

## SECTION 02500

### ASPHALT PAVING AND SURFACING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Traffic control as required to divert vehicular and pedestrian traffic around construction.
- B. Spreading and compacting aggregate sub-base material.
- C. Spreading and compacting aggregate base material.
- D. Spreading and compacting asphalt concrete pavement and surfacing.
- E. Grinding existing pavement at conforms and for overlaying.
- F. Replacing asphalt concrete surfacing (Spot Reconstruction).
- G. Shoulder backing.
- H. Applying prime coat and tack coat.
- I. Dust alleviation and control.
- J. Cleanup and disposal of debris.
- K. Supplying all labor, materials, equipment and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work specified.

##### 1.02 APPLICABLE PUBLICATION

- A. The publications listed below form a part of this specification to the extent referenced. The publication is referred to in the text by the general designation only.
- B. American Society for Testing and Materials (ASTM) Publication:
  - D - 1557      Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb. (4.54 KG) Rammer and 18-in. (457mm) Drop.
- C. California Department of Transportation Testing Manual:
  - Test 304      Method of Preparation of Bituminous Mixtures for Testing
  - Test 375      Determining the In-Place Density and Relative Compaction of AC Pavement

##### 1.03 QUALITY ASSURANCE

- A. Codes and Standards

1. Spreading and compacting of aggregate subbase material shall conform to the applicable provisions of Section 25 of the State Standard Specifications.
2. Spreading and compacting of aggregate base material shall conform to the applicable provisions of Section 26 of the State Standard Specifications.
3. Spreading and compacting of asphalt concrete shall conform to the applicable provisions of Section 39 of the State Standard Specifications.
4. Traffic Control shall conform to Section 01550 of these Specifications.

**B. Allowable Tolerances**

1. Finish surface of the aggregate base or aggregate subbase courses shall not vary more than 0.05 feet from the grade established by the Engineer.
2. Finish surface of asphalt concrete when measured with a twelve-foot straight edge shall not vary more than 0.01 feet in the longitudinal direction and 0.02 feet transversely below the lower edge of the straight-edge.
3. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM Designation D1557.

**C. Submittals**

1. For aggregate bases and sub-bases, the contractor shall arrange and provide for the following acceptance tests to be performed on samples taken at the job site, based on a frequency of one series of tests per 3000 tons of material placed:
  - a. "R" valve, per California Test Method 301;
  - b. Sieve Analysis, per California Test Method 202;
  - c. Sand equivalency, per California Test Method 217;
  - d. For aggregate bases, the durability index, per California Test Method 229.
2. Provide the Engineer daily with one (1) copy of a material certificate signed by material producer certifying that each material item complies with or exceeds the specified requirements for each type of material delivered.
3. Provide the Engineer with one (1) copy of certified plant load out slips for each load of material delivered showing net weight of aggregate base, subbase or asphalt concrete delivered to the job site, to be attached to the appropriate material certificate.
4. Submit a traffic detour plan and obtain approval prior to closing any traffic lane.

**1.04 JOB CONDITIONS & MINIMUM TEMPERATURES**

- A.** Aggregate base or subbase material shall not be placed until the subgrade has been approved.
- B.** Provide satisfactory dust alleviation and control measures continuously during the course of the work.

- C. Prime or tack coat materials shall not be applied unless the ambient temperature is above 50°F and has not been below 35°F during the twelve (12) hours immediately prior to application. Prime or tack coats shall not be applied when the surface to be coated is wet or contains an excess of moisture.
- D. Asphalt concrete shall not be applied unless the ambient temperature is above 50 degrees F and rising, the surface is dry, and upon specific approval by the Engineer.
- E. Temperature of asphalt concrete shall not be less than 250 degrees F during initial spreading.

## **PART 2 - PRODUCTS**

### **2.01 AGGREGATE SUBBASE**

- A. Materials for aggregate subbase shall conform to the requirements for Class 2 aggregate subbase contained in Section 25-1.02A of the State Standard Specification.

### **2.02 AGGREGATE BASE**

- A. Materials for aggregate base shall conform to the requirements for Class 2 aggregate base contained in Section 26-1.02A of the State Standard Specifications.

### **2.03 ASPHALT CONCRETE**

- A. Asphalt to be mixed with aggregate to form asphalt concrete shall be steam-refined paving asphalt, grade PG-64-10, conforming to the requirements of Section 92-1.02 and 1.03 of the State Standard Specifications.
- B. Aggregate for asphalt concrete shall be Type A conforming to the requirements of Section 39-2.02 of the State Standard Specifications with the following special provisions:
  - 1. Grading of combined aggregates for new asphalt concrete pavement, walkways, and overlays two (2) inches or more in thickness shall be three-quarter (3/4) inch maximum size, medium grading.
  - 2. Grading of combined aggregate for asphalt concrete pavement, walkways and overlays less than two (2) inches in thickness shall be one half (1/2) inch maximum size, medium grading.
- C. Liquid asphalt for prime coat shall be Grade SS-1 conforming to the requirements of Section 94 of the State Standard Specifications.
- D. Asphaltic emulsion for tack coat (paint binder) shall be emulsified asphalt, Type SS-1h conforming to the requirements of Section 94-1.01 through 1.05 of the State Standard Specifications.
- E. Suppliers certification showing conformance to these specifications shall be delivered with each shipment of materials to the job site.

## **2.04 REINFORCING FABRIC**

- A.** Reinforcing fabric, if required by the plans, shall conform to Section 88 of the State Standard Specifications.
- B.** At least one side of the reinforcing fabric shall be heat bonded, or heat set.

## **PART 3 - EXECUTION**

### **3.01 AGGREGATE SUBBASE**

- A.** Subbase material shall be placed, spread and compacted in conformance with the requirements of Section 25-1.04 and 1.05 of the State Standard Specifications.
- B.** Subbase material shall be compacted to a relative density of not less than 95% when tested in accordance with the requirements of ASTM 1557.

### **3.02 AGGREGATE BASE**

- A.** Base material shall be placed, spread and compacted in conformance with the applicable requirements of Section 26-1.035, 1.04 and 1.05 of the State Standard Specifications.
- B.** Base material shall be compacted to a relative density of not less than 95% when tested in accordance with the requirements of ASTM 1557.

### **3.03 PRIME, TACK COATS, AND SURFACE PREPARATION**

- A.** Liquid asphalt prime coat shall then be applied to the aggregate base course in conformance with the requirements of Section 39-4.02 of the State Standard Specifications. Prime coat shall be applied at the rate of 0.25 gallons per square yard unless otherwise directed. After the liquid asphalt has penetrated the base course, any excess standing on the surface shall be absorbed to the satisfaction of the Engineer with a suitable coating of clean sand.
- B.** Tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, catch basins, manhole frames, and construction joints in the surfacing to the horizontal surface of all existing pavements to be resurfaced and other surfaces designated. Asphaltic paint binder shall be provided in sufficient quantity to produce a thin, uniform black, glossy coat of asphalt. Pools in unevenly distributed material shall be spread out by squeegee, broom or other means so an even coverage is attained. Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed. Do not track tack coat onto pavement surfaces beyond the job site. Discontinue application of emulsion early enough to comply with lane closure specifications and daily work advancement. Do not track tack coat onto pavement surfaces beyond the job site.
- C.** Distributed areas shall be redistributed by means of hand brooms. Tack coat shall be applied in conformance with the applicable requirements of Section 39-4.02 of the State Standard Specifications.

- D. Prior to placing asphalt over existing pavement, sweep the pavement clean of loose dirt to the satisfaction of the Engineer.

### **3.04 ASPHALT CONCRETE**

- A. Asphalt concrete shall be proportioned, mixed, placed, spread and compacted in conformance with the applicable requirements of Section 39-3 and 39-6 of the State Standard Specifications and the following requirements:
  - 1. Asphalt concrete shall be placed only upon specific approval of the Engineer. When, in the opinion of the Engineer, the surface is too wet, no asphalt concrete shall be placed. The Engineer will make the final decision as to whether conditions are satisfactory for paving.
  - 2. No asphalt concrete surface course shall be placed when the ambient temperature is less than 50° F. All compaction shall be completed before the temperature of the mixture drops below 200 °F.
  - 3. All longitudinal joints shall be "hot" joints; cold joints are only allowed transversely at discontinuance of the day's run.
  - 4. Asphalt concrete for roadways shall be placed in layers when the total depth called for on the plans and detail drawings exceeds two (2) inches. The final layer shall not be less than one and one-half (1-1/2) inches in compacted thickness no more than two (2) inches. Where more than four and one-half (4-1/2) inches in total compacted thickness are specified, three (3) or more layers shall be required. The first lower layer shall not exceed two and one-half (2-1/2) inches in compacted thickness.
  - 5. All asphalt courses shall be placed by means of an approved self-propelled asphalt paving machine. Contractor may place lower courses and compact all courses with equipment conforming to the requirements of Section 39-5 of the State Standard Specification.
  - 6. The window/pick-up machine method for spreading asphalt may be used with the following restrictions:
    - a. The machine is self-supporting and may not transmit loads to the paving machine. The use of a track type machine is recommended.
    - b. The maximum window length in front of the paving machine shall be 200-feet, and shall not block intersections.
    - c. The Contractor shall furnish a "Dump Man" for the control of window distribution.
    - d. At the sole discretion of the Engineer, depending on ambient temperature and the length of haul, the loaded trucks must be covered with a tarp.
    - e. Any damages to the reinforcing fabric caused by the pick-up machine shall be repaired before the work is allowed to continue.
    - f. At the sole discretion of the Engineer, depending on traffic control operations, the use of double-bottom dump trucks may be prohibited.
  - 7. Where asphalt paving is to be laid against concrete gutter, the first pass shall start at the gutter and successive passes work towards the center of the street, and the finish surface of the asphalt concrete wearing course shall be

constructed to a height one-quarter (1/4) inch above the abutting edge of the gutter.

8. Trucks, loaded or empty, shall not be allowed on the new surface until the asphalt concrete reaches ambient temperature.
- B. The final lift of asphalt paving shall not be placed until all other construction activity, including building construction and landscaping is completed.
- C. When placing asphalt over existing pavement, repair large cracks, spalls, and chuck-holes, and clean the pavement surface to the satisfaction of the City Engineer.
- D. Asphalt concrete shall be rolled such that compaction after rolling shall be 95% of the density obtained with the California Test 304. Field density tests may be conducted by the Engineer to confirm density using the California Test 375.
- E. Failure to meet the specified density may require credits back to the City for non-conformance.

### **3.05 ADJUST MANHOLES, VALVES, AND MONUMENT COVERS**

- A. Existing manholes, lampholes, valve and monument covers, or other such structures in the line of the work shall be adjusted to conform with the new grade after completion of paving operations.
- B. The box will be adjusted by removing the existing concrete pad and pouring a new pad of concrete.
- C. The concrete collar shall be circular and shall be covered with a minimum of two (2) inches of asphalt concrete to blend in with the adjacent surfacing.
- D. Extension rings will not be acceptable. Contractor shall be responsible for preserving the survey point in its original position.

### **3.06 ASPHALT PLANING**

- A. The depth, width, and shape of the cut shall be as shown on the plans by a project-specific detail, or if there is no project-specific detail, as shown on City Standard Engineering Detail A-6.
- B. Asphalt planing operations shall provide a final cut resulting in a uniform surface conforming to the typical cross sections, and be performed without damage to the surfacing to remain in place.
- C. For overlay, plane as necessary to allow a minimum overlay of two (2) inch to new elevations.
- D. Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical:Horizontal) or flatter to the level of the planed area.

- E. The contractor will be held responsible for any and all damage to trees, plants, and shrubs caused by the grinding operation and shall satisfactorily replace with new material or correct any damage.
- F. Ground asphalt concrete shall be removed from the job site and disposed of immediately following the grinding operation.
- G. Ground areas shall be overlaid within one week of grinding.

### **3.07 ASPHALT CONCRETE SPOT RECONSTRUCTION**

- A. This work shall consist of removing existing asphalt concrete surfacing and underlying base material and replacing the removed surfacing and base material with new asphalt concrete as shown on the plans and specified in these technical specifications.
- B. The exact limits of asphalt concrete surfacing to be removed and replaced will be determined by the Engineer.
- C. Existing surfacing and underlying base material removed during a work period shall be replaced before the lane is to be opened.
- D. A four-foot wide grind is required as shown on the plans and directed by the Engineer.
- E. Surfacing and base material shall be removed without damage to surfacing that is to remain in place. Damage to pavement which is to remain in place shall be repaired to a condition satisfactory to the Engineer.
- F. The material remaining in place, after removing surfacing and base material to the required depth, shall be graded to a plane, watered, and compacted.
  - 1. The finished surface of the remaining material shall not extend above the grade established by the Engineer
  - 2. Areas of the base material which are low or beyond the area approved by the Engineer as a result of over excavation shall be filled, at the Contractor's expense, with asphalt concrete.

### **3.08 SHOULDER BACKING**

- A. Shoulder backing shall be applied as shown on the plans, in conformance with the applicable provisions of sections 24 and 26, "Lime Stabilization" and "Aggregate Bases" of the State Standard Specifications, and these technical specifications.
- B. Work shall consist of placing a compacted layer of lime treated, Class 2 aggregate base on the shoulder of the roadway, in areas shown on the plans or as directed by the Engineer. Affected shoulder areas generally consist of previously disturbed aggregate and dirt adjacent to the paved roadway.
- C. Shoulder backing shall be four feet in width and two inches in height, unless otherwise shown on the plans or directed by the Engineer.

### **3.09 REINFORCEMENT FABRIC**

- A.** Reinforcing Fabric shall be installed in accordance with Section 39-4.03 of the State Standard Specifications.
- B.** Fabric which may have become damaged by paving equipment shall be satisfactorily repaired prior to proceeding with the paving operation.
- C.** Install fabric with bonded side up.
- D.** At each utility cover which would be covered with fabric, the fabric shall be neatly cut around the cover to allow for raising of the cover to finish grade.

### **3.10 SPEED HUMPS/TABLES**

- A.** Install speed humps/tables where shown on the plans using hot mix asphalt concrete, 3/8" maximum size gradation.
- B.** Apply tack coat to existing pavement prior to laying asphalt.
- C.** Spread asphalt by hand using a template/screed approved by the Engineer to the dimensions shown.
- D.** Compact the humps/tables using an 8-ton static roller.
- E.** Multiple lifts may be required at the discretion of the Engineer, in order to accomplish the design tolerances. In which case, multiple templates or screeds may be required.
- F.** The cross-section of the humps/tables shall not vary by more than 0.25" from the design height.

### **3.11 DUST ALLEVIATION AND CONTROL**

- A.** Contractor shall provide satisfactory pollution and dust abatement and control measures continuously during the course of the work.
- B.** The Contractor shall utilize reclaimed water, or dust palliatives, in compliance with the City's Water Conservation Ordinance.

### **3.12 TRAFFIC CONTROL AND STRIPING**

- A.** Provide satisfactory traffic control measures and warning devices to safely detour traffic around construction activity in accordance with Section 01550 of these Specifications.
- B.** If the street is to be opened for traffic, or as directed by the Engineer, temporary delineation shall be placed on new surfaces immediately after the asphalt concrete has been finished rolled. Temporary delineation shall conform to Section 02840 of these Specifications.



### **3.13 CLEANUP**

- A.** Upon completion of asphalt paving and surfacing operations, the entire work site shall be cleaned of all waste, rubbish, and construction debris of any nature.

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