Sample Project Special Provision: 308ss

Date: 11/01/2012

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SECTION 308

SUBGRADE STABILIZATION

Section 308 of the Standard Specifications is hereby added to this project as follows:

**DESCRIPTION**

**308.01** This work consists of stabilizing the earth subgrade by a mechanical, chemical, or unbound aggregate process in the specified area as shown on the plans or as directed by the Engineer. The material shall be finished to a smooth and uniform surface on which a structural pavement system shall be placed.

**DESIGN REQUIREMENTS**

**308.02** The Contractor shall submit a design to the Engineer for approval prior to construction. Mechanical stabilization and chemical stabilization with cement, fly ash or other chemical agents shall be designed in accordance with CP 26-13. Lime stabilized subgrade and stabilization with unbound aggregate shall be designed in accordance with the current version of CDOT’s Pavement Design Manual.

**MATERIALS**

**308.03** Mechanically stabilized material shall conform to CP 26-13. Materials used for lime stabilized subgrade shall conform to the requirements of Section 307. Chemical stabilization with cement, fly ash or other chemical agents shall conform to CP 26-13. Unbound aggregate material shall conform to the requirements of Section 304.

**CONSTRUCTION REQUIREMENTS**

**308.04 Placing.** The Contractor shall construct one or more compacted courses of stabilized material in the area specified. The stabilized subgrade shall have uniform density and moisture content and be void of all vegetation and other organic material. The stabilized subgrade shall be well bound for its full depth and width with a smooth surface suitable for placing subsequent courses.

**308.05 Mixing.** The Contractor shall regulate the sequence of the work to accurately apply the subgrade stabilization technology courses as necessary to meet the above requirements.

**308.06 Proof Rolling.** After the subgrade has been stabilized, the Contractor shall perform proof rolling in accordance with subsection 203.09. Final proof rolling will take place a maximum of two days after all mechanical stabilization or unbound aggregate work has been completed, unless otherwise approved by the Engineer. Final proof rolling will take place a minimum of two days after all lime or other chemical stabilization work has been completed, unless otherwise approved by the Engineer.

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**308.07 Finishing.** The finished surface shall be smooth and uniform conforming to the typical sections. Variation from the stabilized subgrade plan elevations specified shall not exceed 0.04 foot. All irregularities, depressions, or weak spots, whichdevelop, shall be corrected at the Contractor’s expense. The surface shall be maintained in asmooth condition, free from undulations and ruts, until other work is placedthereon or the work is accepted.

**METHOD OF MEASUREMENT**

**308.08** Stabilized subgrade will be measured by the square yard completed and accepted.

**BASIS OF PAYMENT**

**308.9** The accepted quantities will be paid for at the contract unit price for each of the pay items listed below that appear in the bid schedule. Payment shall include all geosynthetic material, unbound material, processing material, mixing, compaction, and any materials used in curing.

Payment will be made under:

**Pay Item Pay Unit**

Stabilized Subgrade Square Yard

Overlapped material will not be measured and paid for separately, but shall be included in the work. All proof rolling will not be measured and paid for separately but, shall be included in the work.

Instructions to Designers (Please delete before incorporating into spec package):

Designers should consult with the Region Materials Engineer (RME) on whether or not to include this project special provision. The RME may want to eliminate the use of chemical stabilization if documented concentrations of sulfates are found to be present in the soil.

Colorado Procedure 26-13

*Standard Practice for*

# Contractor Approval Process for Subgrade Stabilization

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**1. SCOPE**

* 1. This practice describes the procedures for submitting design and construction information using mechanical stabilization with geosynthetics or chemical stabilization for subgrade stabilization in lieu of unbound aggregates.

**2. REFERENCED DOCUMENTS**

2.1 CDOT Pavement Design Manual.

2.2 Chapter 5 of the FHWA Geosynthetic Design and Construction Guidelines dated August 2008.

**3. APPROVAL OF SUBGRADE DESIGN**

3.1 The design of the subgrade stabilization shall be in conformance with CDOT Pavement Design Manual and other specified Colorado, AASHTO, ASTM, and FHWA procedures. Significant variances from these specifications will require an Experimental Feature in accordance with CDOT’s Procedural Directive 1401.1.

3.2 Mechanical Stabilization with Geosynthetics

3.2.1 Geotextile material shall be on the New York State DOT’s Approved Products List for Geotextiles in the Stabilization Application.

3.2.2 Designs using other geotextile or geogrids shall be submitted and approved by the Engineer prior to incorporation into the work.

* + 1. Design must be calculated with an AASHTO or FHWA approved methodology. Design considerations include, but are not limited to the following:
       1. Submit geosynthetic subgrade stabilization design calculations with input values and any assumptions used in the calculations.
       2. State geosynthetic design methodology used in design calculation and output values.
       3. State the estimated effective resilient modulus of construction platform. Note: the minimum resilient modulus value used in the design shall be equal to or greater than the value shown on the plans or in the Pavement Justification Report.
       4. Upon request, the design software shall be made available to CDOT personnel.
       5. The design shall be stamped by a Professional Engineer registered in the State of Colorado.
    2. Construction requirements include. but are not limited to the following:
       1. The subgrade material shall be placed in accordance with the manufacturer’s recommendations and subsection 203.07.
       2. Proof rolling shall be in accordance with subsection 203.09.

3.3 Chemical stabilization may be accomplished with lime, cement, fly ash or other chemical agents approved by the Engineer.

3.3.1 Design must be calculated with a CDOT, AASHTO or ASTM approved methodology.

* + - 1. Submit design calculations at various application rates.
      2. State the chemical-soil proportion for stabilization.
      3. State unconfined compressive strength at the design value.
      4. The design shall be stamped by a Professional Engineer registered in the State of Colorado.
    1. Construction requirements using lime shall be in accordance with subsection 307.04.
    2. Construction requirements using other chemical agents shall be submitted and approved by the Engineer prior to incorporation into the work.

**4. DESIGN SUBMITAL Requirements**

4.1 All required design and supporting information shall be submitted electronically to the Project Engineer. Acceptable formats include pdf, MS Excel, MS Word, PowerPoint, jpg and other compatible formats. Submittal shall be submitted in the order listed below.

* 1. Subgrade Stabilization Technology Supplier – Submittal shall include, but not limited to the following:
     1. The Submittal for Mechanical Stabilization with Geosynthetics:
* Manufacturer’s product data sheets.
* One sample measuring at least 4 inches by 8 inches.
* Quality control data for each lot incorporated into the project.
* The laboratory performing the quality control shall be currently accredited by GAI-LAP and shall include a copy of their current certificate.
* Provide the name of the manufacturer’s representative who will be available during construction.
* If available, include project locations, supporting design information and any performance data from previous CDOT projects constructed within the last 10 years.
  + 1. The Submittal for Chemical Stabilization:
* Manufacturer’s product data sheets.
* Quality control data on the chemical composition for each lot incorporated into the project.
* Quality control data on the gradation analysis for each lot incorporated into the project.
* Provide the name of the manufacturer’s representative who will be available during construction.

* 1. Subgrade Stabilization Contractor Submittals shall include:
* Summary of contractor’s subgrade stabilization experience, if any. Contact names shall be included for owners of past projects.
* A list of best practices for subgrade stabilization.
* Solutions for corrective actions for typical problems that may need to be utilized. Written explanation shall be provided for the failures.

**5. CDOT REVIEW PROCESS**

* 1. Preliminary review of contractor’s subgrade stabilization proposal will be performed by the Project Engineer in conjunction with Regional Material Engineers as needed.
  2. CDOT may request additional information from Contractor.
  3. Incomplete submittals may be rejected as unacceptable.
  4. Preliminary review is estimated to take up to two weeks, depending upon completeness of initial submittal.
  5. Final approval may take an additional week after the conclusion of the preliminary review.