Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2309-04

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EnergyShield® and ThermalStar® Extended Plate Wall Systems

Trade Secret Report Holder:

Atlas® Roofing Corporation

Phone: 800-388-6134 Website: atlasmoldedproducts.com or atlasrwi.com

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 10 00 - Rough Carpentry

Section: 06 12 00 - Structural Panels

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 20 00 - Thermal Protection

Section: 07 21 00 - Thermal Insulation

Section: 07 27 00 - Air Barriers

1 Innovative Products Evaluated[1]

1.1 EnergyShield and ThermalStar FPIS Products

1.1.1 ThermalStar SWI

1.1.2 ThermalStar X15 and ThermalStar E15[2]

1.1.3 ThermalStar X+15 and ThermalStar E+15

1.1.4 ThermalStar E (T&G)

1.1.5 ThermalStar G and ThermalStar G+

1.1.6 EnergyShield

1.1.7 EnergyShield CGF

1.1.8 EnergyShield CGF Pro

1.1.9 EnergyShield XR

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2 Product Description and Materials

2.1 Examples of the innovative products evaluated in this report are shown in **Figure 1** and defined in **Table 1**.

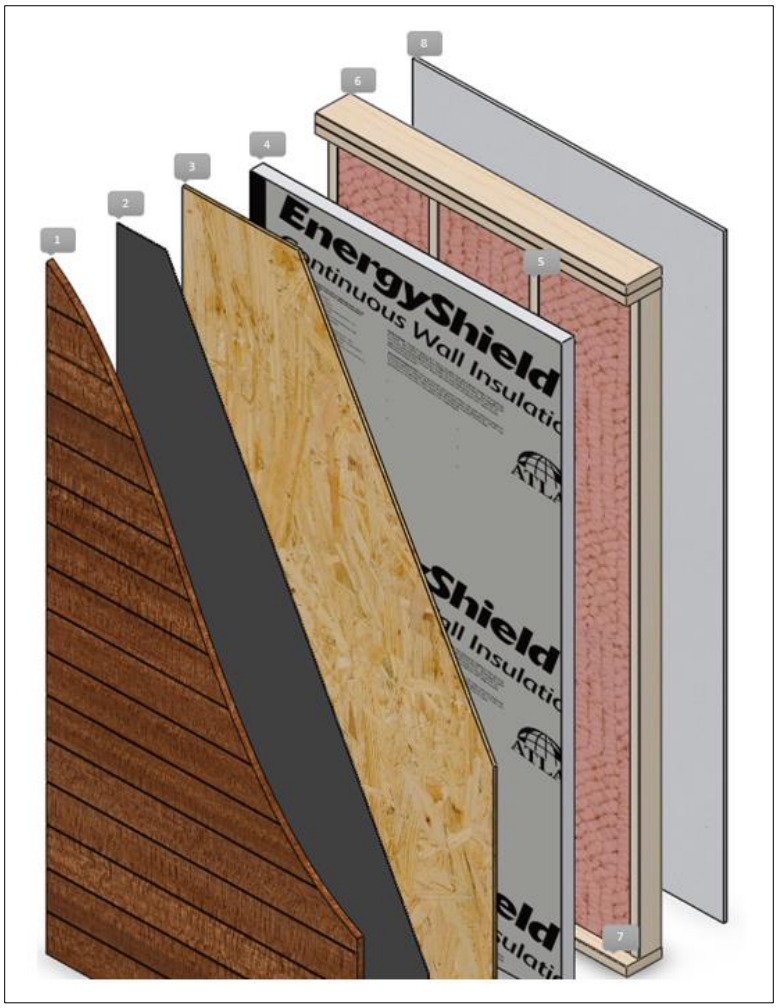


Figure 1. EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System Example

2.2 The EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System are composed of the following components, listed from interior to exterior (see **Figure 1**):

2.2.1 Interior Gypsum Wallboard (GWB)

2.2.2 Nominal 2x studs, with top and bottom plate wider than the stud by the foam thickness

2.2.2.1 This configuration provides a pocket for rigid insulation to be applied continuously across the studs.

2.2.3 2" EnergyShield or ThermalStar rigid foam insulation products listed in **Section 1.1**

2.2.3.1 Wood Structural Panel (WSP)

2.2.3.2 Water-Resistive Barrier (WRB)

2.2.3.3 Exterior wall covering

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2.3 This configuration ensures more than 95% of the wall area is free of thermal bridging.

2.3.1 Common methods and materials for framing, air sealing, insulation, drainage plane, and siding attachment are used.

2.3.2 Double rim board (beam) that is also a header and is inset to provide space for a thermal break.

Table 1. Product Information

Product	Description[1]	Facers	Length and Width (in)	Thickness (in)
ThermalStar SWI	Molded Closed-Cell Expanded Polystyrene (EPS) Foam Plastic Insulating Sheathing Complying with ASTM C578 Type II Requirements	1. Film Facer (serves as a WRB when properly flashed and taped) 2. 0.108" Fiberboard Facer	Standard Width: 48" Standard Lengths: 96", 108", or 120"	1 3/4" or 2"
ThermalStar X+15, ThermalStar E+15		Film Facer		
ThermalStar X15, ThermalStar E15		None		
ThermalStar E (T&G)				
ThermalStar G	Neopor Graphite Polystyrene (GPS) Rigid Foam Plastic Insulating Sheathing Complying with ASTM C578 Type II Requirements	None		
ThermalStar G+		Film Facer		
EnergyShield	Closed-Cell Polyisocyanurate (polyiso) Foam Plastic Insulating Sheathing Complying with ASTM C1289	Tri-laminate Foil on Both Faces (ASTM C1289 Type I, Class 1)		
EnergyShield CGF		Non-Reflective, Coated Glass Mat Facer on Both Faces (ASTM C1289 Type II, Class 2)		
EnergyShield CGF Pro		High Performance Coated Glass Facer on Both Faces (ASTM C1289 Type II, Class 2)		
EnergyShield XR		Foil Facer on Both Faces (ASTM C1289 Type I, Class 1 and 2)		

1. Foam must have a minimum compressive strength of 15-psi.

2.4 For material properties of EnergyShield products, see Report Number 2209-01, Report Number 2202-01, and Report Number 1306-03.

2.5 For material properties of ThermalStar products, see Report Number 1905-02.

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2.6 The sizes of the EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System are as follows:

2.6.1 2 x 4 studs with 2 x 6 plates and 2" EnergyShield Polyiso or ThermalStar products.

2.6.2 2 x 6 studs with 2 x 7.5 plates[3] and 2" EnergyShield Polyiso or ThermalStar products.

2.6.3 2 x 6 studs with 2 x 8 plates and 1 3/4" of EnergyShield Polyiso or ThermalStar products.[4]

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

3 Definitions[5]

3.1 New Materials[6] 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.[7] The design strength and permissible stresses shall be established by tests[8] and/or engineering analysis.[9]

3.2 Duly authenticated reports[10] and research reports[11] are test reports and related engineering evaluations that are written by an approved agency[12] and/or an approved source.[13]

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

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[14]

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

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[15]

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

3.5.1 The Center for Building Innovation (CBI) is ANAB[16] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[17] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[18] 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.[19]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[20] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[21] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[22]

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4 Applicable Local, State, and Federal Approvals; Standards; Regulations[23]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[24]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[25]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[26] and Part 3280[27] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

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

4.2 *Regulations*

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

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

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

4.3 *Standards*

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

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

4.3.3 *DOE/EE-1730 Extended Plate and Beam Construction Guide*

4.3.4 *DOE/EE-1785 Extended plate and Beam Wall System*

5 Listed[28]

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

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *Prescriptive IRC Bracing Applications*

6.1.1 The EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System may be used on braced wall lines for wind as an equivalent alternative to IRC Method WSP and CS-WSP when installed in accordance with IRC Section R602.10 and this report.

6.1.2 Required braced wall panel lengths for the EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System shall be in accordance with IRC Section R602.10.3.

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6.2 *Prescriptive IBC Conventional Light-Frame Wood Construction*

6.2.1 The EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System may be used to brace exterior walls of buildings as an equivalent alternative to IBC Section 2308.10.3,[29] Method WSP. Bracing shall be in accordance with the conventional light-frame construction method of IBC Section 2308.10 and this report.

6.3 The maximum aspect ratio shall be 4:1 or minimum panel width shall be 24". Minimum length of braced wall panels for Method WSP and Method CS-WSP shall be in accordance with IRC Section R602.10.5.

6.4 *Performance-Based Wood-Frame Construction*

6.4.1 The EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System are designed as shear walls and are permitted to be designed in accordance with the methodology used in SDPWS for WSP using the capacities shown in **Table 2**.

6.4.2 EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System shear walls are permitted to resist horizontal wind load forces using the allowable shear loads (in pounds per linear foot) set forth in **Table 2**.

Table 2. Allowable Stress Design (ASD) Capacity – Wind

Product	Joint Condition	Fastener[1]	Fastener Spacing (edge:field) (in)	Maximum Stud Spacing (in)	Gypsum Wallboard (GWB)	Allowable Unit Shear Capacity[2] (plf)
EnergyShield Extended Plate Wall System	Butted	0.131" x 3.5" Nails	3:6	16 o.c.	None	255
ThermalStar Extended Plate Wall System						

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

1. See **Table 5** for a full connection schedule.
2. Solid sawn lumber used as wall studs and plates shall have a minimum oven-dry specific gravity of 0.42.

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6.5 *Thermal Performance*

6.5.1 R-values for the EnergyShield Extended Plate Wall System are provided in **Table 3**.

6.5.2 R-values for the ThermalStar Extended Plate Wall System are provided in **Table 4**.

Table 3. Thermal Performance of EnergyShield Extended Plate Wall System[3,4]

EnergyShield Extended Plate Wall System Assembly	Maximum Stud Spacing (in)	R-Value (°F·ft²·hr/BTU)	
		Nominal[1]	Assembly[2]
2 x 4 Studs with 2 x 6 Plates and 2" of EnergyShield or EnergyShield XR	16 o.c.	13+13.1	24.51
		15+13.1	25.84
2 x 6 Studs with 2 x 7.5 Plates[5] and 2" of EnergyShield or EnergyShield XR	24 o.c.	19+13.1	29.88
		21+13.1	30.84
2 x 6 studs with 2 x 8 plates and 1 3/4" of EnergyShield or EnergyShield XR	24 o.c.	19+11.4	28.12
		21+11.4	28.97
2 x 4 Studs with 2 x 6 Plates and 2" of EnergyShield CGF or EnergyShield CGF Pro	16 o.c.	13+12.1	23.90
		15+12.1	25.16
2 x 6 Studs with 2 x 7.5 Plates[5] and 2" of EnergyShield CGF or EnergyShield CGF Pro	24 o.c.	19+12.1	28.97
		21+12.1	29.88
2 x 6 Studs with 2 x 8 Plates and 1 3/4" of EnergyShield CGF or EnergyShield CGF Pro	24 o.c.	19+10.5	27.31
		21+10.5	28.12

SI: 1 in = 25.4 mm, 1 F·ft²·hr/BTU = 0.1761 K·m²/W

1. The first value is cavity insulation and the second value is continuous insulation (i.e., "15+13.1" means R-15 cavity insulation plus R-13.1 continuous insulation).
2. The calculated assembly value assumes typical wall materials of gypsum drywall, SPF lumber, fiberglass batt insulation, EnergyShield products, OSB structural sheathing, WRB, and vinyl siding.
3. 16" o.c. framing assumes 75% / 20.6% / 4.4% thermal path ratios (cavity / framing / cantilevered plates).
4. 24" o.c. framing assumes 78% / 17.6% / 4.4% thermal path ratios (cavity / framing / cantilevered plates).
5. Plate dimension is actual dimension achieved by ripping down 2 x 10s.

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Table 4. Thermal Performance of ThermalStar Extended Plate Wall System

ThermalStar Extended Plate Wall System Assembly	Maximum Stud Spacing (in)[3,4]	R-Value (°F•ft²•hr/BTU)	
		Nominal[1]	Assembly[2]
2 x 4 Studs with 2 x 6 Plates and 2" of ThermalStar SWI	16 o.c.	13+8.8	20.34
		15+8.8	21.73
2 x 4 Studs with 2 x 6 Plates and 2" of ThermalStar (X15, X+15, E15, or E+15), or ThermalStar E (T&G)	16 o.c.	13+8.4	19.91
		15+8.4	21.24
2 x 6 Studs with 2 x 7.5 Plates[5] and 2" of ThermalStar (X15, X+15, E15, or E+15), or ThermalStar E (T&G)	24 o.c.	19+8.4	25.16
		21+8.4	25.84
2 x 6 Studs with 2 x 8 Plates and 1¾" of ThermalStar (X15, X+15, E15, or E+15), or ThermalStar E (T&G)	24 o.c.	19+7.4	23.90
		21+7.4	25.16
2 x 4 Studs with 2 x 6 Plates and 2" of ThermalStar G or G+	16 o.c.	13+9.4	21.24
		15+9.4	22.24
2 x 6 Studs with 2 x 7.5 Plates[5] and 2" of ThermalStar G or G+	24 o.c.	19+9.4	25.84
		21+9.4	27.31
2 x 6 Studs with 2 x 8 Plates and 1¾" of ThermalStar G or G+	24 o.c.	19+8.2	24.51
		21+8.2	25.84

SI: 1 in = 25.4 mm, 1 F·ft²·h/BTU = 0.1761 K·m²/W

1. The first value is cavity insulation and the second value is continuous insulation (i.e., "13+10" means R-13 cavity insulation plus R-10 continuous insulation).
2. The calculated assembly value assumes typical wall materials of gypsum drywall, SPF lumber, fiberglass batt insulation, of ThermalStar products, OSB structural sheathing, WRB and vinyl siding.
3. 16" o.c. framing assumes 75% / 20.6% / 4.4% thermal path ratios (cavity / framing / cantilevered plates).
4. 24" o.c. framing assumes 78% / 17.6% / 4.4% thermal path ratios (cavity / framing / cantilevered plates).
5. Plate dimension is actual dimension achieved by ripping down 2 x 10s.

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

7 Certified Performance[30]

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.[31]

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.[32]

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8 Regulatory Evaluation and Accepted Engineering Practice

8.1 EnergyShield and ThermalStar FPIS Products comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Structural performance under lateral load conditions for use as an alternative to the IRC intermittent wall bracing provisions of IBC Section 2308.10.3,[33] IRC Section R602.10.4 Method WSP (Wood Structural Panel), and the IRC continuous wall bracing provisions of IRC Section R602.10.4 Methods CS-WSP (Continuously Sheathed Wood Structural Panel).

8.1.2 Structural performance under lateral load conditions for use with the IBC performance based provisions, IBC Section 2306.1 and IBC Section 2306.3, for light-frame wood wall assemblies.

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

8.1.4 Thermal performance in accordance with IECC Section C402.1 and IECC Section R402.1.

8.2 Use in a Continuously Sheathed Portal Frame (CS-PF) is outside of the scope of this report.

8.3 Any building code, regulation, and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[34] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[35] respectively.

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

9 Installation

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

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

9.3 For more information, see the reports and resources for builders from Home Innovation Research Labs™ on Extended Plate Wall (EPW) Systems.

9.4 *Installation Procedure*

9.4.1 Installation shall be in accordance with the US Department of Energy's Build America Program Document, Extended Plate and Beam Construction Guide, DOE/EE-1730.

9.4.2 Double rim joists can be installed flush to exterior face of wall or inset by 1" for installation of 1" Atlas Roofing FPIS products.

9.4.3 Single rim joist must be inset 1".

9.4.3.1 Single rim joist shall not be used as a header.

9.4.4 Rim joist(s) may be inset up to 2" only if the WSP sheathing spans from the top plate all the way to the sill plate and is fastened to the sill plate at 3" o.c. with scheduled nails.

9.4.4.1 The aspect ratio for braced wall panels in this case shall be based on the entire length of the WSP sheathing from the top plate to the sill.

9.4.4.2 Double rim joists are permitted to be designed as a header by an RDP.

9.4.5 If the end bearing length for the floor joists is not adequate, the joists must be supported with metal hangers in accordance with IRC Section R502.6.

9.4.5.1 Joist hangers must be used for all floor joists over window and door openings when rim joist(s) are used in place of header or abut into the face of the header.

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9.4.6 Fastening shall be in accordance with **Table 5**.

9.4.6.1 Exterior cladding is permitted to be fastened directly to OSB per IRC Section R703.3.3.

Table 5. Connection Schedule[1,2]

Connection	Nails	Schedule
Perimeter (Edge) of Wood Sheathing	0.131" x 3.5"	3" o.c.
Field of Wood Sheathing	0.131" x 3.5"	6" o.c.
Corner Studs in Contact with Each Other	0.131" x 3"	12" o.c.
Corners: WSP from Both Intersection Walls to a Common 2x Framing Member	0.131" x 2.5"	6" o.c.
Corner Studs Separated by Up to 2" of ThermalStar or EnergyShield	0.131" x 5"	6" o.c.
	0.190" x 6" SIP Screws	12" o.c.

SI: 1 in = 25.4 mm

1. Use IRC Table R602.3(1) for all other connections.
2. Staples are not an acceptable substitute for nails.

9.4.7 *Roof Detail*

9.4.7.1 Proper installation of the EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System at the roofline is shown in **Figure 2**.

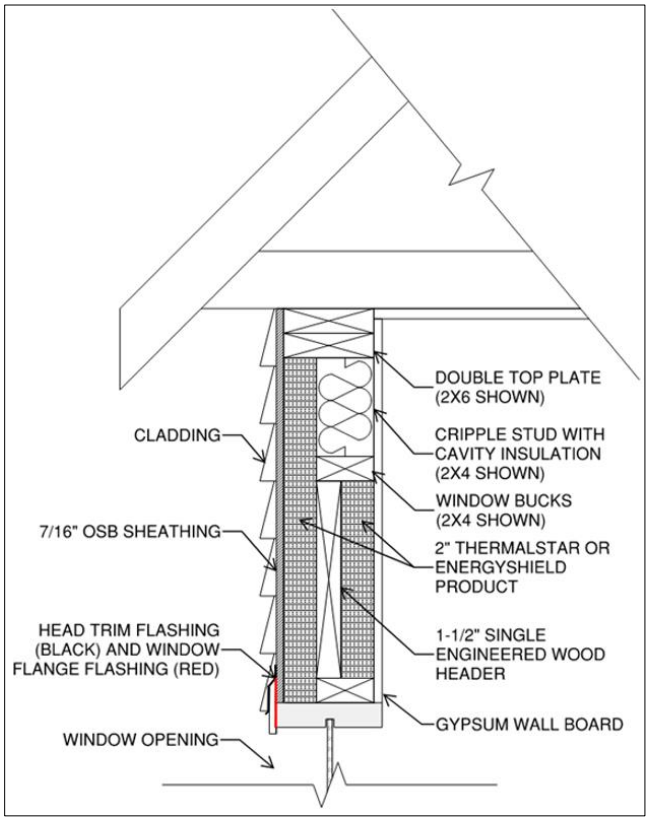


Figure 2. EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System Roofline Detail

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9.4.8 *Floor Line*

9.4.8.1 Proper installation of the EnergyShield Extended Plate Wall System and the ThermalStar Extended Plate Wall System at the floor line is shown in **Figure 3**.

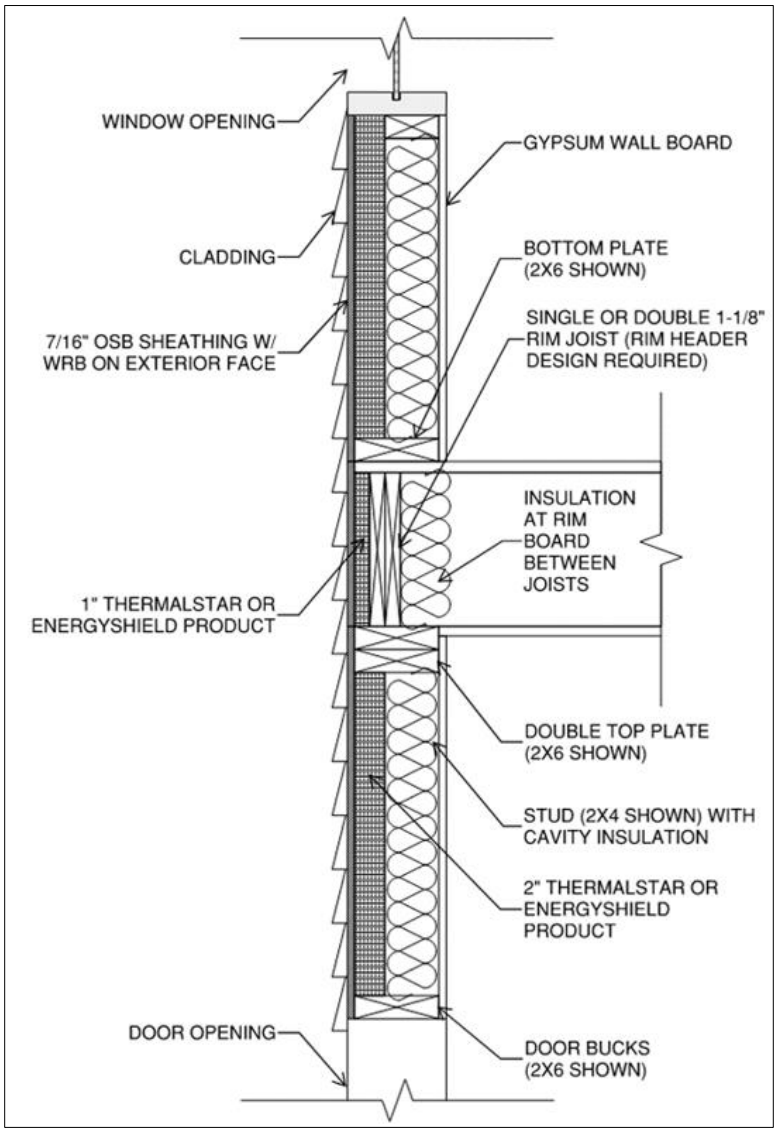


Figure 3. EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System Floor Line Detail

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9.4.9 *Foundation Line*

9.4.9.1 Proper installation of the EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System at the foundation is shown in **Figure 4**.

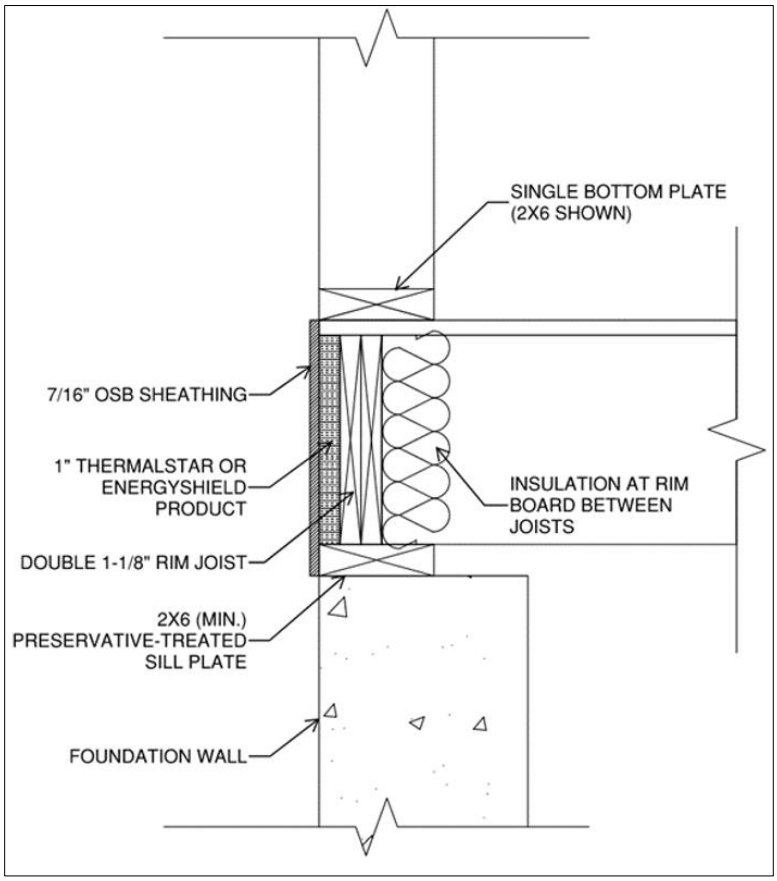


Figure 4. EnergyShield Extended Plate Wall System and ThermalStar Extended Plate Wall System Foundation Line Detail

10 Substantiating Data

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

10.1.1 Lateral load testing in accordance with ASTM E564 and ASTM E72.

10.2 DOE/EE-1785 Extended Plate and Beam Wall System.

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

10.4 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.

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10.5 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.

10.6 *Testing and Engineering Analysis*

10.6.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[36]

10.7 Where additional condition of use and/or regulatory compliance information is required, please search for EnergyShield and ThermalStar FPIS Products on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, EnergyShield and ThermalStar FPIS Products have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to their specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, EnergyShield and ThermalStar FPIS Products shall be approved for the following applications:

11.2.1 Use to resist lateral loads due to wind loads carried by shear walls.

11.2.2 Use as thermal resistance of the exterior wall assembly.

11.3 Unless exempt by state statute, when EnergyShield and ThermalStar FPIS Products are to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Atlas Roofing Corporation.

11.5 IBC Section 104.2.3[37] (IRC Section R104.2.2[38] and IFC Section 104.2.3[39] are similar) in pertinent part state:

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

11.6 **Approved:**[40] Building regulations require that the building official shall accept duly authenticated reports.[41]

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

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

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

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

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[42]

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12 Conditions of Use

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

12.2 As listed herein, EnergyShield and ThermalStar FPIS Products are not intended to be used as a nail base for cladding, trim, windows, or doors.

12.3 Fastening to the WSP or to the framing is acceptable.

12.4 Allowable shear loads are limited to the value provided in **Table 2** for wind.

12.5 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:

12.5.1 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.

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

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

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

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

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

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

12.7 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).

12.8 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 EnergyShield and ThermalStar FPIS Products, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at atlasmoldedproducts.com or atlasrwi.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.

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Notes

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

2 Made in all of the listee locations except Anthony, Texas.

3 Plate dimension is actual dimension achieved by ripping down 2 x 10s.

4 Typically two layers with staggered joints.

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

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

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

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

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

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

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

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

13 https://www.drjcertification.org/2024/ibc/chapter-2/approved-source

14 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.

15 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/

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

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

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

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

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

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

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

23 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

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

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

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

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

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

29 2021 IBC Section 2308.6.3

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

31 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

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[32] 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

[33] 2021 IBC Section 2308.6.3

[34] 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.

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

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

[37] 2021 IBC Section 104.11

[38] 2021 IRC Section R104.11

[39] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

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

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

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

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