

State Materials and Tests Division – Field Operations 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.

Field Operations Section

The Field Operations Section consists of seven teams: Bituminous, Concrete & Aggregate, Pavements, and four Field Services Teams located in Knoxville, Chattanooga, Nashville, and Jackson.

The Bituminous and Concrete & Aggregate Teams are responsible for supporting the manufacturing, construction, design, testing, and acceptance of bituminous, aggregate, and concrete utilized in highway and bridge construction. The Bituminous and Concrete & Aggregate Teams serve as liaisons with TDOT's external producers and suppliers to assist in identifying and addressing industry concerns and partnering with industry to implementing national best practices.

The Pavements Team is responsible for conducting in-house pavement designs and managing consultant pavement designs for all TDOT projects. This Pavement's Team is responsible for the development of pavement design policy and the oversight of pavement research.

Field Services Teams provide expertise and independent oversight during construction to both TDOT Operations and CEI for sampling, testing, tracking, and reporting of materials. Field Services Teams are responsible for obtaining samples from the material suppliers within their respective areas. Field Services Teams in Regions 1, 2 and 4 operate regional laboratories that verify gradations of aggregates, test early break concrete cylinders, and approve asphalt mix designs.

All Field Operations Teams collaborate with TDOT Operations and Project Teams to provide subject matter expertise in administering acceptance or rejection of materials that fail to meet specifications.

EPIC Modifications

- *The Field Services Teams will report to the State Field Operations Manager*
- *To consolidate pavement research, design and evaluation, Pavement Design has been moved from the HQ Roadway Section to the Field Operations Section*
- *SiteManager administration has been shifted to Operations Support*
- *Pavement Evaluation and Testing has been removed from the Bituminous Section and placed in the Pavements Group*
- *Training administration has been moved to Operations Support, while delivery of training remains a Field Operations responsibility*

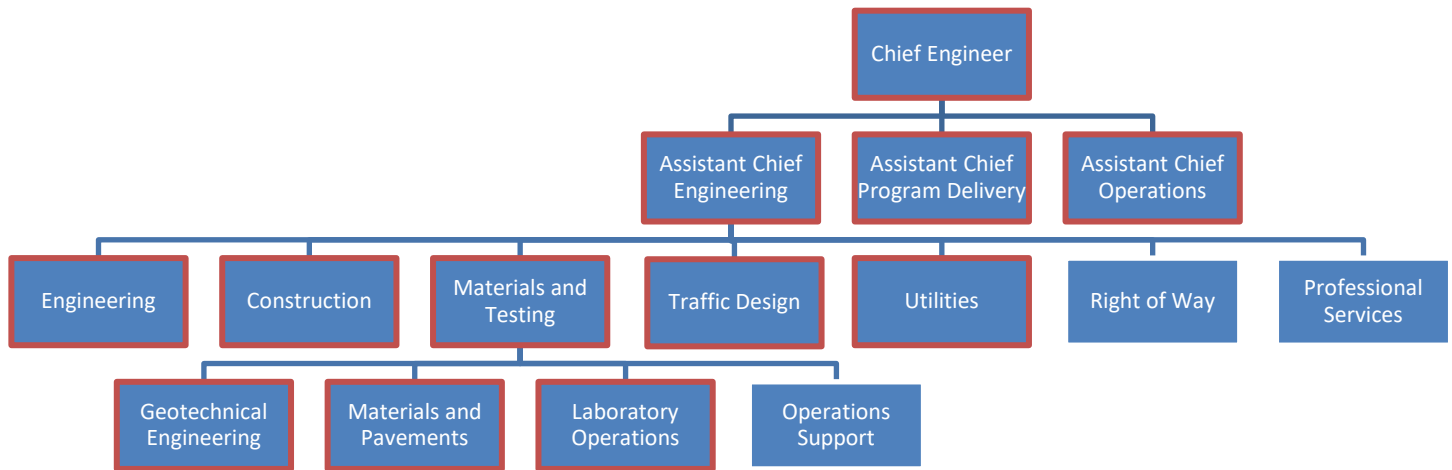
Benefits

- *Provides for greater uniformity of materials, testing policies, and application statewide*
- *Allows for the Bituminous Section to focus solely on technical assistance and research related to asphalt and emulsion and provides for additional staff to support implementation*
- *A combined Pavements Team provides for more focus and integrated efforts on all pavement-related programs*
- *SiteManager and training administration are accomplished in a section designed for broad State Materials and Tests support*
- *Provides succession planning and career advancement opportunities for non-licensed staff, developing leaders both functionally and culturally*
- *Greater collaboration between Pavements and the expertise on specific materials in the Bituminous and/or Concrete & Aggregate Teams in developing Pavement Preservation Treatment Technical Documents/Assistance now that these groups have been consolidated.*

Challenges

- *Integrating Regional Staff into State Materials & Tests*
- *Ensuring continuous and effective collaboration is occurring across the Divisions, Regions, and HQ*
- *Accountability in establishing and delivering on Performance Metrics*
- *Understanding the use of consultants as an extension of TDOT resources in meeting the needs of the Five-Year Work Program*
- *Creating a Consultant Acquisition Plan for Field Operations*
- *Developing a strategy for recruitment and retention of qualified staff*
- *Ensuring Pavement Design, Materials Risk Review, Trial/Implementation Projects are included in the Project Delivery Network (PDN)*
- *Creating a Materials Risk Review procedure*

Functional Organizational Chart



Section Responsibilities

- Research and implement emerging technologies that improve efficiency, effectiveness, reliability, and safety of TDOT's transportation network
- Monitor the quality and performance of TDOT's highway network and effectively coordinate with Design and Construction in tracking data to predict and prevent future concerns
- Participate in peer exchange, fostering collaboration both internally and with relevant partners to share ideas, skills, and insights to get the best results
- Effectively serve as TDOT's liaison in teaming with industry for field operations
- Develop, implement, maintain, and update statewide policy, technical documents, specifications, standard operating procedures, special provisions, design guidance, and acceptance practices that promote uniformity and consistency for Materials and Tests
- Establish minimum requirements for hot mix asphalt mixes and component materials
- Establish specifications and standard operating procedures and train construction inspectors in the process and practice of field sampling of cementitious materials from the source of use (i.e., ready mix, precast, and prestressed concrete plants)
- Establish the minimum qualifications and manage the approval of producers of precast and prestress concrete products and structural members and maintain guidelines and procedures for precast product verification
- Develop pavement design policy and oversight of pavement research and develop the technical process for all pavement design and preservation treatments
- Create, implement, and manage a quality assurance policy, for use with Field Operations, for the purpose of eliminating redundancy and re-work
- Develop and implement performance metrics

- *Administer the Independent Assurance Program*
- *Maintain the Approved Producer's List*
- *Ensure all material suppliers are meeting quality control standards*
- *Field Services Teams ensure minimum sampling and testing requirements and all applicable documentation accounts for the material quantities utilized on construction projects*
- *Assist Field Operations and project staff in dispute resolution with contractors, producers, and/or suppliers*
- *Provide technical expertise and support in matters related to field operations, including specific training to TDOT staff regarding the use of equipment, types of testing, application of tools, and management and coordination of data*
- *Assist TDOT Operations and CEIs in the acceptance of materials used on TDOT construction projects*
- *Deliver training to TDOT Operations and CEIs to certify inspectors on the acceptance of asphalt, concrete, and aggregates*
- *Manage the requirements and deliver training to contractors for TDOT minimum quality control practices for aggregates, concrete, and asphalt and mix design methods for concrete and asphalt*
- *Manage the process and practice for evaluating, testing, and approving aggregate sources and their products for use in TDOT construction and bituminous or concrete surface mixtures*
- *Manage contractor / producer / supplier QCP approval*
- *Manage the material acceptance procedure for HMA and the process and practice of approving HMA plants, asphalt cement and asphalt emulsion producers*
- *Manage the microsurface and HMA mix design / job mix formula approval process*
- *Manage the bituminous / HMA research program, projects and coordination with academia and other outside researchers*
- *Manage all aspects of TDOT's nuclear gauge use, calibration, storage, transportation, and safety*
- *Manage procedures and practices for sampling, handling, and acceptance testing of concrete cylinders used for strength acceptance*
- *Manage the process for submitting and approving ready-mixed, prestressed, precast, and volumetric concrete mixtures*
- *Manage the process and practice of approving ready mix concrete producers that provide concrete for TDOT projects*
- *Manage the approval process of volumetric concrete mobile mixers that provide concrete for TDOT projects*
- *Manage the policy and practice for acceptance of precast/prestressed concrete beams and other structural members*
- *Manage the process and practice of accepting and identifying precast and prestress concrete products and structural members*
- *Manage the process and practice of evaluating TDOT's pavement network for friction*
- *Assist Asset Management Pavement Section in split test verification of Statewide Pavement Distress Survey Contractor*
- *Manage the process and practice of in-house and consultant developed pavement designs for TDOT projects, including pavement evaluation for surface friction, exploratory coring and other pavement testing, research, and on-call distress surveys*

- *Manage the pavements research program, projects and coordination with academia and other outside researchers*
- *Manage internal and consultant on-call pavement testing*
- *Field Services Teams operating regional laboratories verify gradations of aggregates, test early break concrete cylinders, and approve asphalt mix designs*
- *Field Services Teams are responsible for taking possession and transporting of all samples bound for the Central lab*
- *Administer the pavement smoothness preconstruction and acceptance testing*
- *Coordinate with Project Teams to produce materials and testing information and proactively assess materials-related risk factors as part of the Project Teams to minimize potential impacts to the project's scope, schedule, and budget as part of a matrix organization*
- *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*
- *Create and implement a consultant evaluation form tailored to address consultant selections for field operations*
- *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*
- *Collaborate with the Regions in developing and implementing a Consultant Acquisition Plan for field operations*
- *Provide training for consultants to assist in their success with proactively addressing lessons learned, policies, submittal requirements, and procedures for use on TDOT projects*
- *Facilitate recruitment of future staff and provide incentives to learn and grow in the area of field operations by developing and implementing a Work Force Development plan, including training to assist with retaining new hires*
- *Maintain and inventory laboratory equipment, including equipment that has been provided to the Regions*
- *Create policy to establish data consistency and provide access and available server space to existing data across the Regions*
- *Develop and manage the financial performance for the Field Operations Section and provide coordination and oversight with the Regions for expenditures, maintaining alignment with TDOT financial processes to ensure transparency and accountability*

Division Metrics and Performance Goals Metrics and Performance Goals

- *Ensure all materials specifications, guidelines, policies, practices, and standard operating procedures (SOP), are continuously reviewed for improvements*
- *Participate in regular industry/contractor meetings to address issues and communicate upcoming program changes to specifications and volume of work*
- *Earn some level of satisfaction score on internal and external customer surveys*

- *Ensure that sampling and testing for all materials incorporated follow TDOT's SOP 1-1 requirements and sampling/testing is documented*
- *Ensure 100% of pavement designs meet quality, time and budget requirements for all projects*
- *Ensure TDOT's highway network is evaluated biennially for friction data with output acceptable to prioritize resurfacing and asset management programs*

Section Deliverables

- Pavement designs
- Biennial Pavement Friction assessments for routes on network
- Current and accurate Approved Producer List
- Current specs, guidelines, policies, practices, SOPs, etc. for Pavement and Structural Materials
- Annual (or some other timeframe) research plan and implementable research outcomes

Internal Partners

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

External Partners

- *Materials suppliers and producers*
- *Contractors*
- *Contractor/Supplier/Research Associations (TCA, TRBA, ACI, AI, NAPA, ACPA, NCC, CAPRI, NCPP, etc)*
- *NTPEP*
- *AASHTO COMP*
- *ASTM*
- *Other DOTs*
- *Local municipalities and other state agencies*
- *Design and CEI Consultants*
- *Academia*
- *Federal Agencies*



Data Systems