



CERTIFICATION



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Technical Evaluation Report

TER 1907-08

Non-Load Bearing (NLB) Connector

OMG, Inc. DBA FastenMaster®

Product:

**FastenMaster® Non-Load
Bearing (NLB) Connector**

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October 15, 2019

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November 25, 2019

Subject to Renewal:

January 1, 2021

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

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

1 PRODUCT EVALUATED¹

- 1.1 FastenMaster® Non-Load Bearing (NLB) Connector

2 APPLICABLE CODES AND STANDARDS^{2,3}

2.1 Codes

- 2.1.1 *IBC—12, 15, 18: International Building Code®*
- 2.1.2 *IRC—12, 15, 18: International Residential Code®*

2.2 Standards and Referenced Documents

- 2.2.1 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
- 2.2.2 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*
- 2.2.3 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
- 2.2.4 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*
- 2.2.5 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strengths of Screws*

¹ Building codes require data from valid [research reports](#) be obtained from [approved sources](#). Agencies who are accredited through ISO/IEC 17065 have met the [code requirements](#) for approval by the [building official](#). DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation and the [IAF MLA](#), DrJ certification 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.”

Building official approval of a licensed [registered design professional](#) (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant [jurisdiction](#). Therefore, the work of licensed RDPs is accepted by [building officials](#), except when plan (i.e., peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the [building official](#) responds in writing stating the reasons for [disapproval](#).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit drjcertification.org or call us at 608-310-6748.

² Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., *ASCE 7*, *NDS*, *ASTM*). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

³ All terms defined in the applicable building codes are italicized.

3 PERFORMANCE EVALUATION

- 3.1 NLB connectors were evaluated using allowable design values derived from assembly tests as a means of attaching non-load-bearing interior walls to trusses for the purpose of providing lateral load resistance while also allowing the truss to move vertically.
- 3.2 Use in exterior applications is outside the scope of this TER.
- 3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.4 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within Dr.J's professional scope of work.

4 PRODUCT DESCRIPTION AND MATERIALS

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

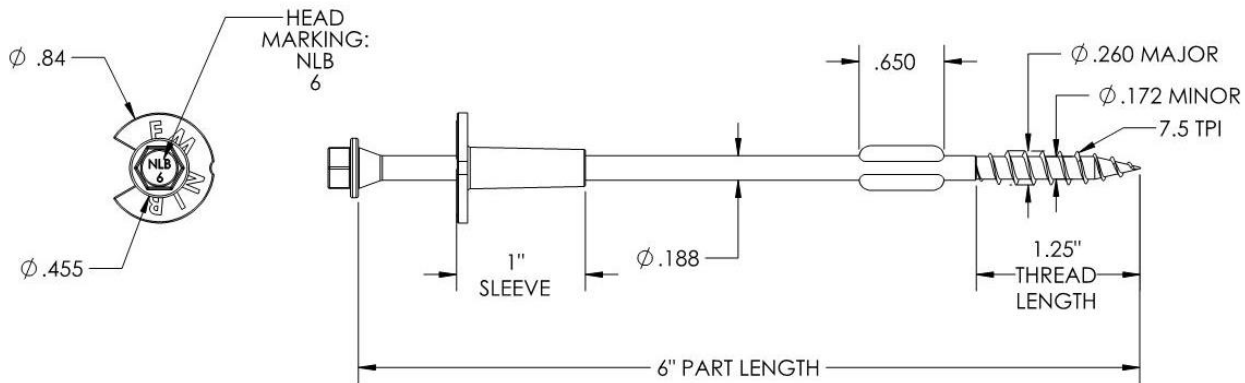


FIGURE 1. NLB CONNECTOR SPECIFICATION

- 4.2 The NLB connectors consist of a carbon steel fastener with a high-density polyethylene sleeve preassembled onto the unthreaded shank.
- 4.3 NLB connectors are manufactured using a modified 10B21 carbon steel wire conforming to the manufacturers specifications and are coated with a proprietary finish.
- 4.4 NLB connectors are approved for use in fire-retardant-treated lumber, provided the conditions set forth by the fire-retardant-treated lumber manufacturer are met, including appropriate strength reductions.
- 4.5 NLB connectors are manufactured using a standard cold-formed process followed by a heat-treating process.
- 4.6 The NLB connectors in this TER are designated in Table 1.

TABLE 1. FASTENER DESIGNATION FOR THE EVALUATED NLB CONNECTOR

Fastener	Fastener Length ¹ (in)	Thread Length ¹ (in)	Head Diameter (in)	Head Height (in)	Shank Diameter ² (in)	Minor Thread (Root) Diameter (in)	Major Thread (Outside) Diameter (in)	Bending Yield ² , f _{yb} (psi)	Ultimate Fastener Tensile Strength ² (psi)
NLB Connector	6.0	1.25	0.45	0.25	0.19	0.170	0.265	191,430	170,440

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

- 1. Fastener length is measured from the underside of the washer head to the tip. Thread length includes tapered tip (Figure 1).
- 2. Bending yield and tension values determined at minor root diameter.

5 APPLICATIONS

5.1 Non-Structural Applications

- 5.1.1 The *IBC* defines a wood stud *non load-bearing wall* as any wall that supports less than 100 pounds per linear foot (1459 N/m) of vertical load in addition to its own weight.
- 5.1.2 NLB connectors are used to attach minimum 2" nominal (1½"-wide) wood roof trusses or 4" nominal (3½" wide) floor trusses to 2" x 4" nominal (1½" thick by 3½" wide) or greater wood walls that meet the requirements of *IBC Section 1607.15* for interior walls and partitions and *IBC Section 2308* or *IRC Section R602* for wood structural framing members. The connectors provide resistance to lateral loads applied parallel and/or perpendicular to the wall or structural framing member.
- 5.1.2.1 Walls shall consist of a single or double top plate designed in accordance with *IBC Section 2308.5.3.2⁴* or *IRC Section R602.3.2*.
- 5.1.2.2 See Table 2 for the allowable design values for NLB connectors.
- 5.1.2.3 See Section 6 for installation requirements.
- 5.1.2.4 NLB connectors are used on interior walls and partitions (*nonload-bearing*) in accordance with *IBC Section 1607.15*.

5.2 Design Concepts and Allowable Design Loads

- 5.2.1 Allowable design loads for lateral (shear) resistance are provided in Table 2 for NLB connectors. Allowable design loads are applicable to connectors installed in accordance with the procedures described in Section 6 and are applicable for both single and double top plate applications (Figure 2).
- 5.2.1.1 Lateral loads parallel (F1) and perpendicular (F2) to the plane of the wall or structural member are equivalent for this system.
- 5.2.2 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

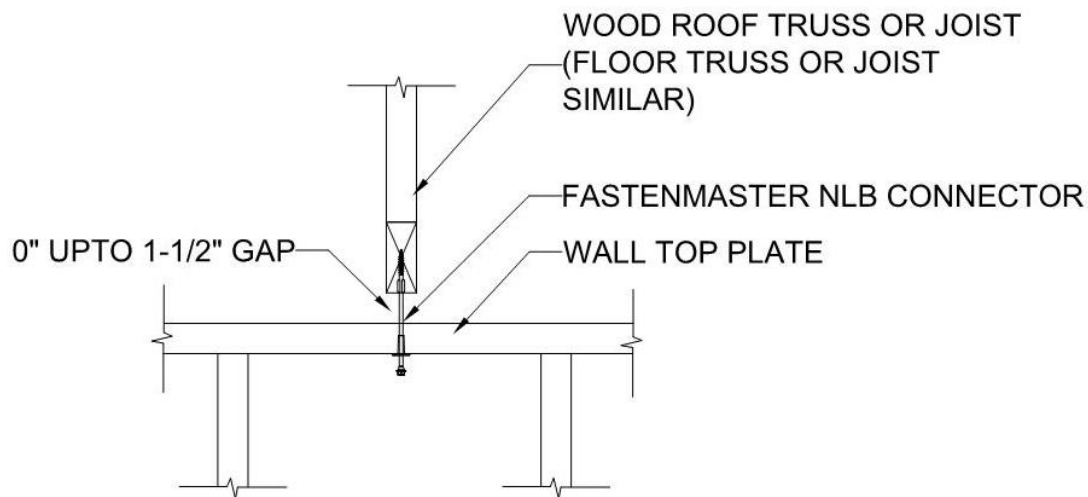


FIGURE 2. TYPICAL NON-LOAD BEARING WALL TO TRUSS CONNECTION

⁴ 2012 *IBC Section 2308.9.2.1*

TABLE 2. NLB CONNECTOR ALLOWABLE LOADS FOR LATERAL RESISTANCE

Fastener Designation	Minimum Penetration into Truss ¹ (in)	Species Group (Specific Gravity)	Lateral Allowable Loads ¹ (lbf)						
			Single Top Plate					Double Top Plate	
			0" Gap	0.25" Gap	0.5" Gap	0.75" Gap	1.5" Gap	0.75" Gap	1.5" Gap
NLB Connector	1¼	Spruce-Pine-Fir/Hem-Fir (0.42)	290	250	220	190	140	210	130

SI: 1 in = 25.4 mm, 1 lb = 4.45 N

1. Wood truss shall be a minimum of 2" nominal thickness. Design of truss members is by others.
2. Equivalent specific gravity shall be equal to or greater than the specific gravities provided in this Table. Refer to product information from SCL manufacturers.
3. For applications involving members with different specific gravities, use the allowable load corresponding to the lowest specific gravity.
4. In 0" gap condition, truss or wood structural member must bear on top plate of partition wall.
5. Load duration factor of 1.6 – no further duration of load increases permitted.
6. Interpolation is not permitted.

6 INSTALLATION

- 6.1 For guidance on designing the connection of partition (*nonload-bearing*) walls to trusses to prevent cracking of the interior gypsum wallboard, see SBCA's report, [Partition Separation Prevention and Solutions](#).
- 6.2 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.
- 6.3 For applications outside the scope of this TER, an engineered design is required.
- 6.4 *Installation Procedure*
 - 6.4.1 Affix the NLB setting tool and hex driver bit into a standard ½" corded or cordless drill (18V or higher). An 18" or longer bit extender can be used between drill and driver to allow installation from the ground without the need for a ladder.
 - 6.4.2 Place one pre-assembled NLB connector into the setting tool.
 - 6.4.3 Align the connector so it is centered on the plate and truss.
 - 6.4.4 On the highest speed drill setting, drive the connector directly upward until disengaged from the tool.

7 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 NLB connector testing conducted by SBCRI, under contract with Qualtim, Inc., 2019 for the following conditions:
 - 7.1.1 Bending yield strength of NLB connectors
 - 7.1.2 Ultimate tensile strength of NLB connectors
 - 7.1.3 Lateral capacity of NLB connectors
- 7.2 Some information contained herein is the result of testing and/or data analysis by other sources which conform to [IBC Section 1703](#) and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.
- 7.3 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS®*, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:

8.1.1 Provide resistance to lateral loads applied in any direction perpendicular to the connector.

8.2 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.9 are similar) 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, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in 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*.

8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.

8.3.1 No known variations

9 CONDITIONS OF USE

- 9.1 For conditions not covered in this TER, connections shall be designed in accordance with accepted engineering practice.
- 9.2 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.
- 9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.4 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 *registered design professional*).
- 9.5 At a minimum, this product shall be installed per Section 6 of this TER and the manufacturer's installation instructions.
- 9.6 Manufacturer's installation instructions shall be shipped to the jobsite with the materials or otherwise be available on the jobsite for inspection.
- 9.7 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
- 9.8 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. Therefore, the TER shall be reviewed for code compliance by the *building official* for acceptance.
- 9.9 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the *building official's* inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

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

11 REVIEW SCHEDULE

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