Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 2211-02

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Subject to Renewal: October 1, 2027

Superior Walls® Precast Concrete Wall Panels

Trade Secret Report Holder:

Superior Walls® of America, Ltd
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Website: www.superiorwalls.com

Additional Listees:

Advanced Concrete Systems, Inc. 55 Advanced Ln Middleburg, PA 17842-8757	**Warrior Precast, LLC dba:** **Superior Walls of East Tennessee** 10144 Sparta Hwy Rock Island, TN 38581-5306
Northeast Precast **dba: Superior Walls of New Jersey** 4081 S Lincoln Ave Vineland, NJ 08361-7762	**Superior Walls of Central Virginia** 10101 Superior Way Amelia, VA 23002-4744
Superior Walls Systems, LLC **dba: Superior Walls of N Carolina** 3570 S Main St Salisbury, NC 28147-7909	**Superior Walls of Upstate New York** 7574 E Main St Lima, NY 14485-9731
Superior Walls by Collier **Foundation Systems, Inc.** 1500 Ellsworth Ave Ste 210 Heidelberg, PA 15106-3959	**Superior Concrete Block Company** 401 McKinzie St S Mankato, MN 56001-1814
Weaver Superior Walls LLC dba: **Superior Walls by Weaver Precast** 824 E Main St Ephrata, PA 17522-2543	**Superior Walls of North Dakota, LLC** 2512 Lockheed Dr Bismarck, ND 58504-1000
Great Lakes Superior Walls 4555 134th Ave Hamilton, MI 49419-8579	**Skill Precast, LLC** 815 E Ramsey Rd Vincennes, IN 47591-6128
KOI Superior Walls, LLC 1640 Distribution Dr Burlington, KY 41005	

CSI Designations:

DIVISION: 03 00 00 - CONCRETE

Section: 03 40 00 - Precast Concrete
Section: 03 41 00 - Precast Structural Concrete

1 Innovative Products Evaluated[1]

1.1 Superior Walls® Xi™ and Xi™ Plus Wall Panels

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2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1**, **Figure 2**, **Figure 3**, and **Figure 4**.

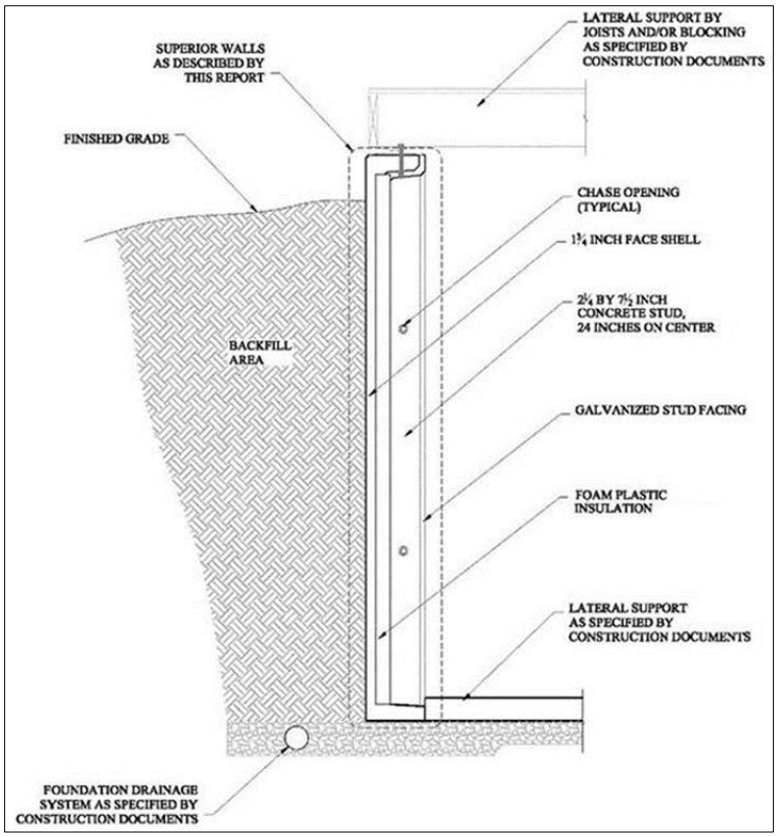


Figure 1. Vertical Cross Section of Superior Walls Xi and Xi Plus Wall Panels Assembly

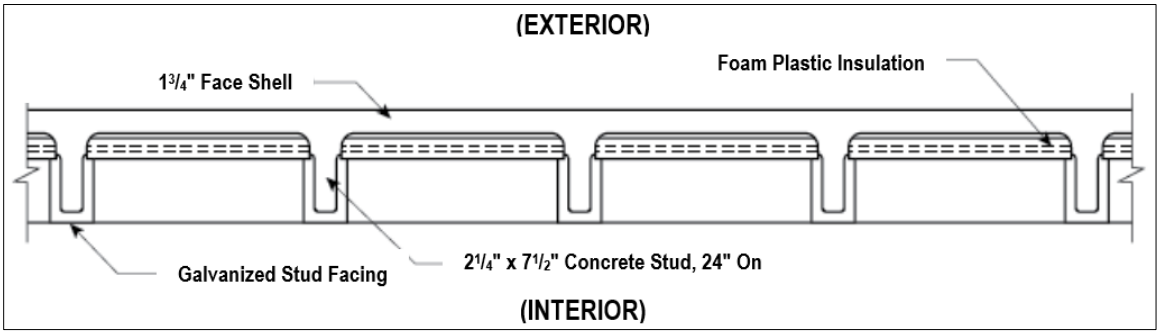


Figure 2. Horizontal Cross Section of Superior Walls Xi and Xi Plus Wall Panels Assembly

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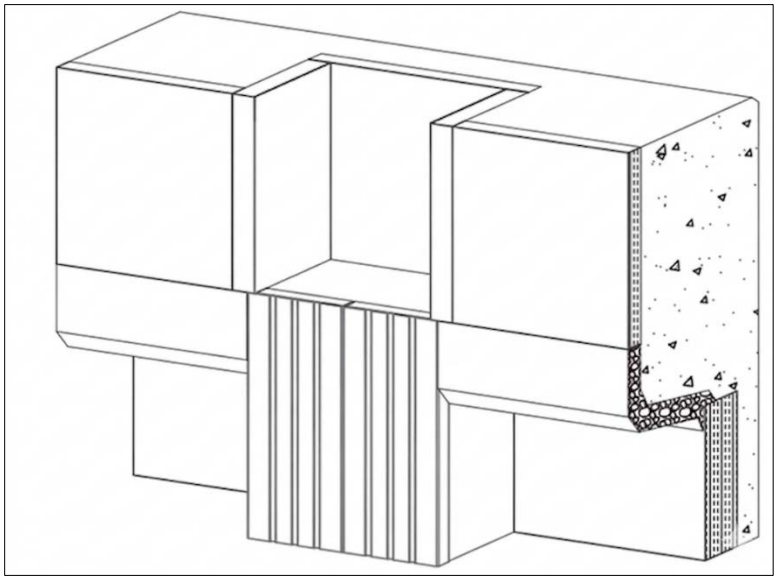


Figure 3. Typical Beam Pocket Detail

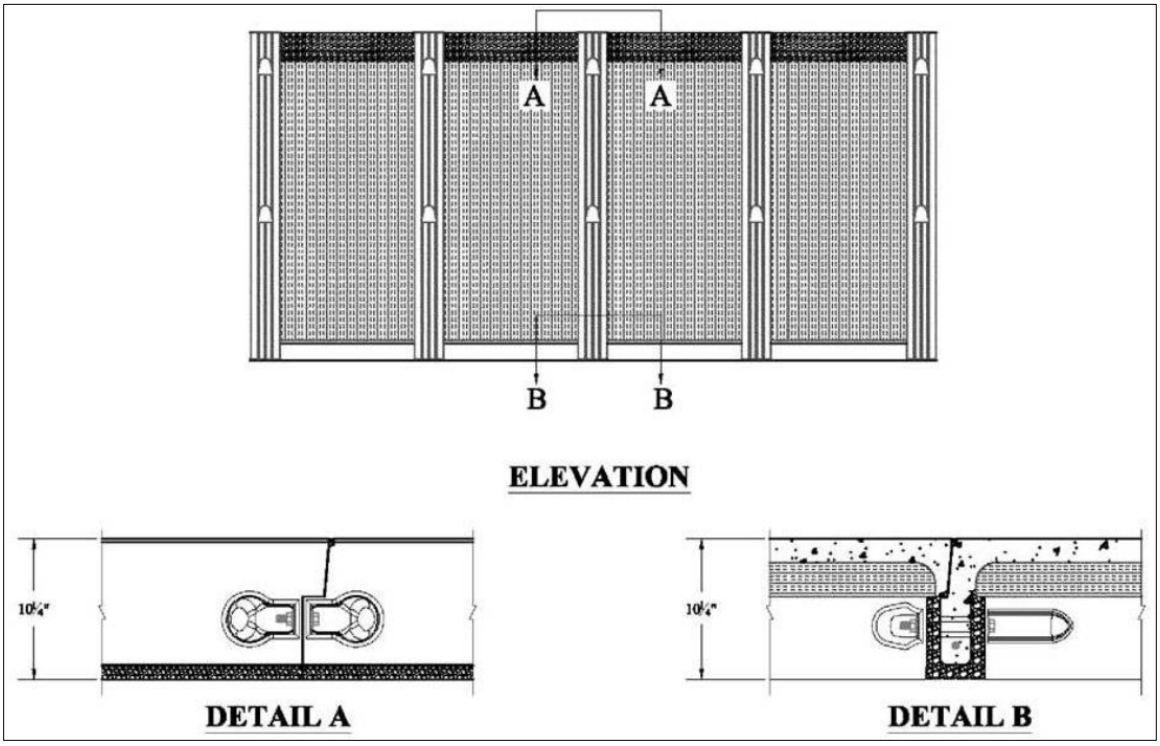


Figure 4. Wall Connection Detail for Superior Walls Xi and Xi Plus Wall Panels Assembly

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2.2 Information on Superior Walls Xi and Xi Plus Wall Panels is provided in **Table 1**.

Table 1. Product Information

Product	Foam Board Options	Wall Height and Weight[1]	Description	Material Properties
Xi	*Option 1:* 2 1/2" (63.5 mm) thick rigid polystyrene	4', 170 lb/ft; 8' 2", 303 lb/ft; 9', 329 lb/ft; and 10', 361 lb/ft	Precast Concrete Wall Panels consisting of a 1 3/4" (44 mm) thick exterior face shell of monolithically cast concrete with 10 1/4" (260 mm) wide top and bottom bond beams and 2 1/4" x 7 1/2" (57 mm x 190.5 mm) concrete studs at 24" (610 mm) on center (See Figure 1 and Figure 2). Various rigid foam boards are bonded to the inside face of the shell. (See *"Foam Board Options"* column.) Each stud is wrapped with 1" (25.4 mm) thick expanded polystyrene insulation on all three of the exposed sides and faced with a galvanized steel channel for interior finish fastening. Chase openings with knockouts are provided in each stud for plumbing and electrical wiring (See Figure 1).	Concrete has 5,000-psi (34.4 MPa) compressive strength and contains synthetic fibers.
	Option 2: 2 1/2" (63.5 mm) thick rigid phenolic foam insulation			
	Option 3: 2" (50.8 mm) thick rigid polystyrene and a 1/2" (12.7 mm) layer of polyisocyanurate insulation			
	Option 4: 1 1/2" (38.1 mm) thick rigid polystyrene and a 1" (25.4 mm) layer of polyisocyanurate insulation			
	Option 5: 2 1/2" (63.5 mm) thick rigid polyisocyanurate			
Xi Plus	4 1/2" (114.3 mm) thick rigid polystyrene and a 1/2" (12.7 mm) layer of polyisocyanurate insulation on the inside face	4', 178 lb/ft; 8' 2", 318 lb/ft; 9', 345 lb/ft; and 10', 378 lb/ft		

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/ft = 0.0146 kN/m, 1-psf = 0.0479 kN/m^2, 1-psi = 0.00689 MPa

1. Wall panel heights evaluated are limited to a maximum of 10'. Panel heights and corresponding weights vary by product configuration and regional offering.

2.3 All insulation is factory-installed in precast walls and shall be as described in approved quality control documentation.

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

3 Definitions[2]

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

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

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

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

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

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

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

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

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

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

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

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

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

4.1 *Local, State, and Federal*

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

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

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

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

4.2 *Regulations*

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

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

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

4.2.4 *FBC-B—20, 23: Florida Building Code[25] – Building (FL 47079)*

4.2.5 *FBC-R—20, 23: Florida Building Code[25] – Residential (FL 47079)*

4.3 *Standards*

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

4.3.2 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

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4.3.3 *CalGreen – The California Green Building Standards Code – Part 11, Title 24, California Code of Regulations*

4.3.4 *CAN/ULC S101: Standard Methods of Fire Endurance Tests of Building Construction Materials*

4.3.5 *ICC 700 National Green Building Standard*

4.3.6 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

4.3.7 *UL 1715: Fire Test of Interior Finish Material*

5 Listed[26]

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 *Transverse Loading*

6.1.1 **Table 2** provides the maximum allowable loads for positive and negative transverse wind loads for above grade walls and allowable transverse soil loads for below grade walls.

Table 2. Allowable Transverse Loads for Superior Walls Xi and Xi Plus Wall Panels[1]

Product	Wall Height (ft)	Allowable Transverse Positive Load, psf (kPa)	Allowable Transverse Negative Load, psf (kPa)
Superior Walls Xi and Xi Plus Wall Panels	≤ 10	235 (11.3)	120 (5.7)

SI: 1 ft = 0.305 m, 1-psf = 0.0479 kPa

1. Assumes wall is supported at top and bottom.

6.2 *Backfill Soil Loads*

6.2.1 A maximum 100 lbf/ft^2/ft equivalent fluid pressure is permitted for backfill soil loading.

6.3 *Brick Ledge Loads*

6.3.1 Use of Superior Walls Xi and Xi Plus Wall Panels with a brick ledge is limited to an allowable load of 2,900 lbf/ft (42.32 kN/m) on the brick ledge. The load applied to the brick ledge shall be considered as part of the total allowable load on the wall as described in **Table 3**.

6.4 *Combined Soil and Compression Loading for Below Grave Walls*

6.4.1 **Table 3** provides the maximum allowable compression loads on the top of the wall when loads from a 100 lbf/ft^2/ft (1,602 kg/m^2/m) soil load is considered along with a 2,900 lbf/ft (42.32 kN/m) vertical load applied to a brick ledge.

Table 3. Maximum Allowable Compression Load for Superior Walls Xi and Xi Plus Wall Panels[2,3]

Product	Allowable Compression Load, lb/ft (kN/m)[1]
Superior Walls Xi and Xi Plus Wall Panels	7,500 (109.45)

SI: 1 lb/ft = 0.0146 kN/m

1. A maximum 2,900 lbf/ft load on a brick ledge is permitted as part of the total allowable compression load.
2. Wall shall be supported at top and bottom.
3. A maximum 100 lbf/ft^2/ft soil load is permitted in combination with the maximum allowable compression load.

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6.4.2 *In-Plane Shear Loads:*

6.4.2.1 Superior Walls Xi and Xi Plus Wall Panels were tested in accordance with ASTM E72 to determine the allowable racking shear loads as shown in **Table 4**.

Table 4. ASTM E72 Allowable Shear Load[1]

Product	Allowable Racking Shear Load,[1] lb/ft (kN/m)
Superior Walls Xi and Xi Plus Wall Panels	745 (10.87)

SI: 1 lb/ft = 0.0146 kN/m
1. Allowable shear load is applicable to wind and soil loading.

6.4.3 *Beam Pocket Loads:*

Table 5. Maximum Allowable Load for Beam Pockets[1,2]

Product	Wall Height (ft)	Maximum Allowable Beam Pocket Load, lb (kN)
Superior Walls Xi and Xi Plus Wall Panels	10	24,000 (106.75)
	< 10	21,600 (96.08)

SI: 1 ft = 0.305 m, 1 lb = 4.45 N
1. Beam pocket with two support studs under the beam pocket.
2. Other beam pocket configurations are outside the scope of this report.

6.4.4 *Bolted Connections at the Top and Bottom of Walls:*

Table 6. Maximum Allowable Shear Load for Bolted Panel Connections

Product	Maximum Allowable Load lb (kN)[1]
Superior Walls Xi and Xi Plus Wall Panels	1,500 (6.75)

SI: 1 lb = 4.45 N
1. Determined by performance testing.

6.5 *Mass Walls*

6.5.1 Superior Walls Xi and Xi Plus Wall Panels are classified as a Mass Wall as defined in IRC Section N1102.2.6[27] and IECC Section R402.2.6.[28] Both the header sections and the interior portions of the wall panels exceed the minimum requirement of 6 BTU/ft²·°F (123kJ/m²·K) as follows:

6.5.1.1 The interior portion of Superior Walls Xi and Xi Plus Wall Panels have a heat capacity of 6.46 BTU/ft²·°F (132 kJ/m²·K).

6.5.1.2 The header portion of Superior Walls Xi and Xi Plus Wall Panels have a heat capacity of 10.55 Btu/ft²·°F (216 kJ/m²·K).

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6.6 *Fire-Resistance Rated Wall Construction*

6.6.1 Superior Walls Xi and Xi Plus Wall Panels were tested to determine their fire resistance rating in accordance with ASTM E119 and CAN ULC S101 with results as follows:

6.6.1.1 *Two-Hour Fire Resistance Rating:*

6.6.1.1.1 The addition of two layers of $^{5}/_{8}$" (15.98 mm) Type X gypsum wallboard complying with ASTM C1396, attached to the stud facing in accordance with the applicable code, provide Superior Walls Xi and Xi Plus Wall Panels, having a maximum allowable axial compressive load of 5,000 lbf/ft (72.97 kN/m), including brick ledge loads, with a two-hour fire-resistance rating.

6.6.1.2 *One-Hour Fire Resistance Rating:*

6.6.1.2.1 The addition of one layer of $^{5}/_{8}$" (15.98 mm) Type X gypsum wallboard complying with ASTM C1396, attached to the stud facing in accordance with the applicable code, provide Superior Walls Xi and Xi Plus Wall Panels having a maximum allowable axial compressive load of 5,000 lbf/ft (72.97 kN/m), including brick ledge loads, with a one-hour fire-resistance rating.

6.6.2 *Thermal Barrier:*

6.6.2.1 Superior Walls Xi and Xi Plus Wall Panels were tested to determine their use as a wall finish without the use of a thermal barrier in accordance with UL 1715 or NFPA 286.

6.6.2.2 A code-prescribed thermal barrier separating the foam plastic from the interior of the building is not required based on testing conducted in accordance with IRC Section R303.6[29] and IBC Section 2603.9.

6.7 *Dampproofing*

6.7.1 Superior Walls Xi and Xi Plus Wall Panels require no additional dampproofing.

6.8 *Green Building Codes and Standards Compliance*

6.8.1 Superior Walls Xi and Xi Plus Wall Panels conform to the requirements of CalGreen Section A4.404.3.3 for pre-manufactured building systems.

6.8.2 Superior Walls Xi and Xi Plus Wall Panels conform to the requirements of ICC 700, Section 601.5 and ICC 700, Section 11.601.5 for pre-manufactured components.

6.8.3 Project specific requirements for use of these products to conform to these codes and standards are outside of the scope of this report.

6.9 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 Superior Walls Xi and Xi Plus Wall Panels comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Superior Walls Xi and Xi Plus Wall Panels were evaluated to determine:

8.1.1.1 Concrete properties in accordance with ASTM C39 and C469

8.1.1.2 Transverse loads for soil and wind in accordance with ASTM E72

8.1.1.3 Racking shear loads in accordance with ASTM E72

8.1.1.4 Compression loads in accordance with ASTM E72

8.1.1.5 Brick ledge loads in accordance with ASTM E72

8.1.1.6 Beam pocket loads in accordance with general engineering principles

8.1.1.7 Bolted connections at the top and bottom of the walls in accordance with general engineering principles

8.1.1.8 Compliance with the mass wall provisions of IRC Section N1102.2.6[33] and IECC Section R402.2.6[34]

8.1.1.9 Fire resistance rated wall construction in accordance with ASTM E119, per IBC Section 703.2.1 and CAN ULC S101

8.1.1.10 Thermal barrier requirement exemption in accordance with IBC Section 2603.9 and IRC Section R303.6[35]

8.1.1.11 *Dampproofing:*

8.1.1.11.1 Water permeability test conducted in accordance with ASTM E96

8.1.1.12 Green Construction in accordance with CalGreen Section A4.404.3.3 for pre-manufactured building systems, and ICC 700 Section 601.5 and ICC 700 Section 11.601.5.

8.2 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[36] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[37] respectively.

8.3 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 *Installation Procedure*

9.3.1 Installation shall be completed by installers certified by Superior Walls of America.

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 Concrete properties in accordance with ASTM C39 and C469

10.1.2 Transverse loads for soil and wind in accordance with ASTM E72

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10.1.3 Racking shear loads in accordance with ASTM E72

10.1.4 Compression loads in accordance with ASTM E72

10.1.5 Brick ledge loads determined by performance testing in accordance with accepted engineering principles

10.1.6 Beam pocket loads determined by performance testing in accordance with accepted engineering principles

10.1.7 Bolted connections at the top and bottom of the walls determined by performance testing in accordance with accepted engineering principles

10.1.8 Fire resistance rated wall construction in accordance with ASTM E119 and CAN ULC S101

10.1.9 Thermal barrier requirements in accordance with IBC Section 2603.9 and IRC Section R303.6[38]

10.1.10 Water permeability for dampproofing in accordance with ASTM E96

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

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

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

10.5 *Testing and Engineering Analysis*

10.5.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[39]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Superior Walls Xi and Xi Plus Wall Panels on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Superior Walls Xi and Xi Plus Wall Panels have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Superior Walls Xi and Xi Plus Wall Panels shall be approved for the following applications:

11.2.1 Foundation and basement walls to support wood frame construction in accordance with IBC Section 1807, IRC Section R402.3.1, and IRC Section R404.

11.2.2 Mass wall provisions of IRC Section N1102.2.6[40] and IECC Section R402.2.6.[41]

11.3 When Superior Walls Xi and Xi Plus Wall Panels 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 where required by the statutes of the jurisdiction in which the project is to be constructed.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Superior Walls of America, Ltd.

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11.5 IBC Section 104.2.3[42] (IRC Section R104.2.2[43] and IFC Section 104.2.3[44] 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:**[45] Building regulations require that the building official shall accept duly authenticated reports.[46]

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.[47]

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 Superior Walls Xi and Xi Plus Wall Panels used in buildings constructed in accordance with the IRC, dampproofing in accordance with IRC Section R406 is not required. Waterproofing is required when a high-water table or other severe soil-water condition is known to exist, or is required by adopted legislation and enforced by the authority having jurisdiction (e.g., building official).

12.3 For Superior Walls Xi and Xi Plus Wall Panels used in buildings constructed in accordance with the IBC, where a subsurface soil investigation has not been performed, or where a subsurface soil investigation has been performed per IBC Section 1803, and indicates that the ground-water table is above or within five (5) feet below the elevation of the lowest below grade floor, the foundation wall shall be waterproofed in accordance with IBC Section 1805.

12.3.1 Evaluation of this waterproofing is outside of the scope of this report.

12.4 Installers certified by Superior Walls of America shall perform installation.

12.5 Soil capacity of the site shall either undergo a complete geotechnical evaluation or may be assumed to have the load bearing values that are specified in IBC Table 1806.2 and IRC Table R401.4.1(1).

12.6 Backfill material shall not exceed 100 lbf/ft^2/ft (1,602 kg/m^2/m) equivalent fluid pressure for Superior Walls Xi and Xi Plus Wall Panels, unless a specific engineering assessment is submitted to justify greater loads.

12.7 When used as lateral force-resisting systems, Superior Walls Xi and Xi Plus Wall Panels are limited to use in Seismic Design Categories A or B for compliance with the IBC and is limited to Seismic Design Categories A, B, or C for compliance with the IRC. Special inspections shall comply with IBC Section 1705.13.[48]

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12.8 Design calculations and construction details shall be submitted to the code official for approval. These shall include the following:

12.8.1 Waterproofing requirements, if applicable

12.8.2 Footing depth and specifications consistent with this report

12.8.3 Resistance to overturning and uplift forces

12.8.4 Details for lateral supports at the top and bottom of the wall panels

12.9 Brick ledges shall not be loaded in excess of 2,900 lbf/ft (42.32 kN/m) unless engineering is submitted to justify higher loads.

12.10 Footings supporting Superior Walls Xi and Xi Plus Wall Panels shall be in accordance with the applicable code.

12.11 For buildings constructed in accordance with the IRC, Superior Walls Xi and Xi Plus Wall Panels may be supported on crushed stone footings, provided the construction be in accordance with IRC Section R403.4 and **Table 7**.

Table 7. Minimum Depth (inches) of Crushed Stone Footings[3,5]

Number of Stories	Assumed Wall Loading (plf)[4]	Load Bearing Capacity (psf) and Class of Materials (Soil Types)[2]					
		1,500	2,000	2,500	3,000	3,500	4,000
		MH, CH, CL, ML	SC, GC, SM, GM SP, SW		GP, GW		
Light-Frame Construction							
1	1,100	4	4	4	4	4	4
2	1,800	7	4	4	4	4	4
3	2,900	14[1]	9[1]	5	4	4	4
Masonry Veneer Over Light-Frame Construction							
1	1,500	5	4	4	4	4	4
2	2,700	13[1]	8	4	4	4	4
3	4,000	22[1]	14[1]	10[1]	7	5	4

1. For crushed Stone Footings greater than 8" in depth, footings shall be consolidated in a Maximum of 8" lifts with a plate vibrator.
2. See IRC Table R401.4.1(1) for description of Class of Materials associated with various bearing capacities.
3. Stone depths are determined using the assumed wall loading (plf) + 378-plf for the self-weight of a 10' Xi Plus foundation wall with a 10¼" wall width.
4. The assumed wall loading shown in pounds per linear foot (plf) is the assumed uniform load of the structure that is supported by the foundation wall and does not include the self-weight of the foundation wall.
5. Stone depths in this table are calculated as follows: Minimum Stone Depth (in) = { [Assumed uniform load (plf) + self-weight of foundation wall (plf) / soil bearing capacity (psf)-(wall width (in)/12)] / [2 x TAN(30)] } x12

12.12 Beam pockets shall be designed and constructed in accordance with the details, dimensions, and specific loading limitations identified in this report, or as engineered by an RDP.

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.

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

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

12.13.5 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.

12.13.6 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.

12.14 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall 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.

12.15 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 Superior Walls Xi and Xi Plus Wall Panels, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.superiorwalls.com/superior-walls-products/xi-wall-superior-walls for Xi wall panels and www.superiorwalls.com/superior-walls-products/xi-plus-superior-walls for Xi Plus wall panels.

14 Review Schedule

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

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

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Issue Date: October 15, 2024
Supplement Revision Date: April 8, 2026
Subject to Renewal: October 1, 2027

FBC Supplement to Report Number 2211-02

REPORT HOLDER: Superior Walls® of America, Ltd

1 Evaluation Subject

1.1 Superior® Walls Xi™ and Xi™ Plus Wall Panels

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Superior Walls Xi and Xi Plus Wall Panels, recognized in Report Number 2211-02, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

2.2.1 *FBC-B—20, 23: Florida Building Code – Building (FL47079)*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential (FL47079)*

3 Conclusions

3.1 Superior Walls Xi and Xi Plus Wall Panels, described in Report Number 2211-02, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this report, they are listed here:

3.2.1 FBC-B Section 104 is reserved.

3.2.2 FBC-B Section 110.4 is reserved and replaces IBC Section 110.4.

3.2.3 FBC-B Section 104.6 is reserved and replaces IBC Section 104.4.

3.2.4 FBC-B Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.5 FBC-B Section 105.3 replaces IBC Section 105.3.

3.2.6 FBC-B Section 105.3.1 replaces IBC Section 105.3.1.

3.2.7 FBC-B Section 110.3 replaces IBC Section 110.3.

3.2.8 FBC-B Section 1705 is reserved and replaces IBC Section 1705.13.

3.2.9 FBC-B Section 1707.1 replaces IBC Section 1707.1.

3.2.10 FBC-B Section 1807 replaces IBC Section 1807.

3.2.11 FBC-B Section 2306.1 replaces IBC Section 2306.1.

3.2.12 FBC-B Section 2306.3 replaces IBC Section 2306.3.

3.2.13 FBC-B Section 2603.9 replaces IBC Section 2603.9.

3.2.14 FBC-R Section N1101.1 replaces IRC Section N1102.2.6.

3.2.15 FBC-R Section R104 and Section R109 are reserved.

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3.2.16 FBC-R Section R316.6 replaces IRC Section R303.6.

3.2.17 FBC-R Section R402.3.1 replaces IRC Section R402.3.1.

3.2.18 FBC-R Section R404 replaces IRC Section R404.

4 Conditions of Use

4.1 Superior Walls Xi and Xi Plus Wall Panels, described in Report Number 2211-02, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 2211-02.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.

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Notes

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

25 All references to the FBC-B and FBC-R are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Florida Supplement at the end of this report.

26 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

27 2021 IRC Section N1102.2.5

28 2021 IECC Section R402.2.5

29 2021 IRC Section R316.6

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 IRC Section N1102.2.5

[34] 2021 IECC Section R402.2.5

[35] 2021 IRC Section R316.6

[36] 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.

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

[38] 2021 IRC Section R316.6

[39] 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

[40] 2021 IRC Section N1102.2.5

[41] 2021 IECC Section R402.2.5

[42] 2021 IBC Section 104.11

[43] 2021 IRC Section R104.11

[44] 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

[45] 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.

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

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

[48] 2018 IBC Section 1705.12

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