



**CERTIFICATION**



**Approved. Sealed. Code Compliant.**

**Technical Evaluation Report**

**TER 1507-07**

**Thermo-Brace® Green Structural  
Sheathing**

**Barricade® Building Products**

**Product:**

**Thermo-Brace® Green Structural  
Sheathing**

Issue Date:

April 15, 2016

Revision Date:

April 28, 2022

Subject to Renewal:

July 1, 2023



COMPANY  
INFORMATION:

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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

SECTION: 07 27 00 - Air Barriers

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## 1 PRODUCT EVALUATED<sup>1</sup>

1.1 Thermo-Brace® Green Structural Sheathing

## 2 APPLICABLE CODES AND STANDARDS<sup>2,3</sup>

### 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®*
- 2.1.4 *FBC-B—17, 20: Florida Building Code – Building<sup>4</sup>*
- 2.1.5 *FBC-R—17, 20: Florida Building Code – Residential<sup>4</sup>*
- 2.1.6 *FBC-EC—17, 20: Florida Building Code – Energy Conservation<sup>4</sup>*

### 2.2 Standards and Referenced Documents

- 2.2.1 *ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic*
- 2.2.2 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*
- 2.2.3 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

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<sup>1</sup> For more information, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> Unless otherwise noted, all references in this TER are from the 2021 version of the codes and the standards referenced therein. This material, design, or method of construction also complies with the 2000-2018 versions of the referenced codes and the standards referenced therein.

<sup>3</sup> All terms defined in the applicable building codes are italicized.

<sup>4</sup> All references to the *FBC-B*, *FBC-R*, and *FBC-EC* are the same as the 2018 *IBC*, *IRC*, and *IECC* unless otherwise noted in the Florida Supplement found at the end of this TER.

- 2.2.4 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*
- 2.2.5 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.6 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.7 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*
- 2.2.8 *ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*
- 2.2.9 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 2.2.10 *UL 723: Test for Surface Burning Characteristics of Building Materials*

### 3 PERFORMANCE EVALUATION

- 3.1 Thermo-Brace® Green Structural Sheathing has been evaluated to determine the following:
  - 3.1.1 Structural performance under lateral load conditions (wind and seismic) for use as an alternative to the *IRC* intermittent wall bracing provisions of *IRC Section R602.10* Method WSP (wood structural panel), and the *IRC* 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).
  - 3.1.2 Structural performance under lateral load conditions for use as an alternative to the *IRC* Continuous Wall Bracing provisions of *Section R602.10.6.2* Method PFH (portal frame with hold-down).
  - 3.1.3 Structural performance under lateral load conditions for wind loading for use with the *IBC* performance-based provisions, *IBC Section 2306.1* and *IBC Section 2306.3*, for light-frame wood wall assemblies.
  - 3.1.4 Structural performance under lateral load conditions for use as an alternative to *SDPWS* Section 4.3 Wood-Frame Shear Walls.
  - 3.1.5 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*.
  - 3.1.6 Resistance to uplift loads for wall assemblies used for light-frame wood construction in accordance with *IBC Section 1609* and *IRC Section R301.2.1*.
  - 3.1.7 Performance for use as a water-resistive barrier (WRB) in accordance with *IBC Section 1403.2<sup>5</sup>* and *IRC Section R703.2*.
  - 3.1.8 Performance for use as an air barrier in accordance with *IRC Section N1102.4.1.1* and *IECC Section R402.4.1.1* and *IECC Section C402.5.1.1*.
  - 3.1.9 Performance for use as a draftstop in accordance with *IBC Section 708.4.2*, *Section 718.3*, and *Section 718.4* and *IRC Section R302.12*.
  - 3.1.10 Surface burn characteristic performance for use as a Class C interior finish material in accordance with *IBC Section 803.1.2<sup>6</sup>* and *IRC Section R302.9*.
- 3.2 Use of Thermo-Brace® Green Structural Sheathing in a fire resistance rated assembly is outside the scope of this TER.
- 3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.4 Any engineering evaluation conducted for this TER was performed within DrJ's ANAB accredited ICS code scope and/or the defined professional engineering scope of work on the dates provided herein.

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<sup>5</sup> 2015 IBC Section 1404.2

<sup>6</sup> 2015 IBC Section 803.1.1

## 4 PRODUCT DESCRIPTION AND MATERIALS

4.1 The product evaluated in this TER is shown in Figure 1.



FIGURE 1. THERMO-BRACE® GREEN STRUCTURAL SHEATHING

4.2 Thermo-Brace® Green Structural Sheathing is composed of pressure-laminated plies consisting of high strength cellulosic fibers. These fibers are specially treated to be water resistant and are bonded with a proprietary water-resistive adhesive. A protective polymer layer is applied on both sides of the panel, and foil facings may be additionally applied on one or both faces.

4.2.1 Thermo-Brace® Green Structural Sheathing panels have a nominal thickness of 0.075" and nominal weight of 0.278 lbs. per square foot.

### 4.3 Material Availability

4.3.1 Standard widths include 48" (1219 mm) and 48<sup>3/4</sup>" (1238 mm).

4.3.2 Standard lengths include 96" (2438 mm) and 108" (2743 mm).

4.3.3 Other custom sizes up to 60" widths and 144" lengths can be manufactured.

## 5 APPLICATIONS

5.1 Thermo-Brace® Green Structural Sheathing panels are used in the following applications:

5.1.1 Wall sheathing in buildings constructed in accordance with the *IBC* and *IRC* for light frame wood construction.

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

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

5.1.4 Structural wall sheathing to provide resistance to transverse loads for wall assemblies used in light frame wood construction.

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

### 5.3 Structural Applications

#### 5.3.1 General Structural Provisions:

5.3.1.1 Except as otherwise described in this TER, Thermo-Brace® Green Structural Sheathing shall be installed in accordance with the applicable building codes listed in Section 2 using the provisions set forth herein for the design and installation of wood structural panels (WSP).

5.3.1.1.1 Thermo-Brace® Green Structural Sheathing is permitted to be designed in accordance with *SDPWS* for the design of shear walls using the methods set forth therein, including the perforated shear wall methodology, and subject to the *SDPWS* boundary conditions, except as specifically allowed in this TER.



- 5.3.1.2 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 2.
- 5.3.1.3 Except as provided for in Section 5.3.2, the maximum aspect ratio for Thermo-Brace® Green Structural Sheathing shall be 4:1.
- 5.3.1.4 The minimum full height panel width shall be 24", except as allowed by Section 5.3.2.
- 5.3.1.5 Installation is permitted for single top plate or double top plate applications.
- 5.3.2 *Prescriptive IRC Bracing Applications:*
  - 5.3.2.1 Thermo-Brace® Green Structural Sheathing may be used on braced wall lines as an equivalent alternative to Method WSP of the *IRC*, when installed in accordance with *IRC Section R602.10* and this TER.
  - 5.3.2.2 For wind design, required braced wall panel lengths for Thermo-Brace® Green Structural Sheathing shall be as shown in Table 1, and shall be used in conjunction with *IRC Table R602.10.3(2)* which provides the required adjustments.
  - 5.3.2.3 For seismic design, required braced wall panel lengths for Thermo-Brace® Green Structural Sheathing shall be as shown in Table 2, and shall be used in conjunction with *IRC Table R602.10.3(4)* which provides the required adjustments.
  - 5.3.2.4 Use of Thermo-Brace® with Method CS-PF is also permitted, in lieu of WSP specified in accordance with *IRC Section R602.10.6.4*.
  - 5.3.2.5 Use of Thermo-Brace® with Method PFH is also permitted, in lieu of WSP specified in accordance with *IRC Section R602.10.6.4*.



TABLE 1. REQUIRED BRACING LENGTHS FOR THERMO-BRACE® GREEN – WIND<sup>1,2,3,4,5,6</sup>

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line											
		Intermittent Sheathing						Continuous Sheathing					
		Wind Speeds (mph)											
		< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.4	1.8	1.8	2.3	2.3	2.7	1.4	1.4	1.8	1.8	2.3	2.3
	20	2.3	3.2	3.2	3.6	4.6	5.0	2.3	2.7	3.2	3.2	3.6	4.6
	30	3.6	4.6	5.0	5.5	6.4	7.3	3.2	4.1	4.1	4.6	5.5	6.4
	40	4.6	5.9	6.4	7.3	8.2	9.6	3.6	5.0	5.5	5.9	6.8	8.2
	50	5.5	7.3	8.2	8.6	10.0	11.8	4.6	6.4	6.8	7.3	8.6	10.0
	60	6.4	8.6	9.6	10.5	11.8	13.7	5.5	7.3	8.2	8.6	10.0	11.8
First Story of Two Stories or Second Story of Three Stories	10	2.7	3.2	3.6	4.1	4.6	5.5	2.3	2.7	3.2	3.2	4.1	4.6
	20	4.6	5.9	6.8	7.6	8.6	10.0	4.1	5.0	5.9	6.4	7.3	8.2
	30	6.4	8.6	9.6	10.5	12.3	14.1	5.5	7.3	8.2	8.6	10.5	11.8
	40	8.6	11.4	12.3	13.7	15.9	18.2	7.3	9.6	10.5	11.4	13.7	15.5
	50	10.5	14.1	15.0	16.4	19.6	22.3	9.1	11.8	12.7	14.1	16.4	19.1
	60	12.3	16.4	18.2	19.6	22.8	26.4	10.5	14.1	15.5	16.8	19.6	22.8
First Story of Three Stories	10	3.6	5.0	5.5	5.9	6.8	7.7	3.2	4.1	4.6	5.0	5.9	6.8
	20	6.8	9.1	10.0	10.5	12.3	14.6	5.9	7.7	8.2	9.1	10.5	12.3
	30	9.6	12.7	14.1	15.5	17.7	20.9	8.2	10.9	11.8	13.2	15.5	17.7
	40	12.3	16.8	18.2	20.0	23.2	26.8	10.5	14.1	15.5	16.8	20.0	22.8
	50	15.5	20.5	22.3	24.6	28.7	33.2	13.2	17.3	19.1	20.9	24.1	28.2
	60	18.2	24.1	26.4	29.1	34.1	39.1	15.5	20.9	22.8	24.6	28.7	33.2

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

1. Thermo-Brace® Green shall be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum 15/16" crown x 1 1/4" leg 16 gauge galvanized staples spaced 3" x 3" (edge:field) per Section 6. Joints may be butted or lapped.
2. Where studs are spaced 24" o.c., bracing lengths shall be multiplied by a factor of 1.4.
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, 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.
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 2.0.
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 2 that are adopted into law and that the manufacturers 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.
6. Linear interpolation is permitted.



TABLE 2. REQUIRED BRACING LENGTHS FOR THERMO-BRACE® GREEN (STUDS 16" O.C.) – SEISMIC<sup>1,2,3,4,5,6</sup>

Condition	Braced Wall Line Length (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line							
		Intermittent Sheathing				Continuous Sheathing			
		Seismic Design Category (SDC)							
		C	D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>	C	D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>
One Story or Top of Two Stories or Top of Three Stories	10	1.5	1.6	1.8	2.3	1.3	1.5	1.5	1.9
	20	2.9	3.3	3.6	4.6	2.5	2.8	3.1	3.9
	30	4.4	4.9	5.5	6.9	3.8	4.2	4.6	5.8
	40	5.8	6.5	7.3	9.1	4.9	5.6	6.2	7.7
	50	7.3	8.1	9.1	11.4	6.2	7.0	7.7	9.6
First Story of Two Stories or Second Story of Three Stories	10	2.7	3.4	4.1	5.0	2.4	2.9	3.4	4.3
	20	5.5	6.9	8.1	10.0	4.6	5.8	7.0	8.6
	30	8.1	10.3	12.3	15.0	7.0	8.7	10.5	12.8
	40	10.8	13.6	16.4	20.0	9.3	11.6	13.9	17.0
	50	13.6	17.1	20.5	25.0	11.6	14.6	17.4	21.3
First Story of Three Stories	10	4.1	4.8	5.5	NP	3.4	4.1	4.6	NP
	20	8.1	9.5	10.9	NP	7.0	8.1	9.3	NP
	30	12.3	14.4	16.4	NP	10.5	12.2	13.9	NP
	40	16.4	19.1	21.8	NP	13.9	16.3	18.5	NP
	50	20.5	23.9	27.3	NP	17.4	20.3	23.2	NP

SI: 1 in = 25.4 mm

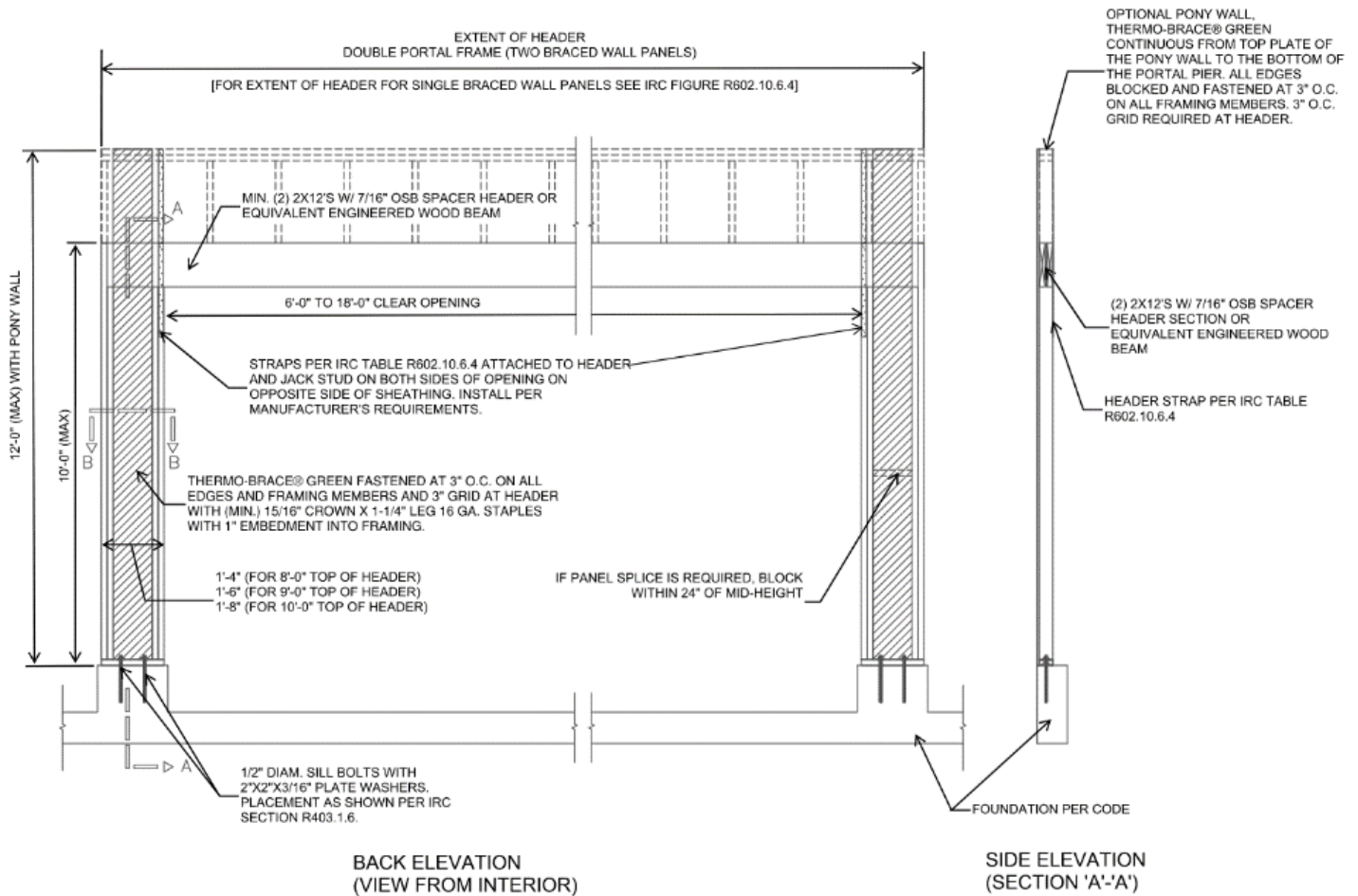
NP = Not Provided

- Thermo-Brace® Green to be installed on 2x4 or 2x6 studs spaced 16" o.c. and fastened with minimum <sup>15</sup>/<sub>16</sub>" crown x 1 1/4" leg 16 gauge galvanized staples spaced 3":3" (edge:field) per Section 6. Joints may be butted or lapped.
- 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 2.0.
- 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, 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 1/4" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
- Tabulated bracing lengths are based on the following:
  - Soil Class D
  - Wall height= 10'
  - 10 psf floor dead load
  - 15 psf roof/ceiling dead load
  - Braced wall line spacing ≤ 25'
- Linear interpolation is permitted.
- 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 2 that are adopted into law and that the manufacturers 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.



5.3.3 **Thermo-Brace® Green CS-PF Portal Frame:**

- 5.3.3.1 A “Thermo-Brace® Green Structural Sheathing CS-PF” was evaluated for equivalency to the *IRC* Method CS-PF (Continuous Sheathed Portal Frame) in accordance with *IRC* Section R602.10.6.4 and Table R602.10.5.
- 5.3.3.2 *IRC* Table R602.10.5 establishes the contributing length 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.
- 5.3.3.3 The capacity of the Thermo-Brace® Green Structural Sheathing 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).
- 5.3.3.4 The Thermo-Brace® Green Structural Sheathing CS-PF is shown in Figure 2.





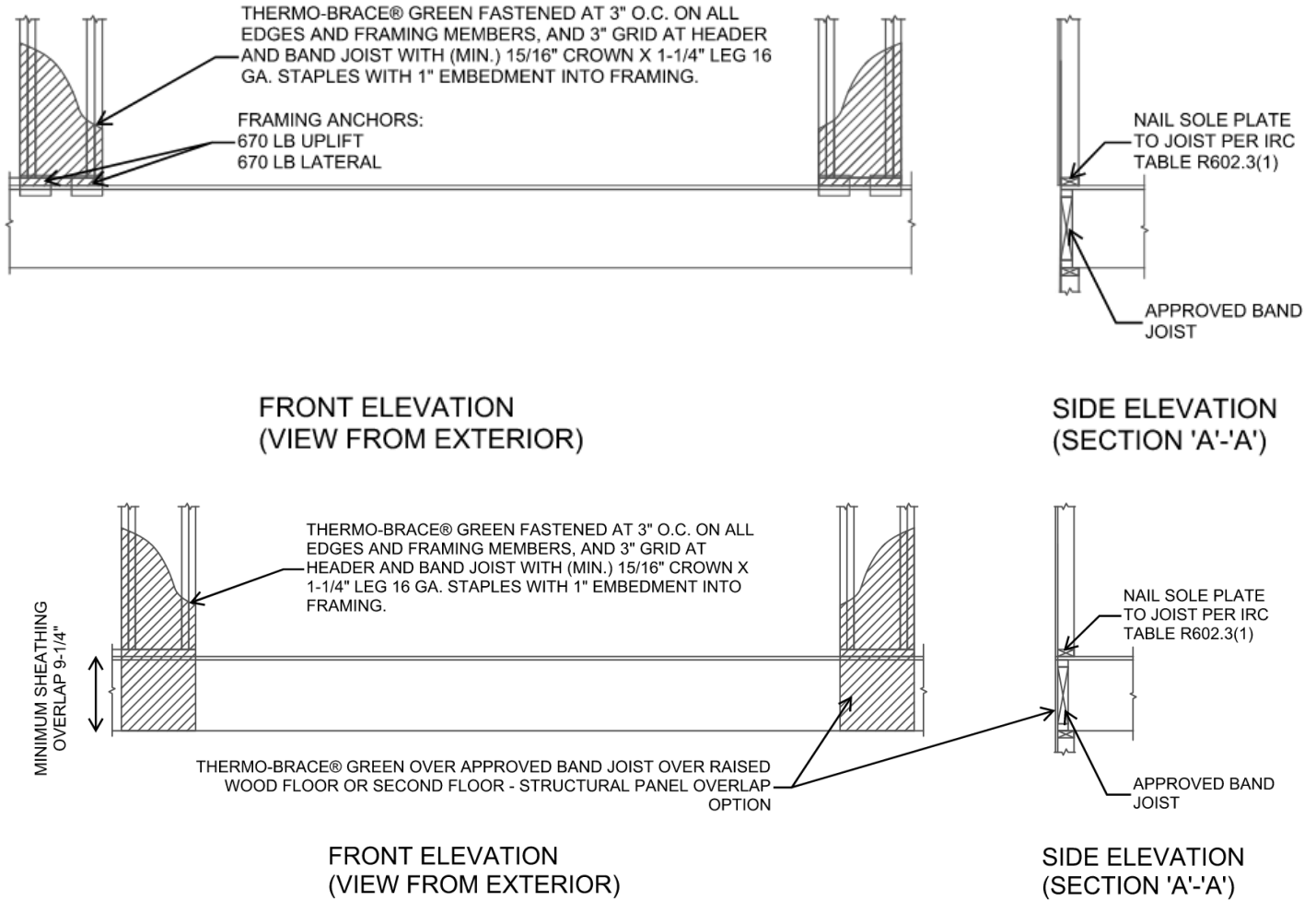


FIGURE 2. THERMO-BRACE® GREEN STRUCTURAL SHEATHING CS-PF

5.3.4 *Thermo-Brace® Green Structural Sheathing Method PFH*

- 5.3.4.1 In accordance with the IRC Section R602.10.6.2, the PFH referenced in the IRC is permitted to be an equivalent replacement for a 4' length of Method WSP bracing.
- 5.3.4.2 Testing of the Thermo-Brace® Green Structural Sheathing PFH assemblies was conducted and compared to testing of Method WSP braced wall panel assemblies using oriented strand board (OSB) to determine whether equivalence could be achieved for the Thermo-Brace® PFH.
- 5.3.4.3 The portal frames were tested in accordance with ASTM E2126 testing procedures. Testing determined their lateral resistance within an identical braced wall line using Method WSP braced wall panels so that a direct performance comparison could be made between the two series of tests.
- 5.3.4.4 A comparison of the WSP braced wall lines, and the Thermo-Brace® Green Structural Sheathing 12" PFH and 24" PFH, is shown in Table 3.

TABLE 3. DESIGN VALUES FOR PFH<sup>1,2,3</sup>

Test Name	Sheathing Method	Fastener Size & Spacing	Total Bracing Width (in)	Maximum Wall Height (ft)	ASD Allowable Design Value per Panel/Pier <sup>4,5</sup> (lbs)
IBC/IRC Benchmark	3/8" OSB, Isolated 4'x8' panels	2 3/8" x 0.113Ø nails, 6:12 spacing	96	Up to 10	700
12" PFH	Thermo-Brace® Green Structural Sheathing	See Figure 3 to Figure 6	12	8	1,280
				10	960
24" PFH	Thermo-Brace® Green Structural Sheathing	See Figure 3 to Figure 6	24	8	2,560
				10	1,920

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

- Capacity derived from multiple full-scale tests, showing the capacity of OSB sheathing in buildings constructed in accordance with the minimum requirements of the IRC.
- The PFH bracing type in the IRC/IBC is defined as equivalent to a 4' BWP using 3/8" WSP. Equivalent capacity is based on comparison testing of the PFH and 3/8" OSB as compared to the published capacities as defined in the IRC and SDPWS.
- For seismic design, reduce capacities by a factor of 1.4.
- Interpolation between the wall heights and pier widths for the 12" PFH & 24" PFH is permitted.
- 10'-high wall design values are provided here that use a 75% factor to reduce the 8'-high wall design values generated by test data.

- 5.3.4.5 The test data and subsequent engineering analysis provides confirmation that the performance of the Thermo-Brace® Green Structural Sheathing 12" PFH and 24" PFH provide comparable equivalence to the Method WSP braced wall panels.
- 5.3.4.6 As detailed in Figure 3, Figure 4, Figure 5, and Figure 6, the maximum allowable compressive strength of the Thermo-Brace® Green Structural Sheathing 12" to 24" PFH is 11,156 lbs per pier. Additional compressive capacity may be engineered into each pier.
- 5.3.4.7 **PFH Assembly**
  - 5.3.4.7.1 The Thermo-Brace® Green Structural Sheathing 12" PFH and 24" PFH is constructed in accordance with Figure 3, Figure 4, Figure 5, and Figure 6.
  - 5.3.4.7.2 The piers in the PFH Assembly are made up of 7/16" OSB sandwiched between nominal 2x4 studs installed flatwise with additional 2x4 studs framing the outside corner (Figure 6).

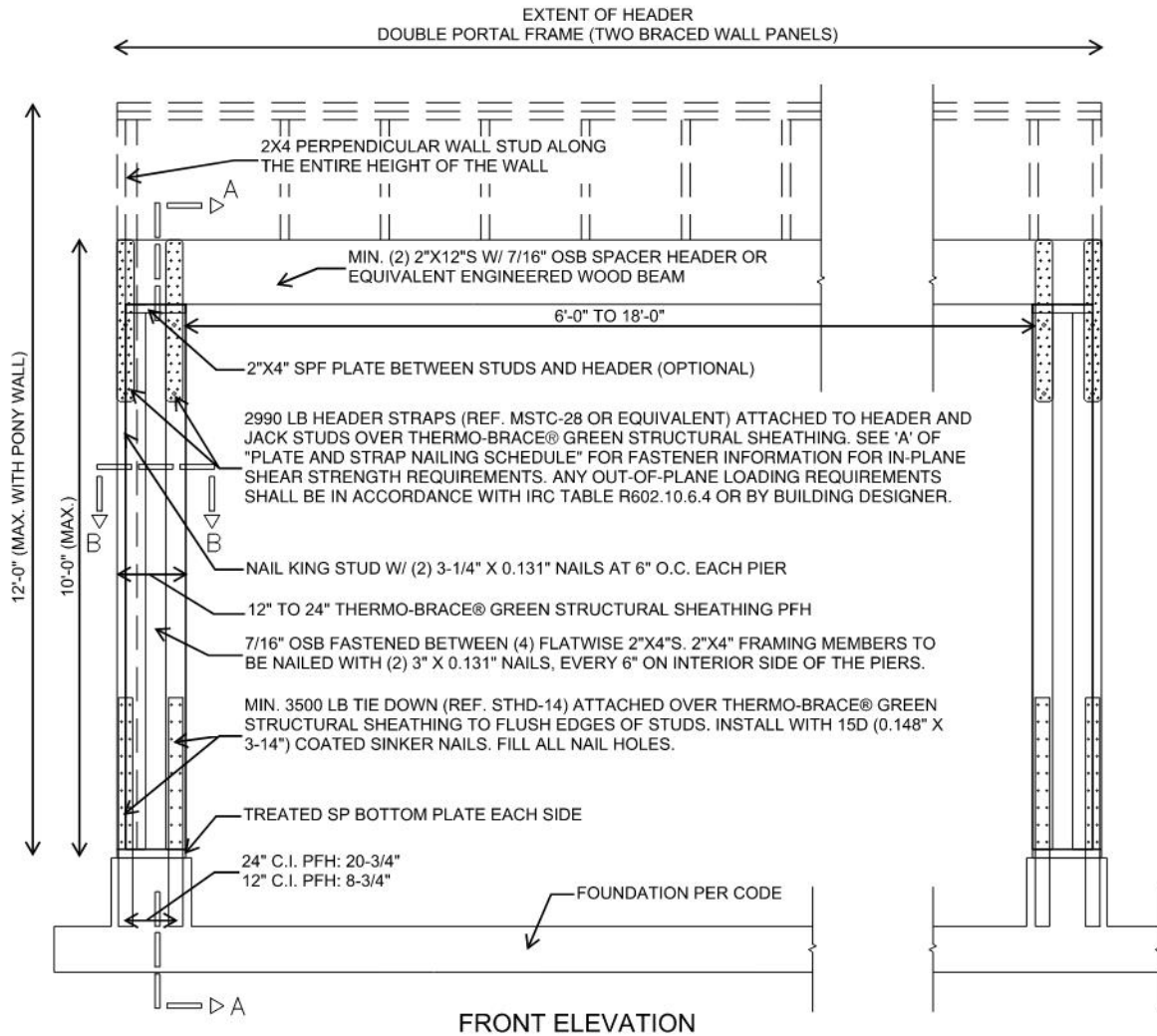


FIGURE 3. CONSTRUCTION DETAILS OF THERMO-BRACE® GREEN STRUCTURAL SHEATHING 12" TO 24" PFH

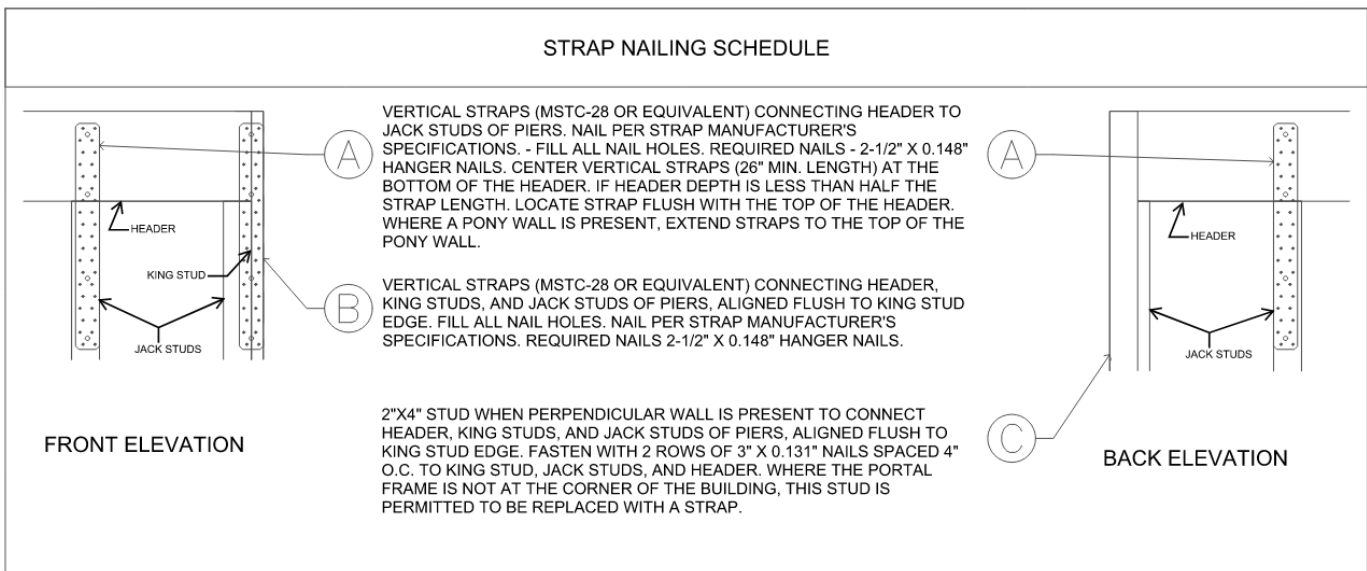


FIGURE 4. HEADER CONNECTION DETAIL

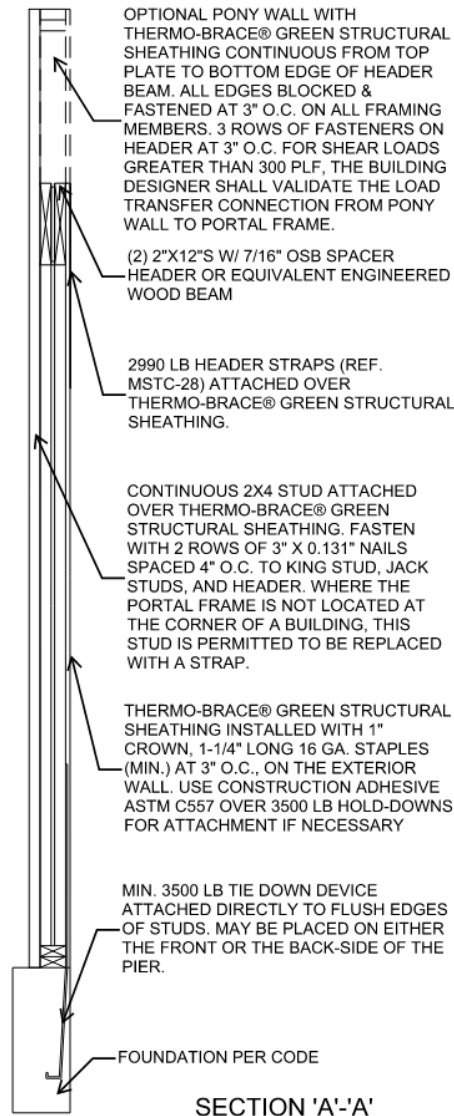


FIGURE 5. PFH SECTION A-A

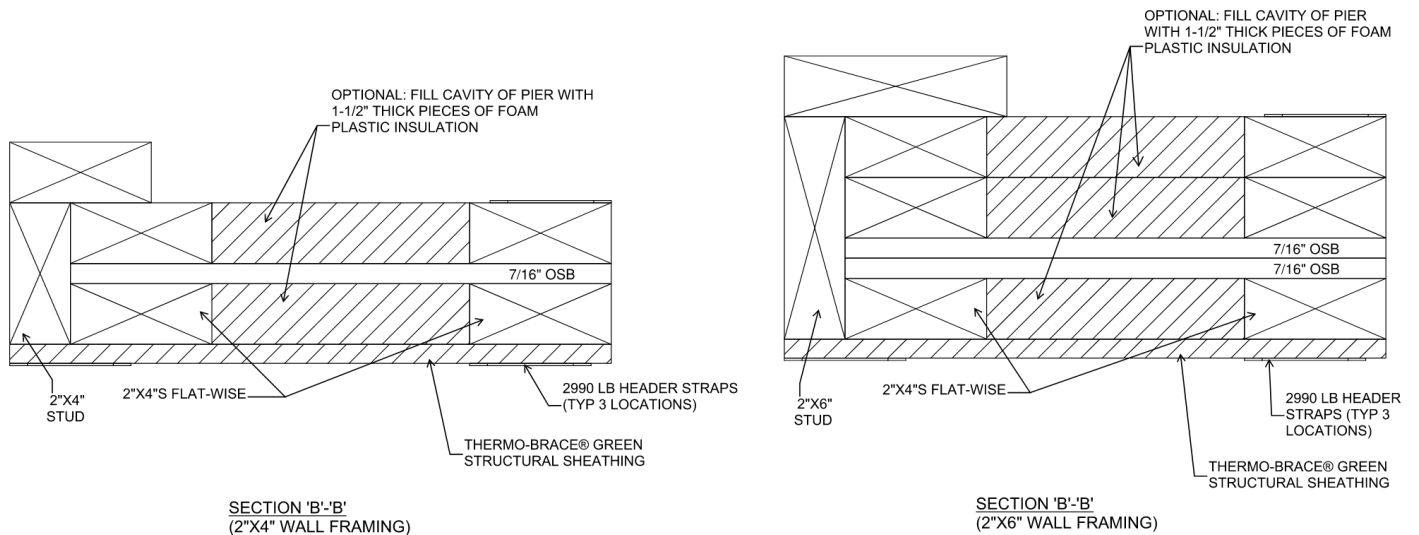


FIGURE 6. PFH SECTION B-B

**5.3.5 Alternative to Prescriptive IRC Bracing Applications:**

5.3.5.1 As an alternative to the requirements of Section 5.3.2 of this TER, the following provisions are permitted:

5.3.5.1.1 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 TER.

5.3.5.1.2 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.

5.3.5.1.3 Required braced wall panel lengths for Thermo-Brace® Green Structural Sheathing shall be as determined by the equivalency factor shown in Table 4 and IRC Section R602.10.3 and Tables R602.10.3(1-4), including all footnotes.

5.3.5.1.3.1 Bracing lengths in the *IRC* tables for the WSP or CS-WSP methods shall be multiplied by the equivalency factors listed in Table 4 below.

TABLE 4. BRACED WALL LINE LENGTH EQUIVALENCY FACTORS<sup>4,5</sup>

Product	Fastener	Fastener Spacing (edge:field) (in)	Maximum Stud <sup>1</sup> Spacing (in)	Gypsum Wallboard <sup>3</sup> (GWB)	GWB Fastening Spacing (edge:field) (in)	Equivalency Factors <sup>2</sup> to <i>IRC</i> WSP or CS-WSP
Thermo-Brace® Green	15/16" crown x 1 1/4" leg 16 ga. staple	3:3	16 o.c.	1/2" GWB	8:8	0.91

SI: 1" = 25.4 mm

- Factors based on SPF framing materials.
- Multiply the bracing lengths indicated for the WSP or CS-WSP continuous sheathing methods in IRC Table R602.10.3(1) and Table R602.10.3(3), and as modified by all applicable factors in IRC Tables 602.10.3(2) and Table R602.10.3(4), by the factors shown here to establish the required bracing length.
- Gypsum wallboard (blocked or unblocked) shall be installed according to the provisions listed in IRC Table R702.3.5. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 2.0 for gypsum fastened 8:8.
- These equivalency factors are valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
- 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 2 of this TER that are adopted into law and that the manufacturers 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.

5.3.5.1.3.2 The braced wall line length equivalency factors in Table 4 are based on equivalency testing and are used to comply with Method WSP and Method CS-WSP of the *IRC*.

5.3.5.1.3.3 Thermo-Brace® Green Structural Sheathing tested equivalency factors in Table 4 allow the user to determine the length of bracing required, by multiplying the factor from Table 4 by the length shown in the WSP or CS columns in IRC Table R602.10.3(1 and 3), as modified by all applicable factors in IRC Table R602.10.3(2 and 4), respectively.

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

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

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

5.3.6.1 Thermo-Brace® Green Structural Sheathing may be used to brace exterior walls of buildings as an equivalent alternative to Method 3 of the *IBC* when installed with blocked or unblocked 1/2" gypsum fastened with a minimum 5d cooler nail or #6 type W or S screw spaced a maximum of 16" o.c. at panel edges and 16" o.c. in the field. Bracing shall be in accordance with the conventional light-frame construction method of IBC Section 2308.6 and this TER.

5.3.7 *Performance-Based Wood-Framed Construction:*

- 5.3.7.1 Thermo-Brace® Green Structural Sheathing 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 5 and Table 6.
- 5.3.7.2 Thermo-Brace® Green Structural Sheathing shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in Table 5.

TABLE 5. ALLOWABLE STRESS DESIGN (ASD) CAPACITIES – WIND

Product	Joint Condition	Fastener <sup>1</sup>	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard <sup>2</sup> (GWB)	GWB Fastener Spacing (edge:field) (in)	Allowable Unit Shear Capacity (plf)
Thermo-Brace® Green	Butted or Lapped	15/16" crown x 1/4" leg 16 ga staple	3:3	16 o.c.	None	-	245
					1/2" GWB	8:8	395

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

1. Thermo-Brace® Green fasteners 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® surface.
2. Gypsum attached with minimum #6 type W or S screws 1 1/4" long or 5d cooler nails with a minimum edge distance of 3/8".

5.3.8 *Uplift Resistance:*

- 5.3.8.1 Thermo-Brace® Green Structural Sheathing panels are permitted to resist uplift load forces using the allowable uplift loads (in pounds per linear foot) set forth in Table 6.

TABLE 6. UPLIFT PERFORMANCE

Product	Maximum Stud Spacing (in)	Fastener <sup>2</sup>	Fastener Spacing (edge:field) (in)	Allowable Unit Uplift Capacity <sup>1</sup> (plf)
Thermo-Brace® Green: Single Bottom Plate	16 o.c.	15/16" crown x 1/4" leg 16 ga galvanized staples or 0.120" x 1 1/4" roofing nails	3:3	400

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

1. Gypsum wallboard on the back (interior) side of the wall
2. Staple crowns to be installed parallel to grain.

5.3.9 *Transverse Wind Loading:*

- 5.3.9.1 Thermo-Brace® Green Structural Sheathing panels are permitted to resist transverse wind load forces using the allowable transverse loads (in pounds per linear foot) set forth in Table 7 and Table 8.

TABLE 7. TRANSVERSE (OUT-OF-PLANE) WIND LOAD RESISTANCE

Product	Maximum Stud Spacing (in)	Fastener <sup>3</sup>	Fastener Spacing (edge:field) (in)	Allowable Design Value <sup>1,2</sup> (psf)
Thermo-Brace® Green	16 o.c.	15/16" crown x 1/4" leg 16 gage galvanized staples or 0.120" x 1 1/4" roofing nails	3:3	80

SI: 1" = 25.4 mm, 1 psf = 0.0479 kN/m<sup>2</sup>, 1 mph = 1.61 km/h

1. The ASD allowable uniform load capacities to be used for wind design are determined by dividing the ultimate uniform load capacities by an ASD reduction factor of 1.6, per *SDPWS* Section 3.2.1 for determining the ASD allowable uniform load capacity.
2. Design wind load capacity shall be in accordance with *IBC Section 1609.1.1*.
3. Staple crowns shall be installed parallel to grain.



TABLE 8. BASIC WIND SPEED FOR USE IN EXTERIOR WALL COVERING ASSEMBLIES

Product	Allowable Components & Cladding Basic Wind Speed <sup>1</sup> (mph)	
	ASCE 7-05 ( $V_{asd}$ )	ASCE 7-10 and 7-16 ( $V_{ult}$ )
Thermo-Brace® Green	155	200

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, 10 sq. ft. effective wind area, Zone 5. See the applicable building code for any adjustment needed for specific building location and configuration.

5.4 *Water-Resistive Barrier*

- 5.4.1 Thermo-Brace® Green Structural Sheathing may be used as a WRB as prescribed in IBC Section 1403.2<sup>7</sup> and IRC Section R703.2 when installed on exterior walls as described in Section 5.4 of this TER.
- 5.4.2 Thermo-Brace® Green Structural Sheathing shall be installed with board joints placed directly over exterior framing spaced a maximum of 16" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.
- 5.4.3 Where seams and joints between boards overlap nominally ¾" (19 mm) and are fastened in accordance with Section 6, seam tape is not required for approval as a WRB.
- 5.4.4 Where seams and joints between boards are butt jointed, they shall be sealed with Barricade® Seam Tape or equivalent in accordance with Section 6. A slight gap of approximately 1/8" between panels is allowed.
- 5.4.5 A separate WRB system may also be provided. If a separate WRB system is used, taping of the sheathing joints is not required.
- 5.4.6 Flashing must be installed at all sheathing penetrations and shall comply with all applicable code sections.

5.5 *Air Barrier*

- 5.5.1 Thermo-Brace® Green Structural Sheathing may be used as an air barrier material as prescribed in IRC Section N1102.4.1.1 and IECC Section R402.4.1.1 and IECC Section C402.5.1.1 in accordance with ASTM E2178.

5.6 *Draftstop*

- 5.6.1 Thermo-Brace® Green Structural Sheathing may be used as a draftstop material in accordance with IBC Section 708.4.2, Section 718.3, and Section 718.4 and IRC Section R302.12.
- 5.6.2 When installed as of a draftstop, Thermo-Brace® Green Structural Sheathing shall be installed in accordance with Section 6.

5.7 *Surface Burn Characteristics*

- 5.7.1 Thermo-Brace® Green Structural Sheathing may be used as a Class C interior finish material in accordance with IBC Section 803.1.2<sup>8</sup> and IRC Section R302.9.
- 5.7.2 Thermo-Brace® Green Structural Sheathing have flame spread characteristics shown in Table 9.

TABLE 9. SURFACE BURN CHARACTERISTICS

Product <sup>1</sup>	Flame Spread	Smoke Developed
Thermo-Brace® Green	< 200	< 450

1. Tested in accordance with ASTM E84

<sup>7</sup> 2015 IBC Section 1404.2

<sup>8</sup> 2015 IBC Section 803.1.1



## 5.8 *Minimum Fastening Requirements for Non-Structural Applications*

- 5.8.1 Where other means of wall bracing are provided, or are not required, any grade of Thermo-Brace® Structural Sheathing may be used to provide other wall functions, when installed in accordance with this section.
- 5.8.1.1 The sheathing panels are applied to wall framing with 16 ga galvanized staples having a  $1^{5/16}$ " crown and  $1^{1/4}$ " leg lengths.
- 5.8.1.2 Fastener spacing shall be a maximum of 6" o.c in the field and 3" o.c. around the perimeter.
- 5.8.1.3 Stud spacing shall be a maximum of 16" o.c.
- 5.8.1.4 Minimum fastener penetration into the framing members is 1".
- 5.8.1.5 Fasten all staples parallel to the framing member, with an edge spacing of  $3/8$ " (9.5 mm).
- 5.8.1.6 All panels are vertically or horizontally installed with all joints backed by studs, plates, or blocks when water or air barrier functionality is desired.
- 5.8.1.7 When used as a WRB, joints shall overlap nominally  $3/4$ " (19.1 mm), or be butted and covered with Barricade® Seam Tape or equivalent. Overlapped joints are not required to be covered with Barricade® Seam Tape.

## 6 INSTALLATION

- 6.1 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.
- 6.2 Basic instructions are printed on every Thermo-Brace® pallet or insert.
- 6.3 *Orientation*
- 6.3.1 Thermo-Brace® Green Structural Sheathing may be installed in either the vertical or the horizontal orientation. To be recognized for the structural values listed in this TER, or as a water barrier, all joints must be backed by studs, plates, or blocks and fastened.
- 6.4 *Fastener Type*
- 6.4.1 *Thermo-Brace® Green Structural Sheathing:*
- 6.4.1.1 Minimum  $1^{5/16}$ " crown x  $1^{1/4}$ " leg, 16 ga., galvanized staples shall be installed per the staple manufacturer's instructions.
- 6.4.1.2 Where permitted in Section 5, 0.120" x  $1^{1/4}$ " roofing nails shall be installed per the nail manufacturer's instructions.
- 6.4.1.3 Fasteners shall be driven such that the head of the fastener is in contact with the surface of the Thermo-Brace® Structural Sheathing. Do not overdrive fasteners.
- 6.4.2 *Gypsum Wallboard:*
- 6.4.2.1 Where required, gypsum wallboard shall be a minimum  $1/2$ " thickness and shall be attached with one of the following:
- 6.4.2.1.1 #6 x  $1^{1/4}$ " type W or S screws
- 6.4.2.1.2 5d cooler nails
- 6.5 *Fastener Edge Distance*
- 6.5.1 Fasteners shall be installed with a nominal edge distance of  $3/8$ " (9.5 mm) for Thermo-Brace® Green Structural Sheathing and gypsum.

## 6.6 Treatment of Joints

- 6.6.1 Thermo-Brace® Green Structural Sheathing joints may be either butted or overlapped.
  - 6.6.1.1 Butted joints shall be placed over framing members and fastened with a single row of fasteners at each panel edge. A slight gap of approximately  $\frac{1}{8}$ " between panels is allowed. Seal butted seams with Barricade® Seam Tape or equivalent when finished attaching the wall panels and all fasteners in the wall line.
  - 6.6.1.2 Lapped joints shall be overlapped by nominally  $\frac{3}{4}$ " (19 mm) and fastened with a single row of fasteners. Always run staples parallel with framing. Overlapped joints do not require Barricade® Seam Tape.
- 6.6.2 Thermo-Brace® Green Structural Sheathing 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's installation instructions.

## 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 load testing in accordance with *ASTM E2126*
  - 7.1.2 Transverse load testing in accordance with *ASTM E330*
  - 7.1.3 Uplift load testing in accordance with *ASTM E72*
  - 7.1.4 Water-resistive barrier testing in accordance with *ASTM E331*
  - 7.1.5 Air barrier material testing in accordance with *ASTM E2178*
  - 7.1.6 Flame spread and smoke developed ratings in accordance with *ASTM E84*
- 7.2 Information contained herein is the result of testing and/or data analysis by sources which conform to IBC Section 1703 and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.
- 7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through state or local adoption of codes and standards. The providers of the codes and standards are legally responsible for their content. DrJ analysis may use code-adopted provisions as a control sample. A control sample versus a test sample establishes a product as being equivalent to that prescribed in this code in quality, *strength*, effectiveness, *fire resistance*, durability, and safety. Where the accuracy of the provisions provided herein is reliant upon the published properties of materials, DrJ relies upon the grade mark, grade stamp, mill certificate, and/or test data provided by material suppliers to be minimum properties. DrJ analysis relies upon these properties to be accurate.

## 8 FINDINGS

- 8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:
  - 8.1.1 Lateral load resistance due to wind loads carried by shear walls
  - 8.1.2 Use as equivalent to the CS-PF as described in IRC Section R602.10.5 and Section R602.10.6.4
  - 8.1.3 Use as an equivalent alternative to Method PFH as described in IRC Section R602.10.6.2
  - 8.1.4 Transverse load resistance due to components and cladding pressures on building surfaces
  - 8.1.5 Uplift load resistance due to wind uplift loads carried by the walls
  - 8.1.6 Performance for use as a WRB in accordance with IBC Section 1403.2<sup>9</sup> and IRC Section R703.2
  - 8.1.7 Performance for use as an air barrier in accordance with IRC Section N1102.4.1.1 and IECC Section R402.4.1.1 and IECC Section C402.5.1.1

<sup>9</sup> 2015 IBC Section 1404.2



- 8.1.8 Performance for use as a draftstop in accordance with IBC Section 708.4.2, Section 718.3, and Section 718.4 and IRC Section R302.12
- 8.1.9 Performance for use as a Class C interior finish material in accordance with IBC Section 803.1.2<sup>10</sup> and IRC Section R302.9.
- 8.2 Building codes require data from valid research reports be obtained from approved sources (i.e., licensed registered design professionals [RDPs]).
  - 8.2.1 Building official approval of a licensed RDP is performed by verifying the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.
- 8.3 Agencies who are accredited through ISO/IEC 17065 have met the code requirements for approval by the building official. DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131 and employs RDPs.
- 8.4 Through ANAB accreditation and the IAF MLA, DrJ certification 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.”
- 8.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10<sup>11</sup> are similar) 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*.

## 9 CONDITIONS OF USE

- 9.1 Thermo-Brace® Green Structural Sheathing shall not be used as a nailing base for claddings, trim, windows, and doors. Fastening through the Thermo-Brace® Green Structural Sheathing into the framing is acceptable.
- 9.2 Walls sheathed with Thermo-Brace® Green Structural Sheathing shall not be used to resist horizontal loads from concrete and masonry walls.
- 9.3 When Thermo-Brace® Green Structural Sheathing is installed as a wall sheathing but is not installed per structural requirements, light-framed walls shall be braced by other means. When used as a WRB, installation shall be in accordance with Section 5.4.
  - 9.3.1 When Thermo-Brace® Structural Sheathing is not installed as a WRB, other means of providing a WRB shall be required, as per the code.
- 9.4 When used in accordance with the *IBC* in high wind areas, special inspections shall comply with IBC Section 1705.12<sup>12</sup>.
- 9.5 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
  - 9.5.1 Allowable shear loads shall not exceed values in Table 5 for wind loads.
  - 9.5.2 Allowable uplift loads shall not exceed values in Table 6.
  - 9.5.3 Transverse design loads shall not exceed those described in Table 7 and Table 8, unless an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing.
- 9.6 Where required by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

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<sup>10</sup> 2015 IBC Section 803.1.1

<sup>11</sup> 2018 IFC Section 104.9

<sup>12</sup> 2018 IBC Section 1705.11



- 9.7 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.8 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 (e.g., owner or RDP).
- 9.9 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.10 This product has an internal quality control program and a third-party quality assurance program in accordance with IBC Section 104.4 and Section 110.4 and IRC Section R104.4 and Section R109.2.
- 9.11 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.
- 9.12 This TER shall be reviewed for code compliance by the AHJ in concert with IBC Section 104.
- 9.13 The implementation of this TER for this product is dependent on the design, quality control, third-party quality assurance, proper implementation of installation instructions, inspections required by IBC Section 110.3, and any other code or regulatory requirements that may apply.

## 10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at [barricadebp.com](http://barricadebp.com).

## 11 REVIEW SCHEDULE

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit [drjcertification.org](http://drjcertification.org).
- 11.2 For information on the current status of this TER, contact [DrJ Certification](http://DrJ Certification).



Issue Date: June 24, 2021  
Subject to Renewal: July 1, 2023

## FBC Supplement to TER 1507-07

REPORT HOLDER: Barricade® Building Products

### 1 EVALUATION SUBJECT

1.1 Thermo-Brace® Green Structural Sheathing

### 2 PURPOSE AND SCOPE

#### 2.1 Purpose

2.1.1 The purpose of this Technical Evaluation Report (TER) supplement is to show Thermo-Brace® Green Structural Sheathing, recognized in TER 1507-07, 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—17, 20: Florida Building Code – Building*
- 2.2.2 *FBC-R—17, 20: Florida Building Code – Residential*
- 2.2.3 *FBC-EC—17, 20: Florida Building Code – Energy Conservation*

### 3 CONCLUSIONS

- 3.1 Thermo-Brace® Green Structural Sheathing, described in TER 1507-07, complies with the *FBC-B*, *FBC-R*, and *FBC-EC* and is subject to the conditions of use described in this supplement.
- 3.2 Where there are variations between the *IBC*, *IRC*, and *IECC* and the *FBC-B*, *FBC-R*, and *FBC-EC* 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, Section R109, Section R602.10, Section R602.10.3, Table R602.10.3(1), Table R602.10.3(2), Table R602.10.3(3), Table R602.10.3(4), Section R602.10.4, Table R602.10.5, and Section R602.10.6.4 are reserved.
  - 3.2.3 *FBC-R* Section N1101 replaces *IRC* Section N1102.4.1.1.
  - 3.2.4 *FBC-B* Section 708.4 replaces *IBC* Section 708.4.2.
  - 3.2.5 *FBC-B* Section 803.1.1 replaces *IBC* Section 803.1.2.
  - 3.2.6 *FBC-B* Section 2308 replaces *IBC* Section 2308.6 and is reserved.
  - 3.2.7 *FBC-B* Section 1404.2 replaces *IBC* Section 1403.2.
  - 3.2.8 *FBC-B* Section 1705 replaces both *IBC* Section 1705.12 and Section 1705.11 and is reserved.

### 4 CONDITIONS OF USE

- 4.1 Thermo-Brace® Green Structural Sheathing, described in TER 1507-07, must comply with all of the following conditions:
  - 4.1.1 All applicable sections in TER 1507-07
  - 4.1.2 The design, installation, and inspections are in accordance with additional requirements of *FBC-B* Chapter 16 and Chapter 17, as applicable.