SECTION 07 44 50
FIBER-REINFORCED CEMENTITIOUS PANELS
SWISSPEARL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fiber-Reinforced Cementitious Panels mounted using the back ventilated rainscreen design principle.

B. Panel fasteners and accessories.

C. [Metal] [Wood] vertical panel supports and fasteners.

1.2 REFERENCES

A. ASTM International

1. ASTM A653/A653M; Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A792; Standard Specification for Steel Sheet, 55 percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
3. ASTM C120; Standard Test Methods of Flexure Testing of Slate (Breaking Load, Modulus of Rupture, Modulus of Elasticity.
4. ASTM C1185; Standard Test Methods for Sampling and Testing Non Asbestos Fiber Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
5. ASTM C1186; Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
6. ASTM E84; Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E228; Standard Test Method for Linear Thermal Expansion of Solid Materials with a Push Rod Dilatometer.
8. ASTM E330 Standard Test Method for Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
9. ASTM G155; Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

B. Florida Building Code

1. Test Application Standard (TAS) 203: Criteria for Testing Products subject to Cyclic Wind Pressure Loading

C. National Fire Protection Agency (NFPA)

1. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

D. National Lumber Grades Authority (NLGA)

E. Southern Pine Inspection Bureau (SPIB)

F. West Coast Lumber Inspection Bureau (WCLIB)

G. Western Wood Products Association (WWPA)

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, manufacturer's technical representative, panel installer, and contractors of related trades.

1.4 SUBMITTALS

A. Refer to Section [01 33 00 Submittal Procedures] [Insert section number and title].

B. Product Data: Submit manufacturer current technical literature for each type of panel and panel fastener.

C. Shop Drawings - Submit detailed drawings showing:

1. Location, layout and dimensions of panels
2. Locations of fasteners
3. Locations of panel fixed fastening points (only for metal sub frame)
4. Cladding details at top, bottom, corner, windows, doors, etc.

D. Samples:

1. Provide nominal 76 by 200 millimeter panel of each color indicated.
2. Provide sample of each type of panel fastener.

E. Delegated Design: Design cementitious panel assembly; submit comprehensive engineering analysis by a qualified professional engineer, using design requirements indicated.

F. ICC Evaluation report for installation on a rear ventilated open joint system.

G. Provide test reports indicating compliance with performance criteria.

H. Provide manufacturer's Design and Installation Manual.

I. Provide manufacturer's sample warranty.

J. Submit evidence of manufacturer's qualifications; provide examples of previous projects of similar type and exposure that have been in place for a minimum of 5 years.

K. Submittals:

1. Material and Resources (MR)

a. Product Certificates for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.

L. Closeout Submittals

1. Refer to Section [01 78 00 Closeout Submittals] [Insert section number and title].
2. Submit manufacturer's cleaning instructions for maintenance of panels.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum of twenty years experience in the production of fiber-reinforced cementitious panels.

B. Installer Qualifications: Acceptable to panel manufacturer's representative.

C. Mock-up:

1. Incorporate surrounding construction in mock-up, including wall assembly fasteners, flashing, and other related accessories all in accordance with manufacturer's Design and Installation Manual.

a. Mock-up size: [Insert size] [As indicated on drawings.]
b. Mock-up [may] [may not] remain as part of the work.

1.6 DELIVERY, STORAGE AND HANDLING

A. Refer to Section [01 60 00 Product Requirements] [Insert section number and title].

B. Storage and handling to comply with Design and Installation Manual.

1.7 WARRANTY

A. Refer to Section [01 78 36 Warranties] [Insert section number and title].

B. Manufacturer standard warranty against material failure for a period of ten (10) years from date of delivery.

C. Failures include, but are not limited to the following:

1. Structural failure: Cracking, rupture, warping, spalling, or peeling.
2. Surface failure: Efflorescence, fading, discoloration.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design: SWISSPEARL; www.swisspearl.com

1. [SWISSPEARL distributor: Innovative Architectural Products; tracy@iaproducts.net; 1.414.899.9983 phone]

B. Substitution Limitations

1. Submit written request for approval of substitutions to the Architect [a minimum of [14] [insert number of days] days prior to the date for receipt of bids] [a minimum of [60] [90] days after contract is signed]. Include the following information:

a. Name of the materials and description of the proposed substitute.
b. Drawings, cut sheets, performance and test data.
c. List of projects of similar scope and photographs of existing installations.
d. Test reports indicating compliance with the performance criteria.
e. Other information necessary for evaluation.

[OR]

C. Substitutions: Not Permitted.

2.2 PERFORMANCE CRITERIA

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 - Quality Requirements, to design the vertical panel supports to support the cementitious panels.

B. Provide panels and panel fasteners from a single source.

C. Provide panels and vertical panel supports capable of the following:

1. Wind Loads:

a. Field: [Insert loading pressure] pounds per square foot, positive and negative pressure.

b. Perimeter: [Insert loading pressure] pounds per square foot, positive and negative pressure.

2. Deflection Limits: Withstand deflection L/300, maximum.

D. Panel Performance:

1. Minimum strength and bending characteristics in accordance with ASTM C120 and ASTM C1185.

a. Modulus of rupture: 0.024 kilonewton per square millimeter (average cross/length)
b. Modulus of elasticity: 16 gigapascal per kilonewton per square millimeter

2. Density: 1.8 grams per cubic centimeter according to ASTM C1186.

3. Panel Weight: [3] [4.5] pounds per square foot
4. Moisture properties per ASTM C1185, by mass

a. Normal: 6 percent
b. Maximum: 20 percent

5. Water tightness per ASTM C1185: No visible droplets or surface wetting.
6. Fire resistance per ASTM E84 and NFPA 285:

a. Noncombustible
b. Flame spread index: 0
c. Smoke developed index: Less than or equal to 15
d. NFPA Class A.
e. No flaming after 30 seconds; weight loss less than or equal to 50 percent; final center temperature less than or equal to 30 deg. C.

7. Cyclic Wind Pressure Loading: Tested in accordance with Florida Building Code, TAS 203 and ASTM E330 for wind loading up to 63 pounds per square foot.
8. Temperature Range: Minus 40 degrees F to plus 176 degrees F
9. Frost Resistance per ASTM C1185: 2944psi
10. Coefficient of thermal expansion per ASTM E228: 10 by 10^{-6} m/m/deg K
11. Color Change in accordance with ASTM G155

a. 2000 Hours: Change in E less than or equal to 1.9
b. 5000 Hours: Change in E less than or equal to 3.6

12. Water tightness per ASTM C1185: No visible droplets or surface wetting.

2.3 MATERIALS

A. Panels made from

1. Portland cement, ground lime stone, additives

2. Polyvinyl alcohol fibers and cellulose fibers
3. Acrylic coating to panel face, rear side and edges

B. The following characteristics are not acceptable

1. Autoclaved products
2. Reinforcement with only cellulose fibers
3. Efflorescence

C. Fiber reinforced cementitious panels air cured for minimum of 4 weeks.

2.4 VERTICAL PANEL SUPPORTS

A. Metal vertical panel supports:

1. General:

a. Minimum 18 gauge, cold-formed metallic-coated steel sheet, [ASTM A653, G60 hot-dip galvanized] [ASTM A653, G90 hot-dip galvanized] [ASTM A792, AZ50 Galvalume / Zincalume].

[OR]

b. Minimum 2 millimeter extruded aluminum alloy AlMgSi, [mill finish] [black anodized].

[OR]

B. Wood vertical panel support battens:
1. General: Provide kiln-dry lumber with a maximum moisture content of 19 percent.
2. Species: [Southern Pine; SPIB] [Douglas fir-larch; WCLIB or WWPA] [Hem-fir (north); NLGA]
3. Grade: Select Structural No. 2
4. Size: batten sizes as per design and installation manual
   a. Vertical panel support battens: 120 by 27 millimeter
   b. Intermediate battens: 60 by 27 millimeter intermediate battens.

5. EPDM Backing Strips: Manufacturer's backing strip, color black.

C. Shims: 50 year durable material compatible with vertical panel supports.

2.5 FABRICATION

A. Fabricate panels at the factory to greatest extent possible

B. Field dimension: Field verify overall dimensions prior to panel fabrication

C. Dimensional tolerances

1. Overall panel dimensions within 1 millimeter of panel width and height

2. Squareness within 0.5 millimeter per meter

D. Labeling. Apply identification label to back side of each fabricated panel

E. [Factory] [Shop] cut cementitious panels

1. Panel thickness: [8] [12] millimeters.

2. Panel size: [2500 by 1220 millimeters] [3040 by 1220 millimeters]

3. Panel Fastening: Exposed
   a. Fasteners: [Rivets - 4 by 18 millimeters with 15 millimeter head] [Screws - 4.8 by 38 millimeter with 12 millimeter head]
   b. Fastener Finish: [Panel color] [Blank].

[OR]

4. Panel Fastening: Concealed
   a. SIGMA [8] [12] concealed fastening system.

2.6 FINISH

A. Finish: [Carat SL] [HR] [Reflex] [Xpressiv] [Custom Shades] [Nobilis] [Planea]

1. Color: [Selected from current SWISSPEARL color chart] [Custom color as selected by Architect] [Insert Color]

2.7 ACCESSORIES

A. Horizontal joint flashings: Manufacturer's standard [aluminum] [stainless steel] flashings, color [black] [to match panel].

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of rear ventilated rain screen cladding.

B. Prior to panel installation verify vertical panel support compliance with Design and Installation Manual.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application

B. Coordinate panel installation with rain drainage work, flashing, trim, soffit, roofing, parapet, wall and other adjoining work to provide a leak-proof, secure and non corrosive installation

C. Allow for scaffolding or mobile access to all parts of cladding

3.3 INSTALLATION

A. Install panels in accordance with manufacturer's Design and Installation Manual and recommendations.

B. Shim and align vertical panel supports. Install shims between substrate and panel supports; no shims between panel and panel supports.

C. Install shims to the following tolerances:

1. 1/4 inch in 20 feet on level, plumb and panel joint lines
2. Joint widths – plus or minus1/16 inch of indicated width.
3. Sub frame profile face alignment maximum L/300 between supports.

D. Attach EPDM backing strips to wooden battens.

3.4 FIELD QUALITY CONTROL

A. Perform daily inspections of panel installation to maintain and confirm that tolerances are being met and that panel manufacturer's design and installation manual is being complied with.

B. Owner engaged third party inspection agency to verify that installed panels meet performance requirements and tolerances.

3.5 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed or otherwise defective panels and replace with new panels. Damage requiring replacement includes, but is not limited to, chips and scratches to panel surfaces.

B. Clean finished surfaces according to manufacturer's instructions.

3.6 PROTECTION

A. Protect installed panel from damage.

END OF SECTION

DISCLAIMER:

This Guide Specification provided by SWISSPEARL has been written as an aid to the professionally qualified Specifier and Design Professional. The use of this Guide Specification requires the sole professional judgment and expertise of the qualified Design Professional to adapt the information to the specific needs for the Building Owner and the Project, to coordinate with their Construction Document Process, and to meet all the applicable building codes, regulations and laws. SWISSPEARL EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OF THIS PRODUCT FOR THE PROJECT.