

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Division 01 – General Requirements
- B. Section 31 20 00 – Earth Moving
- C. Section 32 05 23 – Aggregate Base Courses
- D. Section 32 12 16 – Asphalt Paving
- E. Section 32 13 13 – Concrete Paving
- F. Section 03 30 00 – Cast-in-Place Concrete
- G. Section 31 23 00 – Excavation and Fill for Utilities
- H. Section 32 01 23 – Concrete Paving Joint Sealants
- I. Section 32 05 26 – Concrete Pavement Repair Materials

1.2 REFERENCES, CODES, AND STANDARDS

- A. American Concrete Institute (ACI)
 - 1. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials
 - 2. ACI 318 – Building Code Requirements for Structural Concrete
 - 3. ACI 301 – Specifications for Structural Concrete
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field
 - 2. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - 3. ASTM C94 – Standard Specification for Ready-Mixed Concrete
 - 4. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete
 - 5. ASTM C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement Concrete
 - 6. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete
 - 7. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete
 - 8. ASTM C928 – Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs
 - 9. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction
 - 10. ASTM D6690 – Standard Specification for Joint Sealants, Hot Applied, Elastomeric, for Concrete and Asphalt Pavements
- C. American Concrete Pavement Association (ACPA)
 - 1. ACPA Publication CP-01 – Repairing Concrete Pavements
- D. Occupational Safety and Health Administration (OSHA)
 - 1. OSHA 29 CFR Part 1926 – Safety and Health Regulations for Construction

- E. International Concrete Repair Institute (ICRI)
 - 1. ICRI Guideline No. 310.2R – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
- F. Local and State Codes and Regulations
 - 1. Comply with all applicable local and state building codes, environmental regulations, and permitting requirements.

1.3 SUBMITTALS

- A. Action Submittals
 - 1. Product Data: Submit manufacturer's technical data and installation instructions for repair materials, joint sealants, admixtures, curing compounds, and other products.
 - 2. Shop Drawings: Submit detailed repair plan including locations, extent of repair, joint details, and sequencing.
 - 3. Mix Designs: Submit proposed concrete repair mix design including admixtures, water-cement ratio, slump, and air content.
 - 4. Quality Control Plan: Submit procedures for quality control testing, inspection, and acceptance criteria.
 - 5. 1Safety Plan: Submit site-specific safety plan including hazard assessments and compliance with OSHA requirements.
- B. Informational Submittals
 - 1. Manufacturer's Certificates: Provide certificates verifying compliance of materials with specified standards.
 - 2. Material Safety Data Sheets (MSDS): Submit MSDS for all chemical products used in repair.
 - 3. Test Reports: Submit results of pre-construction material tests and trial batch tests.
 - 4. Warranties: Submit sample warranties specified in paragraph 1.7.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Employ experienced installers specializing in concrete paving repair with minimum 5 years documented experience and successful completion of similar projects.
- B. Testing Agency: Engage an independent testing agency to perform field and laboratory tests including concrete compressive strength, slump, air content, and cure verification.
- C. Mock-Up: Construct a mock-up repair area approximately 100 square feet to demonstrate appearance, workmanship, and compatibility of materials. Approval required before proceeding.
- D. Tolerances: Comply with ACI 117 tolerances for concrete repair thickness, surface finish, and joint alignment.

- E. Environmental Conditions: Perform repairs within manufacturer-recommended ambient temperature and humidity ranges. Protect repair area from precipitation, freezing, and excessive heat during installation and curing.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original unopened containers or packaging, clearly labeled with manufacturer's name, product identification, batch number, and expiration date.
- B. Store cementitious materials in a dry, well-ventilated area protected from moisture and contamination.
- C. Store admixtures and chemical products in accordance with manufacturer's instructions, maintaining recommended temperature ranges.
- D. Handle all materials to prevent damage, contamination, and deterioration. Use sealed containers and protect from exposure to sun and weather.
- E. Dispose of packaging and waste materials in accordance with applicable environmental regulations.

1.7 WARRANTIES

- A. Provide manufacturer's standard warranty for repair materials covering defects in materials and workmanship for a minimum period of one year from date of acceptance.
- B. Provide Contractor's warranty guaranteeing repair workmanship against defects for a minimum period of two years from date of acceptance.
- C. Warranty shall include repair or replacement of defective work at no cost to the Owner.
- D. Submit warranty documents prior to final acceptance.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cementitious Repair Materials
 - 1. Use rapid-setting or standard-setting cementitious repair mortars complying with ASTM C928.
 - 2. Provide repair materials with compressive strength meeting or exceeding 4000 psi at 28 days.
 - 3. Use materials compatible with existing concrete substrate and environment.
- B. Concrete
 - 1. Provide ready-mixed concrete complying with ASTM C94, with minimum 28-day compressive strength as specified in project documents.
 - 2. Use air-entrained concrete for freeze-thaw durability per ASTM C260.
- C. Joint Sealants and Fillers
 - 1. Use preformed expansion joint filler complying with ASTM D1751.

2. Use hot-applied or cold-applied elastomeric joint sealants complying with ASTM D6690.
- D. Admixtures
 1. Use admixtures complying with ASTM C494 as required for water reduction, set control, or air entrainment.
- E. Curing Compounds
 1. Use curing compounds compatible with repair materials and meeting ASTM C309.
- F. Aggregates
 1. Use aggregates conforming to ASTM C33 or project-specific grading requirements for repair mortar and concrete.

2.2 MANUFACTURERS

- A. Cementitious Repair Materials
 1. Sika Corporation – SikaQuick Repair Mortars
 2. BASF Corporation – MasterEmaco S 488
 3. Euclid Chemical Company – Euco Repair
 4. Mapei Corporation – Planitop X
- B. Joint Sealants and Fillers
 1. Pecora Corporation – Pecora 895
 2. D.S. Brown Company – D.S. Brown Joint Sealants
 3. Sonneborn – Sonolastic NP1
- C. Concrete Admixtures
 1. GCP Applied Technologies – ADVA admixtures
 2. Sika Corporation – Sika admixtures
- D. Curing Compounds
 1. Dayton Superior – Aquafilm
 2. Euclid Chemical Company – Euclid Cure & Seal

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify extent and locations of repair work with Contract Documents and site conditions.
- B. Inspect existing concrete paving for cracks, spalls, joint distress, and surface defects.
- C. Verify substrate is sound, clean, free of deleterious materials, loose particles, oils, and contaminants.
- D. Confirm ambient and substrate temperatures are within limits prescribed by repair material manufacturers.

3.2 PREPARATION

- A. Remove deteriorated concrete, unsound material, and loose debris by mechanical means such as chipping, grinding, or hydro-demolition.
- B. Cut back repair edges to square or slightly beveled profiles to provide sound substrate and bonding surface.
- C. Clean repair areas by abrasive blasting or high-pressure water blasting to achieve ICRI CSP 3-5 profile.
- D. Remove all dust, dirt, and debris by vacuum or compressed air immediately prior to placement of repair materials.
- E. Saturate concrete substrate with clean potable water to saturated surface dry (SSD) condition unless otherwise directed by manufacturer.

3.3 INSTALLATION OF REPAIR MATERIALS

- A. Mix repair materials in accordance with manufacturer's instructions using approved mixing equipment.
- B. Place repair material promptly after mixing to prevent premature setting.
- C. Apply bonding agents or primers as recommended by repair material manufacturer.
- D. Place repair material in layers not exceeding maximum thickness per manufacturer's recommendations.
- E. Consolidate repair material thoroughly to eliminate voids and achieve full bond with substrate.
- F. Finish surface to match existing adjacent pavement texture and elevation.
- G. Protect repair area from traffic, precipitation, and temperature extremes during curing period.
- H. Remove forms and perform joint repairs as specified after sufficient curing time.

3.4 JOINT REPAIR AND SEALING

- A. Clean and prepare existing joints to receive new sealant or filler.
- B. Replace or install new preformed joint fillers as required to restore joint function.
- C. Apply joint sealants in strict accordance with manufacturer's instructions, ensuring proper joint width-to-depth ratio and tooling.
- D. Protect joint sealants during cure period from contamination and damage.

3.5 FIELD QUALITY CONTROL

- A. Conduct slump, air content, and temperature tests on concrete repair mixes at frequency specified by testing agency.
- B. Cast and cure test cylinders for compressive strength testing at 7 and 28 days.
- C. Monitor environmental conditions during placement and curing; record data for compliance verification.
- D. Inspect finished repairs for surface defects, cracking, delamination, and adherence to tolerances.

- E. Remove and replace repairs failing to meet quality standards at no additional cost.

3.6 PROTECTION

- A. Protect repaired pavement from vehicular traffic and heavy loads until repair materials achieve specified strength and curing requirements.
- B. Implement erosion and sediment control measures during and after repair work.
- C. Maintain repair areas and adjacent surfaces free of debris and spilled materials.

3.7 CLEANING

- A. Remove excess materials, debris, and equipment from site daily.
- B. Clean all tools and equipment immediately after use.
- C. Restore site conditions affected by repair work to original or better condition.

END OF SECTION