Geotechnical Manual Updates and Drilling Inspections

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INDOT Geotechnical Services Division Website

- Geotechnical Design Manual
- Guidelines and Design Memos
- Construction Forms
- Requirements for Approval

Website can be found at: https://www.in.gov/indot/2804.htm
Aquifer Protection Guidelines

• Revisions were made to the Aquifer Protection Guidelines in response to growing concerns with the settlement of boreholes

• INDOT follows 312 IAC 13 regarding material used to backfill a borehole

• Any other material needs to be approved by INDOT prior to use
Aquifer Protection Guidelines

• Backfilling Revisions:
  • Boreholes depths between 0 to 15 ft (after cave-in)- backfill with salvage soil up to the upper 2.0 ft and then bentonite chips used for the upper 2.0 ft
  • Boreholes depths greater than 15 ft (after cave-in)- the entire hole shall be backfilled with a plugging material
  • Plugging materials must consist of one or a combination of the following:
    • Neat cement with not more than five percent (5%) by weight of bentonite additive
    • Bentonite slurry, which can include polymers designed to retard swelling
    • Pelletized, medium or coarse grade crushed bentonite
    • Other materials approved by the commission as defined in 312 IAC 13
Aquifer Protection Guidelines

- Revised language to include a review of Red Flag Investigation and/or Environmental Document prior to drilling
- Red Flag Investigations give a general overview of the environmental conditions
- Usually one of the first documents to be completed for a project
- Red Flag Investigations include:
  - Infrastructure
  - Water Resources
  - Mining
  - Hazardous Material Concerns
  - Ecological Information
  - Cultural Resources
Aquifer Protection Guidelines

- Additional guidelines were added for backfilling in special conditions such as voids and artesian conditions
- Artesian conditions- use of a heavy grouting mix
- Voids- use of grouting basket or plug
• Piezometer installation and backfilling information has been removed from the Aquifer Protection Guidelines
• Piezometers shall be installed and backfilled in accordance with INDOT Specification 204.04
• Inclinometer installation and backfilling has been updated and is still part of the Aquifer Protection Guidelines
• Inclinometer installation guidelines follow AASHTO R 45-13
• Inclinometer casing shall be abandoned using a bentonite slurry or neat cement within 2 feet of ground surface
• Casing shall be terminated and capped with concrete
Manual Updates

Geotechnical Manual Chapter 3
Subsurface Investigation and Sampling
Requirements:

- Pavement Projects (Sections 3.5.5 and 3.5.6)
- High Mast Lighting & Closed Circuit TV Towers (Section 3.5.7)
- Traffic signal Cantilever Structure (Section 3.5.8)
- Traffic Signs & Light Pole (3.5.10)
- Topsoil/Plant Growth Layer Sampling (Section 3.6.6)
Manual Updates

Geotechnical Manual Chapter 5 Lab Testing:

• Topsoil and Plant Growth Layer Testing (5.21)
• Editorial changes to charts and tables
Website Updates

- Newly added Drilling and Sampling Requirements: https://www.in.gov/indot/files/Drilling_and_Sampling_Requirements.pdf
- Newly added Lab Requirements: https://www.in.gov/indot/files/LaboratoryRequirements.pdf
- Found on Geotechnical Services Division Website under Approved Contractors, Consultants, and Materials Section

Approved Contractors, Consultants, and Materials

- Approved Geotechnical Consultants
- Approved Geotechnical Laboratories
- Approved Materials
- Approved Retaining Wall System Evaluator
- Drilling and Sampling Requirements
- Laboratory Requirements
Drilling Inspections

Inspections are looking at:

• Location
• Type of Boring
• Measurement of Caving
• Condition of Equipment
• Safety Equipment/Personal Protective Equipment
• Traffic Control
• Sampling Procedures
• Driller’s Field Log
• Sample Collection
• Backfilling

• Inspections are reflected in the consultant evaluation done by INDOT’s Geotechnical Project Engineer
Personal Protective Equipment

• Please make sure anyone who is onsite during drilling has the appropriate Personal Protective Equipment (PPE)

• Proper PPE includes hard hats, reflective shirt, and steel toe boots

• Discretion shall be used for eye protection, hearing protection, and gloves

• INDOT Safety Manual can be found at: https://www.in.gov/indot/files/Safety_and_Health_Manual.pdf
Traffic Control

• Please ensure traffic control is in accordance with: Work Zone Traffic Control Guidelines

• Please ensure flagging operations are correct- flaggers are alert and directing traffic

• INDOT Work Zone Traffic Control Guidelines: https://www.in.gov/indot/files/WorkZoneTCH.pdf
Boring Logs

- All boring logs should contain the following information to describe the project and individual borehole location:
  - INDOT Des Number
  - Project Location
  - Boring Number
  - Station, Line, and Offset
  - **Latitude and Longitude** (Decimal Degree)
  - Surface Elevation
  - Drilling Method
  - Drill Rig Type
  - Drilling Date
  - Weather
  - Driller’s Name and Inspector/Helper

- Requirements listed in Project and Borehole Location (Section 4.4.1 of Geotechnical Manual)
Pavement Core Collector Application

• Reminder- All pavement cores should be documented in the pavement core collector application

• If you need access to the application you can contact me at vleffel@indot.in.gov