State Materials and Tests Division – Geotechnical Engineering Section

State Materials and Tests Division Summary

This classification is within the Tennessee Department of Transportation (TDOT) Bureau of Engineering. The State Materials and Testing (M&T) Division plays a key role in developing performance-oriented solutions for Tennessee's ever-changing transportation needs. The Division focuses on the resiliency and sustainability of TDOT's transportation system by minimizing consumption of non-renewable resources, increasing the flexibility of the highway network, and implementing cost-effective innovation into the transportation system.

The M&T Division establishes the criteria for the acceptance, verification, and certification of materials and products used on TDOT projects and ensures that all materials used in the construction and maintenance of Tennessee's highways meet all contractual requirements and appropriate TDOT, ASTM, and AASHTO specifications. The Division provides timely solutions to material-related concerns and technical training to TDOT and its transportation partners.

Geotechnical Engineering Section

The Geotechnical Engineering Section (GES) provides geotechnical services in support of TDOT's transportation projects by testing and evaluating subsurface conditions, characterizing ground capabilities to support structural loads, evaluating foundation systems, and assessing the constructability of geotechnical project elements. The Geotechnical Engineering Section provides geotechnical design criteria that ensures a safe and resilient transportation system.

The GES provides support for emergency geohazards such as karst sinkholes, landslides, and rockfall mitigation in support of maintenance projects.

EPIC Modifications

- *The management of the Unstable Slope Program has been moved to the Program Management Division; however, the Geotechnical Engineering Section will continue to collect unstable slope data, make recommendations, and provide cost estimates*
- *The Geotechnical Engineering Section will not be assigned work in a specific Region based on physical location - all staff members will work in all Regions*

Benefits

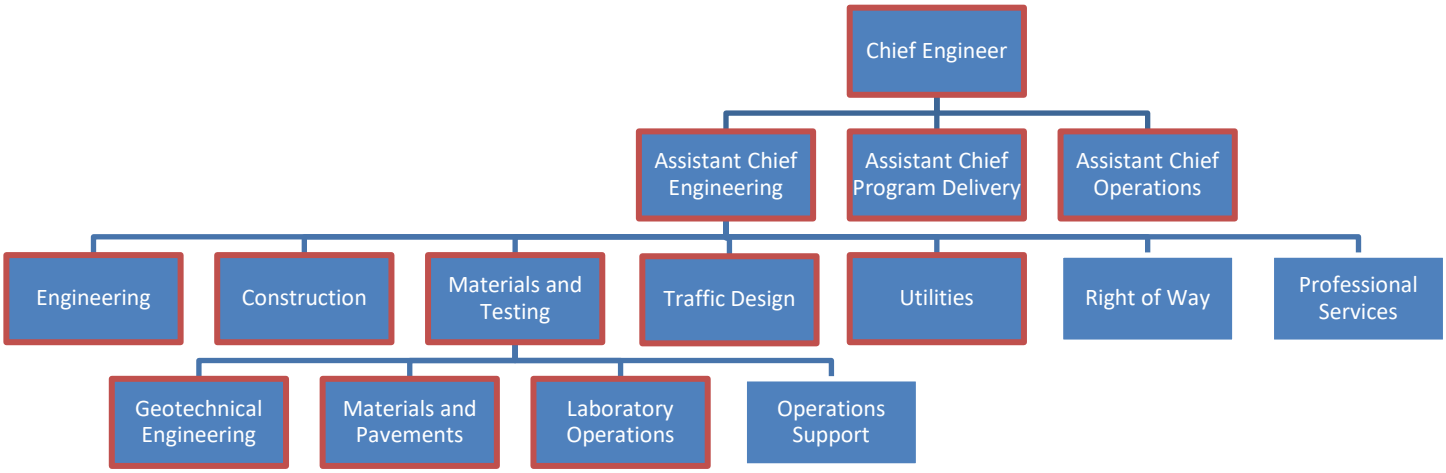
- *Provides improved efficiency and consistency by consolidating the drill crew to one team that provides service throughout the entire state, as needed*
- *Provides improved efficiency and consistency by consolidating geology into one team that provides service throughout the entire state, as needed*
- *Provides improved efficiency and consistency by removing limitations for the Geotechnical Engineering Section with respect to specific Regions*
- *Provides for more focused and integrated efforts related to the Geotechnical Engineering Section's duties and functions*

Challenges

- *Ensuring continuous and effective collaboration is occurring across the Divisions, Regions, and HQ*
- *Transitioning from a Region support system to a statewide support system under the Geotechnical Engineering Section*
- *Developing a strategy for recruitment and retention of qualified staff*
- *Ensuring accountability in establishing and delivering on Performance Metrics*
- *Ensuring consistency in processes and deliverables across TDOT Regions*
- *Understanding the use of consultants as an extension of TDOT resources in meeting the needs of the Five-Year Work Program*
- *Supporting the creation of a Consultant Acquisition Plan for M&T*
- *Ensuring Materials and Tests, specifically the Geotechnical Engineering Section, has active participation and integration with the Project Teams as part of a matrix organization in delivering successful projects that meet schedule, budget, and scope requirements*
- *Implementing and formalizing an Unstable Slope Program*

TN TDOT Department of Transportation

Functional Organizational Chart



Section Responsibilities

- *Research and implement emerging technologies that improve the efficiency, effectiveness, reliability, and safety of TDOT's transportation network*
- *Implement and manage a Quality Assurance Policy to ensure all materials used in TDOT projects meet established requirements, including contracted geotechnical engineering services*
- *Assist in developing, maintaining, and updating TDOT geology/geotechnical related specifications, requirements, standards, and acceptance practices*
- *Proactively assess geology/geotechnical related risk factors on projects and work with the Project Team to minimize potential impacts to the project scope, schedule, and budget*
- *Serve as TDOT's geology/geotechnical liaison in teaming with industry*
- *Implement performance metrics and ensure the Geotechnical Engineering Section performance metrics are met*
- *Provide recommendations for roadway improvements, bridge foundations, retaining wall foundations, and construction concerns*
- *Provide support for emergency geohazards such as karst sinkholes, landslides, and rockfall mitigation*
- *Assist with the retaining wall portion of the asset management program*
- *Perform drilling and follow-on geotechnical analysis across TDOT Regions*
- *Collect and maintain data for the Unstable Slope Management Program*
- *Participate in peer exchange, fostering collaboration both internally and with relevant partners to share ideas, skills, and insights to get the best results*
- *Coordinate with Project Teams to produce geotechnical testing and recommendations within the project's scope, schedule, and budget as part of a matrix organization*
- *Provide technical expertise and support in matters related to geotechnical engineering, including specific training to TDOT staff regarding the use of equipment and management and coordination of data*

- *Facilitate recruitment of future staff and provide incentives to learn and grow in the area of geotechnical engineering by developing and implementing a Work Force Development plan that includes training to assist with retaining new hires*
- *Collaborate with the Regions in developing and implementing a Consultant Acquisition Plan for geotechnical elements*
- *Maintain and inventory geotechnical equipment*
- *Develop and manage the financial performance for the Geotechnical Engineering Section and provide coordination and oversight with the Regions for expenditures, maintaining alignment with TDOT financial processes to ensure transparency and accountability*
- *Serve on selection committees for professional services as part of the Brooks Act, including assistance with RFP development, attendance at marketing meetings, assistance with determining scoring criteria, assistance with project information sessions, when applicable, serving as a scorer as part of the consultant acquisition process, and attendance at de-briefs for consultants where usable feedback must be provided*
- *Create and implement a consultant evaluation form tailored to address consultant selections for geotechnical operations*
- *Assist on Project Teams as part of the Project Delivery Network by providing input at all applicable project milestones, including Project Kick-Off, Risk Workshops, Project Scoping meetings, Plan-in-Hand Field Review meeting, and the Plans, Specs, and Estimates meeting, when applicable*

Section Metrics and Performance Goals

- *Ensure all materials specifications, guidelines, policies, practices, SOPs, etc. are continuously reviewed for improvements*
- *Track the use and cost of consultant support*
- *Quantify and track staff time to project development – in-house and consultant*
- *Earn some level of satisfaction score on internal and external customer surveys*
- *Ensure 100% of materials incorporated into TDOT projects meet minimum acceptance standards or have an approved disposition / mitigation solution to account for deficient materials on the job site*
- *Support PDN schedules – to be revisited*
- *Revisit for asset management purposes*

Section Deliverables

- Geotechnical Reports and Recommendations
- Geotechnical Plans Sheets
- Geotechnical Memorandums
- Unstable Slope Hazard Ratings

Internal Partners

- *State and Region labs*
- *TDOT Regions*
- *Project Management Teams*
- *TDOT HQ Divisions*

External Partners

- *Contractors*
- *Local municipalities and other state agencies*
- *Design and CEI Consultants*
- *Federal Agencies*

Data Systems