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ThermalShell Modular Insulated Pre-Cast Panels

Construction Specification Institute Section 034500 3 Part Guide for Specification

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the performance criteria, materials, production, and erection of insulated architectural precast concrete for the entire project. The work performed under this section includes all labor, material, equipment, related services, and supervision required for the manufacture and erection of the insulated architectural precast concrete work shown on the contract documents.
- B. This Section includes the following:
 - 1. Insulated, architectural precast concrete cladding units
- C. Related Sections include the following:
 - 1. Division 5, Section "Structural Steel"
 - 2. Division 7, Section "Sheet Metal Flashing and Trim"
 - 3. Division 7, Section "Joint Sealants"

1.3 DEFINITIONS

- A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, pre-approved by Architect.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide architectural precast concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:
1. Dead Loads: 35 lbs/square foot
 2. Live Loads: 15 lbs/square foot
 3. Uplift: 5 lbs/square foot
 4. Wind Loads: 80 Mph
 5. Seismic Loads: <Insert Applicable Loads>
 6. Project Specific Loads: <Insert Applicable Loads>
 7. Design framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live load deflection, shrinkage and creep of primary building structure, and other building movements as follows for upward and downward movement of one half (1/2) inch.

1.5 SUBMITTALS

- B. Product Data: Submit producer's or manufacturers specifications and installation instructions for following products.
- C. Shop Drawings: Detail fabrication of architectural insulated precast concrete units. Indicate member locations, plans, elevations, dimensions, shapes and cross sections. Indicate aesthetic intent including joints, reveals, and extent and location of each surface finish. Indicate details at building corners.
1. Design Modifications: If design modifications are necessary to meet the performance requirements and field conditions, submit design calculations and drawings. Do not adversely affect the appearance, durability or strength of units when modifying details or materials and maintain the general design concept.
- D. Samples: Design reference materials for initial verification of design intent, approximately 12 by 12 by 2 inches (300 by 300 by 50 mm), representative of finishes, color, and textures of exposed surfaces of architectural precast concrete units.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:

1. Concrete materials
2. Reinforcing materials
3. Admixtures
4. Insulation
5. Light gauge steel

1.6 QUALITY ASSURANCE

A. Erector Qualification: An Erector with a minimum of 2 years of experience who has completed architectural precast concrete work similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with record of successful in-service performance and approval by ThermalShell manufacturer.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store units with adequate support, bracing, and protection units to prevent contact with soil, staining, and to prevent cracks, distortion, warping or other physical damage.
- B. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses with would cause cracking or damage. Lift and support units only at designated points shown on the Shop Drawings.
- C. Deliver all insulated precast units to the project site in such quantities and at such times to assure compliance with the agreed project schedule and proper setting sequence so as to limit unloading units temporarily on the ground.
- D. Store packaging materials for reuse on the project site in a manner that will prevent damage, staining, and dispersion by wind. Packaging materials not for reuse should be disposed of in an appropriate waste or recycling container.

1.8 PRODUCT WARRENTY

A. Manufacturer's warranty: Submit, for Owner's acceptance, ThermalShell's standard warranty document executed by authorized company official. ThermalShell's warranty is in addition to and not intended to limit other rights Owner may have under the Contract Conditions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements indicated herein, provide products of the following manufacturers:

1. ThermalShell Technologies, Inc.
421 N. California St., Building #2
Sycamore, IL
Phone: (815) 899 – 0224
Fax: (815) 899 – 0226
E-mail: info@thermalshell.com
URL: www.thermalshell.com

2.2 MODULAR SIZES AND WEIGHTS

A. Concrete Wall Panels:

1. Width: 6'-0"
2. Height: [Spec to Requirements, Maximum 48'-0"]
3. Thickness: 8" (R-30)
4. Weight: 22.5 lbs. per square foot

B. Steel Wall and Roof Panels

1. Width: 6'-0"
2. Height: [Spec to Requirements, Maximum 48'-0"]
3. Thickness: 6" (R-26)
4. Weight: 2.5 lbs. per square foot

2.3 MATERIALS

A. Concrete:

1. Refractory Calcium Aluminite Cement
2. 6% Air Entrainment
3. Maximum Water-Cementitious Materials Ratio: 0.4
4. Proprietary Setting Accelerant Admixture
5. Additional Nitrates to Protect Reinforcement from corrosion
6. ASTM C1116 multifilament nylon reinforcement fibers
7. Release Strength (minimum): 3000 psi
8. Final Compressive Strength (28 day): 5500 psi
9. Use of calcium chloride or chloride ions is not permitted.

B. Concrete Reinforcement:

1. ASTM A 497 10 gauge wire mesh in flat sheets, placed no closer than $\frac{3}{4}$ " from surface of concrete
2. ASTM A 615/A 615M #5 rebar fabricated and place as dictated by shop drawings

C. Polyurethane: Insulation value 6.5 R per inch, Minimum 92% closed cell count, Maximum 0.03 lb/sq.ft. Water Absorption.

1. Use UL-94 rated HF-1 Polyurethane products
2. [Use ASTM E-84, Flame Spread: 50, Smoke Developed 350 rated Polyurethane products]

D. Steel: 26 gauge thick, Grade E Full Hard 100,000 psi tensile strength, Form rolled to "R" panel configuration with 1 $\frac{1}{4}$ " standing ribs at 12" on center.

1. Steel Paint: Siliconized Polyester (1 mil) with the following properties: ASTM 3363 rated F-2H hardness; ASTM 523 60 degree gloss; ASTM 2794 impact resistance; ASTM B117 rate 2000 hours of salt spary; ASTM D4585 rate 2200 hours of condensing; ASTM D2247 rated 2000 hours humidity; ASTM D870 rated 1000 hours water immersion; ASTM G87 passed 33 cycles acid rain; ASTM D968 rate 40 liters/mil abrasion resistance.

2.4 FINISHES

A. Standard interior surface: 26 gauge steel paneling, roll formed to "R" panel configuration and tolerances. Smooth Texture. Painted glossy white. [Additional colors available upon request and subject to availability]

[For Steel Wall Panels, Remove Following Paragraph If Unnecessary]

B. Standard exterior steel surface: 26 gauge steel paneling, roll formed to "R" panel configuration and tolerances. Smooth Texture. Painted glossy white. [Additional colors available upon request and subject to availability]

C. Available exterior concrete surfaces: [Choose Finishes appropriate for Project]

1. Smooth Finish: Provide surfaces free of excessive air voids, sand streaks, and honeycombs.
2. Standard Pattern Cast: Use standard plastic concrete molds available from Fitzgerald Formliners or similar manufacturers. [Provide pattern number from manufacturer's catalogue.]
3. Custom Pattern Cast: Subject to availability of suitable mold, use provided artwork to create a non-standard pattern mold to cast into the concrete surface.

4. Brick Tile: Use Thin or Half Brick units with appropriate forms and accessories available from Fitzgerald Formlines or similar manufacturer. [Provide brick sizes and colors from manufacturer's catalogue.]
5. Acid Washed/Exposed Aggregate: Use chemical retarding agents applied to concrete forms and washing/brushing procedures to expose aggregate and surrounding matrix surfaces.
6. No concrete color: Provide surfaces free of pigmentation, debris or excessive mixture color variation.
7. Single concrete color: Use appropriate coloring and admixtures to permanently pigment the concrete without excessive color variation.
8. Single color concrete painting: Finish panels with decorative exterior concrete paint available from Tamms or similar manufacturer. [Provide paint product number and color from manufacturer's catalogue]. Manufacturer is not responsible to any touch up painting.
9. Multiple color concrete painting: Finish panels with decorative exterior concrete paints available from Tamms or similar manufacturer. [Provide paint product numbers and colors from manufacturer's catalogue]. Manufacturer is not responsible to any touch up painting.

PART 3 EXECUTION

END OF SECTION