OS-600 (3-89)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DATE: January 11, 2006 **424-06-01**

SUBJECT: Item Related Standard Special Provision
c02101 Item 9210-2022 (Item 9210-022) – Subgrade Treatment

TO: All District Executives

FROM: Tucker Ferguson, P.E., Director **/s/**
Bureau of Construction and Materials

The above referenced item related standard special provision for Subgrade Treatment has gone through the clearance transmittal process and is now available for incorporating into various highway projects. A copy of the special provision can be obtained in the Departments ECMS system.

The Subgrade Treatment provision was developed in the CPQI Task Force Subgrade Team. This Team consists of members from ACPA, PENNDOT, PA Turnpike, consultants, contractors, and suppliers. The special employs a tool box approach to improving the subgrade for reconstruction projects and provides for a cost effective uniform treatment across the entire project. The Subgrade Treatment special allows the contractor to choose between one foot of rock or chemically stabilizing the top foot to subgrade with a lime product to strengthen the subgrade soils.

The Subgrade Team found that a Subgrade Treatment applied to the entire project and included in the original bid offset spot undercutting costs. Pilot projects bid with the special in the original contract showed costs were as low as 30% the cost of spot undercutting.

Attached please find a subgrade stabilization design worksheet detailing soil studies needed to verify soils are reactive with lime and achieve strength requirements prior to incorporating into contracts. It is the intent of the Department to eventually incorporate the design worksheet into Publication 242 “Pavement Policy Manual”.

Please direct any questions or concerns regarding this Strike-Off Letter to Chris Cepko, Bureau of Construction and Materials at (570) 963-4114.

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Subgrade Stabilization

Design Work

Stage I (40 hours)

1. Look at Old Soils Reports
   and/or
2. Check Geology and Soils map
   a. Know what type of soil you have based on bedrock or soils map.
      1. Limestone - Clay type soils
      2. Shale/Sandstone - Sandy with less clay

Stage II (30 hours)

1. Sampling
   a. Take samples at each major change or at intervals determined by Stage I analysis. Samples should be taken at anticipated subgrade elevation,

Stage III (30 days to get results)

1. Testing
   a. AASHTO M145 Soil Classification
   b. AASHTO T265 Natural Moisture
   c. AASHTO T99 - Optimum Moisture/Maximum Density (without additives)
   e. ASTM D5102 - Unconfined compressive strength (without additives). Prepare sample cylinders according to ASTM D5102, Method B with the following modification: Revise Section 12. to read: Cure compacted specimens in a plastic airtight moisture proof container at a temperature of 40^{o}C (104F) for 7 days.
   f. AASHTO T-193 - CBR (without additives)
   g. ASTM D6276 Using PH to determine Soil/Lime Proportioning. Determine the amount of lime that results in a minimum lime/soil PH of 12.4.
   h. AASHTO T99 - Optimum Moisture/Maximum Density (with lime, lime/fly ash, etc.)
   i. ASTM D5102 - Unconfined compressive strength (with lime, lime/fly ash, etc.). Target minimum = 862 kPa (125 psi). Prepare sample cylinders according to ASTM D5102, Method B with the following modification: Revise Section 12. to read: Cure compacted specimens in a plastic airtight moisture proof container at a temperature of 40^{o}C (104F) for 7 days.
   j. AASHTO T-193 - CBR (with additives)

Stage IV (4 hours)

1. Do a confirmation inspection of exposed subgrade prior to starting stabilization.