



## **PART 1: SCOPE**

- 1.1 An Approved Celcore Applicator shall furnish all labor, materials and supervision for the installation of the complete cellular insulating concrete roof deck to be placed over the existing roofing surface.
- 1.2 The cellular concrete roof deck shall be placed as noted on the project shop drawings and as detailed in the project specifications.

## **PART 2: GENERAL**

- 2.1 A professional analysis shall be obtained, conducted by a registered Architect and/or Engineer, for determination of items 2.2.1, 2.1.2 and 2.1.3.
  - 2.2.1 Adequacy of the structural deck to support the loads to be imposed by the roofing system. The Cellular Concrete Applicator shall supply the Architect and/or Engineer with both the cast and dry weights of the new insulation system in [lbs./sq.ft.] [kg/sq.m] as it is proposed to be installed.
  - 2.1.2 Condition of the existing structural deck system and/or the state of deterioration of the original construction.
  - 2.1.3 Adequacy of the existing roof system to meet the design pressure requirement of the specified uplift resistance value.
- 2.2 The surfaces on which the cellular concrete is to be placed shall be clean of foreign debris, loose gravel, free of standing water and blisters in the roof membrane.
- 2.3 Blisters in the existing roof shall be cut or shaved and then repaired to a watertight condition. This work shall be accomplished by the roofing contractor and performed prior to the beginning of the cellular concrete placement. It shall be the responsibility of the Prime and/or roofing contractor to maintain the building in a watertight condition during the period of construction.
- 2.4 The Cellular Concrete Applicator shall visually inspect and approve the surface condition of the existing membrane prior to beginning placement of the cellular concrete. Areas of unsoundness or requiring additional preparation shall be brought to the attention of the Prime and/or roofing contractor for correction prior to placement.

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- 2.5 All expansion joints, bulkheads, wood nailers, edge forms, angles and other framing, or other work normally within the scope accomplished by other trades, shall be furnished by others.
- 2.6 The Cellular Concrete Applicator shall demonstrate that all Approvals, as required for the project, are current with the respective agencies.

### **PART 3: MATERIALS**

#### 3.1 Cellular Insulating Concrete

- 3.1.1 Foaming Agent; Celcore Foam Concentrate for Concrete shall be manufactured and strictly controlled by Celcore Incorporated, 3148 US Highway 70 West, Black Mountain, NC 28711, (828) 669-4875. The concentrate shall have clear identification on each container and shall bear the UL and FM marks on the labels.
- 3.1.2 Portland cement, Type I, II, or III meeting ASTM C150 shall be used unless otherwise approved.
- 3.1.3 Water for mixing and curing shall be clean, fresh and free from injurious quantities of acid, alkali, salt, oil, organic matter or other impurities. Installations during cold weather may require the use of heated water.
- 3.1.4 Admixtures; No admixture shall be used without the approval of Celcore Incorporated, the architect and/or the engineer. Approved admixtures shall be used in strict accordance with the manufacturer's recommendations.

#### 3.2 Insulation board, Foam Plastic (polystyrene)

- 3.2.1 The insulation board used in Celcore Cellular Concrete roof deck systems shall be a product of expanded polystyrene produced in accordance with ASTM C578, Type I, having a nominal density of 1 pcf [16 kg/m<sup>3</sup>]. The boards shall be fabricated in a 2 ft. by ft. [.61m by 1.22 m] configuration at specified thicknesses with (8) 2-1/2 in. (+/- 1/2 in.) [6.35 cm (+/- 1.27 cm)] diameter holes to provide a positive keying action. The insulation boards shall be FM and UL approved.

#### 3.3 Curing Compound

- 3.3.1 Celcore PVA Curing Compound (CCC) is produced by Celcore Incorporated. Drums of CCC shall be clearly marked and identifiable by labeling.

#### 3.4 Reinforcing Mesh (wire fabric)

- 3.4.1 When required, wire fabric shall be equal to Keydeck, Type 2160-2-1619.

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## **PART 4: APPLICATION**

### 4.1 Cellular Concrete Physical Properties

4.1.1 The mix proportions shall be designed by Celcore Incorporated to yield the proper physical properties. [i.e. compressive strength, density, and thermal conductivity]

### 4.2 Mixing and Placing

4.2.1 Celcore Cellular Concrete shall be produced and pumped into place using an approved batch plant. All mixture ingredients shall be thoroughly and homogeneously blended before being discharged from the mixer.

4.2.2 A cast (wet) density of 36 pcf (+/- 5 pcf) [576 kg/m<sup>3</sup> (+/- 2.27 kg/m<sup>3</sup>)] shall be maintained at the point of placement.

4.2.3 The consistency of the mix shall be such to provide a flowable mix that can be screeded to a smooth finish.

4.2.4 The cellular concrete shall have a minimum thickness of 2 inches [ 5.08 cm] over all substrates. When composite fills are required, a minimum 2 in. [5.08 cm] topping is required over the polystyrene insulation board.

4.2.5 When ambient temperatures are predicted to be above 40 F [4.4 C] for the first (24) hours after placement of the cellular concrete, normal placing procedures shall be followed.

4.2.6 Cold weather placement (35 F [1.7 C] and falling) of cellular concrete should be avoided due to the possibility of the concrete freezing prior to final set. If cold weather installations are required, special considerations must be met. Contact Celcore Incorporated for guidance.

### 4.3 Insulation board and Cellular Concrete Placement

4.3.1 Prior to placement of the insulation boards, the substrate shall be filled with a slurry coat of cellular concrete to minimum thickness of 1/8 in. [.3175 cm]. Where the installation is over an existing membrane with embedded gravel, the surface fill shall be a minimum of 1/8 in. [.3175 cm] thickness over the top of the embedded gravel.

4.3.2 The insulation board shall be placed immediately into the plastic cellular concrete slurry coat.

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- 4.3.3 The insulation boards shall be placed in such a manner as to cause full contact of the board surface with the plastic cellular concrete. Cellular concrete shall enter into the keying holes of the board. The insulation boards shall be placed in a brick-like pattern of staggered joints. All joints shall be butted tightly together.
- 4.3.4 Polystyrene boards, particularly in thicknesses of 2 inches [5.08 cm] or more, have a tendency to float if the cellular concrete topping is applied prior to the adequate bonding of the polystyrene boards to the slurry coat. It shall be the responsibility of the cellular concrete applicator to install the system in an approved manner, ensuring proper thickness of the topping layer of cellular concrete.
- 4.3.5 A minimum of 2 inches [5.08 cm] of cellular concrete shall be placed over the substrate, or in composite fills, over the insulation board and screeded to grade. The finished surface shall be of adequate texture to receive the roofing membrane.

### 4.4 Curing

- 4.4.1 Celcore PVA Curing Compound (CCC) shall be applied over the cellular concrete deck surface as early as is practical once the deck has developed strength sufficient to support foot traffic without damage. The preferred method of application shall be by spraying. Prevent excess roof traffic during the first (24) hours after the cellular concrete placement.

### 4.5 Quality Control

- 4.5.1 The cellular concrete applicator shall be familiar with substrate preparation, experienced and equipped for this type of work with a minimum of (5) years experience in placing cellular concrete.
- 4.5.2 Approval Requirements:
  - 4.5.2.1 Approved by Underwriters Laboratories.
  - 4.5.2.1 Approved by Factory Mutual Research to include reroofing Approvals.
  - 4.5.2.3 When applicable, Miami-Dade County Product Approval, Notice of Acceptance (NOA) for re-roof applications.

### 4.6 Testing

- 4.6.1 Celcore cellular insulating concrete shall be tested in accordance with ASTM C495 modified as follows:

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- 4.6.1.1 Test specimens shall be cylinders 6 in. [15.25 cm] in diameter and 12 in. [30.48 cm] in length.
- 4.6.1.2 In molding the specimens, the cellular concrete shall be poured into the molds in (2) approximately equal layers. The cylinders shall be raised and dropped approximately 1 in. [2.54 cm] (3) times on a hard surface after pouring each layer into the mold. The cellular concrete specimens shall not be rodded.
- 4.6.1.3 After molding the specimens, do not seal the molds. Store the specimens for the initial set period, on a level surface in a place where they will not be disturbed for a least (24) hours.
- 4.6.1.4 The cellular concrete specimens shall not be removed from the molds prior to (7) days of age.

### **PART 5: REFERENCES**

- 5.1 American Society For Testing Materials (ASTM)
  - 5.5.1 ASTM C 150 Portland Cement
  - 5.1.2 ASTM C 495 Compressive Strength of Lightweight Insulating Concrete
  - 5.1.3 ASTM C 578 Polystyrene Thermal Insulation
  - 5.1.4 ASTM C 518 Thermal Transmission Properties by Means of Heat Flow Apparatus
  - 5.1.5 ASTM C 796 Foaming Agent for use in Producing Cellular Concrete Using Preformed Foam
  - 5.1.6 ASTM C 869 Foaming Agents used in Making Preformed Foam for Cellular concrete
- 5.2 American Concrete Institute (ACI)
  - 5.2.1 ACI Committee Report 523.1R Guide for Cast-in-Place Cellular Concrete
- 5.3 Factory Mutual Research Corporation (FMRC)
  - 5.3.1 Roof Cover and Roof Deck Assembly Classifications (4454)
- 5.4 Underwriters Laboratories (UL)

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5.4.1 Fire Resistance Classifications

- END OF SECTION -

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