

Montgomery County Public Schools Facilities Guide  
DIVISION 2 - SITE WORK

**Conditions of Use/ Responsibility of Data**

These “guideline” specifications are to be used by the A/E as a base document in the development of project/site-specific Division 2 – SITE WORK specifications for Montgomery County Public Schools Construction Projects. They may or may not be complete, correct and/or appropriate for use for any given project. It is the responsibility of the A/E to review these “guideline” specifications and to edit and/or supplement them as required to ensure that they represent the full, complete, correct and code-compliant specifications required for all construction of the project to which they apply. The use of these “guideline” specifications, and/or any information herein, in no way releases the A/E from their contractual responsibility to prepare and provide the full, complete and correct code-compliant contract documents, plans and/or specifications required for construction.

Review and editing of these “guideline” specifications shall be performed by appropriately licensed Maryland professional engineer. Specifications are to be prepared in Microsoft Word, edited using the “Track Changes” feature of that software and submitted to MCPS electronically on a compact Disk for review.

**SECTION 02520 – ASPHALT PAVEMENT**

**PART 1 - GENERAL:**

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1, Specification Sections, apply to work in this section.

1.2 DESCRIPTION OF WORK:

- A. Section specifies materials and work required to construct new asphalt pavement over prepared sub-base, asphalt curbing, asphalt walks and overlay existing asphalt pavement.

1.3 RELATED SECTIONS:

- A. Refer to Section 02000 "Clearing", Section 02040 "Demolition", Section 02100 "Earthwork and Grading", Section 02514 "Concrete Curbing".

1.4 CODES AND STANDARDS:

- A. Comply with latest edition of Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials, and approved addenda, except Method of Measurement and Basis of Payment.
- B. Work in County rights-of-way shall comply with latest Montgomery County, Maryland Department of Transportation standards and specifications.

1.5 SUBMITTALS:

A. Products:

1. Submit asphalt plant mix formula, for each course specified. Mix formula to include percentage of aggregate passing each sieve size, percentage of bituminous material added to aggregate and mix temperature.
2. Submit certificates, signed by producer or manufacturer and Contractor, stating that base course material and asphalt comply and meet or exceed standards of this specification.
3. Submit results of testing specified for review by Architect, Owner's Representative and required jurisdictional inspectors.
4. Submit location of product manufacture and of extraction/recovery of primary raw materials.
5. Submit recycled-content data, designating percentages of pre and post-consumer and post-industrial recycled materials.
6. Submit documentation of compliance with Solar Reflectance Index (SRI) requirements for site concrete, including measured reflectance and emittance (to calculate the SRI). The actual SRI or default SRI Value from LEED for Schools 2007 Reference Guide.

1.6 PRODUCT DELIVERY AND STORAGE:

- A. Asphalt mixtures: Delivery temperature not to exceed 25° F below plant mix temperature.

1.7 PROJECT CONDITIONS:

- A. Existing Asphalt Pavements: Verify existing pavement conditions (e.g. deteriorated surface, joints, etc.) during pre-bid inspection.
- B. Traffic: Maintain vehicular traffic during pavement construction operations.

- C. Limitations: Do not proceed with pavement construction until underground utility construction is complete. Do not proceed with asphalt placement operations until adjacent or adjoining Portland cement concrete curb construction is complete. Do not place bituminous materials when ambient air temperature is below 40° or air temperature has been below 35° F for 12 or more consecutive hours. Do not place materials from 15 November to 01 March without written authorization from Architect.
- D. Construction Surveys: Establish and maintain required lines and elevations. Retain services of a Maryland Registered Land Surveyor or Professional Engineer to provide combined horizontal and vertical alignment stakes for road base construction.
  - 1. Paved area base alignment stake horizontal interval: 50 foot maximum stations at centerline and both edges to finished base elevations.

## **PART 2 - PRODUCTS:**

### **2.1 MATERIALS:**

- A. General: Provide products manufactured and of raw materials extracted/recovered within a 500-mile radius of Project Site.
- B. Sub-base Course: SHA Graded Aggregate Base: Section 901.01 – Table B
  - 1. Recycled concrete RC-6 may, at Contractor's discretion and Owner's approval, be used for stone base in previously approved locations.
- C. Asphalt Base (Binder) Course: SHA Hot Mix Asphalt Superpave: Sections 901.01, 904.01 and 904. Gradation shall be as shown on approved drawings.
- D. Tack Coat: SHA cut-back asphalt: Section 504.03.04, M 81 or M 82.
- E. Overlay Binder Coat: Asphalt cement: AASHTO MP-1, penetration grade 80-100.
- F. Overlay Protective Membrane: "Petromat" protective membrane manufactured by Phillips Fiber Corporation, a subsidiary of Phillips Petroleum Company, Greenville, South Carolina.
  - 1. Option: "AmoPave" protective membrane manufactured by Amoco Fabrics Company, Atlanta, Georgia, or approved equal.
- G. Overlay Protective Membrane Strips: "PavePrep" fiber reinforced mastic strips, manufactured by The PavePrep Corporation, Westfield, New Jersey or approved equal.

- H. Asphalt Surface Course: SHA Hot Mix Asphalt Superpave: Section 901.01, 904.01 and 904. Gradation shall be as shown on approved drawings.
- I. Asphalt Surface Course for Athletic Courts and Paved Play Areas: SHA Hot Mix Asphalt Superpave: Sections 901.01, 904.01 and 904. Gradation shall be at 4.75mm
- J. Joint Sealant: SHA Section 911.01.

### **PART 3 - EXECUTION:**

#### **3.1 PROTECTION AND RESTORATION:**

- A. Asphalt Pavement: Protect improvements and facilities during tack coat and overlay binder coat applications to prevent overspray damage. Protect completed surface from damage. Do not permit heavy equipment or rollers on completed surface. Do not permit vehicular traffic on surface for 24 hours after completion. Restore damaged pavement as directed by Owner's Representative or Architect, at no increase to Contract Sum.

#### **3.2 SUB-GRADE PREPARATION:**

- A. Paved Areas: Refer to Section 02100 "Earthwork and Grading" and as noted.
- B. Proof-roll prepared sub-grade to check for unstable areas and areas requiring additional compaction. Do not begin work until deficient sub-grade areas have been corrected and are ready to receive paving.
- C. Verify sub-grade compaction and elevations and correct discrepancies before proceeding with base construction. Verify utility casting elevations and reset or adjust to meet flush with finished pavement surface. Do not place base material/sub-base material on frozen or muddy sub-grade.
- D. Place aggregate base on prepared sub-grade as soon as possible after grading operations are completed.
- E. Aggregate Base Material: Place Aggregate base material in loose layers not exceeding 6" nor less than 3" to a finished thickness 6" compacted depth. Spread, shape and compact all aggregate base materials deposited on sub-grade during same day. Fill areas to contours and elevations using unfrozen materials.
  - 1. Compact aggregate base material to not less than 95 percent of maximum density at optimum moisture content plus or minus 3 percent in accordance with AASHTO T-180.

#### **3.3 PLACING HOT-MIX ASPHALT PAVEMENT**

- A. General: Place Hot-Mixed asphalt mixture on prepared surface, spread and strike off. Spread mixture at minimum temperature of 225 deg F (107 deg C). Place areas inaccessible to equipment by hand. Place each course to require grade, cross-section, and compacted thickness.
- B. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean or replace damaged surfaces at no additional cost to Owner.
- C. Paver Placing: Place in strips not less than 10 feet wide, unless otherwise acceptable to Architect and/or Owner. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
  - 1. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
- D. Base Course: Provide 4" minimum compacted thickness, except as otherwise indicated, conforming to grade, cross-section, finish thickness and density as indicated.
- E. Surface Course: Provide 2" minimum compacted thickness, except as otherwise indicated, compacted with a roller weighing not less than 6-tons.
- F. Joints: Make joints between old and new pavements, or between successive days' Work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of hot-mixed asphalt course. Clean contact surfaces and apply tack coat.

### 3.4 ROLLING

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
- B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been evenly compacted.
- E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained 95 percent laboratory density.
- F. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot hot-mixed asphalt. Compact by rolling to specified surface density and smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.5 TRAFFIC, LANE AND GAME LINE MARKINGS

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
- B. Do not apply marking paint until layout and placement have been verified with Architect.
- C. Apply paint with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates to provide minimum 15 mils dry thickness.
- D. Except where noted otherwise, parking lines shall be white in color (understriping for after-hours parking shall be blue); curbs at loading areas, bus loading lines, lane divisions and fire lanes shall be yellow.

### 3.6 SUBBASE COURSE:

- A. Place sub-base course material on prepared sub-grade in one uniform layer to depth required to produce compacted thickness indicated. Shape material, to sections and elevations indicated with blade grader and compact with pneumatic tired rollers in accordance with Section 02100 "Earthwork and Grading". Control moisture content of base course material to within 2 percent of optimum during compaction operations. Compaction Standard: ASTM D 1557. Proof roll sub-base course with 8-ton tandem steel wheel roller and correct irregularities.

### 3.7 ASPHALT BASE COURSE:

- A. Sub-base Course Surface Preparation: Apply tack coat material to previously placed asphalt base course, existing pavement, curbing, utility castings and any structure abutting or projecting into paved area.
- B. Base Course Placement: Place asphalt in layers not exceeding four inches in compacted depth to total depth required to produce compacted thickness indicated. Place material with mechanical self-powered pavers capable of maintaining required line and grade. Place material by approved manual methods in areas inaccessible to self-powered pavers. Temperature of material shall be not less than 225°F at the time of placement.
- C. Base Course Compaction: Compaction operations shall begin immediately following placement of base course material, and shall consist of breakdown, intermediate and finish rolling. Material shall be compacted in accordance with Section 02100 "Earthwork and Grading". In-place compaction shall be completed before material cools below 185° F. Use self-powered tandem steel wheel rollers. Use power driven trench rollers in areas inaccessible to self-powered equipment. Begin rolling longitudinally at low side or edge and proceed toward high side or crown. Overlap suc-

cessive roller trips one half-roller width. Do not terminate alternate roller trips at same location. Continue finish rolling until 98 percent to 102 percent theoretical maximum density is obtained and all roller marks are eliminated. Density test method: AASHTO T-230.

### 3.8 ASPHALT SURFACE COURSE AND OVERLAY:

- A. General: Provide overlay protective membrane treatment where indicated. Provide overlay protective membrane strips over long, running cracks or pavement joints except in areas where overlay protective membrane is already indicated.
- B. Asphalt Base Course Surface Preparation: Remove loose material from surface before applying tack coat. Apply tack coat material uniformly to surface at a rate of 0.10 gallon per square yard. Allow tack coat to cure as long as required to properly set but not less than 12 hours.
- C. Existing Asphalt Pavement Preparation: Clean and dry pavement, with compressed air, removing debris, dust, foreign materials and moisture.
  - 1. Obtain pavement preparation approval, from Architect prior to overlay binder coat application. Apply overlay binder coat material uniformly to prepared asphalt surface. Apply at a rate of 0.25 gallon per square yard. For long running cracks or joints in existing pavement surface where overlay protective membrane strips will be used, apply overlay binder coat material to a width of approximately two feet so as to span existing cracks or joints. Adjust application rate, based on existing pavement relative porosity, at no increase to Contract Sum. Apply overlay binder coat material at 300° F minimum to 350° F maximum.
  - 2. Lay down overlay protective membrane, on cured overlay binder coat, in accordance with manufacturer's installation instructions and as noted. Transverse joint overlap to be 12 inches, "shingled" in direction of paving to prevent edge pick-up by the pavers. Longitudinal joint overlap to be six inches. Cut and piece membrane to fit irregular shaped areas (e.g. access road intersections, curb returns, etc.). Obtain pavement preparation approval from Owner's Representative or Architect prior to tack coat application.
  - 3. Lay down overlay protective membrane strips on cured overlay binder coat, in accordance with manufacturer's installation instructions and as noted. Unroll overlay protective membrane strips, aligned with pavement joints, and seat in tacky overlay binder coat material by brooming, so as to span existing pavement joints. Blot excess overlay binder coat materials on edges of membrane strips with sand blanket. Cut and piece membrane to fit irregular shaped areas (e.g. access road intersections, curb returns, etc.). Obtain pavement preparation approval from Owner's Representative or Architect prior to tack coat application.

4. Apply tack coat material uniformly to prepared asphalt surface. Apply at rate of minimum of 0.05 gallon per square yard and a maximum of 0.15 gallon per square yard. Tack coat to cure as long as required to properly set, but not less than 12 hours.
  5. Prepare existing asphalt pavement, as indicated and specified, at no increase to Contract Sum.
- D. Surface Course and Overlay Placement: Place asphalt, in one uniform layer, to depth required to produce compacted thickness indicated. Place with mechanical self-powered pavers capable of maintaining required line and grade. Place and spread asphalt by approved manual methods in areas inaccessible to self-powered pavers. Temperature of the material shall be not less than 225° F at time of placement.
- E. Surface Course and Overlay Compaction: Compaction operations shall begin immediately following placement of surface course material, and shall consist of joint, breakdown, intermediate and finish rolling. In-place compaction shall be completed before material cools below 185° F. Use power driven trench rollers in areas inaccessible to self-powered rollers. Begin rolling longitudinally at low side or edge and proceed toward high side or crown. Overlap successive roller trips, one-half roller width. Do not terminate alternate trips at same point. Continue finish rolling until 98 percent to 102 percent theoretical maximum density is obtained and all roller marks are eliminated. Density test method: AASHTO T 230.

### 3.9 JOINT SEALING:

- A. Completely seal and fill joints along existing and new pavement and curbing interface with joint sealant.

### 3.10 TESTING:

- A. Genera: Correct work not conforming to specified tolerances as directed by Owner's Representative or Architect, at no increase to Contract Sum.
- B. Thickness Tests: Conduct sub-base, base and surface course thickness tests and provide test area restoration upon completion. Tolerance not less than 1/2 inch from compacted thickness indicated. Test locations are random and to be determined by Owner's Representative or Architect. Regardless of paved area size, at least one test shall be performed for each newly paved area.
- C. Smoothness Tests: Conduct surface course smoothness tests. Tolerance not to exceed 1/8 inch between any two surface contacts on 10-foot straightedge. Test locations are random and to be determined by Owner's Representative or Architect. Regardless of paved area size, at least one test shall be performed for each newly paved area.

D. Laboratory Density Tests: Conduct sub-grade, sub-base and base course laboratory density tests. Density testing shall be performed by individuals certified to perform asphalt testing. Test method: ASTM D 1557. Test interval to be determined by Owner's Representative or Architect, but no less than one test for each newly paved area and/or one test per 1000 feet of roadway shall be performed.

1. Provide test area restoration.

E. Field Density Tests: Conduct sub-grade, sub-base and base course in-place field density tests. Density testing shall be performed by individuals certified to perform asphalt testing. Test method: ASTM D 1556 or D 2167. Test locations are random and to be determined by Owner's Representative or Architect, but no less than one test for each newly paved area and/or one test per 1000 feet of roadway shall be performed.

1. Provide test area restoration.

3.11 CLEANING:

A. Clean improvements and facilities damaged by tack coat overspray as directed by Owner's Representative or Architect.

3.9 WASTE MANAGEMENT:

A. Recycle waste materials in accordance with Division 1 "Construction Waste Management" requirements.

**END OF SECTION**