

SECTION 02000: MILLING, HOT MIX ASPHALT AND PATCHING PROCEDURES:

A. Milling:

Milling operations will occur on roadways confined by curb and gutter drainage systems. This will be required in such cases as needed to render the final asphalt overlay at an elevation consistent with the elevation at the top of the gutter.

1. Materials:

a. Delivery, Storage, and Handling

1. Millings rendered from this operation will be disposed of concurrent with the milling operation.
2. Dress the reclaimed asphalt area to drain rainwater from the material.

2. Equipment:

a. Milling Equipment

Use power-driven, self-propelled milling equipment that is the size and shape that allows traffic to pass through areas adjacent to the work. Also, use equipment that is:

1. Designed to mill and remove a specified depth of existing asphalt paving
2. Equipment with grade and slope controls that will provide accurate control of the milling operation
3. Capable of removing pavement to an accuracy of 1/8 in.
4. Provided with conveyors capable of side, rear, or front loading to transfer the milled material from the roadway to a truck.

3. Dust Control:

Provide power brooms, vacuum, power blowers, or other means to remove loose debris or dust. Do not allow dust control to restrict visibility of passing traffic or to disrupt adjacent property owners.

4. Milling Operations:

Follow the drawings or statement of work to mill the designated areas and Depths including bridge decks, shoulders, and ramps, as required.

Ensure the following requirements are met:

- a. Schedule the construction operation. Use milling methods that will produce a uniform finished surface and maintain a constant cross slope between extremities in each lane.
- b. Provide positive drainage to prevent water accumulation on the milled pavement, as shown on the Plans or directed by the Engineer.
- c. Bevel back the longitudinal vertical edges greater than 2 in that are produced by the removal process and left exposed to traffic. Bevel them back at least 3 in for each 2 in of material removed. Use an attached method.
- d. When removing material at ramp areas and ends of milled sections, taper the transverse edges 10 ft to avoid creating a traffic hazard and to produce a smooth surface.
- e. Protect with a temporary asphaltic concrete tie-in (paper joint) vertical edges at other areas such as bridge approach slabs, drainage structures, and utility appurtenance greater than ½ in that are left open to traversing vehicles. Place the temporary tie-in at taper rate of at least 6 to 1 horizontal to vertical distance.
- f. Remove dust, residue, and loose milled material from the milled surface. Do not allow traffic on the milled surface and do not place asphaltic concrete on the milled surface until removal is complete. \
- g. Any traffic signal damage (loop damage, signal interference, etc.) that occurs as a result of the construction activity will be the responsibility of the contractor to either repair or replace at no additional cost to Macon-Bibb County.

5. Quality Acceptance:

Ensure that the milling operation produce a uniform pavement texture that is true to line, grade, and cross section.

Milled pavement surface acceptance testing will be performed using a visual inspection.

Milled pavement will be evaluated on individual test sections.

Milled pavement surfaces are subject to visual and straightedge inspection.

Keep a 10 ft straightedge near the milling operation to measure surface irregularities of the milled pavement surface.

Remill irregularities greater than 1/8 in per 10 ft at no additional cost to Bibb County.

Ensure that the cross slope is uniform and that no depressions or slope misalignments greater than 1/4 in per 12 ft exist when the slope is tested with a straightedge placed perpendicular to center line.

B. Special Base Repair:

1. Perform repairs while maintaining traffic unless otherwise specified.
2. Procedure for installation: **Full Depth Reclamation**
 - a. Where pavement distress is greater than can be repaired through full depth reclamation, the contractor shall remove existing pavement and base material; the contractor must then excavate subgrade to a depth as required by Macon-Bibb Engineering to ensure subgrade structural integrity.
 - b. Place suitable sub-grade fill material (GABC) in maximum 6" lifts to the existing Sub-grade level. Compact lifts to ensure integrity of sub-grade to 98% of the maximum dry density using a standard proctor.
3. Procedure for installation: **Deep Patch and Overlay**
 - a. Remove all asphalt and base course material.
 - b. Further remove any damaged or inferior sub-grade material
 - c. Place suitable sub-grade fill material (GABC) in maximum 6" lifts to within 14" of existing pavement surface. Compact lifts to ensure integrity of sub-grade to 98% of the maximum dry density using a standard proctor.
 - d. Pace 10" of GABC base material in 2 equal lifts to within 4" of existing road grade. Compact GABC to insure the integrity of the base course to 100% of the maximum dry density using a standard proctor.

- e. A bituminous prime application will be required on the base course unless the patch is scheduled to be completed within 24 hours.
- f. Place asphalt topping at a depth of 4” to bring the roadway to original grade before placing the asphalt overlay.

C. Hot Mix Asphaltic Concrete Construction: (Resurfacing)

1. General Description

The work includes constructing one or more courses of bituminous plant mixture on the prepared foundation or existing roadway surface. The mixture shall conform with lines, grades, thickness, and typical cross sections shown on the drawings or in the statement of work established by the engineer.

This section includes the requirements for all bituminous plant mixture regardless of the gradation of the aggregates, type and amount of bituminous material, or pavement use.

2. Preparation

A. Full Depth Reclamation

Prepare the existing surface for full depth reclamation as specified in Section 301, “Cement Stabilized Reclaimed Base Construction”.

B. Deep Patch and Overlay

Clean the existing surface to the Engineer’s satisfaction before applying hot mix asphalt pavement.

3. Omitted

4. Construction

Provide Macon-Bibb Engineering at least one day’s notice prior to beginning construction, or prior to resuming production if operations have been temporarily suspended.

5. Observe Weather Condition Limitations

Do not mix and place asphaltic concrete if the existing surface is wet or frozen. Do not lay asphaltic concrete at air temperature below 55F. For

other courses, follow the temperature guidelines in the following table:

Table4-Lift Thickness Table

Lift Thickness	Minimum Temperature
1 in (25 mm) or less	55 F (13 C)
1.1 to 2 in (26 mm to 50 mm)	45 F (8 C)
2.1 to 3 in (51 mm to 75 mm)	35 F (2 C)
3.1 to 4 in (76 mm to 100 mm)	30 F (0 C)
4.1 to 8 in (101 mm to 200 mm)	Contractor's discretion

6. Perform Spreading and Finishing:

Full Depth Reclamation:

- a. 12.5 mm "Superpave" hot mix asphalt is to be spread and finished to a mat thickness of 2.0 in.
- b. Unload the mixture into the paver hopper or into a device designed to receive the mixture from delivery vehicles.
- c. Except for leveling courses, spread the mixture to the loose depth for the compacted thickness or the spread rate, Use a mechanical spreader true to the line, grade, and cross section specified.
- d. Obtain Macon-Bibb Engineering's approval for the sequence of paving operations, including paving the adjoining lanes. Minimize tracking tack onto surrounding surfaces.
- e. Ensure that the outside edges of the pavement being laid are aligned and parallel to the roadway center line.
- f. Where mechanical equipment cannot be used, spread and rake the mixture by hand. Obtain Macon-Bibb Engineering's approval of the operation sequence, including compactive methods, in these areas.

g. Keep small hand raking tools clean and free from asphalt build-up.
Do not use fuel oil or other harmful solvents to clean tools during the work.

h. Do not use mixture with any of these characteristics:

- Segregated
- Nonconforming temperature
- Deficient or excessive asphalt cement content
- Otherwise unsuitable to place on the roadway in the work

i. Remove and replace mixture placed on the roadway that the Engineer determines has unacceptable blemish levels from segregation, streaking, pulling and tearing, or other characteristics. Replace with acceptable mixture at the Contractor's expense. Do not continually place mixtures with deficiencies.

Do not place subsequent course lifts over another lift or course placed on the same day while the temperature of the previously placed mix is 140 F or greater.

j. Obtain the Engineer's approval of the material compaction equipment. Perform the rolling as follows:

1. Begin the rolling as close behind the spreader as possible without causing excessive distortion of the asphalt surface.
2. Continue rolling until roller marks are no longer visible.

k. If applicable, taper or "feather" asphalt from full depth to a depth no greater than 0.5 in long curbs, gutters, raised pavement edges, and areas where drainage characteristics of the road must be retained. The Engineer will determine the location and extent of tapering.

l. The contractor will be responsible for the installation of ring risers on any sewer manhole that needs adjusting while paving. The contractor will be responsible for notifying the Macon Water Authority when there is a need for a ring riser and the appropriate size ring to be installed.

Deep Patch and Overlay:

- a. 9.5 mm "Superpave" hot mix asphalt is to be spread and finished to a mat thickness of 1.25 in.
- b. Unload the mixture into the paver hopper or into a device designed

to receive the mixture from delivery vehicles.

- c. Except for leveling courses, spread the mixture to the loose depth for the compacted thickness or the spread rate, Use a mechanical spreader true to the line, grade, and cross section specified.
- d. Obtain the Engineer's approval for the sequence of paving operations, including paving the adjoining lanes. Minimize tracking tack onto surrounding surfaces.
- e. Ensure that the outside edges of the pavement being laid are aligned and parallel to the roadway center line.
- f. Where mechanical equipment cannot be used, spread and rake the mixture by hand. Obtain the Engineer's approval of the operation sequence, including compactive methods, in these areas.
- g. Keep small hand raking tools clean and free from asphalt build-up. Do not use fuel oil or other harmful solvents to clean tools during the work.
- h. Do not use mixture with any of these characteristics:
 - Segregated
 - Nonconforming temperature
 - Deficient or excessive asphalt cement content
 - Otherwise unsuitable to place on the roadway in the work
- i. Remove and replace mixture placed on the roadway that the Engineer determines has unacceptable blemish levels from segregation, streaking, pulling and tearing, or other characteristics. Replace with acceptable mixture at the Contractor's expense. Do not continually place mixtures with deficiencies.

Do not place subsequent course lifts over another lift or course placed on the same day while the temperature of the previously placed mix is 140 F or greater.

- j. Obtain the Engineer's approval of the material compaction equipment. Perform the rolling as follows:
 1. Begin the rolling as close behind the spreader as possible without causing excessive distortion of the asphalt surface.
 2. Continue rolling until roller marks are no longer visible.

- k. If applicable, taper or “feather” asphalt from full depth to a depth no greater than 0.5 in long curbs, gutters, raised pavement edges, and areas where drainage characteristics of the road must be retained. The Engineer will determine the location and extent of tapering.
- l. The contractor will be responsible for the installation of ring risers on any sewer manhole that needs adjusting while paving. The contractor will be responsible for notifying the Macon Water Authority when there is a need for a ring riser and the appropriate size ring to be installed.

7. Maintain Continuity of Operations

Coordinate plant production, transportation and paving operations to maintain a continuous operation. If the spreading operations are interrupted, construct a transverse joint if the mixture immediately behind the paver screed cools to less than 250 F.

8. Construct the Asphalt Joints

a. Construct Asphalt Joints:

1. Construct asphalt joints to facilitate full depth exposure of the course before resuming placement of the affected course.
2. Properly clean and tack the vertical face of the transverse joint before placing additional material.
3. Straightedge asphalt joints immediately after forming the joint.
4. Immediately correct any irregularity that exceeds 3/16 in. in 10 ft.
5. Never burn or heat the joint by applying fuel oil or other volatile materials.

9. Protect the Pavement

Protect sections of the newly finished pavement from traffic until the traffic will not mar the surface or alter the surface texture. If directed by the Engineer, use artificial methods to cool the newly finished pavement to open the pavement to traffic more quickly.

10. Testing

The Hot Mix Asphalt that is used in any resurfacing project is subject to random geotechnical testing. The contractor will be required to submit 5 grab samples of hot mix asphalt as it is delivered to the project site.

These samples will be tested for graduation and AC content. The contractor must use a certified commercial testing laboratory as directed by the engineer. The engineer will determine when these tests are to be performed. The contractor shall forward the results of random testing to the engineer within 14 days of sampling. Furthermore, a mix design shall be submitted to the engineer 14 calendar days prior to the overlay being applied.

11. Segregated Mixture

If the mixture is segregated in the finished mat, Macon-Bibb County will take actions based on the degree of segregation. The actions are described below.

Unquestionably Unacceptable Segregation:

When the Engineer determines that the segregation in the finished mat is unquestionable unacceptable, following these measures:

1. Suspend Work and require the Contractor to take positive corrective action. The Engineer will evaluate the segregated areas to determine the extent of the corrective work to complete.
2. If there is a mechanical failure that results in a petroleum spill onto the hot mix asphalt mat then production must cease until the necessary mechanical repairs have been made to the equipment and the areas of the mat that have been affected by the spill have been removed and replaced.

12. Adjusting Utilities:

The contractor shall adjust the height of all utilities in the pavement prior to paving to match the elevation of the new surface. Use the products and methods listed below for each manhole, inlet, or valve

- a. For sanitary sewer manholes, the government, through the Macon Water Authority, will provide a pivoted turnbuckle manhole riser of the American Highway Products Ltd. (see www.ahp1.com). The contractor shall install the furnished riser.
- b. For storm drain and other utility(electric, phone, etc.) round manholes, the contractor shall furnish and install the same pivoted turnbuckle manhole riser from American Highway Products Ltd.
- c. For water valves the contractor shall install water valve risers furnished by the Macon Water Authority

- d. For storm drain or other utility manholes, the contractor shall install a rubber riser adjustment underneath the manhole frame to adjust to the proper height. A source for these rubber adjusters is G&H Rubber Supply Co. (1-888-889-9906)
- e. Submit manufacturer's literature for approval

13. Measurement

A. Milling

Milling existing asphalt pavement is measured by the ton. The contractor shall retain all milled material identified as recyclable for his future use; Macon-Bibb County will retain all material that the contractor identifies as waste and will provide hauling for all said waste product to the Macon-Bibb County Public Works West Facility. The contractor shall submit disposal tickets from a certified disposal facility for all material removed from the site.

B. Special Base Course Repair

Full Depth Reclamation:

Measurement for sub-grade failures requiring additional excavation below the cement stabilized base course depth will be measured by the cubic yard of material used. The contractor will be required to submit quantity calculations for excess material used in patched areas 48 hours following placement.

Deep Patching and Overlay:

The area measured for payment (standard 14" depth) is the number of square yards of patching complete in place and accepted. Measurement for sub-grade failures requiring additional excavation below the standard 14" depth will be by the cubic yard of material used. The contractor will be required to submit quantity calculations for excess material used in patched areas 48 hours following placement.

C. Hot Mix Asphalt

Hot mix asphaltic concrete, complete in place and accepted, is measured in tons. Since payments will be by the ton of asphalt used, the contractor shall provide a copy of the asphalt load tickets to the inspector at the time of delivery. Tack coat will be measured by the gallon.

C. Utility Manhole or Valve Adjustment

Manhole or valve adjustment shall cover all work on each manhole or valve.

14. Payment

A. Milling

Milling asphaltic concrete pavement, measured as specified, will be paid for by the Contract Unit Price bid per ton of material that the contractor removes. Payment is full compensation for furnishing equipment, milling, hauling, disposal and satisfactorily performing the work. Macon-Bibb County will be providing hauling equipment and means of disposal for the waste material and the contractor will only be compensated for furnishing equipment and milling of identified waste material.

B. Special Base Course Repair

The area measured as specified above will be paid for at the Contract Unit Price per cubic yard. Payment is full compensation for equipment, tools, labor, incidentals to complete the work, including but not limited to:

1. Removing damaged asphalt, base, and sub-grade material.
2. Furnishing, placing, and finishing materials for grade stabilization

Payment for excess sub-grade material will be by the cubic yard, in place and compacted.

C. Hot Mix Asphalt

Payment for hot mix asphalt of the various types are paid for at the Contract Unit price per ton. Payment for the asphalt tack coat shall be by the gallon. Payment is full compensation for furnishing and placing asphalt, and for cleaning and repairing, preparing surfaces, hauling, mixing, spreading, rolling, and performing other operations to complete the Control item.

D. Utility Manhole or Valve Adjustment

Payment for each manhole or valve shall cover the cost of material, if required that the contractor furnish the material, labor, and equipment to raise the manhole or valve. Note that some material will be furnished by the Macon Water Authority

E. Submittals

Para#	Description	Date Required	Inspector Check
C.10	Asphalt Mix Design	14 days prior	_____
C.10	Random Asphalt Testing Results	14 days following	_____
C.12.E	Manufacture's Literature	14 days prior	_____
C.13.A	Millings Disposal Tickets	5 days following	_____
C.13.B	Quantity calculations (Excess Sub-grade Material)	2 days following	_____
C.13.C	Asphalt Load Tickets	Upon Delivery	_____