

SECTION 1.2 - SOILS INVESTIGATION AND PAVEMENT DESIGN

1.02.01 SOILS INVESTIGATION

- A. The Developer of a proposed subdivision where roads will be conveyed to the Town of Easton shall employ the services of an Engineer to perform a subsurface investigation for the purpose of obtaining information needed to design the proper pavement section.
- B. The Design Engineer shall employ a Geotechnical Engineer registered in the State of Maryland who is qualified and experienced in the field of Geotechnical Engineering and who is actually engaged in the practice of soils mechanics and foundation engineering.
- C. Borings shall be made for all proposed streets within the project area. The following guidelines and methods will be followed when performing the field work:
 - 1. Borings shall be accomplished by using hollow stem augers and/or other equipment necessary to obtain soil samples of each stratum encountered.
 - 2. Boring locations shall be placed along the centerline of the street no more than 300 feet apart, with a minimum of two (2) borings per street. Borings shall be located such that all questionable areas shall be investigated. Borings shall also be performed at roadway intersections and cul-de-sacs.
 - 3. Borings shall be performed to a depth of 5 feet below the subgrade of the proposed pavement system.
 - 4. Soil shall be sampled by stratum and at least every one foot of depth of the boring. At each soil composition change, a sample, sufficient in size to perform the required laboratory testing, shall be obtained.
 - 5. When water is encountered, borings should be left open until water level stabilizes and then depth to water should be recorded.
 - 6. A log of each boring should be performed by the Geotechnical field personnel. The following information should be recorded on the boring log.
 - a. Name of street.
 - b. Location of boring – centerline station and offset measured from the centerline.
 - c. Surface elevation.
 - d. Date boring was performed.
 - e. Depth, vertical arrangement and thickness of each stratum.
 - f. Sample number.
 - g. Visual soil classification of each stratum.

- h. Depth to water (if encountered).
- D. The following laboratory tests shall be performed on each material type encountered in the test borings:
- 1. Practice for dry preparation of soil samples for particle size analysis and determination of soil constants (ASTM Designation D-421).
 - 2. Method of particle-size analysis of soils (ASTM Designation D-422, Sieve Analysis Only).
 - 3. Amount of materials in soils finer than the number 200 sieve (ASTM Designation D-1140).
 - 4. Method of laboratory determination of water content of soils (ASTM Designation D-2216).
 - 5. Classification of soils for engineering purposes (ASTM Designation D-2487).
 - 6. Test method for liquid limit, plastic limit and plasticity index of soils (ASTM Designation D-4318) for cohesive soils.
- E. **California Bearing Capacity (CBR) testing shall be performed for each street at a minimum distance of 600'. CBR values below 10 shall be considered poor soil conditions. CBR values shall be obtained during the design phase and utilized to design pavement sections.**
- F. Methods which deviate from any of the above procedures must be submitted to the Town of Easton for approval.
- G. Results of the soil investigation submitted to the Town of Easton should contain the following information:
- 1. A plan view of the proposed streets showing boring locations.
 - 2. Logs containing the required data for all borings and tests made.
 - 3. Test results of all laboratory tests performed.
 - 4. A profile view of each boring plotted to scale showing the AASHTO classification of soils encountered.
 - 5. Pavement design report by a geotechnical engineer.

1.02.02 SUBDIVISION PAVEMENT DESIGN

- A. Subdivision streets shall be designed on the following standards and practices.
- B. The design of pavement sections for streets shall be based on the type of soils as determined by the soils investigation, the anticipated use of the streets and utilization of streets by construction traffic. Soils investigation shall be performed in accordance with Section 1.04 of these Specifications.
- C. Prior to placing the pavement and graded aggregate section, the subgrade shall be prepared and test rolled in the presence of the Town Engineer or his Agent. If the test rolling shows the subgrade to be unstable, the Contractor shall scarify, disc, aerate or add moisture and recompact the subgrade to the extent that when retested it will be stable. If, in the opinion of the Engineer, there are areas to be removed or undercut, they may be ordered to excavate and replace with approved material. The Town may require an extended warranty at the Engineer's discretion if soils are determined to be unsatisfactory.
- D. The pavement section of street built to serve a future area of development shall be increased in strength to serve both the present and future traffic loads. If such a street must also serve construction traffic of future development, the pavement section shall again be increased per the recommendation of the Geotechnical Engineer as approved by the Town Engineer.
- E. In situations where vehicular traffic utilizes the roadway prior to installation of the surface course, the initial paving section shall be increased to meet or exceed the required structural number. The required structural number shall meet traffic design for residential traffic and construction traffic, as managed by the developer.

1.02.03 SOIL CEMENT

- A. The design of a soil cement shall determine the amount of Portland cement to be added to the soil to produce a cement-treated base. The mix design shall be based upon compressive strength and the moisture/density relationship of the mixture.
- B. Mix designs shall be determined and certified by a Geotechnical Engineer prior to submitting to the Town for approval.
- C. The following laboratory tests shall be performed on the material sampled from each test location:
 - 1. "Moisture-Density Relations of Soil Cement Mixtures, Method B" (AASHTO T 134)
 - 2. "Test Methods for Compressive Strengths of Molded Soil-Cement Cylinders, Method A" (ASTM D 1633)
- D. Materials – Soil-aggregate, mixing water, cement and fly ash shall conform to the Maryland SHA requirements.
- E. The desired compressive strength of the test specimens shall not be less than 300 psi or

greater than 800 psi. A target 28 day strength of 600 psi is recommended.

- F. A minimum two inch (2”) graded aggregate bond breaking layer shall be placed between the soil cement sub-base and pavement to prevent shrinkage cracking from effecting the surface pavement.

1.02.04 STORM DRAIN SYSTEMS

- A. The design of storm drain systems shall be in accordance with the drainage criteria of the State of Maryland Department of Highways rules and regulations and these specifications.
- B. Inlets shall be installed in all low points with 400 feet or more of contributing street length.
- C. The design engineer shall prepare and submit a storm drainage report and calculations to the Town Engineer.

END OF SECTION