Who we are:

Transportation is so basic that many of us overlook its overwhelming importance in our daily lives. Practically everything used in our homes, offices, or schools across Tennessee – from furniture to food items to clothing – requires a large and complex transportation network. The Tennessee Department of Transportation provides citizens of Tennessee and travelers with one of the best transportation systems in the country. TDOT is a multimodal agency with responsibilities in building and maintaining roads, aviation, public transit, waterways, railroads, cycling and walking. Our involvement ranges from airport improvements to funding transit buses to planning for river ports. The Department of Transportation has approximately 3,500 employees with four statewide region facilities in Knoxville, Chattanooga, Nashville, and Jackson.

Hydraulics Design Engineering Specialist
Structures Division – Hydraulics Section
Nashville, TN
$80,784 - $88,860 annually

Job Overview

The Hydraulics Design Engineering Specialist 3 and 4 provides hydraulics design technical expertise to HQ Design teams. This position collaborates with Project Teams by identifying potential design challenges and implementing statewide acquired knowledge that focuses on ensuring quality deliverables, minimizing variability, and increasing the safety and performance of Tennessee's transportation system.

The Hydraulics Design Engineering Specialist 3 and 4 ensures Department policies, technical guidance, and procedures are incorporated into hydraulics design deliverables and assists in implementing the Quality Assurance Program.

This position will apply acquired knowledge to improve TDOT specifications, policies, and procedures that mitigate the Department's risk and increase performance as part of fulfilling TDOT's strategic vision. This position must effectively articulate technical engineering concepts through training, mentoring, and collaborating as part of a matrix organization.

Essential Job Duties of the TDOT Transportation Engineering Specialist 3 and 4 include:

Serve as a resource for Project Teams as part of a matrix organization by applying the Project Delivery Network (PDN) and TDOT's Quality Assurance Program, identifying potential constructability and lifespan concerns in proposed designs and making recommendations for proactive solutions with other disciplines to ensure the project needs are met. Follow TDOT Quality Management processes for deliverables through all project phases supporting effective team Utilization Percentages. Develop Functional Design Plans as necessary throughout the design and repair process.

Integrate Quality Management Guidelines into all deliverables including policies, procedures, and manuals with respect to bridge preservation elements with the purpose of reducing plan errors and re-work, right-of-way delays, construction delays, and contractor claims.

Assist the Hydraulics Section by providing technical knowledge and support related to conventional or complex hydraulics design matters in effectively and efficiently optimizing the Team's ability to successfully address project needs and unanticipated challenges.

Routinely and independently analyze, design, and prepare preliminary and final plans for the hydraulic structures and miscellaneous highway facilities varying in complexity using TDOT's current software programs. Prepare bridge deck drainage analysis. Design and prepare contract documents utilizing inspection reports, existing plans, field reviews, and electronic survey data for hydraulic and miscellaneous highway facility construction projects according to American Association of State Highway and Transportation Officials (AASHTO) and TDOT's current manuals and guides for design. Participate in project meetings and field inspections to facilitate troubleshooting of existing design and construction concerns and conditions. Provide recommendations for the scope of work, construction methodologies, traffic concerns, and recommendations for materials and special equipment.

Routinely collaborate with Project and Region Bridge Teams and Asset Management to identify and document knowledge on industry best practices to avoid past errors and ensure TDOT project successes. Assist with modifications to all applicable policies, procedures, design standards, specifications, and special provisions. Maintain knowledge of applicable design codes and any future changes relevant to the hydraulics discipline by participating in learning opportunities. Provide lessons learned on projects as improvements to leadership through formal and informal presentations. Collaborate on strategies used as best practices for statewide quality assurance needs. Continue to grow skills for design and modeling software tools for structures.

Assist in ensuring Hydraulics Design deliverables are consistent, predictable, and repeatable to maintain consistently high levels of achievement, mitigate risk, and establish a track record of success by implementing statewide policy, data collection, processing standards, specifications, and direction. Utilize best practices and TDOT policy for the incorporation of hydraulics design elements, including access to acquired knowledge across the Regions.

Provide input with the development of a Consultant Acquisition Plan (CAP) to address hydraulic structures analysis and design requests and assist in the oversight of hydraulics consultants by serving on selection committees for professional engineering services as part of the Brooks Act, including assisting with Request For Proposal (RFP) development, attending project-specific marketing meetings, assisting with determining scoring criteria, assisting with project information sessions, when applicable, serving as a scorer as part of the consultant acquisition process, negotiating contracts, attending de-briefs for consultants where usable feedback must be provided, and monitoring contract compliance.

Participate in the review of local program contracts and bid documents to ensure TDOT specifications, policies, and procedures are included to provide concurrence on bid packages. Assist in the preparation of project proposals and bid files. Assist in managing the handling and coordination of Bid Authorization Forms and Bid Conditioning Letters as appropriate. Support the execution final contracts through TDOT’s awards process.

Provide exceptional customer service to both internal and external customers, including mentoring and technical guidance related to hydraulics design, coordinating with other disciplines as part of a matrix organization, exercising effective listening skills, providing prompt responses, maintaining complete and accurate documentation, and communicating effectively.

Additional Job Duties for the TDOT Transportation Engineering Specialist 4 include:

Coordinate with the TDOT Technical Training Director and assist in the development and presentation of training that addresses the hydraulics structures design training program, oversight of local programs, acquired knowledge, risk management, TDOT performance metrics, governing rules and processes, reporting procedures, and emerging technologies related to transportation for the purpose of improving team performance, creating a stronger understanding of the transportation industry, inspiring new ideas, and developing skills.

Participate in the development, implementation, and maintenance of all State Specifications, Special Provisions, Circular Letters, and applicable standard guidance. Schedule and manage shop drawing reviews related to hydraulics structures.

Provide innovative recommendations by incorporating new hydraulics modeling technologies and methodologies such as computational fluid dynamic and underwater sonar for scour analysis for Hydraulics Design activities.

Qualifications

The Transportation Engineering Specialist 1 and 2 are part of the Graduate Transportation Engineer (GTE) Program.

Transportation Engineering Specialist 3:

- Bachelor's Degree in Civil Engineering or Hydraulics Engineering
- 2 years of demonstrated competency in Hydraulics Design and Analysis or related field

OR

- Master's Degree in Civil Engineering or Hydraulics Engineering
- 1 year of demonstrated competency in Hydraulics Design and Analysis or related field

Transportation Engineering Specialist 4:

- Bachelor's Degree in Civil Engineering or Hydraulics Engineering
- 3 years of demonstrated competency in Hydraulics Design and Analysis or related field

OR

- Master's Degree in Civil Engineering or Hydraulics Engineering
- 2 years of demonstrated competency in Hydraulics Design and Analysis or related field

Ideal Candidate

This position is a part of the career path series at TDOT. The Hydraulics Design Engineering Specialist 3 and 4 possess exceptional problem-solving and communication skills, which enable them to effectively articulate hydraulics design, data analysis, and technical concepts to stakeholders. They have an analytical mindset and great attention to detail, which helps them identify inefficiencies and opportunities for improvement that contribute to the success of hydraulics projects. The Hydraulics Design Engineering Specialist 3 and 4 understand that the best results are achieved through collective effort and effective communication.