

SECTION 02520

PORTLAND CEMENT CONCRETE PAVING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete Sidewalk.
- B. Concrete Terrace.
- C. Generator Pad.

1.2 RELATED SECTIONS

- A. Section 02211 - Rough Grading.
- B. Section 02223 - Backfilling: Compacted Subbase for Paving.
- C. Section 02231 - Aggregate Base Course.
- D. Section 02510 - Asphaltic Concrete Paving.
- E. Section 02936 - Landscape Grading, Hydroseeding and Sodding.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Concrete Sidewalk:
 - 1. Basis of Measurement: At the unit price bid per square foot as stated in the proposal.
 - 2. Basis of Payment: Includes all labor, material, and equipment necessary to prepare subgrade, place and compact subbase, set forms, place reinforcing steel, place concrete, float, finish, and test Class A concrete.
- B. Concrete Terrace:
 - 1. Basis of Measurement: At the unit price bid per square foot as stated in the proposal.
 - 2. Basis of Payment: Includes all labor, material, and equipment necessary to prepare subgrade, place and compact subbase, set forms, place reinforcing steel, place concrete, float, finish, and test Class A concrete.
- C. Generator Pad:
 - 1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
 - 2. Basis of Payment: Includes all labor, material, and equipment necessary to prepare subgrade, place and compact subbase, set forms, place reinforcing steel, install 6A stone where indicated, conduit penetrations, place concrete, float, finish, and test Class A concrete. Also includes installation of Durawood HDPE fence, gate, bollards, grading etc. as shown on the plans.

1.4 REFERENCES

- A. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

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- B. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- C. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- D. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- E. ASTM C33 - Concrete Aggregates.
- F. ASTM C94 - Ready Mix Concrete.
- G. ASTM C150 - Portland Cement
- H. ASTM C260 - Air-Entraining Admixtures for Concrete.
- I. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- J. ASTM C494 - Chemical Admixtures for Concrete.
- K. MDOT - Standard Specifications for Construction.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section
- C. Product data shall include information on joint filler admixtures, curing compounds.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with MDOT requirements of Sections 03001 - Concrete, 03100 – Concrete Framework, and 03300 – Cast In Place Concrete.
- B. Obtain cementitious materials from same source throughout.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable standards for Work on public property.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40° F, or surface is wet or frozen.

2. PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. Conform to ACI 301.

2.2 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade billet steel plain and deformed bars; uncoated finish.
- B. Welded Steel Wire Fabric: Plain type, ANSI/ASTM A185; in flat sheets; uncoated finish. Style designation and weight as shown on the drawings.

2.3 CONCRETE MATERIALS

- A. Cement: ASTM C150, normal - Type 1 Air Entraining Portland, grey color.
- B. Fine and Coarse Aggregates: ASTM C33 and MDOT 2NS and 6AA.
- C. Water: Clean and not detrimental to concrete.

2.4 ADMIXTURES.

- A. Air Entrainment Admixture: ASTM C260.
- B. Chlorine based admixtures are prohibited in all reinforced concrete.

2.5 ACCESSORIES

- A. Bonding Agent: Two component epoxy resin; SIKADUR 32 HI-MOD manufactured by SIKA Corp. or equal.
- B. Non-Shrink Grout: Premixed compound with non-metallic aggregate, cement, water reducing and plasticizing agents; capable of minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days.
- C. Dovetail Anchor Slots: Minimum 22 gage thick galvanized steel; foam filled; release tapes; sealed slots; bent tab anchors.
- D. Waterstops: Polyvinylchloride; 4 inches wide.
- E. Construction Joints: As approved by Engineer.
- F. Expansion Joints: ANSI/ASTM D1751, fiber type; 1/4 inch to 1 inch thick, manufactured by A.C.D. International W.R. Meadows, or equal.
- G. Epoxy Adhesive: Two component epoxy resin adhesive; sikadur 35, Hi-Mod LV manufactured by Sika Corporation (708) 924-7900.
- H. Form Ties: Steel Construction of adequate strength and of suitable design. Wire ties will not be permitted. Use 1 inch deep break off ties for hydraulic structures and 1/2 inch for dry locations.
- I. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- J. Form Release Agent: Colorless material which will not stain concrete, absorb moisture manufactured by Wir, Meadows, Inc. or equal.
- K. Corners: Chamfered, wood strip type 1 inch x 1 inch size.

2.6 CURING MATERIALS

- A. Water: Potable.
- B. Absorptive Mat: Cotton fabric of 8 ounces/square yard, clean, roll goods.
- C. Absorptive Mat: Burlap-polyethylene, 8 ounces/square yard, bonded to prevent separation during use.
- D. Membrane Curing Compound: ASTM C309, Type I, Class B clear, non-yellowing curing and sealing compound; manufactured by W.R. Meadows, Inc. (708) 683-4500.

2.7 CONCRETE SEALER

- A. Transparent, one component epoxy eester base, resinous sealer-dust proofer.
- B. Product: Son-no-mor, as manufactured by Sonneborn Chemical and Refining Corporation, or equal.

2.8 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94. and MDOT Specifications.
- B. Class A:
 - 1. Compressive Strength
 - a. 7 days 2600 psi
 - b. 28 days 4000 psi
 - 2. Slump: 2-4 inch
- C. Class B:
 - 1. Compressive Strength
 - a. 7 days: 1950 psi
 - b. 28 days: 3000 psi
 - 2. Slump: 2-5 inch
- D. Class C:
 - 1. Compressive Strength
 - a. 7 days: 1300 psi
 - b. 28 days: 2000 psi
 - 2. Slump: 3-6 inch
- E. All concrete exposed to weathering shall be air entrained with 5 percent to 7 percent total air content by volume.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify base conditions under provisions of Section 01039 – Coordination and Meetings.
- B. Verify compacted subgrade granular base is acceptable and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.

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3.2 SUBBASE

- A. Section 02231 - Aggregate Base Course forms the base construction for Work included in this Section.
- B. Prepare subbase in accordance with Section 02223 – Backfilling, with a minimum compacted depth of 4 inches.

3.2 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Coat surfaces of manhole and catch basin frames and valve and monument boxes with oil to prevent bond with concrete pavement.
- C. Notify Engineer minimum 2 working days prior to commencement of concreting operations.

3.3 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCEMENT

- A. Place reinforcement at mid-height of slabs-on-grade unless otherwise indicated.
- B. Interrupt reinforcement at expansion joints.
- C. Place dowels reinforcement to achieve pavement and curb alignment as detailed.
- D. Provide doweled joints 12 inches on center at interruptions of concrete.

3.5 PLACING CONCRETE

- A. Thickness:
 - 1. Pavement: 6 inches minimum or thickness of existing pavement, whichever is greater.
 - 2. Sidewalks: 4 inches normal and 6 inches at driveways and parking areas.
- B. Width:
 - 1. Pavements: Match existing width.
 - 2. Sidewalks: Match existing width unless otherwise specified on the plans.
- C. Place concrete in accordance with ACI 301.
- D. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.6 SIDEWALK RAMPS

- A. Construct where the proposed walk adjoins existing concrete curbs and gutters at roadways and driveways as shown on the plans.
- B. Construct in accordance with MDOT Standard Detail Type 1 as shown on plans.

3.8 JOINTS

- A. Place expansion joints at 20 foot intervals for sidewalks. Align curb, gutter, and sidewalk joints.
- B. Place scored contraction joints in sidewalks to form squares of not more than 36 square feet nor less than 16 square feet.
- C. Provide keyed joints as indicated.

3.8 FINISHING

- A. Road Paving: Light broom or match existing.
- B. Sidewalk and Terrace Paving: Light broom, radius to 1/4 inch radius, and trowel joint edges, match existing, or as indicated on the plans.
- C. Curbs and Gutters: Light broom or match existing.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.10 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400 – Quality Control.
- B. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- C. Two additional test cylinders will be taken during cold weather and cured on site under same conditions as concrete it represents.
- D. One slump test will be taken for each set of test cylinders taken.
- E. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.10 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION