Section 02741

ASPHALTIC CONCRETE PAVEMENT

1.0 G E N E R A L

1.01 SECTION INCLUDES

A. Surface courses of compacted mixture of coarse and fine aggregates and asphaltic material.

B. References to Technical Specifications:

1. Section 01200 – Measurement and Payment Procedures
2. Section 01350 - Submittals
3. Section 01450 – Testing Laboratory Services
4. Section 02742 – Prime Coat
5. Section 02743 – Tack Coat

C. Referenced Standards:

1. American Society for Testing and Materials (ASTM)

    a. ASTM C 33, “Standard Specification for Concrete Aggregates”
    b. ASTM C 131, “Standard Test Methods for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine”

2. Texas Department of Transportation (TxDOT)

    a. Tex-106-E, “Calculating the Plasticity Index of Soils”
    b. Tex-203-F, “Sand Equivalent Test”
    c. Tex-126-E, “Molding, Testing, and Evaluating Bituminous Black Base Material”
    d. Tex-204-F, “Design of Bituminous Mixtures”
    e. Tex-208-F, “Test for Stabilometer Value of Bituminous Material”
    f. Tex-207-F, “Determining Density of Compacted Bituminous Mixtures”
    g. Tex-227-F, “Theoretical Maximum Specific Gravity of Bituminous Mixtures”
    h. Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2004 Adoption
        1) Item 340, “Dense-Graded Hot-Mix Asphalt (Method)”

1.02 MEASUREMENT AND PAYMENT

A. Measurement for asphaltic concrete pavement is on square yard basis. Separate measurement will be made for each different required thickness of pavement.

B. Payment for asphaltic concrete pavement includes all labor and materials required to complete placement as indicated on Plans.

C. Refer to Section 01200 – Measurement and Payment Procedures.

D. Refer to this Section, 3.07 "Noncomforming Pavement" for unit price adjustments for deficient thickness.

1.03 SUBMITTALS

A. Make Submittals required by this Section under the provisions of Section 01350 – Submittals.

B. Submit certificates that asphaltic materials and aggregates meet requirements of this Section.

C. Submit proposed design mix and test data for each type and strength of surface course in Work.

D. Submit manufacturer's description and characteristics of mixing plant for approval.

E. Submit manufacturer's description and characteristics of spreading and finishing machine for approval.

1.04 TESTING

A. Testing and analysis of product quality, material sources, or field quality shall be performed by an independent testing laboratory provided by the Owner under the provisions of Section 01450 – Testing Laboratory Services and as specified in this Section.

2.0 P R O D U C T S

2.01 MATERIALS

A. Coarse Aggregate: Crushed stone or gravel or combination thereof, that is retained on No. 10 sieve, uniform in quality throughout and free from dirt, organic or other injurious matter occurring either free or as coating on aggregate. Aggregate shall conform to ASTM C 33 except for gradation. Furnish rock or gravel with Los Angeles

abrasion loss not to exceed 40 percent by weight when tested in accordance with ASTM C 131.

B. Fine Aggregate: Sand or stone screenings or combination of both passing No. 10 sieve. Aggregate shall conform to ASTM C 33 except for gradation. Use sand composed of sound, durable stone particles free from loams or other injurious foreign matter. Furnish screenings of same or similar material as specified for coarse aggregate. Plasticity index of that part of fine aggregate passing No. 40 sieve shall be not more than 6 when tested by Tex-106-E. Sand equivalent shall have a minimum value of 45 when tested by Tex-203-F.

C. Composite Aggregate: Conform to the grading limits of TxDOT Item 340 for the paving type indicated on the Plans.

D. Asphaltic Material: Moisture-free homogeneous material which will not foam when heated to 347º F, meeting following requirements:

VISCOSITY GRADE				
TEST	**AC-10**		**AC-20**	
	MIN.	**MAX.**	**MIN.**	**MAX.**
Viscosity, 140º stokes	1000	±200	2000	±400
Viscosity, 275º stokes	1.9	-	2.5	-
Penetration, 77º, 100 g, 5 sec.	85	-	55	-
Flash Point, C.O.C., F.	450	-	450	-
Solubility in trichloroethylene, percent	99.0	-	99.0	-
Tests on residues from thin film oven tests:				
Viscosity, 140º stokes	-	3000	-	6000
Ductility, 77º, 5 cms per min., cms	70	-	50	-
Spot tests	Negative for all grades			

1. Material shall not be cracked.
2. The Engineer will designate grade of asphalt to use after design tests have been made. Use only one grade of asphalt after grade is determined by test design for project.

2.02 EQUIPMENT

A. Mixing Plant: Weight-batching or drum mix plant with capacity for producing continuously mixtures meeting specifications. Plant shall have satisfactory conveyors, power units, aggregate handling equipment, hot aggregate screens and bins, and dust

collectors. Provide equipment to supply materials adequately in accordance with rated capacity of plant and produce finished material within specified tolerances. Following equipment is essential:

1. Cold aggregate bins and proportioning device.
2. Dryer.
3. Screens.
4. Aggregate weight box and batching scales.
5. Mixer.
6. Asphalt storage and heating devices.
7. Asphalt measuring devices.
8. Truck scales.

B. Bins: Separate aggregate into minimum of four bins to produce consistently uniform grading and asphalt content in completed mix.

2.03 MIXES

A. Employ and pay certified testing laboratory to prepare design mixes. Test in accordance with Tex-126-E or Tex-204-F and Tex-208-F.

B. Density and Stability Requirements:

PERCENT DENSITY		PERCENT OPTIMUM	HVEEM STABILITY PERCENT NOT LESS THAN
MIN.	MAX.		
95	99	97	35

C. Proportions for Asphaltic Material: As specified in TxDOT Item 340 for the paving type shown on the Plans.

3.0 E X E C U T I O N

3.01 EXAMINATION

A. Verify compacted base course is ready to support imposed loads.

B. Verify lines and grades are correct.

3.02 PREPARATION

A. Prime Coat: If indicated on the Plans, apply a prime coat conforming to requirements of Section 02742 – Prime Coat. Do not apply a tack coat until primed base has cured to satisfaction of the Engineer.

B. Tack Coat: Conform to requirements of Section 02743 – Tack Coat. Where the mixture will adhere to the surface on which it is to be placed without use of a tack coat, tack coat may be eliminated if approved by the Engineer.

C. Do not use cutback asphalt during the period of April 16 to September 15.

3.03 PLACEMENT

A. Do not place asphaltic mixture in rain or when air temperature is below 50º F and falling. Mixture may be placed when air temperature taken in shade and away from artificial heat is above 40 F and rising.

B. Haul prepared and heated asphaltic concrete mixture to the project in tight vehicles previously cleaned of foreign material. Mixture shall be at temperature between 250º F and 325º F when laid.

C. Spread material into place with approved mechanical spreading and finishing machine of screening or tamping type. Use track-mounted finish machine to place base course directly on earth subgrade.

D. Surface Course Material: Surface course 2 inches or less in thickness may be spread in one lift. Spread all lifts in such manner that, when compacted, finished course will be smooth, of uniform density, and will be to section, line and grade as shown. Coincide construction joints on surface courses with lime lines, or as directed by the Engineer.

E. Place courses as nearly continuously as possible. Pass roller over unprotected ends of freshly laid mixture only when mixture has cooled. When work is resumed, cut back laid material to produce slightly beveled edge for full thickness of course. Remove old material which has been cut away and lay new mix against fresh cut.

F. When new asphalt is laid against existing or old asphalt mat, existing or old asphalt shall be saw cut full depth to provide straight smooth joint.

G. In restricted areas where use of paver is impractical, spread and finish asphalt by mechanical compactor. Use wood or steel forms, rigidly supported to assure correct grade and cross section. Carefully place materials to avoid segregation of mix. Do not broadcast material. Remove any lumps that do not break down readily. Place asphalt courses in same sequence as if placed by machine.

3.04 COMPACTION

A. Begin rolling while pavement is still hot and as soon as it will bear roller without undue displacement or hair cracking. Keep wheels properly moistened with water to prevent adhesion of surface mixture. Do not use excessive water.

B. Compress surface thoroughly and uniformly, first with power-driven, 3-wheel, or tandem rollers weighing from 8 to 10 tons. Obtain subsequent compression by starting at side and rolling longitudinally toward center of pavement, overlapping on successive trips by at least one-half width of rear wheels. Make alternate trips slightly different in length. Continue rolling until no further compression can be obtained and all rolling marks are eliminated. Complete all rolling before mixture temperature drops below 175 F.

C. Use tandem roller for final rolling. Double coverage with approved pneumatic roller on asphaltic concrete surface is acceptable after flat wheel and tandem rolling has been completed.

D. Along walls, curbs, headers and similar structures, and in all locations not accessible to rollers, compact mixture thoroughly with lightly oiled tamps.

E. Compact binder course and surface course to density not less than 93 percent of the maximum possible density of voidless mixture composed of same materials in like proportions.

3.05 TOLERANCES

A. Furnish templates for checking surface in finished sections. Maximum deflection of templates, when supported at center, shall not exceed 1/8 inch.

B. Completed surface, when tested with 10-foot straightedge laid parallel to center line of pavement, shall show no deviation in excess of 1/8 inch in 10 feet. Correct any surface not meeting this requirement.

3.06 FIELD QUALITY CONTROL

A. At the direction of the Engineer, minimum of one core may be taken at random locations per 1,000 feet per lane of roadway or 500 square yards of asphalt concrete pavement to determine in-place depth and density.

B. In-place density will be determined in accordance with Tex-207-F and Tex-227-F from cores or sections of asphaltic base located near each core. Other methods of determining in-place density, which correlate satisfactorily with results obtained from roadway specimens, may be used when approved by the Engineer.

C. Contractor may, at his own expense, request three additional cores in vicinity of cores indicating nonconforming in-place depths. In-place depth at these locations shall be average depth of four cores.

D. Fill cores and density test sections with new compacted asphaltic concrete pavement.

3.07 NONCONFORMING PAVEMENT

A. Recompact pavement sections not meeting specified densities or replace them with new asphaltic concrete material. Replace with new material sections of surface course pavement not meeting surface test requirements or having unacceptable surface texture. Patch asphalt pavement sections in accordance with procedures established by Asphalt Institute.

B. Remove and replace areas of asphaltic concrete pavement found by cores to be deficient in thickness by more than 10 percent at no cost to Owner. Use new asphaltic concrete pavement of thickness shown on Plans.

C. Areas of asphaltic concrete pavement found by cores to be deficient in thickness by less than 10 percent shall be remedied at the Owner's direction by one of the following methods:

1. Remove and replace using new asphaltic concrete pavement of thickness shown on Plans and in accordance with the requirements of this Section at no cost to Owner.

2. Reduce the Unit Price by the ratio of the average thickness (as determined by cores) to the thickness required.

D. No adjustments will be made for excess thickness.

3.08 PROTECTION OF THE WORK

A. Do not open pavement to traffic until 12 hours after completion of rolling, or as shown on Plans.

B. Maintain asphaltic concrete pavement in good condition until completion of Work.

C. Repair defects immediately by replacing asphaltic concrete pavement to full depth at no cost to Owner.

END OF SECTION