

SECTION 07 42 10
CLADDING SUPPORT SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Thermally Isolated Cladding Support Systems for Exterior Cladding.

1.2 RELATED SECTIONS

- A. Section 03 3000 – Cast-in-Place Concrete: Concrete wall substrate
- B. Section 04 2000 – Unit Masonry: Concrete masonry unit (CMU) wall substrate
- C. Section 05 4000 – Cold-Formed Metal Framing: Metal stud substrate support framing
- D. Section 06 1000 – Rough Carpentry: Exterior sheathing and wood stud substrate support framing
- E. Section 07 2500 – Weather Barriers: Air, water, vapor barrier at exterior wall
- F. Section 07 4200 – Wall Panels: Wall cladding system
- G. Section 07 9200 – Joint Sealants: Perimeter sealant
- H. Section 09 2116 – Gypsum Board Assemblies: Exterior sheathing

1.3 REFERENCES

- A. ASCE American Society of Civil Engineers (www.asce.org)
 - 1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2016 with Supplements and Errata
 - 2. ASCE – Structural Plastics Design Manual
- B. ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers (www.ashrae.org)
 - 1. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings; 2019
 - 2. ASHRAE 189.1 – Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings; 2017
- C. ASTM International (American Society for Testing and Materials; www.astm.org)
 - 1. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2015
 - 2. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013
 - 3. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014
 - 4. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015
 - 5. ASTM C1177/C1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013
 - 6. ASTM C1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus; 2011
 - 7. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010e1
 - 8. ASTM D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between minus 30 degrees C and 30 degrees C with a Vitreous Silica Dilatometer; 2008e1
 - 9. ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics; 2015
 - 10. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2010

11. ASTM D792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement; 2013
 12. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2013a
 13. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012
 14. ASTM D4385 - Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products; 2013
 15. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a
- D. IBC – International Building Code (International Code Council); 2018
- E. IECC – International Energy Conservation Code; 2018
- F. IgCC – International Green Construction Code; 2018
- G. NFPA – National Fire Protection Association (www.nfpa.org)
1. NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2015

1.4 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. Review and finalize construction schedule.
 2. Verify availability of materials, installer's personnel, equipment, and facilities needed to maintain schedule.
 3. Review means and methods related to installation, including manufacturer's written instructions.
 4. Examine support conditions for compliance with requirements, including alignment and attachment to structural support system.
 5. Review flashings, wall cladding details, wall penetrations, drainage plane, openings, and condition of other construction that affects this Work.
 6. Review temporary protection requirements for during and after installation of this Work.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
1. This Section includes items identified by the Architect or Engineer of Record as Delegated Design or Deferred Submittal.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings: Submit complete shop drawings for approval prior to fabrication, including elevations, and sections of each condition. Such drawings shall also include metal thickness, finish, methods of installation, anchorage and expansion joints, width, bow, camber, and squareness tolerances necessary to accommodate thermal and moisture related movement.
- D. Contractor Delegated Design: Submit calculations and drawings stamped and sealed by an Engineer registered in the state which the project is located.
- E. Structural Calculations including dead loads, wind loads, seismic loads, snow, and ice loads as applicable.

- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- G. Manufacturer's Certificates: Provide manufacturer's certificate certifying that products of this section meet or exceed specified requirements.
- H. Closeout Submittals: Provide manufacturer's operating and maintenance instructions that include recommendations for periodic checking and adjustment and periodic cleaning and maintenance of all components.
- I. Evaluation Service Reports: Affirm compliance with specified requirements.
- J. Installer's Qualification Statement.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with at least five years of documented experience.
 - 1. Engineering Review: Manufacturer to provide testing and engineering calculations for proper product design.
 - 2. Code Conformance: FRP sub-framing system has been evaluated and found satisfactory for compliance with 2018 International Building Code.
- B. Installer: Company specializing in performing work of this section and the following:
 - 1. Install system in strict compliance with manufacturer's installation instructions.
 - 2. Have not less than three years of documented experience.
 - 3. Factory trained and approved by FRP sub-framing system manufacturer.
- C. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a licensed Structural Engineer experienced in design for this type of Work and licensed in State that Project is located. Engineering information provided shall be signed and verified by licensed Structural Engineer.
- D. Environmental: FRP sub-framing system to follow the below guidelines:
 - 1. The components shall be certified to be halogen/bromine free.
 - 2. FRP sub-framing composite member shall utilize a minimum of 25% post-consumer recycled material content.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 1. Protect products against transportation damage.
 - 2. Provide markings to identify components consistently with Drawings.
 - 3. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting and surface damage.
- B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - 1. Store in well ventilated space out of direct sunlight.
 - 2. Protect from moisture and condensation with tarp or other suitable weather-tight covering installed to provide ventilation.
 - 3. Store at a slope to ensure positive drainage of any accumulated water.
 - 4. Do not store in any enclosed space where ambient temperature can exceed 120 degrees F (48 degrees C).
 - 5. Avoid contact with any other materials that might cause staining, denting, or other surface damage.

1.8 PROJECT 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.

1.9 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. FRP Sub-Framing 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

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: exoGIRT by exoSURFACES, which is located at: 534 Braddock Ave. Turtle Creek, PA 15145; (816) 489-5711; Contact: Michael Allen Email: mallen@exo-surfaces.com; Web: <https://www.exo-surfaces.com>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Components:
 - 1. Design and size components to withstand loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code.
 - 2. Components to be designed and constructed to resist seismic and gravity loads in accordance with applicable codes.
 - 3. Design for thermal and moisture movement of cladding in accordance with applicable codes. Design so that local ambient temperature fluctuations do not result in evidence of permanent deformations of assemblies or components and prevent overstressing of the support structure.
 - 4. Submit the following tests:
 - a. Fastener pullout – ASTM D7332/D7332M
 - b. Tensile Strength – ASTM D638
 - i. Crosswise (CW)
 - ii. Lengthwise (LW)
 - c. Modulus of Elasticity – ASTM D638
 - i. Crosswise (CW)
 - ii. Lengthwise (LW)
 - d. Engineering calculations that include the following:
 - i. Point load calculations of the cladding attachment to the sub-framing
 - 1. Uniform loading not allowed.
 - ii. Include Live and Dead Load simultaneously modeled.
 - iii. Deflection meeting specified criteria.
- B. Cladding Wall Assembly: Design systems and components to be in accordance with applicable codes and adequate to support the following:
 - 1. Dead loads, wind loads, seismic loads, and snow and ice loads as applicable:
 - a. As shown on the Structural Drawings for the Project.
- C. Exterior Wall Assembly/Attachment System:
 - 1. Frequency and spacing of exoGIRT as shown on the approved project specific shop drawings

- and in accordance with applicable codes and these specifications.
2. Finishing Accessories to be used as shown on approved project specific shop drawings and in accordance with applicable codes and these specifications.
- D. Thermal Performance:
1. Complete system to meet U-Value and R-Value requirements of the project.
 2. Cladding support products to meet thermal target requirements as required for Project.
- E. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within cladding support system.
- F. Ventilation: Vent openings at bottom and top of cladding and support system.
- G. Insect Screens: Provide insect screening at locations noted in Drawings.

2.3 THERMALLY ISOLATED ATTACHMENT SYSTEM

- A. Basis of Design: exoGIRT as manufactured by exoSURFACES.
- B. exoGIRT
1. Material: Fiberglass Reinforced Polymer.
 2. Finish: Black.
 3. Length: 128 inches (3251 mm).
- C. Profiles: Engineered Z-girt with 1-3/4 inch (45 mm) wide exterior face designed to accommodate thickness of insulation and provide adequate exterior panel fastening area.
1. Depth: 1.5 inches (38 mm).
 2. Depth: 2 inches (51 mm).
 3. Depth: 2.5 inches (64 mm).
 4. Depth: 3 inches (76 mm).
 5. Depth: 3.5 inches (89 mm).
 6. Depth: 4 inches (102 mm).
 7. Depth: 4.5 inches (114 mm).
 8. Depth: 5 inches (127 mm).
 9. Depth: 5.5 inches (140 mm).
 10. Depth: 6 inches (152 mm).
- D. Fasteners: Verify type of screws with engineer for meeting or exceeding project specific wind loads, gravity loads, seismic loads, and code requirements for each wall type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that building framing members are ready to receive metal cladding support.
- B. Do not begin installation until substrates have been properly constructed and prepared.
- C. Proceed with installation only after wall substrate surfaces have been properly prepared and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install per manufacturer's written instructions.
 - 1. exoGIRT Horizontal or Vertical Installation:
 - a. Install plumb and level to a uniform plane.
 - b. Fasten exoGIRT over the substrate directly to the steel stud, concrete, or wood as applicable, at intervals indicated in the details for each specific project.
 - 2. Ensure assembly is plumb, level, and free of warp or twist; maintain dimensional tolerances
- B. Insulation:
 - 1. Install insulation between exoGIRT vertical legs and in accordance with insulation manufacturer's instructions.
 - 2. After placing the insulation material, use insulation clips for fixing the insulation as required.
 - 3. exoGIRT accommodates all mineral wool insulation or rigid foam board insulation.
- C. Proprietary Panel Guidance, Secondary Structural Supports:
 - 1. Install girts, angles, and other secondary structural panel support members and anchorage according to the Light Gage Structural Institute's guide specifications and Related Roof and Wall Panel Sections.
- D. Install sufficient anchorage devices to fasten system securely and rigidly to building in accordance with drawings.
- E. Spacing for Thermal Expansion/Contraction at 128 inch (3251 mm) Length: 3/16 inch (5 mm).
- F. Built-In Work:
 - 1. As work progresses, build in anchor bolts, flashing and other items supplied by other trades.
 - 2. Install items plumb and true in accordance with manufacturer's instructions.
 - 3. Do not build in organic materials subject to rot or deterioration.

3.4 TOLERANCES

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

3.5 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

3.6 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturers recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION