

Part 1, General (HP DOT Grade Repair Mortar)

1.01 Work Included

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

1.02 Related Work

- A. Joint fillers
- B. Crack repair
- C. Pavement markings

1.03 Quality Assurance

- A. Provide a notarized certificate stating that the portland cement DOT Grade Repair Mortar meets the specified requirements and have the manufacturer's current printed literature on the specified product.
- B. Portland Cement DOT Grade Repair Mortar 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 32 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 DOT Grade Repair Mortar.

Part 2, Products

2.01 Acceptable Products

- A. HP DOT Grade Repair Mortar By U.S. Concrete Products, 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. A certificate of compliance shall accompany this request 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 DOT Grade Repair Mortar:
 - 1. Working Time: 18 minutes
 - 2. Finishing Time: 20 minutes
 - 3. Color: DOT Grade Repair Mortar gray
 - 4. Flow: 100-200% (ASTM C109)

- B. Properties of the cured Portland cement DOT Grade Repair Mortar:
 - 1. Compressive Strength -Minimum- (ASTM C-39 Modified)
 - a. 1 hour 2000 psi
 - b. 1 day 4300 psi
 - c. 7 days 6000 psi
 - d. 28 Days 7000 psi
 - 2. Splitting Tensile Strength (ASTM C-496) at 28 days: 750 psi min.
 - 3. Flexural Strength (Modulus of Rupture)(ASTM C-78) at 28 days: 750 psi min.
 - 4. Bond Strength (ASTM C-882 Modified) at 28 days: 2000 psi min.
 - 5. Thermal Compatibility (ASTM C-884 Modified): passes test min.
 - 6. Abrasion (Taber Abrader) at 7 days.
 - 7. Set time: Initial - 25 min. Final - 35 min.
 - 8. Modulus Of Elasticity (ASTM C 469) 4.4×10^6
 - 9. Coefficient of Thermal Expansion (CRD C 39) 7.0×10^{-6} in./in./F°

2.03 Materials

- A. Portland cement DOT Grade Repair Mortar:
 - 1. HP DOT Grade Repair Mortar™ shall be a blend of selected portland cements, specially graded aggregates admixtures for controlling setting time, water reducers for workability.
 - 2. The ratio of water to HP DOT GRADE REPAIR MORTAR™ shall be 15.15% 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 DOT Grade Repair Mortar shall be supplied in a factory proportioned unit.
 - 6. The Portland cement DOT Grade Repair Mortar must be able to be finished with a power trowel.
 - 7. The Portland cement DOT Grade Repair Mortar must be placeable from 1 in. in depth up to full depth.

Part 3, Execution

3.01 Surface Preparation

- A. The surface must be mechanically prepared. Areas to be patched or overlaid 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 1/4 in. with a new aggregate fractured surface. Be sure the area to be patched or overlaid 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 the patching or overlay work 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 the Portland cement DOT Grade Repair Mortar: Mechanically mix in appropriate sized concrete/mortar mixer. Pour approximately 4 qts. water into the mixing container. Add up to 50 lbs. of a clean well graded 3/8" aggregate (if repair area is greater than 1" in depth) Add HP DOT GRADE REPAIR MORTAR™ while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. If manual mixing takes more than three minutes, mix small quantities. Should smaller quantities be needed, be sure that the HP DOT GRADE REPAIR MORTAR is uniformly pre-mixed before batching.
- B. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or DOT Grade Repair Mortar must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. After filling, consolidate, then screed. Allow mortar to set to desired stiffness. Then finish with trowel, manual or power for smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair area to sound concrete is less than 1 in. shall be repaired with unextended DOT Grade Mortar.
- 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 DOT Grade Repair Mortar in the manufacturers current printed literature.

3.03 Cleaning

- A. The uncured portland cement DOT Grade Repair Mortar can be cleaned from tools with water. The cured portland cement DOT Grade Repair Mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.