

Introduction

This chapter and the following sections of the Tennessee Department of Transportation (TDOT) Geotechnical Guidelines establish uniform procedures for geotechnical services provided by TDOT and the TDOT Geotechnical Engineering Section (GES). These guidelines are intended to promote consistency, technical quality, and clear communication throughout the delivery of geotechnical services on TDOT projects, ultimately ensuring public safety, efficient project delivery, and effective resource utilization.

These guidelines are not intended to serve as legal or administrative interpretations of TDOT contracts. In the event of any discrepancy between contract terms and the contents of this manual, the contract terms shall govern.

This manual applies to both TDOT staff and external geotechnical consultants working on TDOT projects. It outlines a standardized framework for performing, documenting, and submitting geotechnical work in alignment with TDOT's overall project delivery process. The guidelines span the full scope of geotechnical involvement—from early project scoping and field exploration through analysis, reporting, and construction support.

While this manual provides comprehensive direction, it is not a substitute for sound engineering judgment. Unique or complex conditions may require deviation from the procedures outlined here. In such cases, users are encouraged to consult with GES staff to determine appropriate approaches and resources.

Proper use of this manual will help ensure consistency in geotechnical practice, efficient project delivery, and effective collaboration across all regions and stakeholders.

Organizational Structure and Responsibilities

TDOT Organizational Structure

The TDOT organizational structure is separated into 8 key functional groups. Understanding this structure is crucial for effective collaboration on geotechnical projects.

Program Development and Delivery

This section oversees the entire lifecycle of projects, from initial design through delivery. It's responsible for the concept, design, and policies that guide the development of Tennessee's transportation infrastructure.

- **Engineering:** This area encompasses several divisions that develop technical guidance, design standards, and engineering designs. It includes the Design Division

for roadway standards, the Structures Division for bridges and highway structures, the Traffic Design Division for traffic policies and work zones, and the Environmental Division.

- **Engineering Administration:** This function manages key administrative support for engineering projects. It includes Asset Management for the upkeep of the roadway network, Professional Services for the procurement of engineering and surveying contracts, and Right-of-Way and Utilities for property acquisition and utility coordination.
- **Program Delivery:** This group handles the management of statewide projects and programs. It includes Alternative Delivery for innovative contracting methods like Design-Build (DB), and Program Management, which oversees projects from concept to delivery, ensuring compliance with scope, schedule, and budget. This also includes Concept Design and Strategic Program Controls.

Bureau of Major Projects

This bureau specializes in the delivery of large-scale, complex projects by employing innovative and unique contracting methods. This bureau is responsible for driving efficient project implementation through a range of advanced strategies, which encompass Public-Private Partnerships (P3), Innovative Finance, and the management of Major Projects. By utilizing these approaches, the bureau aims to support the financing and delivery of key infrastructure initiatives while emphasizing risk-sharing, cost-effectiveness, and accelerated timelines.

Field Operations and Maintenance

This bureau is responsible for the day-to-day operations, construction, and upkeep of the state's transportation system.

- **Operations:** This area oversees the core functions of TDOT's physical infrastructure. This includes the Maintenance and Operations Division, the Traffic Operations Division, the Safety Division, the Materials and Tests Division, and the Construction Division, which manages the transition of projects from design to the field.
- **Regions (1, 2, 3, 4):** Each region is responsible for the hands-on operations, including highway maintenance, construction engineering, and bridge inspection, within their respective counties. They also handle preconstruction activities.

Other Key TDOT Functions

- **Administration:** Manages internal operations such as Audit, Human Resources, and Technology.
- **Communications and Legislative Affairs:** Oversees Communications, Federal Affairs, and Legislative Affairs.
- **Finance:** Manages Civil Rights, Finance, Procurement, and Program Operations.
- **Legal – General Counsel:** Provides legal oversight.
- **Planning:** Oversees strategic planning, research, and multimodal transportation, including Passenger Transportation, Aeronautics, and Local Programs.

For a full overview of TDOT's organizational structure, visit:

<https://www.tn.gov/tdot/about/tdot-organizational-charts.html>

Materials and Tests Structure

The Materials and Tests (M&T) Division ensures that all materials used in Tennessee's highway construction and maintenance meet ASTM, AASHTO, and TDOT specifications. This division monitors material quality through laboratory testing, field evaluations, production facility reviews, and data analysis. M&T also manages pavement and materials research projects, maintains the Qualified Products List, and provides technical expertise for material specifications, geotechnical consulting, and technician certification.

Key Responsibilities:

- **Materials & Pavement Engineering:** Oversees quality assurance, pavement engineering, and materials testing across the state.
- **Geotechnical Operations:** Provides geotechnical recommendations for roadways, bridge foundations, retaining walls, and emergency geohazard response (sinkholes, landslides, rockfalls).
- **Laboratory Operations:** Conducts central lab testing (bituminous, chemical, physical, and soil) to ensure compliance with AASHTO, ASTM, and TDOT standards.
- **Operations Support:** Evaluates new products, maintains the Qualified Products List, and participates in national product testing programs.
- **Roadway Pavement Design:** Designs pavements for interstates, state routes, and local programs while integrating life-cycle cost analysis.

Geotechnical Engineering Section Structure

The GES is a functional section within the Headquarters Materials and Tests Division. M&T's main office is located in Region 3; however, the GES maintains office staff across the state. Workflow is generally managed by geographic location, but no GES staff members are assigned exclusively to a specific region. The GES serves as TDOT's primary technical authority for all geotechnical matters.

Key GES staff contact information is as follows:

Director of Materials and Tests Division

Heather Purdy, P.E.
6601 Centennial Blvd., Nashville, TN 37248
Phone: 615-350-4100
Email: heather.purdy@tn.gov

Geotechnical Engineering Manager

Travis W. Smith, P.E.
6601 Centennial Boulevard, Nashville, TN 37248
Phone: 615-350-4136
Email: travis.w.smith@tn.gov

Geotechnical Engineering Team Leads

Besmir Zenelaku, P.E.
6601 Centennial Boulevard, Nashville, TN 37248
Phone: 615-350-4121
Email: Besmir.Zenelaku@tn.gov

Lori Fiorentino, P.E.
7345 Region Ln., Knoxville, TN 37914
Phone: 865-594-2704
Email: Lori.Fiorentino@tn.gov

Robert Jowers, P.E.
6601 Centennial Boulevard, Nashville, TN 37248
Phone: 615-350-4133
Email: Robert.Jowers@tn.gov

Geology Team Lead

Jeremiah Kokes, P.G.
7345 Region Ln., Knoxville, TN 37914
Phone: 865-594-2705
Email: Jeremiah.Kokes@tn.gov

Geotechnical Drilling TDOT Supervisor

Russell Shelton
6601 Centennial Boulevard, Nashville, TN 37248
Phone: 615-350-4121
Email: Russell.Shelton@tn.gov

For general inquiries, the GES section can be reached at the shared email address: TDOT.Geotech@tn.gov.

Roles and Responsibilities of Geotechnical Consultants

TDOT GES collaborates with geotechnical consultants through various on-call contracts to support its engineering and infrastructure projects. These contracts include:

- On-Call Geotechnical Engineering: Provides TDOT with access to specialized geotechnical services for a range of projects.
- On-Call Unstable Slope Management Program: Consultants assist in the assessment and mitigation of unstable slopes to maintain safety in areas prone to landslides or slope failures.
- On-Call Laboratory Testing: Enables TDOT to utilize laboratory testing services for soil, rock, and other materials, providing essential data for project design and evaluation.

The following chart outlines the anticipated timelines for future contracts, providing a general framework for expected advertisement and contract start dates; while these projections are not fixed, they reflect historical trends. In the past, contracts have typically been on a five-year basis, with no new work orders issued after the fourth year.

On-Call Contract Type	Estimated Advertisement Dates	Estimated Contract Start	Notes
Geotechnical Engineering Services	January 2028 January 2032	August 2028 August 2032	Typically involves 12 contracts
Unstable Slope Management	January 2030 October 2034	August 2030 August 2034	Typically includes 2 contracts
Laboratory Testing	October 2027 October 2031	January 2028 January 2032	Typically includes 3 contracts, one in the Knoxville area and two in the Nashville area.

In addition to these on-call services, TDOT also works with geotechnical consultants through subcontract arrangements with design consultants. This approach allows for a flexible and integrated project team, leveraging geotechnical expertise within broader design and construction efforts.

All contracts are managed through TDOT's Professional Services Division, which oversees contract management, procurement, and compliance with standards. This division ensures that all contracts are efficiently procured, adhere to TDOT's requirements, and support effective project management throughout the project lifecycle.

For more information, please visit TDOT Professional Services Division's webpage at <https://www.tn.gov/tdot/professional-services.html>.

Project Tracking and Communication

TDOT assigns various project numbers to track and manage projects efficiently. The Project Identification Number (PIN) is the most widely used, assigned by the Program Development and Administration Division. This unique identifier is required on all project correspondence and allows for easy cross-referencing across TDOT databases.

- **GES File Number:** This is specific to the Geotechnical Engineering Section (GES) and is not used by other divisions. It serves as an internal filing system for geotechnical services, organizing reports and project records.

- TX (Speed Chart) Number: Used to track time and costs for TDOT business units.
- State Project Number: Assigned to all TDOT projects.
- Federal Project Number: Assigned to federally funded projects and typically displayed on plan sheets.
- TDOT Contract Number (CN): A unique alphanumeric code assigned when a project is prepared for construction letting, used for managing construction and inspection costs.

The consistent use of these project numbers ensures accurate tracking and coordination across TDOT divisions.

Each project is assigned a designated GES staff member to ensure consistent communication, clear accountability, and effective project tracking throughout the development process. All project-related correspondence must include the appropriate project numbers to facilitate accurate identification and efficient tracking.

TDOT primarily uses email for project communication. The subject line of all email correspondence should include the Project Identification Number (PIN), GES File Number, state route number, and county. Including this information allows GES staff, who often manage numerous projects simultaneously, to quickly identify and respond to correspondence, minimizing administrative delays.

For general inquiries, the GES section can be reached at the shared email address: TDOT.Geotech@tn.gov.

Quality Expectations and Digital Tools

TDOT expects all geotechnical work, whether performed by internal staff or external consultants, to meet high standards of technical quality, clarity, and professionalism. Deliverables should be complete, logically organized, and aligned with applicable TDOT and national standards.

The following general principles apply to all geotechnical submittals:

- Analysis and design should be clearly supported by data and sound engineering rationale.
- Reports must be tailored to the project's stage of development, avoiding overly generic language or boilerplate content.

- Documentation should be reproducible and traceable, including full records of subsurface investigation and laboratory testing.
- Quality control should be integrated into all stages of work, including field data collection, lab testing, analysis, reporting and plans development.

TDOT relies on this manual to help achieve uniform quality across projects and regions. Consistency in approach not only improves deliverable quality but also streamlines coordination with other project disciplines.

Use of Digital Tools and Platforms

Geotechnical data and deliverables must be produced in formats compatible with TDOT's digital infrastructure. While this manual does not prescribe every software or platform to be used, there are specific requirements for data and drawing production:

- All geotechnical drawings must be produced using OpenRoads.
- All geotechnical data (e.g., boring logs, lab results, groundwater measurements) must be produced and submitted using OpenGround or compatible data management system. (starting July 2027)

These tools help maintain consistency across projects, support integration with other design disciplines, and ensure compatibility with TDOT's project delivery platforms. Additional guidance and standards related to digital data management can be found in the TDOT Design Guidelines (<https://www.tn.gov/tdot/state-engineering-technical-training/production-support/design-standards.html>).

TDOT encourages the use of digital workflows that support efficiency, accuracy, and long-term data accessibility. Consultants and internal staff should coordinate with the GES as needed to resolve software-related questions or integration issues.

Project Delivery Network (PDN) Integration

The Project Delivery Network (PDN) is a structured framework that TDOT uses to guide transportation projects from inception to completion. The PDN divides the project delivery process into distinct stages, each with specific tasks, deliverables, and milestones. This structure ensures consistency across all TDOT projects, providing clear guidelines and workflows to manage resources, timelines, and quality control.

By integrating geotechnical engineering into the PDN, TDOT ensures that critical geotechnical considerations are addressed at the appropriate stages of project

development. This integration ensures that geotechnical investigations, analyses, and deliverables are synchronized with overall project milestones, thereby minimizing costly delays and design revisions.

The GES is actively involved throughout a project's lifecycle, ensuring that geotechnical risks are identified and managed proactively:

- **Scoping/Feasibility:** Providing initial geotechnical input and risk assessment for project viability.
- **Preliminary Design:** Conducting subsurface investigations and developing preliminary geotechnical recommendations.
- **Final Design:** Performing detailed analyses, developing final design recommendations, and preparing geotechnical plans and specifications.
- **Construction:** Offering geotechnical construction support, addressing unforeseen site conditions, and reviewing contractor submittals.
- **Post-Construction/Maintenance:** Responding to geohazards (e.g., landslides, rockfalls) and supporting ongoing asset management.

For more detailed information about the PDN, including roles, responsibilities, deliverables, stages, and workflows, visit the TDOT PDN webpage: <https://www.tn.gov/tdot/pm/pdn.html>.

Recognized TDOT Reference Documents and Standards

The Geotechnical Guidelines are intended to complement, not conflict with, other recognized TDOT reference documents and national engineering standards. All geotechnical work performed for or by TDOT shall adhere to the most current editions of these documents.

TDOT Internal Reference Documents

- **TDOT Project Delivery Network (PDN) Manual:** Outlines the structured framework and stages for managing transportation projects from inception to completion. Geotechnical activities and deliverables must align with the requirements and milestones defined within the PDN.
- **TDOT Roadway Design Guidelines (DG):** Provides the basis for the development of Construction Plans for roadway designers.
- **TDOT Structures Design Guidelines (SDG):** Provides structural policy guidance.
- **TDOT Standard Drawing Library (Std. Dwg.):** Contains typical design details for various elements, including those relevant to geotechnical professionals.

- **TDOT Standard Specifications for Road and Bridge Construction (TDOT Specifications):** Contains legally binding information on earthwork, subgrade, base, pavement, and structures.
- **TDOT Traffic Design Manual:** Offers guidance for traffic-related design.
- **Special Provisions (SP):** Developed for specific construction activities requiring detailed guidance.
- **TDOT Environmental Procedures Manual:** Outlines environmental regulations and permitting requirements.
- **TDOT Right-of-Way Manual:** Provides guidance on property acquisition and access.
- **TDOT Subsurface Utility Engineering (SUE) Manual/Guidelines:** Provides procedures for utility identification and coordination.

National Reference Standards and Codes

- **AASHTO LRFD Bridge Design Specifications:** This manual adopts the Load and Resistance Factor Design (LRFD) methodology for geotechnical elements supporting transportation structures.
- **ASTM International Standards (ASTM):** Referenced for test methods, sampling, and material specifications.
- **Federal Highway Administration (FHWA) Publications:** Provide guidance and best practices, including FHWA Geotechnical Engineering Circulars (GECs).
- **National Highway Institute (NHI) Training and Reference Materials:** Provide training and reference on highway engineering topics.
- **U.S. Army Corps of Engineers (USACE) Engineering Manuals:** May be referenced for specific geotechnical applications.
- **U.S. Geological Survey (USGS) Documents:** Provide data and guidance on geological conditions and seismic hazards.

Updates and Revisions Policy

These Geotechnical Guidelines are a "living document" subject to continuous updates and improvements to remain current with industry standards, evolving TDOT practices, and national codes. Revisions, additions, and deletions will be made regularly as necessary.

Accessing the Latest Version

Efforts will be made to post the current guidelines on TDOT's official website at <https://www.tn.gov/tdot/materials-and-tests/geo-technical-operations.html>. Users are encouraged to always refer to the online version to ensure they are utilizing the most up-to-date information.

Revision Log

A global revision log summarizing major changes to the entire manual will be prominently posted on the manual's main webpage.

In addition to this global log, each individual chapter will feature its own specific revision log. These chapter-level logs will provide more detailed information on updates, including the date of revision, specific section changes, and a brief description of the modification.

Providing Feedback

TDOT encourages users of this manual to provide feedback, suggest revisions, or identify areas for improvement. Comments may be submitted to TDOT.Geotech@tn.gov. Your input is invaluable in ensuring the manual remains a practical and accurate resource.