

SECTION 02741 - HOT-MIX ASPHALT PAVEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Bidding requirements, conditions of the contract and pertinent portions of sections in Division 1 of these specifications and MaineDOT Standard of Specifications (current version – as revised), Items 401 – Hot Mix Asphalt Pavement, 403 – Hot Bituminous Pavement, apply to the section as fully as though repeated herein.
- B. Section Includes:
 - 1. Asphalt materials
 - 2. Aggregate materials
 - 3. Aggregate subbase
 - 4. Asphalt paving base course, binder course, and wearing course
 - 5. Asphalt paving overlay for existing paving
- C. Related Sections:
 - 1. Excavation and Fill: Section 02315
 - 2. Subgrade and Roadbed: Section 02335
 - 3. Storm Drainage: Section 02630

1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - 2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
 - 3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
 - 4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
 - 5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
 - 6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
 - 7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
 - 8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.
- B. Asphalt Institute:
 - 1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
 - 2. AI MS-19 - Basic Asphalt Emulsion Manual.
- C. ASTM International:
 - 1. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 - 2. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.

3. ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
6. ASTM D977 - Standard Specification for Emulsified Asphalt.
7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
20. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. MaineDOT Standard Specifications

1. Section 304 - AGGREGATE BASE AND SUBBASE COURSE
2. Section 401 - HOT MIX ASPHALT PAVEMENT
3. Section 402 - PAVEMENT SMOOTHNESS
4. Section 403 - HOT BITUMINOUS PAVEMENT
5. Section 409 - BITUMINOUS TACK COAT

1.03 PERFORMANCE REQUIREMENTS

- A. Paving: Designed for parking and residential streets; as noted in Construction Specifications and Drawings. Standards reference MaineDOT Specifications for Base and Wearing Courses.

1.04 SUBMITTALS

- A. Hot Mix Asphalt Documentation:
 - 1. The Contractor and the Engineer or Owner's Representative shall agree on the amount of Hot Mix Asphalt Pavement that has been placed each day.
 - 2. Submit a copy of material tonnage slips of material placed daily.

1.05 QUALITY ASSURANCE

- A. Mixing Plant: Conform to MaineDOT Standards.
- B. Obtain materials from same source throughout project.
- C. Perform Work in accordance with MaineDOT and City of Portland standards.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Hot Mix Asphalt Pavement used for curb, driveways, sidewalks, islands, or other incidentals is not subject to seasonal limitations, except that conditions shall be satisfactory for proper handling and finishing of the mixture. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface, and the air temperature shall be 40°F or higher.
- B. Place asphalt mixture when temperature is not more than 20°F less than initial mixing temperature.

PART 2 - PRODUCTS

2.01 ASPHALT MATERIALS

- A. Hot Mix Asphalt: In accordance with MaineDOT Standards.

2.02 MIXES

- A. Binder Course: MaineDOT 703.09 "A"
- B. Wearing Course: MaineDOT 703.09 "C"

2.03 SOURCE QUALITY CONTROL

- A. Per MaineDOT Specifications

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.

- B. Verify compacted subgrade is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.
- D. Verify gutter manhole covers, drainage grates and frames are installed in correct position and elevation.

3.02 EQUIPMENT

- A. Pavers shall be a Highway Class, self-contained, self-propelled unit with an activated screed (heated if necessary) capable of placing courses of Hot Mix Asphalt Pavement (HMA) in full lane widths on the main line, shoulder or similar construction. The Contractor shall place Hot Mix Asphalt Pavement on the main line with a paver using an automatic grade and slope controlled screed, unless otherwise authorized by the Engineer or Owner's Representative. The controls shall automatically adjust the screed and increase or decrease the layer thickness to compensate for irregularities in the preceding course. The controls shall maintain the proper transverse slope and be readily adjustable so that transitions and super-elevated curves can be properly paved. The controls shall operate from a fixed or moving reference such as a grade wire or ski type device (floating beam) with a minimum length of 30 ft or a non-contact grade control with a minimum span of 24 ft. The Contractor shall operate the paver in such a manner as to produce a visually uniform surface texture and a thickness within the requirements MaineDOT Section 401.101 - Surface Tolerances. The paver shall have a receiving hopper with sufficient capacity for a uniform spreading operation and a distribution system to place the mixture uniformly, without segregation in front of the screed. The screed assembly shall produce a finished surface of the required evenness
- B. All truck bodies shall have an opening on both sides, which will accommodate a thermometer stem. The opening shall be located near the midpoint of the body, at least 12 in above the bed. Pavement shall have tight, clean, and smooth metal dump bodies, which have been thinly coated with a small amount of lime solution or an approved soap solution or detergent to prevent the mixture from adhering to the bodies. All truck dump bodies shall have a cover of canvas or other water repellent material capable of heat retention, which completely covers the mixture. The cover shall be securely fastened on the loaded truck except when unloading.
- C. Rollers shall be static steel, pneumatic tire, or approved vibrator type. Rollers shall be in good mechanical condition, capable of starting and stopping smoothly, and be free from backlash when reversing direction. Rollers shall be equipped and operated in such a way as to prevent the picking up of hot mixed material by the roller surface. The use of rollers, which result in crushing of the aggregate, or in displacement of the HMA will not be permitted. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of Performance Graded Asphalt Binder, or is in any other way defective shall be removed and replaced at no additional cost with fresh Hot Mix Asphalt Pavement, which shall be immediately compacted to conform to the adjacent area. The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided specification densities are attained.

3.03 EXECUTION

- A. The Contractor shall thoroughly clean the surface upon which Hot Mix Asphalt Pavement is to be placed of all objectionable material. When the surface of the existing base or pavement is irregular, the Contractor shall bring it to uniform grade and cross section.
- B. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the Contractor shall spread, rake, and lute the HMA with hand tools to provide the required compacted thickness.
- C. Immediately after the Hot Mix Asphalt Pavement has been spread, struck off, and any surface irregularities adjusted, the Contractor shall thoroughly and uniformly compact the HMA by rolling. The Contractor shall roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. The Contractor shall prevent adhesion of the HMA to the rollers or vibrating compactors without the use of fuel oil or other petroleum based release agents. The Contractor shall immediately correct any displacement occurring as a result of the reversing of the direction of a roller or from other causes to the satisfaction of the Engineer or Owner's Representative. Any operation other than placement of variable depth shim course that results in breakdown of the aggregate shall be discontinued. Any new pavement that shows obvious cracking, checking, or displacement shall be removed and replaced for the full lane width as directed by the Engineer or Owner's Representative at no cost to the Owner. Along forms, curbs, headers, walls, and other places not accessible to the rollers, the Contractor shall thoroughly compact the HMA with mechanical vibrating compactors. The Contractor shall only use hand tamping in areas inaccessible to all other compaction equipment. On depressed areas, the Contractor may use a trench roller or cleated compression strips under a roller to transmit compression to the depressed area. Any HMA that becomes unacceptable due to cooling, cracking, checking, segregation or deformation as a result of an interruption in mix delivery shall be removed and replaced, with material that meets contract specifications at no cost to the Owner.
- D. The Contractor shall construct wearing course transverse joints in such a manner that minimum tolerances are met. The Contractor shall correct variations exceeding $\frac{1}{4}$ in by removing defective work and replacing it with new material as directed by the Engineer or Owner's Representative. Longitudinal joints shall be constructed in a manner that will best ensure joint integrity. Methods or activities that prove detrimental to the construction of sound longitudinal joints will be discontinued.

3.04 SUBBASE

- A. Aggregate Subbase: Install as specified in Sections 02315 and 02335, Construction Plans and MaineDOT Specifications.

3.05 REPAIR OF EXISTING WORK

- A. Saw cut and notch existing paving as indicted on Drawings.
- B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

- C. Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.06 TACK COAT

- A. Before application of the bituminous tack coat the surface shall be thoroughly cleaned of all loose and objectionable material.
- B. Bituminous material shall be applied by a pressure distributor in a uniform, continuous spread over the area to be treated and within the temperature range specified.
- C. Bituminous material shall not be applied on a wet surface, after sunset or before sunrise, or when the atmospheric temperature is below 50°F in a shaded area at the job site, or when weather conditions are otherwise unfavorable to proper construction procedures.

3.07 DOUBLE COURSE ASPHALT PAVING

- A. Place binder course to 2 inch compacted thickness or thickness indicated on Construction Drawings.
- B. Place wearing course no less than 24 hours after placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.
- C. Place wearing course to 1 inch compacted thickness or thickness indicated on Construction Drawings.
- D. Compact each course by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.08 CURBS

- A. Install extruded asphalt curbs of “cape cod” profile as indicated on Construction Drawings (may be substituted with Concrete “slip form” Curb of like style at Owner’s Discretion/Request).

3.09 ERECTION TOLERANCES

- A. Flatness: Maximum variation of ¼ inch measured with 10.0 feet straight edge.
- B. Scheduled Compacted Thickness: Within ¼ inch.
- C. Variation from Indicated Elevation: Within ½ inch.

3.010 PROTECTION OF FINISHED WORK

- A. Immediately after placement, protect paving from mechanical injury for 24 hours or until surface temperature is less than 140 degrees F.

3.011 SCHEDULES

- A. See Construction Drawings for thickness of pavements in different sections of project.

END OF SECTION 02741