



SECTION 07 42 63
PREFABRICATED WALL PANEL ASSEMBLIES

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Provide ACCEL-E® steel thermal-efficient-panel wall system.

1.2 RELATED SECTIONS

- A. Section 05400 - Cold Formed Metal Framing.
- B. Section 07200 - Thermal Protection.
- C. Section 09110 - Non-Structural Metal Framing.
- D. Section 09200 - Plaster and Gypsum Board.

1.3 REFERENCES

- A. American Institute of Steel Construction (A.I.S.C.) "Manual of Steel Construction," 13th edition.
- B. American Iron and Steel Institute (A.I.S.I.) "North American Specification for the Design of Cold Formed Steel Structural Members," 2001 with 2004 amendments.
- C. American National Standards Institute (A.N.S.I.) A.N.S.I. / AF & PA NDS - 2005 "National Design Specification for Wood Construction."
- D. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) - ASHRAE 90.1 2007 Energy Standard for Buildings Except Low-Rise Residential Buildings
- E. ASTM International (ASTM):
 - 1. ASTM A 370: Standard Test Methods and Definitions for Mechanical Testing of Steel Products.
 - 2. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 3. ASTM C 1363: Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
 - 4. ASTM D 3574: Standard Test Methods for Flexible Cellular Materials Slab, Bonded, and Molded Urethane Foams.
 - 5. ASTM D 1929: Standard Test Method for Determining Ignition Temperature of Plastics
 - 6. ASTM E 72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
 - 7. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building

- Materials.
- 8. ASTM E 90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- 9. ASTM E96/E96M-05 Standard Test Methods for Water Vapor Transmission of Materials
- 10. ASTM E 119: Standard Test Methods for Fire Tests of Building Construction and Materials.
- 11. ASTM E 283: Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
- 12. ASTM E 330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- 13. ASTM E 413: Classification for Rating Sound Insulation.
- 14. ASTM E 1332: Standard Classification for Determination of Outdoor-Indoor Transmission Class.
- 15. ASTM E 2235 Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods
- F. American Welding Society (A.W.S.) D.I.3, 1998 "Structural Welding Code-Sheet Steel."
- G. Code Compliance Research Report (CCRR-0121) from Architectural Testing Inc.
- H. Florida Product Approval No. 13722: 13722.1 and 13722.2-Approved for use outside HVHZ and 13722.3-Approved for use in HVHZ and Impact Resistant
 - 1. TAS 201-94 - Impact Test Procedures
 - 2. TAS 202-94 - Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
 - 3. TAS 203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading
- I. Southwest Research Institute (SwRI) Listing No. 08179-01-01, No. 08179-01-02, No. 08179-01-03, No. 08179-01-04
- J. National Fire Protection Association (NFPA):
 - 1. NFPA 259: Standard Test Method for Potential Heat of Building Materials.
 - 2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

1.4 PERFORMANCE REQUIREMENTS

- A. System Performance Requirements: Comply with the requirements of the Standards and Reports listed in Paragraph 1.3 of this Section.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [Product Data]: Manufacturer's data sheets on each product to be used.
- C. Structural Calculations: Submit structural calculations prepared by manufacturer for approval. Submittal shall be sealed by a professional engineer registered in the state of the project.
 - 1. Description of design criteria.
 - 2. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application.
 - 3. Selection of framing components, accessories and welded connection requirements.
 - 4. Verification of attachments to structure and adjacent framing components.

5. Engineer shall have a minimum of 5 years experience with projects of similar scope.
- D. Shop Drawings:
1. Submit shop drawings prepared by the manufacturer showing plans, sections, elevations, layouts, profiles and product component locations, including anchorage, bracing, fasteners, accessories and finishes.
 2. Show connection details with screw types and locations, weld lengths and locations, and other fastener requirements.
 3. Where prefabricated or pre-finished panels are to be provided, provided drawings depicting panel configurations, dimensions and locations

1.6 QUALITY ASSURANCE

- A. Provide effective full-time quality control over all job-site fabrication and erection activities. Responsibility for quality control shall remain with the Contractor.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect tongue and groove panel edges from damage.
- B. Place hands close to metal stud when carrying panel in a flat position. Grasp metal studs when carrying vertically.
- C. When stacking panels, alternate each panel (face up then face down) so metal studs interlock.
- D. Stage panels close to the area where they will be installed. Store panels on a solid level surface with blocking under first panel spaced approximately one foot in from each end and then every four feet for support. Cover panels to keep them free of dirt and debris. Secure panels to prevent them from becoming airborne in windy conditions.
- E. Wear gloves when handling panels as recommended by the manufacturer.

1.8 WARRANTY

- A. Manufacturer warrants that its products shall be free from defects in materials and workmanship at the time of shipment and are manufactured in accordance with company standards.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: SYNTHEON Inc., which is located at: 1555 Coraopolis Heights Rd. ; Moon Township, PA 15108; Toll Free Tel: 888-922-2353; Fax: 412-490-4325; Email: [request info \(info@ACCEL-E.com\)](mailto:info@ACCEL-E.com); Web: www.ACCEL-E.com
- B. Substitutions: Not permitted.

2.2 EXTERIOR WALL ASSEMBLY SYSTEM

- A. Product Description: ACCEL-E Steel thermal-efficient-panel (STEP) wall system for structural and curtain wall applications that combine framing, cavity insulation and continuous rigid foam sheathing into one component.
- B. Composition and Materials, the ACCEL-E Wall Panel: 4 foot (1219 mm) wide expandable polystyrene (EPS) panel with two proprietary designed cold formed steel studs. Panels available in custom heights limited only by the mode of transport required for delivery. The

studs shall be formed in "S" type cross-section comprised of three 1-5/8 inch (41.3 mm) flanges and two independent webs. EPS is fused through the outer web section to maximize structural and thermal performance. The inner web section, devoid of EPS, provides open cavity to allow use of additional light gauge metal or structural steel framing members and enables use of industry standard electrical and mechanical construction practices. Panels interlock at each side with a tongue and groove configuration molded into EPS. No additional joint treatment required. All steel used in the ACCEL-E STEP wall system is galvanized to building industry standards to prevent rust.

C. Panel Dimensions:

1. Overall Wall Panel Thickness: 5-1/2 inch (139.7 mm).
2. Overall Wall Panel Thickness: 6 inch (152.4)
3. Overall Wall Panel Thickness: 8 inch (203.2 mm).
4. Overall Wall Panel Width: 4 feet (1219.2 mm).
5. Panel Height: Limited only by mode of transportation for delivery.
6. EPS Thickness: 2-3/4 inch (69.9 mm) for 5-1/2 inch panel.
7. EPS Thickness: 3-1/4 inch (82.6) for 6 inch panel.
8. EPS Thickness: 4-3/8 inch (111 mm) for 8 inch panel.
9. Open Cavity Depth: 2-3/4 inch (69.9 mm) for 5-1/2 inch and 6 inch panels.
10. Open Cavity Depth: 3-5/8 inch (92 mm) for 8 inch panel.
11. Mechanical Knockout: 3/4 inch by 4 inch (19 mm by 101.6 mm) for 5-1/2 inch and 8 inch 38 panels (gauge=.038). 8 inch 54 (gauge=.054) 1-1/2 inch by 4 inch (38.1 by 101.6)

D. Panel Physical Properties:

1. Steel Stud Properties (Nominal):
 - a. Stud Base Metal Thickness: 0.038 inch (0.965 mm). and for 6" and 8" also 0.054 (1.37 mm)
 - b. Minimum Galvanized Coating per ASTM A1003: G60.
 - c. Minimum Yield Strength: 40 ksi. for 0.038 and 55 for 0.054
 - d. Flange Width (All Panels): 1-5/8 inch (41.3 mm).
2. EPS Properties (Nominal):
 - a. Density: 1.5 pcf.
 - b. R Value per Inch Thickness: 4.3.
 - c. Color: Gray.
3. Panel Properties (8 inch (203 mm) panel with 2 studs):
 - a. Sound Transmission Coefficient (STC) Assembly Ratings per ASTM E90: 45-57. (Note: 8" 54 TBD)
 - b. Outside Inside Transmission Class OITC Assembly Ratings per ASTM E90: 31/36/40. (Note: 8" 54 TBD)
 - c. Rate of Air Leakage, ASTM E283: Less than 0.01 cfm/ft².
 - d. Water Vapor Transmission, ASTM E96 / E96M-05 (20.8 degrees C, 52.2 percent R.H.): 0.632 perms
 - e. Smoke Developed Index: Less than 450.
 - f. Flame Spread Index: Less than 25.
4. Structural Properties (8 inch (203 mm) 38 panel with 2 studs):
 - a. Allowable Bending Moment (SF=1.95) ASTM E 72: 42,780 in-lb.
 - b. Allowable Axial Load (8 foot height, SF=1.95) ASTM E 72: 8,502 lb.
 - c. Allowable End Reaction (SF=1.95) ASTM E 72: 722 lb.
 - d. Ultimate Racking Shear (7/16 inch OSB plus 1/2 inch Gypsum) ASTM E72: 751 lb/ft.
 - e. Ultimate Racking Shear (4 inch 16 gage 50ksi X-Brace) ASTM E72: 4,304 lb/brace.
5. Structural Properties (8 inch (203 mm) 54 panel with 2 studs):
 - a. Allowable Bending Moment (SF=1.95) ASTM E 72: 59,820 in-lb.
 - b. Allowable Axial Load (8 foot height, SF=1.95) ASTM E 72: 9,178 lb.

- c. Allowable End Reaction (SF=1.95) ASTM E 72: 1,400 lb.
 - d. Ultimate Racking Shear (6 inch 12 gage 50ksi X-Brace) ASTM E72: 4,602 lb/brace
6. Panel Properties (6 inch (152.4 mm) 54 panel with 2 studs):
 - a. Rate of Air Leakage, ASTM E283: Less than 0.01 cfm/ft².
 - b. Smoke Developed Index: Less than 450.
 - c. Flame Spread Index: Less than 25.
 7. Structural Properties (6 inch (152.4 mm) 54 panel with 2 studs):
 - a. Allowable Bending Moment (SF=1.95) ASTM E 72: 29,040 in-lb.
 - b. Allowable Axial Load (8 foot height, SF=1.95) ASTM E 72: 12,572 lb.
 - c. Allowable End Reaction (SF=1.95) ASTM E 72: 1434 lb.
 - d. Ultimate Racking Shear (7/16 inch OSB plus 1/2 inch Gypsum) ASTM E72: 679 lb/ft.
 - e. Racking Shear (4 inch 16 gage 50ksi X-Brace) ASTM E72: 3,776 lb/brace.
 8. Panel Properties (5-1/2 inch (140 mm) panel with 2 studs):
 - a. Sound Transmission Coefficient (STC) Assembly Ratings per ASTM E90: 41/51/55.
 - b. Outside Inside Transmission Class (OITC) Assembly Ratings per ASTM E90: 30/34/37.
 - c. Rate of Air Leakage, ASTM E283: Less than 0.01 cfm/ft².
 - d. Water Vapor Transmission, ASTM E96 / E96M-05 (20.8 degrees C, 52.2 percent R.H.): 0.796 perms
 - e. Smoke Developed Index: Less than 450.
 - f. Flame Spread Index: Less than 25.
 9. Structural Properties (5-1/2 inch (140 mm) panel with 2 studs):
 - a. Allowable Bending Moment (SF=1.95) ASTM E 72: 25,750 in-lb.
 - b. Allowable Axial Load (8 foot height, SF=1.95) ASTM E 72: 6,836 lb.
 - c. Allowable End Reaction (SF=1.95) ASTM E 72: 706 lb.
 - d. Ultimate Racking Shear (7/16 inch OSB plus 1/2 inch Gypsum) ASTM E72: 679 lb/ft.
 - e. Racking Shear (4 inch 16 gage 50ksi X-Brace) ASTM E72: 3,776 lb/brace.
- E. Environmental Considerations:
1. The steel studs contain an average of 54 percent recycled steel with a minimum of 25 percent. The steel studs and expanded polystyrene are 100 percent recyclable. ACCEL-E may contribute toward LEED® project certification under MR credit 2 and 4, EA PRQ and EA Credit 1, and IEQ Credit 7. ACCEL-E is GREENGUARD Indoor Air Quality Certified and GREENGUARD Children & Schools Certified. Exceeds IECC-2009 International Energy Conservation Code and ASHRAE 90.1.

PART 3 EXECUTION

3.1 EXAMINATION

- A. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- B. Verify that related work affecting dimensions has been constructed within acceptable dimensional tolerances.
- C. Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where the installation may properly proceed in strict accordance with the shop drawings.

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. General: Install in accordance with manufacturer's instructions, including but not limited to project documents, manufacturer's engineered drawings and installation manual.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Replace or repair damaged products before Substantial Completion.

END OF SECTION