

SECTION 32 13 13 – PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Exterior concrete for:
 - 1. Paving/Slabs
 - 2. Concrete sidewalks
 - 3. Concrete Curb
- B. Reinforcement
- C. Surface finish.
- D. Curing.

1.2 RELATED WORK

- A. Section 32 11 23 – Aggregate Base Course.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain materials from same source throughout.
- C. Regulatory Requirements:
 - 1. Construct ramps and curb ramps in accordance with Americans with Disabilities Act.

1.4 SUBMITTALS

- A. Submittals:
 - 1. Proposed Mix Design for review prior to commencement of work.
 - 2. Prior to any concrete work being performed, the contractor must provide an on site reference sample to be used for acceptance of workmanship and finish. Samples shall be large enough to represent all finishing that apply, including but not limited to joints, saw cuts, brooming, coloring and stamping. In Lieu of an onsite sample, the contractor may provide a recently finish project within the municipality or at a reasonable distance from the project, as determined by the owner, to be used as a reference site.
 - 3. Product data: manufacturer's specifications and installation instructions for Detectable warnings for curb ramps.

1.5 TESTS

- A. Submit proposed mix design for review prior to commencement of work.
- B. Test Reports: Reports in accordance with requirements specified in Article 3.9D, Field Quality Control.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: Type I conforming to ASTM C 150, "Standard Specification for Portland Cement".
- B. Normal Weight Aggregates: Conforming to ASTM C 33 "Standard Specification for Concrete Aggregate." Aggregates not complying with this standard may be used providing it can be shown by special test or a record of past performance that these aggregates produce concrete of adequate strength and durability.
- C. Fine aggregate: clean, natural sand, free from loam, clay lumps or deleterious substances. Fineness modulus of sand shall have a minimum value of 2.3 and a maximum value of 3.0.

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- D. Coarse aggregate:
 - 1. Crushed and graded limestone containing no clay, mud, loam or foreign matter.
 - 2. Native aggregate from a D.O.T.-approved source pit or quarry may be used in lieu of limestone.
 - 3. Limit to 1% of the coarse aggregate by weight the amount of chert with a specific gravity less than 2.40 in exposed concrete.
 - 4. Coarse aggregate shall be nominal maximum sizes of 3/4", conforming to ASTM C33, Table 2.
 - E. Water: shall be clean and free from deleterious materials.
 - F. Curing Compounds: Conforming to ASTM C-309, Type 1, Class A, clear or translucent without fugitive dye; Wax or saponifiable resin types are not approved.
 - 1. Curing compounds shall exceed the moisture retention requirements of ASTM C309, when tested in accordance with ASTM C156 at the maximum coverage rate recommended by the manufacturer.
 - G. C309, when tested in accordance with ASTM C156 at the maximum coverage rate
 - H. recommended by the manufacturer.
 - 1. Approved Products:
 - a. "Masterseal" by Master Builders
 - b. "1100 Clear" by W.R. Meadows
 - c. "Tri-Kote 26" by T. K. Products
 - I. Integral Color concrete agent if required as manufactured County Materials Corporation, Marathon, WI or Equally approved
- 2.2 REINFORCEMENT (When Noted)
- A. Welded Steel Wire Fabric: ASTM A185 plain type; in flat sheets; uncoated finish.
 - B. Fibermesh 300 homopolymer polypropylene fibrillated fibers. Apply at 1.5 lbs/yd³
- 2.3 DESIGN
- A. Provide concrete mix with the following properties:
 - 1. Compressive Strength: 4,000 psi at 28 days
 - 2. Slump: 2" to 4"
 - 3. Maximum water to cementitious material (cement plus fly ash) ratio: 0.45.
 - 4. Minimum cement plus fly ash content: 520 lbs. per cubic yard
 - 5. Total air content required (air-entrained and entrapped air): 6% +/- 1.5%.
- 2.4 ACCESSORIES
- A. Preformed Joint Filler: ASTM D1751, asphalt impregnated fiber board. Provide filler throughout the slab depth and of 1/2" thickness.
 - B. Detectable Warnings for Curb Ramps: Mat with truncated domes complying with Americans with Disabilities Act; provide fasteners and adhesives as recommended by mat manufacturer.
 - 1. Recycled Tire Core: Nylon and Rayon fibers mixed into rubber composite.
 - 2. Slip resistant surface.
 - 3. Perimeter beveled-edge.
 - 4. Provide fasteners, sealers, and adhesives as recommended by mat manufacturer.

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PART 3 EXECUTION

3.1 GENERAL

- A. Place material meeting requirements of Section 305 of Standard Specifications for Highway and Structure Construction, Current Edition, State of Wisconsin Department of Transportation, Division of Highways.
- B. Compact material meeting Special Compaction Requirements of Section 305 of Standard Specifications for Highway and Structure Construction, Current Edition, State of Wisconsin Department of Transportation, Division of Highways.
- C. Remove surplus material from site and dispose of in a legal manner.

3.2 INSPECTION

- A. Verify compacted granular base is ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of existing conditions.

3.3 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify ARCHITECT a minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

- A. Place reinforcement at top third height of slabs-on-grade.
- B. Interrupt reinforcement at all joints.

3.6 FORMED JOINTS

- A. Place expansion joints in sidewalks every 400 square feet with a maximum 40 ft. o.c. spacing.
- B. Place expansion joints in curb and gutter at 40 ft. o.c.
- C. Place expansion joints between curbs and walks.
- D. Place joint filler in expansion joints and between curbs and walks, between paving components and building, and at catch basins, manholes, and other appurtenances.
- E. Provide scored or sawn control joints unless otherwise specified on plans. Joints shall be at right angles to the edges of work.
 - 1. Where walks are wider than 8'-0" provide longitudinal joints as directed.
 - 2. Space control joints per plan or if not stated at 5 foot intervals for sidewalks.
 - 3. Space control joints at 10 feet intervals for curbs.
 - 4. Place control joints in flat work every 100 square feet with maximum 10 ft. spacing.
 - 5. All panels should be square or nearly so. The length should not exceed 1.5 times the width.

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- F. Align curb, gutter, and sidewalk joints.
 - G. Place construction joints at the end of all pours and at locations where placement operations are stopped for more than 1/2 hour. If the construction joint will also be an expansion joint, dowel and sleeve the reinforcement.
- 3.7 PLACING CONCRETE
- A. Place concrete in accordance with ACI 301.
 - B. Tolerances
Finish grade shall not vary from plan grade at any location by the following:
 - 1. Concrete walks/flat work: 1/8"
 - 2. Concrete curbs and gutter: 1/8"
 - C. Sawcuts and/or tooled joints shall not vary more than 1" off a straight line pulled in 50' of length.
 - D. If the concrete surface or joint line varies more than the allowed tolerance, it will be at the discretion of the CIVIL ENGINEER/or Owner whether the concrete section shall be removed and replaced.
- 3.8 FINISHING
- A. After striking off and consolidating concrete, smooth the surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture.
 - B. Provide positive slope on concrete surfaces to provide drainage.
 - C. After floating, test surface for trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous, smooth finish.
 - D. Work edges of walks and joints with a 1/4" radius edging tool. and a 4" wide smooth troweled surface at edges; provide broom finish on remainder of surface.
 - E. After completion of floating and when excess moisture or surface sheen has disappeared, complete surface finishing by drawing a fine-hair broom across the concrete surface, perpendicular to the line of traffic. Repeat operation if required to provide a fine line texture acceptable to the A/E.
- 3.9 CURING/PROTECTION
- A. Use curing methods and provide protection as required.
 - B. Apply Curing Compound uniformly in continuous operation by power-spray or roller in accordance with manufacturer's instructions.
 - 1. Recoat areas subjected to heavy rainfall occurring within 3 hours after initial application.
 - 2. Maintain continuity of coating and repair damage during curing period.
 - C. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.
 - D. Exclude traffic from concrete for at least 14 days after placement. When construction traffic is permitted, maintain the work as clean as possible and remove surface stains and spillage of materials as stains and spillages occur.
- 3.10 FIELD QUALITY CONTROL
- A. Materials and operations shall be tested and inspected as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the owner for final acceptance.

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- B. Testing agencies shall meet the requirements of "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction", ASTM E 329.
- C. The following testing services shall be performed by the testing agency and shall be paid for by the Owner. Any additional testing due to failing results will be paid for by the Contractor.
 - 1. Secure composite samples in accordance with "Standard Method of Sampling
- D. Fresh Concrete," ASTM C 172.
 - 1. Mold and cure four cylinders from each test required in accordance with "Standard Method of Making the Curing Concrete Test Specimens in the Field," ASTM C 31.
 - 2. Test cylinders in accordance with "Cylindrical Standard Test Method for Compressive Strength of Concrete Specimens," ASTM C 39. Two cylinders shall be tested at 28 days for acceptance and one shall be tested at 7 days and one at 14 days for information.
 - 3. Make one set of cylinders for each 50 cubic yard or 5000 square feet of wall or floor surface or fraction thereof, of each mix design of concrete placed in any one day.
 - 4. A record shall be made by a representative of the general contractor of the
- E. Delivery ticket number for the particular load of concrete tested and the approximate location in the work at which each load represented by a strength test is deposited.
 - 1. Determine total air content of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method," ASTM C231 or "Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method", ASTM C173.
 - 2. Submit one copy of all test data to a/e and the concrete supplier within 3 days of tests.

END OF SECTION

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SECTION 32 13 75 – PAVEMENT JOINT SEALANTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Sealant for:
 - 1. Joints in cement concrete sidewalks.
 - 2. Joints between cement concrete sidewalks, stoops, and other construction.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Qualification Data: For Installer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for sealants.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Trained and approved in writing by Manufacturer.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single Manufacturer.
- C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing of current sealant products within a three (3) year period preceding the commencement of the Work.
- D. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 for testing indicated, as documented according to ASTM E 548.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers with labels indicating Manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials to comply with Manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
- B. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
- C. When joint substrates are wet or covered with frost.
- D. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
- E. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application indicated, as demonstrated by joint-sealant Manufacturer based on testing and field experience.

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- B. Joint Sealant: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Crafcro Inc.; RoadSaver Silicone SL.
 - 2. Dow Corning Corporation; 890-SL.
 - 3. Approved Substitute
- D. Joint-Sealant Backer: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers and approved for applications indicated by joint-sealant Manufacturer based on field experience and laboratory testing.
- E. ASTM D 5249, Type 3, of diameter and density required to control sealant-depth and to prevent bottom-side adhesion of sealant.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants for compliance with Manufacturer's requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

3.3 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint-sealant Manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- D. Do not leave gaps between ends of backer materials.
- E. Do not stretch, twist, puncture, or tear backer materials.
- F. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- G. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
- H. Place sealants, so they directly contact and fully wet joint substrates.
- I. Completely fill recesses provided for each joint configuration.
- J. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- K. Provide recessed joint configuration to comply with joint-sealant Manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by Manufacturers of joint sealants and of products in which joints occur.

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3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage so sealants are without deterioration or damage at time of Substantial Completion. Cut out and remove damaged or deteriorated joint sealants. Install new joint sealant so repairs are indistinguishable from original work.

END OF SECTION

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