

CH20 and CH18 Truss Plates

Installation Instructions

1 Installation

- 1.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, TER 2104-03 and the applicable building code.
- 1.2 In the event of a conflict between the manufacturer installation instructions and TER 2104-03, the more restrictive shall govern.
- 1.3 *Installation Procedure*
 - 1.3.1 Wood trusses connected with CH20 and CH18 Truss Plates shall be assembled in accordance with Chapter 3 of TPI 1 and IBC Section 2303.4, IRC Section R502.11, or IRC Section R802.10.
 - 1.3.2 Single plate installation is not allowable. Install CH20 and CH18 Truss Plates in corresponding pairs on opposite faces of truss member joints.
- 1.3.3 CH20 and CH18 Truss Plates must be pressed into wood for the full depth of the teeth by a hydraulic-platen press, multiple roller presses (partial embedment followed by full embedment presses), or combinations of hydraulic-platen presses and/or roller presses that feed into a stationary finish roller press.

2 Applications

- 2.1 *General*
 - 2.1.1 CH20 and CH18 Truss Plates can be used to connect wood truss members and support the lateral resistance of both vertical and horizontal loads when used in accordance with this TER and the applicable code.
 - 2.1.2 Unless otherwise noted, adjustment of the allowable design values for duration of load shall be in accordance with the applicable code.

2.2 Truss Plate Connection Allowable Design Values

2.2.1 CH20 and CH18 Truss Plates are allowed for use as truss plate connectors for wood trusses in accordance with the applicable allowable design values listed in Table 1.

Table 1. CH Plate Allowable Design Values

CH Plate	Wide Face or Narrow Face ¹	Lumber Species ^{2,3} (SG)	Allowable Design Value (psi/plate)			
			Orientation ⁴			
			AA	EA	AE	EE
CH20	Wide	SPF (0.42)	210	180	130	130
		SP (0.55)	235	190	160	175
	Narrow	SPF (0.42)	180	150	110	110
		SP (0.55)	210	175	165	165
CH18	Wide	SPF (0.42)	185	165	125	130
		SP (0.55)	220	185	175	180
	Narrow	SPF (0.42)	140	140	115	110
		SP (0.55)	165	160	140	155

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 psi = 0.00689 MPa

- Wide face denotes that the CH plate is connected to the face grain of each member. Narrow face denotes that the CH plate is connected to the side grain of each member.
- Wood truss members shall have a minimum specific gravity (SG) of that listed in this table.
- Wood truss members and overall truss design shall be designed by others and shall be of adequate size, species, and grade to resist design loads and requirements in accordance with the applicable building code.
- Orientation refers to both the plate's slot orientation to the load and the load's orientation to grain.
 - AA denotes that the plate's slots are parallel to load and the load is parallel to grain (see Figure 1, showing the wide face connection).
 - EA denotes that the plate's slots are perpendicular to load and the load is parallel to grain (see Figure 1, showing the wide face connection).
 - AE denotes that the plate's slots are parallel to load and the load is perpendicular to grain (see Figure 2, showing the wide face connection).
 - EE denotes that the plate's slots are perpendicular to load and the load is perpendicular to grain (see Figure 2, showing the wide face connection).

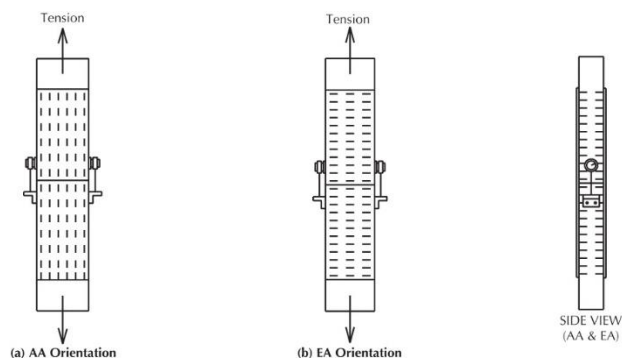


Figure 1. AA and EA Orientations (TPI 1 Figure 5.2-3)

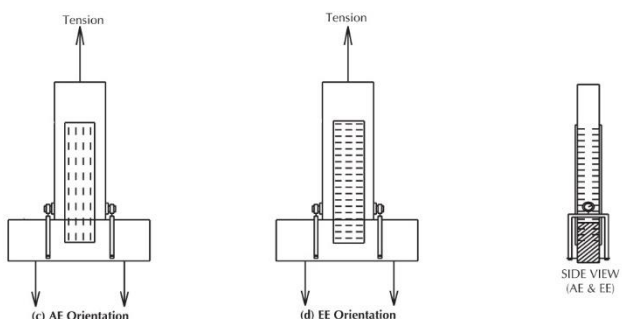


Figure 2. AE and EE Orientations (TPI 1 Figure 5.2-3)

2.3 Tension Design Values and Effectiveness Ratios

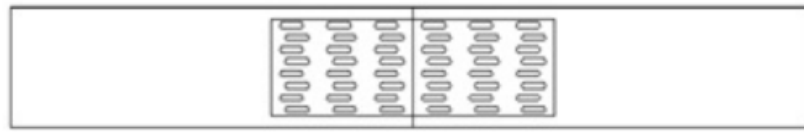
2.3.1 CH20 and CH18 Truss Plates have allowable tension design values and effectiveness ratios as listed in Table 2.

Table 2. CH Plate Allowable Tension Design Values and Effectiveness Ratios

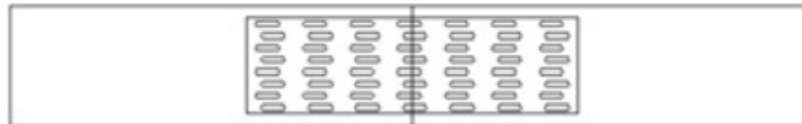
CH Plate	Orientation ¹	Allowable Design Value (pli)	Tensile Effectiveness Ratio ³
CH20	0° (AA)	495	0.453
	90° (EA)	470	0.431
	0° (AA, Non-Standard joint) ²	625	0.570
CH18	0° (AA)	705	0.500
	90° (EA)	715	0.507
	0° (AA, Non-Standard joint) ²	830	0.588

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 pli = 0.175 N/mm

- Orientation refers to the plate's slot orientation to the load (0° is parallel to the plate's slots, 90° is perpendicular to the plate's slots), given tension loading is parallel to grain.
 - AA denotes that the plate's slots are parallel to load and the load is parallel to grain.
 - EA denotes that the plate's slots are perpendicular to load and the load is parallel to grain.
- Non-Standard joints denote full metal plate cross-sectional area across the wood member's joint plane.
- Tensile Effectiveness Ratio (R_t) is defined in TPI 1 as: $R_t = \frac{F_{tp}}{F_{tc}}$, where F_{tp} is the plate's ultimate tensile strength for the given orientation and F_{tc} is the theoretical ultimate tensile strength of the matched solid metal control specimen.



Non-standard test joint for steel tension parallel to slots
(solid steel cross-section over the joint line)



Standard test joint for steel tension parallel to slots
(minimum cross-section over the joint line)

Figure 3. Non-Standard and Standard Joints (TPI 1 Figure 5.4-4)

2.4 Shear Design Values and Effectiveness Ratios

2.4.1 CH20 and CH18 Truss Plates have allowable shear design values as listed in Table 3.

Table 3. CH Plate Allowable Shear Design Values and Effectiveness Ratios

CH Plate	Plate Angle ¹	Allowable Design Value (pli)	Shear Effectiveness Ratio ²
CH20	0°	344	0.51
	30°	394	0.58
	60°	484	0.72
	90°	316	0.47
	120°	288	0.43
	150°	297	0.44
CH18	0°	442	0.62
	30°	472	0.66
	60°	619	0.87
	90°	451	0.63
	120°	345	0.48
	150°	372	0.52

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 pli = 0.175 N/mm

1. Plate angle is measured from the vertical.

2. Shear Strength Effectiveness Ratio (R_s) is defined in TPI 1 as: $R_s = \left(\frac{F_{sp}}{F_{sc}} \right) = \frac{F_{sp}}{0.577 \times F_{tc}}$, where F_{sp} is the plate's ultimate shear stress for the given orientation, F_{sc} is the theoretical ultimate shear stress of the matched solid metal control specimen, and F_{tc} is the average ultimate tensile stress.