Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2406-111

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CAMOBOARD® Structural Insulated Sheathing for Use in Wall Applications

Trade Secret Report Holder:

Progressive Foam Technologies, Inc

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CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 12 00 - Structural Panels

Section: 06 16 00 - Sheathing

Section: 06 16 13 - Insulated Sheathing

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 - Thermal Insulation

Section: 07 21 13 - Foam Board Insulation

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

Section: 07 26 00 - Vapor Retarders

Section: 07 27 00 - Air Barriers

1 Innovative Products Evaluated[1]

1.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings

2 Product Description and Materials

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

Figure 1. CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings

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2.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are structural wall sheathing comprised of a proprietary Foam Plastic Insulating Sheathing (FPIS) adhered to a Wood Structural Panel (WSP) and may be used as wall sheathing for multi-family or residential construction.

2.2.1 The FPIS component is made of Proboard® Versa™ Premium Graphite-Enhanced Polystyrene (GPS) laminated with a film facer.

2.2.2 Nominal thicknesses used with CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are 0.59", 1.02", and 1.55"

2.2.3 Foam conforms to ASTM C578 Type I, Type II, and Type IX

2.2.4 The FPIS component provides continuous insulation and serves as a water-resistive barrier and as an air barrier.

2.3 *Material Availability*

2.3.1 *CAMOBOARD Nominal Thickness:*

2.3.1.1 *$^{7}/_{16}$" OSB as the Structural Backer:*

2.3.1.1.1 1" (1.03")

2.3.1.1.2 1$^{1}/_{2}$" (1.46")

2.3.1.1.3 2" (1.99")

2.3.1.2 *$^{15}/_{32}$" FRT Plywood as the Structural Backer:*

2.3.1.2.1 1" (1.06")

2.3.1.2.2 1$^{1}/_{2}$" (1.49")

2.3.1.2.3 2" (2.02")

2.3.2 *CAMOBOARD Standard Sizes:*

2.3.2.1 2' x 8' (610 mm x 2,438 mm)

2.3.2.2 2' x 9' (610 mm x 2,743 mm)

2.3.2.3 4' x 8' (1,219 mm x 2,438 mm)

2.3.2.4 4' x 9' (1,219 mm x 2,743 mm)

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

3 Definitions[2]

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

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

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

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

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

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

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

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

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

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

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

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

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

4.1 *Local, State, and Federal*

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

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

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

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

4.2 *Regulations*

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

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

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

4.3 *Standards*

4.3.1 *AATCC Test Method 127: Test Method for Water Resistance: Hydrostatic Pressure*

4.3.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

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

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

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4.3.5 *ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*

4.3.6 *ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*

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

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

4.3.9 *ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials*

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

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

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

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

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

4.3.15 *UL 723: Test for Surface Burning Characteristics of Building Materials*

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

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

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

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

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

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

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

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

5 Listed[25]

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

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6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *General*

6.1.1 Except as otherwise described in this report, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed in accordance with the applicable building codes listed in **Section 4**, using the provisions set forth herein for the design and installation of WSP.

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

6.1.2.1 For wind design, anchor bolt spacing shall not exceed 6' o.c. (1,830 mm).

6.1.3 The maximum aspect ratio for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be 4:1.

6.1.4 The minimum full height panel width shall be 24" (610 mm) in accordance with IRC Section R602.10.5.

6.1.5 All panel edges shall be blocked with a minimum 2" (38 mm) nominal lumber.

6.1.6 Fasteners shall be installed flush with the surface of the wood structural panel for foam-out installation configurations.

6.1.7 Installation is permitted for single top plate (advanced framing method) or double top plate applications.

6.1.7.1 Walls shall be constructed in accordance with IBC Section 2308.9.3.2 and IRC Section R602.3.2.

6.1.8 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be used in the following applications:

6.1.8.1 Wall sheathing in buildings constructed in accordance with the IBC and IRC for light-frame wood construction to provide wind load and lateral load resistance induced by wind and/or seismic events.

6.1.8.2 Wall sheathing in Type V construction in accordance with the IBC.

6.1.9 Pursuant to IRC Section R301.1.3, where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

6.2 *Structural Applications*

6.2.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are permitted to be designed in accordance with ANSI/AWC Special Design Provisions for Wind and Seismic (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 report.

6.2.2 *Simplified IRC Bracing Provisions:*

6.2.2.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are permitted to be used in accordance with the IRC simplified bracing method of IRC Section R602.12, as modified by **Table 1** and **Table 2**. All other provisions of the IRC simplified bracing method shall be met.

6.2.2.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed with the foam facing the exterior (foam out).

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Table 1. CAMOBOARD 41 ($^{7}/_{16}$" OSB), Simplified Bracing Table – Foam Out Orientation[1,2,3,4,5,6,7]

Structural Sheathing Product	Ultimate Design Wind Speed, V_{ult} (mph)	Story Level	Eave to Ridge Height (ft)	Minimum Number of Bracing Units Required (Long Side)						Minimum Number of Bracing Units Required (Short Side)					
				Length of Short Side (ft)						Length of Long Side (ft)					
				10	20	30	40	50	60	10	20	30	40	50	60
CAMOBOARD 41 (Foam Out, $^{7}/_{16}$" OSB)	115	One Story or Top of Two or Three Stories	10	1	1	2	2	2	3	1	1	2	2	2	3
		First of Two Story or Second of Three Stories		1	2	3	3	4	5	1	2	3	3	4	5
		First of Three Stories		2	3	4	5	6	7	2	3	4	5	6	7
		One Story or Top of Two or Three Stories	15	1	1	3	3	3	4	1	1	3	3	3	4
		First of Two Story or Second of Three Stories		1	2	3	3	5	6	1	2	3	3	5	6
		First of Three Stories		2	3	4	6	7	8	2	3	4	6	7	8
	130	One Story or Top of Two or Three Stories	10	1	2	2	2	3	3	1	2	2	2	3	3
		First of Two Story or Second of Three Stories		2	2	3	4	5	6	2	2	3	4	5	6
		First of Three Stories		2	3	5	6	7	8	2	3	5	6	7	8
		One Story or Top of Two or Three Stories	15	1	3	3	3	4	4	1	3	3	3	4	4
		First of Two Story or Second of Three Stories		2	2	3	5	6	7	2	2	3	5	6	7
		First of Three Stories		2	3	6	7	8	9	2	3	6	7	8	9

SI: 1 in = 25.4 mm

1. This simplified bracing table is based on the provisions of IRC Section R602.12. All provisions therein shall be observed, except that this table shall replace IRC Table R602.12.4, and CAMOBOARD 41 shall replace the sheathing material.
2. CAMOBOARD 41 installed with butted joints on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x $2^{3}/_{8}$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^{3}/_{8}$". Nails with a head diameter and length greater than the 0.113" x $2^{3}/_{8}$" nails are also permissible.
3. Minimum $^{1}/_{2}$" gypsum wallboard (lightweight minimum) shall be fastened to the interior side of the wall with minimum #6 x $1^{1}/_{4}$" Type W or S screws installed 8" o.c. along the edges and 8" o.c. in the field.
4. Interpolation shall not be permitted.
5. Cripple walls or wood-framed basement walls in a walk-out condition shall be designated as the first story and the stories above shall be re-designated as the second and third stories, respectively, and shall be prohibited in a three-story structure.
6. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
7. For Exposure Category C, multiply bracing units by a factor of 1.20 for a one-story building, 1.30 for a two-story building, and 1.40 for a three-story building

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Table 2. CAMOBOARD 51 ($^{15}/_{32}$" Plywood), Simplified Bracing Table – Foam Out Orientation[1,2,3,4,5,6,7]

Structural Sheathing Product	Ultimate Design Wind Speed, V_{ult} (mph)	Story Level	Eave to Ridge Height (ft)	Minimum Number of Bracing Units Required (Long Side)						Minimum Number of Bracing Units Required (Short Side)					
				Length of Short Side (ft)						Length of Long Side (ft)					
				10	20	30	40	50	60	10	20	30	40	50	60
CAMOBOARD 51 (Foam Out, $^{15}/_{32}$" Plywood)	115	One Story or Top of Two or Three Stories	10	1	1	2	2	2	3	1	1	2	2	2	3
		First of Two Story or Second of Three Stories		1	2	3	3	4	5	1	2	3	3	4	5
		First of Three Stories		2	3	4	5	6	7	2	3	4	5	6	7
		One Story or Top of Two or Three Stories	15	1	1	3	3	3	4	1	1	3	3	3	4
		First of Two Story or Second of Three Stories		1	2	3	3	5	6	1	2	3	3	5	6
		First of Three Stories		2	3	4	6	7	8	2	3	4	6	7	8
	130	One Story or Top of Two or Three Stories	10	1	2	2	2	3	3	1	2	2	2	3	3
		First of Two Story or Second of Three Stories		2	3	3	4	5	6	2	3	3	4	5	6
		First of Three Stories		2	3	5	6	7	9	2	3	5	6	7	9
		One Story or Top of Two or Three Stories	15	1	3	3	3	4	4	1	3	3	3	4	4
		First of Two Story or Second of Three Stories		2	3	3	5	6	7	2	3	3	5	6	7
		First of Three Stories		2	3	6	7	8	10	2	3	6	7	8	10

SI: 1 in = 25.4 mm

1. This simplified bracing table is based on the provisions of IRC Section R602.12. All provisions therein shall be observed, except that this table shall replace IRC Table R602.12.4, and CAMOBOARD 51 shall replace the sheathing material.
2. CAMOBOARD 51 installed with butted joints on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x $2^3/_8$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^3/_8$". Nails with a head diameter and length greater than the 0.113" x $2^3/_8$" nails are also permissible.
3. Minimum $^1/_2$" gypsum wallboard (lightweight minimum) shall be fastened to the interior side of the wall with minimum #6 x $1^1/_4$" Type W or S screws installed 8" o.c. along the edges and 8" o.c. in the field.
4. Interpolation shall not be permitted.
5. Cripple walls or wood-framed basement walls in a walk-out condition shall be designated as the first story and the stories above shall be re-designated as the second and third stories, respectively, and shall be prohibited in a three-story structure.
6. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
7. For Exposure Category C, multiply bracing units by a factor of 1.20 for a one-story building, 1.30 for a two-story building, and 1.40 for a three-story building.

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6.2.3 *Prescriptive IRC Bracing Applications:*

6.2.3.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be used in the following applications:

6.2.3.1.1 On braced wall lines equivalent alternative to the IRC Method WSP when installed in accordance with IRC Section R602.10 and this report.

6.2.3.1.2 To brace walls of buildings as an equivalent alternative to the IRC Method CS-WSP (Continuously Sheathed Wood Structural Panel) when installed in accordance with IRC Section R602.10.4 and this report.

6.2.3.2 All other IRC prescriptive bracing, minimums, spacing requirements, and rules must also be met.

6.2.3.3 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.

6.2.3.4 *Wind Bracing:*

6.2.3.4.1 For wind design, the required braced wall panel lengths are provided in **Table 3** and **Table 4**.

6.2.3.4.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed with the foam facing the exterior (foam out).

6.2.3.4.3 These tables shall be used in place of IRC Table R602.10.3(1).

6.2.3.4.4 All adjustment factors from IRC Table R602.10.3(2) shall still be applied.

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Table 3. Required Bracing Lengths for CAMOBOARD 41 ($^{7}/_{16}$" OSB) – Foam Out, Wind[1,2,3,4,5,6,7]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line											
		Intermittent Sheathing						Continuous Sheathing					
		Ultimate Design Wind Speed, V_{ult} (mph)											
		≤ 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.1	1.5	1.5	1.8	1.8	2.2	1.1	1.1	1.5	1.5	1.8	1.8
	20	1.8	2.6	2.6	2.9	3.7	4.0	1.8	2.2	2.6	2.6	2.9	3.7
	30	2.9	3.7	4.0	4.4	5.1	5.8	2.6	3.3	3.3	3.7	4.4	5.1
	40	3.7	4.7	5.1	5.8	6.6	7.7	2.9	4.0	4.4	4.7	5.5	6.6
	50	4.4	5.8	6.6	6.9	8.0	9.5	3.7	5.1	5.5	5.8	6.9	8.0
	60	5.1	6.9	7.7	8.4	9.5	11.0	4.4	5.8	6.6	6.9	8.0	9.5
First Story of Two Stories or the Second Story of Three Stories	10	2.2	2.6	2.9	3.3	3.7	4.4	1.8	2.2	2.6	2.6	3.3	3.7
	20	3.7	4.7	5.5	5.8	6.9	8.0	3.3	4.0	4.7	5.1	5.8	6.6
	30	5.1	6.9	7.7	8.4	9.9	11.3	4.4	5.8	6.6	6.9	8.4	9.5
	40	6.9	9.1	9.9	11.0	12.8	14.6	5.8	7.7	8.4	9.1	11.3	12.4
	50	8.4	11.3	12.0	13.1	15.7	17.9	7.3	9.5	10.2	11.3	13.1	15.3
	60	9.9	13.1	14.6	15.7	18.3	21.2	8.4	11.3	12.4	13.5	15.7	18.3
First Story of Three Stories	10	2.9	4.0	4.4	4.7	5.5	6.2	2.6	3.3	3.7	4.0	4.7	5.5
	20	5.5	7.3	8.0	8.4	9.9	11.7	4.7	6.2	6.6	7.3	8.4	9.9
	30	7.7	10.2	11.3	12.4	14.2	16.8	6.6	8.8	9.5	10.6	12.4	14.2
	40	9.9	13.5	14.6	16.1	18.6	21.5	8.4	11.3	12.4	13.5	16.1	18.3
	50	12.4	16.4	17.9	19.7	23.0	26.6	10.6	13.9	15.3	16.8	19.3	22.6
	60	14.6	19.3	21.2	23.4	27.4	31.4	12.4	16.8	18.3	19.7	23.0	26.6

SI: 1 ft = 0.3048 m, 1 mph = 1.61 km/h

1. CAMOBOARD 41 shall be installed on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x $2^{3}/_{8}$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^{3}/_{8}$". Nails with a head diameter and length greater than the 0.113" x $2^{3}/_{8}$" nails are also permissible.
2. Demonstrates equivalency to IRC Table R602.10.3(1).
3. All adjustment factors from IRC Table R602.10.3(2) shall be applied.
4. A minimum of $^{1}/_{2}$" gypsum wallboard (lightweight) sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x $1^{1}/_{4}$" Type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
5. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly.
6. The addition of gypsum wallboard to CAMOBOARD 41 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
7. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

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Table 4. Required Bracing Lengths for CAMOBOARD 51 ($^{15}/_{32}$" Plywood) – Foam Out, Wind[1,2,3,4,5,6,7]

Condition	Braced Wall Line Spacing (ft)	Minimum Total Length (ft) of Braced Wall Panels Required Along Each Braced Wall Line											
		Intermittent Sheathing						Continuous Sheathing					
		Ultimate Design Wind Speed, V_{ult} (mph)											
		≤ 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	≤ 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
One Story or the Top of Two or Three Stories	10	1.2	1.5	1.5	1.9	1.9	2.3	1.2	1.2	1.5	1.5	1.9	1.9
	20	1.9	2.7	2.7	3.1	3.9	4.2	1.9	2.3	2.7	2.7	3.1	3.9
	30	3.1	3.9	4.2	4.6	5.4	6.2	2.7	3.5	3.5	3.9	4.6	5.4
	40	3.9	5.0	5.4	6.2	6.9	8.1	3.1	4.2	4.6	5.0	5.8	6.9
	50	4.6	6.2	6.9	7.3	8.5	10.0	3.9	5.4	5.8	6.2	7.3	8.5
	60	5.4	7.3	8.1	8.9	10.0	11.6	4.6	6.2	6.9	7.3	8.5	10.0
First Story of Two Stories or the Second Story of Three Stories	10	2.3	2.7	3.1	3.5	3.9	4.6	1.9	2.3	2.7	2.7	3.5	3.9
	20	3.9	5.0	5.8	6.2	7.3	8.5	3.5	4.2	5.0	5.4	6.2	6.9
	30	5.4	7.3	8.1	8.9	10.4	11.9	4.6	6.2	6.9	7.3	8.9	10.0
	40	7.3	9.6	10.4	11.6	13.5	15.4	6.2	8.1	8.9	9.6	11.9	13.1
	50	8.9	11.9	12.7	13.9	16.6	18.9	7.7	10.0	10.8	11.9	13.9	16.2
	60	10.4	13.9	15.4	16.6	19.3	22.3	8.9	11.9	13.1	14.2	16.6	19.3
First Story of Three Stories	10	3.1	4.2	4.6	5.0	5.8	6.5	2.7	3.5	3.9	4.2	5.0	5.8
	20	5.8	7.7	8.5	8.9	10.4	12.3	5.0	6.5	6.9	7.7	8.9	10.4
	30	8.1	10.8	11.9	13.1	15.0	17.7	6.9	9.2	10.0	11.2	13.1	15.0
	40	10.4	14.2	15.4	16.9	19.6	22.7	8.9	11.9	13.1	14.2	16.9	19.3
	50	13.1	17.3	18.9	20.8	24.3	28.1	11.2	14.6	16.2	17.7	20.4	23.9
	60	15.4	20.4	22.3	24.6	28.9	33.1	13.1	17.7	19.3	20.8	24.3	28.1

SI: 1 ft = 0.3048 m, 1 mph = 1.61 km/h

1. CAMOBOARD 51 shall be installed on 2 x 4 or 2 x 6 studs spaced 24" o.c. maximum, and fastened with minimum 0.113" x $2^3/_8$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^3/_8$". Nails with a head diameter and length greater than the 0.113" x $2^3/_8$" nails are also permissible.
2. Demonstrates equivalency to IRC Table R602.10.3(1).
3. All adjustment factors from IRC Table R602.10.3(2) shall be applied.
4. A minimum of $^1/_2$" gypsum wallboard (lightweight) sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x $1^1/_4$" Type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels
5. Minimum $^1/_2$" gypsum wallboard must be installed as part of the wall assembly.
6. The addition of gypsum wallboard to CAMOBOARD 51 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
7. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

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6.2.3.5 *Seismic Bracing:*

6.2.3.5.1 For seismic design, the required braced wall panel lengths for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be as shown in **Table 5** and **Table 6** shall be used in conjunction with IRC Table R602.10.3(4), which provides the required adjustments.

Table 5. Required Bracing Lengths for CAMOBOARD 41 ($^{7}/_{16}$" OSB) – Foam Out, Seismic[1,2,3,4,5,6,7,8]

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	D0	D1	D2	C	D0	D1	D2
One Story or the Top of Two or Three Stories	10	1.2	1.3	1.5	1.8	1.0	1.2	1.2	1.5
	20	2.3	2.6	2.9	3.7	2.0	2.2	2.5	3.1
	30	3.5	4.0	4.4	5.5	3.0	3.4	3.7	4.6
	40	4.6	5.2	5.8	7.3	4.0	4.5	5.0	6.2
	50	5.8	6.5	7.3	9.1	5.0	5.6	6.2	7.7
First Story of Two Stories or the Second Story of Three Stories	10	2.2	2.8	3.3	4.0	1.9	2.3	2.8	3.4
	20	4.4	5.5	6.5	8.0	3.7	4.6	5.6	6.9
	30	6.5	8.3	9.9	12.0	5.6	7.0	8.4	10.2
	40	8.8	10.9	13.2	16.1	7.4	9.3	11.2	13.7
	50	10.9	13.7	16.4	20.1	9.3	11.7	13.9	17.1
First Story of Three Stories	10	3.3	3.9	4.4	NP	2.8	3.3	3.7	NP
	20	6.5	7.7	8.8	NP	5.6	6.5	7.4	NP
	30	9.9	11.5	13.2	NP	8.4	9.8	11.2	NP
	40	13.2	15.3	17.5	NP	11.2	13.1	14.9	NP
	50	16.4	19.2	21.9	NP	13.9	16.3	18.6	NP

SI: 1 ft = 0.3048 m

1. CAMOBOARD 41 shall be installed on 2 x 4 studs spaced 24" o.c. maximum, and fastened with minimum 0.113" x $2^{3}/_{8}$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^{3}/_{8}$". Nails with a head diameter and length greater than the 0.113" x $2^{3}/_{8}$" nails are also permissible.
2. Demonstrates equivalency to IRC Table R602.10.3(3). All adjustment factors from IRC Table R602.10.3(4) shall be applied.
3. A minimum of $^{1}/_{2}$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x $1^{1}/_{4}$" Type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. 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'
5. Linear interpolation is permitted.
6. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly.
7. The addition of gypsum wallboard to CAMOBOARD 41 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
8. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

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Table 6. Required Bracing Lengths for CAMOBOARD 51 ($^{15}/_{32}$" Plywood) – Foam Out, Seismic[1,2,3,4,5,6,7,8]

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	D0	D1	D2	C	D0	D1	D2
One Story or the Top of Two or Three Stories	10	1.3	1.4	1.5	1.9	1.1	1.3	1.3	1.6
	20	2.4	2.8	3.1	3.9	2.1	2.4	2.6	3.3
	30	3.7	4.2	4.6	5.8	3.2	3.5	3.9	4.9
	40	4.9	5.5	6.2	7.7	4.2	4.7	5.3	6.5
	50	6.2	6.9	7.7	9.6	5.3	5.9	6.5	8.2
First Story of Two Stories or the Second Story of Three Stories	10	2.3	2.9	3.4	4.3	2.0	2.4	2.9	3.6
	20	4.6	5.8	6.9	8.4	3.9	4.9	5.9	7.3
	30	6.9	8.7	10.4	12.7	5.9	7.4	8.9	10.8
	40	9.3	11.5	13.9	16.9	7.9	9.9	11.8	14.4
	50	11.5	14.5	17.3	21.2	9.9	12.3	14.7	18.0
First Story of Three Stories	10	3.4	4.1	4.6	NP	2.9	3.4	3.9	NP
	20	6.9	8.1	9.3	NP	5.9	6.9	7.9	NP
	30	10.4	12.2	13.9	NP	8.9	10.3	11.8	NP
	40	13.9	16.1	18.5	NP	11.8	13.8	15.7	NP
	50	17.3	20.2	23.1	NP	14.7	17.1	19.6	NP

SI: 1 ft = 0.3048 m

1. CAMOBOARD 51 shall be installed on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x $2^3/_8$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^3/_8$". Nails with a head diameter and length greater than the 0.113" x $2^3/_8$" nails are also permissible.
2. Demonstrates equivalency to IRC Table R602.10.3(3). All adjustment factors from IRC Table R602.10.3(4) shall be applied.
3. A minimum of $^1/_2$" gypsum sheathing shall be applied to the interior side of the wall assembly and fastened with a #6 x $1^1/_4$" Type W or S screws spaced 8" o.c. at panel edges and 8" o.c. in the field of the panels.
4. 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'
5. Linear interpolation is permitted.
6. Minimum $^1/_2$" gypsum wallboard must be installed as part of the wall assembly.
7. The addition of gypsum wallboard to CAMOBOARD 51 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
8. Bracing lengths are the results of comparative equivalency testing and analysis using both tested and published design values as points of comparison. DrJ relies upon the design values published in the codes and standards listed in **Section 4** that are adopted into law and that the manufacturer of those products stand behind. DrJ performs all equivalency analysis based on legally defined design values, the responsibility for which is the manufacturer of those products or the members of the associations that publish those design values.

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6.2.4 *Alternative Prescriptive IRC Wall Bracing Applications:*

6.2.4.1 As an alternative to **Section 6.2.2**, the following provisions are permitted:

6.2.4.1.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be used to brace walls of buildings as an alternative to the Intermittent Bracing Method WSP and Continuous Sheathing Method CS WSP provisions of IRC Section R602.10.4, when installed in accordance with this report.

6.2.4.1.2 The braced wall line length equivalency factors provided in **Table 7** are based on equivalency testing and are used to comply with Method WSP and CS-WSP of the IRC.

6.2.4.1.3 Required braced wall panel lengths for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be as determined by multiplying the equivalency factor shown in **Table 7** by the lengths shown in the WSP or CS WSP columns in IRC Table R602.10.3(1) and IRC Table R602.10.3(3), as modified by all applicable factors in IRC Table R602.10.3(2) and IRC Table R602.10.3(4), respectively.

6.2.4.1.3.1 All IRC footnotes shall apply.

6.2.4.1.3.2 Bracing lengths in these tables for Method WSP or CS-WSP shall be multiplied by the equivalency factor listed in **Table 7**.

Table 7. Braced Wall Line Length Equivalency Factor[1,2,4,5,6,7]

Wall Assembly	Foam Board Orientation	Fastener	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard[3] (GWB)	GWB Fastener Spacing[3] (edge:field) (in)	Equivalency Factor to IRC WSP and CS-WSP
CAMOBOARD 41 ($^{7}/_{16}$" OSB)	Foam Out	0.113" x $2^{3}/_{8}$"	6:12	16 o.c.	$^{1}/_{2}$"	#6 x $1^{1}/_{4}$" (8:8)	0.73
				24 o.c.			0.83
CAMOBOARD 51 ($^{15}/_{32}$" Plywood)	Foam Out	0.113" x $2^{3}/_{8}$"	6:12	16 o.c.	$^{1}/_{2}$"	#6 x $1^{1}/_{4}$" (8:8)	0.77
				24 o.c.			0.87

SI: 1 in = 25.4 mm

1. Factors are based on SPF framing members.
2. CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed on 2 x 4 studs spaced 24" o.c. maximum, and fastened with minimum 0.113" x $2^{3}/_{8}$" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $^{3}/_{8}$". Nails with a head diameter and length greater than the 0.113" x $2^{3}/_{8}$" nails are also permissible.
3. Gypsum sheathing installed with Type W screws at 8":8" spacing.
4. For wind bracing, multiply the bracing lengths in IRC Table R602.10.3(1) and the adjustment factors in IRC Table R602.10.3(2) for Method WSP or CS-WSP as applicable, including all footnotes, by the factors shown here to establish the required bracing length.
5. For seismic bracing, multiply the bracing lengths in IRC Table R602.10.3(3) and the adjustment factors in IRC Table R602.10.3(4) for Method WSP or CS-WSP as applicable, including all footnotes, by the factors shown here to establish the required bracing length.
6. Minimum $^{1}/_{2}$" gypsum wallboard must be installed as part of the wall assembly.
7. Valid for single and double top plate CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings installation.

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

6.2.5.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be used to brace exterior walls of buildings as an equivalent alternative to WSP or CS-WSP bracing methods of the IBC when installed with blocked or unblocked $^{1}/_{2}$" gypsum fastened with a minimum #6 Type W screw spaced a maximum of 8" o.c. at panel edges and 8" o.c. in the field.

6.2.5.2 Bracing shall be in accordance with the conventional light-frame construction method of IBC Section 2308.6 and this report.

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6.2.6 *Performance-Based IBC Wood-Frame Construction:*

6.2.6.1 CAMOBOARD panels used in wall assemblies designed as shear walls are approved for the following applications:

6.2.6.1.1 Design in accordance with the methodology used in SDPWS for WSP using the capacities shown in **Table 8**.

6.2.6.1.2 Resistance to lateral wind load forces using the allowable shear loads (in pounds per linear foot) set forth in **Table 8**.

Table 8. Allowable Stress Design (ASD) Capacity for Wind[1,4]

Wall Assembly	Foam Board Orientation	Fastener Schedule[2]	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard[3] (GWB)	GWB Fastener Spacing[3] (edge:field) (in)	Allowable Unit Shear Capacity (plf)
CAMOBOARD 41 (7/16" OSB)	Foam Out	0.113" x 2 3/8"	6:12	16 o.c.	1/2"	8:8	580
				24 o.c.			505
CAMOBOARD 51 (15/32" Plywood)	Foam Out	0.113" x 2 3/8"	6:12	16 o.c.	1/2"	8:8	545
				24 o.c.			480

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

1. Tested in accordance with ASTM E564.
2. CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings installed with butted joints on 2 x 4 studs spaced maximum 24" o.c., and fastened with 2 3/8" x 0.113" nails spaced 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of 3/8".
3. Gypsum attached with minimum #6 type W or S screws 1 1/4" long
4. Nails with a head diameter and length greater than the 2 3/8" x 0.113" nails are also permissible.

6.2.7 CAMOBOARD sheathed shear walls that require seismic design in accordance with IBC Section 1613, shall use the seismic allowable unit shear capacities set forth in **Table 9**.

6.2.8 The response modification coefficient, R, system overstrength factor, Ω_0, and deflection amplification factor, C_d, indicated in **Table 9**, 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.

Table 9. Allowable Unit Diaphragm Shear Capacity for Seismic Applications[1,2,3,4,5,6,7]

Seismic Force Resisting System	Maximum Stud Spacing (in)	GWB Fastening Spacing (edge:field) (in)	Seismic Allowable Unit Shear Capacity (plf)	Apparent Shear Stiffness, G_a (kips/in)	Response Modification Factor, R	System Overstrength Factor, Ω_0	Deflection Amplification Coefficient, C_d	Structural System Limitations and Building Height Limit (ft)				
								SDC[8]				
								B	C	D	E	F
CAMOBOARD 41 (7/16" OSB)	16 o.c.	8:8	320	9.8	6.5	3.0	4.0	NL[1]	NL	65	65	65

SI: 1 in = 25.4 mm, 1 plf = 0.0146 kN/m, 1 kips/in = 6.895 kPa

1. CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed on 2 x 4 spaced 16" o.c. maximum and fastened with minimum 2 3/8" x 0.113" nails spaced 6":12" (edge:field) per **Section 9**.
2. All seismic design coefficients follow the equivalency procedures as defined in **Section 4.4** of this report.
3. Response modification coefficient, R, for use throughout ASCE 7. *Note:* R reduces forces to a strength level, not an allowable stress level.
4. 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.
5. Deflection amplification factor, C_d, for use with ASCE 7 Section 12.8.6, Section 12.8.7, and Section 12.9.1.2.
6. NL = Not Limited. Heights are measured from the base of the structure as defined in ASCE 7 Section 11.2.
7. Gypsum attached with minimum #6 type W or S screws 1 1/4" long spaced 8" o.c. at panel edges and in the field.
8. SDC=Seismic Design Category

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6.2.9 *Perforated Shear Walls:*

6.2.9.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are permitted to be designed in accordance with the methodology found in SDPWS with the following exceptions:

6.2.9.1.1 *2015 SDPWS:*

6.2.9.1.1.1 C_o from Equation 4.3-5 in 2015 SDPWS shall be replaced by the equation presented below:

$$C_O = \frac{r}{(0.66 + 0.34 \times r)} \times \frac{L_{tot}}{\sum L_i}$$

$$r = \frac{1}{1 + \frac{A_o}{h\Sigma L_i}}$$

where:

C_o = shear resistance adjustment factor

r = sheathing area ratio

L_{tot} = total length of the perforated shear wall (including the lengths of perforated shear wall segments, and the lengths of segments containing openings), [ft]

A_o = total area of openings, [ft^2]

h = height of wall, [ft]

ΣL_i = sum of the length of full-height sections, [ft]

6.2.9.1.1.2 For wall diaphragm design, the maximum aspect ratio for full height braced wall segments shall be 4:1, instead of 3.5:1 as listed in SDPWS Section 4.3.4.3. The other requirements of SDPWS Section 4.3 shall be followed, including the adjustment factor for aspect ratio of perforated shear wall segments greater than 2:1 found in SDPWS Section 4.3.4.3.

6.2.9.1.2 *2021 SDPWS:*

6.2.9.1.2.1 C_o from Equation 4.3-5 in 2021 SDPWS shall be replaced by the equation presented below:

$$C_O = \frac{A_{wall}}{(0.66A_o + A_{fhs})}$$

where:

C_0 = shear resistance adjustment factor

A_{wall} = total area of a perforated shear wall equal to the length of the perforated shear wall multiplied by its height, [ft^2]

A_o = total area of openings in the perforated shear wall where individual opening areas are calculated as the opening width multiplied by the clear opening height, [ft^2]

A_{fhs} = total area sheathed with full-height sheathing regardless of whether individual wall segments meet the aspect ratio limits in Section 4.3.3.4, [ft^2]

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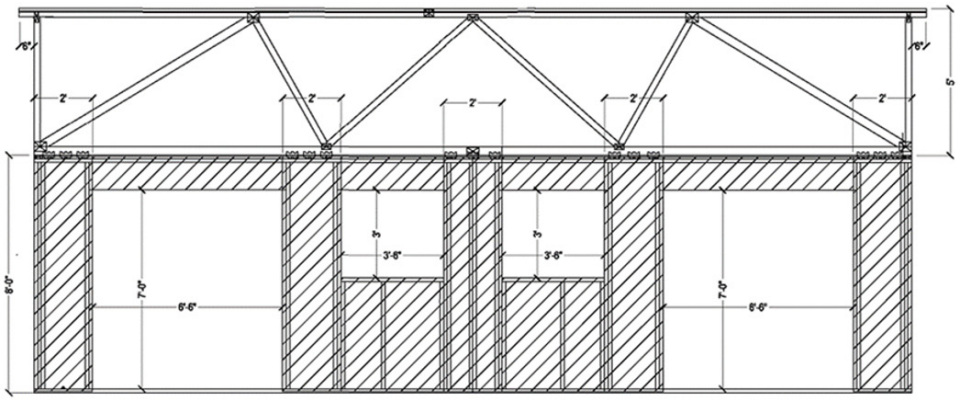
6.2.9.1.2.2 For wall diaphragm design, the maximum aspect ratio for full-height braced wall segments shall be 4:1, instead of 3.5:1 as listed in SDPWS Section 4.3.3.3. The other requirements of SDPWS Section 4.3 shall be followed, including the adjustment factor for aspect ratio of perforated shear wall segments greater than 2:1 found in SDPWS Section 4.3.3.4.

6.2.9.2 **Figure 2** shows how to calculate the capacity of a perforated CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shear wall using the equation in **Section 6.2.9.1.1.1**.



Calculation Steps:

1. The total length of the perforated shear wall (including the lengths of perforated shear wall segments and the lengths of segments containing openings), 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 (full-height sheathing), 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. 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. The shear capacity adjustment factor, C_a, is:

$$C_O = \frac{r}{0.66 - 0.34 \times r} \times \frac{L_{tot}}{\Sigma L_i} = \frac{0.417}{0.66 - 0.34 \times 0.417} * \frac{30}{10} = 2.41$$

7. From **Table 8**, the nominal shear strength per unit length (allowable unit shear capacity), v_n, is 505 plf for the assumed CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings assembly (stud spacing of 24" o.c. with 1/2" GWB).
8. In accordance with Section 4.3.3.5 in SDPWS, the nominal (allowable) shear capacity of this perforated shear wall, V_n, is:

$$V_n = v_n \times \Sigma L_i \times C_a = 580\ plf \times 10\ ft. \times 2.41 = 13{,}978\ lbs.$$

Figure 2. Example of a Perforated Shear Wall

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6.3 *Transverse Load Resistance*

6.3.1 Transverse wind load design shall be in accordance with IBC Section 2304.6.1. Fasteners must be minimum 6d common nail (2" x 0.113") with $1^1/_2$" penetration or 8d common nail ($2^1/_2$" x 0.131") with $1^3/_4$" penetration.

6.3.2 The maximum allowable transverse load resistance capacities at various deflection limits for the evaluated CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings wall assemblies are shown in **Table 10**.

6.3.3 The transverse wind load forces correspond to the allowable basic wind speeds in **Table 11**.

Table 10. Transverse (Out-Of-Plane) Wind Load Resistance[1]

Product	Direction	Fastener[3]	Fastener Spacing (in)	Maximum Stud Spacing (in)	Wind Load[2] (psf)				
					Allowable	L/480	L/360	L/240	L/180
CAMPBOARD 41 ($^7/_{16}$" OSB)	Positive	0.113" x $2^3/_8$"	6:12	24 o.c.	75	25	30	45	55
CAMPBOARD 41 ($^7/_{16}$" OSB)	Positive	0.113" x $2^3/_8$"	6:12	24 o.c.	95	25	30	45	55

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

1. Applies to both negative and positive wind load.
2. Design wind load capacity shall be in accordance with IBC Section 1609.1.1.
3. Fasteners shall be installed with the head in contact with the face of the structural sheathing. Fastener edge distance shall be a minimum of $^3/_8$" on all sides of the board.

Table 11. Basic Wind Speed for Use in Exterior Wall Covering Assemblies[1,2,3,4,5]

Product	Maximum Stud Spacing (in)	Allowable Components and Cladding Basic Wind Speed (mph)					
		Allowable Stress Design Wind Speed[4] (V_{asd})			Basic Design Wind Speed[3] (V_{ult})		
		Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
CAMPBOARD 41 ($^7/_{16}$" OSB)	24 o.c.	155	150	135	200	195	175
CAMPBOARD 41 ($^7/_{16}$" OSB)	24 o.c.	155	155	155	200	200	200

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

1. Wind speed determined in accordance with ASCE 7-22. Applicable to both negative and positive wind load.
2. The tabulated wind speeds correspond to the pressures presented in **Table 10**. See **Table 10** for framing and fastening requirements.
3. Allowable wind speeds are based on the following:
   a. A building height of 30-feet, GC_p= -1.4 for Zone 5 and an Effective Wind Area of 10 ft², Topographic Factor: K_{zt}=1.0, Ground Elevation Factor: K_e=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 for an enclosed building, K_d = 0.85 for Component and Cladding.
4. IBC Section 1609.3.1: $V_{asd} = V_{ult}\sqrt{0.6}$.
5. Reported V_{asd} is capped at 155 mph. Reported V_{ult} is capped at 200 mph.

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6.4 *Axial Load Resistance*

6.4.1 Structural performance for axial compression resistance of CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings wall assemblies were evaluated and allowable compressive loads are provided in **Table 12**.

Table 12. Compressive Resistance of CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings

Assembly	Foam Orientation	Maximum Structural Member Spacing (in)	Interior Sheathing		Allowable Compression Resistance (plf)
			Type	Fastening Schedule	
CAMOBOARD 41 (7/16" OSB)	Foam Out	16 o.c.	1/2" Lightweight GWB	#6 x 1 1/2" drywall screw spaced (edge:field) 8:8 o.c.	1,785
		24 o.c.			1,325
CAMOBOARD 51 (15/32" Plywood)	Foam Out	16 o.c.	1/2" Lightweight GWB	#6 x 1 1/2" drywall screw spaced (edge:field) 8:8 o.c.	2,005
		24 o.c.			1,300
SI: 1 mil = 0.254 mm, 1 in = 25.4 mm, 1 plf = 0.0146 kN/m					

6.4.2 Structural performance under axial uplift load conditions are provided in **Table 13**.

Table 13. Uplift Resistance[1]

Assembly	Foam Orientation	Maximum Structural Member Spacing (in)	Interior Sheathing		Allowable Uplift Resistance (plf)
			Type	Fastening Schedule	
CAMOBOARD 41 (7/16" OSB)	Foam Out	16 o.c.	1/2" Lightweight GWB	#6 x 1 1/2" drywall screw spaced (edge:field) 8:8 o.c.	305
		24 o.c.			240
CAMOBOARD 51 (15/32" Plywood)	Foam Out	16 o.c.	1/2" Lightweight GWB	#6 x 1 1/2" drywall screw spaced (edge:field) 8:8 o.c.	245
		24 o.c.			255

SI: 1 mil = 0.254 mm, 1 in = 25.4 mm, 1 plf = 0.0146 kN/m

1. Fasteners shall be installed with the head in contact with the face of the structural sheathing. Fastener edge distance shall be a minimum of 3/8" on all sides of the board.

6.5 *Water-Resistive Barrier (WRB)*

6.5.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings were evaluated for water penetration performance in accordance with ASTM E331 as specified in IBC Section 1402.2 and IRC Section R703.1.1.

6.5.1.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings installed with foam facing out on exterior walls may be used as a WRB as prescribed in IBC Section 1403.2 and IRC Section R703.2, as described in this section.

6.5.1.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings installed with the foam facing in shall be covered with a code-compliant WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

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6.5.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed with board joints placed directly over exterior framing spaced a maximum of 24" (406 mm) o.c.

6.5.2.1 Vertical joints shall be supported by framing members.

6.5.2.2 Horizontal joists shall be supported by framing members or blocking.

6.5.3 The fasteners used to attach the board shall be installed in accordance with **Table 1** through **Table 10**, and **Section 9**, as applicable.

6.5.3.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be installed as a WRB in a non-structural capacity with the fasteners used to attach the board installed in accordance with **Section 9.5**.

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

6.5.4.1 If a separate WRB method is used, sealing of the sheathing joints is not required.

6.5.5 *Sealing of Joints, Penetrations, and Fasteners:*

6.5.5.1 When CAMOBOARD sheathing is designated as the primary WRB, all joints, through-penetrations (see **Figure 3**), and perimeter sheet fasteners must be sealed to create a continuous barrier to water intrusion unless otherwise stated.

6.5.5.1.1 Flashing or sealing of field fasteners for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings is optional.

6.5.5.1.2 All penetrations through the sheathing, such as for windows, doors, and mechanical services, shall be flashed to create a weather-tight seal. Sealing and flashing shall be in accordance with manufacturer installation instruction. **Figure 3** illustrates the baseline requirements for reference.

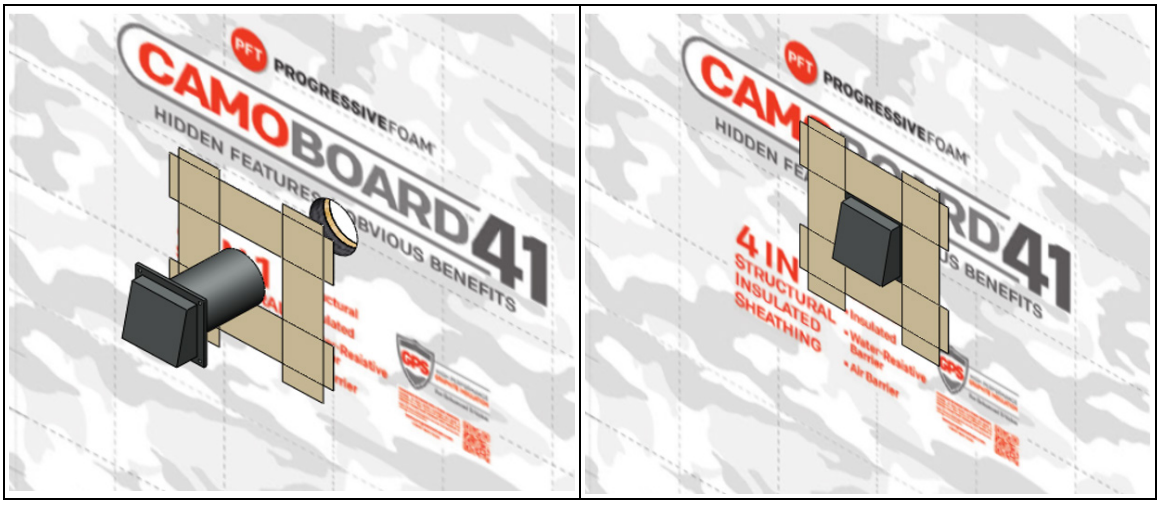

Figure 3. Through-Penetration Sealing Example

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6.5.5.2 All joints and seams between sheathing panels shall be butted together and covered by minimum 3" (76 mm) wide tape (self-adhered membrane) that complies with AAMA 711 as specified in IBC Section 1404.4 and IRC Section R703.4, such as 3M™ Sealing Tape 8777 flashing tape and Progressive Foam Construction Seam Tape.

6.5.5.3 Flashing materials may include liquid-applied flashing materials compliant with AAMA 714 per IBC Section 1404.4 and IRC Section R703.4.

6.5.5.3.1 Application of liquid-applied flashing materials shall be in accordance with manufacturer installation instructions.

6.5.5.3.2 It is the responsibility of the RDP to specify a complete flashing system where all components, including tapes, liquid-applied materials, and adjacent sealants are compatible.

6.6 *Durability*

6.6.1 The foam component of CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings was evaluated for its resistance to UV exposure and accelerated aging.

6.6.1.1 No visible delamination or blistering of the facing layer was evident.

6.6.2 The weathered foam was evaluated for water leakage in accordance with AATCC Test Method 127.

6.6.2.1 The weathered foam did not exhibit any water leakage.

6.7 *Vapor Retarder*

6.7.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are Class I vapor retarders in accordance with IBC Section 1404.3 and as shown in **Table 14**.

Table 14. Water Vapor Barrier Properties[1]

Product	Water Vapor Transmission (perm)	Classification
CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings	≤ 0.1	Class I
1. Foam component tested in accordance with ASTM E96, Desiccant Method.		

6.8 *Air Barrier*

6.8.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings meet the requirements of IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1 for use as an air barrier material when installed in accordance with the manufacturer installation instructions and this report.

6.8.1.1 Air permeability of CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings is provided in **Table 15**.

6.8.2 When used as part of a continuous air barrier assembly, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed in accordance with **Table 1** through **Table 10**, and **Section 9**, as applicable. When installed as part of a continuous air barrier assembly in a non-structural capacity, the fasteners used to attach the board may be installed in accordance with **Section 9.5**.

6.8.3 All sheathing edges at the top and bottom of wall assemblies, and all joints between sheathing panels, shall be sealed in accordance with IRC Section N1102.5.1.1, IECC Section R402.5.1.1, and IECC Section C402.6.1. All joints between sheathing panels shall be covered by minimum 3" (76 mm) wide tape (self-adhered membrane) that complies with IBC Section 1404.4 and IRC Section R703.4.

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Table 15. Air Barrier Properties[1,2,3]

Product	Air Permeability [L/(s·m²)]
CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings	< 0.02

Imperial Units: 1 L/(s·m²) = 0.2 cfm/ft²
1. Tested in accordance with ASTM E2178.
2. Air permeability reading taken at 75 Pa.
3. Minimum thickness of the CAMOBOARD assembly shall be $1^{1}/_{16}$".

6.9 *Thermal Insulation*

6.9.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings meet the continuous insulation requirements of IECC Section C402 and IECC Section R402, and have the thermal resistance provided in **Table 16**.

Table 16. Thermal Resistance Properties[1,2]

Foam Component: Proboard Versa Premium GPS	R-Value (°F·ft²·hr/Btu)
0.50" Thick	2.5
0.59" Thick	3.0
1.02" Thick	5.0
1.55" Thick	7.5

1. Components tested in accordance with ASTM C518.
2. R-value is per inch at 75° F for the foam component.

6.10 *Surface Burning Characteristics*

6.10.1 Components of CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings have the flame spread and smoke developed characteristics shown in **Table 17** when tested in accordance with ASTM E84 per IBC Section 2603.3.

Table 17. Surface Burning Characteristics[1]

CAMOBOARD Component	Flame Spread Index	Smoke Developed Index	Classification
Foam Core	≤ 25	≤ 450	Class A
OSB	< 200	≤ 450	Class C
FRT Plywood	≤ 25	≤ 450	Class A

1. Tested in accordance with UL 723 (ASTM E84).

6.11 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

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7 Certified Performance[26]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[27]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[28]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

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

8.1.1.1 **Table 9** provides SDC that conform to the requirements in ASCE 7 Section 12.2.1, 12.2.1.1, and Table 12.2-1 for design of wall assemblies in buildings that require seismic design.

8.1.2 Structural performance under lateral load conditions for use as an alternative to the conventional wall bracing provisions of IBC Section 2308.6 and IRC Section R602.10 for Method WSP and Method CS WSP.

8.1.3 Structural performance under lateral load conditions for use as a perforated shear wall.

8.1.4 Resistance to transverse loads for wall assemblies used in light-frame wood construction in accordance with IBC Section 1609.1.1.

8.1.5 Performance for use as a component of the air barrier in accordance with IRC Section N1102.5.1, IECC Section R402.5.1.1, and IECC Section C402.6.1.

8.1.6 Performance in accordance with ASTM E84 for flame spread and smoke-developed index ratings in accordance with IBC Section 2603.3 and IBC Section 2603.5.4, as specified in IBC Section 1403.12.

8.2 Fire resistance-rated wall assemblies in accordance with IBC Section 2603.5.1 are outside the scope of this evaluation.

8.3 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[29] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[30] respectively.

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

9 Installation

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

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

9.3 At a minimum, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be fastened to structural framing members in accordance with the sections for wood structural panels in IBC Table 2304.10.2 and IRC Table R602.3(1).

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9.4 *Installation Procedure*

9.4.1 *General:*

9.4.1.1 Fastener edge distance is a minimum of $^{3}/_{8}$" (9.5 mm) for both CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings and gypsum.

9.4.1.2 Where hold-down straps are used, install structural sheathing first, remove foam at strap location, then install the strap over the face of the structural sheathing backer and attach per the manufacturer installation instructions.

9.4.1.3 Where required, gypsum wallboard shall be a minimum $^{1}/_{2}$" and installed with a minimum of #6 x $1^{1}/_{4}$" Type W or S screws or 5d cooler nails. The fastener spacing shall be a maximum of 8" o.c. (76 mm) along the edge and in the field.

9.4.2 *Orientation:*

9.4.2.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings must be installed with the long dimension of the panels parallel to the framing behind, and all panel edges supported by framing or blocking.

9.4.2.2 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings must be installed over studs with a nominal thickness of not less than 2" (51 mm), and spaced a maximum of 24" (610 mm) o.c., unless otherwise limited by this report.

9.4.3 *Fastener Type:*

9.4.3.1 Minimum 0.113" x $2^{3}/_{8}$" nails with a 1" minimum embedment into stud.

9.4.3.2 Nails shall be countersunk into the foam where the nail head is flush with the structural backer.

9.4.4 *Fastener Spacing:*

9.4.4.1 Maximum of 6" o.c. (76 mm) along the edge and 12" o.c. in the field.

9.4.5 *Treatment of Joints:*

9.4.5.1 CAMOBOARD sheathing joints shall be tightly butted at framing members and a single row of fasteners must be applied to both panel edges into the framing behind.

9.4.5.2 Do not tack CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings to framing, but fasten each panel completely once fastening begins.

9.4.5.3 If windows are made to accommodate traditional $^{1}/_{2}$" sheathing materials, order windows with adjustable nailing fins from the supplier. Door brick moldings may be planed or routed $^{3}/_{8}$" in order to accommodate the different sheathing thickness, either at the jobsite or by the millwork supplier.

9.4.5.4 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be installed with appropriate flashing and counter flashing in conformance to accepted building standards and in compliance with local building codes and the flashing manufacturer installation instructions.

9.4.6 *Installation as a Water-Resistive Barrier for CAMOBOARD 41 and CAMOBOARD 51:*

9.4.6.1 When CAMOBOARD is installed as the primary WRB, the following procedures are mandatory in addition to all other applicable installation requirements in this report:

9.4.6.1.1 Joints between boards must be tightly butted. All panel edges must be supported by framing or solid blocking.

9.4.6.1.2 To ensure the system functions as a continuous water-resistive barrier, all vertical and horizontal joints, seams, and corners must be sealed with a minimum 3" wide self-adhering flashing tape compliant with AAMA 711 per IBC Section 1404.4 and IRC Section R703.4.

9.4.6.1.2.1 The tape shall be centered over the joint and firmly rolled to ensure full adhesion.

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9.4.6.1.3 All penetrations, including windows and doors, must be flashed to prevent water from entering the wall cavity, in accordance with IBC Section 1404.4 and IRC Section R703.4. Flashing installation must follow the fenestration manufacturer instructions or, where instructions are not provided, an approved method that ensures proper drainage, as stipulated in IBC Section 1403.2 and IRC Section R703.4.1.

9.4.6.1.4 Where specified by the design professional, fastener heads not otherwise covered by joint tape may be sealed using a liquid-applied flashing compliant with AAMA 714, as referenced in IBC Section 1404.4 and IRC Section R703.4.

9.4.6.1.5 Flashing of fasteners in the field is optional for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings.

9.5 *Minimum Fastening Requirements for Non-Structural Applications*

9.5.1 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, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings may be used for non-structural applications.

9.5.2 The sheathing panels shall be attached to wall framing with the following fasteners:

9.5.2.1 0.113" x 2" long ring-shank nails with $^{7}/_{8}$" diameter plastic cap

9.5.2.2 #6 x 2" long bugle-head coarse thread exterior screws with 1" diameter galvanized washer

9.5.2.3 0.113" x 2" long galvanized roofing nails

9.5.2.4 16-gauge galvanized staples with $^{1}/_{2}$" crown and 2" leg

9.5.3 Fasteners are not required to be countersunk into the foam where the head is flush with the structural backer for non-structural applications.

9.5.3.1 1" minimum embedment into stud is required.

9.5.4 Fastener spacing shall be a maximum of 6" (152 mm) at the edges and 12" (305 mm) on intermediate members.

9.5.4.1 Stud spacing shall be a maximum of 24" (610 mm) o.c.

9.5.5 All joints between sheathing panels shall be covered by minimum 3" (76 mm) wide tape that complies with IBC Section 1404.4 and IRC Section R703.4.

10 Substantiating Data

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

10.1.1 Lateral load wall testing in accordance with ASTM E564 and ASTM E2126

10.1.1.1 Analysis in accordance with ASTM D7989

10.1.2 Transverse load testing in accordance with ASTM E330

10.1.3 Water penetration resistance testing in accordance with ASTM E331

10.1.4 Basic wind speed calculations performed by DrJ Engineering

10.1.5 Axial compression testing in accordance with ASTM E72

10.1.6 Uplift (axial tension) testing in accordance with ASTM E72

10.1.7 Vapor permeance testing in accordance with ASTM E96

10.1.8 Thermal resistance testing in accordance with ASTM C518

10.1.9 Surface burning testing in accordance with ASTM E84

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

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

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

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[31]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be approved for the following applications:

11.2.1 As structural sheathing on exterior walls of Type V construction in accordance with the IBC.

11.2.2 As structural sheathing on exterior walls constructed in accordance with IRC Section R602.

11.2.3 Lateral load resistance due to wind and seismic loads carried by shear walls as described in **Table 8** and **Table 9**.

11.2.4 Transverse load resistance due to components and cladding pressures on building surfaces as described in **Table 10**.

11.2.5 Axial load resistance due to gravity forces and uplift loads induced by wind as described in **Table 12** and **Table 13**.

11.3 When installed in accordance with the manufacturer installation instructions and this report, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings comply with or are a suitable alternative to, the applicable sections of the codes listed in **Section 4** for the following applications:

11.3.1 Performance of foam plastics in accordance with IBC Section 2603 and IRC Section R303.[32]

11.3.2 Performance for use as insulating sheathing in accordance with IRC Section N1102.1, IRC Section N1102.2, IECC Section R402, and IECC Section C402.

11.3.3 Flame spread and smoke developed indices in accordance with IBC Section 2603.3 and IRC Section R303.3.[33]

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11.4 Unless exempt by state statute, when CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.5 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Progressive Foam Technologies, Inc.

11.6 IBC Section 104.2.3[34] (IRC Section R104.2.2[35] and IFC Section 104.2.3[36] are similar) in pertinent part state:

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

11.7 **Approved:**[37] Building regulations require that the building official shall accept duly authenticated reports.[38]

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

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

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

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

11.9 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[39]

12 Conditions of Use

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

12.2 As listed herein, CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be limited to one-story buildings or less than 40 ft in height.

12.3 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall be separated from the interior of the building by an approved thermal barrier or ignition barrier (i.e., $^1/_2$" thick gypsum wallboard) where required by the applicable code.

12.4 Where CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings are not installed for use as wall bracing as described in this report, the walls shall be braced by other materials or methods, in accordance with the applicable code.

12.5 When used in accordance with the IBC in Seismic Design Categories C, D, E, or F, special inspections shall comply with IBC Section 1705.13.[40]

12.6 When used in accordance with the IBC in high wind areas, special inspections shall comply with IBC Section 1705.12.[41]

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

12.7.1 Loads applied shall not exceed those set forth in this report:

12.7.1.1 Allowable shear loads shall not exceed values in **Table 8** for wind loads and **Table 9** for seismic loads.

12.7.1.2 Transverse design loads shall not exceed those described in **Table 10**.

12.7.1.3 Axial loads shall not exceed values in **Table 12** and **Table 13**.

12.8 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings shall not be used in regions where wind speeds exceed those described in **Table 11**.

12.9 All panel edges shall be supported by wall framing or solid blocking a minimum of 2" nominal (1.5" actual) thickness.

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

12.11 In areas where the probability of a termite infestation is labeled, *"very heavy"* for CAMOBOARD boards that are installed on buildings or structures of wood-framed construction, the installation shall follow the provisions of IBC Section 2603.8 and IRC Section R305.4,[42] where applicable.

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

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

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

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

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

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

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

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

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

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

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13 Identification

13.1 CAMOBOARD 41 and CAMOBOARD 51 Structural Insulated Sheathings, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.progressivefoam.com.

14 Review Schedule

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

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

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Notes

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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[29] Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

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

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

[32] 2021 IRC Section R316

[33] 2021 IRC Section R316.3

[34] 2021 IBC Section 104.11

[35] 2021 IRC Section R104.11

[36] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

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

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

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

[40] 2018 IBC Section 1705.12

[41] 2018 IBC Section 1705.11

[42] 2021 IRC Section R318.4

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