# Listing and Technical Evaluation Report™

**A Duly Authenticated Report from an Approved Agency**

**Report No: 1501-06**

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## SMARTci™ Exterior Wall Continuous Insulation System Utilizing GreenGirt™

**Trade Secret Report Holder:**

## A2P, LLC (Advanced Architectural Products)

Phone: 269-355-1818 Website: greengirt.com

## CSI Designations:

**DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION**

Section: 07 20 00 - Thermal Protection

Section: 07 21 00 - Thermal Insulation

Section: 07 27 23 - Board Product Air Barriers

Section: 07 48 00 - Exterior Wall Assemblies

## 1 Innovative Product Evaluated[1]

1.1 SMARTci Exterior Wall Continuous Insulation System

## 2 Product Description and Materials

2.1 SMARTci is a continuous insulation system consisting of a Z-Girt (GreenGirt) and polyisocyanurate (polyiso) insulation.

2.2 GreenGirt acts as a thermal spacer between exterior cladding and interior framing, which prevents thermal bridging.

2.3 The innovative product evaluated in this report is shown in **Figure 1** and **Figure 2**.

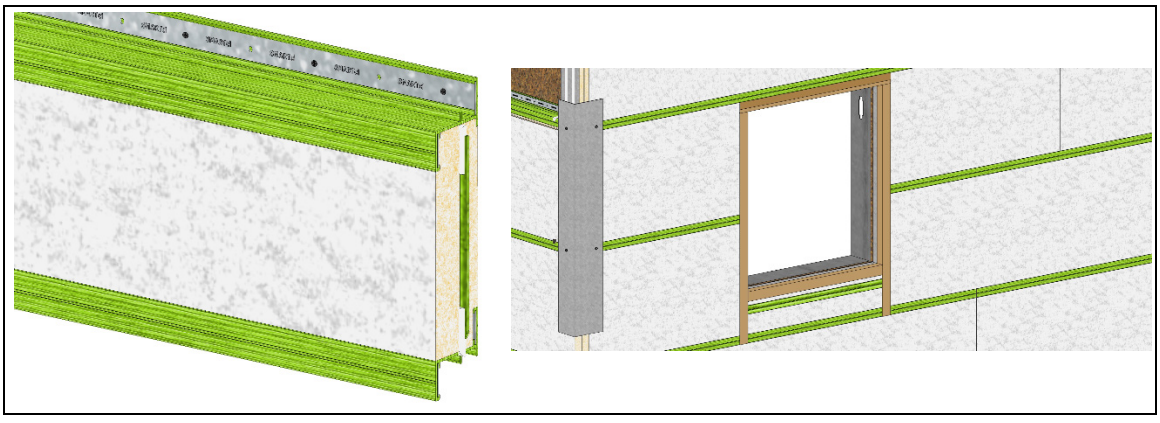

**Figure 1.** SMARTci System

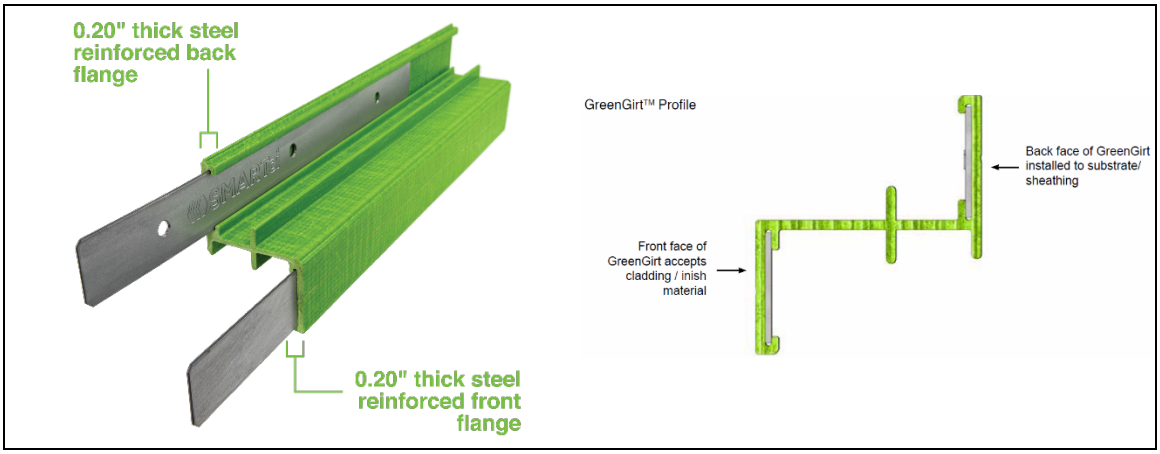


**Figure 2.** GreenGirt

2.4 GreenGirt Adjustable Wall System consists of the same FRP material as GreenGirt, but allows in/out adjustment of the depth of the girt. GreenGirt Adjustable Wall System has a range of depths that the girt can expand to meet.

2.5 *System Components*

2.5.1 In general, the SMARTci Exterior Wall Continuous Insulation System and the GreenGirt Adjustable Wall System are comprised of the following components.

2.5.2 For specific limitations to use in NFPA 285 assemblies, see **Section 6.8.1** and **Section 6.8.2**.

2.5.3 *GreenGirt:*

2.5.3.1 Fiber-reinforced polymer optimized for structural, hygrothermal,[2] and fire resistance formed into a structural *"Z"* shape as shown in **Figure 2**.

2.5.3.2 Slide two 16-gauge high-strength steel inserts into the top and bottom flanges of the GreenGirt to provide added strength in resisting service loads and to act as retention cleats for fasteners while increasing the pullout capacities of fasteners, as shown in **Figure 2**.

2.5.3.3 *Material Availability:*

2.5.3.3.1 *Depth:*

2.5.3.3.1.1 1 1/2", 2", 2 1/2", 3", 3 1/2", 4", 4 1/2", 5", 5 1/2", 6", and 8"

2.5.3.3.2 *Standard Length:*

2.5.3.3.2.1 8'

2.5.4 *Insulation:*

2.5.4.1 Any of the following insulation materials may be used in the SMARTci System:

2.5.4.1.1 Atlas EnergyShield® Pro, EnergyShield® Pro 2, and Rboard Pro

2.5.4.1.2 Carlisle R2+® Panels

2.5.4.1.3 Dow Thermax™ Panels

2.5.4.1.4 Hunter Xci Panels

2.5.4.1.5 Rmax® TSX-8500, Rmax® TSX-8510, or Rmax® TSX-8520

2.5.4.1.6 Firestone Enverge™ CI Panels

2.5.4.1.7 Mineral wool meeting the following requirements:

2.5.4.1.7.1 Minimum 1 1/2" thick

2.5.4.1.7.2 Minimum 4-pcf density

2.5.4.1.7.3 No facer

2.5.4.1.7.4 Noncombustible in accordance with ASTM E136

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

## 3 Definitions[3]

3.1 New Materials[4] 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.[5] The design strength and permissible stresses shall be established by tests[6] and/or engineering analysis.[7]

3.2 Duly authenticated reports[8] and research reports[9] are test reports and related engineering evaluations that are written by an approved agency[10] and/or an approved source.[11]

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).[12]

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.[13]

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[14] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[15] 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[16] 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.[17]

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.[18] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[19] 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.[20]

## 4 Applicable Local, State, and Federal Approvals; Standards; Regulations[21]

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.[22]

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.[23]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[24] and Part 3280[25] 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 *CBC—19, 22: California Building Code[26]*

4.2.5 *CRC—19, 22: California Residential Code[26]*

4.2.6 *FBC-B—20, 23: Florida Building Code[27] – Building*

4.2.7 *FBC-R—20, 23: Florida Building Code[27] – Residential*

4.3 *Standards*

4.3.1 *AAMA 501.1: Standard Test Method for Exterior Windows, Curtain Walls, and Doors for Water Penetration Using Dynamic Pressure*

4.3.2 *ANSI/ASHRAE/IES 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings*

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

4.3.4 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

4.3.5 *ASTM D638: Standard Test Method for Tensile Properties of Plastics*

4.3.6 *ASTM D790: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials*

4.3.7 *ASTM D792: Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement*

4.3.8 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*

4.3.9 *ASTM D1929: Standard Test Method for Determining Ignition Temperature of Plastics*

4.3.10 *ASTM D2990: Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics*

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

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

4.3.13 *ASTM E283: Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen*

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

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

4.3.16 *ASTM G155: Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*

4.3.17 *NFPA 285-12: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*[28]

## 5 Listed[29]

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 and 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 *General*

6.1.1 SMARTci can be installed over substrates including cold-formed steel wall studs, masonry, concrete, or roof decks.

6.1.2 SMARTci may be used in buildings constructed in accordance with IBC/IRC requirements for Type I-V construction.

6.1.3 When used to attach exterior cladding to the building envelope, SMARTci provides the following:

6.1.3.1 Transverse load resistance (wind and seismic)

6.1.3.2 Thermal resistance (provides a thermal break between the cladding and wall framing)

6.1.3.3 Resistance to gravity loads induced by the weight of the cladding materials

6.2 *Cladding Allowable Loading*

6.2.1 The SMARTci System GreenGirt can be installed horizontally or vertically on the exterior side of stud-framed walls at 16", 24", 36", and 48" o.c.

6.2.2 *Brittle Finishes:*

6.2.2.1 For brittle finish exterior cladding, GreenGirt can support cladding out-of-plane lateral loading as shown in **Table 1** for the 1.5" profile and **Table 2** for the 2" profile. Contact the manufacturer for other profile sizes.

**Table 1**. SMARTci GreenGirt Design Values for Brittle Finish Cladding – 1.5" Profile

| GreenGirt Span (Stud Spacing) (in) | GreenGirt Spacing (in) | Allowable Wind Load Design Values[1,2,3,4,5] (psf) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cladding Weight (psf) | | | | | | |
| | | 0 | 3 | 5 | 7 | 9 | 10 | 15 |
| 16 | 16 | 96 | 96 | 96 | 96 | 96 | 96 | 92 |
| | 24 | 64 | 64 | 64 | 64 | 64 | 61 | 59 |
| | 36 | 42 | - | - | - | - | - | - |
| | 48 | 32 | 32 | 31 | 30 | 30 | 25 | 21 |
| 24 | 16 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| | 24 | 45 | 45 | 45 | 45 | 45 | 45 | 43 |
| | 36 | 30 | - | - | - | - | - | - |
| | 48 | 23 | 23 | 23 | 21 | 19 | 17 | 9 |
| 36 | 16 | 36 | 36 | 36 | 36 | 36 | 36 | 36 |
| | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 21 |
| | 36 | 16 | - | - | - | - | - | - |
| | 48 | 12 | 12 | 12 | 11 | 9 | 7 | - |
| 48 | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 18 |
| | 24 | 13 | 13 | 13 | 13 | 12 | 12 | 10 |
| | 36 | 9 | - | - | - | - | - | - |
| | 48 | 7 | 7 | 6 | 5 | 3 | - | - |

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

1. Analysis is for GreenGirt only and does not include insulation.
2. Design values are based on live load deflections of L/240 and total load deflection of L/120.
3. Deflection limits are based on ASCE 7-16 and ASCE 7-22 Components and Cladding loads multiplied by 0.42.
4. Allowable loading is based on allowable stress design with a material stress safety factor > 2.0.
5. Specific project application and details, in addition to the connection design, may limit the allowable loads further.

**Table 2**. SMARTci GreenGirt Design Values for Brittle Finish Cladding – 2" Profile

| GreenGirt Span (Stud Spacing) (in) | GreenGirt Spacing (in) | Allowable Wind Load Design Values[1,2,3,4,5] (psf) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cladding Weight (psf) | | | | | | |
| | | 0 | 3 | 5 | 7 | 9 | 10 | 15 |
| 16 | 16 | 175 | 175 | 175 | 175 | 175 | 175 | 168 |
| | 24 | 116 | 116 | 116 | 116 | 116 | 112 | 108 |
| | 36 | 77 | - | - | - | - | - | - |
| | 48 | 58 | 58 | 56 | 54 | 54 | 45 | 39 |
| 24 | 16 | 124 | 124 | 124 | 124 | 124 | 124 | 124 |
| | 24 | 83 | 83 | 83 | 83 | 83 | 83 | 78 |
| | 36 | 55 | - | - | - | - | - | - |
| | 48 | 41 | 41 | 41 | 39 | 34 | 31 | 16 |
| 36 | 16 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| | 24 | 43 | 43 | 43 | 43 | 43 | 43 | 39 |
| | 36 | 29 | - | - | - | - | - | - |
| | 48 | 22 | 22 | 22 | 20 | 16 | 13 | - |
| 48 | 16 | 36 | 36 | 36 | 36 | 36 | 36 | 33 |
| | 24 | 24 | 24 | 24 | 24 | 23 | 22 | 18 |
| | 36 | 16 | - | - | - | - | - | - |
| | 48 | 12 | 12 | 11 | 9 | 5 | - | - |

SI: 1" = 25.4 mm, 1-psf = 0.0479 kN/m$^2$

1. Analysis is for GreenGirt only and does not include insulation.
2. Design values are based on live load deflections of L/240 and total load deflection of L/120.
3. Deflection limits are based on ASCE 7-16 and ASCE 7-22 Components and Cladding loads multiplied by 0.42.
4. Allowable loading is based on allowable stress design with a material stress safety factor > 2.0.
5. Specific project application and details, in addition to the connection design, may limit the allowable loads further.

6.2.3 *Flexible Finishes:*

6.2.3.1 For flexible finish exterior cladding, SMARTci can resist cladding out-of-plane lateral loading as shown in **Table 3** for the 1.5" profile and **Table 4** for the 2" profile. Contact the manufacturer for other profile sizes.

**Table 3**. SMARTci GreenGirt Design Values for Flexible Finish Cladding – 1.5" Profile

| GreenGirt Span (Stud Spacing) (in) | GreenGirt Spacing (in) | Allowable Wind Load Design Values[1,2,3,4,5] (psf) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cladding Weight (psf) | | | | | | |
| | | 0 | 3 | 5 | 7 | 9 | 10 | 15 |
| 16 | 16 | 185 | 179 | 174 | 170 | 166 | 163 | 152 |
| | 24 | 124 | 117 | 113 | 109 | 105 | 100 | 91 |
| | 36 | 82 | - | - | - | - | - | - |
| | 48 | 62 | 56 | 50 | 45 | 42 | 40 | 30 |
| 24 | 16 | 121 | 120 | 118 | 117 | 117 | 114 | 103 |
| | 24 | 81 | 79 | 78 | 76 | 71 | 68 | 57 |
| | 36 | 54 | - | - | - | - | - | - |
| | 48 | 40 | 39 | 34 | 29 | 25 | 23 | 11 |
| 36 | 16 | 57 | 54 | 53 | 52 | 51 | 50 | 48 |
| | 24 | 38 | 35 | 34 | 33 | 32 | 32 | 29 |
| | 36 | 25 | - | - | - | - | - | - |
| | 48 | 19 | 17 | 16 | 15 | 12 | 9 | - |
| 48 | 16 | 32 | 30 | 29 | 28 | 27 | 26 | 24 |
| | 24 | 21 | 19 | 19 | 18 | 17 | 16 | 13 |
| | 36 | 14 | - | - | - | - | - | - |
| | 48 | 11 | 9 | 8 | 7 | 4 | 3 | - |

SI: 1" = 25.4 mm, 1-psf = 0.0479 kN/m$^2$

1. Analysis is for GreenGirt only and does not include insulation.
2. Design values are based on live load deflections of L/120 and total load deflection of L/90.
3. Deflection limits are based on ASCE 7-16 and ASCE 7-22 Components and Cladding loads multiplied by 0.42.
4. Allowable loading is based on allowable stress design with a material stress safety factor > 2.0.
5. Specific project application and details, in addition to the connection design, may limit the allowable loads further.

**Table 4**. SMARTci GreenGirt Design Values for Flexible Finish Cladding – 2" Profile

| GreenGirt Span (Stud Spacing) (in) | GreenGirt Spacing (in) | Allowable Wind Load Design Values[1,2,3,4,5] (psf) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cladding Weight (psf) | | | | | | |
| | | 0 | 3 | 5 | 7 | 9 | 10 | 15 |
| 16 | 16 | 252 | 243 | 237 | 231 | 226 | 222 | 207 |
| | 24 | 168 | 159 | 154 | 148 | 142 | 136 | 123 |
| | 36 | 112 | - | - | - | - | - | - |
| | 48 | 84 | 76 | 68 | 62 | 57 | 54 | 40 |
| 24 | 16 | 164 | 163 | 161 | 160 | 158 | 155 | 140 |
| | 24 | 110 | 108 | 106 | 103 | 96 | 93 | 78 |
| | 36 | 73 | - | - | - | - | - | - |
| | 48 | 55 | 53 | 47 | 39 | 34 | 31 | 16 |
| 36 | 16 | 77 | 73 | 72 | 70 | 69 | 68 | 65 |
| | 24 | 52 | 48 | 47 | 45 | 44 | 43 | 40 |
| | 36 | 34 | - | - | - | - | - | - |
| | 48 | 26 | 23 | 22 | 20 | 16 | 13 | - |
| 48 | 16 | 43 | 41 | 40 | 38 | 37 | 36 | 33 |
| | 24 | 29 | 26 | 25 | 24 | 23 | 22 | 18 |
| | 36 | 19 | - | - | - | - | - | - |
| | 48 | 14 | 13 | 11 | 9 | 5 | 4 | - |

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

1. Analysis is for GreenGirt only and does not include insulation.
2. Design values are based on live load deflections of L/120 and total load deflection of L/90.
3. Deflection limits are based on ASCE 7-16 and ASCE 7-22 Components and Cladding loads multiplied by 0.42.
4. Allowable loading is based on allowable stress design with a material stress safety factor > 2.0.
5. Specific project application and details, in addition to the connection design, may limit the allowable loads further.

6.3 *Transverse Loads*

6.3.1 SMARTci is permitted to resist transverse wind load forces using the allowable transverse loads (in pounds per square foot) set forth in **Table 5** when installed with Hunter Xci Class A or Rmax TSX 8500 Foam Plastic Insulating Sheathing (FPIS).

**Table 5**. SMARTci Transverse Loads and Wind Speeds[1,2]

| Product Name | Minimum Insulation Thickness (in) | Maximum Stud Spacing (in) | Maximum GreenGirt Spacing (in) | Allowable Pressure (psf) | Allowable Wind Speed, $V_{asd}$ (mph) | Basic Wind Speed, $V_{ult}$ (mph) | Comments |
|---|---|---|---|---|---|---|---|
| SMARTci | 2 | 24 | 24 | 33.3 | 120 | 150 | SMARTci on open studs. Panel joints allowed between studs |

SI: 1" = 25.4 mm, 1-psf = 0.0479 kN/m$^2$, 1 mph = 1.61 km/h

1. Tested in accordance with ASTM E330.
2. Allowable wind speed based on Components and Cladding loads for a building with a mean roof height of 30' and located in Exposure B, Wall Zone 5 and 10-ft$^2$ area. Adjustments for height and exposure shall be in accordance with IRC Figure R301.2(3).

6.4 *Air Barrier*

6.4.1 SMARTci meets the requirements of IECC Section C402.6.1[30] for use as an air barrier assembly when used with Hunter Xci Class A or Rmax TSX 8500 FPIS.

6.4.1.1 FPIS shall be installed in accordance with A2P, LLC installation instructions and this report. See **Table 6** for SMARTci Air Barrier properties.

**Table 6**. SMARTci Air Barrier Properties

| Product Name | Minimum Insulation Thickness[2] (in) | Maximum Stud Spacing (in) | Maximum GreenGirt Spacing (in) | Pressure[1] (psf) | Result (cfm/ft$^2$) | Comments |
|---|---|---|---|---|---|---|
| SMARTci | 2 | 24 | 24 | 20 | < 0.04 | SMARTci on open studs. Panel joint between studs. Includes perforations and taped seams. |

SI: 1" = 25.4 mm, 1-psf = 0.0479 kN/m$^2$

1. Tested in accordance with ASTM E283 as specified in IECC Section C402.6.2.3.2.[31]
2. Products less than 2" thick are not certified for use as air barriers.

6.5 *Water-Resistive Barrier (WRB)*

6.5.1 SMARTci is approved for use as a WRB when installed with Hunter Xci Class A or Rmax TSX 8500 FPIS as prescribed in IBC Section 1404.2 and IRC Section R703.2, when installed on exterior walls as described in this section and as shown in **Table 7**.

6.5.2 Maximum 24" wide insulation boards shall be installed horizontally over exterior framing spaced a maximum of 24" (610 mm) o.c.

6.5.3 Seams are not required to be taped.

6.5.4 Flashing of all sheathing penetrations is required and shall comply with the applicable code.

**Table 7**. SMARTci Water-Resistance Barrier Properties

| Product Name | Minimum Insulation Thickness[3] (in) | Maximum Stud Spacing (in) | Maximum GreenGirt Spacing (in) | Pressure (psf) | Duration of Test (min) | Result | Comments |
|---|---|---|---|---|---|---|---|
| SMARTci | 2 | 24 | 24 | 10 | 15 | No Leakage | SMARTci on open studs. Panel joint between studs. 3" 16-gauge strapping at 24" o.c. No tape on joints[1] |
| | 2 | 16 | 24 | 20 | 15 | No Leakage | SMARTci on open studs. Panel joint between studs. No tape at joints[1] |
| | 2 | 24 | 24 | 20 | 15 | No Leakage | SMARTci on open studs. Panel joint between studs. Includes perforations and taped seams[1] |
| | 2 | 24 | 24 | 15 | 15 | No Leakage | SMARTci on open studs. Panel joint between studs[2] |

SI: 1" = 25.4 mm, 1-psf = 0.0479 kN/m$^2$

1. Tested in accordance with ASTM E331.
2. Tested in accordance with AAMA 501.1.
3. Products less than 2" thick are not certified for use as a WRB.

6.6 *Surface Burning Characteristics*

6.6.1 GreenGirt, Rmax TSX-8500, and Hunter Xci Class A were evaluated to assess performance with regard to flame spread and smoke developed indexes in accordance with ASTM E84 (see **Table 8**).

**Table 8**. Fire Performance of SMARTci

| Product Name | Flame Spread[3] | Smoke Developed[3] | Classification |
|---|---|---|---|
| GreenGirt[1] | ≤ 25 | < 200 | Class A |
| Rmax TSX-8500[2] | ≤ 25 | < 450 | Class A |
| Hunter Xci Class A[2] | ≤ 25 | < 450 | Class A |

1. GreenGirt tested in accordance with ASTM E84.
2. Foam core tested in accordance with ASTM E84.
3. Flame spread and smoke developed numbers are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions.

## 6.7 *Thermal Performance*

6.7.1 SMARTci was evaluated for its thermal properties as shown in **Table 9**.

6.7.1.1 Values were derived from 3D modeling using SOLIDWORKS® Simulation software with a steady state conduction model when installed with polyisocyanurate insulation.

**Table 9**. SMARTci Thermal Performance With and Without Exterior Sheathing[1,3]

| Steel Stud Spacing (in) | FRP Girt Spacing (in) | FRP Girt Size/Exterior Insulation Thickness (in) | Fastener Spacing (in) | Sheathing on Exterior Wall ($^5/_8$" DensGlass) | Nominal | Effective | | % Efficiency[2] |
|---|---|---|---|---|---|---|---|---|
| | | | | | Assembly R Value (hr·ft²·°F/BTU) | Assembly U Factor (BTU/hr·ft²·°F) | Assembly R Value (hr·ft²·°F/BTU) | GreenGirt |
| 16 | 16 | 2.0 | 16 | N | 15.8 | 0.069 | 14.6 | 92.62 |
| | | | | Y | 16.3 | 0.066 | 15.1 | 92.71 |
| 16 | 16 | 2.5 | 16 | N | 19.1 | 0.057 | 17.7 | 92.76 |
| | | | | Y | 19.6 | 0.055 | 18.2 | 92.99 |
| 16 | 16 | 3.0 | 16 | N | 22.3 | 0.048 | 20.7 | 92.75 |
| | | | | Y | 22.8 | 0.047 | 21.2 | 92.87 |
| 16 | 16 | 3.5 | 16 | N | 25.6 | 0.042 | 23.6 | 92.34 |
| | | | | Y | 26.1 | 0.041 | 24.2 | 92.75 |
| 16 | 16 | 4.0 | 16 | N | 28.8 | 0.037 | 26.7 | 92.66 |
| | | | | Y | 29.3 | 0.037 | 27.1 | 92.51 |
| 24 | 24 | 2.0 | 24 | N | 15.8 | 0.066 | 15.1 | 95.37 |
| | | | | Y | 16.3 | 0.064 | 15.6 | 95.69 |
| 24 | 24 | 2.5 | 24 | N | 19.1 | 0.055 | 18.1 | 95.19 |
| | | | | Y | 19.6 | 0.054 | 18.7 | 95.40 |
| 24 | 24 | 3.0 | 24 | N | 22.3 | 0.047 | 21.2 | 95.15 |
| | | | | Y | 22.8 | 0.046 | 21.8 | 95.38 |
| 24 | 24 | 3.5 | 24 | N | 25.6 | 0.041 | 24.3 | 95.11 |
| | | | | Y | 26.1 | 0.040 | 24.8 | 95.22 |
| 24 | 24 | 4.0 | 24 | N | 28.8 | 0.037 | 27.4 | 95.10 |
| | | | | Y | 29.3 | 0.036 | 27.9 | 95.32 |
| 24 | 48 | 2.0 | 24 | N | 15.8 | 0.065 | 15.5 | 97.84 |
| | | | | Y | 16.3 | 0.062 | 16.1 | 98.61 |

**Table 9**. SMARTci Thermal Performance With and Without Exterior Sheathing[1,3]

| Steel Stud Spacing (in) | FRP Girt Spacing (in) | FRP Girt Size/Exterior Insulation Thickness (in) | Fastener Spacing (in) | Sheathing on Exterior Wall ($^5/_8$" DensGlass) | Nominal | Effective | | % Efficiency[2] |
|---|---|---|---|---|---|---|---|---|
| | | | | | Assembly R Value (hr·ft²•°F/BTU) | Assembly U Factor (BTU/hr•ft²•°F) | Assembly R Value (hr•ft²•°F/BTU) | GreenGirt |
| 24 | 48 | 2.5 | 24 | N | 19.1 | 0.054 | 18.6 | 97.74 |
| | | | | Y | 19.6 | 0.052 | 19.2 | 98.05 |
| 24 | 48 | 3.0 | 24 | N | 22.3 | 0.046 | 21.8 | 97.69 |
| | | | | Y | 22.8 | 0.045 | 22.3 | 97.94 |
| 24 | 48 | 3.5 | 24 | N | 25.6 | 0.040 | 25.0 | 97.64 |
| | | | | Y | 26.1 | 0.039 | 25.5 | 97.80 |
| 24 | 48 | 4.0 | 24 | N | 28.8 | 0.036 | 28.1 | 97.61 |
| | | | | Y | 29.3 | 0.035 | 28.6 | 97.76 |
| 16 | 24 | 2.0 | 16 | N | 15.8 | 0.067 | 15.1 | 95.27 |
| | | | | Y | 16.3 | 0.064 | 15.6 | 95.51 |
| 16 | 24 | 2.5 | 16 | N | 19.1 | 0.055 | 18.2 | 95.26 |
| | | | | Y | 19.6 | 0.054 | 18.7 | 95.46 |
| 16 | 24 | 3.0 | 16 | N | 22.3 | 0.047 | 21.2 | 95.21 |
| | | | | Y | 22.8 | 0.046 | 21.8 | 95.49 |
| 16 | 24 | 3.5 | 16 | N | 25.6 | 0.041 | 24.3 | 95.11 |
| | | | | Y | 26.1 | 0.040 | 24.8 | 95.28 |
| 16 | 24 | 4.0 | 16 | N | 28.8 | 0.037 | 27.4 | 95.01 |
| | | | | Y | 29.3 | 0.036 | 27.9 | 95.17 |

SI: 1" = 25.4 mm, 1-psi = 0.00689 MPa

1. Nominal assembly R-values based on ASHRAE 90.1.
2. Computed by dividing the effective R-value of the wall assembly by the nominal R-value of the assembly
3. Steel studs used in this model are more conductive than other options such as wood studs, concrete walls, masonry walls, and large member steel framing. The results in this table may be conservatively extended to those other types of wall substrates.

6.8 *Vertical and Lateral Fire Propagation*

6.8.1 *SMARTci:*

6.8.1.1 SMARTci was tested to assess its performance regarding vertical and lateral fire propagation in accordance with NFPA 285 per IBC Section 2603.5.5 in a wall configuration consisting of polyiso insulation over a metal stud wall without exterior sheathing with Aluminum Composite Material (ACM) cladding (see **Figure 3**). Testing with this configuration is considered worst-case for two reasons:

6.8.1.1.1 Testing with ACM is considered by fire experts as a cladding that easily melts and can spread flames, allowing the underlying insulation to ignite and spread flames via the air gap between the insulation and cladding.

6.8.1.1.2 Testing with no exterior sheathing creates a large air gap that can spread flames worse than a system that uses exterior sheathing.

6.8.1.2 SMARTci was found to not contribute to overall flame spread of a wall assembly.

6.8.1.3 SMARTci was found to withstand fire propagation, allowing the cladding system to remain attached.

6.8.1.4 SMARTci wall configurations conforming to the following limitations are found to be NFPA 285 compliant:

6.8.1.4.1 SMARTci can be used with the polyiso insulations listed in **Section 2.5.3** and **Section 11.2.6**.

6.8.1.4.1.1 Claddings and WRB (installed under the insulation) shall be approved for use with the polyiso insulations as shown in **Section 2.5.3**.

6.8.1.4.1.1.1 NFPA 285-approved claddings such as ACM shall be limited to the maximum air gap as tested or approved.

6.8.1.4.1.1.2 Noncombustible claddings is not limited to any size air gap.

6.8.1.4.1.2 Consult the NFPA 285 approvals (DrJ Research Report 1202-04 or Report Number 1407-01) for these manufacturers to determine if the system is approved for use with no exterior sheathing or if exterior sheathing must be used.

6.8.1.4.2 SMARTci can be used with noncombustible mineral fiber insulation meeting minimum requirements listed in **Section 2.5.4.1.7**.

6.8.1.4.2.1 If mineral wool is 2" thick and meets minimum density requirement, any WRB can be used under the mineral wool.

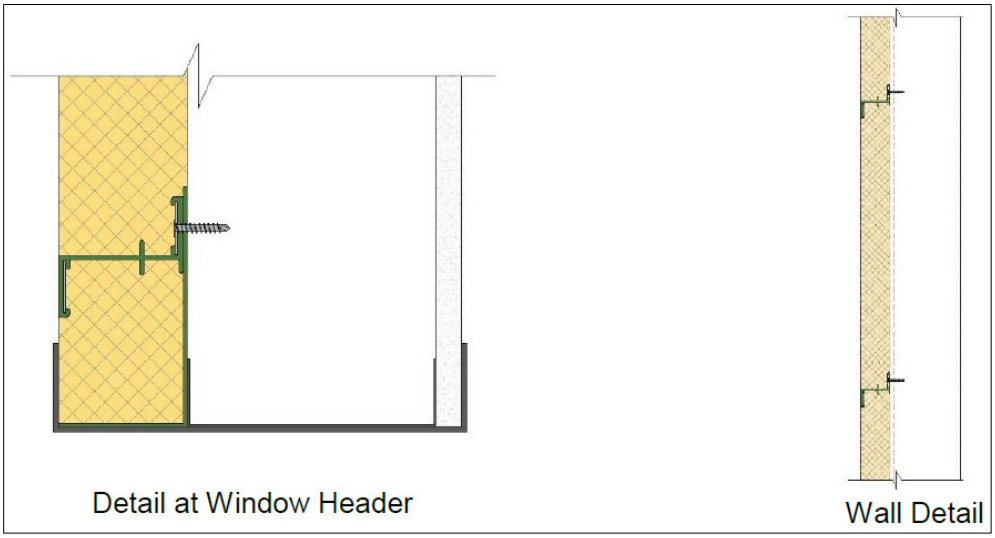


**Figure 3**. SMARTci System Detail

6.8.1.5 SMARTci can be used in assemblies incorporating High Pressure Laminate (HPL) claddings only when the window header design is NFPA 285-approved for use with HPL claddings, and the SMARTci girt is installed in accordance with the following additional conditions to **Section 6.8.1.4**:

6.8.1.5.1 *Horizontal Applications:* The SMARTci girt may be left exposed (not covered by mineral fiber insulation) as shown in **Figure 4**.

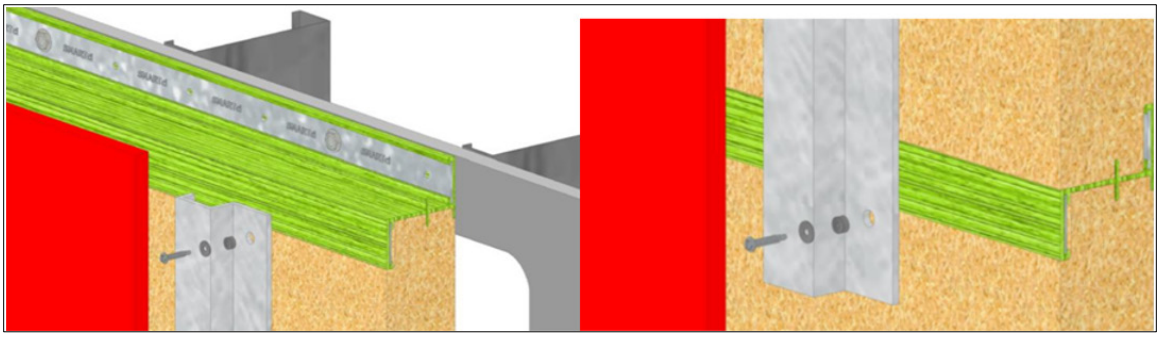

**Figure 4**. SMARTci System Detail of Horizontal Installation with HPL Cladding

6.8.1.5.2 *Vertical Applications:* The SMARTci girt is covered by at least 1" of mineral fiber insulation as shown in **Figure 5**.

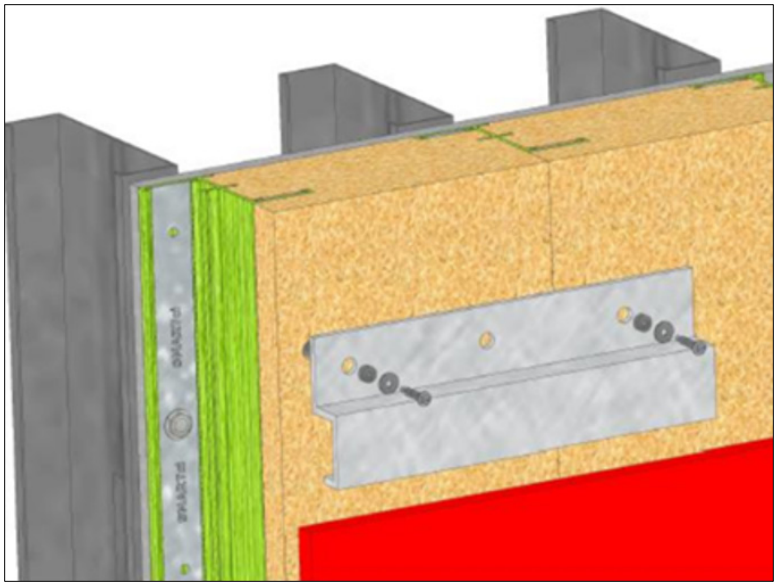

**Figure 5**. SMARTci System Detail of Vertical Installation with HPL Cladding

6.8.2 *GreenGirt Adjustable Wall System:*

6.8.2.1 GreenGirt Adjustable Wall System was evaluated to assess its performance with regard to vertical and lateral fire propagation in accordance with NFPA 285 and IBC Section 2603.5.5 in wall configurations complying with the following limitations:

6.8.2.1.1 For use only with mineral wool exterior insulation meeting minimum requirements in **Section 2.5.4.1.7**.

6.8.2.1.2 For use with claddings approved for use with the polyiso insulations listed in **Section 2.5.4**.

6.8.2.1.3 For use with WRB installed under the insulation and approved for use under the polyiso insulations listed in **Section 2.5.4**.

6.8.2.1.3.1 If mineral wool is 2" thick and meets minimum density requirement, any WRB can be used under the mineral wool.

6.8.2.1.4 For use with NFPA 285-approved claddings such as ACM with the maximum air gap as tested or approved.

6.8.2.1.5 For use with noncombustible claddings with any size air gap.

6.8.2.2 GreenGirt Adjustable Wall System was found to not contribute to overall flame spread of a wall assembly.

6.8.2.3 GreenGirt Adjustable Wall System was found to withstand fire propagation, allowing the cladding system to remain attached.

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[32]

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.[33]

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.[34]

## 8 Regulatory Evaluation and Accepted Engineering Practice

8.1 The SMARTci system was evaluated to determine:

8.1.1 Structural performance under transverse load conditions for wind loading in accordance with IBC Section 1609, specifically IBC Section 1609.4.3.

8.1.2 Performance for use in exterior walls of buildings of any height and of Type I-V construction in accordance with IBC Section 2603.5 and IRC Section R303.5.12.[35]

8.1.3 Performance for use in exterior walls of buildings as an air barrier in accordance with IECC Section C402.6.1.[36]

8.1.4 Performance for use in exterior walls of buildings as a WRB in accordance with IBC Section 1404.2 and IRC Section R703.2.

8.1.5 Performance in accordance with ASTM E84 for flame spread and smoke development ratings in accordance with IBC Section 2603.5.4 and IRC Section R303.3.[37]

8.1.6 Thermal performance as a continuous insulation system in accordance with IECC Section C402.6.1[38] and ASHRAE 90.1.

8.1.7 Use as part of NFPA 285 wall assembly designs, in accordance with IBC Section 2603.5.5.

8.1.8 Fire resistance rated wall assemblies in accordance with IBC Section 2603.5.1 are outside the scope of this report.

8.2 The GreenGirt Adjustable Wall System was evaluated to determine:

8.2.1 Use as part of NFPA 285 wall assembly designs, in accordance with IBC Section 2603.5.5.

8.3 Fire resistance rated wall assemblies in accordance with IBC Section 2603.5.1 are outside the scope of this report.

8.4 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[39] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[40] respectively.

8.5 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 SMARTci shall only be installed under the direct supervision of an experienced craftsperson, trained in the proper application of its diverse offering of products and services.

9.4 Installation shall comply with the manufacturer installation instructions and this report. In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.

9.5 Do not stack other objects on top of SMARTci insulation panels, nor GreenGirt packages.

9.6 GreenGirt may not be cut with plywood or toothed blades. Use only abrasive chop saw/hand saw blades. Do not use actuated fasteners, impact hammers, or impact drills.

9.7 *Installation Procedure*

9.7.1 Cut bottom base insulation panel to size and shim to level. Allow for $^1/_2$" gap between the panel and the base (if applicable) for approved expandable sealant.

9.7.2 Ensure the first GreenGirt is level and plumb. The height above the top of foundation is determined by project-specific factors. In most cases, the first GreenGirt will be installed above the first (bottom) row of insulation panels as shown in **Figure 6**.

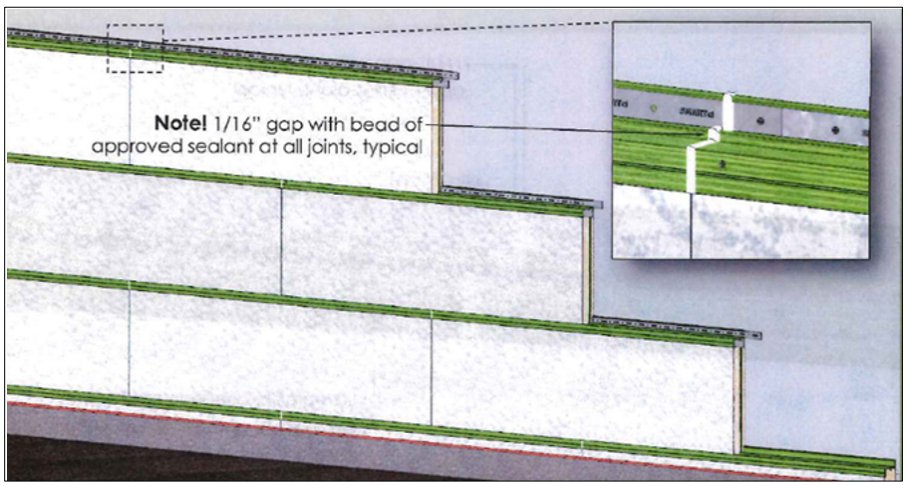


**Figure 6**. Installation Detail

9.7.3 Starting at a transition or termination point, install first (bottom) GreenGirt by gently tamping it down in place along the (top) length of the panel. Ensure that the air seal rib of the GreenGirt aligns with the coordinating channel at the top of the insulation panel to prevent damage before tamping.

9.7.4 Apply two continuous 1/4" minimum beads of approved sealant at all transitions and terminations and onto GreenGirt behind insulation panels before installing them, as shown in **Figure 7**.

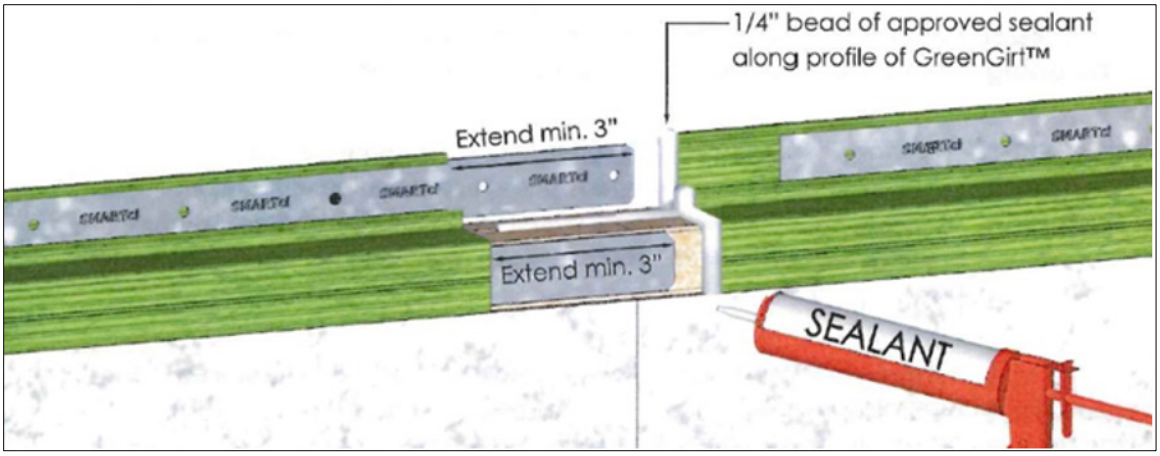


**Figure 7**. Proper Sealing of GreenGirt

9.7.5 When fastening GreenGirt to substrate, the following steps must be taken:

9.7.5.1 The edge distance of any fastener hole (to the side of the GreenGirt) shall be a minimum of 1/2" from the edge of the profile to the closest side of the fastener hole, as demonstrated in **Figure 8**.

9.7.5.2 Minimum clear distance in between holes is 5x the diameter.

9.7.5.3 Minimum end (end of profile to edge of hole) distance in the longitudinal direction is 3x the diameter.

9.7.5.4 Minimum edge (edge of profile to edge of hole) distance in the transverse direction is 2x the diameter.

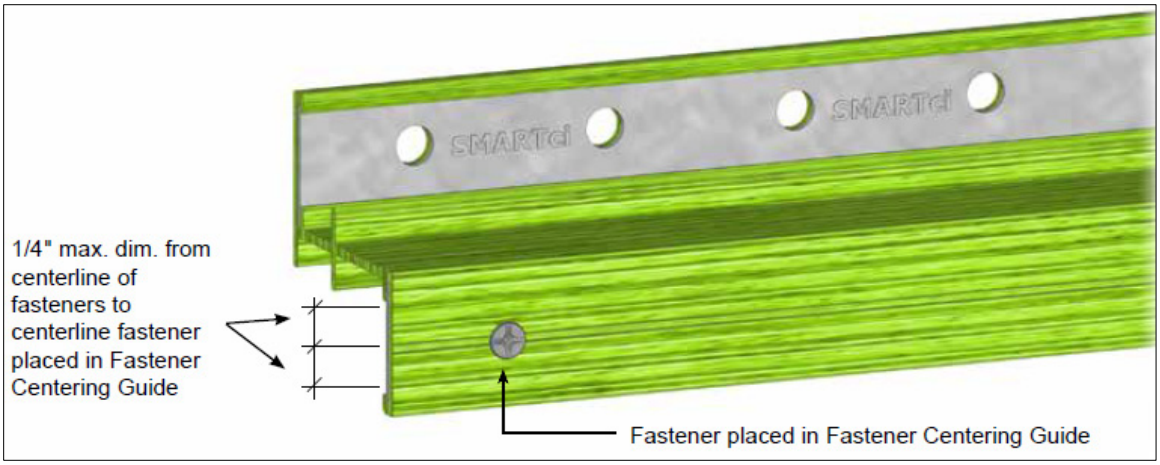


**Figure 8**. Correct Fastener Position in GreenGirt

9.7.5.5 Slide galvanized metal inserts into backside of GreenGirt, with 1/4" minimum continuous bead of approved sealant applied to the adjoining end, with a minimum 3" overlap as shown in **Figure 9**.

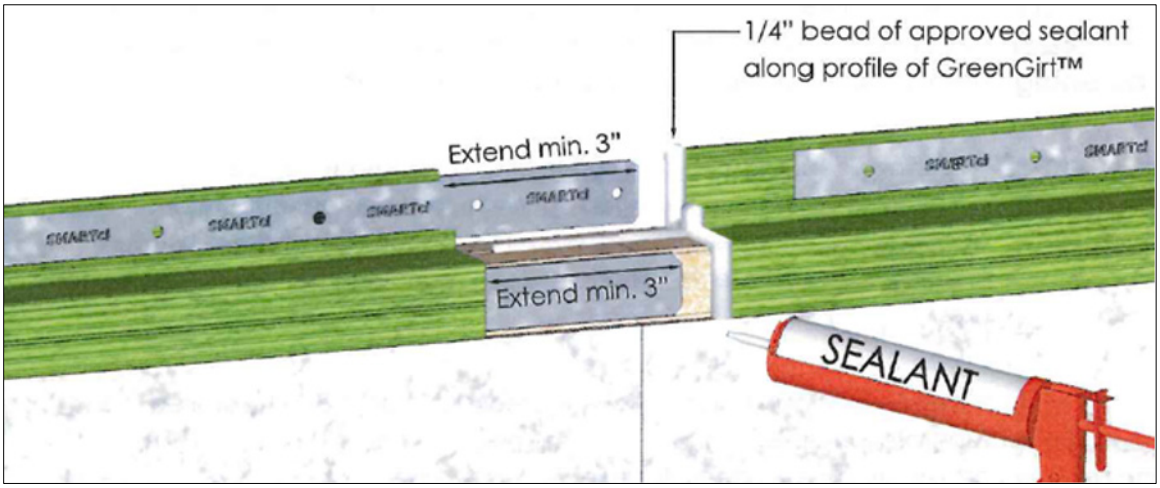


**Figure 9**. Assembly of GreenGirt with Metal Insert and Sealant

9.7.5.6 Lap metal inserts, at least 3", with a continuous bead of approved sealant in the 1/16" gap between, and fasten to stabilize, see **Figure 10**.

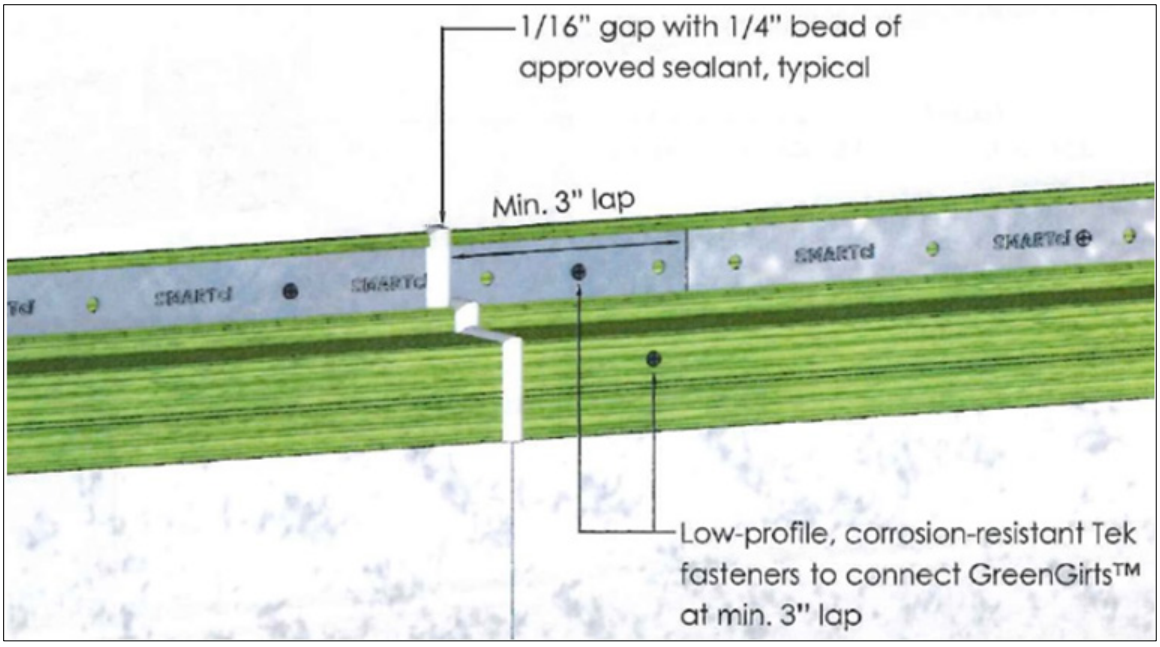


**Figure 10**. Correct Final Installation of GreenGirt

9.7.5.7 Fasten GreenGirt through the overlapped galvanized metal inserts into the substrate with approved Teks® fasteners, and remove any debris or moisture before installing panels.

9.7.5.8 Self-drilling fasteners of sufficient diameter and loading capacity for the application (dependent upon cladding) can be utilized to fasten girt to steel studs. Use pre-drilled holes in retention plates.

9.7.5.9 Threaded concrete fasteners can be used to fasten pre-drilled GreenGirt metal inserts to concrete substrate.

9.7.6 Continue by installing the second panel to the top track of the first (bottom) GreenGirt. Apply a 1/4" minimum continuous bead of approved sealant, at least 2" long in each direction, at all four corners of the panel, and inside the pre-formed center profile channel, as shown in **Figure 11**.

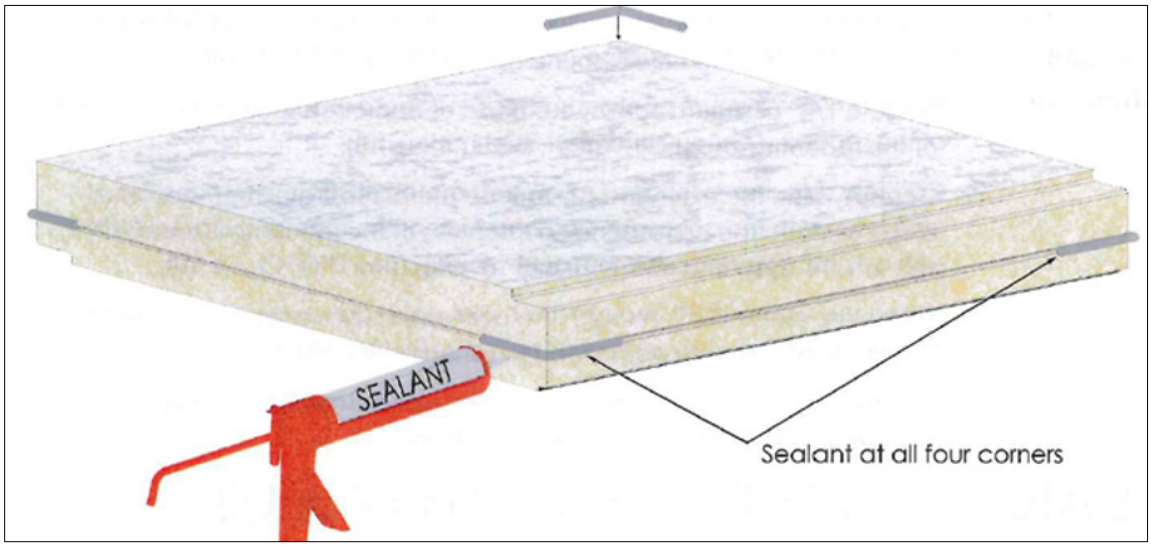


**Figure 11**. Proper Sealing of Insulation Panel

9.7.7 After cleaning debris and moisture from top channel of GreenGirt, place insulation panel into channel, aligning the air seal rib into the groove properly. Insert the GreenGirt spline into the end vertical channel of the insulation panel with a rubber mallet, gently tamping to ensure a snug fit with the corner sealant beads as established in **Figure 12**.

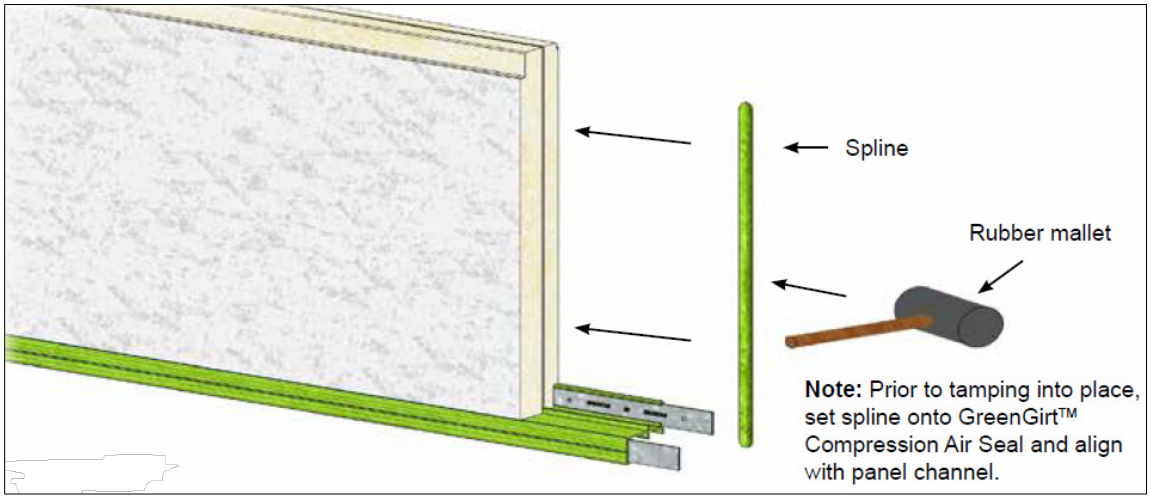


**Figure 12**. Inserting the Spline into the Insulation Panel

9.7.8 Using a spare cutoff of GreenGirt as a buffer, gently tamp down on the insulation panel with a rubber mallet. Ensure a firm bond and that no damage is done to the panel edge, see **Figure 13**.

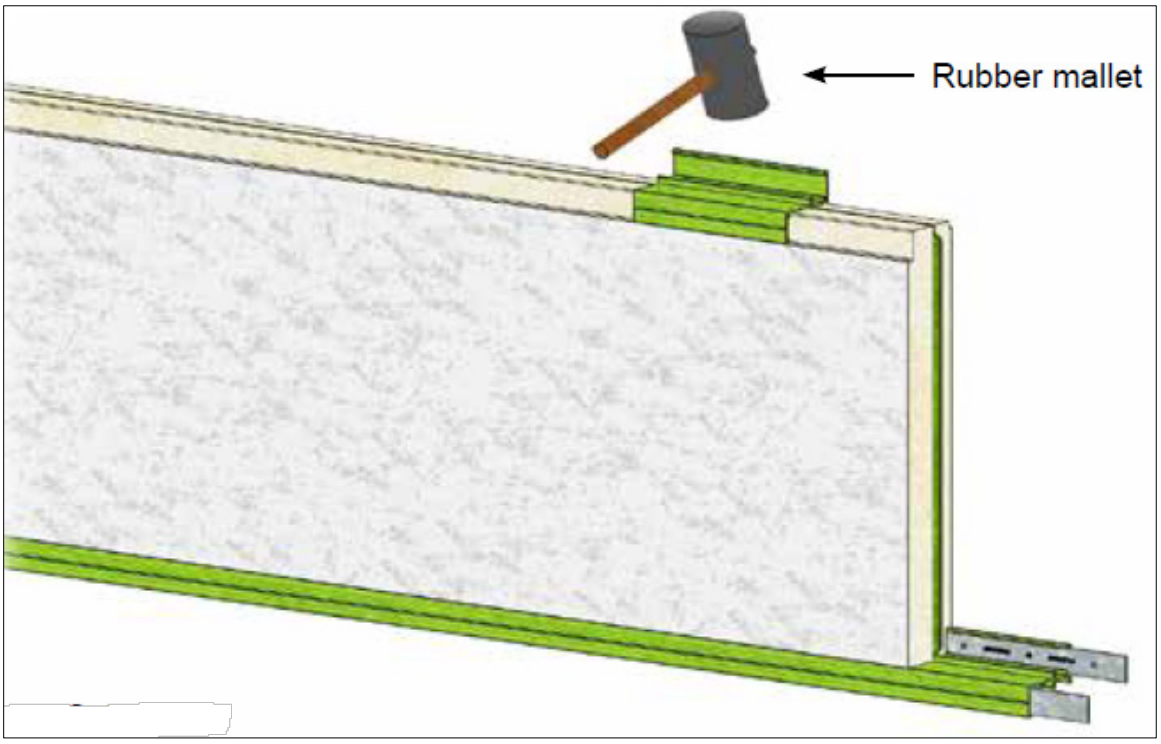


**Figure 13**. Using a Mallet to Tap the Insulation Panel into Place

9.7.9 When installing the next adjacent panel, ***DO NOT SLIDE THE PANEL INTO PLACE***. Use the spare cutoff of GreenGirt to gently tamp it into place along the length of the top. Use the provided notched tamping block to gently tamp the two panels together to create a firm bond with the spline between them. Continue installing panels in this way, bottom to top, ensuring vertical joints are staggered from row to row and adjacent panel joints are fitted tight, see **Figure 14**.

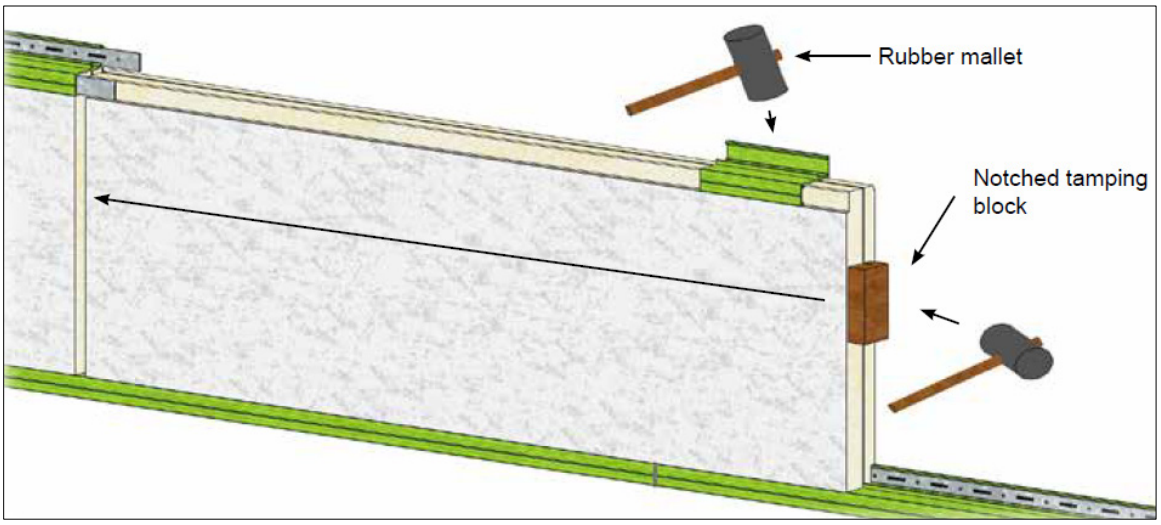


**Figure 14**. Install the Adjacent Panel by Tamping into Place, Not Sliding

9.7.10 Once one row has been completed, install the next GreenGirt by using the provided notched tamping block and rubber mallet, ensuring a firm bond between the bottom channel of the girt and top edge of the insulation panel, as shown in **Figure 15**.

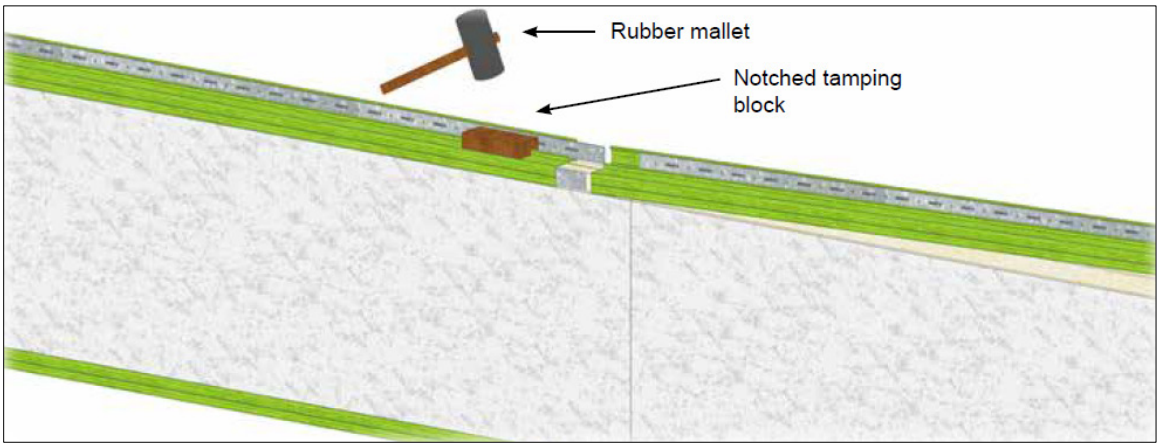


**Figure 15**. Properly Installing the Next GreenGirt Using the Mallet

## 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 Transverse wind load testing in accordance with ASTM E330

10.1.2 Water penetration properties testing in accordance with ASTM E331

10.1.3 Air leakage properties testing in accordance with ASTM E283

10.1.4 Surface burning testing in accordance with ASTM E84

10.1.5 Tensile strength testing in accordance with ASTM D638

10.1.6 Vertical and lateral fire propagation testing in accordance with NFPA 285

10.2 Engineering evaluation of five NFPA 285 tests using A2P, LLC SMARTci System in approved assemblies, performed by Priest & Associates Consulting, LLC.

10.3 Manufacturer technical data sheets and installation instructions.

10.4 Manufacturer quality control manual and evidence of approved agency inspections.

10.5 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.

10.6 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.

10.7 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.

10.8 *Testing and Engineering Analysis*

10.8.1 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.[41]

10.9 Where additional condition of use and/or regulatory compliance information is required, please search for SMARTci on the DrJ Certification website.

## 11 Findings

11.1 As outlined in **Section 6**, SMARTci has 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, SMARTci shall be approved for the following applications:

11.2.1 Structural performance under transverse load conditions in accordance with IBC Section 1609, specifically IBC Section 1609.4.3.

11.2.2 Performance for use in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5 and IRC Section R303.5.12,[42] and Type V construction in accordance with IBC Section 2603.2, IBC Section 2603.3, and IBC Section 2603.4.

11.2.3 Performance for use in exterior walls of buildings as an air barrier in accordance with IECC Section C402.6.1.[43]

11.2.4 Performance for use in exterior walls of buildings as a WRB in accordance with IBC Section 1404.2 and IRC Section R703.2.

11.2.5 Performance in accordance with ASTM E84 for flame spread and smoke development ratings in accordance with IBC Section 2603.5.4 and IRC Section R303.3.[44]

11.2.6 SMARTci is approved for use as the attachment method of the exterior insulation layer when used in the approved NFPA 285 wall assemblies from the following polyisocyanurate manufacturers and their products:

11.2.6.1 Atlas EnergyShield Pro, EnergyShield Pro 2 and Rboard Pro

11.2.6.2 Carlisle R2+ Panels

11.2.6.3 Dow Thermax Panels

11.2.6.4 Hunter Xci Panels

11.2.6.5 Rmax TSX-8500, Rmax TSX-8510, or Rmax TSX-8520

11.2.6.6 Firestone Enverge CI Panels

11.2.7 Mineral wool meeting the following requirements:

11.2.7.1 Minimum $1^1/_2$" thick

11.2.7.2 Minimum 4-pcf density

11.2.7.3 No facer

11.2.7.4 Noncombustible in accordance with ASTM E136

11.3 When used and installed in accordance with the manufacturer installation instructions, the GreenGirt Adjustable Wall System is approved for the following:

11.3.1 As the attachment method of the exterior insulation layer when used in the approved NFPA 285, wall assemblies in **Section 6.8.2**.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from A2P, LLC.

11.5 IBC Section 104.2.3[45] (IRC Section R104.2.2[46] and IFC Section 104.2.3[47] 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:**[48] Building regulations require that the building official shall accept duly authenticated reports.[49]

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.[50]

## 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 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:

12.2.1 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.

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

12.2.3 This innovative product has an internal quality control program and a third-party quality assurance program.

12.2.4 At a minimum, this innovative product shall be installed per **Section 9**.

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

12.2.6 This innovative product has 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.

12.2.7 The application of this innovative product 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.

12.3 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.

12.4 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).

12.5 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 SMARTci Exterior Wall Continuous Insulation System, as listed in **Section 1.1**, is 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 greengirt.com/smartci-building-enclosures.

## 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.

Issue Date: June 30, 2015
Supplement Revision Date: April 29, 2026
Subject to Renewal: July 1, 2027

# CBC and CRC Supplement to Report Number 1501-06

**REPORT HOLDER:** A2P, LLC

## 1 Evaluation Subject

1.1 SMARTci Exterior Wall Continuous Insulation System

## 2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show SMARTci, recognized in Report Number 1501-06 has also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC — 22, 25: California Building Code (Title 24, Part 2)*

2.2.2 *CRC — 22, 25: California Residential Code (Title 24, Part 2.5)*

## 3 Conclusions

3.1 SMARTci, described in Report Number 1501-06, complies with the CBC and CRC and is subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the CBC and CRC applicable to this report, they are listed here:

3.2.1 CBC Section 104.11 replaces IBC Section 104.2.3 and IBC Section 104.2.3.2.

3.2.2 CBC Section 104.7 replaces IBC Section 104.7.2.

3.2.3 CBC Section 1707.1 replaces IBC Section 1707.1.

3.2.4 CBC Section 2603.3 replaces IBC Section 2603.3.

3.2.5 CRC Section R104.4 replaces IRC Section R104.7.2.

3.2.6 CRC Section R104.11 replaces IRC Section R104.2.2.

3.2.7 CRC Section R303.3 replaces IRC Section R303.3.

3.2.8 CRC Section R703.2 replaces IRC Section R703.2.

## 4 Conditions of Use

4.1 SMARTci, described in Report Number 1501-06, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1501-06.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of CBC and CRC, as applicable.

Issue Date: April 25, 2022
Supplement Revision Date: April 29, 2026
Subject to Renewal: July 1, 2027

# FBC Supplement to Report Number 1501-06

**REPORT HOLDER:** A2P, LLC

## 1 Evaluation Subject

1.1 SMARTci Exterior Wall Continuous Insulation System

## 2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show SMARTci, recognized in Report Number 1501-06, has 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*

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

## 3 Conclusions

3.1 SMARTci, described in Report Number 1501-06, complies with the FBC-B and FBC-R and is 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 1404.2 replaces IBC Section 1404.2.

3.2.9 FBC-B Section 1707.1 replaces IBC Section 1707.1.

3.2.10 FBC-B Section 2306.1 replaces IBC Section 2306.1.

3.2.11 FBC-B Section 2306.3 replaces IBC Section 2306.3.

3.2.12 FBC-B Section 2603.3 replaces IBC Section 2603.3.

3.2.13 FBC-B Section 2603.4 replaces IBC Section 2603.4.

3.2.14 FBC-B Section 2603.5 replaces IBC Section 2603.5.

3.2.15 FBC-B Section 2603.5.5 replaces IBC Section 2603.5.5.

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

3.2.17 FBC-R Section R316.3 replaces IRC Section R303.3.

3.2.18 FBC-R Section R316.5.12 replaces IRC Section R303.5.12.

3.2.19 FBC-R Section R703.2 replaces IRC Section R703.2.

## 4 Conditions of Use

4.1 All applicable sections in Report Number 1501-06.

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

# Notes

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

2 In the context of building science, Hygrothermal refers to the combined effect of moisture and heat.

3 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.

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

5 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

6 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

7 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

8 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.

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

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

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

12 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.

13 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/

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

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

16 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

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

18 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

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

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

21 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.

22 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

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

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

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

26 All references to the CBC and CRC are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the CBC and CRC Supplement at the end of this report.

27 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.

28 References to NFPA 285-12 in this report are code compliant through the 2018 version of the IBC.

29 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

30 2021 IECC Section C402.5.1

31 2021 IECC Section C402.5.1.4

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

[33] 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

[34] 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

[35] 2021 IRC Section R316.5.12

[36] 2021 IECC Section C402.5.1

[37] 2021 IRC Section R316.3

[38] 2021 IECC Section C402.5.1

[39] 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.

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

[41] 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

[42] 2021 IRC Section R316.5.12

[43] 2021 IECC Section C402.5.1

[44] 2021 IRC Section R316.3

[45] 2021 IBC Section 104.11

[46] 2021 IRC Section R104.11

[47] 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

[48] 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.

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

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