical flanges and a channel web width equal to the width of the supporting wood girder. The THGLS series hangers have two U-shaped stirrups, fabricated from No. 7 gage by 6-inch-wide (152 mm) hot-rolled steel. The TGLST/THGLST hangers are identical to the TGLS/THGLS series beam saddle hangers, except they have tension straps welded to each side of the support saddles that are designed to transfer axial tension forces induced by wind or seismic loading from one carried beam to the other. The TGLS/THGLS series beam saddle hangers are prepunched for N54A nails, and the tension straps for the TGLST/THGLST series beam saddle hangers have oblong holes for installing three $^{3}/_{4}$-inch-diameter (19 mm) bolts on each side of the carrying girder. See Table 8 for beam saddle models, beam saddle dimensions, fastener schedules, and allowable uplift loads, downloads, and lateral loads.

3.9 THC Hinge Connectors (with Optional THCCT Seismic Strap):

The THC hinge connectors are designed to connect two glued-laminated beams, end-to-end, which have the same width and top elevation. The connectors consist of steel top and bottom bearing plates factory-welded to two No. 7 gage steel vertical side plates forming a loop with a parallelogram-shaped side elevation. Each steel vertical plate has factory-welded top and bottom rotation steel straps with two or three prepunched holes to receive $^3/_4$-inch-diameter (19 mm) bolts that pass through the two beams. The THC hinge connectors are available with the THCCT tension steel straps factory-welded at mid-height of the steel vertical side plates. Each tension steel strap has three prepunched oblong holes to receive $^3/_4$-inch-diameter (19 mm) bolts. See Table 9 for hinge connector models, connector dimensions, fastener schedule, allowable downloads for the connector and allowable tension loads for the connector with tension straps.

3.10 TSL, TSF, TMST, TSI, TSJ, and THST Series Tie Straps:

The TSL, TSF, TMST, TSI, TSJ, and THST series tie straps are designed to connect various wood framing members together to resist tension forces. The TSL, TSF, TSI, and TSJ series tie straps are fastened with nails; the TSMT series tie straps are fastened with either nails or bolts, but not both; and the THST series tie straps are fastened with bolts. See Table 10 for tie strap models, strap dimensions, fastener schedules, and allowable tension loads.

3.11 TCMST Series Coil Straps:

The TCMST12 and TCMST14 coil straps are used to create a continuous tie across multiple roof framing members, or they may be cut to length as prescribed by the building designer. Multiple lengths and multiple nail spacing options are listed in the load tables. Ultimate strap load value is limited to the steel allowable strength in tension. See Table 10 and Figure 10E for coil strap models, strap dimensions, fastener schedules, and allowable tension loads. The TCMST12 and TCMST14 straps have identical nail patterns; however, they vary in material thickness.

3.12 Materials:

3.12.1Steel: The connectors described in this report are fabricated from coated carbon steel specified in Table 11, and have the following minimum base-metal thicknesses:

NOMINAL THICKNESS (gage)	MINIMUM BASE-METAL THICKNESS (inches)
No. 3	0.239
No. 7	0.179
No. 10	0.134
No. 11	0.120
No. 12	0.105
No. 14	0.0747
No. 16	0.0598
No. 18	0.0478
No. 20	0.0359

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

3.12.2Wood: Wood members must be sawn lumber or structural glued laminated lumber (glulam) with a minimum assigned specific gravity of 0.50 or structural composite lumber (SCL), such as laminated veneer lumber (LVL), with a minimum equivalent specific gravity of 0.50, unless otherwise noted in the applicable table within this report. Wood members must have a moisture content not exceeding 19 percent (16 percent for glulam and SCL), except as noted in Section 4.1. The modulus of elasticity for glulam and SCL must be a minimum of 1.4×10^6 psi (9.65 MPa). The thickness of the supporting wood member (header) must be equal to or greater than the length of the fasteners specified in the tables in this report, or as required by wood member design, whichever is greater. For installations in SCL, minimum allowable nail or bolt spacing, edge distance and end distance, as specified in the applicable evaluation report for the SCL, must be met. Refer to Section 3.12.4 for issues related to connectors and fasteners used in contact with preservative-treated or fire-retardant-treated.

3.12.3Fasteners: Required fastener types and sizes for use with the Tobin Steel structural wood connectors described in this report are specified in this section and in the applicable tables of this report.

Bolts used with connectors described in this report must be hex head bolts complying with ASTM A307, Grade A, and ANSI/ASME Standard B18.2.1. Bolt diameters must be as specified in the applicable tables of this report.

Nails used for connectors described in this report must comply with the steel wire material requirements, physical properties, tolerances, workmanship, protective coating and finishes, certification, and packaging and package marking requirements specified in ASTM F1667. The nails must have minimum fastener dimensions and minimum specified bending yield strengths (F_{yb}), determined according to ASTM F1575, as shown in Table 12.

The required number of N16 smooth shank and N54A angular-ring shank nails is supplied by the Tobin Steel Company with each connector that requires these nails for installation as shown in Tables 3, 5, 6 and 8.

3.12.4 Connectors and Fasteners Used with Treated Wood: Connectors and fasteners used in contact with preservative-treated or fire-retardant-treated wood must comply with IBC Section 2304.10.6 (2018 IBC Section 2304.10.5; 2015, 2012 and 2009 IBC Section 2304.9.5) or IRC Section R317.3, as applicable. The lumber treater or the holder of this report (Tobin Steel Company), or both, must be contacted for recommendations on the appropriate level of corrosion resistance to specify for the connectors and fasteners, as well as the connection capacities of the fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.

4.0 DESIGN AND INSTALLATION

4.1 Design:

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

Tabulated allowable loads apply to products connected to wood used under dry conditions and where sustained temperatures are 100ºF (37.8ºC) or less. When products are installed in wood having a moisture content greater than 19 percent (16 percent for engineered wood products), or where wet service is expected, all tabulated loads for connections must be adjusted by the wet service factor, C_M, specified in the NDS for dowel-type fasteners. When connectors are installed in wood that will experience sustained exposure to temperatures exceeding 100ºF (37.8ºC), the allowable loads in this report must be adjusted by the applicable temperature factor, C_t, specified in the NDS. The group action factor, C_g, has been accounted for in accordance with Section 11.3.6 of the 2018 and 2015 NDS (Section 10.3.6 of the 2012 and 2005 NDS for the 2012 and 2009 IBC) where applicable in the tabulated allowable loads in this report.

For connectors installed with bolts, minimum edge distances and end distances within the wood members must be such that the geometry factor, C_Δ, is 1.0, in accordance with Section 12.5.1 of the 2018 and 2015 NDS (Section 11.5.1 of the 2012 and 2009 NDS for the 2012 and 2009 IBC).

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

4.2 Installation:

Installation of the connectors must be in accordance with this evaluation report and the manufacturer's published installation instructions. Connector location must comply with the approved construction documents. Bolts installed in engineered wood must be installed in accordance with the applicable provisions of the NDS or the evaluation report for the engineered wood, whichever is more restrictive. 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 Tobin Steel structural wood hangers and connectors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

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

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

5.3 Use of connectors with preservative- or fire retardant-treated lumber must be in accordance with Section 3.12.4 of this report.

5.4 The connector products are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Joist Hangers and Similar Devices (AC13), dated October 2018 (editorially revised December 2020).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-1822) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, each connector described in this report must be identified by a label with the product model number.

7.3 The report holder's contact information is the following:

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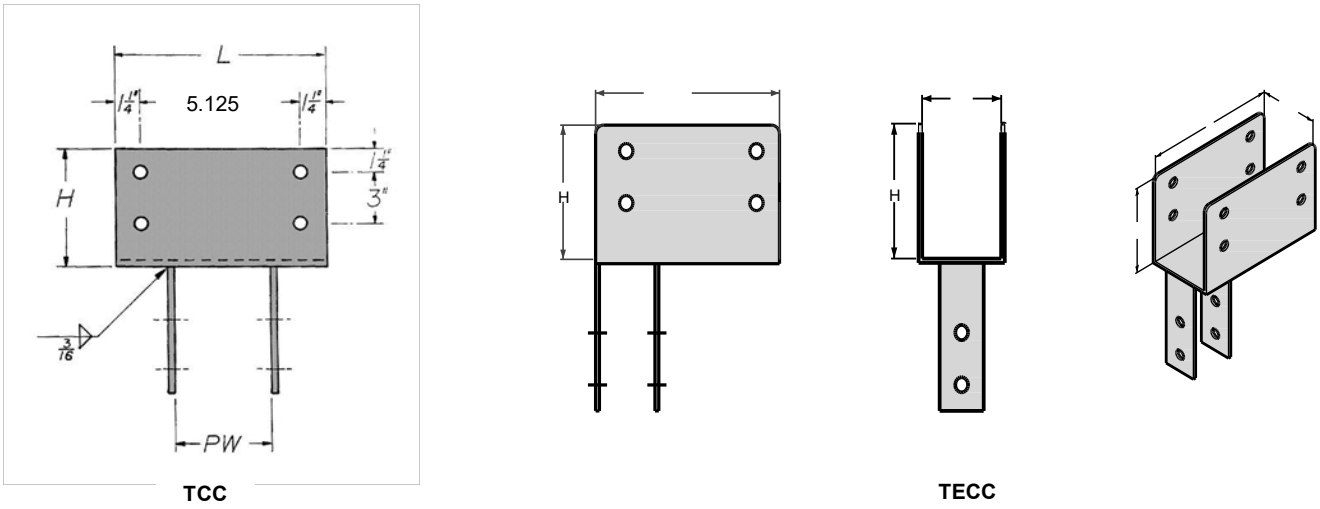
817 EAST SANTA ANA BOULEVARD
SANTA ANA, CALIFORNIA 92701
(714) 541-2268
www.tobinsteel.com

TABLE 1—TECC AND TCC SERIES COLUMN CAPS[1,5,6]

MODEL SERIES	MODEL NO.	COLUMN CAP DIMENSIONS (inches)					BOLTS[2] (quantity) – diameter		ALLOWABLE LOADS (lbf)	
		Width for Beam (BW)	Width for Post (PW)	Bearing Length for Beam (L)	U-Channel Height for Beam (H)	Steel Thickness	Beam	Post	Uplift[3]	Down[4]
									C_D = 1.6	C_D = 1.0
TECC	TECC3-1/4-4	3 1/4	3 5/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	6,960	17,570
	TECC3-1/4-6	3 1/4	5 5/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	6,960	17,570
	TECC44	3 5/8	3 5/8	5 1/2	4	3/16	(2) – 5/8″	(2) – 5/8″	3,930	12,030
	TECC46	3 5/8	5 5/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,510	19,680
	TECC5-1/4-6	5 1/4	5 5/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,940	33,630
	TECC5-1/4-8	5 1/4	7 3/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,940	33,630
	TECC64	5 1/2	3 5/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,510	30,930
	TECC66	5 1/2	5 5/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,490	30,930
	TECC68	5 1/2	7 3/8	9	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,490	30,930
	TECC76	6 7/8	5 5/8	10 1/2	8	3/16	(4) – 3/4″	(2) – 3/4″	10,530	44,290
	TECC77	6 7/8	6 7/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	44,290
	TECC78	6 7/8	7 3/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	44,290
	TECC86	7 1/2	5 5/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	49,220
	TECC88	7 1/2	7 3/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	49,220
	TECC96	8 7/8	5 5/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	57,420
	TECC98	8 7/8	7 3/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	57,420
	TECC106	9 1/2	5 5/8	10 1/2	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	60,700
TCC	TCC3-1/4-4	3 1/4	3 5/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	6.960	21,480
	TCC3-1/4-6	3 1/4	5 5/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	6.960	21,480
	TCC44	3 5/8	3 5/8	7	4	3/16	(2) – 5/8″	(2) – 5/8″	3.930	15,310
	TCC46	3 5/8	5 5/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7.510	24,060
	TCC5-1/4-6	5 1/4	5 5/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,940	41,640
	TCC5-1/4-8	5 1/4	7 3/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,940	41,640
	TCC64	5 1/2	3 5/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,510	37,810
	TCC66	5 1/2	5 5/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,490	37,810
	TCC68	5 1/2	7 3/8	11	6 1/2	3/16	(4) – 5/8″	(2) – 5/8″	7,490	37,810
	TCC76	6 7/8	5 5/8	13	8	3/16	(4) – 3/4″	(2) – 3/4″	10,530	54,840
	TCC77	6 7/8	6 7/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	54,840
	TCC78	6 7/8	7 3/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	54,840
	TCC86	7 1/2	5 5/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	60,930
	TCC88	7 1/2	7 3/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	60,930
	TCC96	8 7/8	5 5/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	71,090
	TCC98	8 7/8	7 3/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	71,090
	TCC106	9 1/2	5 5/8	13	8	1/4	(4) – 3/4″	(2) – 3/4″	10,920	75,150

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]The wood post depth must be equal to the connector's width for the beam (BW).
[2]Bolts must comply with Section 3.12.3.
[3]The tabulated allowable uplift loads are based on the lesser of capacities from either of the bolts in double-shear in the beam or in the post.
[4]The tabulated allowable downloads are based upon allowable beam bearing and bolt double-shear capacity. The tabulated allowable downloads are based on a duration of load of C_D = 1.0 and must not be increased by higher load duration factors. Tabulated values for download are based on $F_{c\perp}$ = 650 psi for glulam and $F_{c\perp}$ = 625 psi for sawn-lumber. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.
[5]The designer must determine that the capacity of the post, the beam and the post bearing is adequate to carry the applied load.
[6]The allowable loads are not applicable to column caps supporting a spliced beam condition.



TCC TECC

FIGURE 1—TYPICAL TCC and TECC COLUMN CAP CONNECTORS

TABLE 2—TF SERIES PANELIZED ROOF HANGERS[1]

MODEL NO.	NOMINAL JOIST SIZE	HANGER DIMENSIONS (in.)				FASTENER SCHEDULE[2] (Quantity–Size)	ALLOWABLE DOWNLOADS[3] (lbf)		
		Joist		Top Flange (Header)			C_D = 1.0	C_D = 1.15	C_D = 1.25
		Width	Height	Depth	Length				
TF24	2 x 4	1 9/16	3 1/2	1 7/16	2 1/2	2-10d	620	620	620
TF26	2 x 6	1 9/16	5 3/8	1 7/16	2 1/2	2-10d	620	620	620
TF34	3 x 4	2 5/8	3 1/2	1 7/16	3 1/2	2-10d	730	730	730
TF36	3 x 6	2 5/8	5 3/8	1 7/16	3 1/2	2-10d	730	730	730
TF44	4 x 4	3 9/16	3 1/2	1 7/16	4 1/2	2-10d	810	810	810
TF46	4 x 6	3 9/16	5 3/8	1 3/8	4 1/2	2-10d	810	810	810

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]The TF series hangers are for panelized roof construction only.
[2]Common nails are installed into the supporting header member.
[3]The tabulated downloads are based on $F_{c\perp}$ = 460 psi. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.

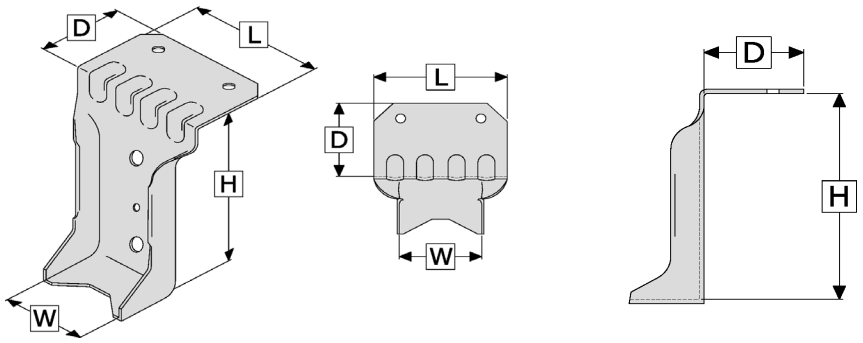


FIGURE 2—TYPICAL TF PANELIZED ROOF HANGER

TABLE 3—TVB KNEE BRACES[1,2,3,4,5]

MODEL NO.	BEAM DEPTH (in.)		LENGTH (feet–inches)	NAILING SCHEDULE[6] (Quantity–Size)		ALLOWABLE TENSION LOADS (lbf)		
	Minimum	Maximum		Each Joist (Purlin)	Beam Bottom	C_D = 1.0	C_D = 1.25	C_D = 1.6
TVB-5	10	15	2′–6″	6–N54A	3–N54A	1,120	1,400	1,415
TVB-7	15	22	3′–6″	6–N54A	3–N54A	1,120	1,400	1,415
TVB-8	22	28	4′–0″	6–N54A	3–N54A	1,120	1,400	1,415
TVB-10	28	35	5′–0″	6–N54A	3–N54A	1,120	1,400	1,415
TVB-12	35	42	6′–0″	6–N54A	3–N54A	1,120	1,400	1,415

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

[1]The tabulated tension loads have been increased for the load duration specified in the table.
[2]A minimum edge distance of $1^1/_2$ inches must be provided for all nails.
[3]Joists perpendicular to the braced beam must be minimum nominal 3 x 8 [$2^1/_2$ x $7^1/_4$ inches (64 x184 mm) actual] wood framing.
[4]The TVB knee braces must be installed at a 45-degree angle to achieve the tabulated allowable tension loads.
[5]Allowable loads shown are for tension loads along the length of the knee brace strap.
[6]N54A fastener is an annular ring shank nail (0.250-inch-diameter x $2^1/_2$-inch long). See Section 3.12.3.

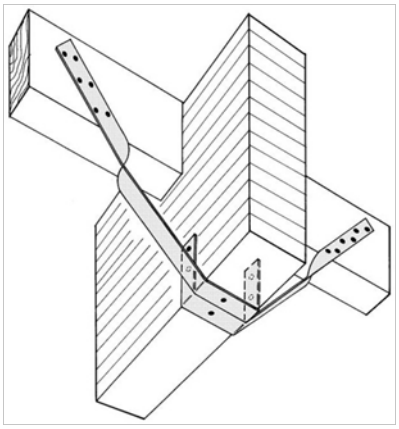


FIGURE 3—TYPICAL TVB KNEE BRACE INSTALLATION

TABLE 4—TXC SERIES PURLIN HANGERS

MODEL NO.	NOMINAL PURLIN SIZE	HANGER DIMENSIONS (in.)			NAILING SCHEDULE (Quantity–Size)		ALLOWABLE LOADS[1,2] (lbf)			
							Downloads			Uplift
		Joist Seat Width (W)	Hanger Height (H)	Joist Seat Depth (B)	Header	Joist	C_D = 1.0	C_D = 1.15	C_D = 1.25	C_D = 1.6
TXC26	2 x 6	$1^9/_{16}$	$5^3/_8$	$2^1/_2$	2-10d	2-10d	1,730	1,730	1,785	440
TXC28	2 x 8		$7^1/_8$							
TXC210	2 x 10		$9^1/_8$							
TXC212	2 x 12		11							
TXC214	2 x 14		13							
TXC216	2 x 16		15							
TXC36	3 x 6	$2^9/_{16}$	$5^3/_8$	$2^1/_2$	2-10d	2-10d	2,770	2,770	2,825	475
TXC38	3 x 8		$7^1/_8$							
TXC310	3 x 10		$9^1/_8$							
TXC312	3 x 12		11							
TXC314	3 x 14		13							
TXC316	3 x 16		15							
TXC46	4 x 6	$3^9/_{16}$	$5^3/_8$	$2^1/_2$	2-10d	2-10d	3,195	3,195	3,195	475
TXC48	4 x 8		$7^1/_8$							
TXC410	4 x 10		$9^1/_8$							
TXC412	4 x 12	$3^9/_{16}$	11	3	2-10d	2-10d	3,195	3,195	3,195	475
TXC414	4 x 14		13							
TXC416	4 x 16		15							
TXC26-2	(2) 2 x 6	$3^1/_8$	$5^3/_8$	$2^1/_2$	2-10d	2-10d	3,195	3,195	3,195	475
TXC28-2	(2) 2 x 8		$7^1/_8$							
TXC210-2	(2) 2 x 10		$9^1/_8$							
TXC212-2	(2) 2 x 12		11							
TXC214-2	(2) 2 x 14		13							
TXC216-2	(2) 2 x 16		15							

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]Tabulated allowable downloads are based on $F_{c\perp}$ = 460 psi. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.
[2]TXC series purlin hangers have not been rated for torsional resistance.

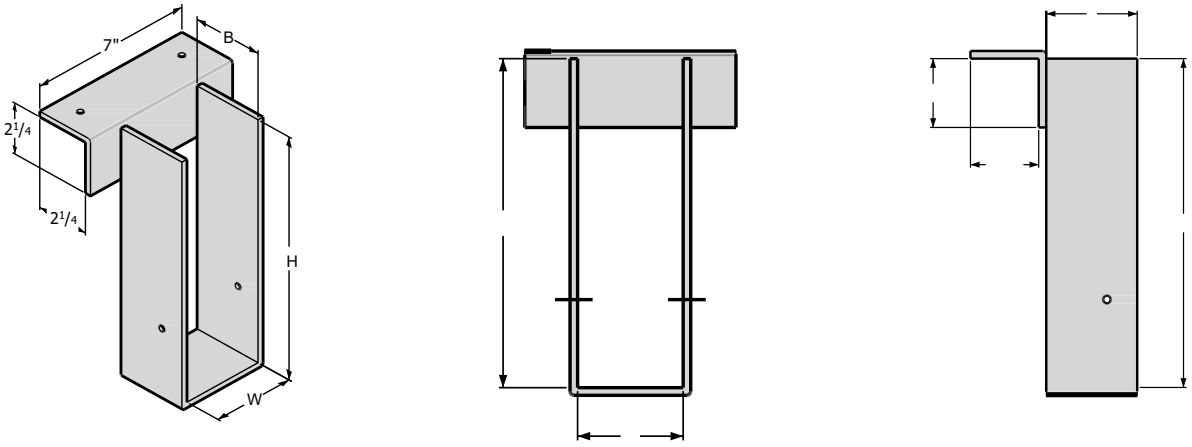


FIGURE 4—TYPICAL TXC SERIES HANGER

TABLE 5—TXD SERIES PURLIN HANGERS

MODEL NO.	NOMINAL PURLIN SIZE	HANGER DIMENSIONS[1] (in.)			NAILING SCHEDULE[2] (Quantity–Size)		ALLOWABLE LOADS[3,4] (lbf)		
							Downloads		Uplift
		Joist Seat Width (W)	Hanger Height (H)	Joist Seat Depth (B)	Header	Joist	C_D = 1.0	C_D = 1.25	C_D = 1.6
TXD46	4 x 6	$3^9/_{16}$	$5^3/_8$	$3^1/_2$	4-N16	2-10d	4,430	4,430	475
TXD48	4 x 8		$7^1/_8$						
TXD410	4 x 10		$9^1/_8$						
TXD412	4 x 12	$3^9/_{16}$	11	3	4-N16	2-10d	4,430	4,430	475
TXD414	4 x 14		13						
TXD416	4 x 16		15						
TXD418	4 x 18	$3^9/_{16}$	17	$3^1/_2$	4-N16	2-10d	4,430	4,30	475
TXD66	6 x 6	$5^9/_{16}$	$5^3/_8$	$3^1/_2$	4-N16	2-10d	4,430	4,430	475
TXD68	6 x 8		$7^1/_8$						
TXD610	6 x 10		$9^1/_8$						
TXD612	6 x 12		11						
TXD614	6 x 14		13						
TXD616	6 x 16		15						
TXD618	6 x 18		17						
TXD86	8 x 6	$7^1/_2$	$5^3/_8$	$3^1/_2$	4-N16	2-10d	4,430	4,430	475
TXD88	8 x 8		$7^1/_8$						
TXD810	8 x 10		$9^1/_8$						
TXD812	8 x 12		11						
TXD814	8 x 14		13						
TXD816	8 x 16		15						
TXD818	8 x 18		17						
TXD 2.6	$2^5/_8$″ LVL	$2^{11}/_{16}$	SPEC ($5^3/_8$ to 30)	4	4-N16	2-10d	4,430	4,430	475
TXD 3.25	$3^1/_8$″ LVL	$3^1/_4$	SPEC (6 to 28)	$3^1/_2$	4-N16	2-10d	4,430	4,430	475
TXD 5.25	$5^1/_8$″ LVL	$5^1/_4$	SPEC (6 to 28)	$3^1/_2$	4-N16	2-10d	4,430	4,430	475

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]SPEC = specify; see table for applicable range.
[2]N16 nails ae 0.162 inch diameter x $2^1/_2$ inch long. See Section 3.12.3.
[3]The tabulated allowable downloads are based on $F_{c\perp}$ = 460 psi. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.
[4]TXD series purlin hangers have not been rated for torsional resistance.

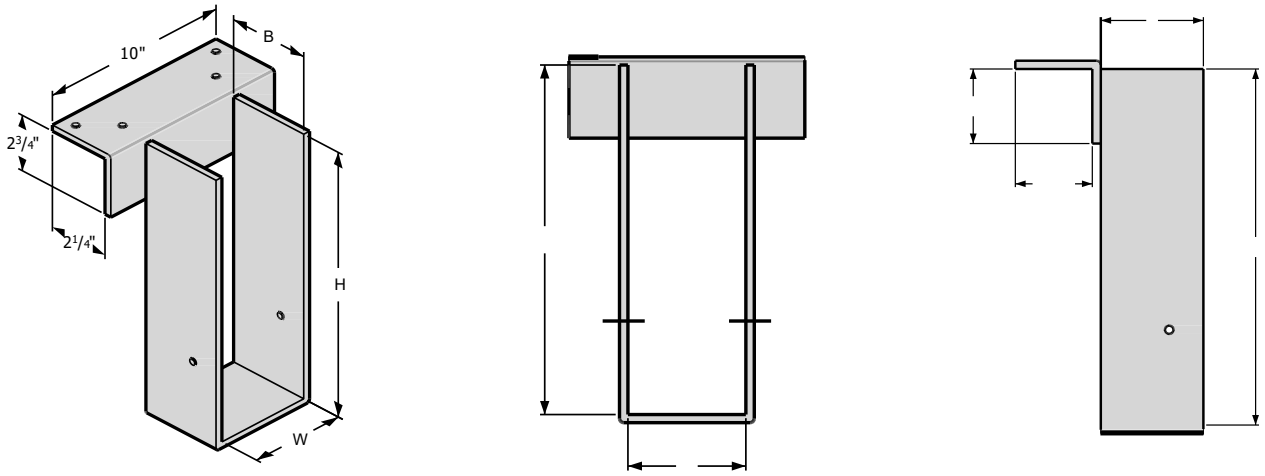


FIGURE 5—TYPICAL TXD SERIES HANGER

TABLE 6—TGLT/THGLT BEAM HANGERS

SERIES	MODEL NO.	MEMBER WIDTH (inch) AND TYPE[1]	HANGER DIMENSIONS[2] (in.)			NAILING SCHEDULE[3] (Quantity–Size)		ALLOWABLE LOADS[4] (lbf)			
			Joist Seat Width (W)	Hanger Height (H)	Top Flange Length (L)	Carrying Member	Carried Member	Uplift	Downloads		
								C_D = 1.6	C_D = 1.0	C_D = 1.15	C_D = 1.25
TGLT	TGLT 2.6	2 1/2 GLB	2 5/8	SPEC	10	10–N54A	6–N54A	1,385	7,315	7,470	7,570
	TGLT 3	3 1/8 GLB	3 1/4	SPEC	10	10–N54A	6–N54A	1,385	7,450	7,610	7,710
	TGLT 3.5	3 1/2 SOLID	3 9/16	SPEC	10	10-N54A	6-N54A	1,385	7,450	7,610	7,710
	TGLT 5	5 1/8 GLB	5 1/4	SPEC	12	10–N54A	6–N54A	1,385	9,380	7,655	9,845
	TGLT 5.5	5 1/2 SOLID	5 9/16	SPEC	12	10–N54A	6–N54A	1,385	8,005	8,820	8,470
	TGLT 7	6 3/4 GLB	6 7/8	SPEC	12	10–N54A	6–N54A	1,385	9,380	9,655	9,845
	TGLT 7.5	7 1/4 SOLID	7 1/2	SPEC	12	10–N54A	6–N54A	1,385	8,005	8,280	8,470
THGLT	THGLT 2.6	2 1/2 GLB	2 5/8	SPEC	12	18–N54A	6–N54A	1,385	8,570	8,730	8,830
	THGLT 3	3 1/8 GLB	3 1/4	SPEC	12	18–N54A	6–N54A	1,385	10,450	10,605	10,710
	THGLT 5	5 1/8 GLB	5 1/4	SPEC	12	18–N54A	6–N54A	1,385	10,855	11,355	11,380
	THGLT 7	6 3/4 GLB	6 7/8	SPEC	12	18–N54A	6–N54A	1,385	10,855	11,355	11,380
	THGLT 9	8 3/4 GLB	8 7/8	SPEC	14	18–N54A	6–N54A	1,385	11,380	11,380	11,380

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]GLB = Glulam beam; SOLID = Visually graded dimension lumber and timbers and similarly sized engineered wood products.
[2]SPEC = specify; applicable range is 7 1/2 to 33 inches.
[3]The N54A fastener is an annular ring shank nail (0.250-inch-diameter x 2 1/2-inch long). See Section 3.12.3.
[4]The tabulated allowable downloads for sawn lumber sizes (TGLT 3.5, 5.5 & 7.5) are based on $F_{c\perp}$ = 460 psi for wood. The tabulated allowable downloads for glulam members are based on $F_{c\perp}$ = 560 psi for wood. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.

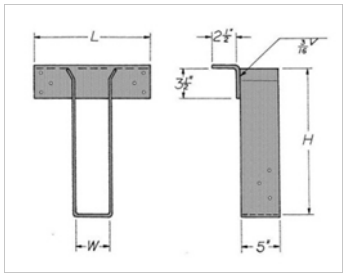


FIGURE 6A—TYPICAL TGLT SERIES HANGER L

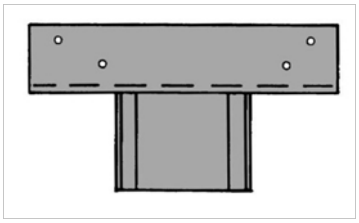


FIGURE 6B—PLAN VIEW OF THE TGLT HANGER

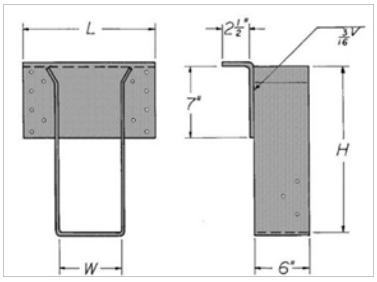


FIGURE 6C—TYPICAL THGLT SERIES HANGER

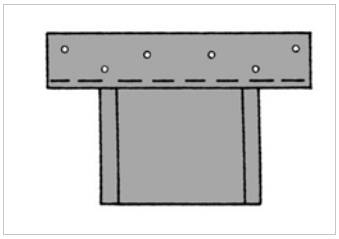


FIGURE 6D—PLAN VIEW OF THE THGLT HANGER

TABLE 7—TLEG/TMEG/TEG SERIES

MODEL NO.	HANGER DIMENSIONS[1] (in.)			BOLT SCHEDULE[2] (Quantity)–Diameter		ALLOWABLE LOADS[3,4] (lbf)		
	Beam Seat Width (W)	Hanger Height (H)	Top Flange Length (L)	Carrying Member	Supported Member	Downloads		Uplift
						C_D = 1.0	C_D = 1.25	C_D = 1.6
TLEG3	3 1/4	5.125	12	(4) – 3/4″	(2) – 3/4″	10,660	11,460	3,900
TLEG5	5 1/4	SPEC	12	(4) – 3/4″	(2) – 3/4″	11,660	11,460	3,900
TLEG7	6 7/8	SPEC	12	(4) – 3/4″	(2) – 3/4″	11,660	11,460	3,900
TMEG5	5 1/4	SPEC	12	(6) – 3/4″	(2) – 3/4″	12,345	13,550	3,900
TMEG7	6 7/8	SPEC	12	(6) – 3/4″	(2) – 3/4″	12,345	13,550	3,900
TEG5	5 1/4	SPEC	12	(8) – 1″	(2) – 1″	16,415	17,265	5,375
TEG7	6 7/8	SPEC	13 1/2	(8) – 1″	(2) – 1″	17,265	17,265	5,375
TEG9	8 7/8	SPEC	15 1/2	(8) – 1″	(2) – 1″	17,265	17265	5,375

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]SPEC = specify; applicable range is 9 to 33 inches.
[2]Bolts must comply with Section 3.12.3.
[3]The tabulated allowable downloads are based on $F_{c\perp}$ = 560 psi. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.
[4]Minimum carrying member width is 5 1/2 inches.

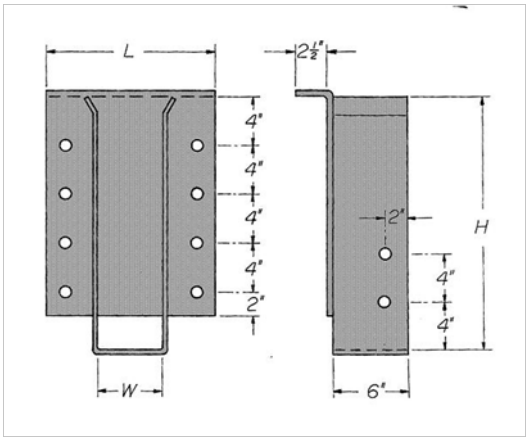


FIGURE 7A—TYPICAL TEG SERIES HANGER

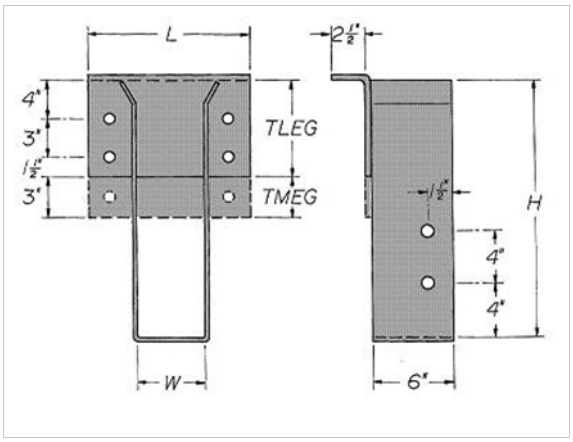


FIGURE 7B—TYPICAL TLEG/TMEG SERIES HANGER

TABLE 8—TGLS/THGLS/TGLST/THGLST BEAM SADDLE HANGERS

MODEL NO.	HANGER DIMENSIONS[1] (in.)				FASTENER SCHEDULE[2] (Qty. Each Beam – Size)		ALLOWABLE LOADS[3] (lbf) (for each supported beam)			
	Beam Seat Width (W1 or W2)	Beam Hanger Height (H1 or H2)	Girder Saddle Width (S)	Girder Saddle Length (L)	Carrying Member	Carried Member	Uplift	Download		Lateral[4]
							C_D = 1.6	C_D = 1.0	C_D = 1.25	C_D = 1.6
TGLS3-5	3 1/4	SPEC	5 1/4	6	6-N54A	6-N54A	1,390	8,890	9,110	—
TGLS3-7	3 1/4	SPEC	6 7/8	6	6-N54A	6-N54A	1,390	8,890	9,110	—
TGLS3-9	3 1/4	SPEC	8 7/8	6	6-N54A	6-N54A	1,390	8,890	9,110	—
TGLS5-5	5 1/4	SPEC	5 1/4	12	6-N54A	6-N54A	1,390	13,645	13,645	—
TGLS5-7	5 1/4	SPEC	6 7/8	9	6-N54A	6-N54A	1,390	13,645	13,645	—
TGLS7-7	6 7/8	SPEC	6 7/8	12	6-N54A	6-N54A	1,390	13,645	13,645	—
TGLS7-9	6 7/8	SPEC	8 7/8	12	6-N54A	6-N54A	1,390	13,645	13,645	—
THGLS5	5 1/4	SPEC	SPEC	12	14-N54A	8-N54A	1,845	15,035	15,035	—
THGLS7	6 7/8	SPEC	SPEC	12	14-N54A	8-N54A	1,845	15,035	15,035	—
THGLS9	8 7/8	SPEC	SPEC	12	14-N54A	8-N54A	1,845	13,035	15,035	—
TGLST3	3 1/4	SPEC	SPEC	12	6-N54A	6-N54A	1,390	8,890	9,150	12,555
TGLST5	5 1/4	SPEC	SPEC	12	6-N54A	6-N54A	1,390	11,390	11,390	12,555
TGLST7	6 7/8	SPEC	SPEC	12	6-N54A	6-N54A	1,390	11,390	11,390	12,555
THGLST5	5 1/4	SPEC	SPEC	12 1/4	14-N54A	8-N54A	1,845	15,035	15,035	12,555
THGLST7	6 7/8	SPEC	SPEC	14	14-N54A	8-N54A	1,845	15,035	15,.035	12,555
THGLST9	8 7/8	SPEC	SPEC	16	14-N54A	8-N54A	1,845	15,035	15,035	12,555

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]SPEC = specify; applicable range is for H is 7 1/2 to 33 inches; applicable range for S is 5 1/4 to 10 7/8 inches.
[2]The N54A fastener is an annular ring shank nail (0.250-inch-diameter x 2 1/2-inch long). See Section 3.12.3.
[3]Tabulated allowable downloads are based on $F_{c\perp}$ = 560 psi. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.
[4]Three 3/4-inch diameter bolts must be installed in the slotted holes in the tension straps on each side of carried beam. One 3/4-inch diameter bolt located at each side of the carried beam must be installed through the carrying beam. The bolts must comply with Section 3.12.3. Lateral (tension) values are based on glulam having a minimum Stress Class of 20F-1.5E, a minimum assigned specific gravity of 0.41 and a minimum supported beam width of 3 1/8 inch.

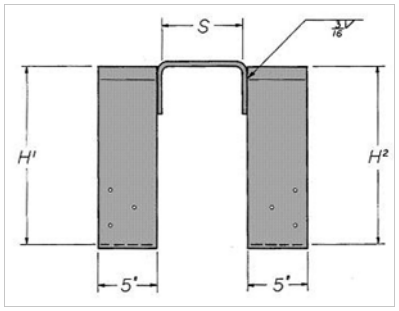


FIGURE 8A—TGLS HANGER

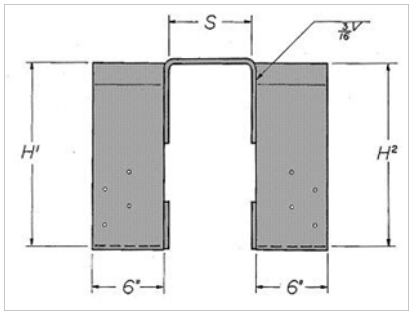


FIGURE 8B—THGLS HANGER

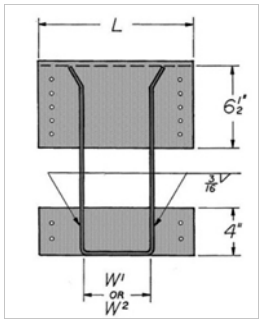


FIGURE 8C—TYPICALTHGLS HANGER

TABLE 9—THC/THCCT HINGE CONNECTORS

MODEL NO.	BEAM WIDTH (in.)	HANGER BEARING PLATE DIMENSIONS (in.)			MINIMUM HANGER HEIGHT[1] (H) (Based on Number of Bolts) (in.)		ALLOWABLE DOWNLOADS[2,3,4,5] (lbf)	
		Thickness (PT)	Width (W)	Depth (PD)	2-Bolt Rotation Straps	3-Bolt Rotation Straps	$F_{c\perp}$ = 460 psi	$F_{c\perp}$ = 560
THC 55	5 1/8	3/4	5 1/4	5	15	12	11,790	14,350
THC 56				6	18 3/4	14 3/4	14,145	17,220
THC 57				7	23 1/2	17 3/4	16,505	20,090
THC 59				9	34 1/2	25 1/4	21,215	25,830
THC 75	6 3/4	1	6 7/8	5	17 3/4	14	15,525	18,900
THC 76				6	23	17 1/2	18,630	22,680
THC 77				7	28 3/4	21 1/2	21,735	26,460
THC 79				9	43 1/2	31 1/4	27,945	34,020
THC 95	8 3/4	1 1/4	8 7/8	5	21 1/4	16 1/4	20,125	24,500
THC 96				6	28	20 3/4	24,150	29,400
THC 97				7	35 1/2	26	28,175	34,300
THC 99				9	54 1/2	38 3/4	36,225	44,100
THC11-5	10 3/4	1 1/2	10 7/8	5	24 3/4	18 3/4	24,725	30,100
THC11-6				6	33	24	29,670	36,120
THC11-7				7	42 1/4	30 1/2	34,615	42,140
THC11-9				9	65 1/2	46	44,505	54,180

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]Minimum height shown is for the tabulated downloads. Also, the hangers must be specified with either 2- or 3-bolt rotation straps. The minimum height depends on the rotation straps specified.
[2]Allowable downloads are based on compression perpendicular to grain and do not include any load duration increase; none are allowed.
[3]The bolts must comply with Secton 3.12.3.
[4]THC connectors have two prepunched holes in each rotation strap (Figure 9B). TH3 connectors are the same as THC connectors, except they have three holes in each rotation strap (similar to Figure 9C). THC3T connectors are the same as THC3 connectors, with the addition of a steel tension strap on each side (Figure 9C).THCCT connectors are identical to the THC connectors except for the addition of two steel tension straps factory welded on each side at the center of the connectors. When three 3/4-inch diameter bolts are installed in each tension strap, the allowable tension load is 12,555 lbf, based on glulam having a minimum Stress Class of 20F-1.5E, a minimum assigned specific gravity of 0.41 and a minimum supported beam width of 3 1/8 inch.
[5]The tabulated allowable downloads are based on $F_{c\perp}$ values shown in the table. When the wood being used has a lower $F_{c\perp}$ value, the allowable download values must be reduced proportionately.

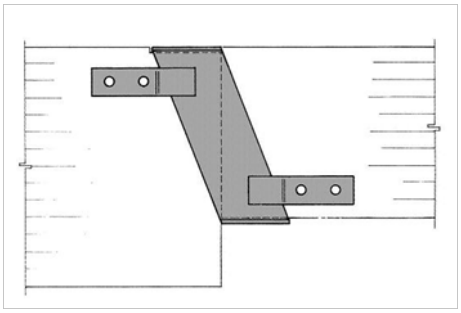


FIGURE 9A—TYPICAL INSTALLATION OF A THC HANGER

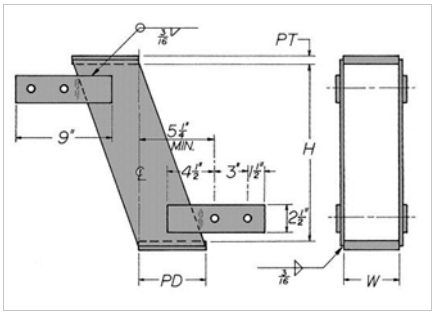


FIGURE 9B—TYPICAL THC HANGER

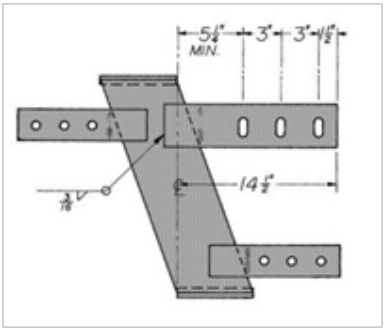


FIGURE 9C—TYPICAL THC3T HANGER (THC3 Similar)

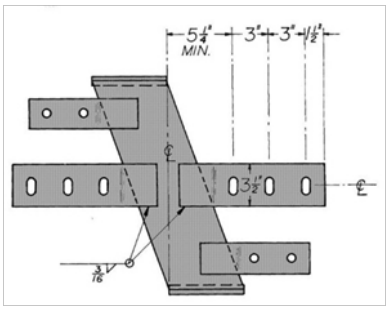


FIGURE 9C—TYPICAL THCCT HANGER

TABLE 10—TSL, TSF, TMST, TSI, TSJ, THST, AND TCMST STRAP SERIES

MODEL SERIES	MODEL NO.	STRAP DIMENSIONS				FASTENER SCHEDULE[1] (Quantity–Size)		ALLOWABLE TENSION LOADS[2,3,4,5,6,7] (lbf)			
		Thickness		Width (in.)	Length (in.)			Nails		Bolts	
		(inch)	(gage)			Nails	Bolts	C_D = 1.0	C_D = 1.6	C_D = 1.0	C_D = 1.6
TSL	TSL14	—	20	3/4	16 5/16	10-16d	—	690	690	—	—
	TSL10	—	20	2 1/16	9 5/16	12-16d	—	830	1,325	—	—
	TSL13	—	20	2 1/16	12 13/16	16-16d	—	1,105	1,765	—	—
	TSL15	—	20	2 1/16	16 5/16	20-16d	—	1,380	2,035	—	—
	TSL16	—	16	2 1/16	16 5/16	20-16d	—	1,420	2,270	—	—
	TSL23	—	16	2 1/16	23 5/16	28-16d	—	1,985	3,180	—	—
	TSL33	—	14	2 1/16	33 13/16	40-16d	—	2,960	4,220	—	—
	TSL9	—	16	1 1/4	9	8-16d	—	570	910	—	—
	TSL12	—	16	1 1/4	11 5/8	10-16d	—	710	1,135	—	—
	TSL18	—	16	1 1/4	17 3/4	14-16d	—	995	1,590	—	—
	TSL22	—	16	1 1/4	21 5/8	18-16d	—	1,278	2,045	—	—
TSF	TSF9	—	12	1 1/2	9	8-16d	—	645	1,030	—	—
	TSF12	—	12	1 1/2	12	8-16d	—	645	1,030	—	—
	TSF18	—	12	1 1/2	18	8-16d	—	645	1,030	—	—
	TSF24	—	12	1 1/2	24	8-16d	—	645	1,030	—	—
	TSF30	—	12	1 1/2	30	8-16d	—	645	1,030	—	—
TMST	TMST27	—	12	2 1/16	26 3/8	30-16d	(4) – 1/2″	2,415	3,865	1,425	2,280
	TMST37	—	12	2 1/16	36 7/8	42-16d	(6) – 1/2″	3,380	5,410	2,015	3,225
	TMST48	—	12	2 1/16	48	54-16d	(6) – 1/2″	4,350	5,910	2,015	3,225
	TMST60	—	10	2 1/16	59 5/8	68-16d	(8) – 1/2″	6,020	6,530	2,620	4,190
	TMST72	—	10	2 1/16	72	68-16d	(8) – 1/2″	6,020	6,530	2,620	4,190
TSI	TSI26	—	12	2 1/16	25	26-10d	—	1,690	2,705	—	—
	TSI36	—	12	2 1/16	35	36-10d	—	2,340	3,745	—	—
	TSI48	—	12	2 1/16	47	48-10d	—	3,125	4,995	—	—
	TSI60	—	12	2 1/16	59	60-10d	—	3,905	6,005	—	—
	TSI72		12	2 1/16	72	72-10d	—	4,685	6,005	—	—
TSJ	TSJ9	—	16	1 1/4	9	8-10d	—	470	750	—	—
	TSJ12	—	16	1 1/4	12	10-10d	—	585	935	—	—
	TSJ15	—	16	1 1/4	15	12-10d	—	700	1,120	—	—
	TSJ18	—	16	1 1/4	18	14-10d	—	820	1,310	—	—
	TSJ24	—	16	1 1/4	24	18-10d	—	1,050	1,685	—	—
	TSJ30	—	16	1 1/4	30	22-10d	—	1,285	2,060	—	—
	TSJ36	—	16	1 1/4	36	26-10d	—	1,520	2,075	—	—
THST	THST2	3/16	—	2 1/2	21 1/4	—	(6) – 5/8″	—	—	3,415	5,460
	THST3	1/4	—	3	25 1/2	—	(6) – 3/4″	—	—	4,985	7,980
	THST5	3/16	—	5	21 1/4	—	(12) – 5/8″	—	—	6,840	10,940
	THST6	1/4	—	6	25 1/2	—	(12) – 3/4″	—	—	9,815	15,705
TCMST[8]	TCMST12-45"	—	12	3	45	100-16d	—		9,095	—	—
	TCMST12-105"	—	12	3	105	118-10d	—		9,190	—	—
	TCMST12-208"	—	12	3	208	118-10d	—		9,190	—	—
	TCMST14-34"	—	14	3	34	74-16d	—		6,495	—	—
	TCMST14-78"	—	14	3	78	88-10d	—		6,565	—	—
	TCMST14-155"		14	3	155	88-10d	—		6,565	—	—

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

[1]One half of the tabulated quantity of fasteners must be installed in each wood member forming the connection.
[2]Allowable loads have been increased for duration of load, C_D, as indicated in the table. No further increase is allowed.
[3]TMST and THST straps: Allowable tension loads with bolts are based on wood members having a minimum specific gravity of 0.50 and a minimum nominal thickness of 4 inches.
[4]TSI and TSJ straps: Allowable tension loads with nails are based on wood members having a minimum specific gravity of 0.50 and a minimum nominal thickness such that the nails have full embedment.
[5]Bolts must comply with Section 3.12.3.
[6]Allowable loads for nailed and bolted straps are not cumulative.
[7]Allowable tension loads are applicable only for the loading direction parallel to grain in both wood members connected by a strap.
8The tabulated number of fasteners is the minimum required to achieve the tabulated allowable loads.

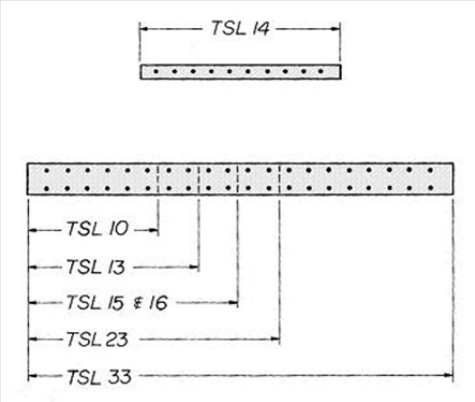


FIGURE 10A—DRAWING SHOWING THE RELATIVE LENGTHS OF THE TSL STRAPS WITHIN THE SERIES (TSF Straps similar)

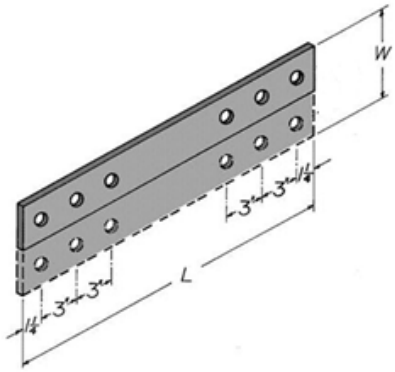


Figure 10B—DRAWING OF THE THST STRAP

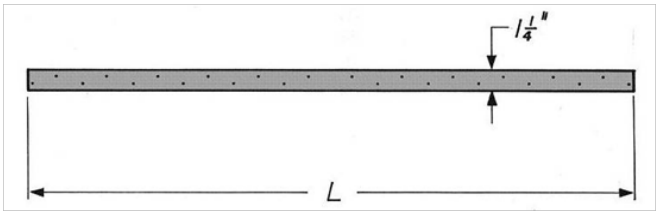


FIGURE 10C—DRAWING OF THE TSJ STRAP

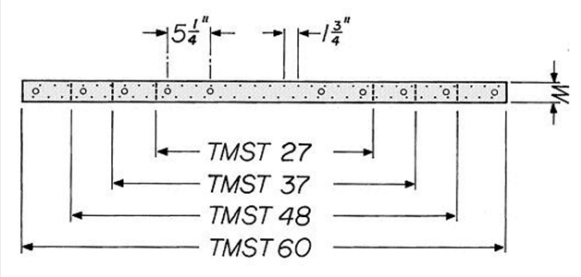


FIGURE 10D—DRAWING SHOWING THE RELATIVE LENGTHS OF THE TMST STRAPS (TMST72 similar; TSI similar, but without bolt holes)

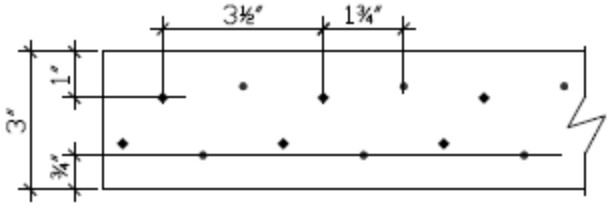


FIGURE 10E—DRAWING OF THE TCMST12 AND TCMST14 STRAPS

TABLE 11—STEEL SPECIFICATIONS, SPECIFIED YIELD AND TENSILE STRENGTHS, AND C COATINGS

TABLE	PRODUCT		STEEL SPECIFICATION	SPECIFIED MINIMUM STEEL STRENGTHS (psi)		COATING
				Yield, F_y	Tensile, F_u	
1	TECC, TCC		ASTM A36	36,000	58,000	Painted
2	TF		ASTM A653 Grade 33	33,000	45,000	G185 Galvanized
						G90 Galvanized
3	TVB		ASTM A653 Grade 33	33,000	45,000	G90 Galvanized
4	TXC	Stirrup	ASTM A1011 Grade 33	33,000	45,000	Painted
		Angle	ASTM A36	36,000	58,000	
5	TXD	Stirrup	ASTM A1011 Grade 33	33,000	58,000	Painted
		Angle	ASTM A36	36,000	58,000	
6	TGLT, THGLT		ASTM A36	36,000	58,000	Painted
7	TLEG, TMEG, TEG		ASTM A36	36,000	58,000	Painted
8	TGLS, THGLS, TGLST, THGLST		ASTM A36	36,000	58,000	Painted
9	THC, THCCT		ASTM A36	36,000	58,000	Painted
10	TSL, TSF, TMST, TSI, TSJ, THST, TMCMST		ASTM A653 (Grade 50)	50,000	65,000	G90 Galvanized

For **SI:** 1 psi = 6.89 kPa.

TABLE 12—NAILS USED FOR CONNECTORS

NAIL TYPE	SHANK DIAMETER (inch)	NAIL LENGTH (inches)	F_{yb} (psi)
10d common	0.148	3	90,000
16d common	0.162	$3^1/_2$	90,000
N16 smooth shank	0.162	$2^1/_2$	90,000
N54A angular-ring shank	0.250	$2^1/_2$	80,000

For **SI:** 1 inch = 25.4 mm, 1 psi = 6.89 kPa.

ICC-ES Evaluation Report

ESR-1822 CA Supplement

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

REPORT HOLDER:

TOBIN STEEL COMPANY, INC.

EVALUATION SUBJECT:

TOBIN STEEL STRUCTURAL WOOD HANGERS AND CONNECTORS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Tobin Steel Structural Wood Hangers and Connectors, described in ICC-ES evaluation report ESR-1822, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Tobin Steel Structural Wood Hangers and Connectors, described in Sections 2.0 through 7.0 of the evaluation report ESR-1822, comply with CBC Chapter 23 provided the design and installation are in accordance with the 2021 International *Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 23 as applicable.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The Tobin Steel Structural Wood Hangers and Connectors, described in Sections 2.0 through 7.0 of the evaluation report ESR-1822, comply with CRC Chapter 3, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2025.