



# Listing and Technical Evaluation Report™

Report No: 1308-11



Issue Date: September 13, 2013

Revision Date: August 21, 2024

Subject to Renewal: October 1, 2025

## FastenMaster® ThruLOK® Pole Barn Header Connection

Trade Secret Report Holder:

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### CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

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

Section: 06 11 00 - Wood Framing

### 1 Innovative Product Evaluated<sup>1</sup>

- 1.1 ThruLOK Screw Bolt Fastening System

### 2 Product Description and Materials

- 2.1 The innovative product evaluated in this report is shown in **Figure 1**.

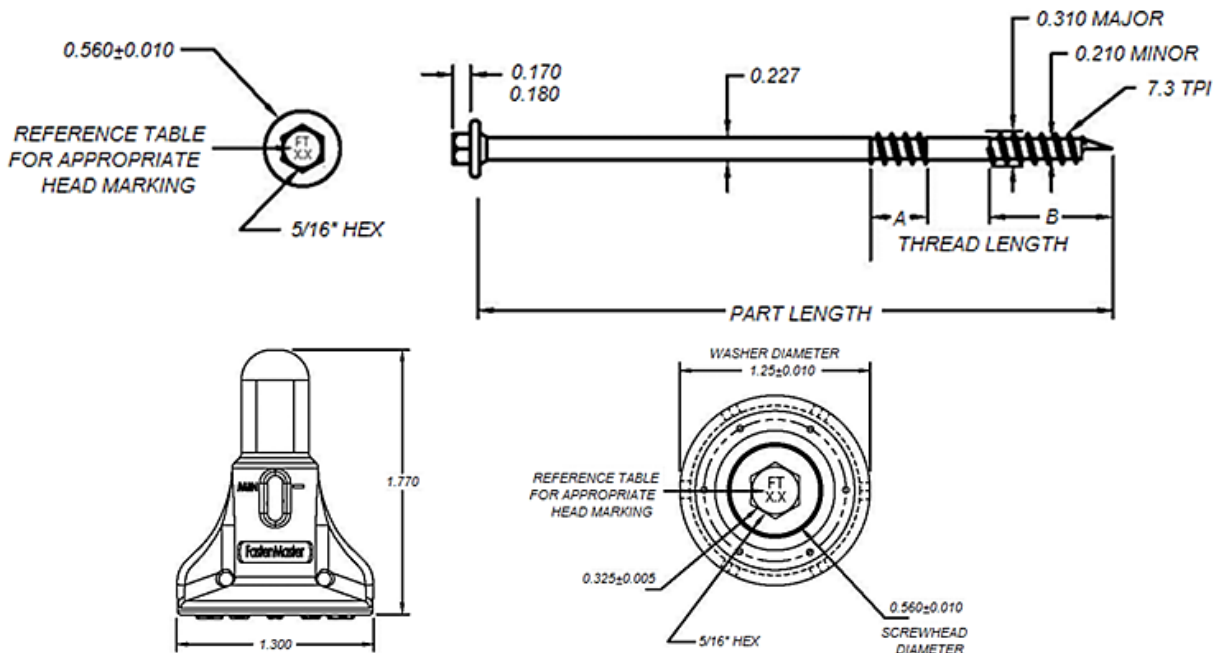


Figure 1. ThruLOK Screw Bolt Fastening System



2.2 ThruLOK Screw Bolt Fastening System, listed in **Table 1** was evaluated.

**Table 1.** Fastener Specifications

Fastener Name	Fastener Designation	Head Marking	Length <sup>1</sup> (in)	Length of Thread <sup>2</sup> (in)		Unthreaded Shank Diameter (in)	Minor Thread (Root) Diameter (in)	Allowable Bending Yield <sup>3</sup> (psi)
				A	B			
ThruLOK	THR912	FT9.5	9.5	0.56	1.2	0.227	0.210	218,400
	THR008	FT8.0	8.0	0.56	1.2	0.227	0.210	218,400

SI: 1 in = 25.4 mm, 1 psi = 0.00689 MPa

- Measured from the underside of the head to the point of the tip.
- The thread lengths given for the ThruLOK are for zones A and B, as depicted in **Figure 1**.
- Determined in accordance with methods specified in ASTM F1575, based on minor thread diameter using a five percent (5%) offset of the load displacement curves developed from bending tests.

- 2.2.1 ThruLOK fastener heads have a  $5/16$ " hex drive.
  - 2.2.2 Allowable bending yield and critical dimensions are found in **Table 1**.
  - 2.2.3 ThruLOK fasteners have a proprietary cutting point and are supplied with a ThruLOK washer and nut.
  - 2.2.4 ThruLOK fasteners are manufactured with carbon steel grade 1022 or 10B21 wire conforming to ASTM A510 with a minimum ultimate tensile strength of 60 ksi.
  - 2.2.5 ThruLOK fasteners are coated with mechanically applied zinc in accordance with ASTM B695, Class 55 as specified in IRC Section R317.3.1.
- 2.3 As needed, review material properties for design in **Section 6** and to regulatory evaluation in **Section 8**.

### 3 Definitions

- 3.1 New Materials<sup>2</sup> are defined as building materials, equipment, appliances, systems or methods of construction not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.<sup>3</sup> The design strengths and permissible stresses shall be established by tests<sup>4</sup> and/or engineering analysis.<sup>5</sup>
- 3.2 Duly authenticated reports<sup>6</sup> and research reports<sup>7</sup> are test reports and related engineering evaluations, which are written by an approved agency<sup>8</sup> and/or an approved source.<sup>9</sup>
  - 3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).<sup>10</sup>
- 3.3 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory.
- 3.4 An approved source is "approved" when a professional engineer (i.e., Registered Design Professional) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.<sup>11</sup>
- 3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body and/or a licensed Registered Design Professional (RDP).
  - 3.5.1 The Center for Building Innovation (CBI) is ANAB<sup>12</sup> ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall enforce<sup>13</sup> the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing<sup>14</sup> stating the nonconformance and the path to its cure.



- 3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.<sup>15</sup>
- 3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.<sup>16</sup> Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>17</sup>
- 3.9 Approval equity is a fundamental commercial and legal principle.<sup>18</sup>

#### 4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation<sup>19</sup>

##### 4.1 Standards

- 4.1.1 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
- 4.1.2 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*
- 4.1.3 *ASTM B695: Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel*
- 4.1.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*
- 4.1.5 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*

##### 4.2 Regulations

- 4.2.1 *IBC – 15, 18, 21: International Building Code®*
- 4.2.2 *IRC – 15, 18, 21: International Residential Code®*

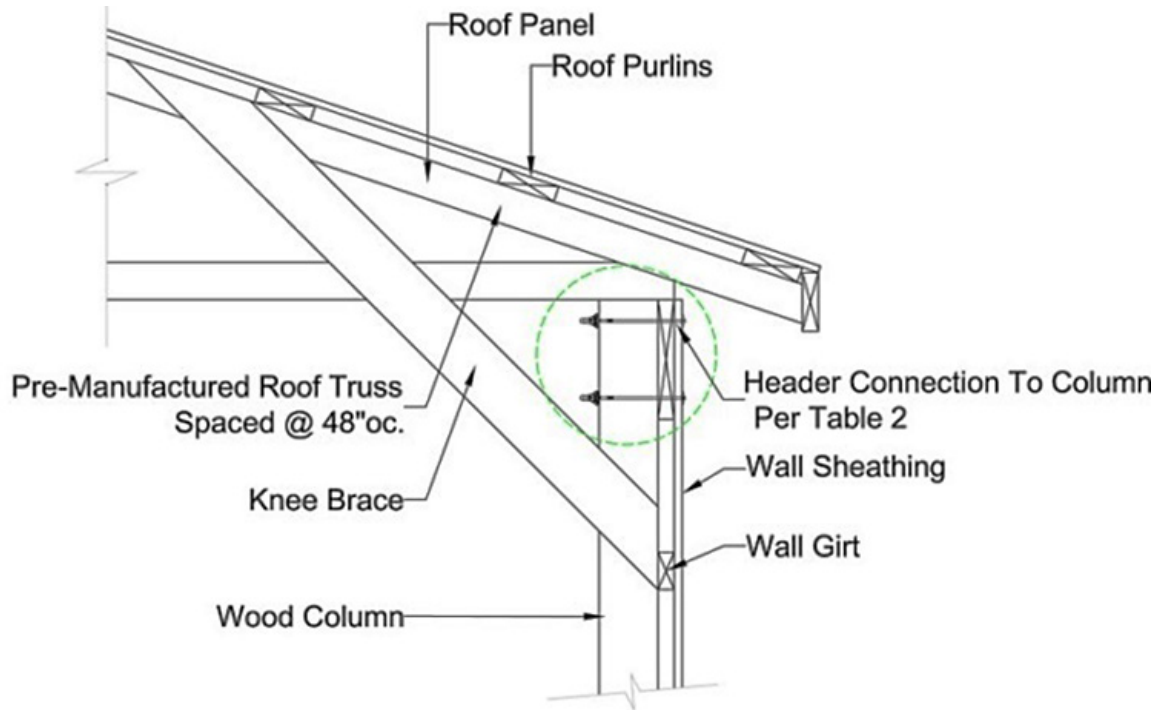
#### 5 Listed<sup>20</sup>

- 5.1 Equipment, materials, products or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), approved agency (i.e., CBI and DrJ), and/or approved source (i.e., DrJ) or other organization concerned with product evaluation (i.e., DrJ) that maintains periodic inspection (i.e., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

## 6 Tabulated Properties Generated from Nationally Recognized Standards

### 6.1 Single Header Configuration

6.1.1 **Figure 2** shows a single header connection using ThruLOK fasteners to resist single shear of one header on one side of one column.



**Figure 2.** ThruLOK Screw Bolt Fastening System – Roof to Header Detail

6.1.2 For the header configuration shown in **Figure 2**, it is assumed that the interior header will receive seventy-five percent (75%) of the load and the exterior header will receive twenty-five percent (25%) of the load.

6.1.3 **Table 2** provides the number of ThruLOK fasteners needed for various snow loading conditions.

**Table 2.** Single Shear – Truss Bearing on One Header to One Column<sup>1,3,4,5</sup>

Building Width Including 1' Overhang Each End (ft)	Species <sup>2</sup> (Pressure Treated)	Truss Spacing (ft)	Column Spacing (ft)	Number of 8" ThruLOK Fasteners per Header		
				Loading (Snow + TC Dead + BC Dead) PSF		
				20+10+5 = 35	30+10+5 = 45	40+10+5 = 55
24	Hem-Fir	4	8	4	6	6
	Douglas-Fir			4	4	6
	Mixed Southern Yellow Pine			4	4	6
28	Hem-Fir	4	8	6	6	8
	Douglas-Fir			4	6	6
	Mixed Southern Yellow Pine			4	6	6



**Table 2. Single Shear – Truss Bearing on One Header to One Column<sup>1,3,4,5</sup>**

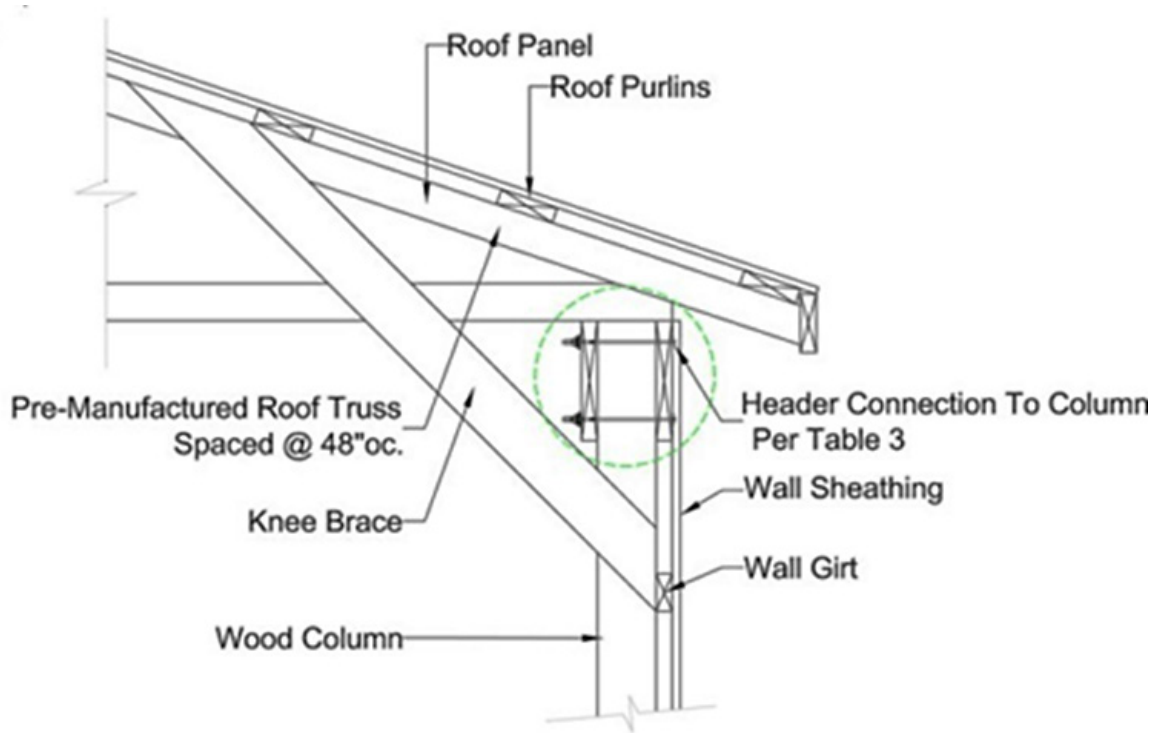
Building Width Including 1' Overhang Each End (ft)	Species <sup>2</sup> (Pressure Treated)	Truss Spacing (ft)	Column Spacing (ft)	Number of 8" ThruLOK Fasteners per Header		
				Loading (Snow + TC Dead + BC Dead) PSF		
				20+10+5 = 35	30+10+5 = 45	40+10+5 = 55
32	Hem-Fir	4	8	6	8	8
	Douglas-Fir			6	6	8
	Mixed Southern Yellow Pine			4	6	8
36	Hem-Fir	4	8	6	8	-
	Douglas-Fir			6	6	8
	Mixed Southern Yellow Pine			6	6	8
40	Hem-Fir	4	8	6	8	-
	Douglas-Fir			6	8	-
	Mixed Southern Yellow Pine			6	6	8
44	Hem-Fir	4	8	8	-	-
	Douglas-Fir			6	8	-
	Mixed Southern Yellow Pine			6	8	-
48	Hem-Fir	4	8	8	-	-
	Douglas-Fir			8	8	-
	Mixed Southern Yellow Pine			6	8	-
52	Hem-Fir	4	8	8	-	-
	Douglas-Fir			8	-	-
	Mixed Southern Yellow Pine			8	8	-

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m<sup>2</sup>

1. Fastener designs were evaluated under NDS wet service (also known as wet use) conditions to account for the effects of higher header and/or column moisture content.
2. Lumber used shall be either treated Southern Pine, treated Hem-Fir or treated Douglas Fir.
3. Connection design assumes that the header supports one truss located at midspan of the header. Trusses located at the columns shall be supported by bearing on the column and shall not apply loads to the header.
4. Design of all wood members (i.e., columns/posts, headers, trusses, girts, knee braces) and connections not shown are by others.
5. See **Section 6.3** for information on minimum required edge and end distances.

## 6.2 Double Header Configuration

6.2.1 **Figure 3** shows a double header connection using ThruLOK fasteners to resist the shear of one header on one side of a single column and another header on the opposite side of the column.



**Figure 3.** ThruLOK Screw Bolt Fastening System – Roof to Header Detail

6.2.2 For the header configuration shown in **Figure 3**, it is assumed that the interior header will receive seventy-five percent (75%) of the load and exterior header will receive twenty-five percent (25%) of the load.

6.2.3 **Table 3** provides the number of ThruLOK fasteners needed for various snow loading conditions.

**Table 3.** Two-Beam Shear – Truss Bearing on Two Headers Connected to One Column<sup>1,3,4,5</sup>

Building Width Including 1' Overhang Each End (ft)	Species <sup>2</sup> (Pressure Treated)	Truss Spacing (ft)	Column Spacing (ft)	Number of 9 <sup>1</sup> / <sub>2</sub> " ThruLOK Fasteners per Header		
				Loading (Snow + TC Dead + BC Dead) PSF		
				20+10+5 = 35	30+10+5 = 45	40+10+5 = 55
24	Hem-Fir	4	8	4	4	6
	Douglas-Fir			4	4	4
	Mixed Southern Yellow Pine			4	4	4
28	Hem-Fir	4	8	4	6	6
	Douglas-Fir			4	4	6
	Mixed Southern Yellow Pine			4	4	4



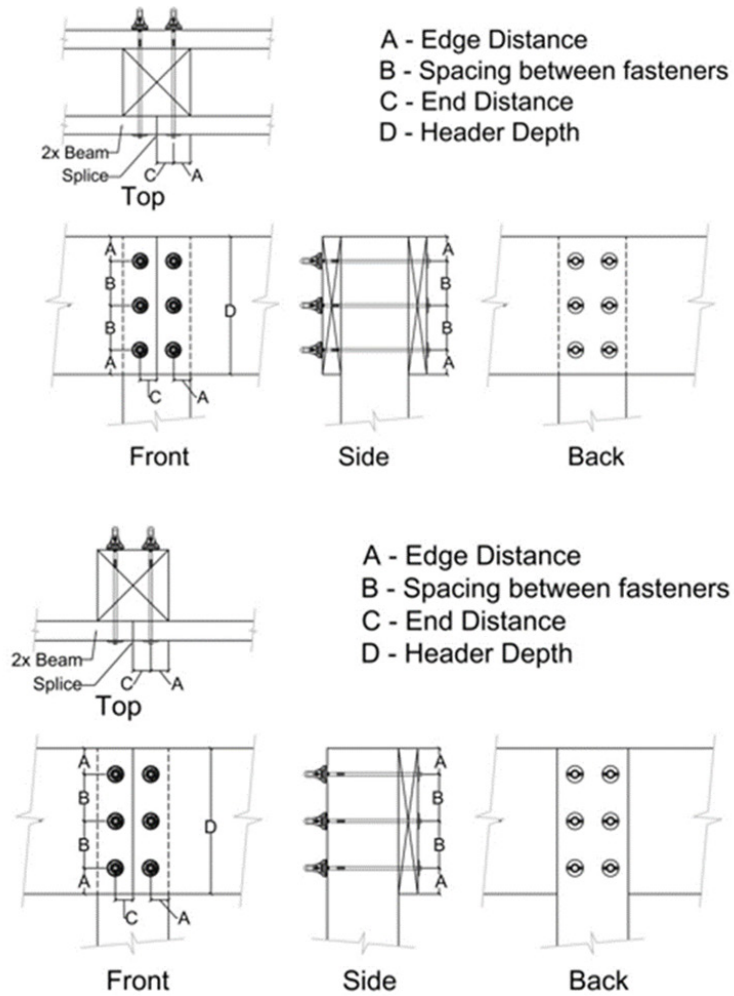
**Table 3. Two-Beam Shear – Truss Bearing on Two Headers Connected to One Column<sup>1,3,4,5</sup>**

Building Width Including 1' Overhang Each End (ft)	Species <sup>2</sup> (Pressure Treated)	Truss Spacing (ft)	Column Spacing (ft)	Number of 9 <sup>1</sup> / <sub>2</sub> " ThruLOK Fasteners per Header		
				Loading (Snow + TC Dead + BC Dead) PSF		
				20+10+5 = 35	30+10+5 = 45	40+10+5 = 55
32	Hem-Fir	4	8	4	6	6
	Douglas-Fir			4	4	6
	Mixed Southern Yellow Pine			4	4	6
36	Hem-Fir	4	8	6	6	8
	Douglas-Fir			4	6	6
	Mixed Southern Yellow Pine			4	6	6
40	Hem-Fir	4	8	6	6	8
	Douglas-Fir			4	6	8
	Mixed Southern Yellow Pine			4	6	6
44	Hem-Fir	4	8	6	8	8
	Douglas-Fir			6	8	8
	Mixed Southern Yellow Pine			4	6	8
48	Hem-Fir	4	8	6	8	-
	Douglas-Fir			6	6	8
	Mixed Southern Yellow Pine			6	6	8
52	Hem-Fir	4	8	6	8	-
	Douglas-Fir			6	8	8
	Mixed Southern Yellow Pine			6	6	8

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m<sup>2</sup>

1. Fastener designs were evaluated under NDS wet service (also known as wet use) conditions to account for the effects of higher header and/or column moisture content.
2. Lumber used shall be either treated Southern Pine, treated Hem Fir or treated Douglas Fir.
3. Connection design assumes that the header supports one truss located at midspan of the header. Trusses located at the columns shall be supported by bearing on the column and shall not apply loads to the header.
4. See **Section 6.3** for information on minimum required edge and end distances.
5. Design of all wood members (i.e., columns/posts, headers, trusses, girts) and connections not shown are by others.

6.3 **Figure 4** and **Table 4** provide the required edge and end distances for the applications described in this report.



**Figure 4.** ThruLOK Screw Bolt Fastening System – Edge, End and Spacing Requirements





**Table 4.** Fastener Edge, End Distance, and Spacing for the ThruLOK Fasteners Evaluated in this Report

Fastener	Beam Size	Number of Fasteners	Header Member		Column Member		Fastener Spacing Between Rows (in)
			Min. Edge Distance (in)	Min. End Distance (in)	Min. Edge Distance (in)	Min. End Distance (in)	
8" & 9 1/2" ThruLOK	2x8	4	2	1	Greater of 1" or 1/2" spacing between rows	2	3 1/4
		6					1 5/8
	2x10	4	2	1	Greater of 1" or 1/2" spacing between rows	2	5 1/4
		6					2 5/8
		8					1 3/4
	2x12	4	2	1	Greater of 1" or 1/2" spacing between rows	2	5 5/8
		6					3 5/8
		8					2 1/2

SI: 1 in = 25.4 mm

6.4 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.

## 7 Certified Performance<sup>21</sup>

- 7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.<sup>22</sup>
- 7.2 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.<sup>23</sup>

## 8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 ThruLOK complies with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
  - 8.1.1 ThruLOK was evaluated to determine its ability to provide code complying attachment of horizontal roof headers to vertical columns (posts) to resist roof to header to column gravity loads and the associated load paths.
    - 8.1.1.1 The evaluation includes both single header and double header configurations.
- 8.2 Use of ThruLOK for other connections is outside the scope of this report.
- 8.3 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified<sup>24</sup> to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.



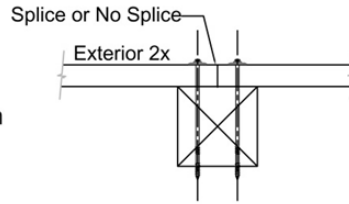
- 8.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which are also its areas of professional engineering competence.
- 8.5 Any regulation specific issues not addressed in this section are outside the scope of this report.

## 9 Installation

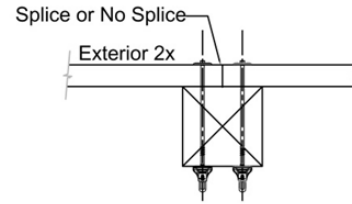
- 9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report and the applicable building code.
- 9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.
- 9.3 *Installation Procedure*
- 9.3.1 The following installation instructions provide the general method of installing the FastenMaster ThruLOK Screw Bolt Fastening System for use with the specific applications as described in **Section 6**.
- 9.3.2 Place the ThruLOK washer on the ThruLOK screw with the teeth of the washer facing away from the head of the fastener (toward the threads of the fastener).
- 9.3.3 Using a high-torque,  $\frac{1}{2}$ " variable-speed drill (18V if cordless) with a  $\frac{5}{16}$ " hex-head driver bit, drive the ThruLOK through the framing until the washer and hex head are just above the wood surface (approximately  $\frac{1}{4}$ " ), and the point of the screw protrudes out of the other side of the connection.
- 9.3.4 Thread the ThruLOK nut onto the point of the fastener and hand tighten the nut until it is flush with the wood.
- 9.3.5 Tighten the screw with the drill-driver.
- 9.3.6 The point of the fastener must engage in the ThruLOK nut to the "*MIN*" line or beyond (**Figure 1**).

9.3.7 A diagram of the installation of a header with a splice on the interior side of a column is illustrated in **Figure 5**.

Installation procedure for when a single 2x header is installed at exterior of column.

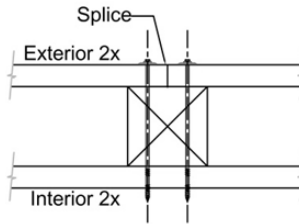


**Step 1.** Install ThruLok's from exterior 2x header side to ensure end and edge distances are maintained.

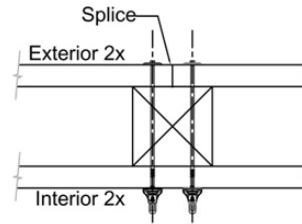


**Step 2.** Install nut on interior face and tighten

Installation procedure for when a header splice falls on exterior side of the column.



**Step 1.** Install ThruLok's from splice side (exterior 2x header side) to ensure end and edge distances are maintained.

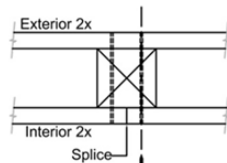


**Step 2.** Install nut on interior face and tighten

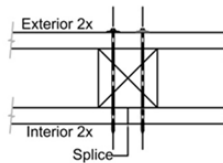
**Figure 5.** Installation of Header with Splice on Exterior Side of Column

9.3.8 A diagram of the installation of a header with a splice on the exterior side of a column is illustrated in **Figure 6**.

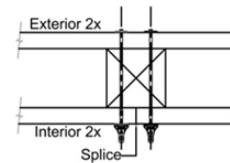
Installation procedure for when a header splice falls on interior side of the column.



**Step 1.** Predrill holes for the fastener from the interior side (spliced side) of assembly using the ThruLoks to ensure end and edge distances are maintained.



**Step 2.** Install ThruLok's through predrilled holes from exterior 2x header face as shown



**Step 3.** Install nut on interior face and tighten

**Figure 6.** Installation of Header with Splice on Interior Side of Column



## 10 Substantiating Data

- 10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 10.1.1 Lateral resistance testing in accordance with ASTM D1761
  - 10.1.2 Bending yield testing in accordance with ASTM F1575
- 10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources and/or RDPs. Accuracy of external test data and resulting analysis is relied upon.
- 10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability and safety.
- 10.4 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 or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.
- 10.5 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.<sup>25</sup>
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for ThruLOK Screw Bolt Fastening System on the DrJ Certification website.

## 11 Findings

- 11.1 As outlined in **Section 6**, ThruLOK has performance characteristics that were tested and/or meet applicable regulations and is suitable for use pursuant to its specified purpose.
- 11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, ThruLOK shall be approved for the following applications:
- 11.2.1 Fastening roof headers to columns for the conditions specified in **Table 2** and **Table 3**.
- 11.3 Unless exempt by state statute, when ThruLOK is to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.
- 11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from FastenMaster.
- 11.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10<sup>26</sup> 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.



- 11.6 **Approved:**<sup>27</sup> Building regulations require that the building official shall accept duly authenticated reports.<sup>28</sup>
- 11.6.1 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited.
- 11.6.2 An approved source is “approved” when an RDP is properly licensed to transact engineering commerce.
- 11.6.3 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. Denial without written reason deprives a protected right to free and fair competition in the marketplace.
- 11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB-Accredited Product Certification Body – Accreditation #1131.
- 11.8 Through the IAF Multilateral Agreements (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.<sup>29</sup>

## 12 Conditions of Use

- 12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.
- 12.2 As defined in **Section 6**, 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.
- 12.3 This report and the installation instructions, when required by a code official, shall be available at the time of permit application.
- 12.4 Installation shall comply with this report and the manufacturer installation instructions. In the event of a conflict between this report and the manufacturer installation instructions, the more restrictive shall govern.
- 12.5 For conditions not covered in this report, connections shall be designed in accordance with generally accepted engineering practice.
- 12.6 Manufacturer installation instructions shall be followed as provided in **Section 6** and at [www.fastenmaster.com](http://www.fastenmaster.com).
- 12.7 The ThruLOK series fasteners are produced in Agawam, Massachusetts.
- 12.8 The fasteners are identified by the designation “*ThruLOK*” on the packaging. The head of the ThruLOK fastener is marked with an “*FT*” followed by a number corresponding to the length of the fastener.
- 12.8.1 The packaging shall include the FastenMaster name and address, fastener size, third-party inspection agency, and this report number.
- 12.9 The ThruLOK series fasteners are produced under a quality control program subject to periodic inspections in accordance with IBC Section 1703.5.2.
- 12.10 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
- 12.10.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.
- 12.10.2 This report and the installation instructions shall be submitted at the time of permit application.
- 12.10.3 This innovative product has an internal quality control program and a third-party quality assurance program.
- 12.10.4 At a minimum, this innovative product shall be installed per **Section 9** of this report.
- 12.10.5 The review of this report by the AHJ shall comply with IBC Section 104 and IBC Section 105.4.



- 12.10.6 This innovative product has 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.
- 12.10.7 The application of this innovative product in the context of this report 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.
- 12.11 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *“the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new material or assemblies as provided for in Section 104.11,”* all of IBC Section 104, and IBC Section 105.4.
- 12.12 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).
- 12.13 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

### 13 Identification

- 13.1 The innovative product listed in **Section 1.1** is identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number and other information to confirm code compliance.
- 13.2 Additional technical information can be found at [www.fastenmaster.com](http://www.fastenmaster.com).

### 14 Review Schedule

- 14.1 This report is subject to periodic review and revision. For the latest version, visit [drjcertification.org](http://drjcertification.org).
- 14.2 For information on the status of this report, please contact [DrJ Certification](#).

### 15 Approved for Use Pursuant to U.S. and International Legislation Defined in Appendix A

- 15.1 ThruLOK Screw Bolt Fastening System is included in this report 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. This report states either that the material, product or service meets recognized standards or has been tested and found suitable for a specified purpose. This report meets the legislative intent and definition of being acceptable to the AHJ.



## Appendix A

### 1 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
  - 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 this innovative product 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),<sup>30</sup> where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years<sup>31</sup> and/or a \$5,000,000 fine or 3 times the value of<sup>32</sup> the Intellectual Property (IP) and Trade Secrets (TS).
    - 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 materials<sup>33</sup> that are not specifically provided for in any regulation, 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.<sup>34</sup>
  - 1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.
  - 1.2.7 The AHJ 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 IBC Section 104.11.<sup>35</sup>



- 1.3 **Approved<sup>36</sup> 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 that 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.<sup>37</sup> The Superintendent of Building Approved Testing Agency Roster 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 DrJ 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.<sup>38</sup>
- 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 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed<sup>39</sup> 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 agreement<sup>40</sup> (i.e., ANAB, International Accreditation Forum also known as IAF, etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods or systems of construction shall be approved, without further evaluation by:
- 1.6.1 A certification mark or listing of an approved certification agency,
  - 1.6.2 A test report from an approved testing laboratory,
  - 1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or
  - 1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed and sealed by a professional engineer or architect, licensed in Florida.
  - 1.6.5 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:
    - 1.6.5.1 A certification mark, listing or label from a commission-approved certification agency indicating that the product complies with the code,
    - 1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,
    - 1.6.5.3 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,





- 1.6.5.4 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, or
- 1.6.5.5 A statewide product approval issued by the Florida Building Commission.
- 1.6.6 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](#).
- 1.8 **Approved by New Jersey:** Pursuant to the 2018 Building Code of New Jersey in [IBC Section 1707.1 General](#),<sup>41</sup> 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)*”.<sup>42</sup> Furthermore N.J.A.C 5:23-3.7 states: “*Municipal approvals of alternative materials, equipment, or methods of construction.*”
  - 1.8.1 **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.
    - 1.8.1.1 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 the above.
    - 1.8.1.2 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 the above.
  - 1.8.2 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 the previous paragraph, 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](#)<sup>43</sup> and [Part 3280](#),<sup>44</sup> the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:
  - 1.9.1 “*All construction methods shall be in conformance with accepted engineering practices.*”
  - 1.9.2 “*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.*”
  - 1.9.3 “*The design stresses of all materials shall conform to accepted engineering practice.*”



- 1.10 **Approval by US, Local and State Jurisdictions in General:** In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:
- 1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.<sup>45</sup>
  - 1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept duly authenticated reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.<sup>46</sup>
    - 1.10.2.1 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is in the ANAB directory.
    - 1.10.2.2 An approved source is “approved” when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.<sup>47</sup>
  - 1.10.3 The design strengths and permissible stresses of any structural material...shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.<sup>48</sup>
- 1.11 **Approval by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:
- 1.11.1 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.
  - 1.11.2 **Approved:** The purpose of the 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, designs, services, and/or methods of construction.
  - 1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.<sup>49</sup>
  - 1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.<sup>50</sup>
- 1.12 Approval equity is a fundamental commercial and legal principle.<sup>51</sup>



# Notes

- 1 For more information, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.
- 2 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702>
- 3 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review <https://www.justice.gov/atr/mission> and <https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11>
- 4 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706>:-:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests%20as
- 5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706>:-:text=shall%20conform%20to%20the%20specifications%20and%20methods%20of%20design%20of%20accepted%20engineering%20practice
- 6 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>:-:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies
- 7 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>
- 8 [https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved\\_agency](https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency)
- 9 [https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved\\_source](https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source)
- 10 <https://www.law.cornell.edu/uscode/text/18/1832> (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of \$5,000,000 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. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: [Intellectual Property and Trade Secrets](#).
- 11 <https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional> AND <https://apassociation.org/list-of-engineering-boards-in-each-state-archive/>
- 12 <https://www.cbiteest.com/accreditation/>
- 13 <https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104>:-:text=to%20enforce%20the%20provisions%20of%20this%20code
- 14 <https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11>:-:text=Where%20the%20alternative%20material%20design%20or%20method%20of%20construction%20is%20not%20approved%20the%20building%20official%20shall%20respond%20in%20writing%20stating%20the%20reasons%20why%20the%20alternative%20was%20not%20approved AND <https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#105.3.1>:-:text=If%20the%20application%20or%20the%20construction%20documents%20do%20not%20conform%20to%20the%20requirements%20of%20pertinent%20laws%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%20stating%20the%20reasons%20therefore
- 15 <https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>:-:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.11
- 16 <https://iaf.nu/en/about-iaf>:-:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%20with%20the%20appropriate%20scope
- 17 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 18 <https://www.justice.gov/crt/deprivation-rights-under-color-law> AND <https://www.justice.gov/atr/mission>
- 19 Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.
- 20 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2>(Listed%20or%20certified); <https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#listed> AND <https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#abeled>
- 21 <https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4>
- 22 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#>:-:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%20livable%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades
- 23 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#>:-:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur
- 24 Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.
- 25 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.
- 26 [2018 IFC Section 104.9](#)
- 27 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.
- 28 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>
- 29 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.



30 <http://www.drjengineering.org/AppendixC> AND <https://www.drjcertification.org/cornell-2016-protection-trade-secrets>  
31 <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years>  
32 <https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided>  
33 <https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>  
34 [IBC 2021, Section 1706.1 Conformance to Standards](#)  
35 [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General](#)  
36 **See Section 11 for the distilled building code definition of **Approved****  
37 [Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES](#)  
38 <https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1>  
39 [New York City, The Rules of the City of New York, § 101-07 Approved Agencies](#)  
40 [New York City, The Rules of the City of New York, § 101-07 Approved Agencies](#)  
41 <https://up.codes/viewer/new-jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1>  
42 <https://www.nj.gov/dca/divisions/codes/codreg/ucc.html>  
43 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>  
44 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>  
45 [IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials, Adopted law pursuant to IBC model code language 1706.2.](#)  
46 [IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General, Adopted law pursuant to IBC model code language 1707.1.](#)  
47 <https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional-boards-in-each-state-archive/> AND <https://apassociation.org/list-of-engineering-boards-in-each-state-archive/>  
48 [IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards](#) Adopted law pursuant to IBC model code language 1706.1.  
49 <https://iaf.nu/en/about-iaf-mla/#:~:text=it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope>  
50 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.  
51 <https://www.justice.gov/crt/deprivation-rights-under-color-law> AND <https://www.justice.gov/atr/mission>