

SP- 095003  
(New)



**SPECIAL PROVISIONS  
FOR  
STABILIZED SOIL EMBANKMENT**

**Monroe County  
ER-C068(69)--58-68**

**Effective Date  
January 18, 2012**

**THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**095003.01 DESCRIPTION.**

This specification covers the construction of a stabilized soil embankment using fly ash or quicklime and existing soils on the site. The work includes furnishing and incorporating fly ash or quicklime with existing soils excavated from the slope, adjusting moisture contents as needed, compacting, and shaping the slope as shown on the plans.

**095003.02 MATERIALS.**

- A. Fly ash shall comply with the physical requirements of ASTM International D-5239 6.4 maintaining minimum compressive strength of 345 MPa (500 psi) at 7 days, and the chemical requirements of ASTM C618, Table 1, for Class "C" fly ash. The fly ash shall contain a minimum of 25% CaO.
- B. Quicklime shall be high calcium quicklime containing a minimum of 95% CaO.
- C. The water used in the stabilized mixture shall be in accordance with Section 4102 of the Standard Specifications. Water known to be potable may be used without testing.

**095003.03 EQUIPMENT.**

- A. The machinery, tools, and equipment necessary for proper mixing and compaction shall be on the project and reviewed by the Engineer prior to beginning construction operations. Blending of the soil-fly ash or quicklime-water mixture shall be accomplished by a Bomag MPH 100 pulv mixer, Wirtgen 2500 reclaimer, Asphalt Zipper, or equivalent approved equipment. Compaction shall be achieved using a vibratory padfoot foot roller. Rubber-tired or smooth-drum rollers will not be permitted. All machinery, tools, and equipment used shall be maintained in a satisfactory and working condition.
- B. Fly ash or quicklime shall be delivered, stored, and handled in closed weatherproof containers until immediately before distribution. Temporary storage (less than 12 hours) in open pits will be allowed, provided wetting of the fly ash or quicklime by rain or groundwater is not allowed. Fly ash or quicklime exposed to moisture prior to mixing with soils shall be discarded.
- C. If the fly ash or quicklime is furnished in trucks, each truck shall have the weight of the material certified on public scales or the contractor shall place a set of standard platform truck scales or hopper scales at a location approved by the Engineer.

**095003.04 CONSTRUCTION.**

**A. General.**

It is the primary purpose of this specification to secure a completed section of treated material which contains a uniform fly ash or quicklime soil mixture, with no loose or segregated areas, which has a uniform density and moisture content, and which is well bound for its full depth. It shall be the responsibility of the Contractor to regulate the sequence of the work, to process a sufficient quantity of material to provide a completed section as shown on the plans, to use the proper amounts of fly ash or quicklime, to achieve final compaction within the specified time, to maintain the work, and to rework the lifts as necessary to meet the above requirements. Soil temperature shall be at or above 40°F at the time the fly ash or quicklime is incorporated.

**B. Preparation of Stabilized Backfill Material.**

- 1. Before other construction operations are begun, the area where the fly ash or quicklime will be placed shall be graded and shaped in conformance with the lines and grades shown on the plans.

2. All areas shall be firm and able to support, without displacement, the construction equipment and the compaction hereinafter specified. Soft or yielding subgrade shall be corrected and made stable by scarifying, adding fly ash or quicklime, and compacting until it is of uniform stability.
3. Where the stabilized section is to extend below the cut surface, the fly ash or quicklime shall be disturbed uniformly across the surface in a quantity sufficient to provide the specified content. The material shall be blended and mixed with a pulv mixer, with water being added to achieve the specified moisture amount.

**C. Moisture Control.**

1. Moisture content shall be achieved through use of a pulv mixer equipped with a spray bar in the mixing drum capable of applying sufficient quantities of water to achieve the required moisture content for the mixture. The system shall be capable of being regulated to maintain moisture contents within the specified range. Ideally, the water truck and the pulv mixer will be connected with a hose suitable to assure continuous water supply and uniform mixture of all soil elements inside the mixing chamber.
2. Required moisture contents will be established by the Engineer based on laboratory tests with the site soils and specific fly ash or quicklime to be used for the treatment. The final moisture content of the mix immediately prior to compaction shall not exceed the specified range of moisture contents. If moisture contents exceed the specified limits, additional fly ash or quicklime may be added to lower moisture contents to the required limits. Lowering moisture contents by aeration following addition of fly ash or quicklime will not be allowed.

**D. Proportions.**

1. If fly ash is used, the final stabilized soil mixture shall contain a minimum of 15 % fly ash by dry soil weight. Based on 10,922 cubic yards of embankment material and a dry soil weight of 110 pounds per cubic foot, a total of 2433 tons of fly ash will be required.
2. If quicklime is used, the final stabilized soil mixture shall contain a minimum of 5 % quicklime by dry soil weight. Based on 10,922 cubic yards of embankment material and a dry soil weight of 110 pounds per cubic foot, a total of 811 tons of quicklime will be required.

**E. Application of Fly Ash or Quicklime.**

Immediately prior to application of fly ash or quicklime, the area shall be bladed to provide a uniform surface for distribution of the fly ash or quicklime. The fly ash or quicklime shall be spread in an approved manner at the rates shown above. The fly ash or quicklime shall be distributed at a uniform rate and in such a manner as to minimize disbursement of the material by wind. The material shall not be applied when wind conditions, in the opinion of the Engineer, are such that blowing material will become objectionable to adjacent property owners. Care shall be taken to avoid disturbing the fly ash or quicklime once spread on the surface to be treated. Mixing operations shall commence as soon as practicable, but no more than 1/2 hour after distribution of the fly ash or quicklime.

**F. Mixing.**

The soil, fly ash or quicklime, and water shall be thoroughly mixed and blended by approved mixers or other approved equipment, and the mixing continued until, in the opinion of the Engineer, a homogeneous, friable mixture of soil and fly ash or quicklime, free from all clods or lumps, is obtained. If the mixture contains clods, they shall be reduced in size by additional pulverization.

**G. Compaction.**

1. Compaction of the mixture shall begin immediately after mixing the fly ash or quicklime, soil, and water. In most cases, two or three passes with the vibratory sheepsfoot roller will produce the desired density. Final compaction of the treated soils should be completed as soon as practicable but within two hours.
2. All non-uniform areas (too wet, too dry, or insufficiently treated) which appear shall be corrected immediately by scarifying the areas affected, adding or removing materials as required, and remixing and re-compacting.
3. The stabilized section shall be compacted to a minimum of 95% of the material's maximum dry density as determined by ASTM D-698 (Standard Proctor Compaction).
4. Moisture content of the soil-fly ash or quicklime mixture shall be in the range developed from the laboratory compaction and strength tests.
5. In addition to the requirements specified for density, the full depth of the material shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section is completed, tests will be made by the Engineer. If the material fails to meet the density or moisture content requirements, the Engineer may require that it be reworked as necessary to meet those requirements or require the Contractor to change the construction methods to obtain required density on the next section. Additional fly ash or quicklime shall be added to areas that are reworked at a rate established by the Engineer. If the material, because of any reason or cause, loses the required stability, density, and finish before the work is accepted, it shall be reprocessed, recompact, and refinished at the sole expense of the Contractor.
6. Reprocessing shall follow the same pattern as the initial stabilization including the addition of fly ash or quicklime.

**H. Finishing.**

1. After the stabilized layer has been compacted, it shall be graded to the required lines and cross slopes shown on the plans.
2. After the stabilized slope has been finished as specified herein, the surface shall be protected against rapid drying by proceeding to spread topsoil. Stabilized material allowed to dry excessively shall be reprocessed, re-compacted, and refinished at the sole expense of the contractor.

**095003.05 METHOD OF MEASUREMENT.**

Payment shall be made for the quantity in cubic yards of Stabilized Soil Embankment shown in the contract documents. No additional measurement will be made.

**095003.06 BASIS OF PAYMENT.**

Payment shall be full compensation for furnishing all equipment, labor, and materials to construct the stabilized soil embankment as shown in the contract documents.