SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold milling of existing hot-mix asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt paving overlay.
5. Pavement-marking paint.

1.2 SYSTEM DESCRIPTION

A. Provide asphalt pavement according to the materials, workmanship, and other applicable requirements of the North Carolina Department of Transportation (NCDOT) Standard Specifications for Road and Structures (SSRS), current edition or of authorities having jurisdiction.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: For each job mix proposed for the Work.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by NCDOT.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of SSRS of NCDOT for asphalt paving work.

1. Measurement and payment provisions included in NCDOT SSRS do not apply to this Section.
2. SSRS requirements supercede all information and requirements of this specification section.

C. Preinstallation Conference: Conduct conference at Project site prior to beginning paving operations.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Tack Coat: Minimum surface temperature of 60 deg F.
2. Asphalt Base Course: Minimum ambient temperature of 35 deg F and rising, and minimum surface temperature of 35 deg F at time of placement.
3. Asphalt Surface Course: Minimum ambient temperature of 40 deg F and minimum surface temperature of 50 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials and 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Aggregate to comply with NCDOT SSRS, Article 1012-1.

2.2 ASPHALT MATERIALS

A. Asphalt materials to comply with NCDOT SSRS, Division 6.

2.3 AUXILIARY MATERIALS

A. Pavement-Marking Paint for use in private driveways and parking areas: Federal Specification TT-P-1952, latest edition, Type I, acrylic, waterborne traffic marking paint.

1. Color: White or as per regulatory requirement or as otherwise indicated on drawings.

B. Thermoplastic Pavement Marking for use in public roadways: Alkyd/Maleic pavement marking material meeting AASHTO M 249, latest edition, and composed of the following in a homogeneous mixture:

Component by Weight	
Alkyd/Maleic binder	18.0% min.
Glass beads (premixed)	30.0% min.
Titanium dioxide pigment (ASTM D476 Type 2)	10.0% min.

C. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

2.4 MIXES

1. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes. Refer to drawings for type and thickness of asphalt mixes. Refer to NCDOT SSRS for mix design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Proceed with paving only after approved by Geotechnical Engineer of the subgrade and unsatisfactory conditions have been corrected.

3.2 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

1. Mill to a depth as indicated.
2. Mill to a uniform finished surface free of gouges, grooves and ridges.
3. Control rate of milling to prevent tearing of existing asphalt surface.
4. Repair or replace curbs, manholes and other construction damaged during cold milling.
5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
6. Keep milled pavement surfaces free of loose material and dust.

3.3 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade. Geotechnical Engineer must approve subgrade compaction prior to paving.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.08 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch less final surface course thickness as indicated on drawings and compact while still hot.

D. Surface Course: Install final surface course of hot-mix asphalt to thickness indicated on drawings (1 inch minimum) and, while still hot, compact flush with adjacent surface.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving. Geotechnical Engineer must approve subgrade compaction prior to paving.

B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.04 to 0.08 gal./sq. yd.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Prime Coat: Apply uniformly over surface of compacted unbound aggregate base course at a rate of 0.20 to 0.50 gal./sq.yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

3.5 HOT-MIX ASPHALT PLACING

A. Place asphalt per NCDOT SSRS.

3.6 JOINTS

A. Construct joints per NCDOT SSRS.

3.7 COMPACTION

A. Compact asphalt per NCDOT SSRS.

3.8 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.

3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.9 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with NCDOT and/or the City of Raleigh.

B. Allow paving to age per company performing paving before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils for each application with a minimum of two applications and sufficient drying time between each.

E. Apply thermoplastic markings by extrusion method to dimensions indicated, with uniform, straight edges. Attain cross sectional thickness of 90 mils per NCDOT SSRS, Table 1205-3.

F. Unless otherwise indicated on drawings, use Thermoplastic Pavement Marking for all public roadways (lane marking). Use acrylic traffic marking paint for all pavement marking within private driveways and parking areas.

3.10 WHEEL STOPS

A. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.12 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION