

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Continuous insulation (CI) composite framing support (CFS) system integrated with vinyl siding exterior wall cladding.
 - 1. Substrate: Concrete masonry units (CMU) or Poured concrete.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - CAST-IN PLACE CONCRETE: Concrete wall substrate
- B. Section 042200 - CONCRETE UNIT MASONRY: Concrete masonry unit (CMU) wall substrate
- C. Division 07: Wall cladding system
- D. Section 079200 - JOINT SEALANTS: Perimeter sealant

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASCE - Structural Plastics Design Manual
- C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2018.
- E. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor; 2013a.
- F. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- G. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.
- H. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.
- I. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2015.
- J. ASTM D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between - 30 C and 30 C with a Vitreous Silica Dilatometer; 2016.
- K. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2016.
- L. ASTM D792 - Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement; 2013.
- M. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2018.

- N. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018b.
- P. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.
- Q. IBC - International Building Code (International Code Council)
- R. IECC - International Energy Conservation Code

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate construction of wall cladding support system over substrate indicated for proper drainage, flashing, trim, back-up support, soffits, and other related Work.

1.05 SUBMITTALS

- A. See Section 013300 - SUBMITTALS, for submittal procedures.
- B. Product Data: Submit for each type of product indicated; include construction details, material descriptions, dimensions of individual components and profiles, and accessories as necessary for complete fully functioning and assembled system.
 - 1. Continuous insulation support system attachment methods and required fasteners.
 - 2. Wall-mounted items including doors, windows, louvers, and lighting fixtures.
 - 3. Wall penetrations including pipes, electrical fixtures, and any other utilities.
- C. Shop Drawings: Submit fabrication and installation layouts of continuous insulation wall cladding support system; including details of edge conditions, joints, corners, anchors, attachment system, trim, flashings, closures, accessories; and any special details.
 - 1. Provide distinction between factory-assembled, shop-assembled, and field-assembled work.
 - 2. Provide details of following items at full scale:
 - a. Manufacturer's standard sheet metal trims.
 - b. Components of CFS system and required fasteners.
- D. Test and Inspection Reports: Submit test and inspection reports on each type of wall cladding/veneer system based on evaluation of comprehensive tests performed by nationally recognized testing agency.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original unopened containers and packaging with labels clearly identifying product name and manufacturer.
- B. Deliver components and other manufactured items or accessories without damage or deformation.

- C. Storage: Store materials in clean, dry, and level interior areas or outdoor areas for limited duration in accordance with manufacturer's written instructions.
- D. Protect components and auxiliary accessories during transportation, handling, and installation from moisture, excessive temperatures and other construction operations in accordance with manufacturer's written instructions.
- E. Handle components in strict compliance with manufacturer's written instructions and recommendations, and in a manner to prevent bending, warping, twisting, and surface, edge or corner damage.

1.07 SITE CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work in accordance with manufacturer's written installation instructions and warranty requirements.

1.08 WARRANTY

- A. CFS System Warranty: Provide written warranty by manufacturer agreeing to correct defects in manufacturing within a five year period after Date of [Substantial Completion].

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Advanced Architectural Products (A2P): SMARTci Plus 2-in-1 System
Address: 959 Industrial Drive, Allegan, Michigan 49010.
Phone: (269) 355-1818; Fax: (866) 858-5568; Website: www.smartcisystems.com
- B. Other products shall be pre-submitted and approved products that meet materials and performance requirements with specified and validated third party testing.

2.02 DESCRIPTION

- A. Attach CFS system components to concrete masonry units (CMU) and poured concrete.
- B. Install CI panels and CFS system components vertically on masonry or concrete substrate with shims as indicated on drawings in compliance with specified requirements.

2.03 PERFORMANCE REQUIREMENTS

- A. Air Infiltration Test: Maximum of 0.06 cfm/sq ft of wall area in accordance with ASTM E283 or ASTM E2357 at an air pressure differential of 6.27 lbf/sq ft across assembly.

2.04 COMPOSITE FRAMING SUPPORT (CFS) SYSTEM

- A. CFS System: Provide CFS system consisting of polyester and vinyl ester bioresin matrix (FRP) with recycled materials, fire retardant additives and integral continuous metal inserts the length of profile. Reinforce CFS system with glass strand rovings used internally for longitudinal (lengthwise) strength and continuous strand glass mats or stitched reinforcements used internally for transverse (crosswise) strength.
 1. Depth of GreenGirt: 2 inch high.
 2. On Center Spacing: 24 inch.

3. Provide continuous non-corrosive steel insert for engagement of fasteners, 16 gage, minimum, with G90 galvanized coating designation in compliance with ASTM A653/A653M.
 - a. Fully engage steel insert with adjacent CFS at ends.
 - b. Anchor sub-girts and other wall cladding support accessories to steel insert set into and part of CFS.
 - c. Provide screw pullout testing that meets or exceeds 210 pounds.
4. Provide integral 3-point compression seal in CFS sections to ensure insulation panel will not dislodge and to eliminate air and water movement throughout system.
5. Provide integral anti-siphon grooves on exterior and interior flanges of CFS.
6. Provide force distribution zones integrally designed into profile of CFS.
7. Provide spline seals for adjacent insulation units into profile of CFS.
8. Surface Burning Characteristics:
 - a. Flame Spread Index (FSI): 25 or less, when tested in accordance with ASTM E84.
 - b. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
9. Flammability: Comply with ASTM E84.
10. Self-Extinguishing: Comply with ASTM D635.
11. Profile Visual Requirements: Comply with ASTM D4385.
12. Tensile Stress: Provide engineered lengthwise and crosswise tensile stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D638.
13. Compressive Stress: Provide engineered lengthwise and crosswise compressive stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D695.
14. Flexural Stress: Provide engineered lengthwise and crosswise flexural stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D790.
15. Modulus of Elasticity: Engineered to meet performance loading criteria and specified safety factors.
16. Barcol Hardness: 45, in accordance with ASTM D2583.
17. Water Absorption: Less than 0.46 percent by weight, within 24 hours, in accordance with ASTM D570.
18. Density: Within range of 0.062 to 0.070 lbs/cubic inch, in accordance with ASTM D792.
19. Lengthwise Coefficient of Thermal Expansion: 7.0×10^{-6} inch/inch/degrees F, in accordance with ASTM D696.
20. Notched Izod Impact, Crosswise: 4 ft lbs/inch, in accordance with ASTM D256 within temperature range indicated.

2.05 INSULATION

2.06 COMPOSITE MATERIAL TRIM FOR OPENINGS

SPECIFIER NOTE: COORDINATE THE FOLLOWING PARAGRAPH FOR PROJECTS WITH PANEL INSULATION, AND OMIT FOR USE WITH SPF AND MINERAL FIBER TYPE INSULATION.

- A. Composite Trim ; Provide composite trim at rough openings to properly transition CI system.
 1. Use trim angles and accessories sized to enclose CI system to provide thermally broken transition from opaque wall assemblies.
 2. Use sealant and tapes as required to transition vapor barrier from substrate onto trim.
 3. Trim to provide 90 degree transition of continuous insulated substrate for vapor barrier and exterior flashings.
 4. Trim to be covered by exterior panel construction and flashings.

5. Tensile Stress: Provide engineered lengthwise and crosswise tensile stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D638.
 - a. Minimum crosswise and longitudinal: 33,000 ksi.
6. Compressive Stress: Provide engineered lengthwise and crosswise compressive stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D695.
 - a. Minimum: 22,000 psi.
7. Flexural Stress: Provide engineered lengthwise and crosswise flexural stress in compliance with performance loading criteria and specified safety factors, in accordance with ASTM D790.
 - a. Minimum: 30,000 psi.
8. Modulus of Elasticity: Engineered to meet performance loading criteria and specified safety factors.
 - a. Minimum: 2,500,000 psi.
9. Surface Burning Characteristics:
 - a. Flame Spread Index (FSI): 25 or less, when tested in accordance with ASTM E84.
 - b. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
10. Comply with fire-resistance requirements, as indicated on drawings, and as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
11. Water Absorption: Less than 0.46 percent by weight, within 24 hours, tested in accordance with ASTM D570.
12. Acceptable Products:
 - a. SMARTci Trim
13. Alternative:
 - a. Performance CI system utilizing metal trim to provide spray foam insulation at a depth of 6" extending 32" around openings to reduce thermal transfer at wall transitions.

2.07 CONTINUOUS INSULATION SYSTEM ASSEMBLY

- A. Assemble CI with CFS system using manufacturer's standard procedures and processes identical to tested units and as necessary to comply with performance requirements indicated.
 1. Comply with CFS system and dimensional and structural requirements as indicated on drawings.
 2. Erect CFS system in established sequence in accordance with manufacturer's standard installation procedures.
 3. CFS and CI panels shall create an air/water/vapor barrier system compliant with requirements for project.
 4. Provide spray foam sealant on backside of cantilevered fasteners that completely puncture insulation layer.

2.08 ACCESSORIES

- A. Provide accessories necessary for complete CFS system including metal closure trim, transition angle, strapping, tie-in brackets, or ____ and similar items.
- B. Fasteners: Corrosion-resistant, self-tapping and self-drilling screws, bolts, nuts, and other fasteners as recommended by CFS system manufacturer for project application.
 1. Cladding to CFS System: Use standard self-tapping metal screws.
 2. CFS System to Concrete/CMU: Use standard masonry or concrete screw anchors in predrilled hole.
 3. DO NOT USE powder, air, or gas actuated fasteners or actuated fastener tools. DO NOT USE impact wrenches when fastening to or from the CFS.

- C. Tape: Pressure sensitive adhesive coated polypropylene woven fabric. Must be mold, water, tear and UV resistant. Must be applicable in a wide temperature range (-20 degrees F).
- D. Sealants: Provide sealants as recommended by CFS manufacturer for openings within CFS system and perimeter conditions.
 - 1. Refer to Section 079200 - JOINT SEALANTS for sealant information.
- E. Closure and Transition Accessories: Use metal or FRP angles and flat stock per standard system details.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas of this work, and project conditions with installer present for compliance with requirements for installation tolerances, substrates, CFS system conditions, and other conditions affecting performance of this Work.
- B. Examine structural wall framing to ensure that angles, channels, studs, and other structural support members have been installed within alignment tolerances required by CFS system manufacturer.
- C. Examine rough-in for components and systems penetrating CFS system to coordinate actual locations of penetrations relative to CFS systems joint locations prior to installation.
- D. Verify that mechanical and electrical services for exterior walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.
- E. Proceed with installation only after wall substrate surfaces have been properly prepared and unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by CFS manufacturer for achieving best result for substrate under project conditions.
- C. Prepare sub-framing, base angles, sills, furring, and other CFS system members and provide anchorage in accordance with ASTM C754 for substrate type and wall cladding type in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install CFS system in accordance with manufacturer's installation instructions.
- B. Install CFS system to meet requirements of ASCE Structural Plastics Design Manual.
- C. Install system to fill-in exterior spaces without gaps or voids, and do not compress insulation panels.
- D. Trim insulation neatly to fit spaces and insulate miscellaneous gaps and voids.

- E. Fit insulation tight in spaces and tight to exterior side of Mechanical/Electrical services within plane of insulation.
- F. Exposed insulation must be protected from open flame.
- G. Exterior wall insulation is not intended to be left exposed for periods of time in excess of 60 days without adequate protection.
 - 1. When extended exposure is anticipated, protect exposed insulation surfaces including corners, window and door openings with a compatible waterproof tape.
- H. Install CFS system in compliance with system orientation, sizes, and locations as indicated on drawings.

3.04 TOLERANCES

- A. Shim and align CFS system within installed tolerances of 1/4 inch in 20 feet, non-cumulative, level, plumb, and on location lines as indicated.

3.05 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.
- B. Ensure that insulation panels are not exposed to moisture.
 - 1. Remove wet insulation panels or allow them to completely dry prior to installation of CFS system.
- C. Replace damaged insulation prior to Date of Substantial Completion.