

TRANSPORTATION ENGINEER V

Code 2706

Salary Grade 0019

I. CLASSIFICATION DEFINITION:

This is team leader and expert level civil engineering work performing complex engineering projects and processes in highway, traffic, construction, structural, rail, port, airport, maintenance, materials or other transportation areas. Some employees serve as team leader on large and complex engineering projects leading and directing multi-disciplinary project teams with professionals and consultants, others may be assigned administrative and managerial responsibility for an organizational unit overseeing technical work functions. Other positions independently perform expert level duties within one or more highly specialized areas within the field of Transportation Engineering such as highway, bridge, airport, rail, port, facility design, traffic or hydraulics.

Employees receive general supervision from a higher level engineering manager. Work is performed in an office setting and in the field; work may require physical inspection of job sites.

Specific position allocation to this level is determined by application of the Position Appraisal Method of Job Evaluation and the point to grade conversion contained in the Transportation Engineer July 1, 2008 ASR classification standards.

II. MINIMUM QUALIFICATIONS:

Education: Possession of a bachelor's degree in engineering from an accredited college or university.

Experience: Five years experience in professional engineering.

Notes:

1. Additional work experience in professional engineering, or in technical engineering at the journey level or above, may be substituted on a year for year basis for the required education.
2. Possession of a Master's Degree in engineering may be substituted for one year of the required experience.
3. Persons currently registered as Professional Engineers in the State of Maryland, or in a State with comparable requirements, are considered to have met the education requirements.

Licenses, Registrations and Certificates:

1. Employees in this class may be required to possess a Professional Engineer, Land Surveyor or Property Line Surveyor License.
2. Employees of the Maryland Transportation Authority may be required to possess an

Engineer-In-Training License from the Department of Labor, Licensing and Regulation.

3. Employees in this classification may be assigned duties which require the operation of a motor vehicle. Employees assigned such duties will be required to possess a motor vehicle operator's license valid in the State of Maryland.

III. EXAMPLES OF WORK: (Examples are illustrative only)

Plans, organizes, coordinates, schedules, assigns and evaluates the work of subordinate engineers and technicians; provides training and work performance counseling as needed;

Serves as project manager on large and complex engineering projects; conducts field work, survey, research, preliminary and final design; determines construction quantities; writes proposals;

prepares contract documents, right of way and easement descriptions; provides engineering detail for environmental impact statements and develops cost estimates;

Prepares engineering designs, plans, specifications and cost estimates for the construction/rehabilitation of roads, bridges, storm drains, rail, buildings and other transportation facilities; participates in public hearings, finalizes plans, drafts specifications, etc.;

Administers consultant contracts including approval of monthly invoices and progress payments;

Reviews and comments on design submittals from consulting engineers to ensure compliance with standards and regulations; meets with consultants to resolve problems;

Supervises and conducts the review and evaluation of Consultant Technical Proposals and Extra Work Requests;

Reviews plans and specifications for roads, bridges, storm drainage, buildings and other facilities submitted for new construction, rehabilitation or improvements to ensure compliance with contracts, regulations and engineering standards;

Prepares and maintains a variety of engineering documents including plans, specifications, contracts, maps and standards;

Prepares designs, plans, specifications and cost estimates for communications maintenance and repair and traffic management systems;

Prepares specifications and cost estimates for construction and maintenance equipment;

Coordinates Emergency Operations Center Team activation and operation;

Coordinates projects among outside agencies, property owners and other divisions within the agency; prepares reports and memos describing projects; conducts inspections of work as needed;

Answers inquiries from other agencies, interested parties and the public regarding engineering projects;

Maintains and prepares public works installation and project records and reports;

Provides information to and works with architects, engineers, contractors and developers to ensure adherence to proper standards and codes;

Conducts research, evaluates and makes recommendations regarding proposed and existing laws, standards and policies; writes contracts for engineering services; prepares requests for proposals; participates in selecting engineering consultants and contractors;

Serves as project liaison with the project construction engineer during the construction phase; makes changes and additions to the construction plans as needed;

Conducts studies and research to analyze and project present and future needs as they relate to engineering designs and solutions to current and anticipated problems;

Provides data and other information to interested groups;

Attends a variety of meetings;

May provide testimony at formal hearings or in court.

IV. REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

Knowledge of professional civil engineering principles, practices and methods;
Knowledge of design principles, strength of materials and stress analysis required in planning construction/rehabilitation projects;
Knowledge of computer applications relative to engineering projects;
Knowledge of construction standards and regulations
Knowledge of effective supervisory methods and practices;
Skill in reading maps, deeds, plats and plans;
Skill in preparing accurate plans, specifications, cost estimates and engineering reports;
Skill in making accurate engineering computations and drawings;
Ability to maintain a variety of technical records and adapt records systems for computerization;
Ability to plan, organize, coordinate, assign and evaluate the work of engineering technicians and other support staff;
Ability to communicate effectively and to prepare technical reports;
Ability to establish and maintain effective working relationships with other employees, engineers, architects and the general public;
Ability to physically perform essential duties.

V. SPECIAL REQUIREMENT:

Applicants may be subject to a background check which may impact employment. A history of arrest or conviction is not an automatic disqualification to employment. Applicants, who are considered for work at the Maryland Aviation Administration, are subject to an extensive pre-employment security background check as required by the Federal Aviation Administration, Federal Aviation Regulation Part 107.

Adopted: July 1, 1997
Revised: July 1, 2001
Revised: July 1, 2008

APPROVED: _____
Director, Office of Human Resources

TRANSPORTATION ENGINEERING TECHNICIAN V

Code 8450

Grade 0015

I. CLASSIFICATION DEFINITION:

This is the advanced technical or senior project management level of work performing a variety of complex engineering support tasks. Some positions in this classification are responsible for supervising staff. Specific duties depend on job assignments and may include serving as Project Engineer for large sized construction and maintenance projects; overseeing complex maintenance activities; serving as Assistant Project Engineer on major bridge and highway design projects; overseeing the development and performance of advanced soils and materials testing programs; serving as party chief on a survey crew, or exploration crew; overseeing the development and advertisement of maintenance contracts, overseeing budget allocations statewide; or designing and coordinating major design and planning and traffic management projects. The employee is expected to give guidance and assistance to less experienced employees and may supervise a project team, crew or unit. Supervision is not a requirement when highly specialized expertise can be documented.

Work is performed under the general direction of an engineer, or other professional employee. Work conditions vary depending on assignments and are performed in the office or in the field during survey and inspection assignments with exposure to varying weather conditions and rough terrain and requirements for walking, standing, bending, and lifting loads weighing up to 80 pounds; may require working in close proximity with traffic on Maryland highways; requires hand/eye coordination in the efficient operation of computers and other office machines, survey equipment and the like. Employees in this classification may be required to work various shifts and on weekends depending on assignments. Employees in some positions in this classification may be required to travel and be available for work in any part of the State, subject to change of assignment, as work requires.

Specific position allocation to this level is determined by application of the Position Appraisal Method of Job Evaluation.

II. MINIMUM QUALIFICATIONS:

Education: Graduation from a standard high school or possession of a high school equivalency certificate.

Experience: Eight years of experience in technical engineering related work in the areas of design, traffic, construction, materials testing, engineering surveys, maintenance, or planning.

Notes:

1. Applicants may substitute education in a civil engineering curriculum at an accredited college or university at the rate of 30 semester credit hours for each year of the required experience, up to a maximum of three years.
2. Applicants who possess an Associates Degree in either Engineering, Construction Management or Surveying or Surveying Technology from an accredited community college, college or university are considered to have met two years of the eight year experience requirement.

Licenses, Registrations and Certificates:

1. Employees in this classification may be assigned duties that require the operation of a motor vehicle. Employees in some positions in this classification may be required to possess a motor vehicle operator's license valid in the State of Maryland. A CDL license may be required for some positions.
2. National Institute for Certification in Engineering Technologies (NICET) certification, in-house certifications or state-sponsored, material-testing certification may be required for some positions.
3. Employees in this classification may be required to possess Federal Highway Administration (FHWA) certification for inspection of In-Service Bridges, or have the ability to acquire this certificate within a given time period.
4. Employees in this classification may be required to achieve certification in field testing procedures in concrete, soil aggregate and Hot Mix Asphalt within a given time period.

III. EXAMPLES OF WORK: (Examples are illustrative only)

Oversees or performs plan review, field inspections, and field investigations during design, construction and maintenance of roadways, structures and traffic control devices for conformance to plans and specifications;

Operates electronic and mechanical equipment required in surveying, drafting and design, field inspection, and materials testing;

Researches a variety of electronic and mechanical equipment in carrying out surveying, drafting and design and materials sampling and testing;

Provides information to and works with architects, engineers, contractors and developers to ensure adherence to standards and codes;

Conducts or participates in project milestone review meetings on transportation related projects;

Prepares correspondence to respond to or inform the public, elected officials, federal, state or local government agencies of project information;

Schedules and directs the work of construction inspectors assigned to construction and maintenance projects;

Monitors contract performance and project status for major construction and maintenance projects;

Develops and oversees material testing programs in permanent and portable labs and at material supplier facilities;

Monitors contractors, producers, and fabricators and assures quality control of materials used in the construction of roadways, bridges and facilities, and assures materials used meet state specifications;

Directs the preparation of plans, plats and drawings for various engineering improvements and installations, prepares construction drawings based on engineer's notes, survey notes, field and records research, and engineering calculations, updates maps, plats, and other engineering records based on "as built," survey notes and other information, and conducts engineering surveys as needed;

Compiles quantities and reviews construction reports and other data;

Creates complex horizontal and vertical alignments using Computer Aided Design and Drafting (CADD) and coordinate geometry software;

Provides technical guidance and support to office and field personnel concerning design, survey, software, hardware and procedures;

Oversees the development of CADD plans, plats and other project documents;

Prepares and reviews special provisions, design agreements, and continuity of plans as necessary, and assists in determining if contract plans are complete;

Performs complex design and survey calculations to translate raw data into information for the design and construction of public works and other transportation-related projects;

Maintains records and prepares reports pertaining to public works installations and projects;

Compiles, documents, and reviews maintenance reports/studies including costs and other data, determining if maintenance contracts adhere to current maintenance practices and standards;

Oversees and is responsible for the clearance of utilities and other underground obstructions prior to subsurface exploration;

Oversees and is responsible for locating subsurface features through the use of preliminary engineering design documents and/or the use of electronic geographical positioning equipment;

Reviews, evaluates and approves Quality Control plans submitted by material producers and fabricators;

Performs hydrographic surveys of shipping channels and berths;

Establishes horizontal and vertical controls for hydrographic surveys;

Determines tide adjustments and edits hydrographic surveys;

Provides data, analysis, recommendations and corrective measures for Environmental Impact Studies;

Reviews work of other employees;

Performs multi-fatal accident analysis;

Performs other related duties.

IV. REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

Knowledge of basic engineering principles, practices, and methods;
Knowledge of CADD using Microstation, manual drafting and surveying;
Knowledge of design criteria, construction standards and inspection methods and techniques;
Knowledge of statistical principles;
Knowledge of algebra, geometry and the principles of basic mathematics used in engineering design, drawing and drafting;
Knowledge of AASHTO and other policies and procedures used in the design and construction of transportation projects;
Knowledge of Temporary Traffic Control Standards, National Electrical and Safety Codes, and Manual on Uniform Traffic Control Devices;
Knowledge of the principles and standards of highway, bridge and interchange design including geometrics, hydraulics, capacity, economics and traffic assignments;
Knowledge of materials and construction methods as they apply to the design of transportation projects;
Knowledge of Federal Highway Regulations and Criteria for Coding In-Service Bridge conditions;
Knowledge of Federal Aid regulations;
Knowledge of AASHTO and ASTM test specifications and methods;
Knowledge of effective supervisory methods and practices;
Skill in interpreting, analyzing, or preparing maps, deeds, plats, and plans;
Skill in operating computers using Microstation and other related engineering software;
Skill in the maintenance and operation of electronic and mechanical equipment used in performing complex technical engineering support tasks;
Skill in reading and creating blueprints and engineering drawings, right of way plats, and plans, using CADD or manual processes;
Skill in reading and interpreting complex engineering drawings and computations;
Ability to streamline and optimize complex design, surveying and mapping processes;
Ability to place complex traffic control devices and systems in operation;
Ability to maintain a variety of technical records and adapt records systems for computerization;
Ability to update computer design files, maps and other records;
Ability to establish and maintain effective working relationships with other employees and the general public;
Ability to prepare correspondence for transportation projects informing the public, elected officials and others about project specific data;
Ability to communicate effectively;
Ability to physically perform essential duties.

V. SPECIAL REQUIREMENTS:

Employees in this classification may be considered “Essential Employees” and may be required to sign and agree to all policies and procedures relating to “Essential Employee” status.

Date Revised: December 16, 2003

APPROVED: _____
Director, Office of Human Resources

TRANSPORTATION ENGINEERING TECHNICIAN III

Code 8448

Grade Band 11-12

I. CLASSIFICATION DEFINITION:

This is the journey level of work performing a variety of engineering support tasks. Employees perform transportation engineering survey, inspection, design, materials testing, data collection, traffic analysis and administrative duties. Specific duties depend on job assignments and may include inspecting construction and maintenance projects; conducting roadway and bridge inspections; evaluating methods for maintenance operations; performing tests on soils and materials; serving on a survey crew; drafting design details, maintenance contract specifications, and construction notes; calculating quantities for construction projects and maintenance activities; preparing Computer Aided Design and Drafting (CADD) plans, maps, or right of way plats; collecting and recording traffic data and conducting traffic studies; and compiling planning data for reports. Employees in this class may serve as a Project Manager on small sized construction projects, or may serve as an experienced rodman on a survey crew. Employees in this class may supervise, and may serve as a lead worker over a crew and may be expected to give guidance and assistance to less experienced employees.

Work is performed under the general supervision of an engineer, surveyor, or higher level technical employees. Work conditions vary depending on assignments and are performed in the office or in the field during survey and inspection assignments with exposure to varying weather conditions and rough terrain and requirements for walking, standing, bending, and lifting loads weighing up to 80 pounds; may require working in close proximity with traffic on Maryland highways; requires hand/eye coordination in the efficient operation of computers and other office machines, survey equipment and the like. Employees in this position may be required to work various shifts and on weekends depending on assignment. Employees in some positions in this classification may be required to travel and be available for work in any part of the State, subject to change of assignment, as work requires.

Positions assigned to the Transportation Engineering Technician III classification function as journey level positions distinguished from the Transportation Engineering Technician II by the ability to perform more complex tasks requiring greater technical knowledge.

II. MINIMUM QUALIFICATIONS:

Education: Graduation from a standard high school or possession of a high school equivalency certificate.

Experience: Three years of experience in technical engineering related work in the areas of design, traffic, construction, materials testing, engineering surveys, maintenance, or planning.

Notes:

1. Applicants may substitute education in a civil engineering curriculum at an accredited college or university at the rate of 30 semester credit hours for each year of the required experience.
2. Applicants who possess an Associates Degree in Engineering, Construction Management or Surveying or Surveying Technology from an accredited community college, college or university are considered to have met two years of the required experience.

Licenses, Registrations and Certificates:

1. Employees in this classification may be assigned duties that require the operation of a motor vehicle. Employees in some positions in this classification may be required to possess a motor vehicle operator's license valid in the State of Maryland. A CDL license may be required for some positions.
2. National Institute for Certification in Engineering Technologies (NICET) certification, in-house certifications or state-sponsored, material-testing certification may be required for some positions.
3. Employees in this classification may be required to possess Federal Highway Administration (FHWA) certification for inspection of In-Service Bridges, or have the ability to acquire this certificate within a given time period.
4. Employees in this classification may be required to possess an American Society for Non-Destructive Testing Level I Certification.
5. Employees in this classification may be required to achieve certification in field testing procedures in concrete, soil aggregate and Hot Mix Asphalt within a given time period.

III. EXAMPLES OF WORK: (Examples are illustrative only)

Performs CADD and hand drafting of highway plans, right of way plats and mosaics, highway design and topographic features requiring reduction of field notes and the application of survey information, using computerized and manual processes;
Develops and updates various road plans, right of way plats and maps;
Checks deed, estate and tax records to establish property lines;
Performs field inspections to monitor road conditions, bridges, road construction and traffic projects, and material used in road construction and repair;
Performs in-service bridge inspections in accordance with FHWA criteria;
Prepares project specifications on transportation projects;
Reviews construction, maintenance or traffic projects for compliance with project specifications;
Participates in traffic control utility relocation activities;
Collects samples, conducts tests and evaluates test results on soils, asphalt, cements/concrete, aggregates, bituminous products, metal products and industrial coatings;
Performs inspection and testing at materials supplier facilities;

Performs calculations to establish design, contract quantities and cost estimates;
Assists in developing construction notes and placing notes on contract documents;
Compiles field notes, completes preliminary drawings, and plot plans, profiles, and elevations;
Uploads and edits field survey data files;
Performs preliminary processing to check and correct field survey data;
Performs surface model and contouring to create digital terrain models (DTM's);
Creates electronic topographic mapping using CADD software;
Assists in performing field reviews to assure accuracy of topographic mapping;
Researches, develops and maintains computerized and manual records, logs, and maps relating to assigned duties;
Operates electronic and mechanical equipment relating to drafting, surveying, materials testing and sampling and inspection;
Conducts ongoing studies of maintenance activities;
Drafts maintenance contract specifications;
Assists in an annual review of highways and roadsides at the shop, district, and statewide levels to determine the quality of highway maintenance;
Assists in the development of software programs for monitoring budget expenditures;
Participates in field reviews for various studies and analyses, and creates condition diagrams via CADD computer programs;
Prepares written correspondence for various data requestors (local police, government agencies, the media, the general public, other SHA departments, etc.);
Conducts moderately complex traffic studies;
Performs other related duties.

IV. REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

Knowledge of basic engineering principles, practices, and methods;
Knowledge of CADD drafting using Microstation or other engineering software;
Knowledge of design criteria, construction standards and inspection methods and techniques;
Knowledge of algebra, geometry and the principles of basic mathematics used in engineering design, drawing and drafting;
Knowledge of Temporary Traffic Control Standards, National Electrical and Safety Codes, and Manual on Uniform Traffic Control Devices;
Knowledge of Federal Highway Regulations and Criteria for Coding In-Service Bridge conditions;
Knowledge of AASHTO and ASTM test specifications and methods;
Knowledge of the American Welding Society specifications for structures and bridges;
Knowledge of human factors relating to traffic control design and driver performance;
Skill in the operation of electronic and mechanical equipment used in performing technical engineering support tasks;
Ability to learn new computer skills and data processing procedures;
Ability to interpret, analyze, or prepare maps, deeds, plats, and plans;
Ability to perform basic mathematical computations used in engineering design, drawing and drafting;
Ability to maintain records and adapt records systems for computerization;

Ability to read and create blueprints and engineering drawings and plans, using CADD or manual processes;

Ability to update computer design files, maps and other records;

Ability to establish and maintain effective working relationships with other employees and the general public;

Ability to communicate effectively;

Ability to physically perform essential duties.

V. SPECIAL REQUIREMENTS:

Employees in this classification may be considered “Essential Employees” and may be required to sign and agree to all policies and procedures relating to “Essential Employee” status.

Date Revised: December 16, 2003

APPROVED: _____
Director, Office of Human Resources