

Seaside Rehabilitation and Healthcare Center
Portland, Maine

SECTION 02500 - PAVING, WALKS AND CURBS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS:

- A. Documents affecting Work of this Section include, but are not necessarily limited to, The CONDITIONS OF THE CONTRACT General Conditions, Supplementary Conditions, Addenda and all Sections of Division 1, which are hereby made a part of this Section.
- B. Coordinate Work with that of other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of the Work.
- C. The "Standard Specifications" referred to herein is the book entitled "*Standard Specifications, Highways and Bridges*" published by the State of Maine Department of Transportation (latest date), and Supplemental Specifications in Force, excluding the following portions thereof:

Division 100, Sections 102 through 109 numerical index of payment items included in each section.

Those Sections of the aforementioned Standard Specifications which are cited herein are applicable to the Work of this Contract as they may be modified, amplified or added to by this Section.

1.02 DESCRIPTION OF WORK:

- A. Provide labor, materials, equipment and services necessary for proper and complete installation of all paving, walks, curbing and related items, as indicated on the Drawings and herein specified:
 - 1. Concrete walk pavement.
 - 2. Architectural Concrete Pavement where required (Specified elsewhere.)
 - 3. Bituminous concrete pavement for sidewalks and parking areas.
 - 4. Pavement markings.
 - 5. Testing as required.
 - 6. Pavement repair.

1.03 QUALITY ASSURANCE:

- A. General: Comply with requirements of Division 1 Sections for Submittals and Quality Control.
- B. Codes and Standards: The Work under this Section shall conform to the following, except as may be modified herein:
 - 1. American Society for Testing and Materials (ASTM), Standard Specifications and Methods of Testing.

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2. State of Maine, Department of Transportation, Standard Specifications, Highways and Bridges, Latest Edition.
3. City of Portland Technical Manual, May 11, 2010 as amended thereafter.

1.04 SUBMITTALS:

- A. General: Comply with requirements of Division 1 Sections for Submittals and Quality Control.
- B. Furnish samples of manufacturer's product data, test reports, and materials certifications as required for bituminous concrete mixes and structural concrete mix.
- C. Furnish product data and shop Drawings as required for pre-cast concrete curb.
- D. Furnish product data for concrete curing and sealing products.
- E. Furnish product data for Architectural Concrete finishes, as required.
- F. Test Results:
 1. Mechanical analysis (ASTM D421), asphalt content (ASTM D2172), and in-place density (ASTM D2041 & D2726) test results for bituminous concrete pavement.
 2. Concrete mix design (ASTM C-94), and in-place test results - slump tests (C-143), air content (C-173), and compressive strength tests (C-31 & C-39) - for concrete sidewalks, pads, and slabs.

1.05 PRODUCT HANDLING:

- A. Store materials properly to prevent damage, deterioration and inclusion of foreign matter. Aggregates shall be stockpiled in a well-drained location.
- B. All asphalt materials and mixes shall be applied at temperatures within their optimum range as defined by MDOT *Standard Specifications*.

1.06 JOB CONDITIONS:

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for normal activities and other construction activities. Coordinate with Owner to allow access to and parking for existing facility, during paving operations.
- B. Utilize flagmen, barricades, warning signs and warning lights as may be required.
- C. Weather Limitations for Bituminous Placement: Apply asphalt prime and tack coats when ambient temperature is above 50 degrees F (10 degrees C), and when temperature has not been below 40 degrees F (1 degree C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- D. Construct asphalt concrete surface course or leveling course when atmospheric temperature is above 50 degrees F (4 degrees C) and when base is dry. Base course may be placed when air

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temperature is above 40 degrees F (4 degrees C) and rising. Do not place pavement on frozen gravel base.

- E. Do not place concrete for sidewalks when air temperature is below 40 degrees F. Do not place concrete on frozen ground. Protect concrete from freezing during initial 24-hour cure.
- F. Grade Control: Contractor shall be responsible for establishment and maintenance of required lines, grades, and surface tolerances (Refer to Section 02030-Layout of Work).

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Base Course Bituminous Concrete Paving: Bituminous material shall conform to Maine DOT *Standard Specifications*, Section 702.01, Viscosity Grade AC-20. Nominal asphalt content shall be 6%. Aggregates shall conform to MDOT *Standard Specifications*, Section 703.09, Grading Type 19 mm.
- B. Top Course Bituminous Concrete Paving: Bituminous material shall conform to Maine DOT *Standard Specifications*, Section 702.01, Viscosity Grade AC-20. Nominal asphalt content shall be 6%. Aggregates shall conform to MDOT *Standard Specifications*, Section 703.09, Type 12.5 mm.
- C. Pre-Cast Concrete Curb Sections: Supplied by an approved manufacturer. Concrete shall have a minimum compressive strength of 4000 psi at 28 days. All surfaces shall be smooth and uniform Planes, exposed edges chamfered, top and ends. Sections shall be straight and true to line; radius Sections as required. All curbing shall be consistent with respect to size, color and texture.
- D. Pavement Markings: Traffic paint conforming to MDOT *Standard Specifications*, Section 708.03 (Type F). Color: White (w/o glass beads); Blue (w/non-skid aggregate) for handicapped drop-off strips only.
- E. Concrete for Sidewalks, Pads, and Slabs:
 - 1. Mix: Maximum 4 gallons of water per 94 lb. sack of cement.
 - 2. Strength: 4000 psi at 28 days.
 - 3. Air Entrainment: total air content shall be 6% by volume.
 - 4. Slump: 3" to 4".
 - 5. Shall conform to MDOT *Standard Specifications*, Section 502.
- F. Expansion Joints: Premolded fiberboard, as shown on Details.
- G. Cement: Portland Cement, Type IIA conforming with MDOT *Standard Specifications*, Section 701.

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- H. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required.
- I. Form Coating: A non-staining form release agent that will not discolor or deface surface of concrete.
- J. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185. Furnish in flat sheets, not rolls, unless otherwise acceptable to Architect/Engineer.
- K. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 40.
- L. Fabricated Bar Mats: Welded or clip-assembled steel bar or rod mats, ASTM A 184. Use ASTM A 615, Grade 40 steel bars, unless otherwise indicated.
- M. Dowel Bars at Control Joints: Galvanized steel bars, ASTM A 615, Grade 40. Cut bars true to length with ends square and free of burrs. One end of bar to be wrapped with felt, to allow horizontal movement of joint.
- N. Hook Bolts: ASTM A 307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- O. Concrete Mix Design and Testing: Comply with requirements of applicable Division 3 Sections for concrete mix design, sampling and testing, and quality control.
- P. Water: Potable, clean, free from oil, acid, vegetable matter, alkalis, salts and other deleterious substances.
- Q. Curing Compound: Brush, roller, or spray-applied curing agent meeting the requirements of ASTM C-309; Cur-to-Spec MS by ProSoCo, Inc.
- R. Surface Treatment for Concrete Walks, Pads and Curbs: Antispalling compound specifically formulated to protect the concrete from moisture and de-icing salts; Consolideck Saltguard by ProSoCo, Inc.
- S. Architectural Concrete Finishes for exterior slabs: As Specified elsewhere.

PART 3 - EXECUTION

3.01 TESTING:

- A. See Item 1.04 of this Section for required tests and test reports.
- B. The Architect/Engineer or his representative will designate test frequencies and locations.

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3.02 BITUMINOUS CONCRETE PAVEMENT:

A. Scope:

1. Construct base course of bituminous concrete pavement on prepared gravel base, to lines, grades and sections shown on the Drawings for each specific area.
2. Construct top course of bituminous concrete pavement on prepared bituminous base, to lines, grades and sections shown on the Drawings for each specific area.

B. Construction Methods:

1. Conform to MDOT *Standard Specifications*, Section 401.16, 401.17, 401.18 and 401.20.
2. Submit certificate of compliance to the specifications from the pavement vendor to the Architect/Engineer (see Item 1.04 D.1).
3. Exposed edges of pavement shall be clean and true. Raveled edges not accepted. Hand-tamp edges and bevel if forms or screed strips are not used.
4. Place asphalt concrete mixture on prepared surface, spread and strike-off, by means of self-propelled paver. Spread mixture at minimum temperature of 225 degrees F (107 degrees C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, compacted thickness, and surface tolerance (see Item 3.07).
5. Make joints between old and new pavements, or between successive days Work, to ensure continuous bond between adjoining Work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.
6. Rolling:
 - a) After the mix has been spread, struck off, and surface irregularities adjusted on each course, it shall be thoroughly compacted by rolling with a powered steel wheel tandem roller weighing not less than 2 or more than 10 tons. Begin rolling as soon as mixture will bear roller weight without excessive displacement.
 - b) Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
 - c) Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
 - d) Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
 - e) Any displacement or irregularities occurring as the result of the reversing of the direction of a roller, or from other causes, shall be corrected at once by the use of rakes or lutes and addition of fresh mixture when required. Care shall be exercised in rolling not to displace the line and grade of the edges of the bituminous mixture.

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- f) Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
- g) Compaction Tests: After construction, the Architect/Engineer will designate locations for removal of pavement cores to determine compaction and thickness. Remove and properly replace pavement in any areas showing deficiencies in required compaction or thickness, with new material properly laid.
- h) Patching: Remove and replace paving areas that become loose, broken or mixed with foreign materials, and any defective or substandard areas. Cut out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.
- i) Protections: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.03 PAVEMENT MARKING

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
- B. Apply paint in accordance with MDOT *Standard Specifications*, Section 627.04, 627.05, and 627.06. (Delete references to glass beads.)
- C. Stripe parking lot spaces and other pavement graphics shown/detailed on Drawings with 4" wide striping. Fire lanes, crosswalks, etc. to be marked as shown on Drawings. The Universal Handicap Symbol, as detailed on Plans, shall be painted at the designated handicapped stalls. The drop-off strips between the handicapped stalls shall be laid out as detailed on the drawings, and painted white.
- D. Apply paint with mechanical equipment to produce uniform straight edges. Apply in 2 coats at manufacturer's recommended rates.

3.04 CONCRETE WALKS, PADS AND SLABS:

- A. Form construction:
 - 1. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of Work and so that forms can remain in place at least 24 hours after concrete placement.
 - 2. Check completed formwork for grade and alignment to following tolerances:
 - Top of forms: not more than 1/8 inch in 10 inches.
 - Vertical face on longitudinal axis: not more than 1/4-inch in 10 feet.
 - 3. Clean forms after each use, and coat with form release agent as often as required to ensure separations from concrete without damage.

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4. Reinforcement: Locate, place and support reinforcement and/or welded wire fabric as detailed on plans and as specified in Division 3 Sections, unless otherwise indicated.

B. Concrete Placement:

1. General: Comply with requirements of Division 3 Sections for mixing and placing concrete, and as herein specified.
2. On prepared aggregate base, construct concrete walk with reinforcing wire mesh, expansion and control joints, etc., where shown on the Plans and as detailed in the Drawings. Butt concrete walk to top of precast concrete curb, where indicated.
3. Forms for sidewalks shall be smooth, free from warp, of adequate strength to resist springing out of shape, and of proper depth to conform to the thickness of the proposed walk. Forms shall be clean and free from dirt, concrete or materials from previous use. Oil all forms prior to placing concrete.
4. Place clean wire mesh as shown in the details; avoid damaging or moving wires while placing concrete.
5. Slabs for concrete walk shall have expansion and control joints as shown on the Plans. Score expansion joints across surface of concrete as detailed, at horizontal intervals of 8 feet, maximum. Control joints shall be full slab depth, and shall include a preformed compressible filler and steel dowel bars, as detailed. Install control joints at intervals of not more than 30 ft., at junctions with all structures, and/or where shown on the Plans.
6. Do not place concrete until subgrade and forms have been checked for line and grade. Moisten subgrade if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
7. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation.
8. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
9. Surface finishing shall be performed after all bleed water and/or water sheen has left the surface and the concrete has started to stiffen. Float the surface with appropriate wooden or aluminum float and steel trowel surface. Surface finishes shall be as directed by the Architect/Engineer. No plastering of the surface with mortar will be permitted.
10. Concrete shall be cured for at least 72 hours. Protect concrete during initial curing process with moist burlap or polyethylene sheeting, and take precautions to exclude vehicular, pedestrian and animal traffic from the walk surfaces. Apply curing compound and/or Architectural Concrete Finishes, as specified in SS 2.01 R and 2.01 T, following initial cure; comply with Architect's directions and manufacturer's instructions.

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11. Provide samples of various concrete pavements and finishes for approval by Architect/Engineer prior to installation, as directed. Samples shall include examples of scoring, troweling, coloring and finishing as directed by the Architect/Engineer.

C. Surface treatment, as specified in SS 2.01 S, shall be applied in two coats at a minimum of 28 days after the concrete is placed.

1. Application procedure, surface preparation, precautions, and the rate of application shall be in strict compliance with the manufacturer's detailed instructions.

3.05 FIELD QUALITY CONTROL:

A. General: Test in-place asphalt concrete courses for compliance with requirements for compaction, thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Engineer.

B. Thickness: After construction, the Architect/Engineer will designate locations for removal of pavement cores to determine compaction and thickness. In-place compaction will not be acceptable if less than 93% of theoretical maximum density as determined by ASTM D-2041 and D-2726. In-place compacted thickness will not be acceptable if less than the required thickness, as shown on Drawings for that particular Section, within a tolerance of minus 1/4 inch, as determined by ASTM D-3549.

C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using a 10-foot straightedge applied parallel with and at right angles to centerline of paved area, or alternately by flooding. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:

Any irregularities which vary 1/4 of an inch from a true surface in the finished surface course shall be corrected. Any irregularities which vary 3/8 of an inch from a true surface in base or binder course shall be corrected. Irregularities which may develop before the completion of rolling and while the material is still workable, may be remedied by loosening the surface mixture and removing or adding material as necessary. Any unsatisfactory irregularities or defects remaining after final compaction shall be corrected by removing and replacing with new materials, as specified, to form a true and even surface. All minor surface projections, joints and minor honeycombed surfaces shall be ironed out smoothly to grade, as directed. Adequate and approved straight edges shall be furnished and used by the Contractor. Architect/Engineer or his representative shall inspect and approve compacted surfaces.

If, at any time before the final acceptance of the Work, any damaged, soft, or imperfect places, or spots shall develop in the surface, all such places shall be removed and replaced with new materials and then compacted until the edges at which the new Work connects with the old become invisible.

D. Concrete testing for concrete sidewalks, pads, and slabs shall be carried out at the time the concrete is placed, as specified in SS 1.04 F.2 and 2.01 P. Surface tolerances for concrete surfaces shall be 1/8 inch in 10 feet.

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3.06 PAVEMENT REPAIR:

- A. Repair any existing bituminous pavement damaged during construction activities, including existing driveway or parking lot pavement and pavement on abutting public streets and highways. Saw cut edges for accurate match of grade and lines.
- B. Meet the original subgrade, gravel base and finished grade Specifications and elevations.
- C. Match the existing pavement in materials, course thickness, and finishes.

END OF SECTION