Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1703-16

Issue Date: November 9, 2017

Revision Date: November 10, 2025

Subject to Renewal: January 1, 2027

Thermo-Brace® Red Structural Insulated Board (SIB™), Thermo-Brace® Red SIB™ Guard, Perma "R" Brace Red SIB™ and Perma "R" Brace Red SIB™

Trade Secret Report Holder:

INDEVCO Building Products

10351 Verdon Rd
Doswell, VA 23047-1600
Phone: 806-876-9176
Website: indevconorthamerica.com

Additional Listees:

Barricade® Building Products
PO Box 2002
Doswell, VA 23047-2002
Phone: 804-876-3135
Website: barricadebp.com

Perma "R" Building Products
2604 Sunset Loop
Grenada, MS 38901
Phone: 800-647-6130
Website: permarproducts.com

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 12 00 - Structural Panels

Section: 06 12 19 - Shear Wall Panels

Section: 06 16 00 - Sheathing

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers

1 Innovative Products Evaluated[1]

1.1 Thermo-Brace Red SIB

1.2 Thermo-Brace Red SIB Guard

1.3 Perma "R" Brace Red SIB

1.4 Perma "R" Brace Red SIB Guard

1.4.1 Unless otherwise noted, where Thermo-Brace Red SIB is stated, the provisions apply equally to Thermo-Brace Red SIB Guard, Perma "R" Brace Red SIB, and Perma "R" Brace Red SIB Guard.

2 Product Description and Materials

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

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

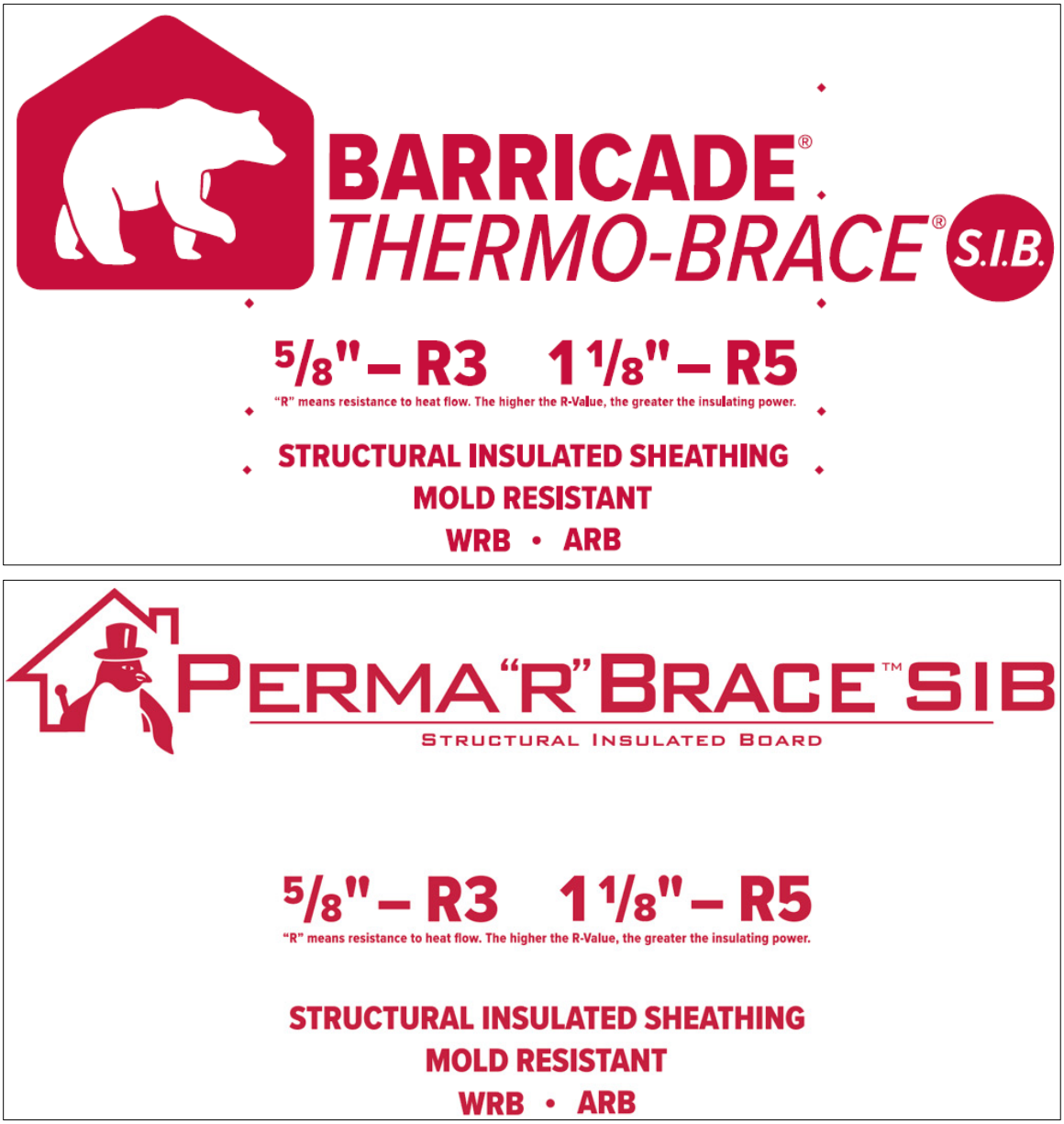


Figure 1. Thermo-Brace Red SIB and Perma "R" Brace Red SIB

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

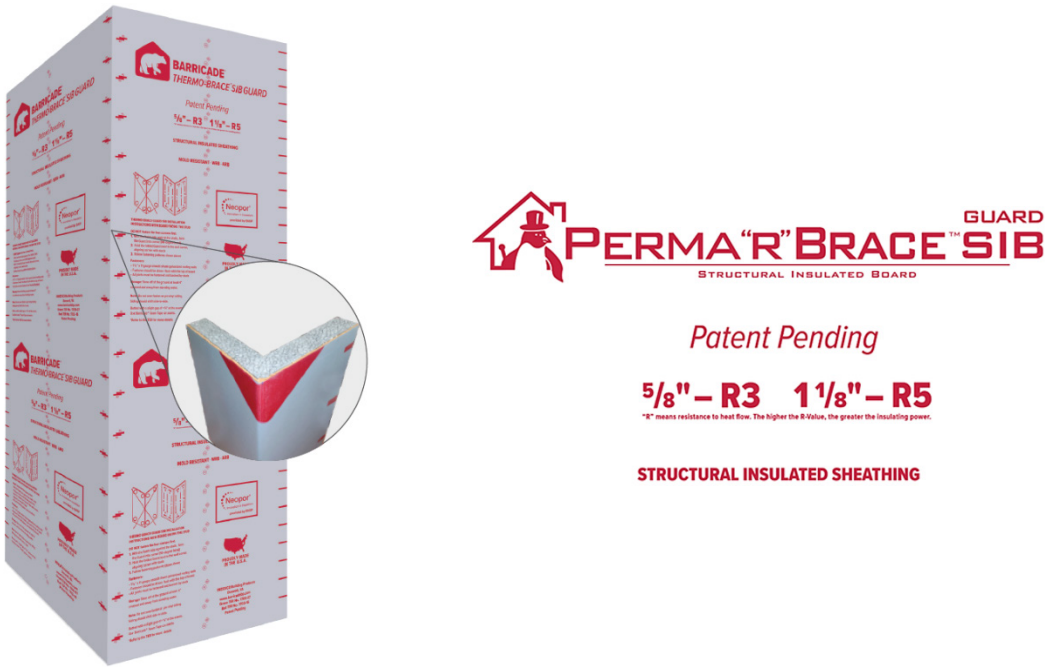


Figure 2. Thermo-Brace Red SIB Guard and Perma "R" Brace Red SIB Guard

2.2 Thermo-Brace Red SIB is a structural, rigid insulating sheathing product consisting of a proprietary cellulosic fiber sheathing board laminated to one side of a proprietary rigid foam plastic insulation.

2.2.1 The proprietary cellulosic fiber sheathing board is composed of pressure-laminated plies consisting of high strength cellulosic fibers with a protective polymer Water-Resistive Barrier (WRB) layer on both sides.

2.2.2 The rigid foam plastic insulation is a proprietary Graphite Polystyrene (GPS) Foam Plastic Insulated Sheathing (FPIS). Polyolefin facings are permitted to be applied to the exterior face or both faces of the GPS prior to lamination to the cellulosic fiber sheathing board, but are not required.

2.3 Thermo-Brace Red SIB Guard and Perma "R" Brace Red SIB Guard are comprised of the same material as the Thermo-Brace Red SIB. The center and edges of the Guard panels are scored in order to apply the Guard panels to the corner of a building without disturbing the air and water barriers.

2.4 *Material Availability*

2.4.1 *Thickness:*

2.4.1.1 $^{5}/_{8}$" (16 mm)

2.4.1.2 $1^{1}/_{8}$" (29 mm)

2.4.2 *Standard Product Width:*

2.4.2.1 48" (1,219 mm)

2.4.2.2 64" (1,626 mm)

2.4.3 *Standard Lengths:*

2.4.3.1 96" (2,438 mm)

2.4.3.2 108" (2,743 mm)

2.4.3.3 120" (3,048 mm)

2.4.4 Other custom widths and lengths can be manufactured.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

2.5 *Thermo-Brace Red SIB Guard and Perma "R" Brace Red SIB Guard*

2.5.1 *Standard Width:*

2.5.1.1 The standard width on each side past the corner is 32" (813 mm)

2.5.2 *Standard Lengths:*

2.5.2.1 96" (2,438 mm)

2.5.2.2 108" (2,743 mm)

2.5.2.3 120" (3,048 mm)

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

3 Definitions[2]

3.1 New Materials[3] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[4] The design strength and permissible stresses shall be established by tests[5] and/or engineering analysis.[6]

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

3.2.1 These reports utilize intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secretes under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[11]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[12]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

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

3.6 The regulatory authority shall enforce[14] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[15] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[16]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[17] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[18] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

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

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[20]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[21]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[22]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[23] and Part 3280[24] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

4.2.3 *IECC – 18, 21, 24: International Energy Conservation Code®*

4.2.4 *FBC-B—20, 23: Florida Building Code[25] – Building (FL 40969)*

4.2.5 *FBC-R—20, 23: Florida Building Code[25] – Residential (FL 40969)*

4.2.6 *FBC-EC—20, 23: Florida Building Code – Energy Conservation*

4.3 *Standards*

4.3.1 *ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic*

4.3.2 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

4.3.3 *ASTM D7989 Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

4.3.4 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

4.3.5 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

4.3.6 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

4.3.7 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

4.3.8 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

4.3.9 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

4.4 Structural performance for shear wall assemblies used as lateral force resisting systems in Seismic Design Categories A through F have been tested and evaluated in accordance with the following standards:

4.4.1 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

4.4.2 *ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

4.4.2.1 ASTM D7989 is accepted engineering practice used to establish Seismic Design Coefficients (SDC).

4.4.2.2 Tested data generated by ISO/IEC 17025 approved agencies and/or professional engineers, which use ASTM D7989 as their basis, are defined as intellectual property and/or trade secrets.

4.4.2.3 All professional engineering evaluations are defined as an independent design review (i.e., listings, certified reports, duly authenticated reports from approved agencies, and/or research reports, are prepared independently by approved agencies and/or approved sources, when signed and sealed by licensed professional engineer pursuant to registration law.

4.4.3 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

4.4.4 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

5 Listed[26]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (i.e., CBI and DrJ), and/or and approved source (i.e., DrJ), or other organization(s) concerned with product evaluation (i.e., DrJ), that maintains periodic inspection (i.e., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 Thermo-Brace Red SIB panels are used in the following applications:

6.1.1 Wall sheathing in buildings constructed in accordance with IBC and IRC provisions for light-frame wood construction.

6.1.2 Structural wall sheathing to provide lateral load resistance (wind) for braced wall panels used in light-frame wood construction.

6.1.3 Wall sheathing in buildings constructed in accordance with IBC requirements for Type V light frame construction.

6.2 When Thermo-Brace Red SIB panels are installed with an approved construction tape on sheathing seams, they are an approved WRB in accordance with IBC Section 1403.2 and IRC Section R703.2. See the manufacturer product information for further details.

6.2.1 Where Thermo-Brace Red SIB joints are not taped, a separate WRB shall be installed in accordance with the WRB manufacturer installation instructions.

6.3 *Structural Applications*

6.3.1 *General Structural Provisions:*

6.3.1.1 Except as otherwise described in this report, Thermo-Brace Red SIB shall be installed in accordance with the applicable building codes listed in **Section 4** using the provisions set forth herein for the design and installation of Wood Structural Panels (WSP).

6.3.1.1.1 Thermo-Brace Red SIB is permitted to be used for the design of shear walls in accordance with SDPWS and using the methods set forth therein.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.3.1.2 Anchorage for in-plane shear shall be provided to transfer the induced shear force into and out of each shear wall. Shear wall anchorage shall be in accordance with the applicable code referenced in **Section 4**.

6.3.1.3 Except as noted in **Section 6.3.2**, the maximum aspect ratio for Thermo-Brace Red SIB shall be 4:1.

6.3.1.4 Except as noted in **Section 6.3.2**, the minimum full height panel width shall be 16" (406 mm).

6.3.1.5 Installation is permitted for single top plate when walls are constructed in accordance with the provisions for single top plate in conformance to IBC Section 2308.9.3.2[27] or IRC Section R602.3.2 (advanced framing method) or double top plate applications.

6.3.2 *Prescriptive IRC Bracing Applications:*

6.3.2.1 Thermo-Brace Red SIB may be used on braced wall lines as an equivalent alternative to IRC Method WSP when installed in accordance with IRC Section R602.10 and this report.

6.3.2.2 When used as intermittent bracing, Thermo-Brace Red SIB may be used to satisfy the bracing lengths required on braced wall lines. Neopor®, which has been properly qualified as a WRB, is permitted to be used on the remaining portions of the braced wall line.

6.3.2.2.1 Where the Neopor has not been qualified as a WRB, a separate WRB shall be installed.

6.3.2.2.2 The Neopor shall also be qualified for wind pressure resistance in accordance with IBC Section 2603.10 and IRC Section R303.8.[28]

6.3.2.3 For wind design, required braced wall panel lengths for Thermo-Brace Red SIB shall be designed as indicated in **Table 1**, **Table 2**, **Table 3**, and **Table 4** of this report, and shall be used in conjunction with IRC Table R602.10.3(2), which provides the required adjustments.

6.3.2.4 For seismic design, required braced wall panel lengths for Thermo-Brace Red SIB shall be as shown in **Table 5**, and shall be used in conjunction with IRC Table R602.10.3(4), which provides the required adjustments.

6.3.2.5 Thermo-Brace Red SIB may be used to brace the walls of buildings as an alternative to the continuous wall bracing provisions of the CS-WSP method described in IRC Section R602.10.4. Bracing shall be designed in accordance with the bracing amounts shown in **Table 1**, **Table 2**, **Table 3**, and **Table 4**, as adjusted in accordance with IRC Table R602.10.3(2).

6.3.2.6 Use of Thermo-Brace Red SIB with Method CS-PF is also permitted in accordance with **Section 6.3.3** per IRC Section R602.10.6.4.

6.3.2.7 Where a building, or portion thereof, does not comply with one or more of the bracing requirements within the prescriptive sections of the IRC, those portions shall be designed and constructed in accordance with IRC Section R301.1.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 1. Required Bracing Lengths for Thermo-Brace Red SIB
(R3 or R5; FPIS Outward; Studs 16" o.c.) – Wind[1,2,3,4,5,6,7,8]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Brace Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing					Continuous Sheathing				
		Ultimate Design Wind Speed, V_{ult} (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.5	1.5	1.9	1.9	2.2	1.1	1.5	1.5	1.9	1.9
	20	2.6	2.6	3.0	3.7	4.1	2.2	2.6	2.6	3.0	3.7
	30	3.7	4.1	4.4	5.2	5.9	3.3	3.3	3.7	4.4	5.2
	40	4.8	5.2	5.9	6.7	7.8	4.1	4.4	4.8	5.6	6.7
	50	5.9	6.7	7.0	8.1	9.6	5.2	5.6	5.9	7.0	8.1
	60	7.0	7.8	8.5	9.6	11.1	5.9	6.7	7.0	8.1	9.6
First Story of Two Stories or Second Story of Three Stories	10	2.6	3.0	3.3	3.7	4.4	2.2	2.6	2.6	3.3	3.7
	20	4.8	5.6	5.9	7.0	8.1	4.1	4.8	5.2	5.9	6.7
	30	7.0	7.8	8.5	10.0	11.5	5.9	6.7	7.0	8.5	9.6
	40	9.3	10.0	11.1	13.0	14.8	7.8	8.5	9.3	11.5	12.6
	50	11.5	12.2	13.3	15.9	18.1	9.6	10.4	11.5	13.3	15.5
	60	13.3	14.8	15.9	18.5	21.5	11.5	12.6	13.7	15.9	18.5
First Story of Three Stories	10	4.1	4.4	4.8	5.6	6.3	3.3	3.7	4.1	4.8	5.6
	20	7.4	8.1	8.5	10.0	11.8	6.3	6.7	7.4	8.5	10.0
	30	10.4	11.5	12.6	14.4	17.0	8.9	9.6	10.7	12.6	14.4
	40	13.7	14.8	16.3	18.9	21.8	11.5	12.6	13.7	16.3	18.5
	50	16.7	18.1	20.0	23.3	27.0	14.1	15.5	17.0	19.6	22.9
	60	19.6	21.5	23.7	27.8	31.8	17.0	18.5	20.0	23.3	27.0

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. Minimum $^{5}/_{8}$" thick Thermo-Brace Red SIB shall be installed on 2 x 4 or 2 x 6 studs spaced 16" o.c. and fastened with staples spaced 3":3" (edge:field) per **Section 9.**
2. Demonstrates equivalency to IRC Table R602.10.3(1). All adjustment factors from IRC Table R602.10.3(2) shall be applied, except when used with method CS-PF. When using method CS-PF, a minimum of $^{1}/_{2}$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or $1^{1}/_{4}$" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
3. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
4. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which belongs to the manufacturer of those products or the members of the associations that publish those design values.
5. Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
6. Linear interpolation is permitted.
7. Wind speeds shown are V_{ult} in accordance with ASCE 7-22. Use the following equation to convert to equivalent Vasd wind in accordance with IBC Section 1609.3.1: $V_{asd} = V_{ult}\sqrt{0.6}$.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 2. Required Bracing Lengths for Thermo-Brace Red SIB
(R3 or R5; FPIS Inward; Studs 16" o.c.) – Wind[1,2,3,4,5,6,7,8]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Brace Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing					Continuous Sheathing				
		Ultimate Design Wind Speed, V_{ult} (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.5	1.5	1.9	1.9	2.3	1.1	1.5	1.5	1.9	1.9
	20	2.7	2.7	3.0	3.8	4.2	2.3	2.7	2.7	3.0	3.8
	30	3.8	4.2	4.6	5.3	6.1	3.4	3.4	3.8	4.6	5.3
	40	4.9	5.3	6.1	6.8	8.0	4.2	4.6	4.9	5.7	6.8
	50	6.1	6.8	7.2	8.4	9.9	5.3	5.7	6.1	7.2	8.4
	60	7.2	8.0	8.7	9.9	11.4	6.1	6.8	7.2	8.4	9.9
First Story of Two Stories or Second Story of Three Stories	10	2.7	3.0	3.4	3.8	4.6	2.3	2.7	2.7	3.4	3.8
	20	4.9	5.7	6.1	7.2	8.4	4.2	4.9	5.3	6.1	6.8
	30	7.2	8.0	8.7	10.3	11.8	6.1	6.8	7.2	8.7	9.9
	40	9.5	10.3	11.4	13.3	15.2	8.0	8.7	9.5	11.8	12.9
	50	11.8	12.5	13.7	16.3	18.6	9.9	10.6	11.8	13.7	16.0
	60	13.7	15.2	16.3	19.0	22.0	11.8	12.9	14.1	16.3	19.0
First Story of Three Stories	10	4.2	4.6	4.9	5.7	6.5	3.4	3.8	4.2	4.9	5.7
	20	7.6	8.4	8.7	10.3	12.2	6.5	6.8	7.6	8.7	10.3
	30	10.6	11.8	12.9	14.8	17.5	9.1	9.9	11.0	12.9	14.8
	40	14.1	15.2	16.7	19.4	22.4	11.8	12.9	14.1	16.7	19.0
	50	17.1	18.6	20.5	23.9	27.7	14.4	16.0	17.5	20.1	23.6
	60	20.1	22.0	24.3	28.5	32.7	17.5	19.0	20.5	23.9	27.7

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. Minimum $^{5}/_{8}$" thick Thermo-Brace Red SIB to be installed on 2 x 4 or 2 x 6 studs spaced 16" o.c. and fastened with staples spaced 3":3" (edge:field) per **Section 9**.
2. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
3. Demonstrates equivalency to IRC Table R602.10.3(1). All adjustment factors from IRC Table R602.10.3(2), including all footnotes, shall be applied, except when used with method CS-PF. When used with method CS-PF, a minimum of $^{1}/_{2}$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or $1^{1}/_{4}$" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
5. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which belongs to the manufacturer of those products or the members of the associations that publish those design values.
6. Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
7. Linear interpolation is permitted.
8. Wind speeds shown are V_{ult} in accordance with ASCE 7-16. Use the following equation to convert to equivalent V_{asd} wind speed in accordance with IBC Section 1609.3.1: $V_{asd} = V_{ult}\sqrt{0.6}$

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 3. Required Bracing Lengths for Thermo-Brace Red SIB
(R3 or R5; FPIS Outward; Studs 24" o.c.) – Wind[1,2,3,4,5,6,7,8]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Brace Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing					Continuous Sheathing				
		Ultimate Design Wind Speed, V_{ult} (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.9	1.9	2.4	2.4	2.9	1.4	1.9	1.9	2.4	2.4
	20	3.4	3.4	3.8	4.8	5.3	2.9	3.4	3.4	3.8	4.8
	30	4.8	5.3	5.8	6.7	7.7	4.3	4.3	4.8	5.8	6.7
	40	6.2	6.7	7.7	8.6	10.1	5.3	5.8	6.2	7.2	8.6
	50	7.7	8.6	9.1	10.6	12.5	6.7	7.2	7.7	9.1	10.6
	60	9.1	10.1	11.0	12.5	14.4	7.7	8.6	9.1	10.6	12.5
First Story of Two Stories or Second Story of Three Stories	10	3.4	3.8	4.3	4.8	5.8	2.9	3.4	3.4	4.3	4.8
	20	6.2	7.2	7.7	9.1	10.6	5.3	6.2	6.7	7.7	8.6
	30	9.1	10.1	11.0	13.0	14.9	7.7	8.6	9.1	11.0	12.5
	40	12.0	13.0	14.4	16.8	19.2	10.1	11.0	12.0	14.9	16.3
	50	14.9	15.8	17.3	20.6	23.5	12.5	13.4	14.9	17.3	20.2
	60	17.3	19.2	20.6	24.0	27.8	14.9	16.3	17.8	20.6	24.0
First Story of Three Stories	10	5.3	5.8	6.2	7.2	8.2	4.3	4.8	5.3	6.2	7.2
	20	9.6	10.6	11.0	13.0	15.4	8.2	8.6	9.6	11.0	13.0
	30	13.4	14.9	16.3	18.7	22.1	11.5	12.5	13.9	16.3	18.7
	40	17.8	19.2	21.1	24.5	28.3	14.9	16.3	17.8	21.1	24.0
	50	21.6	23.5	25.9	30.2	35.0	18.2	20.2	22.1	25.4	29.8
	60	25.4	27.8	30.7	36.0	41.3	22.1	24.0	25.9	30.2	35.0

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. Minimum $^{5}/_{8}$" thick Thermo-Brace Red SIB to be installed on 2 x 4 or 2 x 6 studs spaced 24" o.c. and fastened with staples spaced 3":3" (edge:field) per **Section 9**.
2. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
3. Demonstrates equivalency to IRC Table R602.10.3(1). All adjustment factors from IRC Table R602.10.3(2) shall be applied except when used with method CS-PF. When used with method CS-PF, a minimum of $^{1}/_{2}$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or $1^{1}/_{4}$" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
5. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which belongs to the manufacturer of those products or the members of the associations that publish those design values.
6. Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
7. Linear interpolation is permitted.
8. Wind speeds shown are V_{ult} in accordance with ASCE 7-22. Use the following equation to convert to equivalent V_{asd} wind speed in accordance with IBC Section 1609.3.1: $V_{asd} = V_{ult}\sqrt{0.6}$

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 4. Required Bracing Lengths for Thermo-Brace Red SIB
(R3 or R5; FPIS Inward; Studs 24" o.c.) – Wind[1,2,3,4,5,6,7,8]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Brace Wall Panels Required Along Each Braced Wall Line									
		Intermittent Sheathing					Continuous Sheathing				
		Ultimate Design Wind Speed, V_{ult} (mph)									
		≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	2.4	2.4	3.0	3.0	3.6	1.8	2.4	2.4	3.0	3.0
	20	4.2	4.2	4.8	6.1	6.7	3.6	4.2	4.2	4.8	6.1
	30	6.1	6.7	7.3	8.5	9.7	5.4	5.4	6.1	7.3	8.5
	40	7.9	8.5	9.7	10.9	12.7	6.7	7.3	7.9	9.1	10.9
	50	9.7	10.9	11.5	13.3	15.7	8.5	9.1	9.7	11.5	13.3
	60	11.5	12.7	13.9	15.7	18.2	9.7	10.9	11.5	13.3	15.7
First Story of Two Stories or Second Story of Three Stories	10	4.2	4.8	5.4	6.1	7.3	3.6	4.2	4.2	5.4	6.1
	20	7.9	9.1	9.7	11.5	13.3	6.7	7.9	8.5	9.7	10.9
	30	11.5	12.7	13.9	16.3	18.8	9.7	10.9	11.5	13.9	15.7
	40	15.1	16.3	18.2	21.2	24.2	12.7	13.9	15.1	18.8	20.6
	50	18.8	20.0	21.8	26.0	29.6	15.7	16.9	18.8	21.8	25.4
	60	21.8	24.2	26.0	30.3	35.1	18.8	20.6	22.4	26.0	30.3
First Story of Three Stories	10	6.7	7.3	7.9	9.1	10.3	5.4	6.1	6.7	7.9	9.1
	20	12.1	13.3	13.9	16.3	19.4	10.3	10.9	12.1	13.9	16.3
	30	16.9	18.8	20.6	23.6	27.8	14.5	15.7	17.5	20.6	23.6
	40	22.4	24.2	26.6	30.9	35.7	18.8	20.6	22.4	26.6	30.3
	50	27.2	29.6	32.7	38.1	44.2	23.0	25.4	27.8	32.1	37.5
	60	32.1	35.1	38.7	45.4	52.0	27.8	30.3	32.7	38.1	44.2

SI: 1 in = 25.4 mm, 1 mph = 1.61 km/h

1. Minimum $^5/_8$" thick Thermo-Brace Red SIB to be installed on 2 x 4 or 2 x 6 studs spaced 24" o.c. and fastened with staples spaced 3":3" (edge:field) per **Section 9**.
2. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
3. Demonstrates equivalency to IRC Table R602.10.3(1). All adjustment factors from IRC Table R602.10.3(2) shall be applied, except when used with method CS-PF. When used with method CS-PF, a minimum of $^1/_2$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum of 5d cooler nails or $1^1/_4$" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Minimum $^1/_2$" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
5. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which belongs to the manufacturer of those products or the members of the associations that publish those design values.
6. Bracing lengths are based on the worst-case condition for the product thickness/orientation described.
7. Linear interpolation is permitted.
8. Wind speeds shown are V_{ult} in accordance with ASCE 7-16. Use the following equation to convert to equivalent V_{asd} wind speed in accordance with IBC Section 1609.3.1: $V_{asd} = V_{ult}\sqrt{0.6}$

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 5. Required Bracing Lengths for Thermo-Brace Red SIB
(R3 or R5; FPIS Outward; Studs 16" o.c.) – Seismic[1,2,3,4,5,6,7,8]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Brace Wall Panels Required Along Each Braced Wall Line							
		Intermittent Sheathing				Continuous Sheathing			
		Seismic Design Category (SDC)							
		C	D_0	D_1	D_2	C	D_0	D_1	D_2
One Story or the Top of Two or Three Stories	10	1.2	1.3	1.5	1.8	1.0	1.2	1.3	1.6
	20	2.4	2.7	3.0	3.7	2.0	2.3	2.5	3.2
	30	3.6	4.0	4.4	5.6	3.1	3.4	3.7	4.7
	40	4.7	5.3	5.9	7.4	4.0	4.5	5.1	6.3
	50	5.9	6.6	7.4	9.2	5.1	5.7	6.3	7.8
First Story of Two Stories or Second Story of Three Stories	10	2.2	2.8	3.3	4.1	1.9	2.4	2.8	3.5
	20	4.4	5.6	6.6	8.1	3.7	4.7	5.7	7.0
	30	6.6	8.4	10.0	12.2	5.7	7.1	8.5	10.4
	40	8.9	11.1	13.3	16.3	7.5	9.5	11.3	13.8
	50	11.1	13.9	16.6	20.4	9.5	11.9	14.1	17.3
First Story of Three Stories	10	3.3	3.9	4.4	NP	2.8	3.3	3.7	NP
	20	6.6	7.8	8.9	NP	5.7	6.6	7.5	NP
	30	10.0	11.7	13.3	NP	8.5	9.9	11.3	NP
	40	13.3	15.5	17.8	NP	11.3	13.2	15.1	NP
	50	16.6	19.4	22.2	NP	14.1	16.5	18.9	NP

SI: 1 in = 25.4 mm

1. NP = Not Provided
2. Minimum $^{5}/_{8}$" thick Thermo-Brace Red SIB to be installed on 2 x 4 or 2 x 6 studs spaced 16" o.c. and fastened with staples spaced 3":3" (edge:field) per **Section 9**.
3. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
4. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
5. Demonstrates equivalency to IRC Table R602.10.3(3). All adjustment factors from IRC Table R602.10.3(4) shall be applied, except when used with method CS-PF. When used with method CS-FP, a minimum of $^{1}/_{2}$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1$^{1}/_{4}$" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
6. Tabulated bracing lengths are based on the following:
   a. Soil class = D
   b. Wall height = 10 ft
   c. Floor dead load = 10 psf
   d. Roof/ceiling dead load = 15 psf
   e. Braced wall line spacing ≤ 25'
7. Linear interpolation is permitted.
8. Bracing lengths are the result of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.3.3 *Thermo-Brace Red SIB CS-PF Portal Frame:*

6.3.3.1 Thermo-Brace Red SIB was tested and evaluated for equivalency to the IRC Method CS-PF in accordance with IRC Section R602.10.6.4 and IRC Section R602.10.5.

6.3.3.2 IRC Section R602.10.5 establishes the contributing length of bracing of the CS-PF as equivalent to 1.5 times its actual length and that it contributes this length of bracing to that required by Method CS-WSP.

6.3.3.3 The capacity of the Thermo-Brace Red SIB CS-PF exceeds the capacity of the IRC Method CS WSP and is therefore permitted to be substituted for an equivalent length of bracing (i.e., 1.5 times its actual length).

6.3.3.4 The Thermo-Brace Red SIB CS-PF is shown in **Figure 3**.

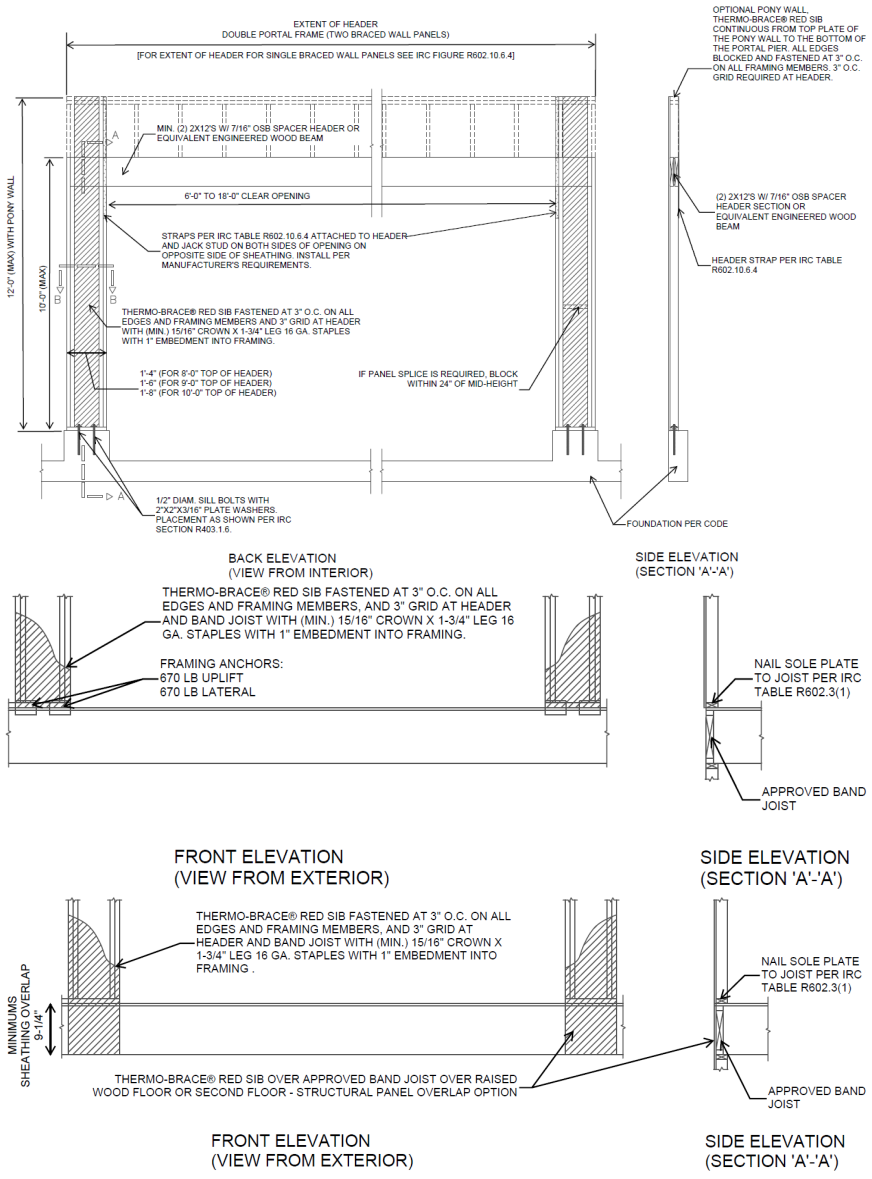


Figure 3. Thermo-Brace Red Structural Sheathing CS-PF

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.3.4 *Alternative to Prescriptive IRC Bracing Applications:*

6.3.4.1 As an alternative to the requirements of **Section 6.3.2**, the following provisions are permitted:

6.3.4.1.1 Thermo-Brace Red SIB may be used on braced wall lines as an equivalent alternative to the WSP method when installed in accordance with IRC Section R602.10 and this report.

6.3.4.1.2 Thermo-Brace Red SIB may be used to brace the walls of buildings as an alternative to the continuous wall bracing provisions of the CS-WSP method described in IRC Section R602.10.4.

6.3.4.1.3 Required braced wall panel lengths for Thermo-Brace Red SIB shall be as determined by the equivalency factors shown in **Table 6** of this report, IRC Table R602.10.3(1) and IRC Table R602.10.3(2), including all footnotes.

6.3.4.1.4 Bracing lengths in the IRC tables for the WSP or CS-WSP methods shall be multiplied by the equivalency factors listed in **Table 6**.

Table 6. Braced Wall Line Length Equivalency Factors

Product	Sheathing Direction	Fastener[2]	Fastener Spacing (edge:field) (in)	Stud Spacing (in)	Equivalency Factors[7] to IRC WSP or CS-WSP
Thermo-Brace Red SIB R3	FPIS Outward	15/16" Crown x 1 3/4" Leg 16-gauge Staple	3:3	16 o.c.	0.80
Thermo-Brace Red SIB R5		15/16" Crown x 2" Leg 16-gauge Staple			0.74
Thermo-Brace Red SIB R3	FPIS Inward	1 3/4" x 11-gauge Smooth Shank Roofing Nail			0.76
Thermo-Brace Red SIB R5		1 3/4" x 11-gauge Ring Shank Roofing Nail			0.82
Thermo-Brace Red SIB R3	FPIS Outward	15/16" Crown x 1 3/4" Leg 16-gauge Staple	3:3	24 o.c.	0.96
Thermo-Brace Red SIB R5		15/16" Crown x 2" Leg 16-gauge Staple			1.03
Thermo-Brace Red SIB R3	FPIS Inward	1 3/4" x 11-gauge Smooth Shank Roofing Nail			1.21
Thermo-Brace Red SIB R5		1 3/4" x 11-gauge Ring Shank Roofing Nail			1.34

SI: 1 in = 25.4 mm

1. Thermo-Brace Red SIB to be a minimum 5/8" thickness installed with staples or nails per **Section 9**.
2. Fasteners listed are minimum sizes.
3. Where the FPIS faces outward, fasteners may be countersunk beneath the surface of Thermo-Brace.
4. Where the FPIS faces inward, fasteners shall be driven flush with the face of Thermo-Brace.
5. Factors based on SPF framing materials.
6. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
7. Multiply the bracing lengths indicated for the WSP or CS-WSP continuous sheathing methods in IRC Table R602.10.3(1) and IRC Table R602.10.3(3), and as modified by all applicable factors in IRC Table R602.10.3(2) and IRC Table R602.10.3(4), respectively, by the factors shown here to establish the required bracing length.
8. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.9.
9. These equivalency factors are valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
10. Equivalency factors are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which belongs to the manufacturer of those products or the members of the associations that publish those design values.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.3.4.1.4.1 These braced wall line length equivalency factors are based on equivalency testing and are used to comply with the IRC WSP and CS-WSP methods.

6.3.4.1.4.2 The length of bracing required shall be determined by multiplying the Thermo-Brace Red SIB tested equivalency factors in **Table 6** by the length indicated for the WSP or CS-WSP methods in IRC Table R602.10.3(1), as modified by all applicable factors in IRC Table R602.10.3(2).

6.3.4.1.5 All IRC prescriptive bracing minimums, spacing requirements and rules must still be met.

6.3.5 *Prescriptive IBC Conventional Light-Frame Wood Construction:*

6.3.5.1 Thermo-Brace Red SIB may be used to brace exterior walls of buildings as an equivalent alternative to Method WSP of the IBC when installed with $^1/_2$" gypsum in accordance with the conventional light frame construction method of IBC Section 2308.10[29] and this report.

6.3.6 *Performance-Based Wood-Framed Construction:*

6.3.6.1 Thermo-Brace Red SIB panels used in wall assemblies designed as shear walls are permitted to be designed in accordance with the methodology used in SDPWS for WSP using the capacities shown in **Table 7**.

6.3.6.2 Thermo-Brace Red SIB shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in **Table 7** of this report.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 7. Allowable Stress Design (ASD) Capacity – Wind

Product	Sheathing Direction	Fastener[1,2]	Fastener Spacing (edge:field) (in)[4]	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	GWB Fastener Spacing (edge:field)[3] (in)	Allowable Unit Shear Capacity (plf)
Thermo-Brace Red SIB R3	FPIS Outward	15/16" Crown x 1 3/4" Leg 16-gauge Staple	3:3	16 o.c.	None	-	300
					1/2" GWB	8:8	450
Thermo-Brace Red SIB R5		15/16" Crown x 2" Leg 16-gauge Staple	3:3		None	-	340
					1/2" GWB	8:8	485
Thermo-Brace Red SIB R3	FPIS Inward	1 3/4" x 11-gauge Smooth Shank Roofing Nail	3:3		None	-	325
					1/2" GWB	8:8	475
Thermo-Brace Red SIB R5		1 3/4" x 11-gauge Ring Shank Roofing Nail	3:3		None	-	290
					1/2" GWB	8:8	440
Thermo-Brace Red SIB R3	FPIS Outward	15/16" Crown x 1 3/4" Leg 16-gauge Staple	3:3	24 o.c.	None	-	260
					1/2" GWB	8:8	375
Thermo-Brace Red SIB R5		15/16" Crown x 2" Leg 16-gauge Staple	3:3		None	-	285
					1/2" GWB	8:8	345
Thermo-Brace Red SIB R3	FPIS Inward	1 3/4" x 11-gauge Smooth Shank Roofing Nail	3:3		1/2" GWB	8:8	295
Thermo-Brace Red SIB R5		1 3/4" x 11-gauge Ring Shank Roofing Nail	3:3		1/2" GWB	8:8	270

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

1. Where staples are used, fasteners are to be installed with the crown parallel to the framing and spaced a maximum of 3" o.c. at the panel edges and 3" o.c. in the field. Fastener edge distance shall be a minimum of 3/8". Set fastener depth on driving tools to the maximum depth.
2. Fasteners listed are minimum size.
3. Gypsum attached with minimum #6 type W or S screws 1 1/4" long.
4. Where SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.

6.4 *Seismic Design*

6.4.1 Thermo-Brace Red Structural Sheathing shear walls that require seismic design in accordance with IBC Section 1613 shall use the seismic allowable unit shear capacities set forth in **Table 8**.

6.4.1.1 The response modification coefficient, R, system overstrength factor, Ω_0, and deflection amplification factor, C_d, indicated in **Table 8**, shall be used to determine the base shear, element design forces, and design story drift in accordance with ASCE 7 Chapter 12 and ASCE 7 Section 14.5.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 8. Seismic Allowable Unit Shear Capacity and Seismic Design Coefficients[1,2,4]

Seismic Force Resisting System	Joint Condition	GWB	Maximum Stud Spacing (in)	Seismic Allowable Unit Shear Capacity[5] (plf)	Apparent Shear Stiffness, G_a (kips/in)	Response Modification Factor, R[6]	System Over-Strength Factor,[7] Ω_0	Deflection Amplification Co-efficient,[8] C_d	Structural System Limitations and Building Height Limit[9] (ft)				
									SDC				
									B	C	D	E	F
Light-Frame (Wood) Walls Sheathed with Thermo-Brace Red SIB	Butted	1/2" GWB	16 o.c.	275	17.6	6.5	3	4	NL	NL	65	65	65
		None	16 o.c.	175	8.4	6.5	3	4	NL	NL	65	65	65

SI: 1 in = 25.4 mm, 1 lb/ft = 0.0146 kN/m, 1 psi = 0.00689 MPa

1. Thermo-Brace Red SIB sheathing (FPIS Outward) attached with a minimum 16-gauge, 15/16" crown staples shall penetrate a minimum of 1" into the stud. Fasteners are to be installed with the crown parallel to the framing and spaced a maximum of 3" o.c. at the panel edges and 3" o.c. in the field. Fastener edge distance shall be a minimum of 3/8". Fastener head shall be in contact with the Thermo-Brace Red SIB surface.
2. Where Thermo-Brace SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
3. Gypsum attached a maximum of 8" o.c. at the panel edges and 8" o.c. in the field, with minimum #6 type W or S screws 1 1/4" long, with a minimum edge distance of 3/8".
4. All seismic design parameters follow the equivalency as defined in **Section 8**.
5. The allowable unit shear capacity is based on the listed reference standards in **Section 4**.
6. Response modification coefficient, R, for use throughout ASCE 7. Note: R reduces forces to a strength level, not an allowable stress level.
7. The tabulated value of the overstrength factor, Ω_0, is permitted to be reduced by subtracting 0.5 for structures with flexible diaphragms.
8. Deflection amplification factor, C_d, for use with ASCE 7 Section 12.8.6, 12.8.7, and 12.9.2.
9. NL = Not Limited. Heights are measured from the base of the structure as defined in ASCE 7 Section 11.2.

6.5 *Transverse Wind Loading*

6.5.1 Thermo-Brace Red SIB panels are permitted to resist transverse wind load forces using the allowable transverse loads (in pounds per linear foot) set forth in **Table 9** and **Table 10**.

Table 9. Transverse (Out-Of-Plane) Wind Load Resistance[1]

Product	Maximum Stud Spacing (in)	Fastener[4]	Fastener Spacing[2] (edge:field) (in)	Allowable Design Value[3,5] (psf)
Thermo-Brace Red SIB	16 o.c.	15/16" Crown x 1 3/4" Leg 16-gauge galvanized Staple (minimum)	3:3	90

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m^2, 1 mph = 1.61 km/h

1. Fastener lengths shall be a minimum of 2" for the R-5 Thermo-Brace Red SIB.
2. Where Thermo-Brace Red SIB Guard is used at building corners, the corner post may be nailed at 6" on center along each side of the post. Offset the fasteners on one side of the corner post 3" from those on the other side of the post resulting in fasteners spaced 3" on center along the length of the corner post staggered on each side of the corner post.
3. Design wind load capacity shall be in accordance with IBC Section 1609.1.1.
4. Staple crowns shall be installed parallel to grain.
5. Applicable to both the positive and negative direction.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Table 10. Basic Wind Speed for Use in Exterior Wall Covering Assemblies[1,2]

Product	Allowable Components and Cladding Basic Wind Speed (mph)	
	Basic Wind Speed, V_{ult}	Allowable Stress Design Wind Speed, V_{asd}
Thermo-Brace Red SIB	200	155

SI: 1 mph = 1.61 km/h

1. Allowable wind speeds are based on the following: Components and Cladding wind loads, Mean roof height 30', Exposure B, Zone 5, 10 sq. ft. effective wind area. See the applicable building code for any adjustment needed for specific building location and configuration.
2. Studs spaced 16" o.c.

6.5.2 When Thermo-Brace Red SIB is used as intermittent bracing, the Neopor used as infill on the non-structural portions of the wall shall also be qualified for wind pressure resistance in accordance with IBC Section 2603.10 and IRC Section R303.8.[30]

6.6 *Water-Resistive Barrier (WRB)*

6.6.1 Thermo-Brace Red SIB may be used as a WRB in accordance with ASTM E331 and as prescribed in IBC Section 1403.2 and IRC Section R703.2 when installed on exterior walls as described in this section.

6.6.2 Thermo-Brace Red SIB installed with the Neopor FPIS facing inward or outward is approved as a WRB provided the following conditions be met:

6.6.2.1 All board joints are placed directly over exterior framing spaced a maximum of 24" o.c. (610 mm). The fasteners used to attach the board shall be installed in accordance with **Section 9**.

6.6.2.2 All seams and joints between boards shall be covered by Barricade® Seam Tape or equivalent after fasteners are installed.

6.6.2.3 Flashing must be installed at all sheathing penetrations and shall comply with all applicable code sections.

6.6.3 When Thermo-Brace Red SIB is used as intermittent bracing, Neopor FPIS alone, which has been properly qualified as a WRB, is permitted to be used on the remaining portions of the braced wall line with all joints taped in accordance with the Neopor FPIS manufacturer installation instructions.

6.6.3.1 Where the Neopor has not been qualified as a WRB, a separate WRB shall be installed.

6.7 *Air Barrier*

6.7.1 Thermo-Brace Red SIB may be used as an air barrier material as prescribed in IRC Section N1102.5.1.1,[31] IECC Section R402.5.1.1,[32] and IECC Section C402.6.1,[33] in accordance with ASTM E2178.

6.8 *Surface Burning Characteristics*

6.8.1 Thermo-Brace Red SIB panels have the flame spread and smoke developed characteristics shown in **Table 11**.

Table 11. Surface Burning Characteristics

Product	Flame Spread	Smoke Developed
Thermo-Brace Red Structural Sheathing (Structural Backing	< 200	< 450
Neopor FPIS	< 25	< 450

1. Tested in accordance with ASTM E84 and UL 723

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.9 *Thermal Barrier Requirements*

6.9.1 Installation shall be fully protected from the interior of the building by an approved 15-minute thermal barrier or ignition barrier as required by IBC Section 2603.4 and IRC Section R303.4.[34]

6.10 *Minimum Fastening Requirements for Non-Structural Applications*

6.10.1 Where other means of wall bracing are provided or are not required, any grade of Thermo-Brace Red SIB may be used to provide other wall functions when installed in accordance with this section.

6.10.1.1 The sheathing panels shall be applied to wall framing with 16-gauge galvanized staples having a minimum $^{15}/_{16}$" crown. Staples for the R3 panels shall be minimum $1^{3}/_{4}$" leg length. Staples for R5 panels shall be minimum 2" in length.

6.10.1.2 Fastener spacing shall be a maximum of 3" o.c in the field and 3" o.c. around the perimeter.

6.10.1.3 Stud spacing shall be a maximum of 24" o.c.

6.10.1.4 Minimum fastener penetration into the framing members shall be 1" for the R3 product and $^{5}/_{8}$" for the R5 product.

6.10.1.5 All staples shall be fastened parallel to the framing member with a minimum edge spacing of $^{3}/_{8}$" (9.5 mm).

6.10.1.6 All panels are installed vertically or horizontally with all joints backed by studs, plates, or blocks when water or air barrier functionality is desired.

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

7 Certified Performance[35]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[36]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[37]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Thermo-Brace Red SIB, Thermo-Brace Red SIB Guard, Perma “R” Brace Red SIB, and Perma “R” Brace Red SIB Guard comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Structural performance for shear wall assemblies used as lateral force resisting systems in Seismic Design Categories A through F, have been tested and evaluated in accordance with the following standards:

8.1.1.1 ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures

8.1.1.2 ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels

8.1.1.3 ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

8.1.1.4 ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings

8.1.1.5 ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings

Information contained in this report was developed using report holder’s confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

8.1.2 Lateral force resisting systems for use in both wind and seismic applications follow the performance-based provisions of IBC Section 2306.1, IBC Section 2306.3, and/or SDPWS Section 4.3 for light-frame wood wall assemblies.

8.1.2.1 **Table 8** provides SDC that conform to the requirements in ASCE 7 Section 12.2.1, 12.2.1.1, and Table 12.2-1 for design of wall assemblies in buildings that require seismic design.

8.1.2.1.1 ASTM D7989 is accepted engineering practice used to establish SDC. Test data generated by ISO/IEC 17025 approved agencies and/or professional engineers, and all associated professional engineering evaluations, which use ASTM D7989 as their basis, are defined as intellectual property and/or trade secrets. They are also defined as an independent design review (i.e., Listings, certified reports, duly authenticated reports from approved agencies, and/or research reports prepared by approved agencies and/or approved sources).

8.1.3 Structural performance under lateral load conditions (wind and seismic) for use as an alternative to the intermittent wall bracing provisions of IRC Section R602.10 Method WSP and the continuous wall bracing provisions of IRC Section R602.10.4 Methods CS-WSP (Continuously Sheathed Wood Structural Panel) and CS-PF (Continuously Sheathed Portal Frame).

8.1.4 Structural performance under lateral load conditions for use as an alternative to the conventional wall bracing provisions of IBC Section 2308.10,[38] Method WSP for Type V construction.

8.1.5 Structural performance under lateral load conditions for both wind and seismic loading for use with the performance-based provisions of IBC Section 2306.1 and IBC Section 2306.3 for light-frame wood wall assemblies.

8.1.5.1 The basis of the seismic evaluation performed as part of this report is based on ASTM D7989 and testing per ASTM E2126 to establish SDC that conform to the requirements of ASCE 7 Section 12.2.1.1.

8.1.5.2 **Table 8** provides SDC that conform to the requirements in ASCE 7 Section 12.2.1 and Table 12.2-1 for design of wall assemblies in buildings that require seismic design in accordance with ASCE 7 (i.e., all seismic design categories).

8.1.5.3 The basis for equivalency testing is outlined in ASCE 7 Section 12.2.1.1:

> **Alternative Structural Systems.** Use of seismic force-resisting systems not contained in Table 12.2-1 shall be permitted contingent on submittal to and approval by the Authority Having Jurisdiction and independent structural design review of an accompanying set of design criteria and substantiating analytical and test data. The design criteria shall specify any limitations on system use, including Seismic Design Category and height; required procedures for designing the system's components and connections; required detailing; and the values of the response modification coefficient, R; overstrength factor Ω_0; and deflection amplification factor, C_d.

8.1.5.4 The SDC evaluation uses the approach found in documentation entitled *"Establishing Seismic Equivalency for Proprietary Prefabricated Shear Panels"* using code-defined accepted engineering procedures, experience, and good technical judgment.

8.1.6 Structural performance under lateral load conditions for use as an alternative to SDPWS Section 4.3 Wood-Frame Shear Walls.

8.1.7 Resistance to transverse loads for wall assemblies used in light-frame wood construction in accordance with IBC Section 1609.1.1 and IRC Section R301.2.1.

8.1.8 Performance for use as foam plastic insulation in accordance with IBC Section 2603 and IRC Section R303.[39]

8.1.9 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

8.1.10 Performance for use as an air barrier material in accordance with the IECC Section C402.6.2.3.1.[40]

8.1.11 Flame spread and smoke developed indexes for Thermo-Brace Red SIB components.

8.2 The use of Thermo-Brace Red SIB on steel studs is outside the scope of this report.

8.3 Performance with regard to thermal-resistance (R-value) is outside the scope of this report.

8.4 The use of Thermo-Brace Red SIB in a fire-resistance rated assembly is outside the scope of this report.

8.5 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[41] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[42] respectively.

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

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

9 Installation

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

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

9.3 *Orientation*

9.3.1 Thermo-Brace Red SIB and Perma "R" Brace Red SIB shall be installed in either the vertical or the horizontal orientation. To be recognized for the structural values listed in this report, all joints must be fastened and backed by studs, plates, or blocks.

9.3.2 Thermo-Brace Red SIB Guard and Perma "R" Brace Red SIB Guard must be installed vertically, centered on the corner of the building. To be recognized as a water barrier, all joints must be backed by studs, plates or blocks and fastened in accordance with **Section 9.4**.

9.4 *Fastener Type*

9.4.1 *Staples for Installation with FPIS Facing Outward:*

9.4.1.1 For R3 Thermo-Brace Red SIB, minimum $^{15}/_{16}$" crown by $1^{3}/_{4}$" leg, 16-gauge galvanized staples shall be installed per the staple manufacturer instructions.

9.4.1.2 For R5 Thermo-Brace Red SIB, minimum $^{15}/_{16}$" crown by 2" leg, 16-gauge galvanized staples shall be installed per the staple manufacturer instructions.

9.4.1.3 Fasteners shall be driven so that the head of the fasteners are slightly overdriven beneath the surface of the Thermo-Brace Red SIB.

9.4.2 *Nails for Installation with FPIS Facing Inward:*

9.4.2.1 For R3 Thermo-Brace Red SIB, minimum $1^{3}/_{4}$" x 11-gauge smooth shank roofing nails shall be installed per the nail manufacturer instructions.

9.4.2.2 For R5 Thermo-Brace Red SIB, minimum $1^{3}/_{4}$" x 11-gauge ring shank roofing nails shall be installed per the nail manufacturer instructions.

9.4.2.3 Fasteners shall be driven so that the head of the fasteners are flush with the surface of the Thermo-Brace Red SIB. Do not overdrive fasteners.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

9.4.3 *Gypsum Wallboard:*

9.4.3.1 Where required, interior gypsum wallboard shall be a minimum $^1/_2$" thickness and shall be attached at a minimum, with one of the following:

9.4.3.1.1 #6 x $1^1/_4$" type W or S screws

9.4.3.1.2 5d cooler nails

9.5 *Fastener Edge Distance*

9.5.1 Fasteners shall be installed with a nominal edge distance of $^3/_8$" (9.5 mm) for Thermo-Brace Red SIB and gypsum.

9.6 *Treatment of Joints*

9.6.1 Thermo-Brace Red SIB joints must be butted.

9.6.1.1 Butt joints shall be placed over framing members and fastened with a single row of fasteners at each panel edge.

9.6.1.2 When used as a WRB with the Neopor FPIS installed facing inward, seal all seams with Barricade Seam Tape or equivalent after all fasteners have been installed.

9.6.1.3 When installed with the Neopor FPIS facing outward, the Neopor FPIS shall be qualified as a WRB and all seams shall be sealed with an approved tape in accordance with the Neopor FPIS manufacturer installation instructions for use as a WRB. Alternately, a separate WRB may be installed.

9.6.2 Thermo-Brace Red SIB must be installed with appropriate flashing and counter flashing, in conformance with accepted building standards and in compliance with local building codes and the flashing manufacturer installation instructions.

10 Substantiating Data

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

10.1.1 Lateral load testing in accordance with ASTM E564

10.1.2 Lateral load testing in accordance with ASTM E2126 and analysis per ASTM D7989

10.1.3 Transverse wind load testing in accordance with ASTM E330

10.1.4 WRB testing in accordance with ASTM E331

10.1.5 Air barrier testing in accordance with ASTM E2178

10.1.6 Flame spread and smoke developed indexes testing in accordance with ASTM E84

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

10.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[43]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Thermo-Brace Red SIB on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Thermo-Brace Red SIB have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Thermo-Brace Red SIB shall be approved for the following applications:

11.2.1 Lateral load resistance due to wind and seismic loads carried by shear walls.

11.2.2 Use as equivalent to the CS-PF as described in IRC Section R602.10.5 and IRC Section R602.10.6.4.

11.2.3 Transverse load resistance due to components and cladding pressures on building surfaces.

11.2.4 Performance of foam plastics in accordance with IBC Section 2603 and IRC Section R303,[44] except as noted herein.

11.2.5 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

11.2.6 Performance for use as an air barrier material as prescribed in IRC Section N1102.5.1.1,[45] IECC Section R402.5.1.1,[46] and IECC Section C402.6.1,[47] in accordance with ASTM E2178.

11.3 Unless exempt by state statute, when Thermo-Brace Red SIB are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from INDEVCO Building Products.

11.5 IBC Section 104.2.3[48] (IRC Section R104.2.2[49] and IFC Section 104.2.3[50] are similar) in pertinent part state:

> **104.2.3 Alternative Materials, Design and Methods of Construction and Equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

11.6 **Approved:**[51] Building regulations require that the building official shall accept duly authenticated reports.[52]

11.6.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.6.3 Federal law, Title 18 US Code Section 242, requires that, where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[53]

12 Conditions of Use

12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.

12.2 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.3 As listed herein, Thermo-Brace Red SIB shall not be used:

12.3.1 As a nailing base for claddings, trim, windows, or doors. Fastening through the Thermo-Brace Red SIB into the framing is acceptable.

12.3.2 To resist horizontal loads from concrete and masonry walls.

12.4 When used as part of a continuous air barrier assembly, all sheathing panel edges at the top and bottom of the wall assemblies and all joints between sheathing panels, shall be sealed with an approved construction tape.

12.5 When Thermo-Brace Red SIB is installed as a wall sheathing, but is not installed per structural requirements, light-framed walls shall be braced by other means.

12.6 When used as a WRB, installation shall be in accordance with **Section 6.6**.

12.7 When Thermo-Brace Red SIB is not installed as a WRB, other means of providing a WRB are code required.

12.8 When used in accordance with the IBC in Seismic Design Categories C, D, E, or F, special inspections shall comply with IBC Section 1705.13.[54]

12.9 When used in accordance with the IBC in high wind areas, special inspections shall comply with IBC Section 1705.12.[55]

12.10 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.

12.10.1 Allowable shear loads shall not exceed the values in **Table 7** for wind loads and **Table 8** for seismic loads.

12.10.2 Transverse design loads and wind speeds shall not exceed those described in **Table 9** and **Table 10** respectively, unless an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing.

12.11 The manufacturer installation instructions shall be available on the jobsite for inspection.

12.12 All panel edges shall be supported by wall framing or solid blocking a minimum of 2" (51 mm) nominal in thickness.

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

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

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

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

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

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

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

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

12.13.7 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

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

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

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

13 Identification

13.1 Thermo-Brace Red SIB, Thermo-Brace Red SIB Guard, Perma "R" Brace Red SIB, and Perma "R" Brace Red SIB Guard, as listed in **Section 1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at indevconorthamerica.com, barricadebp.com, or permarproducts.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Issue Date: February 15, 2022
Subject to Renewal: January 1, 2027

FBC Supplement to Report Number 1703-16

REPORT HOLDER: INDEVCO Building Products

1 Evaluation Subject

1.1 Thermo-Brace Red SIB, Thermo-Brace Red SIB Guard, Perma “R” Brace Red SIB, and Perma “R” Brace Red SIB Guard

1.1.1 Unless otherwise noted, where Thermo-Brace Red SIB is stated, the provisions apply equally to Thermo Brace Red SIB Guard, Perma “R” Brace Red SIB, and Perma “R” Brace Red SIB Guard.

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Thermo-Brace Red SIB, recognized in Report Number 1703-16, 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 (FL 40969)*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential (FL 40969)*

3 Conclusions

3.1 Thermo-Brace Red SIB, described in Report Number 1703-16, 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 report, they are listed here:

3.2.1 FBC-B Section 104 is reserved.

3.2.2 FBC-B Section 110.4 is reserved and replaces IBC Section 110.4.

3.2.3 FBC-B Section 104.6 is reserved and replaces IBC Section 104.4.

3.2.4 FBC-B Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.5 FBC-B Section 105.3 replaces IBC Section 105.3.

3.2.6 FBC-B Section 105.3.1 replaces IBC Section 105.3.1.

3.2.7 FBC-B Section 110.3 replaces IBC Section 110.3.

3.2.8 FBC-B Section 1403.5 replaces IBC Section 1403.2.

3.2.9 FBC-B Section 1609.1.1 replaces IBC Section 1609.1.1.

3.2.10 FBC-B Section 1609.3.1 replaces IBC Section 1609.3.1.

3.2.11 FBC-B Section 1613 is reserved and replaces IBC Section 1613.

3.2.12 FBC-B Section 1705 is reserved and replaces IBC Section 1705.12 and IBC Section 1705.13.

3.2.13 FBC-B Section 1707.1 replaces IBC Section 1707.1.

Information contained in this report was developed using report holder’s confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

3.2.14 FBC-B Section 2306.1 replaces IBC Section 2306.1.

3.2.15 FBC-B Section 2306.3 replaces IBC Section 2306.3.

3.2.16 FBC-B Section 2308 is reserved and replaces IBC Section 2308.9.3.2 and IBC Section 2308.10..

3.2.17 FBC-B Section 2603 replaces IBC Section 2603.

3.2.18 FBC-B Section 2603.4 replaces IBC Section 2603.4.

3.2.19 FBC-B Section 2603.10 replaces IBC Section 2603.10.

3.2.20 FBC-R Section N1101.1 replaces IRC Section N1102.5.1.1.

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

3.2.22 FBC-R Section R301.1 replaces IRC Section R301.1.

3.2.23 FBC-R Section R301.2.1 replaces IRC Section R301.2.1.

3.2.24 FBC-R Section R315.4 replaces IRC Section R303.4.

3.2.25 FBC-R Section R316 replaces IRC Section R303.

3.2.26 FBC-R Section R316.8 replaces IRC Section R303.8.

3.2.27 FBC-R Section R602.3.2 is reserved and replaces IRC Section R602.3.2.

3.2.28 FBC-R Section R602.10 is reserved and replaces IRC Section R602.10.

3.2.29 FBC-R Section R602.10.5 is reserved and replaces IRC Section R602.10.5.

3.2.30 FBC-R Table R602.10.3(1) is reserved and replaces IRC Table R602.10.3(1).

3.2.31 FBC-R Table R602.10.3(2) is reserved and replaces IRC Table R602.10.3(2).

3.2.32 FBC-R Table R602.10.3(3) is reserved and replaces IRC Table R602.10.3(3).

3.2.33 FBC-R Table R602.10.3(4) is reserved and replaces IRC Table R602.10.3(4).

3.2.34 FBC-R Section R602.10.4 is reserved and replaces IRC Section R602.10.4.

3.2.35 FBC-R Section R602.10.6.4 is reserved and replaces IRC Section R602.10.6.4.

3.2.36 FBC-R Section R703.2 replaces IRC Section R703.2.

4 Conditions of Use

4.1 Thermo-Brace Red SIB, Thermo-Brace Red SIB Guard, Perma “R” Brace Red SIB, and Perma “R” Brace Red SIB Guard, described in Report Number 1703-16, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1703-16.

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

Information contained in this report was developed using report holder’s confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

Notes

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

2 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

3 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

4 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

5 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

6 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

8 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

11 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

12 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

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

14 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

15 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

17 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

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

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

20 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

21 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

22 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

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

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

25 All references to the FBC-B and FBC-R are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Florida Supplement at the end of this report.

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

27 2021 IBC Section 2308.5.3.2

28 2021 IRC Section R316.8

29 2021 IBC Section 2308.6

30 2021 IRC Section R316.8

31 2021 IRC Section N1102.4.1.1

32 2021 IECC Section R402.4.1.1

33 2021 IECC Section C402.5.1

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

[34] 2021 IRC Section R316.4

[35] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

[36] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

[37] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[38] 2021 IBC Section 2308.6

[39] 2021 IRC Section R316

[40] 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

[41] 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.

[42] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[43] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[44] 2021 IRC Section R316

[45] 2021 IRC Section N1102.4.1.1

[46] 2021 IECC Section R402.4.1.1

[47] 2021 IECC Section C402.5.1

[48] 2021 IBC Section 104.11

[49] 2021 IRC Section R104.11

[50] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[51] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[52] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

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

[54] 2018 IBC Section 1705.12

[55] 2018 IBC Section 1705.11

Information contained in this report was developed using report holder's confidential intellectual property (IP) and trade secrets (TS), which is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC