Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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Big Timber® STX and SCTX Stainless Steel Screw Properties

Trade Secret Report Holder:

Western Builders Supply dba Big Timber®

Phone: 406-252-6309 Website: bigtimberfasteners.com Email: sales@bigtimberfasteners.com

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 STX and SCTX Stainless Steel Screws

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1** and **Figure 2**.

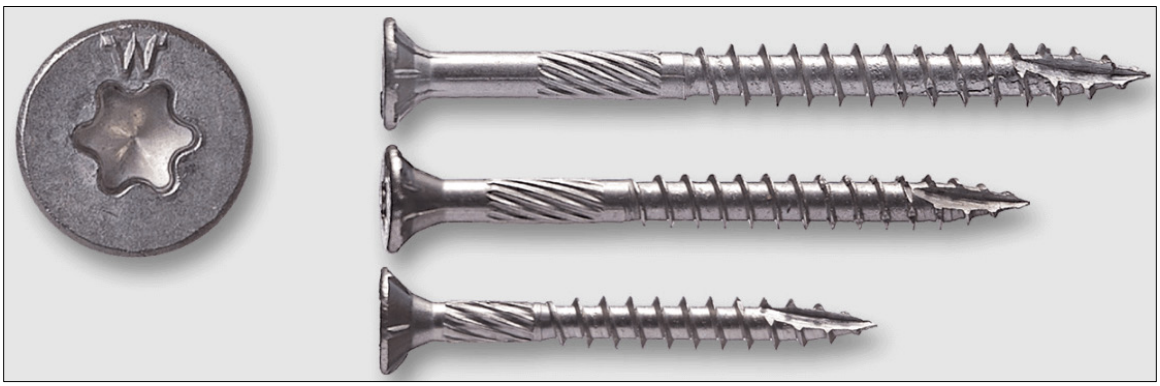

Figure 1. STX Stainless Steel Screws

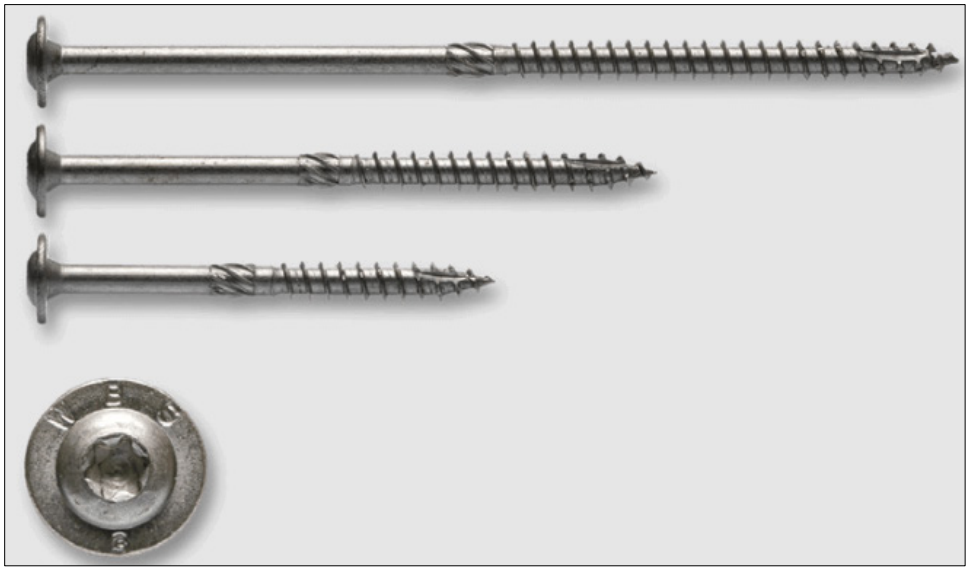

Figure 2. SCTX Stainless Steel Screws

2.2 STX and SCTX Stainless Steel Screws are made from Grade 316 stainless steel.

2.2.1 The STX Stainless Steel Screw has a round flat head with ribs and a star drive (Torx screw) and is partially threaded (see **Figure 1**).

2.2.2 The SCTX Stainless Steel Screw has a round washer head and a star drive (Torx screw) and is partially threaded (see **Figure 2**).

2.3 STX and SCTX Stainless Steel Screws are manufactured using a standard cold-formed process.

2.4 STX and SCTX Stainless Steel 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 STX and SCTX Stainless Steel Screws 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[3] and IRC Section R304.3[4]), allowing for its use in pressure-treated wood.

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

2.7 The fasteners evaluated in this report are set forth in **Table 1**.

Table 1. Fastener Specifications

Fastener Names	Designation	Head		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 (in)	Drive Type				Minor	Major		Tensile	Shear[3]
STX	8 x 1 1/4"	0.329	Torx 20	1 1/4	3/4	0.116	0.100	0.163	122,000	360	355
	8 x 1 1/2"			1 1/2	1						
	8 x 2"			2	1 1/4						
	9 x 1 5/8"	0.350	Torx 25	1 5/8	1	0.130	0.110	0.181	122,000	375	340
	9 x 2"			2	1 1/4						
	9 x 2 1/2"			2 1/2	1 1/2						
	9 x 3"			3	1 1/2						
	10 x 2 1/2"	0.376	Torx 25	2 1/2	1 1/2	0.145	0.126	0.193	124,000	440	420
	10 x 3"			3	1 1/2						
	10 x 3 1/2"			3 1/2	2						
	10 x 4"			4	2						
SCTX	15 x 2"	0.620	Torx 30	2	1 1/2	0.202	0.179	0.275	111,000	855	725
	15 x 2 1/2"			2 1/2	1 1/2						
	15 x 3"			3	2						
	15 x 3 1/2"			3 1/2	2 1/2						
	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. STX fastener length is measured from the top of the head to the tip. SCTX fastener length is measured from the underside 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.

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

3 Definitions[5]

3.1 New Materials[6] 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 tests[8] and/or engineering analysis.[9]

3.2 Duly authenticated reports[10] and research reports[11] are test reports and related engineering evaluations that are written by an approved agency[12] 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 secretes under the regulation, 18.US.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 ANAB[16] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[17] 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[18] 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; Regulations[23]

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 3282.14[26] and Part 3280[27] 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 A493: Standard Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging*

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

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

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

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

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

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

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

4.2.11 *DOC PS 2: Performance Standard for Wood-based Structural-use Panels*

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 *FBC-B 20, 23: Florida Building Code[28] – Building (FL 41094)*

4.3.4 *FBC-R 20, 23: Florida Building Code[28] – Residential (FL 41094)*

5 Listed[29]

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 STX and SCTX Stainless Steel 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 STX and SCTX Stainless Steel 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 *Structural Applications*

6.2.1 Design of STX and SCTX Stainless Steel 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 *STX and SCTX Reference Lateral Design Values (Z)*

6.3.1 Reference lateral design values (lb) for shear load parallel and perpendicular to grain for STX and SCTX Stainless Steel Screws are specified in **Table 2** for Oriented Strand Board (OSB) and **Table 3** for sawn lumber.

Table 2. Reference Lateral Design Values for SPF Main Member and OSB Side Member Connections[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration[4] (in)	Lateral Design Value[2,3] Z (lbf)	
						OSB[5] (SG[6] – 0.50)	
						$Z_{\perp}$	$Z_{\parallel}$
STX	8 x 1 1/2"	1 1/2	1	23/32	3/4	50	50
	8 x 2"	2	1 1/4		1 1/4	60	60
	9 x 1 5/8"	1 5/8	1		7/8		
	9 x 2"	2	1 1/4		1 1/4	65	65
	9 x 2 1/2"	2 1/2	1 1/2		1 1/2		
	9 x 3"	3	1 1/2				
	10 x 2 1/2"	2 1/2	1 1/2		1 1/2	80	80
	10 x 3"	3	1 1/2				
	10 x 3 1/2"	3 1/2	2				
	10 x 4"	4	2				
	8 x 1 1/4"	1 1/4	3/4	7/16	3/4	40	40
	8 x 1 1/2"	1 1/2	1		1	45	45
	8 x 2"	2	1 1/4		1 1/2		
	9 x 1 5/8"	1 5/8	1		1 1/8	55	55
	9 x 2"	2	1 1/4		1 1/2		
	9 x 2 1/2"	2 1/2	1 1/2				
	9 x 3"	3	1 1/2				
	10 x 2 1/2"	2 1/2	1 1/2		1 1/2	70	70
	10 x 3"	3	1 1/2				
	10 x 3 1/2"	3 1/2	2				
	10 x 4"	4	2				

Table 2. Reference Lateral Design Values for SPF Main Member and OSB Side Member Connections[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration[4] (in)	Lateral Design Value[2,3] Z (lbf)	
						OSB[5] (SG[6] – 0.50)	
						$Z_{\perp}$	$Z_{\parallel}$

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

1. Reference lateral design values apply to two-member single shear connections where the side member is OSB, the main member is SPF (SG = 0.42), and the fastener is installed in the face of the member and oriented perpendicular to grain. The main member shall have a minimum thickness of 1.5".
2. Tabulated lateral design values (Z) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
3. $Z_{\perp}$ = Lateral Design Values Perpendicular to Main Member Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Main Member Grain.
4. Fastener main member penetration is the length embedded in the main member, including the tip.
5. OSB shall comply with DOC PS 2. OSB shall have a specific gravity of at least 0.50.
6. SG = Specific Gravity

Table 3. Reference Lateral Design Values for Connections in Sawn Lumber[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration[5] (in)	Lateral Design Value[2,3,4] Z (lbf)					
						HF/SPF (SG = 0.42)		DF-L (SG = 0.50)		SP (SG = 0.55)	
						$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$
STX	8 x 1 1/2"	1 1/2	1	3/4	3/4	40	40	55	55	65	65
	8 x 2"	2	1 1/4		1 1/4	50	50	60	60	70	70
	9 x 1 5/8"	1 5/8	1	3/4	7/8	50	50	70	70	80	80
	9 x 2"	2	1 1/4		1 1/4	60	60	75	75		
	9 x 2 1/2"	2 1/2	1 1/2	1 1/2	1	60	60	75	75	80	80
	9 x 3"	3	1 1/2		1 1/2	65	65				
	10 x 2 1/2"	2 1/2	1 1/2	1 1/2	1	75	75	95	95	110	110
	10 x 3"	3	1 1/2		1 1/2	85	85	100	100	110	110
	10 x 3 1/2"	3 1/2	2								
	10 x 4"	4	2								
SCTX	15 x 2"	2	1 1/2	3/4	1 1/4	75	95	105	130	125	155
	15 x 2 1/2"	2 1/2	1 1/2		1 1/2	95	115	115	145	130	160
	15 x 3"	3	2	1 1/2	1 1/2	115	140	145	185	160	200
	15 x 3 1/2"	3 1/2	2 1/2			125	155				
	15 x 4"	4	2 1/2	1 1/2	2 1/2	125	155	145	185	160	200
	15 x 5"	5	3								
	15 x 6"	6	3								
	15 x 7"	7	3 1/2	3 1/2	3 1/2						
	15 x 8"	8	4								

Table 3. Reference Lateral Design Values for Connections in Sawn Lumber[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Minimum Side Member Thickness (in)	Minimum Main Member Penetration[5] (in)	Lateral Design Value[2,3,4] Z (lbf)					
						HF/SPF (SG = 0.42)		DF-L (SG = 0.50)		SP (SG = 0.55)	
						$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$	$Z_{\perp}$	$Z_{\parallel}$

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

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 installed in the face of the member and 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 0.50, 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 NDS Table 11.3.1.
4. $Z_{\perp}$ = Lateral Design Values Perpendicular to Grain, $Z_{\parallel}$ = Lateral Design Values Parallel to Grain.
5. Fastener main member penetration is the length embedded in the main member, including the tip.

6.4 *STX and SCTX Reference Withdrawal Design Values (W) in Side Grain Applications*

6.4.1 Reference withdrawal design values (lb/in) for STX and SCTX Stainless Steel Screws in sawn lumber are specified in **Table 4** and **Table 5**, respectively.

Table 4. STX Reference Withdrawal Design Values[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Withdrawal Design Value[3] W (lbf/in)		
				Wood Species[2] (Specific Gravity)		
				HF/SPF (0.42)	DF-L (0.50)	SP (0.55)
STX	8 x 1 1/4"	1 1/4	3/4	195	295	295
	8 x 1 1/2"	1 1/2	1			
	8 x 2"	2	1 1/4			
	9 x 1 5/8"	1 5/8	1	210	315	315
	9 x 2"	2	1 1/4			
	9 x 2 1/2"	2 1/2	1 1/2			
	9 x 3"	3	1 1/2			
	10 x 2 1/2"	2 1/2	1 1/2	235	315	315
	10 x 3"	3	1 1/2			
	10 x 3 1/2"	3 1/2	2			
	10 x 4"	4	2			

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m

1. Tabulated withdrawal values (W) 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 0.50, use the tabulated values for specific gravity of 0.42.
3. 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. Fastener penetration is the threaded length embedded in the main member, including the tip.

Table 5. SCTX Reference Withdrawal Design Values[1]

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Withdrawal Design Value,[3] W (lbf/in)		
				Wood Species[2] (Specific Gravity)		
				HF/SPF (0.42)	DF-L (0.50)	SP (0.55)
SCTX	15 x 2"	2	1 1/2	140	345	215
	15 x 2 1/2"	2 1/2	1 1/2			
	15 x 3"	3	2	165		215
	15 x 3 1/2"	3 1/2	2 1/2	285		365
	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/ft = 0.0146 kN/m

1. Tabulated withdrawal values (W) 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. 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. Fastener penetration is the threaded length embedded in the main member, excluding the tip.

6.5 *STX and SCTX Reference Head Pull-Through Design Values (P)*

6.5.1 Reference design values for head pull-through (lb) for STX Stainless Steel Screws are specified in **Table 6** for OSB and **Table 7** for sawn lumber.

6.5.2 Reference design values for head pull-through (lb) for SCTX screws are specified in **Table 8**.

Table 6. STX Reference Head Pull-Through Design Values in OSB

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Head Pull-Through Design Value[1] P (lbf)	
				OSB[2] Thickness (SG = 0.50)	
				$^{23}/_{32}$"	$^{7}/_{16}$"
STX	8 x $1^{1}/_{4}$"	$1^{1}/_{4}$	$^{3}/_{4}$	275	115
	8 x $1^{1}/_{2}$"	$1^{1}/_{2}$	1		
	8 x 2"	2	$1^{1}/_{4}$		
	9 x $1^{5}/_{8}$"	$1^{5}/_{8}$	1	275	115
	9 x 2"	2	$1^{1}/_{4}$		
	9 x $2^{1}/_{2}$"	$2^{1}/_{2}$	$1^{1}/_{2}$		
	9 x 3"	3	$1^{1}/_{2}$		
	10 x $2^{1}/_{2}$"	$2^{1}/_{2}$	$1^{1}/_{2}$	275	115
	10 x 3"	3	$1^{1}/_{2}$		
	10 x $3^{1}/_{2}$"	$3^{1}/_{2}$	2		
	10 x 4"	4	2		

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

1. Tabulated pull-through values (P) shall be adjusted by all applicable adjustment factors per NDS Table 11.3.1.
2. OSB shall comply with DOC PS 2. OSB and have a specific gravity of at least 0.50. Listed thicknesses are minimums.

Table 7. STX Reference Head Pull-Through Design Values in Sawn Lumber

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Head Pull-Through Design Value[1,3] P (lbf)		
				Wood Species[2] (Specific Gravity)		
				HF/SPF (0.42)	DF-L (0.50)	SP (0.55)
STX	9 x 1 5/8"	1 5/8	1	215	335	335
	9 x 2"	2	1 1/4			
	9 x 2 1/2"	2 1/2	1 1/2			
	9 x 3"	3	1 1/2			
	10 x 2 1/2"	2 1/2	1 1/2	280	380	380
	10 x 3"	3	1 1/2			
	10 x 3 1/2"	3 1/2	2			
	10 x 4"	4	2			

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

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 0.50, 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 1.5".

Table 8. SCTX Reference Head Pull-Through Design Values in Sawn Lumber

Fastener Name	Designation	Nominal Length (in)	Thread Length (in)	Head Pull-Through Design Value[1,3] P (lbf)		
				Wood Species[2] (Specific Gravity)		
				HF/SPF (0.42)	DF-L (0.50)	SP (0.55)
SCTX	15 x 2"	2	1 1/2	570	745	815
	15 x 2 1/2"	2 1/2	1 1/2			
	15 x 3"	3	2			
	15 x 3 1/2"	3 1/2	2 1/2			
	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. 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 1.5".

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 Performance[30]

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 STX and SCTX Stainless Steel Screws comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Withdrawal strength in accordance with ASTM D1761

8.1.2 Lateral shear in accordance with NDS

8.1.3 Bending yield in accordance with ASTM F1575

8.1.4 Tensile strength in accordance with AISI S904

8.1.5 Shear strength in accordance with AISI S904

8.1.6 Head pull-through in accordance with ASTM D1761

8.1.7 Corrosion resistance in accordance with ASTM B117 and ASTM G85

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, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[33] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[34] respectively.

8.3 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

8.4 Any regulation specific issues not addressed in this section are outside the scope of this report.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 *Installation Procedure*

9.3.1 Minimum penetration is 1", unless otherwise stated in this report. Install fasteners with head flush to the surface of the wood member.

9.3.2 Lead holes are not required.

9.3.3 Screws shall be installed with the appropriate rotating powered driver and never driven with a hammer.

9.3.4 Minimum requirements for screw spacing, edge distance, and end distance shall be in accordance with **Table 9**.

Table 9. STX and SCTX Screw Spacing, Edge Distance and End Distance Requirements[1,2]

Connection Geometry	Minimum Spacing/Distance (in)			
	STX8	STX9	STX10	SCTX15
Edge Distance – Load in any direction	3/8	3/8	3/8	5/8
End Distance – Load parallel to grain, towards end	1 3/4	2	2 1/4	3 1/8
End Distance – Load parallel to grain, away from end	1 1/4	1 3/8	1 1/2	2 1/8
End Distance – Load perpendicular to grain	1 1/4	1 3/8	1 1/2	2 1/8
Spacing between Fasteners in a Row – Parallel to grain	1 3/4	2	2 1/4	3 1/8
Spacing between Fasteners in a Row – Perpendicular to grain	1 1/4	1 3/8	1 1/2	2 1/8
Spacing between Rows of Fasteners – In-line	5/8	3/4	3/4	1 1/8
Spacing between Rows of Fasteners – Staggered	3/8	3/8	3/8	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.
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 Bending yield testing in accordance with ASTM F1575

10.1.2 Shear and tensile testing in accordance with AISI S904

10.1.3 Lateral strength testing in accordance with ASTM D1761

10.1.4 Withdrawal strength testing in accordance with ASTM D1761

10.1.5 Head pull-through testing in accordance with ASTM D1037 and ASTM D1761

10.1.6 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 STX and SCTX Stainless Steel Screws on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, STX and SCTX Stainless Steel 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, STX and SCTX Stainless Steel Screws shall be approved for the following applications:

11.2.1 Use as fasteners in accordance with the listed design values and any required codes.

11.3 Unless exempt by state statute, when STX and SCTX Stainless Steel 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 ig Timbe.

11.5 IBC Section 104.2.3[36] (IRC Section R104.2.2[37] and IFC Section 104.2.3[38] 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, STX and SCTX Stainless Steel Screws shall not be used:

12.3.1 In sawn lumber with moisture content greater than nineteen percent (19%) or in OSB with moisture content greater than sixteen percent (16%).

12.4 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.4.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

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

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

12.4.4 At a minimum, these innovative products shall be installed per **Section 9**.

12.4.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.4.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.4.7 The application of 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.

12.5 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.6 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.7 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 Big Timber STX and SCTX Stainless Steel 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: March 9, 2022
Subject to Renewal: October 1, 2026

FBC Supplement to Report Number 1911-02

REPORT HOLDER: ig Timbe

1 Evaluation Subject

1.1 STX and SCTX Stainless Steel Screws

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show STX and SCTX Stainless Steel Screws, recognized in Report Number 1911-02, 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 41094)*

2.2.2 *FBC-R 20, 23: Florida Building Code28 – Residential (FL 41094)*

3 Conclusions

3.1 STX and SCTX Stainless Steel Screws, described in Report Number 1911-02, 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 STX and SCTX Stainless Steel Screws, described in Report Number 1911-02, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1911-02.

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%2C%20or%20cause%20to%20be%20made%2C%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.cbitest.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-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%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%2C%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 the FBC-B and FBC-R are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Florida 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%2C%20livable%2C%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.