



Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2406-111



Issue Date: January 20, 2025

Revision Date: April 14, 2025

Subject to Renewal: April 1, 2026

CAMOBOARD™ Structural Insulated Sheathing for Use in Wall Applications

Trade Secret Report Holder:

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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 Product Evaluated¹

1.1 CAMOBOARD Structural Insulated Sheathings:

1.1.1 CAMOBOARD™ 41

1.1.2 CAMOBOARD™ 51

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



- 2.2 CAMOBOARD 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.
- 2.2.1.1 Nominal thicknesses used with CAMOBOARD Structural Insulated Sheathings: 0.59", 1.02", and 1.55"
- 2.2.1.2 Foam conforms to ASTM C578 Type I, Type II, IX, and Type IX
- 2.2.1.3 The FPIS component provides continuous insulation, and serves as a water-resistive barrier and as an air barrier
- 2.2.2 The WSP component can be $\frac{7}{16}$ " thick Oriented Strand Board (OSB), or $\frac{15}{32}$ " thick Fire-Retardant Treated (FRT) plywood.
- 2.3 *Material Availability*
- 2.3.1 *CAMOBOARD Nominal Thickness:*
- 2.3.1.1 $\frac{7}{16}$ " OSB as the structural backer:
- 2.3.1.1.1 1", 1 $\frac{1}{2}$ ", 2" (1.03", 1.46", and 1.99") thick
- 2.3.1.2 $\frac{15}{32}$ " FRT plywood as the structural backer:
- 2.3.1.2.1 1", 1 $\frac{1}{2}$ ", 2" (1.06", 1.49", and 2.02") thick
- 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 to regulatory evaluation in **Section 8**.

3 Definitions

- 3.1 New Materials² 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.³ The design strengths and permissible stresses shall be established by tests⁴ and/or engineering analysis.⁵
- 3.2 Duly authenticated reports⁶ and research reports⁷ are test reports and related engineering evaluations, which are written by an approved agency⁸ and/or an approved source.⁹
- 3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).¹⁰
- 3.3 An approved agency is "approved" when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory.
- 3.4 An approved source is "approved" when a professional engineer (i.e., Registered Design Professional) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.¹¹
- 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 Registered Design Professional (RDP).
- 3.5.1 The Center for Building Innovation (CBI) is ANAB¹² ISO/IEC 17025 and ISO/IEC 17020 accredited.



- 3.6 The regulatory authority shall enforce¹³ 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 writing¹⁴ 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.¹⁵
- 3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.¹⁶ Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.¹⁷
- 3.9 Approval equity is a fundamental commercial and legal principle.¹⁸

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation¹⁹

4.1 Standards

- 4.1.1 AATCC Test Method 127: Test Method for Water Resistance: Hydrostatic Pressure
- 4.1.2 ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction
- 4.1.3 ANSI/AWC SDPWS: Special Design Provisions for Wind and Seismic
- 4.1.4 ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures
- 4.1.5 ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- 4.1.6 ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- 4.1.7 ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- 4.1.8 ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
- 4.1.9 ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials
- 4.1.10 ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference
- 4.1.11 ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- 4.1.12 ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings
- 4.1.13 ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings
- 4.1.14 ASTM E2178: Standard Test Method for Air Permeance of Building Materials.
- 4.1.15 UL 723: Test for Surface Burning Characteristics of Building Materials

- 4.2 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:

- 4.2.1 ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures
- 4.2.2 ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels
 - 4.2.2.1 ASTM D7989 is accepted engineering practice used to establish Seismic Design Coefficients (SDCs).
 - 4.2.2.2 Test 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.



4.2.2.3 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 independently prepared by approved agencies and/or approved sources) when signed and sealed by a licensed professional engineer pursuant to registration law.

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

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

4.3 Regulations

4.3.1 *IBC – 15, 18, 21: International Building Code®*

4.3.2 *IRC – 15, 18, 21: International Residential Code®*

4.3.3 *IECC – 15, 18, 21: International Energy Conservation Code®*

5 Listed²⁰

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

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 General

6.1.1 Except as otherwise described in this report, CAMOBOARD 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 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 2308.5.3.2 and IRC Section R602.3.2.

6.1.8 CAMOBOARD 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 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 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 Structural Insulated Sheathings shall be installed with the foam facing the exterior (foam out).



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

- 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.
- CAMOBOARD 41 installed with butted joints on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x 2³/₈" 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 2³/₈" nails are also permissible.
- 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.
- Interpolation shall not be permitted.
- 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.
- Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
- 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.

**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, Vult (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
CAMOBOARD 51 (Foam Out) ($15/32$ " Plywood) continued	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

- 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.
- CAMOBOARD 51 installed with butted joints on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x 2 $\frac{3}{8}$ " nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of $\frac{3}{8}$ ". Nails with a head diameter and length greater than the 0.113" x 2 $\frac{3}{8}$ " nails are also permissible.
- Minimum $\frac{1}{2}$ " gypsum wallboard (lightweight minimum) shall be fastened to the interior side of the wall with minimum #6 x 1 $\frac{1}{4}$ " Type W or S screws installed 8" o.c. along the edges and 8" o.c. in the field.
- Interpolation shall not be permitted.
- 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.
- Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.
- 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.



6.2.3 Prescriptive IRC Bracing Applications:

6.2.3.1 CAMOBOARD 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 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.

**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, Vult (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 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

- CAMOBOARD 41 shall be installed on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x 2³/₈" 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 2³/₈" nails are also permissible.
- Demonstrates equivalency to [IRC Table R602.10.3\(1\)](#).
- All adjustment factors from [IRC Table R602.10.3\(2\)](#) shall be applied.
- 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
- Minimum 1/2" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.4 per [IRC Table R602.10.3\(2\)](#).
- The addition of gypsum wallboard to CAMOBOARD 41 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
- 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.



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, Vult (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 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

**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, Vult (mph)											
		< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140	< 95	≤ 110	≤ 115	≤ 120	≤ 130	≤ 140
SI: 1 ft = 0.3048 m, 1 mph = 1.61 km/h													
<p>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 2³/₈" 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 2³/₈" nails are also permissible.</p> <p>2. Demonstrates equivalency to IRC Table R602.10.3(1).</p> <p>3. All adjustment factors from IRC Table R602.10.3(2) shall be applied.</p> <p>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</p> <p>5. Minimum 1/2" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.4 per IRC Table R602.10.3(2).</p> <p>6. The addition of gypsum wallboard to CAMOBOARD 51 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.</p> <p>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.</p>													

6.2.3.5 Seismic Bracing:

- 6.2.3.5.1 For seismic design, the required braced wall panel lengths for CAMOBOARD 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 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



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
	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

- CAMOBORD 41 shall be installed on 2 x 4 studs spaced 24" o.c. maximum, and fastened with minimum 0.113" x 2³/₈" 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 2³/₈" nails are also permissible.
- Demonstrates equivalency to [IRC Table R602.10.3\(3\)](#). All adjustment factors from [IRC Table R602.10.3\(4\)](#) shall be applied.
- 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.
- Tabulated bracing lengths are based on the following:
- Soil Class D
- Wall height = 10'
- 10 psf floor dead load
- 15 psf roof/ceiling dead load
- Braced wall line spacing ≤ 25'
- Linear interpolation is permitted.
- Minimum 1/2" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5 per [IRC Table R602.10.3\(4\)](#).
- The addition of gypsum wallboard to CAMOBORD 41 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
- 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.

Table 6. Required Bracing Lengths for CAMOBORD 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 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



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
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

- CAMOBORD 51 shall be installed on 2 x 4 studs spaced 24" o.c. maximum and fastened with minimum 0.113" x 2³/₈" nails installed 6" o.c. along the edges and 12" o.c. in the field. Fastener edge distance shall be a minimum of 3¹/₈". Nails with a head diameter and length greater than the 0.113" x 2³/₈" nails are also permissible.
- Demonstrates equivalency to [IRC Table R602.10.3\(3\)](#). All adjustment factors from [IRC Table R602.10.3\(4\)](#) shall be applied.
- 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.
- Tabulated bracing lengths are based on the following:
 - Soil Class D
 - Wall height = 10'
 - 10 psf floor dead load
 - 15 psf roof/ceiling dead load
 - Braced wall line spacing ≤ 25'
 - Linear interpolation is permitted.
- Minimum 1/2" gypsum wallboard must be installed as part of the wall assembly. Where gypsum wallboard is not applied to the interior side of the wall assembly, bracing lengths shall be multiplied by a factor of 1.5 per [IRC Table R602.10.3\(4\)](#).
- The addition of gypsum wallboard to CAMOBORD 51 wall assemblies provides a benefit greater than the SDPWS additive method for wood structural panels.
- 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.



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 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 These 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 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}

Wall Assembly	Foam Board Orientation	Fastener	Fastener Spacing (edge:field) (in)	Max. Stud Spacing (in)	Gypsum Wallboard ³ (GWB)	Gypsum Wallboard ³ Fastener Spacing (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

- Factors are based on SPF framing members.
- CAMOBOARD Structural Insulated Sheathings shall be installed on 2 x 4 studs spaced 24" o.c. maximum, and fastened with minimum 0.113" x 2³/₈" 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 2³/₈" nails are also permissible.
- Gypsum sheathing installed with Type W screws at 8":8" spacing.
- Multiply the bracing lengths in IRC Table R602.10.3(1) and IRC Table R602.10.3(2) Method WSP or CS-WSP as applicable, including all footnotes, by the factors shown here to establish the required bracing length.
- Where gypsum wallboard is not applied to the interior side of the CAMOBOARD Structural Insulated Sheathings assembly, bracing lengths shall be multiplied by a factor of 1.4.
- Valid for single and double top plate CAMOBOARD Structural Insulated Sheathings installation.

6.2.5 Prescriptive IBC Conventional Light-Frame Wood Construction:

6.2.5.1 CAMOBOARD 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.



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^{1,2,3,4}

Product	Foam Board Orientation	Fastener(s) Schedule ²	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard ³ (GWB)	GWB ³ Fastener Spacing (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" GWB	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" GWB	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 Structural Insulated Sheathings installed with butted joints on 2 x 4 studs spaced maximum 24" o.c., and fastened with 2³/₈" 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 1¹/₄" long
4. Nails with a head diameter and length greater than the 2³/₈" 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**.

6.2.7.1 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 ² (edge:field) (in)	Seismic Allowable Unit Shear Capacity (plf)	Apparent Shear Stiffness, G_a (kips/in)	Response Modification Factor, R	System Over-Strength Factor, Ω_0	Deflection Amplification Co-efficient, 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 Structural Insulated Sheathings shall be installed on 2 x 4 spaced 16" o.c. maximum and fastened with minimum 2³/₈" 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 4.2** 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, 12.8.7 and 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 1¹/₄" long spaced 8" o.c. at panel edges and in the field.
8. SDC=Seismic Design Category

6.2.8 Perforated Shear Walls:

6.2.8.1 CAMOBOARD Structural Insulated Sheathings are permitted to be designed in accordance with the methodology found in SDPWS with the following exceptions:

6.2.8.1.1 2015 SDPWS:

6.2.8.1.1.1 C_0 from Equation 4.3-5 in SDPWS shall be replaced by the equation presented below:

$$C_0 = \frac{r}{(0.66 + 0.34 \times r)} \times \frac{L_{tot}}{\sum L_i}$$

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

where,

C_0 = 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, [ft²]

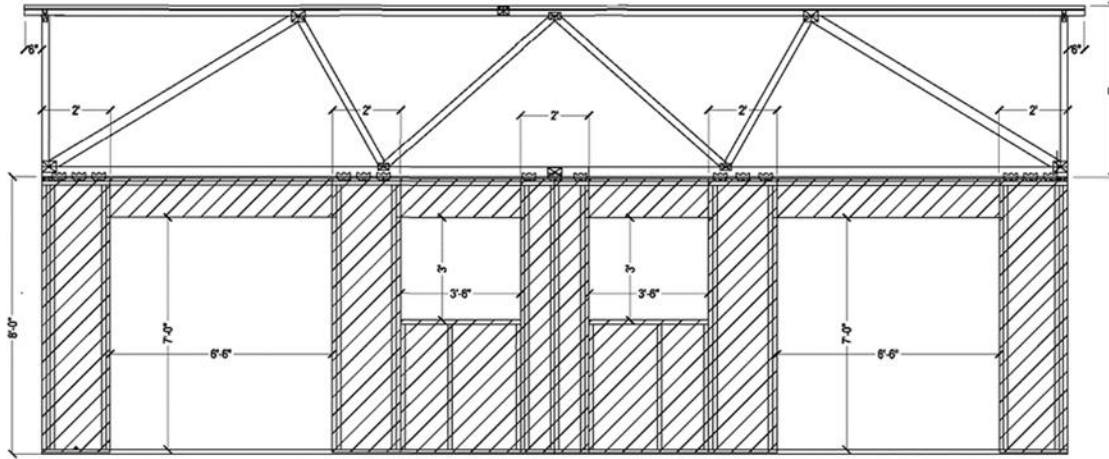
h = height of wall, [ft]

$\sum L_i$ = sum of the length of full-height sections, [ft]



- 6.2.8.1.1.2 For floor and roof diaphragm design, the requirements of SDPWS Section 4.2 for blocked diaphragms shall be followed.
- 6.2.8.1.1.3 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.
- 6.2.8.1.2 *2021 SDPWS:*
 - 6.2.8.1.2.1 For floor and roof diaphragm design, the requirements of SDPWS Section 4.2 for blocked diaphragms shall be followed.
 - 6.2.8.1.2.2 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.

6.2.8.2 **Figure 2** shows how to calculate the capacity of a perforated CAMOBOARD Structural Insulated Sheathings shear wall using the equation in **Section 6.2.8.1.1.1**.



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 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:

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

Figure 2. Example of a Perforated Shear Wall



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 and structural member spacing are shown in:
- 6.3.2.1 Resistance to transverse wind load forces using the allowable transverse loads (in pounds per square foot) set forth in **Table 10**. The transverse wind load forces correspond to the allowable basic wind speeds in **Table 11**.

Table 10. Transverse (Out-Of-Plane) Wind Load Resistance^{1,2,3}

Product	Direction	Fastener	Fastener Spacing (in)	Maximum Stud Spacing (in)	Allowable Design ^{1,2} Value (psf)
CAMOBORD 41 (7/16" OSB)	Positive	0.113" x 2 3/8"	6:12	24 o.c.	75
CAMOBORD 51 (15/32" Plywood)	Positive	0.113" x 2 3/8"	6:12	24 o.c.	95

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

- Applies to both negative and positive wind load.
- Design wind load capacity shall be in accordance with [IBC Section 1609.1.1](#).
- 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.

Table 11. Basic Wind Speed for Use in Exterior Wall Covering Assemblies^{1,2,3,4,5}

Product	Maximum Stud Spacing (in)	Allowable Components & 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
CAMOBORD 41 (7/16" OSB)	24 o.c.	155	150	135	200	195	175
CAMOBORD 51 (15/32" Plywood)	24 o.c.	155	155	155	200	200	200

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

- Wind speed determined in accordance with ASCE 7-22. Applicable to both negative and positive wind load.
- The tabulated wind speeds correspond to the pressures presented in **Table 9**. See **Table 9** for framing and fastening requirements.
- Allowable wind speeds are based on the following:
- A building height of 30-feet, GCp = -1.4 for Zone 5 and an Effective Wind Area of 10 ft², Topographic Factor: Kzt = 1.0, Ground Elevation Factor: Ke = 1.0, Internal Pressure Coefficient, GCpi = +/- 0.18 for an enclosed building, Kd = 0.85 for 'Component and Cladding'.
- [IBC Section 1609.3.1](#): $V_{asd} = V_{ult} \sqrt{0.6}$.
- Reported V_{asd} is capped at 155 mph. Reported V_{ult} is capped at 200 mph.

6.4 Axial Load Resistance

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

Table 12. Compressive Resistance of CAMOBOARD 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 Resistance¹

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 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](#).
- 6.5.2 CAMOBOARD Structural Insulated Sheathings installed with foam facing out on exterior walls may be used as a WRB as prescribed in [IBC Section 1403.2²¹](#) and [IRC Section R703.2](#), as described in this section.
- 6.5.3 CAMOBOARD Structural Insulated Sheathings installed with the foam facing in shall be covered with a code-compliant WRB in accordance with [IBC Section 1403.2²²](#) and [IRC Section R703.2](#).
- 6.5.4 CAMOBOARD Structural Insulated Sheathings shall be installed with board joints placed directly over exterior framing spaced a maximum of 24" (406 mm) o.c.
- 6.5.4.1 Vertical joints shall be supported by framing members.
- 6.5.4.2 Horizontal joists shall be supported by framing members or blocking.



- 6.5.5 The fasteners used to attach the board shall be installed in accordance with **Table 1** through **Table 10**, and **Section 9**, as applicable.
- 6.5.6 A separate WRB may also be provided. If a separate WRB method is used, sealing of the sheathing joints is not required.
- 6.5.7 Flashing must be installed at all sheathing penetrations and shall comply with all the applicable code sections.
- 6.5.8 CAMOBOARD 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**.
 - 6.5.8.1 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](#).
 - 6.5.8.1.1 Tape for the seams of CAMOBOARD Structural Insulated Sheathings as an approved assembly is specified as 3M™ Sealing Tape 8777 flashing tape.

6.6 Durability

- 6.6.1 The foam component of CAMOBOARD 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 Structural Insulated Sheathings are Class III [vapor retarders](#) in accordance with [IBC Section 1404.3](#), and as shown in **Table 14**.

Table 14. Water Vapor Barrier Properties¹

Product	Water Vapor Transmission (perm)	Classification
CAMOBOARD 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 Structural Insulated Sheathings meet the requirements of [IRC Section N1101.10.5](#), [IECC Section R303.1.5](#), and [IECC Section C402.5.1.3](#) 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 Structural Insulated Sheathings is provided in **Table 15**.
- 6.8.2 When used as part of a continuous air barrier assembly, CAMOBOARD 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 N1102.4.1.1](#), [IECC Section R402.4.1.1](#), and [IECC Section C402.5.1](#). 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](#).

**Table 15.** Air Barrier Properties^{1,2,3}

Product	Air Permeability [L/(s·m ²)]
CAMOBOARD Structural Insulated Sheathings	< 0.02
Imperial Units: 1 L/(s·m ²) = 0.2 cfm/ft ² 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 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 GPS2	R-Value (°F·ft ² ·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 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 Burn Characteristics¹

CAMOBOARD Component	Flame Spread Index	Smoke Developed Index	Classification
Foam Core ¹	≤ 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 Where the application falls outside of the performance evaluation, conditions of use, and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.



7 Certified Performance²³

- 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.²⁴
- 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.²⁵

8 Regulatory Evaluation and Accepted Engineering Practice

- 8.1 CAMOBOARD 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 SDCs 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 N1102.4.1, IECC Section R402.4.1.1, and IECC Section C402.5.1.
 - 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 1403.13.
- 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 Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified²⁶ to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.
- 8.4 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which are also its areas of professional engineering competence.
- 8.5 Any regulation specific issues not addressed in this section are outside the scope of this report.



9 Installation

- 9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.
- 9.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.
- 9.3 At a minimum, CAMOBOARD 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).
- 9.4 *Installation Procedure*
 - 9.4.1 *General:*
 - 9.4.1.1 Fastener edge distance is a minimum of $\frac{3}{8}$ " (9.5 mm) for both CAMOBOARD 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 $\frac{1}{2}$ " and installed with a minimum of #6 x 1 $\frac{1}{4}$ " 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 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 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 $\frac{3}{8}$ " nails with a 1" minimum embedment into stud.
 - 9.4.3.2 Nail shall be countersunk into the foam where 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 Structural Insulated Sheathings to framing, but fasten each panel completely once fastening begins.
 - 9.4.5.3 If windows are made to accommodate traditional $\frac{1}{2}$ " sheathing materials, order windows with adjustable nailing fins from the supplier. Door brick moldings may be planed or routed $\frac{3}{8}$ " in order to accommodate the different sheathing thickness, either at the jobsite or by the millwork supplier.
 - 9.4.5.4 CAMOBOARD Structural Insulated Sheathings shall be installed with appropriate flashing and counter flashing in conformance with accepted building standards and in compliance with local building codes and the flashing manufacturer installation instructions.



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 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 $\frac{7}{8}$ " 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 $\frac{1}{2}$ " 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 Basic wind speed calculations performed by DrJ Engineering
 - 10.1.4 Axial compression testing in accordance with ASTM E72
 - 10.1.5 Uplift (axial tension) testing in accordance with ASTM E72
 - 10.1.6 Vapor permeance testing in accordance with ASTM E96
 - 10.1.7 Thermal resistance testing in accordance with ASTM C518
 - 10.1.8 Surface burning testing in accordance with ASTM E84
- 10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or RDPs. 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: 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.²⁷
- 10.6 Where additional condition of use and/or regulatory compliance information is required, please search for CAMOBOARD Structural Insulated Sheathings on the DrJ Certification website.

11 Findings

- 11.1 As outlined in **Section 6**, CAMOBOARD Structural Insulated Sheathings have performance characteristics that were tested and/or meet applicable regulations and 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 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 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 R316.
 - 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 R316.3.
- 11.4 Unless exempt by state statute, when CAMOBOARD 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 104.11 (IRC Section R104.11 and IFC Section 104.10²⁸ are similar) in pertinent part states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.



- 11.7 **Approved:**²⁹ Building regulations require that the building official shall accept duly authenticated reports.³⁰
- 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 Agreements (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.³¹

12 Conditions of Use

- 12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.
- 12.2 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.
- 12.3 Use of CAMOBOARD Structural Insulated Sheathings shall be limited to one-story buildings or buildings less than 40 ft in height.
- 12.4 CAMOBOARD 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.
- 12.5 When CAMOBOARD 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.
- 12.6 When used in accordance with the IBC in Seismic Design Categories C, D, E, or F, special inspections shall comply with IBC Section 1705.13.³²
- 12.7 When used in accordance with the IBC in high wind areas, special inspections shall comply with IBC Section 1705.12.³³
- 12.8 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed.
- 12.8.1 Loads applied shall not exceed those set forth in this report:
- 12.8.1.1 Allowable shear loads shall not exceed values in **Table 8** for wind loads and **Table 9** for seismic loads.
- 12.8.1.2 Transverse design loads shall not exceed those described in **Table 10**.
- 12.8.1.3 Axial loads shall not exceed values in **Table 12** and **Table 13**.
- 12.9 CAMOBOARD Structural Insulated Sheathings shall not be used in regions where wind speeds exceed those described in **Table 11**.
- 12.10 All panel edges shall be supported by wall framing or solid blocking a minimum of 2" nominal (1.5" actual) thickness.
- 12.11 The manufacturer installation instructions shall be shipped to the jobsite with the materials or otherwise be available on the jobsite for inspection.



- 12.12 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 R318.4](#), where applicable.
- 12.13 When required by adopted legislation and enforced by the [building official](#), also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:
- 12.13.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an [approved source](#), shall be approved when signed and sealed.
 - 12.13.2 This report and the installation instructions shall be submitted at the time of [permit](#) application.
 - 12.13.3 These innovative products have an internal quality control program and a third-party quality assurance program.
 - 12.13.4 At a minimum, these innovative products shall be installed per **Section 9** of this report.
 - 12.13.5 The review of this report by the AHJ shall comply with [IBC Section 104](#) and [IBC Section 105.4](#).
 - 12.13.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with [IBC Section 104.4](#), [IBC Section 110.4](#), [IBC Section 1703](#), [IRC Section R104.4](#), and [IRC Section R109.2](#).
 - 12.13.7 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by [IBC Section 110.3](#), [IRC Section R109.2](#), and any other regulatory requirements that may apply.
- 12.14 The approval of this report by the AHJ shall comply with [IBC Section 1707.1](#), where legislation states in part, “*the [building official](#) shall accept duly authenticated reports from [approved agencies](#) in respect to the quality and manner of [use](#) of new material or assemblies as provided for in [Section 104.11](#),*” all of [IBC Section 104](#), and [IBC Section 105.4](#).
- 12.15 [Design loads](#) shall be determined in accordance with the regulations adopted by the [jurisdiction](#) in which the project is to be constructed and/or by the building designer (i.e., [owner](#) or [RDP](#)).
- 12.16 The actual design, suitability, and use of this report for any particular building, is the responsibility of the [owner](#) or the authorized agent of the owner.

13 Identification

- 13.1 The innovative products listed in **Section 1.1** are identified by a label on the board or packaging material bearing the manufacturer name, product name, 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 drjcertification.org.
- 14.2 For information on the status of this report, please contact [DrJ Certification](#).

15 Approved for Use Pursuant to U.S. and International Legislation Defined in Appendix A

- 15.1 are included in this report published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services. This report states either that the material, product, or service meets recognized standards or has been tested and found suitable for a specified purpose. This report meets the legislative intent and definition of being acceptable to the AHJ.



Appendix A

1 Legislation that Authorizes AHJ Approval

- 1.1 **Fair Competition:** State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies, and/or methods of construction that:
- 1.1.1 Advance innovation.
 - 1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints.
 - 1.1.3 Benefit consumers through lower prices, better quality, and greater choice.
- 1.2 **Adopted Legislation:** The following local, state and federal regulations affirmatively authorize these innovative products to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:
- 1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to “*protect economic freedom and opportunity by promoting free and fair competition in the marketplace.*”
 - 1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies, and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.
 - 1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),³⁴ where providing test reports, engineering analysis, and/or other related IP/TS is subject to prison of not more than ten years³⁵ and/or a \$5,000,000 fine or 3 times the value of³⁶ the Intellectual Property (IP) and Trade Secrets (TS).
 - 1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, duly authenticated reports, and/or research reports prepared by approved agencies and/or approved sources.
 - 1.2.4 For new materials³⁷ that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.
 - 1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.³⁸
 - 1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.
 - 1.2.7 The AHJ shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.³⁹



- 1.3 **Approved⁴⁰ by Los Angeles:** The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.⁴¹ The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.⁴²
- 1.4 **Approved by Chicago:** The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly, and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).
- 1.5 **Approved by New York City:** The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed⁴³ an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement⁴⁴ (i.e., ANAB, International Accreditation Forum also known as IAF, etc.).
- 1.6 **Approved by Florida:** Statewide approval of products, methods or systems of construction shall be approved, without further evaluation by:
- 1.6.1 A certification mark or listing of an approved certification agency,
 - 1.6.2 A test report from an approved testing laboratory,
 - 1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or
 - 1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed, and sealed by a professional engineer or architect, licensed in Florida.
 - 1.6.5 For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods:
 - 1.6.5.1 A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code,
 - 1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,
 - 1.6.5.3 A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code,



- 1.6.5.4 A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code, or
- 1.6.5.5 A statewide product approval issued by the Florida Building Commission.
- 1.6.6 The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).
- 1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA]):** A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.
- 1.8 **Approved by New Jersey:** Pursuant to the 2018 Building Code of New Jersey in IBC Section 1707.1 General,⁴⁵ it states: “*In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the Uniform Construction Code (N.J.A.C. 5:23)*”.⁴⁶ Furthermore N.J.A.C 5:23-3.7 states: “*Municipal approvals of alternative materials, equipment, or methods of construction.*”
 - 1.8.1 **Approvals:** Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability, and safety of those conforming with the requirements of the regulations.
 - 1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.
 - 1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.
 - 1.8.2 The New Jersey Department of Community Affairs has confirmed that technical evaluation reports, from any accredited entity listed by ANAB, meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide “*reports of engineering findings.*”
- 1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards:** Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14⁴⁷ and Part 3280,⁴⁸ the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:
 - 1.9.1 “All construction methods shall be in conformance with accepted engineering practices.”
 - 1.9.2 “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.”
 - 1.9.3 “The design stresses of all materials shall conform to accepted engineering practice.”



- 1.10 Approval by US, Local and State Jurisdictions in General:** In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:
- 1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.⁴⁹
 - 1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept duly authenticated reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.⁵⁰
 - 1.10.2.1 An approved agency is “*approved*” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is in the ANAB directory.
 - 1.10.2.2 An approved source is “*approved*” when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.⁵¹
 - 1.10.3 The design strengths and permissible stresses of any structural material...shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.⁵²
- 1.11 Approval by International Jurisdictions:** The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:
- 1.11.1 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.
 - 1.11.2 **Approved:** The purpose of the MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA and subsequently, acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, designs, services, and/or methods of construction.
 - 1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.⁵³
 - 1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.⁵⁴
- 1.12 Approval equity is a fundamental commercial and legal principle.⁵⁵



Notes

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

<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702>

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/colorado/ibc-2021/chapter/1/scope-and-administration#104.11>

<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706>:-:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests%20as

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/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706>:-:text=shall%20conform%20to%20the%20specifications%20and%20methods%20of%20design%20of%20accepted%20engineering%20practice

<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>:-:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies

<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2>

https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency

https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source

<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](#).

<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/>

<https://www.cbiteest.com/accreditation/>

<https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11>:-:text=to%20enforce%20the%20provisions%20of%20this%20code

<https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11>:-:text=Where%20the%20alternative%20material%2C%20design%20or%20method%20of%20construction%20is%20not%20approved%2C%20the%20building%20official%20shall%20respond%20in%20writing%2C%20stating%20the%20reasons%20why%20the%20alternative%20was%20not%20approved AND

<https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#105.3.1>:-:text=If%20the%20application%20or%20the%20construction%20documents%20do%20not%20conform%20to%20the%20requirements%20of%20pertinent%20laws%2C%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%2C%20stating%20the%20reasons%20therefore

<https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>:-:text=the%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%20104.11

<https://iaf.eu/en/about-iaf-mia/#>:-:text=it%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

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

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

Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

<https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2>(Listed%20or%20certified); <https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#listed> AND <https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#labeled>

2015 IBC Section 1404.2

2015 IBC Section 1404.2

<https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4>

<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

<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

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.

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

2018 IFC Section 104.9

Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.



<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1>

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

[2018 IBC Section 1705.12](#)

[2018 IBC Section 1705.11](#)

<http://www.drjengineering.org/AppendixC> AND <https://www.drjcertification.org/cornell-2016-protection-trade-secrets>

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

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

<https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2>

IBC 2021, Section 1706.1 Conformance to Standards

IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

See **Section 11** for the distilled building code definition of **Approved**.

Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

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

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

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

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

<https://www.nj.gov/dca/divisions/codes/codereg/ucc.html>

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

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

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

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

<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/>

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

<https://iaf.nu/en/about-iaf-mla/#:~:text=it%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>

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

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