TECHNICAL SPECIFICATIONS No. 13

ASPHALT CONCRETE SURFACING

DESCRIPTION

1301.1 Furnishing, spreading and compacting Asphalt Concrete shall be in conformance with Section 39, ***"Asphalt Concrete,"*** of the State of California Department of Transportation Standard Specifications except as amended by the Plans or Special Provisions.

MATERIALS

1302.1 Asphalt Concrete shall be **Type A**, unless otherwise specified by the Plans or Special Provisions.

1302.2 Aggregate used in Asphalt Concrete shall conform to the grading requirements of Section 39-2.02, ***"Aggregate,"*** of the Standard Specifications, as modified herein. Aggregate shall be **¾ inch Maximum, Medium, grading for streets** unless otherwise shown on the Plans or Special Provisions. Aggregate shall be **½ inch Maximum, Medium, grading for parking lots, bike paths, alleys and for street overlays with less than 2 ¼ inches in compacted thickness**.

1302.3 Asphalt binder shall be Performance **Grade 70-10** paving asphalt conforming to Section 92, ***"Asphalt,"*** of the Standard Specifications unless otherwise specified on the Plans or Special Provisions.

1302.4 The percentage of air voids in the mix design at the target asphalt binder content ***("Target Oil Content")*** shall be between **three (3) and five (5) percent**.

MIX DESIGN

1303.1 The Contractor shall provide the Asphalt Concrete mix design to the City Engineer at least ten (10) working days prior to start of work on the project for review and approval. The mix design must be approved by the City Engineer prior to commencement of work.

1303.2 The Asphalt Concrete mix design shall indicate the following:

A. Complete aggregate grading with the percentage of aggregate passing each sieve size and that the aggregate gradation is in conformance with these specifications.
B. Percent air voids for each percentage of asphalt binder used in the mix design determination.
C. Hveem Stability for each percentage of asphalt binder used in the mix design determination.

D. Compacted unit weight for each percentage of asphalt binder used in the mix design determination per CTM 308 ***"Method of Test Bulk Specific Gravity and Density of Bituminous Mixtures."***

E. Laboratory Test Maximum Density at Target asphalt binder used in the mix design determination per CTM 375 ***"Determining the in Place Density and Relative Compaction of Asphalt Concrete."***

F. Percent asphalt binder recommended for the Target Oil Content.

1303.3 The Target Oil Content to be mixed with the aggregate for Asphalt Concrete shall be approved by the City Engineer based on data from California Test Method (CTM) 367, ***"Method for Determining Optimum Bitumen Content,"*** provided by the Contractor.

1303.4 No recycled asphalt pavement (RAP) shall be introduced (or mixed) into the asphalt concrete mixture.

PROPORTIONING AND MIX TOLERANCE

1304.1 **Proportioning:** If the Contractor selects the batch mixing method, Asphalt Concrete shall be produced by the automatic batch mixing method as provided in Section 39-3.03 A(2), ***"Automatic Proportioning,"*** of the Standard Specifications.

1304.2 **Mix Tolerance:** The maximum single point tolerance for binder content during placement of the Asphalt Concrete shall be plus or minus 0.45% from the Target Oil Content designated by the approved mix design unless the tolerance will create a mix that is outside the specifications for air voids and/or stability.

SPREADING, COMPACTING AND TESTING

1305.1 Spreading and Compacting shall conform to Section 39-6, ***"Spreading and Compacting,"*** of the Standard Specifications except as amended herein. Asphalt Concrete shall be placed only when the atmospheric temperature is above 50 degrees F. Asphalt Concrete shall be spread at a mix temperature of not less than 260° degrees F. When placing Asphalt Concrete, large aggregate that migrates to the surface during any handwork shall be returned to the paver box, rather than scattered over the surface of the mat.

1305.2 The surface of the finished aggregate base prior to the placement of asphalt concrete at any point shall not vary more than 0.04 ft. above or below the grade established by the improvement plans

1305.3 Asphalt Concrete placed in layers less than two-inches (2") in compacted thickness or widths of less than five-feet (5') shall be spread and compacted with the equipment and by methods specified in Section 39 of the Standard Specifications, except as amended by the specifications.

1305.4 Asphalt concrete placed in layers of two-inches (2") and greater in compacted thickness and widths of five-feet (5') and greater shall be spread and compacted with the equipment and by the methods specified in Section 39 of the standard specification, except as amended by these specifications.

1305.5 The entire contents of Section 39-5.02, ***"Compacting Equipment,"*** of the Standard Specifications are amended to read:

The Contractor shall furnish a sufficient number of rollers to obtain the compaction specified and surface finish required by these Specification. Each roller shall have a separate operator. All rolling equipment shall be self-propelled and reversible. All rollers shall be equipped with pads and water systems, which prevent sticking of asphalt concrete mixtures to the pneumatic or steel-tired wheels. A parting agent, which will not damage the asphalt concrete mixture, as determined by the Inspector, may be used to aid in preventing the sticking of the mixture to the wheels. Other equipment, approved by the Inspector in accordance with CTM 113, ***"Method for Evaluating the Capabilities of Asphalt Concrete Compactors,"*** may be substituted for 3-wheel or tandem rollers when used as specified in Section 39-6.03, ***"Compacting,"*** of the Standard Specifications.

1305.6 The entire contents of Section 39-6.03, ***"Compacting,"*** of the Standard Specifications, is amended to read:

A pass shall be one movement of a roller in either direction. A coverage shall be as many passes as are necessary to cover the entire width being paved. Overlap between passes during any coverage, made to ensure compaction without displacement of material in accordance with industry accepted rolling practice, shall be considered to be part of the coverage being made and not part of a subsequent coverage. Each coverage shall be completed before subsequent coverage is started.

1305.7 Rolling shall commence at the lower edge and shall progress toward the highest portion, except that when compacting layers which exceed 3-inches in compacted thickness, and if directed by the Inspectors, rolling shall commence at the center and shall progress outwards.

1305.8 Rolling shall be performed so that cracking, shoving, or displacement is avoided.

1305.9 Initial breakdown rolling shall commence as soon as practical following the spreading of the Asphalt Concrete.

1305.10 Finish rolling or final compaction shall be completed while the temperature of the mixture is at or above 150° F. A vibratory roller may be used as the finish roller provided that it meets the requirements for a finish roller and is operated with the vibratory unit turned off.

1305.11 Asphalt Concrete shall be finished to the lines, grades, and cross sections shown on the Plans.

1305.12 Asphalt Concrete shall be compacted to not less than 95.0 percent for a single test and not less than an average in place density of 96.0 percent relative compaction of the Laboratory Test Maximum Density as determined by, CTM 375 except as modified by these Specifications.

1305.13 In-place density of the Asphalt Concrete will be based on test results from a nuclear gauge and core samples taken in accordance with CTM 375, ***"Determining the in-Place Density and Relative Compaction of Asphalt Concrete Pavement,"*** except as modified by these specifications. The Inspector will determine when core sample testing shall be completed.

1305.14 The materials testing laboratory will obtain random samples of the asphalt concrete mixture from behind the paving machine in accordance with CTM 125, ***"Methods for Sampling Highway Materials and Products in Roadway Structural Sections,"*** to determine the Laboratory Test Maximum Density of the asphalt concrete mixture in accordance with CTM 308.

1305.15 Asphalt Concrete compaction shall be accepted based upon passing tests taken from the nuclear gauge. In the event that the nuclear gauge testing presents failing results, then core samples will be the determination for the in place density and acceptance or rejection of the compaction.

1305.16 When core testing is to be performed to determine the relative compaction after nuclear gauge testing has not produced passing tests, the materials testing laboratory will obtain four 4" diameter core specimens (or four 6" diameter core specimens) for determination of relative density of the completed pavement. The four cores shall represent each 500 ton lot in lieu of the sample frequency requirements specified in CTM 375.

1305.17 Upon completion of the rolling operations, if requested by the Contractor and accepted by the Inspector, the Asphalt Concrete shall be cooled by applying water. Applying water shall conform to the provisions in Section 17, ***"Watering,"*** of the Standard Specifications.

1305.18 The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the Asphalt Concrete shall be eliminated by rolling or other means approved by the Inspector. The use of any equipment that leaves ridges, indentations or other objectionable marks in the Asphalt Concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

1305.19 When a straightedge 12-foot long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present

when tested with a straightedge 12-feet long laid in a direction transverse to the center line and extending from edge to edge of a 12-foot traffic lane.

1305.20 Pavement within 50-feet of an approach slab, or within 50-feet of a structure when no approach slab exists shall conform to the smoothness tolerances specified in section 51–1.17, ***"Finishing Bridge Decks,"*** of the Standard Specifications.

EXISTING PAVEMENT

1306.1 Cut lines on existing pavement, both longitudinal and transverse, for the placing of a new structural section shall be straight and smooth.

1306.2 Edge grinding (Cold Planning) shall be required where existing asphalt is to be overlaid along the length of the gutter lip and abutting pavement where the Asphalt Concrete pavement is proposed to conform to the existing pavement.

1306.3 The surface edges that abut the proposed Asphalt Concrete shall be clean and free of dirt and dust prior to placing a tack coat. Asphalt emulsion shall be used as a tack coat or paint binder on new pavement that is to receive a second lift which is not placed within 24 hours of the first lift, or which has been exposed to traffic or other sources of contaminants, or on existing pavements that are to receive an asphalt concrete overlay, and also along all exposed edges of abutting pavement and concrete overlay, and gutters. A tack coat may also be required between subsequent layers of Asphalt Concrete placed by the Contractor when ordered by the Inspector, Asphalt emulsion shall conform to Section 92, ***"Asphalts,"*** of the Standard Specifications.

1306.4 Existing pavements to be overlaid with Asphalt Concrete shall include the installation of pavement reinforcing fabric in accordance with Section 88, ***"Engineering Fabrics,"*** of the Standard Specifications.

MISCELLANEOUS PAVING REQUIREMENTS

1307.1 The contractor shall schedule paving operations such that at the end of each work day each layer of Asphalt Concrete is placed on all contiguous lanes and shoulders of a traveled way to be opened to public traffic.

1307.2 At the end of each work day, the distance between the ends of the layers of Asphalt Concrete on adjacent lanes shall not be greater than 10-feet nor less than 5-feet. A drop-off of more than 0.15-foot will not be allowed at any time between adjacent lanes open to public traffic.

1307.3 Additional Asphalt Concrete shall be placed along the transverse edge at the end of each lane and along the exposed longitudinal edges between adjacent lanes, hand raked, and compacted to form temporary conforms. Construction paper, or other approved bond breaker, may be placed under the conform tapers to facilitate the removal of the taper when paving operations resume.

1307.4 Additional Asphalt Concrete surfacing material shall be placed along the edge of the surfacing at private drives, hand raked, if necessary, and compacted to form smooth tapered conforms.

1307.5 All trenches shall be backfilled and covered at the end of each workday and during weekend and holiday periods as specified in these Special Provisions and as directed by the Engineer.

1307.6 In lieu of completely backfilling the trenches, the Contractor may elect to install steel plates over the open trench during non-working hours. In areas where traffic on the plate is expected, the Contractor shall provide traffic rated steel plates and shall provide temporary paving ramping at the edges of the trench plate. In no situation shall the plates rest on shields, supports or other devices raising the plate above adjacent surface grades; the plates shall rest on the adjacent grade.

1307.7 Type "A" plating shall be used in cases where the posted speed exceeds 25 mph, the plates shall be recessed, Type "B" Plating shall be used where the posted speed is less than 25 mph and shall be held in place by pins and cold mix ramps of 2' width on all four sides. See Public Improvement Standard detail #6820.

GRADING TOLERANCE

1308.1 The finished surface of the Asphalt Concrete shall be free from ruts, humps, depressions, or irregularities. The Contractor shall at its own expense, bring the pavement surface within tolerance by one of the following methods: The City Engineer shall determine which method the Contractor is required to perform.

1308.2 **1. Method A**

A. The Contractor shall Cold Plane the asphalt concrete pavement to a minimum depth of 0.15 feet from specified finish surface (lateral limits shall be from edge of Asphalt Concrete; longitudinal limits shall extend a minimum of 50 feet, starting from the outer edge of the tolerance area and extending outward, and as directed by the Inspector). All grindings shall be removed and disposed of in accordance with Section 7-1.1, ***"Disposal of Material outside the Highway Right-of-Way,"*** of the Standard Specifications.

B. The Contractor shall apply tack coat and place an overlay of Asphalt Concrete in accordance with the requirements of these Specifications.

C. The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

1308.3 **2. Method B**

A. The Contractor shall groove and grind the Asphalt Concrete pavement in conformance with Section 42, ***"Groove and Grind Pavement,"*** of the Standard Specifications.

B. The contractor shall furnish and apply a fog seal on the pavement after the inspector approves the groove and grind work. The fog seal shall conform to Section 37, ***"Bituminous Seals,"*** of the Standard Specifications. The Inspector shall approve the grade of asphaltic emulsion to be used in the fog seal and the limits of installation.

C. The area to which the fog seal has been applied shall be closed to public traffic. Care shall be taken to avoid tracking the fog seal material onto existing pavement surfaces beyond the limits of construction.