DrJ CERTIFICATION

Technical Evaluation Report™

TER 2102-05

Attachment of Xci Ply, Xci Ply (Class A), and Xci NB to
Wood, Steel, Concrete, and Masonry

Hunter Panels

Product:

Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A)

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COMPANY INFORMATION:	ADDITIONAL LISTEES:

Hunter Panels
15 Franklin St Ste B2
Portland, ME 04101-7119

P: 888-746-1114

brandon.reynolds@hpanels.com

hunterpanels.com

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES	SECTION: 06 12 19 - Shear Wall Panels
SECTION: 06 12 00 - Structural Panels	SECTION: 06 16 00 - Sheathing

1 Innovative Products Evaluated[1,2]

1.1 Xci Ply

1.2 Xci Ply (Class A)

1.3 Xci NB

1.4 Xci CG

1.5 Xci CG (Class A)

1.6 Xci Foil

1.7 Xci Foil (Class A)

2 Applicable Codes and Standards[3,4]

2.1 *Codes*

2.1.1 *IBC—15, 18, 21: International Building Code®*

2.1.2 *IRC—15, 18, 21: International Residential Code®*

2.1.3 *IECC—15, 18, 21: International Energy Conservation Code®*

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

2 **Federal Regulation Definition.** 24 CFR 3280.2 "Listed or certified" means included in a list published by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection 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. **International Building Code (IBC) Definition of Listed.** Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose Listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. **IBC Definition of Labeled**. Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

3 This Listing is a code defined research report, which is also known as a duly authenticated report, provided by an approved agency (see IBC Section 1703.1) and/or an approved source (see IBC Section 1703.4.2). An approved agency is "approved" when it is ANAB accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory). A professional engineer is "approved" as an approved source when that professional engineer is properly licensed to transact engineering commerce. Where sealed by a professional engineer, it is also a duly authenticated report certified by an approved source. (i.e., Registered Design Professional). DrJ is an ANAB accredited product certification body.

4 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.

2.1.4 *FBC-B—20, 23: Florida Building Code – Building*[5]

2.1.5 *FBC-R—20, 23: Florida Building Code – Residential*[5]

2.2 *Standards and Referenced Documents*

2.2.1 *ASCE/SEI 7: Minimum Design Loads for Buildings and Other Structures*

2.2.2 *AISI S100: North American Specification for the Design of Cold-formed Steel Structural Members*

2.2.3 *ASTM A653: Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-dip Process*

2.2.4 *ASTM C90: Standard Specification for Loadbearing Concrete Masonry Units*

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

3 Performance Evaluation

3.1 Tests, test reports, research reports, duly authenticated reports and related engineering evaluations are defined as intellectual property and/or trade secrets and protected by Defend Trade Secrets Act 2016 (DTSA).[6]

3.2 Testing and/or inspections conducted for this TER were performed an ISO/IEC 17025 accredited testing laboratory,[7] an ISO/IEC 17020 accredited inspection body,[8] which are internationally recognized accreditations through International Accreditation Forum (IAF), and/or a licensed Registered Design Professional (RDP).

3.3 Connection of Xci Panels were evaluated for use in supporting attached cladding weight. The scope of this TER includes connection to light-frame wood construction framing, light-frame cold-formed steel (CFS) framing, concrete substrates, and concrete masonry units (CMU) to support cladding weight.

3.4 Connection of Xci Ply and Xci Ply NB panels were evaluated to determine the allowable out-of-plane wind pressure and maximum wind speeds. Allowable out-of-plane wind pressures are provided for wood construction framing, CFS framing, and CMU. Allowable out-of-plane wind pressures for concrete substrates is outside the scope of this TER.

3.5 Attachment of the cladding to the Xci Panels is outside the scope of this TER.

3.6 Any building code 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 RDPs / approved sources. DrJ is qualified[9] to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.

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

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5 All references to the FBC-B and FBC-R are the same as the 2021 IBC and 2021 IRC, respectively, unless otherwise noted in the Florida Supplement at the end of this TER.

6 https://www.law.cornell.edu/uscode/text/18/part-I/chapter-90. Given our professional duty to inform, please be aware that whoever, with intent to convert a trade secret (TS), that is related to a product or service used in or intended for use in interstate or foreign commerce, to the economic benefit of anyone other than the owner thereof, and intending or knowing that the offense will, injure any owner of that trade secret, knowingly without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information; shall be fined under this title or imprisoned not more than 10 years, or both. 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. As the National Society of Professional Engineers states, "Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve." Therefore, to protect intellectual property (IP) and TS, and to achieve 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. For more information, please review this website: Intellectual Property and Trade Secrets.

7 Internationally recognized accreditations are performed by members of the International Accreditation Forum (IAF). Accreditation Body and Regional Accreditation Group Members of IAF are admitted to the IAF MLA only after a stringent evaluation of their operations by a peer evaluation team, which is charged to ensure that the applicant complies fully with both international standards and IAF requirements. Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.

8 Ibid.

9 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.

3.8 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

4.1 *Xci Panels*

4.1.1 The innovative products evaluated in this TER are shown in Figure 1.

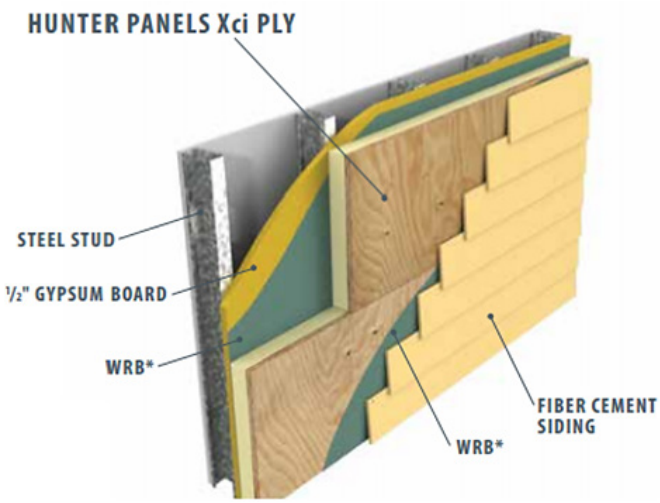

Figure 1. Xci Ply and Xci Ply (Class A)

4.1.2 Xci Ply and Xci Ply (Class A) panels are Type V high thermal rigid insulation panels composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and $^{5}/_{8}$" or $^{3}/_{4}$" fire-retardant treated (FRT) plywood on the other. Both are designed for use in Types I-IV commercial wall applications to provide continuous insulation within the building envelope.

4.1.3 Xci NB is a Type V high thermal rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and $^{7}/_{16}$" or $^{5}/_{8}$" OSB or plywood on the other. It is designed for use in Type V commercial wall applications to provide continuous insulation within the building envelope.

4.2 Xci CG, Xci CG (Class A), Xci Foil, Xci Foil (Class A), are proprietary Foam Plastic Insulating Sheathing (FPIS) products.

4.2.1 Xci CG and Xci CG (Class A) are polyisocyanurate insulation boards adhered to coated glass facers.

4.2.2 Xci Foil and Xci Foil (Class A) are composite boards consisting of a 25 psi closed cell polyisocyanurate insulation foam core, coated on both sides with a glass-backed aluminum foil facer (ASTM C1289 Type I, Class 1).

4.3 *Material Availability*

4.3.1 *Thickness:*

4.3.1.1 Xci Ply and Xci Ply (Class A): 1.6" (41 mm) through 4.7" (119 mm)

4.3.1.2 Xci Ply NB: 1.5" (38 mm) through 4.5" (114 mm)

4.3.2 Standard product width: 48" (1,219 mm)

4.3.3 Standard length: 96" (2,438 mm)

4.4 Throughout this TER, "**Xci Panels**" refers to Xci Ply, Xci Ply (Class A), and Xci NB. "**XCI Foam**" refers to Xci CG, Xci CG (Class A), Xci Foil, Xci Foil (Class A) products.

4.5 *Fasteners*

4.5.1 Xci Panels shall be fastened with one of the proprietary fasteners described in this section of the TER, and in accordance with the provisions of this TER.

4.5.1.1 Proprietary fastener properties shall be per published manufacturer data.

4.5.2 Hunter SIP/WD fasteners (SIPTP fasteners from TRUFAST®) are size No. 14 (shank diameter 0.189") fasteners with a 0.635" diameter pancake head and a T-30 drive. The point is a threaded drill point.

4.5.3 Hunter SIP/SD fasteners (SIPLD fasteners from TRUFAST®) are size No. 14 (shank diameter 0.189") fasteners with a 0.635" diameter pancake head and a T-30 drive. The point is a two-flute formed drill tip.

4.5.4 Hunter SIP/HD (SIPHD fasteners from TRUFAST®) fasteners are size No. 14 (shank diameter 0.189") fasteners with a 0.635" diameter pancake head and a T-30 drive. The point is a two-flute formed drill tip.

4.5.5 1/4" Tapcon® Screw Anchors are a 0.192" shank diameter carbon steel concrete anchors with a 0.475" diameter flat head and Star drive. They have an alternating high-low thread form and a pointed tip.

4.5.6 When referred to in this TER, Hunter SIP/WD, SIP/SD, and SIP/HD fasteners are equivalent to TRUFAST® SIPTP, SIPLD, and SIPHD fasteners, respectively.

4.6 *Framing/Substrate Materials*

4.6.1 *Wood:*

4.6.1.1 Solid sawn wood framing members shall consist of lumber species having a specific gravity of at least 0.42.

4.6.2 *Steel:*

4.6.2.1 Steel framing members must comply with one of the material standards provided in Section A3.1 of AISI S100.

4.6.2.2 At a minimum, steel framing members must comply with the requirements set forth in this TER.

4.6.3 *Concrete:*

4.6.3.1 Normal weight structural concrete must comply with IBC Section 1901.2.

4.6.3.2 Concrete shall remain uncracked for the service life of the fastener.

4.6.4 *Masonry:*

4.6.4.1 Load-bearing Concrete Masonry Units (CMU's) shall comply with IBC Section 2114.3 and IRC Section R606.2.1.

4.6.4.2 CMU's shall be normal-weight and conform to ASTM C90.

5 Applications

5.1 *Xci Panel Attachment to Wood Framing*

5.1.1 Xci Panels shall be fastened along each stud.

5.1.2 Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 1 and Table 2 when 1x wood furring strips (0.75″ thick) are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener head). The design of the furring is outside the scope of this TER, and must be checked for the applied loads.

5.1.3 *Connections to Wood Framing to Support Cladding Weight:*

5.1.3.1 Fasteners are required to attach Xci Panels to wood framing to support the attached cladding weight. See Table 1 for the maximum vertical fastener spacing (along the height of the stud) to support specified cladding weights.

5.1.3.2 See Figure 2 for a typical installation detail of Xci Panels attached to wood studs.

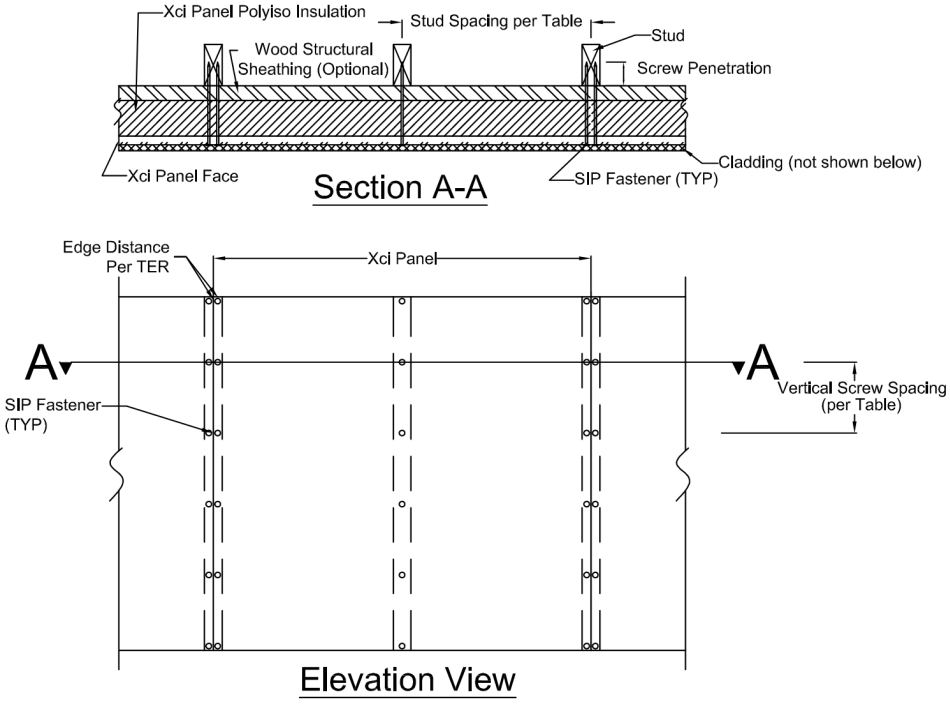

Figure 2. Typical Installation Detail

Table 1. Maximum Fastener Spacing for Xci Panels Attached to Wood Framing[5]

Framing Member[4]	Stud Spacing (in) o.c.	Fastener[1,2]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing (in)					
				Specified Cladding Weight[3] (psf)					
				5	10	15	20	25	30
Wood Framing	16"	Hunter SIP/SD	≤ 2 1/2	24	24	24	24	24	24
			3	24	24	24	24	20	16
			3 1/2	24	24	24	16	12	12
			4	24	16	12	8	8	6
		Hunter SIP/WD	≤ 2	24	24	24	24	24	24
			2 1/2	24	24	24	24	24	20
			3	24	24	24	24	20	16
			3 1/2	24	24	24	16	12	12
			4	24	16	12	8	8	6
	24"	Hunter SIP/SD	1	24	24	24	24	24	24
			1 1/2	24	24	24	24	24	20
			2	24	24	24	24	20	16
			2 1/2	24	24	24	20	16	16
			3	24	24	20	16	12	12
			3 1/2	24	20	16	12	8	8
			4	20	12	8	6	4	4
		Hunter SIP/WD	< 1 1/2	24	24	24	24	20	16
			2	24	24	24	20	16	16
			2 1/2	24	24	24	20	16	12
			3	24	24	20	16	12	12
			3 1/2	24	20	16	12	8	8
			4	20	12	8	6	4	4

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

1. Minimum fastener penetration into stud for Hunter SIP/WD is 1 1/2". Minimum fastener penetration into the stud for Hunter SIP/SD is 2" for use with Xci Panels 4.2" thick or less, and 1.5" for use with Xci Panels 4.6" thick. Fastener penetration length is equal to the threaded portion of the screw in the main member, including the tip.
2. Proprietary fastener properties are per published data or testing. Fastener length shall be chosen to such that the fastener fully penetrates the Xci Panels and achieves the minimum required fastener penetration into stud.
3. The weight of Xci Panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
4. Wood studs shall be a minimum of 2x4 and have a minimum specific gravity of 0.42.
5. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 1 when used with 1x wood furring strips (0.75" thick) are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener's head).

5.1.4 *Connections to Wood Framing to Resist Out-of-Plane Wind Loading:*

5.1.4.1 Xci Panels shall be fastened along each stud with Hunter SIP/WD or Hunter SIP/SD.

5.1.4.2 See Figure 2 for a typical installation detail of Xci Panels attached to wood studs.

Table 2. Allowable Wind Pressures for Xci Ply and Xci Ply NB Attached to Wood Framing With SIP/WD and SIP/SD[1,2,3,6]

Stud Spacing (in) o.c.	Vertical Fastener Spacing (in) o.c.	Allowable Wind Pressure[4] (psf)	Maximum Wind Speed (mph) Based on Wind Exposure[4,5]		
			B	C	D
16"	24	54	165	145	135
	16	81	205	180	165
	12	108	240	205	195
	8	120	260	225	210
24"	24	36	135	115	110
	16	54	165	145	135
	12	72	195	170	155
	8	95	230	100	185

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

1. Minimum fastener penetration into stud is 1.5". Fastener penetration length is equal to the threaded portion of the screw in the main member, including the tip.
2. Proprietary fastener properties are per published data or testing. Fastener length shall be chosen to such that the fastener fully penetrates the Xci Panels and achieves the minimum required fastener penetration into stud.
3. Wood studs shall be a minimum of 2x4 and have a minimum specific gravity of 0.42.
4. Three-second-gust wind speed; based on a building height of 66-feet, Zone 5, Importance Factor, I_w=1.0 and Topographic Factor, K_{zt}=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 in accordance with ASCE 7, Section 30.4.2 and IRC Section R301.2.1. Pressure Equalization Factor, PEF=1.
5. Interpolation between table values is permitted.
6. Where furring strips are used over foam, their adequacy to span between fasteners shall be checked separately. The design of furring strips is not taken into account in this table.

5.2 *Xci Panel Attachment to CFS Framing*

5.2.1 Minimum penetration into CFS framing is the steel framing thickness plus three threads and the tip of the fastener, unless noted otherwise in this TER.

5.2.2 Xci Panels shall be fastened along each stud. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 3, Table 4, Table 5, and Table 6 when light-gauge furring channels or hat channels are installed vertically over the Xci Foam parallel to the studs (furring is in between insulation and underside of fastener's head). Furring or hat channel thickness must be equal to or greater than CFS framing thickness. The design of the furring and hat channels is outside the scope of this TER, and should be checked for the applied loads.

5.2.2.1 Furring or hat channels shall be oriented such that the raised portion of the furring or channel is snug against the polyiso insulation (i.e., inverted orientation).

5.2.3 *XCI Panel Attachment to CFS Framing to Support Cladding Weight:*

5.2.3.1 Fasteners are required to attach Xci Panels to CFS framing to support the attached cladding weight.

5.2.3.1.1 See Table 3 for maximum vertical fastener spacing (along the height of the stud) for 18-gauge CFS framing to support specified cladding weights.

5.2.3.1.2 See Table 4 for maximum vertical fastener spacing (along the height of the stud) for 16-gauge CFS framing to support specified cladding weights.

5.2.3.1.3 See Table 5 for maximum vertical fastener spacing (along the height of the stud) for 12-gauge CFS framing to support specified cladding weights.

Table 3. Maximum Fastener Spacing for Xci Ply Attached to 18-Gauge CFS Framing[5]

Framing Member[4]	Stud Spacing (in) o.c.	Fastener[1,3]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing (in)					
				Specified Cladding Weight[2] (psf)					
				5	10	15	20	25	30
18-gauge CFS Framing[6,7]	16"	Hunter SIP/SD	1	24	24	24	24	24	24
			1 1/2	24	24	24	24	24	20
			2	24	24	24	24	20	16
			2 1/2 to 4	24	24	24	20	16	12
		Hunter SIP/HD	1	24	24	24	24	24	20
			1 1/2	24	24	24	24	20	16
			2	24	24	24	20	16	12
			2 1/2	24	24	20	16	12	8
			3	24	24	16	12	8	8
			3 1/2	24	20	12	8	8	6
			4	24	16	12	8	6	6
	24"	Hunter SIP/SD	1	24	24	24	24	20	16
			1 1/2	24	24	24	20	16	12
			2	24	24	20	16	12	12
			2 1/2 to 3	24	24	16	12	12	8
			3 1/2 to 4	24	24	16	12	8	8
		Hunter SIP/HD	1	24	24	24	20	16	12
			1 1/2	24	24	20	16	12	12
			2	24	24	16	12	8	8
			2 1/2 to 3	24	20	12	8	8	6
			3 1/2	20	12	8	6	6	4
			4	16	8	8	6	4	4

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

1. Minimum fastener penetration into stud is the steel thickness plus three threads and the tip of the fastener. Required fastener length shall be chosen to fully penetrate Xci Panel to achieve minimum fastener penetration into framing.
2. The weight of Xci Panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
3. Proprietary fastener properties are per published data or testing.
4. CFS framing shall be a minimum of 45 mils thick and have a minimum ultimate tensile strength of 45 ksi (i.e., ASTM A653, SS Grade 33).
5. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 3, Table 4, and Table 5 when light-gauge furring channels or hat channels are installed vertically over the Xci Foam parallel to the studs (furring is in between insulation and underside of fastener head).
6. Furring or hat channel thickness must be equal to or greater than CFS framing thickness.
7. Furring or hat channels shall be oriented such that the raised portion of the furring or channel is snug against the polyiso insulation (i.e., inverted orientation).

Table 4. Maximum Fastener Spacing for Xci Ply Attached to 16-Gauge CFS Framing[5]

Framing Member[4]	Stud Spacing (in) o.c.	Fastener[1,3]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing (in)					
				Specified Cladding Weight[2] (psf)					
				5	10	15	20	25	30
16-gauge CFS Framing[6,7]	16"	Hunter SIP/SD	≤ 4	24	24	24	24	24	24
		Hunter SIP/HD	≤ 2	24	24	24	24	24	24
			2 1/2	24	24	24	24	20	16
			3	24	24	24	16	16	12
			3 1/2	24	24	20	16	12	8
			4	24	24	16	12	8	8
	24"	Hunter SIP/SD	≤ 1 1/2	24	24	24	24	24	24
			2	24	24	24	24	24	20
			2 1/2	24	24	24	24	20	16
			3 to 4	24	24	24	20	16	16
		Hunter SIP/HD	1	24	24	24	24	24	24
			1 1/2	24	24	24	24	24	20
			2	24	24	24	24	20	16
			2 1/2	24	24	20	16	12	12
			3	24	20	16	12	8	8
			3 1/2	24	20	12	8	8	6
			4	24	16	12	8	6	6

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

1. Minimum fastener penetration into stud is the steel thickness plus three threads and the tip of the fastener. Required fastener length shall be chosen to fully penetrate the Xci Ply panel to achieve minimum fastener penetration into framing.
2. The weight of Xci Ply panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
3. Proprietary fastener properties are per published data or testing.
4. CFS framing shall be a minimum of 53 mils thick and have a minimum ultimate tensile strength of 65 ksi (i.e., ASTM A653, SS Grade 50).
5. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 3, Table 4, and Table 5 when light-gauge furring channels or hat channels are installed vertically over the Xci Foam parallel to the studs (furring is in between insulation and underside of fastener's head).
6. Furring or hat channel thickness must be equal to or greater than CFS framing thickness.
7. Furring or hat channels shall be oriented such that the raised portion of the furring or channel is snug against the polyiso insulation (i.e., inverted orientation).

Table 5. Maximum Fastener Spacing for Xci Panels Attached to 12-Gauge CFS Framing[5]

Framing Member[4]	Stud Spacing (in) o.c.	Fastener[1,3]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing (in)					
				Specified Cladding Weight[2] (psf)					
				5	10	15	20	25	30
12-gauge CFS Framing[6,7]	16"	Hunter SIP/SD	≤ 4	24	24	24	24	24	24
		Hunter SIP/HD	≤ 2 1/2	24	24	24	24	24	24
			3	24	24	24	24	20	16
			3 1/2	24	24	24	16	12	12
			4	24	20	12	8	8	8
	24"	Hunter SIP/SD	≤ 1 1/2	24	24	24	24	24	24
			2	24	24	24	24	24	20
			2 1/2	24	24	24	24	20	16
			3 to 4	24	24	24	24	16	16
		Hunter SIP/HD	1	24	24	24	24	24	24
			1 1/2	24	24	24	24	24	20
			2	24	24	24	24	20	16
			2 1/2	24	24	20	16	12	12
			3	24	20	16	12	8	8
			3 1/2	24	20	12	8	8	6
			4	24	16	12	8	6	6

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

1. Minimum fastener penetration into stud is the steel thickness plus three threads and the tip of the fastener. Required fastener length shall be chosen to fully penetrate the Xci Panel to achieve minimum fastener penetration into framing.
2. The weight of Xci Panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
3. Proprietary fastener properties are per published data or testing.
4. CFS framing shall be a minimum of 99 mils thick and have a minimum ultimate tensile strength of 65 ksi (i.e., ASTM A653, SS Grade 50).
5. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 3, Table 4, and Table 5 when light-gauge furring channels or hat channels are installed vertically over the Xci Foam parallel to the studs (furring is in between insulation and underside of fastener head).
6. Furring or hat channel thickness must be equal to or greater than CFS framing thickness.
7. Furring or hat channels shall be oriented such that the raised portion of the furring or channel is snug against the polyiso insulation (i.e., inverted orientation).

5.2.4 *Xci Panel Connections to CFS Framing to Resist Out-of-Plane Wind Loading:*

5.2.4.1 Xci Panels shall be fastened along each stud with Hunter SIP/SD.

Table 6. Allowable Wind Pressures for Xci Ply and Xci Ply NB Attached to Steel Framing with SIP/SD[1,2,5]

Steel Design Thickness (in)	Stud Spacing (in) o.c.	Vertical Fastener Spacing (in) o.c.	Allowable Wind Pressure[3] (psf)	Maximum Wind Speed (mph) Based on Wind Exposure[3,4]		
				B	C	D
0.0346" (20-gauge)	16"	16	65	190	165	155
		12	86	200	190	175
		8	129	200	200	200
		6	173	200	200	200
		4	259	200	200	200
	24"	16	43	155	135	125
		12	58	180	155	145
		8	86	200	190	175
		6	115	200	200	200
		4	173	200	200	200
0.0451" (18-gauge)	16"	16	101	195	170	160
		12	135	200	200	200
		8	203	200	200	200
	24"	16	270	200	200	200
		12	405	200	200	200
		8	68	165	145	135
0.0552" (16-gauge)	16"	16	153	200	200	200
		12	204	200	200	200
		8	305	200	200	200
	24"	16	102	200	200	195
		12	136	200	200	200
		8	204	200	200	200
0.0979" (12-gauge)	16"	16	181	200	200	200
		12	242	200	200	200
		8	362	200	200	200
	24"	16	121	200	200	200
		12	161	200	200	200
		8	242	200	200	200

Steel Design Thickness (in)	Stud Spacing (in) o.c.	Vertical Fastener Spacing (in) o.c.	Allowable Wind Pressure[3] (psf)	Maximum Wind Speed (mph) Based on Wind Exposure[3,4]		
				B	C	D

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

1. Minimum fastener penetration into stud is the steel thickness plus three threads and the tip of the fastener. Required fastener length shall be chosen to fully penetrate the Xci Panel to achieve minimum fastener penetration into framing.
2. CFS framing shall be a minimum of 33 mils thick and have a minimum tensile strength of 45 ksi.
3. Three-second-gust wind speed; based on a building height of 66-feet, Zone 5, Importance Factor, I_w=1.0 and Topographic Factor, K_{zt}=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 in accordance with ASCE 7, Section 30.4.2 and IRC Section R301.2.1. Pressure Equalization Factor, PEF=1.0.
4. Interpolation between table values is permitted.
5. Where furring channels or hat channels are used over foam, their adequacy to span between fasteners shall be checked separately. The design of furring channels and hat channels is not taken into account in this table.

5.3 *XCI Panel Attachment to Concrete Substrates*

5.3.1 *XCI Panel Attachment to Concrete Substrates to Support Cladding Weight:*

5.3.1.1 Fasteners are required to attach Xci Panels to concrete to support the attached cladding weight. See Table 7 for maximum vertical fastener spacing to support specified cladding weights.

5.3.1.2 Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 7 when used with 1x wood furring strips (0.75″ thick) are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener head). The design of the furring is outside the scope of this TER, and should be checked for the applied loads.

Table 7. Maximum Fastener Spacing for Xci Panels Attached to Concrete Substrates[7]

Substrate Material[5]	Maximum Horizontal Fastener Spacing (in)	Fastener[1,2,4]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing[6] (in)					
				Specified Cladding Weight[3] (psf)					
				5	10	15	20	25	30
Concrete ($f_c' \geq 2{,}500$ psi)	16"	Hunter SIP/SD	≤ 1 1/2	24	24	24	24	24	24
			2	24	24	24	24	24	20
			2 1/2	24	24	24	24	20	16
			3 to 4	24	24	24	20	16	12
		Hunter SIP/WD	≤ 3	24	24	24	24	24	24
			3 1/2	24	24	24	24	24	20
			4	24	24	24	24	20	16
		¼" Tapcon®	≤ 2	24	24	24	24	24	24
			2 1/2	24	24	24	24	24	20
			3 to 4	24	24	24	24	20	16
	24"	Hunter SIP/SD	1	24	24	24	24	24	20
			1 1/2	24	24	24	24	20	16
			2	24	24	24	20	16	12
			2 1/2 to 3	24	24	20	16	12	8
			3 1/2 to 4	24	24	16	12	8	8
		Hunter SIP/WD	≤ 1 1/2	24	24	24	24	24	24
			2 to 2 1/2	24	24	24	24	24	20
			3	24	24	24	24	20	16
			3 1/2	24	24	24	20	16	12
			4	24	24	20	16	12	8
		¼" Tapcon®	≤1 1/2	24	24	24	24	24	24
			2	24	24	24	24	20	16
			2 1/2	24	24	24	20	16	12
			3 to 4	24	24	20	16	12	12

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

1. Minimum fastener embedment into substrate is 1.5" for the Hunter SIP/SD and SIP/WD. Minimum fastener embedment into the substrate for Tapcon® is 2" for use with Xci Panels 4.2" thick or less, and 1.4" for use with Xci Panels 4.6" thick or thicker. Required fastener length shall be chosen to fully penetrate the Xci Panel to achieve minimum fastener embedment into substrate. Fastener embedment is the threaded length embedded in the substrate, including the tip.
2. Fasteners shall be installed with a minimum end distance of 6" and a minimum edge distance of 2.5".
3. The weight of Xci Panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
4. Proprietary fastener properties are per published data or testing.
5. Concrete shall have a minimum compressive strength of 2,500 psi after 28 days.
6. Maximum Fastener Vertical Spacing is based on allowable lateral shear values determined by dividing the strength design value by a conversion factor (α) of 1.48. The conversion factor is based on the load combination: 1.2D + 1.6L, where Dead Load (D) = 30% and Live Load (L) = 70% of the total load, respectively. Adjustments shall be made where other load combinations control.
7. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with this table when used with 1x wood furring strips (0.75" thick) are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener's head)

5.4 *Xci Panel Attachment to CMU Substrates*

5.4.1 Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with Table 8 when used with 1x wood furring strips (0.75″ thick) and are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener's head)

5.4.2 *Xci Panel Attachment to Masonry Substrates to Support Cladding Weight:*

5.4.2.1 Fasteners are required to attach Xci Panels to masonry substrates to support the attached cladding weight. See Table 8 for maximum vertical fastener spacing to support specified cladding weights.

Table 8. Maximum Fastener Spacing for Xci Panels Attached to Masonry Substrates[7]

Substrate Material[5]	Maximum Horizontal Fastener Spacing (in)	Fastener[1,2,4]	Maximum Nominal Thickness of the Polyiso Portion of Xci Panels (in)	Maximum Fastener Vertical Spacing[6] (in)					
				Specified Cladding Weight[3] (psf)					
				5	10	15	20	25	30
CMU	16"	Hunter SIP/SD	≤ 3 1/2	24	24	24	24	24	24
			4	24	24	24	24	20	16
		Hunter SIP/WD	≤ 4	24	24	24	24	24	24
		1/4" Tapcon®	≤ 2	24	24	24	24	24	24
			2 1/2 to 4	24	24	24	24	20	16
	24"	Hunter SIP/SD	≤ 3	24	24	24	24	24	24
			3 1/2	24	24	24	24	24	20
			4	24	24	20	16	12	12
		Hunter SIP/WD	≤ 2 1/2	24	24	24	24	24	24
			3 to 4	24	24	24	24	24	20
		1/4" Tapcon®	≤ 1 1/2	24	24	24	24	24	24
			2	24	24	24	24	20	16
			2 1/2 to 4	24	24	20	16	12	12

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

1. Minimum fastener embedment into substrate is 2" for the Hunter SIP/SD and 1.5" for the SIP/WD. Minimum fastener embedment into the substrate for Tapcon® is 2" for use with Xci Panels 4.2" thick or less, and 1.4" for use with Xci Panels 4.6" thick or thicker. Required fastener length shall be chosen to fully penetrate the Xci Panel to achieve minimum fastener embedment into substrate. Fastener embedment is the threaded length embedded in the substrate, including the tip.
2. Fasteners shall be installed into the face of CMU block with a minimum end distance shall be 6" and a minimum edge distance shall be 2.5".
3. The weight of Xci Panels are included in the fastener spacing calculations. The specified cladding weight shall include all other supported materials.
4. Proprietary fastener properties are per published data or testing.
5. Masonry shall be normal-weight CMU conforming to ASTM C90.
6. Maximum Fastener Vertical Spacing is based on allowable lateral shear values determined by dividing the strength design value by a conversion factor (α) of 1.48. The conversion factor is based on the load combination: 1.2D + 1.6L, where Dead Load (D) = 30% and Live Load (L) = 70% of the total load, respectively. Adjustments shall be made where other load combinations control.
7. Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is allowable for use in accordance with this table when used with 1x wood furring strips (0.75" thick) are installed vertically over the Xci Foam and parallel to the studs (furring is in between insulation and underside of fastener's head)

5.4.3 *Xci Panel Attachment to Masonry Substrates to Resist Out-of-Plane Wind Loading:*

5.4.3.1 Xci Panels shall be fastened with Hunter SIP/SD.

Table 9. Allowable Wind Pressures for Xci Ply and Xci Ply NB Attached to Masonry Substrates with SIP/SD[1,2]

Horizontal Fastener Spacing (in) o.c.	Vertical Fastener Spacing (in) o.c.	Allowable Wind Pressure[3] (psf)	Maximum Wind Speed (mph) Based on Wind Exposure[4,5]		
			B	C	D
16"	24	34	130	115	105
	16	50	160	140	130
	12	67	190	165	150
	8	101	200	200	185
	6	120	200	200	200
24"	24	23	105	90	85
	16	34	130	115	105
	12	45	150	130	125
	8	67	190	165	150
	6	90	200	190	175

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

1. Masonry to have a minimum specified compressive strength of 2,500 psi. Screw shall have sufficient length and be installed so that it penetrates the masonry a minimum of 1.5 inches.
2. Proprietary fastener properties are per published data or testing.
3. Allowable pressure does not consider masonry strength in holding the fastener as a post-installed embedment in accordance with ACI 318, Appendix D.
4. Three-second-gust wind speed; based on a building height of 66-feet, Zone 5, Importance Factor, I_w=1.0 and Topographic Factor, K_{zt}=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 in accordance with ASCE 7-10 and 7-16, Section 30.4.2 and IRC Section R301.2.1. Pressure Equalization Factor, PEF=1.0.
5. Interpolation between table values is permitted.

5.5 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.

6 Installation

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

6.2 In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.

6.3 All Xci Panel edges shall be supported by framing or blocking.

6.4 Fasteners shall be installed with a minimum edge distance of $^3/_8$" on all sides of the Xci Panel.

6.5 Fasteners shall be installed with the appropriate rotating drill oriented normal to the surface of the Xci Panel.

6.6 Fastener head shall be installed in contact with the face of the Xci Panel.

6.7 Fasteners shall be installed with the maximum on-center spacing indicated in Table 1 through Table 9, as applicable.

6.8 Fasteners installed in masonry shall be in the face of normal-weight CMU block conforming to ASTM C90.

6.9 Fasteners installed in concrete and CMU shall have predrilled holes in accordance with manufacturer installation instructions.

6.10 When Xci Foam (without the FRT plywood or OSB facer adhered to the polyiso insulation) is noted allowable for use in accordance with Table 1 through Table 9, 1x furring strips or inverted hat/furring channels shall be installed in accordance with the respective table and the sections listed below:

6.10.1 See Section 5.2 for wood framing.

6.10.2 See Section 5.3 for CFS framing.

6.10.3 See Section 5.4 for concrete substrates.

6.10.4 See Section 5.5 for masonry substrates.

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 Lateral resistance testing in accordance with ASTM D1761.

7.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., RDPs), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.

7.3 Where pertinent, testing and/or engineering analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

7.4 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, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.

7.5 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.[10]

7.6 Where additional condition of use and/or code compliance information is required, please search for Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) on the DrJ Certification website.

8 Findings

8.1 As delineated in Section 3, Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) have performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.

8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) shall be approved for the following applications:

8.2.1 Use as a nail base for support of cladding materials products.

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

8.3 Unless exempt by state statute, when the Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) is 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.

8.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Hunter Panels.

8.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[11] 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.

8.6 **Approved**:[12] Building codes require that the building official shall accept duly authenticated reports[13] or research reports[14] from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.

8.6.1 Acceptance of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).

8.6.2 Acceptance of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.

8.6.3 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, as denial without written reason deprives a protected right to free and fair competition in the marketplace.

8.7 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.

8.8 Through ANAB accreditation and the IAF Multilateral Agreements, this TER can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "*certified once, accepted everywhere*." IAF specifically says, "*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope*."[15]

9 Conditions of Use

9.1 Material properties shall not fall outside the boundaries defined in Section 3.

9.2 As defined in Section 3, 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.

9.3 As listed herein, Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) shall be used:

9.3.1 In dry lumber with a moisture content less than or equal to nineteen percent (19%).

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[11] 2018 IFC Section 104.9

[12] 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.

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

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

[15] https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise

9.4 Cladding attachment shall be in accordance with the cladding manufacturer installation instructions or an approved engineered design.

9.5 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:

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

9.5.2 This TER and the installation instructions shall be submitted at the time of permit application.

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

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

9.5.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.

9.5.6 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.

9.5.7 The application of these innovative products in the context of this TER are 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.

9.6 The approval of this TER by the AHJ shall comply with IBC Section 1707.1, where legislation states in pertinent part, "*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 104.11*", all of IBC Section 104, and IBC Section 105.4.

9.7 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 building designer (i.e., owner or RDP).

9.8 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.

10 Identification

10.1 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, TER number, and other information to confirm code compliance.

10.2 Additional technical information can be found at hunterpanels.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 status of this TER, contact DrJ Certification.

12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

12.1 Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) are included in this TER 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, and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER 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, and

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 Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A) 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),[16] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than 10 years[17] and/or a $5,000,000 fine or 3 times the value of[18] 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[19] that are not specifically provided for in any building code, 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.[20]

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 has 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.[21]

[16] http://www.drjengineering.org/AppendixC and https://www.drjcertification.org/cornell-2016-protection-trade-secrets.

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

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

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

[20] IBC 2021, Section 1706.1 Conformance to Standards

[21] IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

1.3 **Approved**[22] **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, which 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.[23] The Superintendent of Building roster of approved testing agencies 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 CBI 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.[24]

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 NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed[25] 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[26] (i.e., ANAB, International Accreditation Forum (IAF), etc.).

[22] See Section 8 for the distilled building code definition of **Approved**

[23] Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

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

[25] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

[26] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

1.6 **Approved by Florida**: Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. 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) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 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; 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; 5) A statewide product approval issued by the Florida Building Commission. 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 Building Code 2018 of New Jersey in IBC Section 1707.1 General,[27] 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)”.[28] Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) 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. 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 (a) above. 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 (a) above. 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 2 given that the listed entities are no longer in existence and/or do not provide “reports of engineering findings”.

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

[28] https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

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[29] and Part 3280,[30] the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) “All construction methods shall be in conformance with accepted engineering practices”; 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.”; and 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.[31]

1.10.2 For innovative alternative products, materials, designs, services and/or methods of construction, in the absence of approved rules or other approved standards…the building official shall accept duly authenticated reports (i.e., listing and/or research report) from approved agencies with respect to the quality and manner of use of new materials or assemblies.[32] A building official approved agency is deemed to be approved via certification from an accreditation body that is listed by the International Accreditation Forum[33] or equivalent.

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.[34] An approved source is defined as a PE subject to professional engineering laws, where a research and/or a technical evaluation report certified by a PE, shall be approved.

1.11 **Approval by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements:

1.11.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,

1.11.2 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.

1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.

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

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

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

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

[33] Please see the ANAB directory for building official approved agencies.

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

1.11.4 **Approved**: The purpose of the IAF 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, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.

Issue Date: November 5, 2021

Subject to Renewal: October 1, 2024

FBC Supplement to TER 2102-05

REPORT HOLDER: Hunter Panels

1 Evaluation Subject

1.1 Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A)

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A), recognized in TER 2102-05, has 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*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential*

3 Conclusions

3.1 Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A), described in TER 2102-05, complies with the FBC-B and FBC-R and is 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 TER, they are listed here:

3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved.

3.2.2 FBC-R Section R104 and Section R109 are reserved.

3.2.3 2020 FBC-B Section 2109.3 replaces IBC Section 2114.3

3.2.4 2017 FBC-B Section 2103.1 replaces IBC Section 2114.3

4 Conditions of Use

4.1 Xci Ply, Xci Ply (Class A), Xci NB, Xci CG, Xci CG (Class A), Xci Foil, and Xci Foil (Class A), described in TER 2102-05, must comply with all of the following conditions:

4.1.1 All applicable sections in TER 2102-05.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.