

Technical Evaluation Report™

TER 2104-03

CH Machine Connector Plates

CH Machine, Inc.

Product:

CH20 and CH18 Truss Plates

Issue Date:

February 2, 2022

Revision Date:

February 28, 2023

Subject to Renewal:

April 1, 2024



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INFORMATION:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 05 23 - Wood, Plastic, and Composite Fastenings

SECTION: 06 05 23.17 - Wood Framing Metal Connectors

SECTION: 06 17 53 - Shop-Fabricated Wood Trusses

1 Product Evaluated^{1,2}

1.1 CH20 and CH18 Truss Plates

2 Applicable Codes and Standards³

2.1 Codes

2.1.1 *IBC—15, 18, 21: International Building Code®*

2.1.2 *IRC—15, 18, 21: International Residential Code®*

2.1.3 *FBC-B—17, 20: Florida Building Code – Building⁴*

2.1.4 *FBC-R—17, 20: Florida Building Code – Residential⁴*

2.2 Standards and Referenced Documents

2.2.1 *ASTM A653: Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-dip Process*

2.2.2 *ASTM A879: Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface*

2.2.3 *TPI 1: National Design Standard for Metal-plate-connected Wood Truss Construction*

¹ For more information, visit drjcertification.org or call us at 608-310-6748.

² This TER is a code defined research report provided by an approved source (see IBC Section 1703.4.2) and an approved agency (see IBC Section 1703.1). Given that this TER is for new materials, as defined in IBC Section 1702, for which there are no approved rules or standards, IBC Section 1707.1 states that, "In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports (i.e., research reports) from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11". A professional engineer is approved as an approved source when that professional engineer is properly licensed to transact engineering commerce.

³ Unless otherwise noted, all references in this TER are from the 2021 version of the codes and the standards referenced therein. This material, design, or method of construction also complies with the 2000-2018 versions of the referenced codes and the standards referenced therein.

⁴ All references to the FBC-B and FBC-R are the same as the 2018 IBC and 2018 IRC, respectively, unless otherwise noted in the supplement at the end of this document.

3 Performance Evaluation

- 3.1 Testing and related engineering evaluations are defined as intellectual property and/or trade secrets.⁵
- 3.2 CH20 and CH18 Truss Plates were evaluated to determine:
 - 3.2.1 Structural performance under load conditions for use as a metal plate connector for wood trusses in accordance with IBC Section 2306.1 and TPI 1.
 - 3.2.2 Tensile strength and effectiveness ratio in accordance with TPI 1.
 - 3.2.3 Shear strength and effectiveness ratio in accordance with TPI 1.
- 3.3 Overall truss design is outside the scope of this TER.
- 3.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope, which are also its areas of professional engineering competence.
- 3.5 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

- 4.1 The product evaluated in this TER is shown in Figure 1.

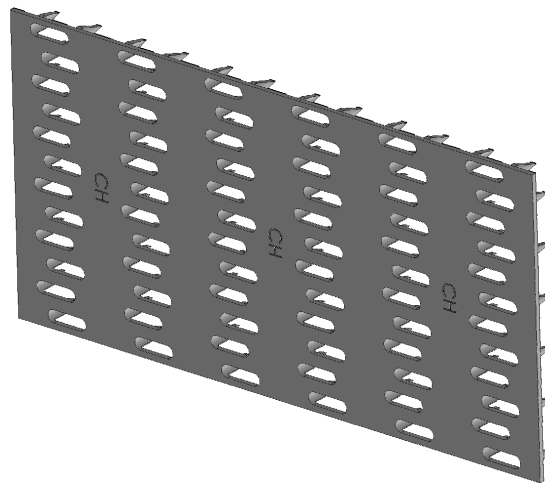


Figure 1. CH Metal Plate Connector

- 4.2 CH20 and CH18 Truss Plates are flat, light gauge galvanized steel plates that use integral teeth to transmit lateral loads between wood truss members.
 - 4.2.1 CH20 is manufactured from galvanized steel sheets complying with ASTM A653, SS Grade 40 with a G60 galvanized coating, or 30Z30Z Electrolytic Zinc coating in accordance with ASTM A879.
 - 4.2.1.1 The minimum uncoated thickness of each steel sheet is 0.034".
 - 4.2.1.2 CH20 has eight (8) teeth per square inch that are 0.35" long, 0.125" wide, and punched perpendicular to the plane of the plate.

⁵ 18 U.S. Code § 1831 - Economic espionage - Whoever, intending or knowing that the offense will benefit any foreign government, foreign instrumentality, or foreign agent, knowingly steals, or without authorization appropriates, takes, carries away, or conceals, or by fraud, artifice, or deception obtains a trade secret shall be fined not more than \$5,000,000 or imprisoned not more than 15 years, or both. Any organization that commits any offense described shall be fined not more than the greater of \$10,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided.
<https://www.law.cornell.edu/uscode/text/18/part-II/chapter-90>.



- 4.2.2 CH18 is manufactured from galvanized steel sheets complying with ASTM A653, SS Grade 40 with a G60 galvanized coating, or 30Z30Z Electrolytic Zinc coating in accordance with ASTM A879.
 - 4.2.2.1 The minimum uncoated thickness of each steel sheet is 0.045".
 - 4.2.2.2 CH18 has eight (8) teeth per square inch that are 0.35" long, 0.125" wide, and punched perpendicular to the plane of the plate.

5 Applications

5.1 General

- 5.1.1 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.
- 5.1.2 Unless otherwise noted, adjustment of the allowable design values for duration of load shall be in accordance with the applicable code.

5.2 Truss Plate Connection Allowable Design Values

- 5.2.1 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

1. 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.
2. Wood truss members shall have a minimum specific gravity (SG) of that listed in this table.
3. 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.
4. Orientation refers to both the plate's slot orientation to the load and the load's orientation to grain.
 - a. AA denotes that the plate's slots are parallel to load and the load is parallel to grain (see Figure 2, showing the wide face connection).
 - b. EA denotes that the plate's slots are perpendicular to load and the load is parallel to grain (see Figure 2, showing the wide face connection).
 - c. AE denotes that the plate's slots are parallel to load and the load is perpendicular to grain (see Figure 3, showing the wide face connection).
 - d. EE denotes that the plate's slots are perpendicular to load and the load is perpendicular to grain (see Figure 3, showing the wide face connection).

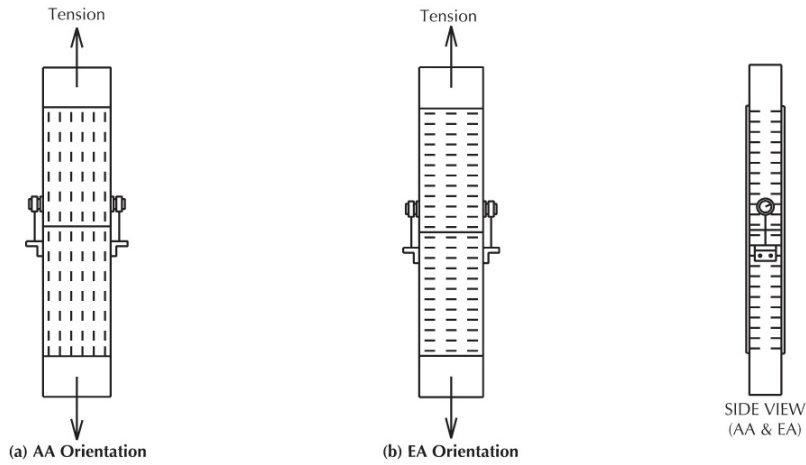


Figure 2. AA and EA Orientations (TPI 1 Figure 5.2-3)

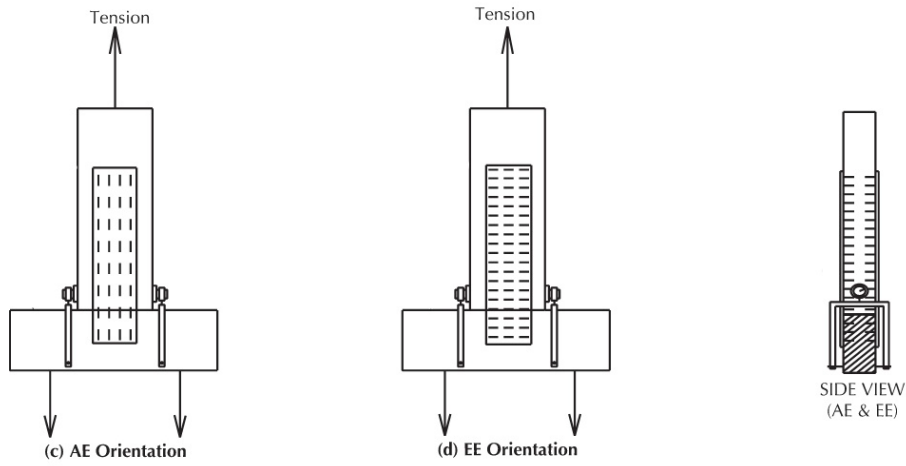


Figure 3. AE and EE Orientations (TPI 1 Figure 5.2-3)

5.3 Tension Design Values and Effectiveness Ratios

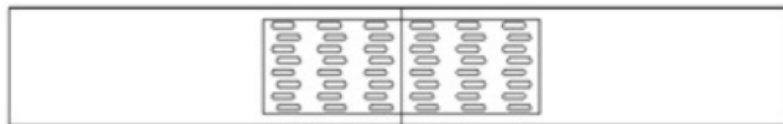
5.3.1 CH20 and CH18 Truss Plates have allowable tension design values and effectiveness ratios as listed in Table 2.

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

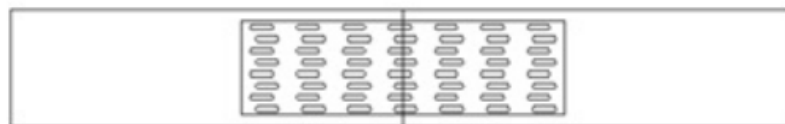
CH Plate	Orientation ¹	Allowable Design Value (pli)	Tensile Effectiveness Ratio ³
CH20	0° (AA)	495	0.453
	90° (EA)	470	0.431
	0° (AA, Non-Standard joint) ²	623	0.570
CH18	0° (AA)	564	0.500
	90° (EA)	571	0.507
	0° (AA, Non-Standard joint) ²	662	0.588

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 (see Figure 2 and Figure 4).
 - EA denotes that the plate's slots are perpendicular to load and the load is parallel to grain (see Figure 2).
- Non-Standard joints denote full metal plate cross-sectional area across the wood member's joint plane (see Figure 4).
- 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 4. Non-Standard and Standard Joints (TPI 1 Figure 5.4-4)

5.4 Shear Design Values and Effectiveness Ratios

5.4.1 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.

5.5 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.

6 Installation

6.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this TER and the applicable building code.

6.2 In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.

6.3 Installation Procedure

6.3.1 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.

6.3.2 Single plate installation is not allowable. Install CH20 and CH18 Truss Plates in corresponding pairs on opposite faces of truss member joints.

6.3.3 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.

7 Substantiating Data

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 7.1.1 Truss plate connector testing for lateral resistance in accordance with TPI 1.
 - 7.1.2 Truss plate connector testing for tensile strength in accordance with TPI 1.
 - 7.1.3 Truss plate connector testing for shear strength in accordance with TPI 1.
- 7.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., registered design professionals [RDP]), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon
- 7.3 Where pertinent, DrJ's analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.
- 7.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of any raw materials. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.
- 7.5 Testing and engineering analysis: The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.⁶

8 Findings

- 8.1 As delineated in Section 3, CH20 and CH18 Truss Plates have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.
- 8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, CH20 and CH18 Truss Plates shall be approved for the following applications:
- 8.2.1 Use as a metal plate connector for wood truss construction in accordance with IBC Section 2306.1.
- 8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from CH Machine, Inc.
- 8.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10⁷ are similar) in pertinent part states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

⁶ See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

⁷ 2018 IFC Section 104.9

- 8.5 Approved:⁸ Building codes require that the building official shall accept duly authenticated reports⁹ or research reports¹⁰ from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.
- 8.5.1 Acceptability of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).
- 8.5.2 Acceptability of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.
- 8.5.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved, as denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 8.6 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.
- 8.7 Through ANAB accreditation and the IAF Multilateral Agreements, this TER can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – “*certified once, accepted everywhere.*”

9 Conditions of Use

- 9.1 Material properties shall not fall outside the boundaries defined in Section 3.
- 9.2 As defined in Section 3, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 9.3 This TER establishes allowable metal connector plate design values only. The design values (lateral resistance values, effective tension strength ratios, and effective shear resistance ratios) used in the design of wood trusses using CH20 and CH18 Truss Plates must not exceed those listed in Table 1, Table 2, or Table 3 of this TER.
- 9.4 All lumber used in the fabrication of wood trusses connected with CH20 and CH18 Truss Plates shall be graded in accordance with the applicable building code and shall have a moisture content not in excess of 19%.
- 9.5 CH20 and CH18 Truss Plates must be installed in corresponding pairs on opposite faces of truss member joints.
- 9.6 Trusses assembled using CH Plates shall be in accordance with the tolerances provided for in with ANSI/TPI 1, Chapter 3.
- 9.7 Allowable loads shown in Table 1, Table 2, or Table 3 have not been adjusted for use in preservative treated or fire-retardant treated lumber. Allowable value shall be adjusted in accordance with the treatment manufacturer's product evaluation report. If this information is not in the report, contact the treatment manufacturer for this information.
- 9.8 Where required by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.
- 9.9 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.10 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (e.g., owner or RDP).

⁸ Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

⁹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

¹⁰ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>



- 9.11 At a minimum, these products shall be installed per Section 6 of this TER.
- 9.12 When required by regulation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
 - 9.12.1 Any calculations, incorporated into the construction documents that are required to show compliance with this TER, shall conform to accepted engineering practice, and shall be approved when requirements of the relevant regulations are met.
 - 9.12.2 This TER and the installation instructions shall be submitted at the time of permit application.
 - 9.12.3 These products have an internal quality control program and a third-party quality assurance program.
 - 9.12.4 At a minimum, these products shall be installed per Section 6 of this TER.
 - 9.12.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.
 - 9.12.6 These products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.
 - 9.12.7 The application of these products in the context of this TER is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2 and any other regulatory requirements that may apply.
- 9.13 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 9.14 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.

10 Identification

- 10.1 The products listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at chmachineinc.com.

11 Review Schedule

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.
- 11.2 For information on the status of this TER, contact DrJ Certification.

12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

- 12.1 CH20 and CH18 Truss Plates are included in this TER published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services, and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER meets the legislative intent and definition of being acceptable to the AHJ.

1 Appendix A: Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:
 - 1.1.1 Advance Innovation,
 - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, and
 - 1.1.3 Benefit consumers through lower prices, better quality, and greater choice.
- 1.2 **Adopted Legislation:** The following local, state, and federal regulations affirmatively authorize CH20 and CH18 Truss Plates to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
 - 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies and/or methods of construction. The goal is to “protect economic freedom and opportunity by promoting free and fair competition in the marketplace.”
 - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation, and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
 - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA).
 - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.
 - 1.2.4 For new materials¹¹ that are not specifically provided for in any building code, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
 - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.¹²
- 1.3 **Approved**¹³ **by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards, which apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.¹⁴ The Superintendent of Building roster of approved testing agencies is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a CBI Listing are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.¹⁵

¹¹ <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

¹² [IBC 2021, Section 1706.1 Conformance to Standards](#)

¹³ See section 8.3 for the distilled building code definition of Approved.

¹⁴ [Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES](#)

¹⁵ <https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>

- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed¹⁶ an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement¹⁷ (i.e., ANAB, International Accreditation Forum (IAF), etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods; 1) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 3) A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code; 4) A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code; 5) A statewide product approval issued by the Florida Building Commission. The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).
- 1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

¹⁶ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

¹⁷ New York City, The Rules of the City of New York, § 101-07 Approved Agencies

- 1.8 **Approved by New Jersey:** Pursuant to Building Code 2018 of New Jersey in [IBC Section 1707.1 General](#),¹⁸ it states: “In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the [Uniform Construction Code \(N.J.A.C. 5:23\)](#)”.¹⁹ Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) Approvals:** Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations.
1. A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of (a) above.
 2. Reports of engineering findings issued by nationally recognized evaluation service programs, such as, but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. The [New Jersey Department of Community Affairs](#) has confirmed that technical evaluation reports, from any accredited entity listed by [ANAB](#), meets the requirements of item 2 given that the listed entities are no longer in existence and/or do not provide “reports of engineering findings”.
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, [Part 3282.14](#)²⁰ and [Part 3280](#),²¹ the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “All construction methods shall be in conformance with accepted engineering practices”; 2) “The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.”; and 3) “The design stresses of all materials shall conform to accepted engineering practice.”
- 1.10 **Approved by US, Local, and State Jurisdictions in General:** In all other local and state jurisdictions, the regulations require approval per Section 8 above.
- 1.11 **Approved by International Jurisdictions:** The [USMCA](#) and [GATT](#) agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the [Technical Barriers to Trade](#) agreements and the [International Accreditation Forum \(IAF\) Multilateral Recognition Arrangement \(MLA\)](#), where these agreements:
- 1.11.1 Permit participation of [conformity assessment bodies](#) located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,
 - 1.11.2 State that [conformity assessment procedures](#) (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.
 - 1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures [shall not be more strict](#) or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.

¹⁸ https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

¹⁹ <https://www.nj.gov/dca/divisions/codes/codreg/ucc.html>

²⁰ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>

²¹ <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>



1.11.4 **Approved:** The purpose of the IAF MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA, and subsequently acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.



Issue Date: February 2, 2022
Subject to Renewal: April 1, 2024

FBC Supplement to TER 2104-03

REPORT HOLDER: CH Machine, Inc.

1 Evaluation Subject

- 1.1 CH20 and CH18 Truss Plates

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show CH20 and CH18 Truss Plates recognized in TER 2104-03, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

- 2.2.1 *FBC-B—17, 20: Florida Building Code – Building*
- 2.2.2 *FBC-R—17, 20: Florida Building Code – Residential*

3 Conclusions

- 3.1 CH20 and CH18 Truss Plates, described in TER 2104-03, comply with the FBC-B and FBC-R and is subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this TER, they are listed here:
 - 3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved.
 - 3.2.2 FBC-R Section R104 and Section R109 are reserved.

4 Conditions of Use

- 4.1 CH20 and CH18 Truss Plates, described in TER 2104-03, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in TER 2104-03
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.