CITY OF COLUMBUS
PUBLIC SERVICE DEPARTMENT
TRANSPORTATION DIVISION

SUPPLEMENTAL SPECIFICATION 1503
SOIL STABILIZATION

JULY 8, 2002

SOIL STABILIZATION

1503.01 Description. This supplemental specification outlines the requirements for constructing a stabilized soil structure by uniformly mixing an approved chemical stabilizer, such as Lime, Quicklime, Fly-Ash and/or Cement with the soil and compacting the resulting mixture.

The intended purpose is to permanently strengthen and weather-proof the subgrade soil. Credit may be accorded for this process in pavement design, if all parameters of this specification are complied with.

1503.02 Materials. The materials used shall meet the following requirements:

Lime. Hydrated lime and Quicklime shall meet the requirements of section 712.04 (b) of the CMSC.

Cement. Cement shall meet the requirements of section 701 of the City of Columbus Construction and Material Specifications.

Fly Ash. Fly Ash, Class C or F, shall meet the requirements of section 705.13 and ASTM C 618. Fly Ash not conforming to these requirements may be considered, provided performance requirements of this specification can be proven.

Water. Water shall be clean and clear. If the water is of questionable quality, it shall be tested in accordance with the requirements of AASHTO T 26.

Other Materials. It is not the intent of this document to limit the use of other materials, however, it is beyond the scope of this document to focus on materials for which AASHTO and ASTM standards have not been developed. Materials not conforming to the above, may be considered, provided performance requirements of this specification can be proven.

1503.03 Laboratory Mixture Design. Proposed mix design proportions and recommended depth of application shall be submitted to the City by an approved geotechnical firm, selected by the Contractor, sufficiently in advance of the work for review and approval. If pavement design options are to be considered, submittals must be received no less than 45 days in advance of stabilization operations. A sufficient number of samples shall be taken to insure control data, {moisture-density relationship curve(s)}, developed in the laboratory, represents field conditions, and to account for any changes in soil type. A mix design shall be submitted for each anticipated soil type.

The proposed mix design shall yield a minimum CBR value of 20 and a minimum average unconfined compressive strength of at least 100 psi at 7 days, and at least 150 psi at 28 days.

1503.04 Equipment. The Contractor shall use equipment that will produce results meeting the requirements for application of materials, compaction, and finishing as

controlled by these Specifications. Mixing shall be performed using an approved power driven rotary type mixer. Prior to construction, all equipment shall be in satisfactory working condition, and available for inspection by the Project Engineer or his designee.

1503.05 Storage and Handling. Admixtures shall be properly stored and handled in closed weatherproof containers until immediately before distribution. Hydrated lime, Quicklime, or Cement in bags shall be properly stored in weather-protected conditions with adequate protection from ground dampness. The storage facilities shall be approved by the City.

1503.06 Construction Methods.

Temperature and Weather Limitations. Stabilization shall be performed only when ambient air temperature is above 40° F, and when the soil is not frozen. Do not perform this work during wet or unsuitable weather, or when freezing weather is anticipated within 24 hours of mixing/compaction.

Preparation of Existing Roadway. Prior to starting the stabilization process all unsuitable materials, such as stumps, roots, and organic material shall be removed. Construct the area to be stabilized to an elevation such that, upon completion of the operations, the subgrade will conform to the lines, grades, and cross-section shown on the plans.

Spreading of Material. The admixture shall be spread using equipment that will provide uniform distribution over the entire repaired area and in such a manner as to limit scattering and loss by wind.

Tailgate spreading of material will not be permitted.

The material may be spread in either a slurry or dry form at the option of the Contractor.

Mixing. Mixing operations shall be such that all ingredients are distributed evenly throughout the required depth, and provide a uniform mixture, free of segregation, that is satisfactory to the Engineer. The moisture content of the mixture shall be maintained at ± 2% of the optimum moisture content.

The material shall be pulverized so that 100% passes the 1 inch sieve and 60% passes the #4 sieve.

Compaction. Immediately upon completion of the spreading/mixing operations, the mixture shall be thoroughly compacted to 98% of the maximum dry density established during the preparation of the laboratory mix design. All soil subgrade shall be compacted to 100%. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density.

If depressions, defective areas or soft spots develop during the compaction operation, they shall be corrected immediately.

After each section is completed, field density tests shall be made in accordance with COC Supplemental Specification 1501. If the compacted mixture fails to meet the

specified density requirements, further evaluation by means of a test roll per section 204.07, may be performed at the discretion of the Project Engineer to evaluate subgrade stability for acceptance. The City may require the area to be reworked as necessary to meet these requirements and may require the Contractor to change compaction equipment and/or methods to obtain the required density.

Finishing. When compaction of the stabilized soil is nearing completion, the surface shall be shaped to the required lines, grades and cross section within the tolerances of item 203.08. Compaction should continue until the required density is obtained.

1503.07 Curing and Protection. After the subgrade has been finished as specified, it shall be cured for a period of at least 5 days above 40°F, or until core samples extracted from the subgrade meet the requirements of 1503.03.

During the curing period, the subgrade shall be protected against drying by applying an approved prime coat or polymer solution to prevent moisture loss.

All traffic or equipment other than curing equipment shall not be allowed on the finished subgrade until completion of curing, unless permitted by the Engineer.

1503.08 Maintenance/Defective Areas. The contractor shall maintain, at his expense the entire stabilized area in a manner satisfactory to the City. Maintenance shall include immediate repairs of any defective or damaged portions of the treated subgrade.

1503.09 Basis of Payment. The accepted quantities of stabilized soil will be paid for at the contract unit price per square yard or cubic yard, *(square meter or cubic meter)*, which price and payment shall be full compensation for furnishing and placing all materials.

Item	Unit	Description
1503	Square Yard *(Square Meter)* Cubic Yard *(Cubic Meter)*	Soil Stabilization