



Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1907-01



Issue Date: September 3, 2019

Revision Date: September 4, 2025

Subject to Renewal: October 1, 2026

Big Timber® CTX Construction Lag Screw Properties

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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 CTX Construction Lag Screws

2 Product Description and Materials

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

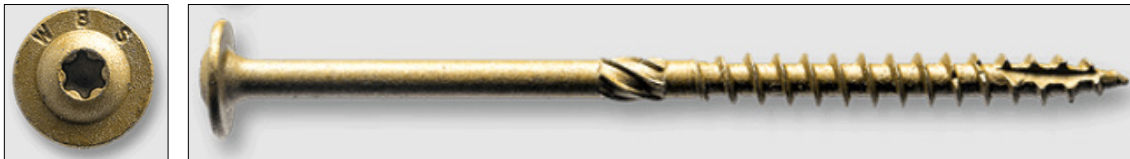


Figure 1. Big Timber CTX Construction Lag Screw

2.2 CTX Construction Lag Screws have a round washer head with a star drive and are partially threaded.

2.3 CTX Construction Lag Screws are manufactured using a standard cold-formed process followed by a heat-treating process, then subsequently coated.

2.3.1 CTX Construction Lag Screws are coated with a proprietary coating, designated as Bronze Star, which exceeds the protections provided by hot-dipped galvanized coatings conforming to ASTM A153.

2.4 CTX Construction Lag Screws are approved for use in chemically treated or untreated lumber where ASTM A153, Class D coatings are approved for use in accordance with IBC Section 2304.10 and IRC Section R304.3.²

2.4.1 The proprietary coating has been evaluated and found to exceed the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D (IBC Section 2304.10.6³ and IRC Section R304.3⁴), allowing for its use in pressure treated wood.



- 2.5 CTX Construction Lag Screws 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.
- 2.6 The fasteners evaluated in this report are specified in **Table 1**.

Table 1. Fastener Specifications

Fastener Name	Designation	Head (in)		Nominal Length ¹ (in)	Thread Length ¹ (in)	Shank Diameter ² (in)	Thread Diameter (in)		Specified Min. Core Hardness ⁴ (HV 03)	Nominal Bending Yield, ⁵ F _{yb} (psi)	Allowable Fastener Strength (lbf)	
		Dia-meter	Drive Type				Minor	Major			Tensile	Shear ³
CTX	14 x 1"	0.531	T25	1	1	0.168	0.146	0.242	355	141,300	930	725
	14 x 1½"			1½	1½							
	14 x 2"			2	2							
	14 x 2½"			2½	2¼							
	14 x 3"			3	2							
	14 x 4"			4	2							
	14 x 5"			5	3							
	14 x 6"			6	3							
	15 x 2"	0.620	T30	2	1½	0.202	0.179	0.275	355	151,000	1,475	1,020
	15 x 2½"			2½	1½							
	15 x 3"			3	2							
	15 x 3½"			3½	2½							
	15 x 4"			4	2½							
	15 x 5"			5	3							
	15 x 6"			6	3							
	17 x 4"	0.675	T40	4	2½	0.226	0.210	0.295	355	170,500	1,850	1,240
	17 x 5"			5	3							
	17 x 6"			6	3							
	17 x 7"			7	3½							
	17 x 8"			8	4							
	17 x 10"			10	4							
	17 x 12"			12	4							
	17 x 14"			14	5							
	17 x 16"			16	5							

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

1. Fastener length is measured from the underside of the head to the tip. Thread length includes tapered tip.
2. Shank diameter based on manufactured thickness. Finished dimensions are larger, due to the proprietary coatings added.
3. Shear determined at smooth shank diameter.
4. Based on a 300-gram load using the Vickers indenter.
5. Bending yield strength is determined in accordance with ASTM F1575 and is based on the minor diameter.

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



3 Definitions⁵

- 3.1 New Materials⁶ 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.⁷ The design strength and permissible stresses shall be established by tests⁸ and/or engineering analysis.⁹
- 3.2 Duly authenticated reports¹⁰ and research reports¹¹ are test reports and related engineering evaluations that are written by an approved agency¹² and/or an approved source.¹³
- 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).¹⁴
- 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.¹⁵
- 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 ANAB¹⁶ ISO/IEC 17025 and ISO/IEC 17020 accredited.
- 3.6 The regulatory authority shall enforce¹⁷ 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 writing¹⁸ 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.¹⁹
- 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.²⁰ Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,²¹ 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.²²

4 Applicable Local, State, and Federal Approvals; Standards; Regulations²³

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.²⁴
- 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.²⁵



4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14²⁶ and Part 3280²⁷ 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 Strength 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 A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*

4.2.5 *ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus*

4.2.6 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*

4.2.7 *ASTM D2395: Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*

4.2.8 *ASTM D2915: Standard Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products*

4.2.9 *ASTM D4442: Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*

4.2.10 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails*

4.2.11 *ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing*

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®*

4.3.4 *FBC-B—20, 23: Florida Building Code²⁸ – Building (FL 35204)*

4.3.5 *FBC-R—20, 23: Florida Building Code²⁸ – Residential (FL 35204)*

5 Listed²⁹

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 and 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 General

6.1.1 CTX Construction Lag Screws are used to attach wood framing members in conventional light-frame construction and provide resistance against withdrawal, head pull-through, axial, and shear loads. See **Section 9** for installation requirements.

6.1.2 CTX Construction Lag Screws are installed without lead holes as prescribed in the NDS.

6.1.3 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.



6.2 Design

- 6.2.1 Design of CTX Construction Lag Screws is governed by the applicable code and the provisions for dowel type fasteners in the NDS.
- 6.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

6.3 CTX Reference Lateral Design Values (Z)

- 6.3.1 Reference lateral design values (lbf) for shear load parallel and perpendicular to grain for CTX Construction Lag Screws are specified in **Table 2**.

Table 2. CTX Construction Lag Screws Reference Lateral Design Values^{1,2,3,4} (Z), lbf

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration ⁵ (in)	Wood Species (Specific Gravity)			
						HF/SPF (0.42)		SP (0.55)	
						Z _⊥	Z _∥	Z _⊥	Z _∥
CTX	14 x 2"	2	2	3/4	1 1/4	85	85	130	130
	14 x 2 1/2"	2 1/2	2 1/4	3/4	1 3/4	155	155	170	215
	14 x 3"	3	2						
	14 x 4"	4	2	1 3/4	2 1/4	225	220	240	245
	14 x 5"	5	3						
	14 x 6"	6	3	3	3	255	300	255	415
	15 x 2"	2	1 1/2	3/4	1 1/4	75	95	125	155
	15 x 2 1/2"	2 1/2	1 1/2			105	130	145	180
	15 x 3"	3	2		2 1/4	160	185	225	285
	15 x 3 1/2"	3 1/2	2 1/2						
	15 x 4"	4	2 1/2	1 1/2	2 1/2	365	375	365	375
	15 x 5"	5	3						
	15 x 6"	6	3	2	4	265	310	265	340
	17 x 4"	4	2 1/2	1 1/2	2 1/2	460	335	460	335
	17 x 5"	5	3						
	17 x 6"	6	3	2	4	180	230	240	300
	17 x 7"	7	3 1/2	2 3/4	4 1/4	280	420	300	485
	17 x 8"	8	4						
	17 x 10"	10	4	3 1/2	6 1/2	310	475	315	630
	17 x 12"	12	4						
	17 x 14"	14	5						
	17 x 16"	16	5						

Table 2. CTX Construction Lag Screws Reference Lateral Design Values^{1,2,3,4} (Z), lbf

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration ⁵ (in)	Wood Species (Specific Gravity)			
						HF/SPF (0.42)		SP (0.55)	
						Z _⊥	Z _∥	Z _⊥	Z _∥
SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/in = 0.175 kN/m									
1. Reference lateral design values apply to two-member single shear connections where both members are of the same specific gravity and the fastener is oriented perpendicular to grain. Where the members are of different specific gravities, use the lower of the two.									
2. For wood species with a specific gravity between 0.42 and 0.55, use the tabulated values for specific gravity of 0.42.									
3. Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per the NDS.									
4. Z _⊥ = Lateral Design Values Perpendicular to Grain, Z _∥ = Lateral Design Values Parallel to Grain.									
5. Fastener main member penetration is the length embedded in the main member, including the tip.									

6.4 CTX Reference Withdrawal Design Values (W) in Side Grain Applications

6.4.1 Reference withdrawal design values (lbf/in) for CTX Construction Lag Screws are specified in **Table 3**.

Table 3. CTX Construction Lag Screws Reference Withdrawal Design Values^{1,2,3,4} (W) – Side Grain Applications, lbf/in

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Wood Species (Specific Gravity)	
				HF/SPF (0.42)	SP (0.55)
CTX	14 x 1"	1	1	120	210
	14 x 1½"	1½	1½		
	14 x 2"	2	2		
	14 x 2½"	2½	2¼	195	215
	14 x 3"	3	2		
	14 x 4"	4	2		
	14 x 5"	5	3		
	14 x 6"	6	3		
	15 x 2"	2	1½	140	215
	15 x 2½"	2½	1½		
	15 x 3"	3	2	165	215
	15 x 3½"	3½	2½		
	15 x 4"	4	2½		
	15 x 5"	5	3		
	15 x 6"	6	3		
	17 x 4"	4	2½	175	230
	17 x 5"	5	3		
	17 x 6"	6	3		
	17 x 4"	4	2½	150	235
	17 x 5"	5	3		
	17 x 6"	6	3		

Table 3. CTX Construction Lag Screws Reference Withdrawal Design Values^{1,2,3,4} (W) – Side Grain Applications, lbf/in

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Wood Species (Specific Gravity)	
				HF/SPF (0.42)	SP (0.55)
CTX Continued	17 x 7"	7	3½	180	235
	17 x 8"	8	4		
	17 x 10"	10	4		
	17 x 12"	12	4		
	17 x 14"	14	5		
	17 x 16"	16	5		
SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/in = 0.175 kN/m					
1. Tabulated withdrawal values (W) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1 .					
2. Minimum fastener penetration into main member of 1" is required. Fastener penetration is the threaded length embedded in the main member, excluding the tip.					
3. For wood species with a specific gravity between 0.42 and 0.55, use the tabulated values for specific gravity of 0.42.					
4. The full design withdrawal value is equal to the reference withdrawal value multiplied by the length of the threaded portion of the fastener embedded in the main member.					

6.5 CTX Reference Head Pull-Through Design Values (P)

6.5.1 Reference design values for head pull-through (lbf) for CTX Construction Lag Screws are specified in **Table 4**.

Table 4. CTX Construction Lag Screws Reference Head Pull-Through Design Values^{1,2,3} (P), lbf

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Wood Species (Specific Gravity)	
				HF/SPF (0.42)	SP (0.55)
CTX	14 x 1"	1	1	345	405
	14 x 1½"	1½	1½		
	14 x 2"	2	2		
	14 x 2½"	2½	2¼		
	14 x 3"	3	2		
	14 x 4"	4	2		
	14 x 5"	5	3		
	14 x 6"	6	3		
	15 x 2"	2	1½	340	485
	15 x 2½"	2½	1½		
	15 x 3"	3	2		
	15 x 3½"	3½	2½		
	15 x 4"	4	2½		
	15 x 5"	5	3		



Table 4. CTX Construction Lag Screws Reference Head Pull-Through Design Values^{1,2,3} (P), lbf

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Wood Species (Specific Gravity)	
				HF/SPF (0.42)	SP (0.55)
	15 x 6"	6	3		
CTX Continued	17 x 4"	4	2½	440	460
	17 x 5"	5	3		
	17 x 6"	6	3		
	17 x 7"	7	3½		
	17 x 8"	8	4		
	17 x 10"	10	4		
	17 x 12"	12	4		
	17 x 14"	14	5		
	17 x 16"	16	5		
SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/in = 0.175 kN/m					
1. Tabulated pull through values (P) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1 .					
2. For wood species with a specific gravity between 0.42 and 0.55, use the tabulated values for specific gravity of 0.42.					
3. Pull-through design values apply to connections having a minimum wood side member thickness of at least ¾".					

6.6 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 Performance³⁰

- 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.³¹
- 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.³²

8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 CTX Construction Lag Screws comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:
- 8.1.1 CTX Construction Lag Screws were tested and evaluated to determine their structural resistance properties, which were used to develop reference design values for Allowable Stress Design (ASD). The following properties were evaluated:
- 8.1.1.1 Withdrawal strength in accordance with ASTM D1761
 - 8.1.1.2 Lateral shear strength in accordance with ASTM D1761
 - 8.1.1.3 Bending yield strength in accordance with ASTM F1575
 - 8.1.1.4 Tensile strength in accordance with AISI S904



- 8.1.1.5 Shear strength in accordance with AISI S904
- 8.1.1.6 Head pull-through strength in accordance with ASTM D1037
- 8.1.1.7 Corrosion resistance of fasteners meeting or exceeding the protection afforded hot-dipped galvanized fasteners in accordance with ASTM A153, Class D
- 8.2 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this evaluation 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, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified³³ to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,³⁴ respectively.
- 8.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is 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, contact the manufacturer for counsel on the proper installation method.
- 9.3 *Installation Procedure*
 - 9.3.1 Minimum penetration is 1", unless otherwise stated in this report.
 - 9.3.2 Install fasteners with head flush to the surface of the wood member.
 - 9.3.3 Lead holes are not required.
 - 9.3.4 Screws shall be installed with the appropriate rotating powered driver.
 - 9.3.5 Minimum requirements for screw spacing, edge distance and end distance shall be in accordance with **Table 5**.

Table 5. CTX Construction Lag Screws Spacing, Edge Distance, and End Distance Requirements¹ (inch)

Connection Geometry	CTX 14	CTX 15	CTX 17
Edge Distance – Load in any direction	1/2	5/8	5/8
End Distance – Load parallel to grain, towards end	2 1/2	3	3 3/8
End Distance – Load parallel to grain, away from end	1 5/8	2	2 1/4
End Distance – Load perpendicular to grain	1 5/8	2	2 3/8
Spacing between Fasteners in a Row – Parallel to grain	2 1/2	3	3 3/8
Spacing between Fasteners in a Row – Perpendicular to grain	1 5/8	2	2 1/4
Spacing between Rows of Fasteners – In-line	7/8	1	1 1/8
Spacing between Rows of Fasteners – Staggered ²	1/2	1/2	5/8
SI: 1 in = 25.4 mm 1. Edge distances, end distances, and spacing of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is the more restrictive. 2. Values for "Spacing between Rows of Fasteners-Staggered" apply where the screws in adjacent rows are offset by one-half of the "Spacing between Fasteners in a Row".			



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 Withdrawal strength testing in accordance with ASTM D1761
 - 10.1.2 Lateral shear strength testing in accordance with ASTM D1761
 - 10.1.3 Head pull-through strength testing in accordance with ASTM D1037
 - 10.1.4 Bending yield strength testing in accordance with ASTM F1575
 - 10.1.5 Tensile strength testing in accordance with AISI S904
 - 10.1.6 Shear strength testing in accordance with AISI S904
 - 10.1.7 Corrosion resistance testing in accordance with ASTM B117 and ASTM G85
- 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.³⁵
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for CTX Construction Lag Screws on the DrJ Certification website.

11 Findings

- 11.1 As outlined in **Section 6**, CTX Construction Lag Screws 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, CTX Construction Lag Screws shall be approved for the following applications:
- 11.2.1 To provide resistance to lateral loads applied to the fastener in a wood-to-wood connection as shown in **Table 2**.
 - 11.2.2 To provide resistance to reference withdrawal loads as shown in **Table 3**.
 - 11.2.3 To provide resistance to head pull-through loads as shown in **Table 4**.
- 11.3 Unless exempt by state statute, when CTX Construction Lag Screws 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.



- 11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Western Builders Supply or Big Timber.
- 11.5 IBC Section 104.2.3³⁶ (IRC Section R104.2.2³⁷ and IFC Section 104.2.3³⁸ 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.

- 11.6 **Approved:**³⁹ Building regulations require that the building official shall accept duly authenticated reports.⁴⁰
- 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 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.⁴¹

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 As listed herein, CTX Construction Lag Screws shall be subject to the following conditions:
- 12.3.1 The listed design values in **Table 2** through **Table 4** are applicable for dry-service conditions where the moisture content of the wood component(s) is less than or equal to nineteen percent (19%).
- 12.3.1.1 When fasteners are installed in a wet service condition, the appropriate reduction factors shall be applied per NDS Table 11.3.1.
- 12.3.2 In cases where fastener metal capacity (instead of the wood member) controls the connection design, the allowable connection strength shall not be multiplied by the adjustment factors specified in the NDS.
- 12.4 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report.
- 12.5 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:
- 12.5.1 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.
- 12.5.2 This report and the installation instructions shall be submitted at the time of permit application.
- 12.5.3 This innovative product has an internal quality control program and a third-party quality assurance program.
- 12.5.4 At a minimum, this innovative product shall be installed per **Section 9**.
- 12.5.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.



- 12.5.6 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.
- 12.5.7 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.
- 12.6 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.*
- 12.7 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).
- 12.8 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 Big Timber CTX Construction Lag Screws, as listed in **Section 1.1**, are 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 bigtimberfasteners.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](#).



Issue Date: December 22, 2020
Subject to Renewal: October 1, 2026

FBC Supplement to Report Number 1907-01

REPORT HOLDER: Western Builders Supply dba Big Timber®

1 Evaluation Subject

- 1.1 CTX Construction Lag Screws

2 Purpose and Scope

2.1 Purpose

- 2.1.1 The purpose of this Report Supplement is to show CTX Construction Lag Screws, recognized in Report Number 1907-01, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 Applicable Code Editions

- 2.2.1 FBC-B—20, 23: Florida Building Code – Building (FL 35204)
- 2.2.2 FBC-R—20, 23: Florida Building Code – Residential (FL 35204)

3 Conclusions

- 3.1 CTX Construction Lag Screws, described in Report Number 1907-01, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this report, they are listed here:
 - 3.2.1 FBC-B Section 104 is reserved.
 - 3.2.2 FBC-B Section 110.4 is reserved and replaces IBC Section 110.4.
 - 3.2.3 FBC-B Section 104.6 is reserved and replaces IBC Section 104.4.
 - 3.2.4 FBC-B Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.
 - 3.2.5 FBC-B Section 105.3 replaces IBC Section 105.3.
 - 3.2.6 FBC-B Section 105.3.1 replaces IBC Section 105.3.1.
 - 3.2.7 FBC-B Section 110.3 replaces IBC Section 110.3.
 - 3.2.8 FBC-B Section 1707.1 replaces IBC Section 1707.1.
 - 3.2.9 FBC-B Section 2304.10 replaces IBC Section 2304.10.
 - 3.2.10 FBC-B Section 2304.10.5 replaces IBC Section 2304.10.6.
 - 3.2.11 FBC-B Section 2306.1 replaces IBC Section 2306.1.
 - 3.2.12 FBC-B Section 2306.3 replaces IBC Section 2306.3.
 - 3.2.13 FBC-R Section R104 and Section R109 are reserved.
 - 3.2.14 FBC-R Section R317.3 replaces IRC Section R304.3.



4 Conditions of Use

- 4.1 CTX Construction Lag Screws, described in Report Number 1907-01, must comply with all of the following conditions:
 - 4.1.1 All applicable sections in Report Number 1907-01.
 - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.



Notes

- 1 For more information, visit drjcertification.org or call us at 608-310-6748.
- 2 [2021 IRC Section R317.3](#)
- 3 [2018 IBC Section 2304.10.5](#)
- 4 [2021 IRC Section R317.3](#)
- 5 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of [TPI 1](#), the [NDS](#), [AISI S202](#), [US professional engineering law](#), [Canadian building code](#), [Canada professional engineering law](#), [Qualtim External Appendix A: Definitions/Commentary](#), [Qualtim External Appendix B: Project/Deliverables](#), [Qualtim External Appendix C: Intellectual Property and Trade Secrets](#), definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.
- 6 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702>
- 7 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/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3>
- 8 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2>:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests
- 9 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/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1>:~:text=Conformance%20to%20Standards-.The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural
- 10 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1>:~:text=the%20building%20official%20shall%20make%20or%20cause%20to%20be%20made%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%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%20104.2.3.
- 11 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2>
- 12 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency
- 13 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source
- 14 <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](#).
- 15 <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/>
- 16 <https://www.cbiteest.com/accreditation/>
- 17 <https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1>:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code
- 18 <https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3> AND <https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1>
- 19 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1>
- 20 <https://iaf.nu/en/about-iaf>:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%20it%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
- 21 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
- 22 <https://www.justice.gov/crt/deprivation-rights-under-color-law> AND <https://www.justice.gov/atr/mission>
- 23 Unless otherwise noted, the links referenced herein use un-amended versions of the [2024 International Code Council \(ICC\)](#) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the [IBC 2024](#) and the [IRC 2024](#) are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.
- 24 See [Adoptions by Publisher](#) for the latest adoption of a non-amended or amended model code by the local jurisdiction. <https://up.codes/codes/general>
- 25 See [Adoptions by Publisher](#) for the latest adoption of a non-amended or amended model code by state. <https://up.codes/codes/general>
- 26 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14>
- 27 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280>
- 28 All references to FBC-B and FBC-R are the same as 2024 IBC and 2024 IRC unless otherwise noted in the Supplement at the end of this report.
- 29 <https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2> (Listed%20or%20certified); <https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed> AND <https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled>
- 30 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4>
- 31 <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>



- 32 <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>
- 33 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.
- 34 <https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH>
- 35 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>
- 36 2021 IBC Section 104.11
- 37 2021 IRC Section R104.11
- 38 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>
- 39 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.
- 40 <https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1>
- 41 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.