SECTION 03 52 16
LIGHTWEIGHT INSULATING CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Insulating concrete fill over structural roof decking
- B. Perimeter joint filler

1.2 REFERENCES
- A. ASTM A185/A185M - Standard Specification for Steel Welded Wire, Reinforcement, Plain for Concrete
- B. ASTM C138/C138M – Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- C. ASTM C150/C150M - Standard Specification for Portland Cement
- D. ASTM C260/C260M - Standard Specification for Air Entraining Admixtures for Concrete
- E. ASTM C332 - Standard Specification for Lightweight Aggregates for Insulating Concrete.
- F. ASTM C495/C495M – Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
- G. FBC - Florida Building Code

1.3 PERFORMANCE REQUIREMENTS
- A. Minimum Thermal Resistance of Installed Fill: Refer to plans and energy form for required R-value.

1.4 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals Procedures
- B. Shop Drawings: Indicate layout of slopes, drain locations, and interruptions.
- C. Product Data: Provide physical characteristics, thermal values, and product limitations.
- D. Certificates: Certify that products meet or exceed specified requirements and achieves the required density, thermal value and performance.
- E. Manufacturer's Installation Instructions: Indicate mix instructions.

1.5 QUALITY ASSURANCE
- A. Installer: Company specializing in placing lightweight concrete fill-material specified in this section with minimum three years documented experience and licensed by manufacturer.
- B. Thermal Resistance Values: Use values base the thermal conductivity of insulating concrete in accordance with ASTM specifications at 40°F mean temperature.
- C. Wind Uplift Resistance: Use a deck system tested approved and listed in Factory Mutual System Approval Guide for FM Class rating matching the required uplift loads of the structural plans.
- D. Certification: Upon completion of roof deck, supply the Owner through the Architect the Manufacturer’s certificate certifying the concrete is per manufacturer's requirements by certified installer.

1.6 REGULATORY REQUIREMENTS
- A. Conform to applicable code for combustibility requirements.

1.7 WARRANTY
- A. Provide Owner with a no-dollar limit insulating concrete warranty for a minimum of 10-years, signed by the manufacturer stating:
  1. Insulating concrete system shall retain a minimum of 80% of designed thermal resistance for the warranty period.

2. Warranty shall include the composite roof deck system - both the concrete and insulation board.
3. Insulating concrete system shall remain re-roofable for the warranty period.
4. Warranty shall not limit by geographic location the Owner's right for claims, actions, or proceedings.
5. Insulating concrete shall remain in place when the roof membrane sustains wind damage.

1.8 PRE-INSTALLATION MEETING
- A. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.
- B. Convene two weeks prior to commencing work of this section.

1.9 ENVIRONMENTAL REQUIREMENTS
- A. Section 01 60 00 - Material Equipment and approved equals: Environmental conditions affecting products on site
- B. Do not place fill at ambient temperatures below 40°F without heating mix water to 90-110°F.

PART 2 PRODUCTS

2.1 MATERIALS
- A. Cement: ASTM C150/C150M, Portland Type I Normal, gray color
- B. Lightweight Aggregate: ASTM C332; Group I, perlite or vermiculite
- C. Concrete Materials: Aggregate required by manufacturer and water
- D. Air-Entrainment Agent: ASTM C260/C260M, type recommended by lightweight aggregate manufacturer

2.2 ACCESSORIES
- A. Reinforcement: Hexagonal woven wire mesh, galvanized.
- B. Perimeter Joint Filler: Glass fiber strips, compressible to 50% original thickness under load of 25 psi with full recovery
- C. Vents: Type recommended by lightweight aggregate manufacturer
- D. Insulation: Molded polystyrene with venting holes to 3% of board area

2.3 CONCRETE MIX
- A. Provide cellular concrete mix to:

Compressive Strength	Wet Density	Oven Dry Density
350 psi Minimum	50 lb/cu ft Maximum	36 lb/cu ft Maximum

PART 3 EXECUTION

3.1 EXAMINATION
- A. Section 01 31 00 Project Management and Coordination: Verify existing conditions prior to beginning work.
- B. Verify the grouting/taping of joints in roof members to prevent seepage of wet insulating concrete.

3.2 PREPARATION
- A. Install one-inch thick expansion joint filler at:
  1. Perimeter of roof decking
  2. Around penetrations through deck
  3. Every 100' of deck surface dimension
  4. Each change of deck direction on metal roof deck surfaces

3.3 INSTALLATION
- A. Slurry deck surface; place insulation; use mix to fill holes and breaks.

B. Place insulating concrete and screed surface to achieve minimum thickness.
C. Slope surface ¼"/foot minimum for roof surface drainage
D. Provide ½"/foot sloped crickets on the high side of roof equipment curb.

3.4 CURING

A. Cure in accordance with lightweight aggregate manufacturer's instructions.
B. Protect insulating concrete from excess evaporation of surface moisture.
C. During low humidity conditions, sprinkle water over concrete surface to aid hydration and curing.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control Field inspection and testing for dry density.
B. Testing Laboratory: Take three test samples from each 75 or less cu yds of insulating concrete placed.
C. Testing Laboratory: Take one additional test sample during cold weather concreting.

END OF SECTION