SECTION 03521

INSULATING CONCRETE FILL

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, equipment and services necessary for and reasonably incidental to the completion of all lightweight insulating concrete fill over structural roof deck as specified herein.

1.02 RELATED SECTIONS

Section 07500 - Built-up Bituminous Roofing and Sheet Metal

1.03 QUALITY ASSURANCE

- A. Applicator must be licensed by the Construction Products Division and must be currently approved by the insulating concrete manufacturer of the aggregate.
- B. Representative of the manufacturer's aggregate shall visit the site, inspect, and certify in writing that:
 - 1. The applicator is approved by the manufacturer of the aggregate.
 - 2. The installation was completed in strict accordance with the recommendations of the manufacturer of the aggregate.

1.04 SUBMITTALS

- A. Submit shop drawings and product data, test reports, installation instruction and other technical data to prove compliance to the requirements specified.
- B. Submit certification as per Article 1.03B above.

1.05 QUALIFICATIONS

Installer: Company specializing in placing lightweight concrete fill material specified in this Section with minimum five (5) years documented experience and approved by manufacturer.

1.06 GUARANTEE BOND

A. The finished surface shall be inspected and approved by the roofing material manufacturer which will issue a ten (10) year guarantee bond on the finished roof, as being in a proper condition to receive the roofing. This approval shall be in writing to the attention of the Department, and must be received by him before any roofing work will be permitted.

1.07 MANUFACTURER:

Lightweight insulating concrete shall be NVS Roof Insulation System as manufactured by W. R. Grace & Co., Elastizell concrete by Elastizell Corporation of America, or approved equal.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cement: ANSI/ASTM C150, Portland Type I Normal, gray color.
- B. Lightweight Aggregate: ANSI/ASTM C332; Group I.
- C. Concrete Materials: ASTM C33 small aggregate and water.
- D. Air Entrainment Agent: Type recommended by lightweight aggregate manufacturer.
- E. Water: Clean, potable and free from deleterious substances.

2.02 ACCESSORIES

- A. Reinforcement: Unwelded wire fabric Keydeck Type 2160-2-1619 galvanized or 4" x 8" x 12/14 gauge galvanized welded wire fabric when required by manufacturer.
- B. Perimeter Joint Filler: Glass fiber strips, compressible to 50 percent original thickness under load with full recovery.
- C. Vents: Type recommended by lightweight aggregate manufacturer.
- D. Calcium chloride or any admixture containing chloride salts not permitted.
- E. Pre-generated foams or similar admixtures not permitted.

2.03 CONCRETE MIX

Physical Properties:

1.	Cement to Aggregate Ratio (By Vol.)	1:3.5 Cu.Ft.
2.	Minimum Compressive Strength	300 PSI (As per ASTM C495-91a)
3.	Density at Placement	64 ± 4 PCF
4.	Dry Density	38 ± 3 PCF

2.04 DESIGN MIXES:

Mix materials in accordance with the manufacturer's recommendations. Design mix shall yield the specified minimum physical properties.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Applicator is responsible for inspection and approval of the structure as being suitable for installation of the lightweight insulating concrete roof deck system.
- B. Verify that deck surface is suitable to receive work of this Section.

3.02 PREPARATION

Install vents in accordance with manufacturer's instructions to encourage drying of concrete.

3.03 INSTALLATION

- A. Lightweight insulating concrete shall be placed by approved equipment. Mixing time shall be sufficient to provide a consistent, thorough mix that will screed to a smooth surface and with a constant density maintained at 64 ± 4 lbs/cu.ft.
- B. The in-place lightweight insulating concrete shall have a volume equal to $100\% \pm 5\%$ of the volume of aggregate used.
- C. A minimum thickness of 2-inches of lightweight insulating concrete shall be placed over the existing concrete substrate and screeded to an even surface to receive the built-up roofing.
- D. Slope top surface to minimum ¼-inch/foot for roof surface drainage or as indicated on the Drawings, whichever is greater.
- E. Do not pour lightweight insulating concrete when the ambient temperature is predicted to be 40 degrees F. or below, for the first 24-72 hours after the pour.
- F. Begin roofing operations within 48 hours to 72 hours after placement, if the lightweight insulating concrete is reasonably dried and supports foot traffic without incurring damage.

3.04 CURING

- A. Air cure in accordance with light weight aggregate manufacturer's instructions.
- B. Protect insulating concrete from excess evaporation of surface moisture.

3.05 FIELD QUALITY CONTROL

- A. The cast density shall be checked hourly at the point of placement by the applicator.
- B. A minimum of seven (7) material specimens shall be retained for each day's pour. The specimens, 3" x 6" cylinders, shall be protected from damage and temperature extremes and tested in accordance with ASTM C495-91a.
- C. Furnish certified copies of test reports to the Engineer of Record.

3.06 Protection:

- A. Do not expose the lightweight insulating concrete to prolonged exposure to the elements.
- B. Do not use as a temporary walking surface without adequate surface protection.

END OF SECTION