

SECTION 32 12 00 – FLEXIBLE PAVING**PART 1 – GENERAL**

1.01 SECTION INCLUDES

- A. Hot-mix asphalt paving.
- B. Hot-mix asphalt patching.
- C. Hot-mix asphalt paving overlay.
- D. Cold milling of existing asphalt pavement.

1.02 REFERENCES

- A. The "PennDOT Sections" noted herein refer to sections contained in the current Commonwealth of Pennsylvania Department of Transportation Specifications Publication 408, as supplemented or revised. The references pertain only to materials, construction, equipment, methods and labor. The payment provisions do not apply to work to be performed under this Contract.
- B. Commonwealth of Pennsylvania Department of Transportation Specifications Publication 408, latest edition.
 - 1. PennDOT Section 210 Subgrade.
 - 2. PennDOT Section 309 Superpave Asphalt Mixture Design, HMA Base Course (Standard).
 - 3. PennDOT Section 350 Subbase.
 - 4. PennDOT Section 401 Plant Mixed Bituminous Concrete Courses.
 - 5. PennDOT Section 409 Superpave Asphalt Mixture Design, HMA Wearing Course (Standard); HMA Wearing Course, RPS; HMA Binder Course (Standard); HMA Binder Course, RPS.
 - 6. PennDOT Section 460 Bituminous Tack Coat.
 - 7. PennDOT Section 470 Bituminous Seal Coat.
 - 8. PennDOT Section 480 Bituminous Surface Treatment.
 - 9. PennDOT Section 491 Milling of Bituminous Pavement Surface.
 - 10. PennDOT Section 703 Aggregates.
 - 11. PennDOT Section 704 Cement Concrete.
- C. Commonwealth of Pennsylvania Department of Transportation Bulletin 25.
- D. Commonwealth of Pennsylvania Department of Transportation Bulletin 27.
- E. Commonwealth of Pennsylvania, Pennsylvania Code, Title 67, Transportation,

Department of Transportation, Chapter 459, Occupancy of Highways by Utilities, as supplemented or revised.

- F. Commonwealth of Pennsylvania, Pennsylvania Code, Title 67, Transportation, Department of Transportation, Chapter 213, Work Zone Traffic Control (PennDOT Chapter 213).

1.03 DEFINITIONS

- A. Street: Unless otherwise specifically qualified herein, the term "Street" as used in this Section shall be understood to mean a street, highway, avenue, boulevard, road, alley, lane, driveway, parking lot, or any other area used as a way for vehicles.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Certificates: Furnish certification from bituminous and aggregate producer attesting that materials conform to requirements of PennDOT Specifications.
- C. Job-Mix Designs: For each job mix proposed for the Work.
- D. Material Slips: Furnish certification of the amount of materials utilized from the producer in accordance with PennDOT specifications.
- E. Qualification Data: For manufacturer and installer.
- F. As-built survey of asphalt base of running track in digital format on 10 ft. grid including 0.08' contours.

1.05 QUALITY ASSURANCE

- A. Source Quality Control:
 - 1. Use materials conforming to PennDOT Publication 408, latest edition and supplementary bulletins thereto.
 - 2. The quality of the work shall be maintained by using the products of a qualified bituminous concrete producer and qualified plant operating workmen, registered with and approved by PennDOT.
 - 3. The bituminous concrete producer shall be a bulk producer regularly engaged in production of hot-mix, hot-laid bituminous concrete conforming to the standards referenced herein.
- B. Installer Qualifications:
 - 1. Engage an experienced installer who has completed hot-mix asphalt paving

similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance of not less than five (5) years, and is prequalified for type of work with PennDOT.

2. Provide at least one person thoroughly trained and experienced in the skills required who readily understands the design and is completely familiar with the application of bituminous concrete paving work. Said person shall be present at all times during progress of bituminous concrete paving work and shall direct the performance of said work.
3. For actual finishing of bituminous concrete surfaces and operation of the equipment, use only personnel thoroughly trained and experienced in the skills required.

C. Requirements of Regulatory Agencies:

1. Removal, protection and replacement of paving on roadways other than state highways must be performed in accordance with the requirements of the municipality in which the work is performed. The Contractor is responsible to meet the requirements of all permits and approvals from the municipality.
2. Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.

D. Requirements of Testing Agency:

1. To qualify for acceptance, the testing agency must demonstrate to Engineer's satisfaction, based on evaluation of submitted criteria conforming to ASTM D 3666, that it has the experience and capability to conduct required field and laboratory testing without delaying the process of the work.

1.06 SITE CONDITIONS

A. Protection:

1. Protect paved surfaces outside of the pavement removal limits as indicated on the Pavement Restoration Details in the Contract Drawings. Repair pavement outside removal limits damaged by construction operations to PennDOT or local municipalities specifications at no additional expense to Owner.
2. Use all means necessary to protect and maintain pavement materials before, during, and after installation.

B. Environmental Requirements:

1. Do not install aggregate courses when ambient temperature is below or is expected to fall below freezing.
2. Do not use aggregate containing frost nor place aggregate courses on frozen subgrade.
3. Terminate placement of bituminous mixtures or courses between October 31, and do not resume placement prior to April 1. Placement of bituminous mixtures or courses between the dates referenced above requires prior Engineer written

- approval.
4. Do not place bituminous paving mixtures or courses when surfaces are wet or when the temperature of either air or the surface on which the mixture or course is to be placed is 40°F or lower. When work is halted because of weather conditions, limited quantities en route to the project may be placed, if permitted by the Engineer.
- C. Grade Control: Establish and maintain required lines, grades and elevations.
- D. Asphalt Paving: Paving activity shall be limited to normal working hours at the project. Any deviation shall be requested in writing a minimum of 14 days in advance in order to receive written approval from the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Bituminous Materials:
1. Asphalt Cement: PG 64 – 22 conforming to PennDOT Bulletin 25.
 2. Asphalt Rubber Sealing Compound: Conforming to PennDOT Bulletin 25.
 3. Bituminous Tack Coat: Class E-1, E-6 or E-8 emulsified asphalt conforming to PennDOT Bulletin 25.
 4. Superpave Asphalt Mixture Design:
 - a. HMA Base Course, Conforming to PennDOT Pub 408, Section 309.
 - b. HMA Binder Course and HMA Wearing Course Conforming to PennDOT Pub 408, Section 409.
 5. Bituminous Surface Treatment: Two (2) applications of bituminous material each followed by application of coarse aggregate conforming to PennDOT Section 480.
 6. Bituminous Seal Coat: Single application of bituminous materials followed by application of aggregate conforming to PennDOT Pub 408, Section 470.
- B. Aggregate Subbase: Type C or better, No. 2A, Section 703.2, placement per PennDOT Pub 408, Section 350.
- C. Select Granular Material: Select Granular Material (2RC) conforming to PennDOT Pub 408 Section 703.3.

2.02 MIXTURES

- A. Provide plant-mixed, hot-laid asphalt-aggregate mixture complying with ASTM D 3515 and as indicated on the contract drawings.
- B. The asphalt mix shall be in accordance with PennDOT Publication 408, Section 309 and Section 409.

1. Superpave Asphalt Mixture Design, HMA Wearing Course, PG 64-22, 3 to 30 million ESAL's, 9.5 mm mix, SRL-H.
 2. Superpave Asphalt Mixture Design, HMA Binder Course, PG 64-22, 3 to 30 million ESAL's, 19.0 mm mix.
 3. Superpave Asphalt Mixture Design, HMA Base Course, PG 64-22, 3 to 30 million ESAL's, 25.0 mm mix.
- C. The asphalt mix design and material certificates shall be submitted for approval prior to mixing and delivery of Asphalt-Aggregate mixture to the job site.

PART 3 – EXECUTION

3.01 GENERAL

- A. Restore streets, driveways, parking areas and other areas according to the Pavement Restoration Details shown on the Contract Drawings and the Pavement Restoration Schedule contained at the end of this section.
- B. Construct new roadways, streets, driveways, parking areas and other areas according to the Pavement Restoration Details shown on the Contract Drawings and the Pavement Restoration Schedule contained at the end of this section.

3.02 PREPARATION

- A. Refer to the Pavement Restoration Schedule for schedule of materials and thicknesses.
- B. Examination:
 1. Verify that backfill to surfacing subgrade as specified in Section 31 23 33 – Trenching and Backfilling for Utilities has been properly completed.
 2. Fine grade and remove loose material from compacted base surface immediately before applying herbicide treatment or prime coat.
- C. Proof-roll prepared base surface to check for unstable areas and areas requiring additional compaction. Perform proof-rolling with a loaded tandem-axle dump truck, as directed and observed by the Engineer.
- D. Notify Engineer of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- E. The contact area between existing and new pavements shall be saw cut full depth of wearing course and binder course so as to be smooth and straight prior to commencement of paving. The contact area of the surface layer shall be a minimum of eighteen (18) inches wider than the base or as indicated in the construction details. The horizontal distance between concrete curbing, etc., shall be sufficient to allow room for

compaction equipment to be used on all layers.

- F. Preparation for Asphalt Overlay:
 - 1. Perform surface preparation and sealing of existing cracks in pavement with materials and products conforming to PennDOT Pub. 408 Specifications, Section 469.
 - a. Clean cracks and joints in existing asphalt pavement.
 - b. Seal cracks 1/8 inch to 1/2 inch wide with polymer modified asphalt.
 - c. Fill cracks in excess of 1/2-inch wide with bituminous wearing course, FJ-1 in lieu of sealing as per PennDOT 408, Section 422.2.
 - 2. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 3. Damaged areas of existing asphalt displaying settlement, severe cracking, deterioration, potholes, etc. shall be removed and restored in accordance with specifications for new asphalt pavement construction.
- G. Tack Coat: apply to uniformly contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into hot-mixed asphalt pavement, including the vertical surfaces of concrete to be in contact with the hot-mixed asphalt. Distribute at rate of 0.05 to 0.15 gal. Per sq. yd. of surface.

3.03 MILLING OF EXISTING ASPHALT PAVEMENT

- A. Perform asphalt-milling operations in accordance with PennDOT PUB. 408, Section 491.
- B. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.
- C. Mill existing asphalt surface as necessary to achieve finish grades and meet existing adjoining surfaces as indicated on the drawings.

3.04 PATCHING

- A. Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending one foot into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Re-compact existing unbound-aggregate base course to form new subgrade. Brush vertical faces clean with stiff brush.
- B. Tack Coat:
 - 1. Apply according to PennDOT Section 460.
 - 2. Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix

- asphalt paving.
 - 3. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 4. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillage and clean affected surfaces.
- C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.
- D. Existing Pavement Removal from trenching operations:
- 1. Sawcut existing pavement using a mechanical saw to neat lines equidistant from and parallel to the centerline of the trench.
 - 2. Remove pavement to width equal to maximum excavated trench width plus at least one foot on each side of the trench. If pavement is removed or disturbed for a greater width without written authorization of the Engineer, the Owner will require the Contractor to replace such pavement without compensation.
 - 3. Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.05 TEMPORARY SURFACING

- A. In the event the permanent pavement cannot be placed due to the weather limitations set forth herein for the placing of bituminous material for the permanent base and surface courses, provide a temporary surface in lieu thereof. The temporary surface shall be as specified in the Restoration Schedule.
- B. The Contractor shall be responsible for the maintenance and protection of all temporary surfacing, as well as manholes, frame and covers, and other facilities or structures located within the areas of the temporary surfacing until such time as that the permanent pavement or surface can be placed. Permanent surfacing must be placed no later than thirty days following the placement of temporary surfacing. In the event that environmental conditions do not allow for placement of permanent surfacing within the thirty days specified, permanent surfacing must be placed as soon as conditions allow.
- C. Prior to placement of final surfacing, the Contractor, Owner, and Engineer shall inspect all areas to be restored. The Contractor shall be responsible for any replacement of material, regrading, or addition of material deemed necessary by the Engineer in any areas found to be unacceptable for receipt of final surfacing.
- D. Contractor shall be responsible for the removal and disposal of the temporary surfacing to the grade required for the placement of the final sub-base, base, and surface at the specified depths.

- E. The Contractor shall be responsible for any necessary adjustments to grade for manholes, frame and covers, and other facilities or structures prior to final surfacing.
- F. Temporary surfacing shall be placed where directed by the Engineer.

3.06 PAVEMENT INSTALLATION

- A. Paved Surfaces:
 1. Aggregate Subbase: Construct and place in accordance with the requirements of PennDOT Section 350.
 - a. Install on prepared subgrade as specified in Section 31 23 33 and in PennDOT Section 210.
 - b. Install subbase to underside of base course as specified in Section 31 23 33.
 2. Superpave Asphalt Mixture Design: HMA Base Course. Construct in accordance with PennDOT Section 309.
 - a. Install the HMA Base Course with the top surface below the surface of the adjacent pavement a distance equal to the thickness of the HMA Wearing Course.
 3. Superpave Asphalt Mixture Design: Wearing Course. Construct in accordance with PennDOT Section 409.
 - a. Install Wearing Course at the required thickness and with the top surface flush with the surface of the adjacent undisturbed pavement.
- B. Compaction
 1. Begin compaction as soon as placed hot-mix asphalt will bear roller weight without excessive displacement. Compact hot-mix asphalt with vibratory-plate compactors in areas inaccessible to rollers.
 2. Complete compaction before mix temperature cools to 185°F.
 3. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness.
 4. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hotmix asphalt course has been uniformly compacted to the following density:
 - a. Specified Density ranges measured from: reference laboratory density according to AASHTO T 245:
 - 1) Base Courses 90 -100 percent
 - 2) Wearing Courses 92 -100 percent
 5. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
 6. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact

thoroughly with appropriate edge tools.

7. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

C. Protection:

1. After final rolling, do not permit vehicular traffic on pavement until it has cooled, cured and hardened.
2. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.07 JOINTS AND SEALING

- A. Construct joints ensure a continuous bond between adjoining paving sections. Construct joints shall be free of depressions with same texture and smoothness as other sections of hot-mix asphalt course. All joints shall be constructed according to Section 401 of PennDOT Publication 408.

- B. Asphalt Rubber Sealing Compound: Apply according to PennDOT Bulletin 25. Use to seal joints between existing and new pavements.

1. When wearing course is placed against existing pavement, notches, curbs, inlets, or utility openings, seal joint surface with hot, asphalt rubberized sealing compound of the class and type designated for the wearing course. Apply sealant evenly and extend 3 inches in both directions from joint, in a straight line creating a neat ribbon-like appearance. Prior to sealing, clean and remove harmful material from the area to be sealed. Control the application rate so residual asphalt completely fills surface voids and provides a watertight joint.
2. Coordinate sealing work to prevent tracking and smearing from traffic until sealer is sufficiently cured and dry.

3.08 INSTALLATION TOLERANCES

- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.09 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
 - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements in PennDOT Publication 408 Section 401.3 at the time pavement is installed.
 - 2. Parameters to Test:
 - a. Percent compaction
 - b. Thickness
- B. Remove and replace placed asphalt material where test results or measurements indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. The Contractor is not permitted to install pavement unless the testing and inspection agency is at the time of paving and ready to conduct the specified testing and inspection.

3.10 CLEAN-UP

- A. During construction, surfaces of all areas including, but not limited to, roads, streets, and driveways shall be maintained on a daily basis to produce a safe, desirable, and convenient condition.
 - 1. Streets shall be swept and flushed after backfilling, and recleaned as dust, mud, stones and debris caused by the work, or related to the work again accumulates.
- B. Repair or Correction of Unsatisfactory Conditions: All unsatisfactory conditions resulting from the work shall be corrected.
- C. Dust Control: Provide effective dust control by sprinkling water, by the use of calcium chloride or by any other methods approved by Engineer. Use dust control measures where, when and in a manner required by Engineer.

3.11 MAINTENANCE

- A. Continuously maintain temporary paving without additional compensation until it is replaced with permanent paving.
- B. Should Contractor fail to perform required maintenance or repairs within three days after written notice from Owner or Engineer, the Owner may perform such maintenance or repairs and deduct the cost thereof from any monies due or to become due Contractor.

END OF SECTION