

7.01 SOILS INVESTIGATION

- A. The Owner or Developer shall employ the services of a Geotechnical Engineering firm to perform a subsurface investigation for the purpose of obtaining information needed to design the proper pavement section.
- B. The Geotechnical Engineering firm used must have on staff, an engineer registered in the State of Delaware 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.
 - 3) Borings shall be performed to a depth of three (3) feet below the subgrade of the proposed pavement system.
 - 4) Soil shall be sampled by stratum. 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 - Station and offset
 - 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)

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- D. The following laboratory tests shall be performed on the material sampled from each stratum encountered in the individual borings:
- 1) Practice for dry preparation of soil samples for particle size analysis and determination of soil constants (ASTM Designation D421).
 - 2) Method of particle-size analysis of soils (ASTM Designation D422).
 - 3) Amount of material in soils finer than the number 200 sieve (ASTM Designation D1140).
 - 4) Method for laboratory determination of water content of soils (ASTM Designation D2216).
 - 5) Classification of soils for engineering purposes (ASTM Designation D2487).
 - 6) Test method for liquid limit, plastic limit and plasticity index of soils (ASTM Designation D4318).
- E. Methods which deviate from any of the above procedures must be submitted to the City of Milford for approval.
- F. Results of the soil investigation submitted to the City of Milford 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 made.
 - 3) Tests results of all laboratory tests performed.
 - 4) A profile view of each street with borings plotted to scale showing the ASTM classification of soils encountered.
- G. The City of Milford reserves the right to check soil survey borings and inspect testing laboratories as part of their review of the investigation work.

7.02 SUBDIVISION PAVEMENT DESIGN

- A. Subdivision streets shall be designed based on the following standards and practices.
- B. The applicable details show typical sections for residential streets, based on the following definitions:

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- 1) Minor Street - A street which will serve less than 50 dwelling units.
 - 2) Minor Collector Street - A street serving between 50 and 300 dwelling units.
 - 3) Major Collector Street - A street serving over 300 dwelling units.
- C. The design of pavement sections for subdivision streets shall be based on the type of soils as determined by the soils investigation, the anticipated number of units utilizing the streets, and the utilization of streets by construction traffic.
- D. The required structural numbers are shown in the attached tabulations.
- E. For all streets, a minimum of three (3)-inches of compacted hot-mix surface and base course and eight (8)-inches of compacted graded aggregate shall be used.
- F. The final wearing course of hot-mix on collector streets shall not be placed until 75% of the houses are completed or within one (1) year of placement of the base course of hot-mix, whichever occurs first.
- G. Prior to placing the pavement section, the subgrade shall be prepared and test rolled as detailed in the most recent DelDOT Specifications for Road and Bridge Construction. 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, excavated and replaced with approved material.
- H. The total minimum required structural number based on the number of units using the street is as follows:

REQUIRED STRUCTURAL NUMBER

| Type | No. of Units | Good Soil | Poor Soil |
|-----------------|---------------------|------------------|------------------|
| Minor | 1 - 50 | 2.32 | 2.70 |
| Minor Collector | 511 - 300 | 2.90 | 3.70 |
| Major Collector | Over 300 | 3.30 | 4.10 |

See most recent DelDOT Rules and Regulations for Subdivision Streets for specific

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material thicknesses.

Note: Good soils - all soils within the A-1, A-2, and A-3 AASHTO soil classifications.

Poor soils - all soils within the A-4, A-5, A-6 and A-7 AASHTO soil classifications.

- I. The pavement section of streets 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 in strength as follows:

| No. of Units Proposed for Future Development Area | Increase in Structural Number |
|---|-------------------------------|
| 1 - 100 | 0.48 |
| 100 - 300 | 0.80 |

- J. Following is the list of structural numbers used to obtain a pavement section thickness which will meet or exceed the minimum required structural number shown above:

| Use | Material | Structural Number for Inch Thickness |
|-----------------|----------------------------------|--------------------------------------|
| Surface Course | Type C Hot-Mix | 0.40 |
| Base Course | Type A Hot-Mix | 0.35 |
| | Type B Hot-Mix | 0.40 |
| | Bituminous Concrete (Deep Lift) | 0.32 |
| Sub-base Course | Select Borrow | 0.08 |
| | Quarry Waste | 0.11 |
| | Crusher Run | 0.14 |
| | Soil Cement (6% Cement \pm 1%) | 0.20 |

END OF SECTION

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