

Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1907-08



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Non-Load Bearing Connector™ (NLB)

Trade Secret Report Holder:

OMG® Inc dba FastenMaster®

Phone: 800-518-3569

Website: www.fastenmaster.com

Email: mguthrie@omginc.com

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

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

1 Innovative Product Evaluated¹

1.1 FastenMaster NLB Connectors (Non-Load Bearing)

2 Product Description and Materials

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

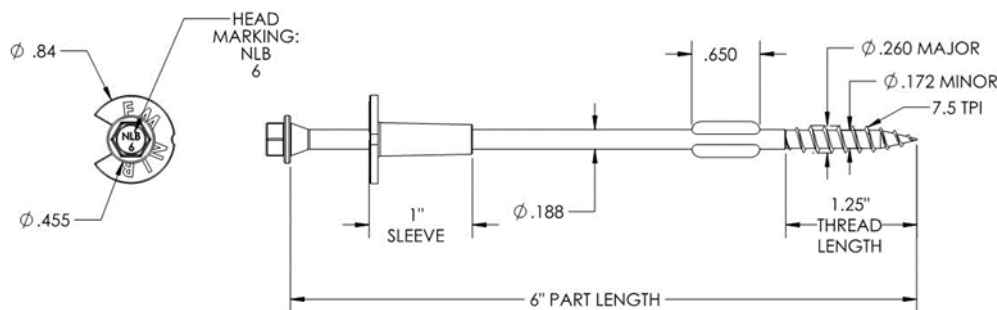


Figure 1. NLB Connectors Specification

2.2 NLB Connectors consist of a carbon steel fastener with a high-density polyethylene sleeve preassembled onto the unthreaded shank.

2.2.1 NLB Connectors are manufactured using a modified 10B21 carbon steel wire conforming to the manufacturer specifications and are coated with a proprietary finish.

2.2.2 NLB Connectors are manufactured using a standard cold-formed process followed by a heat-treating process.

2.3 NLB Connectors are approved for use in fire-retardant treated lumber, provided the conditions set forth by the fire-retardant treated lumber manufacturer be met, including appropriate strength reductions.



2.4 NLB Connectors, evaluated in this report, are outlined in **Table 1**.

Table 1. Fastener Designation for the Evaluated NLB Connectors

Fastener	Fastener Length ¹ (in)	Thread Length ² (in)	Head Diameter (in)	Head Height (in)	Shank Diameter ² (in)	Minor Thread (Root) Diameter (in)	Major Thread (Outside) Diameter (in)	Bending Yield Strength ³ , F _{yb} (psi)	Allowable Tensile Strength (lb)
NLB Connectors	6.0	1.25	0.450	0.250	0.190	0.170	0.265	135,000	1,305
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. 2. Thread length includes tapered tip (see Figure 1). 3. Bending yield strength was determined at the shank diameter.									

2.5 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions²

- 3.1 New Materials³ 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.⁴ The design strength and permissible stresses shall be established by tests⁵ and/or engineering analysis.⁶
- 3.2 Duly authenticated reports⁷ and research reports⁸ are test reports and related engineering evaluations that are written by an approved agency⁹ and/or an approved source.¹⁰
- 3.2.1 These reports utilize intellectual property and/or trade secrets to create public domain material properties for commercial end-use.
- 3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.U.S.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).¹¹
- 3.3 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.
- 3.4 An approved source is “approved” when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.¹²
- 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 RDP.
- 3.5.1 The Center for Building Innovation (CBI) is ANAB¹³ ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall enforce¹⁴ 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 writing¹⁵ 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.¹⁶
- 3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.¹⁷ Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,¹⁸ and can be used in any country that is an MLA signatory found at this link: <https://iaf.nu/en/recognised-abs/>
- 3.9 Approval equity is a fundamental commercial and legal principle.¹⁹



4 Applicable Local, State, and Federal Approvals; Standards; Regulations²⁰

4.1 Local, State, and Federal

- 4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, Texas Department of Insurance, and Wichita.²¹
- 4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.²²
- 4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14²³ and Part 3280²⁴ pursuant to the use of ISO/IEC 17065 duly authenticated reports.
- 4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 Standards

- 4.2.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strengths of Screws*
- 4.2.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*
- 4.2.3 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*
- 4.2.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*
- 4.2.5 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails, Spikes, and Dowel-type Threaded Fasteners*

4.3 Regulations

- 4.3.1 *IBC – 18, 21, 24: International Building Code®*
- 4.3.2 *IRC – 18, 21, 24: International Residential Code®*
- 4.3.3 *IECC – 18, 21, 24: International Energy Conservation Code®*

5 Listed²⁵

- 5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (i.e., CBI and DrJ), and/or an approved source (i.e., DrJ), or other organization(s) 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 Non-Structural Applications

- 6.1.1 IBC Section 202 defines a wood stud nonload-bearing wall as any wall that supports less than 100 pounds per linear foot (1,459 N/m) of vertical load in addition to its own weight.
- 6.1.2 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 1607.16²⁶ 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.
- 6.1.2.1 Walls shall consist of a single or double top plate designed in accordance with IBC Section 2308.9.3.2²⁷ or IRC Section R602.3.2.
- 6.1.2.2 See **Table 2** for the allowable design values for NLB Connectors.
- 6.1.2.3 See **Section 9** for installation requirements.
- 6.1.2.4 NLB Connectors are used on interior walls and partitions (non-loadbearing) in accordance with IBC Section 1607.16.²⁸

6.2 Design Concepts and Allowable Design Loads

- 6.2.1 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 9**, and are applicable for both single and double top plate applications (see **Figure 2**).
- 6.2.1.1 Lateral loads parallel (F1) and perpendicular (F2) to the plane of the wall or structural member are equivalent for this system.
- 6.2.2 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience and technical judgment.

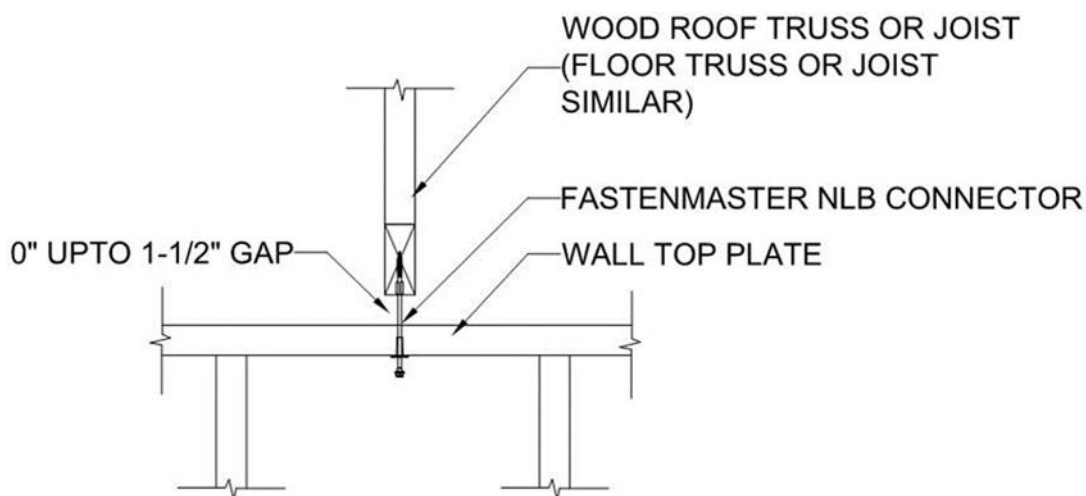


Figure 2. Typical Non-Load Bearing Wall to Truss Connection



Table 2. NLB Connectors 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 Connectors	1 1/4	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

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

- 6.3 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 Performance²⁹

- 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.³⁰
- 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.³¹

8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 NLB Connectors comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
- 8.1.1 NLB Connectors were evaluated using allowable design values derived from assembly tests as a means of attaching non-loadbearing interior walls to trusses for the purpose of providing lateral load resistance while also allowing the truss to move vertically.
- 8.1.2 Use in exterior applications is outside the scope of this report.
- 8.1.3 NLB Connectors were evaluated to assess use where fireblocking is required in accordance with IRC Section R602.8 and IRC Section R302.11.
- 8.2 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 qualified³² to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.



- 8.3 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.
- 8.4 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, contact the manufacturer for counsel on the proper installation method.
- 9.3 For application outside the scope of this report, and engineered design is required.
- 9.4 *Installation Procedure*
- 9.4.1 Affix the NLB setting tool and hex driver bit into a standard 1/2" 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.
- 9.4.2 Place one of the pre-assembled NLB Connectors into the NLB Setting Tool (required for proper installation).
- 9.4.3 Align the connector so it is centered on the plate and truss.
- 9.5 On the highest speed drill setting, drive the connector directly upward until disengaged from the tool.
- 9.6 Where fireblocking is required, batts or blankets of mineral wool or glass fiber shall be installed around the NLB fastener so that it is securely retained in place, in accordance with IRC section R302.11.1, Item 7.

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 Bending yield strength of NLB Connectors in accordance with ASTM F1575
- 10.1.2 Ultimate tensile strength of NLB Connectors in accordance with AISI S904
- 10.1.3 Lateral capacity of NLB Connectors in accordance with ASTM D1761
- 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 an RDP. 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

- 10.5.1 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.³³
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for NLB Connectors on the [DrJ Certification website](#).

11 Findings

- 11.1 As outlined in **Section 6**, NLB Connectors have performance characteristics that were tested and/or meet applicable regulations. In addition, they are 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, NLB Connectors shall be approved for the following applications:
- 11.2.1 To provide resistance to lateral loads applied in any direction perpendicular to the connector.
- 11.3 Where fireblocking is required, batts or blankets of mineral wool or glass fiber shall be installed around the NLB fastener so that it is securely retained in place in accordance with [IRC section R302.11.1, Item 7](#).
- 11.4 Unless exempt by state statute, when NLB Connectors are 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](#).
- 11.5 Any application specific issues not addressed herein can be engineered by an [RDP](#). Assistance with engineering is available from OMG® Inc dba FastenMaster®.
- 11.6 [IBC Section 104.2.3](#)³⁴ ([IRC Section R104.2.2](#)³⁵ and [IFC Section 104.2.3](#)³⁶ are similar) in pertinent part state:
- 104.2.3 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 is not specifically prohibited by this code and has been approved.
- 11.7 **Approved:**³⁷ Building regulations require that the [building official](#) shall accept [duly authenticated reports](#).³⁸
- 11.7.1 An [approved agency](#) is “*approved*” when it is [ANAB ISO/IEC 17065 accredited](#).
- 11.7.2 An [approved source](#) is “*approved*” when an [RDP](#) is properly licensed to transact engineering commerce.
- 11.7.3 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.
- 11.8 DrJ is a licensed engineering company, employs licensed [RDPs](#) and is an [ANAB Accredited Product Certification Body – Accreditation #1131](#).
- 11.9 Through the [IAF Multilateral Arrangement \(MLA\)](#), 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.³⁹

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 For conditions not covered in this report, connections shall be designed in accordance with accepted engineering practice.
- 12.4 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:
- 12.4.1 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.
 - 12.4.2 This report and the installation instructions shall be submitted at the time of permit application.
 - 12.4.3 This innovative product has an internal quality control program and a third-party quality assurance program.
 - 12.4.4 At a minimum, this innovative product shall be installed per **Section 9**.
 - 12.4.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.
 - 12.4.6 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.
 - 12.4.7 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.
- 12.5 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or 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 Section 104.2.3", all of IBC Section 104, and IBC Section 105.3.*
- 12.6 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).
- 12.7 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.

14 Review Schedule

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



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- 31 <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>
- 32 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.
- 33 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>
- 34 2021 IBC Section 104.11
- 35 2021 IRC Section R104.11
- 36 2018: <https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9> AND 2021: <https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11>
- 37 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 (<https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4>) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.
- 38 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1>
- 39 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.