Listing and Technical Evaluation Report™

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Big Timber® Cladding Attachment Through Foam Sheathing

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

1 Innovative Products Evaluated[1]

1.1 Big Timber Screws:

1.1.1 CTX Construction Lag Screws

1.1.2 BL Log, Timber and Landscape Screws

1.1.3 GL Gray Structural Screws

1.1.4 BTX and YTX General Purpose Screws

1.1.5 STX and SCTX Stainless Screws

1.1.6 WTX Wafer Head Screws

2 Product Description and Materials

2.1 *Fastener Descriptions*

2.1.1 CTX Construction Lag Screws have a round washer head with a star drive and are partially threaded. The CTX screw is shown in **Figure 1**.

Figure 1. CTX Construction Lag Screw

2.1.2 BL Log, Timber and Landscape Screws and GL Gray Structural Screws have a hex washer head and are partially threaded. BL Log, Timber and Landscape Screws and GL Gray Structural Screws are shown in **Figure 2** and **Figure 3**, respectively.

Figure 2. BL Log, Timber and Landscape Screw

Figure 3. GL Gray Structural Screw

2.1.3 BTX and YTX General Purpose Screws have a round flat head with a star drive (Torx screw), and are partially threaded. BTX and YTX General Purpose Screws are shown in **Figure 4** and **Figure 5**, respectively.

Figure 4. BTX General Purpose Screw

Figure 5. YTX General Purpose Screw

2.1.4 STX and SCTX Stainless Screws are made from Grade 316 stainless steel. The STX Stainless Screw has a round flat head with ribs and a star drive (Torx screw) and is partially threaded, as shown in **Figure 6**. The SCTX Stainless Screw has a round washer head and a star drive (Torx screw) and is partially threaded, as shown in **Figure 7**.

Figure 6. STX Stainless Screw

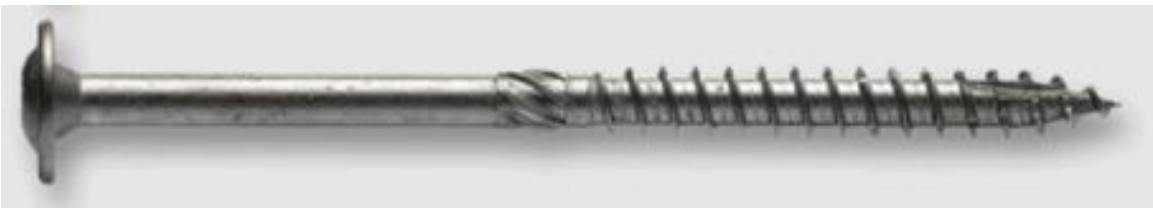

Figure 7. SCTX Stainless Screw

2.1.5 WTX Wafer Head Screws have a round wafer head with a star drive (Torx screw) and are partially threaded. The WTX screw is shown in **Figure 8**.

Figure 8. WTX Wafer Head Screw

2.1.6 Big Timber Screws are manufactured using a standard cold-formed process, followed by a heat-treating process, with the exception of the STX and SCTX Stainless Screws, which do not undergo a heat-treating process.

2.2 *Fastener Coatings*

2.2.1 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.

2.2.2 BL Log, Timber and Landscape Screws and WTX Wafer Head Screws are coated with a proprietary coating designated as Black, which exceeds the protections provided by hot-dipped galvanized coatings conforming to ASTM A153.

2.2.3 GL Gray Structural Screws are coated with a proprietary coating designated as Gray Log, which exceeds the protections provided by hot-dipped galvanized coatings conforming to ASTM A153.

2.2.4 BTX General Purpose Screws are coated with a proprietary coating designated as Bronze, which exceeds the protections provided by hot-dipped galvanized coatings conforming to ASTM A153.

2.2.5 YTX General Purpose Screws are coated with a proprietary zinc coating designated as Gold Star.

2.2.6 CTX, BL, GL, BTX, STX, SCTX and WTX 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 R317.3.

2.2.6.1 The proprietary coating and stainless material have been tested and found to exceed the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153, Class D (IBC Section 2304.10.6[2] and IRC Section R317.3), allowing for use in pressure-treated wood.

2.2.7 Big Timber 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.

2.2.8 Only the STX and SCTX Stainless Screws are approved for use in chemically treated wood with exposure to saltwater, including coastal construction applications.

2.3 The CTX Construction Lag Screws, evaluated in this report, are set forth in **Table 1**.

Table 1. CTX Construction Lag Screw Specifications

Fastener Name	Designation	Head (in)		Nominal Length[1] (in)	Thread Length[1] (in)	Shank Diameter[2] (in)	Thread Diameter (in)		Specified Minimum Core Hardness[4] (HV 0.3)	Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lbf)	
		Diameter	Drive Type				Minor	Major			Tensile	Shear[3]
CTX	14 x 3"	0.531	Torx 25	3	2	0.168	0.146	0.242	355	141,300	930	725
	14 x 4"			4	2							
	14 x 5"			5	3							
	14 x 6"			6	3							
	15 x 3"	0.620	Torx 30	3	2	0.202	0.179	0.275	355	151,600	1,475	1,020
	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	Torx 40	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							

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.

2.4 BL Log, Timber and Landscape Screws and GL Gray Structural Screws are set forth in **Table 2**.

Table 2. BL Log, Timber and Landscape Screws and GL Gray Structural Screws Specifications

Fastener Name	Designation	Head (in)		Nominal Length[1] (in)	Thread Length[1] (in)	Shank Diameter[2] (in)	Thread Diameter (in)		Specified Minimum Core Hardness[4] (HV 0.3)	Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lbf)	
		Diameter	Drive Type				Minor	Major			Tensile	Shear[3]
BL	14 x 4"	0.487	Hex 5/16	4	2	0.189	0.171	0.258	355	177,700	1,085	725
	14 x 5"			5	2							
	14 x 6"			6	2							
	14 x 7"			7	2 1/2							
	14 x 8"			8	2 1/2							
	17 x 4"	0.570	Hex 5/16	4	2	0.224	0.211	0.297	355	172,600	1,990	1,240
	17 x 5"			5	3							
	17 x 6"			6	3							
	17 x 7"			7	3							
	17 x 9"			9	3							
GL	17 x 4"	0.570	Hex 5/16	4	2	0.224	0.211	0.297	355	172,600	1,990	1,240
	17 x 5"			5	3							
	17 x 6"			6	3							
	17 x 7"			7	3							
	17 x 9"			9	3							

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.

2.5 The BTX and YTX General Purpose Screws are set forth in **Table 3**.

Table 3. BTX and YTX General Purpose Screws Specifications

Fastener Name	Designation	Head (in)		Nominal Length[1] (in)	Thread Length[1] (in)	Shank Diameter[2] (in)	Thread Diameter (in)		Specified Minimum Core Hardness[4] (HV 0.3)	Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lbf)	
		Diameter	Drive Type				Minor	Major			Tensile	Shear[3]
BTX	10 x 3"	0.374	Torx 25	3	1 1/2	0.151	0.134	0.209	355	205,000	960	710
	10 x 3 1/2"			3 1/2	2							
	10 x 4"			4	2							
	10 x 5"			5	2 1/2							
	10 x 6"			6	2 1/2							
	14 x 5"	0.465	Torx 30	5	2 1/2	0.169	0.145	0.232	286	211,000	1,270	960
	14 x 6"			6	2 1/2							
	14 x 7"			7	2 1/2							
	14 x 8"			8	2 1/2							
YTX	10 x 3"	0.374	Torx 25	3	1 1/2	0.151	0.134	0.209	355	205,000	960	710
	10 x 3 1/8"			3 1/8	1 1/2							
	10 x 3 1/2"			3 1/2	2							
	10 x 4"			4	2							
	10 x 5"			5	2 1/2							
	10 x 6"			6	2 1/2							

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

1. Fastener length is measured from the top of the head to the tip. Thread length includes the tapered tip and excludes the knurl.
2. Shank diameter based on manufactured thickness. Finished dimensions are larger, due to the proprietary coatings added.
3. Shear strength applicable at both the smooth shank and thread diameter.
4. Based on a 300-gram load using the Vickers indenter.

2.6 STX and SCTX Stainless Screws are set forth in **Table 4**.

Table 4. STX and SCTX Stainless Screws Specifications

Fastener Name	Designation	Head (in)		Nominal Length[1] (in)	Thread Length[1] (in)	Shank Diameter[2] (in)	Thread Diameter (in)		Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lbf)	
		Diameter	Drive Type				Minor	Major		Tensile	Shear[3]
STX	10 x 3 1/2"	0.376	Torx 25	3 1/2	2	0.145	0.126	0.193	124,000	440	420
	10 x 4"			4	2						
SCTX	15 x 3 1/2"	0.620	Torx 30	3 1/2	2 1/2	0.202	0.179	0.275	111,000	855	725
	15 x 4"			4	2 1/2						
	15 x 5"			5	3						
	15 x 6"			6	3						
	15 x 7"			7	3 1/2						
	15 x 8"			8	4						

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

1. Fastener length is measured from the top of the head to the tip. Thread length includes the tapered tip.
2. Shank diameter based on manufactured thickness.
3. Shear strength applicable at both the smooth shank and thread diameter.

2.7 WTX Wafer Head Screws are set forth in **Table 5**.

Table 5. WTX Wafer Head Screws Specifications

Fastener Name	Designation	Head (in)		Nominal Length[1] (in)	Thread Length[1] (in)	Shank Diameter[2] (in)	Thread Diameter (in)		Specified Minimum Core Hardness[4] (HV 0.3)	Nominal Bending Yield, f_{yb} (psi)	Allowable Fastener Strength (lbf)	
		Diameter	Drive Type				Minor	Major			Tensile	Shear[3]
WTX	15 x 3"	0.659	Torx 30	3	2 3/4	0.205	0.187	0.274	286	190,000	1,545	1,165
	15 x 3 1/2"			3 1/2	2							
	15 x 4"			4	2							
	15 x 4 1/2"			4 1/2	2							
	15 x 5"			5	2							
	15 x 6"			6	2 1/2							
	15 x 8"			8	2 1/2							

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

1. Fastener length is measured from the top of the head to the tip. Thread length excludes the knurl. The WTX 15x3" is fully threaded (no knurl).
2. Shank diameter based on manufactured thickness. Finished dimensions are larger, due to the proprietary coatings added.
3. Shear determined at thread or smooth shank diameter.
4. Based on a 300-gram load using the Vickers indenter.

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

3 Definitions

3.1 New Materials[3] 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 strengths and permissible stresses shall be established by tests[5] and/or engineering analysis.[6]

3.2 Duly authenticated reports[7] and research reports[8] are test reports and related engineering evaluations, which are written by an approved agency[9] and/or an approved source.[10]

3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).[11]

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.[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 Registered Design Professional (RDP).

3.5.1 The Center for Building Innovation (CBI) is ANAB[13] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[14] 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[15] 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 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.[17] Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[18]

3.9 Approval equity is a fundamental commercial and legal principle.[19]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[20]

4.1 *Standards*

4.1.1 *AISI S904: Standard Test Methods for Determining the Tensile and Shear Strength of Screws*

4.1.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

4.1.3 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

4.1.4 *ASTM A493: Standard Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging*

4.1.5 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*

4.1.6 *ASTM B117: Standard Test Methods for Operating Salt Spray (Fog) Apparatus*

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

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

4.1.9 *AWC TR 12: General Dowel Equations for Calculating Lateral Connection Values*

4.2 *Regulations*

4.2.1 *IBC – 15, 18, 21: International Building Code®*

4.2.2 *IRC – 15, 18, 21: International Residential Code®*

4.2.3 *IECC – 15, 18, 21: International Energy Conservation Code®*

5 Listed[21]

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 *General*

6.1.1 Big Timber Screws can be used to support the dead load of wall sheathing, furring and/or cladding when connected to the wall framing through an intermediate layer of foam sheathing.

6.1.2 Big Timber Screws are installed without lead holes, as prescribed in 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 Big Timber Screws are governed by the applicable code and the provisions for dowel type fasteners in 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 *Procedure for Calculating Fastener Spacing*

6.3.1 ***Step 1:*** Determine the spacing between studs or framing members, either 16" or 24" o.c. (on-center).

6.3.2 ***Step 2:*** Calculate the correct thickness of rigid foam (up to 4"), needed to obtain the required insulation effect or R-value.

6.3.3 ***Step 3:*** Choose the furring or sheathing (substrate) material to which the cladding will be affixed:

6.3.3.1 Minimum $^{3}/_{4}$" x $3^{1}/_{2}$" wood furring

6.3.3.2 Minimum $^{3}/_{8}$" or Wood Structural Panel (WSP) sheathing

6.3.3.3 Ensure that the substrate allows for cladding connections that are compliant with the cladding manufacturer installation and connection instructions and meet the applicable building code. See **Figure 9** for an illustration of the wall assembly.

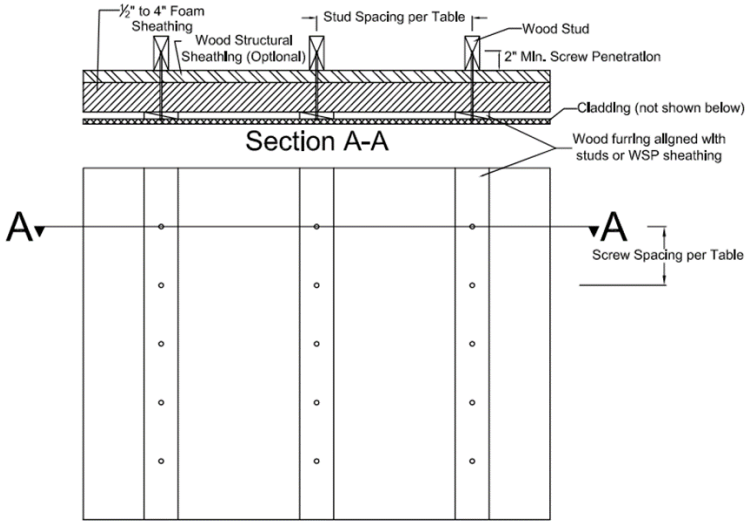

Figure 9. Elevation View of Wall Assembly with Vertically Oriented Wood Furring

6.3.4 ***Step 4:*** Determine the actual weight for the cladding materials being installed per square foot, as given by the cladding manufacturer specifications.

6.3.4.1 Typical cladding weights are 1.3 psf for vinyl siding, 2.5 psf for cement board siding, 11 psf for Portland cement stucco and 25 psf for adhered masonry veneer. Use actual weights for materials installed.

6.3.4.2 Wood furring may add up to 1 psf of additional weight. Wood sheathing may add up to 1.5 psf, depending on thickness.

6.3.5 ***Step 5:*** Using these four values together, find the proper fastening pattern of between 6" and 24" o.c. using the appropriate table in **Section 6.4**.

6.4 *Fastening Design Tables*

6.4.1 Refer to **Table 7** through **Table 16** for recommended fastener spacing for cladding over foam.

6.4.1.1 **Table 6** provides notes that apply to the design tables in **Section 6.4**.

Table 6. General Cladding Over Foam Connection Table Notes

1. Wood framing (studs) shall be a minimum of 2" nominal thickness.
2. Wood framing and furring shall be minimum Spruce-Pine-Fir or any species with specific gravity, SG, of 0.42 or greater.
3. Wood framing, furring, and sheathing shall be designed by others and shall be of adequate size, species, and grade to resist design loads and requirements in accordance with the applicable building code.
4. Furring may be installed vertically or horizontally and shall be installed at the same on-center (o.c.) spacing as the studs. All fasteners shall be installed through the furring and into the studs with a minimum 2" fastener penetration. Alternately, where the furring is installed horizontally, and where the required fastener spacing is 8" o.c. or 12" o.c., the furring may be installed at 16" o.c. or 24" o.c. respectively, provided two (2) fasteners are installed at stud location. Likewise, where the fastener spacing is 6" o.c., the furring may be installed horizontally at 12" o.c. and two (2) fasteners used at each stud. Where multiple fasteners are used, furring or sheathing (substrate) shall be of adequate size to provide proper edge, end, and fastener spacing distances.
5. Maximum allowable cladding weight shall include weight of furring, sheathing, cladding and other supported materials.
6. Furring type and thickness shall be selected based on the cladding manufacturer installation requirements (i.e., required fastener penetration into furring).
7. When using horizontal furring or where durability of the furring is a concern due to moisture between the cladding and the sheathing, consideration should be given to using preservative treated furring.
8. When choosing the length of fastener, the thickness of the wood framing shall be considered so that the fastener does not penetrate through the backside of the framing stud.

Table 7. CTX14 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing1

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
CTX14	16 o.c.	4	0.5	24	24	20	16	12	8	24			16	12	
			1.0		20	12	8		7	-					
		5	1.0							24		16	12	8	
			1.5		16	8	8	6	5	24	20	12	8		7
			2.0		12		6	5	4	-					
		6	2.0							24	16	8		6	5
			2.5	20	8	7	5	4	-		12	8	7	5	4
			3.0	16		6	4	-		-					
	24 o.c.	4	0.5	24	20	12	8		7	24		16	12	8	
			1.0		12	8	7	6	5	-					
		5	1.0							24	16	12	8	7	6
			1.5	20	8	7	5	4	-		12	8	7	5	4
			2.0	16		5	4	-		-					
		6	2.0						-	20	8	7	5	4	-
			2.5	12	7	4	-	-		16		6	4	-	
			3.0		6					-					

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m2

1. See **Table 6** for notes.

Table 8. CTX15 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Fastener Spacing (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
CTX15	16 o.c.	4	0.5	24	24	24	24	20	16	24				20	
			1.0				16	12		-					
		5	1.0							24		24	20	16	12
			1.5			16	12	8	8			20	16	12	8
			2.0		20	12	8	8	7	-					
		6	2.0							24		16	12	8	
			2.5		16			7	6	24	20	12	8		7
			3.0			8	8	6	5	-					
	24 o.c.	4	0.5		24	24	16	12		24			20	16	12
			1.0			16	12	8		-					
		5	1.0							24		16	12	8	
			1.5		16	12	8	7	6	24	20	12	8		7
			2.0		12	8	7	6	5	-					
		6	2.0							24	16	12	8	7	6
			2.5				6	5	4		12	8	7	6	5
			3.0	20	8	7	5	4	-	-					

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2

1. See **Table 6** for notes.

Table 9. CTX17 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
CTX17	16 o.c.	4	0.5	24	24	24	24	24	24	24					
			1.0						20	-					
		5	1.0							24				24	20
			1.5					16						20	16
			2.0				16	12	12	-					
		6	2.0							24			20	16	12
			2.5			20	12		8				16	12	
			3.0			16		8		-					
		7	3.0		24					24	20	12		8	
			4.0		20	12	8		6	-					
		8	4.0							24	16	12	8		
	24 o.c.	4	0.5		24	24	24		20	24					20
			1.0				20	16	12	-					
		5	1.0			24				24	24	20	16	12	
			1.5			20	16	12	8		20	16	12	8	
			2.0			16	12	8		-					
		6	2.0							24	16	12	8		
			2.5		20	12	8		7						
			3.0		16			7	6	-					
		7	3.0							24	20	12	8		6
			4.0		12	8	6	5	4	-					
		8	4.0							24	16	8		6	5

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

1. See **Table 6** for notes.

Table 10. BL14 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
BL14	16 o.c.	4	0.5	24	24	24	24	20	16	24					20
			1.0				16	12		-					
		5	1.0							24			20	16	12
			1.5			16	12	8	8	24		20	16	12	8
			2.0		20	12	8		7	-					
		6	2.0							24		16	12	8	
			2.5		16			7	6	24	20	12	8		7
			3.0			8		6	5	-					
		7	3.0				8			24	16	12	8	7	6
			4.0		12		6	4		-					
		8	4.0							24	12	8	7	6	5
	24 o.c.	4	0.5		24	24	16	12		24			20	16	12
			1.0			16	12	8		-					
		5	1.0							24		16	12	8	
			1.5		16	12	8	7	6	24	20	12	8		7
			2.0		12	8	7	6	5	-					
		6	2.0							24	16	12	8	7	6
			2.5				6	5	4		12	8	7	6	5
			3.0	20	8	7	5	4	-	-					
		7	3.0							24	12	8	6	5	4
			4.0	16		5	4	-		20	8	6	5	4	-
		8	4.0												

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

1. See **Table 6** for notes.

Table 11. BL17 and GL17 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
BL17 GL17	16 o.c.	4	0.5	24	24	24	24	24	24	24					
			1.0						20	-					
		5	1.0							24					20
			1.5					16		24				20	16
			2.0				16	12	12	-					
		6	2.0							24			20	16	12
			2.5			20			8	24			16	12	
			3.0			16	12	8		-					
		7	3.0		24					24		20	12		8
			4.0		20	12	8		7	-					
		9	4.0					8		24		16	12	8	
	24 o.c.	4	0.5		24	24	24		20	24					20
			1.0				20	16	12	-					
		5	1.0							24			20	16	12
			1.5			20	16	12	8	24		20	16	12	8
			2.0			16	12	8		-					
		6	2.0							24		16	12	8	
			2.5		20	12	8		7						
			3.0		16			7	6	-					
		7	3.0			12	8			24	20	12	8		7
			4.0		12	8	7	5	4	-					
		9	4.0							24	16	8		6	5

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

1. See **Table 6** for notes.

Table 12. BTX10 and YTX10 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
BTX10 YTX10	16 o.c.	3.5	0.5	24	24	20	16	12	8	-					
		4	0.5							24			16	12	
			1.0		20	12	8	8	7	-					
		55	1.0							24		16	12	8	
			1.5		16	8		7	5	24	20	12	8		7
			2.0		12		6	5	4	-					
		6	2.0							24	16	8		7	5
			2.5	20	8	7	5	4	-		12	8	7	5	4
			3.0	16		6	4	-		-					
	24 o.c.	3.5	0.5	24	20	12	8		7						
		4	0.5							24		16	12	8	
			1.0		12	8	7	6	5	-					
		5	1.0							24	16	12	8	7	6
			1.5	20	8	7	5	4	-		12	8	7	5	4
			2.0	16		6	4	-		-					
		6	2.0							20	8	7	5	4	-
			2.5	12	7	5	-	-	-	16		6	4	-	
			3.0		6	4				-					

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2

1. See **Table 6** for notes.

Table 13. BTX14 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
BTX14	16 o.c.	5	0.5	24	24	24	20	16	12	24		24	20	16	12
			1.0			16	12	8	8			20	16	12	8
			1.5		20	12	8		7			16	12	8	
			2.0		16	8		6	5	-					
		6	2.0							24	20	12	8		7
			2.5		12		7	5	4		16	8		7	5
			3.0				6	4		-					
		7	3.0							24	12	8	7	6	5
			4.0	16	8	6	4	-		-					
		8	4.0							20	8	7	5	4	-
	24 o.c.	5	0.5	24	24	16	12	8		24		20	12		8
			1.0		16	12	8	7	6		20	12	8		7
			1.5		12	8	7	5	4	24	16	8		6	5
			2.0	20		7	5	4	-	-					
		6	2.0							24	12	8	7	5	4
			2.5	16	8	6	4	-		20	8	7	5	4	-
			3.0			5				-					
		7	3.0							20	8	6	5	4	-
			4.0	12	6	4	-			-					
		8	4.0							12	7	5	-		

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2

1. See **Table 6** for notes.

Table 14. STX10 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
STX10	16 o.c.	3.5	0.5	24	20	12	8		7	-					
		4	0.5							24	20	16	12	8	
			1.0		12	8	7	5	4	-					
	24 o.c.	3.5	0.5					6	5						
		4	0.5							24	16	12	8	7	6
			1.0	16	8	6	4	-		-					

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2

1. See **Table 6** for notes.

Table 15. SCTX15 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
SCTX15	16 o.c.	3.5	0.5	24	24	24		16		-					
		4	0.5							24				20	16
			1.0			20	12		8	-					
		5	1.0							24			16	12	
			1.5		20	12	8	8	7	24		16	12	8	
			2.0		16			7	6	-					
		6	2.0							24	20	12	8		7
			2.5		12	8	7	5	4		16		8	7	6
			3.0				6			-					
		7	3.0							24	16	8		6	5
			4.0	16	8	6	4	-		-					
		8	4.0							24	12	8	6	5	4
	24 o.c.	3.5	0.5	24	24	20	16	12	8	-					
		4	0.5							24		20	16	12	8
			1.0		20	12	8		7	-					
		5	1.0							24		16	12	8	
			1.5		12	8	7	6	5	24	16	12	8	7	6
			2.0				6	4		-					
		6	2.0							24	12	8	7	6	5
			2.5	16	8	6	4	-					6	5	4
			3.0			5				-					
		7	3.0							20	8	7	5	4	-
			4.0	12	6	4	-			-					
		8	4.0							16	8	5	4	-	

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

1. See **Table 6** for notes.

Table 16. WTX15 Fastener Spacing to Support Cladding Weight for Various Thicknesses of Foam Sheathing[1]

Fastener	Stud Spacing (in)	Minimum Fastener Length (in)	Foam Thickness (in)	Maximum Spacing of Fasteners (in)											
				Using 3/8" WSP Sheathing						Using 3/4" x 3 1/2" Wood Furring					
				Maximum Cladding Weight (psf)						Maximum Cladding Weight (psf)					
				5	10	15	20	25	30	5	10	15	20	25	30
WTX15	16 o.c.	3.5	0.5	24	24	24	24	24		-					
		4	0.5							24					
			1.0					20	16	-					
		4.5	1.0							24				20	16
			1.5				16	12	12	-					
		5	1.5							24			16	12	
			2.0			20	12		8	-					
		6	2.0							24		20	16	12	8
			2.5			16		8				16	12	8	
			3.0		20	12	8		7	-					
		8	3.0							24		16	12	8	
			4.0		16	8		6	5	24	16	12	8	7	6
	24 o.c.	3.5	0.5	24	24	24		16		-					
		4	0.5							24				20	16
			1.0			20	16	12	8	-					
		4.5	1.0							24			16	12	
			1.5			16	12	8		-					
		5	1.5							24		16	12	8	
			2.0		20	12	8		6	-					
		6	2.0							24	20	12	8		7
			2.5		16	8		6	5		16		8	7	6
			3.0		12		7	5	4	-					
		8	3.0							24	16	8		6	5
			4.0	20	8	7	5	4	-		12	8	6	5	4

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2

1. See **Table 6** for notes.

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

7 Certified Performance[22]

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.[23]

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.[24]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Big Timber Screws comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Big Timber Screws were evaluated for their ability to support gravity loads in the application of cladding attachment over foam sheathing in wood-frame construction.

8.1.2 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report, with the exception of STX and SCTX Stainless Screws.

8.1.2.1 STX and SCTX Stainless Screws are allowed for use in locations exposed to saltwater or saltwater spray.

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 qualified[25] 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 are 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, the more restrictive shall govern.

9.3 *Installation Procedure*

9.3.1 Big Timber Screws shall be installed using the appropriate rotating driver.

9.3.2 Big Timber Screws shall not be struck with a hammer during installation.

9.3.3 Lead holes are not required.

9.3.4 Minimum penetration into stud for this application is 2". The fastener head must be installed flush to the surface of the wood member being connected. The fastener must not be overdriven.

9.3.5 Fasteners should be aligned perpendicular to the face of the wall stud so that the point engages the center of the wall stud and at a minimum distance of 3" from the end of the stud or furring material.

9.3.6 For applications outside the scope of this report, an engineered design is required.

9.3.7 Minimum requirements for fastener spacing, edge distance and end distance shall be in accordance with **Table 17**.

Table 17. Minimum Spacing, Edge Distance and End Distance Requirements[1]

Connection Geometry	Minimum Spacing/Distance (in)						
	STX10	BTX10, YTX10	CTX14, BTX14	BL14	CTX15, SCTX15, WTX15	BL17, GL17	CTX17
Edge Distance – Load in any direction	3/8	1/2			5/8		
End Distance – Load parallel to grain, towards end	2 1/4	2 3/8	2 5/8	2 7/8	3 1/8	3 3/8	3 3/8
End Distance – Load parallel to grain, away from end	1 1/2	1 5/8	1 3/4	1 3/4	2 1/8	2 1/4	2 1/4
End Distance – Load perpendicular to grain	1 1/2	1 5/8	1 3/4	1 3/4	2 1/8	2 1/4	2 1/4
Spacing between Fasteners in a Row – Parallel to grain	2 1/4	2 3/8	2 5/8	2 7/8	3 1/8	3 3/8	3 3/8
Spacing between Fasteners in a Row – Perpendicular to grain	1 1/2	1 5/8	1 3/4	1 7/8	2 1/8	2 1/4	2 1/4
Spacing between Rows of Fasteners – In-line	3/4	7/8		1	1 1/8		1 1/8
Spacing between Rows of Fasteners – Staggered	3/8	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 more restrictive.

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 Connection design value calculations by DrJ Engineering, LLC in accordance with NDS and accepted engineering practice.

10.1.2 Properties for Big Timber CTX Construction Lag Screws are from Report Number 1907-01.

10.1.3 Properties for Big Timber BL Log, Timber & Landscape Screws and GL Gray Structural Screws are from Report Number 1907-02.

10.1.4 Properties for Big Timber BTX and YTX General Purpose Screws are from Report Number 1911-01.

10.1.5 Properties for Big Timber STX and SCTX Stainless Screws are from Report Number 1911-02.

10.1.6 Properties for Big Timber WTX Wafer Head Screws are from Report Number 1911-04.

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.[26]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Big Timber Screws (CTX Construction Lag Screws, BL Log, Timber and Landscape Screws, GL Gray Structural Screws, BTX and YTX General Purpose Screws, STX and SCTX Stainless Screws and WTX Wafer Head Screws) on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Big Timber Screws have performance characteristics that were tested and/or meet applicable regulations and 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, Big Timber Screws shall be approved for the following applications:

11.2.1 Acceptable use as an alternative material, design and method of construction for the attachment of furring, sheathing or cladding over foam sheathing and into wood framing.

11.2.2 Big Timber Screws meet the requirements of the listed editions of the IBC and IRC for supporting to the dead weight of wall sheathing, furring and/or cladding when connected to the wall framing through an intermediate layer of foam sheathing in conventional light-frame wood construction.

11.3 Unless exempt by state statute, when Big Timber 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 Big Timber.

11.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[27] 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**:[28] Building regulations require that the building official shall accept duly authenticated reports.[29]

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.[30]

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 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report, with the exception of the STX and SCTX Stainless Screws, where exposure to saltwater or saltwater spray is allowed.

12.4 Install fasteners prior to utility installations in exterior walls to avoid accidental penetration of utilities (i.e., electrical wiring, plumbing, etc.)

12.5 Foam sheathing shall be minimum Type II (expanded polystyrene) or Type X (extruded polystyrene) per ASTM C578 or Type 1 (polyiso) per ASTM C1289. Types with greater compressive strength are also acceptable.

12.6 Ensure furring or sheathing material provides adequate substrate and thickness for the application of the siding fastener per the code requirements for siding application and the siding manufacturer installation instructions.

12.6.1 For example, if the siding manufacturer requires the fastener for the siding to penetrate more than $^{3}/_{4}$" into the furring, a 1" x 4" furring strip (actual dimension of $^{3}/_{4}$" x $3^{1}/_{2}$") would not be adequate, and a thicker furring strip, such as a 2" x 4", would be required.

12.7 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:

12.7.1 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.

12.7.2 This report and the installation instructions shall be submitted at the time of permit application.

12.7.3 These innovative products have an internal quality control program and a third-party quality assurance program.

12.7.4 At a minimum, these innovative products shall be installed per **Section 9** of this report.

12.7.5 The review of this report by the AHJ shall comply with IBC Section 104 and IBC Section 105.4.

12.7.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.

12.7.7 The application of these innovative products 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.

12.8 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.

12.9 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).

12.10 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 products 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 www.bigtimberfasteners.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit 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 Big Timber Screws (CTX Construction Lag Screws, BL Log, Timber and Landscape Screws, GL Gray Structural Screws, BTX and YTX General Purpose Screws, STX and SCTX Stainless Screws and WTX Wafer Head Screws) are 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 these innovative products 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),[31] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[32] and/or a $5,000,000 fine or 3 times the value of[33] 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[34] 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.[35]

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.[36]

1.3 **Approved**[37] **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.[38] 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.[39]

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[40] 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[41] (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,[42] 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)*".[43] 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[44] and Part 3280,[45] 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.[46]

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.[47]

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.[48]

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.[49]

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.[50]

1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[51]

1.12 Approval equity is a fundamental commercial and legal principle.[52]

Notes

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

2 2018 IBC Section 2304.10.5

3 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702

4 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

5 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

6 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

7 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

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

9 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency

10 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source

11 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.

12 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/

13 https://www.cbitest.com/accreditation/

14 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104:~:text=to%20enforce%20the%20provisions%20of%20this%20code

15 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11:~:text=Where%20the%20alternative%20material%2C%20design%20or%20method%20of%20construction%20is%20not%20approved%2C%20the%20building%20official%20shall%20respond%20in%20writing%2C%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%2C%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%2C%20stating%20the%20reasons%20therefore

16 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

17 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

18 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

19 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

20 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.

21 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#labeled

22 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4

23 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%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

24 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

25 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.

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

27 2018 IFC Section 104.9

28 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.

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

30 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.

31 http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets

32 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years

33 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided

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

35 IBC 2021, Section 1706.1 Conformance to Standards

36 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

37 See **Section 11** for the distilled building code definition of **Approved**

38 Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

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

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

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

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

43 https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

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

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

46 IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.

47 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.

48 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/

49 IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.

50 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

51 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

52 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission