DrJ™ CERTIFICATION

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Technical Evaluation Report

TER 2104-06

Big Timber® STX and SCTX Stainless Screw Properties - Canada

Western Builders Supply DBA Big Timber®

Products:

STX and SCTX Stainless Screws

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COMPANY INFORMATION:	ADDITIONAL LISTEES:
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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

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

1 Products Evaluated[1]

1.1 STX and SCTX Stainless Screws

2 Applicable Codes and Standards[2,3]

2.1 *Codes*

2.1.1 *NBC—10, 15, 20: National Building Code of Canada*

2.1.2 *O Reg. 332/12: Ontario Building Code (OBC)*[4]

2.2 *Standards and Referenced Documents*

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

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

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

2.2.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*

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

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

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

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

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

2.2.10 *CSA O86: Engineering Design in Wood*

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

[2] Unless otherwise noted, all references in this TER are from the 2020 version of the *NBC*. This *alternative solution* is also approved for use with the 2010 and 2015 *NBC* and the standards referenced therein.

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

[4] References in this TER to the National Building Code of Canada (*NBC*) apply to the Ontario Building Code (*OBC*), unless noted otherwise.

2.2.11 *CSA O325: Construction Sheathing*

3 Performance Evaluation

3.1 Big Timber® STX and SCTX Stainless Screws were tested and evaluated to determine their structural resistance properties, which were used to develop design values for limit states design (LSD) in accordance with *CSA O86*. The following properties were evaluated:

3.1.1 Withdrawal strength in accordance with *ASTM D1761* per *CSA O86* Subsection 12.11.4[5]

3.1.2 Lateral shear in accordance with *CSA O86* Subsection 12.11.3[6]

3.1.3 Bending yield in accordance with *ASTM F1575*

3.1.4 Tensile strength in accordance with *AISI S904*

3.1.5 Shear strength in accordance with *AISI S904*

3.1.6 Head pull-through in accordance with *ASTM D1761* per *CSA O86* Subsection 12.11.4.3[7]

3.1.7 Corrosion resistance in accordance with *ASTM B117* and *ASTM G85*

3.2 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

3.3 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

4 Product Description and Materials

4.1 STX and SCTX Stainless Screws are made from Grade 316 stainless steel. The STX screw has a round flat head with ribs and a star drive (torx screw) and is partially threaded. The SCTX screw has a round washer head and a star drive (torx screw) and is partially threaded. The products evaluated in this TER are shown in Figure 1 and Figure 2, respectively.

Figure 1. STX General Purpose Stainless Steel Screw

Figure 2. SCTX Construction Lag Steel Screw

4.2 STX and SCTX screws are manufactured using a standard cold-formed process.

4.3 STX and SCTX screws approved for use in chemically-treated or untreated lumber where *ASTM A153, Class D* coatings are approved for use in accordance with *NBC* Subsection 5.9.1.[8]

4.3.1 The stainless fasteners have been tested and found to exceed the protection provided by code-approved hot-dipped galvanized coatings meeting *ASTM A153, Class D* (*NBC* Subsection 5.9.1[8]), allowing for its use in pressure treated wood.

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[5] 2014 *CSA O86* Subsection 12.11.5

[6] 2014 *CSA O86* Subsection 12.11.4

[7] 2014 *CSA O86* Subsection 12.11.5.3

[8] *O Reg. 332/12 Subsection 5.10.1*

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

4.5 STX and SCTX screws are approved for use in chemically-treated wood with exposure to saltwater, including coastal construction applications.

4.6 The fasteners evaluated in this TER are set forth in Table 1.

Table 1. Fastener Specifications

Fastener Name(s)	Designation	Head		Nominal Length[1] in (mm)	Thread Length[1] in (mm)	Shank Diameter[2] in (mm)	Thread Diameter in (mm)		Nominal Bending Yield, f_{yb} psi (MPa)	Factored Fastener Strength lbf (kN)	
		Diameter in (mm)	Drive Type				Minor	Major		Tensile	Shear[3]
STX	8 x 1¼"	0.329 (8.4)	Torx 20	1¼ (32)	¾ (19.1)	0.116 (2.9)	0.100 (2.5)	0.163 (4.1)	122,000 (840)	650 (2.9)	640 (2.8)
	8 x 1½"			1½ (38)	1 (25)						
	8 x 2"			2 (51)	1¼ (32)						
	9 x 1⅝"	0.350 (8.9)	Torx 25	1⅝ (41)	1 (25)	0.130 (3.3)	0.110 (2.8)	0.181 (4.6)	122,000 (840)	675 (3.0)	610 (2.7)
	9 x 2"			2 (51)	1¼ (32)						
	9 x 2½"			2½ (64)	1½ (38)						
	9 x 3"			3 (76)	1½ (38)						
	10 x 2½"	0.376 (9.6)	Torx 25	2½ (64)	1½ (38)	0.145 (3.7)	0.126 (3.2)	0.193 (4.9)	124,000 (855)	790 (3.5)	755 (3.4)
	10 x 3"			3 (76)	1½ (38)						
	10 x 3½"			3½ (89)	2 (51)						
	10 x 4"			4 (102)	2 (51)						
SCTX	15 x 2"	0.620 (15.7)	Torx 30	2 (51)	1½ (38)	0.202 (5.1)	0.179 (4.5)	0.275 (7.0)	111,000 (765)	1,540 (6.9)	1,305 (5.8)
	15 x 2½"			2½ (64)	1½ (38)						
	15 x 3"			3 (76)	2 (51)						
	15 x 3½"			3½ (89)	2½ (64)						
	15 x 4"			4 (102)	2½ (64)						
	15 x 5"			5 (127)	3 (76)						
	15 x 6"			6 (152)	3 (76)						
	15 x 7"			7 (178)	3½ (89)						
	15 x 8"			8 (203)	4 (102)						

SI: 25.4 mm = 1 in, 1 N = 0.225 lb, 1 MPa = 145 psi

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.

5 Applications

5.1 *General*

5.1.1 STX and SCTX 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 6 for installation requirements.

5.1.2 STX and SCTX screws are installed without lead holes, as prescribed in *CSA O86* Subsection 12.11.2.1.

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

5.2 *Design*

5.2.1 Design of STX and SCTX screws are governed by the applicable code and the provisions for wood screws in *CSA O86*.

5.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

5.3 *STX and SCTX Factored Lateral Design Values (N_r)*

5.3.1 The factored lateral design values for shear load perpendicular to grain and parallel to grain for STX screws in OSB are specified in Table 2.

Table 2. STX Screw Factored Lateral Design Values for Connections in OSB (N_r)

Fastener Name	Designation	Nominal Length in (mm)	Thread Length in (mm)	Minimum Side Member Thickness in (mm)	Minimum Main Member Penetration[4] in (mm)	Factored Lateral Design Values[1,2,3], lbf (N)	
						Species (Relative Density)	
						OSB[5] (0.42)	
						$N_{r\perp}$	$N_{r\parallel}$
STX	8 x 2"	2 (51)	1¼ (32)	23/32 (18.3)	1¼ (32)	190 (845)	
	9 x 2"	2 (51)	1¼ (32)			195 (870)	
	9 x 2½"	2½ (64)	1½ (38)		1½ (38)	220 (980)	
	9 x 3"	3 (76)	1½ (38)				
	10 x 2½"	2½ (64)	1½ (38)			220 (980)	
	10 x 3"	3 (76)	1½ (38)				
	10 x 3½"	3½ (89)	2 (51)				
	10 x 4"	4 (102)	2 (51)				
	8 x 2"	2 (51)	1¼ (32)	7/16 (11.1)	1½ (38)	165 (735)	
	9 x 1⅝"	1⅝ (41)	1 (25)		1⅛ (29)	155 (690)	
	9 x 2"	2 (51)	1¼ (32)		1½ (38)	190 (855)	
	9 x 2½"	2½ (64)	1½ (38)				
	9 x 3"	3 (76)	1½ (38)				
	10 x 2½"	2½ (64)	1½ (38)			195 (860)	
	10 x 3"	3 (76)	1½ (38)				
	10 x 3½"	3½ (89)	2 (51)				
	10 x 4"	4 (102)	2 (51)				

SI: 25.4 mm = 1 in, 1 N = 0.225 lb

1. Factored 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 values are for a standard load duration. Values shall be factored by all applicable modification factors per *CSA O86*.
3. $N_{r\perp}$ = Lateral Design Values Perpendicular to Grain, $N_{r\parallel}$ = Lateral Design Values Parallel to Grain.
4. Fastener main member penetration is the length embedded in the main member, including the tip.
5. OSB shall comply with *CSA O325*. OSB shall have a relative density of at least 0.42. Listed thicknesses are minimums.

5.3.2 The factored lateral design values for shear load perpendicular to grain and parallel to grain for STX and SCTX screws in solid sawn lumber are specified in Table 3.

Table 3. STX and SCTX Screw Factored Lateral Design Values for Connections in Solid Sawn Lumber (N_r)

Fastener Name	Designation	Nominal Length in (mm)	Thread Length in (mm)	Minimum Side Member Thickness in (mm)	Minimum Main Member Penetration[5] in (mm)	Factored Lateral Design Values[1,2], lbf (N)			
						Species[4] (Relative Density)			
						HF/SPF (0.42)		DF-L (0.49)	
						$N_{r\perp}$	$N_{r\parallel}$	$N_{r\perp}$	$N_{r\parallel}$
STX	8 x 2"	2 (51)	1¼ (32)	¾ (19.1)	1¼ (32)	150 (675)		175 (785)	
	9 x 2"	2 (51)	1¼ (32)			170 (750)		195 (875)	
	9 x 2½"	2½ (64)	1½ (38)	1½ (38)	1 (25)	210 (935)		245 (1,090)	
	9 x 3"	3 (76)	1½ (38)		1½ (38)	255 (1,125)		295 (1,310)	
	10 x 2½"	2½ (64)	1½ (38)		1 (25)	225 (995)		260 (1,160)	
	10 x 3"	3 (76)	1½ (38)		1½ (38)	270 (1,195)		310 (1,390)	
	10 x 3½"	3½ (89)	2 (51)						
	10 x 4"	4 (102)	2 (51)						
SCTX	15 x 3"	3 (76)	2 (51)	1½ (38)	1½ (38)	375 (1,665)		435 (1,945)	
	15 x 3½"	3½ (89)	2½ (64)						
	15 x 4"	4 (102)	2½ (64)		2½ (64)	500 (2,220)		570 (2,545)	
	15 x 5"	5 (127)	3 (76)						
	15 x 6"	6 (152)	3 (76)						
	15 x 7"	7 (178)	3½ (89)	3½ (89)	3½ (89)	635 (2,830)		705 (3,145)	
	15 x 8"	8 (203)	4 (102)						

SI: 25.4 mm = 1 in, 1 N = 0.225 lb

1. Factored lateral design values apply to two-member single shear connections where both members are of the same relative density, and the fastener is oriented perpendicular to grain. Where the members are of different relative densities, use the lower of the two.
2. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per *CSA O86*.
3. $N_{r\perp}$ = Lateral Design Values Perpendicular to Grain, $N_{r\parallel}$ = Lateral Design Values Parallel to Grain.
4. For wood species with a relative density between 0.42 and 0.49, use the tabulated values for relative density of 0.42.
5. Fastener main member penetration is the length embedded in the main member, including the tip.

5.4 *STX and SCTX Factored Withdrawal Design Values in Side Grain Applications (P_{rw})*

5.4.1 The design provisions for withdrawal noted in *CSA O86* Subsection 12.11.4[9] apply to STX and SCTX screws, unless otherwise noted in this TER. Factored withdrawal design values per millimeter of threaded shank penetration for STX and SCTX screws are specified in Table 4.

Table 4. STX and SCTX Factored Withdrawal Design Values (P_{rw}) – Side Grain Applications

Fastener Name	Designation	Nominal Length in (mm)	Thread Length in (mm)	Factored Withdrawal Design Values[1,2], lbf/in (N/mm)	
				Species (Relative Density)	
				HF/SPF (0.42)	DF-L (0.49)
STX[3]	8 x 1¼"	1¼ (32)	¾ (19.1)	420 (74)	635 (111)
	8 x 1½"	1½ (38)	1 (25)		
	8 x 2"	2 (51)	1¼ (32)		
	9 x 1⅝"	1⅝ (41)	1 (25)	455 (80)	680 (119)
	9 x 2"	2 (51)	1¼ (32)		
	9 x 2½"	2½ (64)	1½ (38)		
	9 x 3"	3 (76)	1½ (38)		
	10 x 2½"	2½ (64)	1½ (38)	505 (88)	680 (119)
	10 x 3"	3 (76)	1½ (38)		
	10 x 3½"	3½ (89)	2 (51)		
	10 x 4"	4 (102)	2 (51)		
SCTX[4]	15 x 2"	2 (51)	1½ (38)	300 (53)	745 (130)
	15 x 2½"	2½ (64)	1½ (38)		
	15 x 3"	3 (76)	2 (51)	355 (62)	
	15 x 3½"	3½ (89)	2½ (64)	615 (108)	
	15 x 4"	4 (102)	2½ (64)		
	15 x 5"	5 (127)	3 (76)		
	15 x 6"	6 (152)	3 (76)		
	15 x 7"	7 (178)	3½ (89)		
	15 x 8"	8 (203)	4 (102)		

SI: 25.4 mm = 1 in, 1 kN/m = 737.6 lb/ft

1. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per *CSA O86* for wood screws.
2. For wood species with a relative density between 0.42 and 0.49, use the tabulated values for relative density of 0.42.
3. The full design withdrawal value is equal to the tabulated factored 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.
4. The full design withdrawal value is equal to the tabulated factored 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. Minimum fastener penetration into main member of 1" (25.4 mm) is required.

[9] 2014 *CSA O86* Subsection 12.11.5

5.5 *STX and SCTX Factored Head Pull-Through Design Values (P_{pt})*

5.5.1 The factored design values for head pull-through for STX screws in OSB are specified in Table 5.

Table 5. STX Screw Factored Head Pull-Through Design Values in OSB (P_{pt})

Fastener Name	Designation	Nominal Length in (mm)	Thread Length in (mm)	Factored Head Pull-Through Design Value[1], lbf (N)	
				Species (Relative Density) and Thickness, in (mm)	
				OSB[2] (0.42)	
				$^{23}/_{32}$ (18.3)	$^{7}/_{16}$ (11.1)
STX	8 x 1¼"	1¼ (32)	¾ (19.1)	105 (475)	65 (290)
	8 x 1½"	1½ (38)	1 (25)		
	8 x 2"	2 (51)	1¼ (32)		
	9 x 1⅝"	1⅝ (41)	1 (25)		
	9 x 2"	2 (51)	1¼ (32)		
	9 x 2½"	2½ (64)	1½ (38)		
	9 x 3"	3 (76)	1½ (38)		
	10 x 2½"	2½ (64)	1½ (38)		
	10 x 3"	3 (76)	1½ (38)		
	10 x 3½"	3½ (89)	2 (51)		
	10 x 4"	4 (102)	2 (51)		

SI: 25.4 mm = 1 in, 1 N = 0.225 lb

1. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per *CSA O86* for wood screws.
2. OSB shall comply with *CSA O325*. OSB and have a relative density of at least 0.42. Listed thicknesses are minimums.

5.5.2 The factored design values for head pull-through for STX and SCTX screws in solid sawn lumber are specified in Table 6.

Table 6. STX and SCTX Screw Factored Head Pull-Through Design Values in Solid Sawn Lumber (P_{pt})

Fastener Name	Designation	Nominal Length in (mm)	Thread Length in (mm)	Factored Head Pull-Through Design Value[1,2], lbf (N)
				Species (Relative Density)
				HF/SPF (0.42)
STX	9 x 1⅝"	1⅝ (41)	1 (25)	225 (990)
	9 x 2"	2 (51)	1¼ (32)	
	9 x 2½"	2½ (64)	1½ (38)	
	9 x 3"	3 (76)	1½ (38)	
	10 x 2½"	2½ (64)	1½ (38)	
	10 x 3"	3 (76)	1½ (38)	
	10 x 3½"	3½ (89)	2 (51)	
	10 x 4"	4 (102)	2 (51)	
SCTX	15 x 2"	2 (51)	1½ (38)	
	15 x 2½"	2½ (64)	1½ (38)	
	15 x 3"	3 (76)	2 (51)	
	15 x 3½"	3½ (89)	2½ (64)	
	15 x 4"	4 (102)	2½ (64)	
	15 x 5"	5 (127)	3 (76)	
	15 x 6"	6 (152)	3 (76)	
	15 x 7"	7 (178)	3½ (89)	
	15 x 8"	8 (203)	4 (102)	

SI: 25.4 mm = 1 in, 1 N = 0.225 lb

1. Tabulated values are for a standard load duration. Values shall be factored by all applicable modification factors per CSA O86 for wood screws.
2. Pull-through design values apply to connections having a minimum wood side member thickness of at least 1.5" (38 mm).

6 Installation

6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

6.2 Minimum penetration is 1″ (25.4 mm), unless otherwise noted in this TER. Install fasteners with the underside of the head flush to the surface of the wood member.

6.3 Lead holes are not required.

6.4 Screws shall be installed with the appropriate rotating powered driver.

6.5 Minimum requirements for screw spacing, edge distance, and end distance shall be in accordance with Table 7.

Table 7. STX and SCTX Screw Spacing, Edge Distance, and End Distance Requirements

Symbol	Dimension	Minimum Spacing[1,2] (mm)							
		Species (Relative Density)							
		HF/SPF (0.42)				DF-L (0.49)			
		STX 8	STX 9	STX 10	SCTX 15	STX 8	STX 9	STX 10	SCTX 15
S_P	Spacing parallel to grain	66	74	78	112	82	92	98	140
S_Q	Spacing perpendicular to grain	33	37	39	56	41	46	49	70
a	End distance parallel to grain	49	55	59	84	61	69	74	105
e	Edge distance perpendicular to grain	16.4	18.4	19.6	28.0	20.5	23.0	24.5	35.0

SI: 25.4 mm = 1 in

1. Table values are based on the major thread diameter from Table 1 in accordance with *CSA O86* Table 12.25.
2. Spacing, edge distances, and end distances of fasteners shall be sufficient to prevent splitting of the wood or as shown in this table, whichever is more restrictive.

7 Substantiating Data

7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

7.1.1 Bending yield testing in accordance with *ASTM F1575*

7.1.2 Shear and tensile testing in accordance with *AISI S904*

7.1.3 Lateral strength testing in accordance with *ASTM D1761*

7.1.4 Withdrawal strength testing in accordance with *ASTM D1761*

7.1.5 Head pull-through testing in accordance with *ASTM D1761*

7.1.6 Corrosion resistance testing in accordance with *ASTM B117* and *ASTM G85*

7.2 Information contained herein is the result of testing and/or data analysis by sources that conform to the evaluation requirements of *NBC* Volume 1 Relationship of the *NBC* to Standards Development and Conformity Assessment and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.

7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through provincial, territorial, or local adoption of codes and standards. The providers of the codes and standards are legally responsible for their content. DrJ analysis may use code-adopted provisions as a control sample. A control sample versus a test sample establishes the products as being equivalent to that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the accuracy of the provisions provided herein is reliant upon the published properties of materials, DrJ relies upon the grade mark, grade stamp, mill certificate, and/or test data provided by material suppliers to be minimum properties. DrJ analysis relies upon these properties to be accurate.

8 Findings

8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the products listed in Section 1.1 have the design value properties defined herein and are approved for use in accordance with the applicable code.

8.2 These products have been evaluated in the context of the codes listed in Section 2 and is compliant with all known provincial, territorial, and local building codes. Where there are known variations in provincial, territorial, or local codes applicable to this TER, they are listed here.

8.2.1 No known variations

8.3 *NBC* Volume 1 Relationship of the *NBC* to Standards Development and Conformity Assessment:

> **Certification**
> Certification is the confirmation by an independent organization that a product, service, or system meets a requirement…Certification bodies publish lists of certified products and companies…Several organizations, including the Canadian Construction Materials Centre (CCMC), offer such evaluation services.
>
> **Evaluation**
> An evaluation is a written opinion by an independent professional organization that a product will perform its intended function. An evaluation is very often done to determine the ability of an innovative product, for which no standards exist, to satisfy the intent of the Code requirement...

8.4 Valid *evaluations* are obtained from *independent professional organizations*, which include but are not limited to ISO/IEC 17065 accredited evaluation services and professional engineers.[10]

8.5 ISO/IEC 17065 accreditation bodies, including but not limited to SCC and ANAB, confirm that product certification bodies have the expertise to provide *evaluation* services within their scope of accreditation. All SCC and ANAB product certification bodies meet *NBC* requirements to offer *evaluation* services for *alternative solutions*.[11]

8.5.1 DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131 and employs professional engineers.[12]

8.6 Product certification organizations, accredited by the SCC and ANAB, are defined as equivalent *evaluation* services:

8.6.1 The Canada-United States-Mexico Agreement (CUSMA) Article 11.6 Conformity Assessment confirms mutual recognition by stating, "...each Party shall accord to conformity assessment bodies located in the territory of another Party treatment no less favorable than that it accords to conformity assessment bodies located in its own territory or in the territory of the other Party."

8.6.2 The SCC National Conformity Assessment Principles states, "SCC is a member of a number of international organizations developing voluntary conformity assessment agreements that help ensure the international acceptance of Canadian conformity assessment results. Signatories to these agreements (like SCC) recognize each other's accreditations as being equivalent to their own."[13]

8.7 Building official approval of a licensed professional engineer is performed by verifying the professional engineer and/or their business entity are listed by the licensing board of the relevant jurisdiction.

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[10] *NBC* Division C Subsection 2.2.1.2

[11] *NBC* Division A Subsection A-1.2.1.1.(1)(b) provides information on code compliance via alternative solutions and defines alternative solutions as "...achiev[ing] at least the minimum level of performance required by Division B." *NBC* Division C Section 2.3 includes additional guidance for documentation of alternative solutions.

[12] Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain material, product, design, or method of construction approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "certified once, accepted everywhere."

[13] The National Conformity Assessment Principles states, "Product regulations and standards may vary from country to country. If these are set arbitrarily, they could be deemed as protectionist. The World Trade Organization (WTO) Agreement on Technical Barriers to Trade (TBT Agreement) is intended to ensure that technical regulations, standards and conformity assessment procedures of member countries do not create unnecessary obstacles to trade. Under the TBT Agreement, members of the WTO agree to use international standards, including conformity assessment standards and guides, as a basis for their technical requirements."

9 Conditions of Use

9.1 Wood member moisture content shall be less than or equal to 19% for sawn lumber and less than 16% for OSB.

9.2 Where required by the *authority having jurisdiction* (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

9.4 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the *designer* (e.g., *owner*).

9.5 At a minimum, these products shall be installed per Section 6 of this TER.

9.6 These products have an internal quality control program and a third-party quality assurance program in accordance with ISO/IEC 17065 certification procedures.

9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.

9.8 This TER shall be reviewed for code compliance by the AHJ in concert with the duties and powers granted to the building official by the provincial regulations governing such duties and powers.

9.9 The implementation of this TER for these products is dependent on the design, quality control, third-party quality assurance, proper implementation of installation instructions, inspections, and any other code or regulatory requirements that may apply.

10 Identification

10.1 The products listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.

10.2 Additional technical information can be found at bigtimberfasteners.com.

11 Review Schedule

11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.

11.2 For information on the current status of this TER, contact DrJ Certification.