

SECTION 04062A

04062A– MILLING OF HOT MIX ASPHALT (HMA)

04062B– FULL DEPTH REMOVAL OF HOT MIX ASPHALT (HMA)

Description:

Milling Services consist of the cutting and removal of bituminous concrete material from roads, including all necessary work to establish the lines and grades specified and the removal and clean up of all milling material around catch basin inlets, manholes, utility valve boxes, and any similar structures. Contractors shall delivery all milling material to a designated site within a fifteen (15) mile radius of the work area as directed by the Engineer or his representative unless other arrangements have been made for the removal of milling material.

Full depth removal consists of removing the surface, intermediate and base asphalt courses to the top of the existing subbase.

Materials:

A milling crew shall include a minimum of one (1) milling machine (minimum 6 foot cutting width), all extra teeth and tools needed to perform repairs, a mounted pickup conveyor, operator and grounds person. Take-away trucks with operators, a pick-up broom with operator, water tanker (with water supplied by the Contractor), air compressor (minimum 125 CFM) with operator, a small milling machine with operator capable of removal and clean up of all milling material around grates, manhole covers and other apparatus on roads.

Equipment or milling bituminous concrete shall have a minimum cutting width of 6 feet. It shall be self propelled with sufficient power, traction, and stability to maintain the required depts. And slope and shall be capable of removing the existing bituminous concrete to the line, grade and typical cross-section specified by the Engineer.

Construction Methods:

The Contractor shall remove the Hot Mix Asphalt (HMA) material using means acceptable to Engineer. The pavement surface shall be removed to the line, grade and existing or typical cross-section shown on the plans, or as directed by the Engineer.

The equipment for milling the pavement surface shall be designed and built for milling flexible pavements. It shall be self propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing HMA pavements.

The milling machine shall be equipped with a built-in- automatic grade averaging control system that can control the longitudinal profile and the transverse cross-slope to produce the specified result. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line (30 feet minimum). The transverse controls shall have an automatic system for controlling cross-slope at a given rate. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

The rotary drum of the machine shall utilize carbide tip tools spaced not more than 5/8 inches apart. The forward speed of the milling machine shall be limited to no more than 45

feet/minute. The tools on the revolving cutting drum shall be continually maintained and shall be replaced as warranted to provide a uniform payment texture. The Contractor may request to perform a test strip to demonstrate that the same surface tolerance can be attained at an increase forward speed. The test strip shall be a maximum length of 500 feet and shall have the same criteria for surface tolerance as noted in this specification. The final decision for implementing the increased forward speed shall be at the discretion of the Engineer.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck, all in one (1) operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation.

When milling smaller areas where it is impractical to use the above described equipment, the use of a lesser equipped milling machine may be permitted when approved by the Engineer.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm drainage system, the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed at the Contractor's expense.

For full depth removal, the contractor may propose an alternate method of asphalt removal, either in combination with milling or exclusive of milling. The final decision for alternate construction methods shall be at the discretion of the Engineer.

Surface Tolerance: The milled surface shall provide a riding surface with a uniformed texture appearance. The milled surface shall be free from gouges, longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment or poor workmanship. The Contractor, under the direction of the Engineer, shall perform random spot-checks with a Contractor supplied ten (10) 10 foot straightedge to verify surface tolerances at a minimum of five (5) locations per day. The variation of the top two (2) ridges from the testing edge of the straightedge, between any two (2) ridge contact points, shall not exceed 3/8 inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed 3/8 inch. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

The depth of removal shall be verified by taking a measurement every 250 feet per each milling pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to monitor the average depth of removal.

Where a surface delamination between HMA layers or a surface delamination of HMA on Portland cement concrete causes a non-uniform texture to occur, the depth of milling shall be adjusted +/- 1/2 inch or until delamination is eliminated.

When removing HMA pavement entirely from an underlying Portland cement concrete pavement, all of the HMA pavement shall be removed leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer. Any unsatisfactory surfaces

produced by the milling operation are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

When removing HMA pavement entirely from an underlying processed aggregate or gravel subbase, all of the HMA pavement shall be removed leaving a uniform surface of processed aggregate or gravel. Subbase preparation and the placement of additional processed aggregate are included as separate items in the Contract Documents.

No vertical faces, transverse or longitudinal, shall be left exposed to traffic. If any vertical face is formed in any area exposed to traffic, a temporary paved transition shall be established according to the requirements shown on the plans. If the milling machine is used to form a temporary transition, the length of the temporary transition shall conform to Section 4.06 "Transitions for Roadway Surface", the requirements shown on the plans, or as directed by the Engineer. At all permanent limits of removal, a clean vertical face shall be established by saw cutting prior to paving.

The milling operation shall proceed in accordance with the requirements of the "Maintenance and Protection of Traffic" and "Prosecution and "Progress" specifications, or other contract requirements. The more stringent specifications shall apply.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper. The sweeper shall be equipped with a water tank and capable of removing the millings and loose debris from the surface. Other sweeping equipment may be provided in lieu of the sweeper where accepted by the Engineer.

Method of Measurement:

This work shall be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions shall be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

The depth of removal shall be calculated by taking measurement at a minimum of every 250 feet per each pass of the milling machine, or as directed by the Engineer. The average depth of each section shall determine which payment item is applicable.

Full depth removal will be measured for payment by the number of square yards of area identified for removal at the start of construction and removed. Subbase preparation and the placement of additional processed aggregate are included as separate items in the Contract Documents.

Basis of Payment:

This work shall be paid for at the Contract prior per square yards for "Milling of HMA" or "Full depth removal". This price shall include all equipment, tools, labor and materials incidental thereto.

No separate payments shall be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operations; removal of any temporary milled

transition; removal and disposal of millings; furnishing a sweeper and sweeping after milling. The cost for these items shall be included in the Contract unit price.it price.