FirstEnergy

GEOTECHNICAL DESIGN REQUIREMENTS

Substation and Transmission Line

Contents

Responsibilities:

The FirstEnergy Geotech/Site/Civil group is responsible for reviewing all proposed construction drawings related to the construction of FirstEnergy facilities and/or Interconnection Customers facilities, and any Interconnection Customer asset that interacts with FirstEnergy assets. This includes but is not limited to:

- all access road designs to FirstEnergy assets,
- all grading (cut/fill, embankment, and compaction, etc.) around FirstEnergy assets and any grading/drainage design that conveys water through, toward, or across FirstEnergy assets, and
- any geotechnical reports and/or findings.

The Interconnection Customers may submit documents to FirstEnergy for interim review. This is encouraged as it provides discussion and revisions throughout the normal review process. Prior to commencing construction, the Interconnection Customers connecting to the FirstEnergy transmission facilities shall submit the Interconnection Customers, Issued for Construction ("IFC") documents, certified by a registered professional engineer, to the FirstEnergy Geotech/Site/Civil group for review.

Review Process:

Prior to commencing construction, FirstEnergy shall review the IFC documents and provide comments to the Interconnection Customer within 60 days after its receipt thereof, after which time any drawings not subject to comment shall be deemed to be approved. Construction activities include, but are not limited to any site preparation of the property to be conveyed to FirstEnergy, grading or working on the main access road to the FE Substation (this includes the placing of any stone), earth moving activities around the FE Substation or the surrounding areas which convey water through toward or across FirstEnergy assets (including benching, compacting, cut/fill, etc), grading of detention basins or other environmental features, etc. If there is a question if activities that are to be performed are construction activities that Geotech/Site/Civil need to review, please contact the FirstEnergy Geotech/Site/Civil group at GeotechSiteCivil@firstenergycorp.com.

Final drawings with all necessary changes, certified by a registered professional engineer, must be submitted to the FirstEnergy Geotech/Site/Civil group for review. FirstEnergy shall review the revised/final IFC documents and provide comments to the Interconnection Customer within 60 days after its receipt thereof, after which time any drawings not subject to comment shall be deemed to be approved.

The FirstEnergy review shall include, but is not limited to, the following items.

- Slope Stability Analysis performed by a professional Geotechnical Engineer

- Review of grading design. This includes incorporation of geotechnical recommendations, all water that could be conveyed to, across or through FirstEnergy future owned or accessed facilities, and other gradings/drainage related items.
- Review of Geotechnical documents performed by a professional Geotechnical Engineer
- Review of the main access road used by FirstEnergy to reach their facilities. This includes access road build-up, widths, and slopes.
- Review of the design vehicle used to traverse access roads around and inside the substation(s).

Approved Geotechnical Design Contractors:

The Interconnection Customer shall select its Geotechnical Design contractor from the FirstEnergy "PJM Approved Vendor List" published on the PJM website[1]. All Geotech/Site/Civil work shall be performed by a firm listed on the "PJM Approved Vendor List" unless otherwise approved by FirstEnergy.

Requests to use a Geotechnical Design contractor not listed on the "PJM Approved Vendor List" shall be submitted to the FirstEnergy Geotech/Site/Civil group. Please contact the FirstEnergy Geotech/Site/Civil group at GeotechSiteCivil@firstenergycorp.com. Review of the firm will be complete within 30 days of receiving the required information. The Interconnection Customer shall not proceed with using a firm not listed without written approval from FirstEnergy.

Standards and Guidelines:

Please contact FirstEnergy Geotech/Site/Civil, GeotechSiteCivil@firstenergycorp.com for site specific standards and guidelines that should be followed.

Submissions:

Please note that entire packages should be submitted to FirstEnergy for review. Submissions shall be detailed plans prepared by a drafter. Red-line edits to pdfs will not be accepted. All comments must be closed and the plans corrected before construction can commence.

Preliminary Plan – A preliminary plan can be submitted and reviewed by FirstEnergy Geotech/Site/Civil group. This should contain at a minimum, the plan view location of the FirstEnergy substation, the switchyard, the proposed access road. A profile of any necessary access roads used by FirstEnergy to traverse the site. A typical section depicting the access road width, pavement build-up, and side slope grading.

[1] https://pjm.com/planning/design-engineering/to-tech-standards/private-firstenergy

60% Package – A 60% package should be submitted. The 60% package should provide refinement of the Preliminary plan including cross sections and grading design. Additional items may be requested by FirstEnergy.

90% Package – A 90% package should be submitted. The 90% package should provide refinement of the 60% package including pipe size, location, schedule, E&S details (rock channel protection, ditch lining, ditch details). detailed cross sections showing labeling of slopes, etc. Additional items may be requested by FirstEnergy.

IFC – This is the final design package that shall be reviewed by FirstEnergy. The design package must be certified by a registered professional engineer prior to submission to FirstEnergy.