

An Overview of 7.1 Geotechnical Engineering Services

Iqbal Khan

Geotechnical Services Division

January 28, 2020

SERVICES CATEGORY

- Geotechnical Engineering Services
- Geotechnical Laboratory Services
- Geotechnical Drilling Services

GEOTECHNICAL ENGINEERING SERVICES

This work type consists of providing geotechnical Engineering services. All Geotechnical work shall be performed in accordance with the INDOT Geotechnical Manual, FHWA, AASHTO guidelines and all other pertinent state and federal regulations.

GEOTECHNICAL ENGINEERING SERVICES

Requirements:

- The firm must have at least one (1) full time employee in staff that meets all the requirements of each discipline.
- The qualifying person must have a bachelor's **or** a master's degree in Civil Engineering **or** Geotechnical Engineering.
- The qualifying person must be a licensed professional engineer registered in the State of Indiana.
- The qualifying person (or firm) shall be on the INDOT Office of Geotechnical Services Approved List.

GEOTECHNICAL ENGINEERING SERVICES

Experience:

- The qualifying person must have a minimum of five (5) years experience in geotechnical engineering with a bachelor's degree in Civil Engineering or Geotechnical Engineering.
- Four (4) years of experience in geotechnical engineering with a master's degree in Civil Engineering or Geotechnical Engineering.

GEOTECHNICAL ENGINEERING SERVICES

The qualifying person must demonstrate experience in the following:

- i. Deep foundations
- ii. Shallow foundations
- iii. Earthen structures and retaining walls
- iv. Sampling and laboratory testing
- v. Subsurface exploration

GEOTECHNICAL LABORATORY SERVICES

This work type consists of providing geotechnical laboratory services. All Laboratory work shall be performed in accordance with the INDOT Geotechnical Manual, FHWA, AASHTO guidelines, ITM's and all other pertinent state and federal regulations.

GEOTECHNICAL LABORATORY SERVICES

Requirements:

- The qualifying person must be a professional engineer licensed in the State of Indiana.
- The laboratory must have accreditation of the test procedures cited here by the AASHTO re:source (Formerly known as AASHTO Materials Reference Laboratory (AMRL) prior to applying for INDOT approval.

GEOTECHNICAL LABORATORY SERVICES

Test Methods Accredited by the AASHTO re:source

Test Methods	AASHTO Designation
SOILS	
Dry preparation of samples	R 58-11
Particle Size Analysis of Soils by Hydrometer	AASHTOT 88
Liquid Limit of Soils (Atterberg Limits)	AASHTO T 89
Plastic Limit of Soils (Atterberg Limits)	AASHTO T 90
Moisture-Density (Proctor) of Soils, Standard Method	AASHTO T 99
Specific Gravity of Soils	AASHTO T 100
Unconfined Compression Strength of Soils	AASHTO T 208
Permeability of Granular Soils	AASHTO T 215

GEOTECHNICAL LABORATORY SERVICES

Test Methods Accredited by the AASHTO re:source

One-Dimensional Consolidation of Soils	AASHTO T 216
Moisture Content of Soils	AASHTO T 265
Organic Content in Soils by Loss on Ignition	AASHTO T 267
pH Testing of Soils	AASHTO T 289
Unconsolidated, Undrained Triaxial Compression	AASHTO T 296
Consolidated, Undrained Triaxial Compression	AASHTO T 297
Determination of Calcium/Magnesium Carbonate Content in Soils Using Sequential Loss on Ignition test	ITM No. 507-15T
Determining Sulfate content in soil BY Coloimetric	ITM No.510-13T

GEOTECHNICAL LABORATORY SERVICES

Test Methods	AASHTO Designation
AGGREGATES	
Fine Aggregate	AASHTO T 11
Coarse Aggregate	AASHTO T 27

GEOTECHNICAL LABORATORY SERVICES

■ PROFICIENCY TESTING

- Consultant laboratory accredited by AASHTO re:source must participate in the Proficiency Testing Program (PSP) administered by the AASHTO re:source.
- Each year participation of consultant laboratory in the Proficiency Sampling Program (PSP) is mandatory for the following sample types.
 - a. Soil Classification and Compaction
 - b. Fine Aggregate
 - c. Coarse Aggregate

GEOTECHNICAL LABORATORY SERVICES

Experience:

The qualifying person shall have minimum of five (5) years of experience in soils and rock testing in accordance with AASHTO / ASTM standard.

FACILITY AND EQUIPMENT INSPECTION

The laboratory must pass one time on-site inspection conduct by a Geotechnical Services Division representative.

- The laboratory facility shall have an adequate space for housing all equipment required to perform the test procedure.
- The laboratory shall use testing equipment that meets the requirement of each test procedure perform in the laboratory.
- The laboratory shall maintain temperature and humidity to meet the requirements of test procedure perform in laboratory.

FACILITY AND EQUIPMENT INSPECTION

- Testing equipment shall be calibrated in accordance with the test procedure, mentioned in appropriate sections of AASHTO R-18.
- Calibration documentation of equipment shall be maintained and available during onsite laboratory audit.
- The laboratory shall maintain proper handling and storage of samples.
- Safety equipment will be available and meets the requirement.

GEOTECHNICAL DRILLING SERVICES

This work type shall consist of providing geotechnical drilling and sampling services. All work shall be performed in accordance with the INDOT Geotechnical Manual, FHWA, AASHTO guidelines and all other pertinent state and federal regulations.

GEOTECHNICAL DRILLING SERVICES

Requirements:

- The qualifying person must hold an Indiana Well Driller License.
- The qualifying person (or firm) shall be approved by the Geotechnical Services Division.

GEOTECHNICAL DRILLING SERVICES

- The consulting firm shall have their own drilling rigs, equipment list shall be provided.
- If the consulting firm leases the drilling equipment, lease agreement along with SPT calibration record shall be provided.
- SPT hammer efficiency record as calibrated per ASTM D 4633 within the last two years shall be provided.
- Drilling operation shall be performed by the INDOT approved staff of the consulting firm (Drilling Crew).

GEOTECHNICAL DRILLING SERVICES

Experience:

The qualifying person must have a minimum of three years experience in geotechnical drilling operations.

The qualifying person must demonstrate experience in the following:

- Geotechnical drilling operations
- Sampling
- Instrument installation
- Borehole logging

Thank You