Subsurface Investigation for Pavement Structure Design

Subsurface investigation requirements for pavement structure design vary depending on the nature of the project and the engineering properties desired. Additional information regarding the pavement structure design and subsurface investigation requirements is provided by the Pavement and Geotechnical Engineer Administrator in accordance with DOTD's Pavement Design Guide (DOTD 2013 or latest edition).

Shallow soil borings shall identify the different layers of the soil strata every foot or strata break at the discretion of the lab engineer of record using the AASHTO classification system and the following tests shall be performed: Atterberg Limits, sieve analysis, hydrometer tests, percent of organics, density, moisture content and water table depth. Shallow soil investigation that require in situ strength parameters shall be tested using the dynamic cone penetrometer (DCP) according to DOTD – TR 645-10. The following guidelines should be followed to determine the geotechnical investigation requirements:

New Construction and Widened Areas

A subgrade soil survey is to be performed at proposed new construction and widening areas to determine existing soil properties. Shallow soil borings for new pavement construction, including the widening of existing pavements, are taken approximately every 1,000 feet along the new roadway alignment. The depth of each boring should be at least 8 feet below the finished roadway elevation or natural ground, whichever is greater, with additional testing requirements for areas of cut/fill greater than 10 feet. DCP testing should be performed every 2,000 feet (or at every other boring location) to a minimum depth of 36 inches into the subgrade.

Reconstruction and Overlay Sections

For reconstruction and overlay areas, shallow soil borings are taken approximately every 1,000 feet along the alignment (or next to the existing shoulders) to a depth of 4 feet below the existing roadway and no less than 2 feet below the bottom of the base course, whichever is greater. Pavement cores shall be taken at proposed overlay locations to determine existing pavement surface type, existing base material type and their corresponding thicknesses. Pictures of the pavement core samples shall be provided with the lab report. DCP testing should be performed every 2,000 feet (or at every other pavement core/boring location) to a minimum depth of 36 inches into the subgrade.

Pipe Crossings/Pipe Locations

PH & Resistivity information should be obtained at pipe crossings/locations to determine the material of the pipe that is to be used for the project.