SECTION 32 12 16
ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt paving - all applications

1.02 RELATED REQUIREMENTS

A. Section 32 01 17 – Asphalt Paving Repair

1.03 QUALITY ASSURANCE

A. Obtain materials from same source throughout.

1.04 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 45 degrees Fahrenheit, or surface is wet or frozen.

1.05 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

C. Shop Drawings: Indicate plans for each unit or groups of units, elevations with model number, overall dimensions; construction, and anchorage details.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt paving mixtures shall consist of coarse aggregate, fine aggregate and mineral filler thoroughly coated with asphalt cement. The coarse aggregate shall be sound, angular crushed stone, crushed gravel, or crushed slag. Uncrushed coarse aggregate may be used in base course mixtures if the mixture meets all design criteria. The fine aggregate shall be well graded, moderately sharp to sharp sands. All fine aggregate shall consist of hard, strong, durable particles, which are free from a coating or any injurious materials and injurious amounts of clay, loam, or other deleterious substances. Paving mixtures shall meet the following requirements for grading and composition:

1. PERCENT OF MIXTURE BY WEIGHT PASSING SIEVE:
    a. SIEVE SIZE TYPE 7-F TYPE 6-F TYPE 3 DENSE BINDER
    b. ----------
    c. 1 ½ INCH - - 100
    d. 1 INCH - 100 90-100
    e. ½ INCH 100 95-100 70-90
    f. ¼ INCH 90-100 65-85 48-74
    g. 1/8 INCH 45-70 36-65 32-62
    h. No. 20 15-40 15-39 15-39
    i. No. 40 8-27 8-27 8-27
    j. No. 80 4-16 4-16 4-16
    k. No. 200 2-6 2-6 2-8
    l. Asphaltic Cement 6.8-8.0 5.8-7.0 4.5-6.5
2. All Type 7-F Top Course asphalt, Type 6-F Top Course asphalt and Type 3 Dense Binder shall be in accordance with the New York State Department of Transportation (NYSDOT) current Specifications.
3. Asphalt cement shall be 100% soluble in Trichloroethylene. Viscosity of the asphalt cement shall be AC 20. The mix shall have a minimum Marshall Method Mix Criteria of 500 lbs. Stability, Flow of 8 to 16, and percent of air voids three to five percent. The asphalt shall be prepared by refining crude petroleum by suitable methods. It shall be

homogeneous, free from water and shall not foam when heated to 347 degrees Fahrenheit.

B. The tack coat can be either a diluted, emulsified asphalt for tack coats, such as types SS-1, RS-1 or RS-2, diluted with equal parts of water added to the emulsion, or type RC 70 rapid curing liquid asphalt without dilution, mechanically sprayed in a uniform, thin coat over the entire area. The spray should be applied with an application rate of 0.10 to 0.15 gal/sq. yd.

C. Stone screenings for sub-base shall be either limestone or trap rock of hard, durable sharp angled fragments, free from dirt or other deleterious material and graded within the following limits:

1. SIEVE SIZE PERCENT PASSING SIEVE
   a. 1 INCH 100
   b. ¾ INCH 85
   c. ½ INCH 60
   d. ¼ INCH 25
   e. 1/8 INCH 10
2. Base course shall be a minimum of 4 inches deep. Recycled concrete shall not be used as base course for asphalt pavement.

D. Sampling and testing of paving mixtures; examination of production methods, apparatus and mixing plant if required shall be made in accordance with the latest Specifications of The American Society for Testing Materials.

E. Forms shall be steel or standard nominal 2-inch thick wood planks, free from bends and warps, and shall be cleaned thoroughly and oiled before pavement is placed against them; this cleaning and oiling must be repeated daily as forms are re-used. The forms shall rest firmly upon the thoroughly compacted sub-grade throughout their entire length, shall be joined neatly and tightly, and staked securely to line and grade.

F. Permanent steel curbing/edging if called for on the Drawings shall be as manufactured by Border Concepts, Charlotte, NC, Telephone1.800.845.3343, local Rep is Avanti Industries, Inc., phone 718.406.4116,attn: Anglea or approved equal. It shall be 1/4 inch thick by five (5) inches wide and furnished in 16-foot long sections with slots pressed out along the length and at the ends. The ends shall be shaped to allow interlocking of adjoining sections. The curbing/edging shall be installed flush with the finished surface of the asphalt paving and staked securely in place with tapered steel stakes 12 inches long. Stakes shall be set through the slots in the curbing/edging and driven in place flush with top of curbing/edging. Border King shall be used for heavy duty uses-vehicle areas, high traffic walkways; Border Line shall be used for bed edging, walkways; Border Flex shall be used for areas with limited foot traffic. Color TBD.

1. Permanent concrete curbs, if used for delineating the pavement, may act as forms for the asphalt pavement. Concrete for curbs shall conform to the Concrete Section of these Specifications.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.

B. Submit proposed mix design of each class of mix for review prior to beginning of work.

PART 3 EXECUTION

3.01 CONSTRUCTION

A. The Contractor shall accept the conditions and grades as they exist and shall do all excavating including removals and furnish all clean fill as may be required to establish the compacted sub-grade at the required levels, below and parallel with the finished surface of the pavement.

B. Sub-grade to receive pavement shall be free of soft or spongy material. Material in soft spots shall be removed to the depth required to provide a firm foundation and shall be replaced with clean fill. The sub-grade shall be shaped and compacted with a 5 to 8 ton self-propelled roller. Areas inaccessible to the roller shall be thoroughly compacted with other approved compaction tools. Any work to be constructed below grade must be satisfactorily back-filled before

preparation of sub-grade is begun. Rolling and compaction of the sub-grade shall continue until the surface is hard, uniform, smooth, even bearing, unyielding and true to grade and cross-section.

C. Paved areas where new full depth asphalt paving is called for shall be excavated to the required depth and old pavements removed from the site.

D. Planted areas where new asphalt paving is called for shall be stripped of existing topsoil to the required depth for the paving. The topsoil shall be stockpiled on the site in areas designated by the Development Superintendent. No topsoil shall be removed from the site without permission of the Authority. All debris, vegetation, or other perishable materials shall be removed from the area, except for trees or shrubs designated for preservation.

E. The Contractor shall adjust frames and covers of drainage and other flush surface structures in the construction area to the new finished grades. Walls of these structures shall be cut or extended as required. Extensions shall be of brick and mortar, the same thickness as the existing wall. Inside and outside of extension shall be parged with 1:3 cement mortar 1/2 inch thick. Frames of all adjusted structures shall be set on a full bed of mortar. The Contractor shall properly align the frames and covers. He shall provide all safety and protective barricades around open structures.

F. The surface of curbs, vertical faces of existing pavements and all structures that are to be in actual contact with the asphalt pavement shall be given a thin, even coating of a hot, asphaltic cement, such as RC7O. All curbs, pavements, walls, fences, manholes, drain inlet basins and other structures that will not be in contact with the asphalt pavement shall be fully protected against painting, splattering, staining, or other defacement. Drain inlets, catch basins, manholes and other openings shall be protected against intrusion of any materials. The protection shall be continued and maintained until completion of the paving.

G. STONE SCREENINGS: Where called for on the Drawings, stone screenings shall be evenly spread and compacted on the prepared sub-grade into a uniform layer of the thickness shown on the Drawings. It shall be consolidated and compressed with a self-propelled 5 to 8-ton roller until the surface is even bearing and unyielding. Locations inaccessible to the roller shall be thoroughly compressed with proper tools to a compacted density equal to the rolled area. The Contractor shall maintain and repair the stone screenings base course until the surface course has been placed.

H. TACK COAT: A tack coat shall be used on all pavement surfaces that are to receive an overlying course of new asphalt. A very light tack coat should be applied after brooming, between layers of new pavement. The tack coat shall be applied on only as much pavement as can be covered with asphalt pavement in the same day.

I. TYPE 3 DENSE BINDER: Where called for on the Drawings, a plant mixed binder in accordance with the Materials Section of these Specifications, shall be spread and struck off by means of a mechanical paver of approved design. The binder mix shall be laid to a depth, which after final compaction shall be equal to the specified depth shown on the Drawings. The binder course shall not be laid when the surface temperature is lower than 45 degrees Fahrenheit. Any irregularities in the surface of the pavement course shall be corrected directly behind the paver. After surface irregularities have been adjusted, the mix shall be thoroughly and uniformly compacted by rolling with approved power-driven rollers weighing not less than 5 to 8 tons.

   1. Areas inaccessible to spreaders and rollers shall be prepared by other approved means.
   2. After final compaction, the base course shall have a density of not less than 95 percent of the theoretical maximum density as calculated in accordance with Appendix B of the Asphalt Institute Manual, MS-2. Final rolling shall eliminate marks from previous rolling. After the compaction of the binder course, and before the placing of the surface course, the binder course shall be checked for depressions. The Contractor shall check the entire area using a ten-foot wood or metal straight edge. Any depression greater than three sixteenths of an inch (3/16") shall be corrected before the placing of the surface course.

J. TYPE 6-F or TYPE 7-F, FINE ASPHALTIC CONCRETE: Where called for on the Drawings, a plant mixed surface course of fine asphaltic concrete in accordance with the Materials Section of these Specifications, shall be spread and struck off by means of a mechanical paver of approved design. The fine asphaltic concrete mix shall be laid to a depth, which after final compaction shall be equal to the specified depth shown on the Drawings. The surface course shall be laid hot, upon the dry and properly prepared base, when the weather conditions, in the opinion of the Authority Inspector, are suitable. The surface course shall not be laid when the surface temperature is lower than 45 degrees Fahrenheit. Placing of the surface course shall be a continuous operation. If any irregularities occur, they shall be corrected before final compaction.

1. After surface irregularities have been adjusted, the surface course shall be thoroughly and uniformly compacted by rolling with approved power-driven rollers weighing not less than 5 to 8 tons.
2. Areas inaccessible to spreaders and rollers shall be prepared by other approved means.
3. After compaction the surface course shall have a density not less than 97 percent of the theoretical maximum density as determined by Appendix B of the Asphalt Institute Manual MS-2. Final rolling shall eliminate marks from previous rolling, leaving the finished surface smooth, true to line and grade, properly pitched for surface drainage and free from honeycomb, depressions, bumps, unevenness, waves, and overlapping seams. After the compaction of the surface course, the Contractor shall check the entire paved area for depressions using a ten-foot wood or metal straight edge. Any depression greater than three sixteenths of an inch (3/16") shall be corrected by removing the surface course of the affected areas, and replacing with new material to form a true and even surface.

K. RESURFACING COURSE: Where called for on the Drawings, a plant mixed resurfacing course of TYPE 7-F or TYPE 6-F asphalt in accordance with the Materials Section of these Specifications, shall be spread and struck off by a mechanical paver of approved design. The sheet asphalt mix shall be laid to a depth, which after final compaction shall be equal to the specified depth shown on the Drawings.

1. Edges shall be tapered onto surrounding pavements, to make a smooth, even transition. When resurfacing light duty asphalt, to make this smooth transition, a minimum width of 12" of pavement at the perimeter of the space to be resurfaced, shall be scarified to a depth of 1 1/2" and resurfaced using 1 1/2” of asphalt . When resurfacing heavy duty asphalt the entire area to be resurfaced shall be scarified to a depth of 2” and resurfaced using 2” of asphalt. Type 7F or Type 6F Top Course Asphalt (asphalt resurfacing) shall be installed and tapered to meet existing pavement, providing a smooth, even transition between resurfaced pavements and existing pavements.
2. Prior to placing the resurfacing course, all weak areas shall be repaired with proper patches. Structural patches shall be designed and constructed with full-depth Type 6F fine asphaltic concrete to insure strength equal to or exceeding that of the surrounding pavement structure, in order to produce a uniform supporting layer for the asphalt overlay. All cracks, joints, and scaled areas shall be cleaned, repaired and sealed as per the Asphalt Paving Repair specification. When the surface is distorted, the construction of leveling courses and/or leveling wedges using fine asphaltic concrete shall be required to restore proper line and cross-section. The existing surface shall be thoroughly dry and cleaned of all dirt and foreign material by sweeping with mechanical sweepers or hand brooms. After the existing surface has been prepared and cleaned, a tack coat shall be applied. The tack coat shall be applied to a thoroughly dry surface when there is no threat of rain. The tack coat shall not be applied when the surface temperature is lower than 45 degrees Fahrenheit. The tack coat shall meet the requirements of and be applied in accordance with the Materials Sections of these Specifications. The resurfacing course shall be laid hot, upon the dry and properly prepared base, when the weather conditions, in the opinion of the Authority Inspector, are suitable. The resurfacing course shall not be laid when the surface temperature is lower than 45 degrees F. Placing of the resurfacing course shall be a continuous operation. If any irregularities occur, they shall be corrected before final compaction.

3. After surface irregularities have been adjusted, the resurfacing course shall be thoroughly and uniformly compacted by rolling with approved power-driven rollers weighing not less than 5 to 8 tons.
4. Areas inaccessible to spreaders and rollers shall be prepared by other approved means.
5. After compaction the resurfacing course shall have a density not less than 97 percent of the theoretical maximum density as determined by Appendix B of the Asphalt Institute Manual MS-2. Final rolling shall eliminate marks from previous rolling, leaving the finished surface smooth, true to line and grade, properly pitched for surface drainage and free from honeycomb, depressions, bumps, unevenness, waves, and overlapping seams. The minimum compacted thickness of the resurfacing shall be as shown on the Drawings except where feathered at the edges into adjoining pavements to make smooth, even transitions. After the compaction of the resurfacing course, the Contractor shall check the entire paved area for depressions using a ten-foot wood or metal straight edge. Any depression greater than three sixteenths of an inch (3/16") shall be corrected by removing the resurfacing course of the affected areas, and replacing with new material to form a true and even surface.

L. Rollers shall not pass over the unprotected edges or ends of a freshly laid mixture unless authorized by the Authority Inspector. When the operation of placing the mixture is interrupted, the end of the laid material shall be left unrolled until such time as work is resumed, in order that there may be no joints throughout the project. If it is necessary to roll the end of the laid mixture, the joint made shall be cut back to expose the full depth of the course before re-commencing the operation of placing the mixture. The edges of such joints shall be painted with liquefied asphalt (RC-70) to insure a positive bond with the new mixture. Longitudinal joints caused by the mechanical paver shall be made in a careful manner, parallel to the edge of the pavement and with a continuous, thorough bond. The surface course shall be continuous, homogeneous and smooth.

M. Where defects in composition, compression, or finish appear in the completed work, the defective work will be removed to the full depth of the defective course or courses and the defective material replaced with new material, correctly installed, at the Contractor's expense.

N. Unless otherwise specified, tests of materials shall be made in accordance with the latest specifications of the American Society for Testing Materials Equipment, materials, and preparation of the mixtures will be subject to inspection and approval at the refineries and plant as may be directed. The Contractor shall furnish for test, when required by the Engineer or Authority Inspector, samples of the completed work. The areas of pavement so removed shall be replaced by new mixture and refinished without additional compensation.

O. Shipments of material shall be made in watertight vehicles previously cleaned of all foreign material, and delivered to the job site, so that it will not become contaminated in any way.

P. The Contractor shall provide suitable means for keeping tools free and clean of bituminous accumulations. He shall not store tools, equipment, materials or vehicles on the Development grounds after working hours or on Saturdays, Sundays, or Holidays.

Q. The Contractor shall provide and have ready for use at all times sufficient tarpaulins or covers as may be directed by the Inspector for use in any emergency such as rain, unavoidable delay, chilling winds, etc. for covering and protecting any material not spread.

3.02 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

END OF SECTION 32 12 16