SECTION 32 01 16 ASPHALT OVERLAY

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This Section specifies the requirements for scarifying, grinding, sweeping and repair of existing asphalt concrete pavement to establish a base course and provide a new asphalt surface course to the lines, grades and elevations as determined from the drawings and in accordance with these specifications.

1.2 APPLICABLE PUBLICATIONS

The following publications of the latest issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

A. Texas Department of Transportation 2004 Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT).

1. Item 247 - Flexible Base
2. Item 300 - Asphalts, Oils and Emulsions
3. Item 302 – Aggregates for Surface Treatments
4. Item 310 – Prime Coat
5. Item 320 – Equipment for Asphalt Concrete Pavement
6. Item 340 – Dense Graded Hot Mix Asphalt
7. Item 292 – Asphalt Treatment (Plant Mix)

B. American Society for Testing and Materials Standards (ASTM)

1. D 698 - Moisture Density Relations of Soil Using 5.5 Pound Rammer and 12 Inch Drop.
2. D 8-02 – Standard Terminology Relating to Materials for Road Pavements

C. Texas Department of Transportation Test Procedures

1. TEX 207-F – Determining Density of Compacted Bituminous Mixtures
2. TEX 227-F – Theoretical Maximum Specific Gravity of Bituminous Mixtures
3. TEX 227-F – Theoretical Maximum Specific Gravity of Bituminous Mixtures

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 11 00 Clearing and Grubbing

B. Section 31 22 13 Site Grading

C. Section 31 25 13 Erosion and Sedimentation Control

D. Section 32 17 23.13 Painted Pavement Markings

E. Section 32 17 23.33 Thermoplastic Pavement Markings

1.4 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.5 SUBMITTALS

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

B. Material Certificates: For each paving material, signed by manufacturers.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or if none exists, the DOT of the state in which Project is located.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.

2. Slurry Coat: Comply with weather limitations of ASTM D 3910.

3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.

4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 ASPHALTIC MATERIALS

A. Asphaltic material shall conform to the applicable requirements of TxDOT Item 300.

1. Asphalt cement shall be AC-20.

2. Prime coat shall be MC-250 or as directed by the Engineer.

3. Tack coat shall be CSS-1, CSS-1h, RS-1, or CRS-1 as directed by the Engineer

2.2 MINERAL AGGREGATES

A. The coarse aggregate, fine aggregate, and mineral filler shall conform to the requirements of TxDOT Item 340 article 340.2.A.1 Course Aggregate, 340.2.A.3 Fine Aggregate and 340.2.B Mineral Filler

2.3 ADDITIONAL BASE MATERIAL

A. Additional Crushed Limestone required per section 3.3.B below shall conform to the following requirements:

1. Table 1 in TxDOT Item 247.2.A Aggregate for Grade 2 when constructing roadways and Grade 3 when constructing parking lots.

2. Test results: Maximum Liquid Limit = 40; Maximum Plasticity Index = 12

3. Materials must be Crushed stone produced and graded from oversize quarried aggregate that originates from a single, naturally occurring source. Do not use gravel or multiple sources.

2.4 SURFACE COURSE AGGREGATE

A. Surface course aggregate material shall be composed of clean, tough and durable particles of gravel, crushed gravel or crushed stone meeting the sieve analysis requirements of TxDOT Item 302 "Type D”

2.5 EQUIPMENT

A. All equipment necessary to perform the work within the scope of this Section shall conform to requirements of Item 320, TxDOT.

2.6 WATER

A. Water used for mixing or curing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable matter or other substances injurious to the finished product.

B. Water sources other than the local municipal domestic water supply must be approved by the Owner.

1. If onsite reclaimed water sources are used, tanks and apprentices must be clearly marked with the words “non-potable” water.

PART 3 - EXECUTION

3.1 GENERAL

A. The equipment to be provided for the recycling and stabilization of the material specified herein shall include but not be limited to the following:

B. Recycling Unit: The recycling unit shall be a self propelled unit consisting of a variable speed rotor equipped with a minimum of 100 removable cutting teeth. The rotor shall have a minimum cutting width of 72 inches and a minimum cutting depth of 9 inches.

C. Compaction Equipment: The compaction equipment used to compact the stabilized material shall consist of approved rollers including pneumatic, steel wheel, and vibratory sheepsfoot of sufficient compactive effort to attain the required density requirements.

D. Water Placement Equipment: The equipment used to add water to the mixed material shall include spray bars or other distribution devices which will insure even distribution of water across the surface of the mixture. The equipment shall have adequate capacity to distribute the water during one application.

3.2 EROSION PROTECTION

A. There shall be at all times adequate protection to newly graded areas to prevent soil erosion as provided in Section 31 25 13 Erosion and Sedimentation Control.

B. Soil erosion that occurs prior to acceptance of the work shall be repaired at no expense to the Owner.

3.3 CONSTRUCTION METHOD

A. Prior to the start of the milling/mixing operations the pavement surface shall be cleaned of any loose materials and any and all vegetation. This shall be accomplished by blading and sweeping.

B. All asphalt and base material where specified shall be removed and relocated to a stockpile area. Additional base material consisting of crushed limestone per section 2.2 above as required shall be added to the stockpiled mix. The limestone material shall be thoroughly mixed with the stockpiled material to a uniform gradation throughout the mixture.

C. The completely mixed composite base material shall then be relocated to its original location after the subgrade has been lime stabilized per Section 31 32 13.19 "Lime Stabilization." Water shall be added during this operation until the optimum moisture content has been reached. The water shall be introduced into the mixture and shall be uniformly mixed throughout the material.

D. The base material shall be compacted as described in TxDOT ITEM 247 Flexible Base per article 247.4.C Compaction using Density Controls.

E. Degree of finish:

1. The surface of the completed pavement will be checked longitudinally and transversely for smoothness with a 10 foot straightedge.

2. The surface shall not vary more than 1/4" in 16 feet. Correct by loosening, adding or removing material, reshaping and recompacting in accordance with part C above.

F. Base course shall be allowed to cure until the moisture content is at least 2 percentage points below optimum before applying the next successive course or prime coat.

G. Contractor shall take special care in working in the area of underground electrical conduit for parking lot lights.

3.4 ASPHALTIC STABILIZED BASE

A. Before any material is placed, the subgrade and subgrade material shall be approved by the Owner. Subgrade fill material shall conform to the specifications for select fill as outlined in Site Grading Section 31 22 13, Article *2.2.A.2,* prepared and placed to the lines and grades shown on the plans. This does not preclude using site soils if they can be made to meet these specifications. Subgrade must be compacted to 95% of standard density in accordance with Section 31 22 13 before placing any base material. Where required by these specifications or as shown on the plans, the subgrade shall be stabilized with lime or cement.

B. Asphaltic stabilized base course shall be stockpiled, stored, proportioned, mixed and applied in accordance with Article 340.4 Item 340, TxDOT.

C. A tack coat of 0.05 to 0.15 gallons per square yard of surface shall be applied on each layer of the black base course and allowed to cure before placing the succeeding course.

D. The asphaltic stabilized base material shall be spread and shaped to a thickness and cross section that will provide the required thickness and section after compaction.

E. Compacting and finishing shall be accomplished as follows:

1. The mix shall be compacted immediately after placing.

2. Initial rolling with a steel-wheeled tandem roller, steel three-wheeled roller, or a pneumatic-tired roller shall follow the paver as close as possible.

3. Intermediate rolling with a pneumatic-tired roller shall follow the paver as close as possible.

4. Final rolling shall eliminate marks from previous rolling.

5. Initial, Intermediate and Final rolling pattern input can be obtained from Testing Laboratory in order to meet compaction and density requirements stated below.

6. In areas too small for the roller, a vibrating plate compactor or a hand tamper shall be used to achieve thorough compaction.

7. Compaction with Density Control shall meet requirements stated in TxDOT Item 292.4.E

8. Target density will be determined by taking the average density of five laboratory-prepared specimens collected at random from trucks delivering the mixture to the job site. A bulk sample must be taken at least every 300 tons or at a minimum of 1 per day.

8. Samples will be tested in accordance with TEX 207-F, TEX 222-F and TEX 227-F and test results shall be reported the same day the tests are made.

F. Degree of finish:

1. The surface of the completed pavement will be checked longitudinally and transversely for smoothness with a 10 foot straightedge.

2. The surface shall not vary more than 1/8" in 10 feet.

G. Base course shall be allowed to cure for a minimum of 72 hours prior to asphalt surfacing.

3.5 ASPHALT SURFACE COURSE

A. Asphalt surface course shall be applied in accordance with Article 340.4, Item 340, TxDOT.

B. Prior to the application of the prime coat, the prepared base shall be cleaned of all foreign or objectionable matter with power blowers, power brooms, or hand brooms as required.

C. Prime coat shall be applied to the base at a rate ranging from 0.2 to 0.5 gallons per square yard of surface.

D. Prime coat shall be applied in accordance with Item 310, TXDOT.

1. Material shall be as specified in paragraph *2.1 ASPHALTIC MATERIALS*.

2. Application temperature 100 degrees F.

E. A tack coat of 0.05 to 0.15 gallons per square yard of surface shall be applied on each layer of the surface course and allowed to cure before placing the succeeding course.

F. Compacting and finishing shall be accomplished as follows:

1. The mix shall be compacted immediately after placing.

2. Initial rolling with a steel-wheeled tandem roller, steel three-wheeled roller, or a pneumatic-tired roller shall follow the paver as close as possible.

3. Intermediate rolling with a pneumatic-tired roller shall follow the paver as close as possible.

4. Final rolling shall eliminate marks from previous rolling.

5. In areas too small for the roller, a vibrating plate compactor or a hand tamper shall be used to achieve thorough compaction.

6. Compaction with Air Void Control shall meet requirements stated in TxDOT Item 340.4.H

7. Target density will be determined by taking the average density of five laboratory-prepared specimens collected at random from trucks delivering the mixture to the job site. A bulk sample must be taken at least every 300 tons or at a minimum of 1 per day.

8. Samples will be tested in accordance with TEX 207-F, TEX 222-F and TEX 227-F and test results shall be reported the same day the tests are made

9. The surface of the completed pavement will be checked longitudinally and transversely for smoothness with a 10 foot straightedge.

10. The surface shall not vary more than 1/8" in 10 feet.

3.6 TESTING AND INSPECTION

A. Contractor shall notify Owner's testing laboratory 24 hours in advance of beginning any earth work operations and coordinate testing schedules to meet these specifications.

B. Base Course testing

1. Maximum density tests per ASTM D 698-07e1 shall be taken on all fill materials at a rate of one test for every 100 cubic yards of fill.

2. Field density tests per ASTM D 1556-07 shall be taken on all fill material at a rate of one test for every 100 cubic yards of fill.

3. All imported fill material shall be approved prior to importing.

4. Contractor shall provide certifications from the Owner approved testing laboratory that the specified quantity of cement has been provided.

5. Payment of any and all pay requests will not be made until specified tests are submitted to the Owner.

C. Surface Course Testing

1. Samples will be tested in accordance with TEX 207-F, TEX 222-F and TEX 227-F and test results shall be reported the same day the tests are made

3.7 DUST ABATEMENT

A. The Contractor shall comply with applicable Federal, State, and local laws and regulations concerning the prevention and control of dust pollution.

B. During the performance of the work required by these specifications or any operations appurtenant thereto, whether on right-of-way provided by the Owner or elsewhere, the Contractor shall furnish all the labor, equipment, materials, and means required, and shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance, and to prevent dust which has originated from his operations from damaging crops, orchards, cultivated fields, and dwellings, or causing a nuisance to persons. The Contractor will be held liable for any damage resulting from dust originating from his operations under these specifications.

C. Dust Control shall be accomplished by one of the following methods:

1. Whenever ordered by the Owner, the Contractor shall furnish and distribute over the traveled road surfaces, which have not yet been fully restored, an application of Calcium Chloride. The material used shall be Regular Flake Calcium Chloride having a minimum chemical content of Calcium Chloride of 77%. Unless otherwise specified or ordered by the Owner, rate of application shall be three (3) pounds per square yard of surface covered.

2. Whenever ordered by the Owner, the Contractor shall apply on traveled road surfaces "Bituminous Surface Treatment" in accordance with the current Texas Standard Specifications for Construction of Highways, Streets and Bridges.

D. The cost of sprinkling or of other methods of reducing formation of dust shall be included in the prices bid in the schedule for other items of work.

END OF SECTION