

Subsection 4.03 Fly Ash Treatment for Materials in Place

I. Scope: This subsection includes treating the subgrade, subbase or base (with or without asphaltic concrete pavement) by pulverizing, adding fly ash, mixing and compacting the resultant mixture to the required density. This subsection applies to one or more layers of soil, existing processed pavement, subbase, or base modified with water, and fly ash. Each layer shall conform to the lines, grades, thicknesses, and typical cross sections shown on the plans.

II. Materials

A. General: Furnish fly ash that meets the requirements of DMS-4615, "Fly Ash for Soil Treatment." Use Class CS or FS as shown on the plans.

B. Flexible Base: When required, furnish base material the meets the requirements of Subsection 4.05 "Flexible Base," for the type and grade shown on the plans.

C. Water: Water usage shall conform to Subsection 3.04 "Requirements for Water Usage."

D. Mix Design: The ODR will determine the target fly ash content. The Contractor will supply a mix design to determine optimum moisture content and density. Mix design is limited to no more that 50% of asphalt concrete pavement unless otherwise shown on the plans.

III. Equipment

A. Storage Equipment: Fly ash shall be stored and handled in closed, weather-proofed containers until immediately before distribution. If storage bins are used, they shall be completely enclosed. Materials in bags shall be stored in weatherproof buildings with adequate protection from ground dampness.

B. Water Sprinklers: The sprinklers shall be equipped with positive and rapidly working cut-off valves and approved spray bars and shall be designed, equipped, and operated so as to ensure the distribution of water in a uniform and controllable rate of application.

C. Mixing Equipment: Provide pulverization equipment that:

- a) Cuts and pulverizes material uniformly to the proper depth with cutters that will plane to a uniform surface over the entire width of the cut;
- b) Provides a visible indication of the depth of the cut at all times;

and

c) Uniformly mixes the materials.

IV. Construction Methods

A. General: A completed stabilized subgrade, subbase, or base containing a uniform fly ash mixture free from loose or segregated areas, of uniform density, and moisture content, well bound for its full depth and with a smooth surface suitable for placing subsequent courses shall be constructed. The Contractor shall regulate his work sequence to process a sufficient quantity of material to provide full depth as shown on the plans with proper amount of fly ash; maintain the work; and rework the courses as necessary.

B. Preparation: The previous course shall be graded and shaped as required to construct the fly ash treatment for materials in place in conformance with the lines, grades, thickness, and typical cross section shown on plans. All unsuitable soils or material shall be removed and replaced with acceptable material.

C. Weather Limitations: The stabilized mixture shall not be constructed while the atmospheric temperature is below 40°F. or when conditions indicate that the temperature may fall below 40°F. prior to completion of the operation. The operation shall not be started when weather conditions are foggy or rainy, or when soil, subgrade or base is frozen.

D. Pulverization: The material to be stabilized shall be pulverized until 100% by weight shall pass a 1 inch sieve and 80% shall pass a No. 4 sieve, exclusive of gravel or stone retained on the No. 4 sieve.

E. Preparation of Subgrade or Existing Base for Treatment: When call for in plans, Before treating, remove existing asphalt concrete pavement, before treating in accordance with pertinent Subsections in the plans or as directed by the ODR. Shape existing material to typical sections shown on the plans.

When shown on the plans or directed by the ODR, proof-roll the roadbed in accordance with Subsection 4.31, "Proof Rolling," before pulverizing or scarifying existing material. Correct soft spots as directed.

When new base material is required to be mixed with existing base, deliver, place, and spread the new material in the required amount per station. Manipulate and thoroughly mix new base with existing material to provide a uniform mixture to the specified depth before the addition of fly ash.

F. Applying and Mixing in Place: Fly ash shall be uniformly spread by an approved method over an area only as large as mixing operations can be completed during the same work day. Apply percentage shown in plans. Any fly ash that has been displaced shall be replaced before mixing is started. Do not spread fly ash with a motor grader. After fly ash has been applied, it shall be mixed with the material. Mixing shall continue until the stabilization material has been sufficiently blended with

the material to form a homogeneous mixture. Do not apply fly ash when wind conditions, in the opinion of the ODR, cause blowing fly ash to become dangerous to traffic or objectionable to adjacent property owners.

G. Compaction: Prior to compaction, the mixture shall be in a loose condition for its full depth. The loose mixture shall be uniformly compacted to the specified density within 6 hours. Shaping may be required to obtain uniform compaction and required grade and cross section. The in place density for stabilized subgrade or subbase shall not be less than 95% of the final mixture's Standard Proctor. The in place density for stabilized base shall not be less than 100% of the final mixture's Standard Proctor. Final density mixture testing is the responsibility of the City of Amarillo.

H. Finishing: During and after compaction, the surface of the mixture shall be shaped to the required lines, grades, and cross section. Scarifying may be used to remove any tire imprints or smooth surface imperfections left by equipment. The resulting surface shall then be compacted to the specified density to obtain a dense smooth surface that is free from compaction planes, cracks, ridges, or loose material.

The surface of the mixture shall be maintained at optimum moisture content during the finishing operation. Any portion of the mixture that varies substantially from the specified density shall be removed and replaced by the Contractor.

I. Construction Joints: At the end of each days run, a transverse construction joint shall be formed by a header or by cutting back into the compacted material to form a true transverse vertical face. The construction joints may be protected by the placing, spreading, and compacting of stabilized material without injury to the work previously laid. Care shall be exercised to ensure thorough compaction of the stabilized material immediately adjacent to all construction joints. When it is necessary to operate and/or turn any equipment on the completed stabilized course, sufficient protection and cover shall be provided to prevent damage to the finished surface.

J. Protection and Curing: After the stabilized material has been finished, it shall be protected against drying for a period of no less than 3 days or until the next paving course is placed by applying bituminous material or maintaining the surface in a thorough and continuously moist condition. The curing method shall begin as soon as possible, but no later than 6 hours after finishing. When the air temperature may fall below 35°F, sufficient protection from freezing shall be given the stabilized material.

K. Construction Limitations: The Contractor shall modify construction procedures when any phase is interrupted for more than 30 minutes or the uncompacted mixture is out of the moisture content tolerances. All material designated to be reconstructed shall be at the Contractor's expense.

L. Maintenance: The Contractor shall be required to maintain the entire stabilized material satisfactorily. Maintenance shall include immediate repairs of any defects that may occur either before or after the stabilization material is applied. The work shall be repeated as often as necessary to keep the area intact at all times. Repairs shall be made in a manner that will ensure restoration of a uniform surface and

the durability of the part repaired. Faulty work must be replaced for the full depth of the treatment. Any thin areas shall be remedied by replacing the material for the full depth of the treatment rather than by the addition of a thin layer of stabilized material to a completed surface.

V. Measurement

A. Stabilized Subgrade, Subbase, or Base: The stabilized material shall be measured in square yards of completed and accepted finished surface.

B. Fly Ash: The amount of fly ash shall be measured by the ton installed.

C. Flex Base: Flex base shall be measured by the Square Yard of material required.

VI. Payment

A. Stabilized Subgrade, Subbase, or Base: Payment shall be made at the contract unit price per square yard for stabilized material. This price shall be full compensation for furnishing all materials, all preparation, delivering, placing, and mixing of these materials, except for the stabilization material used, and for all labor, equipment, tools and incidentals necessary to complete this portion of the project. Where subgrade is constructed under this Contract, correction of soft spots in the subgrade or existing base will be at contractor's expense. Where subgrade is not built under this Contract, correction of soft spots in the subgrade or existing base will be in accordance with pertinent Subsections or Article 10.1.1 of the Uniform General Conditions for City of Amarillo Civil Construction Contracts.

B. Fly Ash: Payment shall be made at the contract unit price per ton of fly ash for the calculated amount for planned thickness. This price shall be full compensation for furnishing this material and for all delivery, placing, and incorporation of this material, and for all labor, equipment, tools, and incidentals necessary to complete the work. Fly ash used for reworking a section will not be part for.

C. Flexible Base: Payment shall be made in accordance with Subsection 4.05 "Flexible Base." Mixing, spreading, blading, shaping, compacting, and finishing will be considered part of this subsection.

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