

Part 1, General (Gunitite 7000)

1.01 Work Included

- A. Furnish all materials, labor, tools, and equipment to patch or repair interior and/or exterior horizontal surfaces with pneumatically applied concrete as designated by the owner.

1.02 Related Work

- A. Joint fillers
- B. Crack repair
- C. Rebar Splicing

1.03 Quality Assurance

- A. Provide a notarized certificate stating that the Portland cement pneumatically applied concrete meets the specified requirements and have the manufacturer's current printed literature on the specified product.
- B. Portland Cement pneumatically applied concrete shall be tested by a certified testing laboratory, on a batch basis, to assure the product has been manufactured as specified on manufacturer's printed literature.
- C. Complete laboratory test reports, from an independently qualified testing laboratory, shall be made available for the specified product.

1.04 Delivery, Storage, and Handling

- A. Deliver the specified product in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers.
- B. Store and condition the specified product as recommended by the manufacturer.

1.05 Job Conditions

- A. Environmental Conditions: Do not apply material in rainfall or if the ambient temperature will fall below 40 degrees F. within 24 hours of application.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the Portland cement concrete.

Part 2, Products

2.01 Acceptable Products

- A. Gunitite 7000 as produced by U.S. Concrete Products, LLC, Timonium, Maryland.
- B. Substitutions: The use of other than the specified product will be considered providing the contractor requests its use in writing to the Engineer. This request shall be accompanied by a certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specified performance criteria, tested in accordance with the specified test standards.

2.02 Performance Criteria

- A. Properties of the mixed Portland cement pneumatically applied concrete:
 - 1. Working Time: 30 minutes
 - 2. Finishing Time: 20-60 minutes
 - 3. Color: concrete gray
 - 4. Flow: 100-200% (ASTM C109)

- B. Properties of the cured Portland cement concrete:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day 1800 psi
 - b. 7 days 4000 psi
 - c. 28 days 7000 psi

 - 2. Splitting Tensile Strength (ASTM C-496) at 28 days: 850 psi min.
 - 3. Flexural Strength (Modulus of Rupture)(ASTM C-78) at 28 days: 1200 psi min.
 - 4. Bond Strength (ASTM C-882 Modified) at 28 days: 1450 psi min.
 - 5. Air Content: 6% +/- 1.5%

2.03 Materials

- A. Portland cement pneumatically applied concrete:
 - 1. Gunitite 7000 shall be a blend of selected Portland cements, specially graded aggregates admixtures for controlling setting time, water reducers for workability and the appropriate admixtures to increase hang and decrease rebound.
 - 2. The ratio of water to Gunitite 7000 shall be 1:7.5 by weight.
 - 3. The material shall not contain asbestos, chlorides, nitrates, added gypsum, added lime, or high aluminum cements.
 - 4. The material shall be non-combustible, either before or after cure.
 - 5. The Portland cement pneumatically applied concrete shall be supplied in a factory proportioned unit.
 - 6. The Portland cement pneumatically applied concrete must be able to be finished with a trowel.
 - 7. The Portland cement pneumatically applied concrete must be place able from 1 in. in up to full depth.

Part 3, Execution

3.01 Surface Preparation

- A. The surface must be mechanically prepared. Areas to be repaired must be clean and sound. All loose and deteriorated concrete shall be removed by mechanical means approved by the Engineer. Chip concrete substrate to obtain a surface profile of 1 in. with a new aggregate fractured surface. Be sure the area to be repaired is not less than 1 in. in depth. Sandblast reinforcing steel to remove all contaminants and rust. Where reinforcing steel is encountered, the following procedures will be used. If half of the diameter of the rebar is exposed, chip out behind the reinforcing steel. The distance chipped behind the rebar will be equal to or exceed the minimum placement depth of the approved material.

- B. Cracks in the substrate in the area of repair must be treated as directed by the Engineer.

- C. Extend all existing control and expansion joints through any patch or overlay. Install new joints as directed by the Engineer. Fill all joints as directed by the Engineer.

3.02 Application

- A. Mixing and placing the Portland cement pneumatically applied concrete: If wet shooting (50 lb units): Mix manually or mechanically. Manually mix in a wheelbarrow or mortar box. Mechanically mix in appropriate sized mortar mixer. Pour approximately 2 qts. water into the mixing container. Add Gunitite 7000 while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining water to mix if a more loose consistency is desired. If manual mixing takes more than three minutes, mix small quantities. Should smaller quantities be needed, be sure the components are dosed in the correct ratio and that the Gunitite 7000 is uniformly pre-mixed before batching.

For dry shooting: Place material into holding or feed hopper. Allow material to pass through pre-damping processor if necessary. From holding hopper, or pre-damping processor, feed directly into pneumatic line for placement.

- B. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Place shotcrete with suitable delivery equipment as required by the job conditions. Control thickness, method of support, air pressure and water content to prevent sagging or sloughing off of material. Discontinue shooting if wind or air currents cause separation of materials at the nozzle. For detailed placement procedures refer to ACI 506
- C. Curing is not required under most conditions. However, if ambient condition might cause premature surface drying-high winds, high temperatures, direct sunlight, low humidity, etc., use a fine mist of water, wet burlap, or non-solvent, water based curing compound, which has been pre-approved by the Engineer.
- D. Adhere to all limitations and cautions for the Portland cement pneumatically applied concrete in the manufacturers current printed literature.

3.03 Cleaning

- A. The uncured Portland cement pneumatically applied concrete can be cleaned from tools with water. The cured Portland cement pneumatically applied concrete can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spill-over onto adjacent areas.