Owens Corning Foamular® SWP **TER No. 1502-04**

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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 20 00 – Thermal Protection
Section: 07 21 00 – Thermal Insulation
Section: 07 25 00 – Water-Resistive Barriers/Weather Barriers

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1. Products Evaluated:

1.1. Owens Corning Foamular® SWP

1.1. For the most recent version of this Technical Evaluation Report (TER), visit drjengineering.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjengineering.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.

1.2. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found here) and covered by an IAF MLA Evaluation per the Purpose of the MLA (as an example, see letter to ANSI from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other IAF MLA Signatory Countries and have their products readily approved by authorities having jurisdiction using DrJ's ANSI accreditation.

1.3. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements, such as those found in *IBC* Section 1703. Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI's scope of accreditation. For a list of accredited agencies, visit ANSI's website. For more information, see drjcertification.org.

DrJ is a Professional Engineering Approved Source

Learn more about DrJ's Accreditation

- DrJ is an ISO/IEC 17065 accredited product certification body through ANSI Accreditation Services.
- DrJ provides certified evaluations that are signed and sealed by a P.E.
- DrJ's work is backed up by professional liability insurance.
- DrJ is fully compliant with *IBC* Section 1703.

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1.4. Requiring an evaluation report from a specific private company (i.e. ICC-ES, IAPMO, CCMC, DrJ, etc.) can be viewed as discriminatory and is a violation of international, federal, state, provincial and local anti-trust and free trade regulations.

1.5. DrJ's code compliance work:

1.5.1. Conforms to code language adopted into law by individual states and any relevant consensus based standard such as an ANSI or ASTM standard.

1.5.2. Complies with accepted engineering practice, all professional engineering laws and by providing an engineer's seal DrJ takes professional responsibility for its specified scope of work.

2. Applicable Codes and Standards:[1]

2.1. *2012, 2015* and *2018 International Residential Code* (*IRC*)

2.2. *2012, 2015* and *2018 International Building Code* (*IBC*)

2.3. *2012, 2015* and *2018 International Energy Conservation Code* (*IECC*)

2.4. *ASCE 7 – Minimum Design Loads for Buildings and Other Structures*

2.5. *AWC Wind & Seismic – Special Design Provisions for Wind and Seismic* (*SDPWS*)

2.6. *ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*

2.7. *ASTM E72 –Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*

2.8. *ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials*

2.9. *ASTM E283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

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

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

2.12. *ASTM E564 – Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

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

3. Performance Evaluation:

3.1. Foamular® SWP was evaluated to determine:

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, and the *IRC* Continuous Wall Bracing provisions of *IRC* Section R602.10.4, method CS-WSP (Continuous Sheathed Wood Structural Panel) and CS-PF (Continuous Sheathed Portal Frame).

3.1.2. Structural performance under lateral load conditions (wind and seismic) for use as an alternative to the *IBC* Conventional Wall Bracing provisions, Section 2308.6.3[2], Method WSP, for Type V construction.

3.1.3. Structural performance under lateral load conditions (wind and seismic) for use with the *IBC* performance-based provisions, Section 2306.1 and 2306.3 for light-frame wood wall assemblies.

3.1.3.1. Table 5 provides seismic design coefficients (SDC) that conform to the requirements in *ASCE 7-10* 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).

3.1.3.2. The basis for equivalency testing is outlined in Section 12.2.1 of *ASCE 7*:

[1] Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2018 version of the codes and the standards referenced therein, including, but not limited to, *ASCE 7*, *SDPWS* and *WFCM*. This product also complies with the 2000-2015 versions of the *IBC* and *IRC* and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any see Section 8.

[2] *2012 IBC* Section 2308.9.3

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Seismic force-resisting systems not contained in Table 12.2-1 are permitted provided analytical and test data are submitted to the authority having jurisdiction for approval that establish their dynamic characteristics and demonstrate their lateral force resistance and energy dissipation capacity to be equivalent to the structural systems listed in Table 12.2-1 for equivalent values of response modification coefficient, R, overstrength factor, Ω_o, and deflection amplification factor, C_d.

3.1.3.2.1. The SDC evaluation uses the approach found in documentation entitled "Equivalency Characteristics and Parameters for Proprietary Shear Walls Used in Wood Framed or Cold-formed Steel Construction"[3] using code-defined accepted engineering procedures, experience and technical judgment.

3.1.4. Structural performance under lateral load conditions (wind and seismic) with respect to the use of the ProPink ComfortSeal™ Framing Gasket.

3.1.5. Resistance to uplift loads for wall assemblies used in light-frame wood construction in accordance with *IRC* Section R602.3.5 and *IBC* Section 1604.8.1, 2304.10[4], 2304.10.3[5] and 2308.7.5[6].

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

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

3.1.8. Performance of the foam plastic component of Foamular® SWP for conformance to *IRC* Section R316 and *IBC* Section 2603.

3.1.9. Performance for use as insulating sheathing in accordance with *IRC* Section N1102.1 and N1102.2 and *IECC* Section C402.

3.1.10. Performance for use as a water-resistive barrier (WRB) in accordance with *IRC* Section R703.2 and *IBC* Section 1404.2.

3.1.11. Performance for use as an air barrier material in accordance with *IRC* Section N1102.4 and *IECC* Section C402.

3.1.12. Performance for use without a thermal barrier in accordance with *IRC* Section R316.5.3 and R316.5.4 and *IBC* Section 2603.4.1.6.

3.1.13. Performance for use as non-structural in-fill on those portions of a wall assembly not otherwise designed as part of a braced wall panel or shear wall.

3.2. Use of Foamular® SWP in a portal frame with hold-downs (PFH) is beyond the scope of this TER.

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

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[3] www.structuremag.org
[4] *2012 IBC* Section 2304.9.7
[5] *2012 IBC* Section 2304.9.3
[6] *2012 IBC* Section 2308.10.1

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4. Product Description and Materials:



Figure 1: Foamular® SWP

4.1. Foamular® SWP is a wall sheathing panel consisting of a proprietary foam plastic insulating sheathing (FPIS) adhered to a fibrous sheathing board layer.

4.1.1. The proprietary fibrous sheathing board is a laminated board made of fibered, specially treated plies that are pressure-laminated with a water-resistant adhesive. The surface finish consists of a film or facer on one or both sides.

4.1.2. The FPIS layer consists of Owens Corning extruded polystyrene (XPS) insulation board complying with *ASTM C578* Type X.

4.1.2.1. 1" Foamular® 150

4.1.2.2. ½" Foamular® Half Inch

4.1.3. Foamular® SWP Material Availability

4.1.3.1. Thickness:

4.1.3.1.1. Nominal 1" (25 mm)

4.1.3.1.2. Nominal ½" (12.7 mm)

4.1.3.2. Standard product width: 48" (1219 mm)

4.1.3.3. Standard lengths: 96" (2438 mm), 108" (2743 mm), and 120" (3048 mm)

4.2. ProPink ComfortSeal™ Framing Gasket is a $^{3}/_{16}$" thick, compressive polyethylene foam gasket specifically designed to minimize air leakage into the wall assembly.

5. Applications:

5.1. General

5.1.1. Foamular® SWP is used as structural insulated wall sheathing in buildings constructed in accordance with the *IRC and IBC* to provide:

5.1.1.1. Lateral load resistance (wind and seismic) for braced wall panels used in wood construction.

5.1.1.2. Resistance to transverse loads for wall assemblies used in wood construction.

5.1.1.3. Resistance to uplift loads for wall assemblies used in wood construction.

5.1.2. Foamular® SWP contains foam plastics complying with *IRC* Section R316 and *IBC* Section 2603.

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5.1.3. When Foamular® SWP are installed with sheathing seams sealed with Owens Corning HomeSealR™ Foam Joint Tape or JointSealR® Foam Joint Tape, they are an approved WRB in accordance with *IRC* Section R703.2 and *IBC* Section 1404.2. See the manufacturer's product information for further details.

5.1.3.1. Where the Foamular® SWP joints are not taped, a separate WRB shall be installed in accordance with the WRB manufacturer's installation instructions.

5.1.4. Walls constructed with Foamular® SWP are used to meet air barrier requirements in accordance with *IRC* Section N1102.4 and *IECC* Section C402 when all seams are taped, including the top and bottom of the walls in accordance with the manufacturer's installation instructions and this TER.

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

5.2. Structural Applications

5.2.1. General Provisions

5.2.1.1. Except as otherwise described in this TER, Foamular® SWP shall be installed in accordance with the applicable building codes listed in Section 2 using the provisions set forth therein for the design and installation of wood structural panels (WSP).

5.2.1.1.1. Foamular® SWP 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.

5.2.1.2. Anchorage for in-plane shear shall be provided to transfer the induced shear force into and out of each shear wall.

5.2.1.2.1. For wind design, anchor bolt spacing shall not exceed 6' o.c.

5.2.1.2.2. For seismic design, anchor bolt spacing shall not exceed 4' o.c.

5.2.1.3. The maximum aspect ratio for Foamular® SWP shall be 4:1.

5.2.1.4. The minimum full height panel width shall be 24".

5.2.1.5. Maximum stud spacing shall be 16" o.c.

5.2.1.6. All panel edges shall be blocked with a minimum 2" nominal lumber.

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

5.2.2. Prescriptive *IRC* Bracing Applications

5.2.2.1. Foamular® SWP 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.

5.2.2.2. For wind design, required braced wall panel lengths for nominal ½" Foamular® SWP shall be as shown in Table 1 and required braced wall panel lengths for nominal 1" Foamular® SWP shall be as shown in Table 2, and shall be used in conjunction with *IRC* Table R602.10.3(2)[7], which provides the required adjustments.

[7] *2009 IRC* Table R602.10.1.2(1), including all footnotes

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Required Bracing Lengths; Nominal ½" Foamular® SWP Installed with ½" Gypsum Wallboard @ 16" o.c. Stud Spacing (2x4 or 2x6 Studs) – Wind											
Condition	Braced Wall Line Spacing (ft.)	Intermittent Sheathing					Continuous Sheathing				
		Staples 3" o.c. Edges & 3" o.c. in the Field					Staples 3" o.c. Edges & 3" o.c. in the Field				
		Length of Wall Line to be Braced (ft.)					Length of Wall Line to be Braced (ft.)				
		≤ 110 mph	≤ 115 mph	≤ 120 mph	≤ 130 mph	≤ 140 mph	≤ 110 mph	≤ 115 mph	≤ 120 mph	≤ 130 mph	≤ 140 mph
One Story or Top of Two Stories or Top of Three Stories	10	1.6	1.6	2.0	2.0	2.4	1.2	1.6	1.6	2.0	2.0
	20	2.8	2.8	3.2	4.0	4.4	2.4	2.8	2.8	3.2	4.0
	30	4.0	4.4	4.8	5.6	6.4	3.6	3.6	4.0	4.8	5.6
	40	5.2	5.6	6.4	7.2	8.4	4.4	4.8	5.2	6.0	7.2
	50	6.4	7.2	7.6	8.8	10.4	5.6	6.0	6.4	7.6	8.8
	60	7.6	8.4	9.2	10.4	12.0	6.4	7.2	7.6	8.8	10.4
First Story of Two Stories or Second Story of Three Stories	10	2.8	3.2	3.6	4.0	4.8	2.4	2.8	2.8	3.6	4.0
	20	5.2	6.0	6.4	7.6	8.8	4.4	5.2	5.6	6.4	7.2
	30	7.6	8.4	9.2	10.8	12.4	6.4	7.2	7.6	9.2	10.4
	40	10.0	10.8	12.0	14.0	16.0	8.4	9.2	10.0	12.0	13.6
	50	12.4	13.2	14.4	17.2	19.6	10.4	11.2	12.4	14.4	16.8
	60	14.4	16.0	17.2	20.0	23.2	12.4	13.6	14.8	17.2	20.0
First Story of Three Stories	10	4.4	4.8	5.2	6.0	6.8	3.6	4.0	4.4	5.2	6.0
	20	8.0	8.8	9.2	10.8	12.8	6.8	7.2	8.0	9.2	10.8
	30	11.2	12.4	13.6	15.6	18.4	9.6	10.4	11.6	13.6	15.6
	40	14.8	16.0	17.6	20.4	23.6	12.4	13.6	14.8	17.6	20.0
	50	18.0	19.6	21.6	25.2	29.2	15.2	16.8	18.4	21.2	24.8
	60	21.2	23.2	25.6	30.0	34.4	18.4	20.0	21.6	25.2	29.2

1. This table is applicable to walls constructed with nominal ½" SWP installed with or without the ProPink ComfortSeal™ Framing Gasket
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, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
3. Demonstrates equivalency to *IRC* Table R602.10.1.2(1). All adjustment factors from *IRC* Table R602.10.1.2(1) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5.
5. Bracing lengths are the result of comparative equivalency testing and analysis using both tested and published 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 these 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.

Table 1: Required Bracing Lengths for Nominal ½" Foamular® SWP in Accordance with the *IRC* Wind Bracing Provisions

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Required Bracing Lengths; Nominal 1" Foamular® SWP Installed with ½" Gypsum Wallboard @ 16" o.c. Stud Spacing (2x4 or 2x6 Studs) – Wind											
Condition	Braced Wall Line Spacing (ft.)	Intermittent Sheathing					Continuous Sheathing				
		Staples 3" o.c. Edges & 3" o.c. in the Field					Staples 3" o.c. Edges & 3" o.c. in the Field				
		Length of Wall Line to be Braced (ft.)					Length of Wall Line to be Braced (ft.)				
		≤ 110 mph	≤ 115 mph	≤ 120 mph	≤ 130 mph	≤ 140 mph	≤ 110 mph	≤ 115 mph	≤ 120 mph	≤ 130 mph	≤ 140 mph
One Story or Top of Two Stories or Top of Three Stories	10	1.9	1.9	2.4	2.4	2.8	1.4	1.9	1.9	2.4	2.4
	20	3.3	3.3	3.8	4.7	5.2	2.8	3.3	3.3	3.8	4.7
	30	4.7	5.2	5.6	6.6	7.5	4.2	4.2	4.7	5.6	6.6
	40	6.1	6.6	7.5	8.5	9.9	5.2	5.6	6.1	7.1	8.5
	50	7.5	8.5	8.9	10.3	12.2	6.6	7.1	7.5	8.9	10.3
	60	8.9	9.9	10.8	12.2	14.1	7.5	8.5	8.9	10.3	12.2
First Story of Two Stories or Second Story of Three Stories	10	3.3	3.8	4.2	4.7	5.6	2.8	3.3	3.3	4.2	4.7
	20	6.1	7.1	7.5	8.9	10.3	5.2	6.1	6.6	7.5	8.5
	30	8.9	9.9	10.8	12.7	14.6	7.5	8.5	8.9	10.8	12.2
	40	11.8	12.7	14.1	16.5	18.8	9.9	10.8	11.8	14.1	16.0
	50	14.6	15.5	16.9	20.2	23.0	12.2	13.2	14.6	16.9	19.7
	60	16.9	18.8	20.2	23.5	27.3	14.6	16.0	17.4	20.2	23.5
First Story of Three Stories	10	5.2	5.6	6.1	7.1	8.0	4.2	4.7	5.2	6.1	7.1
	20	9.4	10.3	10.8	12.7	15.0	8.0	8.5	9.4	10.8	12.7
	30	13.2	14.6	16.0	18.3	21.6	11.3	12.2	13.6	16.0	18.3
	40	17.4	18.8	20.7	24.0	27.7	14.6	16.0	17.4	20.7	23.5
	50	21.2	23.0	25.4	29.6	34.3	17.9	19.7	21.6	24.9	29.1
	60	24.9	27.3	30.1	35.3	40.4	21.6	23.5	25.4	29.6	34.3

1. This table is applicable to walls constructed with nominal 1" SWP installed with or without the ProPink ComfortSeal™ Framing Gasket
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, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
3. Demonstrates equivalency to *IRC* Table R602.10.1.2(1). All adjustment factors from *IRC* Table R602.10.1.2(1) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 types W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.6.
5. Bracing lengths are the result of comparative equivalency testing and analysis using both tested and published 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 these 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.

Table 2: Required Bracing Lengths for Nominal 1" Foamular® SWP in Accordance with the *IRC* Wind Bracing Provisions

5.2.2.3. For seismic design, required braced wall panel lengths for nominal ½" Foamular® SWP shall be as shown in Table 3 and required braced wall panel lengths for nominal 1" Foamular® SWP shall be as shown in Table 4, and shall be used in conjunction with *IRC* Table R602.10.3(4)[8], which provides the required adjustments.

5.2.2.4. 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.

[8] *2009 IRC* Table R602.10.1.2(2), including all footnotes

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Required Bracing Lengths; Nominal ½" Foamular® SWP Installed with ½" Gypsum Wallboard @ 16" o.c. Stud Spacing (2x4 or 2x6 Studs) – Seismic									
Condition	Braced Wall Line length (ft.)	Intermittent Sheathing				Continuous Sheathing			
		Staples 3" o.c. Edges & 3" o.c. in the Field				Staples 3" o.c. Edges & 3" o.c. in the Field			
		Minimum Length of Braced Wall Panels Required Along Each Braced Wall Line (ft.)				Minimum Length of Braced Wall Panels Required Along Each Braced Wall Line (ft.)			
		SDC C (townhouses only)	SDC D_0	SDC D_1	SDC D_2	SDC C (townhouses only)	SDC D_0	SDC D_1	SDC D_2
One Story or Top of Two Stories or Top of Three Stories	10	1.3	1.4	1.6	2.0	1.1	1.3	1.4	1.7
	20	2.5	2.9	3.2	4.0	2.2	2.4	2.7	3.4
	30	3.9	4.3	4.8	6.0	3.3	3.7	4.1	5.1
	40	5.1	5.7	6.4	8.0	4.3	4.9	5.5	6.8
	50	6.4	7.2	8.0	10.0	5.5	6.1	6.8	8.5
First Story of Two Stories or Second Story of Three Stories	10	2.4	3.0	3.6	4.4	2.1	2.5	3.0	3.8
	20	4.8	6.0	7.2	8.8	4.1	5.1	6.1	7.5
	30	7.2	9.0	10.8	13.2	6.1	7.7	9.2	11.2
	40	9.6	12.0	14.4	17.6	8.2	10.2	12.2	15.0
	50	12.0	15.0	18.0	22.0	10.2	12.8	15.3	18.7
First Story of Three Stories	10	3.6	4.2	4.8	NP	3.0	3.6	4.1	NP
	20	7.2	8.4	9.6	NP	6.1	7.2	8.2	NP
	30	10.8	12.6	14.4	NP	9.2	10.7	12.2	NP
	40	14.4	16.8	19.2	NP	12.2	14.3	16.3	NP
	50	18.0	21.0	24.0	NP	15.3	17.8	20.4	NP

1. NP = Not Permitted.
2. This table is applicable to walls constructed with nominal ½" SWP installed with or without the ProPink ComfortSeal™ Framing Gasket
3. 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 ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Demonstrates equivalency to *IRC* Table R602.10.1.2(2). All adjustment factors from *IRC* Table R602.10.1.2(2) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
5. Tabulated bracing lengths are based on the following:
   a. Soil Class D
   b. Wall height = 10'
   c. 10 psf floor dead load
   d. 15 psf roof/ceiling dead load
   e. Braced wall line spacing ≤ 25'
6. Linear interpolation is permitted.
7. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5.
8. Bracing lengths are the result of comparative equivalency testing and analysis using both tested and published 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 these 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.

Table 3: Required Bracing Lengths for nominal ½" Foamular® SWP in Accordance with the *IRC* Seismic Bracing Provisions

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Required Bracing Lengths; Nominal 1" Foamular® SWP Installed with min. ½" Gypsum Wallboard @ 16" o.c. Stud Spacing (2x4 or 2x6 Studs) – Seismic									
Condition	Braced Wall Line length (ft.)	Intermittent Sheathing				Continuous Sheathing			
		Staples 3" o.c. Edges & 3" o.c. in the Field				Staples 3" o.c. Edges & 3" o.c. in the Field			
		Minimum Length of Braced Wall Panels Required Along Each Braced Wall Line (ft.)				Minimum Length of Braced Wall Panels Required Along Each Braced Wall Line (ft.)			
		SDC C (townhouses only)	SDC D_0	SDC D_1	SDC D_2	SDC C (townhouses only)	SDC D_0	SDC D_1	SDC D_2
One Story or Top of Two Stories or Top of Three Stories	10	1.6	1.7	1.9	2.3	1.3	1.6	1.6	2.0
	20	3.0	3.4	3.8	4.7	2.5	2.9	3.2	4.0
	30	4.5	5.1	5.6	7.1	3.9	4.3	4.8	6.0
	40	6.0	6.8	7.5	9.4	5.1	5.8	6.4	8.0
	50	7.5	8.4	9.4	11.7	6.4	7.2	8.0	10.0
First Story of Two Stories or Second Story of Three Stories	10	2.8	3.5	4.2	5.2	2.4	3.0	3.5	4.4
	20	5.6	7.1	8.4	10.3	4.8	6.0	7.2	8.9
	30	8.4	10.6	12.7	15.5	7.2	9.0	10.8	13.2
	40	11.3	14.1	16.9	20.7	9.6	12.0	14.4	17.6
	50	14.1	17.7	21.1	25.9	12.0	15.1	17.9	22.0
First Story of Three Stories	10	4.2	5.0	5.6	NP	3.5	4.2	4.8	NP
	20	8.4	9.9	11.3	NP	7.2	8.4	9.6	NP
	30	12.7	14.8	16.9	NP	10.8	12.6	14.4	NP
	40	16.9	19.7	22.6	NP	14.4	16.8	19.2	NP
	50	21.1	24.7	28.2	NP	17.9	20.9	24.0	NP

1. NP = Not Permitted.
2. This table is applicable to walls constructed with nominal 1" SWP installed with or without the ProPink ComfortSeal™ Framing Gasket
3. 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 ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. Demonstrates equivalency to *IRC* Table R602.10.1.2(2). All adjustment factors from *IRC* Table R602.10.1.2(2) shall be applied. Except when used with method CS-PF, a minimum of ½" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a minimum 5d cooler nails or 1¼" #6 type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
5. Tabulated bracing lengths are based on the following:
   a. Soil Class D
   b. Wall height = 10'
   c. 10 psf floor dead load
   d. 15 psf roof/ceiling dead load
   e. Braced wall line spacing ≤ 25'
6. Linear interpolation is permitted.
7. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.6.
8. Bracing lengths are the result of comparative equivalency testing and analysis using both tested and published 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 these 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.

Table 4: Required Bracing Lengths for Nominal 1" Foamular® SWP in Accordance with the *IRC* Seismic Bracing Provisions

5.2.3. Foamular® SWP CS-PF Portal Frame

5.2.3.1. A "Foamular® SWP CS-PF" was tested and evaluated for equivalency to the *IRC* Method CS-PF in accordance with *IRC* Section R602.10.6.4 and Table R602.10.5.

5.2.3.2. *IRC* Table R602.10.5 establishes the contributing length bracing of the CS-PF as equivalent to its actual length and that it contributes this length of bracing to that required by method CS-WSP.

5.2.3.3. The capacity of the Foamular® SWP CS-PF exceeds the capacity of the *IRC* Method CS-WSP and is therefore permitted to be substituted for an equivalent length of bracing.

5.2.3.4. Nominal ½" or 1" SWP may be used in the construction of the CS-PF.

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5.2.3.5. The Foamular® SWP CS-PF is described as follows:

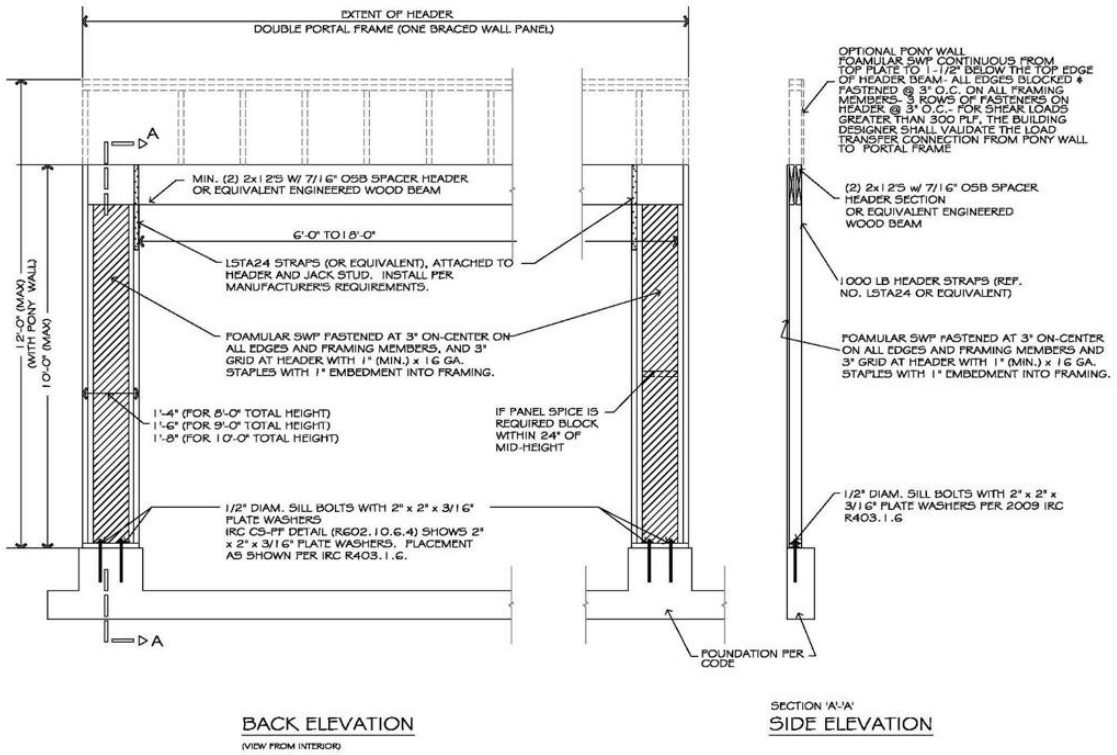

Figure 3: Foamular® SWP CS-PF Back Elevation

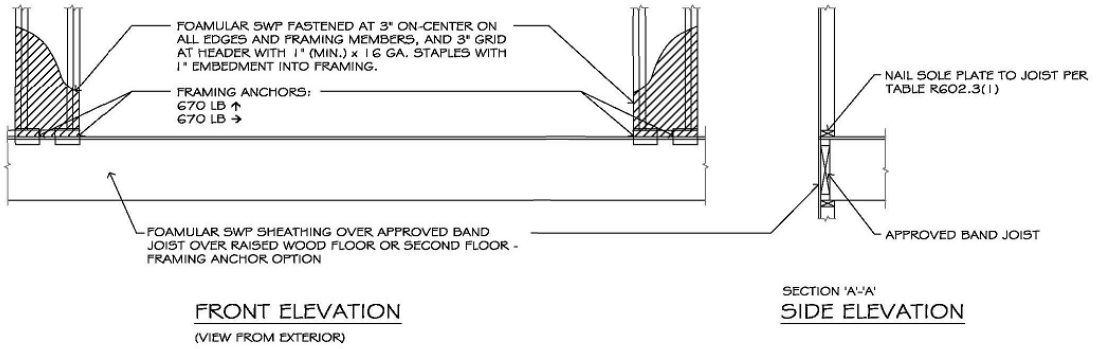

Figure 4: Foamular® SWP CS-PF Front Elevation 1

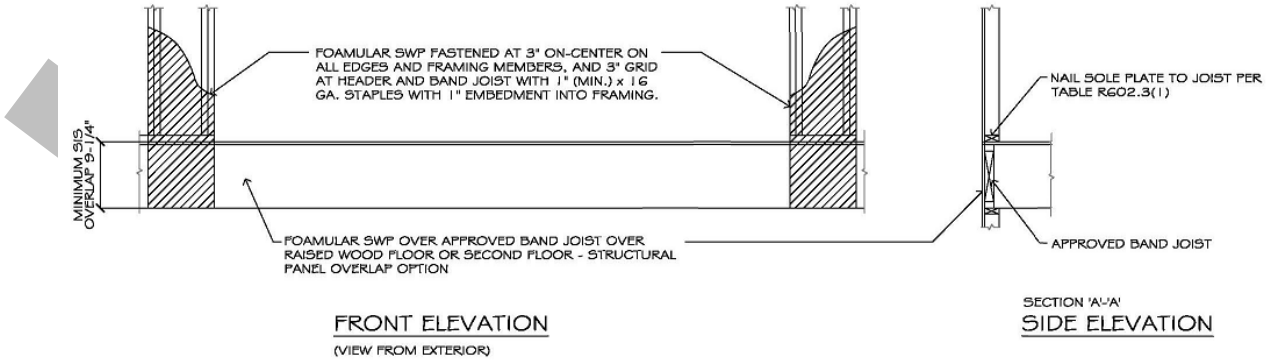

Figure 5: Foamular® SWP CS-PF Front Elevation 2

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5.2.4. Alternative Prescriptive *IRC* Bracing Applications

5.2.4.1. As an alternative to Section 5.2.2, the following provisions are permitted:

5.2.4.1.1. Required braced wall panel lengths for Foamular® SWP shall be as determined by the equivalency factors shown in Table 5 and *IRC* Table R602.10.3(1) and R602.10.3(3)[9], including all footnotes.

5.2.4.1.1.1. Bracing lengths in these tables for Method WSP or CS-WSP shall be multiplied by the equivalency factor listed in Table 5.

Wall Bracing Factors per Comparative Equivalency Testing for *IRC* Prescriptive Wall Bracing Applications				
Structural Wall Panel Type	**Fastener**	**Fastener Spacing (edge: field) (in.)**	**Minimum ½" Gypsum wallboard fastening (edge: field) (in.)**	**Foamular® SWP Tested Equivalency Factors to *IRC* WSP or CS-WSP**
Nominal ½" Foamular® SWP	1" crown x 1-¼" leg 16 ga galvanized staple	3:3	8:8	0.80
Nominal 1" Foamular® SWP	1" crown x 2" leg 16 ga galvanized staple	3:3	8:8	0.94

1. Wall assemblies may be constructed with or without the ProPink ComfortSeal™ Framing Gasket.
2. The crown of the staple must be overdriven past the surface of the foam plastic sheathing a minimum of $^{3}/_{16}$".
3. Multiply the bracing lengths in *IRC* Table R602.10.1.2 (1) and R602.10.1.2 (2) Method WSP or CS-WSP (continuous sheathing) as applicable, including all footnotes, by the factors shown here to establish the required bracing length.
4. Minimum of ½" 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 type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
5. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5 for ½" Foamular® and 1.6 for 1" Foamular®.
6. Valid for single top plate (advanced framing method) wall installations or double top plate wall installations.
7. Equivalency factors based on comparative equivalency of the tested data.

Table 5: Foamular® SWP Braced Wall Line Length Equivalency Factors Based on Equivalency Testing for Use with the *IRC*

5.2.4.1.1.2. These braced wall line length equivalency factors are based on equivalency testing and are used to comply with Method WSP and CS-WSP of the *IRC*.

5.2.4.1.1.3. Foamular® SWP tested equivalency factors in Table 5 allow the user to determine the length of bracing required, by multiplying the factor from Table 5 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 Tables R602.10.3(2 and 4) respectively.

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

5.2.5. Prescriptive *IBC* Conventional Light-Frame Wood Construction

5.2.5.1. Foamular® SWP may be used to brace exterior walls of buildings as an equivalent alternative to Method WSP of the *IBC* when installed with ½" gypsum in accordance with the conventional light-frame construction method of *IBC* Section 2308.6.3 and this TER.

5.2.6. Performance-Based Wood-Framed Construction

5.2.6.1. Foamular® SWP 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 6-8.

[9] *2009 IRC* Table R602.10.1.2(1) and R602.10.1.2(2)

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Structural Wall Panel Type	Nominal Unit Shear Capacity (NUSC) & Allowable Strength Design (ASD) Capacity (Wind)					
	Maximum Stud Spacing (in.)	Fastener Type & Size (minimum)	Gypsum Wallboard (GWB)	Gypsum Wallboard Fastener Spacing (edge: field) (in.)	NUSC (plf)	ASD (plf)
Nominal ½" Foamular® SWP	16" o.c.	1" crown x 1-¼" leg 16 ga galvanized staple	½" GWB	8/8	890	445
Nominal 1" Foamular® SWP	16" o.c.	1" crown x 2" leg 16 ga galvanized staple	½" GWB	16/16	675	335
			½" GWB	8/8	760	380
			No GWB	–	595	300

1. Fasteners are to be spaced a maximum of 3" o.c. at the edges and 3" o.c. in the field with a minimum edge distance of 3/8". The crown of the staple must be overdriven past the surface of the foam plastic sheathing a minimum of 3/16".
2. Gypsum attached with minimum #6 type W or S screws 1¼" long or 5d cooler nails.
3. Foamular® SWP panels may be installed with or without the use of the ProPink ComfortSeal™ Framing Gasket.

Table 6: Ultimate Unit Shear & Allowable Unit Shear Design Values for Foamular® SWP – Wind

5.2.6.2. Foamular® SWP shear walls that require seismic design in accordance with *IBC* Section 1613 shall use the seismic allowable unit shear capacities set forth in Table 7.

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

Allowable Strength Design (ASD) Capacity and Seismic Design Coefficients (Seismic)[1]												
Seismic Force-Resisting System	Maximum Stud Spacing (in.)	Gypsum Wallboard (GWB)	Seismic Allowable Unit Shear Capacity (plf)	Apparent Shear Stiffness, G_a (kips/in.)	Response Modification Factor, R[2]	System Overstrength Factor, Ω_0[3]	Deflection Amplification Coefficient, C_d[4]	Structural System Limitations & Building Height (ft.) Limit[5]				
								Seismic Design Category				
								B	C	D	E	F
Light-Frame (Wood) Walls Sheathed with Foamular® SWP	16" o.c.	½" GWB[6]	210	8	6.5	3	4	NL	NL	65	65	65
	16" o.c.	No GWB	175	6	6.5	3	4	NL	NL	65	65	65

1. All seismic design coefficients follow the equivalency procedures as defined in Section 3 of this TER.
2. Response modification coefficient, R, for use throughout *ASCE 7*. Note R reduces forces to a strength level, not an allowable stress level.
3. The tabulated value of the overstrength factor, Ω_0, is permitted to be reduced by subtracting one-half (0.5) for structures with flexible diaphragms.
4. Deflection amplification factor, C_d, for use with *ASCE 7* Section 12.8.6, 12.8.7 and 12.9.2.
5. NL = Not Limited. Heights are measured from the base of the structure as defined in *ASCE 7* Section 11.2.
6. Gypsum wallboard attached with minimum 5d cooler nails or #6 type W or S screws 1¼" long spaced 16" o.c. at panel edges and in the field.

Table 7: Seismic Performance of Nominal ½" and Nominal 1" Foamular® SWP

5.2.6.4. Foamular® SWP are permitted to resist transverse wind load forces using the allowable transverse loads (in pounds per linear foot) set forth in Table 8 and the allowable wind speeds in Table 9.

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Nominal Uniform Load Capacities (psf) for Foamular® SWP Resisting Out-of-Plane Wind Loads							
Structural Wall Panel Type	Transverse Wind Load Resistance						
	Minimum Nominal Sheathing Thickness (in.)	Negative		Positive		Maximum Stud Spacing (in.)	Fastener Schedule
		Ultimate Average Pressure (psf)	Allowable Design Value (psf)	Ultimate Average Pressure (psf)	Allowable Design Value (psf)		
Foamular® SWP	1/2"	155	95	155	95	16" o.c.	1" crown x 1 ¼", 16 gage galvanized staples, 3" o.c. at the perimeter, 3" o.c. in the field, overdriven a minimum of 3/16". Staple crowns installed parallel to grain.
Foamular® SWP	1"	155	95	155	95	16" o.c.	1" crown x 2", 16 gage galvanized staples, 3" o.c. at the perimeter, 3" o.c. in the field, overdriven a minimum of 3/16". Staple crowns installed parallel to grain.

1. For Foamular® SWP, the ASD allowable uniform load capacities for wind design are determined using the minimum of the nominal uniform load capacities in divided by an ASD reduction factor of 1.6, per *SDPWS* Section 3.2.1.
2. Design wind load capacity shall be in accordance with *IBC* Section 1609.1.1.

Table 8: Transverse Load Performance of Foamular® SWP

Structural Wall Panel Type	Minimum Nominal Sheathing Thickness (in.)	Maximum Stud Spacing (in.)	Allowable Components & Cladding Basic Wind Speed V_{asd} per *ASCE 7-05* (mph)	Allowable Components & Cladding Basic Wind Speed V_{ult} per *ASCE 7-10* (mph)
Foamular® SWP	1/2"	16" o.c.	175	225

1. Allowable wind speeds are based on the following: Mean roof height 30', Exposure B, 10 sq. ft. effective wind area. See the applicable building code for any adjustment need for specific building location and configuration.

Table 9: Basic Wind Speed (mph) for Foamular® SWP Used in Exterior Wall Covering Assemblies

5.2.6.5. Foamular® SWP are permitted to resist uplift wind load forces using the allowable uplift loads (in pounds per linear foot) set forth in Table 10.

Structural Wall Panel Type	Minimum Nominal Sheathing Thickness (in.)	Maximum Stud Spacing (in.)	Fastener Schedule	Gypsum Wallboard (GWB)	Uplift Capacity (lbs.)	Nominal Uplift Capacity (plf)	Allowable Uplift Capacity (plf)
Foamular® SWP	½"	16" o.c.	1" crown x 1 ¼", 16 gage galvanized staples, fastened 3" o.c. to perimeter, 3" o.c. in the field, overdriven a minimum of 3/16". Staple crowns installed parallel to grain.	½"	945	470	295
Foamular® SWP	1"	16" o.c.	1" crown x 2", 16 gage galvanized staples, fastened 3" o.c. to perimeter, 3" o.c. in the field, overdriven a minimum of 3/16". Staple crowns installed parallel to grain.	½"	945	470	295

1. The ASD allowable unit uplift capacity is determined by dividing the tabulated uplift capacity by the ASD reduction factor of 1.6 per *SDPWS* Section 3.2.3 for determining the ASD allowable capacity for uplift conditions.
2. The capacities shown are for the purpose of providing information on the hold-down capacity of the sheathing to the wall plate connection independent of lateral loading. Where combined shear and uplift loading is needed, consult a professional engineer
3. Fastener spacing for GWB is maximum 16" o.c.at the perimeter and 16" o.c. in the field.

Table 10: Uplift Load Performance of Foamular® SWP

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5.2.7. Perforated Shear Walls

5.2.7.1. Foamular® SWP are permitted to be designed in accordance with the methodology found in *SDPWS* Section 4.3.3.5 with the following exceptions:

5.2.7.2. *SDPWS* Equation 4.3-5 for C_o shall be replaced with the equation from Table 11.

Foamular® SWP	Replace *SDPWS* Eq. 4.3-5 with the Following
	$C_o = \frac{r}{(1.1 - 0.1 * r)} * \frac{L_{tot}}{\sum L_i}$

Table 11: C_o for Use with *SDPWS* Perforated Shear Wall Methodology

5.2.7.3. Figure 2 shows how to calculate the capacity of a perforated shear wall with the Foamular® SWP using Table 11.

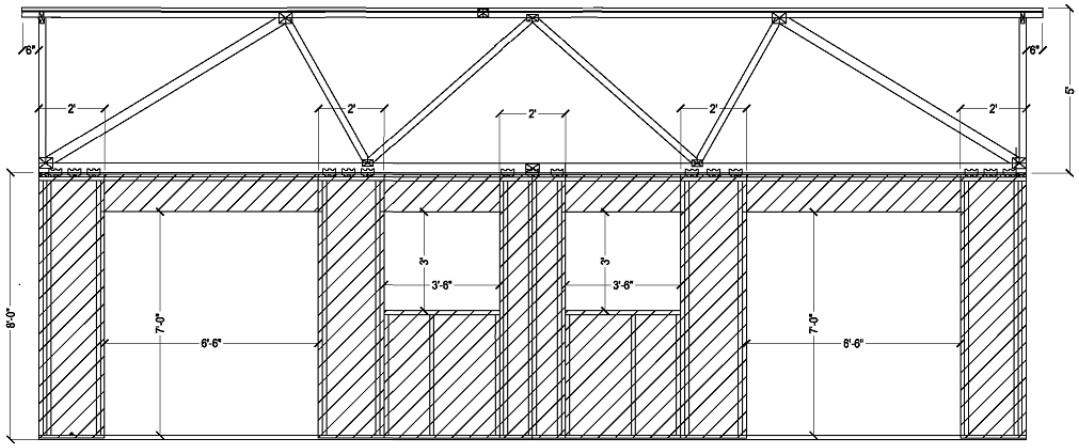

Figure 2: Example of a Perforated Shear Wall

1. The total length of the perforated shear wall, L_{tot}, is 30'.
2. The height of the perforated shear wall, h, is 8'.
3. The sum of the perforated shear wall segment lengths, ΣL_i, is 10'.
4. The total area of the openings, A_o, is:
   - **4.1.** Two (2) 7' x 6' 6" openings – 45.5 sq. ft. x 2 = 91 sq. ft.
   - **4.2.** Two (2) 3' x 3' 6" openings – 10.5 sq. ft. x 2 = 21 sq. ft.
   - **4.3.** Total opening area is: 91 + 21 = 112 sq. ft.
5. Using *SDPWS* Equation 4.3-6, the sheathing area ratio, r, is:

$$r = \frac{1}{1 + \frac{A_o}{h\Sigma L_i}} = \frac{1}{1 + \frac{112}{8 * 10}} = 0.417$$

6. Using Table 10, the shear capacity adjustment factor, C_o, is:

$$C_o = \frac{r}{1.1 - 0.1 * r} * \frac{L_{tot}}{\Sigma L_i} = \frac{0.417}{1.1 - 0.1 * 0.417} * \frac{30}{10} = 1.18$$

7. From Table 6, the allowable unit shear capacity, v, for the Foamular® SWP system is: 445 plf.
8. In accordance with *SDPWS* Section 4.3.3.5, the total ASD shear capacity of this perforated shear wall, $V_{perforated}$, is:

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$$V_{perforated} = v * \Sigma L_i * C_o = 445\ plf * 10\ ft. * 1.18 = 5295\ lbs.$$

5.3. Water-Resistive Barrier

5.3.1. Foamular® SWP may be used as a WRB as prescribed in *IRC* Section R703.2 and *IBC* Section 1404.2 when installed on exterior walls as described in this section.

5.3.2. Foamular® SWP shall be installed with board joints placed directly over exterior framing spaced a maximum of 16" (406 mm) o.c. The fasteners used to attach the board shall be installed in accordance with Section 6.

5.3.3. All seams and joints between boards shall be covered by HomeSealR™ Foam Joint Tape or JointSealR® Foam Joint Tape.

5.3.4. A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.

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

5.4. Permeance

5.4.1. Foamular® SWP has the permeance properties as shown in Table 12.

Foamular® SWP Permeance		
Permeance	*ASTM E96*	<0.3 Perm

Table 12: Foamular® SWP Permeance

5.5. *IECC* Compliance

5.5.1. Foamular® SWP meets the continuous insulated sheathing requirements complying with the provisions of *IECC* Section C402.

5.5.2. Foamular® SWP has the thermal resistance as shown in Table 13.

Foamular® SWP R-value	
Nominal Thickness	**R-Value (h·ft²·°F/Btu)**
½" SWP	3.0
1" SWP	5.0
R-Value based on XPS foam sheathing component only.	

Table 13: Foamular® SWP Thermal Resistance Properties

5.5.3. Foamular® SWP meets the requirements of *IECC* Section C402 for use as a component of the air barrier when installed in accordance with the manufacturer's installation instructions and this TER with all seams, including the top and bottom edges, taped.

Foamular® SWP Air Barrier Properties	
ASTM E2178	< 0.02 (L/s.m²)*1
1. Liter per second per square meter	

Table 14: Foamular® SWP Air Barrier Properties

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5.6. Fire Resistance Properties

5.6.1. Surface Burn Characteristics

5.6.1.1. The foam used in the manufacture of Foamular® SWP has the flame spread characteristics as shown in Table 15.

Flame Spread & Smoke Developed Indexes[1,2]		
Structural Wall Panel Type	**Flame Spread**	**Smoke Developed**
Foamular® SWP	10	175

1. Tested in accordance with *UL 723 (ASTM E 84)*.
2. Foamular® SWP tested using the foam core only in accordance with *IRC* Section 316.3 and *IBC* Section 2603.3.

Table 15: Flame Spread & Smoke Developed Indexes of Foamular® SWP

5.7. Thermal Barrier Requirements.

5.7.1. The foam plastic portion of Foamular® SWP up to 1.5" thick has been tested on walls and ceilings in accordance with *NFPA 286*, in accordance with *IBC* Section 2603.9[10] and *IRC* Section 316.6, and met the criteria of *IBC* Section 803.1.1[11]. Therefore, Foamular® SWP requires no thermal barrier or ignition barrier protection.

5.8. Non-Structural Applications

5.8.1. Where other means of wall bracing are provided, or are not required, and an approved exterior wall covering capable of separately resisting loads perpendicular to the face of the walls is installed over the sheathing, Foamular® SWP is permitted to be installed as follows:

5.8.1.1. Fastening shall be sufficient to hold the Foamular® SWP in place until the exterior wall covering is installed. Once the wall covering is installed, the wall covering fasteners penetrate through the sheathing and into the wall framing, providing the necessary resistance to transverse loads.

5.8.1.2. Fasteners include, but are not limited to, roofing nails, staples, cap nails and bugle head screws.

5.8.1.3. Consult the manufacturer's installation instructions for further details.

6. Installation:

6.1. General

6.1.1. Foamular® SWP shall be installed in accordance with the manufacturer's published installation instructions and this TER.

6.1.2. A copy of the manufacturer's published installation instructions shall be available at all times on the jobsite during installation.

6.1.3. If there are any conflicts between the manufacturer's instructions and this TER, the more restrictive shall govern.

6.1.3.1. Where required, gypsum wallboard shall be a minimum ½" thickness.

6.2. Orientation

6.2.1. Foamular® SWP shall be installed horizontally or vertically with all board joints placed directly over exterior framing or blocking. The fasteners used to attach the board shall be installed in accordance with Section 6.

6.2.2. Foamular® SWP must be installed over studs, with framing or blocking that has a nominal thickness of not less than 2" (50.8 mm) and spaced a maximum of 16" (400 mm) o.c.

[10] *2012 IBC* Section 2603.10
[11] *2012* and *2015 IBC* Section 803.1.2

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6.3. Fastener Type

6.3.1. Foamular® SWP

6.3.1.1. Staples shall be a minimum 16 gauge, 1" crown and shall use the following fastener lengths.

6.3.1.1.1. Nominal ½" SWP- minimum 1-¼" leg

6.3.1.1.2. Nominal 1" SWP-minimum 2" leg.

6.3.1.2. The crown of the staple must be overdriven past the surface of the foam plastic sheathing a minimum of $^{3}/_{16}$". Foamular® SWP may be attached with or without the use of the ProPink ComfortSeal™ Framing Gasket.

6.3.2. Gypsum Wallboard

6.3.2.1. Where required, gypsum wallboard shall be installed with a minimum:

6.3.1.1.3. #6 x $1^{1}/_{4}$" Type W or S screws or 5d cooler nails.

6.4. Fastener Spacing

6.4.1. Foamular® SWP

6.4.1.1. Maximum of 3" o.c. (76.2 mm) along the edge and 3" o.c. in the field.

6.5. Fastener Edge Distance

6.5.1. Fastener edge distance is a minimum of $^{3}/_{8}$" (9.5 mm) for both Foamular® SWP and gypsum.

6.5.2. Always fasten staples parallel to the framing member.

6.6. Treatment of Joints

6.6.1. Foamular® SWP sheathing joints must be butted at framing members, and a single row of fasteners must be applied to each panel edge into the stud below.

6.7. Window Treatments

6.7.1. Foamular® SWP 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. Test and Engineering Substantiating Data:

7.1. Lateral load testing conducted, based on *ASTM E2126*.

7.2. Lateral load testing conducted, with and without the ProPink ComfortSeal™ Framing Gasket, based on *ASTM E564*.

7.3. Transverse load testing conducted, based on *ASTM E330*.

7.4. Uplift load testing conducted, based on *ASTM E72*.

7.5. Thermal resistance property testing conducted by RADCO, based *ASTM C518*.

7.6. Water vapor permeance testing conducted by RADCO, based on *ASTM E96*.

7.7. Air barrier testing by AIR-INS, Intertek and QAI based on *ASTM E2178*.

7.8. Water-resistive barrier testing conducted by Intertek based on *ASTM E2178*.

7.9. Water-resistive barrier testing conducted by QAI based on *ASTM E2178*.

7.10. Flame spread and smoke developed rating tests conducted by UL in accordance with *ANSI/UL 723 / ASTM E84*.

7.11. Test reports and data for determining comparative equivalency for use as an alternative material conducted based on *ASTM E564*, 2012.

7.12. Test reports and data for determining comparative equivalency for use as an alternative material conducted based on *ASTM E2126*, 2013.

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7.13. The product(s) evaluated by this TER fall within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.

7.14. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineering mechanics based means of compliance. This TER assesses compliance with defined standards, accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.

7.15. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate, as it undertakes its engineering analysis.

7.16. DrJ has reviewed and found the data provided by other professional sources are credible. The information in this TER conforms with DrJ's procedure for acceptance of data from approved sources.

7.17. DrJ's responsibility for data provided by approved sources conforms with *IBC* Section 1703 and any relevant professional engineering law.

7.18. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS, NDS, ACI, AISI, PS-20, PS-2*, etc.). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g. lumber, steel, concrete, etc), DrJ relies upon grade/properties provided by the raw material supplier to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8. Findings:

8.1. When installed in accordance with the manufacturer installation instructions and this TER, Foamular® SWP complies with, or is a suitable alternative to, the applicable sections of the codes listed in Section 2 for the following applications.

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

8.1.2. Use as an equivalent alternative to the CS-PF as described in *IRC* Section R602.10.5 and R602.10.6.4.

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

8.1.4. Uplift load resistance due to components and cladding pressures on building surfaces.

8.1.5. Performance of foam plastics in accordance with *IRC* Section R316 and *IBC* Section 2603.

8.1.6. Performance for use as insulating sheathing in accordance with *IRC* Section N1102.1 and N1102.2 and *IECC* Section C402.

8.1.7. Performance for use as a WRB in accordance with *IRC* Section R703.2 and *IBC* Section 1404.2.

8.1.8. Performance for use as an air barrier in accordance with *IRC* Section N1102.4 and *IECC* Section C402.

8.1.9. Performance for use without a thermal barrier in accordance with *IRC* Section R316.5.3 and R316.5.4 and *IBC* Section 2603.4.1.6.

8.2. *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.9 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, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code. … Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.

8.3. This TER uses professional engineering law, the building code, ANSI/ASTM consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ's professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

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9. Conditions of Use:

9.1. Where required by the Authority Having Jurisdiction (AHJ) in which the project is to be constructed, this report and the installation instructions shall be submitted at the time of permit application.

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

9.3. 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, Registered Design Professional, etc.).

9.4. Except as provided in Section 5.7, this product shall be fully protected from the interior of the building by an approved 15-minute thermal barrier or ignition barrier where required by the applicable code.

9.5. In areas where the probability of termite infestation is very heavy, in accordance with *IBC* Section 2603.8 or *IRC* Section R318.4, the product must not be placed on exterior walls located within 6" (152 mm) of the ground.

9.6. Foamular® SWP shall not be used as a nailing base.

9.7. Foamular® SWP shall not be used to resist horizontal loads from concrete and masonry walls.

9.8. When Foamular® SWP is not installed for use as wall bracing, as described in this TER, the stud walls shall be braced by other materials, in accordance with the applicable code.

9.9. When used as a WRB, Foamular® SWP seams shall be taped with HomeSealR™ Foam Joint Tape or JointSealR® Foam Joint Tape.

9.10. When used in accordance with the *IBC* in SDCs C, D, E or F, special inspections shall comply with *IBC* Section 1705.12[12].

9.11. When used in accordance with the *IBC* in high wind areas, special inspections shall comply with *IBC* Section 1705.11[13].

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

9.13. The manufacturer's installation instructions shall be shipped to the jobsite with the materials or otherwise be available on the jobsite for inspection.

9.14. All panel edges shall be supported by wall framing or solid blocking a minimum of 2" nominal in thickness.

9.15. Design

9.15.1. Building Designer Responsibility

9.15.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer for the Building and shall be in accordance with *IRC* Section R106 and *IBC* Section 107.

9.15.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with *IRC* Section R301 and *IBC* Section 1603.

9.15.2. Construction Documents

9.15.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.

9.16. Responsibilities

9.16.1. The information contained herein is a product, material, detail, design and/or application TER evaluated in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering practice, experience and technical judgment.

9.16.2. DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated sections.

[12] *2012 IBC* Section 1705.11
[13] *2012 IBC* Section 1705.10

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9.16.3. The engineering evaluation was performed on the dates provided in this TER, within DrJ's professional scope of work.

9.16.4. This product is manufactured under a third-party quality control program in accordance with *IRC* Section R104.4 and R109.2 and *IBC* Section 104.4 and 110.4.

9.16.5. 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, and the TER shall be reviewed for code compliance by the Building Official.

9.16.6. The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the Building Official's inspection and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10. Identification:

10.1. Each Foamular® SWP described in this TER is identified by a label on the board or packaging material bearing the manufacturer's name, product name, label of the third-party inspection agency, and other information to confirm code compliance.

10.2. Additional technical information can be found at www.Foamular.com.

11. Review Schedule:

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

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

- Mission and Professional Responsibilities
- Product Evaluation Policies
- Product Approval – Building Code, Administrative Law and P.E. Law

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